

Licensed Services Equipment Review and Approval – Miscellaneous Updates

Office of Engineering and Technology
Laboratory Division
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Updates (May 5, 2017) are shown in BLUE



Overview

- Draft revision of KDB Pub. 971168 D01 on general measurement procedures for licensed **d**-services devices is open for comments until Friday May 19, 2017 [†]
 - 971168 D01 overlaps with ANSI C63.26-2015—discussed in other presentation
- Updates of KDB Pub. 971168 D02 for selected specific licensed devices topics are planned for publishing in the near future
 - Errata correction in Table 1 BRS/EBS OOB examples
 - Reiterate guidance for Part 90 4940-4990 MHz mask and max. bandwidth
 - Reiterate 700 MHz Public Safety Part 90 broadband and narrowband U.S. available operations
 - Guidance for ESMR Part 90 with Part 22 operations from Apr. 2016 will be added
- Note recent Part 22 Subpart H rule changes
- Note recent Part 25 rule changes TLPS

[†] OET Lab. Div. published documents available for review and comment: (<https://apps.fcc.gov/oetcf/kdb/reports/PublishedDocumentList.cfm>); 971168 D01 Power Meas License Digital Systems DR03-42830, (<https://apps.fcc.gov/eas/comments/GetPublishedDocument.html?id=423&tn=952994>).



971168 D02 Updates (1)

- Errata to be corrected in the BRS/EBS OOB parameters Table 1

TABLE 1—Example channel placements, frequency offsets, attenuations per § 27.53(m)(4), and associated parameters

#	Center freq. MHz	ch span	BRS/EBS ch	ch BW MHz	EBW MHz	X MHz	Above or Below EBW	40+10logP ± 5 MHz	43+10logP ± (5 to X) MHz	fixed 43+10logP 2490.5-2496 MHz	55+10logP ± X MHz	fixed 55+10logP f < 2490.5 MHz
1	2680	2670-2690	BRS H3 2668-2673.5 EBS G1 2673.5-2679 EBS G2 2679-2684.5 EBS G3 2684.5-2690	20	20	20	A	2690-2695	2695-2715 2695-2710	na	f > 2715 f > 2710	na
2	2680	2671-2689	do	20	18	18	A	2689-2694	2694-2712 2694-2707	na	f > 2712 f > 2707	na
3	2681	2672-2690	do	20	18	18	A	2690-2695	2695-2713 2695-2708	na	f > 2713 f > 2708	na
4	2560	2550-2570 (LBS)	EBS C3 2546-2551.5 EBS D1 2551.5-2557 EBS D2 2557-2562.5 EBS D3 2562.5-2568 EBS J 2568-2572 EBS I 2496-2502	20	20	20	A	2570-2575 (LBS, MBS)	2575-2595 2575-2590 (MBS)	na	f > 2595 f > 2590	na



971168 D02 Updates (2)

- Reiterate 4940-4990 MHz mask meas. Method and max. EBW –
- Part 90 Subpart Y 4940-4990 MHz mask background
 - First unnumbered paragraph of § 90.210 mentions "total power contained in the channel bandwidth"
 - Inserted by the part 90 re-write rulemaking document FCC-95-255 (docket 92-235)
 - That § 90.210 first-paragraph provision was not considered when Subpart Y service rules were developed (docket 00-32), therefore is taken to be not applicable for devices subject to Mask L and Mask M [§§ 90.210(l) and (m), respectively]
- §§ 90.210(l) and (m) measurement procedure
 - "The rule indicates using a minimum RBW of 1% of the fundamental emission to determine the zero dB reference level, and also to determine the mask skirts.
 - The mask plot should be developed using the same RBW throughout, for the zero dB reference level and the mask skirts.
 - §§ 90.210(l)(7) and (m)(7) lists average; therefore average is used to measure the L and M masks."
- In other words, the fundamental emission highest average power spectral density (RBW = 1% x OBW, or larger) across the designated channel bandwidth is compared to the highest average power spectral density (same RBW) for the specified offsets from the channel center frequency
- 20 MHz is maximum allowed emission bandwidth [§ 90.1213]



971168 D02 Updates (3)

– Reiterate 700 MHz Public Safety Part 90 –

- 700 MHz Public Safety Narrowband (PS NB)
 - 769-775 MHz / 799-805 MHz; BW < 25 kHz
 - For example 775-776 MHz and 805-806 MHz are Part 27 = not applicable for Part 90 grant listing
 - OMB approval still pending for revised §§ 2.1033(c)(20) and 90.548(c) (81 FR 66832) interop. filing requirements
- 700 MHz Public Safety Broadband (PS BB)
 - 758-769 MHz / 788-799 MHz; single nationwide license
 - New grants in PS BB spectrum should support LTE operations
 - Service rules and routine licensing not available for PS NB operations within PS BB spectrum (licensee FirstNet)
 - At present OET Lab has not precluded grants for devices with narrowband operating modes in PS BB spectrum
 - Such devices must also support narrowband operations in 769-775/799-805 MHz [per KDB Pub. 634817 D01, 2.962(f)(1)]



Part 22 Subpart H Update

- § 22.913 modified consistent with, e.g., §§ 27.50(d)(5) & (d)(6)
- § 22.917 modified for 1 MHz reference BW above 1 GHz

Eff. date May 12, 2017

Tracks per: [FCC 17-27](#); [Docket Nos. 12-40, 10-112, RM-11510, RM-11660](#); [SECOND REPORT AND ORDER](#),
[Adopted: March 23, 2017](#); [Released: March 24, 2017](#); [32 FCC Rcd 2518](#); [82 FR 17583](#).

§ 22.913 Effective radiated power limits.

Licenses in the Cellular Radiotelephone Service are subject to the effective radiated power (ERP) limits and other requirements in this Section. See also § 22.169.

(a) Maximum ERP. The ERP of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(1) Except as described in paragraphs (a)(2), (3), and (4) of this section, the ERP of base stations and repeaters must not exceed— ...

(2) ...

...

(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

(b) Power flux density (PFD). ...

...

(d) Power measurement. Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB. Power measurements for base transmitters and repeaters must be made in accordance with either of the following:

(1) A Commission-approved average power technique (see FCC Laboratory's Knowledge Database); or

(2) For purposes of this section, peak transmit power must be measured over an interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(e) ...

...

[59 FR 59507, Nov. 17, 1994, as amended at 69 FR 75171, Dec. 15, 2004;
as revised at 82 FR 17582, Apr. 17, 2017]

§22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a ~~resolution bandwidth of 100 kHz or greater, reference bandwidth as follows:~~

(1) In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater.

In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). ...

(2) In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz.

(c) ***

(d) ***

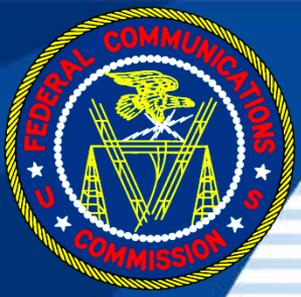
[67 FR 77191, Dec. 17, 2002,

as amended at 82 FR 17583, Apr. 17, 2017]



Part 25 Update - TLPS

- Part 25 amended and revised per FCC-16-181 (82 FR 8814, Jan. 31, 2017) for terrestrial low-power system equipment 2483.5-2495 MHz
 - § 25.149(c)(4)(i) digitally modulated transmit signal
 - § 25.149(c)(4)(ii) 6 dB BW \geq 500 kHz
 - § 25.149(c)(4)(iii) Max. transmit $P \leq 1$ W, peak EIRP ≤ 6 dBW
 - § 25.149(c)(4)(iv) Max. antenna-conducted $P \leq 8$ dBm/(3 kHz) during any continuous-transmission time interval
 - § 25.149(c)(4)(v) Attenuation factor below 2483.5 MHz
 - 40 + 10 log (P) dB at channel edge (2483.5 MHz)
 - 43 + 10 log (P) dB at 2478.5 MHz (5 MHz below 2483.5)
 - 55 + 10 log (P) dB at X MHz below 2483.5 MHz; X = max{6 MHz, EBW}
 - § 25.149(c)(4)(vi) Attenuation factor above 2495 MHz
 - 43 + 10 log (P) dB for 2495 MHz to (2495 + X) MHz
 - 55 + 10 log (P) dB for (2495 + X) MHz and above; X = max{6 MHz, EBW}
 - § 25.149(c)(4)(vii) In 1 MHz immediately above and adjacent to 2495 MHz, RBW $\geq 0.01 \cdot$ EBW allowed, and meas. power must be integrated over the required 1 MHz meas. (reference) BW [NOTE: similar provision not specified for 2483.5 MHz edge]
- OET Lab. Div. will be collaborating with FCC International Bureau (FCC IB) soon for updating the Part 25 general guidance KDB Pub. 273109
- TBD supporting information and/or demonstration of Network Operating System (NOS) might be requested [§§ 25.149(g)(3), (g)(2)]



QUESTIONS ?

**Labs and applicants and TCBs please
let us know in case of any other
971168 D02 change requests**