TEST REPORT

DT&C Co., Ltd.

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1. Report No :	DRTFCC1912-0316
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Dt&C

- 2. Customer
 - Name : HYUNDAI MOBIS CO., LTD.
 - Address : 203, Teheran-ro Gangnam-gu, Seoul, South Korea, 135-977
- 3. Use of Report : FCC Original Grant
- 4. Product Name / Model Name : DIGITAL CAR AUDIO SYSTEM / ADB10SVGG FCC ID : TQ8-ADB10SVGG
- 5. Test Method Used : KDB558074 D01v05r02, ANSI C63.10-2013 Test Specification : FCC Part 15.247
- 6. Date of Test : 2019.11.04 ~ 2019.11.22
- 7. Testing Environment : See appended test report.
- 8. Test Result : Refer to the attached test result.



The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DT&C Co., Ltd.

2019.12.09.



If this report is required to confirmation of authenticity, please contact to report@dtnc.net



Test Report Version

Test Report No.	Date	Description	Revised By	Reviewed By
DRTFCC1912-0316	Dec. 09, 2019	Initial issue	JungWoo Kim	Geunki Son



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1. EUT DESCRIPTION

FCC Equipment Class	Digital Transmission System(DTS)
Product	DIGITAL CAR AUDIO SYSTEM
Model Name	ADB10SVGG
Add Model Name	ADB10SVIG, ADB11SVGG, ADB12SVGG, ADB13SVGG, ADB10SVGN, ADB11SVGN, ADB10SVMG, ADB10SVGL, ADB14SVGG
Hardware Version	1.0
Software Version	1.0
Power Supply	DC 14.4 V
Frequency Range	▪ 802.11b/g/n(20 MHz) : 2412 MHz ~ 2462 MHz
Max. RF Output Power	2.4GHz Band • 802.11b : 13.21 dBm • 802.11g : 20.97 dBm • 802.11n (HT20) : 21.57 dBm
Modulation Type	• 802.11b: CCK, DSSS • 802.11g/n: OFDM
Antenna Specification	Antenna type: PCB Pattern Antenna Antenna gain: -0.01 dBi

2. INFORMATION ABOUT TESTING

2.1 Test mode

Test	Worst case data rate	Tested Frequency(MHz)			
mode		Lowest	Middle	Highest	
TM 1	802.11b 1 Mbps	2412	2437	2462	
TM 2	802.11g 6 Mbps	2412	2437	2462	
ТМ 3	802.11n(HT20) MCS 6	2412	2437	2462	

Note 1: The worst case data rate is determined as above test mode according to the power measurements. Note 2: The power measurement results for all modes and data rate were reported.

2.2 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
-	-	-	-	-
-	-	-	-	-

2.3 Tested environment

Temperature	:	20 °C ~ 25 °C
Relative humidity content	:	35 % ~ 45 %
Details of power supply	:	DC 14.4 V

2.4 EMI suppression Device(s) / Modifications

EMI suppression device(s) added and/or modifications made during testing \rightarrow None

2.5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014 and ANSI C 63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Test items	Measurement uncertainty
Transmitter Output Power	0.7 dB (The confidence level is about 95 %, $k = 2$)
Conducted spurious emission	0.9 dB (The confidence level is about 95 %, $k = 2$)
Radiated spurious emission (1 GHz Below)	5.1 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (1 GHz ~ 18 GHz)	5.4 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (18 GHz Above)	5.3 dB (The confidence level is about 95 %, $k = 2$)

3. SUMMARY OF TESTS

FCC Part	RSS Std.	Parameter	Limit	Test Condition	Status Note 1
15.247(a)	RSS-247 [5.2]	6 dB Bandwidth	> 500 kHz		С
15.247(b)	RSS-247 [5.4]	Transmitter Output Power	< 1 Watt		С
15.247(d)	RSS-247 [5.5]	Out of Band Emissions / Band Edge	20 dBc in any 100 kHz BW	Conducted	С
15.247(e)	RSS-247 [5.2]	Transmitter Power Spectral Density	< 8 dBm/3 kHz		С
-	RSS-Gen [6.7]	Occupied Bandwidth (99 %)	RSS-Gen(6.7)		NA
15.247(d) 15.205 15.209	RSS-247 [5.5] RSS-GEN [8.9] RSS-GEN [8.10]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	FCC 15.209 limits	Radiated	с
15.207	RSS-Gen [8.8]	AC Line Conducted Emissions	FCC 15.207 limits	AC Line Conducted	NA Note3
15.203	RSS-Gen [8.3]	Antenna Requirements	FCC 15.203	-	С

Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable

Note 2: For radiated emission tests below 30 MHz were performed on semi-anechoic chamber which is correlated with OATS.

Note 3: This device is installed in a car. Therefore the power source is a battery of car.



4. TEST METHODOLOGY

The measurement procedures described in the ANSI C63.10-2013 and the guidance provided in KDB558074 D01v05r02 were used in measurement of the EUT.

The EUT was tested per the guidance of KDB558074 D01v05r02. And ANSI C63.10-2013 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing.

4.1 EUT configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT exercise

The EUT was operated in the test mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

4.3 General test procedures

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB558074 D01v05r02.

So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10-2013.

The EUT is placed on the wooden table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and Average detector

Radiated Emissions

Basically the radiated tests were performed with KDB558074 D01v05r02. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10-2013.

The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

4.4 Description of test modes

The EUT has been tested with all modes of operating conditions to determine the worst case emission characteristics. A test program is used to control the EUT for staying in continuous transmitting mode.



5. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

6. FACILITIES AND ACCREDITATIONS

6.1 Facilities

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site complies with the requirements of § 2.948 according to ANSI C63.4-2014.

- FCC MRA Accredited Test Firm No. : KR0034

www.dtnc.net		
Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

6.2 Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, loop, horn. Spectrum analyzers with pre-selectors and peak, quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

7. ANTENNA REQUIREMENTS

7.1 According to FCC 47 CFR §15.203

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The internal antenna is printed on the PCB.

8. TEST RESULT

8.1 6dB bandwidth

Test Requirements and limit, §15.247(a)

The bandwidth at 6 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration:

Refer to the APPENDIX I.

Test Procedure:

- KDB558074 D01v05r02 Section 8.2
- ANSI C63.10-2013 Section 11.8.2
- 1. Set resolution bandwidth (RBW) = 100 kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- (<u>RBW : 100 kHz / VBW : 300 kHz</u>)
- 3. Detector = **Peak**.
- 4. Trace mode = **Max hold**.
- 5. Sweep = Auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results: Comply

Test Mode	Frequency	Test Results[MHz]	
	Lowest	7.07	
TM 1	Middle	7.09	
	Highest	7.11	
	Lowest	16.34	
TM 2	Middle	16.36	
	Highest	16.29	
	Lowest	17.71	
ТМ 3	Middle	17.66	
	Highest	17.68	



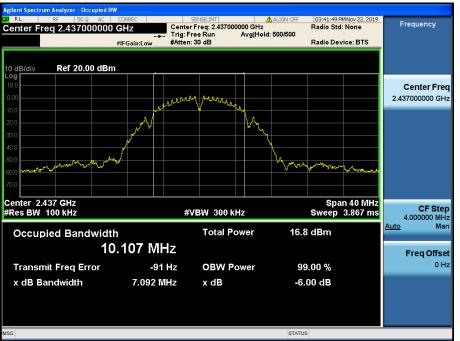
RESULT PLOTS

6 dB Bandwidth



6 dB Bandwidth

TM 1 & Middle



6 dB Bandwidth

TDt&C

TM 1 & Highest

Agilent Spectrum Analyzer - Occupied BV						
M RL RF 50 Ω AC Center Freq 2.462000000		SENSE:INT	ALIGN OFF 03:45:17 F Radio Sto	MNov 22, 2019	Frequency	
Center 1160 2.402000000	Trig: Free Run Avg Hold: 500/500					
(#IFGain:Low #Atten	: 30 dB	Radio De	lice: BIS		
10 dB/div Ref 20.00 dBm						
10.0					Center Freq	
0.00	Arnord .	M manage			2.462000000 GHz	
-10.0		V "My				
-20.0	\rightarrow					
-30.0	- North	V	1			
-40.0			¥			
-50.0			W man Manan			
-60.0 maximalina francisco targe targe			V Ha V Hanner	- ford-workelike		
-70.0						
Center 2.462 GHz			Spa	n 40 MHz		
#Res BW 100 kHz	#	VBW 300 kHz		3.867 ms	CF Step 4.000000 MHz	
		T 4 1 D	40.0 10-		Auto Man	
Occupied Bandwidth		Total Power	16.6 dBm			
10	.070 MHz				Freq Offset	
Transmit Freq Error	8.505 kHz	OBW Power	99.00 %		0 Hz	
x dB Bandwidth	7.108 MHz	x dB	-6.00 dB			
	7.108 MHZ	хав	-0.00 dB			
MSG			STATUS			
1100			STATUS			

6 dB Bandwidth

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TM 2 & Lowest ctrum Analyze SENSE:INT ALIGN OFF Center Freq: 2.412000000 GHz Trig: Free Run Avg|Hold: 500/500 #Atten: 30 dB 03:49:45 PMNov 22, 2019 Radio Std: None Frequency Center Freq 2.412000000 GHz Radio Device: BTS #IFGain:Low Ref 20.00 dBm 0 dB/di **Center Freq** 2.412000000 GHz n. J. J A. A month Center 2.412 GHz #Res BW 100 kHz Span 40 MHz Sweep 3.867 ms CF Step 4.000000 MHz Man #VBW 300 kHz Auto Occupied Bandwidth Total Power 17.5 dBm 16.401 MHz Freq Offset -7.742 kHz **OBW Power** 99.00 % 0 Hz Transmit Freg Error x dB Bandwidth 16.34 MHz x dB -6.00 dB

STATUS

6 dB Bandwidth

TM 2 & Middle



6 dB Bandwidth

TM 2 & Highest



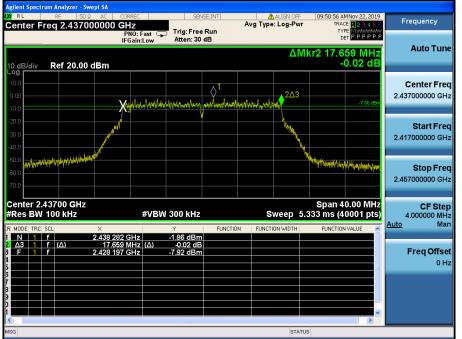
Dt&C

6 dB Bandwidth

TM 3 & Lowest gilent Spectrum Analyzer - Swept SA ABURINGIAN OF AC LONNEL Center Freq 2.412000000 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 30 dB Frequency ALIGN OFF Avg Type: Log-Pwr TYPE MWWWWW DET PPPPP Auto Tune ΔMkr2 17.709 MHz -0.08 dB Ref 20.00 dBm /div **Center Freq** 2.412000000 GHz North .A. Antoria X Start Freq 2.392000000 GHz Windowski *ί*Νυ/w Alust months Stop Freq 2.432000000 GHz Center 2.41200 GHz #Res BW 100 kHz Span 40.00 MHz Sweep 5.333 ms (40001 pts) CF Step 4.000000 MHz Man #VBW 300 kHz Auto 2.405 755 G 17.709 MHz 2.403 147 GHz -1.62 dBm -0.08 dB -7.66 dBm 1 f 1 f (Δ) (Δ) Freq Offset 0 Hz STATUS

6 dB Bandwidth

TM 3 & Middle



TDt&C

6 dB Bandwidth

TM 3 & Highest

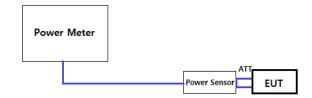


8.2 Maximum peak conducted output power

Test Requirements and limit, §15.247(b)

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

- KDB558074 D01v05r02 Section 8.3.1.3
- ANSI C63.10-2013 Section 11.9.1.3

PKPM1 Peak power meter method

- 1. The maximum conducted output powers were measured using a broadband peak RF power meter which has greater video bandwidth than DUT's DTS bandwidth and utilize a fast-responding diode detector.
- KDB558074 D01v05r02 Section 8.3.2.3
- ANSI C63.10-2013 Section 11.9.2.3.2

Method AVGPM-G

 The average conducted output powers were measured using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.



Test Results: Comply

Erog			Maxim	um Peak Co	onducted Ou	tput Power	(dBm) for <u>8</u>	02.11b			
Freq. (MHz)	Det.	Data Rate [Mbps]									
		1	2	5.5	11	-	-	-	-		
2412	PK	13.21	13.18	13.17	13.16	-	-	-	-		
2412	AV	10.04	10.00	10.31	10.22	-	-	-	-		
2437	PK	13.02	12.92	12.95	12.96	-	-	-	-		
2437	AV	9.88	9.86	9.85	9.88	-	-	-	-		
2462	PK	12.93	12.91	12.87	12.90	-	-	-	-		
2402	AV	9.79	9.81	9.80	9.74	-	-	-	-		

From			Maximum Peak Conducted Output Power (dBm) for <u>802.11g</u>									
Freq. (MHz)	Det.	Data Rate [Mbps]										
		6	9	12	18	24	36	48	54			
2412	PK	20.12	20.08	20.11	19.86	18.79	19.72	18.83	18.38			
2412	AV	10.33	10.38	10.34	10.34	9.79	10.36	9.95	9.92			
2437	PK	20.91	20.85	20.81	20.51	19.85	20.58	19.82	19.33			
2437	AV	10.16	10.12	10.15	10.13	9.66	10.14	9.87	9.81			
2462	PK	20.97	20.95	20.94	20.68	19.84	20.47	19.94	19.22			
2402	AV	10.06	10.04	10.10	10.03	9.59	10.01	10.02	9.89			

From			Maximum	Peak Condu	icted Outpu	t Power (dB	m) for <u>802.</u>	<u>11n(HT20)</u>				
Freq. (MHz)	Det.	Data Rate [MCS]										
		0	1	2	3	4	5	6	7			
2412	PK	20.60	19.81	19.99	20.46	20.27	20.27	20.71	20.46			
2412	AV	9.71	9.76	9.85	10.23	9.98	10.04	10.82	10.36			
2437	PK	21.35	20.98	20.94	21.08	21.03	21.05	21.57	21.38			
2437	AV	9.64	9.62	9.69	10.05	9.93	10.01	10.64	10.15			
2462	PK	20.56	19.75	19.94	20.51	20.34	20.16	20.68	20.44			
2402	AV	9.18	9.25	9.22	9.80	9.44	9.52	10.11	9.89			



8.3 Maximum power spectral density

Test requirements and limit, §15.247(e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Configuration:

Refer to the APPENDIX I.

Test Procedure

- KDB558074 D01v05r02 Section 8.4
- ANSI C63.10-2013 Section 11.10.2

Method PKPSD (peak PSD)

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to : $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
- 4. Set the VBW \geq 3 x RBW
- 5. Detector = **Peak**
- 6. Sweep time = **Auto couple**
- 7. Trace mode = **Max hold.**
- 8. Allow trace to fully stabilize.

9. Use the **peak marker function** to determine the maximum amplitude level within the RBW.

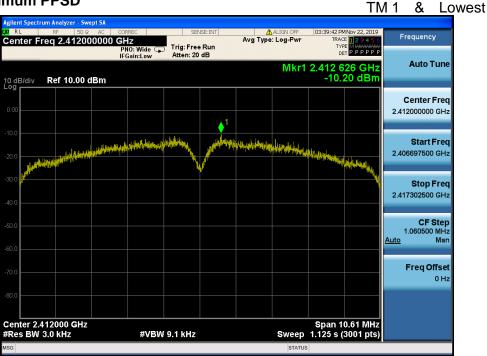
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Results: Comply

Test Mode	Frequency	RBW	PKPSD [dBm]
	Lowest	3 kHz	-10.20
TM 1	Middle	3 kHz	-12.10
	Highest	3 kHz	-12.02
	Lowest	3 kHz	-12.40
TM 2	Middle	3 kHz	-13.80
	Highest	3 kHz	-13.52
	Lowest	3 kHz	-14.51
ТМ 3	Middle	3 kHz	-15.49
	Highest	3 kHz	-15.44

RESULT PLOTS





Maximum PPSD

TM 1 & Middle



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🛈 Dt&C



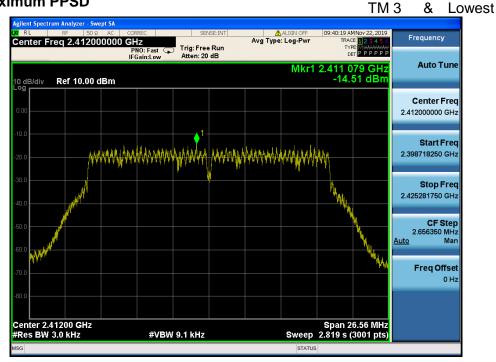


TM2 & Middle





🛈 Dt&C



Maximum PPSD

TM 3 & Middle



TDt&C

Maximum PPSD





8.4 Out of band emissions at the band edge / conducted spurious emissions

Test requirements and limit, §15.247(d)

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If **the peak output power procedure** is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated **by at least 20 dB** relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in band average PSD level. In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

Test Configuration:

Refer to the APPENDIX I.

Test Procedure

- KDB558074 D01v05r02 Section 8.5
- ANSI C63.10-2013 Section 11.11

- Reference level measurement

- 1. Set instrument center frequency to DTS channel center frequency.
- 2. Set the span to \geq 1.5 times the DTS bandwidth.
- 3. Set the RBW = **100 kHz**.
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = **Peak.**
- 6. Sweep time = **Auto couple.**
- 7. Trace mode = **Max hold.**
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum PSD level.

- Emission level measurement

- 1. Set the center frequency and span to encompass frequency range to be measured.
- 2. Set the RBW = 100 kHz. (Actual 1 MHz , See below note)
- 3. Set the VBW ≥ 3 x RBW. (Actual 3 MHz, See below note)
- 4. Detector = **Peak**.
- 5. Ensure that the number of measurement points \geq Span / RBW.
- 6. Sweep time = **Auto couple.**
- 7. Trace mode = **Max hold.**
- 8. Allow the trace to stabilize. (this may take some time, depending on the extent of the span)
- 9. Use the peak marker function to determine the maximum amplitude level.

Note : The conducted spurious emission was tested with below settings. Frequency range: 9 kHz ~ 30 MHz RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40001

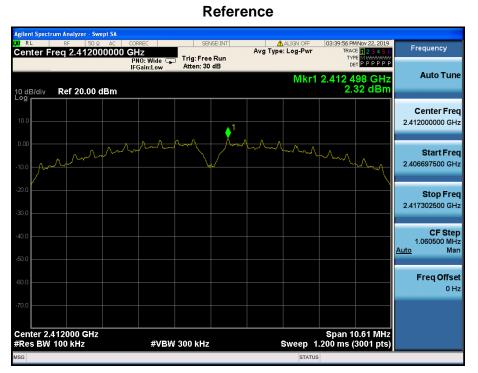
Frequency range: 30 MHz ~ 10 GHz, 10 GHz ~25 GHz RBW = 1 MHz, VBW = 3 MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 40001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 kHz, VBW = 300 kHz)

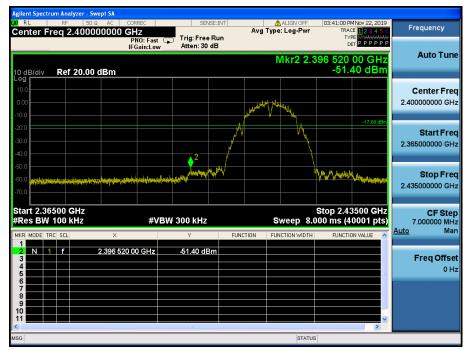
If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SPAN = 100 MHz and BINS = 2001 to get accurate emission level within 100 kHz BW.

RESULT PLOTS

TM 1 & Lowest



Low Band-edge



Agilent Spectrum Analyz						
Center Freq 15		SENSE:IN	Avg	ALIGN OFF	03:41:07 PMNov 22, 2019 TRACE 1 2 3 4 5 TYPE M WARKING	Frequency
	PNO: Fast IFGain:Low	· → · · · · · · · · · · · · · · · · · ·			TYPE MWWWW DET PPPP	
10 dB/div Ref 2	0.00 dBm			ſ	Vlkr1 295.4 kHz -56.18 dBm	
Log 10.0						Center Freq
0.00						15.004500 MHz
-10.0					-17.68 dBr	
-30.0						Start Freq 9.000 kHz
-40.0						5.000 KHZ
-50.0						Stop Freq
-60.0	nodudration of the providence of the second	Vin har is the second second second	edul sullinguisme	الألبيان والترادية والمراجع	deflahftethfactaringingingetterarranisabileeth	30.000000 MHz
Start 9 kHz #Res BW 100 kH	lz #V	BW 300 kHz		Sweep 5.3	Stop 30.00 MHz 333 ms (40001 pts	CF Step 2.999100 MHz
MKR MODE TRC SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f	295.4 kHz	-56.18 dBm				Freq Offset
3 4 5						0 Hz
6						
8						
10					· · · · · · · · · · · · · · · · · · ·	
K MSG		111		CTATUS	DC Coupled	
				STATUS	- DC Coupled	

Agilent Spectr			t SA									
Center F	RF			RREC	SEN	ISE:INT	Ava		ALIGN OFF		MNov 22, 2019 E 1 2 3 4 5 6	Frequency
Center P	eq J.	015000	P	NO: Fast	Trig: Free Atten: 30					TY	PE MWAWAAAA	
			IF	Gain:Low_	Atten: 30	ab						Auto Tune
	D-6		B						IVIKE	-45	41 GHz 96 dBm	
10 dB/div Log	Ref	20.00 di	Bm								oo abiii	
10.0			— \									Center Freq
0.00												5.015000000 GHz
-10.0												
-20.0			_								-17.68 dBm	Start Freq
-30.0												30.000000 MHz
-40.0						A 4 5		A <mark>2</mark>				30.000000 MH2
-50.0			Lund at Street	Hereiter	a succession in the last of the last	. Yelfan	anatara guntata (ngla)	J _{no-n}	ndenergine og	a talanta a sala a sa	ويتلبعه أنفتا مرتب	
	- Lake and a second		and a second second	a state of the second			a significant a second single a	h a manta	an and a second and dealer in the	field the ended site	and the second states and	Stop Freq
-70.0												10.00000000 GHz
10.0												
Start 30 N										Stop 10	.000 GHz	CF Step
#Res BW	1.0 M	Hz		#VB	W 3.0 MHz			S	weep 18.	.67 ms (4	0001 pts)	997.000000 MHz Auto Man
MKR MODE TR	RC SCL		×		Y		FUNCTION	FUN	CTION WIDTH	FUNCTI	ON VALUE	Auto Man
2 N 1	f		2.411 0 6.681 2	4 GHz	5.48 dl -45.83 dl	3m						
3 N 1	f		<u>5.361 9</u> 5.147 6		-45.86 de -45.87 de	3m		-				Freq Offset
5 N 1	f		5.293 4	II GHz	-45.96 dE	3m					=	0 Hz
6 7								-				
8												
10												
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MSG						_			STATUS			
						_						

TDt&C

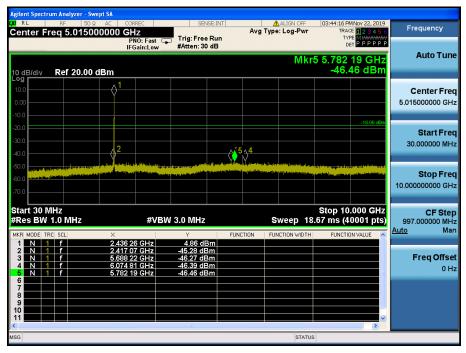
gilent Spectrum Analyzer	50 Ω AC CORREC	SENSE: IN	T ALIGN OFF		
Center Freq 17.5		Trig: Free Run	Avg Type: Log-Pwr	03:41:23 PMNov 22, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW	Frequency
	IFGain:Lov	Atten: 30 dB	Mkr2 (DET PPPPP 23.903 875 GHz	Auto Tun
0 dB/div Ref 20	.00 dBm		WIKIO 2	-36.93 dBm	
.og 10.0					Center Fre
0.00					17.500000000 GH
20.0				-17.68 dBm	
30.0				3	Start Fre 10.000000000 GH
40.0		in the state of the state of the state			
50.0 Historic Angel March		and a set of the set of			Stop Fre
70.0					25.000000000 GH
tart 10.000 GHz				Stop 25.000 GHz	CF Ste
Res BW 1.0 MHz	#V	BW 3.0 MHz		.00 ms (40001 pts)	1.50000000 GH Auto Ma
IKR MODE TRC SCL	× 24.764 500 GHz	-36.25 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f	24.694 375 GHz 23.903 875 GHz	-36.61 dBm -36.93 dBm			Freq Offs
5					0 H
6 7 8					
9					
				×	

TM 1 & Middle

Reference



Agilent Spectrum Analyzer - Sw (X) RL RF 50 G Center Freq 15.004	2 ADC CORREC	SENSE:II	Avg	ALIGN OFF	03:44:08 PMNov 22, 2019 TRACE 123456 TYPE MUMANANA	
10 dB/div Ref 20.00	PNO: Fast IFGain:Low dBm			ſ	Ukr1 284.2 kHz -55.81 dBm	
10.0 0.00						Center Freq 15.004500 MHz
-20.0					-18.06 dBm	Start Freq 9.000 kHz
-50.0 -60.0 -70.0	aj-aringtastinetagetatteranosastatis	ny phanter being her man an a	haureddaie dheisdaet	Northbortholdersteadestrong	alty inclusion and in the state of the	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	X	BW 300 kHz Y	FUNCTION	Sweep 5.3	Stop 30.00 MHz 333 ms (40001 pts) FUNCTION VALUE	CF Step 2.999100 MHz Auto Man
1 N 1 f 2 3 4 4 5 6 9	284.2 kHz	-55.81 dBm				Freq Offset 0 Hz
7 8 9 10 11						
MSG		III		STATUS	DC Coupled	



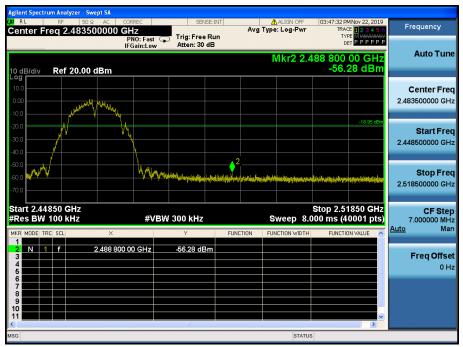
Agilent Spectrum Analyzer - Swept SA				
KL RF 50 Ω AC CORREC Center Freq 17.5000000000 GHz PN0: Fast	SENSE:INT	ALIGN OFF	03:44:24 PMNov 22, 2019 TRACE 1 2 3 4 5 6 TYPE M WARMAN	Frequency
10 dB/div Ref 20.00 dBm		Mkr3 2	3.403 250 GHz -37.88 dBm	Auto Tune
				Center Freq 17.500000000 GHz
-20.0		- NARE THE EXTENSION	-18.06 dBm	Start Fred 10.000000000 GHz
-50.0				Stop Frec 25.00000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz #V	BW 3.0 MHz	Sweep 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Step 1.500000000 GH: <u>Auto</u> Mar
1 N 1 f 24.855 250 GHz 2 N 1 f 24.104 875 GHz 3 N 1 f 23.403 250 GHz 4 5 5 5	-36.47 dBm -37.54 dBm -37.88 dBm			Freq Offset 0 Hz
6 7 8 9 10 11				
K MSG	III	STATUS		

TM 1 & Highest

Reference



High Band-edge



Agilent Spectrum Analyzer - Swep WRL RF 50 2 Center Freq 15.0045	DC CORREC	SENSE:INT	ALIGN OFF	03:48:05 PM Nov 22, 2019 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 d	PNO: Fast G IFGain:Low	⊃ Trig: Free Run #Atten: 30 dB	• •	түре Милинин Det Р Р Р Р Р Р Mkr1 299.9 kHz -55.58 dBm	Auto Tune
					Center Fred 15.004500 MH
-20.0				-18.95 dBm	Start Free 9.000 kH
-50.0	รรณสุปสาหารสุประกรรณ์ได้เราจะ	teriorical Anadorital interaction and	alwingh the and their matching of a destand in	ing, deraward war of the state of	Stop Fred 30.000000 MH
Start 9 kHz #Res BW 100 kHz	#VBV	/ 300 kHz	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Ste 2.999100 MH <u>Auto</u> Ma
1 N 1 f 2 3 4 4 4 5 7	299.9 kHz	-55.58 dBm			Freq Offse 0 H
6 7 8 9 10 11					
KSG ST			STATU	S LDC Coupled	

	m Analyzer - Swe									
	RF 50 Ω eq 5.01500			SENS	E:INT	Ανα Τι	ALIGN OFF		Nov 22, 2019	Frequency
Center Pro	54 3.0 1300	PNO:		Trig: Free #Atten: 30			,	TYF	E MWAWAAAA T P P P P P P	
		IFGair	1:Low	#Atten: 30	aD					Auto Tune
10 dB/div	Ref 20.00 c	lBm					WKR	5 7.376 -46.5	15 GHZ 53 dBm	
Log 10.0		1								Contra Eng
0.00		F Y F								Center Freq 5.015000000 GHz
-10.0										5.015000000 GH2
-20.0									-18.95 dBm	
										Start Freq
-30.0						۸ <u>2</u>	. 5			30.000000 MHz
-40.0					\bigcirc	$ \rangle$				
deside sources	an internet and a second s	Contraction of the local division of the loc	and a state of the second	In the second second		(Admithitisture	and the factor of the second second	أحزر ويحتظهم وتهريه	and a field of the second s	Stop Freq
-00.0	ndia a constant									10.000000000 GHz
-70.0										
Start 30 M	Hz							Stop 10.	000 GHz	CF Step
#Res BW 1	.0 MHz		#VBW 3	.0 MHz			Sweep 18.	67 ms (4)	0001 pts)	997.000000 MHz
MKR MODE TRO	SCL	х		Y		TION	FUNCTION WIDTH	FUNCTIO	N VALUE	<u>Auto</u> Man
1 N 1 2 N 1	f	2.461 93 G 6.155 32 G		4.93 dB -45.54 dB						
3 N 1	f	5.814 10 G	Hz	-46.29 dB	m					Freq Offset
4 N 1 5 N 1	f	5.839 52 G 7.376 15 G	iHz iHz	-46.45 dB -46.53 dB	m m					0 Hz
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mod							STATUS			

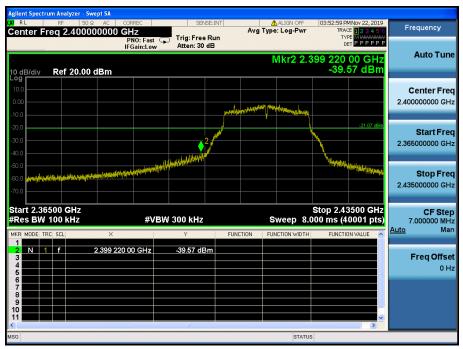
BL	RE 50	Swept SA	CORREC	SENSE:	INT	ALIGN OFF	03:48:21 PM Nov 2	2,2019	
enter Fr	eq 17.50	0000000			Avç un	Type: Log-Pwr	TRACE 12 TYPE MM DET P P	3456	Frequency
I0 dB/div	Ref 20.0		in odinicovi			Mkr3 2	3.319 250 (-37.52 c		Auto Tun
10.0 0.00									Center Fre 17.500000000 GH
20.0 30.0 40.0							-1E	1.95 dBm →2 ↓	Start Fre 10.000000000 GH
50.0									Stop Fre 25.000000000 G⊦
Start 10.0 Res BW			#VB	W 3.0 MHz		Sweep 40	Stop 25.000 .00 ms (40001	pts)	CF Ste 1.50000000 GH
IKR MODE TR	C SCL	× 24.854 (500 GHz	ץ -35.86 dBm		FUNCTION WIDTH	FUNCTION VALU		<u>Auto</u> Ma
2 N 1 3 N 1 4 5	f f	24.201 (23.319)	625 GHz 250 GHz	-37.17 dBm -37.52 dBm					Freq Offs 0 ⊦
6 7 8 9									
10				Ш				>	
G						STATUS			

TM 2 & Lowest

Reference



Low Band-edge



Agilent Spectrum Analyzer - Swe		SENSE: INT	A 11 101 101	00,50,07,044,	
Center Freq 15.0045		Trig: Free Run	Avg Type: Log-Pwr	03:53:07 PMNov 22, 2019 TRACE 2 3 4 5 6 TYPE M WANNAME DET P P P P P P	Frequency
10 dB/div Ref 20.00 d	IFGain:Low	Atten: 30 dB		Mkr1 284.9 kHz -56.48 dBm	Auto Tune
10.0 0.00 -10.0					Center Freq 15.004500 MHz
-20.0				-21.07 dBm	Start Freq 9.000 kHz
-50.0	hushildushahaha, aayafatiha yayadaya	dfferði kalman far Tayrey i er viði viði kinn svað h	sanindarna shiyaminiyinlaharinin aqaqaq	en et de seu annieur met de la seu en seu anne annieur annieur annieur annieur annieur annieur annieur annieur	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VBV	/ 300 kHz	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Step 2.999100 MHz <u>Auto</u> Mar
1 N 1 f 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	284.9 kHz	-56.48 dBm			Freq Offset 0 Hz
6 7 8 9 10 11				-	
MSG		III	STATUS	DC Coupled	

Agilent Spectr			SA								
Center F	RF			RREC	SEN	SE:INT	Ava	ALIGN OFF		MNov 22, 2019 ACE 1 2 3 4 5 6	Frequency
Genter P	eq J.	015000	PI	NO:Fast 🔾	Trig: Free			.,,	т	PPE MWARMAN	
										Auto Tune	
10 dB/div											
Log 10.0			1								
0.00			Ĭ								Center Freq 5.015000000 GHz
-10.0											5.015000000 GH2
-20.0										-21.07 dBm	
											Start Freq
-30.0							5				30.000000 MHz
-40.0			Auto	and here in the	141		′I 🖗				
-50.0	and the second second	and a support of the second	and the second	A Property and a sure	and the second secon	day of the second second			and a first free start from a	a and a literative state of the second	Stop Freq
-00.0											10.00000000 GHz
-70.0											
Start 30 N	ЛНz								Stop 10	0.000 GHz	CF Step
#Res BW	1.0 MI	Hz		#VB	W 3.0 MHz			Sweep	18.67 ms (4	10001 pts)	997.000000 MHz
MKR MODE TR	RC SCL		×		Y		ICTION	FUNCTION WID	TH FUNCT	ION VALUE 🔼	<u>Auto</u> Man
1 N 1 2 N 1	f		2.411 3		8.13 dE -46.14 dE						
3 N 1	f		6.244 3	0 GHz	-46.14 dE	m					Freq Offset
4 N 1 5 N 1	f		5.861 7 5.780 4	0 GHZ 5 GHZ	<u>-46.28 dE</u> -46.45 dE	m m				=	0 Hz
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Dt&C

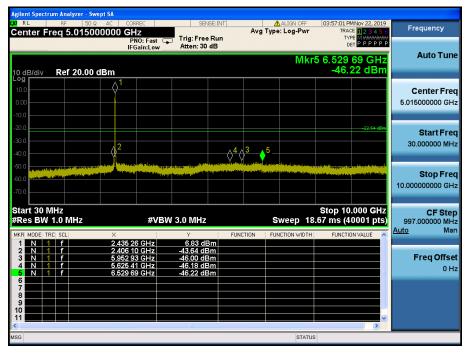
RL		Swept SA າວ AC ດ	ORREC	SENSE:II	T	ALIGN OFF	03:53:23 PMNov	22 2010	
		0000000			Avg	Type: Log-Pwr	TRACE		Frequency
0 dB/div	Ref 20.0		Gameon			Mkr3 2	3.369 875 -36.66		Auto Tune
.og 10.0 0.00									Center Free 17.500000000 GH
20.0 30.0 40.0					to programs with the life .	a Hersengel ange grad and the same	3_	21.07.0Bm	Start Fre 10.000000000 GH
50.0 4.0194 50.0					a province of the second se				Stop Fre 25.00000000 G⊦
tart 10.0 Res BW	00 GHz 1.0 MHz		#VB	W 3.0 MHz		Sweep 40	Stop 25.00 .00 ms (4000	1 pts)	CF Ste 1.50000000 GF
KR MODE TH		× 24.852 2	50 GHz	∨ -35.90 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VA	LUE	<u>Auto</u> Ma
2 N 1 3 N 1 4 5		24.970 7 23.369 8		-36.36 dBm -36.66 dBm					Freq Offs 0 ⊦
6 7 8 9									
10				THE SECOND				~	
						STATUS			

TM 2 & Middle

Reference



Agilent Spectrum Analyzer - Swi X RL RF 50 Q Center Freq 15.0045	▲DC CORREC	SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	03:56:52 PMNov 22, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 20.00 d	IFGain:Low_	Atten: 30 dB		остреререр Mkr1 287.2 kHz -53.77 dBm	Auto Tune
Log					Center Freq 15.004500 MHz
-20.0				-22.54 dBm	Start Freq 9.000 kHz
-50.0 1 -60.0 -70.0	the second second second second	where and a state of the state	st flage water af the list of water states and be by	naurrentarrouratestrationt	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VB	W 300 kHz	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Step 2.999100 MHz <u>Auto</u> Man
1 N 1 f 2 3 3 4 5 6	287.2 kHz	-53.77 dBm			Freq Offset 0 Hz
7 8 9 10 11					
MSG			STATU	s LDC Coupled	



Agilent Spectru	m Analyzer - S	Swept SA								
LXIRL			RREC	SENSE	E:INT	Aug Ty	ALIGN OFF		4Nov 22, 2019 E 1 2 3 4 5 6	Frequency
Center Fre	eq 17.500	P	NO:Fast C	🕞 Trig: Free F		Avgiy	pe. Log-Fwi	TY	~ 123450 ~ M WWWWW TPPPPP	
			Gain:Low	Atten: 30 d	В			DI	Пььььь	Auto Tune
							Mkr3 2	4.874 7	50 GHz	Auto Tune
10 dB/div	Ref 20.00) dBm						-36.1	19 dBm	
										Conton From
										Center Freq 17.50000000 GHz
0.00										17.50000000 GHz
-10.0										
-20.0									-22.54 dBm	Start Freq
-30.0									-0'*	10.00000000 GHz
-40.0				ى يەرملىقىمىسى		بالارت المرابع	A REAL PROPERTY.	THE OWNER AND PARTY OF		
-50.0 - 100 - 100 - 10	ligner hannen er	andy one decision from					in the second	Constant of the second second		
-60.0										Stop Freq
-70.0										25.00000000 GHz
Start 10.00								Stop 25	.000 GHz	CF Step
#Res BW 1	1.0 MHz		#VB	W 3.0 MHz			Sweep 40	.00 ms (4	0001 pts)	1.50000000 GHz
MKR MODE TRO		Х		Y		CTION F	UNCTION WIDTH	FUNCTIO	IN VALUE	<u>Auto</u> Man
1 N 1 2 N 1	f	23.922 62 24.846 62	5 GHz 5 GHz	-35.95 dBn -36.01 dBn						
3 N 1	f	24.874 75		-36.19 dBn						Freq Offset
4 5										0 Hz
6										
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9	<u> </u>									
11									~	
<				111					>	
MSG							STATUS			

Pages: 39 / 68

TM 2 & Highest

Reference



High Band-edge



【 RL RF 50 S	wept SΛ Ω ΛΩDC CORREC	SENSE:INT	T ALIGN OFF	04:00:48 PM Nov 22, 2019	
Center Freq 15.004	500 MHz PNO: Fast	🕞 Trig: Free Run	Avg Type: Log-Pwr		
10 dB/div Ref 20.00	IFGain:Low	Atten: 30 dB		Mkr1 285.7 kHz -55.61 dBm	Auto Tune
10.0 0.00					Center Free 15.004500 MH
-20.0				2.41 dBm	Start Free 9.000 kH
-50.0	etelantentykon freetilippiertesfordeleren.	Annalistatist. H. Andrik Song San Statist.	id Magazilliqayi Isela iyola iyoladi adala	imeniska kana ingeniska kana kata kana kata kana kata kana kata kana kata kana kata kat	Stop Fre 30.000000 MH
Start 9 kHz #Res BW 100 kHz	#V	BW 300 kHz	Sweep 5	Stop 30.00 MHz .333 ms (40001 pts)	CF Ste 2.999100 MH
MKRI MODEL TRC. SCL	×	Y	FUNCTION FUNCTION WIDT	H FUNCTION VALUE 🔼	Auto Ma
1 N 1 f	285.7 kHz	-55.61 dBm			
	285.7 kHz	-55.61 dBm			-
1 N 1 f 2 3 4	285.7 kHz	-55.61 dBm			Freq Offse 0 H
1 F 2 - 3 - 4 - 5 - 6 - 7 - 8 -	285.7 kHz	-55.61 dBm			

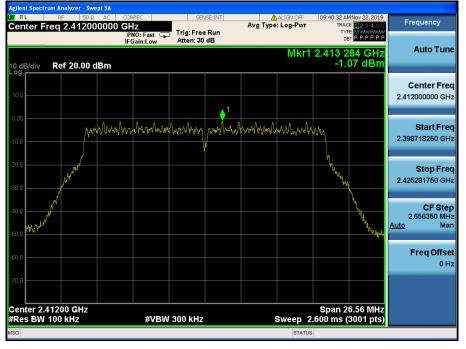
Agilent Spectrum Analyze					
Center Freg 5.0	50 Ω AC CORREC	SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	04:00:57 PMNov 22, 2019 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB			
			Mkr	5 5.587 28 GHz	Auto Tune
10 dB/div Ref 20	0.00 dBm			-46.03 dBm	
10.0	Q ¹				Center Freq
0.00					5.015000000 GHz
-10.0					
-20.0	2			22.41 dBm	Start Freq
-30.0	Q ²		2 . 4		30.000000 MHz
-40.0			≜_ 0 ⁴		
-50.0 Holes and the second second	The second s			مردون الانتقاع المردون من المردون ومردون ومرد المردون ومرد المردون ومرد المردون ومردون المردون ومردون المردون و مردون الانتقار أن أمسارك من المرادين ومردون ومردون ومراد المردون ومردون ومردون ومردون ومردون ومردون ومردون ومرد	Stop Freq
-60.0					10.00000000 GHz
-70.0					
Start 30 MHz			a	Stop 10.000 GHz	CF Step
#Res BW 1.0 MH:		3W 3.0 MHz	-	.67 ms (40001 pts)	997.000000 MHz Auto Man
MKR MODE TRC SCL	× 2.462 93 GHz	7.06 dBm	VICTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f	2.445 48 GHz 5.781 69 GHz	-34.09 dBm -45.54 dBm			Freq Offset
4 N 1 f 5 N 1 f	6.328 80 GHz 5.587 28 GHz	-45.96 dBm -46.03 dBm			0 Hz
6	0.001 20 0112	40.00 42.00			
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11 <		111		×	
MSG			STATUS	3	

Dt&C

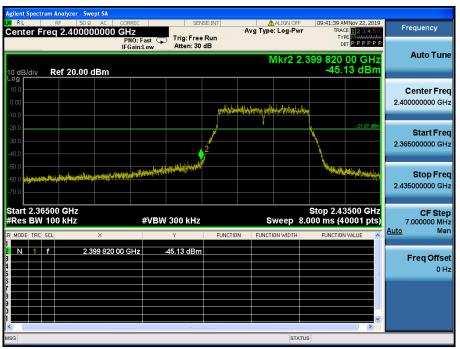
LXI RL	um Analyzer - S RF 50 eq 17.500	Ω AC CORR 0000000 GH		SENS Trig: Free F Atten: 30 d	Run		ALIGN OFF	TRAC	1Nov 22, 2019 E 1 2 3 4 5 6 E M WWWWW T P P P P P P	Frequency
10 dB/div	Ref 20.00		iin:Low	Atten: 50 G			Mkr3 2	4.209 5 -37.4	00 GHz 41 dBm	Auto Tune
Log 10.0 0.00										Center Freq 17.500000000 GHz
-20.0 -30.0 -40.0						landy di film Jacquel I. In		ر میں میں انھر انہوں کی میں انھر	22.41 dDm	Start Freq 10.000000000 GHz
-50.0			in a ciptorati							Stop Freq 25.000000000 GHz
Start 10.0 #Res BW	1.0 MHz		#VBV	V 3.0 MHz			Sweep 40	.00 ms (4		CF Step 1.50000000 GHz Auto Man
MKR MODE TR 1 N 1 2 N 1 3 N 1 4 - - 5 - - 7 - - 8 - - 9 - - 10 - 11	f	× 24.858 625 23.926 000 24.209 500	GHz	-35.91 dBr -37.21 dBr -37.41 dBr	n		UNCTION WIDTH	FUNCTIC		Freq Offset 0 Hz
MSG				ш			STATUS		>	

TM 3 & Lowest

Reference



Low Band-edge



LXI RL	r um Analyzer - Swe j RF 50 Ω <mark>(</mark>	DC CORREC	SEN	ISE:INT		ALIGN OFF		4Nov 22, 2019	Frequency
Center F	req 15.0045	00 MHZ PNO: Fa: IFGain:Lo			Avg lype	: Log-Pwr	TYF	E 123456 E MWWWWWW T P P P P P P	
10 dB/div	Ref 20.00 d	Bm					Mkr1 28 -54.:	1.9 kHz 36 dBm	Auto Tune
Log 10.0 0.00									Center Freq 15.004500 MHz
-20.0								-21.07 dBm	Start Freq 9.000 kHz
-40.0 -50.0 -60.0	Winstellassanthisels.Au	http://www.automatics.com	Veninian Magnation America	a lation ly realizable	allinanana mitala	aladolagaatilooga	den and the second	nistan haitanista ja ka	Stop Freq 30.000000 MHz
Start 9 kl #Res BW	lz 100 kHz		VBW 300 kHz		s		Stop 3 333 ms (4	0.00 MHz 0001 pts)	CF Step 2.999100 MH: Auto Mar
R MODE TRC N 1 2 3 4 4		× 281.9 kHz	∀ -54.36 dBm	FUNCTION	FUNCT	ON WIDTH	FUNCTION	VALUE	Freq Offset
MSG			III			STATUS		v lad	

	rum Analyzer - Swept S								
Center F	RF 50 Ω A req 5.0150000			ISE:INT		ALIGN OFF : Log-Pwr	TRAC	MNov 22, 2019 E 1 2 3 4 5 6	Frequency
		PNO: I IFGain:	ast 🖵 Trig: Free				TYF	E MWWWWW T P P P P P P	
		ii Gain.	Low			Mk	5 6.558	61 GH7	Auto Tune
10 dB/div	Ref 20.00 dBi	n				IVII		58 dBm	
Log 10.0		∆ ¹							0
		Ĭ							Center Freq 5.015000000 GHz
-10.0									3.013000000 GHZ
-20.0								-21.07 dBm	
-30.0		2							Start Freq
-40.0		84			5				30.000000 MHz
70.0		Antonio		ang dang di karang dang dang dang dang dang dang dang d	and a strange of the	A fore an elf-sectory	مر المراجعة	المريمة المحادية المحادي	
Lange Station		and the second second	Manager Property and State		والقريبين والقادي	intel a semplation of		and the second	Stop Freq
-70.0									10.00000000 GHz
Start 30 M #Res BW			#VBW 3.0 MHz		G	ween 1	Stop 10 3.67 ms (4	.000 GHz	CF Step 997.000000 MHz
R MODE TRC			Y	FUNCTION		ON WIDTH	FUNCTION		Auto Man
	f 2.	415 57 GHz	7.05 dBm		PONCT	ON WIDTH	FUNCTION	VALUE	
2 N 1 3 N 1		429 28 GHz 387 66 GHz	-36.42 dBm -36.62 dBm						Freq Offset
4 N 1	f 2.	373 70 GHz 558 61 GHz	-43.08 dBm -46.68 dBm						0 Hz
5		000010112	40.00 dBill						
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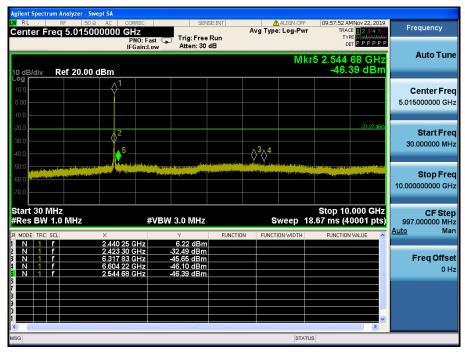
RL	RF	50 Ω AC	CORREC	SEN	ISE:INT		ALIGN OFF	09:42:04 A	4Nov 22, 2019	
enter F	req 17.	5000000	00 GHz PNO: Fast IFGain:Lov	Trig: Free		Avg Type	: Log-Pwr	TY	E 1 2 3 4 5 6 E M MMMMM T P P P P P P	Frequency
) dB/div	Ref 2	0.00 dBm					Mkr3 2		75 GHz 08 dBm	Auto Tur
°g 10.0 1.00										Center Fre 17.500000000 G⊦
0.0 0.0 0.0			and a first sector of the first					and the set for so if it	-21.07 dBm 3.	Start Fre 10.000000000 GH
i0.0 						annan far Kongay , kan a san b				Stop Fre 25.000000000 GF
tart 10.0 Res BW			#\	/BW 3.0 MHz		SI	veep 40		.000 GHz 0001 pts)	CF Ste 1.50000000 GF
MODE TRC	SCL f	× 24 787	750 GHz	-35.09 dBm	FUNCTIO	IN FUNCTI	ON WIDTH	FUNCTION	VALUE	<u>Auto</u> M
N 1 N 1	f f	24.844	000 GHz 875 GHz	-35.97 dBm -37.08 dBm						Freq Offs 0 F
									~	
									>	

TM 3 & Middle

Reference



Agilent Spectrum Analyzer - Swe WRL RF 50 QZ Center Freq 15.0045	dc correc	SENSE:INT	ALIGN OFF	09:57:42 AM Nov 22, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 20.00 d	IFGain:Low	ng. rree Run Atten: 30 dB		_{рет} реререр Mkr1 281.9 kHz -56.62 dBm	Auto Tune
10.0 0.00					Center Freq 15.004500 MHz
-10.0				-21.27 dBm	Start Freq 9.000 kHz
-50.0 1	Sectors for the second	dirangyan disakan dara sakina disara disaking	New Mariant-rispacety for some	terreter and an and the second states and the second states and the second states and the second states and the	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz R MODE TRC SCL	#VBW 3		Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Step 2.999100 MHz <u>Auto</u> Man
N 1 F	281.9 kHz -56	62 dBm			Freq Offset 0 Hz
MSG			STATU	DC Coupled	



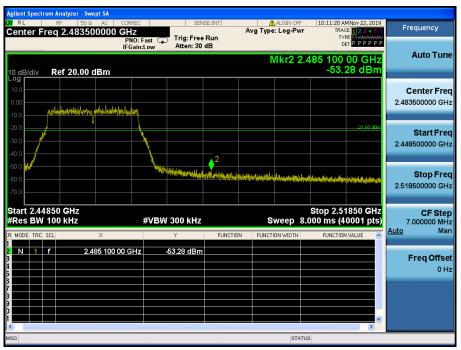
Agilent Spectrum Analyzer - Swept SA	CORREC SENSE:INT	ALIGN OFF	09:57:59 AM Nov 22, 2019	
Center Freq 17.50000000	PNO: Fast 😱 Trig: Free Run	Avg Type: Log-Pwr	TRACE 123456 TYPE MWWWWWW DET P P P P P P	Frequency
10 dB/div Ref 20.00 dBm	IFGain:Low Atten: 30 dB	Mkr3 2	23.326 000 GHz -37.52 dBm	Auto Tune
10.0 0.00 -10.0				Center Freq 17.500000000 GHz
-20.0 -30.0 -40.0			21.27.dBm	Start Freq 10.000000000 GHz
-50.0 to control to the second				Stop Freq 25.000000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz		Stop 25.000 GHz .00 ms (40001 pts)	CF Step 1.50000000 GHz <u>Auto</u> Man
N 1 f 24.778 75 2 N 1 f 24.132 25 3 N 1 f 23.326 00 4	50 GHz -35.67 dBm 50 GHz -37.49 dBm			Freq Offset 0 Hz
> -				
MSG	Internet in the second s	STATUS	3	

TM 3 & Highest

Reference



High Band-edge



Agilent Spectr	um Analyzer - Swept RF 50 Ω 🛕 E		SEA	ISE:INT	1	ALIGN OFF	10:11:27.6	MNov 22, 2019	
	req 15.004500	D MHz PNO: Fast	Trig: Free	Run		: Log-Pwr	TRAG		Frequency
10 dB/div	Ref 20.00 dB	IFGain:Low	Atten: 30	dB			Mkr1 28		Auto Tune
Log 10.0 0.00 -10.0									Center Freq 15.004500 MHz
-20.0 -30.0 -40.0								-21.93 dBm	Start Freq 9.000 kHz
-50.0	hadana ishaihayo, qiyo, Minaa si w	ารระบาร์เหล่างการการการการการการการการการการการการการก	rmanartiluadastelas	derweren er en er en Er en er e	htte en te se	atta an	the permittation and bit	leter/lal-receiver	Stop Freq 30.000000 MHz
Start 9 kH #Res BW	100 kHz		BW 300 kHz	FUNCTIO		weep 5.3	Stop 3 333 ms (4 FUNCTION		CF Step 2.999100 MHz <u>Auto</u> Mar
1 N 1 2 3 4		287.2 kHz	-56.53 dBm						Freq Offset 0 Hz
7 3 9 1									
MSG	-		III			STATU	s 🚺 DC Cou	upled	

Agilent Spectrum Analyzer - Swept SA [X] RL RF 50 Ω AC			MNov 22, 2019	Frequency
Center Freq 5.01500000	OGHZ PNO: Fast Trig: Free IFGain:Low Atten: 30	Log-Pwr TRA TY	CE 123456 PE MWWWWWW ET P P P P P P	Trequency
10 dB/div Ref 20.00 dBm	I GUILEON	Mkr5 5.358 -46.	97 GHz 32 dBm	Auto Tune
10.0 0.00 -10.0)1			Center Freq 5.015000000 GHz
-20.0	2		21.93-dBm	Start Freq 30.000000 MHz
-50.0				Stop Freq 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBW 3.0 MHz	veep 18.67 ms (4		CF Step 997.000000 MHz uto Man
2 N 1 f 2.51 3 N 1 f 5.279 4 N 1 f 5.830	7 94 GHz 5.04 dBm 153 GHz -45.33 dBm 9 95 GHz -45.69 dBm 0 05 GHz -46.06 dBm 8 97 GHz -46.32 dBm	N WIDTH FUNCTIO		Freq Offset 0 Hz
MSG		STATUS		

50 Ω AC CORREC	SENSE	INT	ALIGN OFF	10:11:45 AM	1Nov 22, 2019	
PNO: Fa		Run	vg Type: Log-Pwr	TRAC TYP	E 123456 E MWWWWW	Frequency
IFGain:Lo	ow Atten: 30 d	8	Mkr3	23.883 6	25 GHz	Auto Tun
0.00 dBm				-37.5	51 dBm	
						Center Fre
						17.500000000 GH
					-21.93 dBm	Start Fre
						10.00000000 GH
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						25.00000000 GI
	VBW 3.0 MHz		Sweep 40	Stop 25. 0.00 ms (4)	000 GHz	CF Ste 1.50000000 G
X	Y	FUNCTION	FUNCTION WIDTH			<u>Auto</u> Ma
24.890 500 GHz	-35.53 dBm					
23.883 625 GHz	-37.51 dBm					Freq Offs
					=	01
					~	
	20.00 dBm	Z 24.890 500 GHz 24.227 500 GHz 24.227 500 GHz 25.53 dBm 25.53 dBm 24.227 500 GHz 25.53 dBm 25.53 dBm	20.000 GHz PNO: Fast PNO: Fast	Avg Type: Log-Pwr PN0: Fast PN0: Fast PN0	S00000000 GHz IFGain:Low Trig: Free Run Atten: 30 dB Avg Type: Log-Pwr Trace Type PN0: Fast IFGain:Low Trig: Free Run Atten: 30 dB Mkr3 23.883 6 20.00 dBm -37.5 20.00 dBm -37.2 20.00 dBm -37.2	Avg Type: Log-Pwr PN0: Fast PN0: Fast IFGsin:Low Trig: Free Run Arten: 30 dB Mkr3 23.883 625 GHz -37.51 dBm Arten: 40 dB -37.51 dB -3



8.5 Radiated spurious emissions

Test Requirements and limit, §15.247(d), §15.205, §15.209

In any 100 kHz bandwidth outside the operating frequency band, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed.

• FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 – 30.0	30	30
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

• FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	608 ~ 614	3345.8 ~ 3358		
		960 ~ 1240	3600 ~ 4400		

• FCC Part 15.205(b): The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

Test Configuration

Refer to the APPENDIX I.

Test Procedure

- 1. The EUT is placed on a non-conductive table, emission measurements at below 1 GHz, the table height is 80 cm and above 1 GHz, the table height is 1.5 m.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 1 or 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.

- KDB558074 D01v05r02 - Section 8.6

- ANSI C63.10-2013 – Section 11.12

Peak Measurement

RBW = As specified in below table, VBW \ge 3 x RBW, Sweep = Auto, Detector = Peak, Trace mode = Max Hold until the trace stabilizes.

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
>1000 MHz	1 MHz

Average Measurement:

- 1. RBW = 1 MHz (unless otherwise specified).
- 2. VBW \geq 3 x RBW.
- 3. Detector = RMS (Number of points ≥ 2 x Span / RBW)
- 4. Averaging type = power. (i.e., RMS)
- 5. Sweep time = auto.
- 6. Perform a trace average of at least 100 traces.
- 7. A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
- 1) If power averaging (RMS) mode was used in step 4, then the applicable correction factor is 10 log(1/D), where D is the duty cycle.
- 2) If linear voltage averaging mode was used in step 4, then the applicable correction factor is 20 log(1/D), where D is the duty cycle.
- 3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Test Mode	Date rate	T _{on} (ms)	T _{on+off} (ms)	D = T _{on} / (T _{on+off})	DCCF = 10 log(1/D) (dB)	
TM 1	1Mbps	12.410	12.510	0.9920	NA	
TM 2	6Mbps	2.064	2.166	0.9529	0.21	
TM 3	MCS 6	0.248	0.349	0.7106	1.48	

Duty Cycle Correction factor

Note1: Where, T= Transmission duration / D= Duty cycle Note2: Please refer to the appendix II for duty cycle plots.

Test Results: Comply

Radiated Spurious Emissions data(9 kHz ~ 25 GHz) : <u>TM 1</u>

Tested Frequency	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	2389.41	V	Х	PK	53.89	2.34	N/A	N/A	56.23	74.00	17.77
	2389.52	V	Х	AV	42.98	2.34	N/A	N/A	45.32	54.00	8.68
Lowest	4823.58	V	Х	PK	50.85	1.93	N/A	N/A	52.78	74.00	21.22
Lowest	4823.68	V	Х	AV	39.28	1.94	N/A	N/A	41.22	54.00	12.78
	7234.82	V	Х	PK	53.99	8.45	N/A	N/A	62.44	74.00	11.56
	7234.82	V	Х	AV	44.06	8.45	N/A	N/A	52.51	54.00	1.49
	4874.07	V	Х	PK	49.59	2.10	N/A	N/A	51.69	74.00	22.31
Middle	4873.57	V	Х	AV	39.07	2.10	N/A	N/A	41.17	54.00	12.83
wilddie	7310.30	V	Х	PK	50.70	8.98	N/A	N/A	59.68	74.00	14.32
	7309.33	V	Х	AV	42.79	8.97	N/A	N/A	51.76	54.00	2.24
	2484.71	V	Х	PK	52.94	2.81	N/A	N/A	55.75	74.00	18.25
	2484.44	V	Х	AV	42.91	2.81	N/A	N/A	45.72	54.00	8.28
Lighoot	4923.53	V	Х	PK	50.60	2.12	N/A	N/A	52.72	74.00	21.28
Highest	4923.72	V	Х	AV	39.34	2.12	N/A	N/A	41.46	54.00	12.54
	7385.02	V	Х	PK	50.58	8.60	N/A	N/A	59.18	74.00	14.82
	7384.53	V	Х	AV	41.34	8.60	N/A	N/A	49.94	54.00	4.06

Note.

- 1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
- 2. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F + DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

3. Information of Distance Factor.

For finding emissions, the test distance might be reduced from 3m to 1m. In this case, the distance factor(-9.54dB) is applied to the result.

- Calculation of distance factor = 20 log(applied distance / required distance) = 20 log(1 m / 3 m) = -9.54 dB



	Tested Frequency	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
		2389.33	V	Х	PK	55.88	2.34	N/A	N/A	58.22	74.00	15.78
		2389.10	V	Х	AV	45.22	2.33	0.21	N/A	47.76	54.00	6.24
	Lowoot	4824.15	V	Х	PK	49.76	1.94	N/A	N/A	51.70	74.00	22.30
	Lowest	4824.13	V	Х	AV	39.58	1.94	0.21	N/A	41.73	54.00	12.27
		7234.19	V	Х	PK	57.81	8.45	N/A	N/A	66.26	74.00	7.74
		7234.58	V	Х	AV	39.90	8.45	0.21	N/A	48.56	54.00	5.44
		4874.03	V	Х	PK	50.81	2.10	N/A	N/A	52.91	74.00	21.09
	Middle	4874.00	V	Х	AV	39.61	2.10	0.21	N/A	41.92	54.00	12.08
	Midule	7311.59	V	Х	PK	56.23	8.98	N/A	N/A	65.21	74.00	8.79
		7310.90	V	Х	AV	39.32	8.98	0.21	N/A	48.51	54.00	5.49
		2484.44	V	Х	PK	53.59	2.81	N/A	N/A	56.40	74.00	17.60
		2483.94	V	Х	AV	43.19	2.81	0.21	N/A	46.21	54.00	7.79
	Highest	4923.85	V	Х	PK	50.48	2.12	N/A	N/A	52.60	74.00	21.40
		4924.31	V	Х	AV	39.45	2.12	0.21	N/A	41.78	54.00	12.22
		7385.47	V	Х	PK	57.32	8.60	N/A	N/A	65.92	74.00	8.08
		7386.23	V	Х	AV	40.22	8.59	0.21	N/A	49.02	54.00	4.98

Radiated Spurious Emissions data(9 kHz ~ 25 GHz) : <u>TM 2</u>

Note.

1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

2. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

3. Information of Distance Factor.

For finding emissions, the test distance might be reduced from 3m to 1m. In this case, the distance factor(-9.54dB) is applied to the result.

- Calculation of distance factor = 20 log(applied distance / required distance) = 20 log(1 m / 3 m) = -9.54 dB

Dt&C

Tested Frequency	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	2389.64	V	Х	PK	57.83	2.34	N/A	N/A	60.17	74.00	13.83
	2389.77	V	Х	AV	45.33	2.34	1.48	N/A	49.15	54.00	4.85
Laurat	4824.21	V	Х	PK	50.12	1.94	N/A	N/A	52.06	74.00	21.94
Lowest	4824.13	V	Х	AV	39.59	1.94	1.48	N/A	43.01	54.00	10.99
	7235.66	V	Х	PK	55.97	8.46	N/A	N/A	64.43	74.00	9.57
	7235.77	V	Х	AV	39.50	8.46	1.48	N/A	49.44	54.00	4.56
	4874.26	V	Х	PK	50.06	2.10	N/A	N/A	52.16	74.00	21.84
Middle	4874.38	V	Х	AV	39.90	2.10	1.48	N/A	43.48	54.00	10.52
Middle	7310.62	V	Х	PK	54.65	8.98	N/A	N/A	63.63	74.00	10.37
	7310.54	V	Х	AV	37.94	8.98	1.48	N/A	48.40	54.00	5.60
	2483.99	V	Х	PK	51.69	2.81	N/A	N/A	54.50	74.00	19.50
	2483.97	V	Х	AV	41.53	2.81	1.48	N/A	45.82	54.00	8.18
l l'ab a at	4923.85	V	Х	PK	50.01	2.12	N/A	N/A	52.13	74.00	21.87
Highest	4923.66	V	Х	AV	39.70	2.12	1.48	N/A	43.30	54.00	10.70
	7386.04	V	Х	PK	51.98	8.59	N/A	N/A	60.57	74.00	13.43
	7385.88	V	Х	AV	37.48	8.59	1.48	N/A	47.55	54.00	6.45

Radiated Spurious Emissions data(9 kHz ~ 25 GHz) : TM 3

Note.

1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

2. Sample Calculation.

Margin = Limit – Result / Result = Reading + T.F + DCCF + DCF / T.F = AF + CL – AG Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

3. Information of Distance Factor.

For finding emissions, the test distance might be reduced from 3m to 1m. In this case, the distance factor(-9.54dB) is applied to the result.

- Calculation of distance factor = 20 log(applied distance / required distance) = 20 log(1 m / 3 m) = -9.54 dB

8.6 Power-line conducted emissions

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency Range	Conducted I	_imit (dBuV)
(MHz)	Quasi-Peak	Average
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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Procedure

- 1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
- 2. The EUT is connected via LISN to the test power supply.
- 3. The measurement results are obtained as described below:
- 4. Detectors Quasi Peak and Average Detector.
- Test Results: NA



9. LIST OF TEST EQUIPMENT

Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	18/12/19	19/12/19	MY49060056
Spectrum Analyzer	Agilent Technologies	N9020A	18/12/19	19/12/19	MY48011700
Spectrum Analyzer	Agilent Technologies	N9020A	19/06/26	20/06/26	MY46471251
DC Power Supply	Agilent Technologies	66332A	18/12/19	19/12/19	US37476998
DC Power Supply	SM techno	SDP30-5D	19/06/24	20/06/24	305DMG305
Multimeter	FLUKE	17B	18/12/18	19/12/18	26030065WS
Signal Generator	Rohde Schwarz	SMBV100A	18/12/19	19/12/19	255571
Signal Generator	ANRITSU	MG3695C	18/12/10	19/12/10	173501
Thermohygrometer	BODYCOM	BJ5478	18/12/27	19/12/27	120612-1
Thermohygrometer	BODYCOM	BJ5478	18/12/27	19/12/27	120612-2
Thermohygrometer	BODYCOM	BJ5478	19/07/03	20/07/03	N/A
Loop Antenna	ETS-Lindgren	6502	19/09/18	21/09/18	00226186
BILOG ANTENNA	Schwarzbeck	VULB 9160	19/04/23	21/04/23	9160-3362
Horn Antenna	ETS-Lindgren	3115	18/01/30	20/01/30	6419
Horn Antenna	Schwarzbeck	BBHA 9120C	17/12/04	19/12/04	9120C-561
Horn Antenna	A.H.Systems Inc.	SAS-574	19/07/03	21/07/03	155
PreAmplifier	tsj	MLA-0118-J01-45	18/12/19	19/12/19	17138
PreAmplifier	tsj	MLA-1840-J02-45	19/06/27	20/06/27	16966-10728
PreAmplifier	H.P	8447D	18/12/18	19/12/18	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000- 15000-40SS	19/06/26	20/06/26	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300- 18000-60SS	19/06/26	20/06/26	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	19/06/27	20/06/27	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	19/06/27	20/06/27	16012202
Attenuator	SRTechnology	F01-B0606-01	19/06/27	20/06/27	13092403
Attenuator	Aeroflex/Weinschel	20515	19/06/27	20/06/27	Y2370
Attenuator	SMAJK	SMAJK-2-3	19/06/27	20/06/27	2
Attenuator	SMAJK	SMAJK-50-10	19/06/25	20/06/25	15081903
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	18/12/19	19/12/19	1338004 1306053
EMI Receiver	ROHDE&SCHWARZ	ESW44	19/07/30	20/07/30	101645
Cable	Junkosha	MWX241	19/01/14	20/01/14	G-04
Cable	Junkosha	MWX241	19/01/14	20/01/14	G-07
Cable	DT&C	Cable	19/01/14	20/01/14	G-13
Cable	DT&C	Cable	19/01/14	20/01/14	G-14
Cable	HUBER+SUHNER	SUCOFLEX 104	19/01/14	20/01/14	G-15
Cable	Radiall	TESTPRO3	19/01/16	20/01/16	M-01
Cable	Junkosha	MWX315	19/01/16	20/01/16	M-05
Cable	Junkosha	MWX221	19/01/16	20/01/16	M-06
Cable	Radiall	TESTPRO3	19/01/15	20/01/15	RF-65

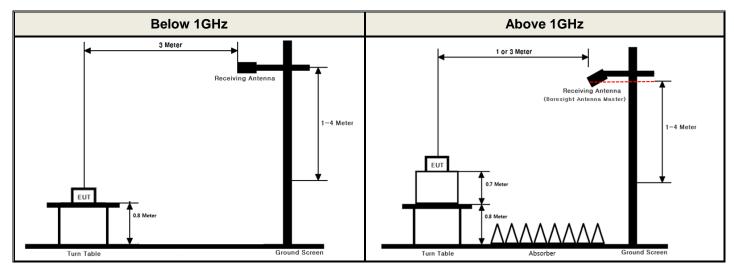
Note 1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017

Note 2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

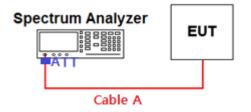
APPENDIX I

Test set up diagrams

Radiated Measurement



Conducted Measurement



Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
0.03	9.63	15	11.67
1	9.91	20	12.46
2.412 & 2.437 & 2.462	10.41	25	12.80
5	10.61	-	-
10	10.90	-	-

Note 1: The path loss from EUT to Spectrum analyzer was measured and used for test. Path loss (S/A's correction factor) = Cable A + Attenuator (Attenuator, Applied only when it was used externally)

TM 1

Middle

&

APPENDIX II

Duty cycle plots

Test Procedure

Duty Cycle was measured using section 6.0 b) of KDB558074 D01V05R02 :

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value. Set VBW \geq RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T \leq 16.7 microseconds.)

Duty Cycle

Avg Type: Log-Pwr Sweep/Control e 75.33 m PNO: Fast Trig: Free Ru Atten: 30 dB Sweep Time 75.33 ms AMkr3 Ref 20.00 dBm R, Center 2.437000000 GHz Res BW 8 MHz Span 0 Hz Sweep 75.33 ms (10001 pts) #VBW 50 MHz 13 Gate (Δ) (Δ) [Off,LO] Points 10001 STATUS

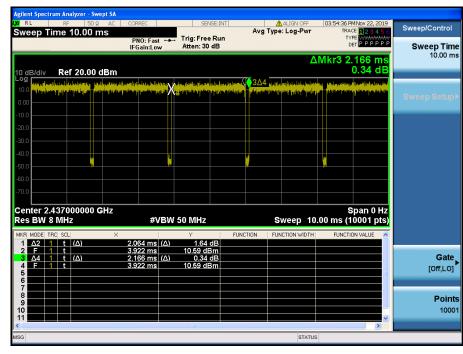
TRF-RF-236(04)171516

Dt&C

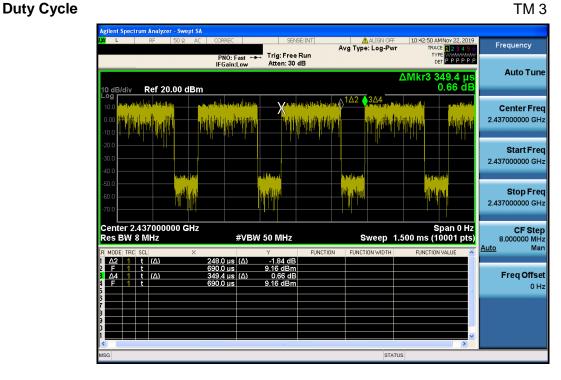
TM 2 &

Middle

Duty Cycle

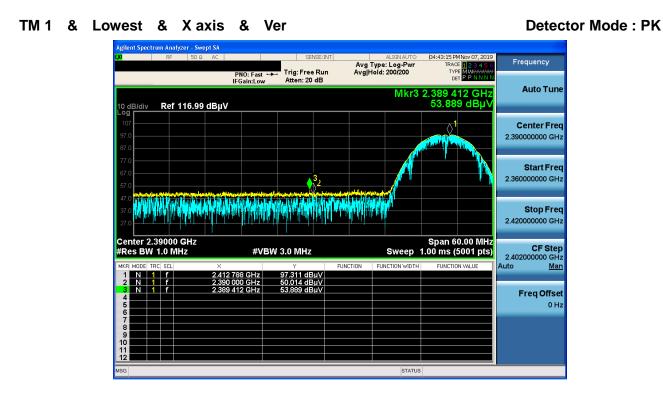


& Middle

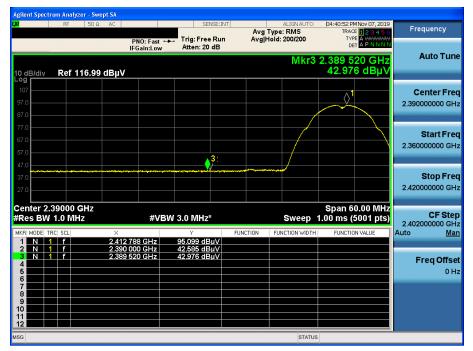


APPENDIX III

Unwanted Emissions (Radiated) Test Plot



TM 1 & Lowest & X axis & Ver



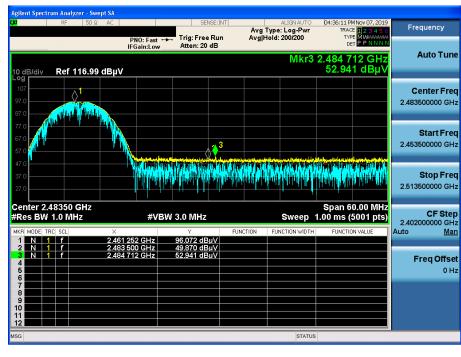
Detector Mode : AV

Pages: 61 / 68



TM 1 & Highest & X axis & Ver

Detector Mode : PK



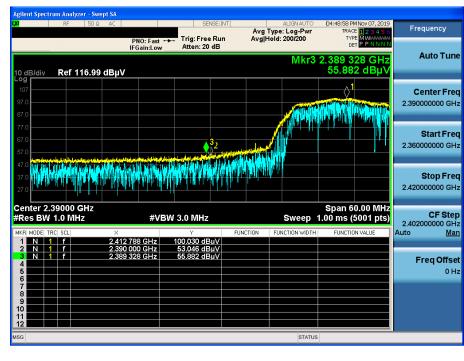
TM 1 & Highest & X axis & Ver





TM 2 & Lowest & X axis & Ver





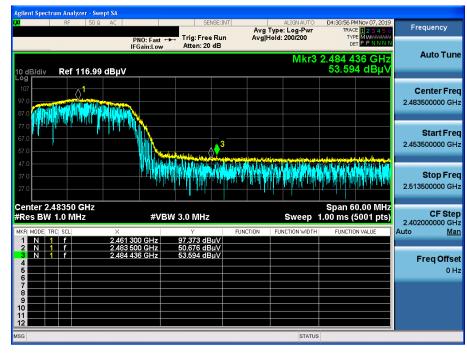
TM 2 & Lowest & X axis & Ver

SENSE:INT 04:47:11 PM Frequency Avg Type: RMS Avg|Hold: 200/200 Trig: Free Run Atten: 20 dB TYPE DE1 PNO: Fast IFGain:Low Auto Tune Mkr3 2.389 100 GHz 45.215 dBµ∖ Ref 116.99 dBµV 10 dB/div Center Freq 2 390000000 GHz Start Freq 2.360000000 GHz Stop Freq 2.420000000 GHz Center 2.39000 GHz #Res BW 1.0 MHz Span 60.00 MHz Sweep 1.00 ms (5001 pts) CF Step 2.40200000 GHz #VBW 3.0 MHz* Auto Man 44.709 dBµV 45.215 dBµV Freq Offset 0 Hz STATUS



TM 2 & Highest & X axis & Ver

Detector Mode : PK



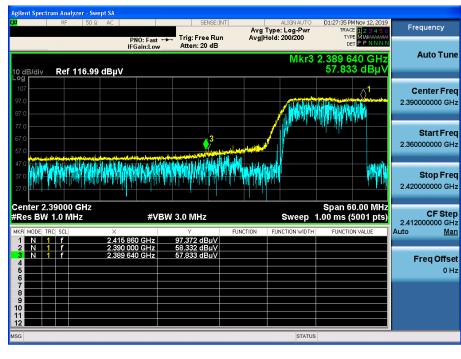
TM 2 & Highest & X axis & Ver





TM 3 & Lowest & X axis & Ver





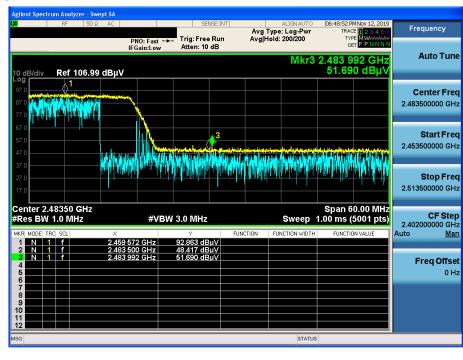
TM 3 & Lowest & X axis & Ver

SENSE:INT Frequency Avg Type: RMS Avg|Hold: 200/200 Trig: Free Run Atten: 20 dB TYPE DE1 PNO: Fast IFGain:Low Auto Tune Mkr3 2.389 772 GHz 45.329 dBµ∿ Ref 116.99 dBµV 10 dB/div Center Freq \wedge^1 2 390000000 GHz Start Freq 2.360000000 GHz Stop Freq 2.420000000 GHz Center 2.39000 GHz #Res BW 1.0 MHz Span 60.00 MHz Sweep 1.00 ms (5001 pts) **CF Step** 2.412000000 GHz #VBW 3.0 MHz* Auto Man 89.125 dBµ\ 44.638 dBµ\ 45.329 dBµ\ Freq Offset 0 Hz STATUS



TM 3 & Highest & X axis & Ver

Detector Mode : PK



TM 3 & Highest & X axis & Ver

Frequency Avg Type: RMS Avg|Hold: 200/200 Trig: Free Run Atten: 10 dB PNO: Fast IFGain:Low Auto Tune Mkr3 2.483 968 GH: 41.531 dBu Ref 106.99 dBµV **Center Freq** 2.483500000 GHz Start Freq 2.453500000 GHz (3 **Stop Freq** 2.513500000 GHz Center 2.48350 GHz #Res BW 1.0 MHz Span 60.00 MHz 1.00 ms (5001 pts) CF Step 2.40200000 GHz #VBW 3.0 MHz* Sweep Auto Man ELINIC' 2.483 500 GHz 2.483 968 GHz 41.252 dBµV 41.531 dBµV Freq Offset 0 Hz 11 12 STATUS

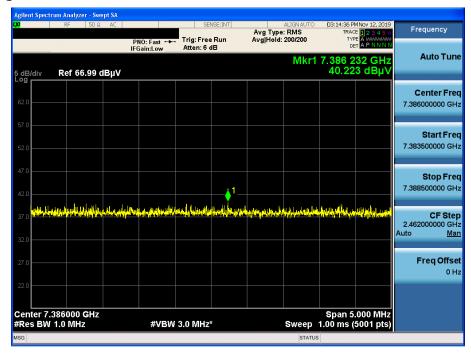


TM 1 & Lowest & X axis & Ver





TM 2 & Highest & X axis & Ver







TM 3 & Lowest & X axis & Ver

