

Cambium Networks' comments on KDB 558074 DTS Measurement Guidance DR02 41075

Summary

We have one minor comment and one major comment

Minor Comment

In Para 5.0, which covers measuring the duty cycle and transmission duration, sub Para (a) the second bullet point says

- Set the RBW \geq bandwidth of the signal

This may not be possible in general and, in any event, is not needed. The RBW only has to be large enough so that the transient response of the filter does not impact the timing accuracy. It depends on the TDD structure, but typically 1MHz is enough (especially as the document only mandates ≥ 100 sweep points).

Is it really necessary to use a peak detector? It will make the measurement more noisy and reduce accuracy.

Major Comment

KDB Content

Para 10.1 claims to re-iterate the FCC Part 15 rule for out-of-band emissions. It says

10.1 Unwanted Emissions into Non-Restricted Frequency Bands

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power, based on either RF conducted or radiated measurements, shall be attenuated according to the following conditions:

If the maximum peak conducted output power procedure was used to demonstrate compliance to **15.247(b)(3)** requirements, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

If maximum (average) conducted output power was used to demonstrate compliance to **15.247(b)(3)** requirements, then the peak power in any 100 kHz bandwidth outside of the

authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band average PSD level in 100 kHz.

In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

Actual FCC Rules

However, the KDB does not repeat what the published rules say and we are not aware of any rule-making action applicable to Part 15 that covers this sub-part of the rules.

Following the link to the Part 15 Rules on the OET site shows that Para 15.247(d) rule actually says

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

There is nothing in the rules that could be construed to require anything other than a straight dBc measurement using the same settings for the in-band and out-of-band parts of the measurement, and indeed this has been the custom and practice accepted by the OET itself since the RMS averaging provisions were added some years ago.

As the FCC is aware, products in these bands tend to use OFDM modulation schemes which have a peak to mean ratio of greater than 10dB (11/12dB is not uncommon). If the Draft KDB is accepted as it stands, then the change in measurement method will significantly reduce transmit power levels that can be supported, especially in the channels closer to the edges of the band. This would result in less use of those channels (wasted spectrum) and more congestion in the centre of the band.

Cambium believes that

- a) the OET is, in effect, trying to change the actual FCC rules by using its KDB process, and further that
- b) such a change should be properly considered in a formal rulemaking process

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