

Radiated Emissions

Limits

FCC §2.1051 and §24.238. RSS-133, Clause 6.5.

The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log(P)$ dB. P in watts.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater.

At P_o transmitting power, the specified minimum attenuation becomes $43+10 \log(P_o)$, and the level in dBm relative to P_o becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log(P_o \text{ in mW}) - 30] = -13 \text{ dBm}$$

Method

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements from 30 MHz up to 18 GHz. For measurements above 18 GHz the distance is reduced to 1 meter.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the height and polarization of the measuring antenna. The maximum meter reading was recorded.

The maximum field strength (dB μ V/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

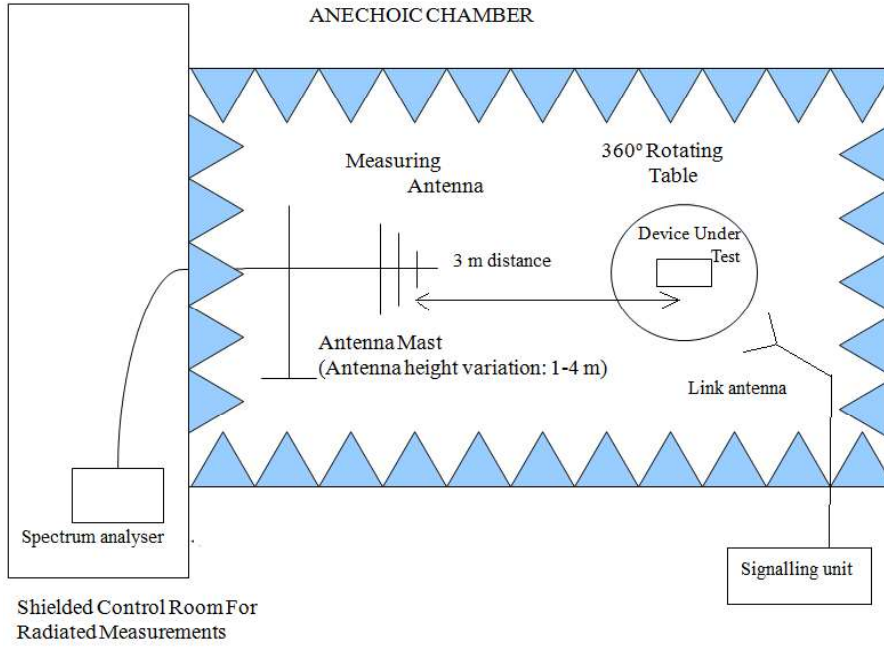
$$\text{EIRP (dBm)} = E(\text{dB}\mu\text{V/m}) + 20 \log(D) - 104.8$$

Where D is the measurement distance (in the far field region) in m.

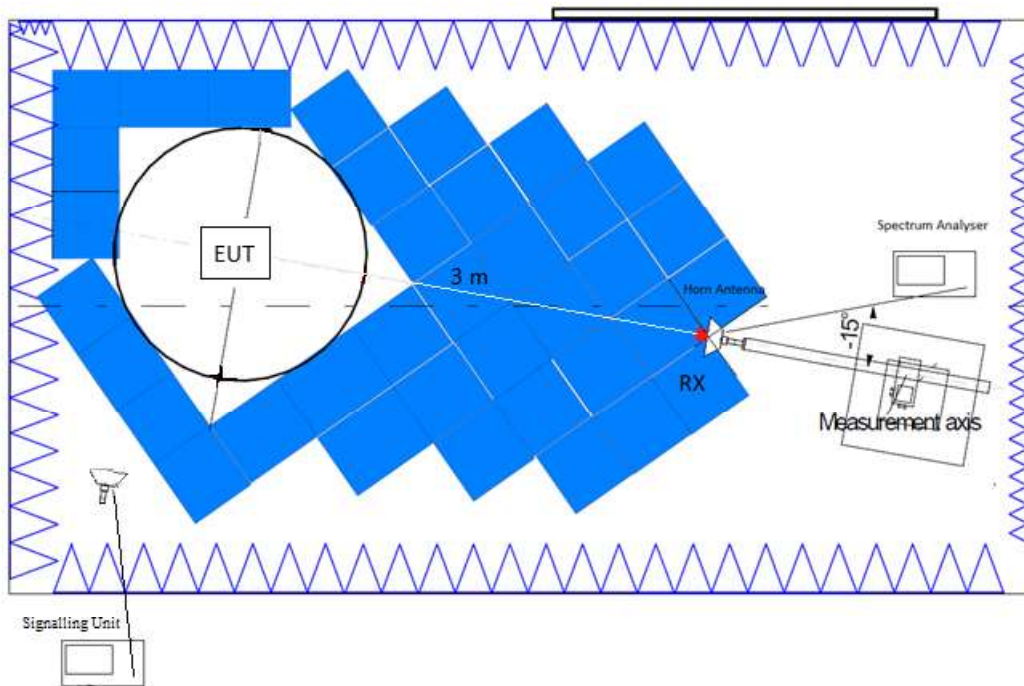
The configuration of tones and modulation which is the worst case for conducted power was used.

Test setup

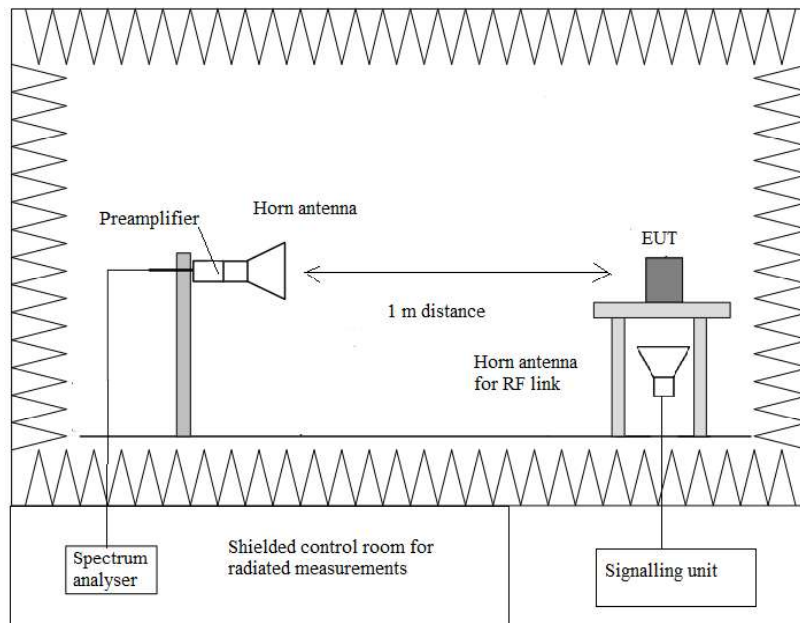
Radiated measurements below 1 GHz.



Radiated measurements between 1 GHz and 18 GHz.



Radiated measurements above 18 GHz.



Results

Preliminary measurements determined $\pi/4$ - QPSK modulation, 3 tones 15 kHz, Offset Tone = 6, as the worst case. The next results are for this worst-case configuration.

NBloT Band 25:

$\pi/4$ - QPSK modulation. 3 tones 15 kHz, Offset Tone = 6.

- Low Channel:

Frequency range 30 MHz – 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 GHz – 18 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 18 GHz – 20 GHz

No spurious frequencies at less than 20 dB below the limit.

- Middle Channel:

Frequency range 30 MHz – 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 GHz – 18 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 18 GHz – 20 GHz

No spurious frequencies at less than 20 dB below the limit.

- High Channel:

Frequency range 30 MHz – 1 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 GHz – 18 GHz

No spurious frequencies at less than 20 dB below the limit.

Frequency range 18 GHz – 20 GHz

No spurious frequencies at less than 20 dB below the limit.

Verdict

Pass

Attachments

NBloT Band 25.

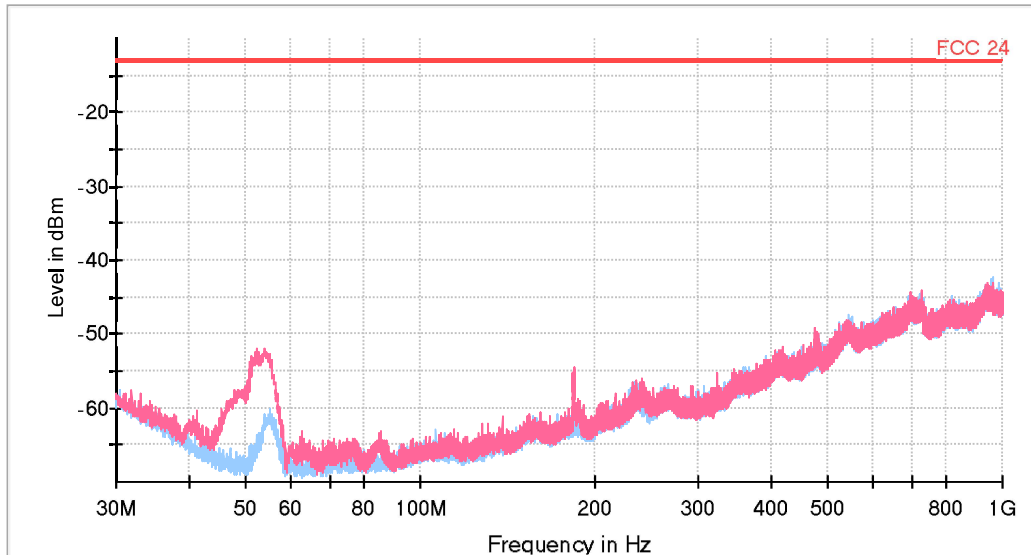
$\pi/4$ - QPSK modulation. 3 tones 15 kHz, Offset Tone = 6.

The peak above the limit in the frequency range 1 GHz – 3 GHz is the carrier frequency.

The setting for each measured frequency range is stated in the following tables:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
Receiver: [ESR 7] 30 MHz - 1 GHz	30,312 kHz	PK+	1 MHz	1 s	0 dB
Receiver: [FSV 40] 1 GHz - 3 GHz	62,5 kHz	PK+	1 MHz	1 s	0 dB
Receiver: [FSV 40] 3 GHz - 18 GHz	468,75 kHz	PK+	1 MHz	1 s	0 dB
Receiver: [FSV 40] 18 GHz - 20 GHz	62,5 kHz	PK+	1 MHz	1 s	0 dB

FREQUENCY RANGE 30 MHz – 1 GHz



— Preview Result 1H-PK+ — Preview Result 1V-PK+ ★ Critical_Freqs PK+
— FCC 24 ◆ Final_Result PK+

This plot is valid for Low, Middle and High Channels