TEST REPORT

Dt&C

Dt&C Co., Ltd.

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042 Tel: 031-321-2664, Fax: 031-321-1664

1. Report No: DRTFCC2307-0088					
2. Customer					
• Name (FCC) : Point Mobile Co., LTD. / Name (IC) : POINTMOBILE CO.,LTD					
 Address (FCC) : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu, Seoul, South Korea, 08512 Address (IC) : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu Seoul Korea (Republic Of) 					
3. Use of Report : FCC & IC Certification					
 4. Product Name / Model Name : MOBILE COMPUTER / PM86 FCC ID : V2X-PM86 IC : 10664A-PM86 					
 FCC Regulation(s): Part 15.247 IC Standard(s): RSS-247 Issue 2, RSS-Gen Issue 5 Test Method used: ANSI C63.10-2013, KDB789033 D02v02r01, KDB662911 D01v02r01 					
6. Date of Test : 2023.05.12 ~ 2023.06.19					
7. Location of Test : X Permanent Testing Lab On Site Testing					
8. Testing Environment : See appended test report.					
9. Test Result : Refer to the attached test result.					
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report is not related to KOLAS accreditation.					
Affirmation Tested by Technical Manager					
Name : SeungMin Gil Seurge) Name : JaeJin Lee					
2023.07.17.					
Dt&C Co., Ltd.					
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
DRTFCC2307-0088	Jul, 17. 2023	Initial issue	SeungMin Gil	JaeJin Lee

Table of Contents

1. General Information	. 4
1.1. Description of EUT	4
1.2. Declaration by the applicant / manufacturer	
1.3. Testing Laboratory	5
1.4. Testing Environment	5
1.5. Measurement Uncertainty	
1.6. Test Equipment List	6
2. Test Methodology	
2.1. EUT Configuration	
2.2. EUT Exercise	
2.3. General Test Procedures	
2.4. Instrument Calibration	
2.5. Description of Test Modes	
3. Antenna Requirements	
4. Summary of Test Result	11
5. Test Result	12
5.1. Maximum Peak Output Power	12
5.1.1. Test Setup	
5.1.2. Test Procedures	.12
5.1.3. Test Results	.12
5.2. 6 dB Bandwidth	14
5.2.1. Test Setup	14
5.2.2. Test Procedures	14
5.2.3. Test Results	.15
5.3. Power Spectral Density	20
5.3.1. Test Setup	20
5.3.2. Test Procedures	20
5.3.3. Test Results	21
5.4. Unwanted Emissions (Conducted)	26
5.4.1. Test Setup	26
5.4.2. Test Procedures	26
5.4.3. Test Results	.27
5.5. Unwanted Emissions (Radiated)	59
5.5.1. Test Setup	61
5.5.2. Test Procedures	
5.5.3. Test Results	62
5.6. AC Power-Line Conducted Emissions	64
5.6.1. Test Setup	
5.6.2. Test Procedures	64
5.6.3. Test Results	64
5.7. Occupied Bandwidth	67
5.7.1. Test Setup	
5.7.2. Test Procedures	
5.7.3. Test Results	67
	72
	10

IC : 10664A-PM86

1. General Information

1.1. Description of EUT

Equipment Class	Digital Transmission System (DTS)		
Product Name	MOBILE COMPUTER		
Model Name	PM86		
Add Model Name	-		
Firmware Version Identification Number	86.00		
EUT Serial Number	Conducted: 23070A0067, Radiated: 23070A0126		
Power Supply	DC 3.8 V		
Modulation Technique	• 802.11ax: OFDM, OFDMA		
Antenna Specification	Antenna type: LDS Antenna Antenna gain: Refer to the clause 3 in test report.		

Band	Mode	Tx. frequency(MHz)	Max. conducted power(dBm)	Antenna gain(dBi)	Max. e.i.r.p (dBm)
2.4 GHz	802.11ax	2 412 ~ 2 462	25.14	6.60	31.74

Note: e.i.r.p = $P_{cond} + G_{EUT}$

 P_{cond} = measured power at feedpoint of the EUT antenna, in dBm (Peak Conducted Output Power) G_{EUT} = gain of the EUT radiating element (antenna), in dBi

1.2. Declaration by the applicant / manufacturer

N/A

IC : 10664A-PM86

1.3. Testing Laboratory

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 Part 2.948 according to ANSI C63.4-2014.

- FCC & IC MRA Designation No. : KR0034

- ISED#: 5740A

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

1.4. Testing Environment

Ambient Condition	
 Temperature 	+21 ℃ ~ +24 ℃
 Relative Humidity 	+40 % ~ +43 %

1.5. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Antenna-port conducted emission	1.1 dB (The confidence level is about 95 %, $k = 2$)
AC power-line conducted emission	3.4 dB (The confidence level is about 95 %, $k = 2$)
Radiated emission (1 GHz Below)	4.8 dB (The confidence level is about 95 %, $k = 2$)
Radiated emission (1 GHz ~ 18 GHz)	5.0 dB (The confidence level is about 95 %, k = 2)
Radiated emission (18 GHz Above)	5.2 dB (The confidence level is about 95 %, k = 2)

1.6. Test Equipment List

Туре	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	22/06/24	23/06/24	MY46471622
Spectrum Analyzer	KEYSIGHT	N9020A	22/12/16	23/12/16	MY53290984
Spectrum Analyzer	Agilent Technologies	N9020A	22/12/16	23/12/16	MY48011700
Spectrum Analyzer	Agilent Technologies	N9020A	22/06/24	23/06/24	US47360812
DC Power Supply	Agilent Technologies	66332A	22/06/24	23/06/24	US37473422
Multimeter	FLUKE	17B+	22/12/16	23/12/16	36390701WS
Signal Generator	Rohde Schwarz	SMBV100A	22/12/16	23/12/16	255571
Signal Generator	ANRITSU	MG3695C	22/12/16	23/12/16	173501
Thermohygrometer	BODYCOM	BJ5478	22/12/16	23/12/16	120612-1
Thermohygrometer	BODYCOM	BJ5478	22/12/16	23/12/16	120612-2
Thermohygrometer	BODYCOM	BJ5478	22/06/24	23/06/24	N/A
Loop Antenna	ETS-Lindgren	6502	22/04/22	24/04/22	00203480
Hybrid Antenna	Schwarzbeck	VULB 9160	22/12/16	23/12/16	3362
Horn Antenna	ETS-Lindgren	3117	22/06/24	23/06/24	00143278
Horn Antenna	A.H.Systems Inc.	SAS-574	22/06/24	23/06/24	155
PreAmplifier	tsj	MLA-0118-B01-40	22/12/16	23/12/16	1852267
PreAmplifier	tsj	MLA-1840-J02-45	22/06/24	23/06/24	16966-10728
PreAmplifier	H.P	8447D	22/12/16	23/12/16	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000- 15000-40SS	22/06/24	23/06/24	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300- 18000-60SS	22/06/24	23/06/24	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	22/06/24	23/06/24	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	22/06/24	23/06/24	16012202
Attenuator	Aeroflex/Weinschel	56-3	22/06/24	23/06/24	Y2370
Attenuator	SMAJK	SMAJK-2-3	22/06/24	23/06/24	3
Attenuator	SMAJK	SMAJK-2-3	22/06/24	23/06/24	2
Attenuator	Aeroflex/Weinschel	86-10-11	22/06/24	23/06/24	408
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	22/12/16	23/12/16	1338004 1911481
EMI Test Receiver	ROHDE&SCHWARZ	ESCI7	23/01/31	24/01/31	100910
PULSE LIMITER	Rohde Schwarz	ESH3-Z2	22/08/22	23/08/22	101333
LISN	SCHWARZBECK	NSLK 8128 RC	22/10/26	23/10/26	8128 RC-387
Thermo Hygro Meter	TESTO	608-H1	23/01/13	24/01/13	45084791
Cable	Dt&C	Cable	23/01/04	24/01/04	G-2
Cable	HUBER+SUHNER	SUCOFLEX 100	23/01/04	24/01/04	G-3
Cable	Dt&C	Cable	23/01/04	24/01/04	G-4
Cable	OMT	YSS21S	23/01/04	24/01/04	G-5
Cable	Junkosha	MWX241	23/01/03	24/01/03	mmW-1
Cable	Junkosha	MWX241	23/01/03	24/01/03	mmW-4
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04	24/01/04	M-01
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04	24/01/04	M-02
Cable	JUNKOSHA	MWX241/B	23/01/04	24/01/04	M-03
Cable	JUNKOSHA	J12J101757-00	23/01/04	24/01/04	M-07
Cable	HUBER+SUHNER	SUCOFLEX106	23/01/04	24/01/04	M-09
Cable	Dt&C	Cable	23/01/04	24/01/04	RFC-69
Test Software	tsj	Radiated Emission Measurement	NA	NA	Version 2.00.0147
Test Software	tsj	Noise Terminal Measurement	NA	NA	Version 2.00.0185

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by Dt&C itself.



2. 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.

2.1. 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.

2.2. 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.

2.3. 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 as stated on section 12.1 of the KDB558074 D01v05r02.

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.

2.4. 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.



2.5. Description of Test Modes

The EUT has been tested with the operating condition for maximizing the emission characteristics. A test program is used to control the EUT for staying in continuous transmitting.

Transmitting Configuration of EUT

	SISO		MIMO(CDD)	MIMO(SDM)	
Mode	Ant 1	Ant 2	Ant 1 & 2	Ant 1 & 2	
		Data	rate		
802.11ax(HE20)	MCS 0 ~ 9(1SS)	MCS 0 ~ 9(1SS)	MCS 0 ~ 9(1SS)	MCS 0 ~ 9(2SS)	

Note1: SDM = Spatial Diversity Multiplexing, CDD = Cycle Delay Diversity, SS = Spatial Streams

Test Mode

Test mode	Worst case data rate	Tested Frequency (MHz)		Hz)
TM 1	802.11ax(HE20) OFMD_MCS 0 (CDD Multiple transmitting)	2 412	2 437	2 462

Note1: The worst case data rate was determined according to the power measurements.

EUT Operation test setup

- Test Software: Using the adb command

- Power setting: Refer to the table below.

Tested frequency and power setting

	802.11ax(HE20)			
Tones(RU Index)	Channel	Frequency	Power Setting	
	onanner	(MHz)	MCS 0 ~ MCS 9	
	1	2 412	15	
26(0, 4, 8)	6	2 437	15	
	11	2 462	12	
	1	2 412	15	
52(37, 38, 40)	6	2 437	15	
	11	2 462	13	
	1	2 412	14	
106(53, 54)	6	2 437	15	
	11	2 462	12	

		802.11ax(HE20)						
Tones(RU Index)	Channel	Frequency	Power Setting					
	Channel	(MHz)	MCS 0 ~ MCS 11					
	1	2 412	11					
242(61)	6	2 437	15					
	11	2 462	10					
	1	2 412	12					
SU	6	2 437	15					
	11	2 462	10					

3. Antenna Requirements

According to Part 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 antenna is attached on the device by means of unique coupling method. Therefore this E.U.T complies with the requirement of Part 15.203

Directional antenna gain:

Danda	SI	50	MIMO (CDD) Note 1.	MIMO (SDM) Note 2	
Bands	ANT 1 [dBi] ANT 2 [dBi]		Directional Gain[dBi]	Directional Gain[dBi]	
2.4 GHz	3.900	3.270	6.600	3.600	

Note 1. Directional gain(correlated signal with unequal antenna gain and equal transmit power) 10 log [(10 G1/20 + 10 G2/20 + ... + 10 GN/20) ² / N^{ANT}] dBi

Note 2. Directional gain(completely uncorrelated signal with unequal antenna gain and equal transmit power) 10 log [(10 G1/10 + 10 G2/10 + ... + 10 GN/10) / N^{ANT}] dBi

4. Summary of Test Result

FCC part section(s)	RSS section(s)	Test Description 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]	Maximum Peak Output Power	< 1 Watt (conducted), FCC & IC < 4 Watt (e.i.r.p), IC		С
15.247(d)	RSS-247[5.5]	Unwanted Emissions(Conducted)	20 dBc in any 100 kHz BW	Conducted	с
15.247(e)	RSS-247[5.3]	Power Spectral Density	er Spectral Density < 8 dBm / 3 kHz		с
-	RSS-Gen[6.7]	Occupied Bandwidth (99 %)	NA		С
15.247(d) 15.205 15.209	RSS-247[5.5] RSS-Gen[8.9] RSS-Gen[8.10]	Unwanted Emissions(Radiated)	Part 15.209 limits (Refer to section 5.5)	Radiated	C Note 3
15.207	RSS-Gen[8.8]	AC Power-Line Conducted Emissions	Part 15.207 limits (Refer to section 5.6)	AC Line Conducted	С
15.203	-	Antenna Requirements	Part 15.203 (Refer to section 3)	-	С

Note 3: This test item was performed in three orthogonal EUT positions and the worst case data was reported.



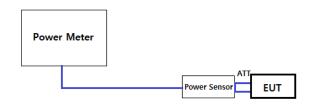
5. Test Result

- 5.1. Maximum Peak Output Power
- Test Requirements and limit, Part 15.247(b) & RSS-247 [5.4]

The maximum permissible conducted output power is 1 Watt.

The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of RSS-247.

5.1.1. Test Setup



5.1.2. Test Procedures

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

RBW ≥ DTSPKPM1 Peak-reading power meter method

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

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.

5.1.3. Test Results

- Refer to the next page

	Maximum Peak Conducted Output Power (dBm) for							(dBm) for <u>8</u>	302.11ax		
	Tanaa	RU Index	Det	Freq.(MHz)							
ANT	Tones		Det.		CDD			SDM			
				2 412	2 437	2 462	2 412	2 437	2 462		
		•	PK	21.34	21.56	20.51	21.29	21.50	20.42		
		0	AV	14.13	14.12	12.09	14.08	14.03	12.01		
	00	4	PK	21.58	21.34	21.20	21.53	21.25	21.12		
	26	4	AV	15.14	14.36	12.81	15.08	14.28	12.76		
		0	PK	21.90	21.23	21.00	21.85	21.17	20.94		
		8	AV	15.29	14.82	12.56	15.23	14.74	12.51		
		37	PK	21.30	21.16	21.02	21.21	21.08	20.96		
		37	AV	14.10	14.04	13.12	14.04	13.96	13.03		
	52	38	PK	21.46	21.37	21.06	21.41	21.27	20.96		
ANT 1	52	- 30	AV	14.69	14.38	13.13	14.63	14.28	13.08		
		40	PK	21.62	21.29	20.94	21.57	21.24	20.86		
		-0	AV	15.07	14.55	13.28	15.00	14.47	13.22		
		53	PK	21.03	21.14	20.58	20.93	21.09	20.51		
	106 242		AV	13.88	14.04	12.25	13.80	13.96	12.16		
		54	PK	21.44	21.06	20.88	21.37	20.97	20.78		
			04	AV	14.42	14.29	12.76	14.42	14.20	12.67	
		61	PK	20.37	21.29	20.06	20.29	21.20	19.99		
			AV PK	11.82	14.28	10.72	11.72	14.20	10.64		
	S	SU		21.08	21.22	20.06	20.98	21.14	19.98		
				12.80	14.37	10.93	12.75	14.27	10.84		
		0	PK	22.57	21.54	22.02	22.48	21.47	21.93		
			AV	15.49	14.04	13.99	15.44	13.95	13.99		
	26	4	PK	22.32	21.72	22.25	22.22	21.66	22.19		
			AV	14.94	14.56	13.84	14.86	14.51	13.79		
		8	PK	21.81	22.31	21.29	21.75	22.22	21.24		
			AV	14.05	15.95	12.67	13.97	15.90	12.60		
		37	PK	22.52	21.51	22.71	22.43	21.45	22.65		
			AV	15.10	14.08	14.98	15.00	14.00	14.88		
	52	38	PK	22.71	21.39	22.63	22.63	21.34	22.55		
ANT 2			AV	15.23	14.06	14.99	15.18	14.01	14.93		
		40	PK	21.98	22.27	22.23	21.91	22.18	22.14		
			AV	14.02	15.75	13.76	13.97	15.68	13.70		
		53	PK	22.05	21.26	21.55	21.95	21.20	21.46		
	106		AV PK	14.45 21.84	14.04 22.06	13.84 21.03	14.48 21.79	13.94 21.99	13.78 20.96		
		54	AV	13.60	15.28	12.96	13.52	15.22	12.96		
			PK	19.86	21.65	20.22	19.79	21.60	20.16		
	242	61	AV	19.80	14.63	11.80	11.67	14.54	11.75		
			PK	21.74	21.53	21.13	21.66	21.47	21.07		
	S	U	AV	12.78	14.55	11.94	12.73	14.47	11.86		
		0	PK	25.01	24.56	24.34	24.94	24.50	24.25		
	26	4	PK	24.98	24.54	24.77	24.90	24.47	24.70		
	_0	8	PK	24.87	24.81	24.16	24.81	24.74	24.10		
		37	PK	24.96	24.35	24.96	24.87	24.28	24.90		
Sum	52	38	PK	25.14	24.39	24.93	25.07	24.32	24.84		
(ANT 1+2)		40	PK	24.81	24.82	24.64	24.75	24.75	24.56		
	100	53	PK	24.58	24.21	24.10	24.48	24.16	24.02		
	106	54	PK	24.65	24.60	23.97	24.60	24.52	23.88		
	242	61	PK	23.13	24.48	23.15	23.06	24.41	23.09		
		U	PK	24.43	24.39	23.64	24.34	24.32	23.57		



5.2.6 dB Bandwidth

Test Requirements and limit, Part 15.247(a) & RSS-247 [5.2]

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

The minimum permissible 6 dB bandwidth is 500 kHz.

5.2.1. Test Setup

Refer to the APPENDIX I.

5.2.2. Test Procedures

- 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.
- 3. Detector = **Peak**.
- 4. Trace mode = **max hold**.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Option 1 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.

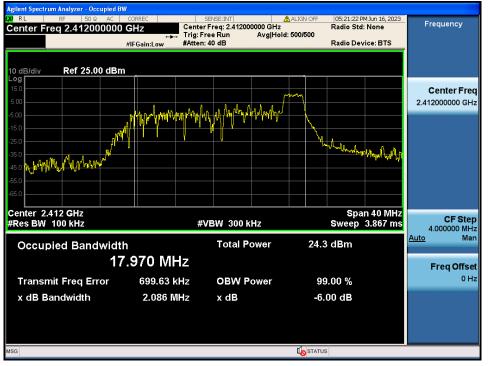
Option 2 - The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW \ge 3 × RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be \ge 6 dB.

5.2.3. Test Results

M 1					
ANT	Tones	RU		Test Results[MHz]	
	Tones	Index	2 412	2 437	2 462
		0	2.10	2.09	2.11
	26	4	2.63	2.61	2.71
ANT 1		8	2.09	2.09	2.10
	242	61	19.11	18.99	19.06
	S	U	18.70	18.75	18.78
		0	2.12	2.04	2.09
	26	4	2.68	2.68	2.64
ANT 2		8	2.14	2.14	14.58
	242	61	19.04	19.07	18.94
	S	U	18.17	17.07	17.02

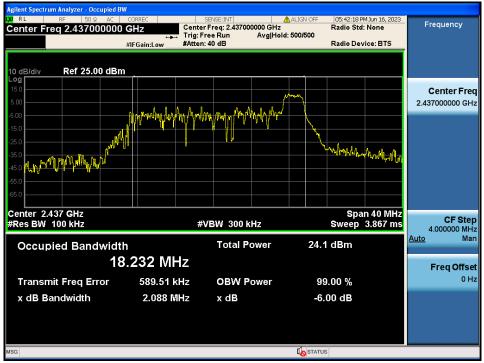
Note 1: The worst-case plots(Minimum 6dB Bandwidth) were attached to the next page.

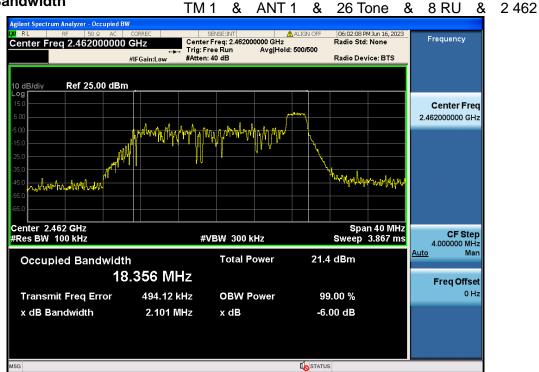




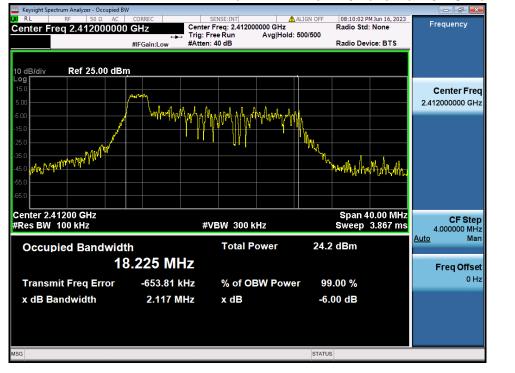
6 dB Bandwidth

TM 1 & ANT 1 & 26 Tone & 8 RU & 2 437





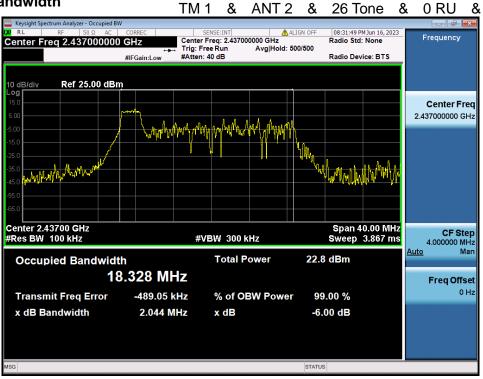
TM 1 & ANT 2 & 26 Tone & 0 RU & 2412

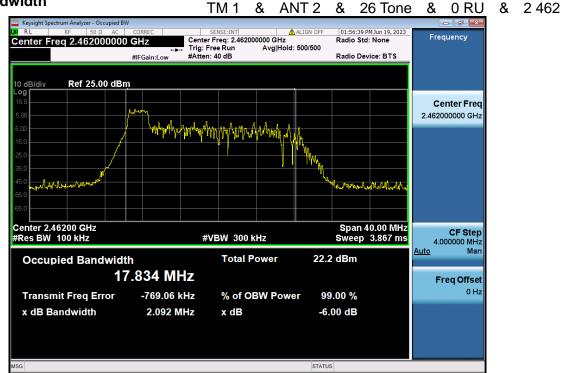


6 dB Bandwidth

TM 1 & ANT 2 & 26 Tone &

& 2 4 3 7





5.3. Power Spectral Density

Test requirements and limit, Part 15.247(e) & RSS-247 [5.2]

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

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.

5.3.1. Test Setup

Refer to the APPENDIX I.

5.3.2. Test Procedures

- 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 : 3 kHz \leq RBW \leq 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 amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3.3. Test Results

		RU		Po	wer Spectral Densi	ty (dBm) for <u>802.1</u>	<u>1ax</u>
ANT	Tones	Index	RBW	2 412 MHz	2 437 MHz	2 462 MHz	Limit (dBm / 3 kHz)
		0	3 kHz	-1.61	-3.00	-4.79	8.00
	26 4		3 kHz	-2.20	-2.66	-4.98	8.00
ANT 1		8	3 kHz	-1.25	-1.42	-4.30	8.00
	242	61	3 kHz	-13.97	-10.22	-13.92	8.00
	S	SU	3 kHz	-11.15	-10.02	-10.02 -13.42	
		0	3 kHz	-1.52	-3.21	-2.43	8.00
	26	4	3 kHz	-1.25	-2.52	-3.44	8.00
ANT 2		8	3 kHz	-2.70	-0.90	-5.15	8.00
	242	61	3 kHz	-14.44	-10.52	-14.07	8.00
	S	SU	3 kHz	-10.32	-9.08	-12.86	8.00
		0	3 kHz	1.45	-0.09	-0.44	7.40
	26	4	3 kHz	1.31	0.42	-1.13	7.40
Sum (ANT 1+2)		8	3 kHz	1.10	1.86	-1.69	7.40
(7111 172)	242	61	3 kHz	-11.19	-7.36	-10.98	7.40
	S	SU	3 kHz	-7.70	-6.51	-10.12	7.40

Note 1: The worst-case plots were attached to the next page.

Note 2: The limit is reduced by the amount of dB above which the antenna gain exceeds 6 dBi.

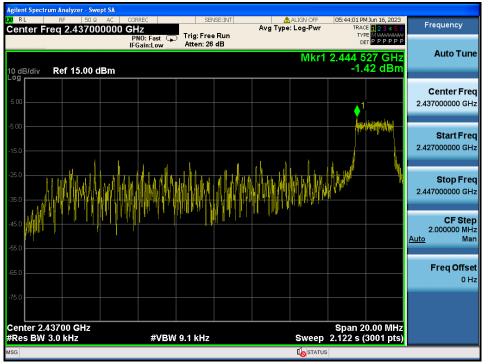
2 4 1 2



Power Spectral Density TM 1 & ANT 1 & 26 Tone & 0 RU &

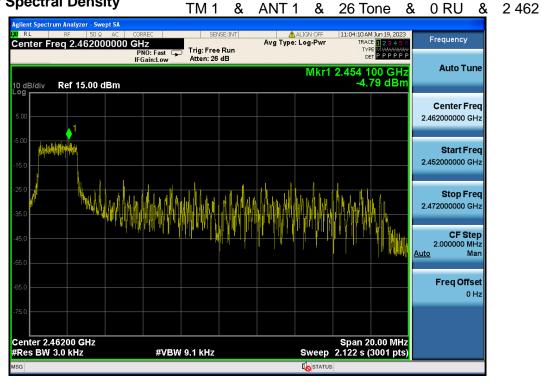


Power Spectral DensityTM 1 & ANT 1 & 26 Tone & 8 RU & 2 437



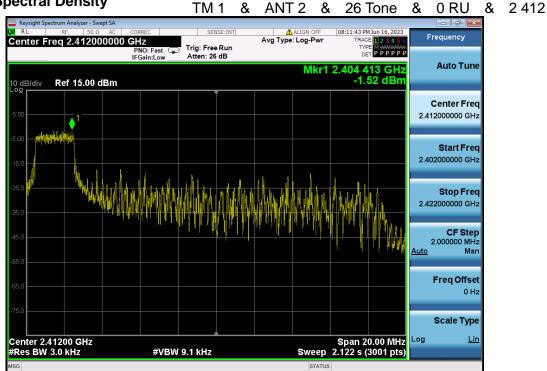




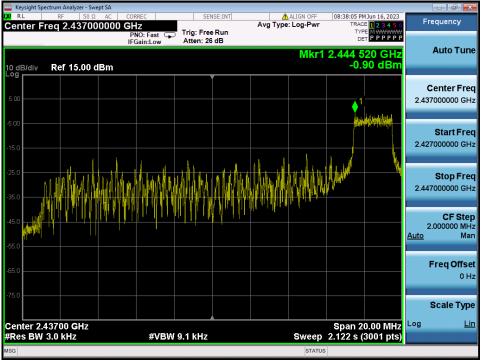




Power Spectral Density



Power Spectral Density TM 1 & ANT 2 & 26 Tone & 8 RU & 2 437



0 Hz

<u>Lin</u>

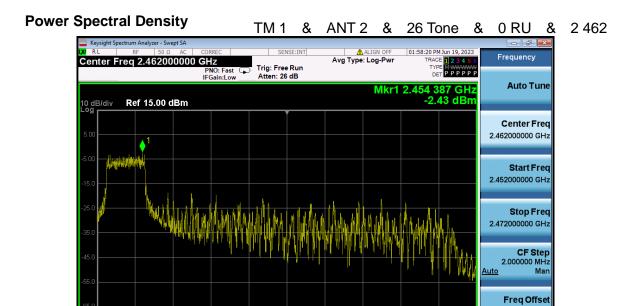
Scale Type

Log

Span 20.00 MHz Sweep 2.122 s (3001 pts)



Center 2.46200 GHz #Res BW 3.0 kHz



#VBW 9.1 kHz

5.4. Unwanted Emissions (Conducted)

Test requirements and limit, Part 15.247(d) & RSS-247 [5.5]

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 inband average PSD level. In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

5.4.1. Test Setup

Refer to the APPENDIX I including path loss

5.4.2. Test Procedures

- 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 LIMIT LINE = 20 dB below of the reference 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 \geq 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.

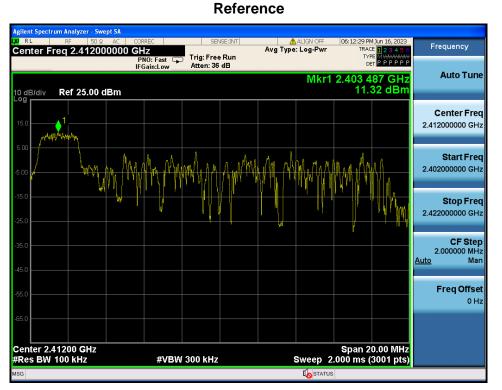
Note. The unwalled emission(conducted) was tested with below settings.									
Frequency range	RBW	VBW	Detector	Trace	Sweep Point				
9 kHz ~ 30 MHz	100 kHz	300 kHz							
30 MHz ~ 10 GHz	1 MHz	3 MHz	Peak	Max Hold	40 001				
10 GHz ~ 25 GHz	1 MHz	3 MHz]						

Note: The unwanted emission(conducted) was tested with below settings.

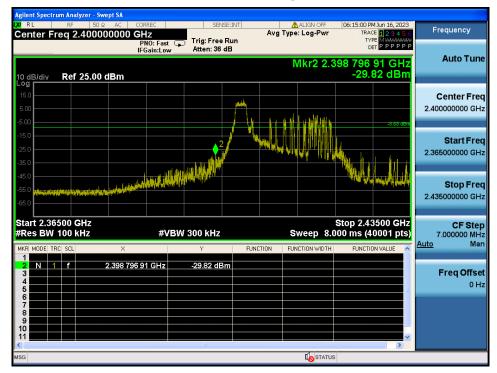
If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SPAN = 100 MHz and BINS = 2 001 to get accurate emission level within 100 kHz BW.

5.4.3. Test Results

TM 1 & ANT 1 & 26 Tone & 0 RU & 2 412

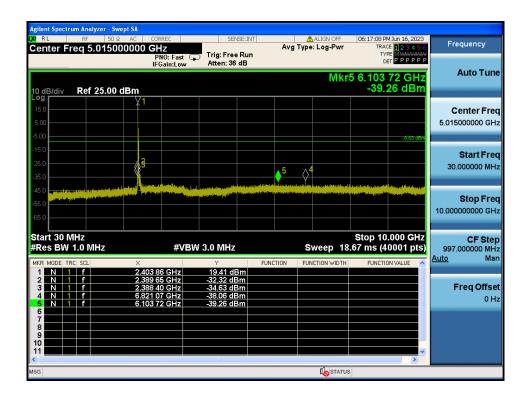


Low Band-edge





RL RF 50 2 ▲ D0 Center Freq 15.004500		SENSE:INT	Avg 1	ALIGN OFF	TRAC	1 Jun 16, 2023 E 1 2 3 4 5 6 E M WWWWW T P P P P P P	Frequency
0 dB/div Ref 25.00 dBr	IFGain:Low	Atten: 36 dB		1	//kr1 284		Auto Tun
og 15.0 5.00						-8.66 dBm	Center Fre 15.004500 M⊦
5.0							Start Fre 9.000 ki
5.0 5.0 5.0	nteren etter en etter första första en efter etter	anatoministic manufut the calification of	uning standard	uthata an thairrint at any	alan gergeren angele	hytipsaljatijis, plasta	Stop Fre 30.000000 MH
tart 9 kHz Res BW 100 kHz	#VB\ ×	№ 300 kHz	FUNCTION	Sweep 5.3	Stop 30 33 ms (40 FUNCTIO		CF Ste 2.999100 MH <u>Auto</u> Ma
NN 1 N 1 F 2 3 -	284.2 kHz	-38.34 dBm	FONCTION	FUNCTION WIDTH	FUNCTIO		Freq Offs 0 F



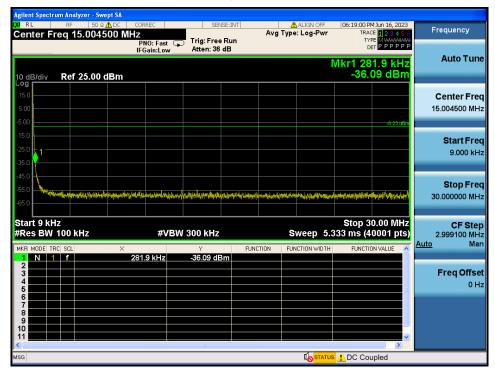




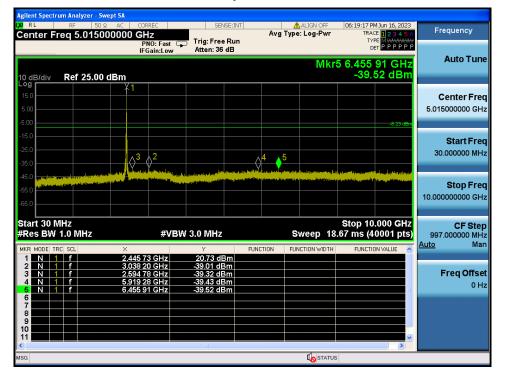
TM 1 & ANT 1 & 26 Tone & 8 RU & 2 437

Reference











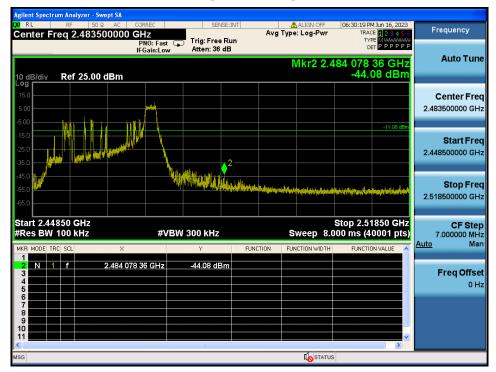
IC : 10664A-PM86

TM 1 & ANT 1 & 26 Tone & 8 RU & 2 462

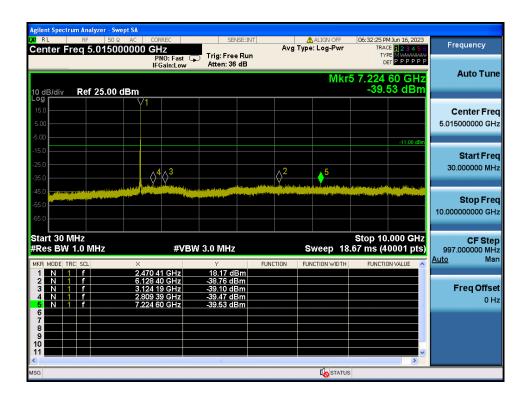


Reference

High Band-edge

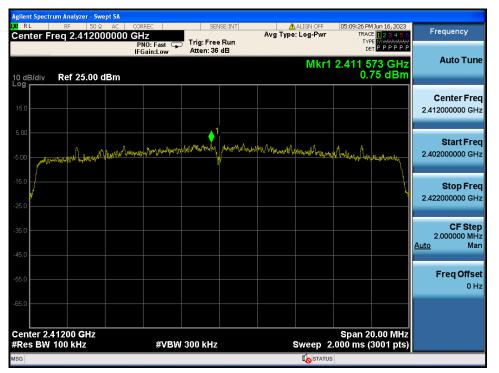


	um Analyzer - S						
Center Fr	RF 50 eq 15.004	Ω [▲] DC CORREC			ALIGN OFF	06:32:10 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref 25.00	PNO: F IFGain:	ast 🕞 Trig: Free Low Atten: 36			ТҮРЕ М DET P P P P P P Mkr1 281.9 kHz -38.80 dBm	Auto Tune
15.00							Center Freq 15.004500 MHz
-15.0 -25.0 -35.0						-11.08 dBm	Start Freq 9.000 kHz
-45.0 -55.0 -65.0	Antoint for the fam	Henrya baar ky i arth laet y taar a	hannelation of the second second	there the stand of t	Antipling in the state of the set	angang tanah kangan di genangan kanananga kan	Stop Freq 30.000000 MHz
Start 9 kH #Res BW MKR MODE TR	100 kHz	× 281.9 kł	#VBW 300 kHz	FUNCTION	Sweep 5.3	Stop 30.00 MHz 333 ms (40001 pts) FUNCTION VALUE	CF Step 2.999100 MHz <u>Auto</u> Mar
2 3 4 5 6 7		201.3 Ki					Freq Offset 0 Hz
8 9 10 11			an a			~	
ISG						DC Coupled	



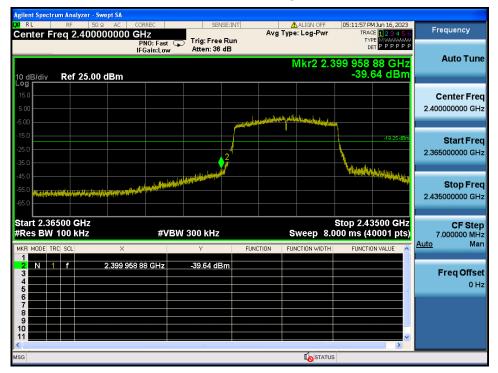
gilent Spectrum Analyzer - Swept SA				
RL RF 50 Q AC Center Freq 17.50000000	CORREC SENSE:IN	Avg Type: Log-Pwr	06:32:38 PM Jun 16, 2023 TRACE 123456	Frequency
10 dB/div Ref 10.00 dBm	PNO: Fast 🖵 Trig: Free Run IFGain:Low Atten: 20 dB		24.269 875 GHz -39.60 dBm	Auto Tune
og 0.00 -10.0			-11.08 dBm	Center Freq 17.500000000 GHz
30.0 40.0 50.0	, we have a second data of the rest			Start Freq 10.000000000 GHz
60.0 <mark>400,000 400 400 400 400 400 400 400 400 </mark>				Stop Freq 25.000000000 GHz
Start 10.000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz		Stop 25.000 GHz 0.00 ms (40001 pts)	CF Step 1.500000000 GHz Auto Mar
2 N 1 f 24.90	Y 3875 GHz 8500 GHz 9875 GHz 39.60 dBm 39.60 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
G				

TM 1 & ANT 1 & SU & 2412

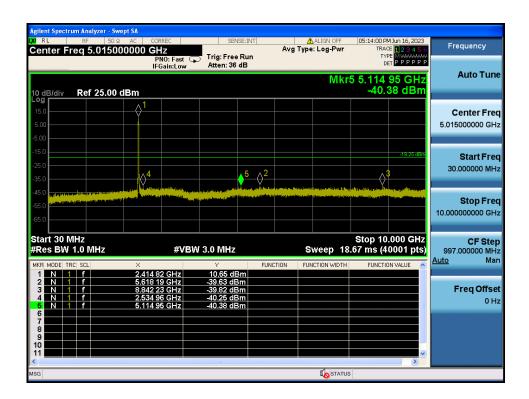


Reference

Low Band-edge



🗶 RL RF 50 Ω 🚹 DC	CORREC							
		SENSE	INT		ALIGN OFF		4 Jun 16, 2023	Frequency
Center Freq 15.004500 MI	PNO: Fast	Trig: Free F	tun	Avgiype	: Log-Pwr	TY	CE 123456 PE MWWWW ET P P P P P P	
10 dB/div Ref 25.00 dBm	IFGain:Low	Atten: 36 d				Mkr1 28		Auto Tune
15.0 -5.00								Center Freq 15.004500 MHz
-15.0 -25.0 -36.0							-19.25 dBm	Start Freq 9.000 kHz
-45.0 -55.0 -65.0	terreitserrigerendenterrei	an the state of the	il ^h latari dellata	happytheresister	eteritettinetetristet	addalalaantintajaan	ngaratiy <mark>disasi</mark> tiyadi	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz MKRI MODEI TRCI SCLI X	#VBV	/ 300 kHz	FUNC		weep 5.3	333 ms (4	0.00 MHz 0001 pts)	CF Step 2.999100 MHz <u>Auto</u> Man
	281.9 kHz	-39.17 dBn				Tonenk		Freq Offset 0 Hz
MSG					STATUS	DC Cou	pled	



Agilent Spectr <mark>XI</mark> RL	RF	50 Ω	AC COF	RREC	SEN	SE:INT		ALIGN OFF		MJun 16, 2023	Frequency
Center F	req 1	7.5000	P	Hz NO: Fast Gain:Low	Trig: Free Atten: 20		Avg Typ	e: Log-Pwr	TY	CE 123456 PE MWWWWW ET P P P P P P	
10 dB/div	Ref	10.00 d	IBm					Mkr3 2	24.766 C -39.	00 GHz 34 dBm	Auto Tune
- og 0.00 10.0 20.0										-19.25 dBm	Center Fred 17.500000000 GHz
30.0 40.0 50.0				diagter for all and the	and all a			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	The second s		Start Fred 10.000000000 GHz
60.0 1411-14 70.0 80.0							i i i i i i i i i i i i i i i i i i i				Stop Fred 25.000000000 GHz
tart 10.0 Res BW				#VE	3W 3.0 MHz		ş	weep 40	Stop 25 .00 ms (4	.000 GHz 0001 pts)	CF Step 1.50000000 GH
MKR MODE TR 1 N 1 2 N 1 3 N 1 4	RC SCL f f f		× 24.992 12 24.920 87 24.766 00	5 GHz	Y -38.79 d⊟ -39.07 d⊟ -39.34 d⊟	m	DN FU	NCTION WIDTH	FUNCTI	ON VALUE	Auto Mar Freq Offset
5 6 7 8 9 10											0 H:
SG					Ш			STATUS	6	>	

TM 1 & ANT 1 & SU & 2437



Reference

		RREC	SENS	BE:INT	ALIGN			1)un 16, 2023 E <mark>1 2 3 4 5</mark> (Frequency
enter Freq 15.0	P	NO: Fast G Gain:Low	Trig: Free Atten: 36	Run	Avg Type. Log-	- wr	TYP			
dB/div Ref 25	i.00 dBm					М		4.9 kHz I6 dBm		Auto Tui
5 .0										Center Fr 15.004500 M
.00 5.0 5.0 5.0 1								-15.98 dBm		Start Fr 9.000 k
5.0										
and the second s	erhet fal hoat to oan alle fille fal hethooar	an a	etalomphaquinathalistean (sallaf	in the second of the second	uran af the first of the second	ng (gagair) yi	by Apple 1994	ogletterforsetsettert		
5.0 tart 9 kHz Res BW 100 kHz			N 300 kHz		Sweep	5.33	Stop 3(3 ms (4)	0.00 MHz 0001 pts	Auto	Stop Fr 30.000000 M CF Sto 2.999100 M 2 M
5.0 HILL STORE STO	z X			FUNCTIO	Sweep	5.33	Stop 3	0.00 MHz 0001 pts	Auto	30.000000 M CF St 2.999100 M
tart 9 kHz Res BW 100 kHz	z X	#VB\	Af 300 kHz Y	FUNCTIO	Sweep	5.33	Stop 3(3 ms (4)	0.00 MHz 0001 pts	Auto	30.000000 M CF St 2.999100 M Freq Offs

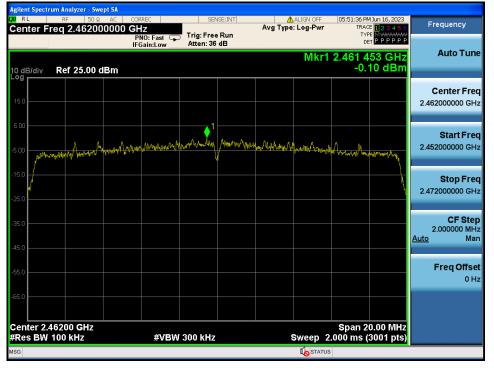


gilent Spectrum Analyzer - Swept					
RL RF 50 Ω Center Freq 5.015000		SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	05:36:56 PMJun 16, 2023 TRACE 123456	Frequency
	PNO: Fast G IFGain:Low	⊃ Trig: Free Run Atten: 36 dB	Mkr	түре Милинин Det РРРРР 5 7.391 10 GHz	Auto Tune
10 dB/div Ref 25.00 dE				-39.62 dBm	
5.00					Center Fre 5.015000000 GH
15.0				-15.98 dBm	Start Fre
35.0 45.0		a provide a state of the state		and a second	30.000000 MH
55.0	No. of Concession, Street, or Concession, Street, Stre		den ble der Eddig Vikil, die eine eine die in dei blemine bye	n an de an tha a dha an an tha tha an an tha an	Stop Fre 10.000000000 GH
65.0 Start 30 MHz FRes BW 1.0 MHz	#VBV	V 3.0 MHz	Sweep 18	Stop 10.000 GHz 67 ms (40001 pts)	CF Ste 997.000000 MH
IKR MODE TRC SCL	X		JNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
1 N 1 f 2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	2.439 00 GHz 6.608 46 GHz 6.943 20 GHz 7.208 15 GHz 7.391 10 GHz	13.50 dBm -39.12 dBm -39.47 dBm -39.52 dBm -39.62 dBm			Freq Offse 0 H
6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7.39110 GH2	59.02 dBiii			
9 10 11 11				×	
SG					





TM 1 & ANT 1 & SU & 2462

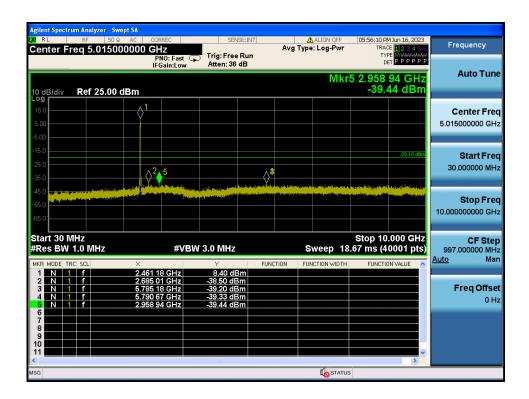


Reference

High Band-edge



	rum Analyzer - S								
LXI RL		Ω 🛕 DC 📔 COR	REC	SENSE		ALIGN OFF		4 Jun 16, 2023	Frequency
Center F	req 15.004	500 MHz		Trig: Free R		g Type: Log-Pwr	TY		Trequency
			l0: Fast Ģ jain:Low_	Atten: 36 dE			Mkr1 28		Auto Tune
10 dB/div Log	Ref 25.00	dBm						38 dBm	
15.0									Center Freq
5.00									15.004500 MHz
-5.00									
-15.0								-20.10 dBm	Start Freq
-25.0									9.000 kHz
-35.0									
-45.0									Stop Freq
-55.0	Mahan siyatiyi dagaran di dan sadaga	herst marked her the sectored	والإيارة والمتربية والمترافية	and the state of the	all and an		an and the second second	and revised a stille	30.000000 MHz
-65.0									
Start 9 kl	Hz						Stop 3	0.00 MHz	CF Step
#Res BW			#VBV	/ 300 kHz		Sweep 5.	333 ms (4	0001 pts)	2.999100 MHz
MKR MODE T		Х		Y	FUNCTION	FUNCTION WIDTH	FUNCTIO	ON VALUE	<u>Auto</u> Man
1 N ⁻	1 f	281.	9 kHz	-38.38 dBm					
3									Freq Offset
4								_	0 Hz
5									
6									
6 7 8									
6 7									
6 7 8 9 10 11									
6 7 8 9 10				III		Le STATU	S L DC Cou	>	



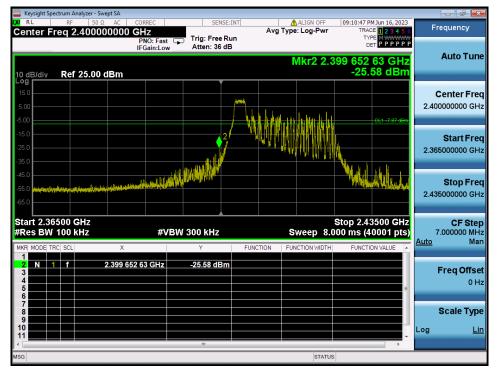
ilent Spectrum A	n <mark>alyzer - Swe</mark> RF 50 Ω		0.54	IOT JAK IT		AL TON OFF	05:56:22 PM	h = 16,0000	
Center Freq		00000 GHz				Lign OFF	TRACE	1 2 3 4 5 6	Frequency
10 dB/div R	ef 10.00 d	PNO: Fa IFGain:Lo IBM				Mkr3 2	DE 3.410 0	PPPPP	Auto Tune
0.00 10.0 20.0								-20.10 dBm	Center Fred 17.500000000 GH;
30.0 40.0 50.0		يىمى يۇرىي يى	and the second	and and a second se	an ite stiller		Hitter Pitter and Karl	3,2 () ¹	Start Free 10.000000000 GH:
60.0 									Stop Fred 25.000000000 GH:
tart 10.000 Res BW 1.0	MHz		VBW 3.0 MHz			· ·	Stop 25. .00 ms (40	0001 pts)	CF Step 1.500000000 GH Auto Mar
MKR MODE TRC SI 1 N 1 f 2 N 1 f 3 N 1 f 4		× 24.257 125 GHz 23.723 500 GHz 23.410 000 GHz	-40.89 dE	3m	DN FUN	ICTION WIDTH	FUNCTIO		Freq Offse
6 7 8 9 10									
5G						STATUS			

TM 1 & ANT 2 & 26 Tone & 0 RU & 2 412

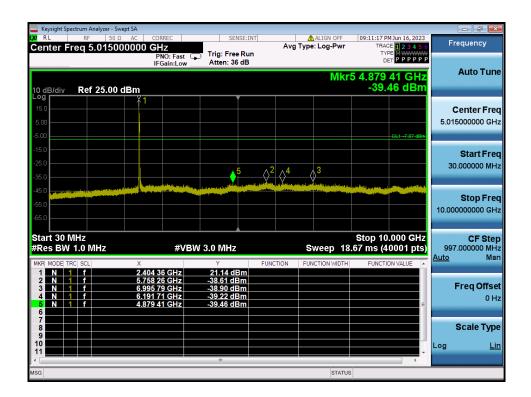


Reference

Low Band-edge



Keysight Spectrum Analyzer - Swept SA				- đ 론
α RL RF 50 Ω ▲ DC Center Freg 15.004500 M	CORREC SENSE:IM	ALIGN OFF	09:10:56 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 25.00 dBm	PNO: Fast Trig: Free Run IFGain:Low Atten: 36 dB	n	ТҮРЕ М DET P P P P P P Mkr1 298.4 kHz -50.53 dBm	Auto Tun
15.0 5.00			DL1 -7.87 dBm	Center Fre 15.004500 MH
15.0 25.0 36.0				Start Fre 9.000 k⊢
45.0 1 55.0 March 1990 and 1	าระางกำให้เป็นไปการแนะเขาเป็นการการการการการการการการการการการการการก	anne an the anne and the anne and the anne and the anne and	nei trig degot getanation eksenten eksenten eksenten eksenten eksenten eksenten eksenten eksenten eksenten ekse	Stop Fre 30.000000 MH
tart 9 kHz Res BW 100 kHz	#VBW 300 kHz	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Ste 2.999100 MH Auto Ma
1 N 1 f 2 3 4 4 5 6	298.4 kHz -50.53 dBm		E	Freq Offs 0 H
7 8 9 10				Scale Typ

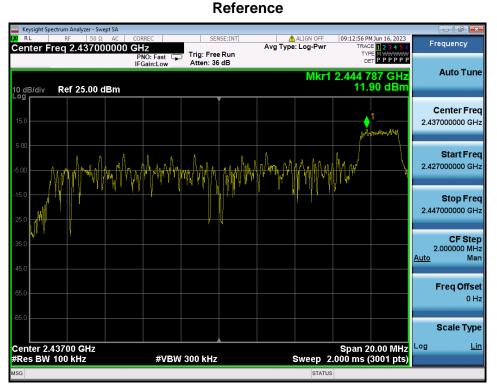




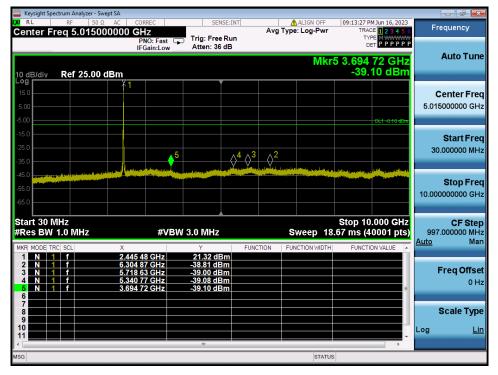




TM 1 & ANT 2 & 26 Tone & 8 RU & 2 437



Keysight Spe	ectrum Analyzer - Swept RF 50 Ω Λ		SENSE:I	NT	ALIGN OFF	09:13:04 PM Jun 16, 2023	
Center F	req 15.00450	0 MHz PNO: Fast IFGain:Low	Trig: Free Ru Atten: 36 dB		Type: Log-Pwr	TRACE 1 2 3 4 5 TYPE M WWWW DET P P P P P	P
10 dB/div	Ref 25.00 dE	١m				4 Wkr1 308.9 kH -50.84 dBn	
15.0							Center Fre 15.004500 MH
-5.00						DL1 -0.10 dDr	•
-15.0							Start Fre 9.000 ki
-45.0 1	ettelakteringen seten etter	alestation Materialistation	den transferier and the second second second	hallan an a	latertudoret fræretare atorenstedtade	Henishishishishishishishishishishishishishi	Stop Fre 30.000000 MH
tart 9 k⊦ ⊄Res BW	lz 100 kHz	#VB	W 300 kHz		Sweep 5.3	Stop 30.00 MH 33 ms (40001 pts	
MKR MODE TF	RC SCL	× 308.9 kHz	۲ -50.84 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
2 3 4 5 6							Freq Offs 01
7 8 9							Scale Typ
10						Þ	Log <u>L</u>
SG					STATUS	L DC Coupled	





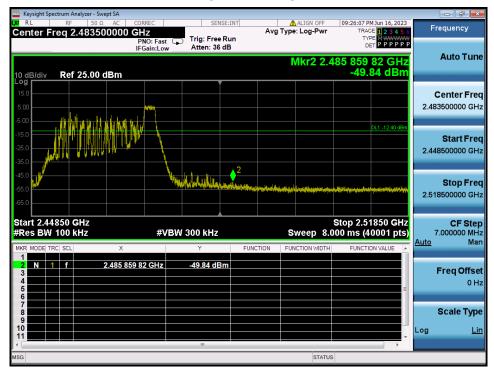
IC : 10664A-PM86

TM 1 & ANT 2 & 26 Tone & 8 RU & 2 462

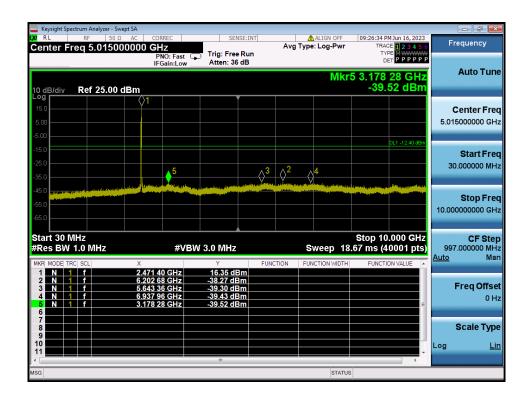


Reference

High Band-edge



Keysight Spectrum Analyzer - Swept SA				
RL RF 50 Ω ▲ DC enter Freg 15.004500 N	CORREC SENSE:IN	ALIGN OFF	09:26:15 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
) dB/div Ref 25.00 dBm	PNO: Fast Trig: Free Run IFGain:Low Atten: 36 dB		Mkr1 287.9 kHz -51.40 dBm	Auto Tun
5.0 .00				Center Fre 15.004500 MH
5.0			DL1 -12.40 dBm	Start Fre 9.000 kH
5.0 1	Rifeizenten der nichter und bister dieset einen der Siegen	กระบาทรับประชาติเป็นที่ประเทศ และ เห็นเป็นเห็น เป็นเห็น เป็นเป็นเป็นเป็นเป็นเป็นเป็นเป็นเป็นเป็น	hater Marches with Electric predictions	Stop Fre 30.000000 MH
tart 9 kHz Res BW 100 kHz	#VBW 300 kHz		Stop 30.00 MHz 333 ms (40001 pts)	CF Ste 2.999100 Mi <u>Auto</u> Mi
N 1 F X 1 N 1 f 2 2 - - - - 3 - - - - - 4 -	287 <u>.9 kHz</u> -51.40 dBm	FUNCTION FUNCTION WIDTH		Freq Offs 0 F
6				
6 7 8 9 0 1				Scale Typ



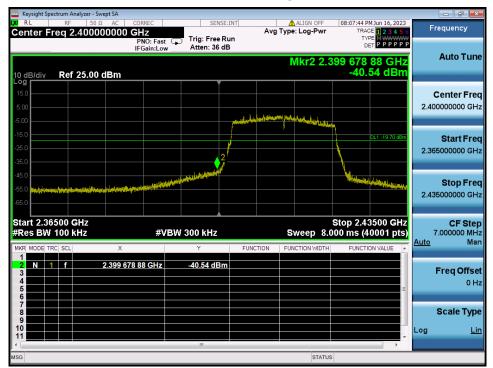


TM 1 & ANT 2 & SU & 2412

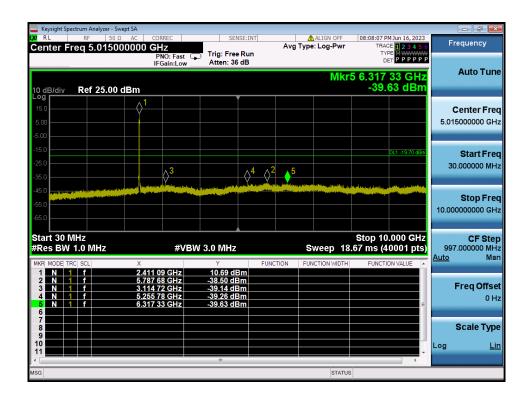


Reference

Low Band-edge



Keysight Spectrum Analyzer - Swept SA				- đ - ×
RL RF 50 Ω ▲ DC Center Freg 15.004500 I	CORREC SENSE:II	Avg Type: Log-Pwr	08:07:52 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
0 dB/div Ref 25.00 dBm	PNO: Fast Trig: Free Run IFGain:Low Atten: 36 dB		Mkr1 281.9 kHz -51.09 dBm	Auto Tun
•g 15.0 5.00				Center Fre 15.004500 MH
25.0			DL1 -19.70 dBm	Start Fre 9.000 k⊦
45.0 1	athlenativelesingerinationshipelinesingerineskande	อสู่ไขข้อ _เ สไปที่[แก่เอน แล้มุเมาไซอ _เ สน _ี ประกั <mark>บ</mark> ได้เ	elevension in the station of the state of the	Stop Fre 30.000000 M⊢
tart 9 kHz Res BW 100 kHz	#VBW 300 kHz		Stop 30.00 MHz 333 ms (40001 pts)	CF Ste 2.999100 MH Auto Ma
KR MODE TRC SCL X 1 N 1 F 2 3 4 5 6	281.9 kHz -51.09 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offs 0 F
7 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10				Scale Typ
GG		STATU	s 🚺 DC Coupled	

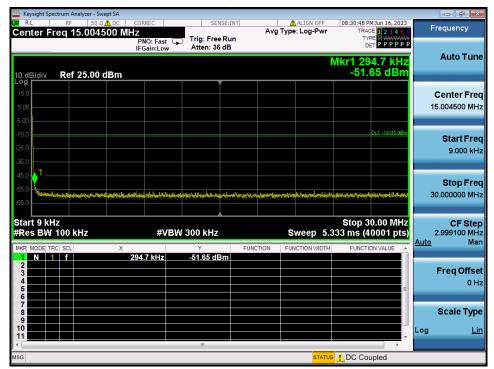




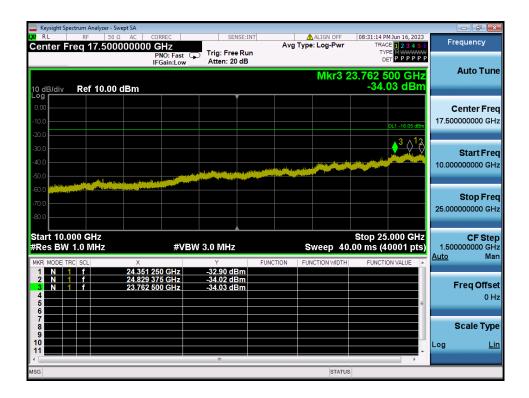
TM 1 & ANT 2 & SU & 2437



Reference



Keysight Spectrum Analyzer - Swept SA					
X/ RL RF 50Ω AC Center Freq 5.015000000	CORREC	SENSE:INT	ALIGN OFF	08:31:04 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 25.00 dBm	PNO: Fast	Trig: Free Run Atten: 36 dB	Mkı	туре Муники DET P P P P P P 5 6.438 97 GHz -39.46 dBm	Auto Tune
15.0 -5.00					Center Freq 5.015000000 GHz
-15.0			³ ♦ ⁴ ⁵ ♦ ²	DL116.05 dBm	Start Freq 30.000000 MHz
-45.0 -55.0 -65.0					Stop Fred 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz MKR MODE TRC SCL X	#VBW 3.	.0 MHz		Stop 10.000 GHz 8.67 ms (40001 pts)	CF Step 997.000000 MH; <u>Auto</u> Mar
2 N 1 f 7.1 3 N 1 f 5.8 4 N 1 f 6.2	30 63 GHz - 40 27 GHz - 81 19 GHz -	12.88 dBm 38.56 dBm 38.94 dBm 38.97 dBm 39.46 dBm			Freq Offset 0 Hz
7 8 9 10 11					Scale Type Log <u>Lir</u>
MSG			STATU	IS	

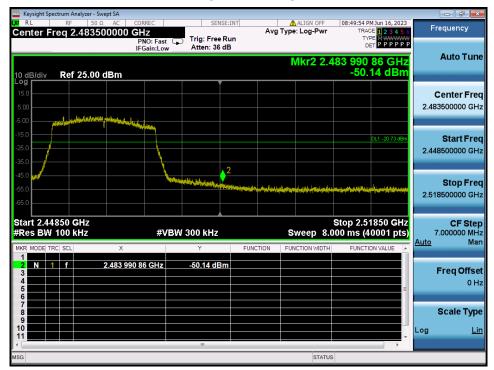


TM 1 & ANT 2 & SU & 2462

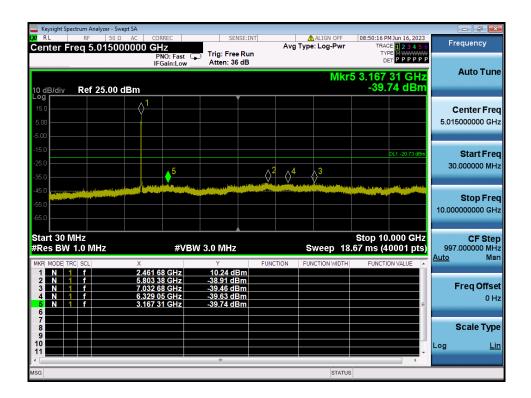


Reference

High Band-edge



Keysight Spectrum Analyzer - Swept SA					×
α RL RF 50 Ω ▲ DC Center Freg 15.004500 I		SENSE:INT	ALIGN OFF	08:50:03 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
0 dB/div Ref 25.00 dBm	PNO: Fast 🕞 Tri IFGain:Low At	g: Free Run ten: 36 dB		TYPE NUMBER DET PPPPPP Mkr1 311.9 kHz -50.93 dBm	Auto Tune
• g 15.0 5.00					Center Fre 15.004500 MH
15.0 25.0 35.0				0L1 -20.73 dBm	Start Fre 9.000 k⊢
45.0 1	tervenanthalantationalantationalantation	ก. รักประวัณ เพิ่ม เราไป 1. กระบุปัญญา (4. เสรรณ	frederijset _{an} et statifieren _e rterendeteren	^ม าร <u>แรงสูง</u> กรุงไม้สารสุขม _{าสสุ} น _{อร} สมรูปเอริสัมรุงที่จะทำ _ค ะกรุงไ	Stop Fre 30.000000 M⊢
tart 9 kHz Res BW 100 kHz	#VBW 300	Y FUNCTION		Stop 30.00 MHz 33 ms (40001 pts)	CF Ste 2.999100 MH <u>Auto</u> Ma
KR MODE TRC SCL X		.93 dBm	FUNCTION WIDTH		Freq Offs 0 ⊦
7 8 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10					Scale Typ
G		m	STATUS	DC Coupled	



Keysight Spectrum Analyzer - Swept SA				
RL RF 50 Ω AC Center Freg 17.50000000	CORREC SENSE:INT	ALIGN OFF Avg Type: Log-Pwr	08:50:27 PM Jun 16, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 10.00 dBm	PNO: Fast Trig: Free Run IFGain:Low Atten: 20 dB	Mkr3 2	23.726 125 GHz -33.76 dBm	Auto Tune
-0.00			DL1 -20.73 dBm	Center Freq 17.500000000 GHz
-30.0			<u>→</u> ³ ↓ ¹ &	Start Freq 10.000000000 GHz
-60.0				Stop Fred 25.000000000 GHz
Start 10.000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Step 1.50000000 GH: <u>Auto</u> Mar
2 N 1 f 24.74	8 000 GHz -33.23 dBm 6 500 GHz -33.42 dBm 6 125 GHz -33.76 dBm		E	Freq Offset 0 Hz
7 8 9 10				Scale Type
isg	m	STATUS	3	

5.5. Unwanted Emissions (Radiated)

Test Requirements and limit,

Part 15.247(d), Part 15.205, Part 15.209 & RSS-247 [5.5], RSS-Gen [8.9], RSS-Gen [8.10]

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of Part 15.247 the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Part 15.209 & K55-Gen[6.9]. General requirement									
Frequency (MHz)	FCC Limit (uV/m)	IC Limit (μA/m)	Measurement Distance (m)						
0.009 - 0.490	2 400 / F (kHz)	6.37/F (F in kHz)	300						
0.490 – 1.705	24 000 / F (kHz)	63.7/F (F in kHz)	30						
1.705 - 30.0	30	0.08	30						

- Part 15.209 & RSS-Gen[8.9]: General requirement

Frequency (MHz)	FCC Limit (uV/m)	IC Limit (uV/m)	Measurement Distance (m)
30 ~ 88	100 **	100	3
88 ~ 216	150 **	150	3
216 ~ 960	200 **	200	3
Above 960	500	500	3

**Except as provided in paragraph (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.



- Part 15.205(a): Restricted band of operation

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.414 25 ~ 8.414 75	108 ~ 121.94	1 300 ~ 1 427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1 435 ~ 1 626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.173 5 ~ 2.190 5	12.519 75 ~ 12.520 25	149.9 ~ 150.05	1 645.5 ~ 1 646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.576 75 ~ 12.577 25	156.524 75 ~ 156.525 25	1 660 ~ 1 710	8.025 ~ 8.5	22.01 ~ 23.12
4.177 25 ~ 4.177 75	13.36 ~ 13.41	156.7 ~ 156.9	1 718.8 ~ 1 722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.207 25 ~ 4.207 75	16.42 ~ 16.423	162.012 5 ~ 167.17	2 200 ~ 2 300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 310 ~ 2 390	10.6 ~ 12.7	36.43 ~ 36.5
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 483.5 ~ 2 500	13.25 ~ 13.4	Above 38.6
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	2 655 ~ 2 900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 260 ~ 3 267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 332 ~ 3 339		
8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 240	3 345.8 ~ 3 358		
			3 600 ~ 4 400		

- RSS-Gen[8.10]: Restricted frequency bands

MHz	MHz	MHz	MHz	MHz	GHz
0.090 ~ 0.110	8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 345.8 ~ 3 358	9.0 ~ 9.2
0.495 ~ 0.505	8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 427	3 500 ~ 4 400	9.3 ~ 9.5
2.173 5 ~ 2.190 5	8.414 25 ~ 8.414 75	108 ~ 138	1 435 ~ 1 626.5	4 500 ~ 5 150	10.6 ~ 12.7
3.020 ~ 3.026	12.29 ~ 12.293	149.9 ~ 150.05	1 645.5 ~ 1 646.5	5 350 ~ 5 460	13.25 ~ 13.4
4.125 ~ 4.128	12.519 75 ~ 12.520 25	156.524 75 ~	1 660 ~ 1 710	7 250 ~ 7 750	14.47 ~ 14.5
4.177 25 ~ 4.177 75	12.576 75 ~ 12.577 25	156.525 25	1 718.8 ~ 1 722.2	8 025 ~ 8 500	15.35 ~ 16.2
4.207 25 ~ 4.207 75	13.36 ~ 13.41	156.7 ~ 156.9	2 200 ~ 2 300		17.7 ~ 21.4
5.677 ~ 5.683	16.42 ~ 16.423	162.01 25 ~ 167.17	2 310 ~ 2 390		22.01 ~ 23.12
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 483.5 ~ 2 500		23.6 ~ 24.0
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 655 ~ 2 900		31.2 ~ 31.8
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	3 260 ~ 3 267		36.43 ~ 36.5
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 332 ~ 3 339		Above 38.6

5.5.1. Test Setup

Refer to the APPENDIX I.

5.5.2. Test Procedures

- 1. 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.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 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.

Note: Measurement Instrument Setting for Radiated Emission Measurements.

- KDB558074 D01v05r02 Section 8.6
- ANSI C63.10-2013 Section 11.12

1. Frequency Range Below 1 GHz

RBW = 100 or 120 kHz, VBW = 3 x RBW, Detector = Peak or Quasi Peak

2. Frequency Range > 1 GHz

```
Peak Measurement > 1 GHz
```

RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Sweep time = Auto, Trace mode = Max Hold until the trace stabilizes Average Measurement > 1 GHz

- 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.

Duty Cycle Correction factor

Mode	Tone	Date rate	T _{on} (ms)	T _{on+off} (ms)	$D = T_{on} / (T_{on+off})$	DCCF = 10 log(1/D) (dB)
	26 Tone	MCS 0	5.172	5.232	0.989	N/A
	52 Tone	MCS 0	2.625	2.667	0.984	N/A
802.11ax(HE20) CDD	106 Tone	MCS 0	0.323	0.473	0.683	1.66
	242 Tone	MCS 0	3.942	4.956	0.795	0.99
	SU	MCS 0	1.017	1.125	0.904	0.44

Note1: Where, T= Transmission duration / D= Duty cycle

Note2: Please refer to the appendix II for duty cycle plots.

5.5.3. Test Results

Test Notes -

1. The radiated emissions were investigated 9 kHz to 25 GHz. And no other spurious and harmonic emissions were found below listed frequencies. 2. Information of Distance Correction Factor

For finding emissions, measurements may be performed at a distance closer than that specified in the regulations.

In this case, the distance factor is applied to the result.

- Calculation of distance correction factor

At frequencies below 30 MHz = 40 log(tested distance / specified distance)

At frequencies at or above 30 MHz = 20 log(tested distance / specified distance)

When distance factor is "N/A", the measurements were performed at the specified distance and distance factor is not applied.

3. Sample Calculation.

Margin = Limit - Result / Result = Reading + TF+ DCCF + DCF / TF = AF + CL + HL + AL - AG Where, TF = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, HL = High pass filter Loss, AL = Attenuator Loss, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

Radiated Spurious Emissions data(9 kHz ~ 25 GHz) : TM 1

Tested	_		Frequency	ANT	EUT	Detector	Reading	TF	DCCF	DCF	Result	Limit	Margin
Frequency (MHz)	Tone	RU	(MHz)	Pol	Position (Axis)	Mode	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
	26	0	2 389.79	н	Х	PK	66.59	4.60	N/A	N/A	71.19	74.00	2.81
	26	0	2 388.29	Н	Х	AV	46.15	4.60	N/A	N/A	50.75	54.00	3.25
	26	4	4 823.88	Н	Х	PK	50.53	2.34	N/A	N/A	52.87	74.00	21.13
	26	4	4 824.11	Н	Х	AV	40.53	2.34	N/A	N/A	42.87	54.00	11.13
	52	37	2 388.03	Н	Х	PK	66.60	4.61	N/A	N/A	71.21	74.00	2.79
	52	37	2 389.54	Н	Х	AV	45.73	4.60	N/A	N/A	50.33	54.00	3.67
	106	53	2 389.13	Н	Х	PK	61.02	4.60	N/A	N/A	65.62	74.00	8.38
2 4 4 2	106	53	2 389.58	Н	Х	AV	44.79	4.60	1.66	N/A	51.05	54.00	2.95
2 412	242	61	2 388.75	Н	Х	PK	58.53	4.60	N/A	N/A	63.13	74.00	10.87
	242	61	2 389.87	Н	Х	AV	45.11	4.60	0.99	N/A	50.70	54.00	3.30
	242	61	4 824.44	Н	Х	PK	49.48	2.34	N/A	N/A	51.82	74.00	22.18
	242	61	4 823.98	Н	Х	AV	38.87	2.34	0.99	N/A	42.20	54.00	11.80
	SU	NA	2 389.75	Н	Х	PK	58.52	4.60	N/A	N/A	63.12	74.00	10.88
	SU	NA	2 389.66	Н	Х	AV	45.17	4.60	0.44	N/A	50.21	54.00	3.79
	SU	NA	4 825.12	Н	Х	PK	50.44	2.34	N/A	N/A	52.78	74.00	21.22
	SU	NA	4 825.50	Н	Х	AV	39.97	2.34	0.44	N/A	42.75	54.00	11.25
	26	4	4 874.08	Н	Х	PK	50.70	2.18	N/A	N/A	52.88	74.00	21.12
	26	4	4 873.92	Н	Х	AV	39.37	2.18	N/A	N/A	41.55	54.00	12.45
0.407	242	61	4 873.30	Н	Х	PK	50.14	2.18	N/A	N/A	52.32	74.00	21.68
2 437	242	61	4 874.05	Н	Х	AV	39.77	2.18	0.99	N/A	42.94	54.00	11.06
	SU	NA	4 874.09	Н	Х	PK	49.91	2.18	N/A	N/A	52.09	74.00	21.91
	SU	NA	4 874.09	Н	Х	AV	39.72	2.18	0.44	N/A	42.34	54.00	11.66
	26	8	2 484.66	Н	Х	PK	64.20	5.63	N/A	N/A	69.83	74.00	4.17
	26	8	2 485.00	Н	Х	AV	44.19	5.64	N/A	N/A	49.83	54.00	4.17
	26	4	4 923.29	Н	Х	PK	48.51	2.57	N/A	N/A	51.08	74.00	22.92
	26	4	4 924.39	Н	Х	AV	38.71	2.57	N/A	N/A	41.28	54.00	12.72
	52	40	2 484.00	Н	Х	PK	61.79	5.62	N/A	N/A	67.41	74.00	6.59
	52	40	2 484.20	Н	Х	AV	45.38	5.63	N/A	N/A	51.01	54.00	2.99
	106	54	2 483.54	Н	Х	PK	62.08	5.62	N/A	N/A	67.70	74.00	6.30
0.400	106	54	2 483.75	Н	Х	AV	43.00	5.62	1.66	N/A	50.28	54.00	3.72
2 462	242	61	2 484.14	Н	Х	PK	61.03	5.62	N/A	N/A	66.65	74.00	7.35
	242	61	2 483.81	н	Х	AV	45.26	5.62	0.99	N/A	51.87	54.00	2.13
	242	61	4 923.54	Н	Х	PK	49.86	2.57	N/A	N/A	52.43	74.00	21.57
	242	61	4 923.91	Н	Х	AV	39.27	2.57	0.99	N/A	42.83	54.00	11.17
	SU	NA	2 484.14	Н	Х	PK	59.89	5.62	N/A	N/A	65.51	74.00	8.49
	SU	NA	2 483.88	Н	Х	AV	45.59	5.62	0.44	N/A	51.65	54.00	2.35
	SU	NA	4 923.76	Н	Х	PK	49.55	2.57	N/A	N/A	52.12	74.00	21.88
	SU	NA	4 923.27	Н	Х	AV	39.39	2.57	0.44	N/A	42.40	54.00	11.60



5.6. AC Power-Line Conducted Emissions

Test Requirements and limit, Part 15.207 & RSS-Gen [8.8]

An intentional radiator that 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.

	Conducted Limit (dBuV)				
Frequency Range (MHz)	Quasi-Peak	Average			
0.15 ~ 0.5	66 to 56 *	56 to 46 *			
0.5 ~ 5.0	56	46			
5 ~ 30	60	50			

* Decreases with the logarithm of the frequency

5.6.1. Test Setup

See test photographs for the actual connections between EUT and support equipment.

5.6.2. Test Procedures

Conducted emissions from the EUT were measured according to the ANSI C63.10-2013.

- The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
- 2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
- 3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
- 4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

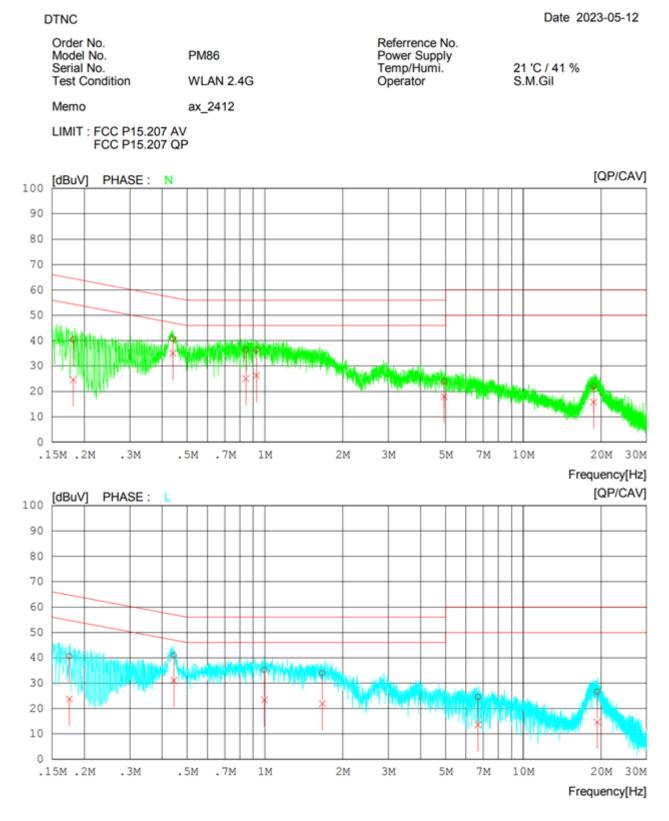
5.6.3. Test Results

Refer to the next page. (The worst case data was reported. The worst data is TM 1 & Lowest)

IC : 10664A-PM86

AC Power-Line Conducted Emissions (Graph)

Results of Conducted Emission



DTNC

AC Power-Line Conducted Emissions (List)

Results of Conducted Emission

Date 2023-05-12

Order No. Model No. PM86 Serial No.			Referrence Power Supp Temp/Hum	ply		21 'C / 41 %		
Test Condition	WLAN 2.4G		Operator		S.M.Gil			
Memo	Memo ax_2412							
LIMIT : FCC P15.207 A FCC P15.207 C								
N N	ADING C.FACTOR		LIM		MARGIN	PHASE		
QP [MHz] [dBu]	CAV V][dBuV] [dB]	QP CAV	QP 71 (dBuV)	CAV	QP CAV [dBuV][dBuV]	1		
[[[]]]	Alfangaal [an]	[abav] [aba	(abar)	[[abav]	[abav][abav]			
1 0.18114 30.4	714.65 9.99	40.4624.64	64.43	54.43 2	3.97 29.79	N		
2 0.43977 30.7	4 24.99 10.00	40.7434.99	57.07 4	47.07 1	6.3312.08	N		
3 0.84339 26.4	1 15.10 10.00	36.4125.10	56.00 4	46.00 1	9.59 20.90	N		
4 0.92700 26.4	0 16.26 10.01	36.4126.27	56.00 4	46.00 1	9.5919.73	N		
5 4.93340 13.8	1 7.73 10.19	24.0017.92	56.00 4	46.00 3	2.00 28.08	N		
6 18.70200 11.4	2 5.24 10.56	21.9815.80	60.00	50.00 3	8.02 34.20	N		
7 0.17501 30.7	313.93 9.89	40.6223.82	64.72	54.72 2	4.10 30.90	L		
8 0.44399 30.9	7 21.20 9.90	40.87 31.10	56.99 4	46.99 1	6.1215.89	L		
9 0.99369 25.2	1 13.51 10.00	35.2123.51	56.00 4	46.00 2	0.79 22.49	L		
10 1.66820 23.9	4 11.92 10.03	33.9721.95	56.00 4	46.00 2	2.0324.05	L		
11 6.67580 14.3	7 3.51 10.14	24.5113.65	60.00	50.00 3	5.49 36.35	L		
12 19.32880 16.2	5 4.37 10.35	26.6014.72	60.00	50.00 3	3.40 35.28	L		