

Wireless test report – 365560-3TRFWL

Applicant:
DAMM Cellular Systems A/S

Product type
400 MHz band cellular base station

Model: FCC ID:
10520141 Z5W-10520141

IC Registration number:
10159A-10520141

Specifications:

- ◆ **FCC Part 90, Subpart I**
Private land mobile radio services
- ◆ **RSS-119 Issue 12, May 2015**
Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz

Date of issue: July 16, 2020

Yong Huang, Wireless/EMC Specialist

Tested by



Signature

Kevin Rose, Wireless/EMC Specialist

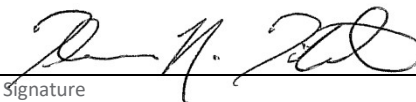
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Test location

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Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 1. Report summary

1.1 Applicant/Manufacturer

Company name	DAMM Cellular Systems A/S
Address	Møllegade 68, 6400 Sønderborg, Denmark

1.2 Test specifications

FCC Part 90, Subpart I	Private land mobile radio services
RSS-119 Issue 12, May 2015	Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz

1.3 Test methods

ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
FCC Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.5 Exclusions

None.

1.6 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2. Summary of test results

2.1 FCC– Intentional Radiators, test results

Clause	Test description	Verdict
\$90.205, \$2.1046	Transmitter output power	Pass
\$2.1047	Modulation characteristics	Pass
\$2.1049	Occupied Bandwidth	Pass
\$90.210, \$2.1051	Emission masks and spurious emissions	Pass
\$90.213, \$2.1055	Frequency stability	Pass
\$90.214	Transient frequency behavior	Pass

2.2 RSS-119 Issue 12– Intentional Radiators, test results

Part	Test description	Verdict
5.3	Transmitter Frequency Stability	Pass
5.4	Transmitter Output Power	Pass
5.5	Channel Bandwidth, Authorized Bandwidth, Occupied Bandwidth and Spectrum Masks	Pass
5.8	Transmitter Unwanted Emissions	Pass
5.9	Transient frequency behavior	Pass

Section 3. Equipment under test (EUT) details

3.1 EUT information

Product name	400 MHz band cellular base station
Model	10520141
Serial number	20025971 (420 to 425 MHz) 20025970 (425 to 430 MHz) 20029141 (460 to 470 MHz) 20025686 (465 to 470 MHz)

3.2 Technical information

Operating frequencies	421–430 MHz and 460–470 MHz (USA) 420–430 MHz and 460–470 MHz (Canada)
Channel bandwidths	DMR 2 Slot TDMA data: 15 kHz Analogue Voice: 7.5 kHz, 15 kHz, 30 kHz 0.20TETRA 4 Slot TDMA: 30 kHz 0.35TETRA 4 Slot TDMA: 30 kHz TEDS: 25 kHz, 50 kHz, 100 kHz, 150 kHz
Modulation type	FM modulation
Emission designator	DMR 2 Slot TDMA data, 7K60FXW Analog voice, 2.5 kHz deviation, 16K0F3E, 11K0F3E, 6K00F3E 0.20TETRA 4 Slot TDMA, ETS 300 392, 20K0D1W 0.35TETRA 4 Slot TDMA, ETS 300 392, 21K0D1W TEDS: 21K0D1W
Power requirements	–48 V _{DC}
Antenna information	External Antenna with N connector. Antenna type preferred is Omnidirectional with 5.2 dBi max, gain and an electrical down tilt of 6 degrees. Various types can be used.
Firmware/Software version	8.00 2019-05-17

3.3 Product description and theory of operation

Outdoor base station featuring multiple technologies in one single core-connected system: TETRA, DMR Tier III, TEDS and Analog. During test EUT was set to continues transmit mode with test software OM, controlled with command provided by client. Each BS422 can operate up to four different carriers simultaneously, independent of the selected radio technology, inside a defined band. The different carriers may operate in different bandwidths depending of the selected technology.

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None.

4.3 Deviations from laboratory tests procedures

The following deviations were made: As per customer, EUT can be supplied by battery, the switch on voltage is between 45–47 V, and the switch off voltage is between 40–42 V. The maximum supply voltage is 59.9 V. Hence frequency stability was tested for input voltage –48 Vdc (STV), range from –55.2 Vdc (this is 115%STV) to –42 Vdc (this is 87.5%STV rather than 85%).

Section 5. Test equipment

5.1 Test equipment list

Table 5.1-1: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002532	2 year	January 10, 2020
Flush mount turntable	Sunol	FM2022	FA002550	—	NCR
Controller	Sunol	SC104V	FA002551	—	NCR
Antenna mast	Sunol	TLT2	FA002552	—	NCR
DC Power Supply	Sorensen	SGA80X125C-AAA	FA002738	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	December 6, 2019
DFS and Adaptivity system	Aeroflex	PXI 30xx	FA002628	1 year	August 26, 2019
Bilog antenna (20–2000 MHz)	Sunol	JB1	FA002517	1 year	January 3, 2020
Horn antenna (1–18 GHz)	EMCO	3115	FA001451	1 year	April 12, 2020
50 Ω coax cable	C.C.A.	None	FA002603	1 year	September 19, 2019
50 Ω coax cable	C.C.A.	None	FA002605	—	VOU
50 Ω coax cable	C.C.A.	None	FA002831	—	VOU
50 Ω coax cable	Huber + Suhner	None	FA002607	1 year	November 30, 2019
50 Ω coax cable	C.C.A.	None	FA002603	1 year	September 19, 2019
Environmental Chamber	Espec	EPX-4H	FA002736	1 year	May 28, 2020
Spectrum analyzer	Rohde & Schwarz	FSV 40	FA002731	1 year	September 30, 2019
Power sensor	Rohde & Schwarz	NRP18S	FA002730	1 year	September 26, 2019
Spectrum analyzer	Rohde & Schwarz	FSW43	FA002971	1 year	December 21, 2020 ¹

Note: NCR - no calibration required

1. For additional tests performed from July 13th 2020

Section 6. Testing data

6.1 Transmitter power

6.1.1 Definitions and limits

FCC Part 90, Subpart I §90.205

(g) 421-430 MHz. Limitations on power and antenna heights are specified in §90.279.

(h) 450-470 MHz. (1) The maximum allowable station effective radiated power (ERP) is dependent upon the station's antenna HAAT and required service area and will be authorized in accordance with table 2. Applicants requesting an ERP in excess of that listed in table 2 must submit an engineering analysis based upon generally accepted engineering practices and standards that includes coverage contours to demonstrate that the requested station parameters will not produce coverage in excess of that which the applicant requires.

(2) Applications for stations where special circumstances exist that make it necessary to deviate from the ERP and antenna heights in Table 2 will be submitted to the frequency coordinator accompanied by a technical analysis, based upon generally accepted engineering practices and standards, that demonstrates that the requested station parameters will not produce a signal strength in excess of 39 dBu at any point along the edge of the requested service area. The coordinator may then recommend any ERP appropriate to meet this condition.

(3) An applicant for a station with a service area radius greater than 32 km (20 mi) must justify the requested service area radius, which may be authorized only in accordance with table 2, note 4. For base stations with service areas greater than 80 km, all operations 80 km or less from the base station will be on a primary basis and all operations outside of 80 km from the base station will be on a secondary basis and will be entitled to no protection from primary operations.

Table 2—450-470 MHz—Maximum ERP/Reference HAAT for a Specific Service Area Radius

	Service area radius (km)									
	3	8	13	16	24	32	40	48 ⁴	64 ⁴	80 ⁴
Maximum ERP (w) ¹	2	100	² 500	² 500	² 500	² 500	² 500	² 500	² 500	² 500
Up to reference HAAT (m) ³	15	15	15	27	63	125	250	410	950	2700

¹Maximum ERP indicated provides for a 39 dBu signal strength at the edge of the service area per FCC Report R-6602, Fig. 29 (See §73.699, Fig. 10 b).

²Maximum ERP of 500 watts allowed. Signal strength at the service area contour may be less than 39 dBu.

³When the actual antenna HAAT is greater than the reference HAAT, the allowable ERP will be reduced in accordance with the following equation: $ERP_{allow} = ERP_{max} \times (HAAT_{ref} / HAAT_{actual})^2$.

⁴Applications for this service area radius may be granted upon specific request with justification and must include a technical demonstration that the signal strength at the edge of the service area does not exceed 39 dBu.

RSS-119, Issue 12

5.4 Transmitter Output Power

The output power shall be within ±1 dB of the manufacturer's rated power listed in the equipment specifications.

The transmitter output power limits set forth in Table 2 will come into force upon the publication of Issue 12 of this standard and will apply to newly certified equipment.

Table 2 — Transmitter Output Power

Frequency Bands (MHz)	Transmitter Output Power (W)	
	Base/Fixed Equipment	Mobile Equipment
406.1-430 and 450-470	110	60

6.1.2 Test summary

Test start date:	June 14, 2019
Test engineer:	Yong Huang

6.1.3 Observations settings and special notes

For each band, two Samples were provided by client.
Sample 1 Tx was configured on low band
Sample 2 Tx was configured on high band
Client specified max rated power 50 W.
Tests were performed with power meter, as per test method described in ANSI C63.26, clause 5.2.4.2

6.1.4 Test data

Table 6.1-1: Transmitter power results

Freq. (MHz)	Modulation	Rated Output Power, W	Conducted Output Power, dBm	Limit, dB	Margin, dB
421.1	7K60FXW	50	47.6	±1	0.4
421.1	16K0F3E	50	47.6	±1	0.4
421.1	0.35TETRA	25	44.7	±1	0.3
421.1	25kHzTEDS	10	40.8	±1	0.2
429.9	7K60FXW	50	47.2	±1	0.8
429.9	16K0F3E	50	47.2	±1	0.8
429.9	0.35TETRA	25	44.3	±1	0.7
429.9	25kHzTEDS	10	40.4	±1	0.6
460.1	7K60FXW	50	47.3	±1	0.7
460.1	16K0F3E	50	47.3	±1	0.7
460.1	0.35TETRA	25	44.5	±1	0.5
460.1	25kHzTEDS	10	40.5	±1	0.5
469.9	7K60FXW	50	47.4	±1	0.6
469.9	16K0F3E	50	47.4	±1	0.6
469.9	0.35TETRA	25	44.3	±1	0.7
469.9	25kHzTEDS	10	40.6	±1	0.4

Table 6.1-2: Transmitter ERP results

Freq. (MHz)	Modulation	Conducted Output Power, dBm	Antenna Max Peak Gain, dBd	ERP, dBm
421.1	7K60FXW	47.6	3.05	50.65
421.1	16K0F3E	47.6	3.05	50.65
421.1	0.35TETRA	44.7	3.05	47.75
421.1	25kHzTEDS	40.8	3.05	43.85
429.9	7K60FXW	47.2	3.05	50.25
429.9	16K0F3E	47.2	3.05	50.25
429.9	0.35TETRA	44.3	3.05	47.35
429.9	25kHzTEDS	40.4	3.05	43.45
460.1	7K60FXW	47.3	3.05	50.35
460.1	16K0F3E	47.3	3.05	50.35
460.1	0.35TETRA	44.5	3.05	47.55
460.1	25kHzTEDS	40.5	3.05	43.55
469.9	7K60FXW	47.4	3.05	50.45
469.9	16K0F3E	47.4	3.05	50.45
469.9	0.35TETRA	44.3	3.05	47.35
469.9	25kHzTEDS	40.6	3.05	43.65

Notes: The output power shall be within ±1 dB of the manufacturer's rated power
 $ERP = P + GT - LC$
P = conducted output power, in dBm
GT = gain of Tx antenna, in dBd (ERP)
LC = signal loss in the cable connecting EUT and Tx antenna, in dB
dBd = dBi - 2.15, ERP = EIRP - 2.15, EIRP = ERP + 2.15

6.2 FCC 2.1047 Modulation characteristic

6.2.1 Definitions and limits

FCC §2.1047 Measurements required: Modulation characteristics.

(a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

(b) Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed

6.2.2 Test summary

Test start date	July 11, 2019
Test engineer	Kevin Rose and Yong Huang

6.2.3 Observations, settings and special notes

Tests were performed as per test method described in ANSI C63.26, clause 5.3

Receiver setting:

Detector mode	Peak
Demod bandwidth	25 kHz
Trace mode	Max Hold

6.2.4 Test data

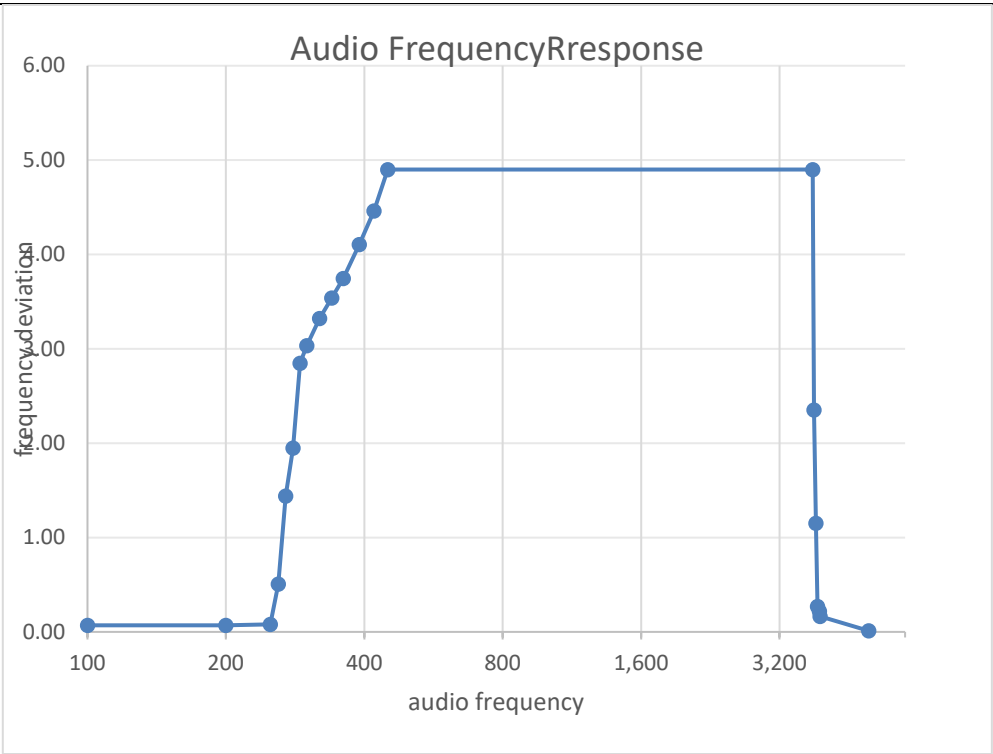


Figure 6.2-1: Audio Frequency Response

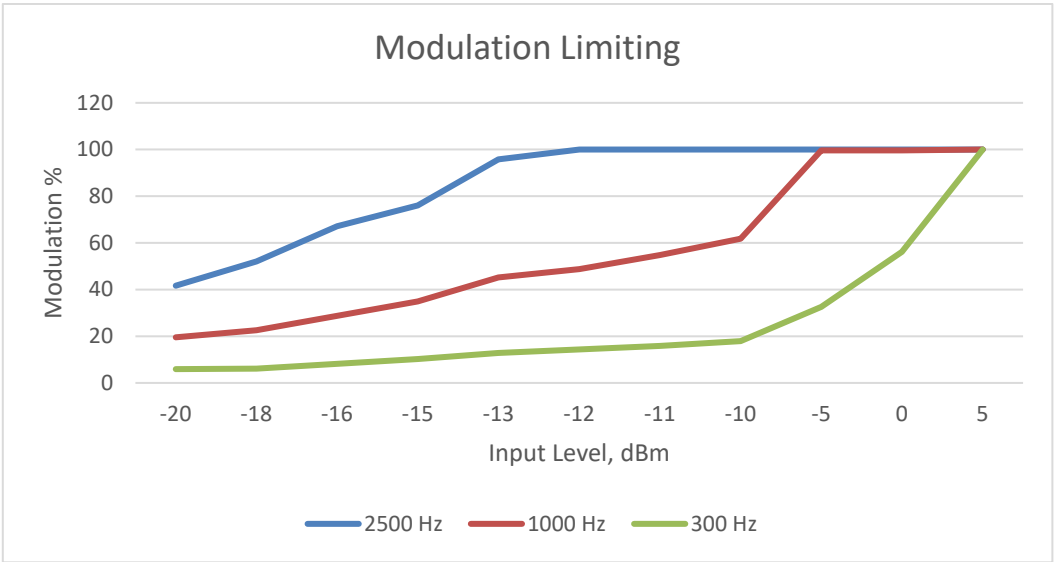


Figure 6.2-2: Modulation Limiting, modulation 16kF3E

Note: frequency deviations of 100% modulation are: 4.9 kHz for 300 Hz audio frequency, 4.8 kHz for 1000 kHz audio frequency , 4.8 kHz for 2500 kHz

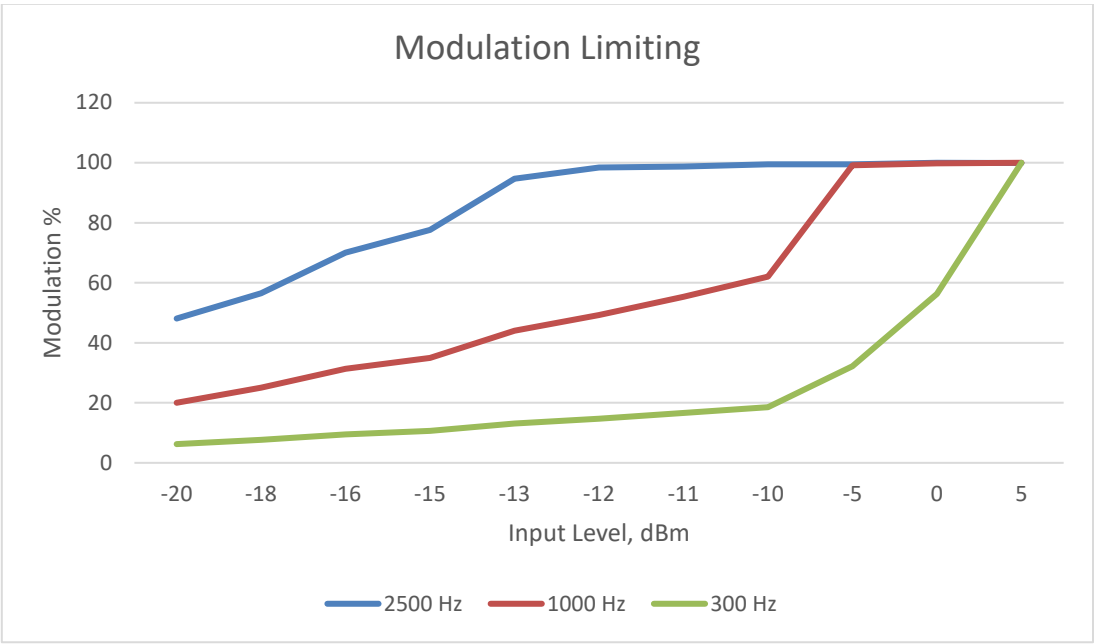


Figure 6.2-3: Modulation Limiting, modulation 11K0F3E

Note: frequency deviations of 100% modulation are: 2.5 kHz for 300 Hz audio frequency, 2.4 kHz for 1000 kHz audio frequency , 2.2 kHz for 2500 kHz

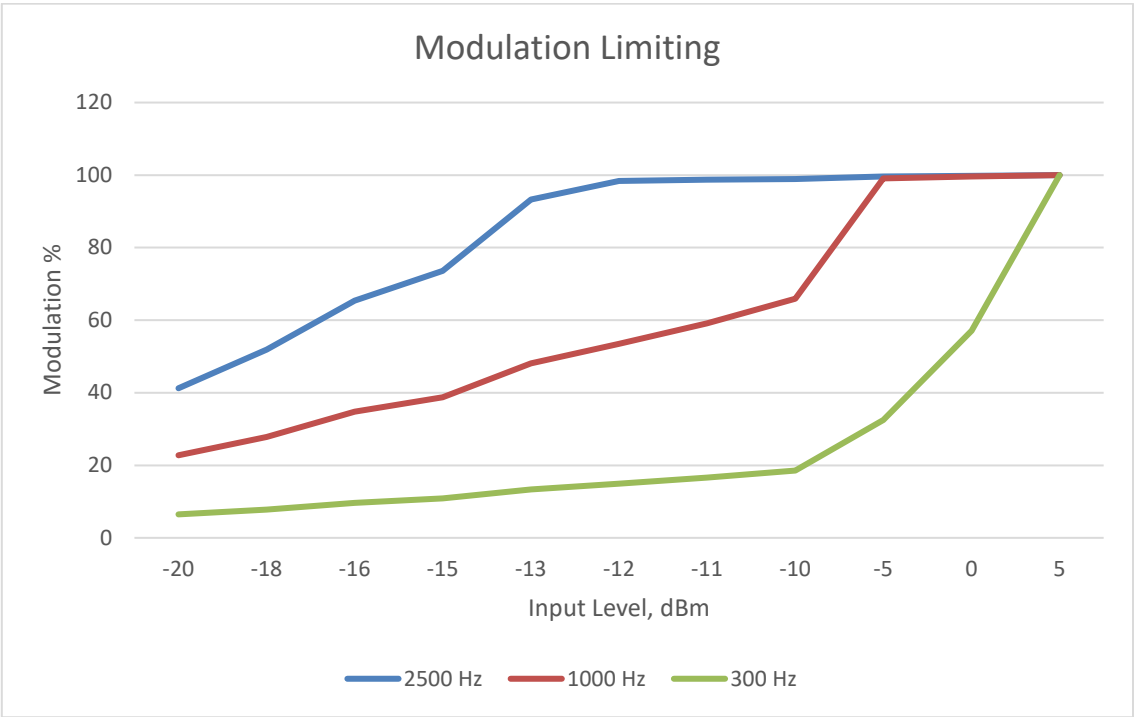


Figure 6.2-4: Modulation Limiting, modulation 6K00F3E

Note: frequency deviations of 100% modulation are: is 1.2 kHz for 300 Hz audio frequency, 1.1 kHz for 1000 kHz audio frequency , 1.2 kHz for 2500 kHz

6.3 RSS-119 5.5 Occupied bandwidth

6.3.1 Definitions and limits

RSS-119

5.5 Channel Bandwidth, Authorized Bandwidth, Occupied Bandwidth and Spectrum Masks

For the purpose of this document, channel bandwidth is the channel width in which the equipment is designed to operate.

The maximum permissible occupied bandwidth shall not exceed the authorized bandwidth specified in Table 3 for the equipment's frequency band. The authorized bandwidth is defined as the maximum width of the band of frequencies used to derive spectrum masks and is not necessarily equivalent to the bandwidth found on radio and spectrum licences.

The channel bandwidths, authorized bandwidths and spectrum masks are given in Table 3 for equipment having an output power greater than 120 mW. For equipment with an output power that does not exceed 120 mW, Section 5.10 applies.

Table 3 — Channel Bandwidths, Authorized Bandwidths and Spectrum Masks

Frequency Band (MHz)	Related SRSP for Channelling Plan and ERP	Channel Bandwidth (kHz)	Authorized Bandwidth (kHz)	Spectrum Masks for Equipment with Audio Filter	Spectrum Masks for Equipment Without Audio Filter
406.1-430 and 450-470	SRSP-501	25	20	B	C (G) ^{Footnote 1}
			22	Y	Y
		12.5	11.25	D	D
		6.25	6	E	E

1. Paging transmitters in the bands 406.1-430 MHz and 450-470 MHz are to use mask G.

5.8 Transmitter Unwanted Emissions

The spectrum plots of the unwanted emissions shall comply with the masks specified in Table 3.

Descriptions of these permissible emission masks are given in the sections that follow.

The term displacement frequency, f_d , used in these sections refers to the difference between the channel frequency and the emission component frequency expressed in kilohertz, and p is the transmitter output power in Watts.

5.8.1 Emission Mask B for Transmitters Equipped with an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 5.

Table 5 — Emission Mask B

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$10 < f_d \leq 20$	25	300
$20 < f_d \leq 50$	35	300
$f_d > 50$	$43 + 10 \log_{10}(p)$	Specified in Section 4.2.1

5.8.3 Emission Mask D for Transmitters Equipped with or Without an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 7.

Table 7 — Emission Mask D

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$.625 < f_d \leq 12.5$	$7.27(f_d - 2.88)$	Specified in Section 4.2.2
$f_d > 12.5$	Whichever is the lesser: 70 or $50 + 10 \log_{10}(p)$	Specified in Section 4.2.2

5.8.4 Emission Mask E for Transmitters Equipped with or Without an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 8.

Table 8 — Emission Mask E

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$3 < f_d \leq 4.6$	Whichever is the lesser: $30 + 16.67(f_d - 3)$ or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2
$f_d > 4.6$	Whichever is the lesser: 57 or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2

5.8.9.2 Out-of-Band Emission Limit

On any frequency outside of the ranges specified in the ACP tables 13 to 16, the power of any emission shall be attenuated below the mean output power P (dBW) by at least $43 + 10 \log_{10}(p)$, measured in a 100 kHz bandwidth for frequencies less than or equal to 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

In addition, for operations in the bands 768-776 MHz and 798-806 MHz, all emissions (including harmonics in the band 1559-1610 MHz), shall not exceed:
–70 dBW/MHz equivalent isotropically radiated power (e.i.r.p.) for wideband emissions, and
–80 dBW/kHz e.i.r.p. for discrete emissions of less than 700 Hz bandwidth.

5.8.10 Emission Mask Y for Equipment With a 25 kHz Channel Bandwidth and an Occupied Bandwidth Greater Than 20 kHz

Equipment with a 25 kHz channel bandwidth and an occupied bandwidth greater than 20 kHz shall have the power of any emission attenuated below the transmitter output power P (dBW) as specified in Table 17.

Table 17 — Emission Mask Y		
Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$12.375 < f_d \leq 13.975$	Whichever is the lesser: $30 + 16.67(f_d - 12.375)$ or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2
$f_d > 13.975$	Whichever is the lesser: 57 or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2

6.3.2 Test summary

Test date	June 7, 2019
Test engineer	Yong Huang

6.3.3 Observations, settings and special notes

Tests were performed as per test method described in ANSI C63.26, clause 5.4.4

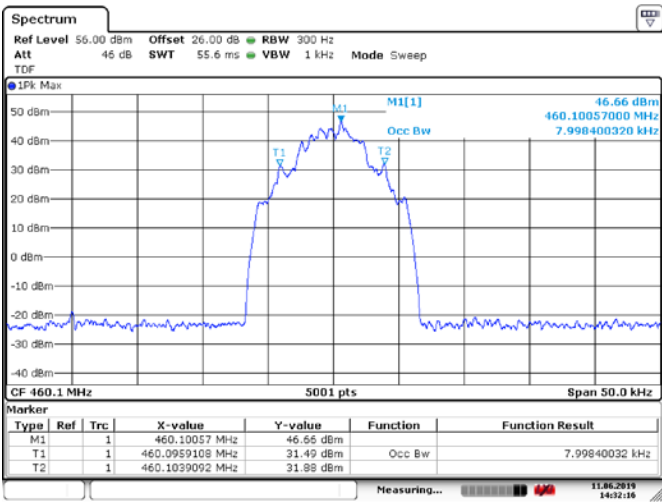
Spectrum Analyzer setting

Detector mode	Peak
Resolution bandwidth	100 and 300 Hz
Video bandwidth	More than RBW $\times$ 3
Trace mode	Max Hold

6.3.4 Test data

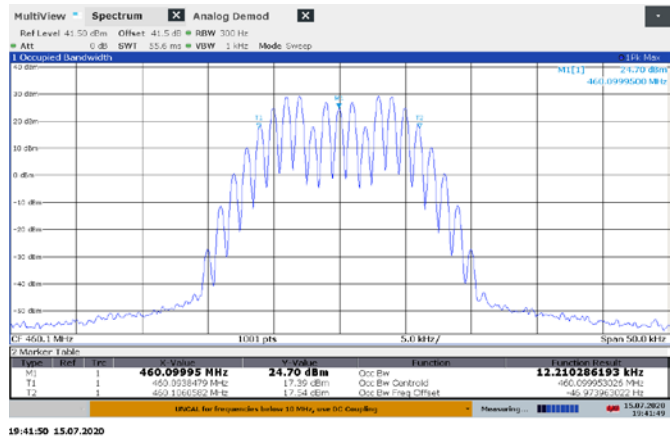
Table 6.3-1: Occupied Bandwidth test results

Freq. (MHz)	Modulation	99% Occupied Bandwidth, kHz	Limit, kHz	Margin, kHz
460.1	7K60FXW	8.00	11.25	3.25
460.1	16K0F3E	8.24	20.00	11.76
460.1	11K0F3E	4.52	11.25	6.73
460.1	6K00F3E	2.06	6.00	3.94
460.1	0.20TETRA	19.35	20.00	0.65
460.1	0.35TETRA	21.07	25.00	3.93
460.1	25kHzTEDS	21.19	25.00	3.81



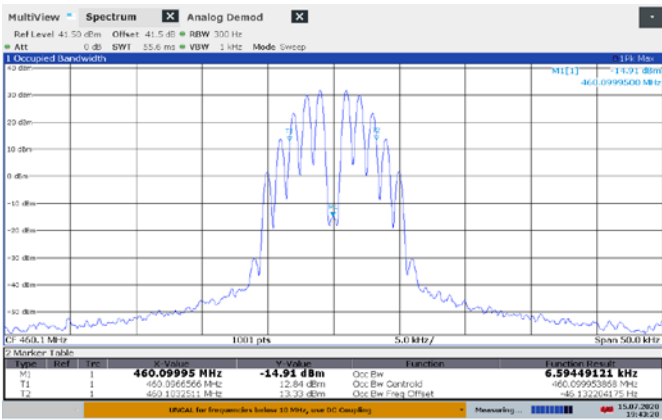
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Figure 6.3-1: Occupied Bandwidth, Tx @mid channel 7k60FXW modulation



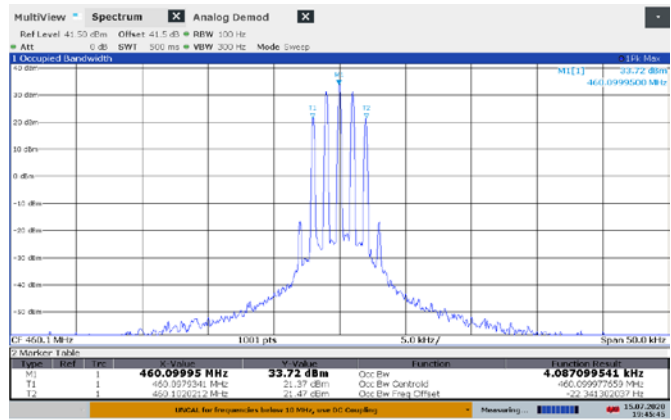
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Figure 6.3-2: Occupied Bandwidth, Tx @mid channel 16k0F3E modulation



19:43:21 15.07.2020

Figure 6.3-3: Occupied Bandwidth, Tx @mid channel 11k0F3E modulation



19:45:46 15.07.2020

Figure 6.3-4: Occupied Bandwidth, Tx @mid channel 6k00F3E modulation

Note For analog modulations, the modulating audio frequency is 1 kHz. Audio level at 16 dB above 50% modulation 50% modulation frequency deviations are 2.4 kHz for 16k0F3E, 1.2 kHz for 11k0F3E, and 0.5 kHz for 6k00F3E

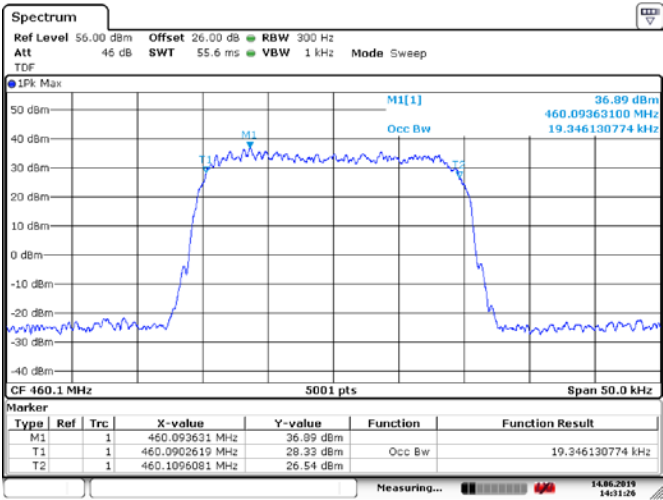


Figure 6.3-5: Occupied Bandwidth, Tx @mid channel 0.20TETRA modulation

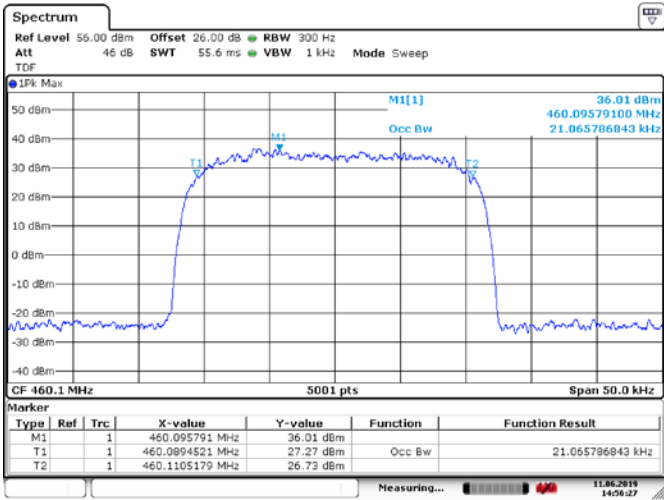


Figure 6.3-6: Occupied Bandwidth, Tx @mid channel 0.35TETRA modulation

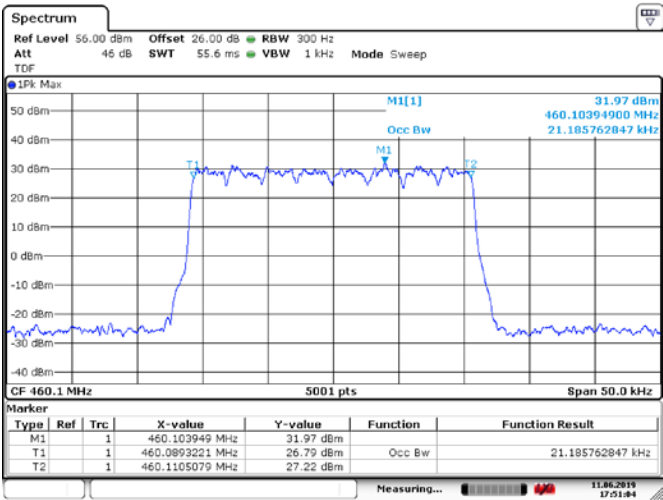


Figure 6.3-7: Occupied Bandwidth, Tx @mid channel 25kHzTEDS modulation

6.4 FCC 90.210, and RSS-119 5.8 Emission limits, Emission mask

6.4.1 Definitions and limits

FCC §90.210

(b) **Emission Mask B.** For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

(d) **Emission Mask D—12.5 kHz channel bandwidth equipment.** For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_a in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_a - 2.88 \text{ kHz})$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_a in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings does not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

(e) **Emission Mask E—6.25 kHz or less channel bandwidth equipment.** For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_a in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least $30 + 16.67(f_a - 3 \text{ kHz})$ or $55 + 10 \log (P)$ or 65 dB, whichever is the lesser attenuation.
- (3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least $55 + 10 \log (P)$ or 65 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings does not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

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5.5 Channel Bandwidth, Authorized Bandwidth, Occupied Bandwidth and Spectrum Masks

For the purpose of this document, channel bandwidth is the channel width in which the equipment is designed to operate.

The maximum permissible occupied bandwidth shall not exceed the authorized bandwidth specified in Table 3 for the equipment's frequency band. The authorized bandwidth is defined as the maximum width of the band of frequencies used to derive spectrum masks and is not necessarily equivalent to the bandwidth found on radio and spectrum licences.

The channel bandwidths, authorized bandwidths and spectrum masks are given in Table 3 for equipment having an output power greater than 120 mW. For equipment with an output power that does not exceed 120 mW, Section 5.10 applies.

Table 3 — Channel Bandwidths, Authorized Bandwidths and Spectrum Masks

Frequency Band (MHz)	Related SRSP for Channelling Plan and ERP	Channel Bandwidth (kHz)	Authorized Bandwidth (kHz)	Spectrum Masks for Equipment with Audio Filter	Spectrum Masks for Equipment Without Audio Filter
406.1-430 and 450-470	SRSP-501	25	20	B	C (G) ^{Footnote 1}
			22	Y	Y
		12.5	11.25	D	D
		6.25	6	E	E

1. Paging transmitters in the bands 406.1-430 MHz and 450-470 MHz are to use mask G.

5.8 Transmitter Unwanted Emissions

The spectrum plots of the unwanted emissions shall comply with the masks specified in Table 3.

Descriptions of these permissible emission masks are given in the sections that follow.

The term displacement frequency, f_d , used in these sections refers to the difference between the channel frequency and the emission component frequency expressed in kilohertz, and p is the transmitter output power in Watts.

5.8.1 Emission Mask B for Transmitters Equipped with an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 5.

Table 5 — Emission Mask B

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$10 < f_d \leq 20$	25	300
$20 < f_d \leq 50$	35	300
$f_d > 50$	$43 + 10 \log_{10}(p)$	Specified in Section 4.2.1

5.8.3 Emission Mask D for Transmitters Equipped with or Without an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 7.

Table 7 — Emission Mask D

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$.625 < f_d \leq 12.5$	$7.27(f_d - 2.88)$	Specified in Section 4.2.2
$f_d > 12.5$	Whichever is the lesser: 70 or $50 + 10 \log_{10}(p)$	Specified in Section 4.2.2

5.8.4 Emission Mask E for Transmitters Equipped with or Without an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 8.

Table 8 — Emission Mask E

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$3 < f_d \leq 4.6$	Whichever is the lesser: $30 + 16.67(f_d - 3)$ or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2
$f_d > 4.6$	Whichever is the lesser: 57 or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2

5.8.9.2 Out-of-Band Emission Limit

On any frequency outside of the ranges specified in the ACP tables 13 to 16, the power of any emission shall be attenuated below the mean output power P (dBW) by at least $43 + 10 \log_{10}(p)$, measured in a 100 kHz bandwidth for frequencies less than or equal to 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

In addition, for operations in the bands 768-776 MHz and 798-806 MHz, all emissions (including harmonics in the band 1559-1610 MHz), shall not exceed:

- 70 dBW/MHz equivalent isotropically radiated power (e.i.r.p.) for wideband emissions, and
- 80 dBW/kHz e.i.r.p. for discrete emissions of less than 700 Hz bandwidth.

5.8.10 Emission Mask Y for Equipment With a 25 kHz Channel Bandwidth and an Occupied Bandwidth Greater Than 20 kHz

Equipment with a 25 kHz channel bandwidth and an occupied bandwidth greater than 20 kHz shall have the power of any emission attenuated below the transmitter output power P (dBW) as specified in Table 17.

Table 17 — Emission Mask Y		
Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$12.375 < f_d \leq 13.975$	Whichever is the lesser: $30 + 16.67(f_d - 12.375)$ or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2
$f_d > 13.975$	Whichever is the lesser: 57 or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2

6.4.2 Test summary

Test date	June 7, 2019
Test engineer	Yong Huang

6.4.3 Observations, settings and special notes

Tests were performed as per test method described in ANSI C63.26, clause 5.7.3

Spectrum Analyzer setting

Detector mode	Peak
Resolution bandwidth	100 Hz
Video bandwidth	More than RBW $\times$ 3
Trace mode	Max Hold

6.4.4 Test data

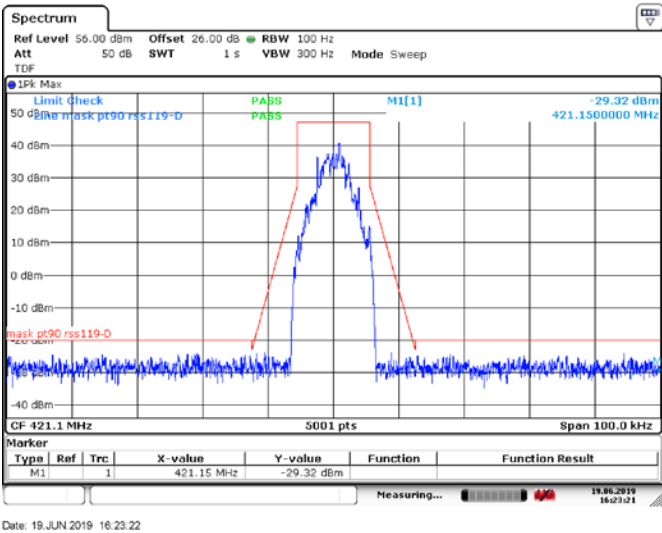


Figure 6.4-1: Mask d, Tx @low channel of 420 MHz band, 50W 7k60FXW modulation

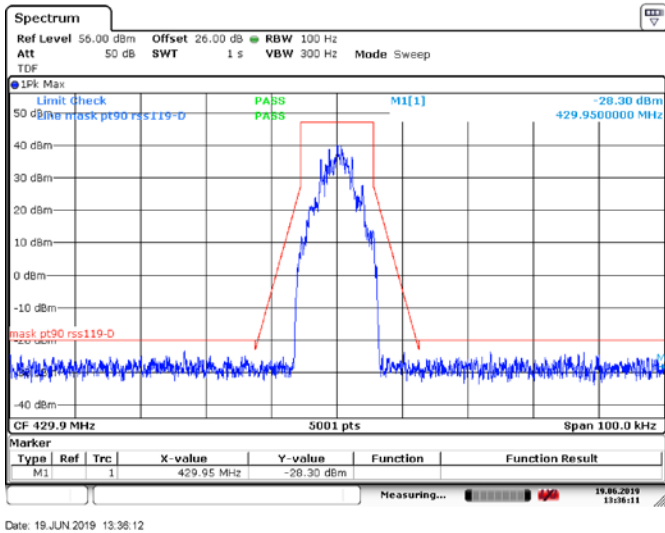


Figure 6.4-2: Mask d, Tx @high channel of 420 MHz band, 50W 7k60FXW modulation

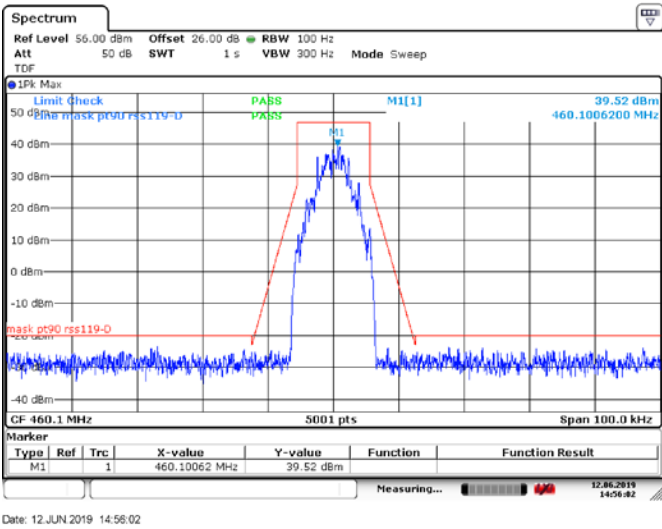


Figure 6.4-3: Mask d, Tx @low channel of 460 MHz band, 50W 7k60FXW modulation

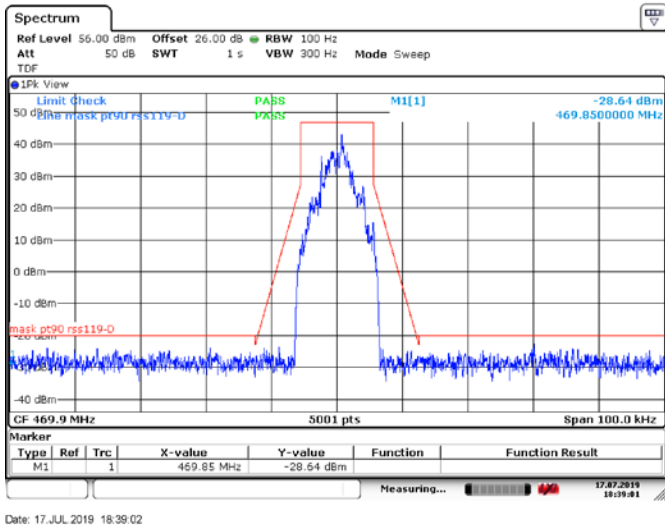
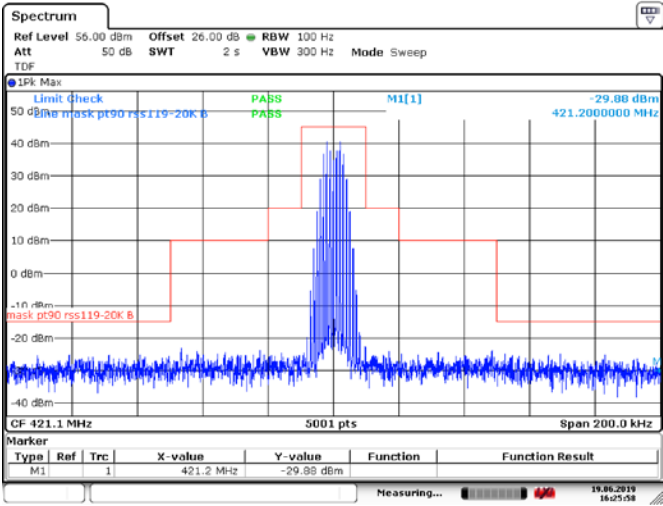


Figure 6.4-4: Mask d, Tx @low channel of 460 MHz band, 50W 7k60FXW modulation

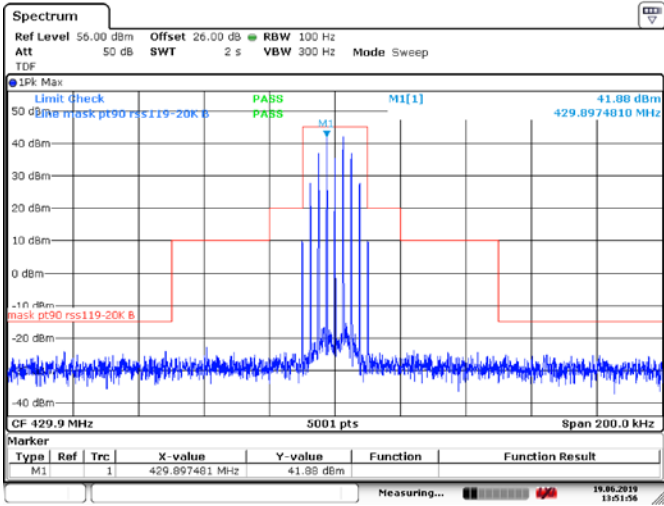
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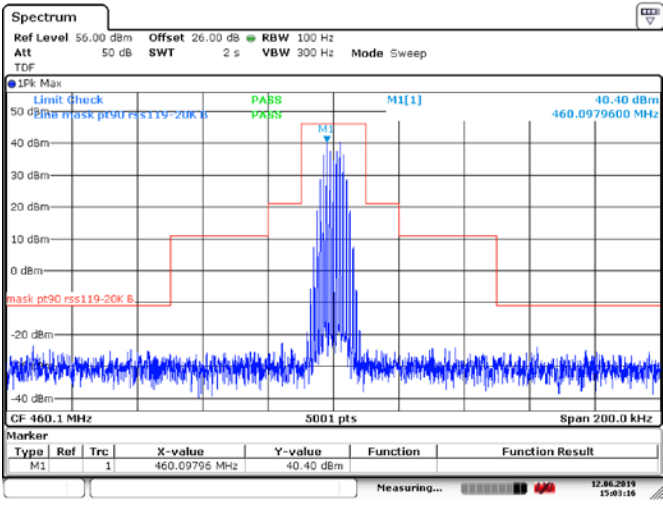
Date: 19 JUN 2019 16:25:59

Figure 6.4-5: Mask b, Tx @low channel of 420 MHz band, 50W 16kF3E modulation



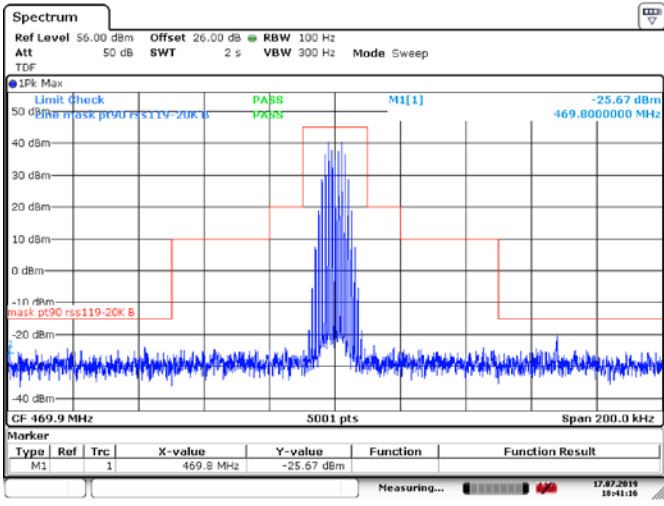
Date: 19 JUN 2019 13:51:57

Figure 6.4-6: Mask b, Tx @high channel of 420 MHz band, 50W 16kF3E modulation



Date: 12 JUN 2019 15:03:17

Figure 6.4-7: Mask b, Tx @low channel of 420 MHz band, 50W 16kF3E modulation

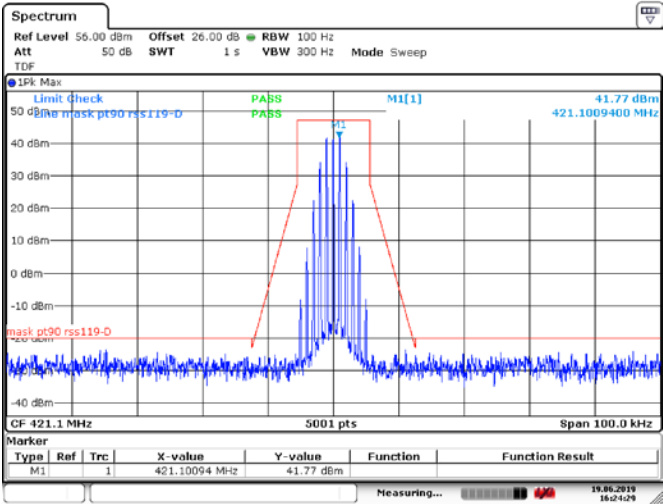


Date: 17 JUL 2019 18:41:17

Figure 6.4-8: Mask b, Tx @high channel of 420 MHz band, 50W 16kF3E modulation

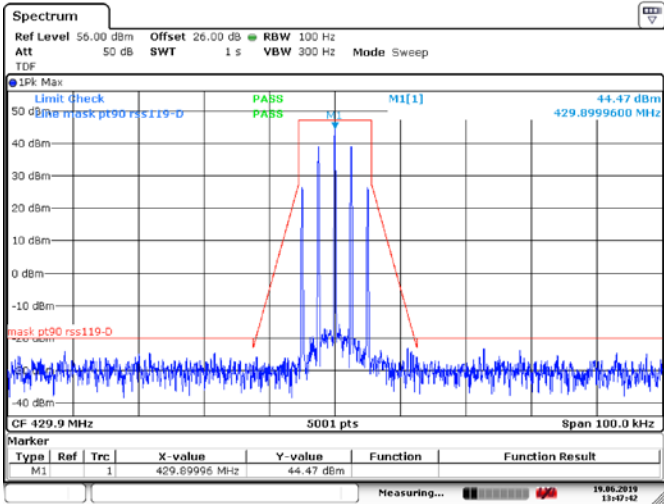
Section 8
Test name
Specification

Testing data
Emission limits, Emission mask
FCC 90.210 and RSS-119 5.8



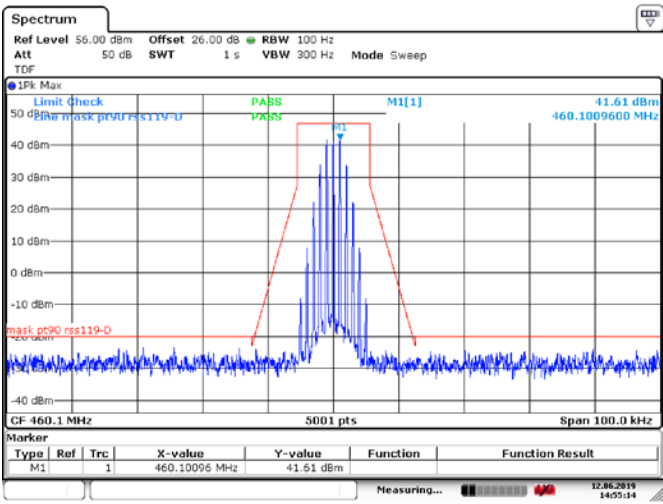
Date: 19 JUN 2019 16:24:29

Figure 6.4-9: Mask d, Tx @low channel of 420 MHz band, 50W 11kF3E modulation



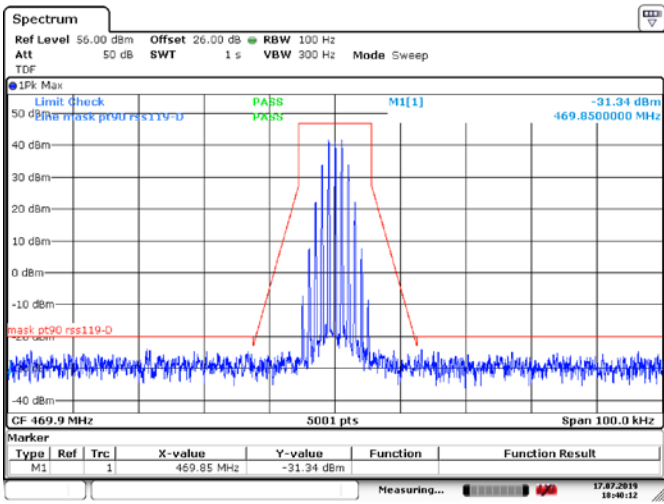
Date: 19 JUN 2019 13:47:42

Figure 6.4-10: Mask d, Tx @high channel of 420 MHz band, 50W 11kF3E modulation



Date: 12 JUN 2019 14:55:15

Figure 6.4-11: Mask d, Tx @low channel of 460 MHz band, 50W 11kF3E modulation

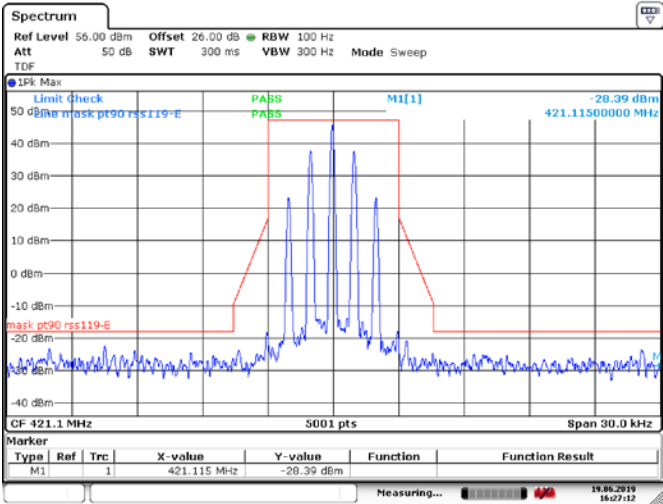


Date: 17 JUL 2019 18:40:13

Figure 6.4-12: Mask d, Tx @low channel of 460 MHz band, 50W 11kF3E modulation

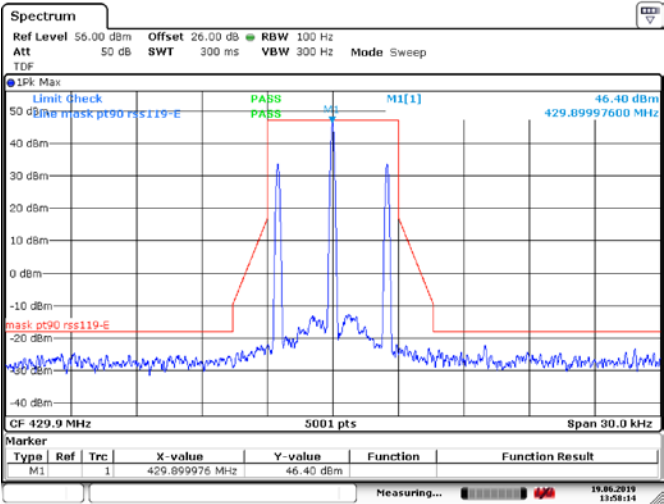
Section 8
Test name
Specification

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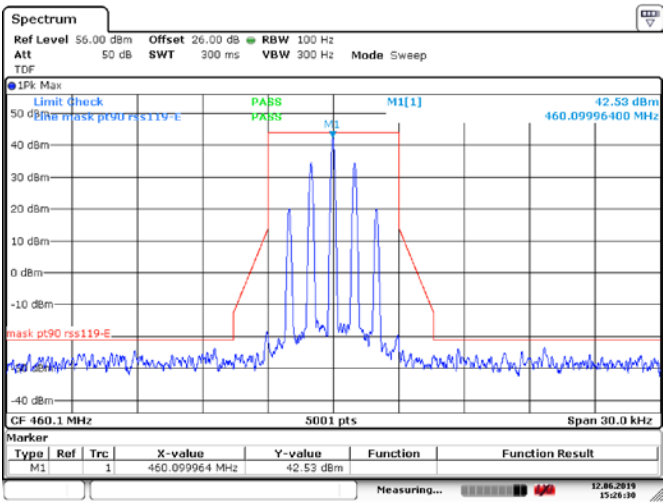
Date: 19 JUN 2019 16:27:13

Figure 6.4-13: Mask e, Tx @low channel of 420 MHz band, 50W 6k00F3E modulation



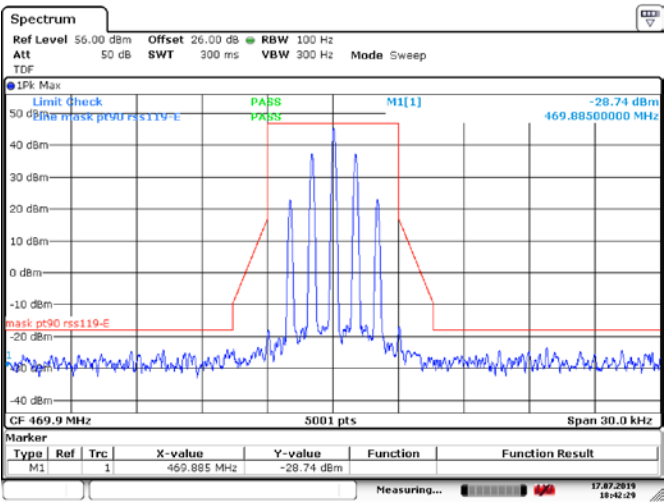
Date: 19 JUN 2019 13:58:14

Figure 6.4-14: Mask e, Tx @high channel of 420 MHz band, 50W 6k00F3E modulation



Date: 12 JUN 2019 15:28:30

Figure 6.4-15: Mask e, Tx @low channel of 460 MHz band, 50W 6k00F3E modulation



Date: 17 JUL 2019 18:42:29

Figure 6.4-16: Mask e, Tx @low channel of 460 MHz band, 50W 6k00F3E modulation

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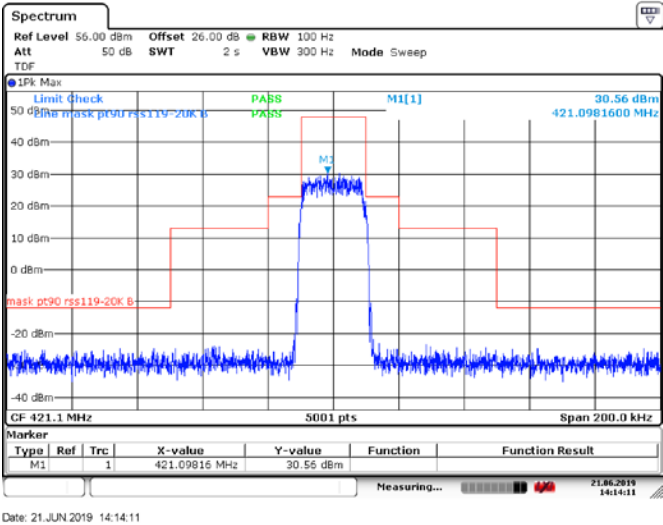


Figure 6.4-17: Mask b, Tx @low channel of 420 MHz band, 25 W 0.20TETRA modulation

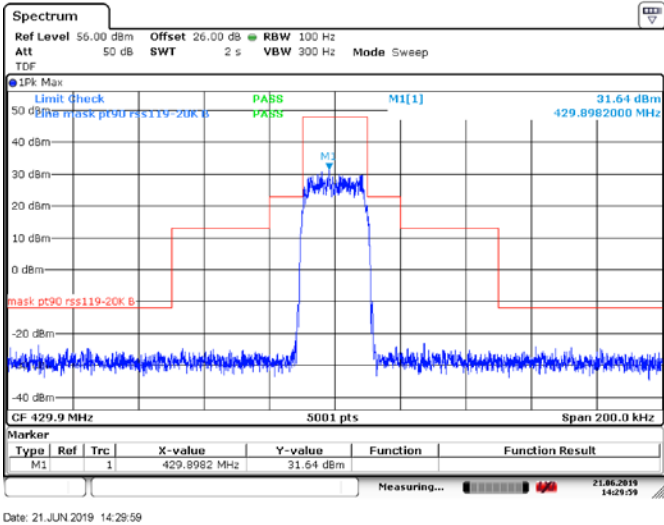


Figure 6.4-18: Mask b, Tx @high channel of 420 MHz band, 25 W 0.20TETRA modulation

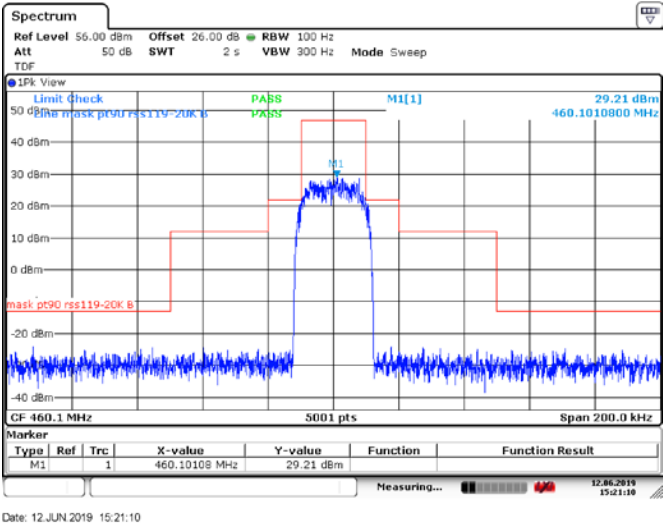


Figure 6.4-19: Mask b, Tx @low channel of 460 MHz band, 25 W 0.20TETRA modulation

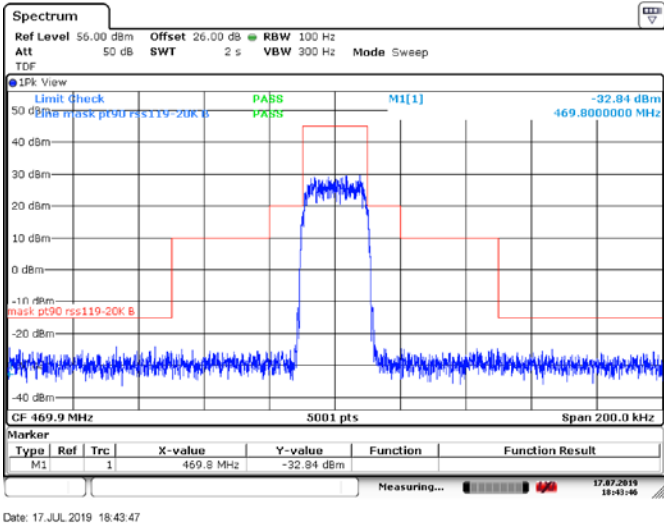
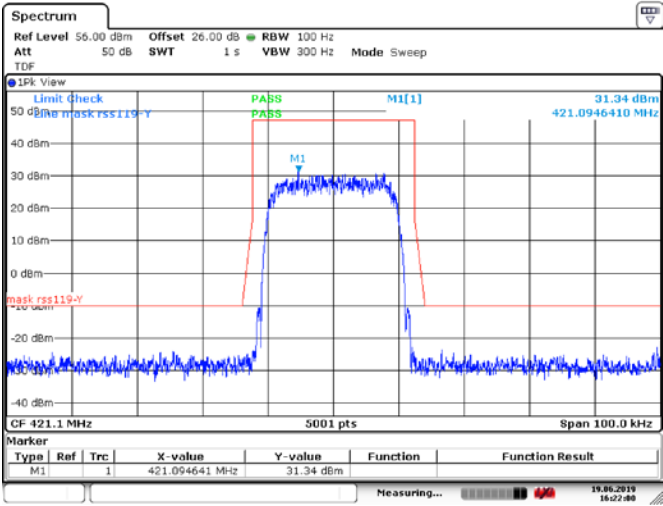


Figure 6.4-20: Mask b, Tx @low channel of 460 MHz band, 25 W 0.20TETRA modulation

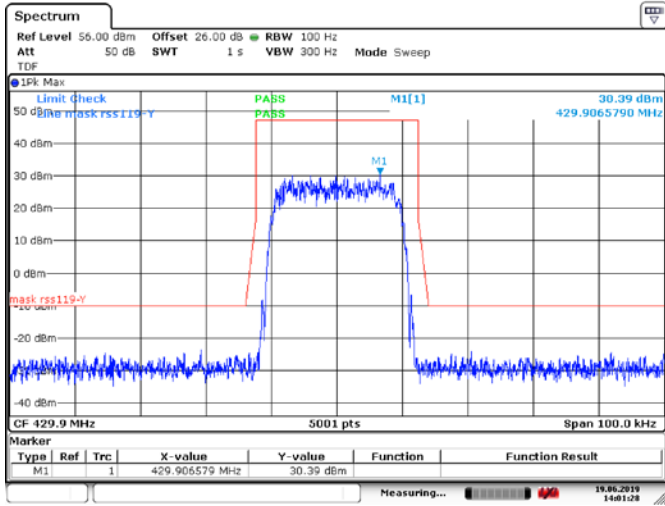
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Test name
Specification

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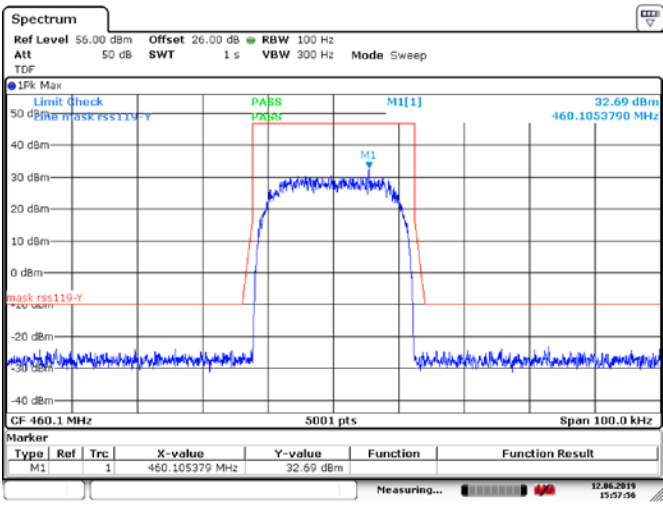
Date: 19 JUN 2019 16:22:00

Figure 6.4-21: Mask y, Tx @low channel of 420 MHz band, 25 W o.35TETRA modulation



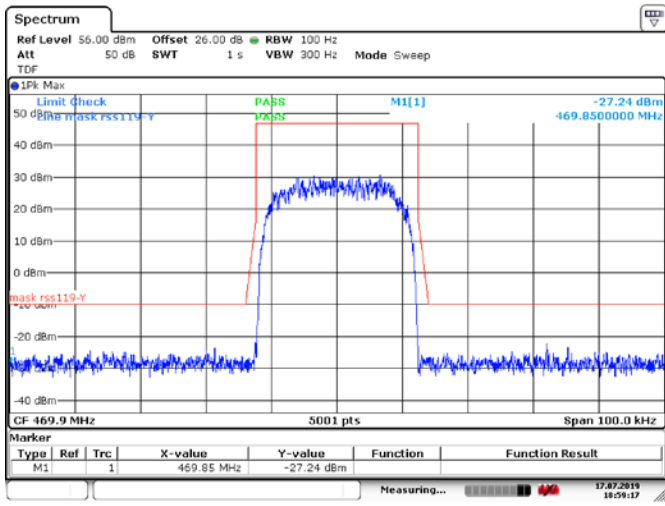
Date: 19 JUN 2019 14:01:28

Figure 6.4-22: Mask y, Tx @high channel of 420 MHz band, 25 W o. 35TETRA modulation



Date: 12 JUN 2019 15:57:56

Figure 6.4-23: Mask y, Tx @low channel of 460 MHz band, 25 W o. 35TETRA modulation

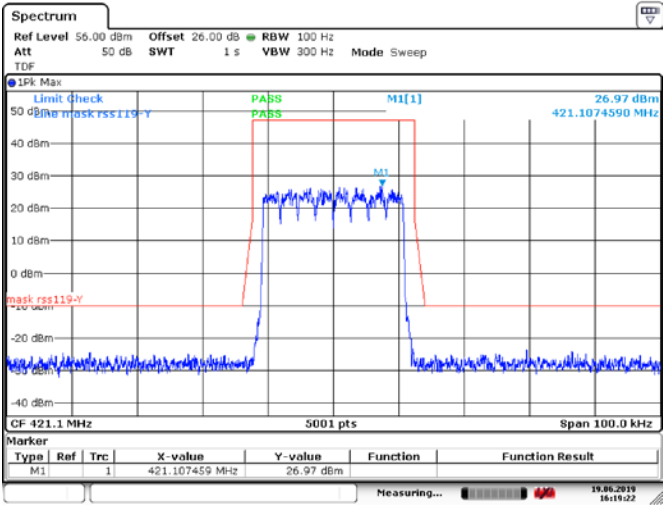


Date: 17 JUL 2019 18:58:17

Figure 6.4-24: Mask y, Tx @low channel of 460 MHz band, 25 W o. 35TETRA modulation

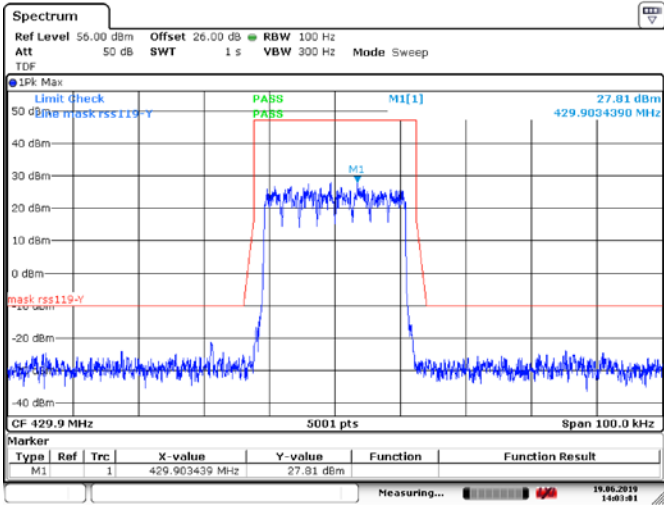
Section 8
Test name
Specification

Testing data
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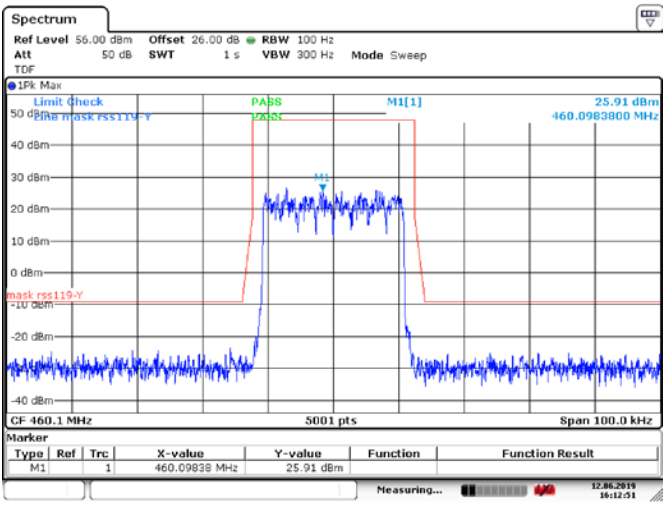
Date: 19 JUN 2019 16:19:22

Figure 6.4-25: Mask y, Tx @low channel of 420 MHz band, 10 W 25kHzTEDS modulation



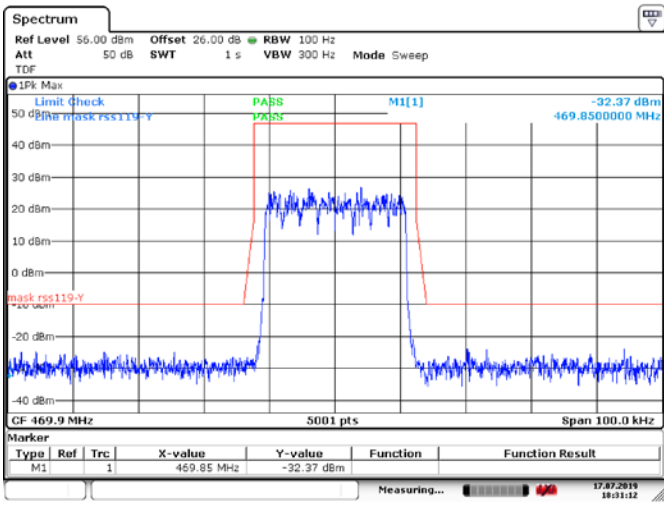
Date: 19 JUN 2019 14:03:01

Figure 6.4-26: Mask y, Tx @high channel of 420 MHz band, 10 W 25kHzTEDS modulation



Date: 12 JUN 2019 16:12:51

Figure 6.4-27: Mask y, Tx @low channel of 460 MHz band, 10 W 25kHzTEDS modulation



Date: 17 JUL 2019 18:31:12

Figure 6.4-28: Mask y, Tx @low channel of 460 MHz band, 10 W 25kHzTEDS modulation

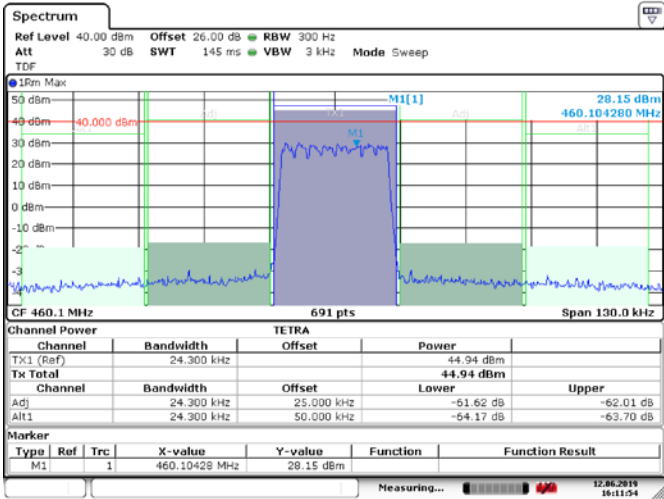
Section 8
Test name
Specification

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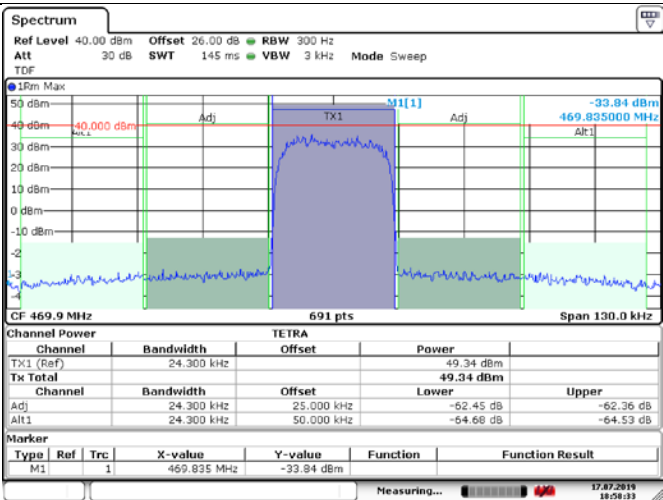
Date: 12 JUN 2019 16:10:02

Figure 6.4-29: ACP, Tx @low channel of 460 MHz band, 25 W 0.35TETRA modulation



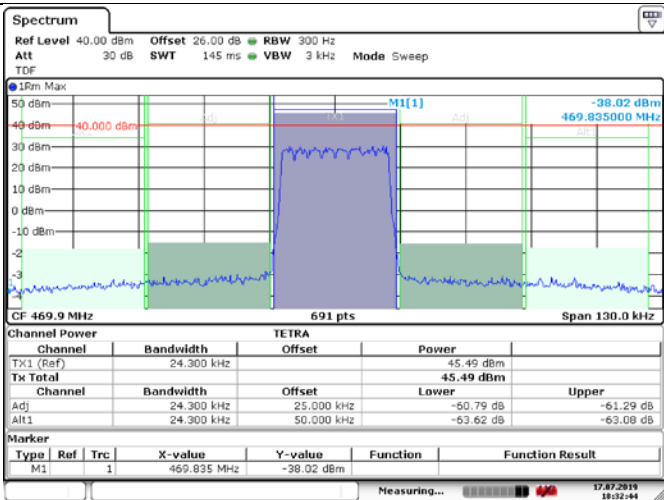
Date: 12 JUN 2019 16:11:55

Figure 6.4-30: ACP, Tx @low channel of 460 MHz band, 10 W 25kHzTEDS modulation



Date: 17 JUL 2019 18:58:32

Figure 6.4-31: ACP, Tx @high channel of 460 MHz band, 25 W 0.35TETRA modulation



Date: 17 JUL 2019 18:58:44

Figure 6.4-32: ACP, Tx @high channel of 460 MHz band, 10 W 25kHzTEDS modulation

6.5 FCC 90.210 and RSS-119 5.8 Emission limits, conducted method

6.5.1 Definitions and limits

FCC §90.210

(b) **Emission Mask B.** For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

(d) **Emission Mask D—12.5 kHz channel bandwidth equipment.** For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings does not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

(e) **Emission Mask E—6.25 kHz or less channel bandwidth equipment.** For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0 : Zero dB.
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least $30 + 16.67(f_d - 3 \text{ kHz})$ or $55 + 10 \log (P)$ or 65 dB, whichever is the lesser attenuation.
- (3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least $55 + 10 \log (P)$ or 65 dB, whichever is the lesser attenuation.
- (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings does not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

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5.5 Channel Bandwidth, Authorized Bandwidth, Occupied Bandwidth and Spectrum Masks

For the purpose of this document, channel bandwidth is the channel width in which the equipment is designed to operate.

The maximum permissible occupied bandwidth shall not exceed the authorized bandwidth specified in Table 3 for the equipment's frequency band. The authorized bandwidth is defined as the maximum width of the band of frequencies used to derive spectrum masks and is not necessarily equivalent to the bandwidth found on radio and spectrum licences.

The channel bandwidths, authorized bandwidths and spectrum masks are given in Table 3 for equipment having an output power greater than 120 mW. For equipment with an output power that does not exceed 120 mW, Section 5.10 applies.

Table 3 — Channel Bandwidths, Authorized Bandwidths and Spectrum Masks

Frequency Band (MHz)	Related SRSP for Channelling Plan and ERP	Channel Bandwidth (kHz)	Authorized Bandwidth (kHz)	Spectrum Masks for Equipment with Audio Filter	Spectrum Masks for Equipment Without Audio Filter
406.1-430 and 450-470	SRSP-501	25	20	B	C (G) ^{Footnote 1}
		12.5	22	Y	Y
		6.25	11.25	D	D
			6	E	E

1. Paging transmitters in the bands 406.1-430 MHz and 450-470 MHz are to use mask G.

5.8 Transmitter Unwanted Emissions

The spectrum plots of the unwanted emissions shall comply with the masks specified in Table 3.

Descriptions of these permissible emission masks are given in the sections that follow.

The term displacement frequency, f_d , used in these sections refers to the difference between the channel frequency and the emission component frequency expressed in kilohertz, and p is the transmitter output power in Watts.

5.8.1 Emission Mask B for Transmitters Equipped with an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 5.

Table 5 — Emission Mask B

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$10 < f_d \leq 20$	25	300
$20 < f_d \leq 50$	35	300
$f_d > 50$	$43 + 10 \log_{10}(p)$	Specified in Section 4.2.1

5.8.3 Emission Mask D for Transmitters Equipped with or Without an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 7.

Table 7 — Emission Mask D

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$.625 < f_d \leq 12.5$	$7.27(f_d - 2.88)$	Specified in Section 4.2.2
$f_d > 12.5$	Whichever is the lesser: 70 or $50 + 10 \log_{10}(p)$	Specified in Section 4.2.2

5.8.4 Emission Mask E for Transmitters Equipped with or Without an Audio Low-Pass Filter

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 8.

Table 8 — Emission Mask E

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$3 < f_d \leq 4.6$	Whichever is the lesser: $30 + 16.67(f_d - 3)$ or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2
$f_d > 4.6$	Whichever is the lesser: 57 or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2

5.8.9.2 Out-of-Band Emission Limit

On any frequency outside of the ranges specified in the ACP tables 13 to 16, the power of any emission shall be attenuated below the mean output power P (dBW) by at least $43 + 10 \log_{10}(p)$, measured in a 100 kHz bandwidth for frequencies less than or equal to 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

In addition, for operations in the bands 768-776 MHz and 798-806 MHz, all emissions (including harmonics in the band 1559-1610 MHz), shall not exceed:

- 70 dBW/MHz equivalent isotropically radiated power (e.i.r.p.) for wideband emissions, and
- 80 dBW/kHz e.i.r.p. for discrete emissions of less than 700 Hz bandwidth.

5.8.10 Emission Mask Y for Equipment With a 25 kHz Channel Bandwidth and an Occupied Bandwidth Greater Than 20 kHz

Equipment with a 25 kHz channel bandwidth and an occupied bandwidth greater than 20 kHz shall have the power of any emission attenuated below the transmitter output power P (dBW) as specified in Table 17.

Table 17 — Emission Mask Y		
Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$12.375 < f_d \leq 13.975$	Whichever is the lesser: $30 + 16.67(f_d - 12.375)$ or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2
$f_d > 13.975$	Whichever is the lesser: 57 or $55 + 10 \log_{10}(p)$	Specified in Section 4.2.2

6.5.2 Test summary

Test date	June 7, 2019
Test engineer	Yong Huang

6.5.3 Observations, settings and special notes

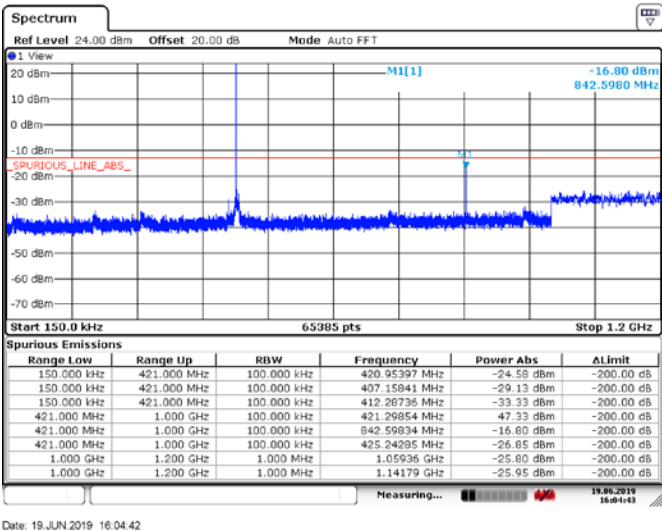
Tests were performed as per test method described in ANSI C63.26, clause 5.7.4

The spectrum was searched from 30 MHz to the 10th harmonic.

Spectrum Analyzer's setting:

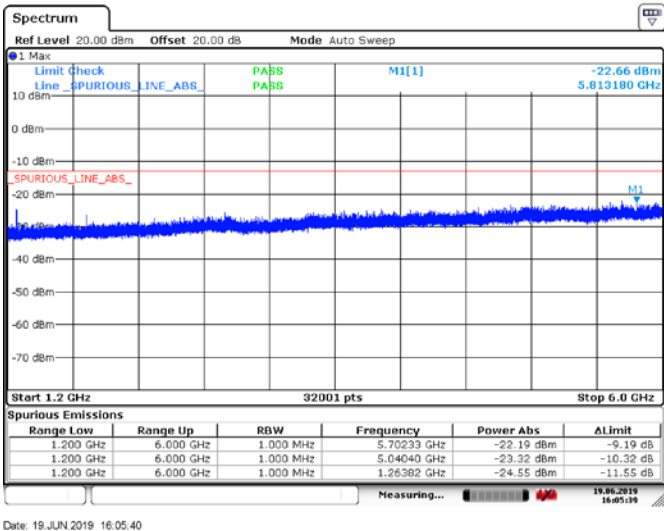
Detector mode	Peak
Resolution bandwidth	100 kHz below 1 GHz/1 MHz above 1 GHz
Video bandwidth	RBW $\times$ 3
Trace mode	Max Hold

6.5.4 Test data



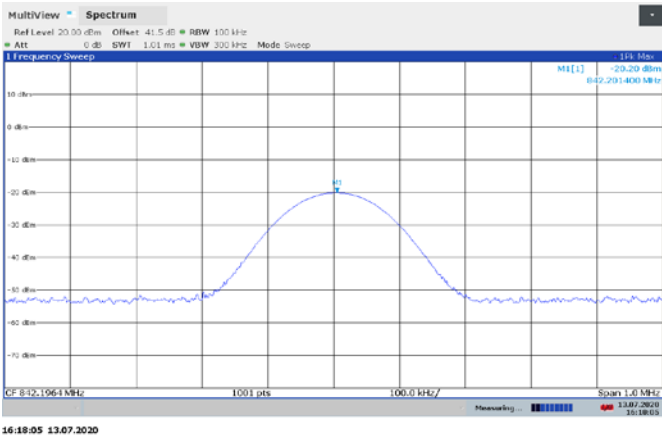
Date: 19 JUN 2019 16:04:42

Figure 6.5-1: Conducted Spurious Emissions below 1.2 GHz, Tx @Low channel of 420 MHz band, 50W 7k60FXW modulation



Date: 19 JUN 2019 16:05:40

Figure 6.5-2: Conducted Spurious Emissions above 1.2 GHz, Tx @Low channel of 420 MHz band, 50W 7k60FXW modulation



16:18:05 13.07.2020

Figure 6.5-3: Conducted Spurious Emissions @842.2 MHz, Tx @Low channel of 420 MHz band, 50W 7k60FXW modulation

Note: the limit line is -20 dBm in plots above, wherever the spurious emissions were over the limit in broad band scan, the emissions are verified with filter on fundamental emission, and it's found to be below the limit.

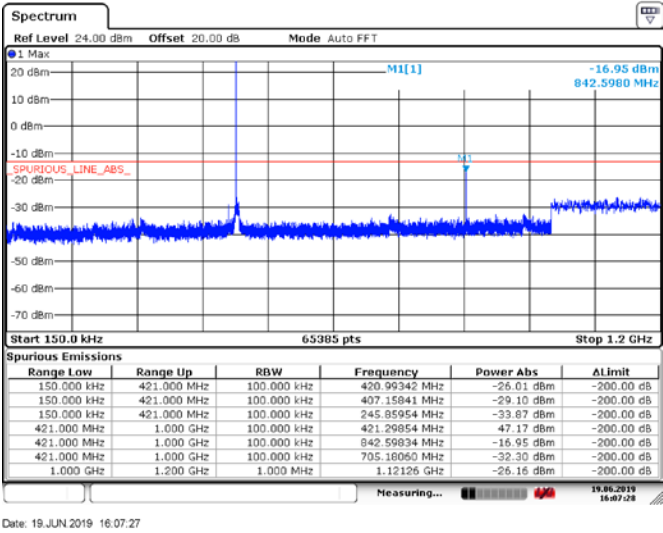


Figure 6.5-4: Conducted Spurious Emissions below 1.2 GHz, Tx @Low channel of 420 MHz band, 50W 16Kof3E modulation

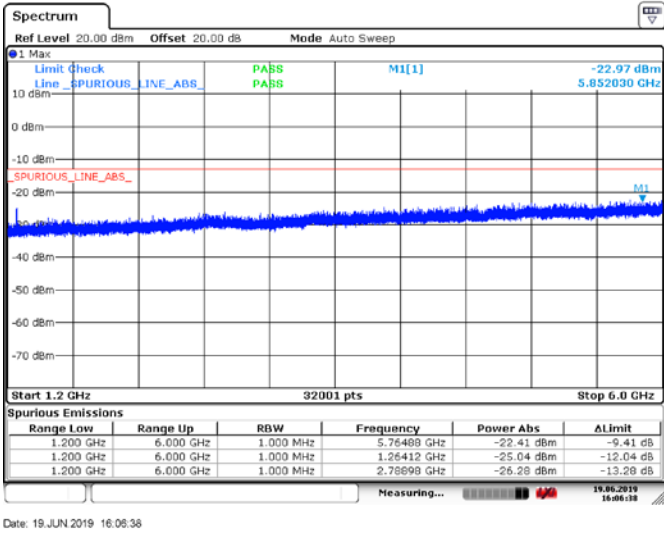


Figure 6.5-5: Conducted Spurious Emissions above 1.2 GHz, Tx @Low channel of 420 MHz band, 50W 16Kof3E modulation

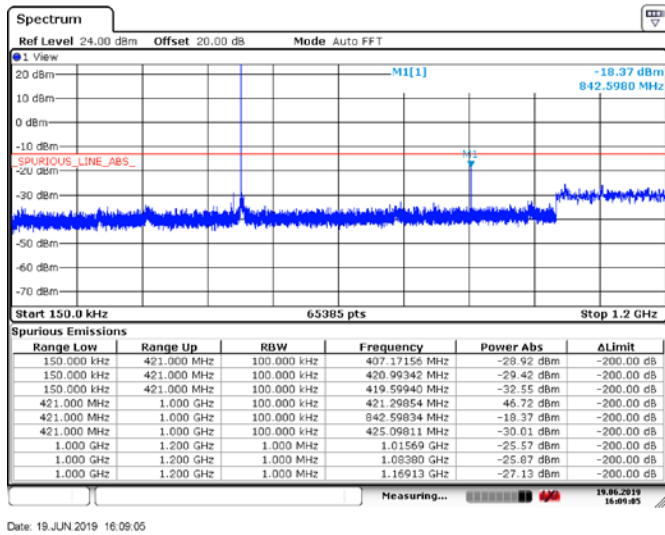


Figure 6.5-6: Conducted Spurious Emissions below 1.2 GHz, Tx @Low channel of 420 MHz band, 25W 0.35TETRA modulation

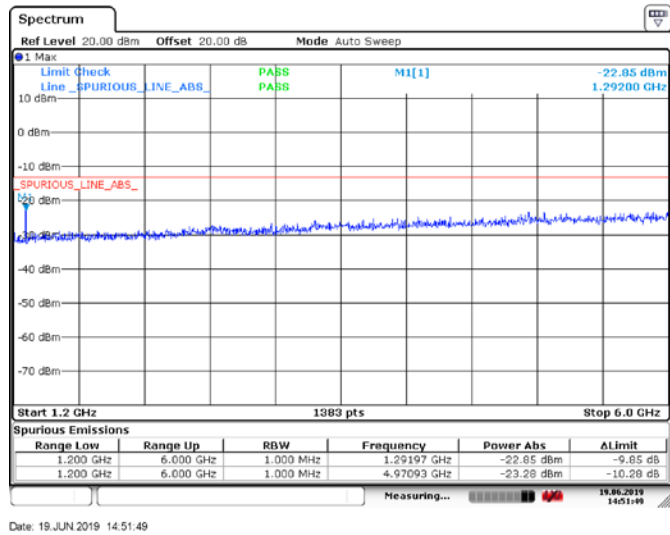


Figure 6.5-7: Conducted Spurious Emissions above 1.2 GHz, Tx @Low channel of 420 MHz band, 25W 0.35TETRA modulation

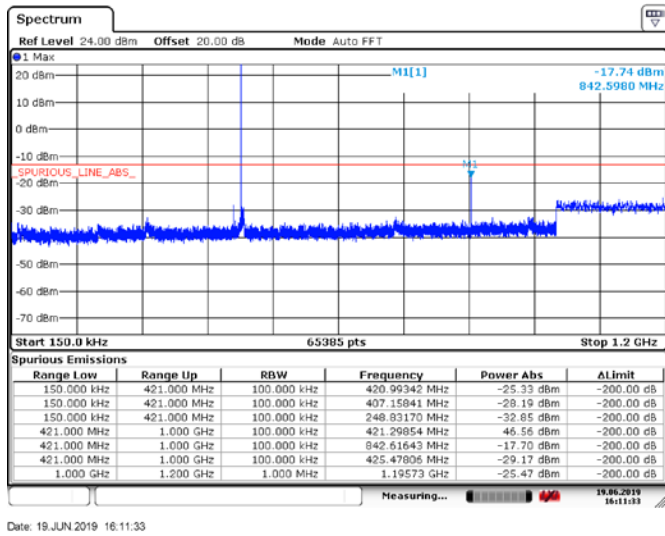


Figure 6.5-8: Conducted Spurious Emissions below 1.2 GHz, Tx @Low channel of 420 MHz band, 10W 25kHzTEDS modulation

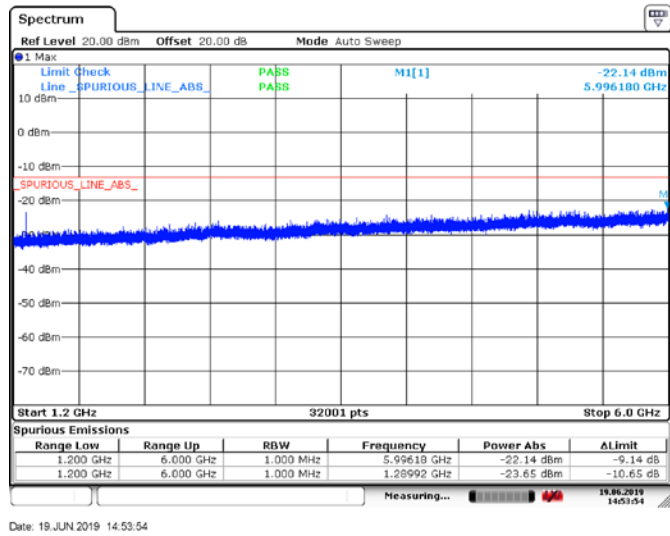


Figure 6.5-9: Conducted Spurious Emissions above 1.2 GHz, Tx @Low channel of 420 MHz band, 10W 25kHzTEDS modulation

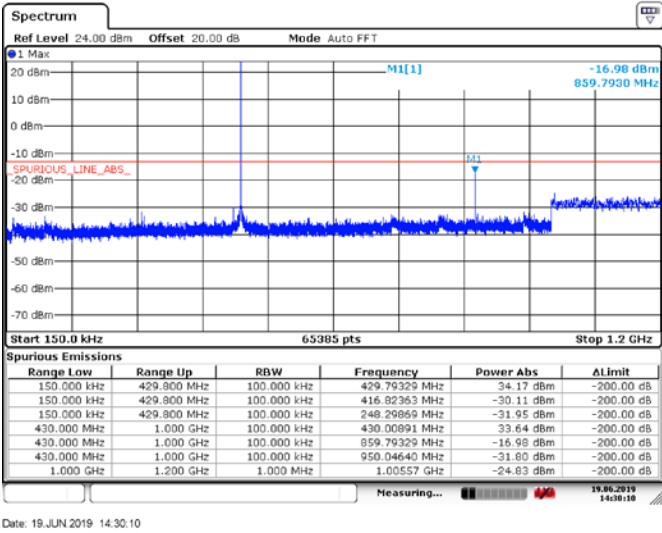


Figure 6.5-10: Conducted Spurious Emissions below 1.2 GHz, Tx @high channel of 420 MHz band, 50W 7k60FXW modulation

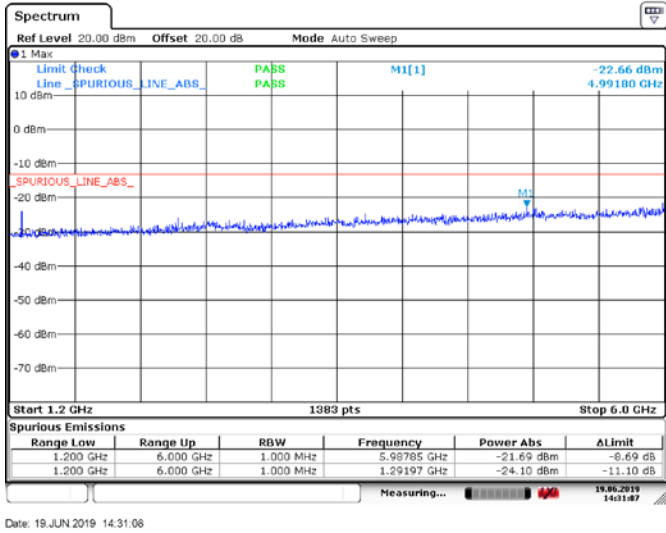


Figure 6.5-11: Conducted Spurious Emissions above 1.2 GHz, Tx @high channel of 420 MHz band, 50W o. 7k60FXW modulation

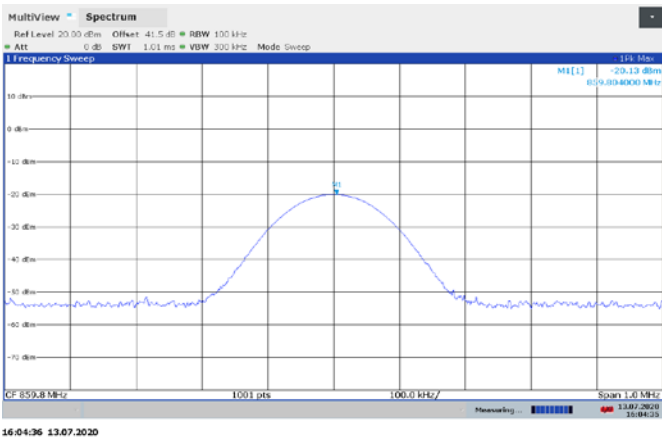


Figure 6.5-12: Conducted Spurious Emissions @859.8 MHz, Tx @high channel of 420 MHz band, 50W 7k60FXW modulation

Note: the limit line is -20 dBm in plots above, wherever the spurious emissions were over the limit in broad band scan, the emissions are verified with filter on fundamental emission, and it's found to be below the limit.

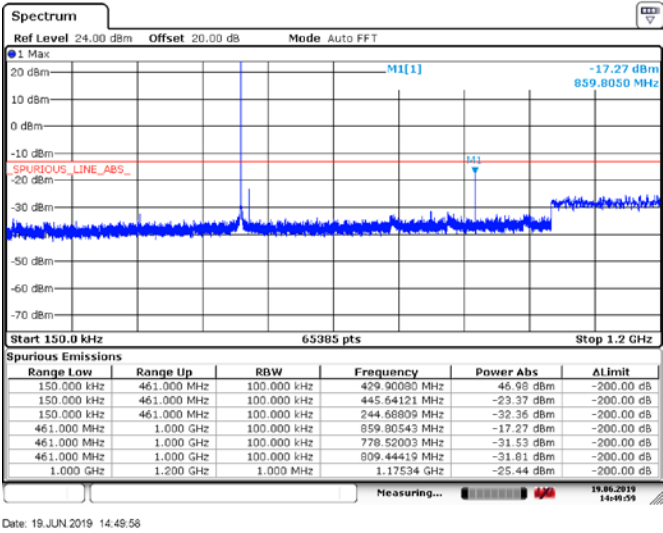


Figure 6.5-13: Conducted Spurious Emissions below 1.2 GHz, Tx @high channel of 420 MHz band, 50W 16kOF3E modulation

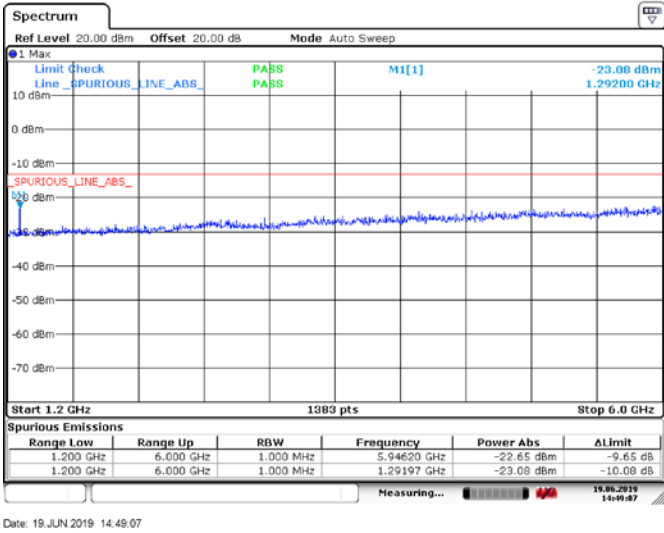
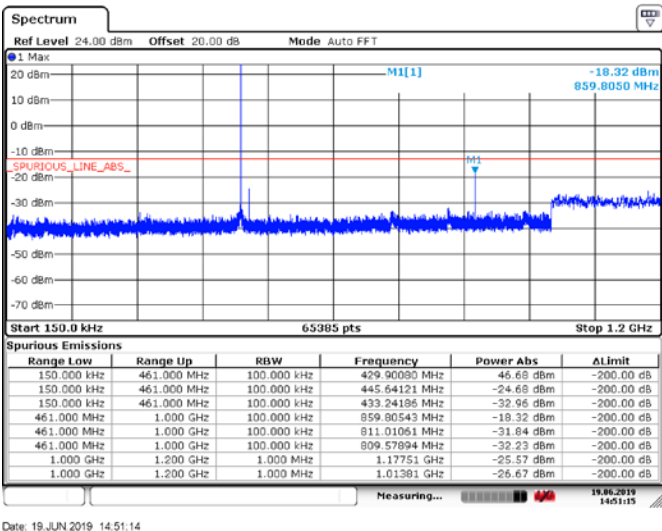
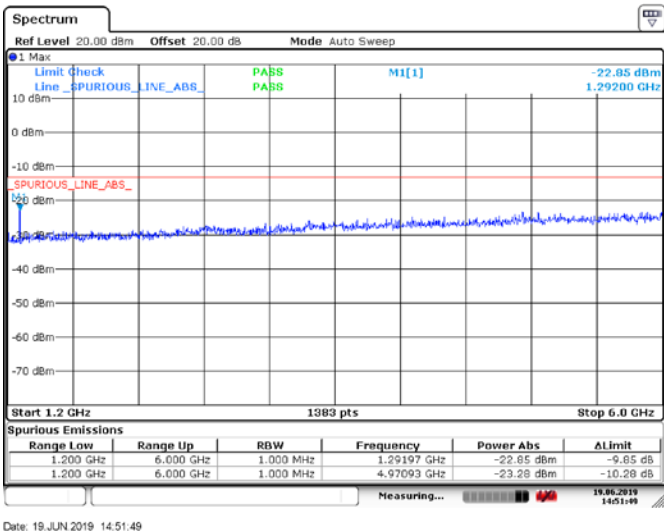


Figure 6.5-14: Conducted Spurious Emissions above 1.2 GHz, Tx @high channel of 420 MHz band, 50W 16kOF3E modulation



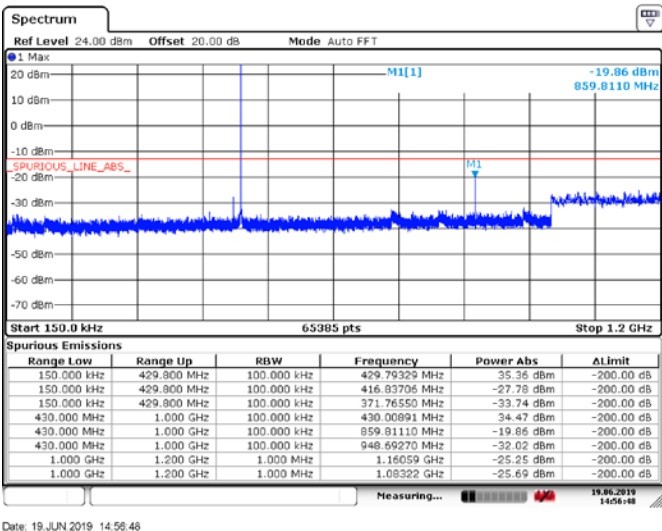
Date: 19 JUN 2019 14:51:14

Figure 6.5-15: Conducted Spurious Emissions below 1.2 GHz, Tx @high channel of 420 MHz band, 25W 0.35TETRA modulation



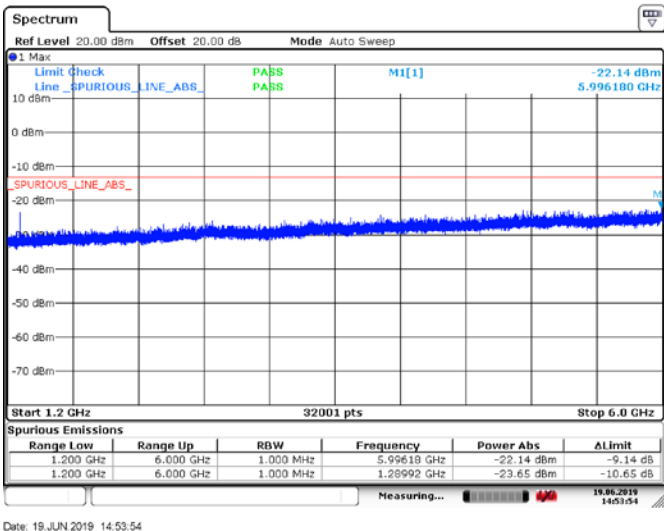
Date: 19 JUN 2019 14:51:49

Figure 6.5-16: Conducted Spurious Emissions above 1.2 GHz, Tx @high channel of 420 MHz band, 25W 0.35TETRA modulation



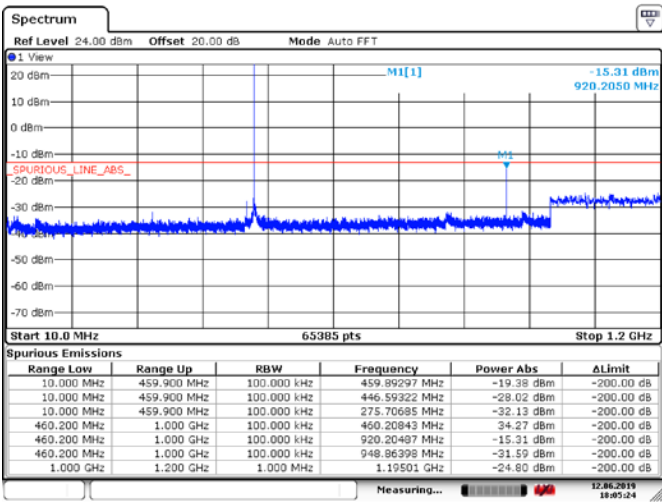
Date: 19 JUN 2019 14:56:48

Figure 6.5-17: Conducted Spurious Emissions below 1.2 GHz, Tx @high channel of 420 MHz band, 10W 25kHzTEDS modulation



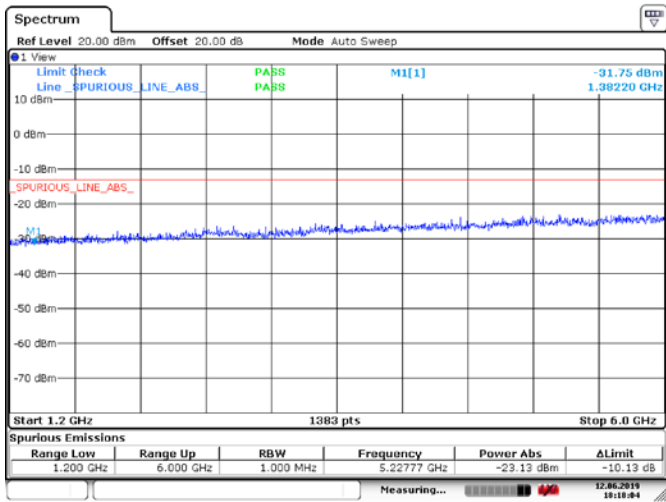
Date: 19 JUN 2019 14:53:54

Figure 6.5-18: Conducted Spurious Emissions above 1.2 GHz, Tx @high channel of 420 MHz band, 10W 25kHzTEDS modulation



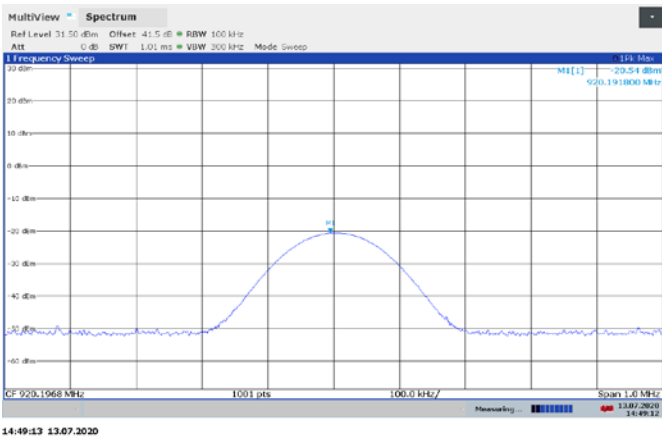
Date: 12 JUN 2019 18:05:24

Figure 6.5-19: Conducted Spurious Emissions below 1.2 GHz, Tx @ low channel of 460 MHz band, 50W 7k60FXW modulation



Date: 12 JUN 2019 18:18:05

Figure 6.5-20: Conducted Spurious Emissions above 1.2 GHz, Tx @ low channel of 460 MHz band, 50W o. 7k60FXW modulation



14:49:13 13.07.2020

Figure 6.5-21: Conducted Spurious Emissions @920.2 MHz, Tx @ low channel of 460 MHz band, 50W 7k60FXW modulation

Note: the limit line is -20 dBm in plots above, wherever the spurious emissions were over the limit in broad band scan, the emissions are verified with filter on fundamental emission, and it's found to be below the limit.

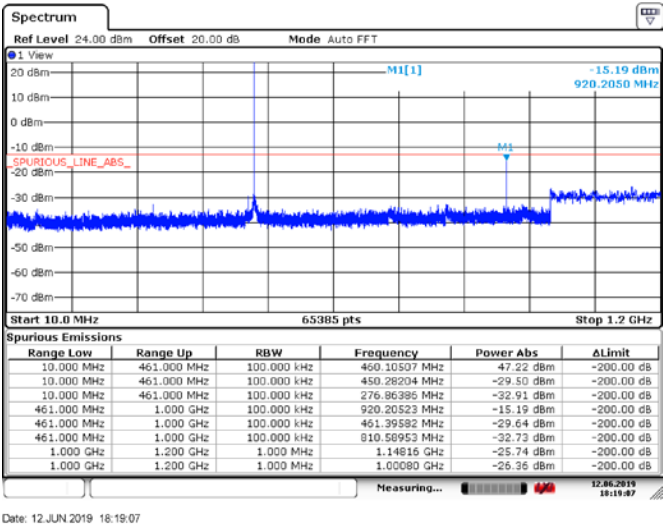


Figure 6.5-22: Conducted Spurious Emissions below 1.2 GHz, Tx @ low channel of 460 MHz band, 50W 16k0F3E modulation

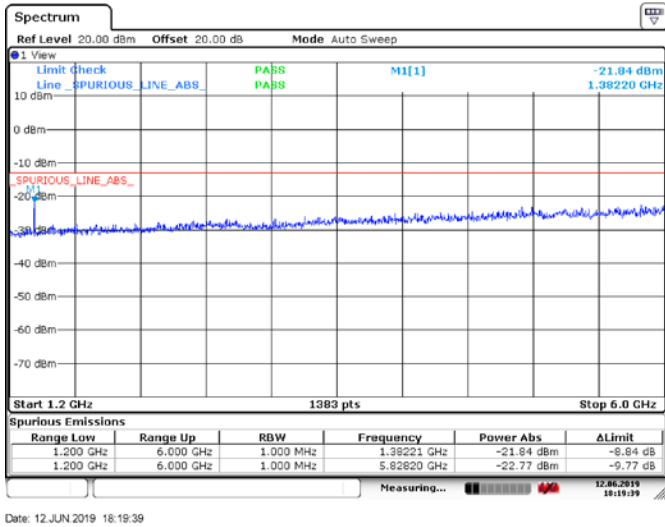
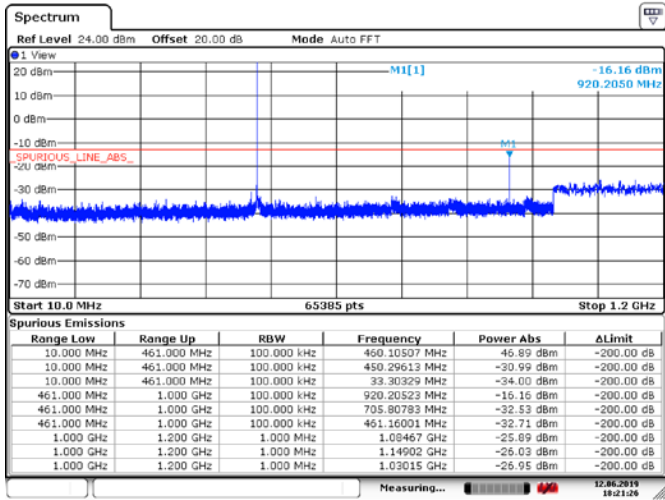
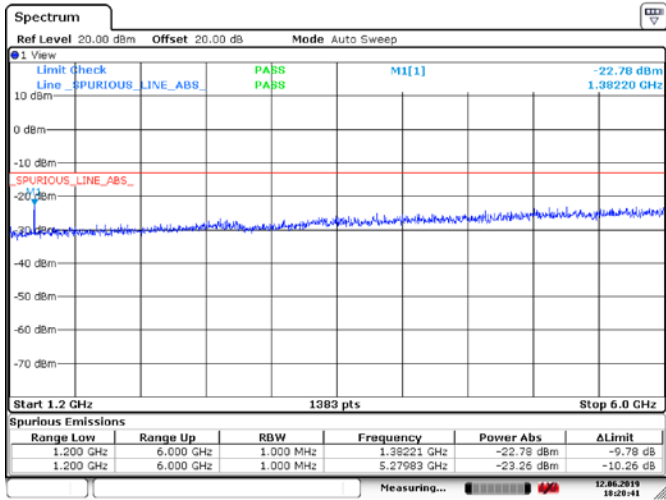


Figure 6.5-23: Conducted Spurious Emissions above 1.2 GHz, Tx @ low channel of 460 MHz band, 50W 16k0F3E modulation



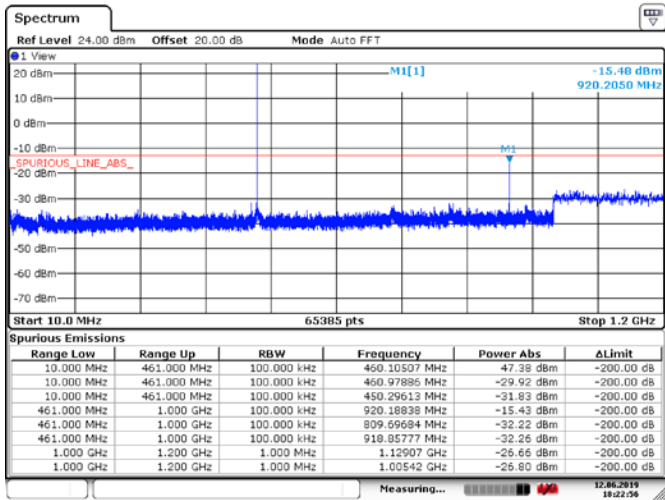
Date: 12 JUN 2019 18:21:27

Figure 6.5-24: Conducted Spurious Emissions below 1.2 GHz, Tx @ low channel of 460 MHz band, 25W 0.35TETRA modulation



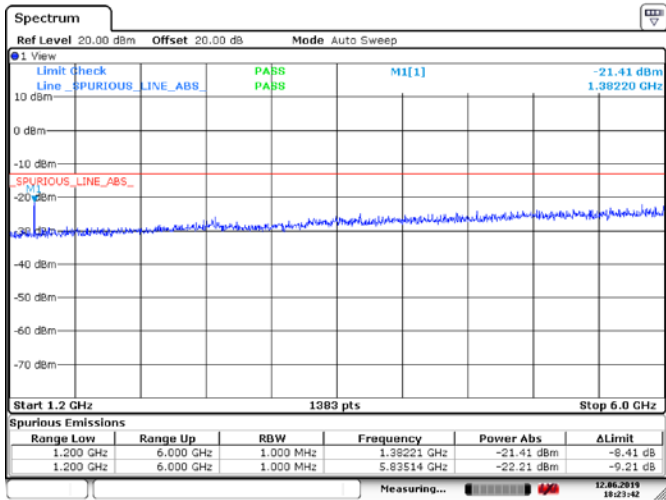
Date: 12 JUN 2019 18:20:41

Figure 6.5-25: Conducted Spurious Emissions above 1.2 GHz, Tx @ low channel of 460 MHz band, 25W 0.35TETRA modulation



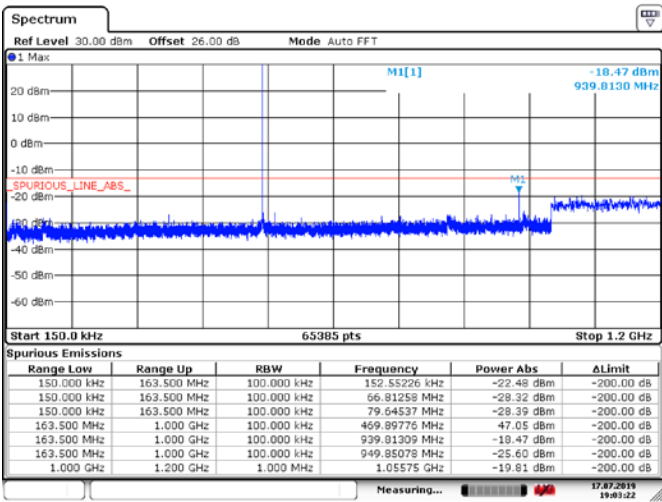
Date: 12 JUN 2019 18:22:57

Figure 6.5-26: Conducted Spurious Emissions below 1.2 GHz, Tx @ low channel of 460 MHz band, 10W 25kHzTEDS modulation



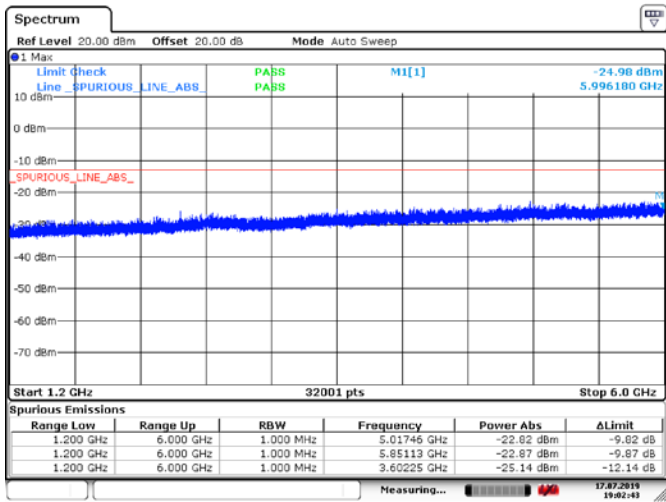
Date: 12 JUN 2019 18:23:43

Figure 6.5-27: Conducted Spurious Emissions above 1.2 GHz, Tx @ low channel of 460 MHz band, 10W 25kHzTEDS modulation



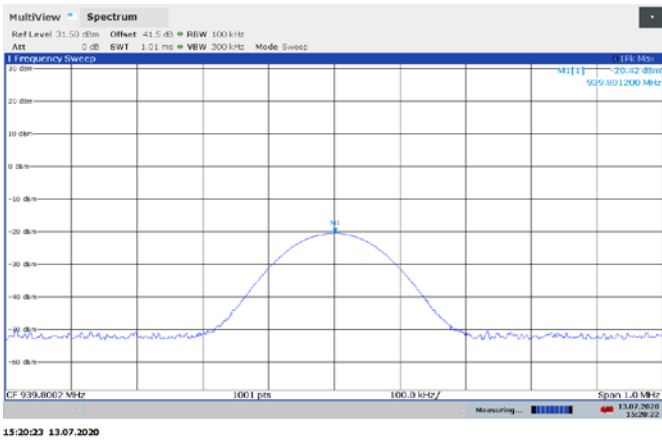
Date: 17 JUL 2019 19:03:22

Figure 6.5-28: Conducted Spurious Emissions below 1.2 GHz, Tx @high channel of 460 MHz band, 50W 7k60FXW modulation



Date: 17 JUL 2019 19:02:43

Figure 6.5-29: Conducted Spurious Emissions above 1.2 GHz, Tx @high channel of 460 MHz band, 50W o. 7k60FXW modulation



15:20:23 13.07.2020

Figure 6.5-30: Conducted Spurious Emissions @939.9 MHz, Tx @high channel of 460 MHz band, 50W 7k60FXW modulation

Note: the limit line is -20 dBm in plots above, wherever the spurious emissions were over the limit in broad band scan, the emissions are verified with filter on fundamental emission, and it's found to be below the limit.

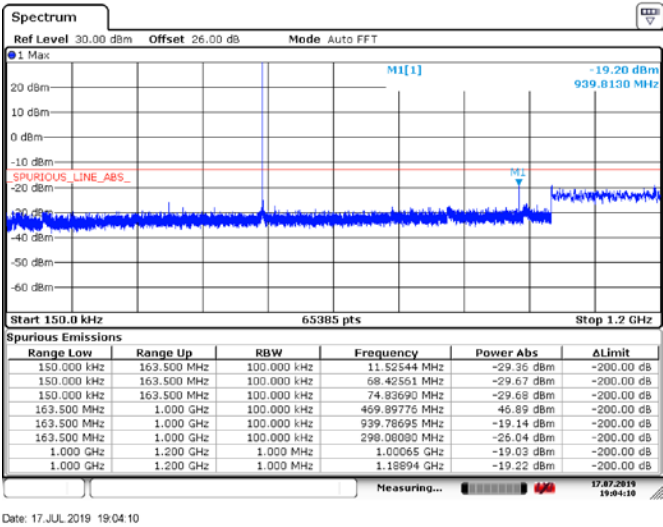


Figure 6.5-31: Conducted Spurious Emissions below 1.2 GHz, Tx @high channel of 460 MHz band, 50W 16kF3E modulation

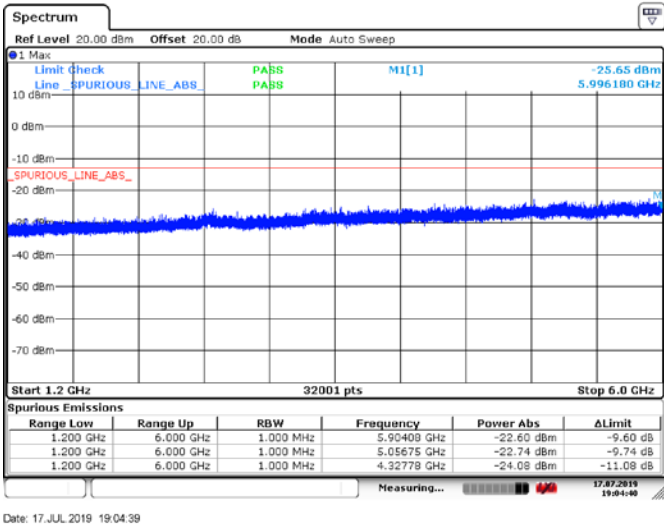


Figure 6.5-32: Conducted Spurious Emissions above 1.2 GHz, Tx @high channel of 460 MHz band, 50W 16kF3E modulation