Test Report

Curtis-Straus LLC, *a wholly owned subsidiary of BV CPS*

Report No	ER1807-6
Client	Honeywell International Inc.
Address	277 West Main Street Niantic, CT 06357
Phone	860-739-4468
Items tested FCC ID IC	e7 Thermostat - Model Number: 201-528-24-BK, 201-528-24-WH HS9-20152824 573R-20152824
Equipment Type Equipment Code	Digital Transmission System DTS
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2
Test Dates	07-20-2017 to 09-06-2017
Results	As detailed within this report
Prepared by	Zachary Johnson – Test Engineer
Authorized by	Jason Haley – Sr. EMC Engineer
Issue Date	10/17/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 25 of this report.

Contents

Report REV Sep-08-2017 - YF

Summary

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2

The product is the e7 Thermostat. It is a direct sequence spread spectrum transmitter that operates in the 2405MHz to 2480MHz frequency range.

Antenna Type: Surface Mount
Gain: 1.3dBi

We found that the product met the above requirements without modification.

Model tested: e7 Thermostat 24V AC –Zigbee Transmitter

Test samples were received in good condition.

Test Methodology

All testing was performed according to the following rules/procedures/documents; CFR 47 Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v04 and ANSI C63.10-2013.

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity.

EUT operating voltage is 24V AC

The following bandwidths were used during radiated spurious and AC line conducted emissions testing.

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	R1807		
Company:	Honeywell International Inc.		
Company Address:	277 West Main Street		
	Niantic, CT, 06357		
Contact:	Ravi Sagar		
	MN	**PN**	**SN**
EUT:	e7 Thermostat	--	--
EUT Description:	Thermostat		

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
H3 RS485	RS-485	1	1	-	No	No	0	in	no	Setup only
H4 BLE	other	1	1	other	No	No	1	in	yes	
5 Pin Mounting plate	other	1	1	other	No	No	0	in	no	Separate from EUT, used for saving settings
Zigbee connector	other	1	1	other	No	No	1	in	yes	
H2 (GND, 12V, and S5 Bus)					No	No	2	in	yes	

Software Operating Mode Description:

Thermostat needs to be continuous pinging between 0 and 14 (8) in wire and wireless mode.

Statement of Conformity

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	4		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
8.3			15.203	EUT employs 1.3dBi peak gain surface mount antenna.
8.10			15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable
8.8			15.207	The unit complies with AC line conducted emissions requirements.

Refer to Appendix A of this report for antenna port conducted measurements.

Test Results

*****All test Data in this report refers to the Zigbee Transmission operating at 24V AC***

Radiated Spurious Emissions

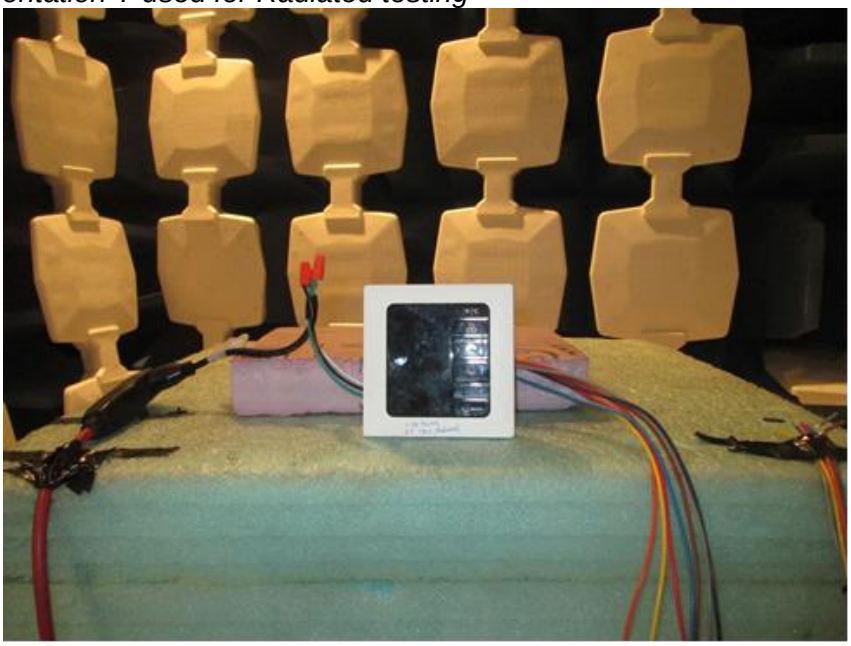
LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
[15.247(d)]

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) and worst case emissions were observed in Y orientation. All the results below are for the worst case orientation only.

MEASUREMENTS / RESULTS

Worst Case Orientation Y used for Radiated testing



Y Orientation

Curtis Straus - a Bureau Veritas Company					Work Order - R1807				
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24Vac				
Top Peaks Horizontal 30-1000MHz					Test Site - Chamber 1				
Operator: Chris Bramley					Temp; Humid; Pres - 25.8°C; 41%RH; 1010mBar				
Zigbee Mid Channel 2440MHz					Witnessed by - N/A				
Y-Orientation					EUT Maximum Frequency - 2440MHz				
80cm Height									
Frequency	Peak Reading	Correction Factor	Adjusted Peak Amplitude	Req 1 Limit	Req 1 Margin	Req 1 Test Results	Antenna Height	EUT Azimuth	Worst Margin Req 1
MHz	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)
94.069	52.2	-26.8	25.5	43.5	-18.1	PASS	200	90	
150.11	47.9	-22.5	25.3	43.5	-18.2	PASS	200	90	
163.763	49.5	-22.9	26.5	43.5	-17	PASS	250	315	
211.414	50.6	-24.3	26.3	43.5	-17.2	PASS	150	270	
224.218	50.9	-23.6	27.3	46	-18.8	PASS	150	225	
478.164	48.2	-16.2	32.1	46	-14	PASS	150	45	-14

Curtis Straus - a Bureau Veritas Company				Work Order - R1807					
Radiated Emissions Electric Field 3m Dista				EUT Power Input - 24Vac					
Top Peaks Vertical 30-1000MHz				Test Site - Chamber 1					
Operator: Chris Bramley				Temp; Humid; Pres - 25.8°C; 41%RH; 1010mBar					
Zigbee Mid Channel 2440MHz									
Y-Orientation				EUT Maximum Frequency - 2440MHz					
80cm Height									
Frequency	Peak Reading	Correction Factor	Adjusted Peak Amplitude	Req 1 Limit	Req 1 Margin	Req 1 Test Results	Antenna Height	Turntable Azimuth	Worst Margin Req 1 Limit
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)
91.353	57	-27.4	29.5	43.5	-14	PASS	100	225	
92.419	56.6	-27.2	29.4	43.5	-14.1	PASS	100	270	
94.02	56.5	-26.8	29.7	43.5	-13.8	PASS	100	270	-13.8
100.374	51	-24.8	26.1	43.5	-17.4	PASS	100	45	
163.739	49	-22.9	26.1	43.5	-17.4	PASS	100	90	
844.897	42.6	-10.7	32	46	-14.1	PASS	150	315	

30-1000MHz Mid Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24VAC										
1-6GHz Horizontal Tabular Data					Test Site - CH-1										
Operator: AKZ					Temp; Humid; Pres - 24.5°C; 41%RH; 1016mBar										
Zigbee															
*Applied DCCF to Harmonic															
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	dBµV	dBµV	dB/m	dBµV/m	dBµV/m	dBµV/m	dB	Pass/Fail	dBµV/m	dB	Pass/Fail	centimeter	degrees	dB	dB
4809.1	61.2	41.2	2.1	63.3	43.3	74	-10.6	PASS	54	-10.6	PASS	191	51	-10.6	-10.6
5264.4	38.5	30.2	4.4	43	34.6	74	-31	PASS	54	-19.4	PASS	292	117		

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24VAC										
1-6GHz Vertical Tabular Data					Test Site - CH-1										
Operator: AKZ					Temp; Humid; Pres - 24.5°C; 41%RH; 1016mBar										
Zigbee															
*Applied DCCF to Harmonic															
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	dBµV	dBµV	dB/m	dBµV/m	dBµV/m	dBµV/m	dB	Pass/Fail	dBµV/m	dB	Pass/Fail	centimeters	degrees	dB	dB
4809	58.9	38.9	2.1	61	41	74	-13	PASS	54	-13	PASS	275	33	-13	-13
5264.9	39.6	30.4	4.4	44.1	34.8	74	-29.9	PASS	54	-19.2	PASS	296	9		
5275.7	38.2	30.1	4.5	42.7	34.6	74	-31.3	PASS	54	-19.4	PASS	107	199		

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24VAC										
1-6GHz Horizontal Tabular Data					Test Site - CH-1										
Operator: AKZ					Temp; Humid; Pres - 24.5°C; 41%RH; 1016mBar										
Zigbee															
*DCCF applied to Harmonic															
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	dBµV	dBµV	dB/m	dBµV/m	dBµV/m	dBµV/m	dB	Pass/Fail	dBµV/m	dB	Pass/Fail	centimeters	degrees	dB	dB
4889	62.2	42.2	2.4	64.6	44.6	74	-9.4	PASS	54	-9.4	PASS	189	12	-9.4	-9.4
5263.1	39.6	30.1	4.4	44	34.5	74	-29.9	PASS	54	-19.5	PASS	110	340		
5277.3	39.2	30	4.5	43.8	34.5	74	-30.2	PASS	54	-19.5	PASS	184	148		

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24VAC										
1-6GHz Vertical Tabular Data					Test Site - CH-1										
Operator: AKZ					Temp; Humid; Pres - 24.5°C; 41%RH; 1016mBar										
Zigbee															
*DCCF applied to Harmonic															
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	dBµV	dBµV	dB/m	dBµV/m	dBµV/m	dBµV/m	dB	Pass/Fail	dBµV/m	dB	Pass/Fail	centimeters	degrees	dB	dB
4889.1	60.4	40.4	2.4	42.8	56.4	74	-11.2	PASS	54	-11.2	PASS	288	40	-11.2	-11.2
5261.2	39.3	30.3	4.4	43.7	34.7	74	-30.3	PASS	54	-19.2	PASS	124	75		
5276.2	38.7	30.1	4.5	43.2	34.6	74	-30.8	PASS	54	-19.3	PASS	104	124		

1-6GHz Mid Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24VAC										
1-6GHz Vertical Tabular Data					Test Site - CH-1										
Operator: AKZ					Temp; Humid; Pres - 24.5°C; 41%RH; 1016mBar										
Zigbee															
*Applied DCCF to Harmonic															
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	dBµV	dBµV	dB/m	dBµV/m	dBµV/m	dBµV/m	dB	Pass/Fail	dBµV/m	dB	Pass/Fail	centimeters	degrees	dB	dB
4961	59.7	39.7	2.7	62.4	42.4	74	-11.6	PASS	54	-11.6	PASS	216	36	-11.6	-11.6
5262.9	39.4	30.4	4.4	43.9	34.8	74	-30.1	PASS	54	-19.2	PASS	191	110		
5274.6	41.2	30.2	4.5	45.7	34.7	74	-28.3	PASS	54	-19.3	PASS	291	175		

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 24VAC										
1-6GHz Horizontal Tabular Data					Test Site - CH-1										
Operator: AKZ					Temp; Humid; Pres - 24.5°C; 41%RH; 1016mBar										
Zigbee															
*Applied DCCF to Harmonic															
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	dBµV	dBµV	dB/m	dBµV/m	dBµV/m	dBµV/m	dB	Pass/Fail	dBµV/m	dB	Pass/Fail	centimeters	degrees	dB	dB
4960.9	57.6	37.6	2.7	60.3	40.3	74	-13.7	PASS	54	-13.7	PASS	223	44	-13.7	-13.7
5260.9	38.7	30.6	4.4	43.2	35.1	74	-30.8	PASS	54	-18.9	PASS	175	110		
5750.7	38.9	29.6	5.3	44.2	34.9	74	-29.8	PASS	54	-19.1	PASS	207	234		

1-6GHz High Channel

Curtis Straus - a Bureau Veritas Company							Work Order - R1807								
Radiated Emissions Electric Field 1m Distance							EUT Power Input - 24V / 60Hz								
Top Peaks Horizontal 6-18GHz							Test Site - Chamber 1								
Operator: ZJ							Temp; Humid; Pres - 24.2°C; 35%RH; 999mBar								
*Applied DCCF to Harmonics															
							EUT Maximum Frequency - 2480MHz								
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Margin to Peak Limit	Peak Limit Test Results	Average Limit	Margin to Average Limit	Average Limit Test Results	Antenna Height	EUT Azimuth	Peak Limit Worst Margin	Average Limit Worst Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
7215	63.1	43.1	7.7	70.8	50.8	83.5	-12.7	PASS	63.5	-12.7	PASS	175	116	-12.7	
9620.1	60.2	40.2	9.5	69.7	49.7	83.5	-13.8	PASS	63.5	-13.8	PASS	175	55		
12025.2	58.2	38.2	12	70.2	50.2	83.5	-13.3	PASS	63.5	-13.3	PASS	175	70		
14454.9	43.7	43.7	13.5	57.3	57.3	83.5	-26.2	PASS	63.5	-6.2	PASS	200	200		
15534.6	42.2	42.2	15.5	57.7	57.7	83.5	-25.8	PASS	63.5	-5.8	PASS	125	315		-5.8
16835.4	49.9	29.9	17.1	67	47	83.5	-16.5	PASS	63.5	-16.5	PASS	175	315		

Curtis Straus - a Bureau Veritas Company							Work Order - R1807								
Radiated Emissions Electric Field 1m Distance							EUT Power Input - 24V / 60Hz								
Top Peaks Vertical 6-18GHz							Test Site - Chamber 1								
Operator: ZJ							Temp; Humid; Pres - 24.2°C; 35%RH; 999mBar								
*Applied DCCF to Harmonics															
							EUT Maximum Frequency - 2480MHz								
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Margin to Peak Limit	Peak Limit Test Results	Average Limit	Margin to Average Limit	Average Limit Test Results	Antenna Height	EUT Azimuth	Peak Limit Worst Margin	Average Limit Worst Margin
(MHz)	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
7215	66.4	46.4	7.7	74.1	54.1	83.5	-9.4	PASS	63.5	-9.4	PASS	175	22	-9.4	
9620.1	58.7	38.7	9.5	68.2	48.2	83.5	-15.3	PASS	63.5	-15.3	PASS	175	301		
12024.9	49.3	29.3	12	61.3	41.3	83.5	-22.2	PASS	63.5	-22.2	PASS	150	122		
15612.3	42.3	42.3	15.4	57.7	57.7	83.5	-25.8	PASS	63.5	-5.8	PASS	150	45		
16835.4	42.4	42.4	17.1	59.5	59.5	83.5	-24	PASS	63.5	-4	PASS	150	215		-4
17967.9	38.4	38.4	20.7	59	59	83.5	-24.5	PASS	63.5	-4.5	PASS	200	292		

6-18GHz Low Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 24V / 60Hz										
6-18GHz Horizontal Data					Test Site - Chamber 1										
Operator: ZJ					Temp; Humid; Pres - 24.2°C; 35%RH; 999mBar										
*Applied DCCF to Harmonics															
Center channel					EUT Maximum Frequency - 2480MHz										
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
7335.1	63.9	43.9	7.9	71.8	51.8	83.5	-11.7	PASS	63.5	-11.7	PASS	147	87		
9780.1	63	43	10	73	53	83.5	-10.5	PASS	63.5	-10.5	PASS	169	57	-10.5	-10.5
12225.1	58.3	38.3	12.8	71.1	51.1	83.5	-12.4	PASS	63.5	-12.4	PASS	166	66		
13890.3	40.7	30.8	13.6	54.2	44.4	83.5	-29.3	PASS	63.5	-19.1	PASS	169	76		
17115.4	51.7	31.7	18.1	69.7	49.7	83.5	-13.8	PASS	63.5	-13.8	PASS	169	315		
17941.9	36.2	26.2	20.6	56.8	46.8	83.5	-26.7	PASS	63.5	-16.7	PASS	175	165		

Curtis Straus - a Bureau Veritas Company						Work Order - R1807									
Radiated Emissions Electric Field 1m Distance						EUT Power Input - 24V / 60Hz									
6-18GHz Vertical Data						Test Site - Chamber 1									
Operator: ZJ						Temp; Humid; Pres - 24.2°C; 35%RH; 999mBar									
*Applied DCCF to Harmonics															
Center channel						EUT Maximum Frequency - 2480MHz									
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
7335.1	59.8	39.8	7.9	67.8	47.8	83.5	-15.7	PASS	63.5	-15.7	PASS	100	0	-15.7	
9780.1	53.9	33.9	10	63.9	43.9	83.5	-19.6	PASS	63.5	-19.6	PASS	100	10		
11291.7	40.1	30	11.4	51.5	41.3	83.5	-32	PASS	63.5	-22.2	PASS	100	73		
12225.2	43.5	39.8	12.8	56.4	52.6	83.5	-27.1	PASS	63.5	-10.9	PASS	100	21		-10.9
14716.8	38.4	29.8	14.2	52.6	44	83.5	-30.9	PASS	63.5	-19.5	PASS	100	0		
17115	40.1	34.2	18.1	58.2	52.3	83.5	-25.3	PASS	63.5	-11.2	PASS	200	296		

6-18GHz Mid Channel

Curtis Straus - a Bureau Veritas Company							Work Order - R1807								
Radiated Emissions Electric Field 1m Distance							EUT Power Input - 24V / 60Hz								
Top Peaks Horizontal 6-18GHz							Test Site - Chamber 1								
Operator: ZJ							Temp; Humid; Pres - 24.2°C; 35%RH; 999mBar								
*Applied DCCF to Harmonics															
							EUT Maximum Frequency - 2480MHz								
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Margin to Peak Limit	Peak Limit Test Results	Average Limit	Margin to Average Limit	Average Limit Test Results	Antenna Height	EUT Azimuth	Peak Limit Worst Margin	Average Limit Worst Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
7440	61.1	41.1	8.1	69.3	49.3	83.5	-14.2	PASS	63.5	-14.2	FAIL	150	77		
9920.1	59.7	39.7	10.2	69.8	49.8	83.5	-13.7	PASS	63.5	-13.7	FAIL	175	52	-13.7	
12400.2	52.9	32.9	13.7	66.5	46.5	83.5	-17	PASS	63.5	-17	FAIL	175	67		
13997.7	43.7	43.7	14.3	58	58	83.5	-25.5	PASS	63.5	-5.5	PASS	100	108		
17360.1	51.4	31.4	17.6	69	69	83.5	-14.5	PASS	63.5	-14.5	FAIL	175	315		
17976	38.6	38.6	20.7	59.3	59.3	83.5	-24.2	PASS	63.5	-4.2	PASS	125	67		-4.2

Curtis Straus - a Bureau Veritas Company					Work Order - R1807										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 24V / 60Hz										
Top Peaks Vertical 6-18GHz					Test Site - Chamber 1										
Operator: ZJ					Temp; Humid; Pres - 24.2°C; 35%RH; 999mBar										
*DCCF Applied to Harmonics															
					EUT Maximum Frequency - 2480MHz										
Frequency	Raw Peak Reading	Raw Average Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Margin to Peak Limit	Peak Limit Test Results	Average Limit	Margin to Average Limit	Average Limit Test Results	Antenna Height	EUT Azimuth	Peak Limit Worst Margin	Average Limit Worst Margin
(MHz)	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
7440	65	45	8.1	73.1	53.1	83.5	-10.4	PASS	63.5	-10.4	PASS	175	21	-10.4	
9920.1	57.9	37.9	10.2	68.1	48.1	83.5	-15.4	PASS	63.5	-15.4	PASS	175	300		
12400.2	45.8	25.8	13.7	59.5	39.5	83.5	-24	PASS	63.5	-24	PASS	175	6		
16731.3	42.1	42.1	17	59.1	59.1	83.5	-24.4	PASS	63.5	-4.4	PASS	150	140		
17360.4	45.2	45.2	17.6	62.8	62.8	83.5	-20.7	PASS	63.5	-0.7	PASS	175	315		-0.7
17980.2	38.6	38.6	20.7	59.3	59.3	83.5	-24.2	PASS	63.5	-4.2	PASS	200	202		

6-18GHz High Channel

Radiated Emissions Table

Date: 29-Aug-17 **Company:** Inncom **Work Order:** R1807
Engineer: Zac Johnson **EUT Desc:** Core Thermostat **EUT Operating Voltage/Frequency:** 24V / 60Hz
Temp: 24.2°C **Humidity:** 35% **Pressure:** 999mBar
Frequency Range: 18-25GHz **Measurement Distance:** 0.1 m
Notes: 24V Zigbee Mode **EUT Max Freq:** 2480MHz
Tested Center Channel, Peak readings only due to -20dB DCCF

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Center Channel												
H / V	19561.0	73.8	42.1	40.3	3.8	75.8	103.5	-27.7	Pass	---	---	---
H / V	22006.0	77.0	42.7	40.5	4.1	78.9	103.5	-24.6	Pass	---	---	---
H / V	24450.0	51.7	40.7	40.2	4.3	55.5	103.5	-48.0	Pass	---	---	---
			---	---	---	---	---	---	---	---	---	---
High Channel			---	---	---	---	---	---	---	---	---	---
H / V	19841.0	68.5	42.4	40.3	3.9	70.3	103.5	-33.2	Pass	---	---	---
H / V	22321.0	63.7	42.7	40.5	4.2	65.7	103.5	-37.8	Pass	---	---	---
H / V	24800.0	49.9	41.3	40.2	4.5	53.3	103.5	-50.2	Pass	---	---	---
			---	---	---	---	---	---	---	---	---	---
Low Channel			---	---	---	---	---	---	---	---	---	---
H / V	19241.0	68.6	42.0	40.3	3.9	70.8	103.5	-32.7	Pass	---	---	---
H / V	21645.0	73.0	43.1	40.4	4.1	74.4	103.5	-29.1	Pass	---	---	---
H / V	24050.0	55.7	40.9	40.4	4.3	59.5	103.5	-44.0	Pass	---	---	---

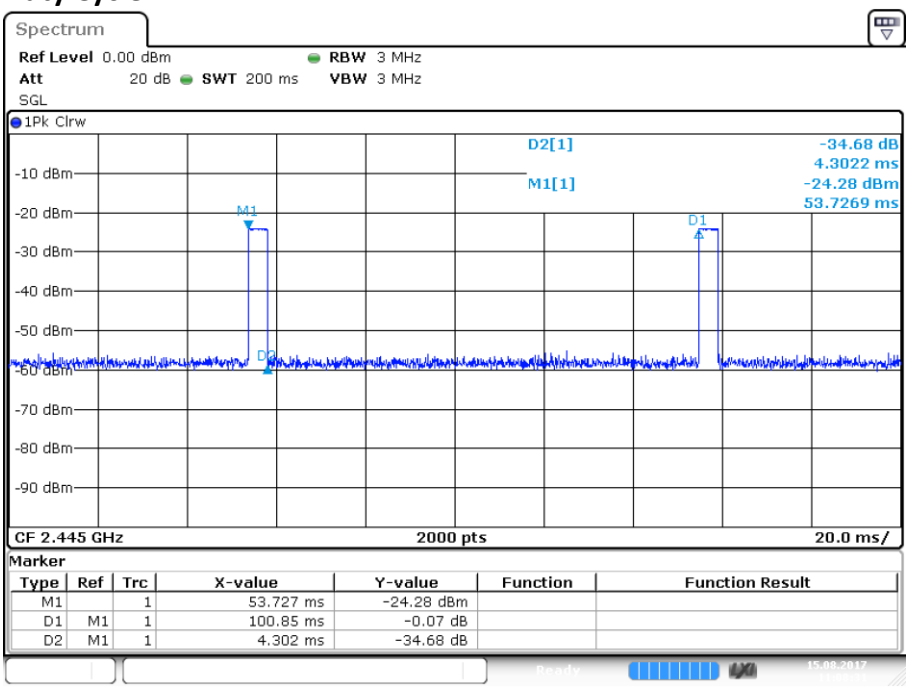
Table Result: Pass by -24.6 dB ***Worst Freq:*** 22006.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2328 **Cable 2:** --- **Cable 3:** ---
Analyzer: Brown SA **Preamp:** 18-26.5GHz **Antenna:** 18-26.5GHz Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.188

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

18-25GHz Low, Mid, High Channel

Duty Cycle



Date: 15.AUG.2017 11:08:32

DCCF = 20*Log(4.3/100) = -27dB
DCCF ≈ -20dB (max DCCF)
This correction applied where noted in REMI data tables

Radiated Band Edge

Radiated Emissions Table

Date: 17-Jul-17 **Company:** Inncom **Work Order:** R1807
Engineer: Zac Johnson **EUT Desc:** Thermostat **EUT Operating Voltage/Frequency:** 24V / 60Hz
Temp: 25.2C **Humidity:** 47% **Pressure:** 1010
Frequency Range: 2310-2500MHz **Measurement Distance:** 3 m
Notes: Zigbee Mode **EUT Max Freq:** 2480MHz

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
V	2351.0	31.8	11.8	0.0	32.0	3.4	67.2	47.2	74.0	-6.8	Pass	54.0	-6.8	Pass
V	2390.0	22.7	2.7	0.0	32.2	3.4	58.3	38.3	74.0	-15.7	Pass	54.0	-15.7	Pass
V	2483.5	24.3	4.3	0.0	32.4	3.5	60.2	40.2	74.0	-13.8	Pass	54.0	-13.8	Pass
V	2487.0	23.1	3.1	0.0	32.4	3.5	59.0	39.0	74.0	-15.0	Pass	54.0	-15.0	Pass

Table Result: Pass by -6.8 dB ***Worst Freq:*** 2351.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.188

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Test Equipment Used:

Test Equipment Used								
Rev. 7/29/2017								
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	8/9/2017	8/9/2016
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	I	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Green	0.009-2000MHz	ZFL-1000-LN	CS	N/A	802	II	9/19/2017	9/19/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-White Bilog	30-2000MHz	JB1	Sunol	A091604-1	1105	I	8/12/2017	8/12/2015
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2054	9kHz - 18GHz		Florida RF			II	10/30/3017	10/30/2016
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.								

Radiated Emissions 30-1000MHz

Rev. 7/26/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	8/9/2017	8/9/2016
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
2111 HF Preamp	0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/5/2017	11/5/2016
2116 BRF	0.009-18000MHz	BRM50702	Micro-Tronics	G226	2116	II	11/26/2017	11/26/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Black Horn	1-18GHz	3115	EMCO	9703-5148	56	I	8/29/2018	8/29/2016
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2078		HTC-1	HDE		2078	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1522	9kHz - 18GHz		Florida RF			II	2/11/2018	2/11/2017
Asset #2051	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2054	9kHz - 18GHz		Florida RF			II	10/30/3017	10/30/2016

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions 1-18GHz

Rev. 8/25/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	7/26/2018	7/26/2017
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	9/16/2017	9/16/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2328	1 - 26.5GHz	PE350-72	Pasternack	1539		II	2/6/2018	2/6/2017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions 18-25GHz

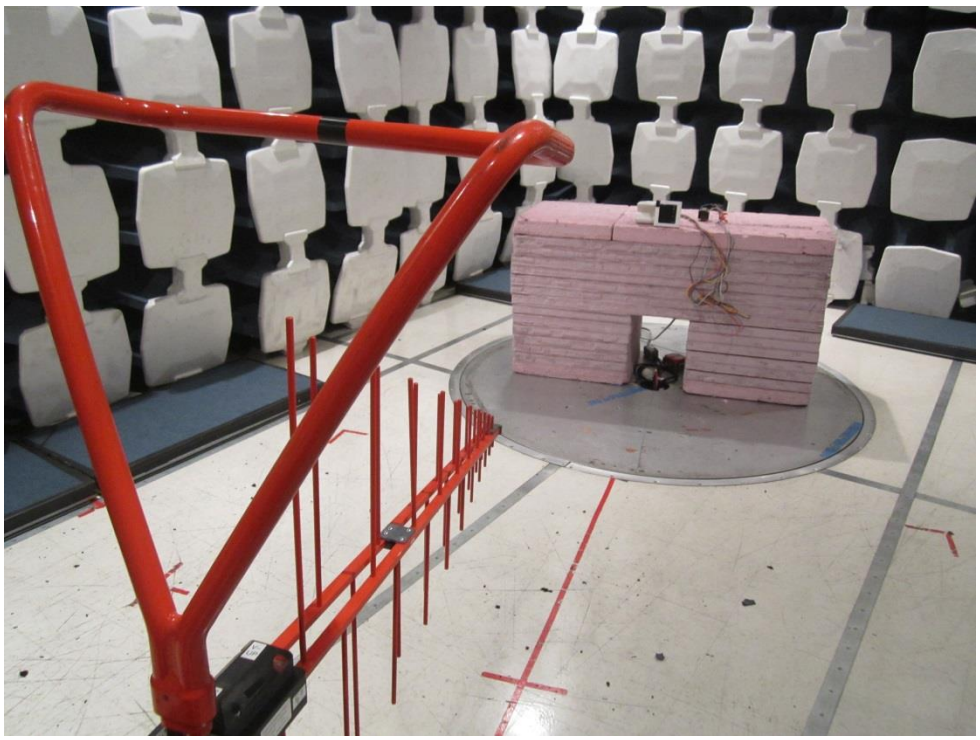
Rev. 9/10/2017

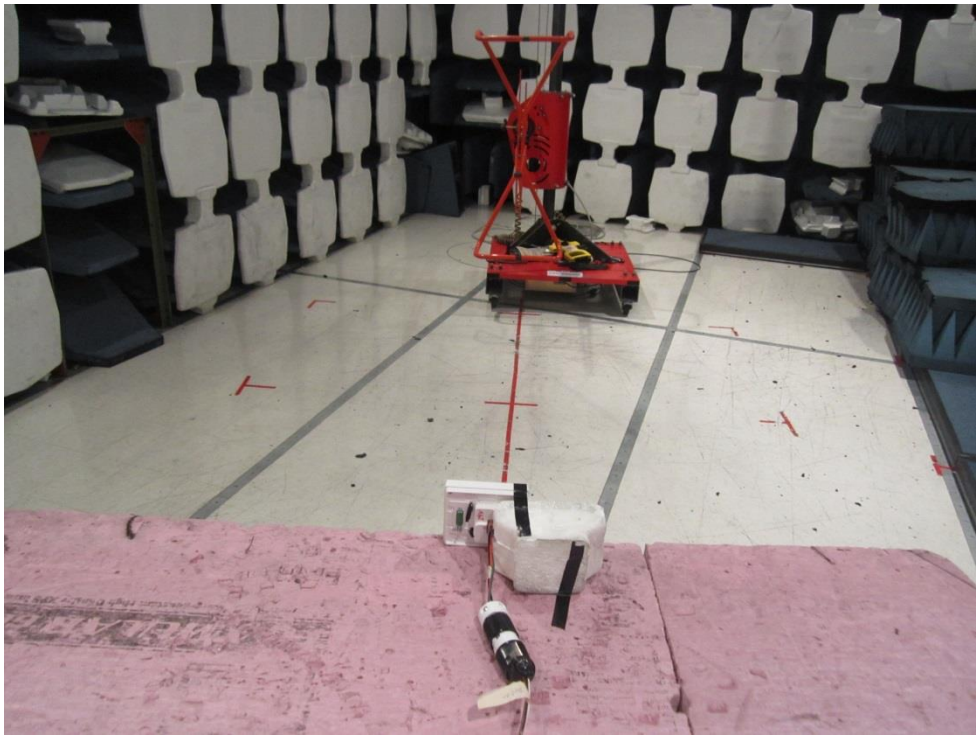
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018	12/21/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2078		HTC-1	HDE		2078	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2052	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2053	9kHz - 18GHz		Florida RF			II	10/30/3017	10/30/2016

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

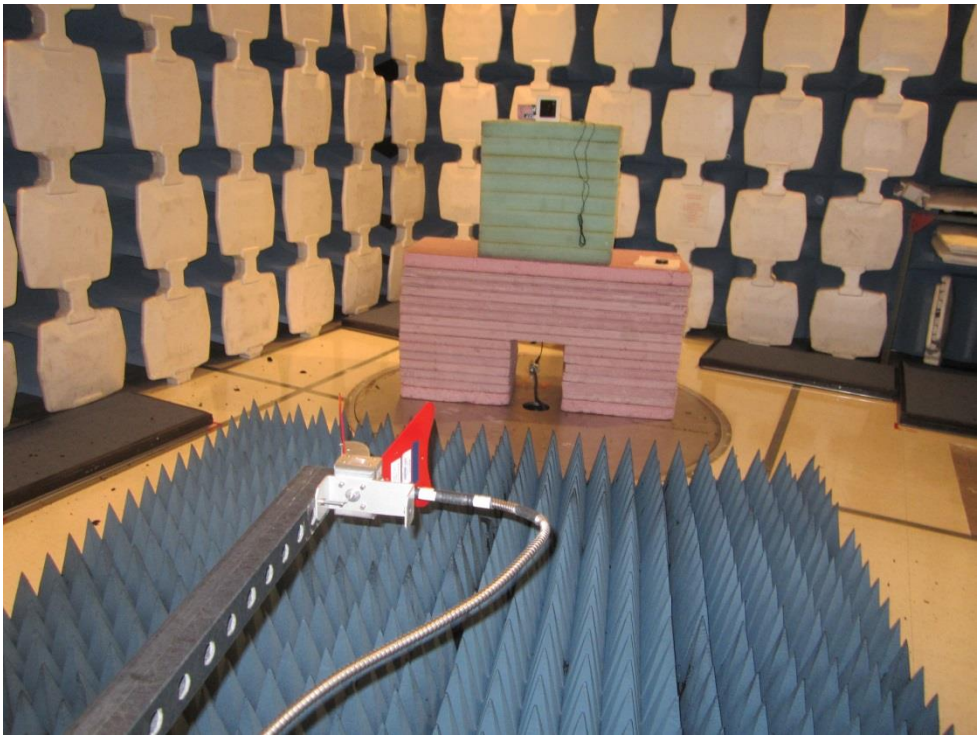
Radiated Bandedges and Worst Case

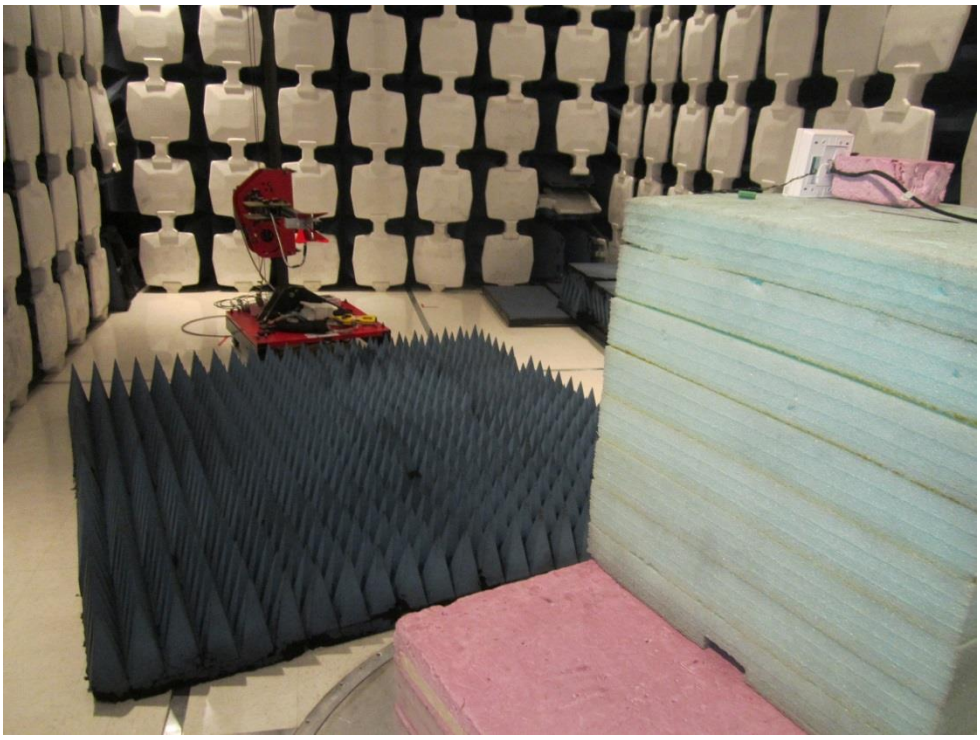
Pictures:



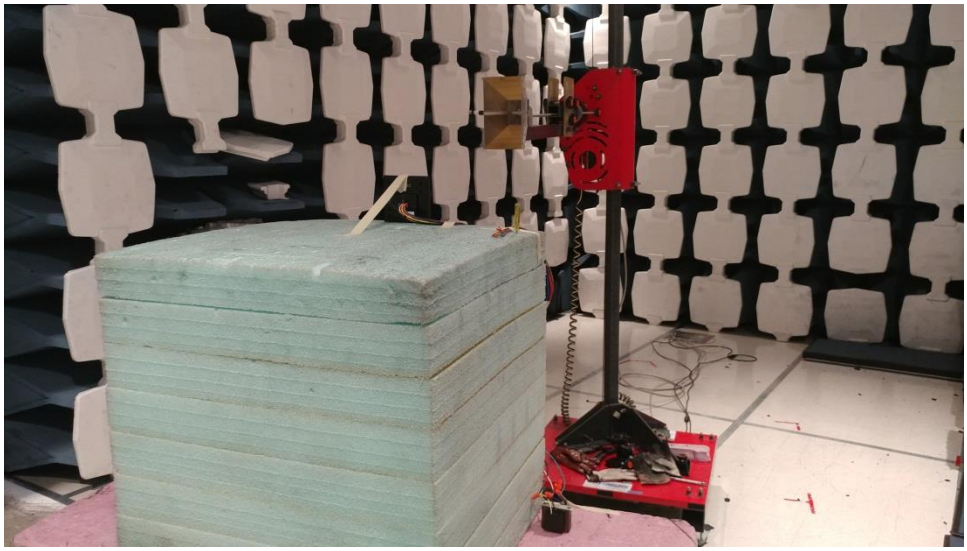


30-1000MHz

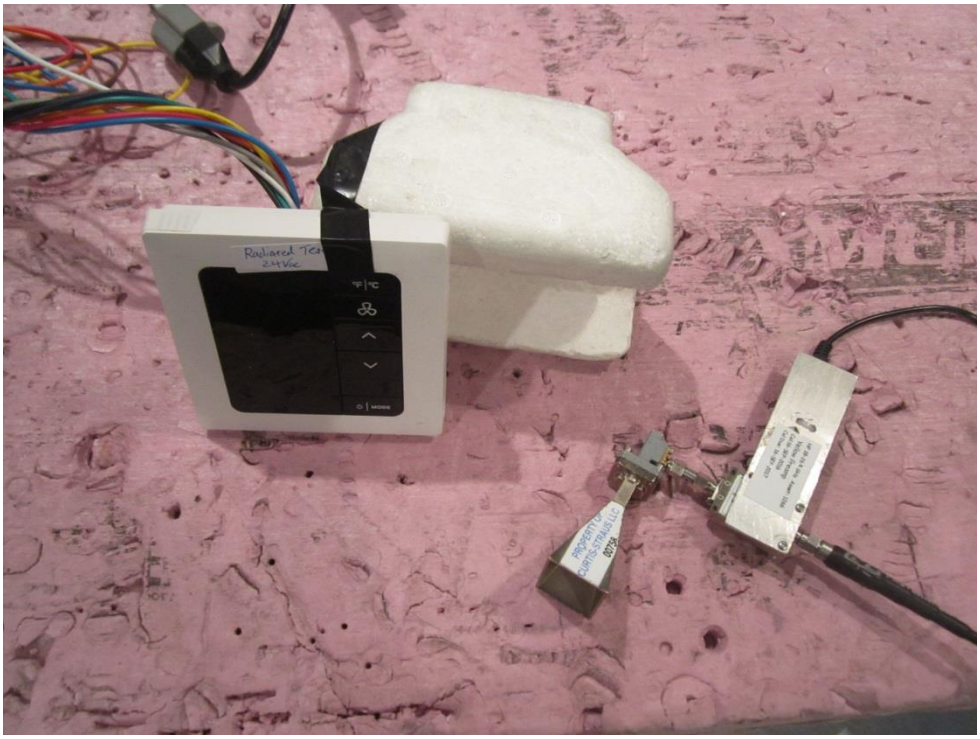




1-6GHz



6-18GHz



18-25GHz

AC Line Conducted Emissions

LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company									Work Order # - R1807			
Conducted Emissions									EUT Power Input - 120VAC/60 Hz			
Peak Detector Tabular Data - Voltage Measurement									Test Site - CEMI-2			
Operator: Michael Mehrmann									Temp; Humid; Pres - 23.4°C;50 %RH;1009 mBar			
EUT Line tested:120 VAC/60Hz; Phase												
									EUT Maximum Freq - 2480MHz			
									Requirement - FCC/CISPR Class B			
Frequency	Raw Peak	Correction	Adjusted I	Quasi-pea	Margin to	Peak to Q	Worst Ma	Average L	Margin to	Peak to Av	Worst Margin	
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB	dBµV	dB	Pass/Fail	dB	
0.51	15.9	20.1	36	56	-20	PASS		46	-10	PASS		
0.638	14.5	20.1	34.6	56	-21.4	PASS		46	-11.4	PASS		
0.766	18.7	20.1	38.8	56	-17.2	PASS	-17.2	46	-7.2	PASS	-7.2	
0.893	16.5	20.1	36.6	56	-19.4	PASS		46	-9.4	PASS		
1.149	14.7	20.1	34.8	56	-21.2	PASS		46	-11.2	PASS		
2.17	14.3	20.2	34.5	56	-21.5	PASS		46	-11.5	PASS		

0.15-30MHz Hot Lead

Curtis Straus - a Bureau Veritas Company						Work Order # - R1807	
Conducted Emissions						EUT Power Input - 120VAC/60 Hz	
Peak Detector Tabular Data - Voltage Measurement						Test Site - CEMI-2	
Operator: Michael Mehrmann						Temp; Humid; Pres - 23.4°C;50 %RH;1009 mBar	
EUT Line tested:120 VAC/60Hz; Neutral							
						EUT Maximum Freq - 32MHz	
						Requirement - FCC/CISPR Class B	
Frequency	Raw Peak	Correction	Adjusted I	Quasi-pea	Margin to	Peak to Q	Worst Margin
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB
0.512	22.7	20.1	42.9	56	-13.1	PASS	
0.766	23.8	20.1	43.9	56	-12.1	PASS	
1.149	22	20.1	42.1	56	-13.9	PASS	
11.664	35.3	20.3	55.6	60	-4.4	PASS	-4.4
11.751	31.3	20.3	51.7	60	-8.3	PASS	
11.837	28	20.3	48.3	60	-11.7	PASS	

0.15-30MHz Neutral Lead Peak

Curtis Straus - a Bureau Veritas Company						Work Order # - R1807				
Conducte(CISPR Average Detector						EUT Power Input - 120VAC/60 Hz				
Final Average Detector Tabular Data - Voltage Measurement						Test Site - CEMI-2				
Operator: Michael Mehrmann						Temp; Humid; Pres - 23.4°C;50 %RH;1009 mBar				
EUT Line tested:120 VAC/60Hz; Neutral										
						EUT Maximum Freq - 32MHz				
						Requirement - FCC/CISPR Class B				
Frequency	Raw Avera	Correction	Adjusted A	Average L	Average M	Average R	Worst Average Margin			
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB			
0.511	21.5	20.1	41.6	46	-4.4	PASS				
0.639	19	20.1	39.1	46	-6.9	PASS				
0.767	22.5	20.1	42.6	46	-3.4	PASS	-3.4			
1.15	20	20.1	40.1	46	-5.9	PASS				
1.791	17.1	20.1	37.2	46	-8.8	PASS				
1.917	18.3	20.2	38.4	46	-7.6	PASS				

0.15-30MHz Neutral Lead Average

Test Equipment Used:

Rev. 9/10/2017

Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental EXA Signal Analyzer(1118473)	9KHz-26.5GHz	N9010A-526;N	AT	MY51170076	1118473	I	5/19/2018	5/19/2017
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 1791	9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-603	1791	I	6/28/2018	6/28/2017
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 2	719150		A-0015			III	NA	N/A
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2079		HTC-1	HDE		2079	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-14	9kHz - 2GHz		C-S			II	10/2/2017	1/2/2016
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-05	9kHz-2GHz	2	Aeroflex/Weinschel	BS9092		II	8/8/2018	8/8/2017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) NIST CISPR	 5.6dB 4.6dB	 N/A 5.2dB (Ucispr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions NIST CISPR	 3.9dB 3.6dB	 N/A 3.6dB (Ucispr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation: • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	 3.4% 0.3dB	 5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS** (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.
14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.
Rev.160009121(2)_#684340 v14CS

Appendix A:

Summary and Test Methodology

This test report is an Appendix to Curtis-Straus Test Report ER1807-6 and includes antenna port RF conducted measurement data to demonstrate compliance with the following rules sections:

CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2

We found that the product met the above requirements without modification.

All testing was performed according to the following rules/procedures/documents;
CFR 47 Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v04 and ANSI C63.10-2013.

Test samples were received in good condition.

Test Results

CFR Title 47 FCC Part §15.247 2400-2483.5 MHz

DUT Information

DUT Name:	E7 Thermostat
Manufacturer:	Honeywell
Model:	201-528-24-BK
Comment:	802.15.4

Frequencies

ZigBee CH 11 (2405 MHz) ZigBee CH 19 (2445 MHz) ZigBee CH 26 (2480 MHz)

Bandwidths

2 MHz

Power

Setting 1 (Max Power)

Beamforming Gain

N/A

Antenna Gain

Chip Antenna (1.3dBi)

DUT Settings

No. of transmission chains	1
Digital Modulation	Yes
Frequency Hopping	No

Hardware Setup: WMS Measurements\TS8997 Hardware Setup

Rev. 9/17/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
FSV40 Spectrum Analyzer	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/30/2018	6/30/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
DUT1	30MHz-26GHz		Micro-Coax			II	6/21/2018	6/21/2017
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
10dB Attenuator-01 Brown	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017
Power/Noise Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
OSP - open switch and control platform	30MHz-18GHz	OSP120	ROHDE & SCHWARZ	101674		I	6/1/2018	6/1/2017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Summary (2405MHz, Channel 11)

Test	Frequency (MHz)	Result
RF average output power	2405.000	PASS
Peak Power Spectral Density	2405.000	PASS
Minimum Emission Bandwidth 6 dB	2405.000	PASS
Band Edge low	2405.000	PASS
Band Edge high	2405.000	PASS
Tx Spurious Emission	2405.000	PASS

RF average output power (2405 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2405.000000	19.1	30.0	20.4	100.000	PASS

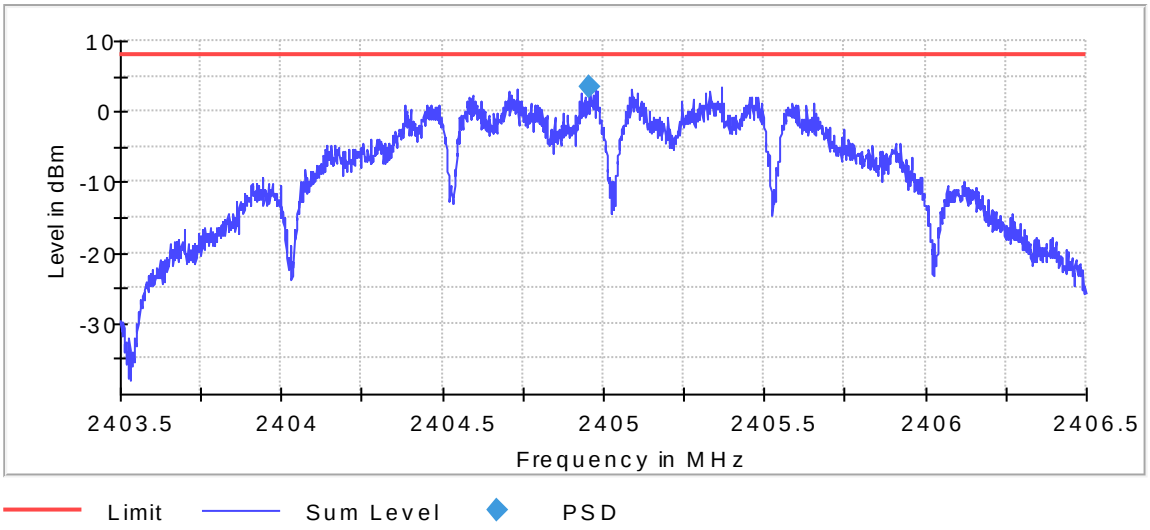
Peak Power Spectral Density (2405 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

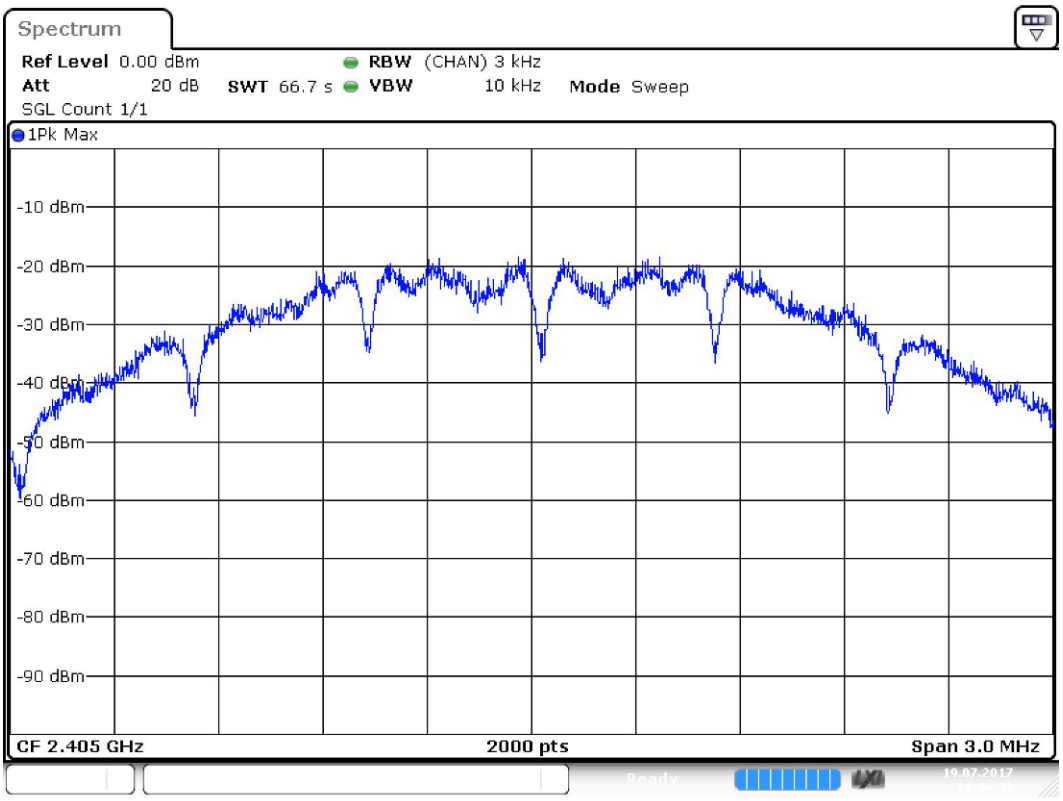
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 1.3 dB

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2405.000000	2404.959520	3.369	8.0	PASS



PSD Connector 1



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40350 GHz	2.40350 GHz
Stop Frequency	2.40650 GHz	2.40650 GHz
Span	3.000 MHz	3.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	2000	~ 2000
Sweeptime	66.700 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

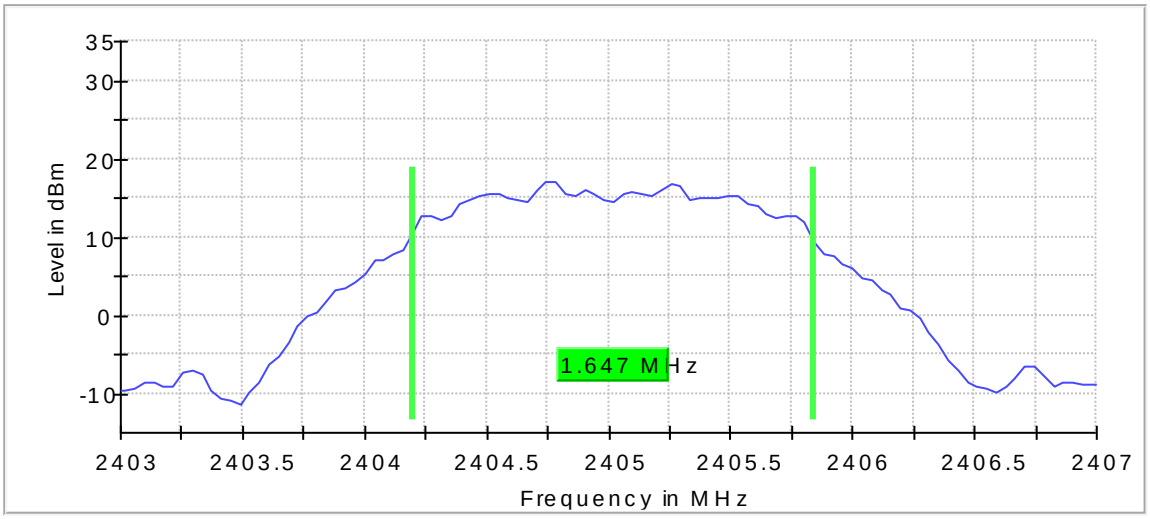
Minimum Emission Bandwidth 6 dB (2405 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

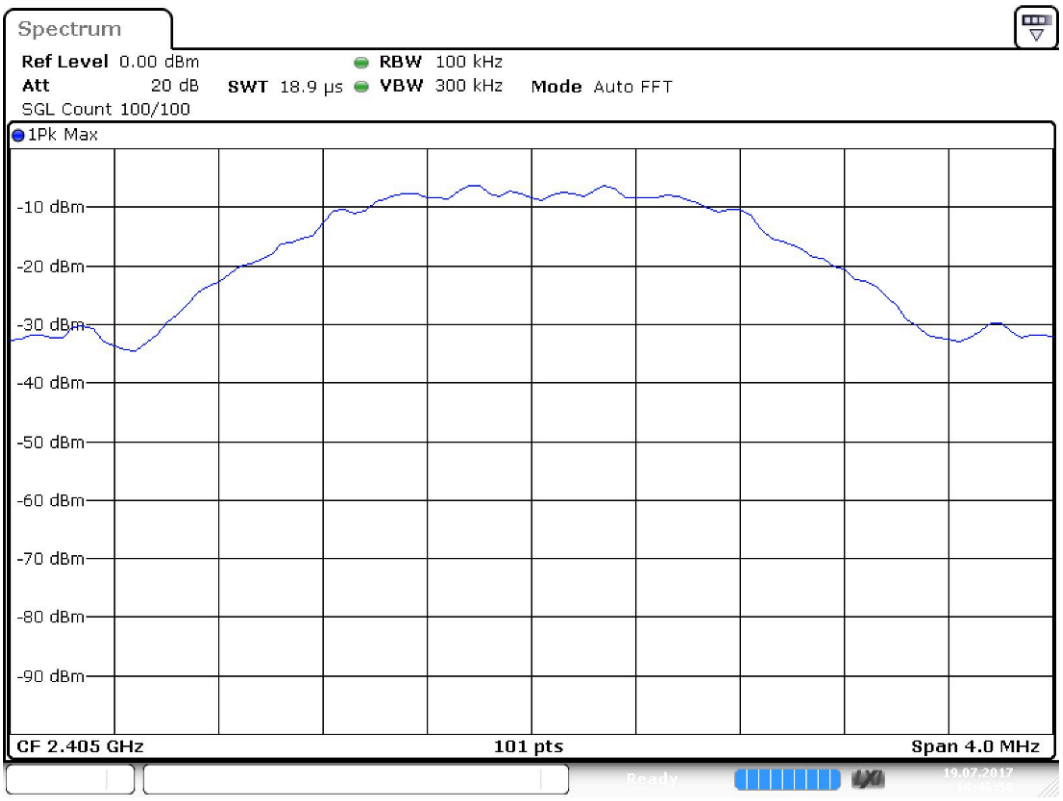
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 2%

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2405.000000	1.647059	0.500000	---	2404.196078	2405.843137	17.0	PASS



Bandwidth



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40300 GHz	2.40300 GHz
Stop Frequency	2.40700 GHz	2.40700 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	Off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	46 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.00 dB	0.50 dB

Band Edge low (2405 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 0.8 dB

Result

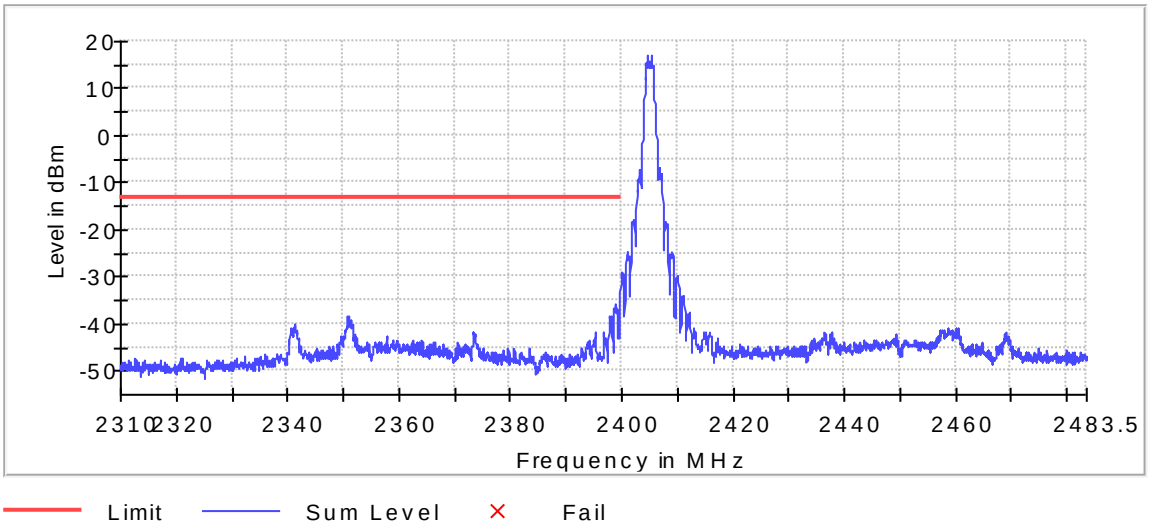
DUT Frequency (MHz)	Result
2405.000000	PASS

Inband Peak

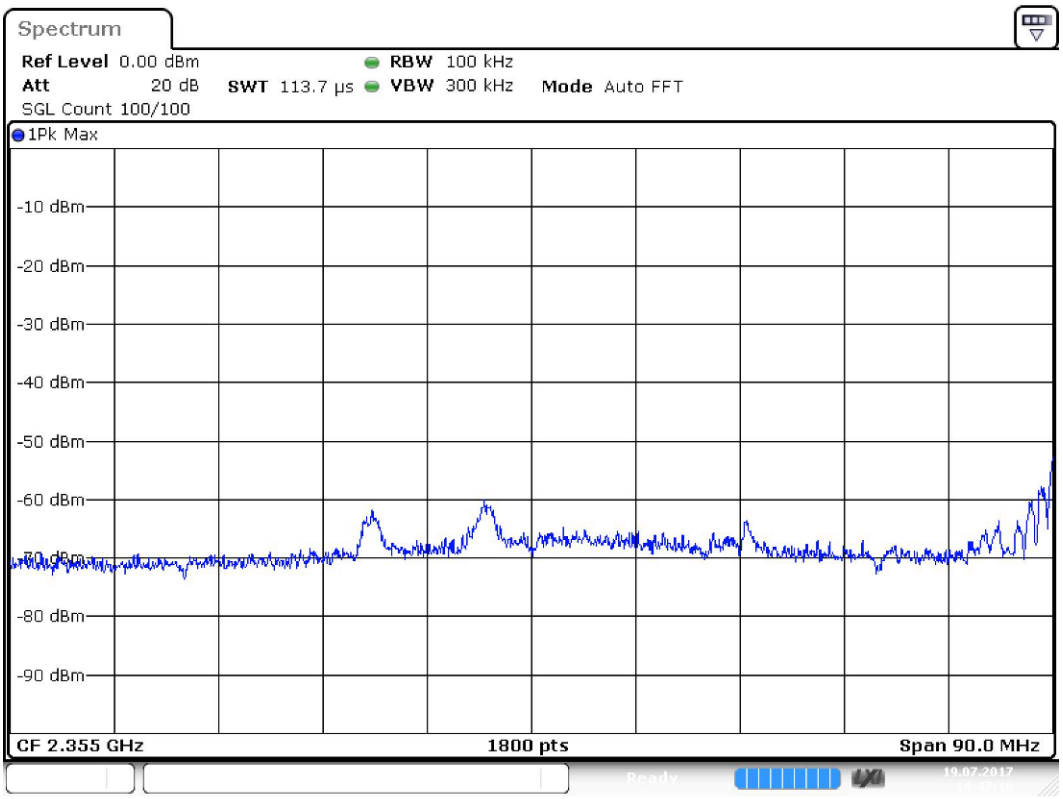
Frequency (MHz)	Level (dBm)
2405.271843	17.0

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.875069	-30.9	17.9	-13.0	PASS
2399.925042	-30.9	17.9	-13.0	PASS
2399.825097	-31.5	18.5	-13.0	PASS
2399.775125	-33.2	20.2	-13.0	PASS
2399.725153	-33.5	20.4	-13.0	PASS
2399.675180	-35.4	22.4	-13.0	PASS
2398.875625	-35.8	22.8	-13.0	PASS
2398.925597	-35.9	22.9	-13.0	PASS
2399.625208	-35.9	22.9	-13.0	PASS
2399.075514	-36.1	23.0	-13.0	PASS
2399.025541	-36.4	23.3	-13.0	PASS
2398.725708	-36.6	23.6	-13.0	PASS
2398.775680	-36.9	23.9	-13.0	PASS
2399.125486	-36.9	23.9	-13.0	PASS
2399.225430	-37.0	24.0	-13.0	PASS



Band Edge Connector 1_0



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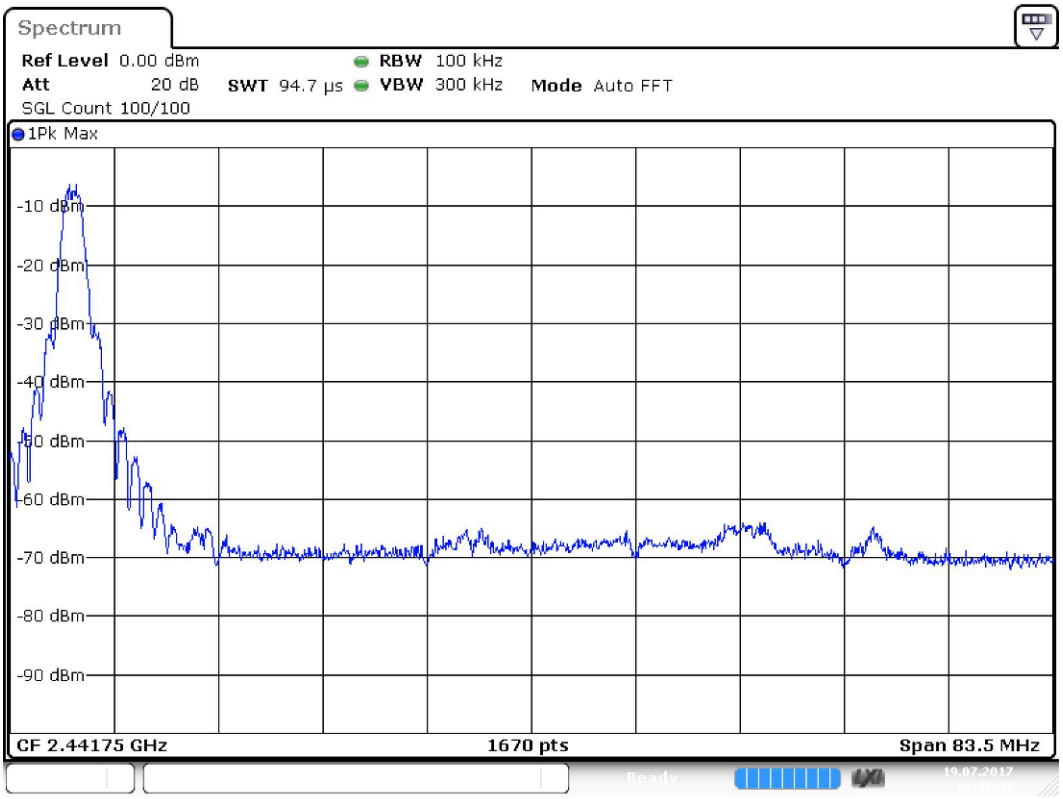
Band Edge Connector 1_1



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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	Off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	9 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	Off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	19 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Band Edge high (2405 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 0.8 dB

Result

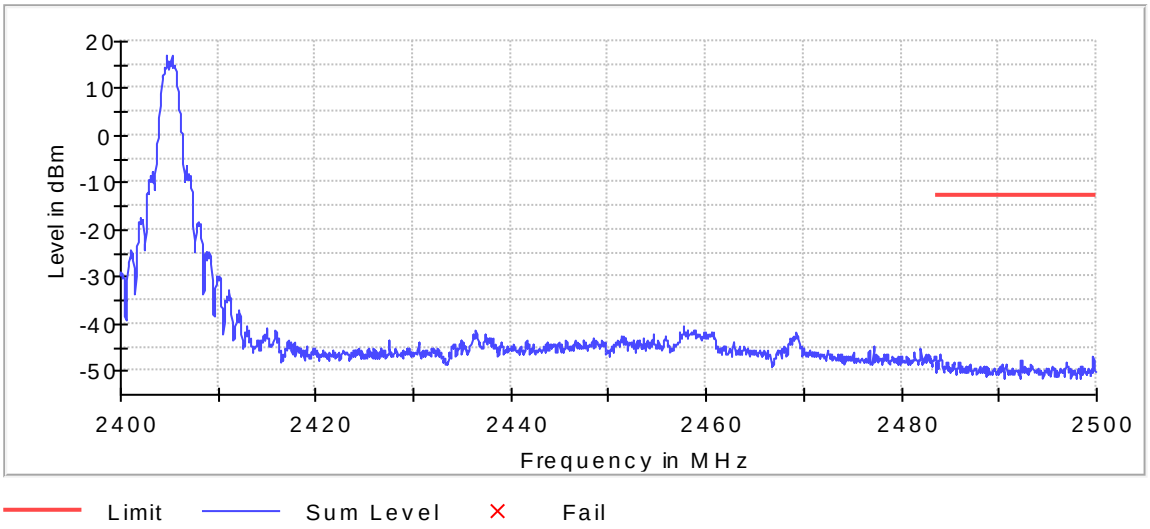
DUT Frequency (MHz)	Result
2405.000000	PASS

Inband Peak

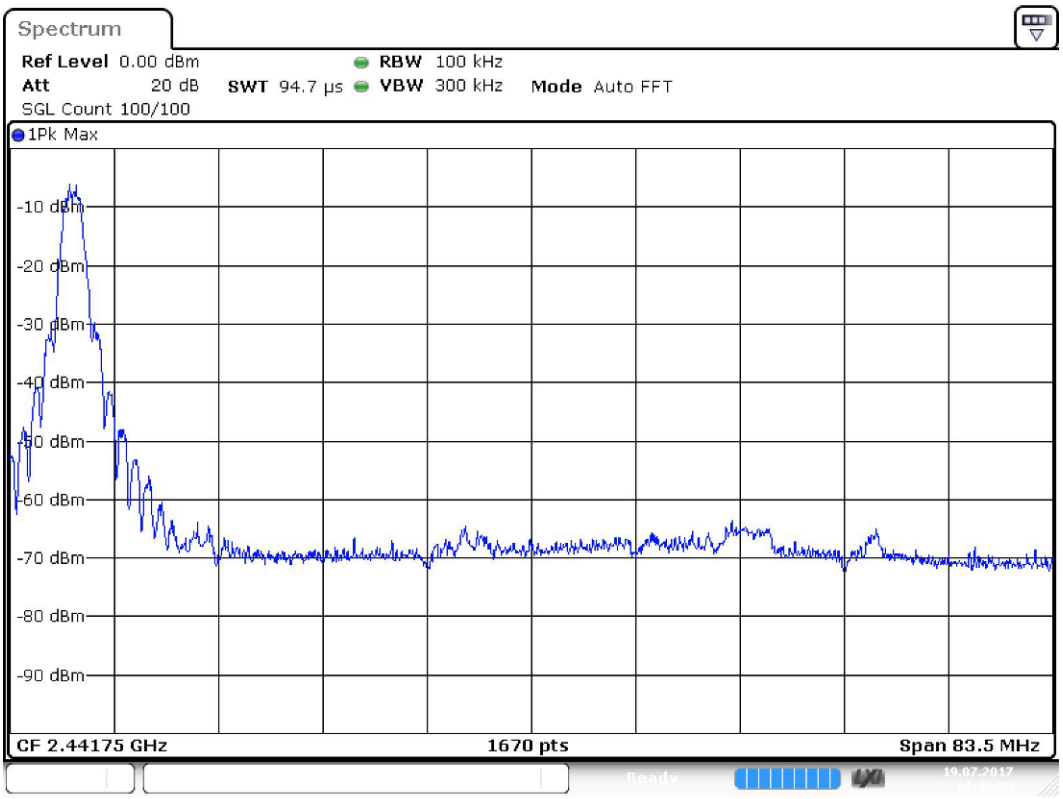
Frequency (MHz)	Level (dBm)
2404.772142	17.0

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.973565	-46.6	33.6	-13.0	PASS
2499.675982	-47.1	34.1	-13.0	PASS
2484.023414	-47.1	34.2	-13.0	PASS
2484.073263	-47.4	34.4	-13.0	PASS
2499.626133	-47.5	34.6	-13.0	PASS
2492.348187	-47.6	34.6	-13.0	PASS
2484.123112	-47.6	34.6	-13.0	PASS
2483.873867	-47.7	34.7	-13.0	PASS
2499.725831	-47.7	34.7	-13.0	PASS
2492.298338	-47.7	34.8	-13.0	PASS
2483.923716	-47.9	34.9	-13.0	PASS
2483.824018	-47.9	34.9	-13.0	PASS
2483.724320	-48.1	35.1	-13.0	PASS
2483.674471	-48.2	35.2	-13.0	PASS
2485.967523	-48.2	35.2	-13.0	PASS



Band Edge Connector 1_0



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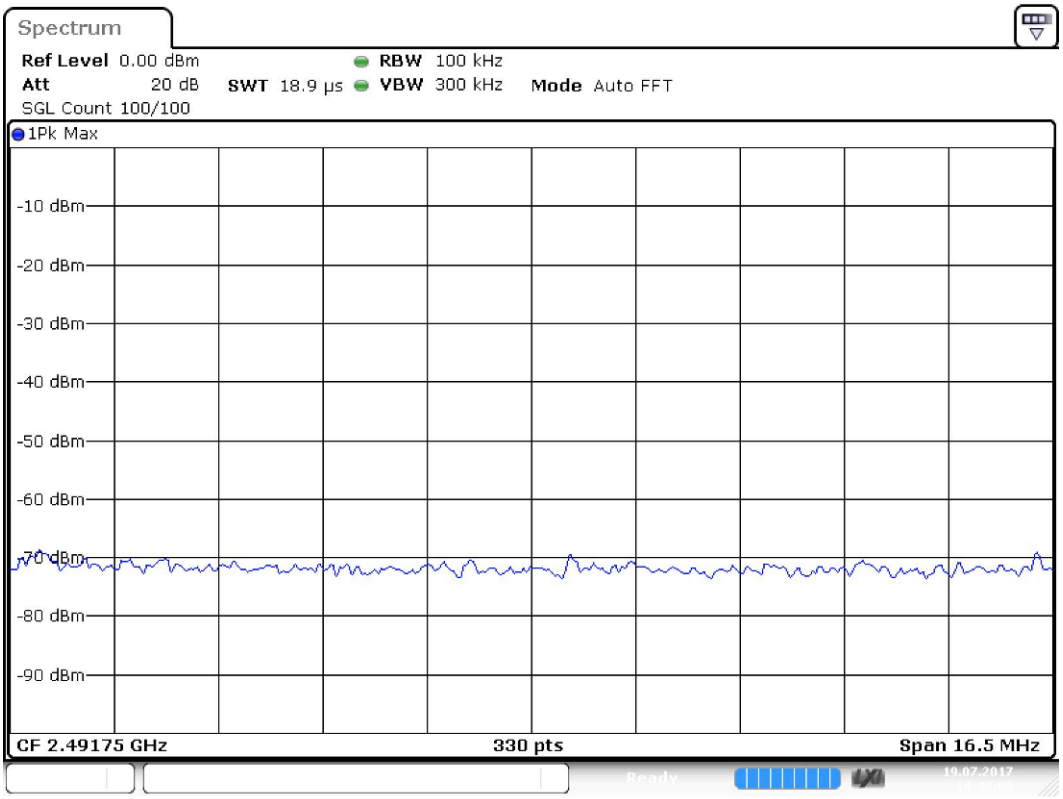
Band Edge Connector 1_1



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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	Off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	13 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
Sweeptime	18.945 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	Off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Tx Spurious Emission (2405 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 1.8 dB

Result

DUT Frequency (MHz)	Result
2405.000000	PASS

Final measurements

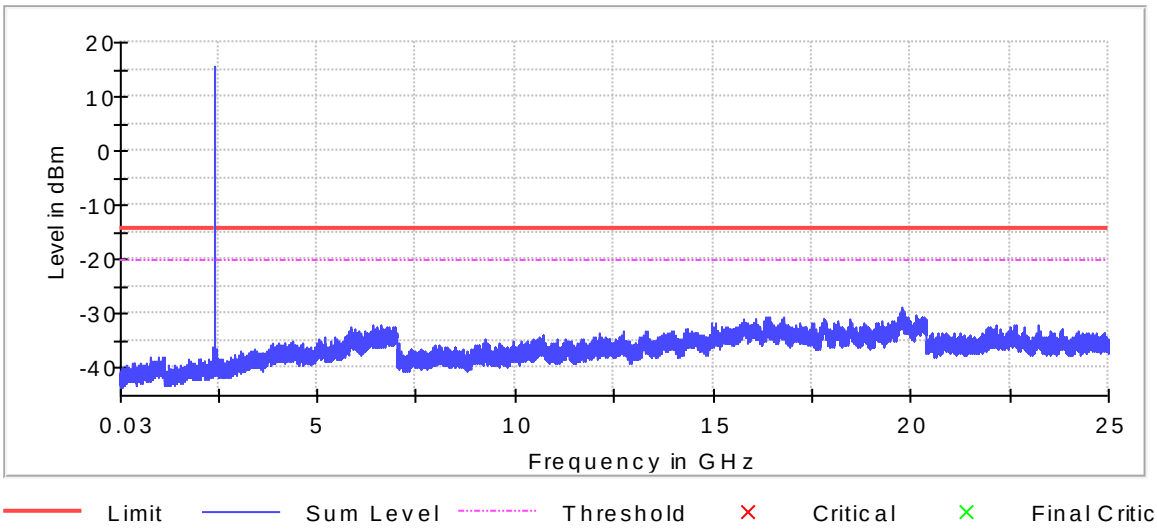
Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
---	---	---	---	---	---

Pre Measurements

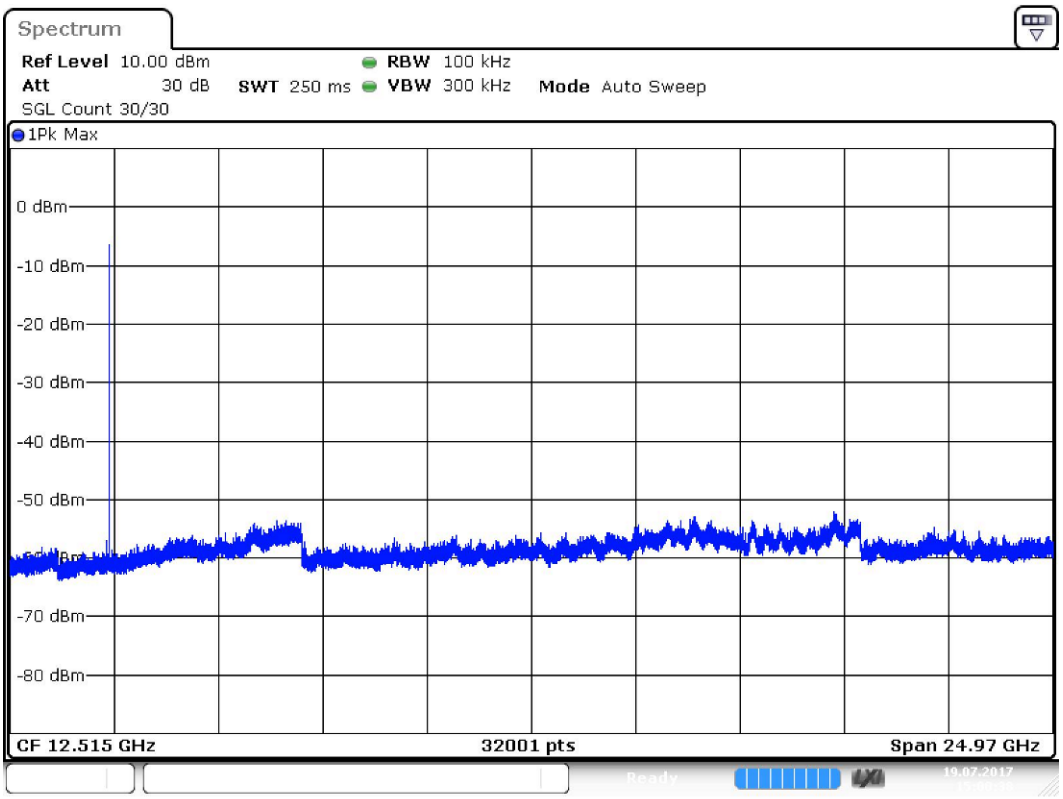
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19758.578370	-28.8	14.4	-14.4
19771.062590	-29.3	14.9	-14.4
19813.977095	-29.4	15.1	-14.4
19804.613930	-29.5	15.1	-14.4
19797.591557	-29.5	15.1	-14.4
19736.730986	-29.8	15.4	-14.4
19769.502062	-29.9	15.5	-14.4
19772.623117	-29.9	15.5	-14.4
19757.017843	-29.9	15.5	-14.4
19827.241579	-29.9	15.5	-14.4
19786.667865	-29.9	15.5	-14.4
19764.040216	-30.0	15.6	-14.4
19749.215205	-30.0	15.6	-14.4
19748.434942	-30.1	15.7	-14.4
19755.457315	-30.1	15.7	-14.4

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	25000.000000	1	1



Spurious Connector 1_0



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Pre Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	32001	~ 320001
Sweeptime	250.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	Off	Off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 10	max. 10
Stable	3 / 3	3
Max Stable Difference	0.20 dB	0.50 dB

Summary (2445MHz, Channel 19)

Test	Frequency (MHz)	Result
RF average output power	2445.000	PASS
Peak Power Spectral Density	2445.000	PASS
Minimum Emission Bandwidth 6 dB	2445.000	PASS
Band Edge low	2445.000	PASS
Band Edge high	2445.000	PASS
Tx Spurious Emission	2445.000	PASS

RF average output power (2445 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2445.000000	18.7	30.0	20.0	100.000	PASS

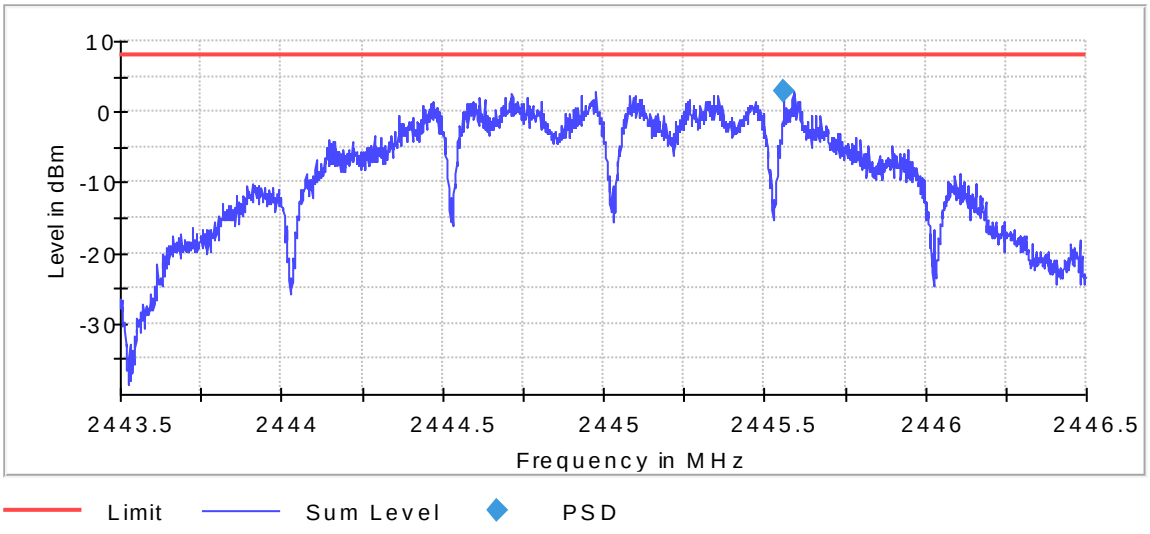
Peak Power Spectral Density (2445 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

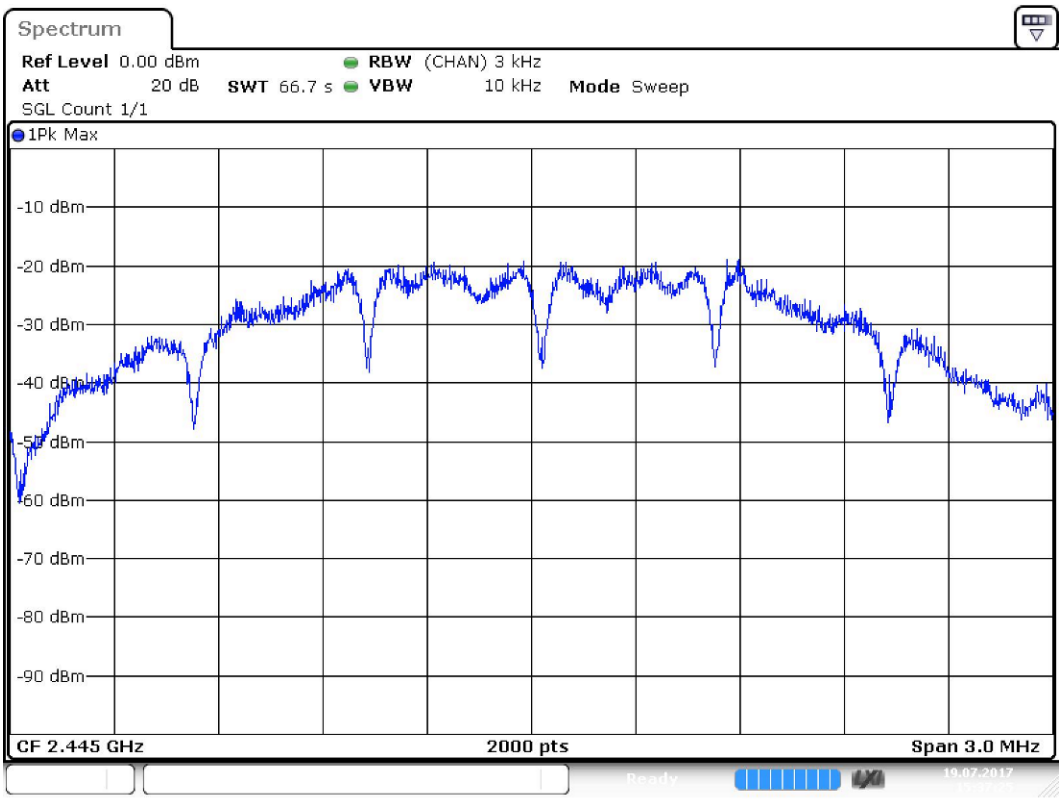
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 1.3 dB

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2445.000000	2445.559220	2.983	8.0	PASS



PSD Connector 1



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44350 GHz	2.44350 GHz
Stop Frequency	2.44650 GHz	2.44650 GHz
Span	3.000 MHz	3.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	2000	~ 2000
Sweeptime	66.700 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

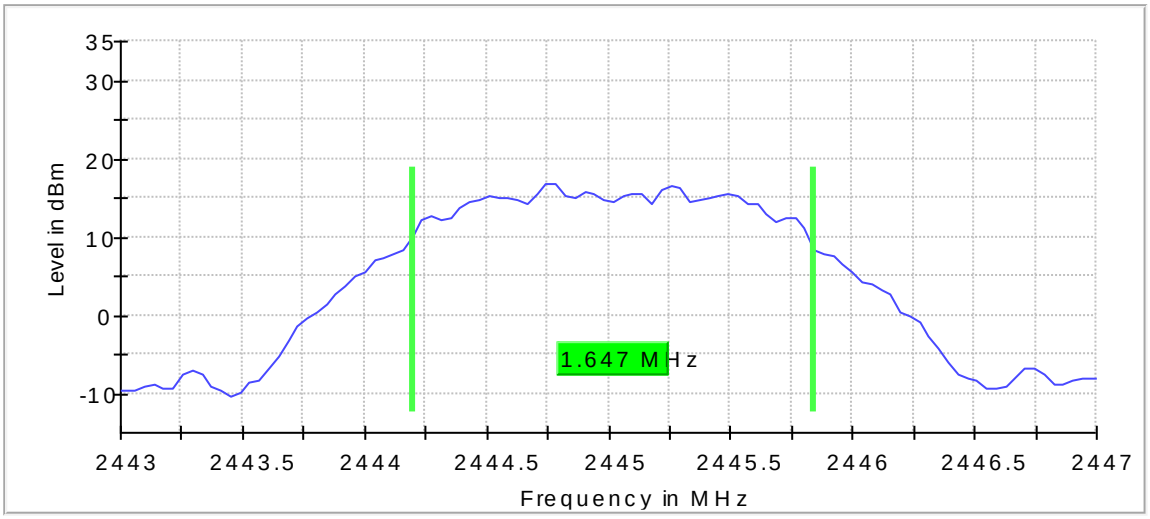
Minimum Emission Bandwidth 6 dB (2445 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

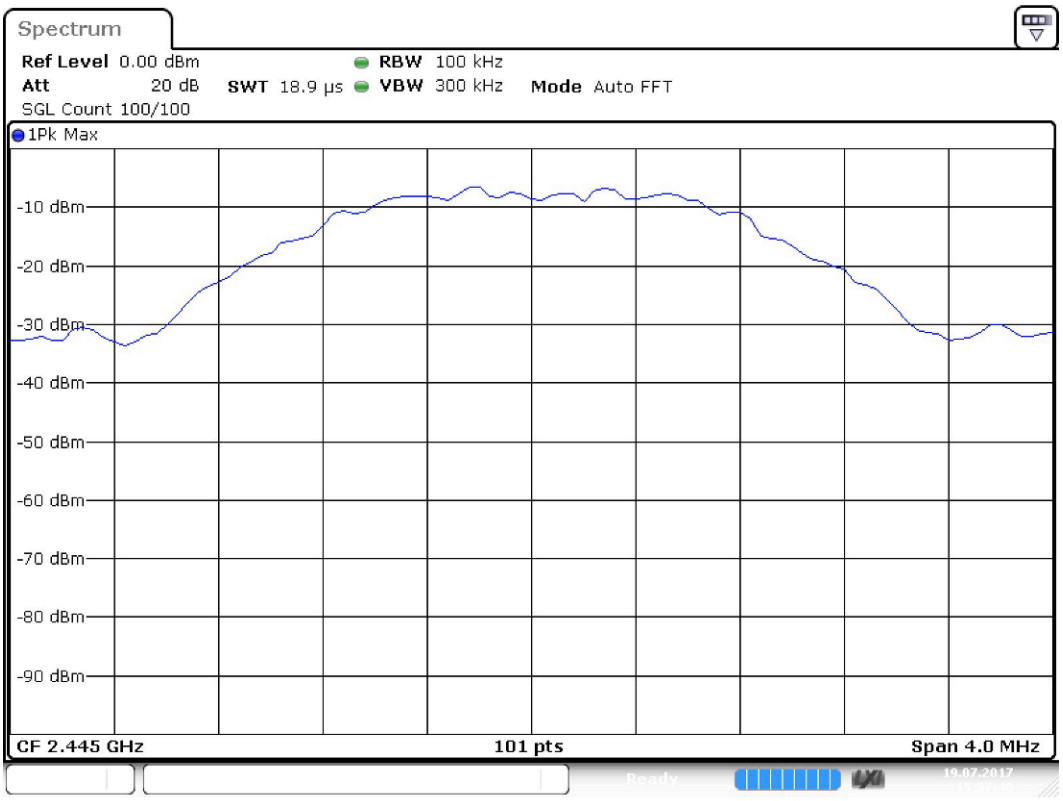
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 2%

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2445.000000	1.647059	0.500000	---	2444.196078	2445.843137	16.8	PASS



Bandwidth



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.44300 GHz	2.44300 GHz
Stop Frequency	2.44700 GHz	2.44700 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	48 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.16 dB	0.50 dB

Band Edge low (2445 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 0.8 dB

Result

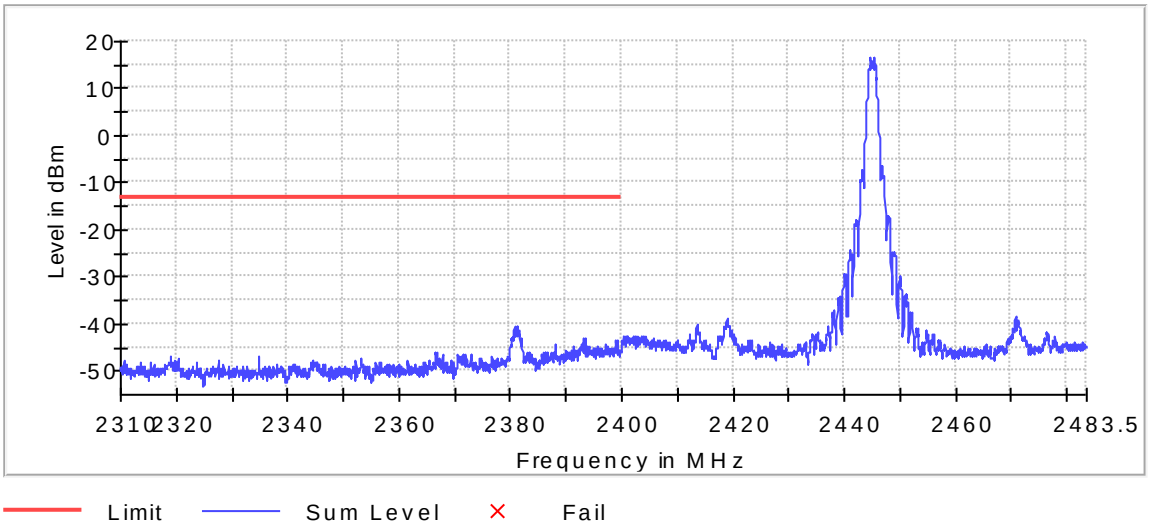
DUT Frequency (MHz)	Result
2445.000000	PASS

Inband Peak

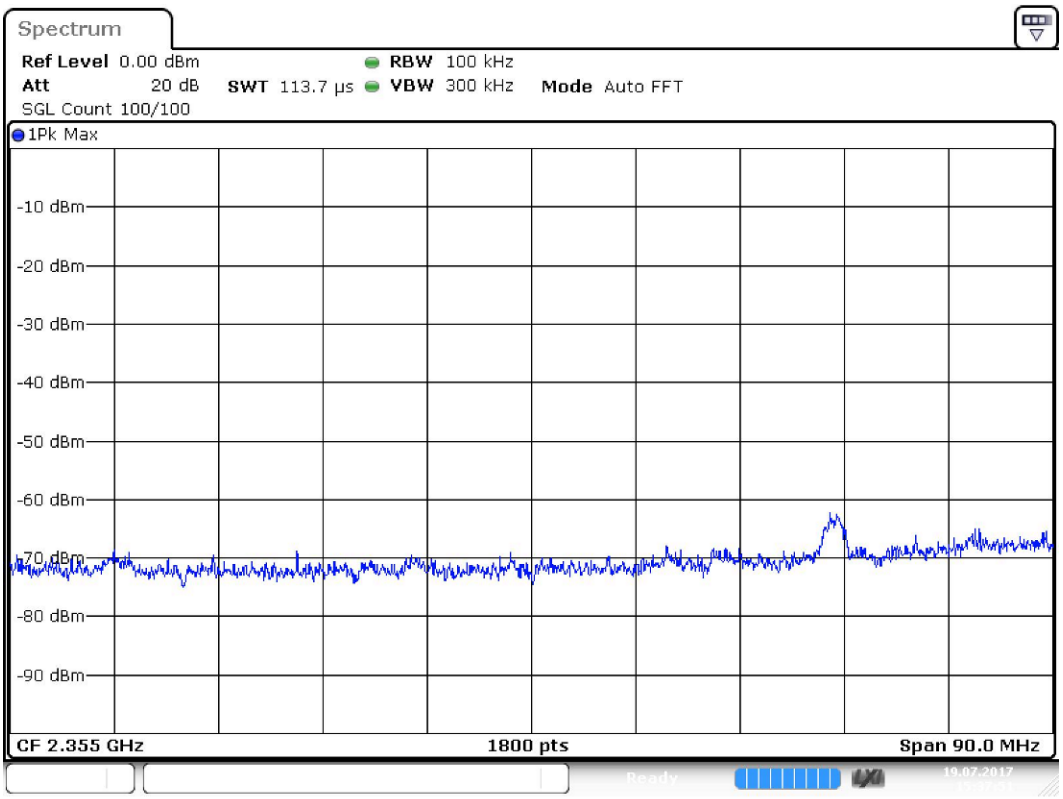
Frequency (MHz)	Level (dBm)
2444.748205	16.7

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2380.735702	-40.5	27.2	-13.3	PASS
2381.235425	-40.7	27.4	-13.3	PASS
2381.285397	-40.9	27.6	-13.3	PASS
2381.385341	-41.0	27.7	-13.3	PASS
2381.335369	-41.0	27.7	-13.3	PASS
2381.485286	-41.2	27.9	-13.3	PASS
2380.785675	-41.2	27.9	-13.3	PASS
2380.685730	-41.2	27.9	-13.3	PASS
2381.535258	-41.3	28.1	-13.3	PASS
2381.085508	-41.7	28.4	-13.3	PASS
2381.435314	-41.7	28.4	-13.3	PASS
2381.185453	-41.8	28.5	-13.3	PASS
2380.935591	-41.8	28.5	-13.3	PASS
2380.885619	-41.9	28.6	-13.3	PASS
2381.585230	-42.0	28.7	-13.3	PASS



Band Edge Connector 1_0



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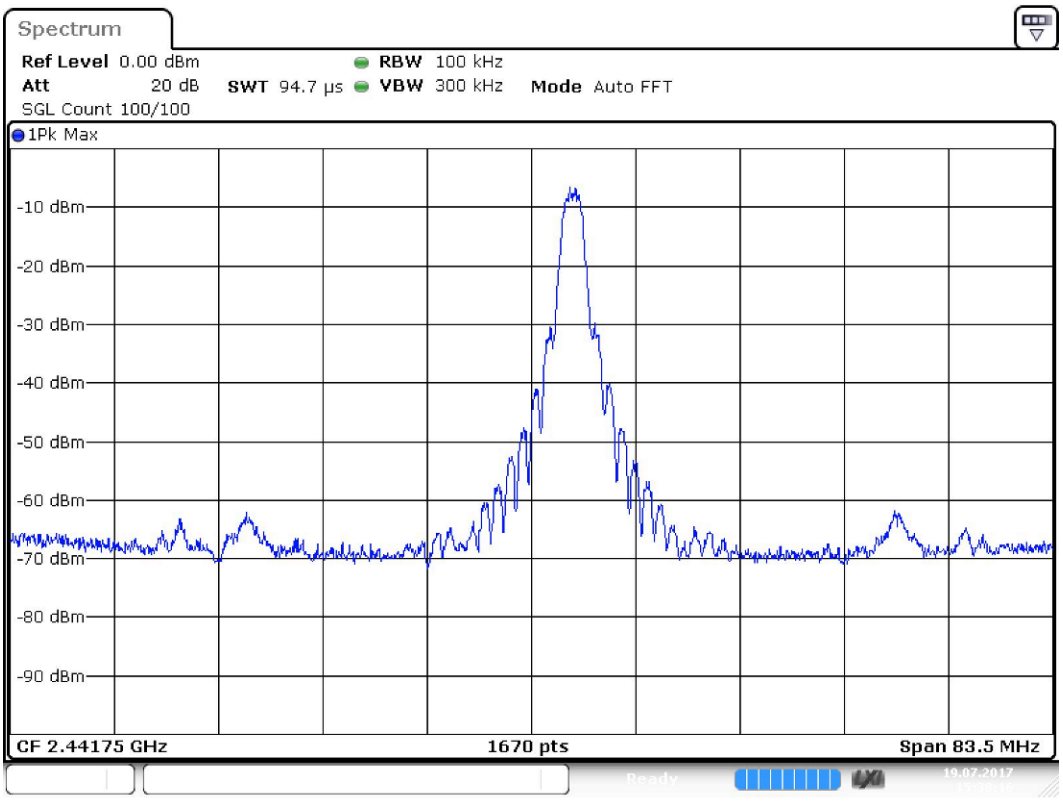
Band Edge Connector 1_1



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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	20 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Band Edge high (2445 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 0.8 dB

Result

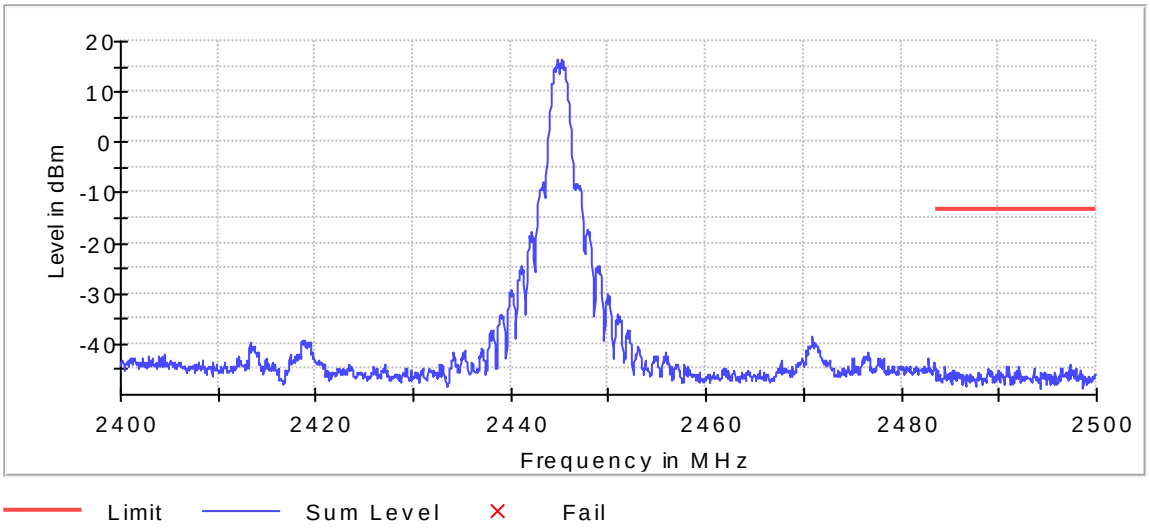
DUT Frequency (MHz)	Result
2445.000000	PASS

Inband Peak

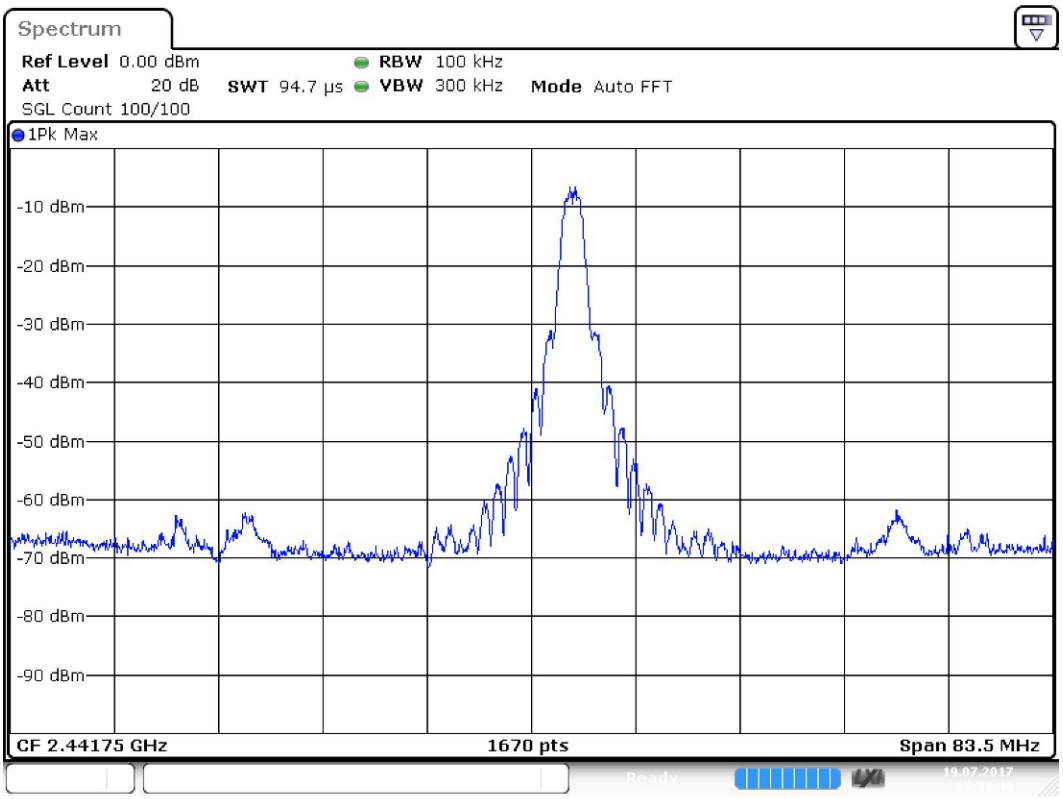
Frequency (MHz)	Level (dBm)
2444.748205	16.6

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2497.233384	-44.2	30.8	-13.4	PASS
2497.283233	-44.3	30.9	-13.4	PASS
2484.422205	-44.4	31.0	-13.4	PASS
2491.002266	-44.5	31.1	-13.4	PASS
2492.049094	-44.5	31.1	-13.4	PASS
2484.472054	-44.6	31.2	-13.4	PASS
2490.852719	-44.6	31.2	-13.4	PASS
2491.052115	-44.6	31.2	-13.4	PASS
2491.999245	-44.6	31.2	-13.4	PASS
2496.435801	-44.7	31.3	-13.4	PASS
2490.902568	-44.8	31.4	-13.4	PASS
2496.385952	-44.9	31.5	-13.4	PASS
2488.908610	-45.0	31.6	-13.4	PASS
2488.858761	-45.0	31.6	-13.4	PASS
2493.594411	-45.0	31.6	-13.4	PASS



Band Edge Connector 1_0



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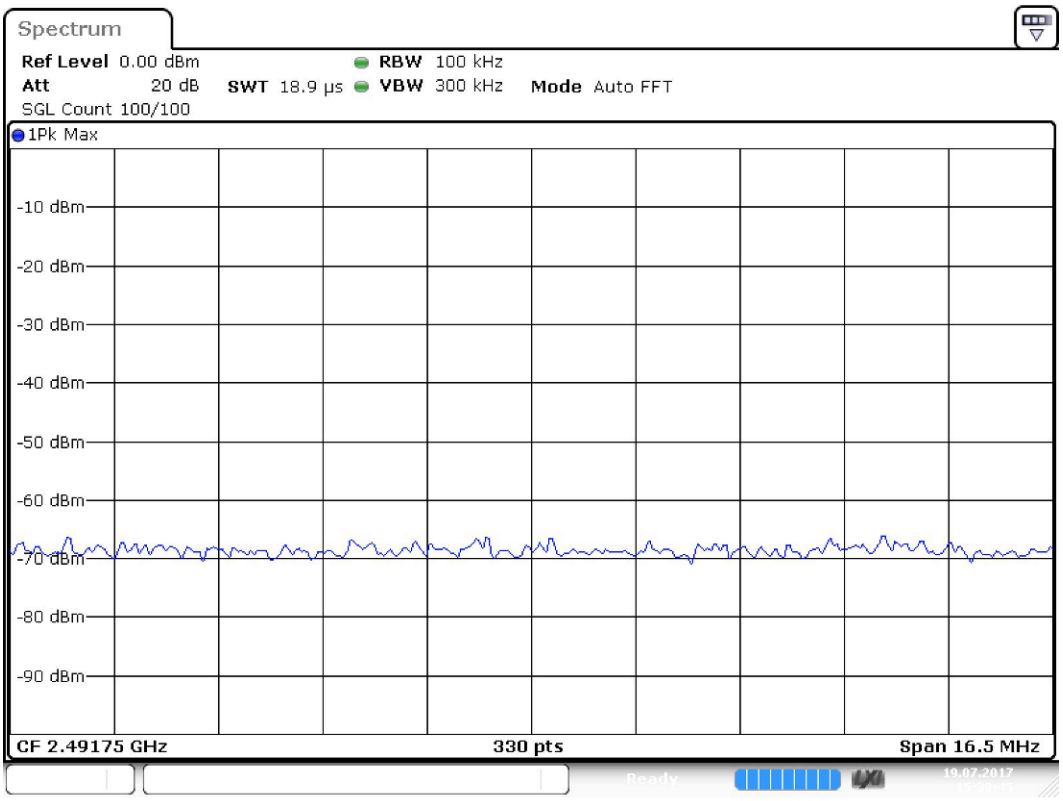
Band Edge Connector 1_1



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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	16 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.21 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
Sweeptime	18.945 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Tx Spurious Emission (2445 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 1.8 dB

Result

DUT Frequency (MHz)	Result
2445.000000	PASS

Final measurements

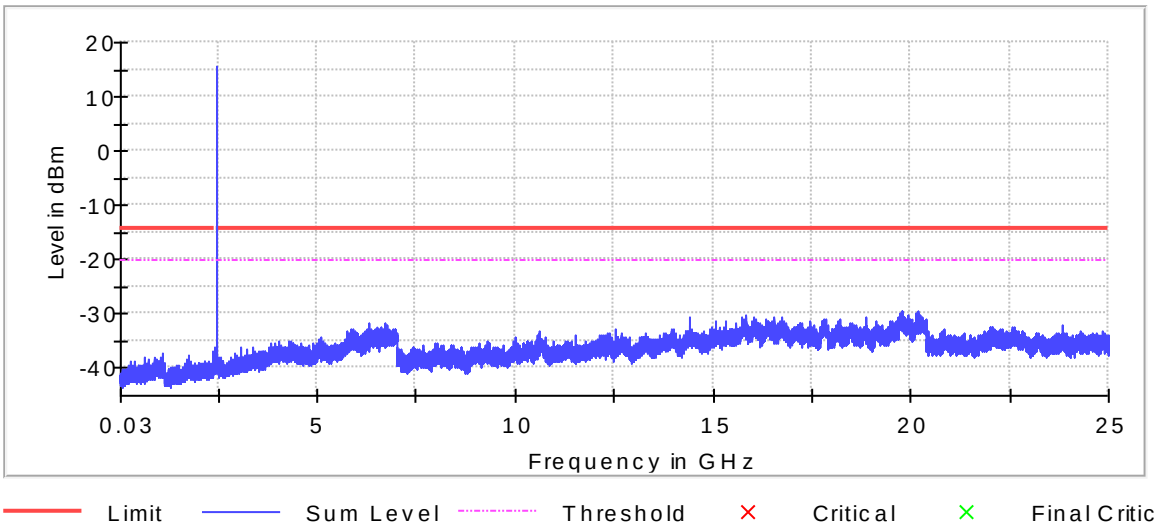
Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
---	---	---	---	---	---

Pre Measurements

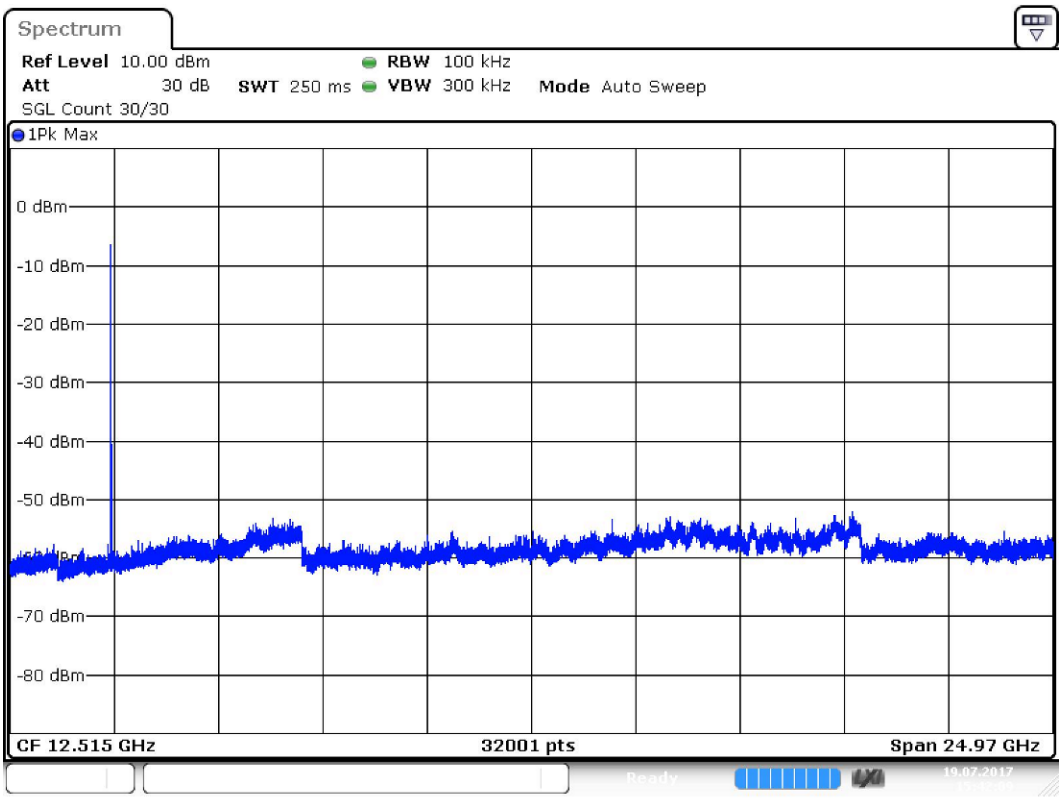
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20180.701050	-29.5	15.1	-14.4
19762.479689	-29.5	15.1	-14.4
19778.865227	-29.5	15.1	-14.4
19777.304700	-29.6	15.2	-14.4
19749.215205	-29.7	15.3	-14.4
19794.470502	-29.8	15.4	-14.4
19775.744172	-29.8	15.4	-14.4
19782.766546	-29.8	15.4	-14.4
19764.820480	-29.9	15.5	-14.4
19783.546810	-29.9	15.5	-14.4
20124.522061	-29.9	15.5	-14.4
19767.941535	-29.9	15.5	-14.4
20210.351072	-30.0	15.6	-14.4
19788.228392	-30.2	15.8	-14.4
19792.129711	-30.2	15.8	-14.4

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	25000.000000	1	1



Spurious Connector 1_0



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Pre Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	32001	~ 320001
Sweeptime	250.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 10	max. 10
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Summary (2480MHz, Channel 26)

Test	Frequency (MHz)	Result
RF average output power	2480.000	PASS
Peak Power Spectral Density	2480.000	PASS
Minimum Emission Bandwidth 6 dB	2480.000	PASS
Band Edge low	2480.000	PASS
Band Edge high	2480.000	PASS
Tx Spurious Emission	2480.000	PASS

RF average output power (2480 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2480.000000	18.3	30.0	19.6	100.000	PASS

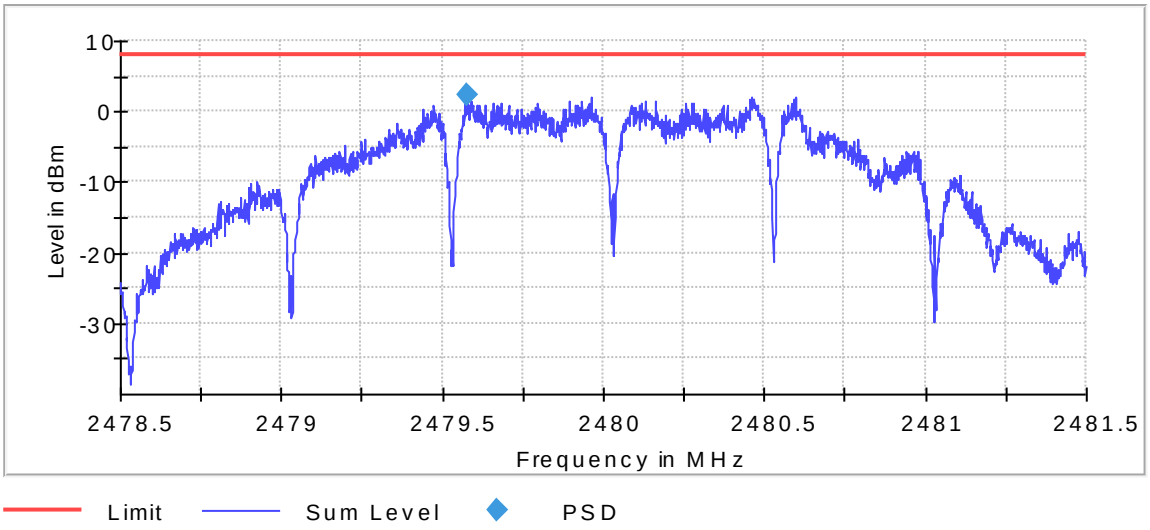
Peak Power Spectral Density (2480 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

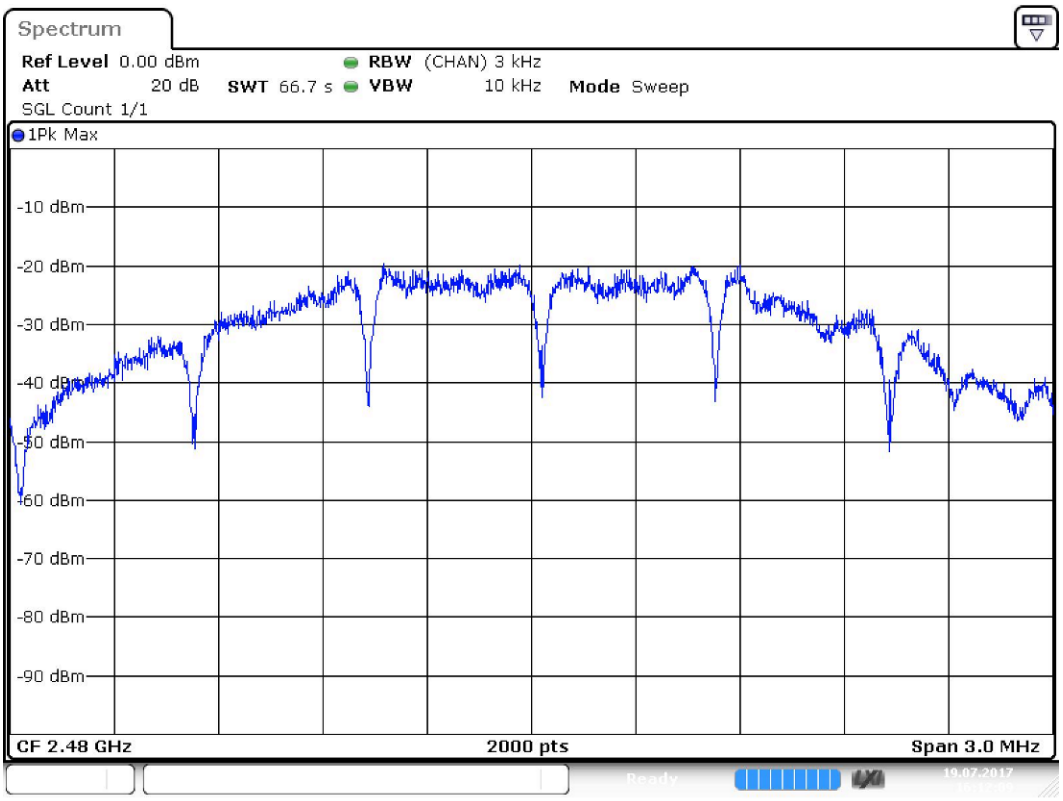
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 1.3 dB

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2479.574213	2.375	8.0	PASS



PSD Connector 1



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47850 GHz	2.47850 GHz
Stop Frequency	2.48150 GHz	2.48150 GHz
Span	3.000 MHz	3.000 MHz
RBW	3.000 kHz	<= 3.000 kHz
VBW	10.000 kHz	>= 9.000 kHz
SweepPoints	2000	~ 2000
Sweeptime	66.700 s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off

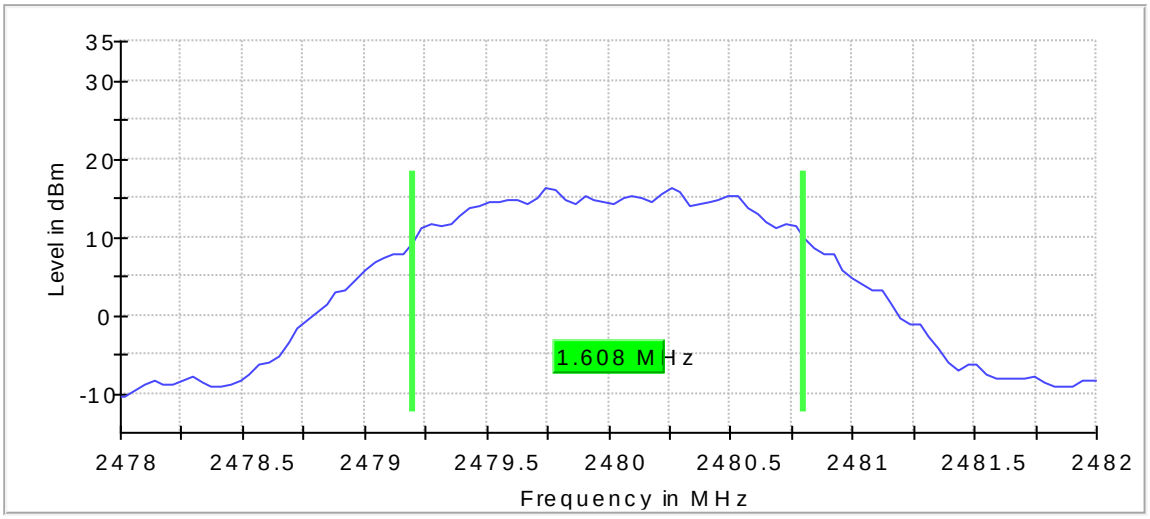
Minimum Emission Bandwidth 6 dB (2480 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

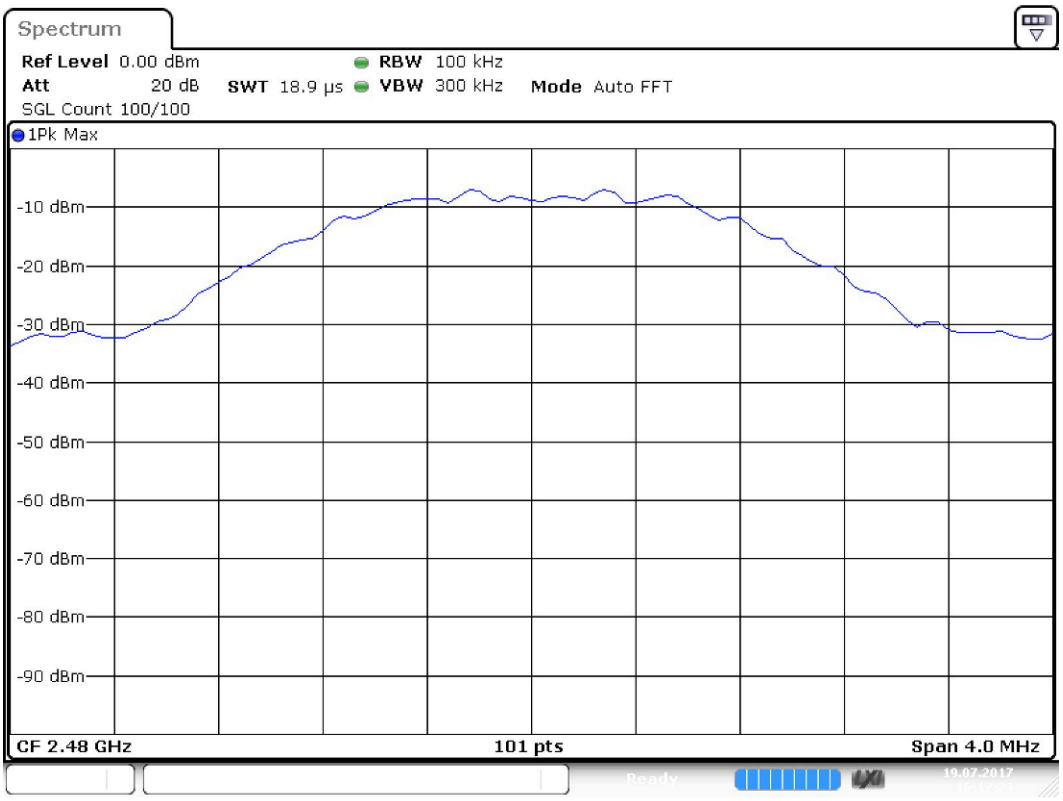
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 2%

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2480.000000	1.607844	0.500000	---	2479.196078	2480.803922	16.2	PASS



Bandwidth



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Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
Sweeptime	18.938 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	38 / max. 150	max. 150
Stable	15 / 15	15
Max Stable Difference	0.10 dB	0.50 dB

Band Edge low (2480 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 0.8 dB

Result

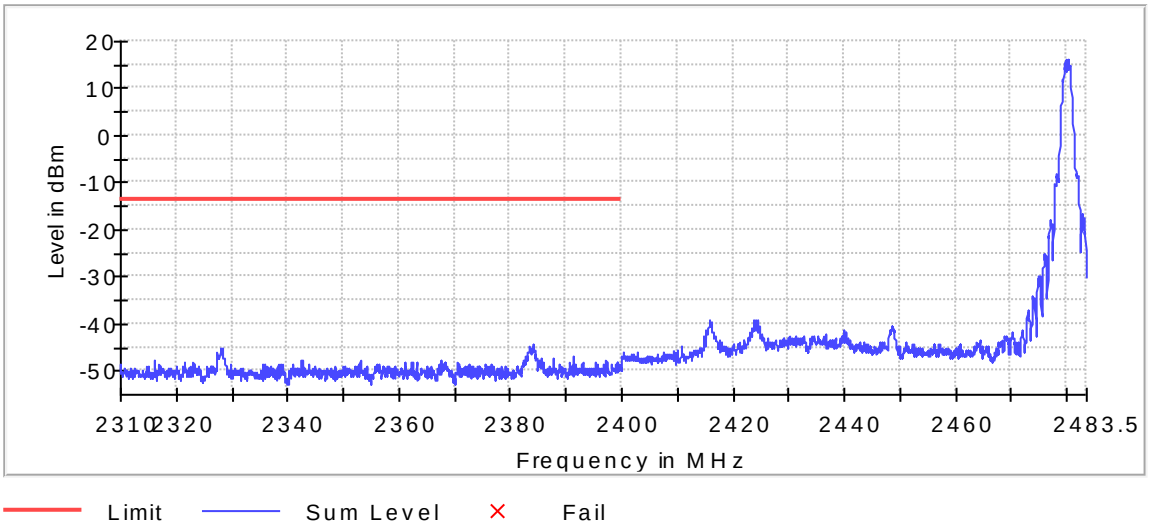
DUT Frequency (MHz)	Result
2480.000000	PASS

Inband Peak

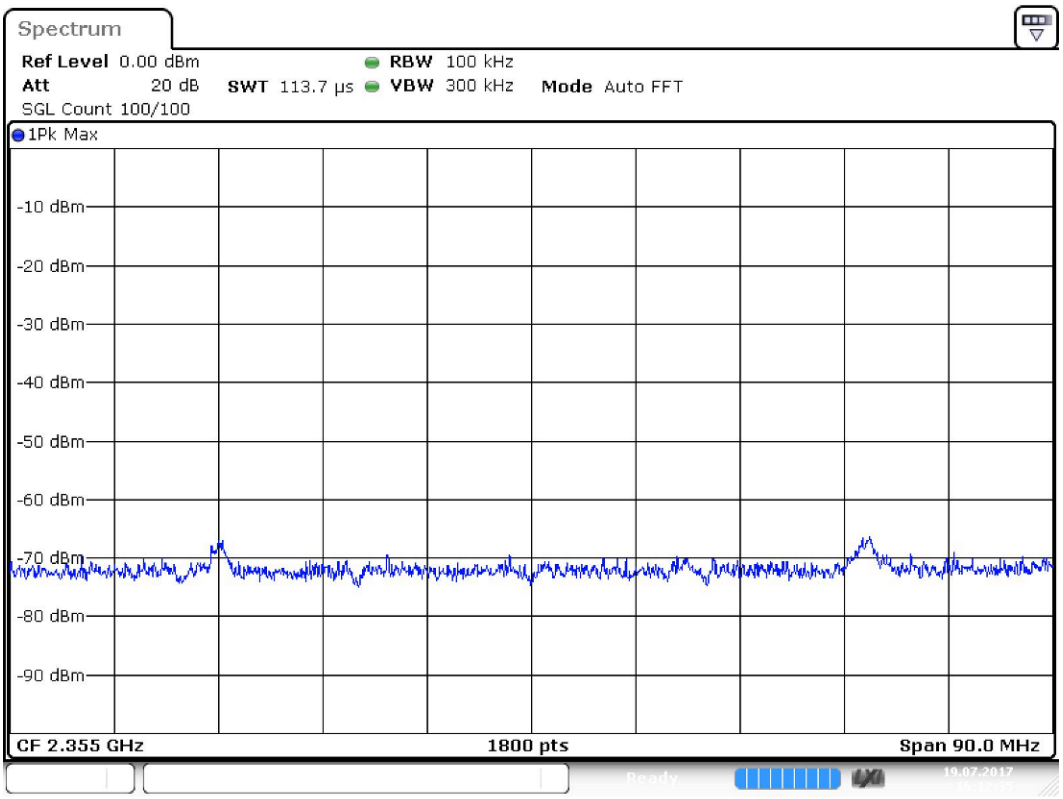
Frequency (MHz)	Level (dBm)
2480.226960	16.3

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2384.083842	-44.4	30.6	-13.7	PASS
2383.484175	-44.6	30.9	-13.7	PASS
2384.133815	-44.8	31.0	-13.7	PASS
2383.534148	-44.8	31.0	-13.7	PASS
2383.584120	-44.9	31.2	-13.7	PASS
2384.233759	-44.9	31.2	-13.7	PASS
2383.434203	-45.1	31.3	-13.7	PASS
2384.033870	-45.1	31.3	-13.7	PASS
2328.314825	-45.1	31.4	-13.7	PASS
2383.983898	-45.1	31.4	-13.7	PASS
2383.933926	-45.2	31.5	-13.7	PASS
2327.965019	-45.2	31.5	-13.7	PASS
2383.883953	-45.3	31.5	-13.7	PASS
2383.833981	-45.5	31.8	-13.7	PASS
2384.183787	-45.6	31.8	-13.7	PASS



Band Edge Connector 1_0



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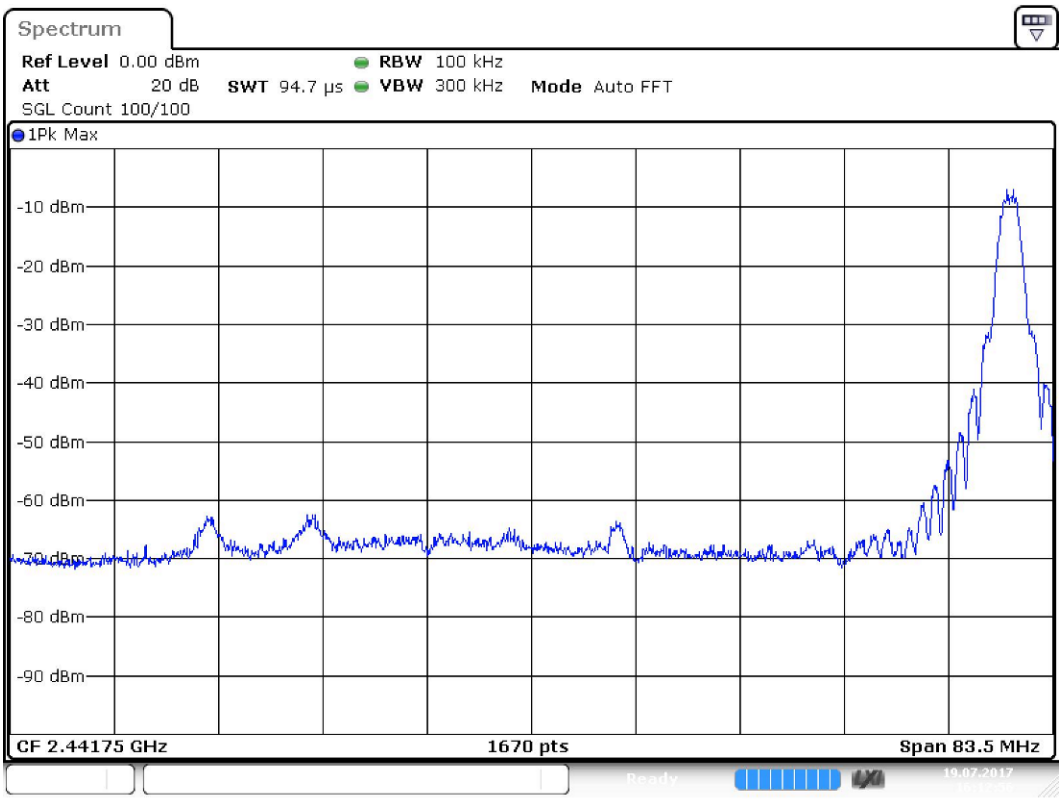
Band Edge Connector 1_1



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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	16 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.18 dB	0.50 dB

Band Edge high (2480 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 0.8 dB

Result

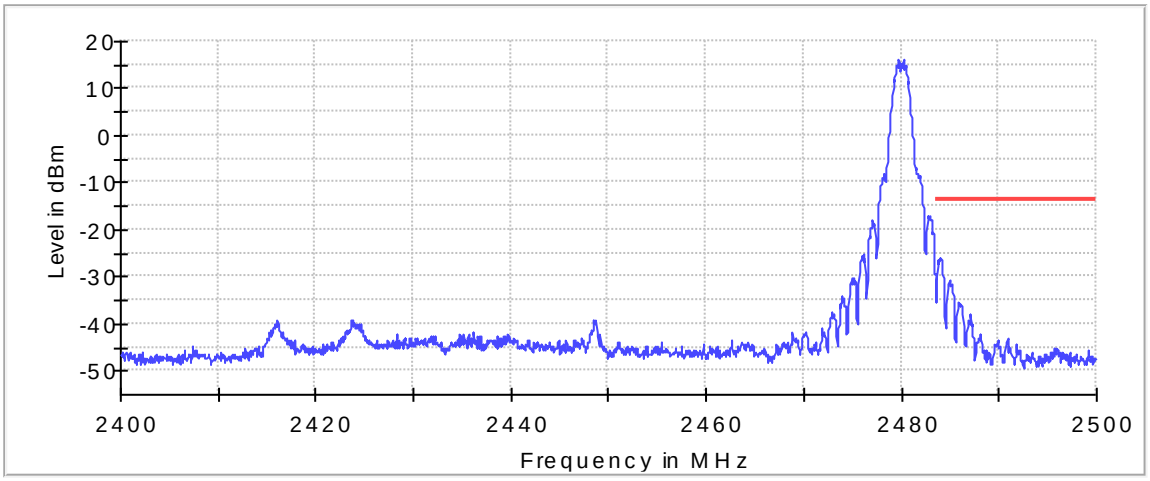
DUT Frequency (MHz)	Result
2480.000000	PASS

Inband Peak

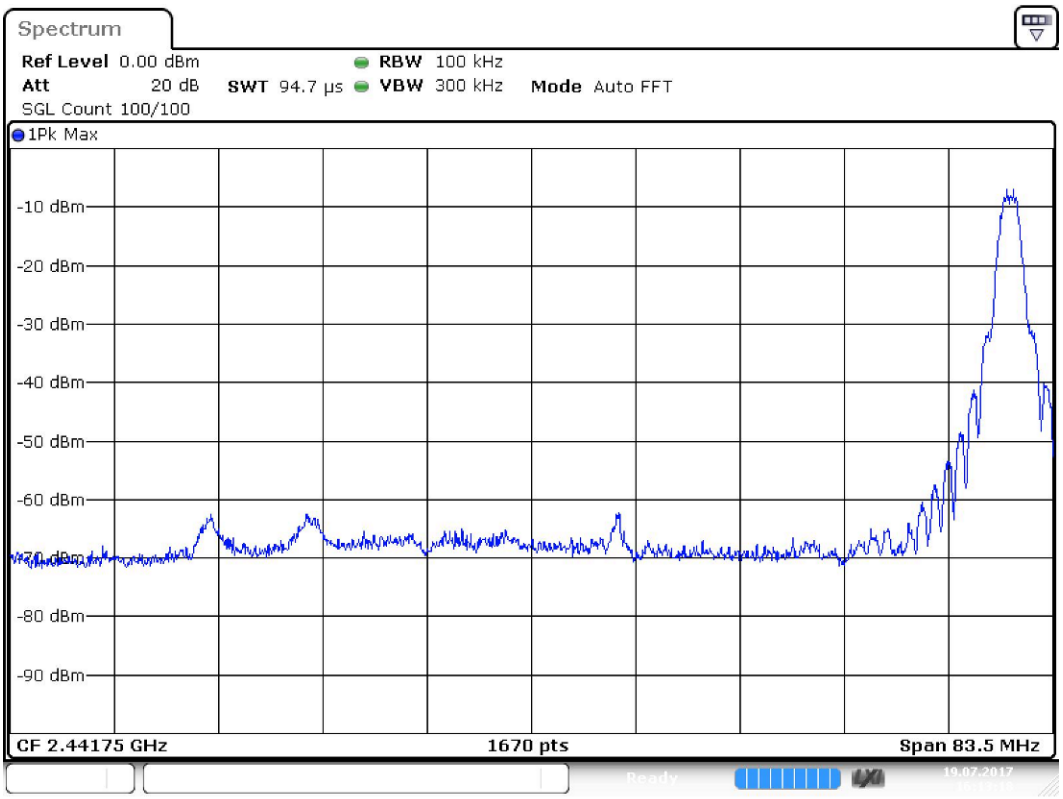
Frequency (MHz)	Level (dBm)
2480.226960	16.3

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.923716	-25.9	12.1	-13.7	PASS
2484.073263	-26.1	12.4	-13.7	PASS
2483.973565	-26.2	12.4	-13.7	PASS
2484.023414	-26.3	12.6	-13.7	PASS
2484.123112	-26.4	12.6	-13.7	PASS
2483.774169	-26.5	12.8	-13.7	PASS
2483.824018	-26.8	13.1	-13.7	PASS
2484.172961	-27.1	13.3	-13.7	PASS
2483.873867	-27.1	13.4	-13.7	PASS
2483.724320	-27.9	14.2	-13.7	PASS
2484.222810	-29.1	15.4	-13.7	PASS
2484.272659	-29.4	15.7	-13.7	PASS
2484.322508	-30.3	16.5	-13.7	PASS
2483.674471	-30.6	16.9	-13.7	PASS
2484.920695	-30.7	17.0	-13.7	PASS



Band Edge Connector 1_0



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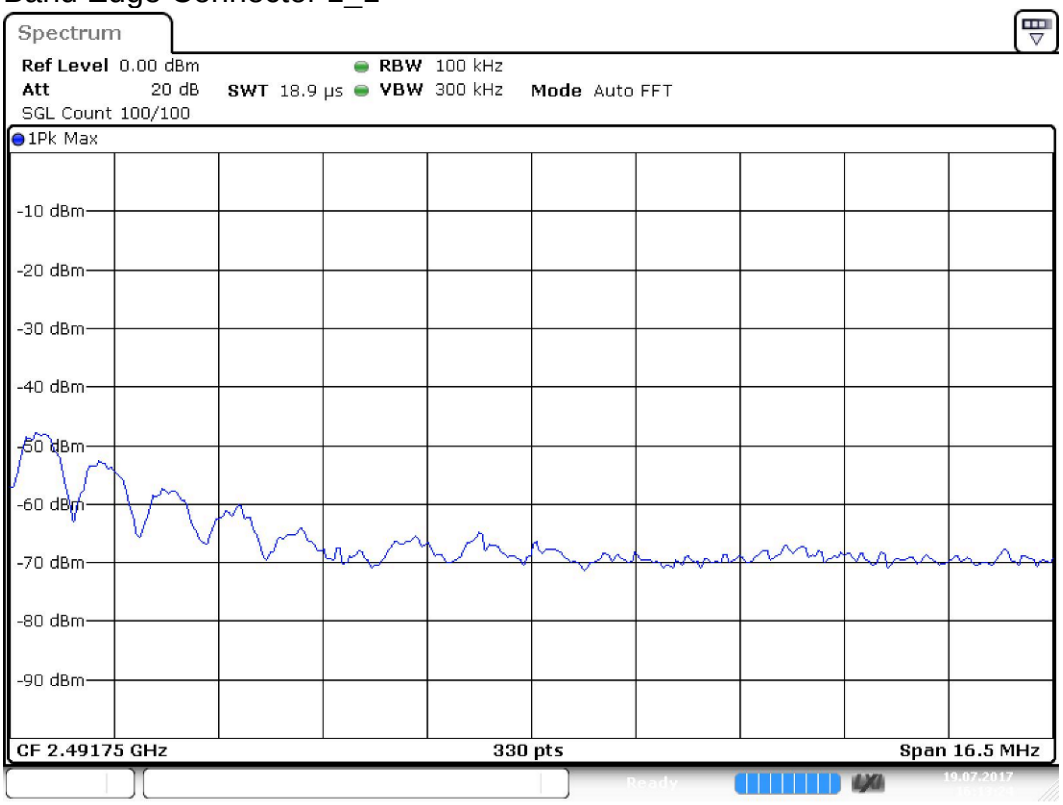
Band Edge Connector 1_1



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Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	15 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.12 dB	0.50 dB

Measurement 2

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
Sweeptime	18.945 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	11 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.27 dB	0.50 dB

Tx Spurious Emission (2480 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Uncertainty (K=2) < 1.8 dB

Result

DUT Frequency (MHz)	Result
2480.000000	PASS

Final measurements

Frequency (MHz)	Level Pre Measurement (dBm)	level (dBm)	Limit (dBm)	Margin (dB)	Result
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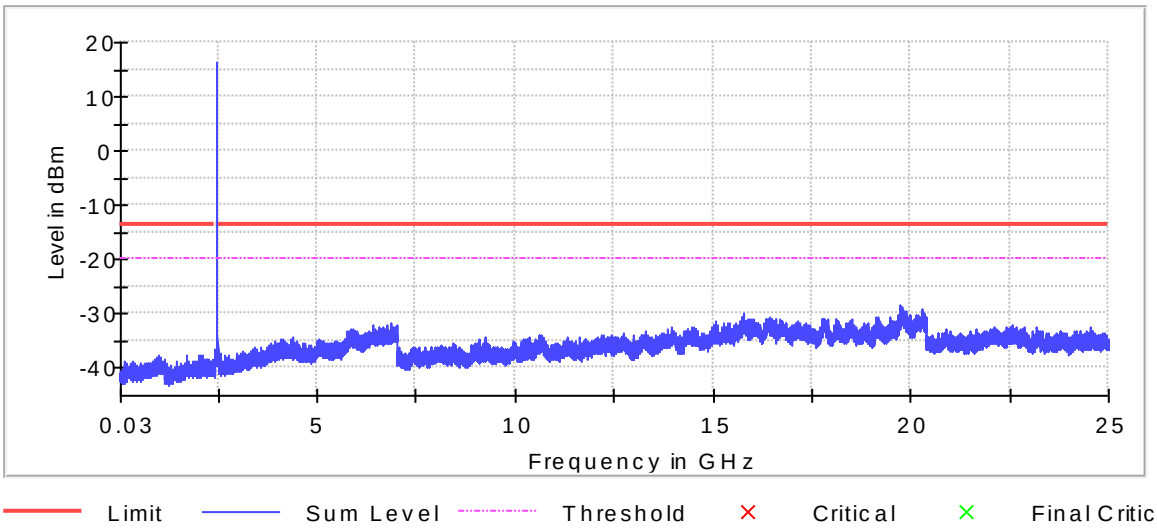
Pre Measurements

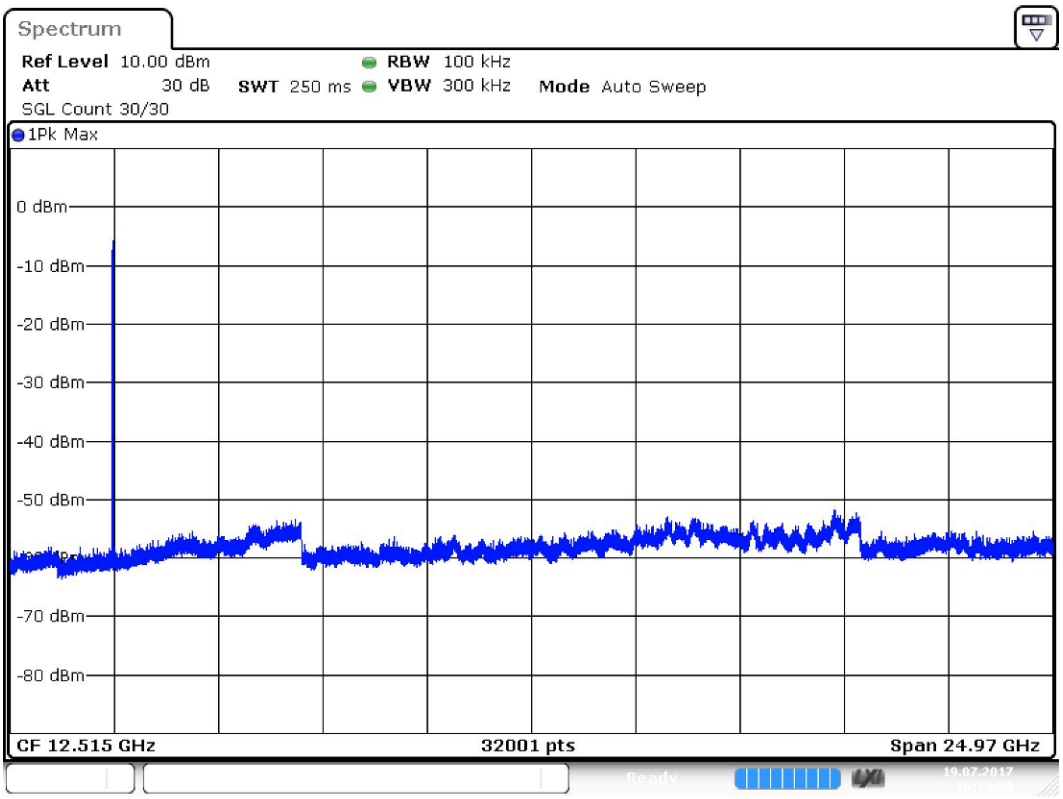
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2483.539310	-21.7	8.0	-13.7
2484.319574	-26.3	12.5	-13.7
19754.677051	-28.4	14.7	-13.7
19777.304700	-28.7	15.0	-13.7
19790.569183	-29.1	15.4	-13.7
19746.874414	-29.2	15.5	-13.7
19746.094150	-29.2	15.5	-13.7
20285.256390	-29.2	15.5	-13.7
19710.982282	-29.4	15.7	-13.7
19763.259953	-29.4	15.7	-13.7
19735.950722	-29.4	15.7	-13.7
19768.721799	-29.5	15.7	-13.7
19895.124523	-29.5	15.8	-13.7
19836.604743	-29.6	15.9	-13.7
19735.170458	-29.6	15.9	-13.7

Measurement Settings

Start Frequency (MHz)	Stop Frequency (MHz)	Pre Measurement	Final Measurement
30.000000	25000.000000	1	1



Spurious Connector 1_0



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Pre Measurement 1

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	32001	~ 320001
Sweeptime	250.000 ms	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	30	30
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 10	max. 10
Stable	2 / 3	3
Max Stable Difference	0.00 dB	0.50 dB