

Recent Rules Updates Highlights Including BRS/EBS Emissions

Office of Engineering and Technology
Laboratory Division



Overview

- Survey notable recent FCC rulemaking Federal Register notices
- Highlights KDB Pub. 971168 licensed device EMC / radio-parameter measurements guidance update posted October 19, 2014
- Discuss BRS/EBS mobile station emission limits and measurements portion of KDB Pub. 971168 new D02



Recent Fed. Reg. Releases

| | Brief Description | FCC /DA | Docket No. | FR Publ. | Eff. Date | Remarks |
|-------|---------------------------------|---------|----------------|---------------------------|-----------|---|
| FR | Part 22 correction | na | na | 6/20/14 | 6/20/14 | Corr. 22.355 |
| FR | AWS-3 | 14-31 | 13-185 | 6/4/14 | 7/7/14 | 2.106 and OMB PRA pending |
| FR | Radio Experim. & Market Trials | 13-15 | 10-236, 06-155 | 7/11/14; 4/29/13 | 7/11/14 | OMB PRA 2.803(c)(2) |
| Order | 700 MHz Narrowband | 13-40 | 96-86 | 7/10/14 | 8/11/14 | Parts 27, 90 changes |
| Order | Wireless Mic licensee expansion | 14-62 | 10-24, etc | 7/14/14 | 8/13/14 | |
| Order | BRS/EBS mobile rules | 14-76 | 03-66 | 7/16/14 | 8/15/14 | |
| FR | Radio Experim. & Market Trials | 13-15 | 10-236, 06-155 | 8/22/14; 8/18/14; 4/29/13 | 8/18/14 | Corr. §§ 2.803, 2.805(a)(3), 5.302, 5.303 |
| FR | AWS-3 Corrections | 14-31 | 13-185 | 10/1/14 | 10/1/14 | Corr. 27.50(d)(5) to (10) |
| FR | 600 MHz band | 14-50 | 12-268 | 8/15/14 | 10/14/14 | Parts 15, 27, etc changes |
| Order | UPCS Stds Update (FCC 8/14/14) | 14-1189 | 10-97 | tbd | tbd | IBR ANSI C63.17-2013 |
| Recon | Signal Boosters (FCC 9/23/14) | 14-138 | 10-4 | tbd | tbd | |
| Order | UPCS Rules (FCC 10/20/14) | 14-1507 | tbd | tbd | tbd | Delete UTAM reqmt. |

- This is a summary list only; applicants, TCBs, and test labs should review actual documents for provisions applicable for any device under evaluation
- (<https://www.federalregister.gov/articles/search#advanced>); (https://apps.fcc.gov/edocs_public/)



Recent Fed. Reg. Releases

| | Brief Description | FCC /DA | Docket No. | FR Publ. | Eff. Date | Remarks |
|-------|-----------------------------|---------|------------|--------------------|-----------|------------------------------|
| FR | U-NII-1 Filing Requirements | 14-30 | 13-49 | 9/24/14 | 9/24/14 | OMB PRA |
| FR | U-NII Rule Corrections | 14-30 | 13-49 | 9/24/14; 5/1/14 | 9/24/14 | Corr. § 15.407(a)(2), (h)(2) |
| Order | MBAN Recon | 14-124 | 08-59 | 10/6/14 | 11/5/14 | |

- Survey of the documents listed above is given in other 2014 FCC-TCB conference sessions
- This is a summary list only; applicants, TCBs, and test labs should review actual documents for provisions applicable to any device at hand
- (<https://www.federalregister.gov/articles/search#advanced>); (https://apps.fcc.gov/edocs_public/)



KDB Pub. 971168 Updates – D01

- Footnote added in Sec. 2 about using base-station simulator alternative for power measurements
- Cross-reference to KDB Pub. 662911 (MIMO etc.) added at 5.5
- Far-field basic condition reiterated at 5.8.3
- Guidance about trace-average setting rather than max-hold added in Sec. 6



KDB Pub. 971168 Updates – D02

- Previous KDB Pub. 149672 consolidated and superseded by Sec. II of new 971168 D02
 - Pertains to upper-700 MHz part 27 Block C; updated due to adjacent part 90 bands allocations and service rules changes since mid-2000s
 - Added reminder that normalizing results by ratio of the limit reference BW to the measurement BW is generally appropriate only when the signal is shown to be noise-like and relatively flat across the spectrum under measurement
- Previous KDB Pub. 245669 consolidated and superseded by Sec. III of new 971168 D02
 - Updated legacy rulemaking cross-references
- Sec. IV added about BRS/EBS emissions measurements
 - Uses hypothetical question-and-answer format
 - Developed based on recent inquiries, internal FCC discussions, and concepts from Oct. 2003 FCC-TCB conference notes on licensed devices



BRS/EBS Emission Limits (1)

- §§ 27.53(m)(4) emission limits for mobile digital station equipment and (m)(6) measurement procedure were recently updated per rulemaking Order FCC-14-76
 - Other paragraphs of § 27.53(m) unchanged
- Various terms are used in §§ 27.5(i) , 27.53(m), and part 27 subpart M service rules describing spectrum and emission limits
 - Including: “licensee’s frequency bands of operation,” “out-of-band,” “edges of the contiguous channels,” “channel edge of its frequency block,” “adjacent channel,” “band edge”
- For equipment authorization purposes the BRS/EBS channels are considered analogous to frequency blocks, for example like part 24 Broadband PCS (§§ 24.229, 24.238)



BRS/EBS Emission Limits (2)

- Summary of §§ 27.53(m)(4) and 27.1220 provisions
 - [§ 27.1220] Licensee may subchannelize its authorized bandwidth
 - [§ 27.1220] Multiple licensees may coordinate for using wider emission bandwidths
 - [§ 27.53(m) ¶ 1] For multiple contiguous channels constituting “licensee's frequency bands of operation,” OOBs are relative to the upper and lower edges of the contiguous channels
 - [§ 27.53(m) ¶ 1] Power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) per the schedule in § 27.53(m)(4)

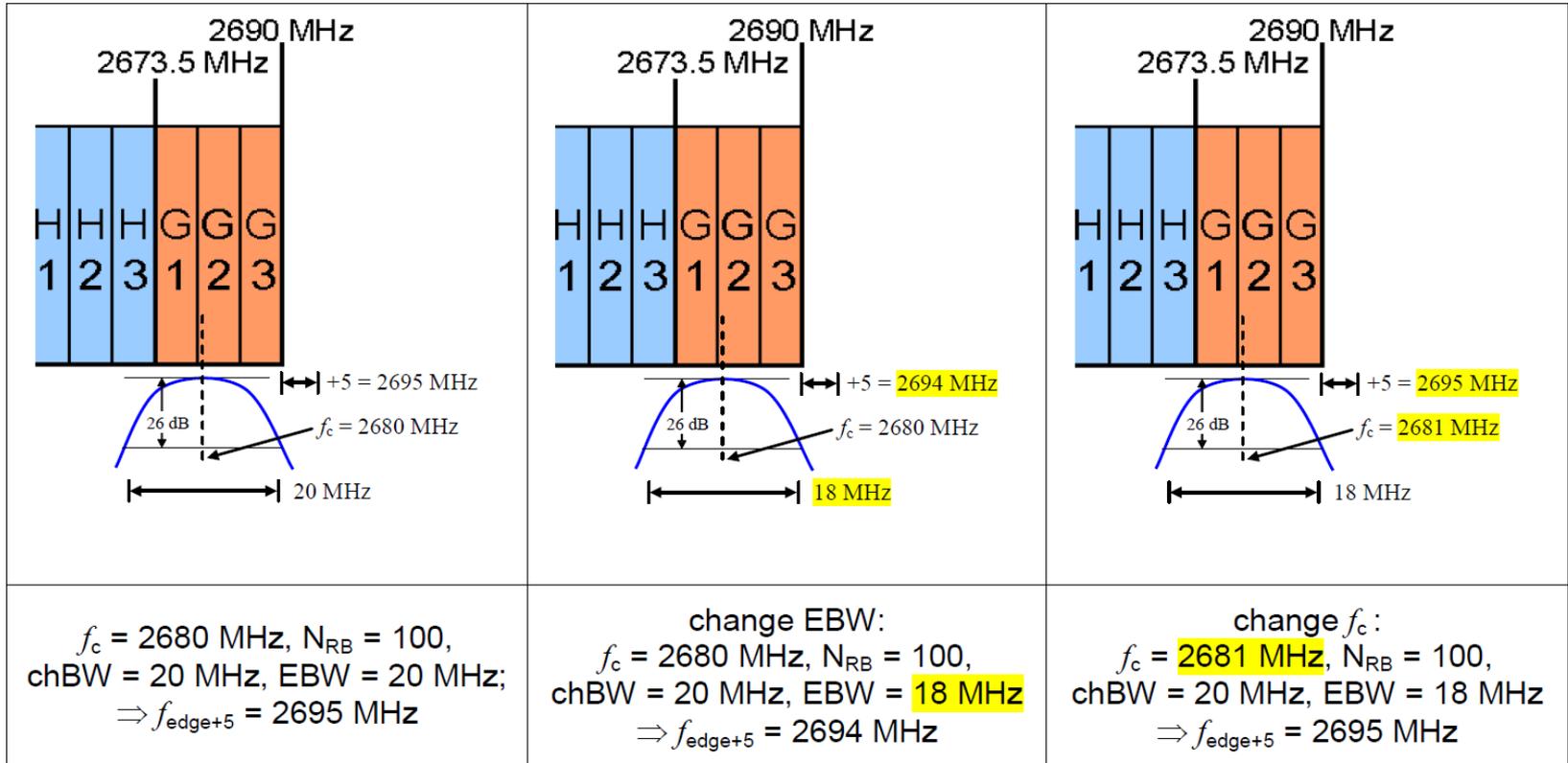


BRS/EBS Emission Limits (3)

- For each emission bandwidth supported by a mobile/portable device, listings on Form-731 applications and Form-731A grants may use either:
 - center frequencies of the lowest and highest channels tested, or
 - lower and upper allocation-band frequencies
- If listing uses the lower and/or upper allocation-band frequencies, when measuring for demonstrating compliance the nominal center frequency (and corresponding emission bandwidth) shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the equipment design permits
- For 3GPP LTE devices, emissions compliance data should be provided at minimum with all resource blocks (RB) active for each channel bandwidth



BRS/EBS Emission Limits (4)



NOT TO SCALE

Example channel placements and frequency offsets
for hypothetical 3GPP LTE band 41 device



Wrap-up

Following pages are backup material,
other background, and/or for reference



Scope B1 – Block Edge Policy

➤ Part 22 H & Part 24 E Block Edge Requirements

- ▶ New Rule Parts 22.917(c) & 24.238(c) allow for alternative out of band emission limits pursuant to a private contract with all affected licensees and applicants.
 - ▶ Previous Policy required measurements at the upper and lower edge of each block.
 - ▶ Current Policy requires measurements at the upper and lower band edge only.
 - Submission of block edge data is optional

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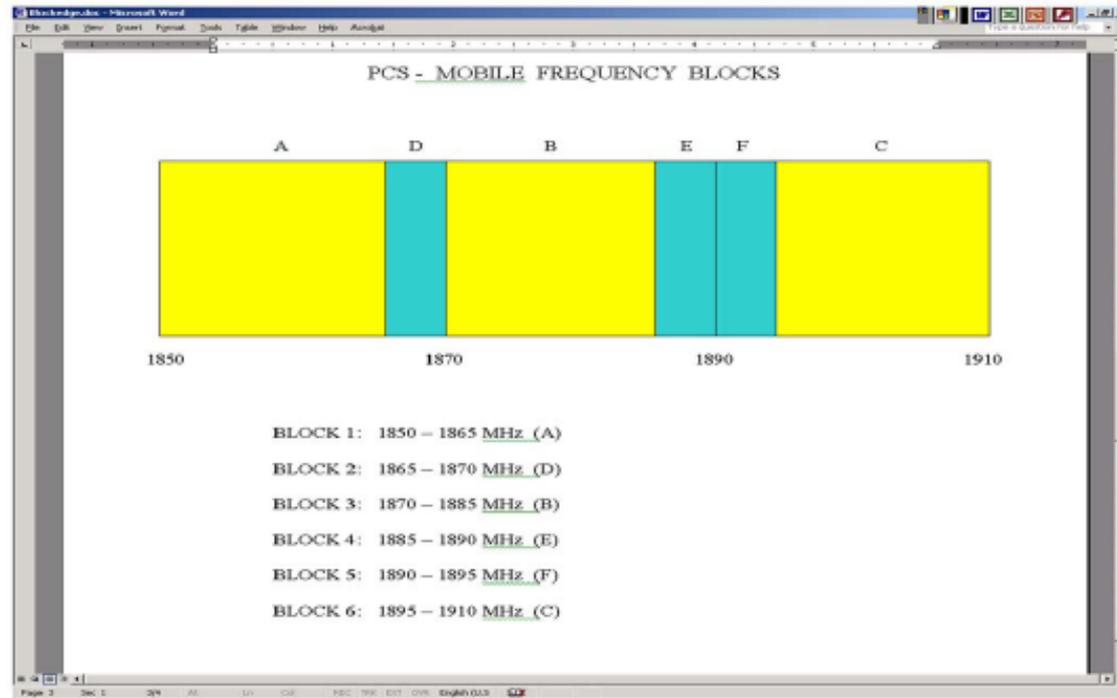
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Sections 22.917(c) and 24.238(c) modified in FCC 02-229.

Since equipment may be broadband and go across block edges, the policy of requiring block edge measurements for each block has been relaxed.



Scope B1 - PCS Blocks - Mobile



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This slide shows the PCS blocks for a mobile unit.

Under previous policy 12 block edge measurements would have been required. Now, only two tests are required. One just above 1850 MHz and one just below 1910 MHz.

If test data isn't submitted at the edges of the band it may affect the frequency listed on the grant.



Scope B1 – Band Edge Question 1

- **Question: What is the proper frequency band to list on the grant for a licensed cellular or PCS device?**
 - ▶ For services/operating modes that are assigned specific channels the entire band may be listed on the grant or the center frequency of the lowest and highest channel.
 - ▶ Example: Cellular AMPS (prior to FCC 02-229)
 - ▶ For services/operating modes that are not assigned a specific channel and are allowed to use the entire band as long as the band edges are compliant the grant should list the center channel frequency of the lowest and highest compliant channels
 - ▶ Example: 22.901(d) Alt. Technology Cellular/PCS

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Non Channelized service example: If a CDMA 800 MHz has an authorized bandwidth of 1M25 and operates across the entire allocated band for example 824-849 MHz the highest center channel listed should be at least 625 kHz below 849 MHz.



Scope B1 – Band Edge Question 2



- **TCB Question: Operating frequency for cellular**
 - ▶ “If the US CDMA 800 MHz phone is capable of operating on the channels specified on the 3GPP2C.S0011-B Table 3.1.3-3 and Band Subclass ‘0’(FCC) and band subclass ‘1’(Korea) would it be possible to show the band subclass ‘1’ ‘end’ frequency (848.370) on the FCC grant instead of the band subclass ‘0’ ‘end’ frequency(848.310)?”
 - ▶ Since this is a non-channelized operating mode, as long as the device complies with the band edge requirements when operating at 848.370 MHz, it is acceptable to list 848.370 MHz on the grant.

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3GPP2C.S0011-B – Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations Table 3.1.1-3

CDMA 800 MHz is a non channelized service. The emission mask applies only at the band edges. The typical emission designator listing is 1M25F9W. The grant may list the center frequency of the highest and lowest compliant operating channels in the allocated band or a narrower band.

For formerly channelized services such as Cellular AMPS the above policy may be used or the entire band may be listed