

**Federal Communications Commission
Office of Engineering and Technology
Laboratory Division**

OCT 25, 2022

PRE-APPROVAL GUIDANCE LIST

1. INTRODUCTION

In establishing the requirements for the Telecommunications Certification Body (TCB) program, the Commission stated that while it intended to allow TCBs to certify a broad range of equipment, certain functions should continue to be performed by the Commission.

To certify certain types of equipment for which the Commission has not yet established specific guidelines, where a new technology or new rule part is integral, where there is an obligation by the Commission to approve an authorization, or where there is a need to provide case-by-case guidance, the Commission has adopted by rule¹ the Pre-Approval Guidance (PAG) procedure. The procedure is described in the companion attachment, 388624 D01 Pre-Approval Guidance, of this KDB (388624) publication.

This document is the “Pre-approval Guidance List” that identifies the current PAG items.² Each PAG item uses a six character identification code organized under six categories:

- RF Exposure
- Sample Submission
- EMC Radio Parameters
- Administrative
- Rule Part Specific
- Hearing Aid Compatibility

A TCB is required to use all the applicable PAG codes when submitting a PAG³.

Section III below provides a list of specific PAG items⁴ by code that are permitted to request PAG Reuse as described in KDB Publication 388624 D01.

The Appendixes are identified by PAG code, and provide a check list guide for TCBs to use when submitting a PAG.

¹ § 2.964(a): The Commission will publish a “Pre-approval Guidance List” identifying the categories of equipment or types of testing for which Telecommunication Certification Bodies (TCBs) must request guidance from the Commission before approving equipment on the list.

² The D02 Pre-Approval Guidance List document’s version and revision tag (i.e. v01r02) of the published documents represent the current PAG items.

³ TCBs must use the first category “PBA Submittal” and an appropriate second category and identify all applicable PAG items. Then for each 731 applications required for a grant, the 731 “Related to a KDB Inquiry” selection shall be set to Yes and the PAG tracking number shall be inserted into the “KDB Tracking number” field. This is required for each application even if the PAG item is not related to that individual application. Only after the FCC reviews the PAG and sets the “KDB Permit but ask reviewed” to Yes, for all applications can the TCB grant all applications.

⁴ Only PAG items list on the PAG reuse list are eligible to request reuse.

2. PAG LIST

2.1 RF EXPOSURE

2.1.1 DEVICES REQUIRING APPROVAL FOR AUTHORIZATION PROCEDURES ⁵

NUMSIM

RF exposure evaluations using numerical simulations or computational modeling techniques.

OVER6G

RF exposure evaluation of portable transmitters operating at frequencies above 6 GHz, except when related to a C2PC in U-NII Bands 5.925-7.125 GHz for an already certified module addressing RF exposure conditions for a specific host(s). A checklist for this PAG item is provided in [Appendix OVER6G](#).

PWRDYN

Mobile and portable devices incorporating mechanisms to actively control the output power (for instance, Time-Average SAR implementations), transmission intervals, transmission durations, transmission duty factors or other relevant parameters in a dynamic or non-systematic manner to mitigate the potential of RF exposure according to time-averaging considerations to determine RF exposure compliance.

2.1.2 DEVICES WITH NEW OR UNIQUE OPERATION OR INSTALLATION ISSUES

PHANTM

When KDB Publication 447498 and other KDB publications referenced therein do not establish procedures that readily support the form factor, design, or implementation of a product or exposure condition, or when phantom configurations or test procedures that are not specified in KDB Publication 447498, and other KDB publications referenced therein, are proposed for SAR evaluation. For example, when a flat phantom is not used for testing extremity SAR in hands, wrists, feet or ankles, or when the SAM phantom or other specific phantoms (described in IEC/IEEE SAR measurement standards) is used for testing other exposure conditions, such as wrist-worn, head-worn devices, or other use conditions that may require field reconstruction techniques or non-standard post-processing procedures to determine the 1-g SAR.

OCCPTT

When SAR test reduction is applied not in accordance with KDB Publication 643646 to occupational handheld push-to-talk (PTT) radios, or when KDB Publication 643646 is applied and the highest reported SAR is > 6.0 W/kg.

ANTTUN

When dynamic antenna tuning is applied to optimize transmission efficiency for wide range frequency operations or other operating requirements. On the other hand, static antenna tuning, i.e. antenna tuning implementations that are the same for any operating conditions using a fixed table look-up mechanism that is fully contained within the approved transmitter, do not require this PAG.

⁵ Per KDB Publication 388624D01, devices in this class of PAG have no published guidance, or it may be unclear how rules or policies apply to the technology in question. Thus FCC must make the determination on procedures used for compliance demonstrations. This guidance must be obtained through the KDB Inquiry system prior to an approval, so that the TCB knows how to properly evaluate the test procedures and results as part of its initial review.

PWRRED

When a power reduction feature is used to reduce the transmit power. Exceptions that do not require this PAG are any of the following:

- when the power reduction is implemented using a single fixed level of reduction through static table look-up for all exposure test configurations in a single wireless operating mode of a frequency band and it is triggered by a single event or operation
- when simultaneous transmission requires power reduction and it is not implemented for satisfying SAR compliance requirements
- where a simultaneous transmission SAR test exemption is applied according to the *reported* standalone SAR tested at the maximum output power level without any power reduction.

TXSENS

When proximity, device tilt, movement detection, or other sensors for external conditions are used to reduce the transmit power, with the exception of devices that implement capacitive proximity sensors for power reduction, and apply the guidance found in KDB Publication 616217 for sensor verification and testing. Thus, for instance, devices that use Hall effect or gravity sensors will still require a PAG. Other device features that control the power based on the mode of operation of the device transmitters (e.g. switching on “hotspot mode”, etc.) are not subject to PAG. PAG guidance for TXSENS is provided in [Appendix TXSENS](#).

DUTFACT

When a duty factor is invoked for the purpose of demonstrating compliance. This requires an analysis report that shows how the reported duty factor is effectively maintained in all reasonable, even infrequent, use conditions of the device.

AGGREG

Mobile and portable devices designed to transmit using *carrier aggregation* techniques involving at least two non-contiguous channels. PAG is not required when carrier aggregation occurs only on contiguous channels. This PAG requirement is also waived for devices using *carrier aggregation* techniques in accordance with KDB Publication 248227. PAG guidance for AGGREG is provided in [Appendix AGGREG](#).

SARWID

Technologies operating with wide channel bandwidths or transmission bands where the SAR probe calibration and tissue-equivalent dielectric medium may not fully support such wide band measurements, or when specific procedures in KDB Publication 248227 are not applicable, or when KDB Publication 865664 D01 SAR probe calibration and tissue dielectric parameter requirements cannot be met.

WPTAPP

Wireless power transfer (WPT) applications, except for those applications that meet the established criteria in KDB Publication 680106 D01. All WPT systems qualified as “at-a-distance” per KDB Publication 680106 D01, i.e., designed to operate with receiver/client at more than one meter from the transmitter, shall be considered under this PAG item.

DUTFACT

A PAG is required when:

- the use of a duty factor less than 100% is essential for obtaining RF exposure compliance and
- the compliance duty factor value is determined by a subjective, or approximate assessment, e.g., based on “typical”, averaged, or assumed use-case conditions, or conditions that can be altered by the user.

Accordingly, when the compliance duty factor is instead established and fixed by design (i.e. via hardware, software, or communication protocol), the PAG is not required, as long as a filed RF exposure exhibit provides sufficient and verifiable information. For instance, this can be the case for devices that connect to a wireless network only for a time-limited window, and with assigned periodicity.

A PAG is also not required when RF exposure compliance is demonstrated for 100% duty factor, regardless of the actual duty cycle use during normal operations.

No linear scaling from a lower value of duty factor shall be applied. For example, if SAR is evaluated at 0.7 W/kg for a 10% duty factor, it is not possible to conclude that at 20% demonstrated maximum duty factor SAR will be 1.4 W/kg. Similarly, linear scaling shall not be applied when MPE (or TER) limits are used.

CHECKLIST

- Provide an analysis that demonstrates how the proposed duty factor is effectively maintained in all reasonable, even infrequent, use conditions of the device
- Show how the design inherently provides protection from alterations of the maximum duty factor that was considered for compliance purposes
- Provide RF exposure evaluations related to the maximum achievable duty factor condition, without applying any linear scaling from lower values

2.2 DEVICES REQUIRING SAMPLE SUBMISSION

UNIDFS

Unlicensed National Information Infrastructure (U-NII) devices with Dynamic Frequency Selection (DFS) capability (Part 15, Subpart E), including client devices operating in the DFS bands that have radar detection capability.

2.3 EMC RADIO PARAMETERS

DRGAIN

Where Directional Gain (DG) of a multi-antenna transmitter is being measured to show compliance for an unlicensed device. Directional antenna gain measurement procedure and measurement test results should be provided as described in KDB Publication 662911 D03.

This PAG is not required where composite gain calculations are not relevant for certification, for instance, as in:

- a) Systems that do not employ beamforming or steering, where DG is measured for the composite antenna system without the need to calculate DG.
- b) Single output per band antenna systems where composite antenna DG is not relevant.
- c) Devices with built-in antenna systems subject to radiated field limits.
- d) Devices with omni antennas deployed in omni configuration only.

A checklist for this PAG item is provided in [Appendix DRGAIN](#)

2.4 ADMINISTRATIVE

CONFID

Requests for permanent confidentiality, under circumstances deemed exceptional by the applicant with well documented reasons, for exhibits that are not to be held confidential. For instance, this PAG applies to requests of confidentiality for external photos, or other exhibits which are not eligible for “Long Term Confidentiality”, as noted in KDB Publication 726920 D03. As discussed in KDB Publication 726920, if a

non-disclosure agreement (NDA) or some similar arrangements are required between the user and the grantee, and a sample NDA is included in the application, such applications are not subject to PAG.

SOFTDR

Devices requesting approval or Class III permissive change for Software Defined Radio (SDR) subject to Section 2.944 (KDB Publication 442812).⁶ A checklist for this PAG item is provided in [Appendix SOFTDR](#)

SWC2PC

Class II permissive changes for devices that have not been approved as Software Defined Radio (SDR), but the grantee intends either under their control or to authorize certain approved third parties to change the circumstances under which the transmitter operates by distribution of the software to field deployed devices (KDB Publications 178919 and 594280).⁷

TXSPLT

Split modular transmitters authorized under Section 15.212 (KDB Publication 996369).

ENFORC

Devices restricted to use by only State, Local, or Federal law enforcement agencies.

WAIVER

Grants issued under an FCC Waiver. TCB procedures are as follows; see also KDB Publication 502150: (1) the 731 form associated waiver questions must be checked yes; (2) support information must be uploaded; (3) the waiver must be submitted as part of the filing in the cover letter or attestation exhibit type; (4) a letter from the grantee indicating how the waiver is applicable and indicating the that waiver conditions are met; (5) enter grant comments on Form 731 that identifies the waiver by the waiver order and operational restrictions; (6) manuals must include information on the waiver conditions.

C2PCPX

C2PC applications on a case-by-case guidance related to accommodate non-pin-to-pin compatible parts modifications under procedures provided in KDB Publication 178919 as attachment: [Notification 202109-001](#).

2.5 RULE-PART SPECIFIC

SLOWRA

Transmitters operating under the special provisions of spectral efficiency specified in Section 90.203(j)(8) for slower data rate where case-by-case consideration is necessary (KDB Publication 579009).

MEDIMP

Implanted transmitters with maximum total available output power > 1.0 mW, except Part 95 *MedRadio* devices.

MEDRAD

MedRadio transmitters designed to operate in 413-419 MHz, 426-432 MHz, 438-444 MHz, 451-457 MHz, and 2360-2400 MHz bands (Part 95 Subpart I).

⁶ SDR applications are automatically defined by EAS as a PAG and therefore PAG reuse cannot be used. However, when SOFTDR is applicable as a PAG or an item in a MPAG, the TCBs should reference previously approved application by FCC ID, TC # and inquiry number to help expedite the review for this item.

⁷ Certain devices may be approved under the PAG Reuse procedure if the software control mechanisms are identical to previously approved PAG for the same Grantee.

UWB15F

Ultra-wideband devices operating under Part 15 Subpart F. A checklist for this PAG item is provided in [Appendix UWB15F](#)

UMFLEX

Devices certified under Part 30 Upper Microwave Flexible Use Service.

UN5GHZ

U-NII devices authorized in U-NII-4 band 5.850-5.895 GHz and channels that span U-NII-3 and U-NII-4 Bands under Part 15 Subpart E, except when related to a C2PC in the aforementioned bands/channels for an already certified module addressing RF exposure conditions for a specific host(s). A checklist for this PAG item is provided in KDB Publication 291074 D04.

UN6GHZ

U-NII devices authorized in U-NII Bands 5.925-7.125 GHz under guidance of KDB Publication 987594, except when related to a C2PC in U-NII bands 5.925-7.125 GHz for an already certified module addressing RF exposure conditions for a specific host(s). A checklist for this PAG item is provided in KDB Publication 987594 D04.

RDR255

Field disturbance sensors⁸ and/or radar devices under Section 15.255. The Operational Description exhibit submitted with the equipment authorization application shall include a detailed explanation of how the fixed operation requirement of Section 15.255(a)(2) is satisfied. If certification is being requested for non-fixed operation as a Short-Range Interactive Motion Sensor (SRIMS), then a comprehensive justification shall be provided in the Operational Description exhibit.

WSD15H

White Space Devices (WSD) operating under Part 15 Subpart H. Procedures in KDB Publication 416721 are to be followed.

MODLIM

Under 47 CFR 15.212(b) requirements, the Grantee of a limited module must file with the certification application a description of the proposed method used to ensure host with the limited module installed are compliant. No specific format or template required for this filing. The Grantee can devise a strategy to be reviewed and approved through a Pre-Approval Guidance (KDB) procedure. Once approved, the same approval can be reused for additional modules by the same Grantee using the same method.

MODHES

Approval for the Host Environment Simulator (HES) design is required for split modules, in 996369 D05 Split Module, for an initial certification or C2PC. Once approved, the same HES can be reused for additional modules by the same Grantee when the same conditions apply.

⁸ § 15.255(a) Operation under the provisions of this section [§ 15.255] is not permitted for (2) Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation, or used as short-range devices for interactive motion sensing. For the purposes of this section, [§ 15.255] the reference to fixed operation includes field disturbance sensors installed in fixed equipment, even if the sensor itself moves within the equipment. For field disturbance sensors, TCBS are encouraged to submit inquiries to be evaluated prior to submitting a PAG.

2.6 HEARING AID COMPATIBILITY

HAC5GS

Demonstrating T-coil compliance when interim procedures as defined in KDB Publication 285076 D03 HAC FAQ Question 9 are used for testing VoLTE calls for 5G sub-6 bands when call boxes do not support 5G calling.

3. PAG REUSE LIST

The following items from the PAG list (Section 2, Section 3, and Section 4 of this document) may be approved using the PAG Reuse procedures outlined in KDB Publication 388624 D01; PAG Reuse is allowed only for the following PAG list items:

UNIDFS: DFS reuse will be allowed only if the device has the same DFS sensing hardware and software of a previously approved DFS PAG.

HAC5GS: HAC PAG list of Section 4.5. For reuse approval, use a PAG formatted in accordance with KDB Publication 285076 D03 HAC FAQ Question 9.

ANTTUN: Dynamic antenna tuning.

TXSENS: Reuse is permitted only for power reduction for convertible laptops utilizing Hall effect or G-sensors, under PAG item TXSENS.⁹

MODLIM: The same Grantee using the same method.

MODHES: The same Grantee when the same conditions apply.

⁹Reuse is only applicable for convertible laptops whose screen rotates around 1 axis, from 0 degrees to 360 degrees, in a clamshell style, from closed mode, to open mode, to tent mode, and finally to tablet mode. Actual screen lid angles where power reduction triggering occurs, and amount of power reduction may differ in later applications but the same sensor mechanism hardware as the original PAG must be used.

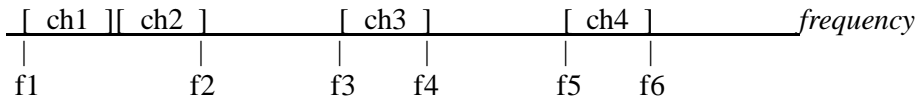
Appendix AGGREG

AGGREG

Mobile and portable devices designed to transmit using *carrier aggregation* techniques involving at least two non-contiguous channels. PAG is not required when carrier aggregation occurs only on contiguous channels. This PAG requirement is also waived for devices using *carrier aggregation* techniques in accordance with KDB Publication 248227.

CHECKLIST FOR THE PAG REVIEW

1. Show that SAR evaluation needs to be referring to a uniform channel distribution according to the provisions in KDB 447498-D01 (Sect. 3.1.6 on “*Determination of the Frequencies for SAR Testing*”), in each non-contiguous frequency interval that contains contiguous channels (regardless of being formally defined as “band”).
2. Provide a sketch of the carrier aggregation scheme, similar to the example shown below. In this case it is shown that there are two contiguous channels “ch1” and “ch2” from frequency f1 to f2, plus two non-contiguous channels “ch3” and “ch4” in a higher frequency band, the first from frequency f3 to f4, and the second from frequency f5 to f6.



3. Show the frequencies selected for the RF exposure evaluation according to the KDB Pub. 447498-D01. In the example shown above, the frequencies for the RF exposure evaluation shall be computed separately for the three frequency intervals [f1, f2], [f3,f4] and [f5,f6].

APPENDIX DRGAIN

DRGAIN

Where Directional Gain (DG) of a multi-antenna transmitter is being measured to show compliance for an unlicensed device. Directional antenna gain measurement procedure and measurement test results should be provided as described in KDB Publication 662911 D03.

This PAG is not required where composite gain calculations are not relevant for certification, for instance, as in:

- a) Systems that do not employ beamforming or steering, where DG is measured for the composite antenna system without the need to calculate DG.
- b) Single output per band antenna systems where composite antenna DG is not relevant.
- c) Devices with built-in antenna systems subject to radiated field limits.
- d) Devices with omni antennas deployed in omni configuration only.

CHECKLIST FOR THE PAG REVIEW

1. Test dates, names of test engineers that performed the testing, table of contents, A table of calibrated test equipment used, and Names of any commercial test software used
2. Antenna system specification, configuration and description, including RF Chains and operating modes,
3. Antenna gain measurement setup, photos, units and conversions, test method and environment, calibration method and corrections.
4. Radiations plots viewable without magnification and are annotated with values of interest. Raw test data are not required.
5. DG composite gain formulas to be used, justification, calculations and summary tables for each in-band RF Chain or Operating Mode
6. For radiated out-of-band limits, DG must be determined and summarized for the entire frequency range of investigation.
7. Complex composite antenna gain systems require detail description and justification for an alternative DG determination method for consideration.

APPENDIX OVER6G

OVER6G

RF exposure evaluation of portable transmitters operating at frequencies above 6 GHz, except when related to a C2PC in U-NII Bands 5.925-7.125 GHz for an already certified module addressing RF exposure conditions for a specific host(s). A checklist for this PAG item is provided in Appendix OVER6G.

CHECKLIST FOR THE PAG REVIEW

RF Exposure Evaluation Policy for sources with frequency between 6000 MHz and 8500 MHz

1. For frequencies up to 8500 MHz provide spatial peak SAR evaluation based on IEC/IEEE 62209-1528:2020, along with applicable product-specific procedures among KDB Pubs. 648474, 616217, 941225. SAR test data shall account for device tune-up tolerance (that is referred to as "*Reported SAR*" in KDB 447498).
2. This policy considers a device compliant for Equipment Authorization purposes, so long as the SAR evaluation of step 1. is within the same SAR limits that have been established for frequencies below 6000 MHz (e.g., 1.6 W/kg for 1-g average SAR). In this case, the SAR evaluations are taken as a conservative compliance demonstration to the MPE power density limits of 47 CFR 1.1310(d)(3).
3. Documentation is required to support evaluation with MPE limits providing power density data in accordance with the following:
 - 3.1 For the test configurations of step 1 having the highest SAR, evaluate Incident Power Density (IPD), using a suitable near-field probe and a total-field/power-density reconstruction method (e.g., as per methods in [Pfeiffer, 2019])
 - 3.2 Report estimated IPD measurement uncertainty (e.g., per methods of IEC/IEEE 63195-1:2022)¹⁰
 - 3.3 Power density test data shall account for device tune-up tolerance
 - 3.4 If supported by the test system, also report estimated Absorbed (epithelial) Power Density (APD) (e.g., as per method in [Samaras, 2021])
4. The process of steps 1 to 4 shall be repeated for at least five channels, at the channel center frequency, selected to cover uniformly the largest frequency ranges used in the device, between 5925 MHz and 8500 MHz, and consistent with KDB Publication 248227 test configuration provisions.
5. For the purpose of SAR test exemption, analyses of simultaneous transmission combinations of RF sources with frequencies from 4 MHz and 8500 MHz (where the lowest frequency is per KDB Publication 447498-D01 SAR evaluation requirements¹¹), may be performed according to the SPLSR approach (*id.*). Accordingly, no further compliance evaluation is needed for all antenna pairs for which the SPLSR exemption is applicable.

¹⁰ Similar to that KDB Pub. 865664 D02 has 30% as maximum expanded measurement uncertainty for SAR test data, where PD test data expanded measurement uncertainty > 30% ($k = 2$), methods of e.g., IEC 62479:2010 apply for reporting purposes.

¹¹ The lowest frequency of 4 MHz for SAR measurements is per 2022 FCC Equipment Authorization presentations and 2022 revision version of KDB Pub. 447498-D01.

One or more RF source(s) operating above 8500 MHz, Including Simultaneous Transmissions

6. For evaluations and test exemption analyses of simultaneous-transmission combinations of different RF sources, the procedure outlined above, for a single source between 6000 and 8500 MHz shall be included in the calculation of total exposure ratio (TER) as in KDB Pub. 447498-D01-Appendix C.
7. Any source above 8500 MHz shall be evaluated via incident power density measurements.

References

- [Pfeifer, 2019] S. Pfeifer *et al.*, “Total Field Reconstruction in the Near Field Using Pseudo-Vector E-Field Measurements,” *IEEE Trans. EMC*, 61, (2): 476-486 (2019)
- [Samaras, 2021] T. Samaras *et al.*, “Compliance Assessment of the Epithelial or Absorbed Power Density Below 10 GHz Using SAR Measurement Systems,” *Bioelectromagnetics*, 42: 484-490 (2021)
- IEC/IEEE 63195-1:2022 (2022-05), *Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) – Part 1: Measurement procedure*
- IEC 62479:2010, *Assessment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)*

APPENDIX SOFTDR

SOFTDR

Devices requesting approval as SDR or Class III permissive change for Software Defined Radio (SDR) subject to Section 2.944 (KDB Publication 442812).

CHECKLIST FOR THE PAG REVIEW

1. Compliance must be demonstrated answering all questions using the questionnaire Guide of Section II **SOFTWARE DEFINED RADIO SECURITY DESCRIPTION GUIDE**, per that the KDB 442812..
2. Guide in Section II , Software-defined operating parameters shall include statements that software that controls regulatory compliance is only configurable by the manufacturer or if applicable any authorized party.
3. Any authorized party given the same software regulatory control capabilities, the grantee must provide a detailed description of the licensing or legal arrangement in place that requires the authorized party to adhere to the same security and regulatory requirements applicable for this application.
4. Regulatory configuration security controls must describe in the questionnaire the method used for best practice tamper-proof implementations that are not available to third parties.
5. If a C3PC applies, a cover letter is provided to include S/W version identifier and specify if existing devices will be field-upgraded.
6. If a C3PC, if applicable confirm that there is no change to the initial Software Security description provided or if changes provide a description of the new for this application.
7. Upload software security exhibits to SDR Software/Security info folder..
8. A high-level, clear operational description, or flow diagram, for the software that controls the RF parameters shall be provided.

APPENDIX TXSENS

TXSENS

When proximity, device tilt, movement detection, or other sensors for external conditions are used to reduce the transmit power, with the exception of devices that implement capacitive proximity sensors for power reduction, and apply the guidance found in KDB Publication 616217 for sensor verification and testing. Thus, for instance, devices that use Hall effect or gravity sensors will still require a PAG. Other device features that control the power based on the mode of operation of the device transmitters (e.g. switching on “hotspot mode”, etc.) are not subject to PAG.

The following additional guidance applies only to convertible laptops whose screen rotates around one axis, from 0 degrees to 360 degrees, in a clamshell style, i.e., from closed mode, to open mode, to “tent” mode, and finally to tablet mode. This process must be followed to determine the lid angle where a power reduction occurs, by taking power measurements at each step, as indicated in the step listed here below:

- i. From the lid in closed mode (0 degrees), open the screen in 10 degree steps until laptop mode is obtained
- ii. Lower the screen by 5 degrees increments to verify that the “closed mode” is triggered
- iii. From the position of the previous step, open the screen in 1 degree increments until laptop mode is triggered again
- iv. Continue opening the screen in 1 degree increments until at least 5 degrees past where “laptop mode” was obtained, then continue opening the screen in 10 degree steps until the device switches to tablet mode
- v. Reverse the previous procedure to go from tablet mode back down to closed mode

CHECKLIST FOR THE PAG REVIEW

1. Description of the sensor technology
2. Demonstration of sensor trigger conditions, showing response to changing conditions, such as proximity detection for target going in/out of range due to motions near the detection distance threshold. Possible hysteresis effects should be also described.
3. Compliance data in the full range of conditions for which the sensors are designed to operate (e.g., closest/furthest distance, etc.)
4. Failsafe scenarios, as applicable
5. (For convertible laptop only) Verification of the impact of lid orientation, per procedure illustrated above.

APPENDIX UWB15F

UWB15F

Ultra-wideband devices operating under Part 15 Subpart F.

CHECKLIST FOR THE PAG REVIEW

1. Show that the device mode operation is permissible under the specific Part 15 subpart
2. Specify if § 15.250 (15C) is used as alternative to §15.517 or §15.519 (15F)
3. Show that KDB 393764 Q6 is being followed
4. Account for all technical requirements specific to each UWB mode of operation
5. Verify that §15.519 devices do not utilize fixed infrastructure
6. Verify that grant restrictions and notices are in accordance with specific rule part
7. Verify requirements and restrictions for UWB modular approvals
8. TCB to include §15.521(a) statement on Grant Restrictions and verify the required device/user manual for all UWB modes of operation

CHANGE NOTICE

04/20/2021 388624 D02 Pre-Approval Guidance List v17 replaces 388624 D02 Pre-Approval Guidance List v16r12. Added identification of PAG items using a 6-digit item Identifier, Clarification on 15.255 (RDR255), Clarification in 6GHz (MOBPOR) for exception to C2PC for RF exposure, added new PAG reuse item TXSENS, and added a PAG item WAIVER. Removed from (v16r12) the PAG list II C II C 2 a (i): Using massive MIMO techniques, II C 2 m: White Space Devices and II C 2 f (i): OTT HAC.

04/28/2021: 388624 D02 Pre-Approval Guidance List v17r01 replaces 388624 D02 Pre-Approval Guidance List V17 for corrections. II C 2 m: White Space Devices was incorrectly removed from the PAG list and is now added back as WSD15H. Also, correction made to 5.PAG REUSE LIST, HAC5GS reference to KDB Publication 285076 D03 HAC FAQ Question 8 reference was removed since 285076 D03 HAC FAQ Question 8 is no longer a PAG.

06/16/2021: 388624 D02 Pre-Approval Guidance List v17r02 replaces 388624 D02 Pre-Approval Guidance List v17r01 for corrections. Code ANTTUN is the correct one for the antenna tuning item in the reuse list, it replaces the incorrect cross reference to UPMIMO. Removed extraneous wording in OVER6G item. Removed the SARTDD item. Reworded TXSENS, Note 6, Note 7, AGGREG, and Note 8, SARRAY and removed former Note 10. Introduced specific cross-references to KDB publications also in SARWID, NOTSAR, FACTOR, PHANTM, and UPMIMO.

07/02/2021: 388624 D02 Pre-Approval Guidance List v17r03 replaces 388624 D02 Pre-Approval Guidance List v17r02 to add item UN5GHZ to the PAG list.

09/21/2021: 388624 D02 Pre-Approval Guidance List v17r04 replaces 388624 D02 Pre-Approval Guidance List v17r03 to add item C2PCPX to the PAG list in section 4.3 Administrative Issues. Modified PAG item WAIVER to reference new KDB Publication 502150

12/03/2021: 388624 D02 Pre-Approval Guidance List v17r05 replaces 388624 D02 Pre-Approval Guidance List v17r04 to modify for clarification PAG items TXSENS and AGGREG. Current guidance on TXSENS and AGGREG are provided in Appendix A and B respectively in v17r05 of this document. Also Note 11 above was modified to provide clarification for PAG item SOFTDR. Pag item PWRDIN identification code was changed to PWRDYN, for DYN to refer to DYNAMIC.

07/19/2022: 388624 D02 Pre-Approval Guidance List v18 replaces 388624 D02 Pre-Approval Guidance List v17r05. v18 is the current list of PAG items. Several changes were introduced to update the content of the list to the reflect more closely the OET present equipment authorization focus. Items removed: RFXLIM, MOBPOR, POR100, SAREXC, NOTSAR, SIMULT, FACTOR, UPMIMO, PWRINC, LODUTY, SARRAY. Items updated: OVER6G, PWRDYN, PHANTM, ANTTUN, PWRRED, AGGREG, SARWID, WPTAPP, DRGAIN, CONFID, SOFTDR, UWB15F, UN6GHZ, UN5GHZ. The item LODUTY was changed and renamed DUTFCT. Checklists were added in the Appendixes for items OVER6G, DRGAIN, SOFTDR, UWB15F. Additional checklists for the items UN6GHZ and UN5GHZ have been added as a separate document in the KDB Publications 987594 D04 and 291074 D04, respectively.

09/01/2022: 388624 D02 Pre-Approval Guidance List v18r01 replaces 388624 D02 Pre-Approval Guidance List v18. UN5GHZ has been changed to add an exception for C2PC for an already certified module addressing RF exposure conditions for a specific host(s).

09/23/2022: 388624 D02 Pre-Approval Guidance List v18r02 replaces 388624 D02 Pre-Approval Guidance List v18r01 . DUTFCT has been added for a duty factor less than 100% essential for obtaining RF exposure compliance.

10/25/2022: 388624 D02 Pre-Approval Guidance List v18r03 replaces 388624 D02 Pre-Approval Guidance List v18r02. MODLIM has been added for limited modules. MODHES has been added for Split modules.