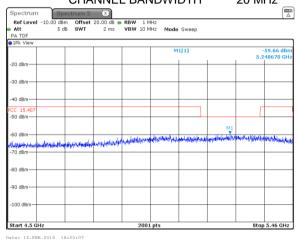
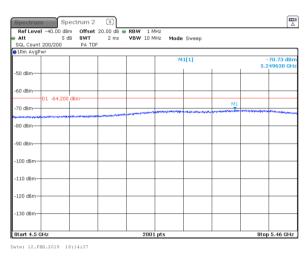


Test specification: FCC section 15.407(b), RSS-247 section 6.2.4.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 11-Feb-19 Temperature: 26 °C Relative Humidity: 45 % Air Pressure: 1020 hPa Power: 48 VDC Remarks:

Plot 7.10.23 Conducted spurious emission measurements in the range 4.5 - 5.46 GHz

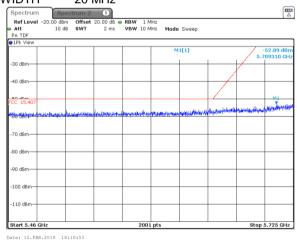
CARRIER FREQUENCY CHANNEL BANDWIDTH 5788 MHz 20 MHz





Plot 7.10.24 Conducted spurious emission measurements in the range 5.46 – 5.725 GHz

CARRIER FREQUENCY CHANNEL BANDWIDTH 5788 MHz 20 MHz



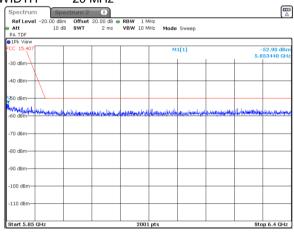




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.4.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	11-Feb-19	verdict.	PASS					
Temperature: 26 °C	Relative Humidity: 45 %	Air Pressure: 1020 hPa	Power: 48 VDC					
Remarks:								

Plot 7.10.25 Conducted spurious emission measurements in the range 5.85 – 6.4 GHz CARRIER FREQUENCY 5788 MHz

CHANNEL BANDWIDTH 20 MHz



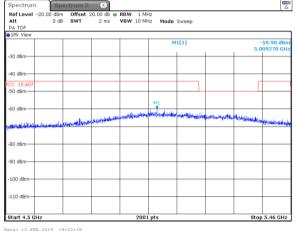


Test specification: FCC section 15.407(b), RSS-247 section 6.2.4.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 11-Feb-19 Temperature: 26 °C Relative Humidity: 45 % Air Pressure: 1020 hPa Power: 48 VDC Remarks:

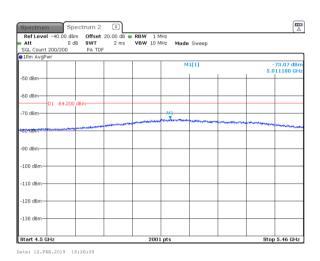
Plot 7.10.26 Conducted spurious emission measurements in the range 4.5 - 5.46 GHz

5840 MHz

CHANNEL BANDWIDTH 20 MHz m 2 X set 20.00 dB • T 2 ms RBW 1 MHz
 VBW 10 MHz Mode Sweep

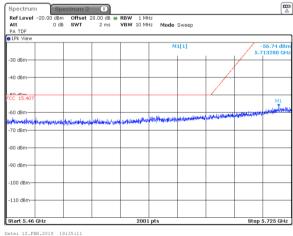


CARRIER FREQUENCY



Plot 7.10.27 Conducted spurious emission measurements in the range 5.46 - 5.725 GHz CARRIER FREQUENCY 5840 MHz

CHANNEL BANDWIDTH 20 MHz



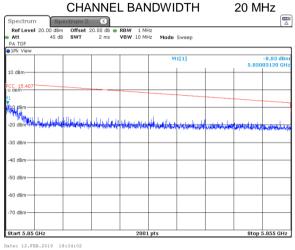


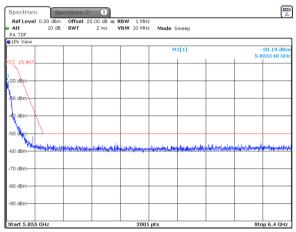


Test specification:	FCC section 15.407(b), RSS-247 section 6.2.4.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, ANS	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	11-Feb-19	verdict.	PASS					
Temperature: 26 °C	Relative Humidity: 45 %	Air Pressure: 1020 hPa	Power: 48 VDC					
Remarks:								

Plot 7.10.28 Conducted spurious emission measurements in the range 5.85 – 6.4 GHz

CARRIER FREQUENCY 5840 MHz
CHANNEL BANDWIDTH 20 MHz









Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

7.11 Conducted out of band emissions at 5150 – 5250 MHz range

7.11.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.11.1 & EIRP of undesirable emission limits are given in Table 7.11.2

Table 7.11.1 Unwanted emissions limit within restricted bands above 1 GHz

Frequency, MHz	Field strength a	t 3 m, dB(μV/m)*	Equivalent EIRP*, dBm		
riequelicy, winz	Peak	Average	Peak	Average	
1000 – 40000	74.0	54.0	-21.2	-41.2	

^{*} Equivalent EIRP was calculated as follow: Field strength – 95.2

Table 7.11.2 EIRP of undesirable emission limits outside restricted bands above 1 GHz

Frequency, MHz	EIRP of spurious, dBm/MHz	
Outside 5150-5350 band	-27	

7.11.2 Test procedure

- 7.11.2.1 The EUT was set up as shown in Figure 7.11.1, energized and the performance check was conducted.
- 7.11.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- **7.11.2.3** The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set to 1 MHz.
- **7.11.2.4** The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- **7.11.2.5** The maximum band edge emission and modulation product outside of the band were measured as provided in the associated tables and plots.
- **7.11.2.6** The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the mid and highest carrier frequencies.
- 7.11.2.7 Test results are shown in the Table 7.11.3, Table 7.11.4, Table 7.11.5 and the associated plots.

Figure 7.11.1 Setup for conducted spurious emissions





Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

Table 7.11.3 Conducted spurious emission within restricted band test results

ASSIGNED FREQUENCY RANGE: 5.15 – 5.25 GHz INVESTIGATED FREQUENCY RANGE: 4500 - 6400 MHz

MODULATION: QPSK **DETECTOR USED:** Peak RESOLUTION BANDWIDTH 1000 kHz

EUT CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), non-

coherent signal

CHANNE	L BANWI	OTH:			10	MHz					
Fraguenav	Antonno	Antenna		Peak				Averag	е		
Frequency, MHz	Antenna gain, dBi	gain	SA reading,	EIRP**,	Limit,	Margin***,	SA reading,	EIRP**,	Limit,	Margin***,	Verdict
1411 12	gain, ubi	array*, dB	dBm	dBm/MHz	dBm	dB	dBm	dBm/MHz	dBm	dB	
Low carrie	r frequen	су									
5149.840	17.0	3.0	-49.25	-29.25	-21.2	-8.05	-65.09	-42.62	-41.2	-1.42	Pass
5497.599	17.0	3.0	-59.01	-39.01	-21.2	-17.81	-70.65	-48.18	-41.2	-6.98	Pass
Mid carrie	r frequenc	су									
4915.300	17.0	3.0	-50.88	-30.88	-21.2	-9.68	-64.42	-41.95	-41.2	-0.75	Pass
5406.539	17.0	3.0	-56.11	-36.11	-21.2	-14.91	-72.71	-50.24	-41.2	-9.04	Pass
High carrie	er frequer	псу									
4915.300	17.0	3.0	-50.39	-30.39	-21.2	-9.19	-64.07	-41.60	-41.2	-0.40	Pass
5369.103	17.0	3.0	-50.38	-30.38	-21.2	-9.18	-69.60	-47.13	-41.2	-5.93	Pass

CHANNEL BANWIDTH: 15 MHz

017/1111	,				10 1111						
Francisco	Antonno	Antenna Peak			Average						
Frequency,		gain	SA reading,	EIRP**,	Limit,	Margin***,	SA reading,	EIRP**,	Limit,	Margin***,	Verdict
MHz	gain, dBi	array*, dB	dBm	dBm/MHz	dBm	dB	dBm	dBm/MHz	dBm	dB	
Low carrie	r frequen	су									
5149.840	17.0	3.0	-48.43	-28.43	-21.2	-7.23	-63.79	-41.32	-41.2	-0.12	Pass
5391.367	17.0	3.0	-54.51	-34.51	-21.2	-13.31	-69.68	-47.21	-41.2	-6.01	Pass
Mid carrier	frequenc	y									
5115.080	17.0	3.0	-51.45	-31.45	-21.2	-10.25	-65.00	-42.53	-41.2	-1.33	Pass
5378.668	17.0	3.0	-50.01	-30.01	-21.2	-8.81	-71.38	-48.91	-41.2	-7.71	Pass
High carrie	er frequen	су									
4871.130	17.0	3.0	-53.12	-33.12	-21.2	-11.92	-64.31	-41.84	-41.2	-0.64	Pass
5419.843	17.0	3.0	-54.02	-34.02	-21.2	-12.82	-72.08	-49.61	-41.2	-8.41	Pass





Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, ANS	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

Table 7.11.3 Conducted spurious emission within restricted band test results

ASSIGNED FREQUENCY RANGE: 5.15 - 5.25 GHz 4500 - 6400 MHz INVESTIGATED FREQUENCY RANGE:

MODULATION: QPSK **DETECTOR USED:** Peak RESOLUTION BANDWIDTH 1000 kHz

EUT CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), non-

coherent signal 20 MHz

CHANNEL BANWIDTH:

CHANNEL BANWIDTH. 20 WHZ											
	Antenna			Peak			Average				
Frequency, MHz	Antenna gain, dBi	nain	SA reading, dBm	Peak EIRP**, dBm/MHz	Limit, dBm	Margin***, dB	SA reading, dBm	Average EIRP****, dBm/MHz	Limit, dBm	Margin***, dB	Verdict
Low carrie	r frequen	су									
5149.190	17.0	3.0	-46.18	-26.18	-21.2	-4.98	-63.72	-41.25	-41.2	-0.05	Pass
5406.869	17.0	3.0	-52.12	-32.12	-21.2	-10.92	-66.05	-43.58	-41.2	-2.38	Pass
Mid carrier	frequenc	y									
4915.300	17.0	3.0	-56.23	-36.23	-21.2	-15.03	-64.09	-41.62	-41.2	-0.42	Pass
5406.759	17.0	3.0	-57.64	-37.64	-21.2	-16.44	-72.06	-49.59	-41.2	-8.39	Pass
High carrie	High carrier frequency										
4915.300	17.0	3.0	-54.79	-34.79	-21.2	-13.59	-63.87	-41.40	-41.2	-0.20	Pass
5406.869	17.0	3.0	-58.11	-38.11	-21.2	-16.91	-71.25	-48.78	-41.2	-7.58	Pass

^{* -} Antenna gain array = 10log(N_{ant}), where N_{ant} = 2 (two cross-polarized antennas with non-coherent signals)

Table 7.11.4 Duty cycle factor calculation

Burst dration, ms	Burst period, ms	Duty cycle*	Duty cycle factor**, dB	
2.83	5.00	0.566	2.47	

^{*-} Duty cycle = Burst duration / Burst period

^{** -} Peak EIRP = SA reading + Antenna gain + Antenna gain array

^{*** -} Margin = EIRP – specified limit.

**** - Average EIRP = SA reading + Antenna gain + Antenna gain array + Duty cycle factor

^{** -} Duty cycle factor = 10log(1/Duty cycle)



Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions						
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7					
Test mode:	Compliance	Verdict:	PASS				
Date(s):	10-Feb-19	verdict.	PASS				
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC				
Remarks:							

Table 7.11.5 Conducted spurious emission outside restricted band test results

ASSIGNED FREQUENCY RANGE: 5.15 – 5.25 GHz INVESTIGATED FREQUENCY RANGE: 4500 - 6400 MHz

MODULATION: QPSK
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz

EUT CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), non-

coherent signal

CHANNEL BANWIDTH:

10 MHz

15 MHz

·····			10 1111112				
Frequency, MHz	SA reading, dBm	Antenna gain, dBi	Antenna gain array*, dB	EIRP**, dBm/MHz	Limit, dBm/MHz	Margin***, dB	Verdict
Low carrier fre	Low carrier frequency						
5499.700	-58.97	17.0	3.0	-38.97	-27.0	-11.97	Pass
Mid carrier free	Mid carrier frequency						
5690.890	-50.52	17.0	3.0	-30.52	-27.0	-3.52	Pass
High carrier frequency							
5736.460	-50.15	17.0	3.0	-30.15	-27.0	-3.15	Pass

CHANNEL BANWIDTH:

Frequency, MHz	SA reading, dBm	Antenna gain, dBi	Antenna gain array*, dB	EIRP**, dBm/MHz	Limit, dBm/MHz	Margin***, dB	Verdict	
Low carrier fre	Low carrier frequency							
5932.820	-55.24	17.0	3.0	-35.24	-27.0	-8.24	Pass	
Mid carrier free	Mid carrier frequency							
5753.370	-51.27	17.0	3.0	-31.27	-27.0	-4.27	Pass	
High carrier frequency								
5795.180	-51.53	17.0	3.0	-31.53	-27.0	-4.53	Pass	

CHANNEL BANWIDTH: 20 MHz

Frequency, MHz	SA reading, dBm	Antenna gain, dBi	Antenna gain array*, dB	EIRP**, dBm/MHz	Limit, dBm/MHz	Margin***, dB	Verdict
Low carrier fre	Low carrier frequency						
5576.740	-57.78	17.0	3.0	-37.78	-27.0	-10.78	Pass
Mid carrier free	Mid carrier frequency						
5697.000	-53.33	17.0	3.0	-33.33	-27.0	-6.33	Pass
High carrier frequency							
5730.350	-52.53	17.0	3.0	-32.53	-27.0	-5.53	Pass

^{* -} Antenna gain array = 10log(N_{ant}), where N_{ant} = 2 (two cross-polarized antennas)

Reference numbers of test equipment used

_					
	HL 3901	HL 4355			

Full description is given in Appendix A.

^{** -} EIRP = SA reading + Antenna gain + Antenna gain array

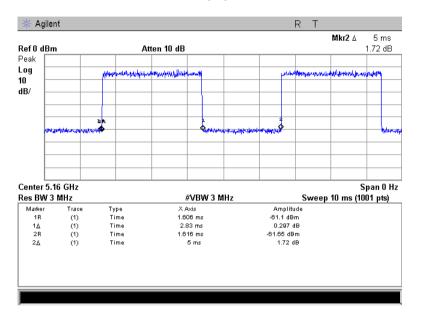
^{*** -} Margin = EIRP - specified limit.





Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions				
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	10-Feb-19	verdict.	PASS		
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC		
Remarks:					

Plot 7.11.1 Duty cycle



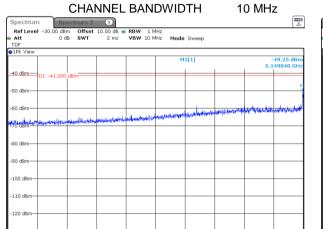




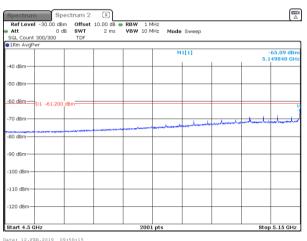
Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 10-Feb-19 Temperature: 25 °C Air Pressure: 1019 hPa Power: 48 VDC Relative Humidity: 48 % Remarks:

Plot 7.11.2 Conducted spurious emission measurements in the range 4.5 – 5.15 GHz

5160 MHz



CARRIER FREQUENCY

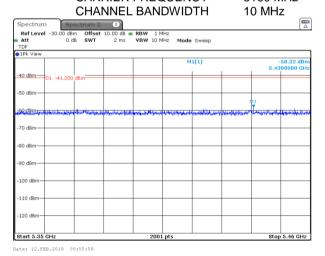


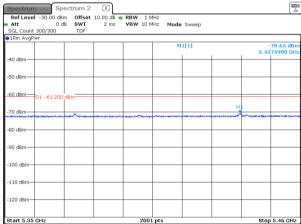
*Applied Limit = Specification limit - Antenna Gain - Antenna Array gain

Plot 7.11.3 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz

CARRIER FREQUENCY 5160 MHz

Date: 12.FEB.2019 09:56:49



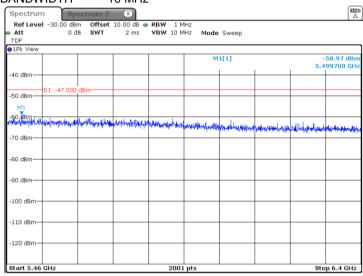




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.4 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5160 MHz CHANNEL BANDWIDTH 10 MHz



Date: 12.FEB.2019 09:53:34





30 dBm

40 dBm-

-120 dBn

Start 4.5 GHz

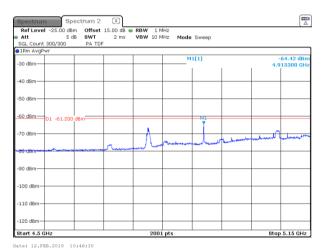
Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 10-Feb-19 Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC Remarks:

Plot 7.11.5 Conducted spurious emission measurements in the range 4.5 - 5.15 GHz

CARRIER FREQUENCY 5200 MHz CHANNEL BANDWIDTH 10 MHz
 Spectrum 2
 X

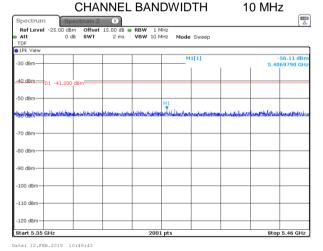
 0 dBm
 Offset 15.00 dB

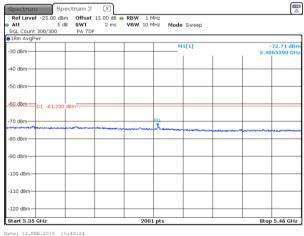
 5 dB
 SWT 2 ms
 Ref Level -25.00 Mode Sweep



Plot 7.11.6 Conducted spurious emission measurements in the range 5.35 - 5.46 GHz CARRIER FREQUENCY 5200 MHz

Stop 5.15 GHz



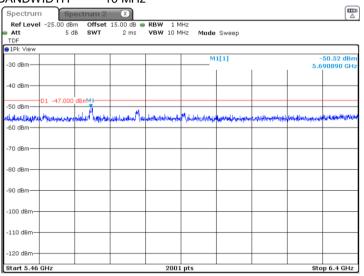




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.7 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5200 MHz CHANNEL BANDWIDTH 10 MHz



Date: 12.FEB.2019 10:53:03





Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions

Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7

Test mode: Compliance Verdict: PASS

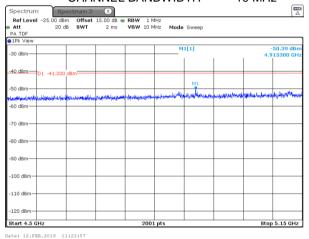
Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC

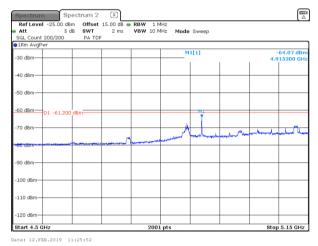
Remarks:

Plot 7.11.8 Conducted spurious emission measurements in the range 4.5 - 5.15 GHz

CARRIER FREQUENCY 5.
CHANNEL BANDWIDTH 1.

5245 MHz 10 MHz





Plot 7.11.9 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz
CARRIER FREQUENCY 5245 MHz

CHANNEL BANDWIDTH

Spectrum

Spectrum

Ref Level -25.00 dem

Offset 15.00 de RBW 1 MHz

Att 20 de SWY 2 ms VBW 10 MHz

Node Sweep

PA TOF

30 dem

-01 -41.200 dem

N1

So dem

-70 dem

-90 dem

-90 dem

-110 dem

-120 dem

-120 dem

Start S.35 GHz

Stop S.46 GHz

Date: 12.FEB.2019 11:23:06

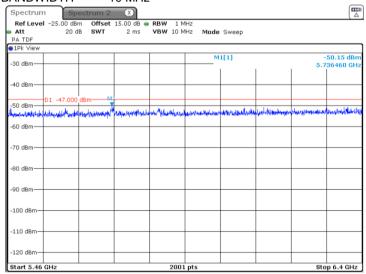




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.10 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5245 MHz
CHANNEL BANDWIDTH 10 MHz



Date: 12.FEB.2019 11:21:45

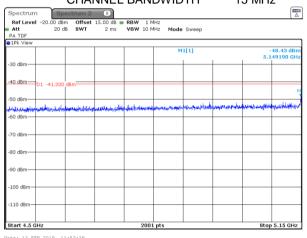


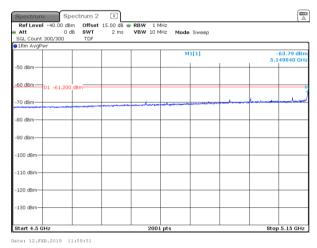


Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 10-Feb-19 Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC Remarks:

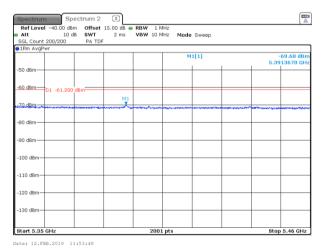
Plot 7.11.11 Conducted spurious emission measurements in the range 4.5 – 5.15 GHz

CARRIER FREQUENCY CHANNEL BANDWIDTH 5165 MHz 15 MHz





Plot 7.11.12 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz
CARRIER FREQUENCY 5165 MHz

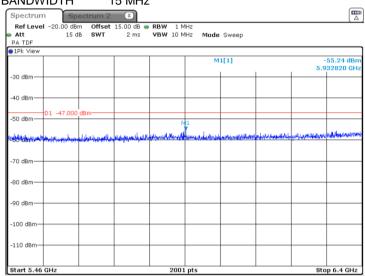




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.13 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5165 MHz CHANNEL BANDWIDTH 15 MHz



Date: 12.FEB.2019 11:49:54





Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions

Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7

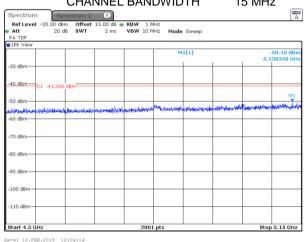
Test mode: Compliance Verdict: PASS

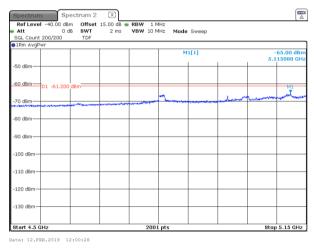
Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC

Remarks:

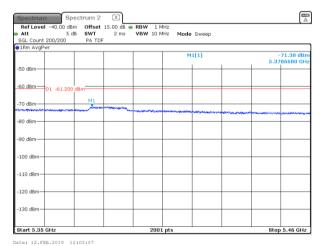
Plot 7.11.14 Conducted spurious emission measurements in the range 4.5 – 5.15 GHz

CARRIER FREQUENCY CHANNEL BANDWIDTH 5200 MHz 15 MHz





Plot 7.11.15 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz
CARRIER FREQUENCY 5200 MHz

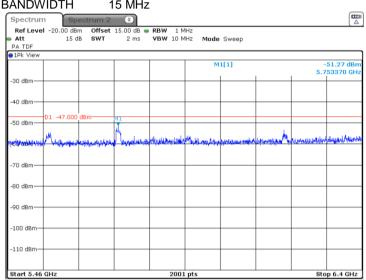




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.16 Conducted spurious emission measurements in the range 5.46 - 6.4 GHz

CARRIER FREQUENCY 5200 MHz CHANNEL BANDWIDTH 15 MHz



Date: 12.FEB.2019 12:06:30





Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions

Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7

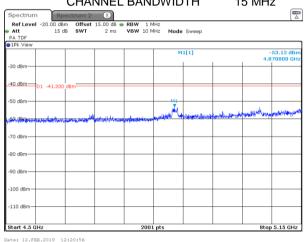
Test mode: Compliance Verdict: PASS

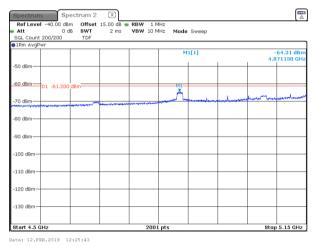
Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC

Remarks:

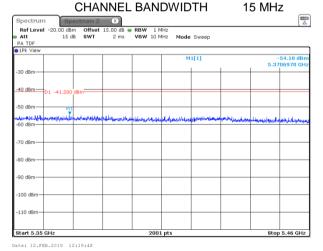
Plot 7.11.17 Conducted spurious emission measurements in the range 4.5 – 5.15 GHz

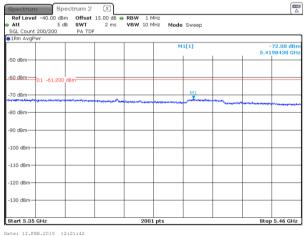
CARRIER FREQUENCY CHANNEL BANDWIDTH 5240 MHz 15 MHz





Plot 7.11.18 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz CARRIER FREQUENCY 5240 MHz



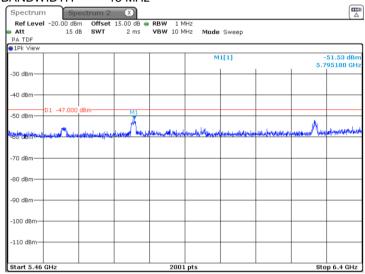




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.19 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5240 MHz
CHANNEL BANDWIDTH 15 MHz



Date: 12.FEB.2019 12:18:21

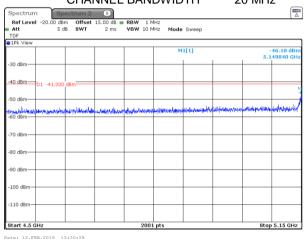


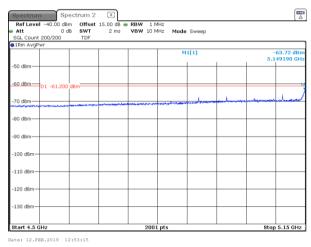


Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 10-Feb-19 Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC Remarks:

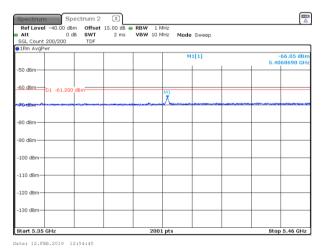
Plot 7.11.20 Conducted spurious emission measurements in the range 4.5 - 5.15 GHz

CARRIER FREQUENCY CHANNEL BANDWIDTH 5165 MHz 20 MHz





Plot 7.11.21 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz
CARRIER FREQUENCY 5165 MHz

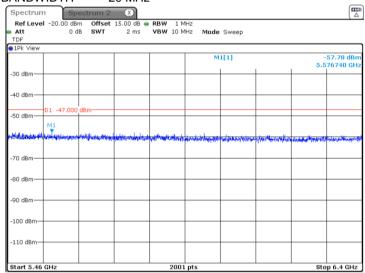




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions			
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	10-Feb-19	verdict.	PASS	
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC	
Remarks:				

Plot 7.11.22 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5165 MHz CHANNEL BANDWIDTH 20 MHz



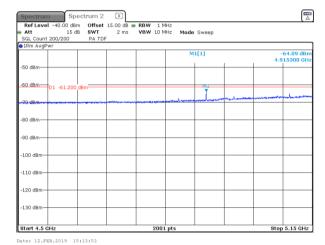
Date: 12.FEB.2019 12:33:07





Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 10-Feb-19 Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC Remarks:

Plot 7.11.23 Conducted spurious emission measurements in the range 4.5 – 5.15 GHz
CARRIER FREQUENCY 5200 MHz



Date: 12.FEB.2019 15:15:28

Ref Level -20.0

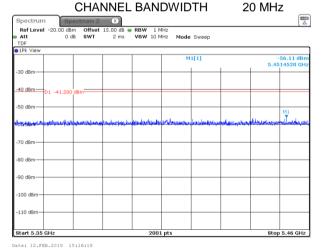
40 dBm

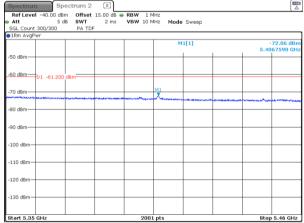
70 dBm

110 di

Plot 7.11.24 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz
CARRIER FREQUENCY 5200 MHz

Stop 5.15 GHz





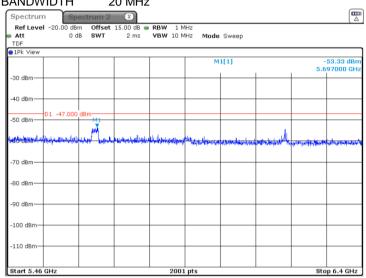
Date: 12.FEB.2019 13:37:06



Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

Plot 7.11.25 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5200 MHz
CHANNEL BANDWIDTH 20 MHz



Date: 12.FEB.2019 15:17:34





Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions

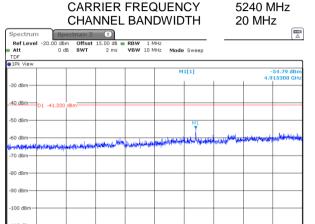
Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7

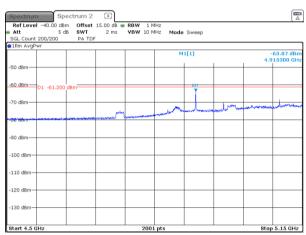
Test mode: Compliance Verdict: PASS

Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC

Remarks:

Plot 7.11.26 Conducted spurious emission measurements in the range 4.5 – 5.15 GHz

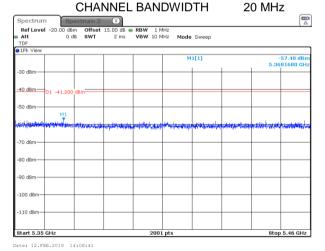


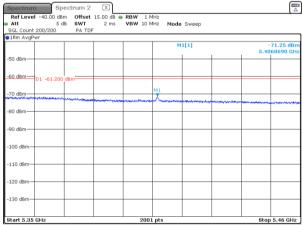


Date: 12.FEB.2019 14:07:55

Plot 7.11.27 Conducted spurious emission measurements in the range 5.35 – 5.46 GHz
CARRIER FREQUENCY 5240 MHz

Stop 5.15 GHz



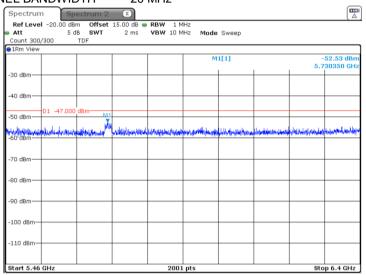




Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, ANS	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

Plot 7.11.28 Conducted spurious emission measurements in the range 5.46 – 6.4 GHz

CARRIER FREQUENCY 5240 MHz CHANNEL BANDWIDTH 20 MHz



Date: 12.FEB.2019 14:09:54





Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

7.12 Conducted out of band emissions at 5150 - 5250 MHz range

7.12.1 General

This test was performed to measure spurious emissions from the EUT near the band edges and within the pass band of the antenna. Specification test limits are given in Table 7.12.1 & EIRP of undesirable emission limits are given in Table 7.12.2

Table 7.12.1 Unwanted emissions limit within restricted bands above 1 GHz

Frequency, MHz	Field strength at	t 3 m, dB(μV/m)*	Equivalent EIRP*, dBm			
Frequency, MITZ	Peak	Average	Peak	Average		
1000 – 40000	74.0	54.0	-21.2	-41.2		

^{*} Equivalent EIRP was calculated as follow: Field strength - 95.2

Table 7.12.2 EIRP of undesirable emission limits outside restricted bands above 1 GHz

Frequency, MHz	EIRP of spurious, dBm/MHz
Outside 5150-5350 band	-27

Test procedure

- 7.12.1.1 The EUT was set up as shown in Figure 7.12.1, energized and the performance check was conducted.
- **7.12.1.2** The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- **7.12.1.3** The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set to 1 MHz.
- **7.12.1.4** The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- **7.12.1.5** The maximum band edge emission and modulation product outside of the band were measured as provided in the associated tables and plots.
- **7.12.1.6** The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the mid and highest carrier frequencies.
- 7.12.1.7 Test results are shown in the Table 7.12.3, Table 7.12.4, Table 7.12.5 and the associated plots.

Figure 7.12.1 Setup for conducted spurious emissions





Test specification: FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions Test procedure: KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7 Test mode: Compliance **PASS** Verdict: Date(s): 10-Feb-19 Temperature: 25 °C Relative Humidity: 48 % Air Pressure: 1019 hPa Power: 48 VDC Remarks:

Table 7.12.3 Conducted spurious emission within restricted band test results

ASSIGNED FREQUENCY: 5.15 - 5.25 GHz INVESTIGATED FREQUENCY RANGE: 4500 - 6400 MHz

MODULATION: QPSK

DETECTOR USED: Peak/Average RESOLUTION BANDWIDTH: 1000 kHz

EUT CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas),

coherent signal

					000.	onit orginal					
CHANNEL	BANWID	TH:			10 MF	Ηz					
Fraguenay	Antonno	Antenna		Peak				Average			
Frequency, MHz	Antenna gain, dBi	gain	SA reading,	EIRP**,	Limit,	Margin***,	SA reading,	EIRP**,	Limit,	Margin***,	Verdict
IVITIZ	gaiii, ubi	array*, dB	dBm	dBm/MHz	dBm	dB	dBm	dBm/MHz	dBm	dB	
Low carrie	r frequenc	су									
5149.840	17.0	6.0	-51.28	-28.28	-21.2	-7.08	-66.76	-41.29	-41.2	-0.09	Pass
5437.544	17.0	6.0	-58.67	-35.67	-21.2	-14.47	-70.45	-44.98	-41.2	-3.87	Pass
Mid carrier	frequenc	y									
4915.300	17.0	6.0	-55.78	-32.78	-21.2	-11.58	-66.82	-41.35	-41.2	-0.15	Pass
5376.139	17.0	6.0	-55.98	-32.98	-21.2	-11.78	-72.89	-47.42	-41.2	-6.22	Pass
High carrie	High carrier frequency										
4915.300	17.0	6.0	-56.12	-33.12	-21.2	-11.92	-66.78	-41.31	-41.2	-0.11	Pass
5370.477	17.0	6.0	-56.21	-33.21	-21.2	-12.01	-70.27	-44.80	-41.2	-3.60	Pass

CHANNEL BANWIDTH: 15 MHz

	Antonno									
Frequency, Antenna Antenna			Peak			Average				
	gain	SA reading,	EIRP**,	Limit,	Margin***,	SA reading,	EIRP**,	Limit,	Margin***,	Verdict
gain, ubi	array*, dB	dBm	dBm/MHz	dBm	dB	dBm	dBm/MHz	dBm	dB	
rfrequenc	су									
17.0	6.0	-53.23	-30.23	-21.2	-9.03	-67.30	-41.83	-41.2	-0.63	Pass
17.0	6.0	-55.13	-32.13	-21.2	-10.93	-69.48	-44.01	-41.2	-2.81	Pass
frequenc	y									
17.0	6.0	-54.93	-31.93	-21.2	-10.73	-68.72	-43.25	-41.2	-2.05	Pass
17.0	6.0	-55.10	-32.10	-21.2	-10.90	-71.75	-46.28	-41.2	-5.08	Pass
High carrier frequency										
17.0	6.0	-55.63	-32.63	-21.2	-11.43	-68.01	-42.54	-41.2	-1.34	Pass
17.0	6.0	-56.92	-33.92	-21.2	-12.72	-70.19	-44.72	-41.2	-3.52	Pass
	17.0 17.0 frequenc 17.0 17.0 r frequen 17.0	gain, dBi gain array*, dB frequency 17.0 6.0 17.0 6.0 frequency 17.0 6.0 17.0 6.0 r frequency 17.0 6.0	gain, dBi gain array*, dB SA reading, dBm frequency 17.0 6.0 -53.23 17.0 6.0 -55.13 frequency 17.0 6.0 -54.93 17.0 6.0 -55.10 r frequency 17.0 6.0 -55.63	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz frequency 17.0 6.0 -53.23 -30.23 17.0 6.0 -55.13 -32.13 frequency 17.0 6.0 -54.93 -31.93 17.0 6.0 -55.10 -32.10 r frequency 17.0 6.0 -55.63 -32.63	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz Limit, dBm frequency 17.0 6.0 -53.23 -30.23 -21.2 17.0 6.0 -55.13 -32.13 -21.2 frequency 17.0 6.0 -54.93 -31.93 -21.2 17.0 6.0 -55.10 -32.10 -21.2 r frequency 17.0 6.0 -55.63 -32.63 -21.2	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz Limit, dBm Margin***, dB frequency 17.0 6.0 -53.23 -30.23 -21.2 -9.03 17.0 6.0 -55.13 -32.13 -21.2 -10.93 frequency 17.0 6.0 -54.93 -31.93 -21.2 -10.73 17.0 6.0 -55.10 -32.10 -21.2 -10.90 r frequency 17.0 6.0 -55.63 -32.63 -21.2 -11.43	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz Limit, dBm Margin***, dB SA reading, dBm frequency 17.0 6.0 -53.23 -30.23 -21.2 -9.03 -67.30 17.0 6.0 -55.13 -32.13 -21.2 -10.93 -69.48 frequency 17.0 6.0 -54.93 -31.93 -21.2 -10.73 -68.72 17.0 6.0 -55.10 -32.10 -21.2 -10.90 -71.75 r frequency 17.0 6.0 -55.63 -32.63 -21.2 -11.43 -68.01	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz Limit, dBm Margin***, dB SA reading, dBm/MHz EIRP**, dBm/MHz frequency 17.0 6.0 -53.23 -30.23 -21.2 -9.03 -67.30 -41.83 17.0 6.0 -55.13 -32.13 -21.2 -10.93 -69.48 -44.01 frequency 17.0 6.0 -54.93 -31.93 -21.2 -10.73 -68.72 -43.25 17.0 6.0 -55.10 -32.10 -21.2 -10.90 -71.75 -46.28 r frequency 17.0 6.0 -55.63 -32.63 -21.2 -11.43 -68.01 -42.54	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz Limit, dBm Margin***, dBm SA reading, dBm/MHz EIRP**, dBm Limit, dBm frequency 17.0 6.0 -53.23 -30.23 -21.2 -9.03 -67.30 -41.83 -41.2 17.0 6.0 -55.13 -32.13 -21.2 -10.93 -69.48 -44.01 -41.2 frequency 17.0 6.0 -54.93 -31.93 -21.2 -10.73 -68.72 -43.25 -41.2 17.0 6.0 -55.10 -32.10 -21.2 -10.90 -71.75 -46.28 -41.2 r frequency 17.0 6.0 -55.63 -32.63 -21.2 -11.43 -68.01 -42.54 -41.2	gain, dBi gain array*, dB SA reading, dBm EIRP**, dBm/MHz Limit, dBm Margin***, dBm SA reading, dBm/MHz EIRP**, dBm Limit, dBm Margin***, dBm/MHz Margin***, dBm/MHz SA reading, dBm EIRP***, dBm/MHz Limit, dBm Margin***, dBm/MHz Margin***, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm Margin***, dBm/MHz Margin***, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz Margin***, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz Margin***, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz Margin****, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz Margin****, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz Margin****, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz Margin****, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz Limit, dBm/MHz SA reading, dBm/MHz EIRP***, dBm/MHz C41.2 -0.63 -0.63 -21.2 -10.93 -69.48 -44.01 -41.2 -2.81 -2.81 -20.93 -21.2 -10.73 -68.72





Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

Table 7.12.3 Conducted spurious emission within restricted band test results

ASSIGNED FREQUENCY RANGE: 5.15 - 5.25 GHz 4500 - 6400 MHz INVESTIGATED FREQUENCY RANGE:

MODULATION: QPSK **DETECTOR USED:** Peak RESOLUTION BANDWIDTH 1000 kHz

EUT CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas),

coherent signal

CHANNEL BANWIDTH:

CHANNEL	- DAINWID	νıπ:			20 MF	12					
	Antenna				Peak			Average			
	Antenna gain, dBi	gain array*, dB	SA reading, dBm	Peak EIRP**, dBm/MHz	Limit, dBm	Margin***, dB	SA reading, dBm	Average EIRP****, dBm/MHz	Limit, dBm	Margin***, dB	Verdict
Low carrie	r frequen	су									
5099.810	17.0	6.0	-58.95	-35.95	-21.2	-14.75	-66.88	-41.41	-41.2	-0.21	Pass
5406.704	17.0	6.0	-58.39	-35.39	-21.2	-14.19	-66.95	-41.48	-41.2	-0.28	Pass
Mid carrier	frequenc	y									
4915.300	17.0	6.0	-56.72	-33.72	-21.2	-12.52	-67.78	-42.31	-41.2	-1.11	Pass
5406.759	17.0	6.0	-56.49	-33.49	-21.2	-12.29	-71.12	-45.65	-41.2	-4.45	Pass
High carrier frequency											
4915.300	17.0	6.0	-57.03	-34.03	-21.2	-12.83	-67.92	-42.45	-41.2	-1.25	Pass
5406.869	17.0	6.0	-57.31	-34.31	-21.2	-13.11	-71.11	-45.64	-41.2	-4.44	Pass

^{* -} Antenna gain array = 10log(N_{ant}), where N_{ant} = 4 (two cross-polarized antennas with coherent signals)

Table 7.12.4 Duty cycle factor calculation

Burst dration, ms	Burst period, ms	Duty cycle*	Duty cycle factor**, dB		
2.83	5.00	0.566	2.47		

^{*-} Duty cycle = Burst duration / Burst period

^{** -} Peak EIRP = SA reading + Antenna gain + Antenna gain array

^{*** -} Margin = EIRP – specified limit.

**** - Average EIRP = SA reading + Antenna gain + Antenna gain array + Duty cycle factor

^{** -} Duty cycle factor = 10log(1/Duty cycle)



Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions							
Test procedure:	KDB 662911; KDB 789033, AN	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7						
Test mode:	Compliance	Verdict:	PASS					
Date(s):	10-Feb-19	verdict.	PASS					
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC					
Remarks:								

Table 7.12.5 Conducted spurious emission outside restricted band test results

ASSIGNED FREQUENCY RANGE: 5.15 – 5.25 GHz INVESTIGATED FREQUENCY RANGE: 4500 - 6400 MHz

MODULATION: QPSK
DETECTOR USED: Peak
RESOLUTION BANDWIDTH 1000 kHz

EUT CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas),

coherent signal

CHANNEL BANWIDTH:

10 MHz

15 MHz

<u> </u>				10 1111112						
Frequency, MHz	SA reading, dBm	Antenna gain, dBi	Antenna gain array*, dB	EIRP**, dBm/MHz	Limit, dBm/MHz	Margin***, dB	Verdict			
Low carrier fre	equency									
5680.550	-59.91	17.0	6.0	-36.91	-27.0	-9.91	Pass			
Mid carrier free	quency									
5693.710	-55.16	17.0	6.0	-32.16	-27.0	-5.16	Pass			
High carrier from	High carrier frequency									
6282.320	-52.04	17.0	6.0	-29.04	-27.0	-2.04	Pass			

CHANNEL BANWIDTH:

Frequency, MHz	SA reading, dBm	Antenna gain, dBi	Antenna gain array*, dB	EIRP**, dBm/MHz	Limit, dBm/MHz	Margin***, dB	Verdict
Low carrier frequency							
5951.140	-55.73	17.0	6.0	-32.73	-27.0	-5.73	Pass
Mid carrier frequency							
5751.020	-54.36	17.0	6.0	-31.36	-27.0	-4.36	Pass
High carrier frequency							
6348.090	-55.81	17.0	6.0	-32.81	-27.0	-5.81	Pass

CHANNEL BANWIDTH: 20 MHz

Frequency, MHz	SA reading, dBm	Antenna gain, dBi	Antenna gain array*, dB	EIRP**, dBm/MHz	Limit, dBm/MHz	Margin***, dB	Verdict
Low carrier fre	Low carrier frequency						
5706.390	-61.41	17.0	6.0	-38.41	-27.0	-11.41	Pass
Mid carrier frequency							
5691.830	-54.24	17.0	6.0	-31.24	-27.0	-4.24	Pass
High carrier frequency							
5691.183	-55.14	17.0	6.0	-32.14	-27.0	-5.14	Pass

^{* -} Antenna gain array = 10log(N_{ant}), where N_{ant} = 2 (two cross-polarized antennas)

Reference numbers of test equipment used

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	HL 3901	HL 4355			

Full description is given in Appendix A.

^{** -} EIRP = SA reading + Antenna gain + Antenna gain array

^{*** -} Margin = EIRP - specified limit.



Test specification:	FCC section 15.407(b), RSS-247 section 6.2.1.2, Conducted out of band emissions				
Test procedure:	KDB 662911; KDB 789033, ANSI C63.10, section 12.7.6 & 12.7.7				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	10-Feb-19	verdict.	PASS		
Temperature: 25 °C	Relative Humidity: 48 %	Air Pressure: 1019 hPa	Power: 48 VDC		
Remarks:					

Plot 7.12.1 Duty cycle

