



Project No: Report No.: TM-2307000414P TMWK2307002566KR FCC ID: 2A2P5-ARFSA06

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FCC RADIO TEST REPORT FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.249
FCC ID	2A2P5-ARFSA06
Trade name	Acer Gadget Inc.
Product name	24GHz Radar
Model No.	ARFSA06
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:

sehni. Hu

Sehni Hu Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

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Revision History

Rev.	lssue Date	Revisions	Effect Page	Revised By
00	August 25, 2023	Initial Issue	ALL	Allison Chen
01	September 1, 2023	See the following Note Rev.(01)	4-5, 8, 11, 22-30	Allison Chen

Note:

Rev.(01)

1. Modify application and manufacturer information in section 1.1.

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2. Modify frequency range in section 1.2, instrument calibration in section 1.6.

3. Modify spurious emission test mode below/above 1GHz in section 4.3.4.

4. Add tx justification in section 3.2.



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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Acer Gadget Inc. 24F., No. 112, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan
Manufacturer	Acer Gadget Inc. 24F., No. 112, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan
Equipment	24GHz Radar
Model Name	ARFSA06
Model Discrepancy	N/A
EUT Functions	24G Radar
Received Date	July 21, 2023
Date of Test	July 24 ~ August 18, 2023
Output Power	Peak : 102.53 dBuV/m Average : 98.31 dBuV/m
Power Operation	 AC DC Type : Battery DC Power Supply: 12VDC □ External DC adapter

Remark:

1. For more details, please refer to the User's manual of the EUT.

2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.



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1.2 EUT CHANNEL INFORMATION

Frequency Range	24.152 ~ 24.247 GHz
Centre frequency	24.199 GHz
Modulation Type	FMCW
Number of channel	1

1.3 ANTENNA INFORMATION

Antenna Type	🗌 PCB 🗌 PIFA 🗌 Dipole 🗌 Coils 🖂 Patch
Antenna Gain	Gain: 11.5 dBi
Brand / Model	ALPHA / 1X2 Patch 24GHz
Antenna connector	N/A



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1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.213 dB
Channel Bandwidth	± 2.7 %
Radiated Emission_9kHz-30MHz	± 3.761 dB
Radiated Emission_30MHz-200MHz	± 3.473 dB
Radiated Emission_200MHz-1GHz	± 3.946 dB
Radiated Emission_1GHz-6GHz	± 4.797 dB
Radiated Emission_6GHz-18GHz	± 4.803 dB
Radiated Emission_18GHz-26GHz	± 3.459 dB
Radiated Emission_26GHz-40GHz	± 3.297 dB
Radiated Emission_40GHz-60GHz	± 2.317 dB
Radiated Emission_60GHz-90GHz	± 2.256 dB
Radiated Emission_90GHz-140GHz	± 2.278 dB

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.



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1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

AC Powerline Conducted Emission and Conducted:

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

Radiated emission:

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

No. 12, Ln. 116, Wugong 3rd Rd., Wugu Dist., New Taipei City, Taiwan 24803 (Only 9kHz to 40GHz)

CAB identifier: TW1309

Test site Test Engineer		Remark
AC Conduction Room		Not applicable, because EUT doesn't connect to AC Main Source direct.
Radiation	Tony Chao, Ray Li	
RF Conducted	Allen Shen	

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC pubic Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309.

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site							
Name of EquipmentManufacturerModelSerial NumberC					Cal Due		
Coaxial Cable	EMC	EMC104-35M-2000	230204	2023-03-13	2024-03-12		
EXA Signal Analyzer	Keysight	N9010B	MY60242460	2023-02-02	2024-02-01		
Horn Antenna SCHWARZBECK BBHA9170 1047 2022-12-30 2023-12							
Software	N/A						

Remark:

1. Each piece of equipment is scheduled for calibration once a year.

2. N.C.R. = No Calibration Required.



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3M 966 Chamber Test Site (966A)										
Name of Equipment	Name of Equipment Manufacturer Model Serial Number Cal Date Cal Due									
Pre-Amplifier	MITEQ	AMF-6F-180040 00-37-8P	985646	2022-09-07	2023-09-06					
Loop Antenna	COM-POWER	AL-130 121051 2023-05-23 2		2024-05-22						
Preamplifier	EMEC	EM330	060609	2023-02-22	2024-02-21					
Thermo-Hygro Meter	WISEWIND	1206	D07	2022-12-19	2023-12-18					
Signal Analyzer	R&S	FSV 40	101073	2022-08-25	2023-08-24					
PXA Signal Analyzer	Keysight Technologies	N9030B	MY62291089	2022-10-14	2023-10-13					
Preamplifier	HP	8449B	3008A00965	2022-12-23	2023-12-22					
Cable	Huber+Suhner	104PEA	20995+21000+18 2330	2023-02-22	2024-02-21					
Signal Generator	Agilent	E8257C	US42340383	2023-06-17	2024-06-16					
STANDARD GAIN HORN ANTENNA	СМІ	RCHO08R	RCHO08R	2023-06-16	2024-06-15					
STANDARD GAIN HORN ANTENNA	СМІ	RCHO12R	RCHO12R	2023-06-16	2024-06-15					
STANDARD GAIN HORN ANTENNA	СМІ	RCHO19R	RCHO19R	2023-06-15	2024-06-14					
SA EXTENSION MODULE	VDI	SAX WR8.0	SAX982	2023-06-14	2024-06-13					
SA EXTENSION MODULE	VDI	SAX WR12 SAX983		2023-06-14	2024-06-13					
SA EXTENSION MODULE	VDI	SAX WR19 SAX993		2023-06-14	2024-06-13					
Bi-Log Antenna	Sunol Sciences	JB1	A052609	2023-02-09	2024-02-08					
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2023-01-12	2024-01-11					
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2022-12-30	2023-12-29					
Pre-Amplifier	EMCI	EMC184045SE	980860	2022-12-07	2023-12-06					
Cable	EMCI	EMC101G	211010+211011+ 211012	2022-12-22	2023-12-11					
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R					
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R					
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R					
Software	Software e3 V9-210616c									

Remark:

Each piece of equipment is scheduled for calibration once a year.
 N.C.R. = No Calibration Required.



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1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment						
No. Equipment Brand Model Series No. FCC ID						
	N/A					

Support Equipment							
No.	No. Equipment Brand Model Series No. FCC ID						
1	NB(E)	Lenovo	T460	N/A	N/A		

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 15.249.



2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	N/A
15.215 4.2		20dB Bandwidth and Occupied Bandwidth (99%)	Pass
15.249(a)	4.3	Filed strength of fundamental	Pass
15.249(a)	4.3	Radiation Spurious Emission	Pass



3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G			
Test Condition	Radiated Emission Above 1G		
Power supply Mode	ver supply Mode Mode 1: EUT power by Power supply		
Worst Mode	🖾 Mode 1 🗌 Mode 2 🗌 Mode 3 🗌 Mode 4		
Worst Position	 Placed in fixed position. Placed in fixed position at X-Plane (E2-Plane) Placed in fixed position at Y-Plane (E1-Plane) Placed in fixed position at Z-Plane (H-Plane) 		

Radiated Emission Measurement Below 1G			
Test Condition Radiated Emission Below 1G			
Power supply Mode Mode 1: EUT power by Power supply			
Worst Mode Mode 1 Mode 2 Mode 3 Mode 4			

Remark:

1. The worst mode was record in this test report.

2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

3.2TX JUSTIFICATION

- 1. Connect the prototype to the computer and start the PCAN software
- 2. At this time, it should be in the state of frequency scanning

The client's software is PCAN-View 4.2.1.533



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4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range	Limits(dBµV)	
(MHz)	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.

2. EUT connected to the line impedance stabilization network (LISN)

3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

Not applicable, because EUT doesn't connect to AC Main Source direct.



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4.220dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

TEST CONFIGURATION



TEST PROCEDURE

- 1. Place the EUT on the table and set it in the transmitting mode.
- 2. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth and 20dB Bandwidth
- 3. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.

TEST RESULTS

Compliance.

Temperature:	26.3 ℃	Tested by:	Allen Shen
Humidity:	56% RH	Test Date:	July 24, 2023

Test Condition	Frequency(GHz)	Occupied Bandwidth 99% (MHz)	20 dB Bandwidth (MHz)
24G Radar	24.152 ~ 24.247	95.044	96.3769



Test Plot

20dB Bandwidth & BANDWIDTH (99%)





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4.3 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION

4.3.1 Test Limit

According to §15.249(a)

(1) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

* Field strength limits are specified at a distance of 3 meters

Fundamental Limit Conversion				
Average Average Peak				
(mV/m) (dBuV/m)		(dBuV/m)		
at 3M	at 3M	at 3M		
250	107.96	127.96		

Harmonic Limit Conversion				
Average	Average	Peak		
(uV/m) (dBuV/m)		(dBuV/m)		
at 3M	at 3M	at 3M		
2500	67.96	87.96		



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(2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209(follow the table), whichever is the lesser attenuation

Below 30 MHz

Frequency	Field Strength (µA/m)	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)		
	Transmitters	Receivers	
30-88	100 (3 nW)	100 (3 nW)	
88-216	150 (6.8 nW)	150 (6.8 nW)	
216-960	200 (12 nW)	200 (12 nW)	
Above 960	500 (75 nW)	500 (75 nW)	



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4.3.2 Test Procedure

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m, below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. The SA setting following :

(1) Below 1G : RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak,

(2) Above 1G :

(2.1) For Peak measurement : RBW = 1MHz, VBW \geq 3 RBW.

(2.2) For Average measurement : RBW = 1MHz, VBW = 1kHz.

Note:

(1) the measurement distance of the Fundamental frequency is 3m.

(2) No emission found between lowest internal used/generated frequency to 30MHz (9KHz~30MHz)

The measurement distance 30 MHz to 40 GHz is set 3m away from the receiving antenna.

The measurement distance above 40 GHz is set 1m away from the receiving antenna.



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4.3.3 Test Setup <u>9kHz ~ 30MHz</u>



<u> 30MHz ~ 1GHz</u>





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Above 1 GHz



Above 40 GHz





4.3.4 Test Result

Test Data

(1) Filed strength of fundamental :

Test Mode:	TX-24GHz	Temp/Hum	24.3(°∁)/ 57%RH
Test Item	Fundamental	Test Date	July 25, 2023
Polarize	Vertical	Test Engineer	Tony Chao
Detector	Peak and Average		
120 Level (dBuV 105.0 90.0 75.0 60.0 45.0 30.0 15.0 0 23950	/m)	24160. 24230	24300
Trace: 1		-, (,	

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
(MHz)	(PK/QP/AV)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
23953.50	Average	36.05	-1.47	34.58	54.00	-19.42
23985.35	Peak	51.01	-1.48	49.53	74.00	-24.47
24152.65	Peak	103.50	-0.98	102.53	127.96	-25.43
24152.65	Average	99.29	-0.98	98.31	107.96	-9.65
24250.65	Peak	64.73	-0.64	64.09	74.00	-9.91
24250.65	Average	48.06	-0.64	47.42	54.00	-6.58
	•	•		•	•	



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Test Mo	ode:	TX-24GHz		Temp/Hum	24.3(°(C)/ 57%RH
Test It	em	Fundamenta	al	Test Date	July	25, 2023
Polari	ze	Horizontal	Т	est Engineer	Tor	ny Chao
Detec	tor P	Peak and Average		¥		•
120 Le 105.0 90.0 75.0 60.0 45.0 30.0 15.0 239	vel (dBuV/m)	20. 240: Fr	90. 24 equency (Mi	160. 24	230. 2	4300
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Read Level	1 40101	FS	Linit	margin
(MHZ)	(PK/QP/AV)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
(MHz) 23979.40	(PK/QP/AV) Peak	(dBµV) 47.67	(dB) -1.48	(dBµV/m) 46.19	(dBµV/m) 74.00	(dB) -27.81
(MHz) 23979.40 23997.60	(PK/QP/AV) Peak Average	(dBµV) 47.67 35.99	(dB) -1.48 -1.48	(dBµV/m) 46.19 34.51	(dBµV/m) 74.00 54.00	(dB) -27.81 -19.49
(MHz) 23979.40 23997.60 24152.65	(PK/QP/AV) Peak Average Peak	(dBµV) 47.67 35.99 99.71	(dB) -1.48 -1.48 -0.98	(dBµV/m) 46.19 34.51 98.73	(dBµV/m) 74.00 54.00 127.96	(dB) -27.81 -19.49 -29.23
(MHz) 23979.40 23997.60 24152.65 24152.65	(PK/QP/AV) Peak Average Peak Average Average	(dBµV) 47.67 35.99 99.71 95.82	(dB) -1.48 -1.48 -0.98 -0.98	(dBµV/m) 46.19 34.51 98.73 94.84	(dBµV/m) 74.00 54.00 127.96 107.96	(dB) -27.81 -19.49 -29.23 -13.12
(MHz) 23979.40 23997.60 24152.65 24152.65 24250.30	(PK/QP/AV)PeakAveragePeakAveragePeakAverage	(dBµV) 47.67 35.99 99.71 95.82 60.49	(dB) -1.48 -0.98 -0.98 -0.64	(dBµV/m) 46.19 34.51 98.73 94.84 59.85	(dBµV/m) 74.00 54.00 127.96 107.96 74.00	(dB) -27.81 -19.49 -29.23 -13.12 -14.15



(2) Below 1G :

Test Mode:	TX_2	24GHz	Temp/	Hum	24.6(°C)/ 59%RI	Ч
Test Item	30MH;	z-1GHz	Test D	Date	August 18, 2023	3
Polarize	Ver	rtical	Test En	gineer	Tony Chao	
Detector	Peak and	Quasi-peak			•	
		•				
120 Level (dBu	V/m)					
105.0						
103.0						
90.0						
75.0						
60.0						
00.0						
45.0		A	A			
30.0	AL AN				the second se	
15.0						
13.0						
0 <mark></mark> 30	224.	418.	612.	806.	1000	
		Frequency	(MHz)			

			F3		ina giii
(/QP/AV)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
Peak	53.38	-16.17	37.22	40.00	-2.78
Peak	44.81	-10.06	34.75	46.00	-11.25
QP	51.20	-7.03	44.17	46.00	-1.83
Peak	45.29	-3.95	41.33	46.00	-4.67
Peak	42.80	-2.11	40.68	46.00	-5.32
Peak	39.94	1.10	41.04	46.00	-4.96
	JQP/AV) Peak Peak QP Peak Peak Peak	JQP/AV) (dBµV) Peak 53.38 Peak 44.81 QP 51.20 Peak 45.29 Peak 42.80 Peak 39.94	JQP/AV)(dBµV)(dB)Peak53.38-16.17Peak44.81-10.06QP51.20-7.03Peak45.29-3.95Peak42.80-2.11Peak39.941.10	J/QP/AV)(dBµV)(dB)(dBµV/m)Peak53.38-16.1737.22Peak44.81-10.0634.75QP51.20-7.0344.17Peak45.29-3.9541.33Peak42.80-2.1140.68Peak39.941.1041.04	JQP/AV)(dBµV)(dB)(dBµV/m)(dBµV/m)Peak53.38-16.1737.2240.00Peak44.81-10.0634.7546.00QP51.20-7.0344.1746.00Peak45.29-3.9541.3346.00Peak42.80-2.1140.6846.00Peak39.941.1041.0446.00



Test Mode:	TX_24GHz	Temp/Hum	24.6(°∁)/ 59%RH
Test Item	30MHz-1GHz	Test Date	August 18, 2023
Polarize	Horizontal	Test Engineer	Tony Chao
Detector	Peak and Quasi-peak		
120 Level (dBu 105.0 90.0 75.0 60.0 45.0 30.0 15.0 0 30	V/m)	612. 806. (MHz)	

Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
(MHz)	(PK/QP/AV)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
129.06	Peak	47.18	-9.35	37.84	43.50	-5.66
213.69	Peak	50.30	-11.93	38.37	43.50	-5.13
369.26	QP	52.10	-6.88	45.22	46.00	-0.78
398.84	QP	48.80	-5.75	43.05	46.00	-2.95
644.74	QP	44.90	-0.64	44.26	46.00	-1.74
718.22	Peak	44.11	0.23	44.34	46.00	-1.66



(3) Above 1G :

Test Mo	de:	TX_24GH	z	Temp/H	lum	24.3(°(C)/ 57%RH
Test Ite	m	1GHz-40GI	Hz	Test D	ate	July	25, 2023
Polariz	e	Vertical		Test Eng	ineer	F	Ray Li
Detecto	or	Peak					
120 105.0 90.0 75.0 60.0 45.0 30.0	evel (dBuV/m)						
15.0 0 10	00 88	00. 166 Fr	i00. Tequency (24400. MHz)	32200). 40	000
Freq	Detector	Spectrum	Factor	Actu	al	Limit	Margin
(1 164.	Mode	Read Level		FS			
(MHz)	(PK/QP/AV)	(dBµV)	(dB)	(dBµV	/m) (αΒμV/m)	(dB)
1063.000	Peak	62.92	-9.31	53.6	1	74.00	-20.39
1598.000	Peak	58.86	-7.42	51.4	4	74.00	-22.56
1996.000	Peak	55.64	-4.98	50.6	6	74.00	-23.34
2656.000	Peak	54.24	-2.92	51.3	2	74.00	-22.68

Remark:

N/A

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit



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Test Mod	de:	TX_24GHz		Temp/Hum	24.3(°(C)/ 57%RH
Test Ite	m	1GHz-400	SHz	Test Date	Julv	25, 2023
Polariz	е	Horizont	al	Test Enginee	er F	Ray Li
Detecto	or	Peak		0		<u> </u>
120	evel (dBuV/	m)			1 1	
105.0						_
90.0						-
75.0						-
60.0						
45.0						-
30.0						-
15.0						-
9						
		8800. 16	600	24400. 32	200. 40	0000
	00	8800. 16	600. Frequency (24400. 32 MHz)	200. 40	0000
	00	8800. 16 I	600. Frequency (24400. 32 MHz)	200. 40	0000
	00	8800. 16 I	600. Frequency (24400. 32 MHz)	200. 40	0000
Freq	Detecto	8800. 16 r Spectrum	Frequency (24400. 32 MHz) Actual	1200. 40	Margin
Freq.	Detector Mode	r Spectrum Read Level	Frequency (24400. 32 MHz) Actual FS	Limit	Margin
Freq. (MHz)	Detecto Mode (PK/QP/A	r Spectrum Read Level V) (dBµV)	Frequency (Frequency (Factor (dB)	24400. 32 MHz) Actual FS (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Freq. (MHz) 1308.000	Detector Mode (PK/QP/A Peak	ssoo. 16 r Spectrum Read Level V) (dBμV) 59.00	Frequency (Frequency ((dB) -7.89	24400. 32 MHz) 32 (dBµV/m) 51.11	Limit (dBµV/m) 74.00	Margin (dB) -22.89
Freq. (MHz) 1308.000 1500.000	Detecto Mode (PK/QP/A Peak Peak	ssoo. 16 r Spectrum Read Level V) (dBµV) 59.00 59.22	Frequency (Frequency ((dB) -7.89 -7.97	24400. 32 MHz) 32 Actual FS (dBμV/m) 51.11 51.25	Limit (dBµV/m) 74.00 74.00	Margin (dB) -22.89 -22.75
Freq. (MHz) 1308.000 1500.000 2128.000	Detector Mode (PK/QP/A Peak Peak Peak	ssoo. 16 r Spectrum Read Level V) (dBμV) 59.00 59.22 55.40 55.40	Frequency (Frequency ((dB) -7.89 -7.97 -3.49	24400. 32 MHz) 32 Actual FS (dBµV/m) 51.11 51.25 51.91	Limit (dBµV/m) 74.00 74.00 74.00	Margin (dB) -22.89 -22.75 -22.09
Freq. (MHz) 1308.000 1500.000 2128.000 N/A	Detector Mode (PK/QP/A Peak Peak Peak	ssoo. 16 r Spectrum Read Level V) (dBμV) 59.00 59.22 55.40	Frequency (Frequency ((dB) -7.89 -7.97 -3.49	24400. 32 MHz) 32 Actual FS (dBµV/m) 51.11 51.25 51.91	Limit (dBµV/m) 74.00 74.00	Margin (dB) -22.89 -22.75 -22.09
Freq. (MHz) 1308.000 1500.000 2128.000 N/A	Detector Mode (PK/QP/A Peak Peak Peak	ssoo. 16 r Spectrum Read Level V) (dBµV) 59.00 59.22 55.40	Frequency (Frequency ((dB) -7.89 -7.97 -3.49	24400. 32 MHz) 32 Actual FS (dBµV/m) 51.11 51.25 51.91	Limit (dBµV/m) 74.00 74.00	Margin (dB) -22.89 -22.75 -22.09
Freq. (MHz) 1308.000 1500.000 2128.000 N/A	Detector Mode (PK/QP/A Peak Peak Peak	8800. 16 r Spectrum Read Level V) (dBµV) 59.00 59.22 55.40	Frequency (Frequency ((dB) -7.89 -7.97 -3.49	24400. 32 MHz) 32 Actual FS (dBµV/m) 51.11 51.25 51.91	Limit (dBµV/m) 74.00 74.00	Margin (dB) -22.89 -22.75 -22.09
Freq. (MHz) 1308.000 1500.000 2128.000 N/A	Detector Mode (PK/QP/A Peak Peak Peak	8800. 16 r Spectrum Read Level (dBµV) 59.00 59.22 55.40	600. Frequency ((dB) -7.89 -7.97 -3.49	24400. 32 MHz) 32 Actual FS (dBµV/m) 51.11 51.25 51.91	Limit (dBµV/m) 74.00 74.00	Margin (dB) -22.89 -22.75 -22.09
Freq. (MHz) 1308.000 1500.000 2128.000 N/A	Detector Mode (PK/QP/A Peak Peak Peak	8800. 16 r Spectrum Read Level V) (dBµV) 59.00 59.22 55.40	600. Frequency ((dB) -7.89 -7.97 -3.49	24400. 32 MHz) 32 Actual FS (dBµV/m) 51.11 51.25 51.91	Limit (dBµV/m) 74.00 74.00	Margin (dB) -22.89 -22.75 -22.09

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit



Test Mode:	TX 240	GHz	Temp/ł	Hum	24.3(°C)/	′ 57%RH
Test Item		0GHz	Test D	Date	July 25	5, 2023
Polarize	Vertical/Hc	orizontal	Test End	gineer	Tony	Chao
Detector	Peak					
		Peak				
Spectrum Analyzer 1	-				Marker	· · · 宗
KEYSIGHT Input: Ext Mixer Signal ID: On	Corr CCorr RCal Freq Ref: Int (S)	PNO: Fast Gate: Off	Avg Type: Log-Powe Avg Hold:>100/100	er 1 2 3 4 5 6	Select Marker	
Align: Off	NFE: Off	IF Gain: Low Sig Track: Off	Trig: Free Run	PNNNN	Marker Frequency	Sottingo
1 Spectrum Scale/Div 10 dB	Ref Level 84	4.99 dBµV	Mkr1 48.3	05 300 GHz 21.41 dBµV	48.305300000 GHz	Peak
Log		<u> </u>			Marker Mode	Search Pk Search
65.0					Delta (∆)	Config
55.0					Fixed	Properties
45.0					off	Function
35.0					Delta Marker (Reset Delta)	Marker→
25.0 					Marker Table	Counter
15.0					Off	
4.99					Diagram	
-5.01					All Markers Off	Local
					Couple Markers	
Start 40.00 GHz #Res BW 1 MHz	#Video BW	/ 3.0 MHz	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts)	Couple Markers On Off	
Start 40.00 GHz #Res BW 1 MHz	#Video BW	/ 3.0 MHz	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts)	Couple Markers On Off	
Start 40.00 GHz #Res BW 1 MHz	#Video BW	Averaç	Sweep 21.3	Stop 60.00 GHz ms (32001 pts)	Couple Markers On Off	
Spectrum Analyzer 1	#Video BW	Averag	Sweep 21.3	Stop 60.00 GHz ms (32001 pts)	Couple Markers Off Off Marker	
Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID On Algo Off	#Video BW	3.0 MHz Averac PNO: Fast Gate: Off IF Gan: Low	Sweep 21.3	Stop 60.00 GHz ms (32001 pts) RMS 12 3 4 5 6 M WW WWW	Couple Markers Off Marker Select Marker Marker 1	• **
Spectrum Analyzer 1 Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID On Align Off	#Video BW	3.0 MHz Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Sweep 21.3	Stop 60.00 GHz ms (32001 pts) SMS 12 3 4 5 6 M WWWWW P NN NN N 05 300 GHz	Couple Markers Off Off Select Marker Marker 1 Marker 5300000 GHz	Settings
Spectrum Analyzer 1 Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID: On Align: Off Scale/Div 10 dB Log	#Video BW	3.0 MHz Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 4.99 dBµV	Sweep 21.3	Stop 60.00 GH2 3 ms (32001 pts) 3 ms (12 3 4 5 6 M wwwww P NN N N N 05 300 GH2 15.36 dBµV	Couple Markers Off Off Select Marker Marker 1 Marker 1 Marker Select Marker Marker Marker Marker Marker Marker Mode	Settings Peak Search
Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Scale/Div 10 dB	#Video BW	3.0 MHz Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 4.99 dBpV	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts) 3 ms (12 3 4 5 6 M WWWWW P NN N N N 05 300 GHz 15.36 dBµV	Couple Markers Off Marker Select Marker Marker 1 Marker Frequency 48.30530000 GHz Marker Mode Normal	Settings Peak Search Pk Search Pk Search Config
Spectrum Analyzer 1 + KEYSIGHT Input: Ext Mixer RL Signal ID. Cr Signal	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GHz ms (32001 pts) SMS 12 3 4 5 6 M WWWWW P N N N N 05 300 GHz 15.36 dBµV	Couple Markers Off Off Select Marker Marker T Marker Frequency 48.305300000 GHz Marker Mode Normal Deita (Δ)	Settings Peak Search Pk Search Config Properties
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Scale/Div 10 dB Cog 75.0 55.0	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts) 3 ms (32001 pts) 5 ms (3200 pts) 5 ms (Couple Markers Off Off Select Marker Marker 1 Marker 1 Marker 1 Marker Mode Normal Delta (Δ)	Settings Peak Search Pk Search Pk Search Properties Harkerton
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID: On Signal ID: On Scale/Div 10 dB Og 75.0 55.0	#Video BW	3.0 MHz Averac PNO: Fast Cate: Off IF Gain: Low Sig Track: Off	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts) 3 ms (32001 pts) 5 ms (32001 pts) 5 ms (32001 pts) 5 ms (32001 pts) 1 2 3 4 5 6 M www.www P NN N N N 05 300 GHz 15.36 dBµV	Couple Markers Off Off Select Marker Marker 1 Marker Frequency 48.30530000 GHz Marker Mode Normal Deita (Δ) Fixed Off	Settings Peak Search Pk Search Pk Search Properties Marker Marker
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 KEYSIGHT Input: Ext Mixer RL Signal ID: Cn Signal	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GHz ms (32001 pts)	Couple Markers Off Off Select Marker Marker 1 Marker Frequency 48.30530000 GHz Marker Mode Normal Delta (Δ) Fixed Off Delta Marker (Reset Delta)	Settings Peak Search Pkonfig Properties Marker Function Marker Counter
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Scale/Div 10 dB CV 55.0 55.0 55.0 55.0 55.0 55.0 55.0 55.	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GH2 3 ms (32001 pts) 3 ms (12 3 4 5 6 M wwwww P N N N N N 05 300 GH2 15.36 dBµV	Couple Markers Off Off Select Marker Marker 1 Marker 1 Marker 1 Marker 1 Marker 1 Marker 1 Marker Δode Normal Delta (Δ) Fixed Off Delta Marker (Reset Delta) Marker Table Off	Settings Peak Search Pk Search Config Properties Marker Marker Marker Marker Counter
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID: On Scale/Div 10 dB Cog 75.0 55.0 55.0 55.0 55.0 55.0 55.0 55.0	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts) 3 ms (32001 pts) 3 ms (32001 pts) 5 ms (32001 pts) 5 ms (32001 pts) 1 2 3 4 5 6 M www.www P NN N N N 05 300 GHz 15.36 dBµV	Couple Markers Orf Orf Select Marker Marker T Marker Frequency 48.30530000 GHz Marker Mode Normal Delta (Δ) Fixed Off Delta Marker (Reset Delta) Marker Table Off Delta Marker Settings Off	Settings Peak Search Pk Search Properties Marker Marker Counter
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 KEVSIGHT Input: Ext Mixer Signal ID: Cn Signal ID:	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GH2 3 ms (32001 pts) 3 ms (32001 pts) 3 ms (32001 pts) 5 ms (32001 pts) 5 ms (32001 pts) 1 2 3 4 5 6 M wwwww P N N N N 05 300 GH2 15.36 dBµV	Couple Markers Off Off Select Marker Marker 1 Marker Frequency 48.30530000 GHz Marker Mode Normal Delta (Δ) Fixed Off Delta Marker (Reset Delta) Marker Cable Off Delta Marker (Reset Delta) Marker Settings Diagram All Markers Off	Settings Peak Search Pk Search Config Properties Marker Function Marker Counter
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 KEYSIGHT Input: Ext Mixer RL Signal ID: Cr Signal	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GHz ms (32001 pts) Stop 60.00 GHz Stop 60.00 GHz	Couple Markers Off Select Marker Select Marker Marker 1 Marker 3 Marker 1 Marker 3 Marker 3 M	Settings Peak Search Pk Search Config Properties Marker Marker Marker Counter
Start 40.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID: On Signal ID: On Signal ID: On Scale/Div 10 dB Scale/Div 10 dB Scale/Div 10 dB Scale Scale SA Sole Sole Sole Sole Sole Sole Sole Sole	#Video BW	3.0 MHz	Sweep 21.3	Stop 60.00 GHz 3 ms (32001 pts) 3 ms (32001 pts) 3 ms (32001 pts) 3 ms (32001 pts) 5 3 00 GHz 4 5 3 00 GHz 5 1 s (32001 pts) 5 1 s (32001 pts)	Couple Markers Off Off Select Marker Marker 1 Marker Frequency 48.30530000 GHz Marker Mode • Normal • Delta (Δ) • Fixed • Off Delta Marker (Reset Delta) Marker Table • Off Cauple Markers Off Couple Markers Off Couple Markers Off Couple Markers Off	Settings Peak Search Pk Search Properties Marker Marker Counter

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
 Level= SA Reading + Antenna Factor + Cable Loss Distance factor [20*log(3/1) ex: 9.54dB]



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Unwanted Emission 40GHz~60GHz									
Frequency (GHz)	SA Reading (dBuV)	Antenna Factor	Cable Loss	Distance (m)	Level (dBuV/m)	Limit (dBm)	Margin (dB)	Remark	Result
48.3053	21.2	42.51	6.41	1	60.57	87.96	-27.39	Peak	Pass
48.3053	15.36	42.51	6.41	1	54.73	67.96	-13.23	AVG	Pass



Tast Mada:	TX 24GHz	Temp/Hum	01 0(°⊂)/ E70/ DL	
Test Mode.		icinp/riun	24.3(°C)/57%RH	
Test Item	60GHz-90GHz	Test Date	July 25, 2023	
Polarize	Vertical/Horizontal	Test Engineer	Tony Chao	
Detector	Peak			
	Pe	ak		
Spectrum Analyzer 1			Marker 🔻 👯	
RL Signal ID: On Align: Off	Corr CCorr RCal PNO: Fast Freq Ref: Int (S) Gate: Off NFE: Off IF Gain: Low Sig Track: C	#Avg Type: Power (RMS 1 2 3 4 5 6 Avg Hold.>100/100 Trig: Free Run P N N N N M	Select Marker Marker 1	
1 Spectrum v	Ref Level 99 99 dBuV	Mkr1 72.458 0 GHz	72.457950000 GHz	
Log			Marker Mode Search	
80.0			Delta (Δ)	
70.0			Fixed Marker	
60.0			Off	
			Marker→	
50.0			(Reset Delta)	
50.0			Oelta Marker (Reset Delta) Marker Table On	
50.0 40.0 30.0 20.0 automatic provide and the data of			Counter (Reset Delta) Marker Table On Off Marker Settings	
50.0 40.0 30.0 20.0 9.99			Detta Marker (Reset Detta) Marker Table Off Marker Settings Diagram All Markers Off	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz	#Video BW 3.0 MHz	t of the state of the second state of a state of the stat	Counter (Reset Delta) Marker Table Off Marker Settings Diagram All Markers Off Onp Onp All Markers	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz	#Video BW 3.0 MHz	Stop 90.00 GH Sweep 28.9 ms (31001 pt	Counter Counter Marker Table Off Marker Settings Diagram All Markers Off Couple Markers Off Couple Markers	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz The formation of the formatio	#Video BW 3.0 MHz Jul 25, 2023	Stop 90.00 GH Sweep 28.9 ms (31001 pts	Counter Counter Marker Table On Off Marker Settings Diagram All Markers Off Couple Markers On Off	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Start 60.00 GHz #Res BW 1 MHz Start 60.00 GHz #Res BW 1 MHz + + + + + + + + + + + + + + + + + + +	#Video BW 3.0 MHz Jul 25, 2023	Stop 90.00 GH Sweep 28.9 ms (31001 pts age	Counter Marker Table Off Marker Soff Couple Markers Off Couple Markers Off Marker V	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Swept SA	#Video BW 3.0 MHz #Video BW 3.0 MHz Jul 25, 2023 Corr CCorr RCal Freq Ref: Int (S) NFE: Off Sig Track O	Stop 90.00 GH Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts	Delta Marker (Reset Delta) Counter Marker Table Off On Marker Soff Diagram All Markers Off On On Off Select Marker Select Marker	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Spectrum A	#Video BW 3.0 MHz Jul 25, 2023 15:58:20 Corr CCorr RCal Freq Ref. Int (S) Ref. Off Freq Ref. Int (S) Sig Track: O	Stop 90.00 GH: Stop 90.00 GH: Sweep 28.9 ms (31001 pts) Image: Stop 90.00 GH: Sweep 28.9 ms (31001 pts) Image: Stop 90.00 GH: Image: Stop 90.00 GH: <td< td=""><td>Detta Marker (Reset Delta) Marker Table On Off Counter Off Couple Markers Off Couple Markers Off Off Marker 1 Select Marker Marker 1 Marker Frequency 72.457950000 GHz</td></td<>	Detta Marker (Reset Delta) Marker Table On Off Counter Off Couple Markers Off Couple Markers Off Off Marker 1 Select Marker Marker 1 Marker Frequency 72.457950000 GHz	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Supectrum Signal ID On Align: Off CVT Scale/Div 10 dB		Stop 90.00 GH: Stop 90.00 GH: Sweep 28.9 ms (31001 pts Mkr1 72.458 0 GHz 16.40 dBµV	Delta Marker (Reset Delta) Counter Marker Table On Off On Diagram All Marker Soff Couple Markers Off Couple Markers Off Select Marker Marker 1 Marker 1 Marker Frequency Y2.457950000 GHz Peak Search	
50.0 40.0 30.0 20.0 Start 60.00 GHz #Res BW1 MHz Start 60.00 GHz #Res BW1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Sign off Scale/Div 10 dB Log 90.0 9	AVIdeo BW 3.0 MHz #Video BW 3.0 MHz Jul 25, 2023 T5:58:20 Corr CCorr RCal Freq Ref: Int (S) NFE: Off Ref Level 99.99 dBµV	Stop 90.00 GH Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts) S	Delta Marker (Reset Delta) Counter Marker Table Off On Off Off All Marker Soff Couple Markers On Off Off Off Select Marker Select Marker Marker 1 Marker 1 Marker Kreguency Settings Marker Mode Search Normal Pk Search Opelta (Δ) Delta (Δ)	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Start 60.00 GHz #Res BW 1 MHz EXT Spectrum Analyzer 1 Spectrum Analyzer 1 Signal ID On Align Off CV Scale/Div 10 dB 90.0	Wideo BW 3.0 MHz Jul 25, 2023 Jul 25, 2023 Total State Jul 25, 2023 Market State Jul 25, 2023 Market State Jul 25, 2023 State Jul 25, 2023 Market State State Corr Ccorr RCal Freq Ref: Int (S) Sig Track: O Ref Level 99.99 dBµV	Stop 90.00 GH Sweep 28.9 ms (31001 pts Avg Hold 1/100 Trg. Free Run Mkr1 72,458 0 GH2 16.40 dBµ	Delta Marker (Reset Delta) Counter Marker Table On Off Counter Off Marker Soff Couple Markers Off Off Couple Markers Off Off Select Marker Marker 1 Image: Couple Marker Off Marker 1 Image: Couple Marker Image: Couple Marker Image: Couple Marker	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Soportrum V Scale/Div 10 dB Log 90.0 80.0 70.0 60.0	Jul 25, 2023 Image: Control of the second	Stop 90.00 CH Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts) S	Delta Marker (Reset Delta) Counter Marker Table Orf Counter Orf Orf All Marker Soff Diagram All Markers Off Orf Couple Markers Orf Or Orf Select Marker Select Marker Marker Frequency Settings 72.457950000 GHz Peak Search Normal Pk Search Orf Properties Fixed Marker Off Marker	
50.0 40.0 30.0 20.0 20.0 10.0 9.99 99 Start 60.00 GHz #Res BW 1 MHz Impute Start 60.00 GHz Spectrum Analyzer 1 Spectr	AVideo BW 3.0 MHz AVideo BW 3.0 Mideo BW AVideo BW 3.0 MHz AVideo BW 3.0 Mideo BW AVideo BW AVideo BW AVideo BW 3.0 Mideo BW AVideo BW	Stop 90.00 GH Sweep 28.9 ms (31001 pts Avgl+od: 1/100 Trg: Free Run Mkr1 72.458 0 GH 16.40 dBµ	Detta Marker (Reset Delta) Counter On Off On Off Marker Table Off Counter On Off Off Marker Settings Diagram On On Off Off Select Markers On Marker 1 ✓ Marker Frequency Settings YZ-457950000 GHz Settings Marker Mode Search Config Normal Pk Search Config Detta (Δ) Fixed Marker Marker Off Marker	
50.0 40.0 30.0 10.0 20.0 10.0 9.99 10.0 Start 60.00 GHz #Res BW1 MHz Image: Start 60.00 GHz Spectrum Analyzer 1 Swept SA Sympet SA Spectrum Analyzer 1 Spectrum Analyzer 1 Start 60.00 GHz Swept SA Sonal ID On Align Off Sonal ID On GHZ Jog Sonal ID On GHZ GUID ID GB Sonal ID On GHZ Imput Ext Mixer GUID ID GB GO GO GO GO GO GO GO GO GO GO GO GO GO GO GO GO GO GO<	Image: Second	Stop 90.00 GH: Stop 90.00 GH: Sweep 28.9 ms (31001 pts	Delta Marker (Reset Delta) Counter Marker Table On On ✓ Marker Settings Diagram Counter All Marker SOff On Couple Markers On On Off Select Marker V Marker T V Marker T V Marker Frequency Settings Marker Frequency Settings Normal Peak Search Normal Properties Fixed Marker Off Marker Off Marker Off Marker Off Marker Delta (Δ) Properties Fixed Marker Off Marker Off Marker Off On	
50.0 40.0 30.0 9.9 Start 60.00 GHz #Res BW1 MHz Imput Ext Mixer 1 Spectrum Analyzer 1 Swept SA Sign: Off Scale/Div 10 dB 90.0 80.0 70.0 80.0 90.0 <t< td=""><td>Wideo BW 3.0 MHz Wideo BW 3.</td><td>Stop 90.00 GH Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts</td><td>Delta Marker (Reset Delta) Counter Marker Table Orf Orf Marker Settings Diagram Counter All Marker Soff On On Off Select Marker Imarker Frequency Zettings Settings Marker Trequency Settings Marker Mode Peak Search Normal Pk Search Off Properties Fixed Marker Off Marker Off Marker Delta (Δ) Properties Fixed Marker Off Marker Off Counter Or Off</td></t<>	Wideo BW 3.0 MHz Wideo BW 3.	Stop 90.00 GH Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts) Sweep 28.9 ms (31001 pts	Delta Marker (Reset Delta) Counter Marker Table Orf Orf Marker Settings Diagram Counter All Marker Soff On On Off Select Marker Imarker Frequency Zettings Settings Marker Trequency Settings Marker Mode Peak Search Normal Pk Search Off Properties Fixed Marker Off Marker Off Marker Delta (Δ) Properties Fixed Marker Off Marker Off Counter Or Off	
50.0 40.0 30.0 20.0 9.99 Start 60.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Sognal ID: On Align Off 20.0 1 Spectrum v Scale/Div 10 dB 10.0	Wideo BW 3.0 MHz Jul 25, 2023 Jul 25, 2023 Total 15:58:20 Corr Ccorr RCal PNO: Fast Freq Ref: Int (S) Ref Level 99.99 dBµV Image: Corr RCal PNO: Fast Gain: Lov Sig Track: Of	Stop 90.00 GH Stop 90.00 GH Sweep 28.9 ms (31001 pts Image: Stop 90.00 GH	Detta Marker (Reset Delta) Counter On Off On All Marker Soff On On Off Off Select Markers On Marker Frequency Settings YZ-457650000 GHz Peak Search Marker Mode Peak Search Normal Pk Search Detta (Δ) Properties Fixed Marker Marker Table Off Off Detta Marker Off Marker Marker Marker Table Off Marker Search Pix Search Counter Off Marker Table Off	
50.0 40.0 30.0 20.0 Start 60.00 GHz #Res BW 1 MHz Start 60.00 GHz #Res BW 1 MHz Spectrum Analyzer 1 Spectrum Input: Ext Mixer R L Spectrum Scale/Div 10 dB Log 90.0 80.0 70.0 60.0 50.0 40.0 50	Image: state of the state o	Stop 90.00 GH; Stop 90.00 GH; Sweep 28.9 ms (31001 pts	Delta Marker (Reset Delta) Counter Marker Table On Off On Diagram Counter All Marker Soff Diagram All Markers Off Couple Markers On Off On Counter Select Marker On Off Narker V V Select Marker 1 V V V Marker Frequency 72.457950000 GHz Peak Search Peak Search Normal Pk Search Pk Search Delta (Δ) Properties Marker Off Delta (Δ) Properties Fixed Marker Marker Marker Table Off Ounter Off Delta Marker Counter Off Marker Soff Counter Off All Marker Soff Counter Off Diagram All Markers Off Ouple Markers Soff Couple Markers E	
50.0 40.0 30.0 20.0 Start 60.00 GHz #Res BW1 MHz Spectrum Analyzer 1 Swept SA Spectrum Analyzer 1 Swept SA Sign Off Scale/Div 10 dB Log 90.0 80.0 70.0 60.0 60.0 9	Juli 25, 2023 Image: Control of the second seco	Stop 90.00 GH Sweep 28.9 ms (31001 pts Sweep 28.9 ms (31001 pts Agge #Avg Type: Power (RMS) Agge #Avg Type: Power (RMS) Market 1 (2 3 4 5 0) Mkr1 72.458 0) 16.40 dBµV Stop 90.00 GH	Delta Marker (Reset Delta) Counter Marker Table Orf Counter Marker Settings Diagram Counter All Markers Off On On Off Select Marker Settings Marker Trequency Settings VZ-457950000 GHz Settings Paak Search Normal Pk Search Off Delta (Δ) Properties Marker Marker Table Off Off Marker Off Marker Off Marker Off Marker Off Marker Marker Soff Counter Off Off Marker Soff Counter Off Off Marker Soff Counter Off Off Off Off	

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
 Level= SA Reading + Antenna Factor + Cable Loss Distance factor [20*log(3/1) ex: 9.54dB]



Report No.:	TMWK2307002566KR
1.0000111011	

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Unwanted Emission 60GHz~90GHz										
Frequency (GHz)	SA Reading (dBuV)	Antenna Factor	Cable Loss	Distance (m)	Level (dBuV/m)	Limit (dBm)	Margin (dB)	Remark	Result	
72.45795	21.01	46.00	6.41	1	63.88	87.96	-24.08	Peak	Pass	
72.45795	16.4	46.00	6.41	1	59.27	67.96	-8.69	AVG	Pass	



Test Mode:	TX_24	Temp/Hum		24.3(°C)/ 57%R⊦		
Test Item	90GHz-10	00GHz	Test D	Date	July 25, 2023	
Polarize	Vertical/Ho	orizontal	Test Engineer		Tony Chao	
Detector	Pea	Peak			,	
		Peak				
Spectrum Analyzer 1	F				Marker	· · · · · · · · · · · · · · · · · · ·
KEYSIGHT Signal ID: On	Corr CCorr RCal Freg Ref: Int (S)	PNO: Fast Gate: Off	#Avg Type: Power (F Avg Hold:>100/100	RMS123456	Select Marker	
Align: Off	NFE: Off	IF Gain: Low Sig Track: Off	Trig: Free Run	PNNNN	Marker Frequency	
1 Spectrum Scale/Div 10 dB	Ref Level 8	6.99 dBuV	Mkr1 90	6.610 6 GHz 20.71 dBuV	96.610600000 GHz	Settings
Log					Marker Mode	Search
77.0					Delta (A)	Pk Search Config
67.0					Fixed	Properties
47.0					Off	Marker Function
37.0					Delta Marker	Marker→
27.0					(Reset Delta) Marker Table	Counter
17.0					On Off	
6.99					Marker Settings Diagram	
-3.01					All Markers Off	
						Local
Start 90.000 GHz	#Video BW	/ 3.0 MHz	Si	top 100.000 GHz	Couple Markers On	
Start 90.000 GHz #Res BW 1 MHz	#Video BW	/ 3.0 MHz	St Sweep 10.7	top 100.000 GHz 7 ms (20000 pts)	Couple Markers On Off	
Start 90.000 GHz #Res BW 1 MHz	#Video BV		Si Sweep 10.7	top 100.000 GHz 7 ms (20000 pts)	Couple Markers On Off	
Start 90.000 GHz #Res BW 1 MHz	#Video BV	Averaç	Si Sweep 10.7	top 100.000 GHz 7 ms (20000 pts)	Couple Markers On Off	
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1	#Video BV	Averaç PNO: Fast	Si Sweep 10.7	top 100.000 GHz 7 ms (20000 pts)	Couple Markers On Off Trace	• 👯
Start 90.000 GH2 #Res BW 1 MHZ Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL C Start I D On Align. Off	#Video BV Jul 25, 2023	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Sisweep 10.7	top 100.000 GHz 7 ms (20000 pts)	Couple Markers Off Off Trace Select Trace Trace 1	• 👯
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Nalign. Off	#Video BV	Average PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Sweep 10.7 Sweep 10.7 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Top 100.000 GHz T ms (20000 pts) RMS 12 3 4 5 6 MWW WWW P N N N N 6.610 6 GHz	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write	Trace Control
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Signal ID On Align Off UT Scale/Div 10 dB	#Video BW Jul 25, 2023	PNO: Fast Gate: off IF Gain: Low Sig Track: Off 6.99 dBpV	Sweep 10.7 Sweep 10.7 I I I I I C #Avg Type: Power (f Avg Hold: 2/100 Trig: Free Run Mkr1 9	RMS 12 3 4 5 6 M WWWWW P N N N N 6.610 6 GHz	Couple Markers Off Off Trace Select Trace Trace 1 Trace Type Clear / Write Trace Average	Trace Control Detector
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Sale/Div 10 dB Log 77.0	#Video BV	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 6.99 dBpV	Sweep 10.7 Sweep 10.7 It I I I I I I I I I I I I I I I I I I	top 100.000 GHz 7 ms (20000 pts)	Couple Markers On Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold	Trace Control Detector Math
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID: On Scale/Div 10 dB Cog 77.0 67.0	#Video BV	Averaç PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 6.99 dBµV	Kana Kana Kana Kana Kana Kana Kana Kana	RMS 12 3 4 5 6 MWS 12 3 4 5 6 MWW WWW P N N N N 6.610 6 GHz 15.07 dBµV	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold	Trace Control Detector Math Trace Function
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Signal ID on Scale/Div 10 dB Co 77.0 67.0 57.0	#Video BV	Averac PNO: Fast Gate: Off IF Gein: Low Sig Track: Off 6.99 dBµV	#Avg Type: Power (f Avg Hold: 2/100 Trig: Free Run Mkr1 90	RMS 1 2 3 4 5 6 MWS 1 2 3 4 5 6 MWW WWW PNNNNN 6.610 6 GHz 15.07 dBµV	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Restart Max Hold	Trace Control Detector Math Trace Function Normalize
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer RL Signal ID On Scale/Div 10 dB Scale/Div 10 dB	#Video BW Jul 25, 2023	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 6.99 dBµV	Avg Hold: 2/100 Trig: Free Run	RMS 12 3 4 5 6 M WWWWW P N N N N 6.610 6 GHz 15.07 dBµV	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Restart Max Hold View/Blank	Trace Control Detector Math Trace Function Normalize
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Scale/Div 10 dB Log 77.0 67.0 57.0 47.0 37.0 27.0	#Video BV	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Sweep 10.7	RMS 12 3 4 5 6 MWS 12 3 4 5 6 MWW WWW P N N N N 6.610 6 GHz 15.07 dBµV	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Restart Max Hold View/Blank Active	Trace Control Detector Math Trace Normalize
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 KEYSIGHT Input Ext Mixer Sign. Off CV Scale/Div 10 dB Log 77.0 67.0 57.0 47.0 37.0 27.0 17.0	#Video BV	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Sweep 10.7	RMS 2 3 4 5 6 MWW WWW P N N N N N 6.610 6 GHz 15.07 dBµV	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Kestart Max Hold View/Blank Active View	Trace Control Detector Math Trace Function Normalize
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer RL Signal ID: On Align: Off Scale/Div 10 dB Cog 77.0 67.0 57.0 47.0 37.0 27.0 1.0 9 9	#Video BW Jul 25, 2023 I6:20:31 Corr CCorr RCal Freq Ref: Int (S) NFE: Off Ref Level 8	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power (f Avg Hold: 2/100 Trig: Free Run Mkr1 90	Top 100.000 GHz 7 ms (20000 pts) Image: Comparison of the system of the	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Restart Max Hold View/Blank Active View Blank	Trace Control Detector Math Trace Function Normalize
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input: Ext Mixer Signal ID: On Scale/Div 10 dB Log 77.0 67.0 57.0 47.0 37.0 27.0 17.0 6.99 -3.01	#Video BW Jul 25, 2023 Control Contr	Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 6.99 dBpV	#Avg Type: Power (f Avg Hold: 2/100 Trig: Free Run Mkr1 9	top 100.000 GHz 7 ms (20000 pts)	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Kestart Max Hold View/Blank Active View Blank Background	Trace Control Detector Math Trace Function Normalize
Start 90.000 GHz	#Video BV	Z 3.0 MHz Averac PNO: Fast Gate: Off IF Gain: Low Sig Track: Off 6.99 dBµV	Karley Sister State Stat	top 100.000 GHz 7 ms (20000 pts) 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Kestart Max Hold View/Blank Active View Blank Background Trace Settings Table	Trace Control Detector Math Trace Function Normalize
Start 90.000 GHz #Res BW 1 MHz Spectrum Analyzer 1 Swept SA KEYSIGHT Input Ext Mixer Scale/Div 10 dB Log 77.0 67.0 57.0 47.0 57	#Video BV	Averac PNO: Fast Gato: Off IF Gain: Low Sig Track: Off 6.99 dBµV	E HAvg Type: Power (f Avg]Hold: 2/100 Thg. Free Run Mkr1 90 Mkr1 90 Sweep 7. Sweep 7.	top 100.000 GHz 7 ms (20000 pts) 7 ms (20000 pts) 7 ms (20000 pts) 7 ms (20000 pts) 7 ms (2000 pts) 7 ms (20000 pts) 7 ms (20000 pts) 7 ms (20000 pts)	Couple Markers Off Off Select Trace Trace 1 Trace Type Clear / Write Trace Average Max Hold Min Hold Restart Max Hold View/Blank Active View Blank Background Trace Settings Table	Trace Control Detector Math Trace Function Normalize

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
 Level= SA Reading + Antenna Factor + Cable Loss Distance factor [20*log(3/1) ex: 9.54dB]



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Report No.: TMWK2307002566KR

Unwanted Emission 90GHz~100GHz										
Frequency (GHz)	SA Reading (dBuV)	Antenna Factor	Cable Loss	Distance (m)	Level (dBuV/m)	Limit (dBm)	Margin (dB)	Remark	Result	
96.6106	20.71	49.60	7.29	1	68.06	87.96	-19.90	Peak	Pass	
96.6106	15.07	49.60	7.29	1	62.42	67.96	-5.54	AVG	Pass	

- End of Test Report -