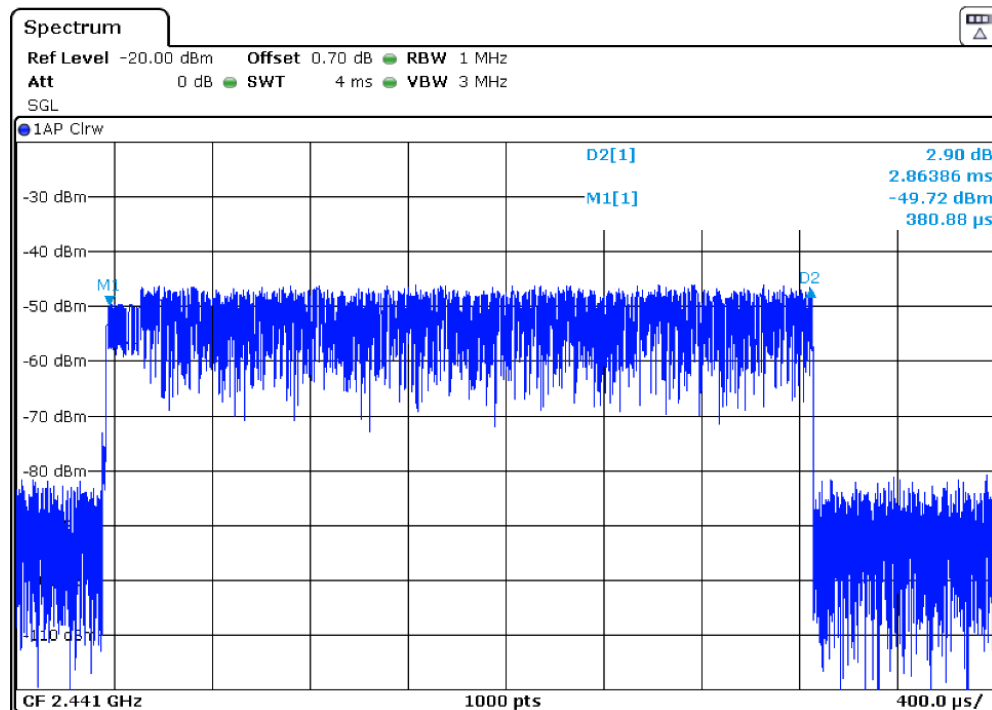


PACKET TYPE 2DH5

A DH5 packet needs 5 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/6 = 266.67$ hops per second with 79 channels. So you have each channel $266.67/79 = 3.37$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $3.37 \times 31.6 = 106.49$ times of appearance.

Each Tx – Time per appearance is 2.86386 ms (See next plot).

So we have $106.49 \times 2.86386 = 304.97$ ms per 31.6 seconds.



Measurement uncertainty (%)

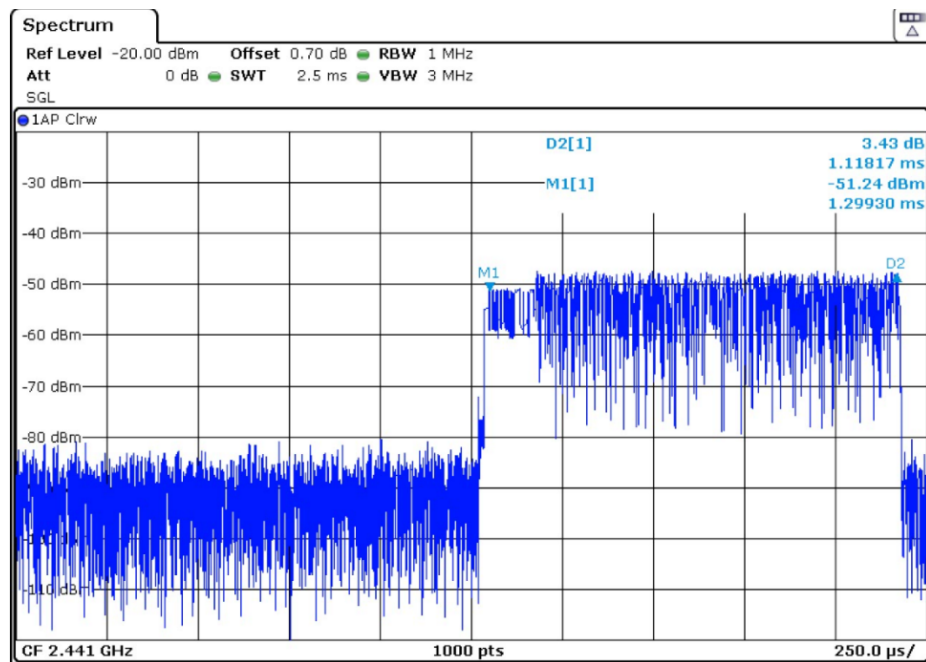
< $\pm$ 0.12

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (8DPSK)
TEST RESULTS:	PASS
TEST RESULTS (Cont.)	PACKET TYPE 3DH1

The system makes worst case 1600 hops per second or 1 time slot has a length of 625 μ s with 79 channels. A DH1 packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 1600/2 = 800 hops per second with 79 channels. So you have each channel 800/79 = 10.13 per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $10.13 \times 31.6 = 320.11$ times of appearance.

Each Tx – Time per appearance is 1.11817 ms (See next plot).

So we have $320.11 \times 1.11817 \text{ ms} = 357.937 \text{ ms}$ per 31.6 seconds.



Measurement uncertainty (%)	<±0.12
-----------------------------	--------

#

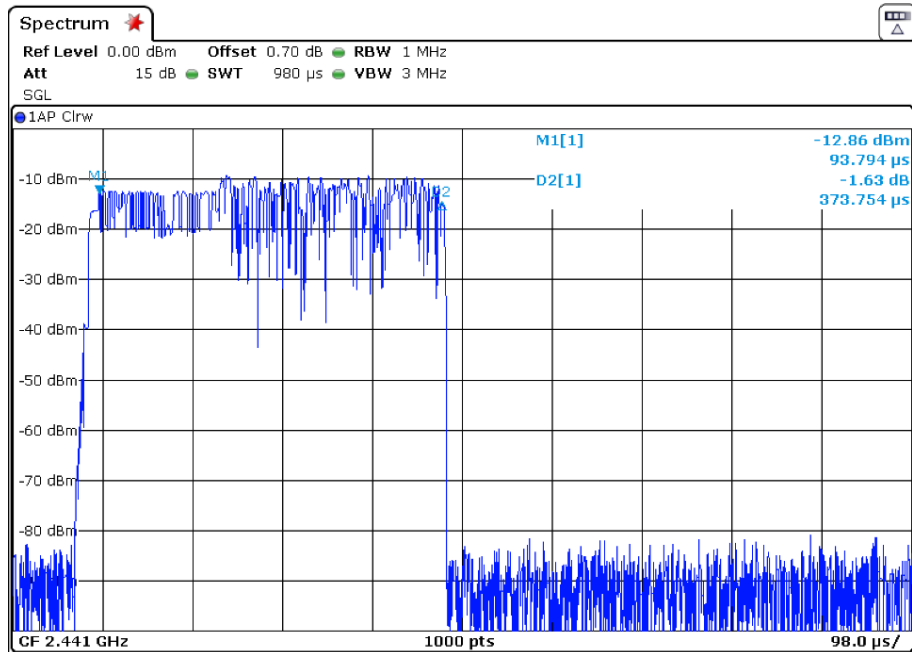
PACKET TYPE 3DH3

Time of Channel Occupancy = 10.903 ms

A DH3 packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/4 = 400$ hops per second with 79 channels. So you have each channel $400/79 = 5.1$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $5.1 \times 31.6 = 161.16$ times of appearance.

Each Tx – Time per appearance is 93.794 μ s (See next plot).

So we have $161.16 \times 93.794 \mu\text{s} = 15.1158 \text{ ms}$ per 31.6 seconds.



Measurement uncertainty (%)

< $\pm$ 0.12

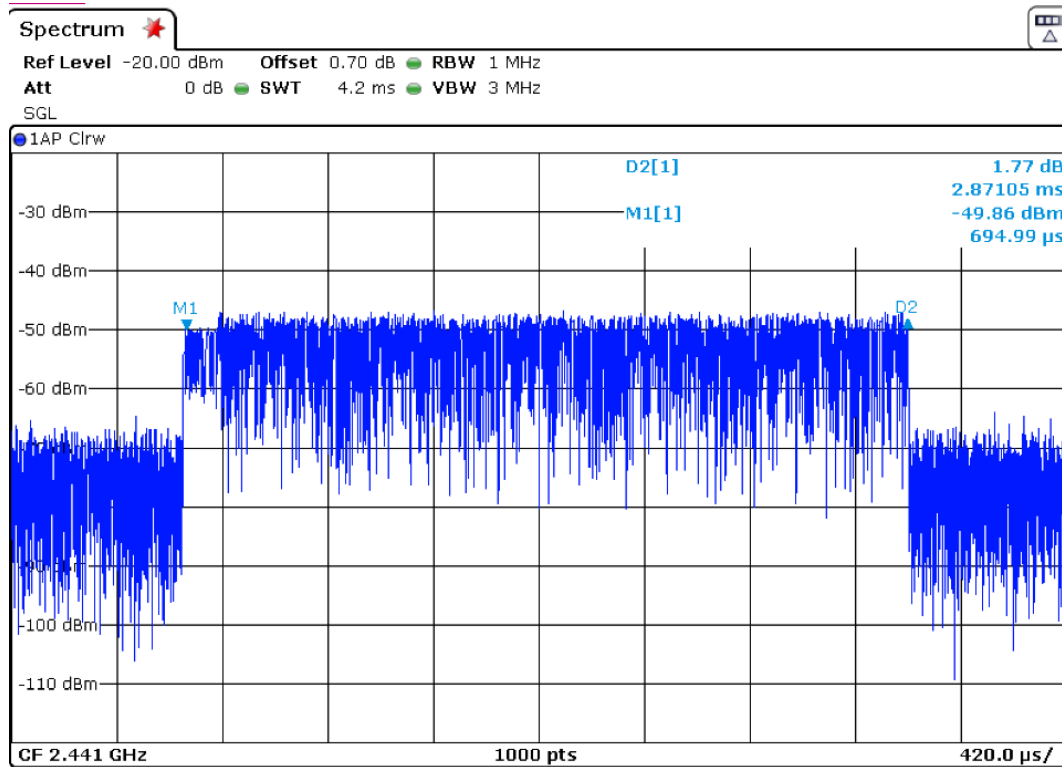
#

PACKET TYPE 3DH5

A DH5 packet needs 5 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/6 = 266.67$ hops per second with 79 channels. So you have each channel $266.67/79 = 3.37$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $3.37 \times 31.6 = 106.49$ times of appearance.

Each Tx – Time per appearance is 2.87105 ms (See next plot).

So we have $106.49 \times 2.87105 = 305.738$ ms per 31.6 seconds.



Measurement uncertainty (%)

<±0.12

TEST B.4: MAXIMUM PEAK CONDUCTED OUTPUT POWER AND ANTENNA GAIN

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(b) (3) and RSS-247 5.4(b)

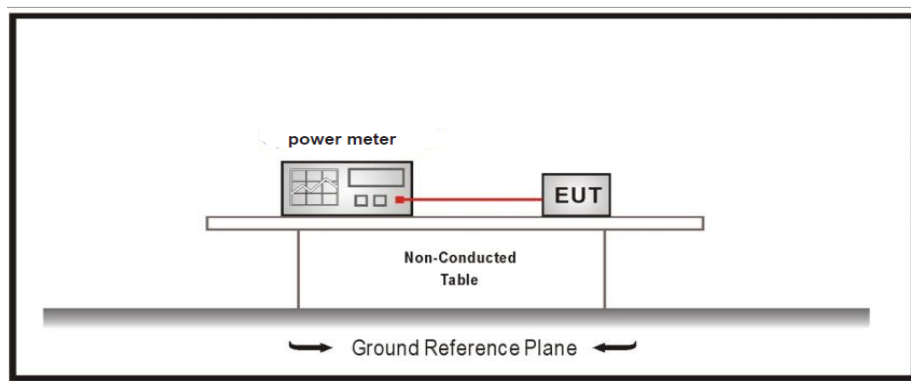
LIMITS

For Frequency Hopping systems operating in the 2400 – 2483.5 MHz band employing at least 75 hopping channels: 1 watt (30 dBm). (Part 15 Subpart C §15.247).

The e.i.r.p. shall not exceed 4 W (RSS-247).

TEST SETUP

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Maximum declared antenna gain: +2.5 dBi

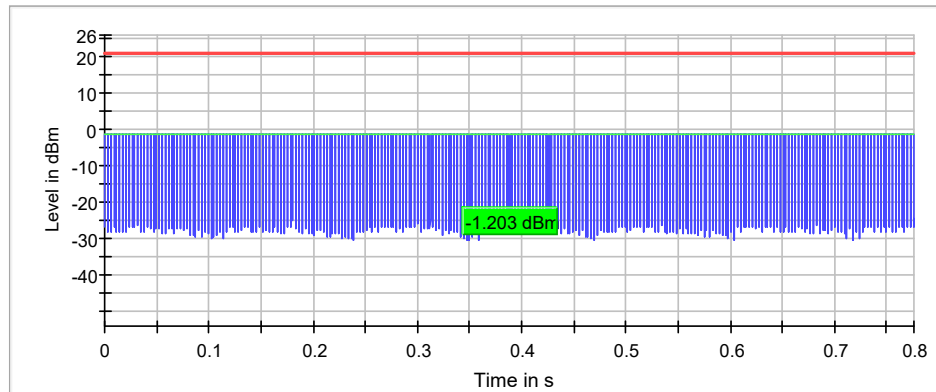
	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum conducted power (dBm)	-1.2	0.0	0.8
Maximum EIRP power (dBm)	1.3	2.5	1.7
Measurement uncertainty (dB)	<±0.78		

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

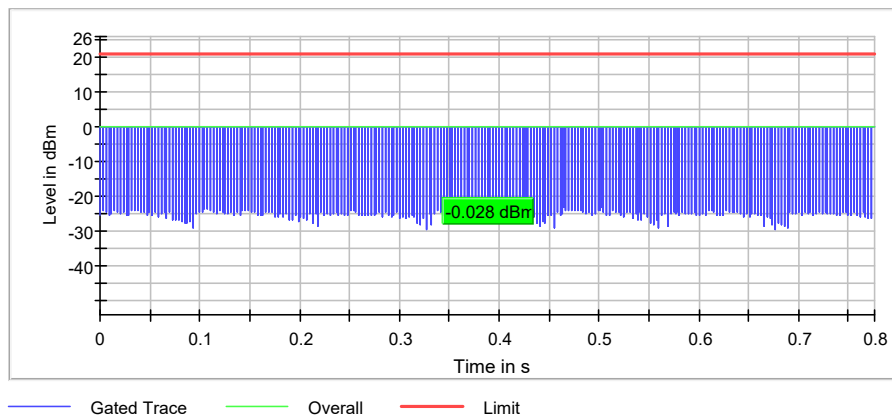
TEST RESULTS (Cont.):

CONDUCTED OUTPUT POWER

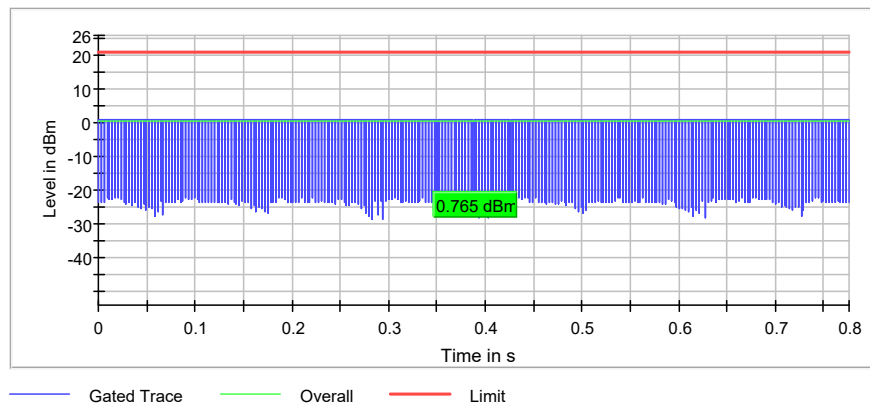
Lowest Channel



Middle Channel



Highest Channel



#

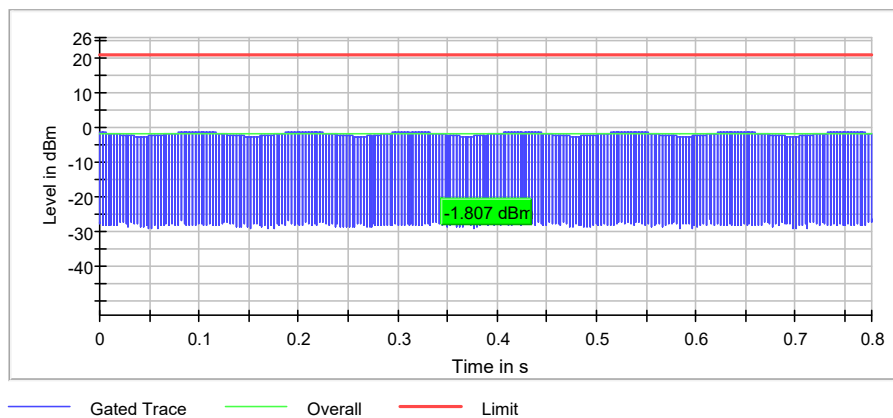
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02
TEST RESULTS:	PASS

Maximum declared antenna gain: +2.5 dBi

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum conducted power (dBm)	-1.8	-1.1	-0.3
Maximum EIRP power (dBm)	1.2	1.4	2.2
Measurement uncertainty (dB)	<±0.78		

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

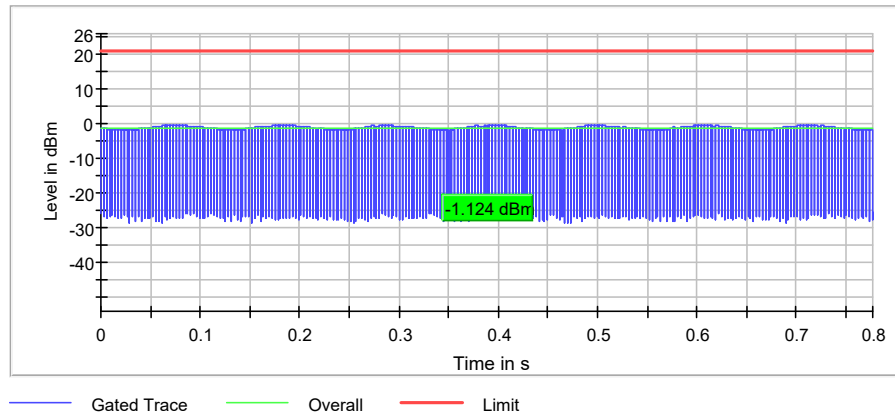
Lowest Channel



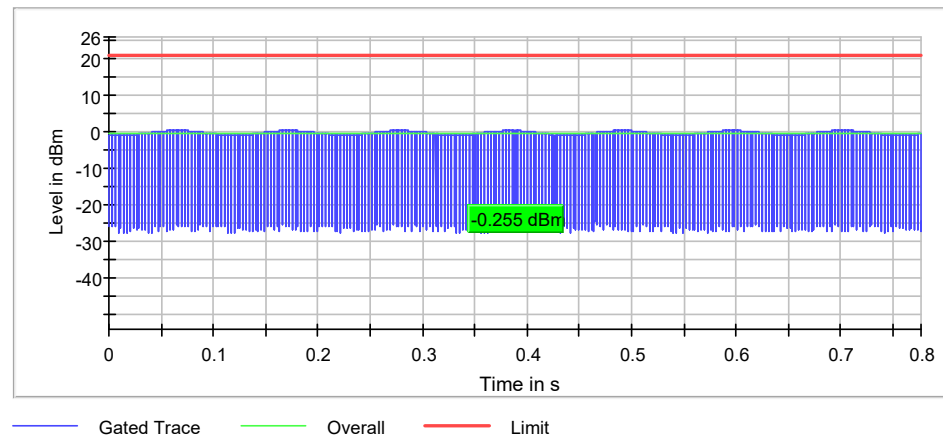
TEST RESULTS (Cont.)

CONDUCTED OUTPUT POWER

Middle Channel



Highest Channel



#

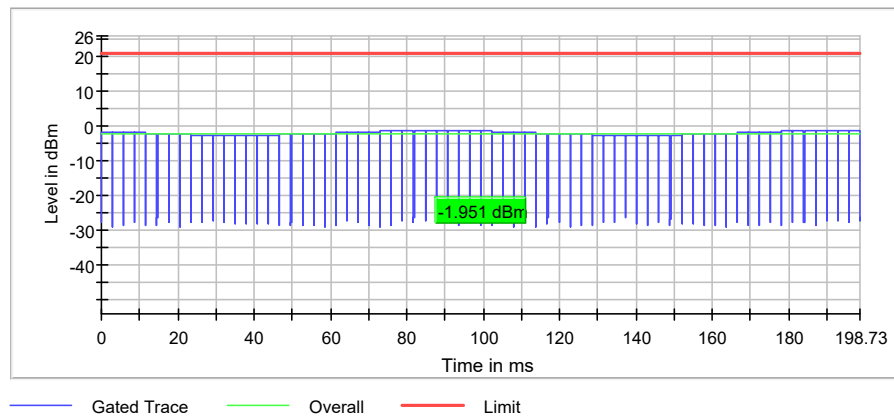
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03
TEST RESULTS:	PASS

Maximum declared antenna gain: +2.5 dBi

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum conducted power (dBm)	-2.0	-1.2	-0.4
Maximum EIRP power (dBm)	0.5	1.3	2.1
Measurement uncertainty (dB)	<±0.78		

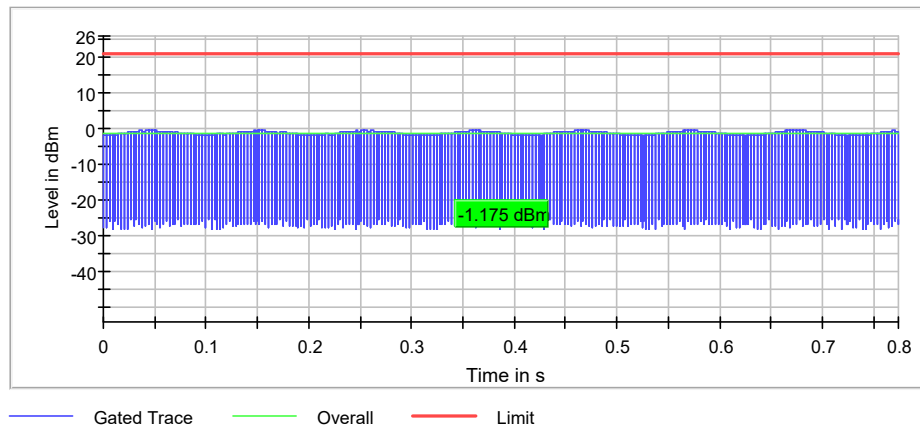
The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel

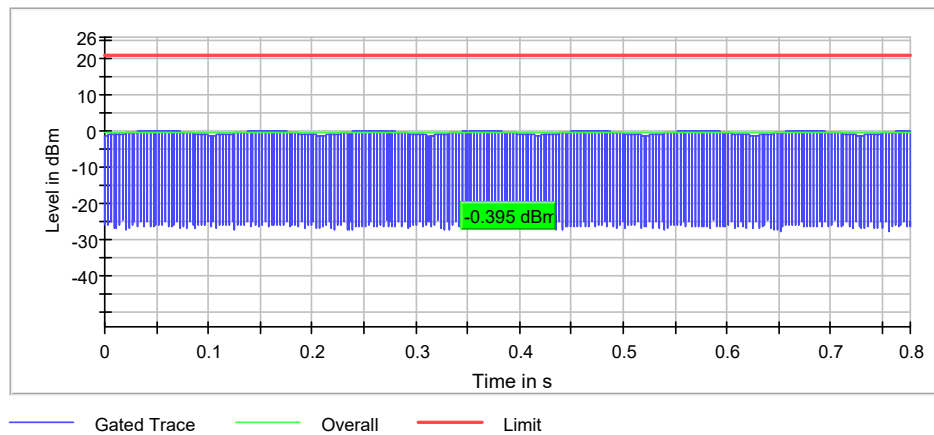


TEST RESULTS (Cont.)

Middle Channel



Highest Channel



#

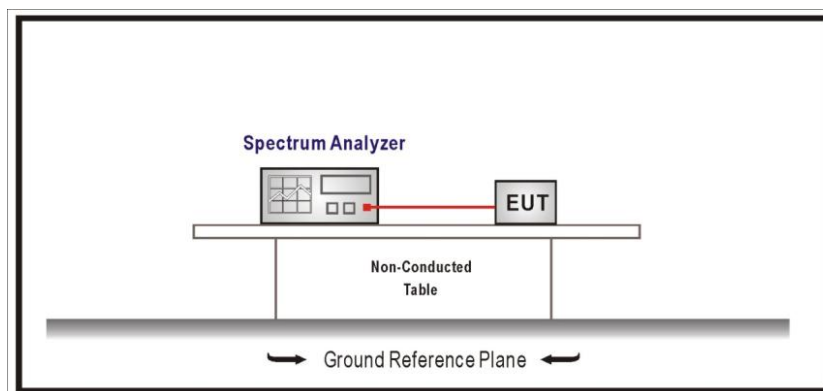
TEST B.5: BAND-EDGE EMISSIONS COMPLIANCE (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(d) and RSS-247 5.5

LIMITS

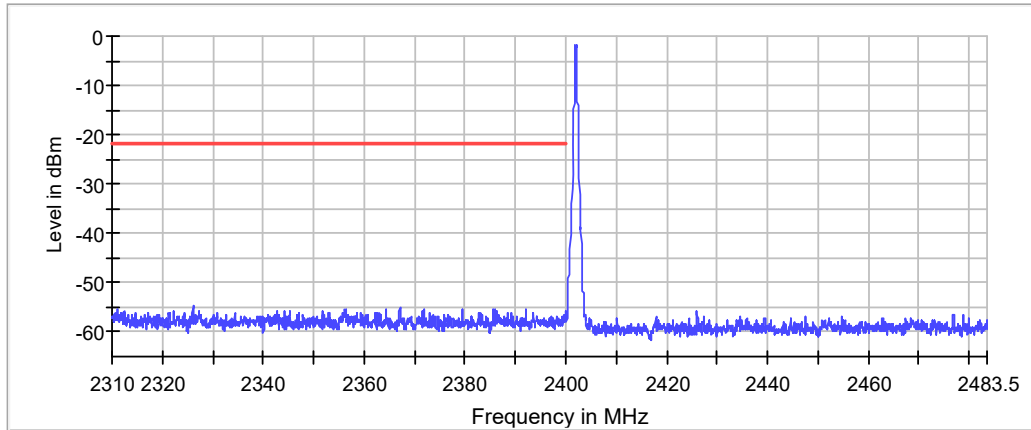
Emissions outside the frequency band in which the intentional radiator is operating shall be at least 20dB below the highest level of the desired power.

TEST SETUP



#

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS
TEST RESULTS (Cont.)	HOPPING OFF (Lowest channel)



— Limit — Sum Level × Fail

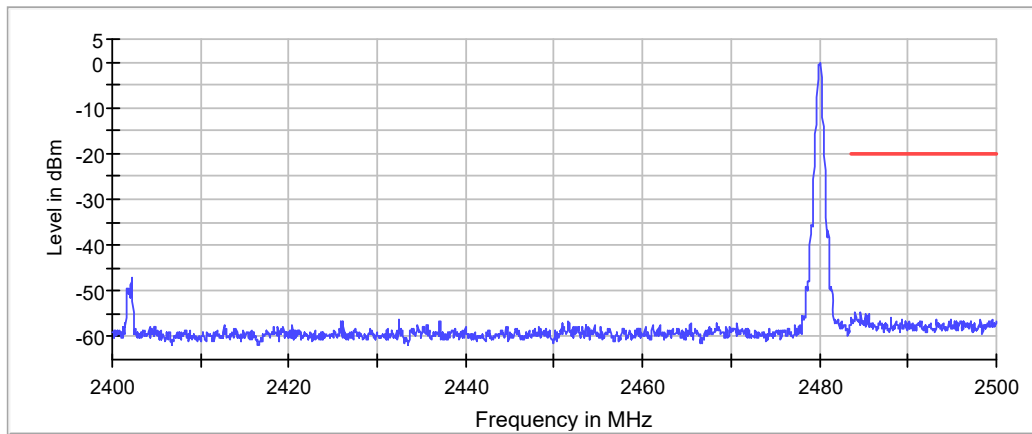
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1800	1670
Sweep time	113.672 μ s	94.727 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	10 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.05 dB

#

TEST RESULTS (Cont.):

HOPPING OFF (Highest channel)



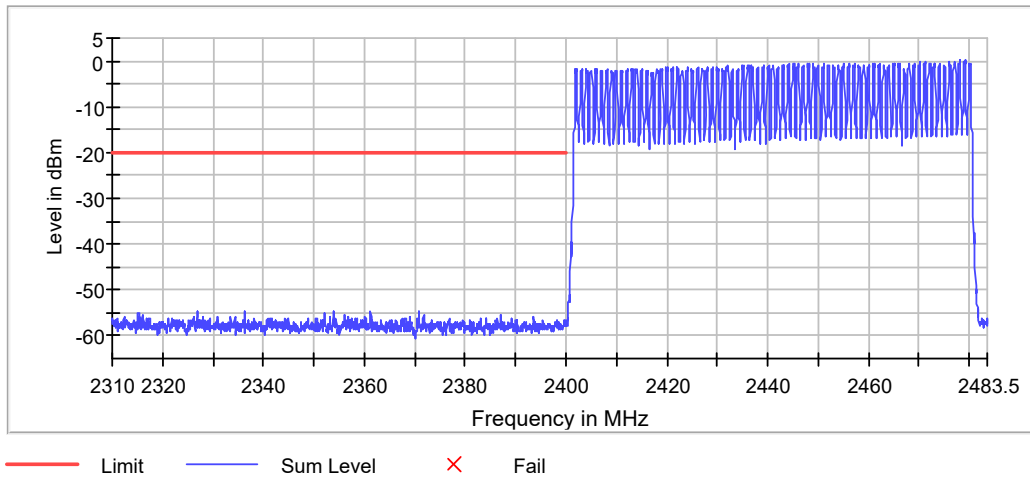
— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.48350 GHz
Stop Frequency	2.48350 GHz	2.50000 GHz
Span	83.500 MHz	16.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1670	330
Sweep time	94.727 μ s	18.945 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	6 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.18 dB	0.50 dB

TEST RESULTS (Cont.):

HOPPING ON (Lowest channel)

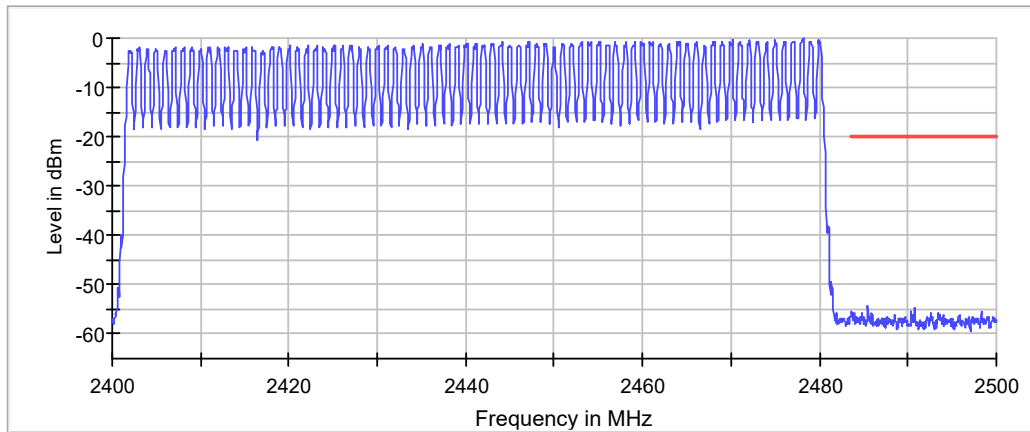


Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1800	1670
Sweep time	113.672 μ s	94.727 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamplifier	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	150 / max. 150
Stable	3 / 3	0 / 3
Max Stable Difference	0.58 dB	0.50 dB

TEST RESULTS (Cont.):

HOPPING ON (Highest channel)



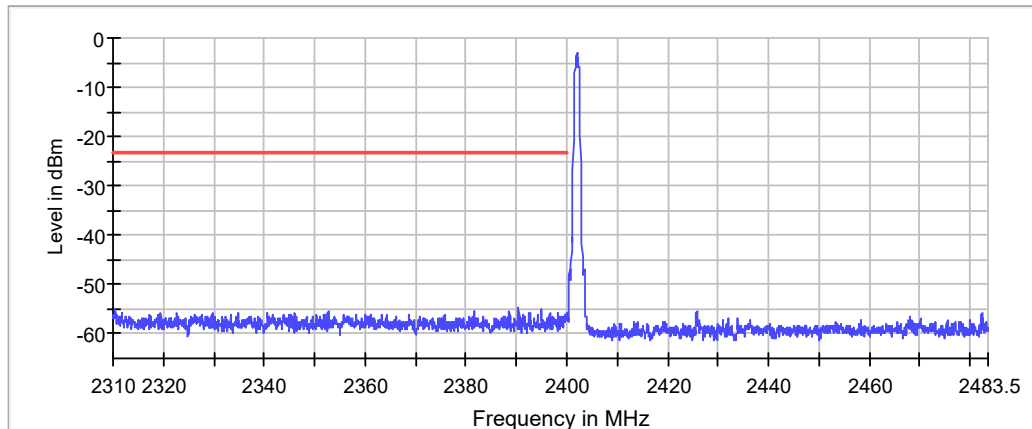
— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.48350 GHz
Stop Frequency	2.48350 GHz	2.50000 GHz
Span	83.500 MHz	16.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1670	330
Sweep time	94.727 μ s	18.945 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	128 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.32 dB	0.50 dB

#

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (PI4DQPSK)
TEST RESULTS:	PASS
TEST RESULTS (Cont.)	HOPPING OFF (Lowest channel)



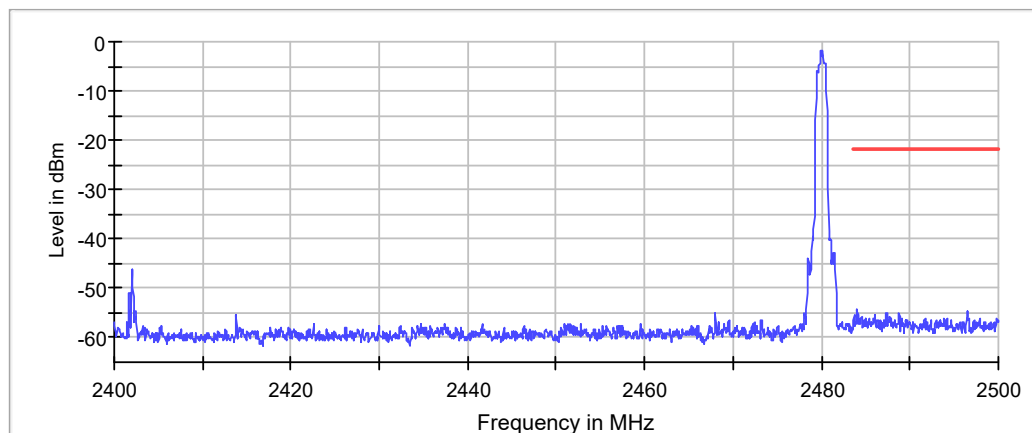
— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	Instrument	2.40000 GHz
Stop Frequency	2.31000 GHz	2.48350 GHz
Span	2.40000 GHz	83.500 MHz
RBW	90.000 MHz	100.000 kHz
VBW	100.000 kHz	300.000 kHz
Sweep Points	300.000 kHz	1670
Sweep time	1800	94.727 μ s
Reference Level	113.672 μ s	10.000 dBm
Attenuation	10.000 dBm	30.000 dB
Detector	30.000 dB	MaxPeak
Sweep Count	MaxPeak	100
Filter	100	3 dB
Trace Mode	3 dB	Max Hold
Sweep type	Max Hold	FFT
Preamp	FFT	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	8 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.00 dB

TEST RESULTS (Cont.):

HOPPING OFF (Highest channel)



— Limit — Sum Level × Fail

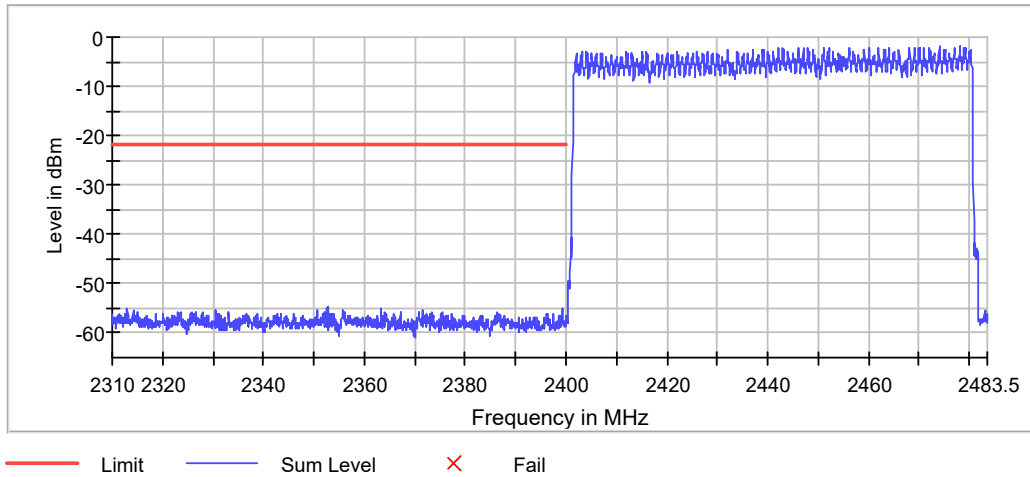
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.48350 GHz
Stop Frequency	2.48350 GHz	2.50000 GHz
Span	83.500 MHz	16.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1670	330
Sweep time	94.727 μ s	18.945 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	9 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.02 dB	0.00 dB

TEST RESULTS (Cont.):

HOPPING ON (Lowest channel)

Lowest Channel



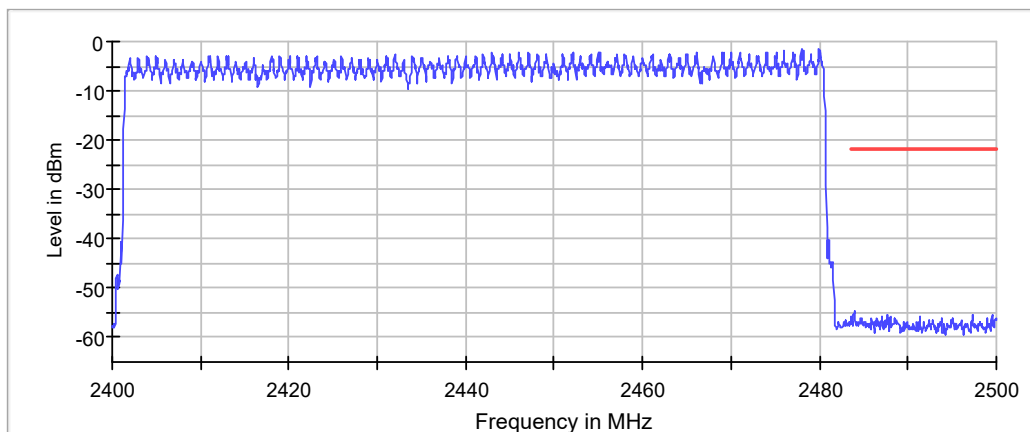
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1800	1670
Sweep time	113.672 μ s	94.727 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	150 / max. 150
Stable	3 / 3	0 / 3
Max Stable Difference	0.00 dB	0.91 dB

#

TEST RESULTS (Cont.):

HOPPING ON (Highest channel)



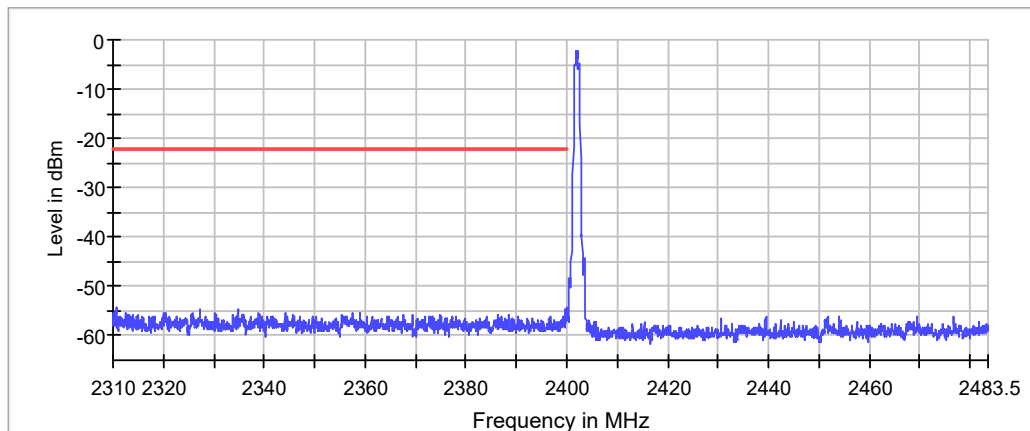
— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.48350 GHz
Stop Frequency	2.48350 GHz	2.50000 GHz
Span	83.500 MHz	16.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1670	330
Sweep time	94.727 μ s	18.945 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	150 / max. 150	4 / max. 150
Stable	0 / 3	3 / 3
Max Stable Difference	1.12	0.00 dB

#

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (8DPSK)
TEST RESULTS:	PASS
TEST RESULTS (Cont.)	HOPPING OFF (Lowest channel)



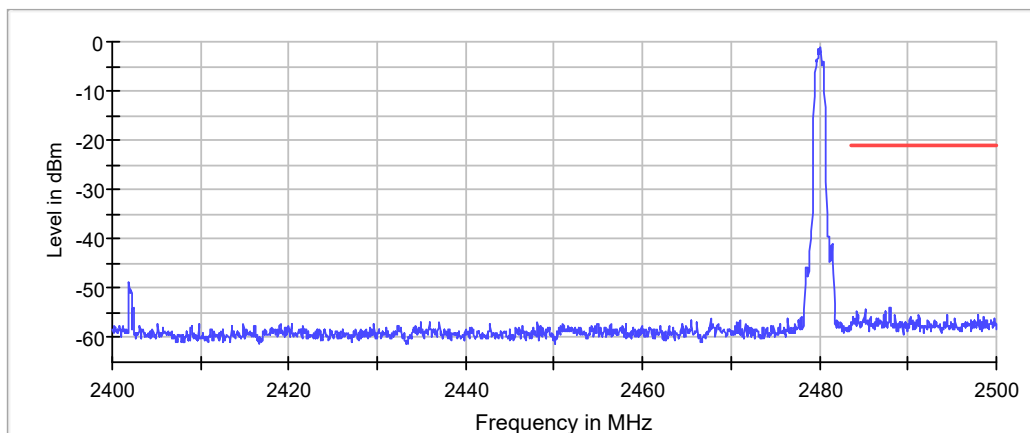
— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1800	1670
Sweep time	113.672 μ s	94.727 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	7 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.29 dB

TEST RESULTS (Cont.):

HOPPING OFF (Highest channel)



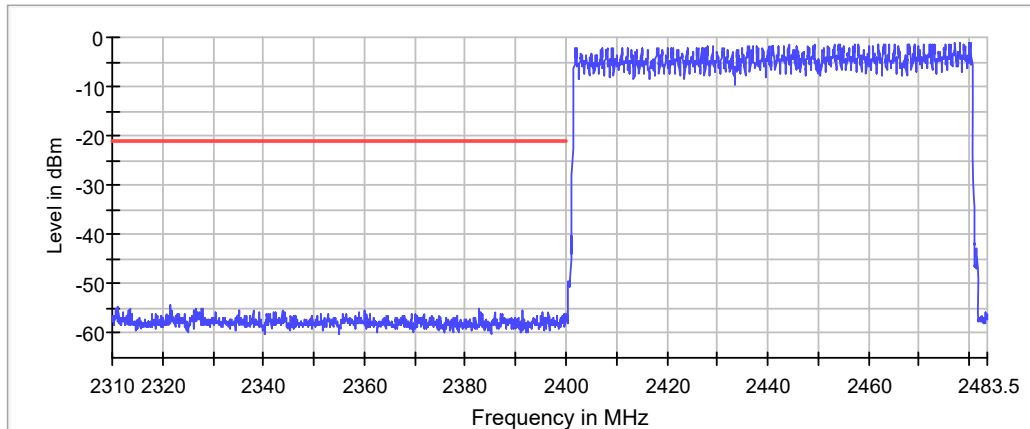
— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.48350 GHz
Stop Frequency	2.48350 GHz	2.50000 GHz
Span	83.500 MHz	16.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1670	330
Sweep time	94.727 μ s	18.945 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	9 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.24 dB	0.00 dB

TEST RESULTS (Cont.):

HOPPING ON (Lowest channel)



— Limit — Sum Level × Fail

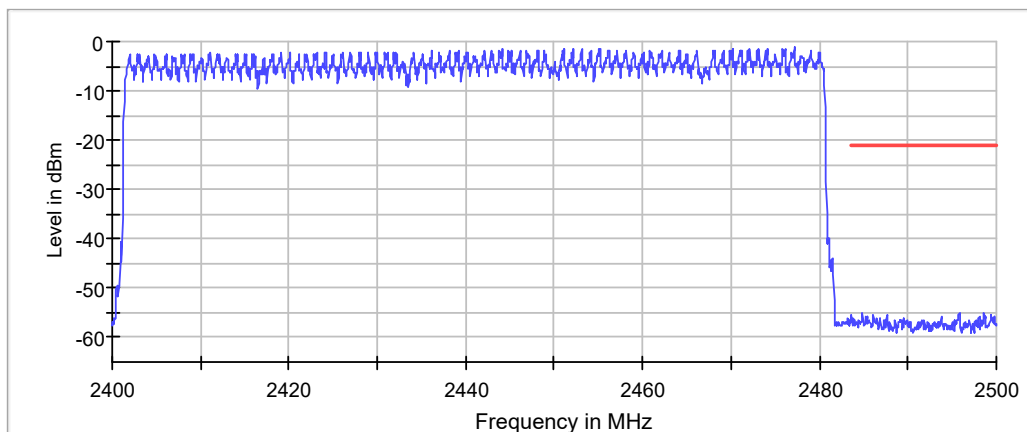
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1800	1670
Sweep time	113.672 μ s	94.727 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	150 / max. 150
Stable	3 / 3	0 / 3
Max Stable Difference	0.00 dB	2.41 dB

#

TEST RESULTS (Cont.):

HOPPING ON (Highest channel)



— Limit — Sum Level × Fail

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.48350 GHz
Stop Frequency	2.48350 GHz	2.50000 GHz
Span	83.500 MHz	16.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1670	330
Sweep time	94.727 µs	18.945 µs
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	150 / max. 150	4 / max. 150
Stable	0 / 3	3 / 3
Max Stable Difference	1.36 dB	0.00 dB

#

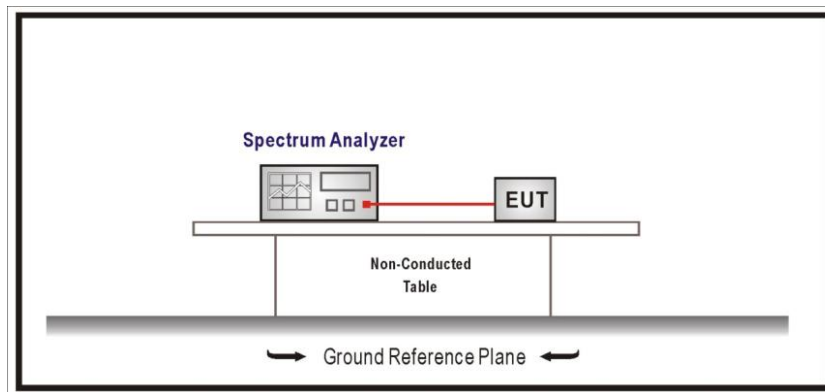
TEST B.6: EMISSION LIMITATIONS CONDUCTED (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(d) and RSS-Gen 8.9 and 8.10

SPECIFICATION

In any 100 kHz bandwidth outside the frequency band in which the 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB instead of 20 dB.

TEST SETUP



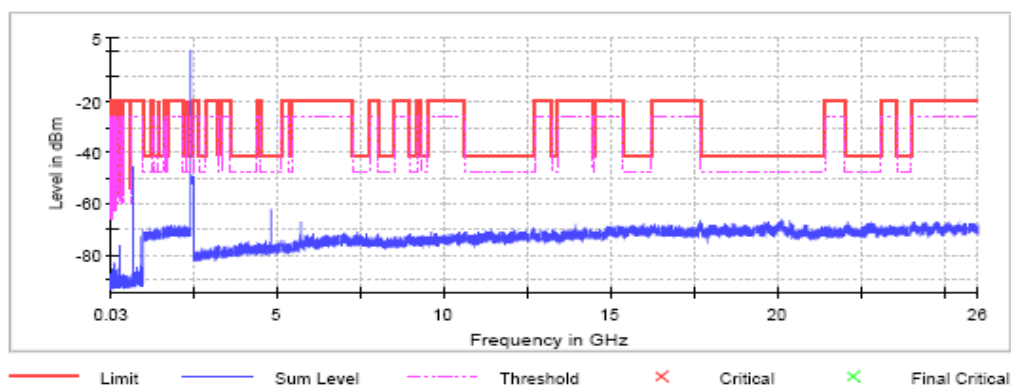
#

TEST SETUP (CONT.)	
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (GFSK)
TEST RESULTS:	PASS

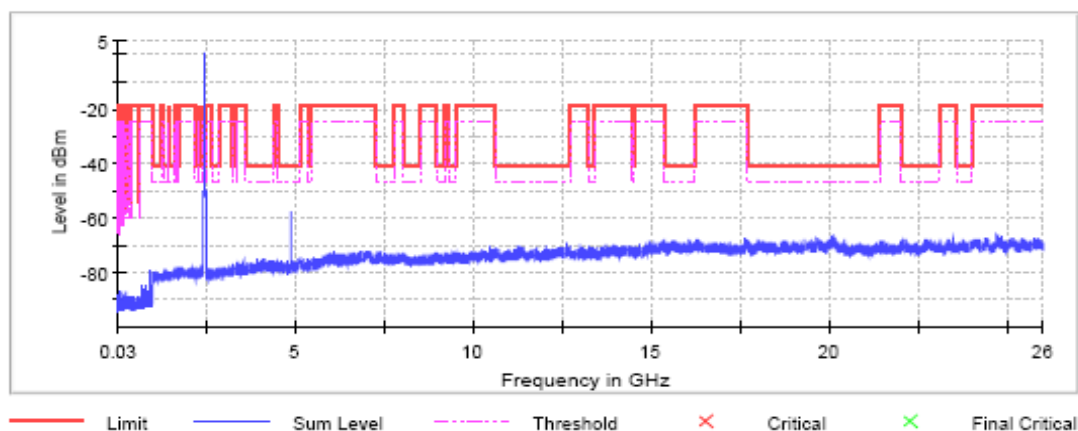
Frequency range 30 MHz – 26 GHz

The conducted spurious signals detected at less than 20 dB respect to the limit for low, mid and high operating channels are shown below with plots.

Low Channel:



Mid Channel:

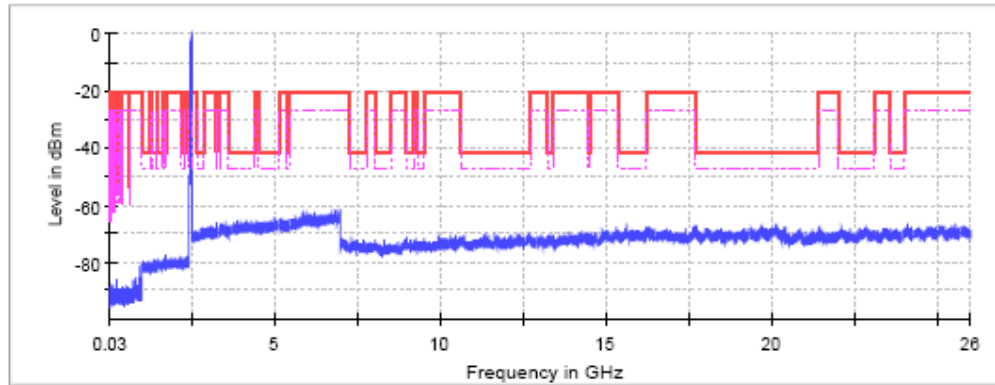


#

#

TEST RESULTS (Cont.):

High Channel:



— Limit — Sum Level - - - Threshold × Critical × Final Critical

#

Measurement

Setting	Instrument Value	Instrument Value
RBW	100.000 kHz	1.000 MHz
VBW	300.000 kHz	3.000 MHz
Sweep Points	19400	2800
Sweep time	1.061 ms	2.800 ms
Reference Level	-30.000 dBm	-20.000 dBm
Attenuation	0.000 dB	10.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	Sweep
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	52 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.00 dB

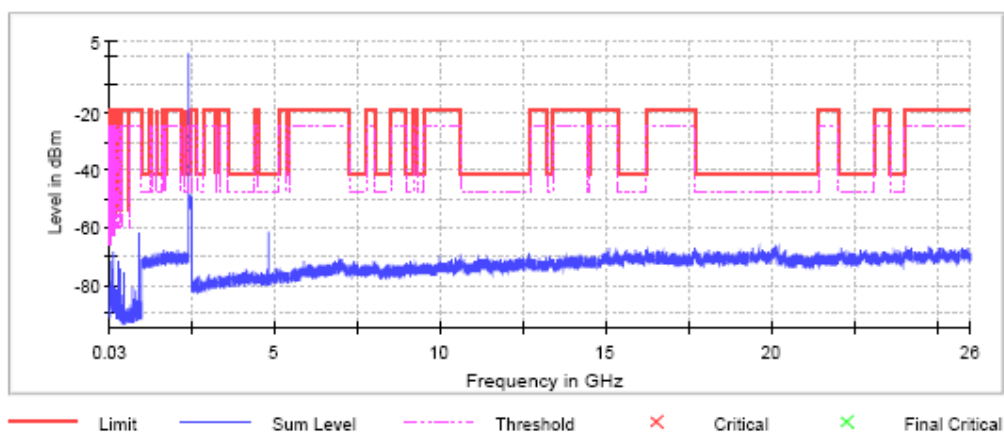
#

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (PI4DQPSK)
TEST RESULTS:	PASS

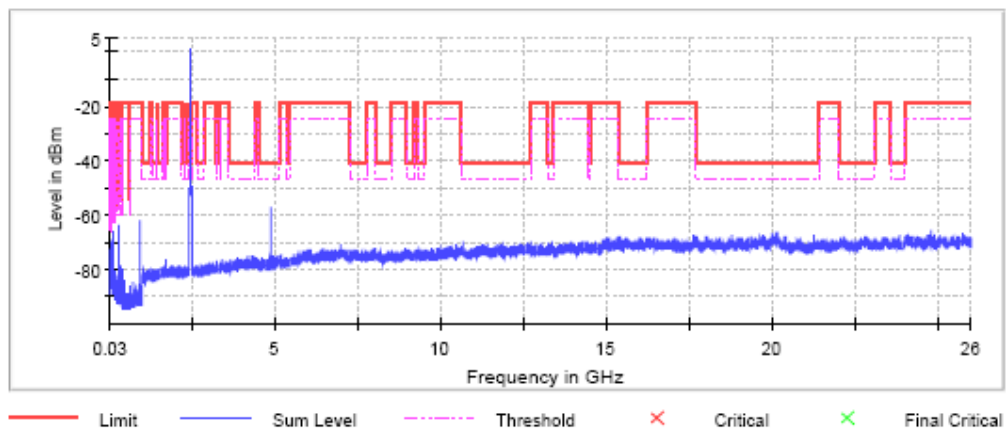
Frequency range 30 MHz – 26 GHz

The conducted spurious signal detected at less than 20 dB respect to the limit for low and high operating channels are shown below with plots.

Low Channel:



Mid Channel:



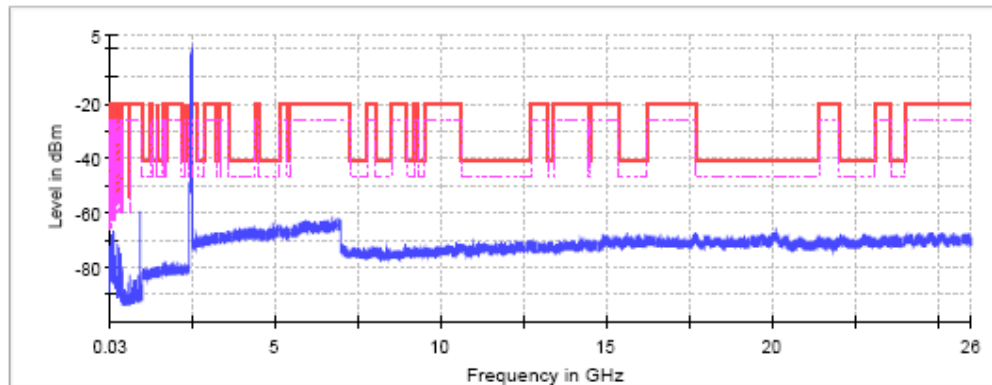
#

#

#

TEST RESULTS (Cont.):

High Channel:



— Limit — Sum Level - - - Threshold × Critical × Final Critical

#

Measurement

Setting	Instrument Value	Instrument Value
RBW	100.000 kHz	1.000 MHz
VBW	300.000 kHz	3.000 MHz
Sweep Points	19400	2800
Sweep time	1.061 ms	2.800 ms
Reference Level	-30.000 dBm	-20.000 dBm
Attenuation	0.000 dB	10.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	Sweep
Preamplifier	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	32 / max. 150	7 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.00 dB

#

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (8DPSK)
TEST RESULTS:	PASS

Frequency range 30 MHz – 26 GHz

The conducted spurious signal detected at less than 20 dB respect to the limit for low and high operating channels are shown below with plots.

Low Channel:



Mid Channel:



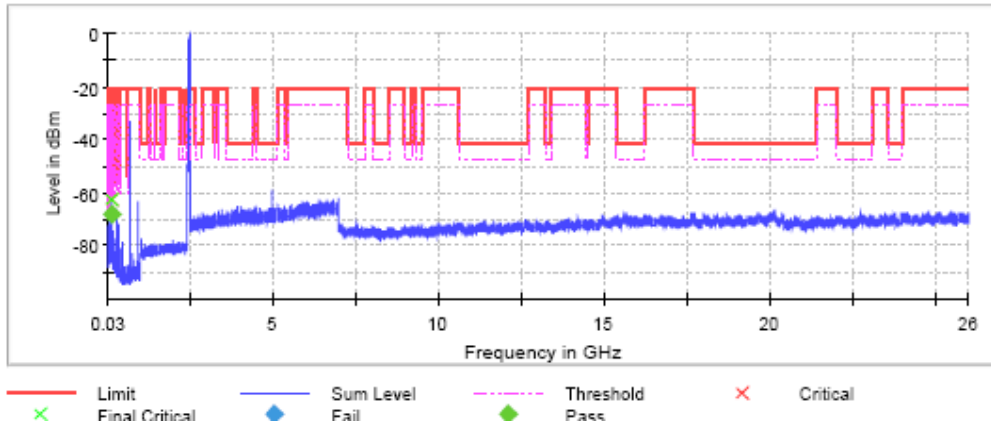
#

#

#

TEST RESULTS (Cont.):

High Channel:



#

Measurement

Setting	Instrument Value	Instrument Value
RBW	100.000 kHz	1.000 MHz
VBW	300.000 kHz	3.000 MHz
Sweep Points	19400	2800
Sweep time	1.061 ms	2.800 ms
Reference Level	-30.000 dBm	-20.000 dBm
Attenuation	0.000 dB	10.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	Sweep
Preamplifier	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	64 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.00 dB

TEST B.7: EMISSION LIMITATIONS RADIATED (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(d) and RSS-247 5.5

LIMITS

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247. Attenuation below the general field strength limits specified in RSS-Gen is not required

TEST SETUP

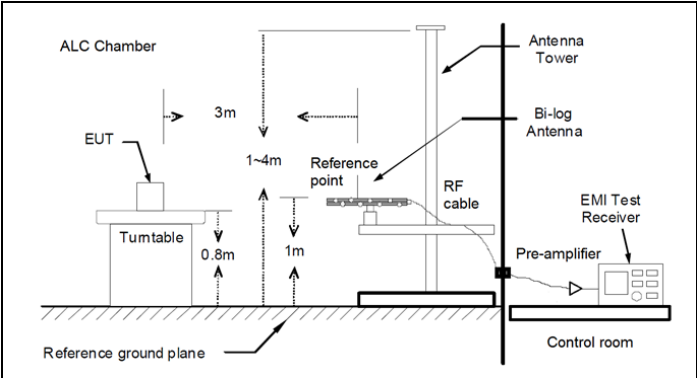
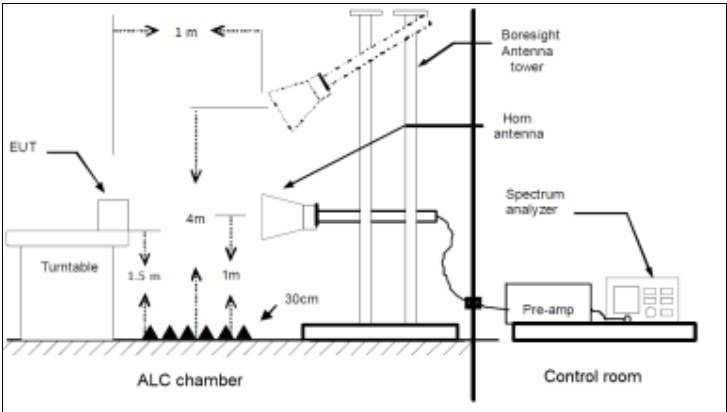
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at 3 m for the frequency range 30-1000 MHz (Bilog antenna) and at 1m for the frequency range 1-40 GHz (1 GHz-18 GHz and 18 GHz-40 GHz Double ridge horn antennas).

For radiated emissions in the range 1-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

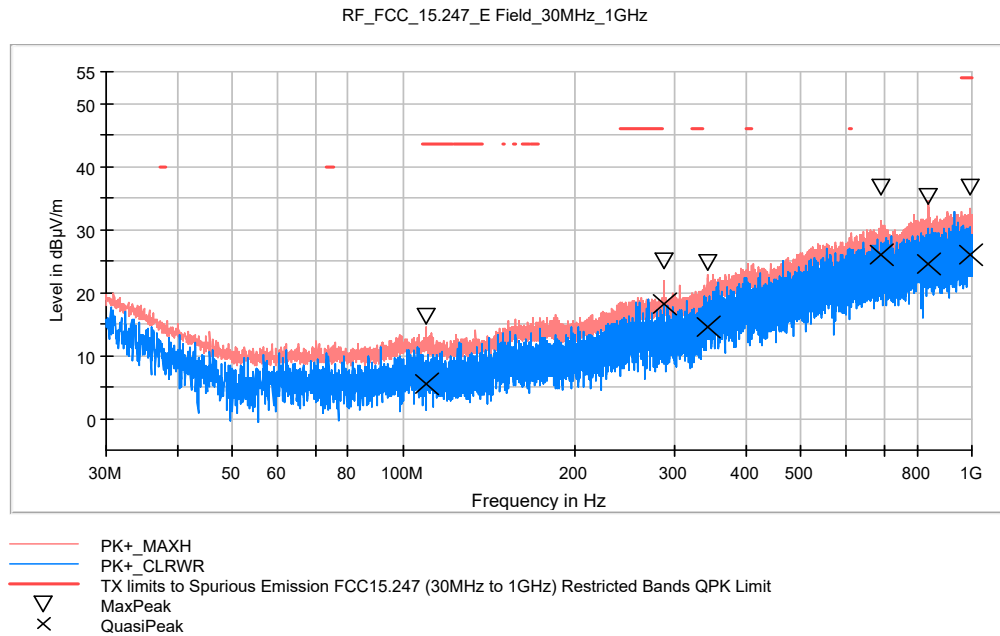
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)	
Radiated measurements Setup $f < 1\text{ GHz}$  Radiated measurements setup $f > 1\text{ GHz}$ 	
TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01 (GFSK)
TEST RESULTS:	PASS
Frequency range 30 MHz – 1000 MHz The spurious emissions below 1 GHz do not depend on the operating channel selected in the EUT. No radiated spurious signal was detected at or above 20 dB below the limit. Frequency range 1 GHz – 26 GHz The results in the following plots and tables show the maximum measured levels in the 1-26 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.	

TEST RESULTS (Cont.):

30 MHz – 1000 MHz (GFSK)

Low Channel



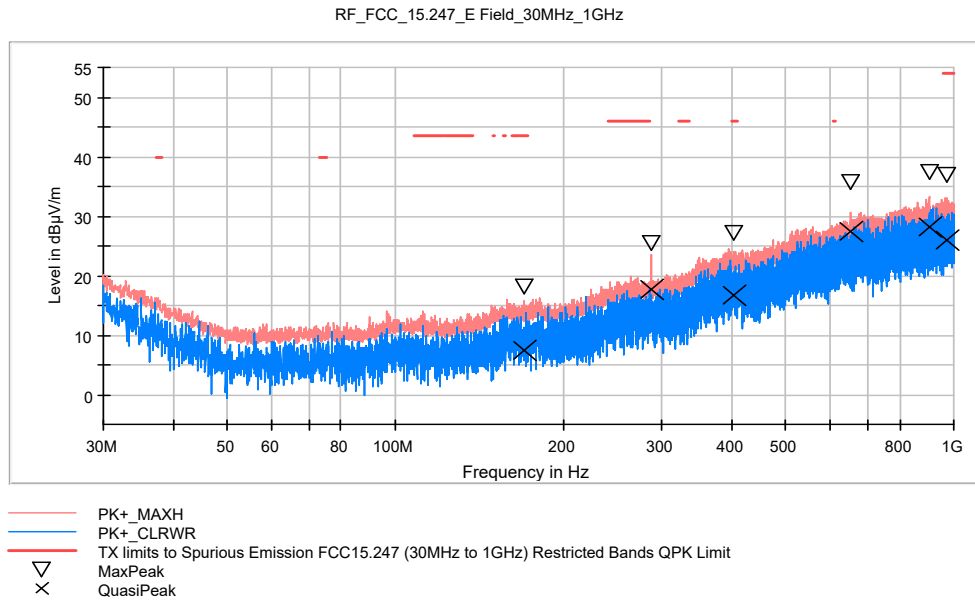
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol
109.782500	16.20	5.42	H
287.971500	24.98	18.14	V
344.231500	24.81	14.48	H
691.249000	36.74	25.95	V
836.797500	35.23	24.57	H
994.180000	36.80	26.01	V

TEST RESULTS (Cont.):

30 MHz – 1000 MHz (GFSK)

Mid Channel



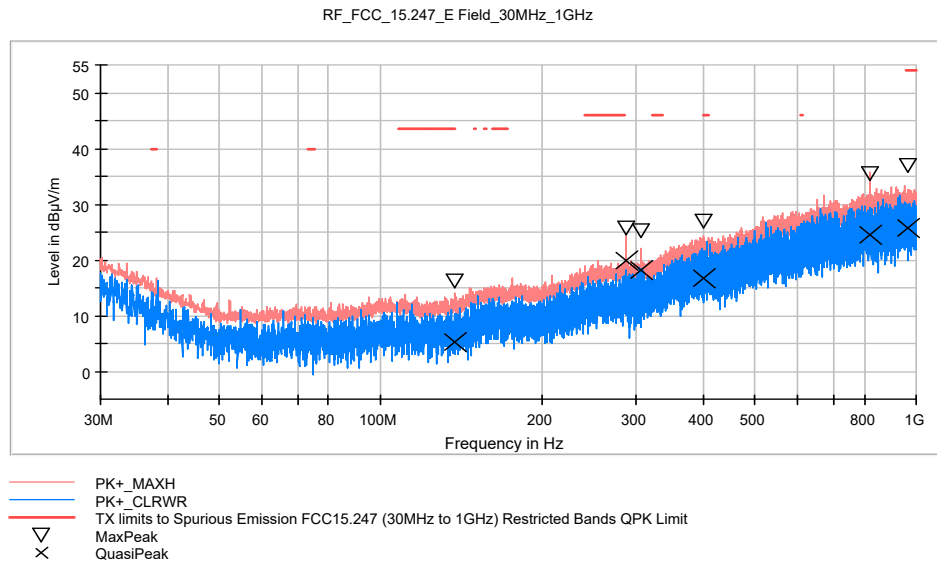
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol
170.359000	18.07	7.54	V
287.971500	25.46	17.76	V
404.129000	27.24	16.72	H
652.788500	35.83	27.55	V
902.418000	37.39	28.07	V
973.567500	37.03	25.91	V

TEST RESULTS (Cont.):

30 MHz – 1000 MHz (GFSK)

High Channel



Result Table_Single

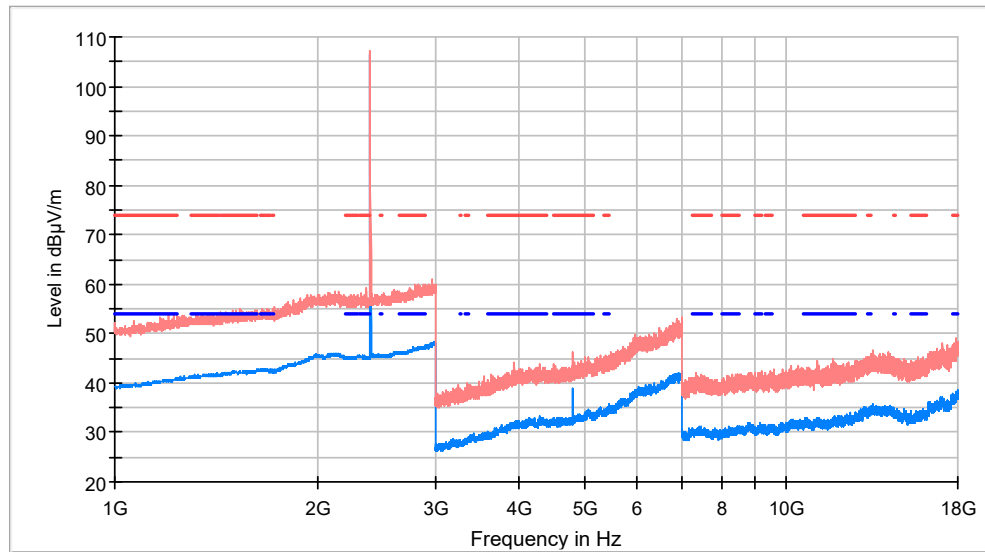
Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Pol
137.330500	16.27	5.29	V
287.971500	25.84	20.00	V
307.226000	25.22	18.06	H
402.237500	26.88	16.72	V
817.785500	35.44	24.55	H
962.752000	37.04	25.85	V

TEST RESULTS (Cont.)

1 GHz – 18 GHz (GFSK)

CHANNEL: Lowest (2402 MHz).

RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

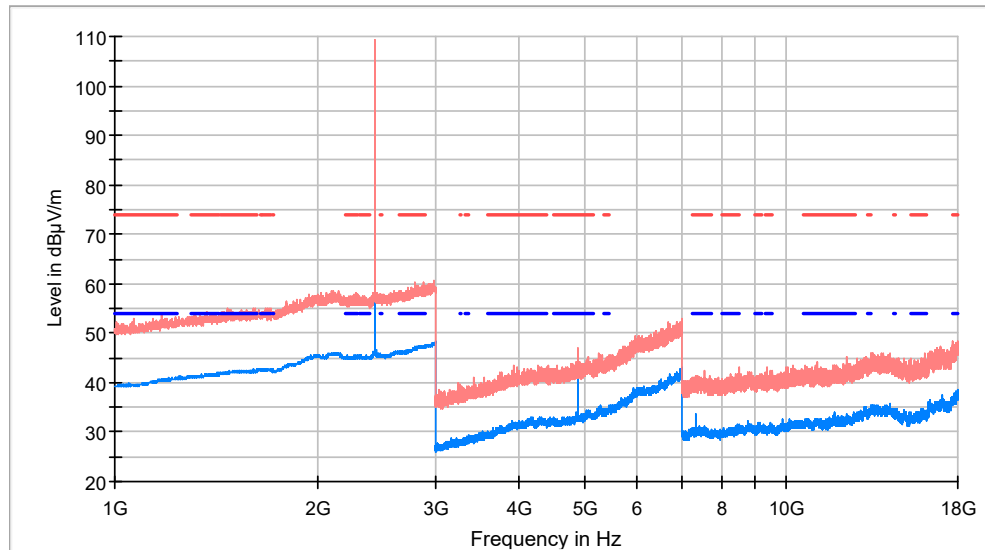
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comments
2402.000000	107.36	106.43	V	Fundamental
4804.000000	46.18	38.93	V	

TEST RESULTS (Cont.)

CHANNEL: Middle (2441 MHz).

RF_FCC_15.247_E Field_1GHz_18GHz



— AVG_MAXH
— PK+_MAXH
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

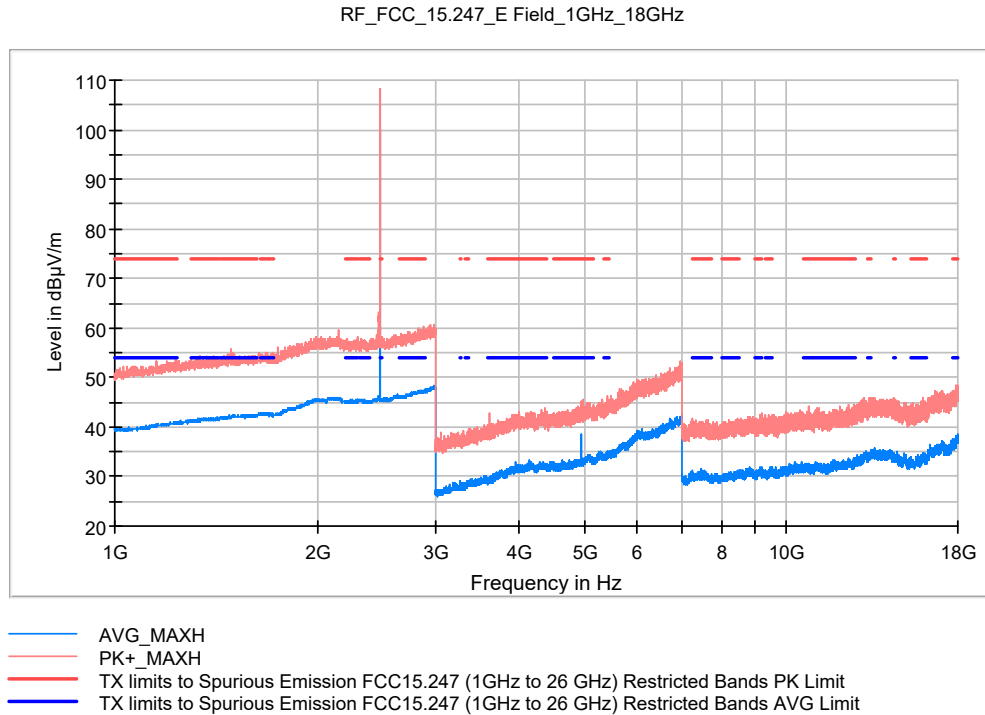
Maximizations

Frequency (MHz)	PK+_MAXH (dBuV/m)	AVG_MAXH (dBuV/m)	Pol	Comments
2441.000000	109.17	108.49	V	Fundamental
4881.500000	47.07	43.94	V	
7322.500000	41.20	33.74	V	

#

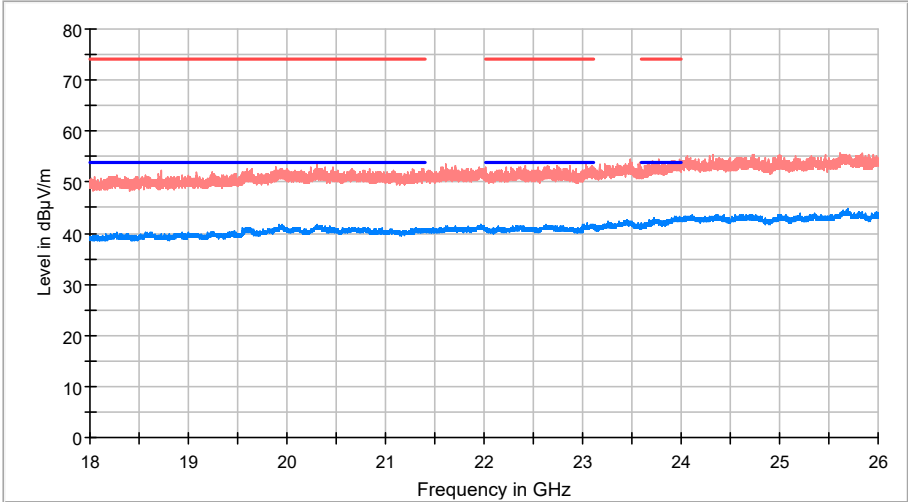
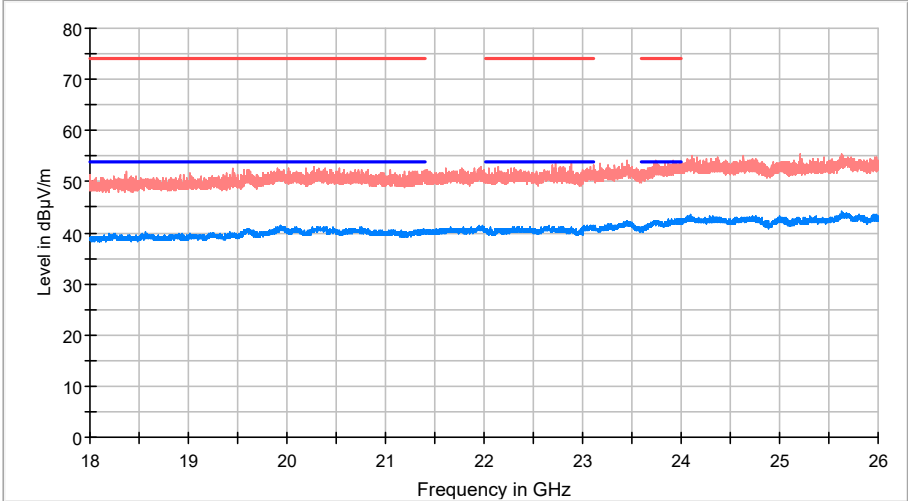
TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz).



Maximizations

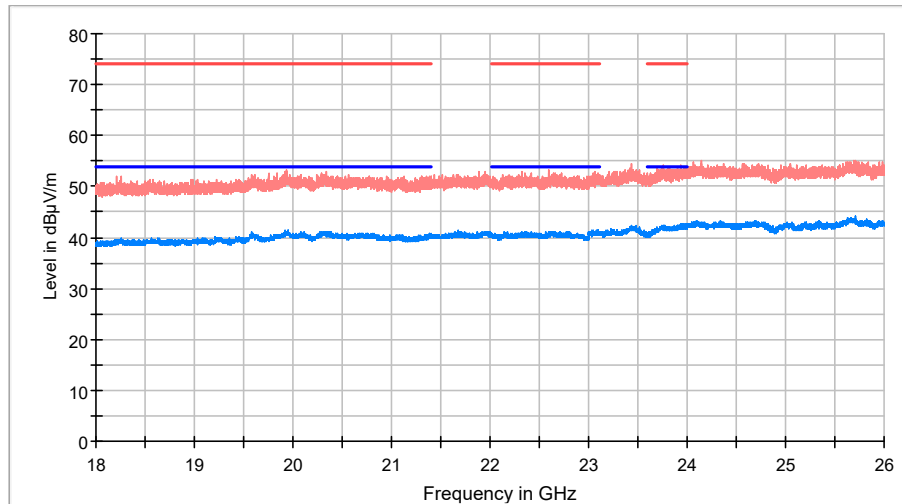
Frequency (MHz)	PK+ _MAXH (dBμV/m)	AVG _MAXH (dBμV/m)	Pol	Comments
2480.000000	108.08	100.21	V	Fundamental
4960.000000	45.32	38.49	V	

TEST RESULTS (Cont.)	18 GHz – 26 GHz (GFSK)
FREQUENCY RANGE	
CHANNEL: Lowest (2402 MHz). RF_FCC_15.247_E Field_18GHz_26GHz  Frequency in GHz — AVG_MAXH — PK+_MAXH — TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit — TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit CHANNEL: Middle (2441 MHz). RF_FCC_15.247_E Field_18GHz_26GHz  Frequency in GHz — AVG_MAXH — PK+_MAXH — TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit — TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit	

TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz).

RF_FCC_15.247_E Field_18GHz_26GHz



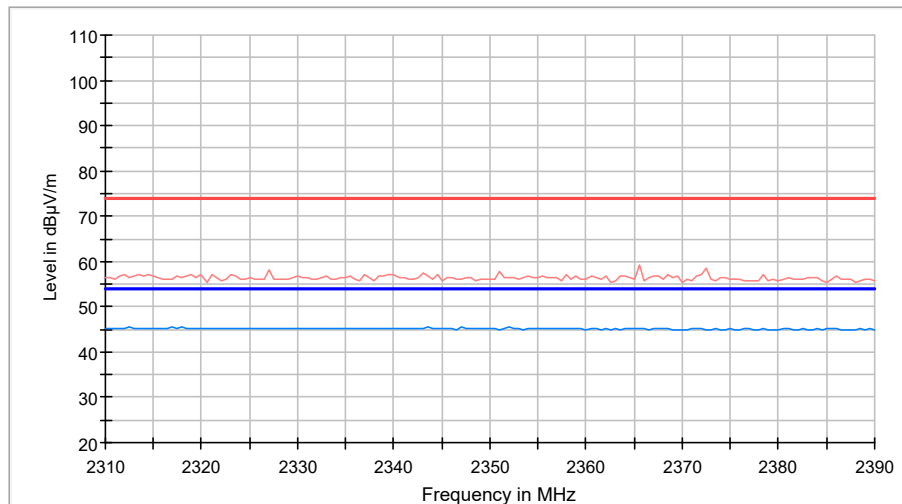
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

RESTRICTED BANDS

2.31 GHz – 2.39 GHz (GFSK)

CHANNEL: Lowest (2402 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz

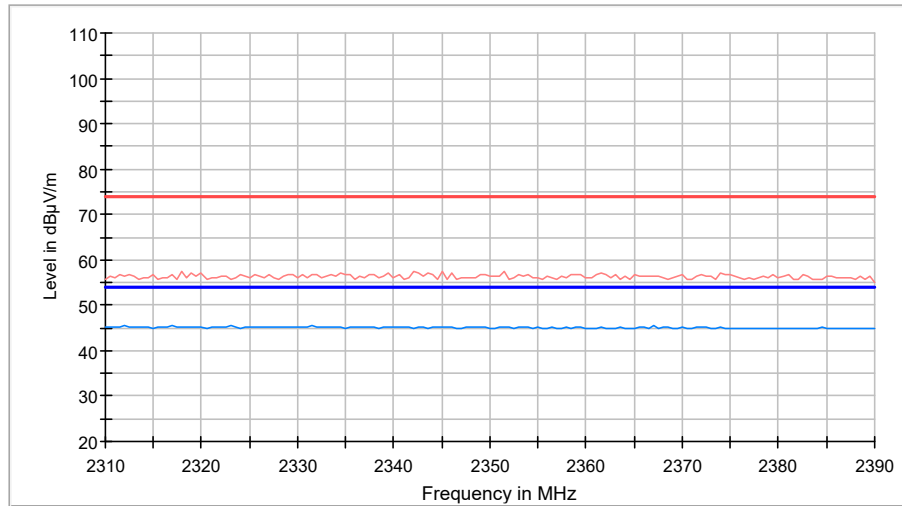


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.)

CHANNEL: Middle (2441 MHz)

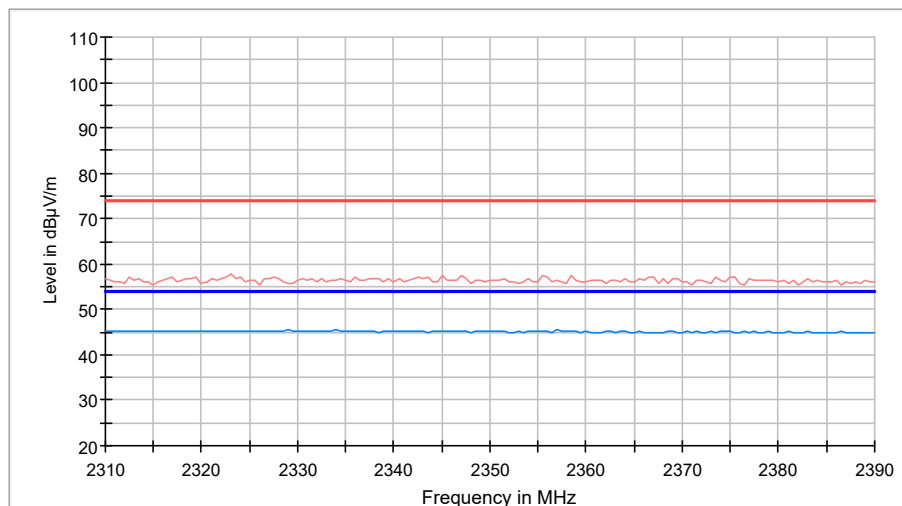
RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz

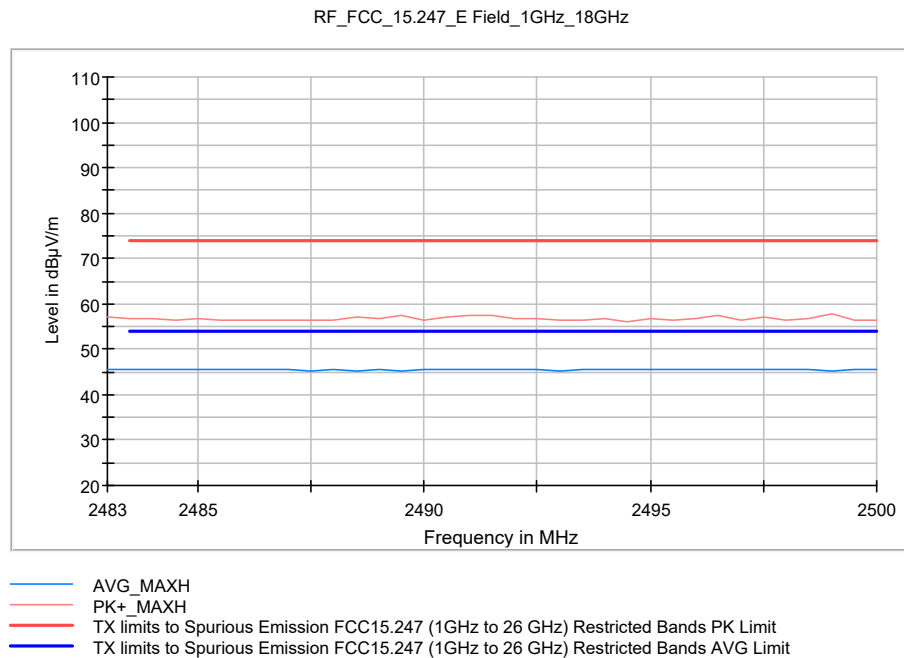


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

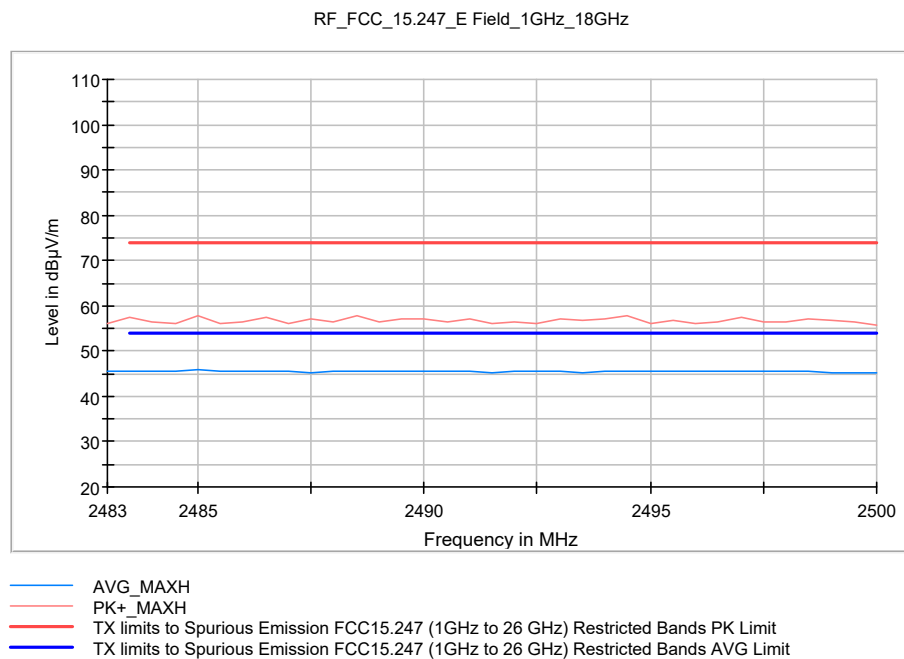
TEST RESULTS (Cont.)

RESTRICTED BAND 2.483 GHz – 2.5 GHz (GFSK)

CHANNEL: Lowest (2402 MHz)



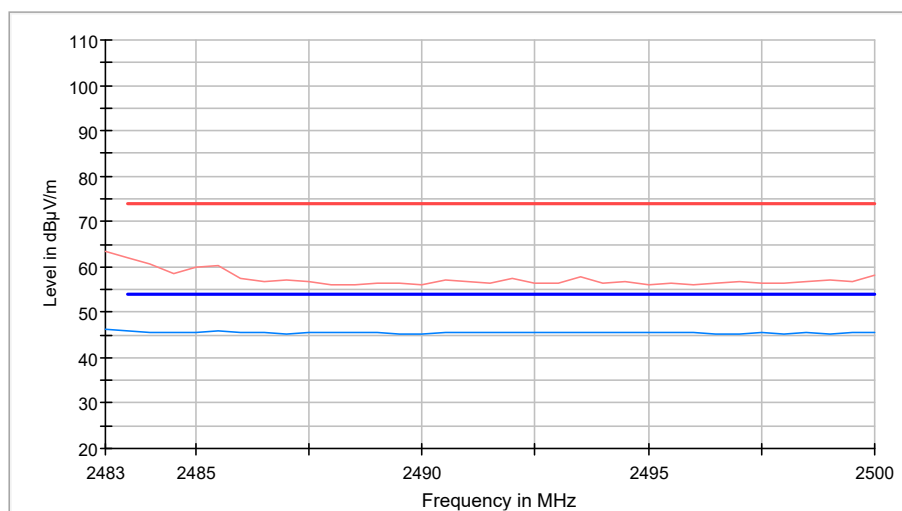
CHANNEL: Middle (2441 MHz)



TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TESTED SAMPLES:

S/02

TESTED CONDITIONS MODES:

TC#02 (PI4DQPSK)

TEST RESULTS:

PASS

Frequency range 30 MHz – 1000 MHz

The spurious emissions below 1 GHz do not depend on the operating channel selected in the EUT.

No radiated spurious signal was detected at or above 20 dB below the limit.

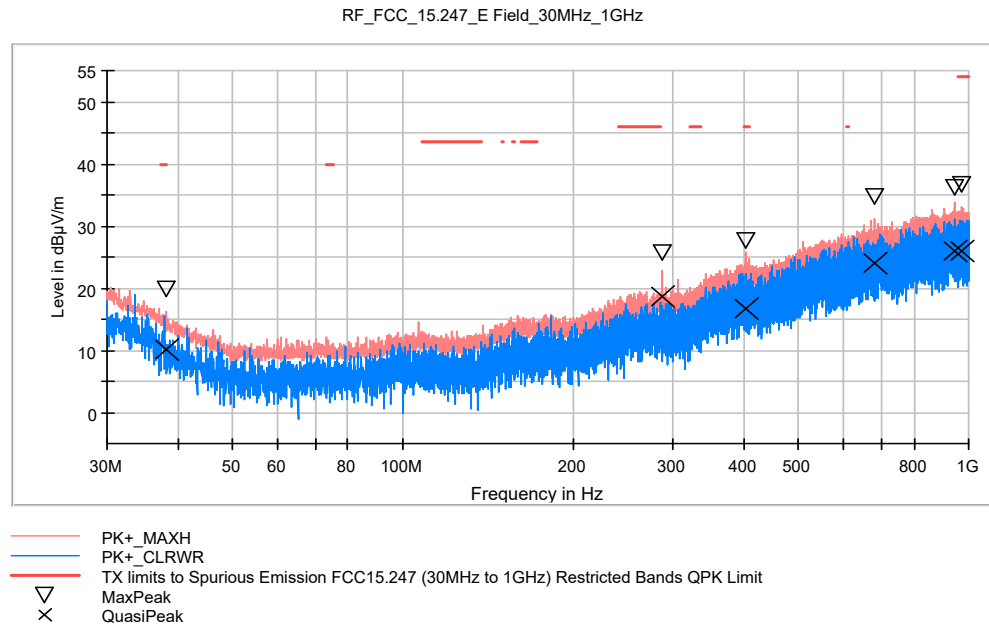
Frequency range 1 GHz – 26 GHz

The results in the following plots and tables show the maximum measured levels in the 1-26 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

TEST RESULTS (Cont.)

30 MHz – 1000 MHz (PI4DQPSK)

Low Channel

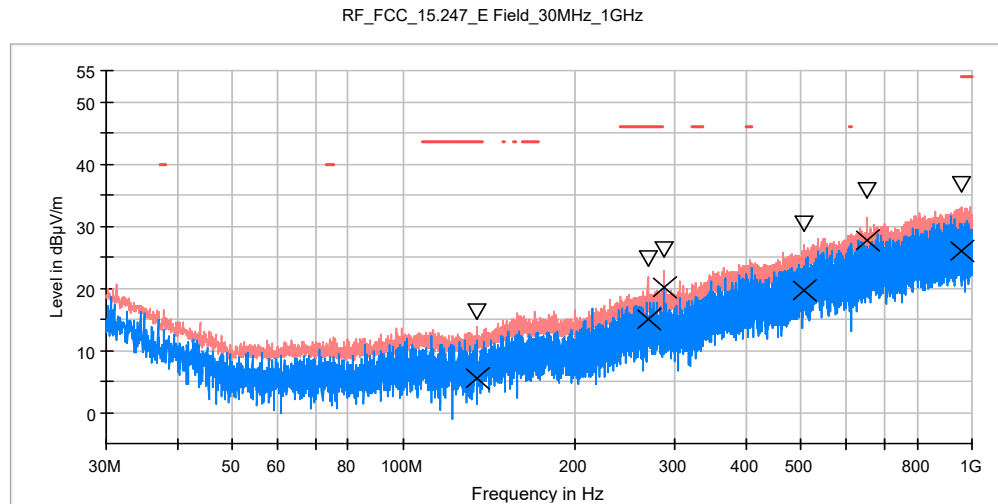


Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Pol
38.099500	19.97	10.12	H
287.971500	25.62	18.59	V
403.547000	27.73	16.77	V
680.239500	34.71	24.04	V
946.795500	36.28	25.95	V
971.821500	36.70	25.95	V

TEST RESULTS (Cont.):

30 MHz – 1000 MHz (PI4DQPSK)

Mid Channel



— PK+ MAXH
— PK+ CLRWR
- - TX limits to Spurious Emission FCC15.247 (30MHz to 1GHz) Restricted Bands QPK Limit
▽ MaxPeak
× QuasiPeak

Result Table_Single

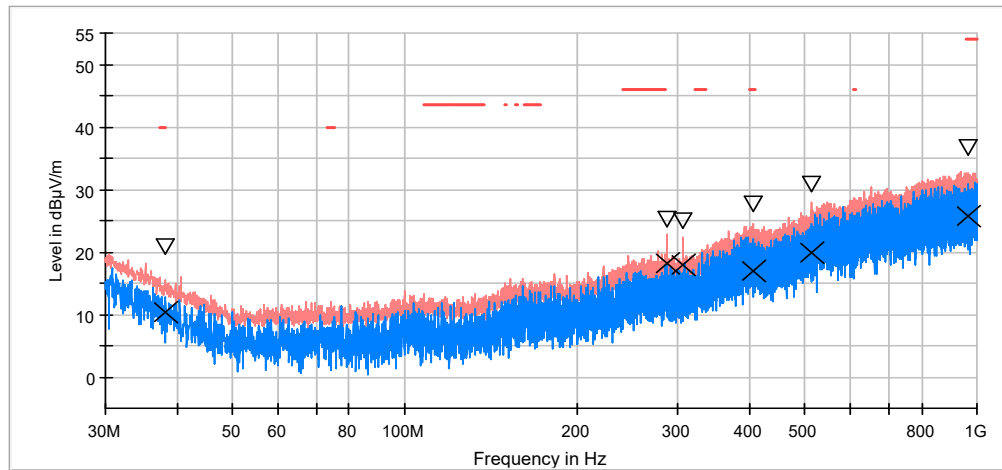
Frequency (MHz)	MaxPeak (dBuV/m)	QuasiPeak (dBuV/m)	Pol
134.469000	16.34	5.50	H
268.765500	24.71	15.05	V
288.020000	26.14	20.18	V
507.967500	30.33	19.72	H
652.788500	35.63	27.69	V
957.271500	36.62	25.90	H

TEST RESULTS (Cont.):

30 MHz – 1000 MHz (PI4DQPSK)

High Channel

RF_FCC_15.247_E Field_30MHz_1GHz



— PK+ _MAXH
— PK+ _CLRWR
— TX limits to Spurious Emission FCC15.247 (30MHz to 1GHz) Restricted Bands QPK Limit
▽ MaxPeak
x QuasiPeak

Result Table_Single

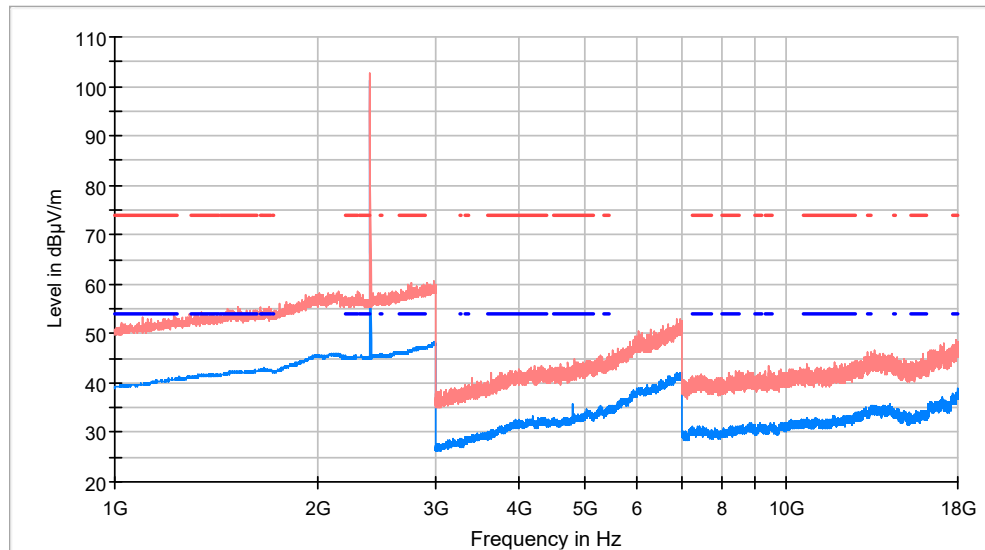
Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol
38.099500	20.80	10.25	H
287.971500	25.25	18.12	V
307.226000	25.02	17.82	H
405.972000	27.63	16.90	H
513.496500	30.80	19.95	V
967.602000	36.69	25.80	V

TEST RESULTS (Cont.)

1 GHz – 18 GHz (PI4DQPSK)

CHANNEL: Lowest (2402 MHz).

RF_FCC_15.247_E Field_1GHz_18GHz



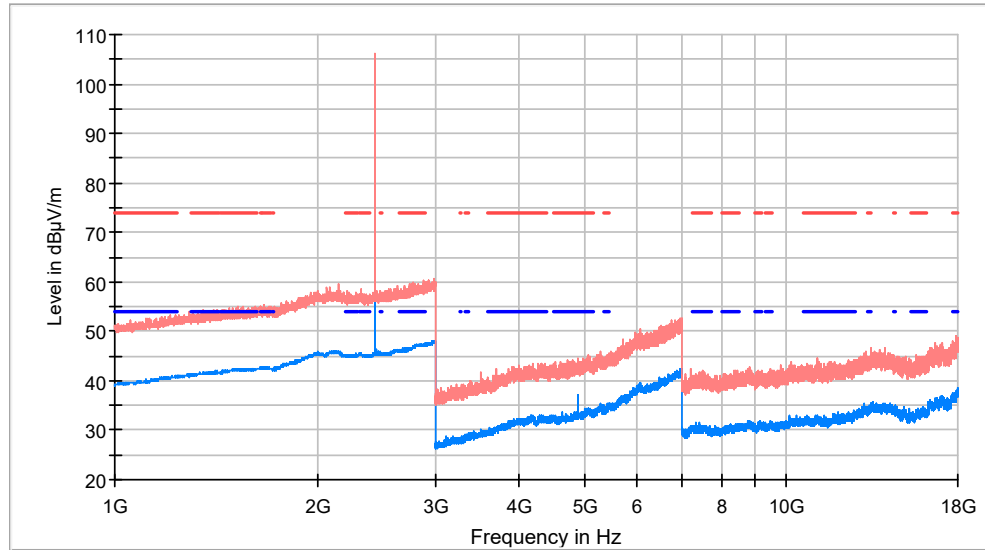
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comments
2402.000000	102.55	101.21	V	Fundamental
4804.000000	43.61	35.79	V	

TEST RESULTS (Cont.)

CHANNEL: Middle (2441 MHz).

RF_FCC_15.247_E Field_1GHz_18GHz



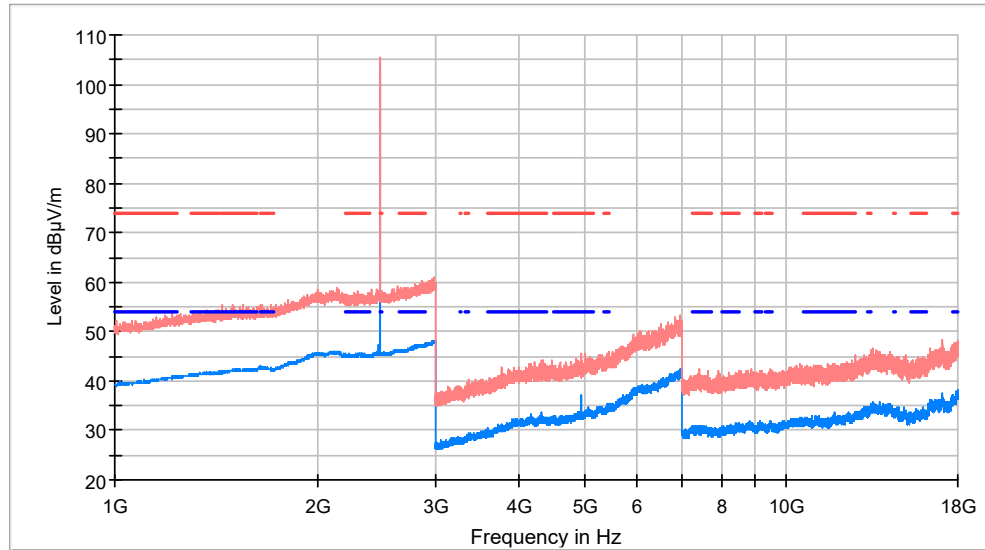
— AVG_MAXH
— PK+_MAXH
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Comments
2441.000000	106.14	104.50	V	Fundamental
4882.000000	44.36	37.24	V	

TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



— AVG_MAXH
— PK+_MAXH
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

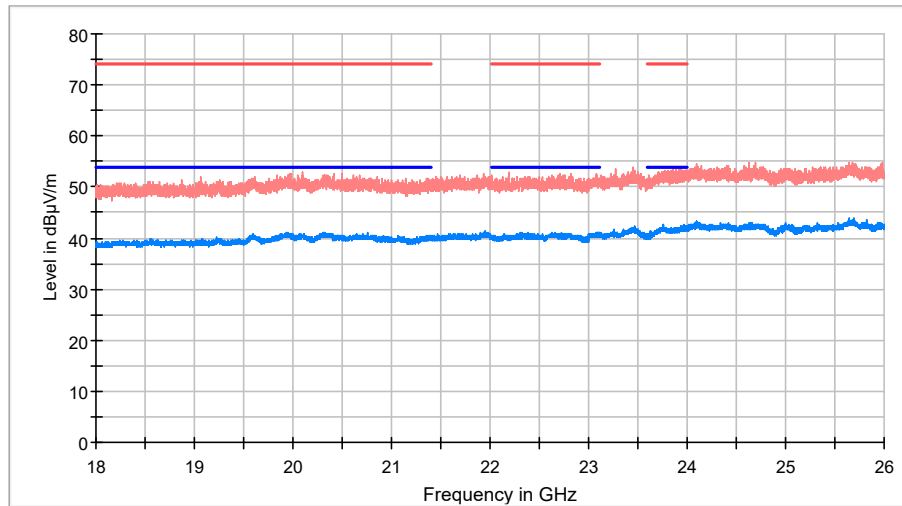
Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comments
2480.500000	105.13	103.70	V	Fundamental
4960.000000	45.73	37.19	V	

TEST RESULTS (Cont.)

18 GHz – 26 GHz (PI4DQPSK)

CHANNEL: Lowest (2402 MHz)

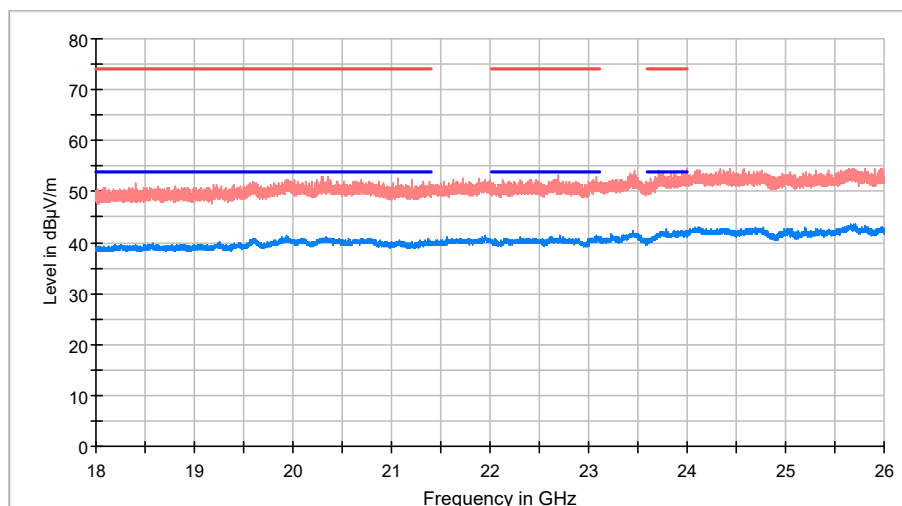
RF_FCC_15.247_E Field_18GHz_26GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

CHANNEL: Middle (2441 MHz)

RF_FCC_15.247_E Field_18GHz_26GHz

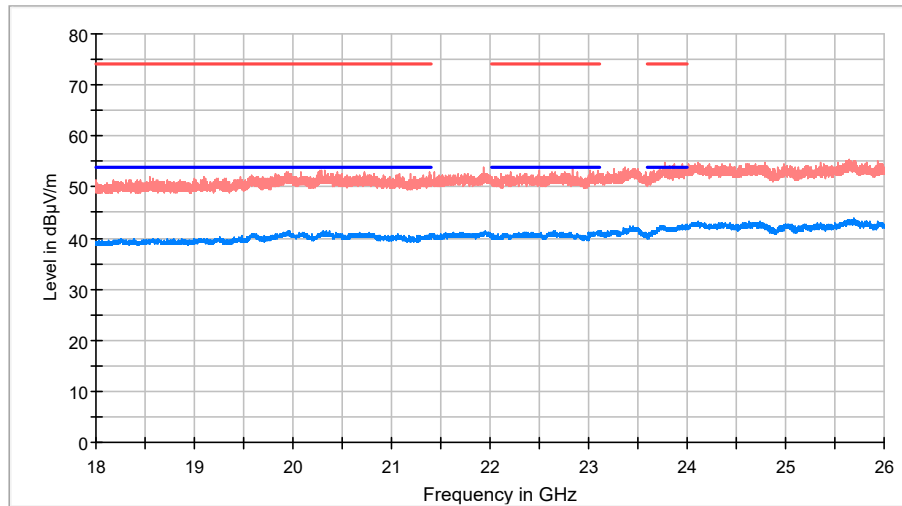


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_18GHz_26GHz



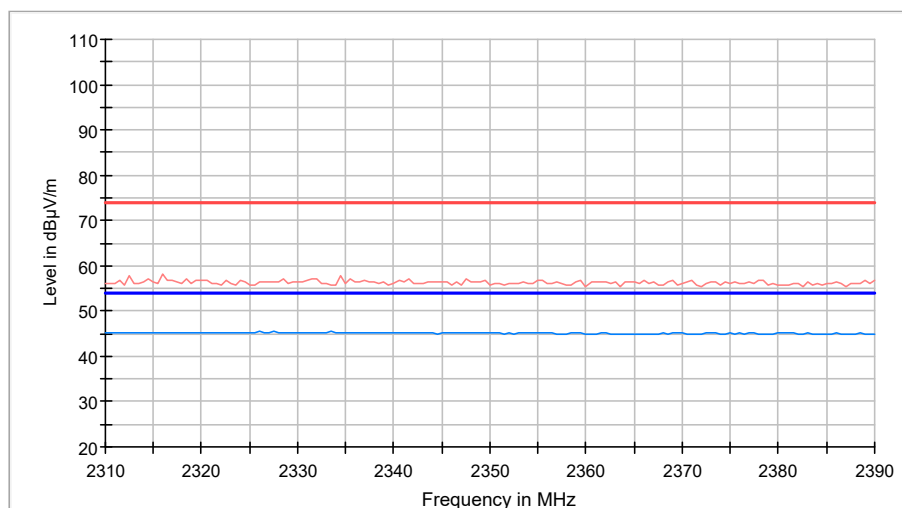
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.):

RESTRICTED BAND 2.31 GHz – 2.39 GHz (PI4DQPSK)

CHANNEL: Lowest (2402 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz

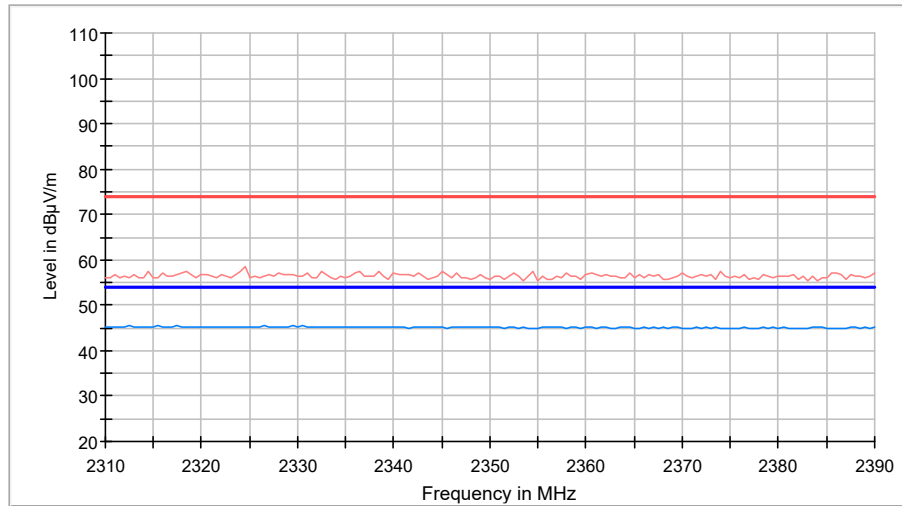


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.)

CHANNEL: Middle (2441 MHz)

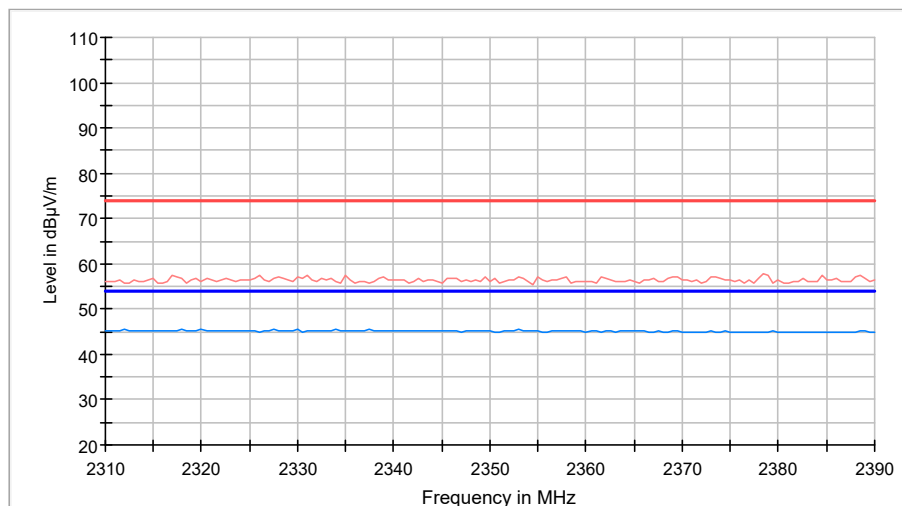
RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz

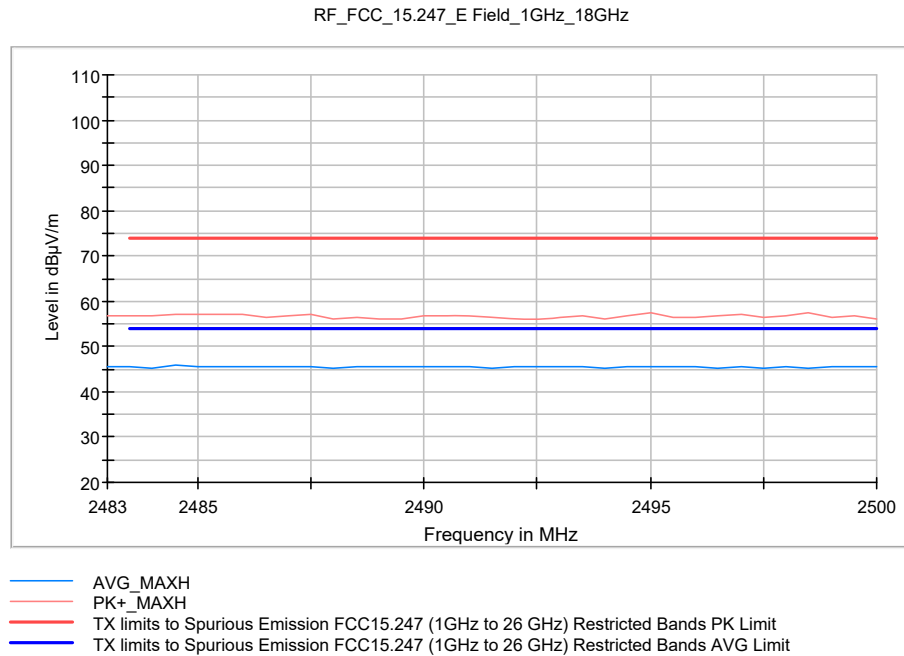


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

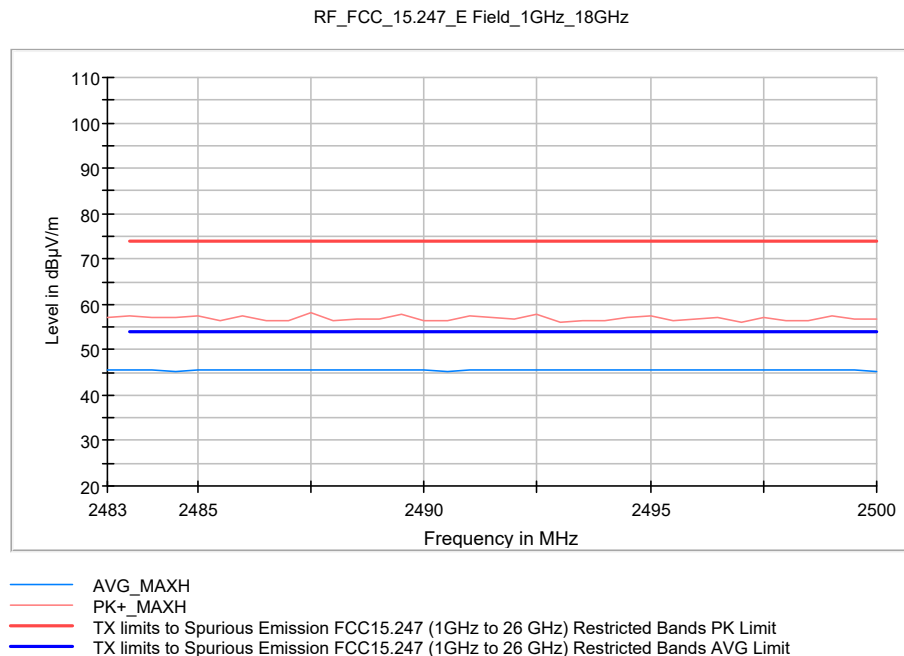
TEST RESULTS (Cont.)

RESTRICTED BAND 2.483 GHz – 2.5 GHz (PI4DQPSK)

CHANNEL: Lowest (2402 MHz)



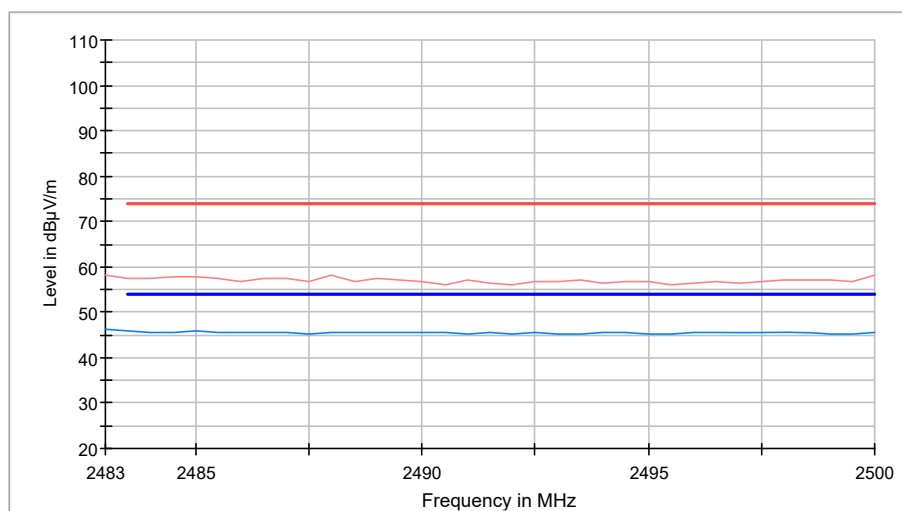
CHANNEL: Middle (2441 MHz)



TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TESTED SAMPLES:

S/02

TESTED CONDITIONS MODES:

TC#03 (8DPSK)

TEST RESULTS:

PASS

Frequency range 30 MHz – 1000 MHz

The spurious emissions below 1 GHz do not depend on the operating channel selected in the EUT.

No radiated spurious signal was detected at or above 20 dB below the limit.

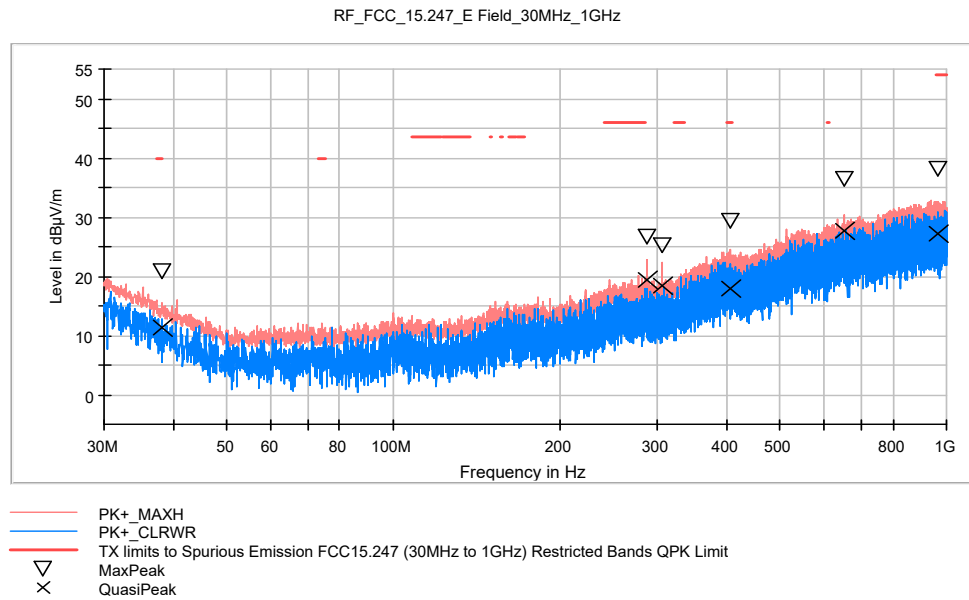
Frequency range 1 GHz – 26 GHz

The results in the following plots and tables show the maximum measured levels in the 1-26 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

TEST RESULTS (Cont.)

30 MHz – 1000 MHz (8DPSK)

Low Channel



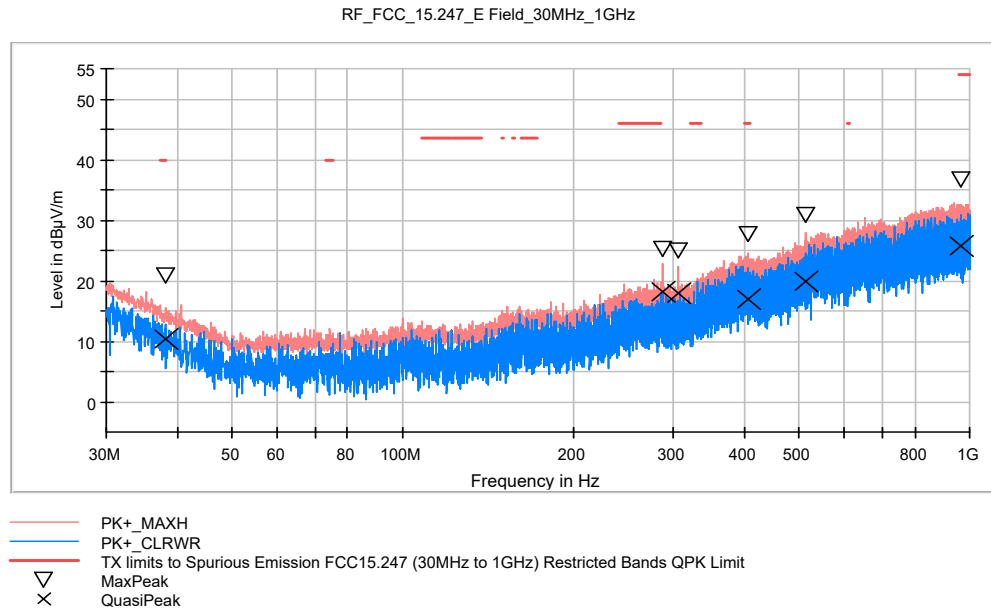
Result Table_Single

Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBμV/m)	Pol
38.099500	20.87	11.34	H
287.971500	26.69	19.32	V
307.226000	25.28	18.36	H
405.972000	29.30	18.02	H
652.788500	36.42	27.78	V
967.602000	38.14	27.21	V

TEST RESULTS (Cont.)

30 MHz – 1000 MHz (8DPSK)

Mid Channel



Result Table_Single

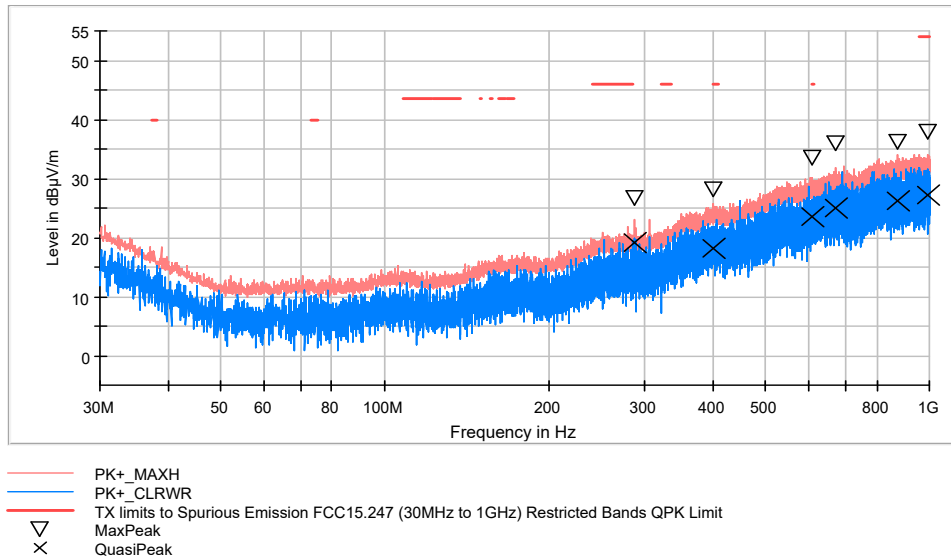
Frequency (MHz)	MaxPeak (dBuV/m)	QuasiPeak (dBuV/m)	Pol
38.099500	20.80	10.25	H
287.971500	25.25	18.12	V
307.226000	25.02	17.82	H
405.972000	27.63	16.90	H
513.496500	30.80	19.95	V
967.602000	36.69	25.80	V

TEST RESULTS (Cont.)

30 MHz – 1000 MHz (8DPSK)

High Channel

RF_FCC_15.247_E Field_30MHz_1GHz



Result Table_Single

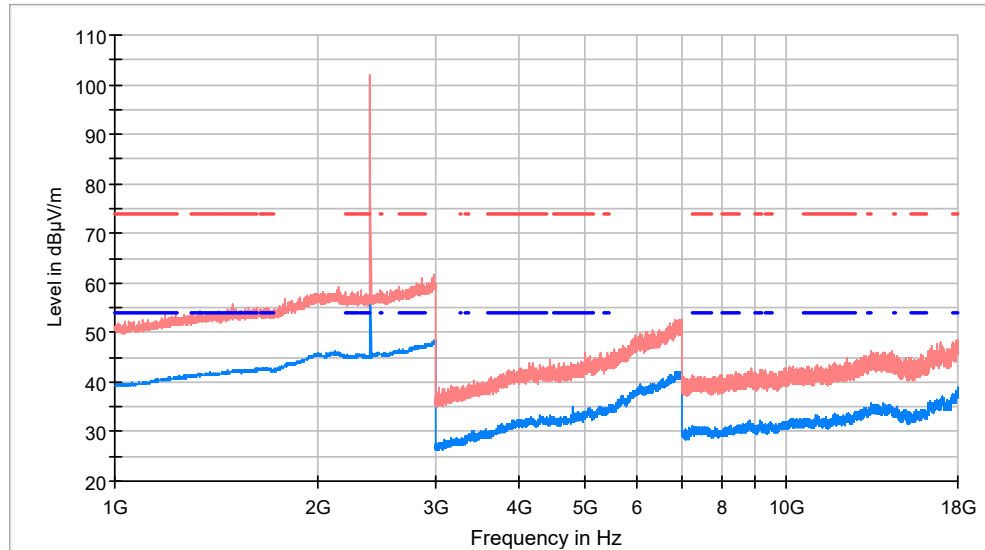
Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol
287.971500	26.77	19.15	V
401.413000	28.08	18.11	H
611.030000	33.52	23.55	H
671.994500	35.94	25.12	H
876.810000	36.21	26.30	H
989.669500	37.92	27.24	H

TEST RESULTS (Cont.)

1 GHz – 18 GHz (8DPSK)

CHANNEL: Lowest (2402 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



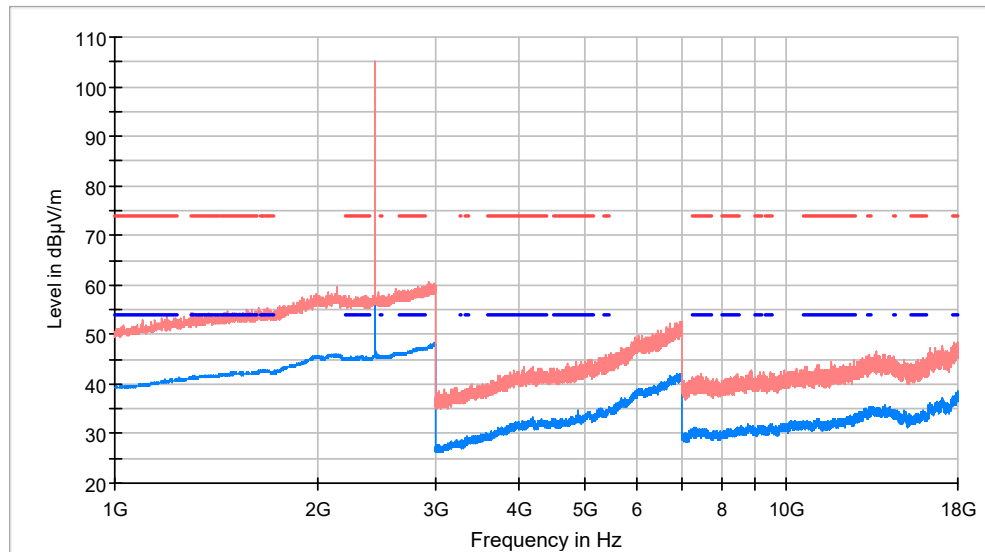
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Comments
2402.000000	101.60	101.15	V	Fundamental
4804.000000	42.66	34.98	V	

TEST RESULTS (Cont.)

CHANNEL: Middle (2441 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



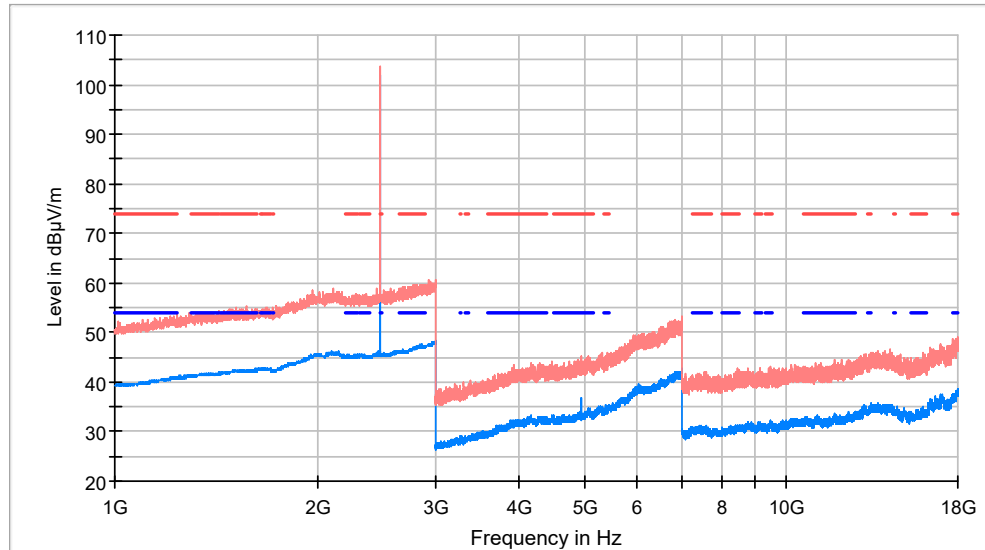
— AVG_MAXH
— PK+_MAXH
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
— TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comments
2441.000000	104.96	104.20	V	Fundamental
4881.500000	41.97	34.83	V	

TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

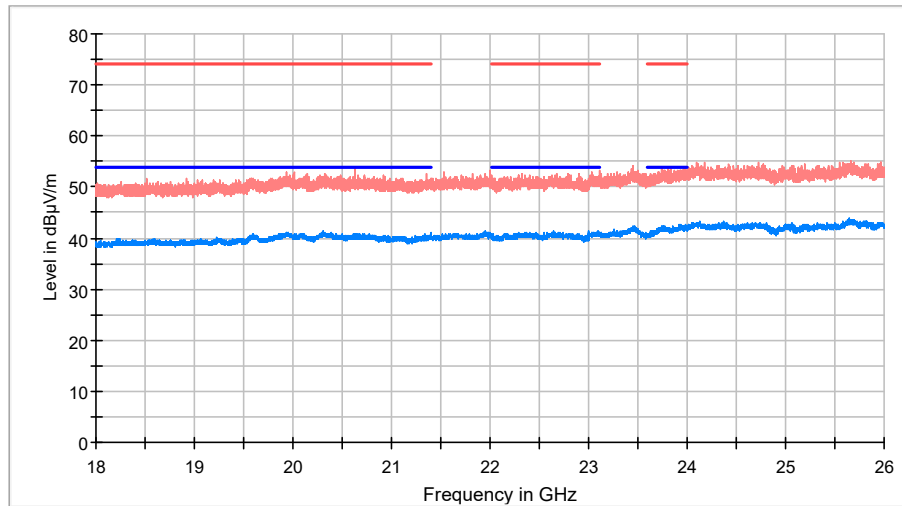
Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comments
2480.000000	103.76	101.94	V	Fundamental
4960.000000	42.89	36.68	V	

TEST RESULTS (Cont.)

18 GHz – 26 GHz (8DPSK)

CHANNEL: Lowest (2402 MHz)

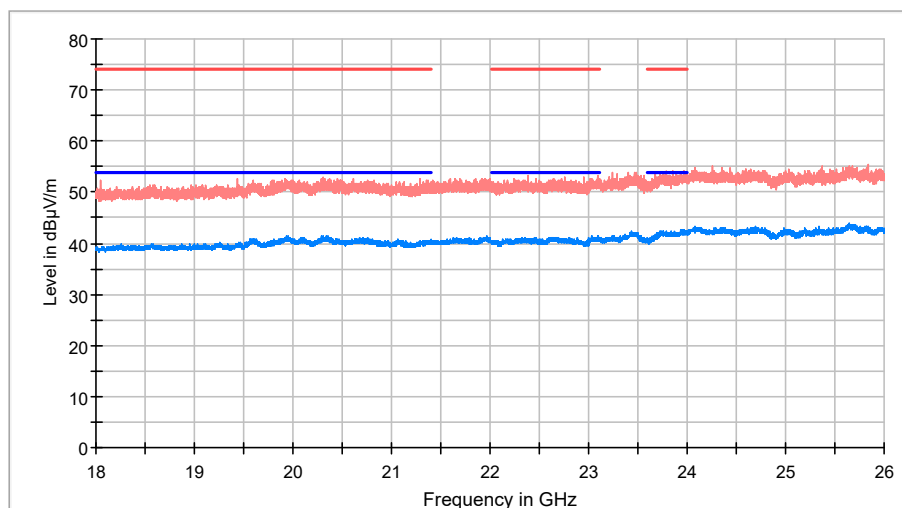
RF_FCC_15.247_E Field_18GHz_26GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

CHANNEL: Middle (2441 MHz)

RF_FCC_15.247_E Field_18GHz_26GHz

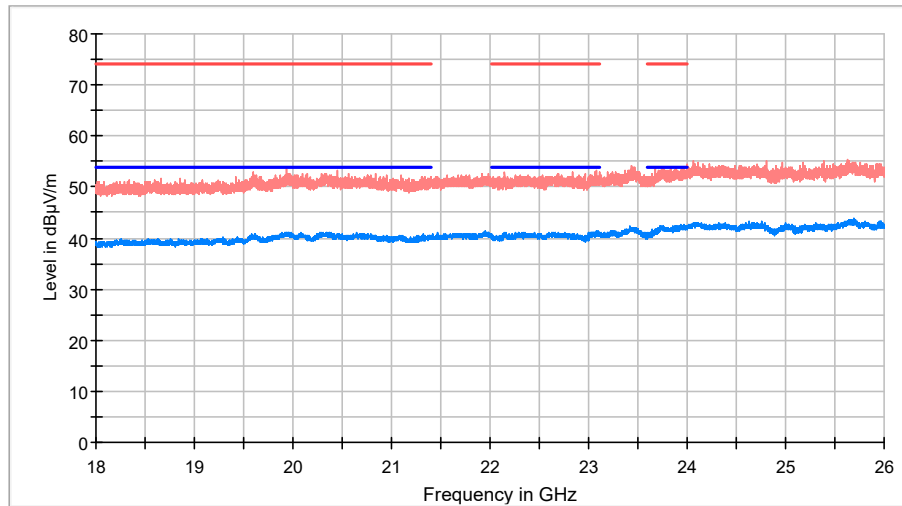


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_18GHz_26GHz



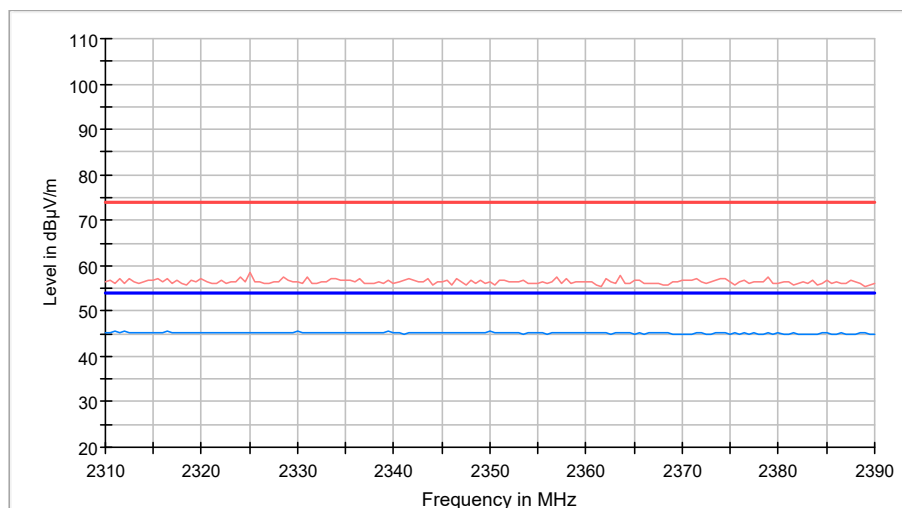
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

RESTRICTED BANDS

2.31 GHz – 2.39 GHz (8DPSK)

CHANNEL: Lowest (2402 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz

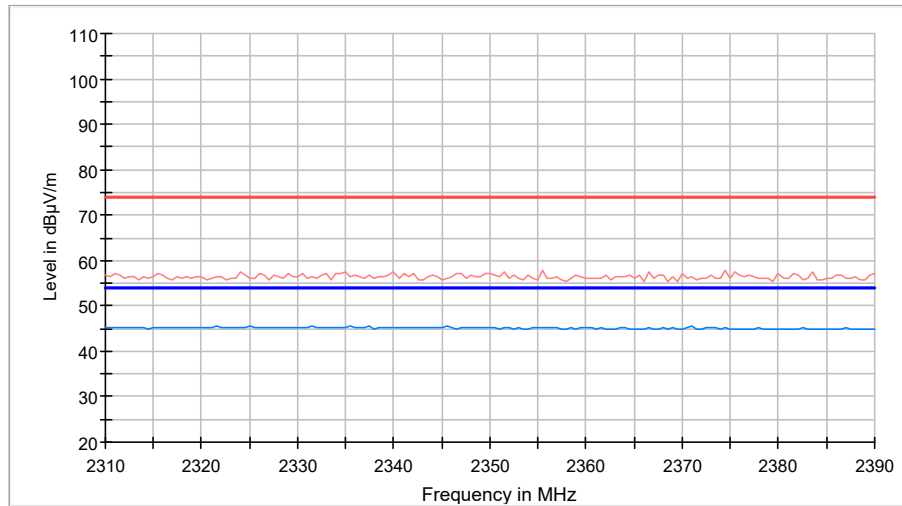


- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.)

CHANNEL: Middle (2441 MHz)

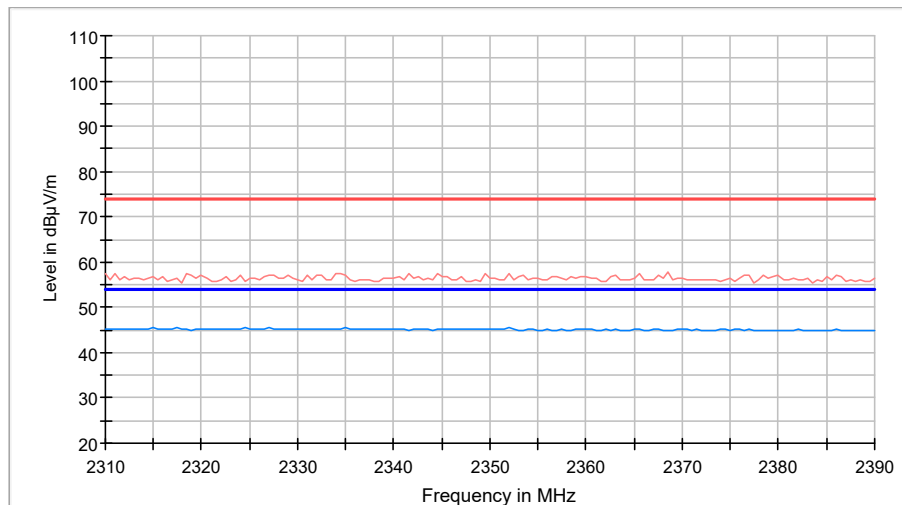
RF_FCC_15.247_E Field_1GHz_18GHz



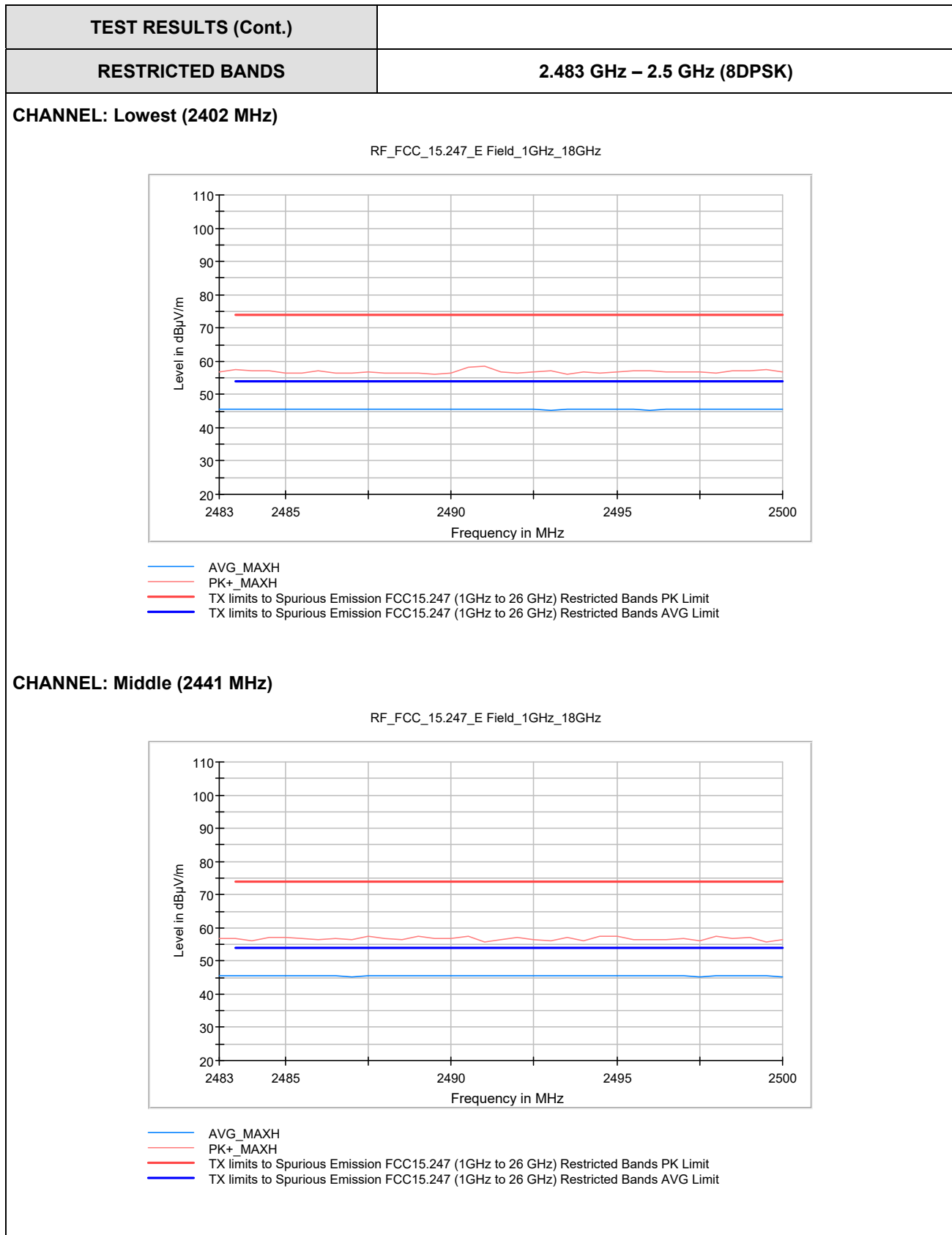
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



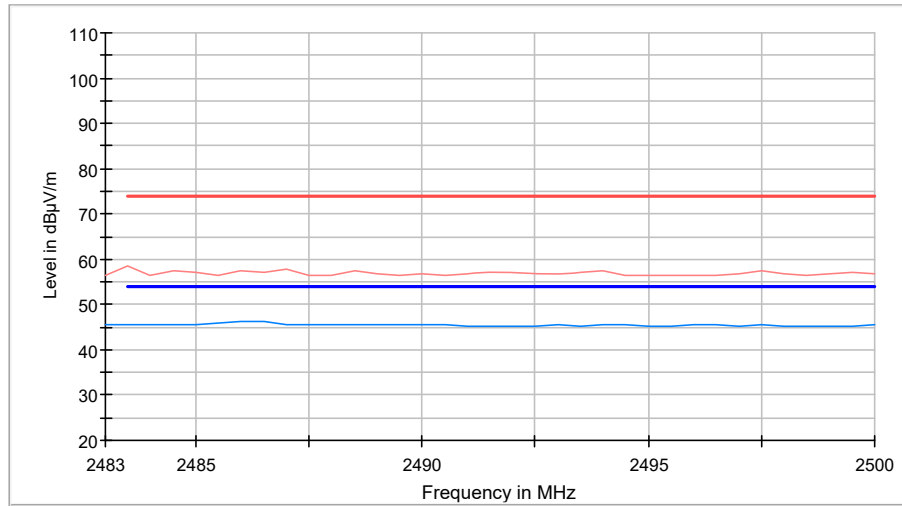
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit



TEST RESULTS (Cont.)

CHANNEL: Highest (2480 MHz)

RF_FCC_15.247_E Field_1GHz_18GHz



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.247 (1GHz to 26 GHz) Restricted Bands AVG Limit

Appendix C: Test results (WIFI 2.4GHz)

Appendix C Content

#

#

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PRODUCT INFORMATION

The following information is provided by the supplier, in accordance with clause 5.4.1:

Information	Description
Modulation	DSSS/OFDM
Maximum RF Output Power	18 dBm
Operation mode	Equipment with only one antenna
- Operating Frequency Range	2412 – 2462 MHz
- Nominal Channel Bandwidth	20 / 40 MHz
Extreme operating conditions	
- Temperature range	-40 °C to +85 °C
Antenna type	Dedicated Antenna
Antenna gain	+2.5 dBi
Nominal Voltage	
- Supply Voltage	3.8 Vdc
- Type of power source	DC voltage
Equipment type	WIFI 2.4GHz b/g/n20/n40
Geo-location capability	No

#

DESCRIPTION OF TEST CONDITIONS

During transmitter test the EUT was being controlled by the SW tool to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

TEST CONDITIONS	DESCRIPTION
TC#01 ⁽¹⁾ (b mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> Lowest channel: 2412 MHz Middle channel: 2437 MHz Highest channel: 2462 MHz
TC#02 ⁽¹⁾ (g mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> Lowest channel: 2412 MHz Middle channel: 2437 MHz Highest channel: 2462 MHz
TC#03 ⁽¹⁾ (n mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted:</u> Lowest channel: 2412 MHz Middle channel: 2437 MHz Highest channel: 2462 MHz
TC#04 ⁽¹⁾ (n mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Channel Bandwidth:</u> 40 MHz <u>Test Frequencies for Conducted:</u> Lowest channel: 2422 MHz Middle channel: 2437 MHz Highest channel: 2452 MHz

Note (1): For spurious emissions for OFDM modes 802.11g and 802.11n20 a preliminary scan was performed to determine the worst case. The following tables and plots show the results for the worst case in DSSS modulation (802.11b) and OFDM modulation (802.11g).
The data rates of 1Mb/s for 802.11b, 6.5Mb/s for 802.11g, MCS0 for 802.11n20/n40 were selected based on preliminary testing that identified those rates corresponding to the worst cases.

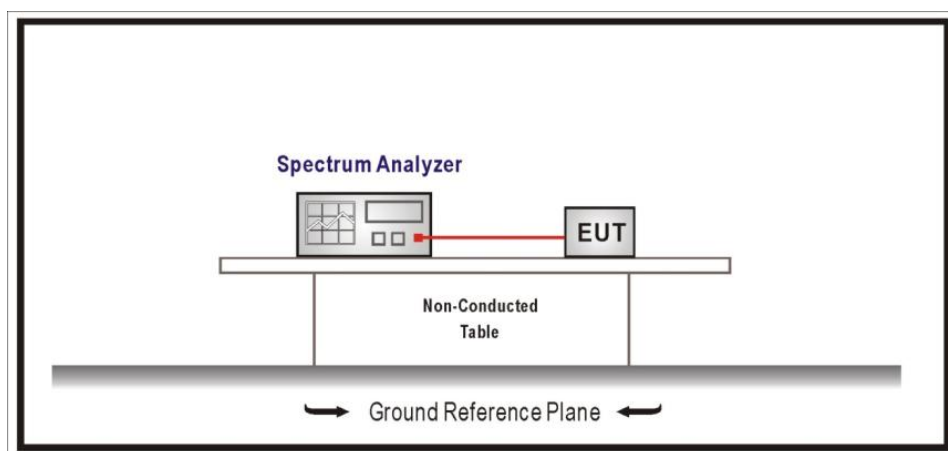
TEST C.1: 99% OCCUPIED BANDWIDTH AND 6DB BANDWIDTH

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	§2.1049, Part 15 Subpart C §15.247(a)(2) and RSS-247 5.2(a)

LIMITS

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 KHz.

TEST SETUP



#

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (b mode)
TEST RESULTS:	PASS

Type of equipment: Adaptive equipment without the possibility to switch to a non-adaptive mode.

	Lowest frequency 2412 MHz	Middle frequency 2437 MHz	Highest frequency 2462 MHz
6dB Bandwidth (MHz)	8.30	8.30	8.30
Occupied bandwidth (kHz)	13.2	13.6	13.2
Measurement uncertainty (kHz)	<± 1.80		

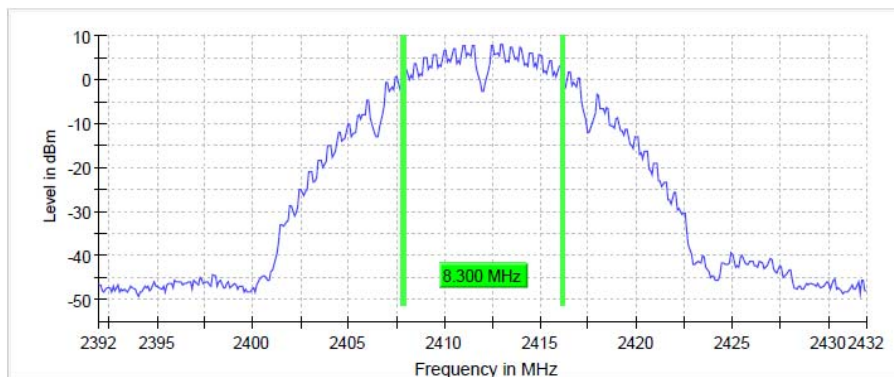
6dB Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.39200 GHz	2.41700 GHz	2.44200 GHz
Stop Frequency	2.43200 GHz	2.45700 GHz	2.48200 GHz
Span	40.00 MHz	40.000 MHz	40.000 MHz
RBW	100.000 kHz	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz	300.000 kHz
Sweep Points	400	800	400
Sweep time	56.886 µs	56.836 µs	56.886 µs
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB	40.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamplifier	off	off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	13 / max. 150	9 / max. 150	8 / max. 150
Stable	3 / 3	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.17 dB	0.22 dB

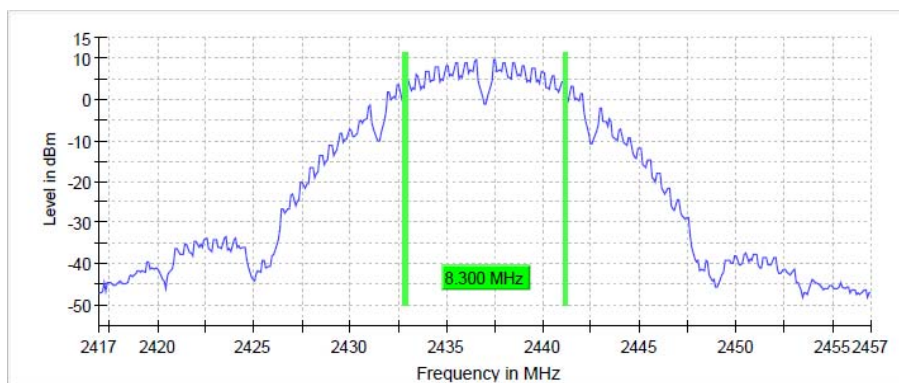
TEST RESULTS (Cont.):

6 dB BANDWIDTH

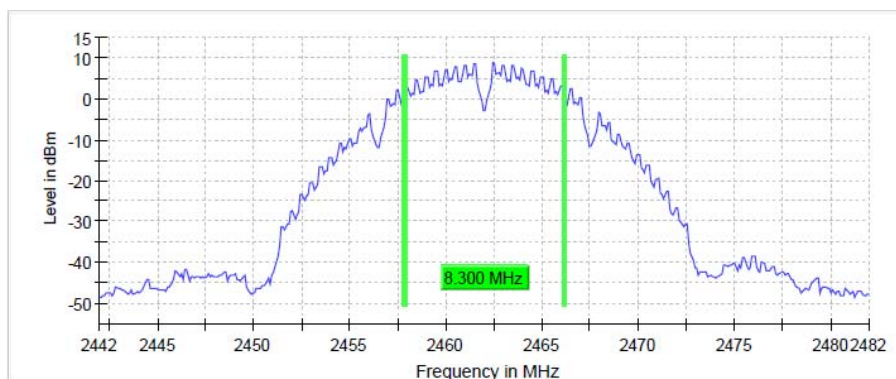
Lowest Channel



Middle Channel



Highest Channel



#

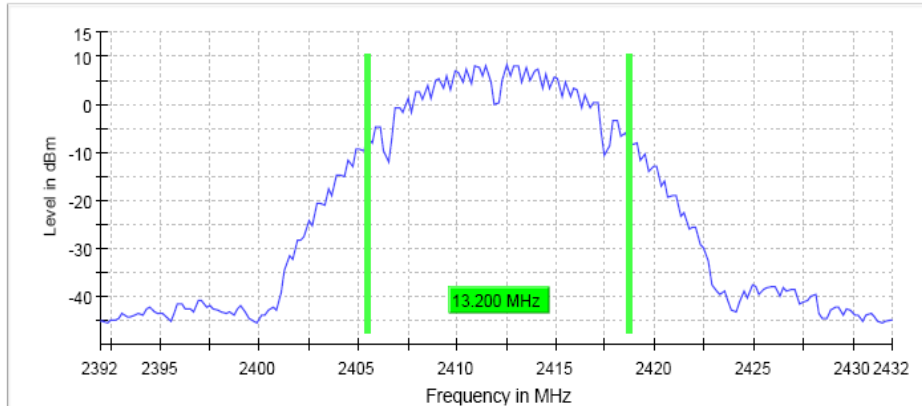
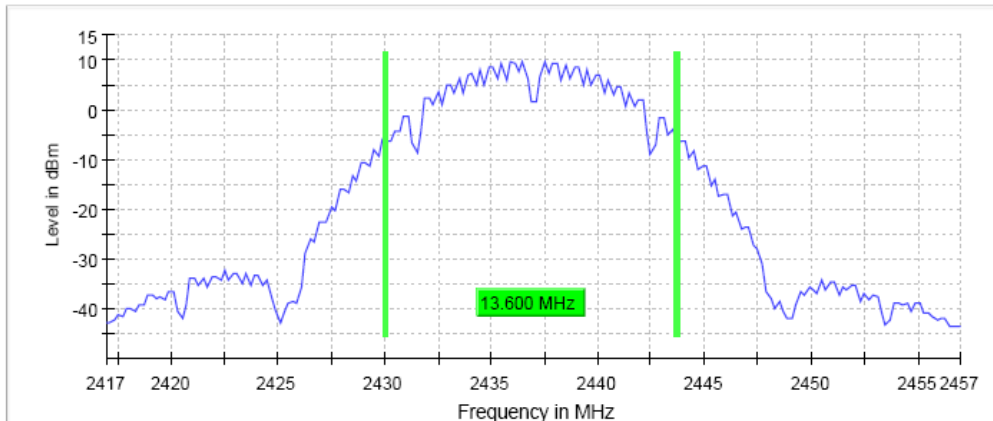
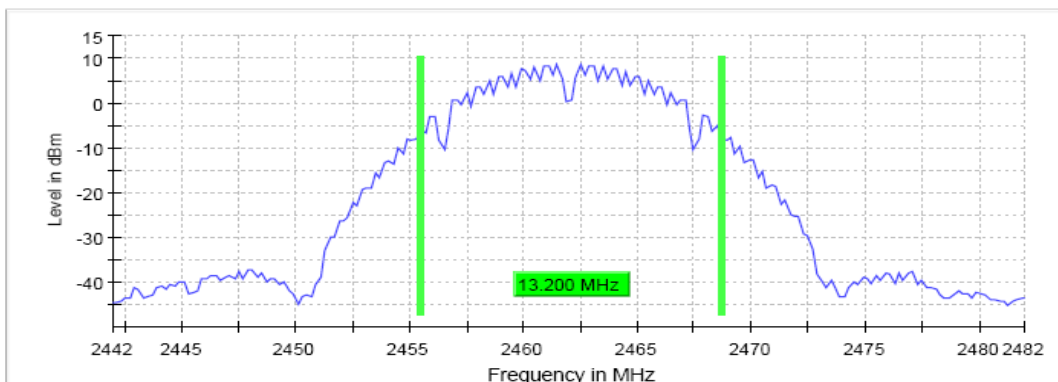
TEST RESULTS (Cont.):

OBW Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.39200 GHz	2.41700 GHz	2.44200 GHz
Stop Frequency	2.43200 GHz	2.45700 GHz	2.48200 GHz
Span	40.00 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 kHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
Sweep Points	200	200	200
Sweep time	28.443 µs	28.443 µs	28.443 µs
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB	40.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	off	off
Stable mode	Trace	Trace	Trace
Stable value	0.30 dB	0.30 dB	0.30 dB
Run	4 / max. 150	4 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.12 dB	0.08 dB	0.15 dB

#

#

TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH
Lowest Channel  Level in dBm Frequency in MHz 13.200 MHz Middle Channel  Level in dBm Frequency in MHz 13.600 MHz Highest Channel  Level in dBm Frequency in MHz 13.200 MHz	