TEST REPORT

700			Dt&C Co., I	Ltd.
U	Dt&C		on-gil, Cheoin-gu, Yongin- el : 031-321-2664, Fax : 0	si, Gyeonggi-do, Korea, 17042 31-321-1664
1. Report N	lo: DRTFCC2410-0114	ł		
2. Custome	er			
• Name (F	CC) : Caresix			
Address	(FCC) : 516 RO 2870 St	uit 9304, Jeju-si, Je	ejudo, South Korea	
3. Use of R	eport : FCC Original Gra	nt		
	Name / Model Name : G/ : 2BKB8-GW100	ATEWAY / GW100		
	gulation(s): Part 15.247 hod used: KDB558074 D	001v05r02, ANSI C	63.10-2013	
6. Date of	Гest : 2024.07.11 ~ 2024	.08.09		
7. Location	of Test : 🛛 Permanent	Testing Lab	📋 On Site Testing	
8. Testing	Environment : See apper	ided test report.		
9. Test Res	sult : Refer to the attache	d test result.		
	shown in this test report references to KOLAS	•	e(s) tested unless other	wise stated.
Affirmation	Tested by		Technical Manager	- AL
	Name : SeungMin Gil	Seugere)	Name : JaeJin Lee	(Signature)
		2024.10.	11.	
		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
DRTFCC2410-0114	Oct, 11. 2024	Initial issue	SeungMin Gil	JaeJin Lee

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1. General Information

1.1. Description of EUT

Equipment Class Digital Transmission System (DTS)		
Product Name	GATEWAY	
Model Name	GW100	
Add Model Name	-	
Firmware Version Identification Number	V1.0	
EUT Serial Number	No Specified	
Power Supply	DC 5 V	
Frequency Range	2 402 MHz ~ 2 480 MHz	
Max. RF Output Power	-4.95 dBm (0.32 mW)	
Modulation Technique (Data rate)	GFSK (1 Mbps, 2 Mbps)	
Antenna Specification	Antenna Type: FPC Antenna Gain: 1.21 dBi (PK)	

1.2. Declaration by the applicant / manufacturer

N/A

1.3. Testing Laboratory

Dt&C Co., Lte	d.	
The 3 m test si	te and	conducted measurement facility used to collect the radiated data are located at the
42, Yurim-ro, 1	54beor	n-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 ℃ ~ +25 ℃	
 Relative Humidity 	+42 % ~ +45 %	

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	1.0 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)	5.0 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz ~ 18 GHz)	4.8 dB (The confidence level is about 95 %, k = 2)
Radiated emission (18 GHz Above)	5.7 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	23/12/15	24/12/15	MY48010133
Spectrum Analyzer	Agilent Technologies	N9020A	24/06/03	25/06/03	US47360812
Spectrum Analyzer	Agilent Technologies	N9020A	24/06/03	25/06/03	MY46471622
DC Power Supply	Agilent Technologies	66332A	24/06/05	25/06/05	US37474125
DC Power Supply	SM techno	SDP30-5D	24/06/05	25/06/05	305DMG288
Multimeter	FLUKE	17B+	23/12/15	24/12/15	36390701WS
Signal Generator	Rohde Schwarz	SMBV100A	23/12/15	24/12/15	255571
Signal Generator	ANRITSU	MG3695C	23/12/15	24/12/15	173501
Thermohygrometer	BODYCOM	BJ5478	23/12/15	24/12/15	120612-1
Thermohygrometer	BODYCOM	BJ5478	23/12/15	24/12/15	120612-2
Thermohygrometer	BODYCOM	BJ5478	24/06/05	25/06/05	N/A
Loop Antenna	ETS-Lindgren	6502	23/11/09	24/11/09	00060496
Hybrid Antenna	Schwarzbeck	VULB 9160	23/12/15	24/12/15	3362
Horn Antenna	ETS-Lindgren	3117	24/06/04	25/06/04	00143278
Horn Antenna	A.H.Systems Inc.	SAS-574	24/06/11	25/06/11	155
PreAmplifier	tsj	MLA-0118-B01-40	23/12/15	24/12/15	1852267
PreAmplifier	tsj	MLA-1840-J02-45	24/06/03	25/06/03	16966-10728
PreAmplifier	H.P	8447D	23/12/15	24/12/15	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000- 15000-40SS	24/06/12	25/06/12	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300- 18000-60SS	24/06/12	25/06/12	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	24/06/12	25/06/12	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	24/06/12	25/06/12	16012202
Attenuator	Aeroflex/Weinschel	56-3	24/06/12	25/06/12	Y2370
Attenuator	SMAJK	SMAJK-2-3	24/06/12	25/06/12	3
Attenuator	SMAJK	SMAJK-2-3	24/06/12	25/06/12	2
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	23/12/15	24/12/15	1338004 1911481
EMI Test Receiver	ROHDE&SCHWARZ	ESCI7	24/01/29	25/01/29	100910
PULSE LIMITER	ROHDE&SCHWARZ	ESH3-Z2	23/08/21	24/08/21	101333
LISN	SCHWARZBECK	NSLK 8128 RC	23/10/26	24/10/26	8128 RC-387
Digital Thermo Hygrometer	CAS	TE-303N	24/02/07	25/02/07	220502531
Cable	Dt&C	Cable	24/01/03	25/01/03	G-2
Cable	HUBER+SUHNER	SUCOFLEX 100	24/01/03	25/01/03	G-3
Cable	Dt&C	Cable	24/01/03	25/01/03	G-4
Cable	OMT	YSS21S	24/01/03	25/01/03	G-5
Cable	Junkosha	MWX241	24/01/03	25/01/03	mmW-1
Cable	Junkosha	MWX241	24/01/03	25/01/03	mmW-4
Cable	HUBER+SUHNER	SUCOFLEX100	24/01/03	25/01/03	M-01
Cable	HUBER+SUHNER	SUCOFLEX100	24/01/03	25/01/03	M-02
Cable	JUNKOSHA	MWX241/B	24/01/03	25/01/03	M-03
Cable	JUNKOSHA	J12J101757-00	24/01/03	25/01/03	M-07
Cable	HUBER+SUHNER	SUCOFLEX106	24/01/03	25/01/03	M-09
Cable	Dt&C	Cable	24/01/03	25/01/03	RFC-69
Cable	Radiall	TESTPRO3	24/01/03	25/01/03	RFC-70
Test Software (AC Line Conducted)	tsj	EMI Measurement	NA	NA	Version 2.00.0190
Test Software (Radiated)	tsj	EMI 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. The Bluetooth low energy mode with below low, middle and high channels were tested and reported.

		Tested Frequency (MHz)			
Test Mode	Description	Lowest Frequency	Middle Frequency	Highest Frequency	
TM 1	BT LE(1 Mbps)	2 402	2 440	2 480	
TM 2	BT LE(2 Mbps)	2 402	2 440	2 480	

EUT Operation test setup

- Test Software: Vysor 5.0.7

- Power setting: Default of EUT

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

4. Summary of Test Results

mit Te Cond	Jaius				
	С				
nducted)	С				
Unwanted Emissions(Conducted) 20 dBc in any 100 kHz BW Conducted					
κHz	С				
imits tion 5.5) Radi	ated C Note 2				
imits AC L tion 5.6) Condu	C				
tion 3)	- C				
10.201 Not Fower Line conducted Linestons (Refer to section 5.6) Conducted 15.203 Antenna Requirements Part 15.203 (Refer to section 3) - - Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable Note 2: This test item was performed in three orthogonal EUT positions and the worst case data was reported. -					

5. Test Result

5.1. Maximum Peak Conducted Output Power

Test Requirements and limit, Part 15.247(b)

A transmitter antenna terminal of EUT is connected to the input of a spectrum analyzer.

Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

5.1.1. Test Setup

Refer to the APPENDIX I.

5.1.2. Test Procedures

- KDB558074 D01v05r02 Section 8.3.1.1
- ANSI C63.10-2013 Section 11.9.1.1

RBW ≥ DTS bandwidth

- 1. Set the RBW ≥ DTS bandwidth. Actual RBW = 2 MHz or 2.4 MHz
- 2. Set $VBW \ge 3 \times RBW$. Actual VBW = 6 MHz or 8 MHz
- 3. Set span ≥ 3 x RBW.
- 4. Sweep time = **auto couple**
- 5. Detector = **peak**
- 6. Trace mode = **max hold**
- 7. Allow trace to fully stabilize
- 8. Use peak marker function to determine the peak amplitude level.

5.1.3. Test Results

Test Mode	Tested Channel	Burst Average Output Power	Peak Output Power
Test Mode	resteu Chaimer	dBm	dBm
	Lowest	-4.98	-4.95
TM 1	Middle	-5.44	-5.32
	Highest	-6.73	-6.42
	Lowest	-5.43	-4.97
TM 2	Middle	-5.87	-5.31
	Highest	-6.70	-6.41

Note 1: The average output power was tested using an average power meter for reference only. Note 2: See next pages for actual measured spectrum plots.

TM 1 Test Channel : Lowest



Peak Output Power

TM 1 Test Channel : Middle



TM 1 Test Channel : Highest

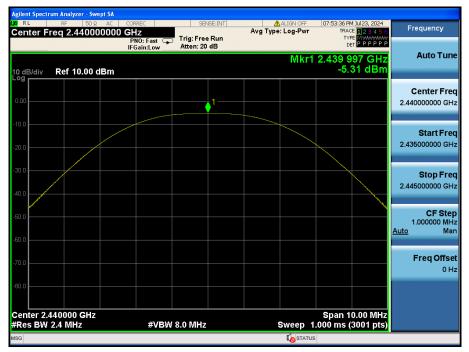


TM 2 Test Channel : Lowest



Peak Output Power

TM 2 Test Channel : Middle



TM 2 Test Channel : Highest



5.2.6 dB Bandwidth

Test Requirements and limit, Part 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 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

Test Mode	Tested Channel	Test Results (MHz)
	Lowest	0.668
TM 1	Middle	0.673
	Highest	0.669
	Lowest	1.181
TM 2	Middle	1.172
	Highest	1.245

TM 1 Test Channel : Lowest



6 dB Bandwidth

TM 1 Test Channel : Middle



TM 1 Test Channel : Highest



TM 2 Test Channel : Lowest

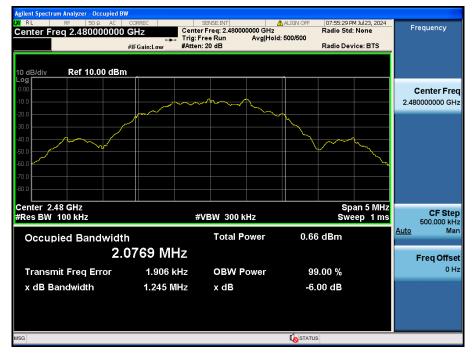


6 dB Bandwidth

TM 2 Test Channel : Middle



TM 2 Test Channel : Highest



5.3. Power Spectral Density

Test requirements and limit, Part 15.247(e)

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 : $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- 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.

5.3.3. Test Results

Test Mode	Tested Channel	PKPSD (dBm)
	Lowest	-21.24
TM 1	Middle	-21.57
	Highest	-22.63
	Lowest	-23.70
TM 2	Middle	-24.00
	Highest	-25.07



Maximum PKPSD

TM 1 Test Channel : Middle

TM 1 Test Channel : Lowest



TM 1 Test Channel : Highest



TM 2 Test Channel : Lowest



Maximum PKPSD

TM 2 Test Channel : Middle



TM 2 Test Channel : Highest



5.4. Unwanted Emissions (Conducted)

Test requirements and limit, Part 15.247(d)

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 unwanted(conducted) emission 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			

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.



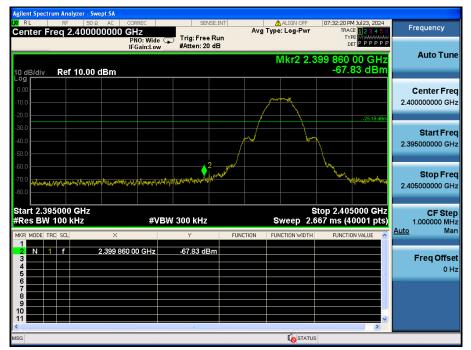
5.4.3. Test Results

🛈 Dt&C



TM 1 Reference (Test Channel : Lowest)

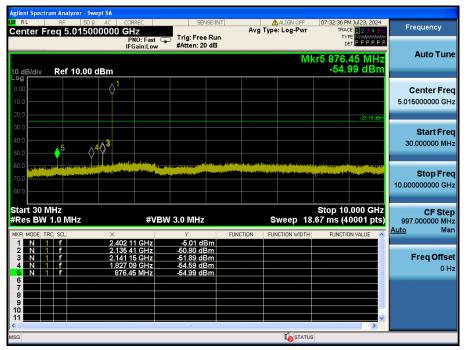
TM 1 Low Band-edge (Test Channel : Lowest)



Agilent Spectrum Analyzer -							
Center Freq 15.00		SENSE:IN	Avg	ALIGN OFF	07:32:27 PM TRACE	Jul 23, 2024 1 2 3 4 5 6 M WWWWWWW	Frequency
10 dB/div Ref 10.0	PNO: Fast C IFGain:Low 10 dBm	Trig: Free Rur #Atten: 20 dB	1		DE [*]	PPPPP	Auto Tune
-00 -10.0 -20.0						-25.18 dBm	Center Fre 15.004500 MH
-30.0 1						-23.10 000	Start Fred 9.000 kH
-60.0	haanin filifaan ah	pholonomic district in a superfactor	rousehelysorpunathanna	المتها المراسية ومروم والمراسية المتوسية والمراسية المراسية المراسية والمراسية والمراسية والمراسية والمراسية و	iftereturiyeyekti tegeke	ryinterinterint	Stop Fre 30.000000 MH
Start 9 kHz #Res BW 100 kHz	#VB	W 300 kHz	FUNCTION	Sweep 5.3	Stop 30 333 ms (40		CF Ste 2.999100 MH <u>Auto</u> Ma
1 N 1 f 2 3 3 4 5 6	283.4 kHz	-38.15 dBm					Freq Offse 0 H
7 8 9 10 11						~	
ISG					DC Cou		

TM 1 Conducted Spurious Emissions 1 (Test Channel : Lowest)

TM 1 Conducted Spurious Emissions 2 (Test Channel : Lowest)



	RF 50 :	Ω AC CC	DRREC	SENS	SINT	ALIGN OFF	07:22:44 0	M Jul 23, 2024	
enter Fre	eq 17.500	0000000			Avg Run	Type: Log-Pwr	TRA		Frequency
0 dB/div	Ref 10.00		Guineow			Mkr3 2		750 GHz 73 dBm	Auto Tun
0.00								-25.18 dBm	Center Fre 17.500000000 GH
40.0 50.0			al at 1 Malyana		n a fan Turde oa stêr tiebelister oar	International Society of Society Street			Start Fre 10.000000000 GH
60.0 1994 1999 70.0 80.0 					<u>. وهم بلغ</u> ام دغن _{ا الله} <u>. مع</u>				Stop Fre 25.000000000 GH
			#VBI	W 3.0 MHz		Sweep 40	Stop 25 .00 ms (4	5.000 GHz 0001 pts)	1.500000000 GH
Start 10.00 Res BW 1	SCL	×		Y	FUNCTION	Sweep 40	.00 ms (4	5.000 GHz 10001 pts) ON VALUE	CF Stej 1.500000000 GH <u>Auto</u> Ma
Res BW 1	.0 MHz	× 24.246 24 23.783 8 24.352 74	50 GHz 75 GHz		n n		.00 ms (4	.0001 pts)	1.50000000 GH <u>Auto</u> Ma Freq Offse
Res BW 1 IKR MODE TRC 1 N 1 2 N 1 3 N 1 4 - - 5 - - 6 - - 7 - - 8 - - 9 - -	I.O MHZ	24.246 2 23.783 8	50 GHz 75 GHz	√ -48.49 dBr -48.58 dBr	n n		.00 ms (4	.0001 pts)	1.50000000 GH <u>Auto</u> Ma Freq Offse
Res BW 1 KR MODE TRC 1 N 1 2 N 1 3 N 1 4 - - 5 - - 6 - - 7 - - 8 - -	I.O MHZ	24.246 2 23.783 8	50 GHz 75 GHz	√ -48.49 dBr -48.58 dBr	n n		.00 ms (4	.0001 pts)	1.500000000 GH

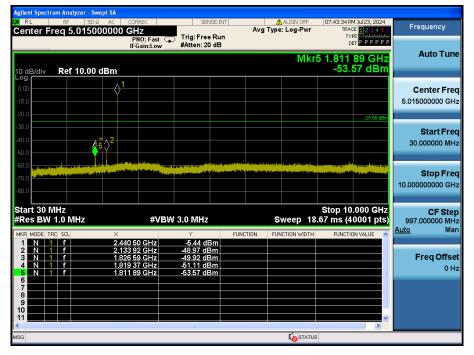
TM 1 Conducted Spurious Emissions 3 (Test Channel : Lowest)



TM 1 Reference (Test Channel : Middle)

TM 1 Conducted Spurious Emissions 1 (Test Channel : Middle)

	Ω 🛕 DC 📔 CORREC 📗	SENSE:IN		🛕 ALIGN OFF	07:43:25 PM Jul 23, 2024	Francisco
Center Freq 15.004	500 MHz PNO: Fast IFGain:Lov	Trig: Free Run #Atten: 20 dB		Type: Log-Pwr	TRACE 123456 TYPE MWWWWW DET PPPPP	Frequency
0 dB/div Ref 10.00	dBm			ſ	//kr1 284.9 kHz -36.74 dBm	Auto Tun
.og 0.00 10.0 20.0						Center Fre 15.004500 MH
40.0					-25.56 dBm	Start Fre 9.000 k⊦
60.0 70.0 80.0	Anal Marine Charge and the	ารสมไปสี่ว่าสุดเห็นระบบสายสูงสุดรูปกับได้เรอส	ebyelenendelaarselme	interneting to be fare a large	Millelletten in Son Myrate and y Units	Stop Fre 30.000000 MH
Start 9 kHz Res BW 100 kHz		'BW 300 kHz			Stop 30.00 MHz 33 ms (40001 pts)	CF Ste 2.999100 MH Auto Ma
MKR MODE TRC SCL 1 N 1 f 2 3 4	× 284.9 kHz	-36.74 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Freq Offs
5 6 7 8 9 9						01
11					~	



TM 1 Conducted Spurious Emissions 2 (Test Channel : Middle)

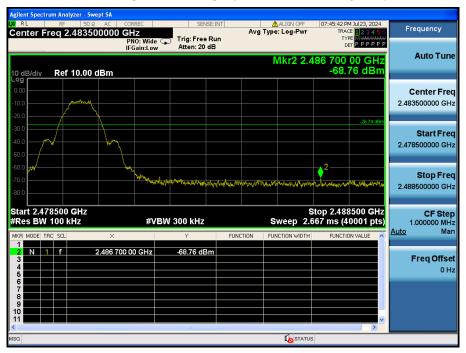
TM 1 Conducted Spurious Emissions 3 (Test Channel : Middle)





TM 1 Reference (Test Channel : Highest)

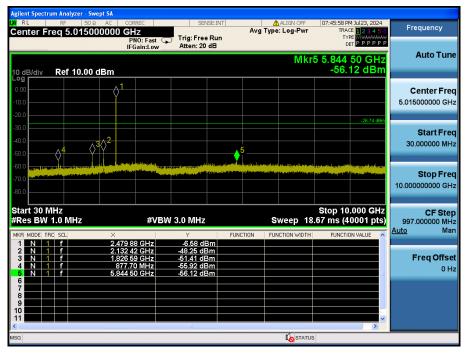
TM 1 High Band-edge (Test Channel : Highest)



Agilent Spectrum Analyzer - Swe							
<mark>02/</mark> RL RF 50 Ω, Center Freq 15.0045	00 MHz	SENSE: IN	Avg T	ALIGN OFF	07:45:49 PM TRACI	Jul 23, 2024 1 2 3 4 5 6 E M M M M M M	Frequency
10 dB/div Ref 10.00 c	PNO: Fast G IFGain:Low	Atten: 20 dB			DE Vikr1 28'	TPPPPP	Auto Tune
-10.0							Center Freq 15.004500 MHz
-30.0 1						-26.74 dBm	Start Freq 9.000 kHz
-60.0	habayyan hilikutin tajay kuratin foruntu	lateration (the states of the	had the register of the second se	Newly hilly should be helper here	urtenya kana kata fa	ingeninistant state	Stop Frec 30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VBV	V 300 kHz	FUNCTION	Sweep 5.3	Stop 30 33 ms (40 FUNCTIO		CF Step 2.999100 MH Auto Mar
1 N 1 F 2 3 4 5 6 4 6	281.9 kHz	-37.53 dBm					Freq Offse 0 H:
7 8 9 10 11						~	
MSG					LDC Cou		

TM 1 Conducted Spurious Emissions 1 (Test Channel : Highest)

TM 1 Conducted Spurious Emissions 2 (Test Channel : Highest)



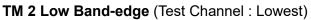
RL RF 5	Swept SA IO Ω AC CORF	REC	SENSE:IN	т	ALIGN OFF	07:46:06 PM Jul 23, 20	124
enter Freq 17.50	10000000 GI		Trig: Free Run Atten: 20 dB	Avg	Type: Log-Pwr	TRACE 2 3 4 TYPE MWWW DET P P P	5 6 Frequency
) dB/div Ref 10.0					Mkr3 2	4.921 250 GI -48.61 dB	
0.00							Center Fre 17.500000000 GH
0.0		ىرىلىر س		her any other a high hitrory	and the second	-28.74	Start Fre 13. 10.000000000 G⊢
				see, _{ap} - ell strake solling, e			Stop Fre 25.000000000 G⊦
tart 10.000 GHz Res BW 1.0 MHz		#VBW	3.0 MHz		Sweep 40	Stop 25.000 G .00 ms (40001 p	ts) 1.500000000 GH
KR MODE TRC SCL	× 24.382 000		∨ -47.67 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
2 N 1 f 3 N 1 f 4	24.391 750 24.921 250		-48.44 dBm -48.61 dBm				Freq Offso 0 H
6 7 8 9 9							
1							

TM 1 Conducted Spurious Emissions 3 (Test Channel : Highest)





TM 2 Reference (Test Channel : Lowest)





Agilent Spectrum Analyzer - Swe					07/54/00 04	1.100.0004	
Center Freq 15.0045	00 MHz	SENSE:INT		ALIGN OFF e: Log-Pwr	07:51:28 PM TRACE	123,2024 123456 MWWWWWW	Frequency
10 dB/div Ref 10.00 d	PNO: Fast G IFGain:Low	Atten: 20 dB			DE Mkr1 281	TPPPPP	Auto Tune
-20.0						0570 10	Center Freq 15.004500 MHz
-30.0						-25.79 dBm	Start Freq 9.000 kHz
-60.0 -70.0 -80.0	negladostrostoriadischestelleinestelle	ละก่ _{องสาร} งการให้กระจะให้กระก็	ft sägen der er stad der ser	alukurdelik filosom (kilosom	dan sa Milia na Antonia	haan hay hay be	Stop Freq 30.000000 MHz
Start 9 kHz #Res BW 100 kHz		V 300 kHz		Sweep 5.3	333 ms (40		CF Step 2.999100 MHz Auto Mar
MKR MODE THC SCL 1 N 1 f 2 3 4 5 4 4 5 6 6 7 7 8 9 9 10 9 11 1	× 281.9 kHz	Y -34.60 dBm	FUNCTION FU	NCTION WIDTH	FUNCTIO	N VALUE	Freq Offse 0 Hz
ISG					LDC Cou	pled	

TM 2 Conducted Spurious Emissions 1 (Test Channel : Lowest)

TM 2 Conducted Spurious Emissions 2 (Test Channel : Lowest)

Agilent Spectrum Analyzer - Swe	ept SA					
	AC CORREC	SENSE:IN		ALIGN OFF	07:51:37 PM Jul 23, 2024	Frequency
Center Freq 5.01500	DOOOO GHZ PNO: Fast IFGain:Low	Trig: Free Run Atten: 20 dB		'ype: Log-Pwr	TRACE 123456 TYPE MWWWW DET PPPPP	
10 dB/div Ref 10.00	dBm			Mkr	5 1.820 11 GHz -52.26 dBm	Auto Tune
-10.0	1				-25.79 dBm	Center Freq 5.015000000 GHz
-30.0 -40.0 -50.0	5 ₅ 3					Start Freq 30.000000 MHz
-60.0 List the language of the part of the language of the lan		nggangang pengengan tertapat pengenakan di kanan bertapat pengenakan di kanan bertapat pengenakan di kanan ber Kanan kanan di patrim di kanan bertapat pengenakan di kanan bertapat pengenakan di kanan bertapat pengenakan di	a ja si a fara faran fara di basa ya na a di ba na gina a hanan ca ni basa ya di ananan na gina a hanan ca ni basa ya di ananan		ng dengan kanang kanang di dan bang pengan kanang di dan bang pengan Kanang dan kanang dan kanang di dan kanang pengah kanang pengan kanang pengah kanang pengan kanang pengan kanan Kanang dan kanang dan kanang dan kanang pengan kanang pengan kanang pengan kanang pengan kanang pengan kanang p	Stop Freq 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VE	3W 3.0 MHz		Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Step 997.000000 MHz
MKR MODE TRC SCL	× 2.402 61 GHz	⊻ -5.06 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Man
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f 6	1.827 84 GHz 2.131 18 GHz 1.813 13 GHz 1.820 11 GHz	-48.80 dBm -50.46 dBm -50.97 dBm -52.26 dBm				Freq Offset 0 Hz
8 9 10						
11		ш			×	
MSG				I ostatus		

	um Analyzer - S								
RL	RF 50 reg 17.50			SENSE		ALIGN OFF	07:51:45 PM Jul 2 TRACE	23456	Frequency
Senter T			PNO: Fast C FGain:Low	 Trig: Free R Atten: 20 di 	un		TYPE M Det P	PPPPP	
10 dB/div	Ref 10.0	dBm				Mkr3 2	4.878 125 -48.35		Auto Tune
									Center Fre
10.0									17.500000000 GH
20.0 30.0								25.79 dBm	01
40.0								\Diamond^1	Start Fre 10.000000000 GH
50.0 60.0 10.0	and the second		nila, gelaggan miguna Na cogna chailtean		د. المحمول الم المحمد المحمول ا				
70.0									Stop Fre 25.00000000 GH
tart 10.0 Res BW	00 GHz 1.0 MHz		#VB	W 3.0 MHz		Sweep 40	Stop 25.00 .00 ms (4000	0 GHz 1 pts)	CF Ste
IKR MODE TH		×		Y	FUNCTION	FUNCTION WIDTH	FUNCTION VA		<u>Auto</u> Ma
1 N 1 2 N 1		24.244 7 24.726 6	25 GHz	-48.02 dBm -48.29 dBm				_	
3 N 1 4	f	24.878 1	25 GHz	-48.35 dBm					FreqOffse 0⊦
6 7									
8									
				m				~	
SG									

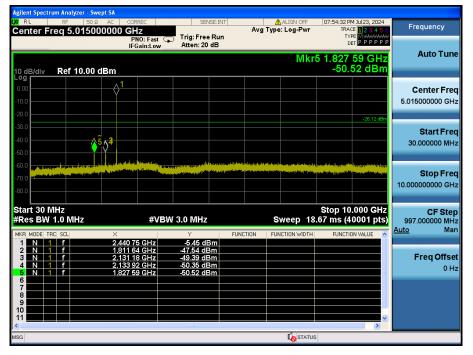
TM 2 Conducted Spurious Emissions 3 (Test Channel : Lowest)



TM 2 Reference (Test Channel : Middle)

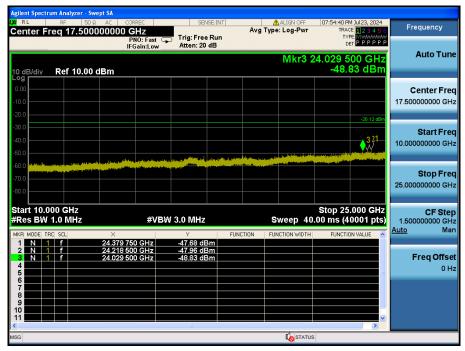
TM 2 Conducted Spurious Emissions 1 (Test Channel : Middle)

Agilent Spectrum L <mark>XI</mark> RL	RF 50 Ω	🛕 DC 🔋 COF	RREC	SENS	E:INT		ALIGN OFF		1 Jul 23, 2024	Frequency
Center Fre	q 15.0045	Р	NO: Fast G Gain:Low	Trig: Free Atten: 20 o		Avg Type	≌: Log-Pwr	TRAC TYP DE	E 123456 E M MMMMM T P P P P P P	
10 dB/div	Ref 10.00 (dBm						Vkr1 28 -36.9	1.9 kHz 90 dBm	Auto Tune
-10.0										Center Fred 15.004500 MHz
-20.0									-26.12 dBm	Start Fred
-40.0										9.000 kHz
-60.0	nan dina bilan	generion (mileretuspe	ifiburthofostologu	heijerfelde sjoe felderste efelde	i,ninailiftigeat,dio	holoholdenneler	afidethionalismister	belgfingsfigerfynteinindy	Anishminiki, mul	Stop Free 30.000000 MH
Start 9 kHz #Res BW 1			#VB\	V 300 kHz			weep 5.3	133 ms (4		CF Stej 2.999100 MH Auto Ma
MKR MODE TRC	SCL f	× 281	.9 kHz	∀ -36.90 dB	FUNCT	TION FUT	NCTION WIDTH	FUNCTIO	IN VALUE	
3 4 5									=	Freq Offse 0 H
6 7 8 9										
10 11 11				00					~	
ISG								LDC Cou	pled	



TM 2 Conducted Spurious Emissions 2 (Test Channel : Middle)

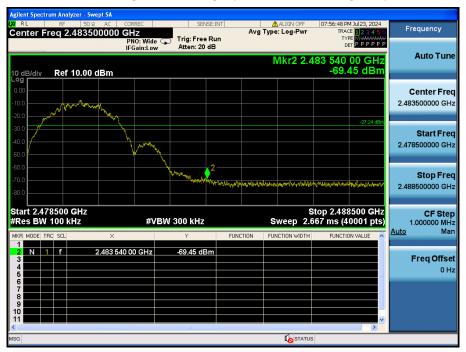
TM 2 Conducted Spurious Emissions 3 (Test Channel : Middle)





TM 2 Reference (Test Channel : Highest)

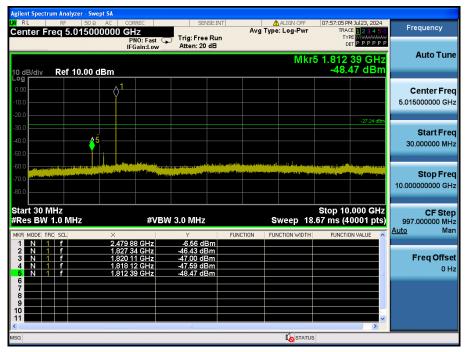
TM 2 High Band-edge (Test Channel : Highest)



Agilent Spectrum Analyzer - Swep ೫ RL RF 50 Ω▲ Center Freq 15.00450	DC CORREC	SENSE:INT		ALIGN OFF	07:56:56 PM Jul 23, 2024 TRACE 12 3 4 5 6	Frequency
10 dB/div Ref 10.00 dB	PNO: Fast G IFGain:Low	Trig: Free Run Atten: 20 dB			TYPE MUMMUN DET PPPPP Vikr1 281.9 kHz -37.02 dBm	Auto Tune
- 00 - 10.0 - 20.0						Center Free 15.004500 MH:
-30.0 x 1 -40.0 -50.0					-27 24 dBm	Start Free 9.000 kH
60.0 .70.0 .80.0	isterettetette	ne Ville Statistica and the official	nfaffamysajaciastiqa	يابياري البراي	art for it want at the world of the search and the state	Stop Fre 30.000000 MH
Start 9 kHz Res BW 100 kHz MKR MODE TRC SCL	#VBV	/ 300 kHz -37.02 dBm	FUNCTION	Sweep 5.3	Stop 30.00 MHz 33 ms (40001 pts) FUNCTION VALUE	CF Ste 2.999100 MH <u>Auto</u> Ma
					=	Freq Offse 0 H
7 8 9 10 11					~	
SG					L Coupled	

TM 2 Conducted Spurious Emissions 1 (Test Channel : Highest)

TM 2 Conducted Spurious Emissions 2 (Test Channel : Highest)



Agilent Spectrum Analyzer - !					
RL RF 50 Center Freq 17.50		SENSE:INT		07:57:13 PM Jul 23, 2024 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast IFGain:Low	Trig: Free Run Atten: 20 dB		TYPE MWWWWWW DET P P P P P P	
			Mkr3 2	4.297 625 GHz	Auto Tune
0 dB/div Ref 10.0	0 dBm			-48.79 dBm	
0.00					Center Fre
10.0					17.500000000 GH
20.0					
30.0				-27.24 dBm	
40.0				3 1 <mark>A</mark>	Start Free 10.000000000 GH
50.0				<u> </u>	10.00000000 GH
60.0 Hitsoftwarthan	and the state of the	the state of the bar state of	And a state of the second s	and an internet start whether a second start with	
					Stop Fre
80.0					25.00000000 GH
tart 10.000 GHz Res BW 1.0 MHz	#\/□	W 3.0 MHz	Sween 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Ste 1.50000000 GH
IKR MODE TRC SCL	X		JNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
1 N 1 f	24.910 000 GHz	-47.79 dBm	INCTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 N 1 f	24.205 375 GHz 24.297 625 GHz	-48.68 dBm -48.79 dBm			Freq Offse
4	24.237 023 6112	-40.79 dBill			0 H
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SG			🚺 STATUS		

TM 2 Conducted Spurious Emissions 3 (Test Channel : Highest)

5.5. Unwanted Emissions (Radiated)

Test Requirements and limit,

Part 15.247(d), Part 15.205, Part 15.209

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: General requirements

Frequency (MHz)	FCC Limit (uV/m)	Measurement Distance (m)
0.009 - 0.490	2 400 / F (kHz)	300
0.490 - 1.705	24 000 / F (kHz)	30
1.705 – 30.0	30	30

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



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 \geq 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	T _{on} (ms)	T _{on} + T _{off} (ms)	$D = T_{on} / (T_{on+off})$	DCCF = 10 log(1 / D) (dB)
TM 1	2.124	2.496	0.851 0	0.70
TM 2	1.070	1.868	0.572 8	2.42

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 below 1 GHz were investigated 9 kHz to 1 GHz and the worst case data was reported.

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.

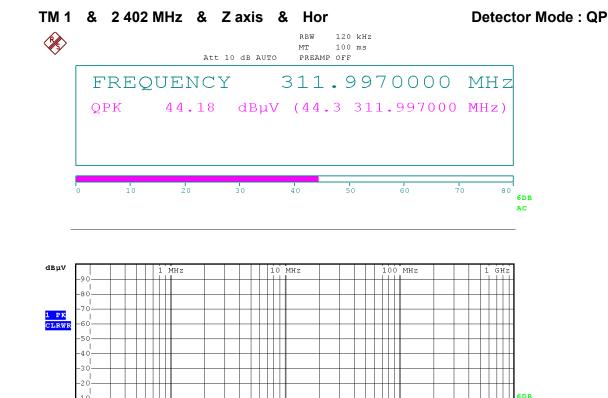
3. Sample Calculation.

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 Emissions data(9 kHz ~ 1 GHz) : TM 1

Tested Frequency (MHz)	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
	237.58	Н	Z	QP	45.60	-7.27	N/A	N/A	38.33	46.00	7.67
2 402	312.00	Н	Z	QP	44.30	-4.49	N/A	N/A	39.81	46.00	6.19
	360.00	Н	Z	QP	40.90	-3.45	N/A	N/A	37.45	46.00	8.55



150 kHz

Date: 23.JUL.2024 18:35:16

AC

GHZ



- Test Notes

1. The radiated emissions were investigated 1 GHz 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

Frequency Range : 1 GHz ~ 25 GHz_TM 1

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 389.61	Н	Х	PK	48.88	4.97	N/A	N/A	53.85	74.00	20.15
2 389.61	Н	Х	AV	39.11	4.97	0.70	N/A	44.78	54.00	9.22
4 805.00	Н	Х	PK	50.95	2.47	N/A	N/A	53.42	74.00	20.58
4 805.74	Н	Х	AV	39.85	2.47	0.70	N/A	43.02	54.00	10.98

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 878.04	Н	Х	PK	50.21	2.63	N/A	N/A	52.84	74.00	21.16
4 878.41	Н	Х	AV	40.05	2.66	0.70	N/A	43.41	54.00	10.59

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 484.42	Н	Х	PK	50.13	5.67	N/A	N/A	55.80	74.00	18.20
2 483.64	Н	Х	AV	39.53	5.65	0.70	N/A	45.88	54.00	8.12
4 962.08	Н	Х	PK	49.70	3.30	N/A	N/A	53.00	74.00	21.00
4 961.49	Н	Х	AV	39.17	3.31	0.70	N/A	43.18	54.00	10.82

Frequency Range : 1 GHz ~ 25 GHz_TM 2

Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 489.24	Н	Х	PK	48.69	5.76	N/A	N/A	54.45	74.00	19.55
2 388.96	Н	Х	AV	39.36	4.96	2.42	N/A	46.74	54.00	7.26
4 806.21	Н	Х	PK	39.91	2.47	N/A	N/A	42.38	74.00	31.62
4 805.85	Н	Х	AV	39.86	2.47	2.42	N/A	44.75	54.00	9.25

Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4 878.96	Н	Х	PK	49.91	2.69	N/A	N/A	52.60	74.00	21.40
4 878.26	Н	Х	AV	39.82	2.65	2.42	N/A	44.89	54.00	9.11

Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2 484.75	Н	Х	PK	50.16	5.67	N/A	N/A	55.83	74.00	18.17
2 484.18	Н	Х	AV	39.72	5.66	2.42	N/A	47.80	54.00	6.20
4 959.55	Н	Х	PK	50.23	3.33	N/A	N/A	53.56	74.00	20.44
4 959.27	Н	Х	AV	39.02	3.33	2.42	N/A	44.77	54.00	9.23



5.6. AC Power-Line Conducted Emissions

Test Requirements and limit, Part 15.207

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.

- 1. The test procedure is performed in a 6.5 m x 3.5 m x 3.5 m (L x W x 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.

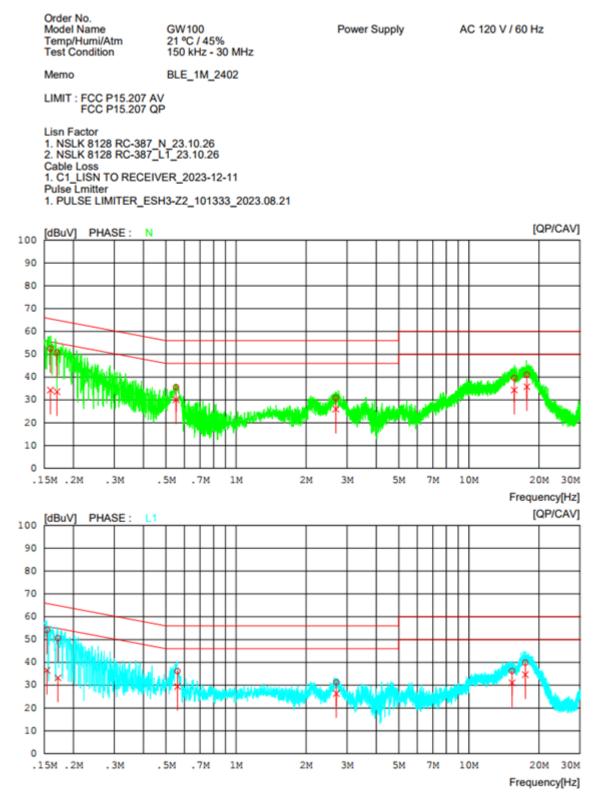
5.6.3. Test Results

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

AC Power-Line Conducted Emissions (Graph)

Results of Conducted Emission

Date 2024-07-29



AC Power-Line Conducted Emissions (List)

Results of Conducted Emission

Date 2024-07-29

Power Supply

AC 120 V / 60 Hz

LIMIT : FCC P15.207 AV FCC P15.207 QP

Order No. Model Name

Memo

Temp/Humi/Atm

Test Condition

Lisn Factor 1. NSLK 8128 RC-387_N_23.10.26 2. NSLK 8128 RC-387_L1_23.10.26 Cable Loss 1. C1_LISN TO RECEIVER_2023-12-11 Pulse Limiter 1. PULSE LIMITER_ESH3-Z2_101333_2023.08.21

GW100

21 °C / 45%

150 kHz - 30 MHz

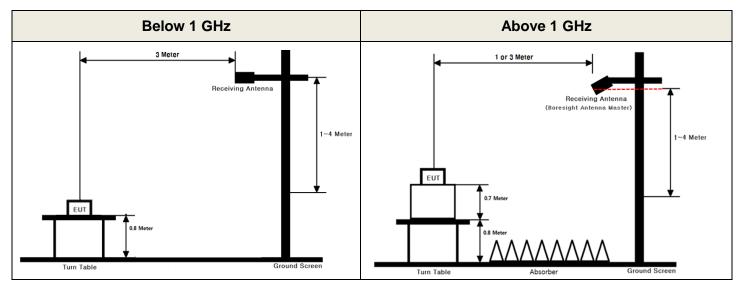
BLE_1M_2402

NO	FREQ [MHz]	READING QP CAV [dBuV][dBuV]	C.FACTOR [dB]	RESULT QP CAV [dBuV][dBuV]	LIMIT QP CAV [dBuV][dBuV]	MARGIN QP CAV [dBuV][dBuV]	PHASE
-	0.17021 0.55233 2.68280 15.67760 17.75160 0.15418 0.17192 0.56052	42.52 24.30 40.68 23.62 25.55 20.08 20.76 15.91 29.07 23.77 30.54 25.24 44.22 26.52 40.64 23.23 26.10 19.42 21.07 16.16	10.53 10.54 9.99 9.99 10.06	52.51 34.29 50.67 33.61 35.55 30.08 30.83 25.98 39.60 34.30 41.08 35.78 54.21 36.51 50.63 33.22 36.16 29.48 31.24 26.33	65.49 55.49 64.95 54.95 56.00 46.00 56.00 50.00 60.00 50.00 65.77 55.77 64.87 54.87 56.00 46.00 56.00 46.00	12.98 21.20 14.28 21.34 20.45 15.92 25.17 20.02 20.40 15.70 18.92 14.22 11.56 19.26 14.24 21.65 19.84 16.52 24.76 19.67	N N N N L1 L1 L1 L1
11	15.33100		10.62	36.18 31.02 39.89 34.64	60.00 50.00 60.00 50.00	23.82 18.98 20.11 15.36	L1 L1

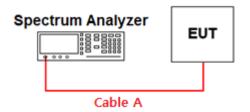
APPENDIX I

Test set up diagrams

Radiated Measurement



Conducted Measurement



Path loss information

Frequency (GHz)	Path Loss (dB)	Frequency (GHz)	Path Loss (dB)
0.03	0.56	15	1.57
1	0.73	20	2.70
2.402 & 2.440 & 2.480	0.82	25	2.82
5	1.01	-	-
10	1.33	-	-

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



APPENDIX II

Duty cycle plots

Test Procedures

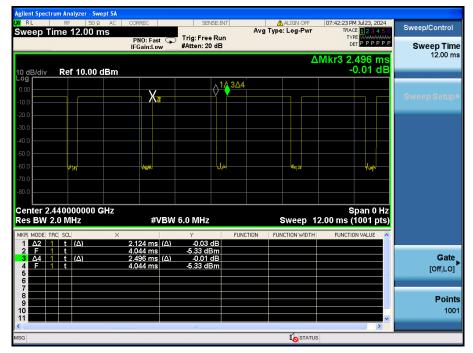
- KDB558074 D01v05r02 - Section 6

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

TM 1 Test Channel : Middle



Duty Cycle

Dt&C

TM 2 Test Channel : Middle

weep T	RF ime	50 Ω AC 7.533 ms	PNO: Fast IFGain:Low	Trig: Fr			ALIGN OFF	TRAC	4 Jul 23, 2024 E <mark>1 2 3 4 5 6</mark> PE WWWWWWW ET P P P P P P	Sweep/Control
0 dB/div	Re	f 10.00 dBm					Δ		868 ms 2.93 dB	7.533 r
.og 0.00				X	\langle	142	3∆4 —			Sweep Setup
20.0										
40.0										
50.0 50.0		erentii perezet		manuruh		dest and the second	(unt-ult.	hangy	
70.0 80.0										
enter 2. tes BW :		00000 GHz Hz	#V	BW 8.0 MH	z		Sweep 7.	S 533 ms (pan 0 Hz 1001 pts)	
1 A2			1.070 ms	Y 20	FUNC		ICTION WIDTH		IN VALUE	
2 F 3 Δ4	1 t	(Δ) (Δ)	3.420 ms 1.868 ms 3.420 ms	-5.34	dBm 3 dB				=	Gat [Off,LO
5										
										Poir 10

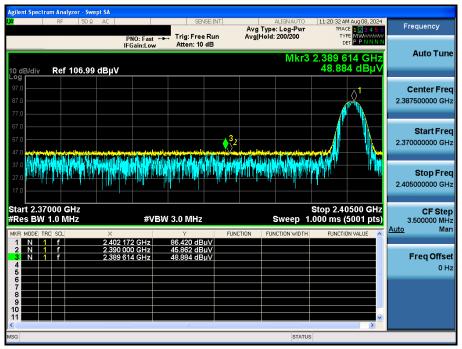
Dt&C

Detector Mode : PK

APPENDIX III

Unwanted Emissions (Radiated) Test Plot

TM1 & Lowest & X & Hor



TM1 & Lowest & X & Hor

m Analyzer - Swept SA Avg Type: RMS Avg|Hold: 200/200 Frequency Trig: Free Run Atten: 10 dB TYPE DET PNO: Fast ↔ IFGain:Low Auto Tune Mkr3 2.389 614 GH: 39.109 dBµ Ref 106.99 dBµV 10 dB/div **Center Freq** 2.387500000 GHz Start Freq 2.370000000 GHz **3**2 Stop Freq 2.405000000 GHz Start 2.37000 GHz #Res BW 1.0 MHz Stop 2.40500 GHz 1.000 ms (5001 pts) CF Step 3.500000 MHz Man #VBW 3.0 MHz* Sweep Auto 38.075 dBµV Freq Offset 0 Hz

Detector Mode : AV

Detector Mode : PK

🛈 Dt&C

TM1 & Highest & X & Hor



Detector Mode : AV

TM1 & Highest & X & Hor



Dt&C

TM1 & Middle & X & Hor

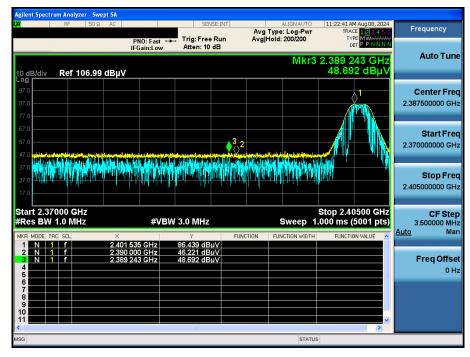
Detector Mode : AV

KI RF	50Ω AC		SENSE:INT	ALIGNAUTO Avg Type: RMS Avg Hold: 200/200	01:23:58 PM Aug 08, 2024 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
dB/div Re	f 66.99 dBµ\	PNO: Fast	Atten: 6 dB		4.878 412 GHz 40.054 dBµV	Auto Tun
62.0						Center Fre 4.880000000 GH
57.0						Start Fre 4.877500000 GF
47.0	¢1					Stop Fre 4.882500000 GF
37.0 32.0	n yn haedd falen rhyn yn y far y'r hyfr yn hyfr	handra analala ini perawahlara	nt an	in had an ann thigh i gear ann an thair ann an	ennennennennen första der som en s	CF Ste 2.44000000 GF Auto <u>M</u> a
27.0						Freq Offs 0 I
22.0 Center 4.8800		#\/B\A	3.0 MHz*	Sween 1	Span 5.000 MHz .000 ms (5001 pts)	



TM2 & Lowest & X & Hor

Detector Mode : PK



TM2 & Lowest & X & Hor

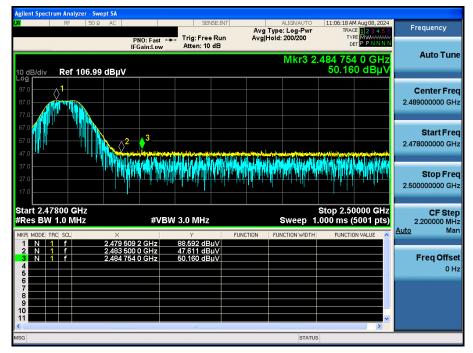
Detector Mode : AV



Detector Mode : PK

🛈 Dt&C

TM2 & Highest & X & Hor



Detector Mode : AV

TM2 & Highest & X & Hor



Dt&C

TM2 & Middle & X & Hor

Detector Mode : AV

XI	RF 50 Ω A(SENSE:INT	ALIGNAUTO Avg Type: RMS	01:23:01PM Aug 08, 2024 TRACE 1 2 3 4 5 6 TYPE A WWAWW	Frequency
		PNO: Fast ↔ IFGain:Low	Trig: Free Run Atten: 6 dB	Avg Hold: 200/200	DET A P N N N N	Auto Tur
dB/div	Ref 66.99 dBµ	v		IVIKIT	4.878 258 GHz 39.819 dBµV	
62.0						Center Fre 4.880000000 GF
57.0						Start Fr 4.877500000 GI
47.0						Stop Fr 4.882500000 Gi
37.0	and a standard and a standard and a standard and a standard a standard a standard a standard a standard a stand A standard a	alatinitation and an	hittingtingensetting politications and	nad navina international adjust references prime	etintimetherissiniset all anythographics	CF Ste 2.44000000 GI Auto <u>M</u>
27.0						Freq Offs
	1.880000 GHz				Span 5.000 MHz	
Res B	№ 1.0 MHz	#VBV	/ 3.0 MHz*	Sweep 1	.000 ms (5001 pts)	