

PHONEGATE

**Documented warnings, officially confirmed non-compliance,
and the urgent need for effective health protection**

Alerte Phonegate's comments on radiofrequency exposure

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Real-world exposure • Reliability of testing • Proprietary software • Public health



Worldwide health alert on cell phones hazards

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France

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EXECUTIVE SUMMARY

TWO CONSULTATIONS, ONE EVIDENTIARY DOSSIER. This substantive report was prepared to inform two separate public consultations: the FCC proceeding addressing the issues remanded by the federal court and the Department of Health and Human Services (HHS) proceeding on health evidence, standards and regulatory approaches concerning radiofrequency exposure. [34][75]

THE CENTRAL ISSUE. Since 2012, US authorities have received warnings about whether SAR compliance tests are representative of actual use. A phone may be certified as compliant under laboratory conditions without those tests reproducing ordinary use next to the head and body. Until very recently, US procedures permitted testing separations of up to 25 mm. Yet test separation, proximity and motion sensors, power-reduction mechanisms and software updates directly influence measured exposure. Alerte Phonegate has warned the FCC since 2018 about this discrepancy between certification and real-world exposure. [1][2][74]

THE EVIDENCE. In 2019, Pulitzer Prize-winning journalist Sam Roe's investigation for the Chicago Tribune documented SAR measurements well above 1.6 W/kg in several configurations across eleven phone models. It also experimentally demonstrated that procedures intended to trigger sensors altered measured results for certain phones. The data from subsequent FCC testing at 2 mm warrant independent, adversarial scrutiny. Official market surveillance by France's ANFR and Canada's ISED has likewise revealed exposure-limit exceedances, withdrawals and/or post-market corrections. [4][5][6][14][74]

THE INSTITUTIONAL WARNING. The iPhone 12 case shows that proprietary power-management algorithms and testing methods lie at the heart of market surveillance. The European Commission's Joint Research Centre (JRC) identified shortcomings in the harmonized standard, particularly regarding sensors and dynamic transmission systems. On January 5, 2024, ANFR Director General Gilles Brégrant officially warned the European Commission of the risk that authorities could be required to test devices specially prepared by manufacturers, potentially different from the products sold to consumers. These warnings substantiate our demand for independent verification of the software integrity of the devices being tested. [7][8][77]

THE HEALTH DIMENSION. These findings call for a reassessment of the exposure levels actually experienced by populations before corrective measures were introduced, and how those exposures have been considered in risk assessments. This report examines findings from the National Toxicology Program (NTP), brain-cancer data including glioblastoma published by Santé publique France, effects on reproduction and pregnancy, childhood exposure, and symptoms reported by people with electromagnetic hypersensitivity. It also addresses conflicts of interest, notably surrounding the international MOBI-KIDS study, and the accountability of standard-setting organizations. Spot SAR measurements alone cannot capture the public-health implications of repeated exposures over several decades. [9][18][19][23][47]

ACTIONS REQUESTED. We call for testing in direct contact and under foreseeable conditions of use; independently verifiable testing of commercially purchased devices; traceability of software versions and power settings; access to the information required for independent testing; publication of test reports and follow-up measures after exceedances; effective enforcement and penalties; and a transparent reassessment of exposure standards. These requests concern certification, consumer information, prevention and public health. The dossier comprises twelve chapters, fifteen proposals addressed to the FCC, scientific studies, official decisions and key evidence reproduced in its annexes. [34][35][75][76]

01 THE FCC WAS WARNED: SUSTAINED INTERNATIONAL ACTION (2012–2026)

In August 1996, the FCC adopted its radiofrequency-exposure guidelines (FCC 96-326), including a localized SAR limit of 1.6 W/kg averaged over 1 g of tissue for the general public. Thirty years after their adoption, those requirements call for reassessment in light of the sensors, software updates and testing methods used in today's smartphones. [85]

In July 2012, the Government Accountability Office (GAO), the US congressional audit agency, called on the FCC to review exposure limits and phone-testing procedures, particularly when devices are used against the body. **Both GAO recommendations were ultimately designated 'Closed – Not Implemented'.** This official report establishes that the need for representative testing had been identified even before Alerte Phonegate began its interventions. [1]

On March 20, 2018, Alerte Phonegate sent FCC Commissioners a letter signed by its president, Dr Marc Arazi, with the participation of Professor Devra Davis. The letter detailed ANFR findings and called for body-contact testing, stronger protection of children and oversight of mechanisms capable of changing transmission power during measurements. [2]

That same year, Alerte Phonegate submitted written comments to the NTP and took part in the scientific review of its studies in North Carolina, where Dr Marc Arazi delivered an oral statement in March 2018. In June 2018, the association reiterated the importance of the French measurements and exceedances identified in certain devices, pointing out that ANFR-measured human SAR levels were higher than those investigated in NTP experiments. [3]

In August 2019, Sam Roe's Chicago Tribune investigation revealed concerning laboratory results for several popular smartphones. The journalist had been in contact with Alerte Phonegate since January 2018. Our NGO subsequently submitted to Congress its 'Background and Facts Documenting PhoneGate and Our Call for Congressional Action', addressing failures in certification procedures, public information and manufacturer oversight. [4]

Continued cooperation with North American organizations after 2019

The dossier is not confined to our US actions in 2018–2019. Alerte Phonegate continued to exchange information and documentary evidence with American and Canadian organizations, as well as legal advisers involved in multiple proceedings concerning certification and consumer information.

This sustained work must be considered alongside public legal and regulatory actions: the 2021 ruling in Environmental Health Trust v. FCC; Canadian decisions in 2022 and 2024 in proceedings involving Apple and Samsung; the Canadian Supreme Court's refusal of leave to appeal in May 2025; official JRC findings and European decisions concerning the iPhone 12; and the continued FCC remand proceedings in 2026.

[2][22][59–63][7][8]

THE QUESTION STILL UNANSWERED

What specific measures has the FCC taken since GAO's 2012 warnings and Alerte Phonegate's warnings in 2018 and 2019 to prevent certification under conditions more favorable than those encountered by users?

The US documentary record made the issue impossible to ignore

GAO Report 12-771 of July 24, 2012 was not merely an NGO proposal: it came from the congressional audit agency. Its recommendation on test procedures specifically addressed foreseeable scenarios in which a phone is held against the body. GAO emphasized that testing at a separation distance might fail to disclose maximum exposure. The official follow-up record lists both recommendations as 'Closed – Not Implemented'. [1]

Our letter of March 20, 2018 went further. It did not merely raise a health concern: it called for contact-testing protocols; scenarios involving metal objects and implants; methods adapted to children; clearly visible consumer information; and verification of devices or algorithms capable of influencing transmitted

power during tests. This seven-page letter remains a foundational documentary exhibit in the history of the campaign. The 2026 FCC submission must restate its demands and show, item by item, what has or has not changed. [2]

In March 2018, Alerte Phonegate did more than submit public comments. After submitting written observations, Dr Marc Arazi presented the association's comments during the scientific peer review of the NTP's animal studies. Additional observations were submitted for the June 2018 meeting. The precise question was the comparability of exposure levels and the actual levels experienced by certain human tissues. [3]

The dossier submitted to Congress in 2019 remains relevant today. It highlighted the contradiction between compliance demonstrations conducted at a distance from the body and everyday uses depicted in advertising; difficult-to-find user manuals; and inadequate post-market inspections. Its purpose was explicitly political and administrative: who oversees manufacturers, who informs consumers and who is accountable for devices already sold? [4]

Sam Roe's contribution: an independent investigation that extended an earlier warning

Sam Roe's investigation, published by the Chicago Tribune on August 21, 2019, covered eleven retail-purchased phone models tested by RF Exposure Lab, a laboratory recognized by the FCC. The investigation compared certification separation distances selected by manufacturers (5, 10 or 15 mm) with a 2 mm distance representing carrying a phone in a pocket. After Apple and Motorola challenged the results, the newspaper commissioned modified tests intended to activate power-reduction 'proximity sensors'. The figures below are those reported by the investigation, not certification values approved by the regulator. [4][74]

Device	Standard test: manufacturer's distance	2 mm test: pocket	Modified test targeting sensors
iPhone 8	2.64 W/kg at 5 mm	About three times 1.6 W/kg	Below 1.6 W/kg at 5 mm
iPhone 7 — four devices	Mean of 2.59 W/kg at 5 mm	All above 1.6 W/kg	Mean of 3.225 W/kg at 5 mm; all above 1.6 W/kg
Motorola Moto e5 Play	4.70 W/kg at 5 mm	About four times 1.6 W/kg	Below 1.6 W/kg at 5 mm
Samsung Galaxy S8	Below 1.6 W/kg at manufacturer's distance	8.22 W/kg	No new test of this kind reported
Galaxy S9 / Galaxy J3	Below 1.6 W/kg at 10 or 15 mm	More than twice 1.6 W/kg	No new test of this kind reported

REGULATORY SIGNIFICANCE. As early as 2019, the Chicago Tribune's tests established that protocols designed to activate power-reduction sensors could change measured SAR values. The iPhone 8 and Motorola Moto e5 Play results fell below 1.6 W/kg in the subsequent tests, whereas those of the four iPhone 7 devices did not. The FCC must establish how laboratories trigger, check and document these functions, and verify that phones sold to consumers reproduce the tested configurations. [74][84]

A CONTINUOUS DOCUMENTARY RECORD

2012: GAO sounds the alarm. 2018: Alerte Phonegate directly warns the FCC and participates in the NTP review. 2019: Sam Roe's investigation and a Congressional dossier make the issue public. 2026: the FCC must still justify its methods.[1][2][3][4][34]

02 COMPLIANCE TESTING: ISSUES FOR THE FCC AND HHS

User exposure depends on the separation between the device and the body, transmitted power, frequencies, antennas, network availability, accessories and software. Holding a phone near the ear, in a pocket or against the abdomen is not an exceptional use: it is everyday life for millions of consumers.

Specific Absorption Rate (SAR) limits are supposed to safeguard health by checking compliance with absorption limits. A finding of compliance obtained solely in artificially separated configurations does not establish that the same levels would be measured during direct contact. The US limit of 1.6 W/kg averaged over 1 g and the European limit of 2 W/kg over 10 g cannot be compared directly without accounting for other testing parameters. [5][11]

REGULATORY FRAMEWORKS: VALUES, MASS, DURATION AND DISTANCE MUST BE DISTINGUISHED

PARAMETER	UNITED STATES / FCC	EUROPEAN UNION / ICNIRP
Head and trunk SAR, public	1.6 W/kg averaged over 1 g	2 W/kg averaged over 10 g
Limb / extremity SAR	4 W/kg averaged over 10 g for extremities	4 W/kg averaged over 10 g for limbs
Head / limb testing separation	FCC position- and category-specific conditions	Head in contact; limbs in contact (0 mm)
Trunk / body-worn SAR	2025 guidance generally ≤ 5 mm, subject to specified exceptions	Previous trunk framework up to 5 mm; A2:2025 moves toward 0 mm for relevant configurations
Averaging times	Vary by quantity and population; duration cannot be reduced to a single protective factor	ICNIRP 2020: 6 minutes for localized SAR; 30 minutes for whole-body exposure

Commission Implementing Decision (EU) 2026/2003 of September 4, 2026 added a reference to an amendment of EN 50566:2017 to the list of harmonized standards, with a transitional period for the former reference until March 7, 2028. **This change concerns trunk SAR; limb SAR was already to be tested in direct contact.** [12]

What carrying a phone against the body actually means

A phone against the fabric of a jeans pocket, near the abdomen of a seated person or against the chest is neither misuse nor an unlikely scenario. A regulatory 5 mm test separation does not automatically reproduce these conditions. The effect of distance varies with frequency band, antenna, phone geometry, positioning and software settings. The request for contact testing must therefore be accompanied by testing the **reasonably foreseeable worst-case scenario**, rather than reduced to a single supposedly universal distance. [5][7][8][12]

SAR is not a measure of the 'total amount of radiation' a person receives over a lifetime. It measures absorption averaged over a particular mass of tissue and duration, under defined technical conditions. This is why the association calls for comparable results, realistic scenarios, software traceability and eventually additional exposure indicators. **SAR is intended to protect health; a protective metric cannot suffice if its measurement conditions do not adequately reflect actual use.** [5][11]

The comparison must also encompass occupational exposure

Under FCC and ICNIRP frameworks, limits for workers and persons exposed under controlled conditions are higher than those for the general public. For localized head/trunk SAR, the FCC specifies 1.6 W/kg for the public and 8 W/kg for occupational exposure, both averaged over 1 g. ICNIRP 2020 sets 2 and 10 W/kg respectively over 10 g. Such occupational limits presuppose training, control over exposure and access to information—conditions that cannot simply be assumed for every worker. [11][38]

This difference has practical implications. Antenna technicians, workers using multiple radios, personnel equipped with connected professional devices and intensive smartphone users are not a homogeneous population. The FCC should explain how its system assesses actual exposure, simultaneous transmissions and accumulated exposure duration, and how users can determine which requirements apply to them. The distinction between public and occupational limits is meaningful only where the underlying real-world conditions can be verified.

EXPOSURE TO DISTINGUISH	CERTIFICATION ISSUE	REQUESTED ACTION
Head SAR — contact	Head near the antenna during calls; adult/child models	Verify positions, anatomical models and scenarios.
Trunk SAR — 5 mm / contact	Phone in a pocket, against abdomen or chest	Test in contact for foreseeable use conditions.
Limb SAR — 0 mm	Hand, wrist, body-worn uses; official iPhone 12 case	Maintain contact testing and examine algorithms.
Occupational SAR	Higher exposures allowed where exposure control is assumed	Document training, control and cumulative sources.

03 OFFICIALLY CONFIRMED EXCEEDANCES: HOW WILL THE FCC RESPOND?

France has inspected hundreds of phone models since 2012. Since 2018, ANFR market-surveillance campaigns have resulted in withdrawals, recalls or software updates involving dozens of phones and tablets. Alerte Phonegate's inventory presented to OPECST reported 71 affected devices as of August 2026. [5][13]

In Canada, ISED records obtained through our NGO's transparency initiatives provided data on 90 tested models and identified eight devices whose measured levels exceeded the applicable limits in the examined configurations. Some cases led to software-based power reductions. **A later software correction does not undo the period of earlier use.** [14]

In the United States, the Chicago Tribune investigation prompted the FCC to conduct its own tests in 2019. A 2025 analysis by Theodora Scarato of documents obtained through FOIA reports that **ten of seventeen trunk SAR measurements at 2 mm, on eleven phones, exceeded 1.6 W/kg**. These tests demonstrate why close-to-body use conditions require more thorough public investigation. The underlying FCC data tables should also be compared with this analysis. [6]

A PRINCIPLE OF PROTECTION

If a laboratory obtains a different result as soon as separation or software changes, the regulatory question is not settled by saying 'compliant under the protocol'. The protocol itself, its representativeness and the information given to the user must be reexamined.

France: products sold and subsequently withdrawn or corrected

ANFR surveillance campaigns have established that marketed products can exceed applicable limits under measured conditions. Orders for withdrawal, recall or software updates are not allegations made by Alerte Phonegate: they are administrative measures targeting identifiable models. Our 2026 inventory brings the total in France since 2018 to 71 phones and two tablets. [5][13]

A product withdrawal establishes a conformity failure sufficiently serious to warrant regulatory intervention. The practical consequences are considerable: consumers may have carried devices close to their bodies before learning, sometimes years later, about a possible corrective update; subsequent software changes have reduced power levels. Previous exposure does not disappear when the manufacturer releases new firmware.

Canada: transparency requests and eight identified exceedances

Test findings disclosed following Alerte Phonegate's access-to-information efforts relate to 90 models and identify eight devices that exceeded limits in the configurations examined. The records cover multiple manufacturers and establish that active surveillance outside Europe can uncover comparable problems. Investigations and corrective measures were carried out for certain devices, including software-based power reductions. [14]

The implication for the FCC is clear: if ISED and ANFR have found anomalies in phones already sold, the United States must account for the resources, frequency and representativeness of its own post-market checks. Recognition of initial certification results is not proof that a retail-purchased device, updated and used in present-day conditions, will remain compliant.

The FCC's own testing in 2019: a record that must be fully disclosed

Sam Roe's investigation prompted testing by the US regulator. A scientific article by Theodora Scarato published in December 2025 reports, from FOIA records, **ten measurements above 1.6 W/kg among seventeen trunk SAR measurements taken at 2 mm on eleven phones**. The FCC did not consider these figures evidence of failure to comply with its then-applicable protocols and publicly described the phones as compliant under its test conditions. [6] **In its official letter of September 29, 2023** to Theodora Scarato responding to two FOIA requests, the FCC expressly acknowledged that its 2 mm measurements exceeded its exposure limits, while characterizing those conditions as 'extreme'. Eleven of eighteen identified documents were released and seven withheld under Exemption 5. [86]

That is precisely the distinction that must be made explicit: compliance as defined by a test procedure does not necessarily settle the exposure level when users place a phone close to their body. We call for release of the original testing table, exact device and distance identifiers, and an explicit response on what these findings mean for testing protocols and consumer information.

Post-market surveillance must go beyond recording that an FCC ID authorization exists. It must connect authorization records to the hardware, radio configuration, updates, reasonably foreseeable use conditions and independent test results. Alerte Phonegate is not asking the FCC to create a database that already exists; we are asking that the database become the starting point for verifiable and independently reviewable oversight.

THREE SYSTEMS, ONE SHARED WEAKNESS REQUIRING INVESTIGATION
France: official non-compliance and corrective actions. Canada: eight devices exceeding limits in disclosed testing. United States: concerning FCC 2 mm results according to FOIA records.
The common finding is that an assurance of compliance is insufficient.^{[5][6][14]}

04 IPHONE 12, ANFR AND JRC: WHAT THE FCC MUST EXAMINE

Among the most revealing evidence in the current dossier are the findings of the European Commission Joint Research Centre (JRC) report of July 25, 2024, subsequently provided to Alerte Phonegate. The report examines tests of the iPhone 12 A2403, Apple's proposed protocols and the investigations conducted by CETECOM laboratory. ^[7]

In particular, it establishes that the standard specified no testing method for smartphones equipped with motion sensors, multiple-antenna systems, dynamic antenna switching and power-control mechanisms such as time-averaged SAR (TAS). ^[7]

JRC FINDING, JULY 25, 2024
A harmonized compliance standard did not provide the methods needed to address several hardware and software functions already present in products sold to consumers. This institutional finding directly echoes Alerte Phonegate's warnings over many years.

Commission Implementing Decision (EU) **2025/1760 of August 19, 2025** goes further. It describes the Body Detect feature, the initial testing protocol proposed by Apple using a motorized device and artificial vibrations, ANFR's rejection of that protocol, and subsequent tests that produced a limb SAR of **5.740 W/kg** against a limit of 4 W/kg. ^[8]

The Commission considers it inappropriate to rely on proprietary tools whose algorithms are undisclosed when independently evaluating SAR (recital 82). It confirms that France's measure was justified. It also notes that the corrective permanent activation of Body Detect was initially confined to devices operating on French networks, despite the release of iOS 17.1. ^[8]

The FCC ID BCG-E3544A certification file also contains a 2020 Body Detect validation report, noting the use of power tables configured for validation that could differ from those of the final marketed product. ^[15]

OFFICIAL EVIDENCE	ESTABLISHED FACT	QUESTION FOR THE FCC
JRC — July 25, 2024	Methodological gap concerning sensors and algorithms	How does US certification validate the same mechanisms?
EU 2025/1760 — iPhone 12	Limb SAR 5.740 W/kg; updated Body Detect functionality	Do equivalent configurations exist on US models?
FCC BCG-E3544A — 2020	Validation report concerning a proprietary power-management mechanism	Correspondence between test tables, retail software versions and updates?

The full significance of the JRC findings: a methodological failure, not an Apple anecdote

The authors of the 2024 JRC report do more than recommend another Apple software release. They establish that the harmonized standard itself lacked procedures suited to features affecting measurement outcomes. This is a systemic finding: where a standard fails to address the sensors and algorithms deployed in a generation of phones, regulators cannot assume that mechanically repeating old tests suffices to establish public protection. [7]

The JRC's conclusions extend beyond Apple: they reveal gaps in the harmonized standard when applied to modern dynamic-power-management technologies. The FCC must therefore examine real transmission configurations across manufacturers and ensure that tests can be reproduced without reliance on algorithms or tools controlled exclusively by the manufacturers. [7][8]

What ANFR actually requires from laboratories: algorithms, controls and traceability

Alerte Phonegate's request is grounded here in written records from the French authority, not speculation. Article 3 of the November 19, 2018 Particular Contract Clauses (CCP) for market-surveillance testing states that when maximum power depends on a proximity, motion or time-based power-control algorithm, 'this algorithm shall be supplied by ANFR and must be implemented' by the laboratory. The authority itself thus recognized a requirement for technical reproducibility. [56; Annex F]

ANFR went further in its letter to Apple of April 26, 2023. It reiterated its demand for a detailed description of the iPhone 12 power-management algorithm, information that should have been included in the technical file so that tests could be carried out 'without resorting to the manufacturer's assistance'. Because the documentation necessary for new measurements was unavailable at that stage, ANFR stated that it could not commission further tests from the CTC laboratory. [57; Annex G] Independent oversight is not an abstract demand: its practical impossibility was expressly recorded in an official letter.

ANFR's Director General made this issue an institutional matter in his letter to the Commission dated January 5, 2024. Gilles Brégant warned that accepting the manufacturer's objections could lead authorities to inspect 'specially prepared' devices potentially differing from those sold to consumers. This official position establishes the risk to independent market surveillance: samples, their operating systems and settings, and their power-reduction mechanisms must be verifiable without relying exclusively on the manufacturer's preparation or proprietary tools. [77]

Since 2019, CTC/CETECOM reports published by ANFR have included a section on power-management mechanisms with three checkboxes: proximity, motion and time-averaged SAR (TAS). Annexes E and F to our memorandum for the French ministry faithfully reproduce the reported status of these items in selected Apple, Samsung, Xiaomi and Google test reports, correlating each report with SAR values, test separation and compliance findings. [58]

Device / test campaign	ANFR report checkboxes	Documented result
iPhone 12, 2022	Proximity ☐ · Motion ☐ · TAS ☐	5.615 W/kg · limb at 0 mm · NON-COMPLIANT
iPhone 12, 2023, Protocol 2	Proximity ☐ · Motion ☒ · TAS ☒ *	5.740 W/kg · limb at 0 mm · NON-COMPLIANT
iPhone 12, 2023, corrective update	Proximity ☐ · Motion ☒ · TAS ☒	3.935 W/kg · limb at 0 mm · Compliant
Xiaomi Poco X3, 2022	Proximity ☒ · Motion ☐ · TAS ☐	2.330 W/kg trunk; then 5.490 W/kg limb; then 2.780 W/kg limb after second correction
Samsung Galaxy S23, 2023	Proximity ☒ · Motion ☐ · TAS ☒	1.173 W/kg · trunk at 5 mm · Compliant

An essential distinction: a checked or unchecked box records the status indicated in a test report.

'Deactivation keys' are one possible technical means of imposing or checking power states; the cited CCP expressly requires the algorithm to be disclosed and implemented. We ask the FCC to retain, for each certification, evidence of what was supplied, configured, tested and independently reproduced. [56–58]

Implications for the FCC: for US devices featuring sensors or TAS, require operational descriptions of power states, means for independent control, certified software versions and findings from tests on retail devices. The iPhone 12 record makes clear that this documentation cannot be dismissed as incidental information.

The US connection: Body Detect was already in the iPhone 12's 2020 FCC file

The BCG-E3544A equipment-authorization file includes an annex entitled 'Power Reduction Verification — Body Detect Validation', dated November 9, 2020. It describes proprietary power-reduction technology and states that validation tests could use special power tables differing from those in the final marketed product. Its presence establishes that software behavior already determined the verification procedures submitted to the US regulator. [\[15\]](#)

Three concrete investigations are needed: determine the correspondence between FCC variants and the European A2403 model; retrieve the settings and software versions actually certified and sold; and compare activation of power states during laboratory sequences and foreseeable use on retail devices. The FCC should also establish whether Body Detect settings and corrective changes effective on French networks are reflected in US devices. The objective is a reproducible comparison, not an unverified assumption that all variants are identical.

STAGE	RECORD AND RESULT	WHAT THE FCC MUST EXPLAIN
2022: 5.615 W/kg	ANFR: iPhone 12 A2403 limb SAR in contact, above 4 W/kg.	Would US testing detect this result and its conditions?
2023: Apple's protocols	1 mm + motor rejected; second protocol at 0 mm with button pressed every 20 seconds; 5.740 W/kg.	What audit is possible without proprietary tools or artificial test behavior?
2023: corrective update	iOS 17.1; corrective activation of Body Detect initially limited to French networks.	How can software compliance be monitored across countries and versions?
2024: JRC	Standard lacking methods for sensors, ARTD, TAS and multiple antennas.	Have FCC frameworks addressed an equivalent gap?
2025: Commission	Decision 2025/1760; undisclosed proprietary tools deemed unsuitable for independent assessment.	What effective access to algorithms and validation settings?

05 FROM DIESELGATE TO PHONEGATE: WHO CONTROLS THE SOFTWARE?

In the Volkswagen case, US authorities demonstrated their ability to identify software designed to alter a vehicle's behavior artificially during regulatory tests. In smartphones, proximity sensors, TAS algorithms, motion functions and power tables can determine the SAR values measured in the laboratory as well as network performance. [\[8\]](#)[\[15\]](#)

The comparison raises a fundamental question of regulatory integrity: can an oversight authority properly evaluate equipment when the manufacturer alone controls the software conditions on which compliance depends?

Alerte Phonegate calls for tests on retail-purchased devices, secure access to the necessary parameters, comparisons before and after software updates, and investigative follow-up whenever discrepancies are established. Under 47 CFR § 2.939, authorizations can already be revoked or restricted under the conditions specified in that provision. [\[16\]](#)

Intentional deception: a question the FCC must investigate rather than dismiss

Alerte Phonegate considers that the accumulation of documented findings warrants investigation into possible intentional deception: certifications conducted using selected configurations; products actually used against the body; proprietary power-management algorithms and tables; mechanisms triggered by proximity or motion; and insufficient disclosure of the precise conditions under which compliance was established. The question is not merely an outdated standard. It concerns what manufacturers knew about potential discrepancies and what they represented to laboratories, regulators and consumers. [\[2\]](#)[\[5\]](#)[\[7\]](#)[\[8\]](#)[\[15\]](#)

The FCC must establish, manufacturer by manufacturer and model by model, whether authorization files and marketing claims were accurate and complete; whether the conditions triggering power reduction were disclosed; whether reasonably foreseeable configurations were deliberately excluded; and whether independent tests can reproduce the results without manufacturer intervention.

We therefore request a documentary and experimental investigation into representations made during certification, including preservation of software versions, histories of power-table changes, instructions to

laboratories, marketing documents and test results from retail-purchased devices. The FCC should publish its findings and, when legal conditions are met, take corrective action or initiate the appropriate enforcement proceedings. [16]

Lessons from Volkswagen for US regulators

In Dieselgate, US investigators showed that software could recognize or infer that a regulatory test was taking place and command behavior different from ordinary use. The EU decision does not impose a criminal fraud conviction, but it underscores an operational requirement: **regulators must test the actual products they oversee under independently controlled configurations instead of relying solely on manufacturer-directed test results.** [8][27]

The smartphone market is especially vulnerable to this problem because power-management functions can also change SAR measurements during a test. The FCC investigation should establish which functions exist, how they are triggered, their power tables, firmware versions, indicators that could identify a testing environment and any discrepancies with retail devices. Manufacturers must be required to provide missing records; lack of independent access must never be treated as evidence of compliance.

47 CFR § 2.939 provides mechanisms for revoking or restricting authorizations when statements are false, compliance failures emerge or unauthorized modifications occur. The FCC therefore has enforcement tools beyond revising testing procedures. Alerte Phonegate calls for those tools to be used where warranted by the evidence, and for relevant information to be shared with authorities responsible for deceptive commercial practices or offenses. [16]

Other manufacturers must be investigated: Phonegate is not only about Apple

ANFR test reports include fields relating to proximity, motion and TAS mechanisms. Samsung, Xiaomi, Google, Motorola, Oppo, Honor and Huawei device families must be examined using the same documentary criteria and safeguards for data integrity. [13]

For each model, the investigation should correlate all available PDF reports, including original and corrective tests, with separation distances, SAR values and software configurations. Independent testing of retail units can then reveal whether particular types of mechanisms behave differently under test conditions.

OUR REQUEST ON CERTIFICATION INTEGRITY

Compare laboratory and retail devices; audit power mechanisms; investigate each manufacturer; reexamine and where necessary revoke non-compliant authorizations. Future standard reform must not suspend responsibilities under existing rules. [8][15][16]

06 PUBLIC HEALTH AND LONG-TERM EXPOSURE: ISSUES FOR HHS

SAR was developed as a protective metric addressing health effects associated in particular with tissue heating. ICNIRP's 2020 guidelines distinguish a 'safety' factor of **50 for whole-body exposure** and **10 for localized exposure** of the general public. Describing an undifferentiated 'safety factor of 50', as several authorities have done, as a guarantee applicable to localized mobile-phone SAR is therefore misleading. [11]

A measured exceedance establishes a failure to meet the regulatory criterion under the test conditions concerned. A post-market correction does not erase earlier exposure. Regulatory authorities must consider these objective findings in health-risk assessments and inform the users concerned. [5][8]

Cancer evidence is retained here as scientific and public-health context for HHS. The scope of the present FCC consultation encompasses the justification for test procedures, non-cancer effects, children, long-term exposure and the environment. These data also directly concern the HHS consultation on the state of knowledge, health and standards. [34–35]

Brain cancer: the scientific debate cannot be closed by administrative decree

Santé publique France: three decades of rising glioblastoma incidence

The joint Santé publique France–INCa–Francim–Hospices Civils de Lyon report published in July 2019 examines 1990–2018. It estimates 823 newly diagnosed, histologically confirmed glioblastoma cases in 1990 compared with 3,481 in 2018: more than a fourfold increase. Age-standardized rates also increased, by 3.6% annually in men and 3.3% in women over the period. These are official figures, not an extrapolation by Alerte Phonegate. [52]

The report documents increasing glioblastoma incidence from 1990 to 2018 and identifies electromagnetic-field exposure among factors requiring investigation. Changes in diagnosis and classification must be considered without erasing the observed trends. Reassessment of real-world exposures identified in official monitoring is essential to rigorous causal research. [52]

In 2011, the International Agency for Research on Cancer (IARC) classified radiofrequency electromagnetic fields as **Group 2B** ('possibly carcinogenic to humans'). NTP studies published in 2018 reported clear evidence of carcinogenic activity for malignant heart schwannomas in male rats, with differing evidence categories for gliomas and other lesions examined. Later reviews of animal and human evidence have reached differing conclusions. These discrepancies require detailed methodological examination rather than a blanket assertion that risk has been excluded. [3][9][17]

Annex J brings together selected studies and reviews concerning non-cancer effects: memory and cognition, oxidative stress, reproduction, electromagnetic hypersensitivity and dosimetric accuracy. It separately identifies works published before the FCC's 2019 decision and more recent publications, which are particularly relevant to the HHS consultation.

Fertility, pregnancy and development

Experimental studies and scientific reviews document effects of radiofrequency exposure on reproductive parameters, including sperm motility and integrity, oxidative-stress markers, reproductive tissues and development. Health authorities must examine exposure levels actually measured among users, durations and tissues involved, and act to prevent avoidable exposure, particularly prolonged carrying of devices against the pelvis or abdomen. [19][43]

For a person carrying a phone near the pelvis or abdomen over many years, exposure duration, device position and transmission conditions must be incorporated into research and proportionate preventive information. Pregnant women and children cannot simply be reduced to the anatomical model of a standard adult.

Early-onset colorectal cancer and wearing a phone below the belt. At BioEM 2025, Professor De-Kun Li presented an exploratory case-control study involving 50 people diagnosed with colorectal cancer before age 50 and 50 matched controls. Prolonged carriage of a phone below the belt was associated with higher risk (adjusted odds ratio: 4.1; 95% confidence interval: 1.0–16.4), with a stronger association when the phone was worn on the same side as the tumor (OR: 12.1). This conference presentation calls for confirmatory research and the inclusion of body-carrying histories in epidemiological studies. [83]

Electromagnetic hypersensitivity, sleep, cognition and quality of life

People describing electromagnetic hypersensitivity may experience severe symptoms, including sleep disruption, headaches, skin sensations, fatigue and difficulty concentrating. WHO recognizes that these symptoms are real, while stating that the available studies have not established a specific causal link with electromagnetic fields. **Recognition of clinical experience calls for care and research, not denial of suffering. [20]**

A March 2022 US Army Research Laboratory technical report emphasizes, in a different experimental context, the importance of frequency, intensity, pulse patterns, duration and repetition of exposures when characterizing biological interactions. [21]

WHY THE HEALTH DIMENSION BELONGS IN THE FCC PROCEEDING

In 2021, the Court of Appeals expressly required the FCC to justify its positions on portable-device testing, children, non-cancer effects, long-term exposure and the environment. **Health protection is therefore at the heart of the present consultation.**[22]

For exposed populations, the relevant timescale is measured in years

The same phone may be held against the ear during calls, slipped into a pocket while traveling, positioned near the abdomen on public transport and kept beside a bed at night. Daily repetition of these uses over years makes it impossible to treat close-to-body carrying as exceptional. For a child beginning to use a smartphone at age ten, the scientific and regulatory debate may span several decades of life. **Prevention must be assessed on this human timescale.**

People affected by these tumors deserve research that measures their historical exposure accurately. [18]

Fertility, pregnancy and development: blind spots in a single-point measurement

A phone placed near the pelvis creates localized and potentially prolonged exposure. Experimental research reports effects on sperm, oxidative-stress markers, reproductive tissues and some developmental parameters, with varying levels of evidence and experimental conditions. Systematic reviews published in 2024 as part of the WHO evidence programme identify several experimental signals alongside methodological limitations in human data. **Insufficient human evidence does not justify the absence of a properly designed research programme or assurances extending beyond the available data.** [19] [43]

Pregnancy and exposure early in life require a distinct approach: body morphology, phone position, repeated scenarios and developmental outcomes. Protection of a child or pregnant woman cannot simply be inferred from tests on a standard adult phantom. The FCC and US public-health agencies must identify the vulnerability factors they considered and the studies funded to address the gaps.

Electromagnetic hypersensitivity, sleep, cognition and other non-cancer effects

ANSES's 2018 expert report on electromagnetic hypersensitivity discusses prevalence estimates of around 5%, depending on studies and definitions. People affected report symptoms that can be disabling, including disturbed sleep, pain, fatigue, difficulty concentrating and dizziness. WHO recognizes that these symptoms are real while holding that studies available to date have not established a specific causal relationship with electromagnetic fields under the conditions examined. Independent assessment must continue research into mechanisms, individual susceptibility, exposure characterization and clinical management. **Lack of demonstrated causality must never be equated with denial of reported suffering.** [20]

The debate on non-cancer effects also includes neurological, behavioral and cellular markers. In 2021, the US Court of Appeals specifically required the FCC to justify its position on non-cancer effects, children, long-term exposures and the environment. Our submission is therefore not attempting to shift the FCC case arbitrarily into an unrelated health field: these issues lie **at the heart of the judicial remand.** [22][34]

Two questions that SAR certification cannot resolve on its own

First, SAR compliance establishes at most that an exposure falls within limits defined for particular biological assumptions and technical configurations. It cannot guarantee the absence of all health effects from all possible exposures. Second, a spot measurement does not characterize patterns of use accumulated over decades. The future framework must therefore better capture dose, duration, sources, the radiofrequency environment and individual vulnerabilities. [11][21]

HEALTH ISSUE	EVIDENCE TO REVIEW	REGULATORY IMPLICATION
Brain cancers	IARC 2B; NTP 2018; animal and human reviews; SPF 2025 incidence	Explain assessment, document historical exposures and fund independent cohorts.
Fertility and pregnancy	Experimental studies and 2024 reviews; limits of extrapolation	Measure carrying patterns and proximity to reproductive organs.
Children / adolescents	Longer potential exposure lifetimes; particular anatomy and usage	Define tailored scenarios and prevention.
EHS and other non-cancer outcomes	Reported symptoms and causality debate; 2021 judicial remand	Independent research, care and reasoned FCC response.

07 MOBI-KIDS: THE INDEPENDENCE OF RESEARCH UNDER QUESTION

MOBI-KIDS included 899 brain-tumor cases and 1,910 controls across 14 countries. According to the European Commission's CORDIS database, the project cost €6,078,765.80, including €3,499,748 in EU funding. Industrial contributions and participation demand complete transparency. Alerte Phonegate highlighted Orange Labs' role in exposure-estimation tools and disclosures of competing interests completed after publication. Biases acknowledged by the authors do not permit an increased risk to be ruled out; public-health agencies must describe these limitations fully. [23][24][25]

Since 2022, Alerte Phonegate has documented the involvement of Orange Labs staff in exposure assessment, subsequent amendments to the publication's interest disclosures and institutional and industrial ties involving several participants. In June 2026, our NGO formally asked ANSES to examine ethical requirements in its use of the study for the French health assessment. [24][25]

The European Ombudsman also found maladministration by the Commission in an access-to-documents procedure concerning the project. That decision addressed administrative transparency rather than the medical validity of MOBI-KIDS, but underscores the need for independent scrutiny of the methods and funding of a study in the public interest. [26]

THE FUNDAMENTAL PROBLEM

Manufacturers and operators must not be the final arbiters of the exposure they help define. This requirement applies to phone certification software as well as dosimetric models used in major epidemiological studies.

Orange, exposure tools and declarations of interests: an investigation led by Alerte Phonegate

The association's investigations published in January–February 2022 documented participation by several Orange Labs employees in exposure characterization. People named in the association's sources include Joe Wiart, Emmanuelle Conil, Nadège Varsier, Thierry Sarrebourg and Abdelhamid Hadjem. Exposure tools including XMobisense and XGridmaster, identified in consortium documentation, warrant a reproducible audit of their assumptions, inputs and algorithms. [24][25]

Following Alerte Phonegate's investigations, the MOBI-KIDS publication was supplemented with interest disclosures. In its letter to ANSES of June 3, 2026, the association highlighted industrial participants' roles in exposure modelling, inconsistencies identified in some interest disclosures and the need for an independent ethics review. Funding sources, access to data and the operation of exposure tools must be subject to public scrutiny. [24][25][48]

This action reflects Alerte Phonegate's mission: an industrial stakeholder must not be permitted to shape exposure assessments without its interests, contributions and tools being freely open to examination. Our request concerns verifiable independence and the duty to inform the public of relevant interests.

The European Ombudsman and ANSES: transparency is itself an outcome of the campaign

In case 2103/2022/OAM, the European Ombudsman criticized the refusal to disclose certain information about MOBI-KIDS and found maladministration. The scope is precise: the decision concerned access to documents, not a ruling on the epidemiological validity of the study. Nevertheless, this institutional finding directly supports our demand that methods and funding be sufficiently transparent for independent assessment. [26]

ANSES relied on MOBI-KIDS in its 2025 'Radiofrequencies and Cancer' assessment. On June 3, 2026, Alerte Phonegate asked ANSES management to examine interest declarations, methodology, industry links and consistency with recommendations from its ethics committee. **A health agency cannot be excused from that scrutiny merely because a study appeared in a peer-reviewed journal.** [25]

Implications for the FCC: no industry should control the safety narrative alone

Operators and manufacturers possess substantial resources to shape technical work, participate in standard setting, finance research and promote the compliance of their products. Their involvement is not inherently illegitimate. The danger arises when decisive data, measurement tools or competing interests

cannot be examined with the same independence as public results. The histories of tobacco and asbestos show how selective presentation of science can delay public-health action. The FCC must require complete evidentiary records rather than adopt assurances of 'guaranteed safety' without verifying their foundation. [23][24][25][27]

THE CROSS-CUTTING QUESTION RAISED BY MOBI-KIDS
Who controls exposure measurement? The same question applies to smartphone certification software and dosimetry algorithms in health studies. Alerte Phonegate calls for independent audits, complete disclosure of relevant interests and access to information necessary to reproduce results.

08 TOBACCO, ASBESTOS, DIESELGATE: LESSONS FOR REGULATORS

In tobacco litigation, US courts established that deceptive practices had been used to sustain doubt about health risks. The history of asbestos demonstrates the significance of long latency periods and the cost of delayed responses. Dieselgate exposed the potential role of software in manipulating regulatory tests. [27]

These precedents demonstrate that independent scientific knowledge, truthful consumer information and autonomous product testing are essential, especially where major economic interests are at stake.

Beyond compliance standards, the legal discussion must address consumer protection: the 2021 Environmental Health Trust v. FCC ruling and follow-up litigation in 2026; federal preemption of certain US claims; the continuation of authorized class actions in Quebec; and the binding 2025 European decision concerning the iPhone 12. [22][28][8]

PRECEDENT	DOCUMENTED OUTCOME	LESSON FOR PHONEGATE
United States — EHT v. FCC, 2021	Remand requiring fuller reasoning on specific issues	Reasoned response and effective testing oversight.
Canada — Apple/Samsung proceedings	Class actions authorized and appeals decided; no final merits ruling	Right to information and manufacturer accountability.
European Union — 2025/1760	ANFR's iPhone 12 measure found justified	Software compliance and independent oversight.
Volkswagen — US proceedings	Penalties following detection of software designed to manipulate tests	Investigate potential divergence between test and real use.

Three historical scandals, three institutional lessons

Tobacco: the Department of Justice and US courts established that manufacturers had organized deceptive practices, notably regarding health risks and addiction. Court-ordered corrective statements demonstrate that reassuring industry claims are inadequate scientific proof where relevant information was concealed. The lesson for radiofrequencies is clear: disclose methods, data and conflicts of interest, and sanction proven false representations. [27]

Asbestos: long disease latency periods and the scale of exposure made delays in prevention particularly costly. This experience underlines the importance of monitoring exposures and long-latency illnesses over several decades. Epidemiological surveillance and exposure traceability are therefore essential. [27]

Dieselgate: sanctions against Volkswagen established that software could manipulate a regulatory inspection procedure. The FCC must apply equivalent standards of product-integrity oversight instead of waiting for a manufacturer voluntarily to reveal problematic software functions. The assembled documentary record warrants an independent, evidence-based investigation into software and testing conditions. [8][16][27]

Comparative litigation makes the FCC's responsibility even more decisive

The 2021 Environmental Health Trust v. FCC ruling did not invalidate the entire US framework, but remanded specific questions because the agency had failed to provide adequate reasoned justification. The FCC's 2026 brief shows that the remand remains at issue. Federal-preemption cases, including Cohen v. Apple, show that consumers' state-law claims can be blocked by federal regulation. The more fully federal rules occupy this field, the more effective the federal system of monitoring and redress must be. [22][32][42]

In Canada, Quebec rulings concerning class actions against Apple and Samsung, and the Supreme Court's refusal of leave to appeal in 2025, have allowed proceedings to continue. They are not final judgments on the merits; they preserve judicial scrutiny of manufacturers' disclosures and obligations. In the EU, by contrast, Decision 2025/1760 settles a specific administrative issue: France's measure concerning iPhone 12 A2403 was justified. [8][28]

United States and Canada: two contrasting judicial treatments of claims against Apple and Samsung

United States — Cohen v. Apple Inc. Litigation brought after the 2019 Chicago Tribune investigation alleged misleading or insufficient information about radiofrequency exposure. On August 26, 2022, the US Court of Appeals for the Ninth Circuit affirmed dismissal of state-law claims against Apple: in the court's view, applying those claims would interfere with the FCC's federal framework and the policy balance it establishes. Samsung was initially a defendant, but the plaintiffs dropped their claims against it; the appeal concerns Apple's liability. [42,59]

The institutional significance is substantial. Federal rules presented as protective can also bar certain state-law claims. The FCC participated in the judicial debate over that preemptive effect in Cohen. It must therefore account for the effectiveness of its own inspections, the representativeness of tests and available remedies for consumers. The 2022 judgment did not establish that the devices complied at 0 mm; it addressed legal admissibility and preemption of the claims. [59]

Canada — Arial v. Apple Canada Inc. and Samsung. On September 22, 2022, the Quebec Superior Court partly authorized a class action concerning disclosure to users and close-to-body use. On September 18, 2024, the Quebec Court of Appeal dismissed the appeals and cross-appeal (2024 QCCA 1195). On May 29, 2025, the Supreme Court of Canada denied both manufacturers leave to appeal, cases 41548 (Samsung) and 41555 (Apple). These decisions allow proceedings to continue; they do not constitute final judgments on manufacturers' liability. [60–63]

United States — Cohen	Canada — Arial	QUESTION FOR THE FCC
Consumer action alleging misleading information about RF emissions of certain iPhones.	Class action partially authorized against Apple and Samsung.	Does FCC compliance bar too many potential remedies?
August 26, 2022: federal preemption affirmed by the Ninth Circuit.	September 18, 2024: appeal dismissed by the Quebec Court of Appeal.	What administrative protections compensate for the exclusive role of federal rules?
The proceedings did not reach a judgment on Apple's liability on the merits.	May 29, 2025: Apple and Samsung denied leave to appeal; underlying case still pending.	How can truthful information and post-market investigations be guaranteed?

Alerte Phonegate asks the FCC expressly to consider these decisions in its assessment of the compliance framework, examine how preemption affects consumer remedies, and strengthen investigation, disclosure and correction mechanisms applicable to all manufacturers. [59–63]

09 TOWARD AN INTERNATIONAL FRAMEWORK BEYOND SAR ALONE

Multiband devices now combine transmissions assessed through SAR (W/kg) and emissions at higher frequencies evaluated through metrics including power density (W/m²). These quantities cannot be added directly: regulatory frameworks use sums of fractions of the applicable limits. 5G devices also combine active antennas, variable beams, simultaneous transmissions and software-based control over time.

Alerte Phonegate calls for a coherent, multidimensional international framework rather than another single figure that hides part of the exposure. It must combine parameters already measurable today and advance health expertise on additional appropriate indicators.

DIMENSION	PARAMETERS THAT MUST BE ACCESSIBLE AND VERIFIABLE
Absorption / surface	SAR averaged over 1 g and 10 g; incident and/or absorbed power density as appropriate to frequency.
Time	Duration, peaks, intermittency, averaging and cumulative exposure consistent with the quantities used.
Signals / antennas	Bands, modulation, simultaneous transmissions, beamforming and antenna selection.
Body / populations	Contact, real-world carrying, anatomical models, pregnancy, children and occupational exposure.
Software	Sensors, triggering thresholds, TAS, power tables and firmware versions.
Health / evidence	Experimental findings, epidemiology, long-term surveillance and independent assessment.

For some occupational exposures, Russia also uses energy-exposure quantities that account for time. This offers a relevant methodological precedent. [\[29\]](#)

From 1G to 6G: technologies evolve and compliance demonstrations must keep pace

From analog 1G to digital 2G and then 3G and 4G networks, devices progressively added dynamic power control, antenna diversity, data transmissions, carrier aggregation and MIMO. 5G introduces or expands multiple-antenna configurations, directed beams, simultaneous transmissions and, in some bands, the need for complementary metrics beyond SAR. 6G remains in research and standard-setting programmes: it requires anticipatory assessment, not assertions that future products have already produced measured emissions.

The difficulty is not a mechanical increase in frequencies with each network generation, as some spectrum bands are reused. It is the multiplication of configurations, the growing role of software in allocating power, and the need to validate every hardware-software combination that may affect exposure. Direct-to-device satellite features are a further scenario requiring explicit examination.

SPEAG, ART-Fi and standard-setting: the measurement chain must be auditable

SAR results also depend on whether probes, phantoms, software and reconstruction algorithms correctly measure complex fields. Scanning systems and vector sensor-array technologies require reproducible interlaboratory comparisons, including publication of uncertainty, operating parameters and validation criteria. Published scientific work on variable-phase MIMO equipment, including Teniou et al. (2021), demonstrates the importance of measurement systems adapted to contemporary signals. [\[72\]](#)

Alerte Phonegate also calls on the FCC to examine the independence and concentration of measurement-instrument suppliers, conflict management within standards committees and access to certification for competing measurement methods. This assessment must rely on independent comparative tests and raw data available to independent reviewers.

The coexistence of SAR and power density is already a practical regulatory challenge

Below 6 GHz, SAR remains central to assessing localized exposure. Above this range, particularly at millimeter-wave frequencies, standards use power density and, depending on the system, absorbed power per unit area. W/kg and W/m² cannot be added directly; compliance frameworks sum fractions of their respective limits. Within the same 5G smartphone, beams, transmitters and software can operate across several bands simultaneously. [\[11\]\[30\]\[38\]](#)

For a user, however, exposure remains a single, continuing experience. It is not naturally divided by the administrative threshold of 6 GHz. A credible framework must compare simultaneous-transmission scenarios, document actual absorbed power and its variation over time, and provide intelligible public information on the safety conditions for foreseeable use. **Merely advertising a 'maximum SAR' without explaining configurations, frequencies, durations and software power states is no longer sufficient.**

Russian regulatory approaches show that a further exposure dimension can be considered

SanPiN 1.2.3685-21 provides, for certain occupational exposures, an energy-exposure metric connecting intensity with duration. This approach is not an automatically validated substitute for SAR when a smartphone is carried against the body. It does show that a regulator can choose to incorporate duration into monitoring tools, particularly in workplaces. The usefulness of such metrics should be investigated with regard to frequency, near and far fields, and tissue properties. [29]

An international effort on two tracks: act immediately while developing more protective indicators

The first track concerns the FCC's existing powers: examine separation distances, software mechanisms, retail devices and non-compliance; order corrective measures; and penalize violations. The second should bring together the FCC, HHS and international standards organizations to develop multidimensional indicators validated by independent health research. This means a set of measurements and justifiable combination rules, not one unverifiable marketing score. [11][34][38]

Preventing thermal effects is already a regulatory obligation. Accounting for possible nonthermal effects and long-term exposures requires better research and health-monitoring programmes. These objectives are complementary: **developing more ambitious standards for tomorrow does not excuse failure to protect people today against exceedances already documented.**

REFORM OBJECTIVE

A multidimensional international framework combining localized absorption, power density, duration, intermittency, simultaneous emissions, carrying conditions, signal characteristics and software states. Validation must be both health-based and metrological—and independent of industry.

10 ISED AND ANFR: RELEVANT PRECEDENTS FOR THE FCC

Canada strengthened the requirements addressing TAS mechanisms and sensors in **RSS-102.SAR.MEAS, Issue 2** (August 2025). ISED publishes a detailed list of approved TAS algorithms, including Qualcomm, Samsung, MediaTek and Semtech versions. Annex G specifies validation procedures for the products concerned. [30]

For some proprietary protocols, a laboratory's access to the technology may depend on the developer's authorization. That is precisely what the FCC must examine: can oversight be regarded as independent when access to essential parameters is contractually controlled by industry? Access to technical files is also debated in Canada under confidentiality and access-to-information rules.

Conversely, an October 2025 Canadian notice provides, under certain conditions, an exemption from 0 mm limb SAR testing when trunk SAR testing has already been conducted at 5 mm or less. Alerte Phonegate calls for every simplification to be scientifically justified and verifiable. **Canada's recognition of algorithms is progress, not proof that all deficiencies have disappeared.** [31]

A substantive Canadian change: manufacturers must supply algorithm documentation

RSS-102.SAR.MEAS, Issue 2 of August 15, 2025, requires more than disclosure of a final SAR value. Its Annex G covers evaluation of approved TAS technologies and the end products incorporating them. The documentation must include a detailed operational description of the algorithm, limitations on its use, an integration manual identifying configurable settings, and validation results on a representative host. These are formal requirements, not optional best practices. [30][37]

At the date of our review, ISED's list of approved TAS algorithms names Qualcomm Smart Transmit, Samsung S.LSI TAS, MediaTek TA-SAR and certain sensing technologies. The list is public and updated over time. **A manufacturer's absence from the list does not establish that its phones lack such mechanisms:** the algorithm may come from another developer or fall into a different category. The value of the list is that names, versions and approval dates make the corresponding records traceable. [30]

ISED continued developing its approach in 2026, including recognition of international measurement standards while maintaining specific Canadian requirements for some TAS validations. This confirms that software-based compliance is now an explicit object of regulation in North America. [37]

Our request to the FCC is specific: match and exceed Canadian transparency regarding algorithms; improve public access to authorization files; and institute independent physical tests of retail-purchased devices.

CANADIAN DOCUMENTS	REQUIREMENT / DEVELOPMENT	IMPLICATION FOR THE FCC
RSS-102.SAR.MEAS Issue 2, 2025	Detailed algorithm description and validation on the finished product.	Require audited US equivalents.
ISED TAS list, 2026	Algorithms identified by developer, name, version and date.	Match certified software to the version sold.
Access-to-information files	Requests for test records and settings; exceptions require justification.	Do not automatically place trade secrecy above health oversight.
Notice 2025-DRS0007	Conditional exemption from limb testing.	Publish scientific evidence supporting equivalence.

11 FCC INDEPENDENCE IN THE FACE OF ECONOMIC INTERESTS

In its brief of **September 25, 2026**, the FCC cites a CTIA estimate that the US wireless industry contributes **more than \$825 billion annually to GDP**. It also invokes the time and complexity of responding to the 2021 judicial remand. [32]

The sector's economic importance is undeniable; it does not answer questions about testing discrepancies or compliance failures. Transmitted power may affect both connectivity and SAR, and therefore performance and marketing choices. The regulator's role is to establish and enforce health protection, not permit protective conditions to be shaped by commercial performance goals.

A 1976 Defense Intelligence Agency review had already discussed possible economic and military consequences of stricter standards. It provides historical evidence of this tension. [33]

Spectrum allocation: protecting health decisions from deployment interests

Spectrum allocation and auction revenues create a structural tension: the state benefits financially from commercializing frequencies and promotes territorial coverage, while simultaneously being responsible for independent protection from exposure. US law expressly recognizes the need to limit the influence of auction revenues in certain public-interest decisions (47 U.S.C. § 309(j)(7)). [73]

We request publication of the organizational safeguards separating health assessment from spectrum valuation, base-station and small-cell deployment targets and relationships with operators. The same issue arises for the representativeness of Wi-Fi and fixed-infrastructure testing, although the metrics and methods differ by transmitter category.

Ajit Pai and Meredith Attwell Baker: moving from the FCC into industry lobbying leadership

On March 12, 2025, CTIA, the US wireless-industry association, formally announced the appointment of former FCC Chairman Ajit Pai as President and CEO, effective April 1, 2025. [54] He succeeded Meredith Attwell Baker, a former FCC Commissioner who had led CTIA since 2014. [55] These are not conjectures: the professional association itself describes these career paths.

Repeated transitions between leadership of the regulator and the regulated industry's lobbying organization raise a legitimate question of public trust: what recusal rules, contact-transparency requirements, records of industry arguments and conflict-management procedures safeguard independent health decisions? These careers warrant stronger independent oversight, disclosure of influence and reasoned decisions, particularly when economic interests are expressly invoked in court filings. [26,54,55]

ICNIRP: the scientific accountability of a private body whose recommendations become public standards

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) is neither a UN agency nor a public regulator. It identifies itself as a nonprofit scientific association registered in Germany and recognized as a non-state actor collaborating with WHO and ILO. Its advice nevertheless has considerable influence over national RF-exposure policies, notably in the EU. Its private legal status does not eliminate the need to examine the scientific responsibility associated with the methods, data and claims underlying its recommendations. [64,67]

This international influence must be distinguished from the legal foundations of US limits. The FCC's 1996 exposure limits were based primarily on US NCRP Report No. 86 and ANSI/IEEE C95.1-1992, as expressly reflected in 47 CFR § 1.1310. We therefore do not claim that the FCC directly incorporated ICNIRP recommendations. We ask the FCC to examine this international body of evidence and its limitations through open, independent scrutiny rather than regard health questions as resolved by compliance with a single set of SAR figures. [11][65][66]

ICNIRP states that it maintains independence rules: Commission members cannot be industry employees, declarations of interest are required, funding information is disclosed and public consultations are held. The existence of such procedures does not remove the need to examine their implementation, selection of studies, evidentiary choices, treatment of contradictory findings and possible institutional ties. Our demand is verifiable access to methods, declarations, exclusion criteria, dissenting views and responses to scientific criticisms. [67,68]

ACTOR	RESPONSIBILITY TO EXAMINE	REQUESTED OVERSIGHT
ICNIRP (scientific association)	Methodology, study selection, declarations of interest and scope of health claims.	Independent critical assessment and disclosure of records and interests.
Public authorities adopting or citing recommendations	Justification of selected limits, adaptation to actual use, market surveillance and responses to warnings.	Reasoned decisions, independent protocols and public inspection reports.
FCC and US health agencies	Justification of national rules, consideration of all evidence and implications for legal remedies.	Effective response to 2021 remand, audits, corrective measures and new assessment.

For future litigation, responsibility must be framed rigorously. Any action involving a scientific body, regulator or manufacturer would require identification of a specific legal duty, proven breach, harm, causation and a competent court; these conditions vary among jurisdictions and defendants. Alerte Phonegate already calls for preservation of working documents, interest declarations, correspondence with public authorities and materials used to establish or retain recommendations, so the decision-making chain can be examined independently. [64–68]

The August 13, 2021 ruling in *Environmental Health Trust v. FCC* provides a directly relevant US precedent: the DC Circuit required reasoned justification of the FCC's position on several health issues, including non-cancer effects, children, long-term exposures and testing procedures. The Court did not impose civil liability on ICNIRP, but confirmed that a public authority cannot simply invoke standards or opinions to evade scientifically relevant comments submitted to it. [22,69]

Annexes K and L connect two dimensions the FCC should not separate: the actual timeline of protective action and the global economic concentration of the industry.

A credible regulatory response must identify deadlines and accountable institutions

A consultation ending with more statements about the importance of public health—but without a testing plan, published surveillance findings or investigative procedures concerning algorithms—would fail to answer eight years of warnings. Each Alerte Phonegate request must have an identified public authority, defined deliverable and deadline. We distinguish immediate responses to the 2021 judicial remand, investigations into existing authorizations and the longer-term project of international harmonization.

12 FIFTEEN ACTIONS REQUESTED OF THE FCC

Consultation DA 26-997 addresses the specific scope of the 2021 judicial remand: testing procedures, children, long-term exposures, non-cancer effects and the environment. Alerte Phonegate therefore distinguishes requests directly responsive to that remand from matters requiring investigations or separate rulemaking. **The notice's limited scope must not become an excuse to disregard new evidence.** [34]

A. Responses and decisions within the immediate scope of the remand

- 01 Publicly justify retaining or revising portable-device testing procedures based on foreseeable conditions of contact with the body.
- 02 Reassess protection of children, pregnant users and vulnerable populations, including the suitability of anatomical models.
- 03 Explicitly address non-cancer effects, long-term exposures and conflicting scientific findings; explain the selection of studies and the significance of advisory opinions, including international ones.
- 04 Respond to the environmental issues identified by the Court, with reasoning supported by relevant scientific studies.
- 05 Publish a traceable response to warnings, test findings and arguments raised since the 2012 GAO report and our interventions in 2018–2019.

B. Investigations into certifications and accountability

- 06 Open an independent, documented review of relevant US iPhone certification files, particularly iPhone 12, Body Detect and the power tables used during validation.
- 07 Extend checks to other manufacturers using sensors, TAS, motion-based mechanisms and antenna selection; compare tested configurations against retail devices.
- 08 Require traceability of certified software versions and assess SAR effects of any update capable of changing transmission power during compliance tests.
- 09 Ensure laboratories and regulators have verifiable access to necessary parameters without exclusive dependence on manufacturers' proprietary tools.
- 10 Use inspection, correction, withdrawal and authorization-revocation powers when the legal conditions are met; refer evidence of offenses to the competent authorities.

C. Transparency, prevention and international reform

- 11 Strengthen post-market checks of retail-purchased products and publish test results and corrective measures.
- 12 Improve effective consumer information about SAR, testing conditions and software corrections; examine how federal preemption affects available consumer remedies.
- 13 Establish documented cooperation with ANFR, ISED and European authorities concerning non-compliance, software mechanisms and corrective action.
- 14 Launch an international programme with US public-health agencies, independent experts and standards bodies to develop more comprehensive indicators; publish an independent critical review of ICNIRP, NCRP and IEEE recommendations.
- 15 Set a public schedule for decisions, revised procedures and monitoring of implementation, with accessible civil-society reporting.

TWO COMPLEMENTARY OBLIGATIONS

Future improvements to standards must never suspend efforts to establish present responsibilities. Existing rules must be enforced, equipment inspected and consumers informed now.

Priority actions during the first six months

Within thirty days of the filing, the FCC should appoint a team to review iPhone 12 A2403/BCG-E3544A records, document relevant variants and software versions, and publish an inspection

timetable. This proposed deadline is an Alerte Phonegate recommendation, not an existing legal obligation.

Within ninety days, the agency should publish an independent comparative-testing method covering body-contact configurations, Body Detect states, motion functions and different TAS algorithms. It should establish reporting and audit procedures covering other manufacturers, starting with devices whose European or Canadian surveillance reports show power-related corrections.

Within six months, the FCC should report the first results of tests on products sold to consumers, its reasons concerning the health effects within the 2021 judicial remand, and a timetable for new proceedings on multiband and long-duration exposure indicators. HHS, which is being approached separately, should participate in developing the health criteria. [22][34]

Accountability matrix: every request should lead to a verifiable action

REQUEST GROUP	ACTION TO INITIATE	EXPECTED PUBLIC DELIVERABLE
Actual compliance — 1, 2, 5, 6, 7	Contact tests, independent laboratory, retail purchases, retesting after corrections	Reproducible protocols and results for each version.
Software integrity — 3, 4	Audit Body Detect, TAS, proximity/motion and power tables	Mechanism descriptions and reasoned findings.
Accountability — 8, 9, 10	Authorization decisions; international notification and exchanges	Corrective actions, reasoned sanctions or justified non-action.
Health — 11, 12, 13	Responses to remand, lifetime-exposure studies and vulnerable groups	Documented independent assessment and prevention.
Reform — 14, 15	Multiband indicator programme led by FCC–HHS–international organizations	Standards timetable and public consultations.

SEVEN ACTIONS REQUESTED OF HHS

In response to HHS consultation HHS–OASH–2026–0397, Alerte Phonegate submits the same evidentiary dossier so federal health authorities can take account of real-world exposure conditions and the reliability of regulatory testing. The following requests fall within HHS's responsibilities for scientific assessment, coordination, research and prevention, rather than powers over equipment certification alone. [75]

H1 — Standards and assessment framework (Q5–6). Conduct an independent health reassessment of FCC, ICNIRP, IEEE and NCRP limits and frameworks, making explicit their assumptions, protective scope and discrepancies with real-world use.

H2 — Measurement and real-world exposure (Q7–8). Incorporate test separation, proximity sensors, power-management software, TAS, software versions and simultaneous transmissions into scientific assessment; compare laboratory configurations with close-to-body use.

H3 — Public transparency (Q9). Recommend standardized, understandable disclosures concerning SAR testing conditions, updates affecting power, identified exceedances and corrective actions.

H4 — Health surveillance and sensitive populations (Q10–11). Explicitly evaluate exposure of children, pregnant women, workers and intensive users, and propose appropriate surveillance and prevention tools.

H5 — Health evidence (Q6 and Q12). Undertake an independent critical review of human, animal and mechanistic evidence, including non-cancer effects, reproduction, cancer and long-term exposure, and publish inclusion criteria, exclusions and conflicts of interest.

H6 — Research priorities and coordination (Q16–17). Work with the FDA, NIH, CDC and independent institutions to define research on real-world exposure, biological mechanisms and reproducibility; publish responsible institutions and deadlines.

H7 — Institutional follow-up and prevention (Q18). Forward relevant scientific findings to the FCC for certification methods, engage ANFR, ISED and European institutions, and publish recommendations to reduce avoidable exposure.

CONCLUSION — PROTECT HEALTH AND MAKE OVERSIGHT EFFECTIVE

The FCC was warned by GAO as early as 2012 and directly by Alerte Phonegate in March 2018. Since 2019, our work has continued with North American scientific, civil-society and legal organizations. Our 2026 submission builds on that history and new documentary evidence: official measurements, device corrections, certification records, JRC findings and changes in standards.

The evidence assembled no longer justifies a response consisting of general assurances of compliance. It supports investigation of discrepancies between test conditions and actual use, control of software parameters, information provided to laboratories and consumers, and possible intentionally deceptive practices. We ask the FCC to verify what manufacturers knew, declared and actually did, and publish findings that can be independently checked.

The question reaches beyond smartphones. The same requirements of transparency, representative metrology, separation of interests and independent oversight apply to connected devices, Wi-Fi networks, base stations and small cells, using the metrics and procedures appropriate to each configuration. The investigation demonstrates why cross-sector independent verification is needed.

The FCC must carry out independently reviewable tests of retail devices; demand access to necessary software parameters; examine compliance declarations and public disclosures; investigate weaknesses in the measurement chain; and initiate corrective action or sanctions supported by evidence. Advances in 5G, satellite services and future 6G make this requirement more urgent. HHS must assess the public-health validity of the testing protocols and exposure assumptions on which standards and regulatory decisions rely.

HHS must undertake an independent and comprehensive reassessment of the health risks associated with radiofrequency exposure, including cancer risks, particularly brain tumors, as well as non-cancer effects.

This assessment must examine the full body of experimental and epidemiological evidence, including the NTP findings and the methodological limitations and potential conflicts of interest surrounding studies such as MOBI-KIDS. Particular attention must be paid to long-term exposure, children, pregnant women and occupational exposure. Scientific transparency and independence must be central to this process.

Eight years of warnings delivered directly to US institutions, following the earlier GAO warnings, cannot be met with another generic response. Protection of the public must be demonstrated by representative measurements, guaranteed through transparency and followed by decisions for which each institution accepts responsibility.

Someone who learns that their phone model exceeded a limit should not need to read hundreds of pages of laboratory reports to understand what happened. They should be able to identify the model, test configuration, limit exceeded, marketing date and any correction. Alerte Phonegate's request is also a demand for the right to information: device operation and the role of algorithms cannot remain unintelligible when people carry these devices close to their bodies every day.

HHS should take the lead in launching an immediate public information campaign advising users not to keep smartphones and connected devices in direct contact with their bodies or heads. Priority should be given to children, pregnant women and workers with prolonged exposure. Such preventive action, without waiting for further regulatory revisions, would represent a major public health advance for hundreds of millions of people.

We did not wait for these facts to emerge before taking action; we helped bring them to light. This comment is therefore not a neutral digest of administrative positions. It is an evidence-based appeal by the organization that has sounded the alarm, sought access to records and advocated protection of users since 2018.

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ANNEX A — LETTER TO THE FCC OF MARCH 20, 2018 (SIGNATURES REDACTED)

Seven-page submission sent by Alerte Phonegate to FCC Commissioners. It records earlier requests concerning direct-contact testing, children, power-control sensors and algorithms, consumer disclosures and independent monitoring. All seven pages of the original letter are reproduced; handwritten signatures have been redacted but signatories' names and capacities retained.

20 March 2018

Mr. Ajit Pai, Chairman
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Mr. Michael O'Rielly, Commissioner
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Mr. Brendan Carr, Commissioner
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Ms. Jessica Rosenworcel, Commissioner
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Dear Madam, Dear Sir,

We refer to the Federal Communications Commission's scheduled proceedings in 2018 to address human exposure to radiofrequency (RF) fields, the first public meeting of which will take place on March 22. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) will also be considering revision of the high-frequency part of its EMF Guidelines this year.

In this context, we wish to bring to your attention the recently released data from the French government National Frequencies Agency (ANFR) relating to human exposure of radiofrequencies emitted by mobile phones. The ANFR data provides extensive documentation that mobile phones on the market today expose the human body to radiation that far exceeds regulatory limits in both the U.S. and France. Current test systems and protocols that manufacturers use for mobile phone radiation testing are rigged, because phones are tested at a distance from the body and brain. The revelations of this data are at the origin of the international scandal referred to as "Phonegate."

In July 2016, the French National Agency for Food, Environmental and Occupational Health and Safety (ANSES) published an important report entitled, "[Exposure to Radiofrequencies and Child Health](#)". This report brought to light information hitherto unknown to the public, namely that ANFR had been testing hundreds of mobile phones for radiation emissions since 2012 and that most of these phones exceeded regulatory SAR limits—when tested in body-contact positions. For example, the European Union regulatory limit for cell phone SAR is 2 W/kg, however, 9 out of 10 mobile phones tested in 2015 (at 0 mm distance from the

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body) showed a SAR level higher than 2 W/kg, and 1 out of 4 had a SAR level higher than 4 W/kg.

Manufacturers test mobile phones for radiation SAR values *with a distance* between the phone and the body, and manufacturers instruct consumers to keep at least this specific distance from their phones. However, these instructions to keep a distance between the phone and body are hidden deep in unread mobile phone manuals or embedded within the operating system. ANFR tested phones at the manufacturers' stipulated separation distances *and also at 0 mm distance* to replicate common consumer behavior of holding the phone close.

People use phones in positions of close body contact every day. They rest phones on their abdomens, tuck phones in their tight pants pockets and sleep with phones against their heads. However, the public was unaware of the ANFR testing until the 2016 ANSES Report was published.

In June 2017, after several legal actions brought by our organization, ANFR eventually released the first data set of partial results of the SAR tests that it conducted on 379 mobile phones selected from stores between 2012 and 2016. ANFR measurements show that the leading mobile phones sold in France, as well as in Europe, exceed the European regulatory thresholds for the SAR trunk and extremities. Regulations allowed mobile phones to be tested at a distance of 15 to 25 mm from the skin. In June 2016, at the initiative of France, the European Commission adopted a precautionary notice for manufacturers, asking them to test the SAR extremities at 0 mm and the SAR trunk at a few millimeters without any upper limit.

On March 8, 2018, ANFR published the second data set of the complete SAR measurement reports of 442 cell phones tested until 2017. [The results of the tests can be viewed on ANFR's DATA site.](#)

This issue was the subject of our [presentation given at the scientific symposium organized by the Environmental Health Trust](#) on July 31, 2017, in Jackson Hole, Wyoming, "Phonegate Cell Phone Radiation Tests of France Violate Safety Limits." For years, Environmental Health Trust scientists and advisors have [published papers](#) on how the current mobile phone test protocols are deeply flawed and allow consumers to be exposed to radiation that exceeds regulatory thresholds.

The French government ANFR test data provides clear documentation that many, if not all, mobile phones emit RF energy at a level that far exceeds not only European limits of 2.0 W/kg, but also exceeds the U.S. government SAR limit of 1.6 W/kg for the body. This is not merely a European issue as it applies to mobile phones sold worldwide (including the United States, Canada, Australia and China).

In January 2018, the Finnish deputy to the European Parliament [raised the subject of the impact of cell phone radiation on the health of European citizens](#), referring to the ANFR test measurement results. On March 15, [the European Commission replied](#), explaining the steps it had taken to date on this issue, which we find unsatisfactory.

The European standards are more lenient than the U.S. regulatory limits adopted by the FCC in 1996. The U.S. SAR limits for the general public are 1.6 W/kg SAR averaged over 1 g of

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tissue for 6 minutes for the SAR head, trunk, arms and legs and 4.0 W/kg SAR averaged over 10 g of tissue for 30 minutes for SAR extremities, which are the ear, wrist, hands, ankles and feet. In contrast, the European limits not only allow a 2 W/kg SAR but also average that SAR over 10 grams rather than 1 gram of tissue. Thus, one needs to convert a SAR that uses the European 10 gram average protocol to the FCC 1 gram average in order to compare the numbers.

Converting the European 10 gram SAR to a U.S. FCC 1 gram SAR

Scientific documentation indicates that because European test protocols use 10 grams and U.S. test protocols use 1 gram, the computation to convert the French test results to U.S. FCC testing methods involves roughly doubling to tripling the European SAR value.

“A mobile phone compliant with the ICNIRP standard of 2.0 W/kg SAR in 10 g of tissue may lead to a 2.5 to 3 times excess above the FCC standard of 1.6 W/kg in 1 g of tissue (i.e., 4-5 W/kg in a cube of 1g of tissue).” ([Gandhi 2011](#))

For scientific documentation we refer you to these studies:

1. [Some present problems and a proposed experimental phantom for SAR compliance testing of cellular telephones at 835 and 1900 MHz](#)
2. [Inaccuracies of a Plastic "Pinna" SAM for SAR Testing of Cellular Telephones Against IEEE and ICNIRP Safety Guidelines](#)
3. [SARs for pocket-mounted mobile telephones at 835 and 1900 MHz.](#)

Thus, a mobile phone tested at 7 W/kg by ANFR would have a SAR 2 to 3 times higher, i.e. 14 W/kg to 20 W/kg for 1 g of tissue, and up to nearly 15 times the legal threshold allowed in the U.S., as indicated in the [table of ANFR test results at manufacture set distance and minimum FCC equivalent](#).

Furthermore, the current SAR test system protocols do not take into account the unique physiology of children, who have smaller heads and thinner skulls than adults. This allows RF energy to penetrate more deeply into their brains due to the shorter distance from their skull to their brain center.

In addition, it has been documented that when it comes to SAR testing there can be a margin of error 30% plus or minus in regards to the psSAR. [Read the Inquiry letter to the FCC](#). This means the SAR could be far higher than tests document.

SAR tests in the laboratory are under controlled conditions that do not represent real-life environments, especially in regards to metal implants or metal near the body. Published [research](#) shows that eyeglasses with metal frames and [metal jewelry](#) can affect the SAR levels. For example, a [study](#) found the SAR measured in the eye closest to the phone increased up to almost 30% when metal glasses were a part of the calculation. Similarly, [publications](#) have reported that the peak SAR can be up to 25% higher when a 900 MHz phone is pressed up to an ear pierced with a metallic object such as an earring. Another [study](#) looked at the SARs into the leg and reproductive organs when a cell phone was placed in a pocket alongside a keychain with a metal ring and found that the presence of a metallic ring significantly increases the averaged 10 g SAR inside the testicle by more than 20% at 1.8

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GHz. Additionally, many persons have a variety of metal implants in their body, such as dental implants, skull plates, the pins used for broken bones, hip replacements and brain implants. Metallic implants inside the body have been found to [increase](#) the SAR levels in [several studies](#). Increased SAR levels in the brain and body tissue from implanted metal is a serious concern that mobile phone SAR test protocols and regulatory agencies have not addressed.

During the Peer Review meeting on 26-28 March, we are delivering our [comments](#) on the NTP studies in person, including our reaction to John Bucher's presentation at the February 2 telephone press conference.

The Food and Drug Administration is aware of the French tests and studies. The subject was officially raised by the Environmental Health Trust ([EHTrust.org](#)), our partner in the U.S. In June and September 2017, the Executive Director of Environmental Health Trust, Theodora Scarato, wrote to the FDA to inform them of the results of the ANFR tests and of the ANSES scientific report. Scarato also informed the FDA that cell phones exceeded FCC limits when tested in body-contact positions and provided documentation.

However, the FDA simply wrote back October 18, 2017 that "the information is interesting and we would like to see the experimentation in its entirety." Note: The reports are now posted in their entirety and the FDA has been informed of this.

When asked if the FDA was OK with regulatory limits being violated, they responded. "FDA is not saying that it is OK to exceed a regulatory limit. We stated that there is a large safety factor built into these regulatory limits. Please contact FCC regarding their compliance testing and enforcement policies regarding their regulatory limits."

When asked "What is the SAR limit violation of which the public will be informed by the FDA that cell phones violate US regulatory SAR limits?" The FDA did not respond. Will the FDA act if a phone exceeds the regulatory limit by 5 times or 10 times or 20 times? How high does the radiation SAR value need to go to trigger an FDA response? However, instead of responding to the question asked on October 18, 2017, Dr. Daniel Kassiday, Radiation Safety Engineer, wrote on behalf of the FDA, "At this time the FDA has no concerns about the regulatory safety limit set by the FCC."

The FDA has been fully informed that regulatory limits can be violated by common consumer behavior and has failed in its duty to protect public health.

Furthermore, the FDA has stated that the National Toxicology Program findings of increased tumors in rats is not applicable to health risks to people—discounting the association with cancer—allegedly because the NTP used higher exposures than those to which people are exposed. However, the French tests show that, in fact, people can receive exposures that are higher than those used in the 2-year NTP bioassay—between 3 to 12 times higher than the recommended limits—to the areas of their bodies where they hold the phone in contact with their body. Thus, contrary to what FDA replied in their letter of 2017, the NTP study findings are directly relevant to human health, especially when you consider that children will have a lifetime of exposure and they and many adults sleep with their phones, unaware of the radiation exposure.

2018 FCC letter — page 5 of 7 (facsimile)

Considering that the French documentation on test results has found SARs higher than 6 W/kg, the NTP studies are quite relevant. [We wish to share the important recommendations to the French public provided of Roget Genet, Director-General of ANSES, in the July 2016 report:](#)

- “Ensure in all circumstances the respect of regulatory limit values of exposure, no matter what type of emitting devices are used and their conditions of use (positioning in contact with the body)”
- “Re-evaluate the pertinence of the specific absorption rate (SAR) used in the establishment of limit values of exposure of people for means of protection against known and proven health effects (thermal effects) of radiofrequencies.”
- “And develop a measurement representative of the actual exposure of users of mobile phones, no matter what the conditions of use: signal used, good or bad reception, type of use (calls, loading of data, etc.)

These recommendations echo the [ones made recently by the California Department of Public Health in December 2017](#). In order to better protect mobile phone users, the Department recommends, for example:

- Keep your mobile phone away from your body, using the speakerphone and avoid keeping it in the pocket or in a bra;
- Use the hands-free kit only for short phone conversations.

These recommendations were also kept secret by the California Department of Public Health since 2009 and were obtained through Dr. Joel Moskowitz’s fight for transparency.

In revising these two-decade old standards, we would ask you to consider the documentation from France and Europe, in the revision of the SAR standards regarding human exposure to radiofrequency fields emitted by mobile phones, and recommend measures to better protect the people of the United States and the other countries to which these standards apply. It is also imperative to note the radical change in uses and users of these and related devices. As the American Academy of Pediatrics has noted, children are not little adults. They advise, and we concur, that the fast-growing brains and bodies of the young can absorb proportionally more RF and that many uses by children should be curtailed.

We sincerely hope that you will review in detail and in depth these SAR measurements from a French national agency and consider the vulnerability of children and infants (who are handed phones and other wireless devices as toys or learning devices, despite the lack of validation of their value for these purposes). There are no validated models for evaluating RF exposures into the young body and brain.

To reflect realistic uses of phones and other mobile wireless devices today, it is also important that the FCC require manufacturers to test all body SARs on contact at 0 mm distance instead of 10 mm for devices to be sold in the U.S. As a reminder, [the new European standard EN 50566/2003](#) requires manufacturers to test the SAR extremities at 0 mm and the SAR trunk at a few mm (without more precision). Other policies that should be undertaken include:

- Actively champion making the SAR test protocol average of 1 g of tissue used in the U.S. the reference at the international level. This will impact the health of hundreds of millions of people.

2018 FCC letter — page 6 of 7 (facsimile)

- Set a maximum time for testing exposure that is more in line with the reality of use—6 minutes and even 30 minutes do not reflect current uses and underestimate the reality of thresholds of human exposure.
- Ensure that no devices and no algorithms allowing further reduction of the actual exposure values are used by the manufacturers during the tests.
- Require manufacturers to incorporate various common scenarios into the SAR testing so they consider metal glasses and jewelry inside, on or near the body.
- Work with the American Academy of Pediatrics and other health professional organizations to provide lower regulatory thresholds that account for mobile phone use by children, infants and pregnant women by developing a proper safety standard developed by scientists, health agencies, public health experts and medical experts.
- Make the display of all SAR values mandatory—both at point of sales and in advertisements—along with public educational programs to promote safer technology.
- As France and other nations have done, it is critically important that the FCC develop and implement public health campaigns and recommendations to reduce exposure directed primarily at parents, children, pregnant women and medically sensitive populations.

We remain at your disposal for any additional exchange that you or your team wish to have with our association on this subject. We are counting on you to ensure better protection for the public. Implementing these public health and safety measures is critical to ensuring regulatory compliance.

Respectfully yours,

Dr. Marc Arazi
President
Association Alerte Phonegate

Devra Davis, PhD, MPH, FACE
Visiting Professor of Medicine, The Hebrew University
President, Environmental Health Trust
Guest Editor in Chief, “Wireless Radiation and Health”, a special issue of *Environmental Research*, an Elsevier Publication, in press

2018 FCC letter — page 7 of 7 (facsimile)

Copy:

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Commissioner for Internal Market,
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European Commission
elzbieta.bienkowska@ec.europa.eu

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Alerte Phonegate, independant ONG, 35 rue François Rolland 94130 Nogent-sur-Marne,
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ANNEX B — SAR TESTS: THE ACTUAL CONDITIONS OF LABORATORY CONTROLS

KEY POINT A SAR result has meaning only when the device, its position, test separation and verified software and radio configuration are identified.



B1. Phone placed on a measurement platform alongside anatomical phantoms. Photograph supplied for this dossier; ANFR laboratory surroundings are visible.

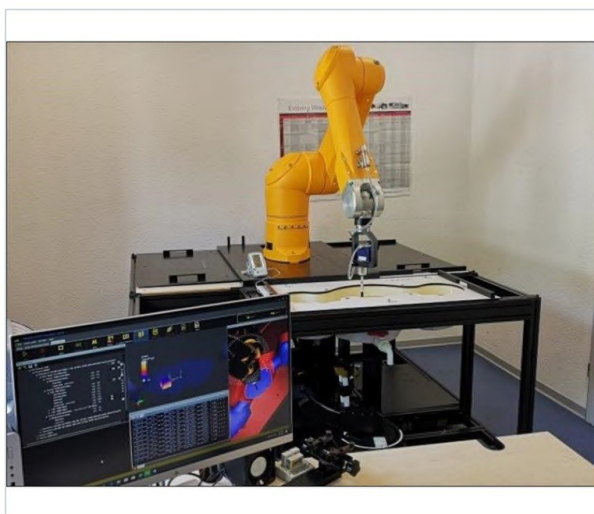


B2. A probe positioned above a phone mounted on a phantom. ANFR photograph of the positioning beneath the probe.

From the picture to the measurement: five details that must be recorded

01 · Position	Head (cheek/tilted), trunk or limb: photographs must be linked to the exact protocol.
02 · Distance	Millimeter separation and reference measurement point; distinguish 0, 2 and 5 mm and earlier separations.
03 · Emission	Measured bands, channels, active antennas and simultaneous transmissions.
04 · Software	OS/firmware version, proximity, motion and TAS mechanisms and verified triggering conditions.
05 · Traceability	Model, sample, date, laboratory, uncertainty, corrections and comparison with retail products.

Additional photographs: authentic laboratory report



Banc de laboratoire



Position corps : exemple

B3. Laboratory bench and positioning photographs from CTC advanced Test Report No. 1-1800/21-226-02 (iPhone 12 file).

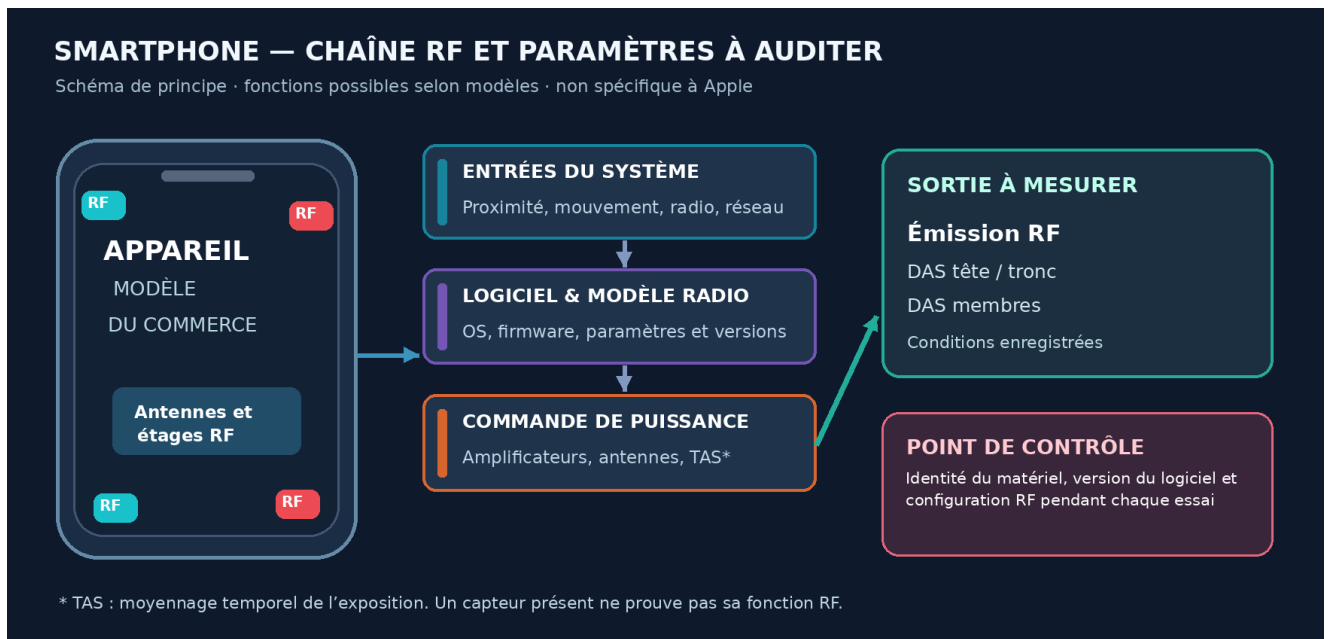
SOURCE ANFR — how SAR is measured (methods and phantoms) [Open source](#)

SOURCE FCC — KDB 447498 (positions, distances and methodology) [Open source](#)

SOURCE MVG — SAM and elliptical phantoms [Open source](#)

ANNEX C — SMARTPHONES: HARDWARE, SENSORS AND SOFTWARE

KEY POINT Independent verification requires access to the parameters through which sensors and software control RF power.



C1. Original educational diagram of generic functions: sensor inputs, software versions and RF control.

Visible hardware and information a photograph cannot reveal



C2. Identified antenna areas in CTC advanced Report No. 1-1800/21-226-02, p. 56. Independent verification also requires access to power tables and algorithm-triggering conditions.

What public sources establish — and what remains to be disclosed

Apple (public information)	Official iPhone 12 specifications name the accelerometer, gyroscope and proximity sensor; the repair manual includes an interior view.
SAR report	Each measurement must be linked to its band, position, protocol, hardware and the hardware/software configuration used during testing.
Proprietary software	RF-stage settings, power tables, detection thresholds and test configurations require independent documentation and verification.
Priority audit	Confirm the identity of sold and tested samples; iOS/firmware version history; activation of sensors and power reduction; reproducibility without exclusive tools.

QUESTION FOR THE FCC / HHS

How can an authority assess real-world exposure and certify a configuration if software conditions changing transmitted power are neither documented nor independently reproducible?

Photographic and technical references

SOURCE Apple — official interior view of the iPhone 12 [Open source](#)

SOURCE Apple — iPhone 12 specifications and sensors [Open source](#)

SOURCE Apple — official iPhone 12 repair manual [Open source](#)

ANNEX E — ANFR TEST REPORTS: APPLE

Extracts from the October 2026 memorandum to the French ministry: the three checkbox states, SAR results and successive corrections. Links to the individual PDFs are provided in the source memorandum.

ALERTE PHONEGATE | NOTE MINISTERE DE LA TRANSITION ECOLOGIQUE | OCTOBRE 2026

ANNEXE A | RAPPORTS ANFR

Apple — dispositifs pris en compte et résultats DAS

Essais publiés depuis 2019. Cases reproduites à partir des rapports officiels CTC/Cetecom ; PDF accessibles ligne par ligne.

Modèle / essai	Rapport ANFR	Prox.	Mouv.	TAS	DAS / limite · type	Conformité
iPhone XS (A2097) 2019	1-7879/19-31-02 Ouvrir le PDF	☐	☐	☐	1,670 / 2 Tronc · 5 mm	Conforme
iPhone 11 (A2221) 2019	1-7879/19-93-02 Ouvrir le PDF	☐	☐	☐	0,844 / 2 Tronc · 5 mm	Conforme
iPhone 12 (A2403) · initial 2022	1-1800/21-269-02 Ouvrir le PDF	☐	☐	☐	5,615 / 4 Membre · 0 mm	NON CONFORME
iPhone 13 (A2633) 2022	1-1800/21-228-02 Ouvrir le PDF	☐	☐	☐	1,260 / 2 Tronc · 5 mm	Conforme
iPhone 12 · protocole 2 2023	1-6460/23-01-02 Ouvrir le PDF	☐	☒	☒ *	5,740 / 4 Membre · 0 mm	NON CONFORME
iPhone 12 · correctif iOS 2023	1-6460/23-30-03 Ouvrir le PDF	☐	☒	☒	3,935 / 4 Membre · 0 mm	Conforme
iPhone 14 (A2882) 2023	1-6460/23-10-02 Ouvrir le PDF	☐	☒	☒	1,413 / 2 Tronc · 5 mm	Conforme
iPhone 15 (A3090) 2024	1-7502/24-07-02 Ouvrir le PDF	☐	☒	☒	0,986 / 2 Tronc · 5 mm	Conforme
iPhone 16 (A3287) 2025	1-7502-24-83-02_TR1-R01 Ouvrir le PDF	☐	☒	☒	1,260 / 4 Membre · 0 mm	Conforme

☒ : case cochée dans le rapport officiel CTC/Cetecom · ☐ : case non cochée dans le rapport officiel.

iPhone 12 : trois cases non cochées pour l'essai non conforme de 2022 ; nouvel échec en 2023 ; conformité mesurée après correctif.

ANNEX F — ANFR TEST REPORTS: SAMSUNG, XIAOMI, GOOGLE

Extracts from the October 2026 ministerial memorandum, including the November 19, 2018 ANFR contractual provision concerning algorithms.

ALERTE PHONEGATE | NOTE MINISTERE DE LA TRANSITION ECOLOGIQUE | OCTOBRE 2026

ANNEXE B | RAPPORTS ANFR

Samsung, Xiaomi, Google — autres fabricants

Rapports publiés depuis 2019, avec cas de non-conformité et corrections successives (Poco X3).

Modèle / essai	Rapport ANFR	Prox.	Mouv.	TAS	DAS / limite · type	Conformité
Samsung Galaxy S10e 2019	1-7879/19-19-02 Ouvrir le PDF	☒	☐	☐	1,200 / 2 · Tronc 5 mm	Conforme
Samsung Galaxy S21 2021	1-1800/21-95-02 Ouvrir le PDF	☒	☐	☐	0,996 / 2 · Tronc 5 mm	Conforme
Samsung Galaxy S23 2023	1-6460/23-26-02 Ouvrir le PDF	☒	☐	☒	1,173 / 2 · Tronc 5 mm	Conforme
Samsung Galaxy S25 2025	1-0020-25-04-02 Ouvrir le PDF	☐	☐	☒	2,990 / 4 · Membre 0 mm	Conforme
Xiaomi Mi 8 2019	1-7879/19-25-02 Ouvrir le PDF	☐	☐	☐	1,400 / 2 · Tronc 5 mm	Conforme
Xiaomi Poco X3 · initial 2022	1-1800/21-252-02 Ouvrir le PDF	☒	☐	☐	2,330 / 2 · Tronc 5 mm	NON CONFORME
Xiaomi Poco X3 · 1er correctif 2022	1-4050/22-137-02 Ouvrir le PDF	☒	☐	☐	5,490 / 4 · Membre 0 mm	NON CONFORME
Xiaomi Poco X3 · 2e correctif 2022	1-4050/22-241-02 Ouvrir le PDF	☒	☐	☐	2,780 / 4 · Membre 0 mm	Conforme
Xiaomi 15 2025	1-0020-25-30-02 Ouvrir le PDF	☒	☐	☒	2,213 / 4 · Membre 0 mm	Conforme
Google Pixel 3 2019	1-7879/19-29-02 Ouvrir le PDF	☒	☐	☐	1,300 / 2 · Tronc 5 mm	Conforme
Google Pixel 6 2022	1-4050/22-36-02 Ouvrir le PDF	☐	☒	☒	1,725 / 2 · Tronc 5 mm	Conforme
Google Pixel 9 Pro 2026	1-0020-25-66-02 Ouvrir le PDF	☐	☒	☒	2,549 / 4 · Membre 0 mm	Conforme

Lecture : tronc à 5 mm et membre à 0 mm ne sont pas directement comparables. Le statut « conforme » se rapporte exclusivement aux mesures et conditions citées dans le PDF correspondant.

PIÈCE COMPLÉMENTAIRE · Extrait du cahier des charges ANFR aux laboratoires [24]

Pour les cas où la puissance maximale est basée sur un algorithme mis en œuvre dans l'équipement en condition réelles d'utilisation pour assurer soit le contrôle de la puissance de transmission (capteurs de proximité, accéléromètre ...) soit le contrôle de la valeur moyenne temporelle de la puissance de transmission, cet algorithme sera communiqué par l'ANFR et devra être mis en œuvre. Le titulaire devra indiquer par email à l'adresse sma@anfr.fr quelles sont ses possibilités et limitations dans ce domaine ainsi qu'éventuellement les coûts additionnels pouvant être associés à la mise en œuvre des essais.

ANNEX G — ANFR'S OFFICIAL LETTER TO APPLE, APRIL 26, 2023

Two pages: request for a detailed description of the power-management algorithm and acknowledgment that further testing could not be carried out with the documentation then available.



Le Directeur Général
Réf : ANFR/DG/SJ-2023-11754-D-/229/CP



APPLE DISTRIBUTION INTERNATIONAL Ltd
Hollyhill Industrial Estate
99136 Hollyhill
Cork
IRLANDE

Lettre recommandée avec avis de réception
n° RK 33 614 942 1 FR
Copie par courriel

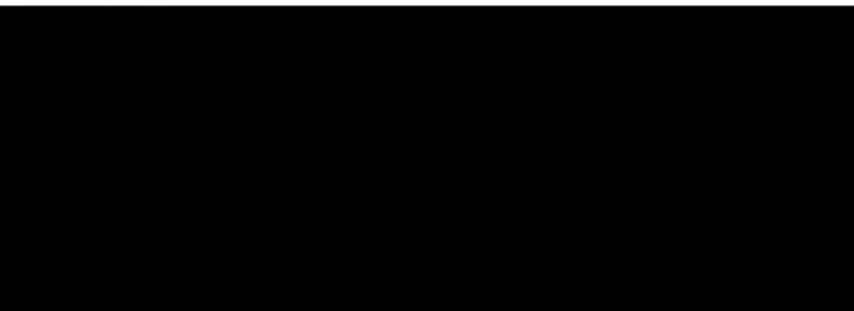
Maisons-Alfort, le 26 avril 2023

Monsieur,

Dans le cadre de l'évaluation de l'équipement iPhone 12 5G, par courrier du 21 décembre 2022, la société Apple a été mise en demeure par l'Agence nationale des fréquences (ANFR) de mettre fin aux non-conformités constatées par le laboratoire CTC¹ sur cet équipement. A la demande de la société Apple, une réunion s'est tenue dans les locaux de l'ANFR le 27 janvier 2023. Il a été convenu que la société Apple communiquerait, dans un délai d'un mois, les informations qui permettraient à l'ANFR de réaliser des essais sur l'équipement en tenant compte de toutes ses spécificités.

Par courriel du 28 février 2023, la société Apple a communiqué deux documents à l'ANFR :

- Un document intitulé « A2403_iPhone_SAR_Evaluation_In_UserMode » décrivant le protocole de test à mettre en œuvre pour pouvoir tester l'équipement iPhone 12 dans des conditions réelles d'utilisation ;
- un document intitulé « iPhone SAR Algorithms_Annexs » explicitant les algorithmes utilisés par Apple et leurs interactions avec l'utilisateur.



¹ Laboratoire désigné par le ministre chargé des communications électroniques par arrêté du 19 décembre 2005.

Agence nationale
des fréquences

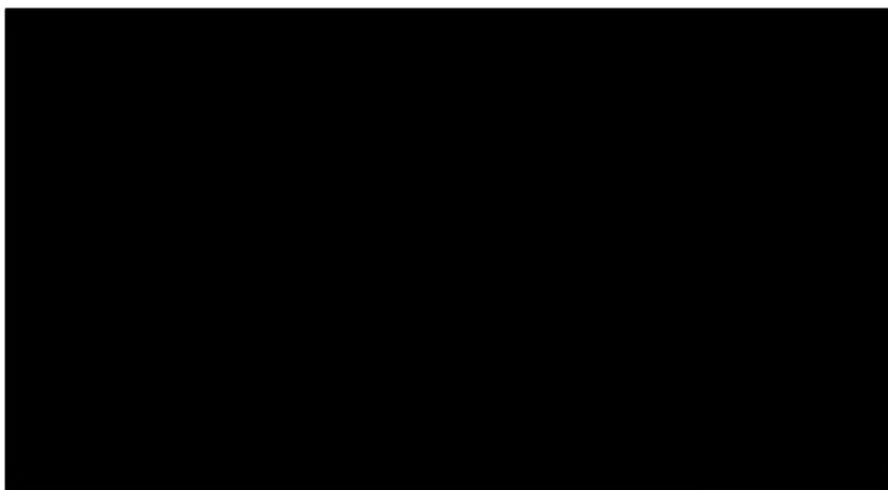
78, avenue du Général de Gaulle
94704 MAISONS-ALFORT CEDEX

T. +33 (0)1 45 18 72 72
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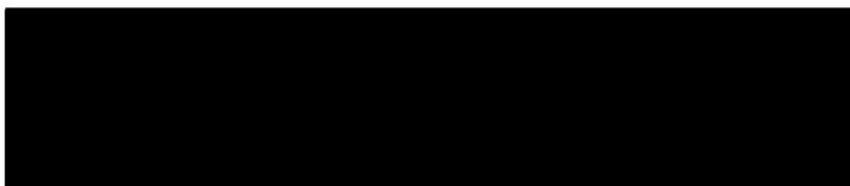
SIREN : 180 053 027
Code APE : 8413Z

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Annex G — ANFR–Apple letter, second page



D'autre part, lors de la réunion du 23 janvier 2023, et tel que confirmé par courriel du même jour, l'ANFR a demandé à la société Apple de compléter sa documentation technique d'une description détaillée de l'algorithme de gestion de puissance, conformément à l'article R. 20-8 du code des postes et des communications électroniques. Il avait été rappelé que ces informations auraient dû y figurer, notamment pour permettre aux autorités de surveillance du marché de réaliser des essais en tenant compte de toutes les caractéristiques de l'équipement, sans recourir à l'assistance du fabricant.



Par conséquent et en tout état de cause, l'ANFR ne peut faire réaliser de nouvelles mesures par le laboratoire CTC et constate que la non-conformité de l'équipement iPhone 12 5G persiste. Il est donc demandé à la société Apple d'adopter toutes les mesures correctrices appropriées pour mettre l'équipement susmentionné en conformité dans un délai d'un mois à compter de la réception par courriel. Passé ce délai, l'échantillon de l'équipement iPhone 12 5G sera envoyé au laboratoire désigné et fera l'objet de mesures en tenant compte de la documentation technique dont dispose l'ANFR. Dans l'hypothèse où l'évaluation relèverait la persistance du dépassement du DAS, l'ANFR sera contrainte d'adopter des mesures provisoires, conformément au V de l'article R. 20-21 du code des postes et des communications électroniques.

Je vous prie d'agréer, Monsieur, l'expression de mes sentiments les meilleurs.



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ANNEX G — ADDITIONAL EVIDENCE: BRÉGANT'S LETTER TO THE COMMISSION (JANUARY 5, 2024)



ANFR–Commission letter, January 5, 2024 — page 2 of 2

Enfin, la méthodologie de test mise en œuvre par le laboratoire accrédité a bien intégré le protocole proposé par Apple pour mesurer le DAS d'un terminal mis sur le marché en tenant compte de son dispositif de gestion de puissance. Toutefois, plutôt que de reconnaître une erreur dans la programmation ou le paramétrage de son terminal, la société Apple a préféré expliquer, y compris dans sa communication publique, que l'ANFR utilisait un protocole de test qui ne tenait pas compte du mécanisme de détection d'éloignement du corps de l'iPhone, indiquant notamment que « l'iPhone possède des capteurs qui lui permettent de détecter lorsqu'il est posé sur une surface statique, comme une table » et présentant cela comme un « mécanisme de détection d'éloignement du corps » (cf. annexe¹). Cette explication met en avant un fonctionnement du terminal qui donnerait injustement la priorité à la détection d'un éventuel support statique par rapport celle de la proximité du corps. Elle affirme également que le mécanisme mis en œuvre dans l'iPhone 12 a été « soigneusement testé et vérifié à l'échelle internationale afin de garantir sa conformité aux exigences de débit d'absorption spécifique », alors même que le fabricant soutient que le fonctionnement des terminaux mis sur le marché ne peut pas être correctement contrôlé par l'administration française en appliquant les normes harmonisées et le protocole qu'il a lui-même proposé. Retenir ces objections priverait les autorités de surveillance des moyens de contrôler effectivement le rayonnement des terminaux mis sur le marché. Les fabricants auraient, en effet, la possibilité d'exiger que les contrôles des autorités portent sur des terminaux spécialement préparés par eux, qui pourraient être différents des terminaux mis sur le marché.

Je me tiens à votre disposition pour tout complément d'information que vous souhaiteriez sur cette affaire, qui me semble emblématique de la capacité de l'Union à faire respecter les règles européennes qu'elle édicte pour assurer la santé de ses citoyens.

Je vous prie d'agréer, Monsieur le chef d'unité, l'expression de mes sentiments les meilleurs.


Gilles BREGANT
Directeur Général

¹ <https://support.apple.com/fr-fr/104994>

Reference: ANFR/DSE/DSM-2024-1; Ares(2024)76758; item 40.3 in the European transparency dossier.
View the document on the Commission's portal. [Open source](#)

ANNEX I — JRC: OFFICIAL FINDINGS ON THE IPHONE 12

European Commission Joint Research Centre (DG JRC), July 25, 2024; reference Ares(2026)4327550.

All four pages of the original document are reproduced in full after this summary, with no changes to their contents.

Findings and verifiable conclusions

Independent protocol validated — The JRC concluded that the measurements performed by CETECOM under 'Protocol 2', applied by ANFR, complied with harmonized standard EN 50566:2017.

Gap in the harmonized standard — EN 50566:2017 did not prescribe a testing method for devices using motion sensors, multiple antennas, dynamic antenna switching (ARTD) or time-based power control (TAS).

Exceedance and health requirements — The JRC concluded that exceeding an applicable SAR limit rendered a device non-compliant with the essential health and safety requirements of the Radio Equipment Directive.

Foreseeable conditions of use — Assessments must consider normal and reasonably foreseeable use conditions, avoiding factors capable of distorting measurements in those configurations.

Software correction initially territorial — The JRC noted that the Body Detect correction distributed in iOS 17.1 initially worked only on French cellular networks despite wider distribution of the software.

Regulatory implication — The JRC recommended amending harmonized standards to address recent hardware and software, enabling manufacturers and market authorities to reproduce tests.

Implications for the FCC: examine whether its protocols and certification reports enable independent evaluation of the same mechanisms on marketed and updated devices.

iPhone 12 case

Findings and conclusion from JRC

25 July 2024

In August 2022, France's national frequency agency (ANFR) conducted measurements of Specific Absorption Rate (SAR) on the Apple iPhone 12 through the accredited laboratory CETECOM. These measurements showed a non-compliant limb SAR value at a distance of 0 mm according to the SAR limits set out in Council Recommendation 1999/519/EC (*ICSMS reference: [NAN-COM054210042-02 1-1800_21-269-02](#)*). This finding was communicated to the economic operator (Apple), who argued that the power reduction mechanisms of iPhone 12 had not been taken into account in the SAR measurements.

Due to the above, Apple suggested to repeat the measurements under a specific testing procedure (Protocol 1), which was communicated to ANFR in February 2023. ANFR rejected Protocol 1, as it required a specific measurement setup that –in their view– could influence the test conditions.

[REDACTED]

In June 2023, Apple shared a second measurement procedure (Protocol 2) with ANFR for conducting limb SAR measurements at a distance of 0 mm from the phantom. ANFR agreed to carry out additional SAR measurements following this procedure (*ICSMS reference: [12_A2403_iPhone_SAR_Evaluation_In_UserMode_V2.0](#)*).

[REDACTED]

[REDACTED]

JRC — original document, page 2 of 4

[REDACTED]

In August 2023, CETECOM conducted SAR measurements on the iPhone 12 as defined in Protocol 2. These measurements showed a non-compliant limb SAR value at a distance of 0 mm according to the SAR limits set out in Council Recommendation 1999/519/EC (*ICSMS reference: [NAN-COM054210042-03 1-6460_23-01-02](#)*).

In accordance with the national safeguard procedure defined in Article 40 of the Radio Equipment Directive 2014/53/EU (RED), on 12 September 2023 ANFR decided to withdraw the iPhone 12 from the French market (*ICSMS reference: 14_APPLE - iPhone 12 - Decision 023-113 du 110923*). As required by Article 40(4), on 5 October 2023 ANFR informed the European Commission and Member States about this measure by placing the related information on the EU's Information and Communication System for Market Surveillance (*ICSMS*).

Following ANFR's concerns, Apple developed a corrective firmware modifying the functioning of Apple's Body Detect algorithm. [REDACTED]

New measurements conducted by CETECOM in September 2023 validated the compliance of the iPhone 12 running the corrective firmware with the SAR limits set out in Council Recommendation 1999/519/EC. The corrective firmware was later on released to the general public as part of iOS 17.1 (*ICSMS reference: [16_APPLE - IPHONE 12 - Rapport sur correctif 1-6460_23-30-03](#)*). Despite the worldwide release of iOS 17.1, modifications to the functioning of Apple's Body Detect algorithm were only applicable to iPhone 12 devices operating in cellular networks located in continental and overseas' French territories.

In October 2023, in accordance with Article 40(6) of the RED, the general communications regulator of Ireland (ComReg) objected to the national measure adopted by ANFR in relation to the withdrawal of the iPhone 12 from the French market. Pursuant to Article 41(1) of the RED, the Commission entered into consultations with France, Ireland and Apple to evaluate ANFR's measure. On the basis of the results of that evaluation, the Commission shall adopt an implementing act determining whether or not ANFR's measure is justified.

As the European Commission's in-house science and knowledge service, the Directorate-General Joint Research Centre (DG JRC) has worked in close cooperation with DG GROW.H.2 to analyse the documentation provided by all involved actors – including the measurement reports by CETECOM as well as the SAR measurement reports for the iPhone 12 carried out on behalf of Apple and sent upon request to the EC services.

JRC — original document, page 3 of 4

To further investigate this issue, DG GROW (in collaboration with DG JRC) submitted a list of questions on the definition and implementation of Protocol 2 to ANFR and Apple. Both actors provided timely replies to those questions – including some additional clarifications.

Furthermore, DG GROW organised a series of online consultations with ANFR, ComReg and Apple to provide further clarity on this matter.

After carefully analysing the documentation provided by all actors, DG JRC has come up with the following findings:

- The measurement procedure implemented by CETECOM in application of Protocol 2 complies with the Harmonised European Standard EN 50566:2017, [REDACTED]
[REDACTED]
[REDACTED]
- Harmonised European Standard EN 50566:2017 does not define a measurement methodology for mobile communications devices featuring motion sensors, multiple antenna systems, dynamic antenna switching algorithms (such as ARTD) or transmission power control algorithms (such as Time-Average SAR or TAS).
- Any measurement deviation above the SAR limits in Council Recommendation 1999/519/EC renders a communications device non-compliant with the essential requirements set out in Article 3(1.a) of the RED regarding the protection of health and safety of persons and domestic animals.
- In accordance with Article 40 of the RED, ANFR and Apple cooperated as necessary during the course of their additional testing and investigations.
- [REDACTED]
[REDACTED]
- [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
- [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
- According to Art. 17 of RED, the conformity assessment shall take into account all intended operating conditions as well as the reasonably foreseeable conditions. As such, any element [REDACTED] that may affect the

JRC — original document, page 4 of 4

measurements carried out during the operating and reasonably foreseeable conditions shall be avoided when performing a conformity assessment.

Takeaways and lessons learned:

It is paramount that Harmonised European Standards for market surveillance evolve accordingly to reflect the latest hardware and software developments featuring in mobile communications devices (e.g., motion sensors, transmission power control algorithms, Time-Average SAR, dynamic transmission antenna switching algorithms, etc.), so that a common standardised methodological approach can be used by both manufacturers and market surveillance authorities.

ANNEX J — SCIENTIFIC STUDIES BEYOND CANCER

A. Studies published before the FCC's 2019 decision

F1. Body-carried phones: comparative measurements and modelling

Kang G. and Gandhi O. P., 'SARs for Body- and Pocket-Mounted Mobile Telephones at 835 and 1900 MHz', URSI conference paper (2002). [• Source](#)

For the devices studied, results showed substantially greater localized SAR in certain pocket or belt positions, with values up to three times those obtained under head-measurement procedures.

F2. Children and underestimation of absorption

Gandhi O. P., Morgan L. L., de Salles A. A., Han Y.-Y., Herberman R. B. and Davis D. L., 'Exposure Limits: The Underestimation of Absorbed Cell Phone Radiation, Especially in Children', *Electromagnetic Biology and Medicine* 31(1), 34–51 (2012). [• Source](#)

A dosimetry study examining anatomical differences and the limitations of extrapolating adult measurements to certain exposure situations involving children.

F3. Maximum SAR in superficial tissues and in vitro testing

Schmid G. and Kuster N., 'The Discrepancy Between Maximum In Vitro Exposure Levels and Realistic Conservative Exposure Levels of Mobile Phones Operating at 900/1800 MHz', *Bioelectromagnetics* 36, 133–148 (2015). [• Source](#)

Comparing 80 in vitro studies with numerical estimates, the authors report that certain superficial tissues may locally exceed 40 W/kg; they recommend experimental conditions accounting for such localized distributions.

F4. Real-world exposure as a function of signal quality

Wall S., Wang Z.-M., Kendig T., Dobraca D. and Lipsett M., 'Real-world Cell Phone Radiofrequency Electromagnetic Field Exposures', *Environmental Research* 171, 581–592 (2019). [• Source](#)

Experimental measurements in California involving the studied phones and networks: exposure was strongly affected by signal quality and distance. Tests included 2G technologies.

F5. Contact SAR: analysis of ANFR results

Gandhi O. P., 'Microwave Emissions From Cell Phones Exceed Safety Limits in Europe and the US When Touching the Body', *IEEE Access* (2019). [• Source](#)

Analysis of ANFR measurements showing substantial increases in SAR as testing separation decreases; relevant to assessing realistic measurement protocols.

F6. Experimental cellular injury and signal variability

Panagopoulos D. J., 'Comparing DNA Damage Induced by Mobile Telephony and Other Types of Man-made Electromagnetic Fields', *Mutation Research – Reviews in Mutation Research* 781, 53–62 (2019). [• Source](#)

Comparative review of experimental results concerning the reproductive system of Drosophila, including the effects of modulation and variability in exposure.

B. Studies published after 2019 — particularly relevant to HHS

F7. Cellular and molecular effects

Lai H. and Levitt B. B., 'Cellular and Molecular Effects of Non-Ionizing Electromagnetic Fields', *Reviews on Environmental Health* (2023). [• Source](#)

Review of cellular stress responses, oxidative mechanisms and dependence of certain effects on time and field intensity.

F8. Reproduction: experiment involving high-power microwaves

Li Y. et al., 'Oxidative Stress and Energy Metabolism in Male Reproductive Damage From Single and Combined High-Power Microwave Exposure at 1.5 and 4.3 GHz', *Reproductive Toxicology* 132, 108759 (2025). [• Source](#)

In this rat experiment, the authors report changes in tissue, sperm quality and oxidative-stress markers after separate or combined exposure to 1.5 and 4.3 GHz.

F9. Multiple antennas and SAR variation with power distribution

Gu Y. et al., 'SAR Evaluation of MIMO Antennas With a Wide Tunable Range Power Divider', Scientific Reports 15, 11895 (2025). [• Source](#)

The study models how power distribution among antennas and body proximity affect SAR in a MIMO system; it illuminates the limitations of static test protocols for dynamic radio architectures.

ANNEX K — TIMELINE OF WARNINGS, TESTS AND REFORMS (2012–2026)

Purpose: make visible the intervals between official warnings or findings, regulatory action and changes to applicable rules. A lack of reform does not automatically mean a lack of inspections: we distinguish actions taken from their limitations.

K1. Evidentiary timeline: what authorities knew, and when

YEAR	ORIGINAL WARNING / FACT	DOCUMENTED RESPONSE	WHAT THE TIMELINE ESTABLISHES
2012	GAO Report 12-771 calls on FCC to reassess tests of phones carried against the body.	FCC: recommendations subsequently marked 'Closed – Not Implemented'.	Starting point for documented failure to implement GAO recommendations in the US. [G1]
2016	French disclosure of early ANFR results, including 2015 close-to-body measurements.	The test-distance issue becomes a matter of public record.	Results available before the first French withdrawals in 2018. [G2]
2018	March 20: formal Alerte Phonegate warning to FCC; March/June: NTP submissions; April: first French withdrawal (Hapi 30).	France starts withdrawing non-compliant devices; FCC receives formal warning.	Authorities formally notified and market surveillance under way, with no general US shift to contact testing. [G3]
2019	Sam Roe's investigation; Alerte Phonegate's Congressional dossier; ANSES opinion recommending contact trunk testing.	FCC conducts additional testing but retains its limits in December 2019.	Testing-distance issue known on both sides of the Atlantic. [G4]
2020	French formal objection to EN 50566:2017; challenge to tests conducted at a separation distance.	EU standardization process initiated.	Formal objection is a dated administrative milestone, not an immediate reform. [G5]
2021	August 13: DC Circuit remands several issues to FCC.	Requirement for reasoned response on portable testing, children, non-cancer effects and exposure duration.	Judicial remand still central to a new 2026 comment procedure. [G6]
2022	iPhone 12 limb SAR exceedance in France; ISED releases data on 90 phones following access request.	Apple formally notified in December; Canadian surveillance data disclosed.	Devices were already marketed before non-compliance was identified or disclosed. [G7]
2023	April 26: ANFR tells Apple documentation is still insufficient for independent retesting; further iPhone 12 tests, French withdrawal in September and software correction.	Apple changes Body Detect; software correction used to resolve the issue.	Effective testing depends on documentation controlled by manufacturer. [G8]
2024	July 25: JRC identifies gaps in EN 50566:2017 concerning sensors, antennas and TAS.	European scientific authority officially acknowledges the methodological gap.	Problem extends beyond the iPhone 12. [G9]
2025	EU Decision 2025/1760 upholds French measure; ISED revises RSS-102.SAR.MEAS in August.	Commission rules on Apple dispute; Canada strengthens algorithm validation.	Software mechanisms become explicit objects of regulation. [G10]
2026	EU amends harmonized-standard reference in September; FCC seeks comments again on remand in September.	EU transitional period announced through March 2028; FCC comments due October 22, 2026.	Approximately seven years between ANSES 2019 recommendation and EU revised reference in 2026; transition extends old regime. [G11]

K2. Delays: monitoring indicators

SEQUENCE	APPROXIMATE INTERVAL	SIGNIFICANCE / LIMITATION
GAO 2012 → FCC consultation 2026	≈ 14 years	Time since institutional warning; does not mean FCC took no actions whatsoever.
ANSES 2019 → EU standards decision, September 2026	≈ 7 years	Time from contact-trunk recommendation to new harmonized reference; transition until 2028.
iPhone 12 exceedance 2022 → correction 2023	≈ 1 year	Period of exchanges and retesting; exact release dates and affected populations must be established by variant.
EHT v. FCC 2021 → 2026 comment request	≈ 5 years	Judicial and regulatory delay directly relevant to FCC public timetable request.

Important: the columns above document identifiable delays. Attributing a legal failure to a particular actor requires separate analysis of its duties, powers, deadlines and available means of action.

K3. Primary sources and calculation method

[G1] GAO, GAO-12-771 (2012): <https://www.gao.gov/products/gao-12-771>

[G2] ANFR, SAR results and historical data; 2019 ANSES report: <https://data.anfr.fr/visualisation/table/?id=das-telephonie-mobile>

[G3] Alerte Phonegate's March 20, 2018 letter to the FCC (see Annex A); NTP records from 2018. • **Document**

[G4] Chicago Tribune, August 21, 2019; ANSES opinion 2017-SA-0229 (2019); FCC 2019. • **Document**

[G5] France's formal objection of September 22, 2020 concerning EN 50566:2017. • **Document**

[G6] EHT v. FCC, 9 F.4th 893 (D.C. Cir. 2021). • **Document**

[G7] ANFR, iPhone 12; ISED, market-surveillance records released in 2022. • **Document**

[G8] ANFR, letter to Apple of April 26, 2023 (Annex G); EU Decision 2025/1760. • **Document**

[G9] JRC, 'iPhone 12: Findings and Conclusions' (July 25, 2024), reproduced in Annex I. • **Document**

[G10] Commission Implementing Decision (EU) 2025/1760; ISED RSS-102.SAR.MEAS Issue 2, August 15, 2025. • **Document**

[G11] Commission Implementing Decision (EU) 2026/2003; FCC Public Notice DA 26-997, published in the Federal Register on September 22, 2026:

<https://www.govinfo.gov/content/pkg/FR-2026-09-22/html/2026-19364.htm>

ANNEX L — GLOBAL ECONOMIC WEIGHT OF THE SMARTPHONE AND WIRELESS INDUSTRY

Purpose: measure the economic importance of companies affected by exposure rules.

L1. Major participants in the global smartphone market

Source: Counterpoint Research, worldwide unit shipments (sell-in), 2025. Approximately 1.255 billion smartphones were shipped globally in 2025. Percentages are rounded; other market participants include manufacturers from a range of countries.

ORIGIN	MANUFACTURER / GROUP	2025 GLOBAL SHARE	OBSERVATION
United States	Apple	≈ 20%	Largest brand by smartphone shipments in 2025.
South Korea	Samsung Electronics	≈ 19%	Second-largest global brand in 2025.
China	Xiaomi	≈ 13%	Third-largest global brand in 2025.
China	vivo; OPPO/OnePlus; Honor; Huawei; Transsion	Other substantial positions	Groups cannot be added without a common scope and consistent source.
Europe	HMD/Nokia, Fairphone and other niche producers	Included in 'other'	No zero-share claim; markets, licenses and value chains differ.
Japan	Sony Xperia, Sharp and others	Included in 'other'	Also significant in sensors and components, with modest overall smartphone share.

A recent quarterly snapshot confirms market concentration: Counterpoint estimates approximately 23% of Q2 2026 shipments for Samsung, 21% for Apple, 11% for Xiaomi, and 8% each for vivo and OPPO; 'other' brands account for approximately 27%.

L2. The industry's role in compliance and regulation

ECONOMIC REGION	EXAMPLE COMPANIES	KEY ROLE IN COMPLIANCE
United States	Apple; Qualcomm; Google; Broadcom	Handsets, modems and chips, operating systems, platforms and certification records.
China	Huawei; Xiaomi; OPPO; vivo; Honor; Transsion	Equipment, handsets and software ecosystems; domestic market and exports.
South Korea	Samsung Electronics; SK hynix	Handsets, chipsets and components.
Japan	Sony; Sharp; Murata	Selected handsets, sensors, RF components and modules.
Europe	Ericsson; Nokia; STMicroelectronics; HMD; Fairphone	Networks, components, standardization and some handset manufacturers.

L3. Implications for public authorities

This industrial concentration helps explain why certification rules, SAR test procedures and power algorithms carry major transnational economic consequences. It calls for independent laboratory governance, public validation rules and reproducible oversight mechanisms, particularly for products sold simultaneously in multiple jurisdictions.

We ask the FCC to assess the effects of its testing and transparency rules on manufacturers, subcontractors, chipset designers, software platforms, laboratories and consumers, and publish the safeguards ensuring independence of its decisions.

L4. Sources for the industry annex

[H1] Counterpoint Research, 'Global Smartphone Shipments Grew 2% YoY in 2025':

<https://counterpointresearch.com/en/insights/global-smartphone-shipments-grew-2-percent-YoY-in-2025>

[H2] Counterpoint Research, 'Global Smartphone Market Share Quarterly', Q2 2026:

<https://counterpointresearch.com/en/insights/global-smartphone-share>

[H3] Counterpoint Research, 'Global Smartphone Shipments 2018–2025':

<https://counterpointresearch.com/en/insights/global-smartphone-shipments-share>

[H4] Huawei, Annual Report 2025: <https://www.huawei.com/en/annual-report/2025>

[H5] Gartner, 'Semiconductor Revenue 2025' (January 12, 2026):

<https://www.gartner.com/en/newsroom/press-releases/2026-01-12-gartner-says-worldwide-semiconductor-revenue-grew-21-percent-in-2025>

ANNEX M — OFFICIAL TABLE OF 71 PHONES AND 2 TABLETS

ALERTE PHONEGATE / FRANCE / OCTOBER 2026



71 phones and 2 tablets flagged for SAR exceedances

France · Market surveillance and corrective measures · Documentary status as of 19 October 2026

Regulatory limits: head and torso SAR 2 W/kg; limb SAR 4 W/kg. Measurements are in W/kg. "After correction" values are those published for the tested configurations. A dash means that the corrected value is unavailable or unverified.

No.	Model	SAR type	Before correction	After correction	Administrative action	Reference date
1	Orange HAPI 30	Torso	2,10	—	Withdrawal + recall	08/04/2018
2	Neffos X1 TP902	Torso	2,52	—	Withdrawal + recall	29/05/2018
3	Razer Phone 2	Torso	3,29	—	Withdrawal + recall	20/05/2020
4	Huawei Honor 8	Torso	2,11	1,45	Update	29/05/2018
5	Echo Star Plus	Torso	2,05	1,41	Update	29/05/2018
6	Alcatel Pixi 4 (6 pouces)	Torso	2,04	1,58	Update	29/05/2018
7	Wiko Tommy 2 (Bouygues)	Torso	2,46	1,66	Update	26/07/2018
8	Hisense F23	Torso	2,13	1,46	Update	26/07/2018
9	Wiko View	Torso	2,44	1,34	Update	30/10/2018
10	Archos Access 50	Torso	3,01	1,36	Update	19/12/2018
11	Logicom M Bot 60	Torso	2,81	1,51	Update	10/01/2019
12	Xiaomi Redmi Note 5	Head	2,08	0,356	Update	27/02/2019
13	Xiaomi Mi Mix 2S	Torso	2,94	1,42	Update	27/02/2019
14	Echo Horizon Lite First correction insufficient; later withdrawal/recall and reported penalty.	Torso	2,38	2,84	Withdrawal + recall	04/10/2019
15	Nokia 3	Torso	2,37	1,64	Update	29/04/2019

ALERTE PHONEGATE / FRANCE / OCTOBER 2026

No.	Model	SAR type	Before correction	After correction	Administrative action	Reference date
16	Nokia 3.1	Torso	2,73	1,82	Update	16/04/2020
17	Nokia 5	Torso	2,24	1,81	Update	05/04/2019
18	Nokia 6.1 (TA-1043)	Torso	3,85	1,92	Update	12/07/2019
19	OnePlus 6T	Torso	2,56	1,17	Update	13/03/2020
20	Logicom Le Hola	Torso	2,58	1,61	Update	16/04/2020
21	Xiaomi Redmi 7	Torso	2,01	0,951	Update	16/06/2020
22	Gigaset Plus	Torso	2,37	0,899	Update	16/06/2020
23	Xiaomi Mi Note 10	Torso	2,45	1,12	Update	30/07/2020
24	Nokia 7 Plus First correction at 2.15 W/kg; reported financial penalty.	Torso	3,48	1,58	2 updates	25/08/2020
25	Sony Xperia 5	Torso	2,64	1,13	Update	16/10/2020
26	EssentielB HeYou 60	Torso / Limbs	2,86 / 5,26	1,11 / 2,92	Update	24/03/2021
27	EssentielB HeYou 40	Torso / Limbs	2,54 / 4,02	1,29 / 2,22	Update	15/04/2021
28	Realme 7i	Limbs	4,91	2,37	Update	20/12/2021
29	Samsung Galaxy Note 10 Plus	Limbs	4,33	2,05	Update	11/07/2022
30	Hisense Infinity H30	Limbs	4,30	2,04	Update	11/07/2022
31	Gigaset GX290	Torso	2,94	0,779	Update	11/07/2022
32	Xiaomi Redmi Note 9 Pro	Limbs	4,96	2,69	Update	28/07/2022
33	OnePlus 7 Pro	Limbs	4,42	2,33	Update	19/10/2022
34	Samsung Galaxy Z Flip First correction at 3.024 W/kg; reported €7,500 fine.	Torso	2,502	1,024	2 updates	18/11/2022
35	Wiko Y82	Limbs	4,01	2,30	Update	18/11/2022
36	Logicom Le Pulse Intermediate corrections still non-compliant; reported €7,500 fine.	Torso / Limbs	2,47 / 4,36	0,393 / 0,799	3 updates	15/12/2022
37	Xiaomi Poco X3 The 5.49 W/kg limb value comes from the first correction.	Torso / Limbs	2,33 / 5,49	1,30 / 2,78	2 updates	01/03/2023

ALERTE PHONEGATE / FRANCE / OCTOBER 2026

No.	Model	SAR type	Before correction	After correction	Administrative action	Reference date
38	Logicom Le Swipe The first two corrections were still non-compliant; reported €7,500 fine.	Torso	2,07	0,757	2 updates	01/03/2023
39	Essentiel Clap 20+	Torso / Limbs	2,73 / 4,14	—	Recall announced	04/04/2023
40	Motorola Edge First correction at 2.24 W/kg; reported €7,500 fine.	Torso	2,12	1,50	2 updates	22/05/2023
41	Apple iPhone 12 (A2403)	Limbs	5,74	3,94	Temporary withdrawal + update	12/09/2023
42	Emporia Simplicity V27 Update published on 23/07/2024.	Limbs	4,23	2,97	Withdrawal then update	19/10/2023
43	Doogee S88 Plus	Limbs	4,23	—	Withdrawal + recall	19/10/2023
44	Emporia Smart 4	Limbs	4,74	—	Withdrawal + recall	04/01/2024
45	Logicom Flow	Torso	2,09	1,05	Update	12/02/2024
46	Hotwav Cyber 7	Torso / Limbs	2,112 / 4,246	—	Withdrawal + recall	08/04/2024
47	Nokia G22	Torso	2,39	1,15	Update	24/07/2024
48	Motorola Moto G53	Limbs	5,61	3,44	Update	24/07/2024
49	SPC Discovery	Limbs	4,71	3,34	Update	24/07/2024
50	Doogee N50	Limbs	5,40	—	Withdrawal + recall	09/08/2024
51	Doogee S100 Pro	Torso	2,29	—	Withdrawal + recall	09/08/2024
52	Oscal C80	Limbs	4,21	—	Withdrawal + recall	12/08/2024
53	Doro 8100 Plus	Limbs	6,24	1,27	Update	06/12/2024
54	Ulefone Note 16 Pro	Limbs	4,78	—	Withdrawal + recall	17/02/2025
55	Oukitel WP28	Limbs	4,06	—	Withdrawal + recall	17/02/2025
56	Nokia 110 (TA-1543)	Limbs	4,23	2,87	Update	13/03/2025
57	Crosscall Core S5	Limbs	4,33	1,45	Update	05/06/2025
58	Leagoo S8	Torso	2,39	—	Ministerial ban	12/07/2019
59	Allview X4 Soul Mini S	Torso	4,60	—	Ministerial ban	12/07/2019
60	Doogee X98	Limbs	6,25	—	Withdrawal + recall	12/06/2025

ALERTE PHONEGATE / FRANCE / OCTOBER 2026

No.	Model	SAR type	Before correction	After correction	Administrative action	Reference date
61	Blackview Shark 8	Head	3,74	0,559	Update	16/12/2025
62	Oukitel WP36	Limbs	5,40	2,97	Update	22/12/2025
63	Hotwav Note 13	Limbs	5,75	—	Withdrawal + recall	31/12/2025
64	Fossibot F105	Limbs	4,08	—	Withdrawal + recall	31/12/2025
65	Nubia Z70 Ultra (NX733J)	Limbs	4,923	—	Withdrawal + recall	16/07/2026
66	Doogee N55 Plus	Limbs	4,85	—	Withdrawal + recall	30/07/2026
67	Infinix Smart 9 (X6532)	Limbs	4,53	—	Withdrawal + recall	30/07/2026
68	AGM Note N1	Limbs	4,44	—	Withdrawal + recall	30/07/2026
69	Nothing Phone (3a)	Limbs	4,32	—	Withdrawal + recall	30/07/2026
70	Motorola G05 (XT2523-3)	Limbs	5,53	1,98	Update	12/10/2026
71	Danew Konnect 42	Limbs	4,160	3,29	Update	12/10/2026

Tablets — two devices listed separately from phones

Limb SAR exceedances; limit: 4 W/kg.

Device	SAR type	Before correction	After correction	Administrative action	Reference date
Lenovo Tab P11 (TB-J607Z)	Limbs	7,050	1,272	Update	05/08/2024
Zebra ET45CA	Limbs	4,586	2,41	Update	25/07/2024