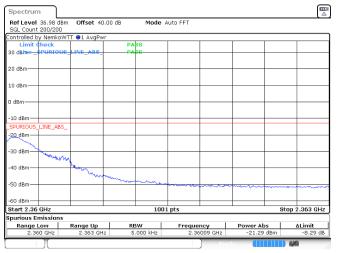
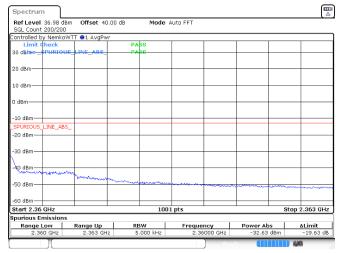


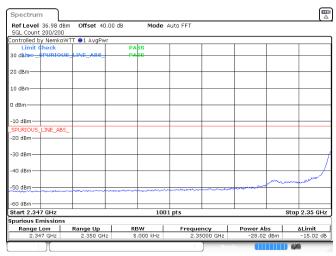
Low band edge, 2 signals, level = AGC Threshold + 3



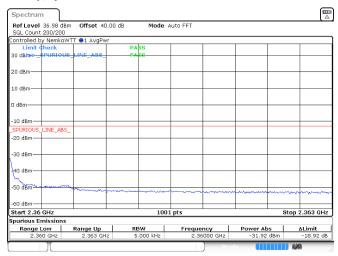
High band edge, 2 signals, level = AGC Threshold - 0.5



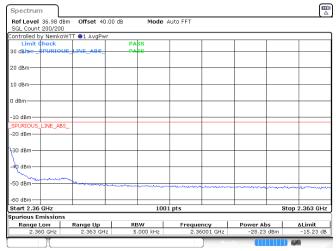
High band edge, 2 signals, level = AGC Threshold + 3



Low band edge, 1 signal, level = AGC Threshold + 3



High band edge, 1 signal, level = AGC Threshold - 0.5



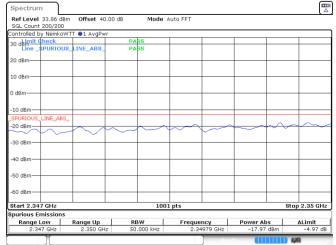
Low band edge, 1 signal, level = AGC Threshold + 3

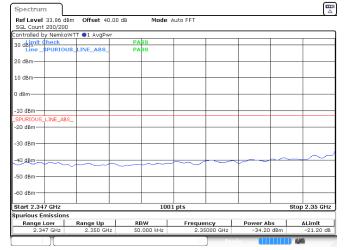


Table 8.5-6: Spurious emissions at RF connector test data, broadband

Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 2 Low band edge	2349.785714	-17.97	-13.00
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 1 Low band edge	2349.998501	-34.20	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 2 Low band edge	2349.998501	-30.61	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 Low band edge	2349.998501	-34.59	-13.00
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 2 High band edge	2360.139361	-35.08	-13.00
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 1 High band edge	2360.001499	-34.46	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 2 High band edge	2360.079421	-32.65	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 High band edge	2630.001499	-33.71	-13.00

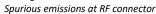
Broadband signals:



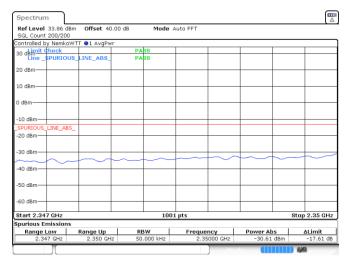


Low band edge, 2 signals, level = AGC Threshold - 0.5

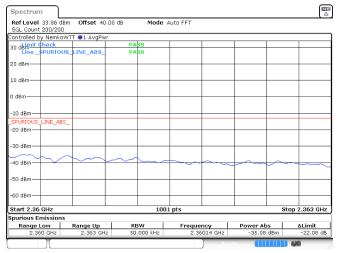
Low band edge, 1 signal, level = AGC Threshold - 0.5



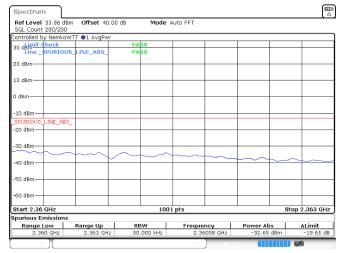




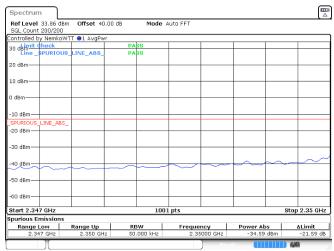
Low band edge, 2 signals, level = AGC Threshold + 3



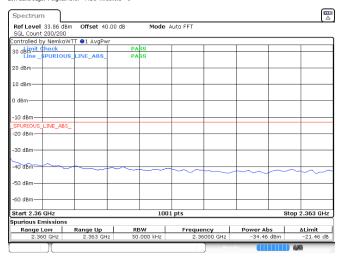
High band edge, 2 signals, level = AGC Threshold - 0.5



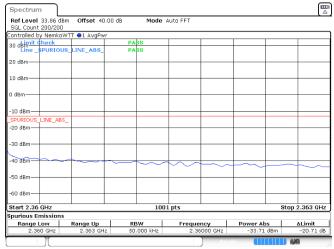
High band edge, 2 signals, level = AGC Threshold + 3



Low band edge, 1 signal, level = AGC Threshold + 3



High band edge, 1 signal, level = AGC Threshold - 0.5



Low band edge, 1 signal, level = AGC Threshold + 3



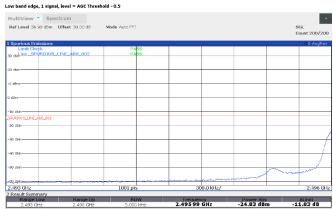
8.5.5.4 Operating frequency band: band 41: 2496 – 2690 MHz

Table 8.5-7: Spurious emissions at RF connector test data, narrowband

Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)	
Input Level = AGC Threshold0.5 dB Input signal = narrowband Number of signals: 2 Low band edge	2495.986513	-33.22	-13.00	
Input Level = AGC Threshold0.5 dB Input signal = narrowband Number of signals: 1 Low band edge	2495.959510	-24.83	-13.00	
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 2 Low band edge	2495.995504	-32.88	-13.00	
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 1 Low band edge	2495.995504	-21.50	-13.00	
Input Level = AGC Threshold0.5 dB Input signal = narrowband Number of signals: 2 High band edge	2690.010490	-30.58	-13.00	
Input Level = AGC Threshold0.5 dB Input signal = narrowband Number of signals: 1 High band edge	2690.004496	-26.91	-13.00	
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 2 High band edge	2690.004496	-30.76	-13.00	
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 1 High band edge	2690.004496	-24.36	-13.00	

Narrowband signal(s):







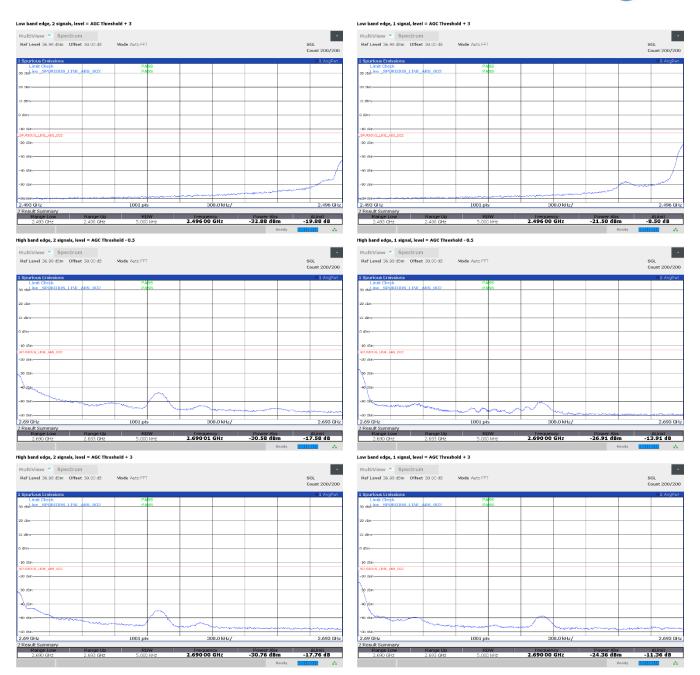
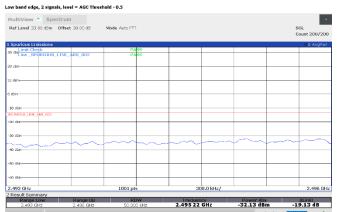


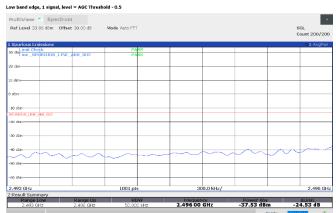


Table 8.5-8: Spurious emissions at RF connector test data, broadband

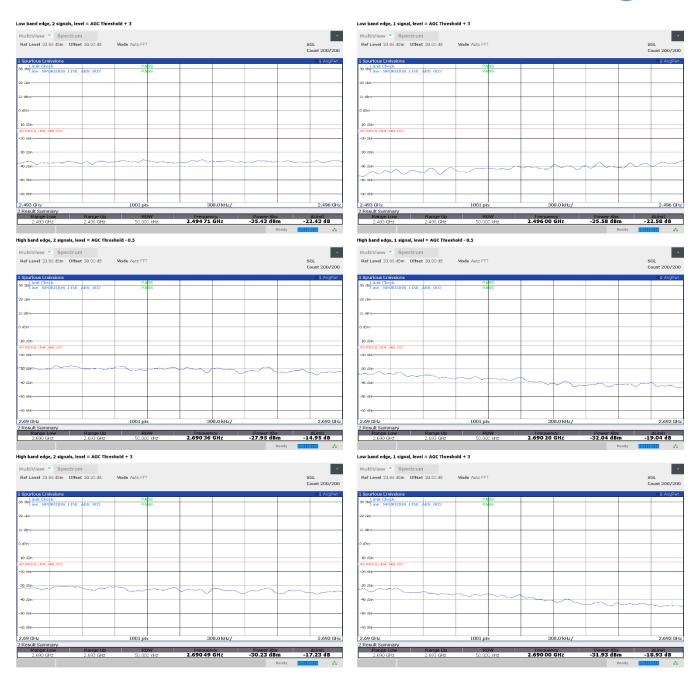
Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 2 Low band edge	2495.216284	-32.13	-13.00
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 1 Low band edge	2495.998501	-37.53	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 2 Low band edge	2494.706793	-35.43	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 Low band edge	2495.998501	-35.58	-13.00
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 2 High band edge	2690.358142	-27.95	-13.00
Input Level = AGC Threshold0.5 dB Input signal = broadband Number of signals: 1 High band edge	2690.199301	-32.04	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 2 High band edge	2690.487013	-30.23	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 High band edge	2690.001499	-31.93	-13.00

Broadband signals:







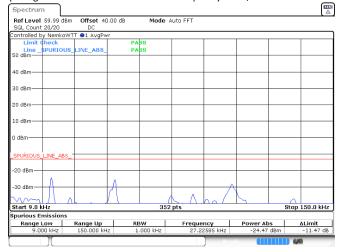




8.5.6 Test data - conducted spurious emissions:

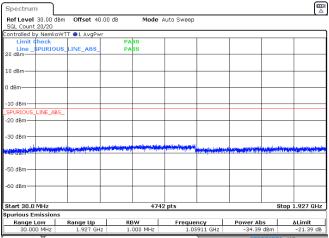
8.5.6.1 Operating frequency band: band 25: 1930 – 1995 MHz

Input signal = **lowest channel** within the frequency block; **narrowband**:



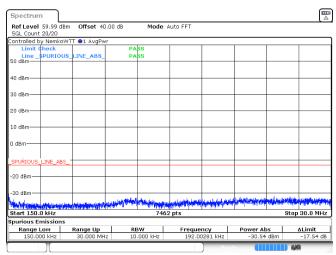
Conducted Spurious Emissions, Low channel, low frequency ran

ge, NB



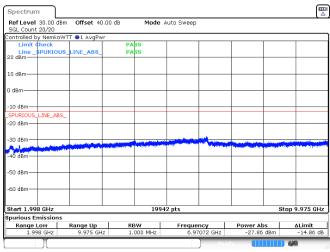
Conducted Spurious Emissions, Low channel, low frequency ran

ge, NB



Conducted Spurious Emissions, Low channel, low frequency ran

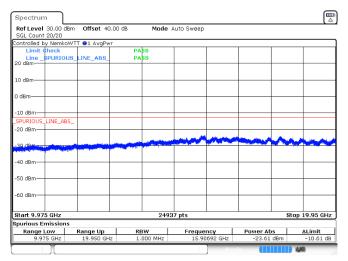
ge, NB



Conducted Spurious Emissions, Low channel, low frequency ran

ge, N

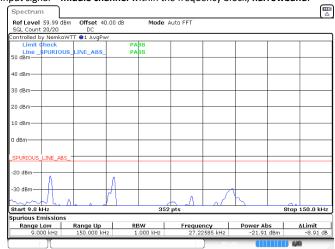




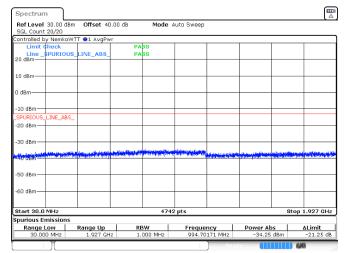
Conducted Spurious Emissions, Low channel, low frequency ran

ge, NB

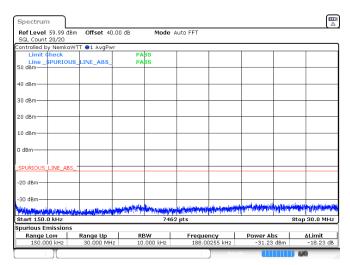
Input signal = middle channel within the frequency block; narrowband:



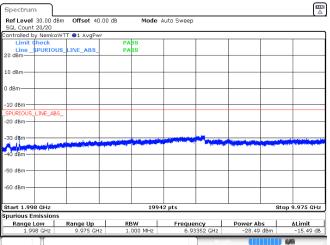
Conducted Spurious Emissions, Middle channel, NB



Conducted Spurious Emissions, Middle channel, NB

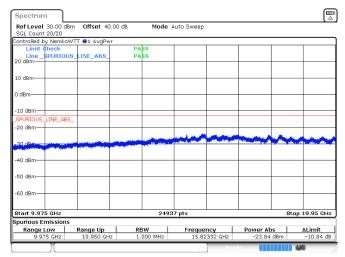


Conducted Spurious Emissions, Middle channel, NB

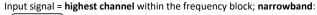


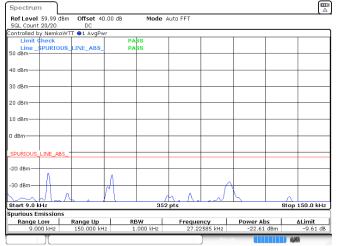
Conducted Spurious Emissions, Middle channel, NB

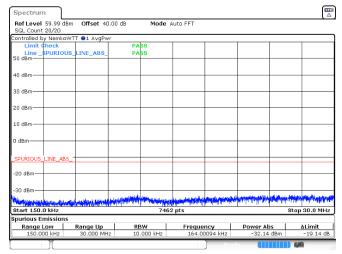




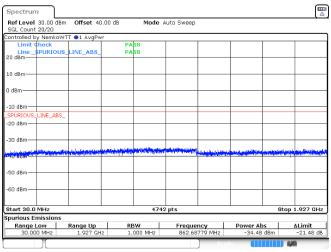
Conducted Spurious Emissions, Middle channel, NB



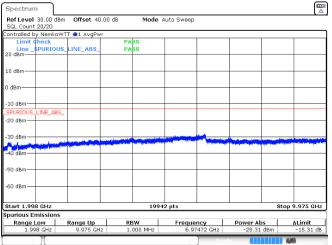




Conducted Spurious Emissions, High channel, NB



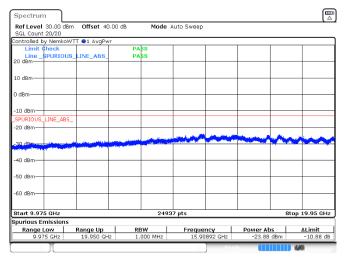
Conducted Spurious Emissions, High channel, NB



Conducted Spurious Emissions, High channel, NB

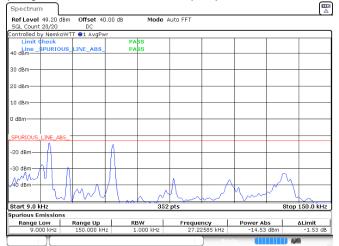
Conducted Spurious Emissions, High channel, NB





Conducted Spurious Emissions, High channel, NB

Input signal = **lowest channel** within the frequency block; **broadband**:

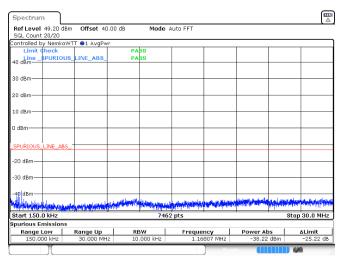


Conducted Spurious Emissions, Low channel, low frequency ran ge, BB

Spectrum Ref Level 30.00 dBm Offset 40.00 dB Mode Auto Sweep SGL Count 20/20 Controlled by NemkoWTT 1 AvgPw SPURIOUS_LINE_ABS 0 dBm INE ABS -30 dBm--60 dBm-Start 30.0 MHz 4742 pts Stop 1.927 GHz Spurious Emissions Range Low ∆Limit -21.74 dB
 Frequency
 Power Abs

 1.04191 GHz
 -34.74 dBm

Conducted Spurious Emissions, Low channel, low frequency ran

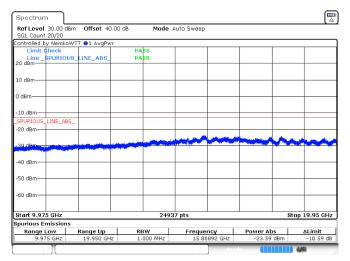


Conducted Spurious Emissions, Low channel, low frequency ran ge, BB

Spectrum Ref Level 30.00 dBm Offset 40.00 dB Mode Auto Sweep SGL Count 20/20 Controlled by NemkoWTT •1 AvgPo SPURIOUS LINE ABS dBm-INE ABS -30 d**B**m 50 dBm--60 dBm-Start 1.998 GHz 19942 pts Stop 9.975 GHz | Spurious Emissions | Range Low | Range Up | 1 998 GHz | 9,975 GHz ΔLimit

Conducted Spurious Emissions, Low channel, low frequency ran





Spectrum

Ref Level 49.20 dBm

ontrolled by NemkoWTT 1 AvgPv

Conducted Spurious Emissions, Middle channel, BB

Ref Level 30.00 dBm Offset 40.00 dB

SPURIOUS

Spectrum

dBm-

-30 dBm

-60 dBm-

Start 1.998 GHz

SGL Count 20/20 Controlled by NemkoWTT •1 AvgPt Limit ¢heck

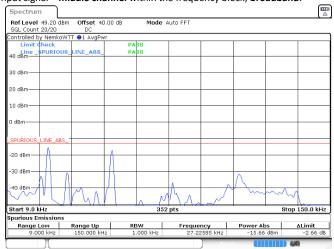
SGL Count 20/20

Offset 40.00 dB

Conducted Spurious Emissions, Low channel, low frequency ran

ge, BB

Input signal = middle channel within the frequency block; broadband:



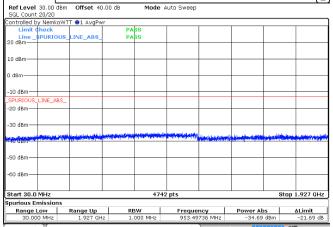
Mode Auto Sweep

19942 pts

Mode Auto FFT

Conducted Spurious Emissions, Middle channel, BB





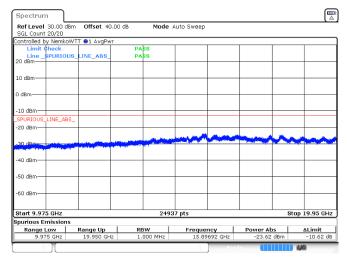
Conducted Spurious Emissions, Middle channel, BB

Conducted Spurious Emissions, Middle channel, BB

Stop 9.975 GHz

ΔLimit n -15.37

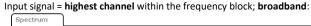


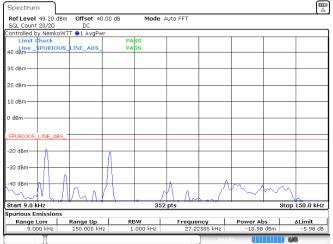


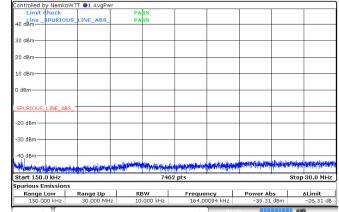
Spectrum

Ref Level 49.20 dBm Offset 40.00 dB

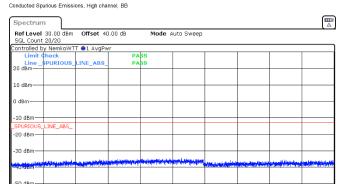
Conducted Spurious Emissions, Middle channel, BB



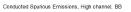


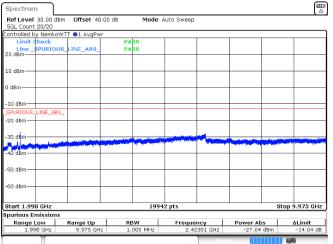


Mode Auto FFT



4742 pts





Conducted Spurious Emissions, High channel, BB

-60 dBm-

Start 30.0 MHz

Range Low 30.000 MHz

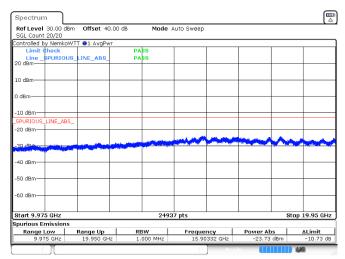
Conducted Spurious Emissions, High channel, BB

Stop 1.927 GHz

| Frequency | Power Abs | ΔLimit | 2 | 1.02991 GHz | -34.22 dBm | -21.22

Range Up



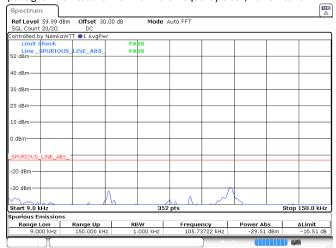


Conducted Spurious Emissions, High channel, BB



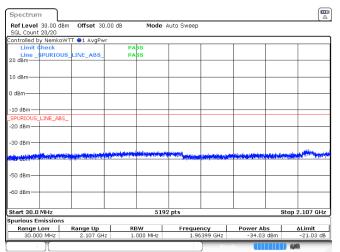
8.5.6.2 Operating frequency band: band 66: 2100 – 2180 MHz

Input signal = **lowest channel** within the frequency block; **narrowband**:



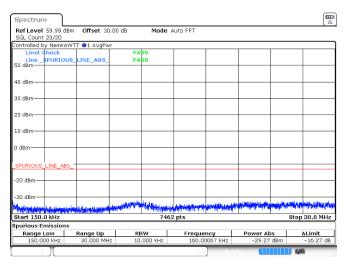
Conducted Spurious Emissions, Low channel, low frequency ran

ge, NB



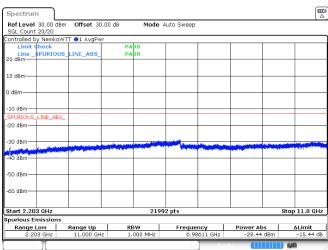
Conducted Spurious Emissions, Low channel, low frequency ran

ge, NB



Conducted Spurious Emissions, Low channel, low frequency ran

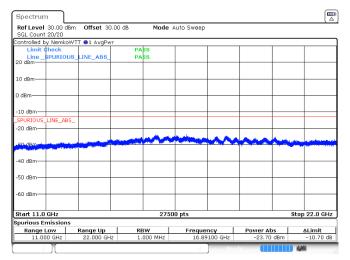
ge, NB



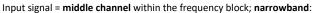
Conducted Spurious Emissions, Low channel, low frequency ran

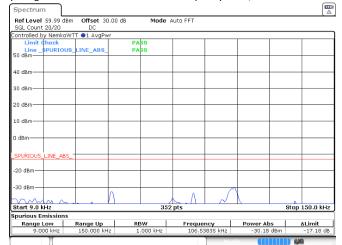
ge, NB



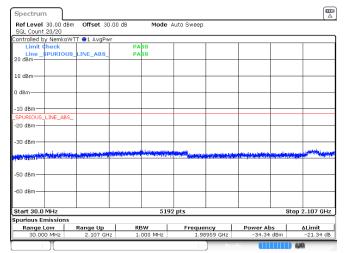


Conducted Spurious Emissions, Low channel, low frequency ran

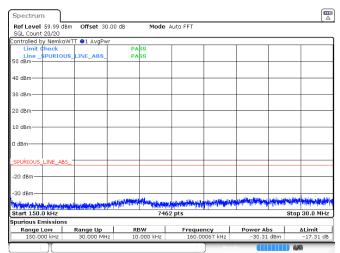




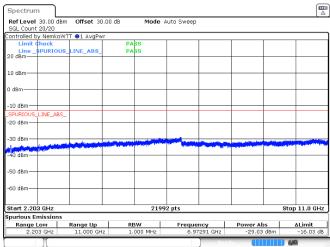
Conducted Spurious Emissions, Middle channel, NB



Conducted Spurious Emissions, Middle channel, NB

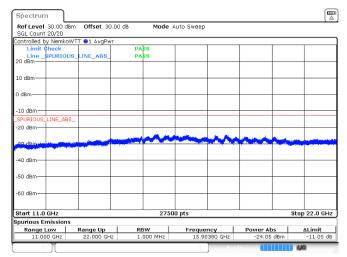


Conducted Spurious Emissions, Middle channel, NB



Conducted Spurious Emissions, Middle channel, NB

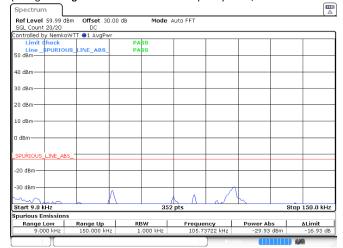


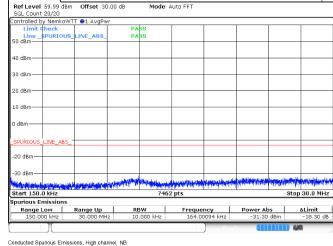


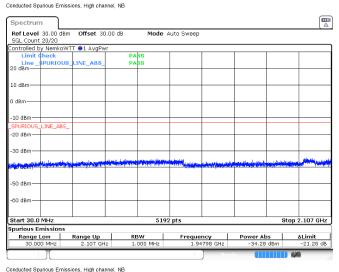
Spectrum

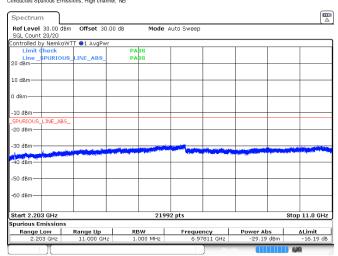
Conducted Spurious Emissions, Middle channel, NB





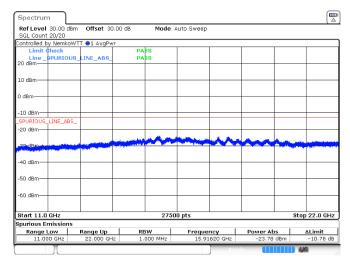






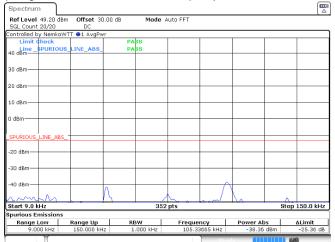
Conducted Spurious Emissions, High channel, NB





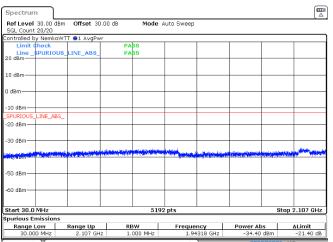
Conducted Spurious Emissions, High channel, NB



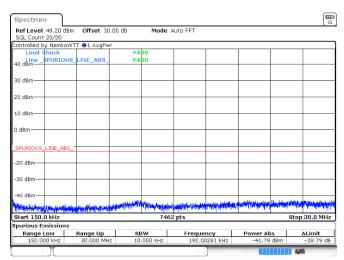


Conducted Spurious Emissions, Low channel, low frequency ran

ge, BB

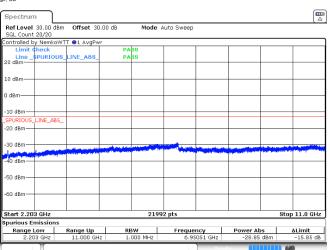


Conducted Spurious Emissions, Low channel, low frequency ran



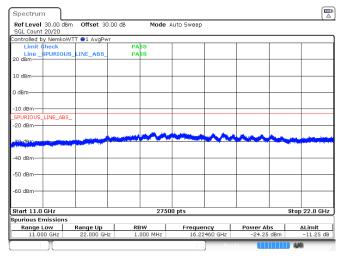
Conducted Spurious Emissions, Low channel, low frequency ran

ge, BB



Conducted Spurious Emissions, Low channel, low frequency ran

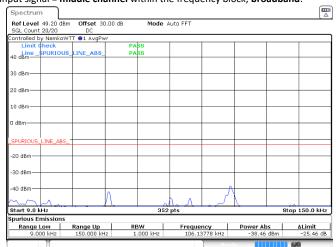




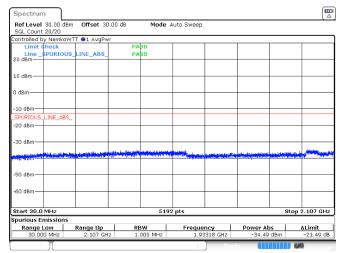
Conducted Spurious Emissions, Low channel, low frequency ran

ge, BB

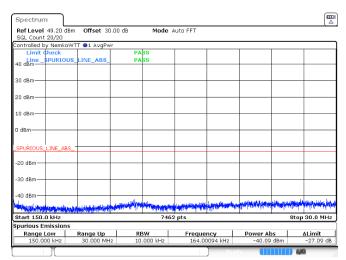
Input signal = middle channel within the frequency block; broadband:



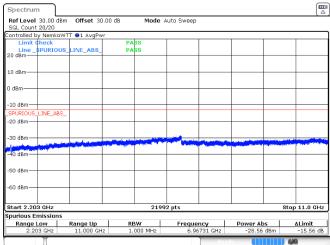
Conducted Spurious Emissions, Middle channel, BB



Conducted Spurious Emissions, Middle channel, BB

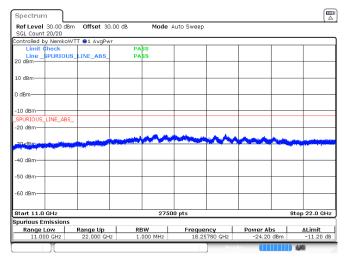


Conducted Spurious Emissions, Middle channel, BB



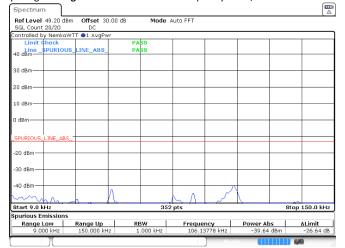
Conducted Spurious Emissions, Middle channel, BB

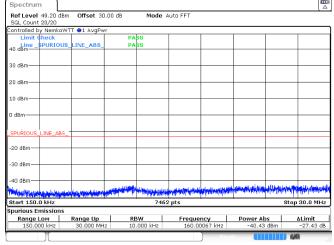


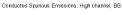


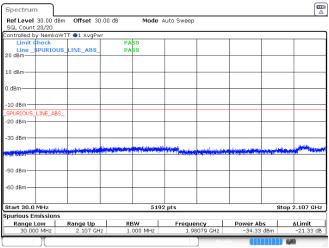
Conducted Spurious Emissions, Middle channel, BB

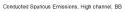


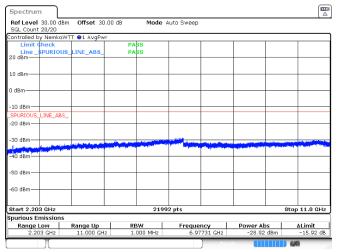








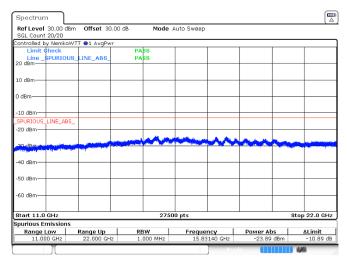




Conducted Spurious Emissions, High channel, BB

Conducted Spurious Emissions, High channel, BB



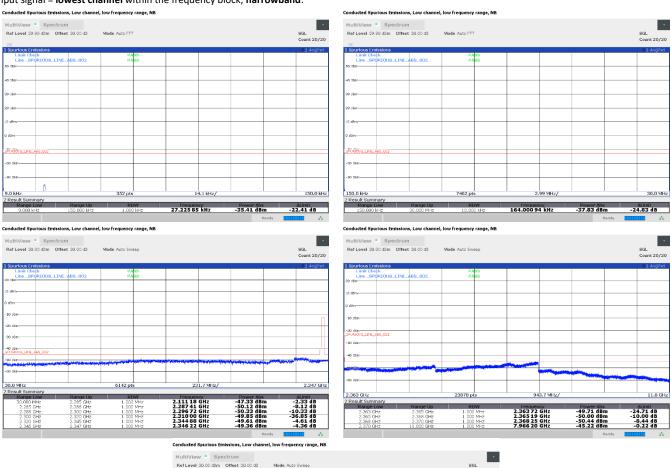


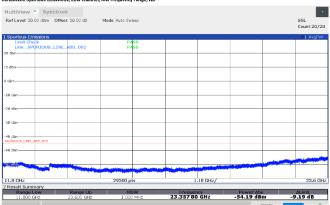
Conducted Spurious Emissions, High channel, BB



8.5.6.3 Operating frequency band: band 30: 2350 – 2360 MHz

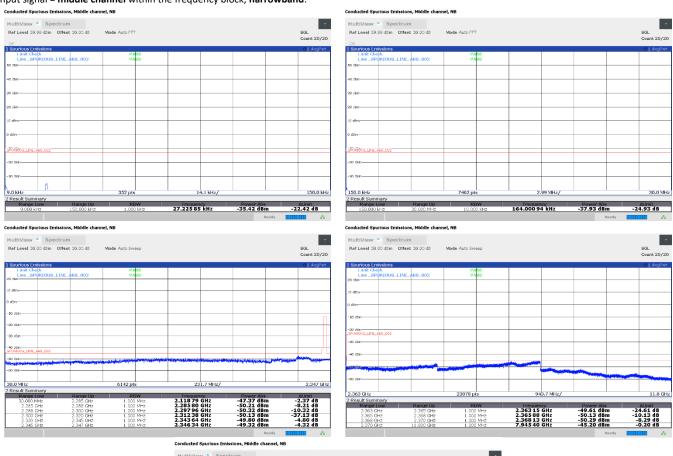
Input signal = **lowest channel** within the frequency block; **narrowband**:

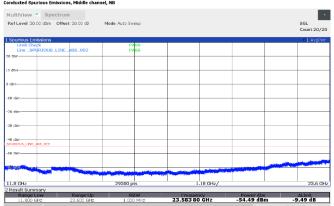






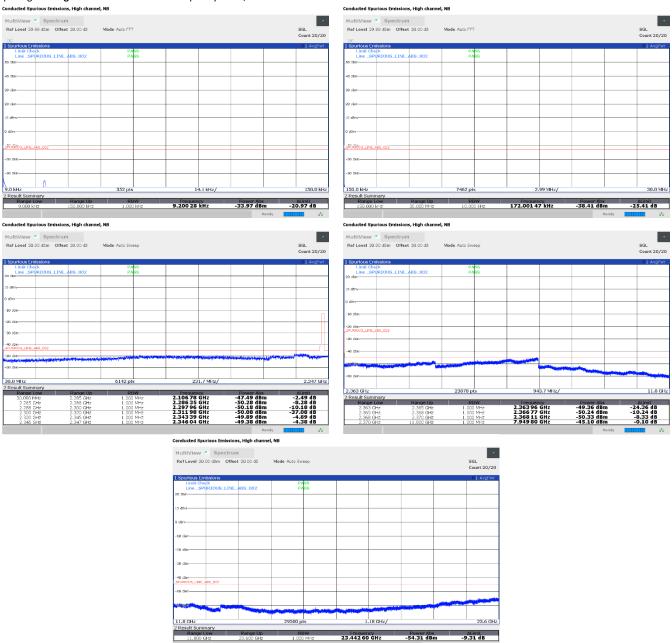
Input signal = middle channel within the frequency block; narrowband:







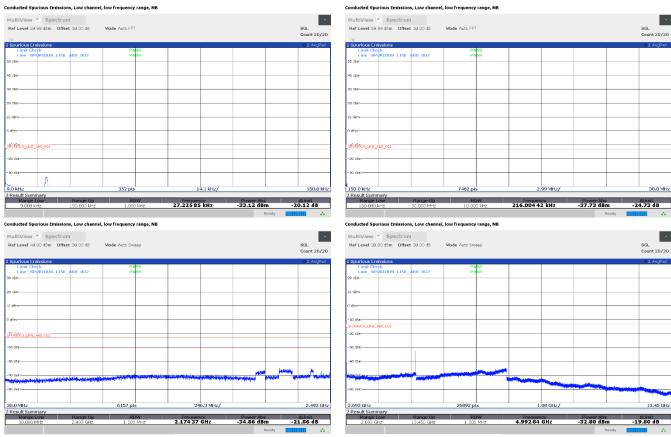
Input signal = **highest channel** within the frequency block; **narrowband**:

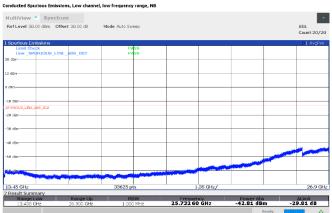




8.5.6.4 Operating frequency band: band 41: 2496 – 2690 MHz

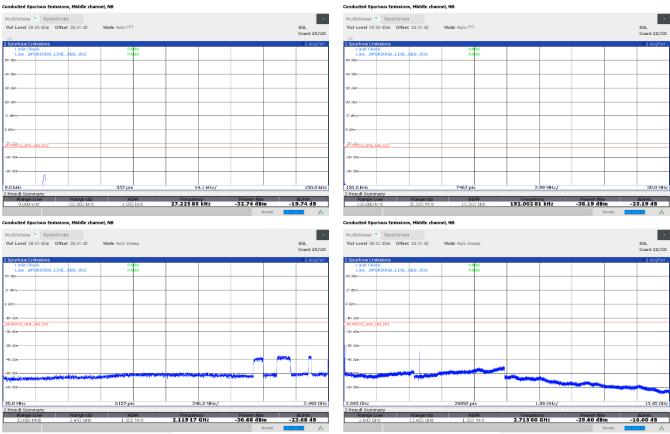
Input signal = **lowest channel** within the frequency block; **narrowband**:







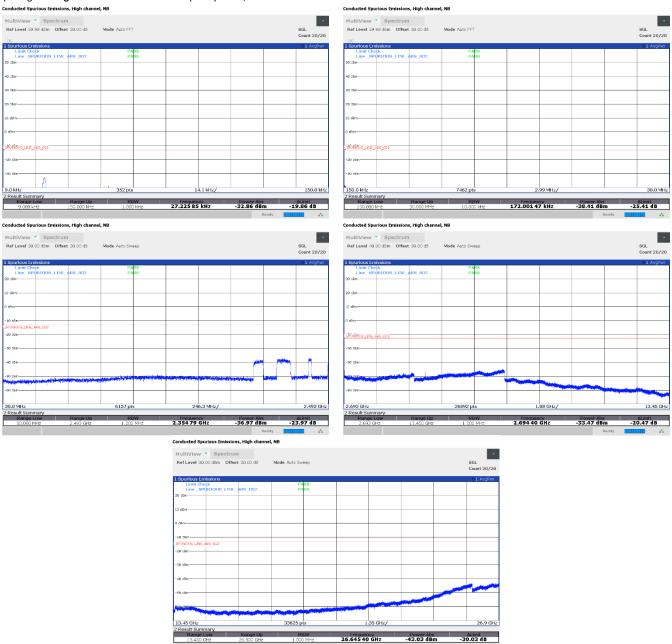
Input signal = middle channel within the frequency block; narrowband:





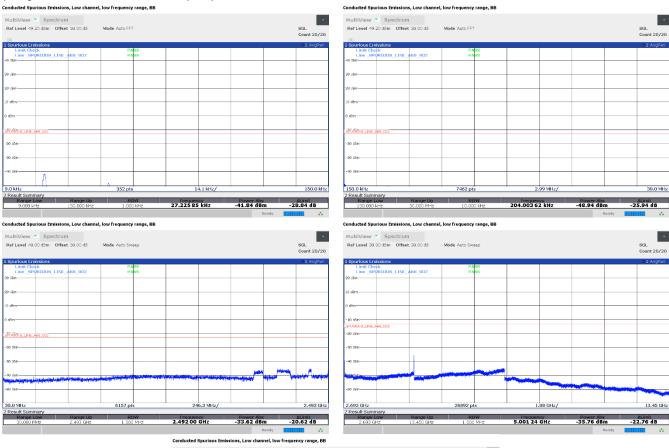


Input signal = **highest channel** within the frequency block; **narrowband**:





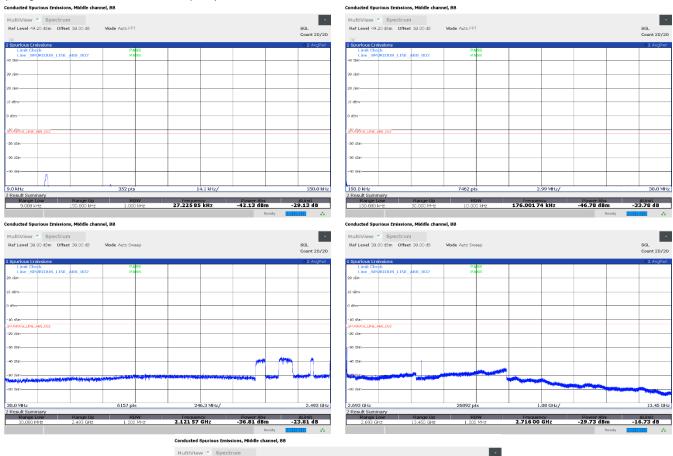
Input signal = **lowest channel** within the frequency block; **broadband**:

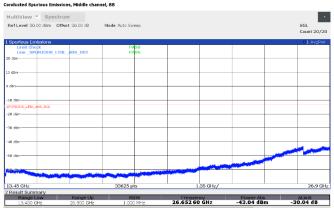






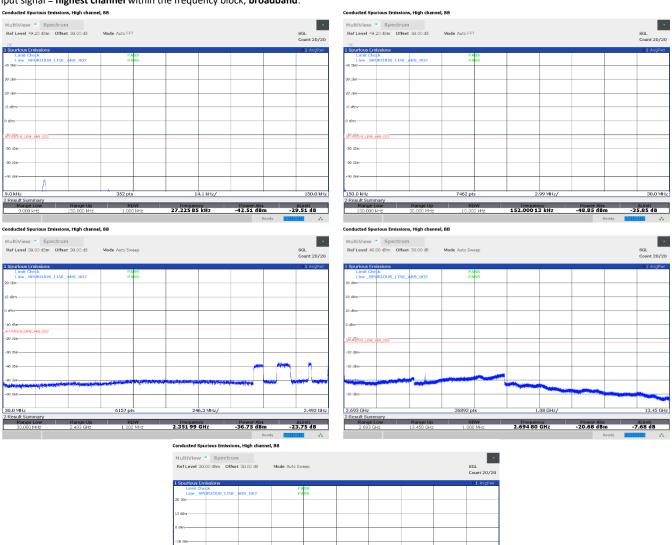
Input signal = middle channel within the frequency block; broadband:







Input signal = highest channel within the frequency block; broadband:



33625 pts

1.35 GHz/

Power Abs -43.35 dBm

Frequency 25.696 20 GHz 26.9 GHz

ΔLimit -30.35 dB Radiated spurious emissions



8.6 Radiated spurious emissions

8.6.1 References and limits

- FCC Part 24.238 & RSS-133 (band 25 operation)
- FCC Part 27.53(a) & RSS-195 (band 30 operation)
- FCC Part 27.53(h) & RSS-139 (band 66) and RSS-199 (band 41) (band 66, and 41 operation)
- ANSI C63.26 Clause 7.2.2.5
- KDB 935210 D05v01r05 Clause 3.8

8.6.2 Test summary

Verdict	Pass		
Test date	February 13, 2024	Temperature	20 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1008 mbar
Test location	□ 10m semi anechoic chamber☒ 3m semi anechoic chamber□ Other:	Relative humidity	51 %

8.6.3 Notes

Testing was performed with a narrowband test signal (MSK modulated, gaussian filter of 0.3 and data rate 270 kbps) and a broadband signal (AWGN, 4.1 MHz 99% occupied bandwidth) on lowest, middle, and highest channels of each supported frequency band. Only the worst-case data (broadband signal) are presented here.

In the range 30 – 1000 MHz, radiated emissions were essentially identical for all operational modes. Thus, data in this range is only presented for one representative operational mode (band 30 operation chosen since the emissions limit is the most stringent).

8.6.4 Setup details

FUT names input during test	120.1/40 / 60.11-				
EUT power input during test	120 VAC / 60 Hz				
EUT setup configuration	☑ Table-top				
	☐ Floor standing				
	☐ Other:				
Measurement details	Receiver/spectrum analyzer settings for frequencies below 1 GHz:				
	Resolution bandwidth	100 kHz			
	Detector mode	Peak (Preview measurement)			
	Trace mode	Max Hold			
	Measurement time	 100 ms (Peak preview measurement) 			
		– 5000 ms (Peak final measurement)			
	Receiver/spectrum analyzer settings for frequencies above 1 GHz:				
	Resolution bandwidth	1 MHz			
	Detector mode	Peak (Preview measurement)			
		Peak (Final measurement)			
	Trace mode	Max Hold			
	Measurement time	100 ms (Peak preview measurement)			
		5000 ms (Peak final measurement)			



8.6.5 Test data

8.6.5.1 Representative data: 30 – 1000 MHz

Full Spectrum

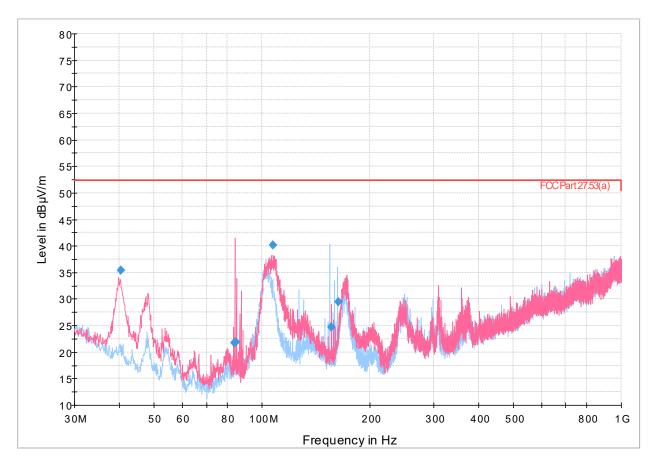


Figure 8.6-1: Radiated emissions spectral plot (30 MHz - 1 GHz)

Table 8.6-1: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
40.374000	35.38	52.38	17.00	5000.0	100.000	100.0	V	263.0	18.9
83.629000	21.79	52.38	30.59	5000.0	100.000	263.0	V	0.0	14.3
84.622000	21.87	52.38	30.51	5000.0	100.000	364.0	V	20.0	14.4
107.054000	40.22	52.38	12.16	5000.0	100.000	100.0	V	135.0	17.9
155.457000	24.70	52.38	27.68	5000.0	100.000	201.0	Н	100.0	17.7
163.274000	29.46	52.38	22.92	5000.0	100.000	183.0	Н	212.0	17.1

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.