

ELECTROMAGNETIC EMISSIONS **COMPLIANCE REPORT**



Applicant:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Manufacturer:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Product Name:	Qualcomm WiFi 7/BT Combo module
Brand Name:	Qualcomm
Model No.:	QCNCM825
Model Difference:	N/A
Report Number:	TERF2403000774E2
FCC ID	MSQ-QCNCM825
Date of EUT Received:	March 26, 2024
Date of Test:	March 27,2024~April 08,2024
Issue Date:	April 24, 2024
	ALNO HSieh

Approved By

Arno Hsieh

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.407.

The results of this report relate only to the sample identified in this report.

t (886-2) 2299-3279

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Revision History									
Report Number	Revision	Description	Issue Date	Revised By	Remark				
TERF2403000774E2	00	Original.	April 24, 2024	Karen Huang					

Note:

1 · Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received. And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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GENERAL INFORMATION 1

1.1 **Product Description**

Product Name:	Qualcomm WiFi 7/BT Combo module
Brand Name:	Qualcomm
Model No.:	QCNCM825
Model Difference:	N/A
Power Supply of Host:	11.67Vdc for Rechargeable Li-Polymer Battery Pack or 5 / 9 / 15 / 20V from AC/DC Adapter
Host Information:	Product Type: Notebook PC Brand Name: ASUS Model Name: S5507Q, S5507QA, S5507QAD, K5507Q, V5507Q, P5507CQ All models are electrically identical, different model names are for marketing purpose.

1.2 **Modulation & Data Rate**

Modulation type	4096QAM, 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK
Transfer Rate	802.11 a: up to 54 Mbps 802.11 n: up to MCS7 802.11 ac: up to MCS9 802.11 ax: up to MCS11 802.11 be: up to MCS13

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1.3 **Antenna Designation**

Antenna Type	Main / Aux	Freq. (MHz)	Peak Antenna Gain (dBi)
		5150~5250	2.95
		5250~5350	2.98
	Main	5470~5725	3.79
		5725~5850	3.88
		5850~5895	3.37
PIFA -	Aux	5150~5250	1.29
		5250~5350	1.29
		5470~5725	2.01
		5725~5850	2.07
		5850~5895	2.52

Note:

- 1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
- 2. Antenna information is provided by the applicant.

Operation Frequency 1.4

Operation Frequency	5180 ~ 5320MHz, 5500 ~ 5700MHz, 5745 ~ 5885MHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20), 802.11be (EHT20): 28 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40), 802.11be (EHT40): 14 802.11ac (VHT80), 802.11ax (HE80), 802.11be (EHT80): 7 802.11ac (VHT160), 802.11ax (HE160), 802.11be (EHT160): 3

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1.5 **Test Methodology of Applied Standards**

FCC Part 15, Subpart E §15.407 FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 FCC KDB 662911 D01 Multiple Transmitter Output v02r01 FCC KDB 291074 D02 EMC Measurement v01 ANSI C63.10:2013

1.6 **Test Facility**

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
		SAC 1		
		SAC 2		
		SAC 3		
	No. 124 Mar Kung Dood Now Toingi	Conduction 1		
	No.134, Wu Kung Road, New Taipei	Conducted 1	T\4/0027	TW3702
	Industrial Park, Wuku District, New Taipei City, Taiwan.	Conducted 2	TW0027	
	Taiper City, Taiwan.	Conducted 3		
		Conducted 4	-	
		Conducted 5		
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.	No 2 Kaji 4et Dd. Quishen District	Conduction C	-	
(TAF code 3702)		SAC C		
		SAC D		
		SAC G		
		Conducted A		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conducted B	TW0028	
	Tabydan City, Taiwan 555	Conducted C]	
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		
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1.7 **Special Accessories**

There are no special accessories used while test was conducted.

1.8 **Equipment Modifications**

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION 2

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 which intends to maximize its emission characteristics in a continuous normal application.

2.2 **EUT Exercise**

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 **Test Procedure**

2.3.1 **Conducted Emissions**

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 **Radiated Emissions**

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m 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. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

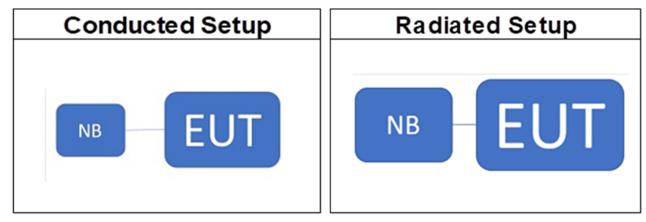
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

2.5 **Test Configuration**



2.6 Control Unit(s)

Conducted Emission Test Site: Conducted C								
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.								
LAN Cable AMP AMP-6e N/A N/A N/A								
	Radiated Emission Test Site: SAC C							
EQUIPMENT TYPE MFR MODEL NUMBER SERIAL NUMBER LAST CAL. CAL DUE.								
USB to RJ45	TP-Link	UE300	22085L3000699	N/A	N/A			

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SUMMARY OF TEST RESULT 3

FCC Rules	Description Of Test	Result
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.205 §15.209 §15.407(b)	Undesirable Radiated Emissions	Compliant

Note:

1. All of test item are based on client's request.

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DESCRIPTION OF TEST MODES 4

4.1 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.
- Therefore, below summary is the modes of test configuration that yield the highest read-4. ing and generate the highest emission chosen to carry out the relevantly mandatory test items.

CONDUCTED TEST							
MODE	FREQUENCY	AVAILABLE	TESTED		DATA RATE	ANTENNA	
MODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	(Mbps)	PORT	
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	2TX	
	5210	42	42	OFDM	MCS0		
802.11ac VHT80	5290	58	58			2TX	
002.1180_011100	5530~5610	106 to 122	106,122			217	
	5775	155	155				
802.11ac_VHT160	5250	50	50	OFDM	MCS0	2TX	
	5570	114	114		MC30	217	

TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)							
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA	
MODE	BAND (MHz)	CHANNEL	CHANNEL	WODULATION	(Mbps)	PORT	
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	2TX	
	5210	42	42	OFDM	MCS0	2TX	
802.11ac_VHT80	5290	58	58				
002.1180_011100	5530~5610	106 to 122	106,122				
	5775	155	155				
802.11ac_VHT160	5250	50	50	OFDM	MCS0	2TX	
	5570	114	114	OFDM	OFDM MICSU	218	

Note:

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (NB/PAD) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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MEASUREMENT UNCERTAINTY 5

Test Items	Un	Uncertainty				
AC Power Line Conducted Emission	+/-	1.54	dB			
Output Power measurement	+/-	0.97	dB			
Emission Bandwidth	+/-	1.38	Hz			
Conducted emission measurement	+/-	0.77	dB			
Peak Power Density	+/-	0.61	dB			
Temperature	+/-	0.6	°C			
Humidity	+/-	3	%			
DC / AC Power Source	+/-	1	%			

Radiated Spurious Em	nissior	n Measur	rement	Uncertainty
	+/-	1.89	dB	9kHz~30MHz
Polarization: Vertical	+/-	4.15	dB	30MHz - 1000MHz
	+/-	3.43	dB	1GHz - 18GHz
	+/-	3.86	dB	18GHz - 40GHz
	+/-	1.89	dB	9kHz~30MHz
Polarization: Horizontal	+/-	4.02	dB	30MHz - 1000MHz
	+/-	3.43	dB	1GHz - 18GHz
	+/-	3.86	dB	18GHz - 40GHz
	+/-	2	dB	33GHz-50GHz
	+/-	1.59	dB	50GHz-60GHz
Radiated Spurious Emission	+/-	1.7	dB	60GHz-90GHz
	+/-	1.64	dB	90GHz-140GHz
	+/-	3.83	dB	140GHz-220GHz

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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MEASUREMENT EQUIPMENT USED 6

6.1 **Condcuted Measurement**

Conducted Emission Test Site: Conducted C									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	05/23/2023	05/22/2024				
Power Meter	Anritsu	ML2496A	2138002	08/31/2023	08/30/2024				
Power Sensor	Anritsu	MA2411B	1911390	08/31/2023	08/30/2024				
Power Sensor	Anritsu	MA2411B	1911398	08/31/2023	08/30/2024				
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R				
Attenuator	Woken	WATT-218FS-10	RF18	11/15/2023	11/14/2024				
Attenuator	Woken	WATT-218FS-10	RF19	11/15/2023	11/14/2024				
DC Block	PASTERNACK	PE8210	RF155	11/15/2023	11/14/2024				

6.2 **Radiated Measurement**

	Radiated Emission Test Site: SAC C										
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.						
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/24/2024	01/23/2025						
3m Site NSA	SGS	966 chamber C	N/A	03/02/2024	03/01/2025						
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071574	06/29/2023	06/28/2024						
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R						
Pre-Amplifier	EMC Instruments	EMC118A45SE	980789	11/15/2023	11/14/2024						
Attenuator	Woken	WATT-218FS-10	RF03	11/15/2023	11/14/2024						
Coaxial Cables	Woken	00100A1F2A196C	RF95	11/15/2023	11/14/2024						

NOTE: N.C.R refers to Not Calibrated Required.

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MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 7

7.1 Standard Applicable

7.1.1 **Duty Cycle**

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

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FCC 7.1.2

			e-CRF Title 47 §15.407							
Band	С	EUT ATEGORY	Conducted Output Power	EIRP	TPC	Antenna Directional Gain Requirements				
		Fixed point-to- point	1 Watt(30dBm)	Not required	Not required	23dBi				
U-NII-1		Outdoor AP	1 Watt(30dBm)	Elevation angle above 30 degrees 125mW (21dBm)	Not required	6dBi				
U-INII-1		Indoor AP	1 Watt(30dBm)	Not required	Not required	6dBi				
	V	Other	250mW(23.98dB m)	Not required	Not required	6dBi				
U-NII-2A	V	Other	250mW(23.98dB m) or 11dBm+10 log B	Not required	When EIRP >500mW At least 6dB below EIRP 1W (30dBm)	6dBi				
U-NII-2C	v	Other	250mW(23.98dB m) or 11dBm+10 log B	Not required		6dBi				
	V	Other	1 Watt(30dBm)	Not required	Not required	6dBi				
U-NII-3		Fixed point-to- point	1 Watt(30dBm)	Not required	Not required	Not required				
		Indoor AP (a channel spans 5725~5850 and 5850~5895MHz)	Not required	36dBm	Not required	Not required				
U-NII-4	v	indoor client (a channel spans 5725~5850 and 5850~5895MHz)	Not required	30dBm	Not required	Not required				
		subordinate device	Not required	36dBm	Not required	Not required				

1. If transmitting antennas of directional gain greater than the antenna requirements column, the Maximum transmit power shall be reduced by the amount in dB that the direction-al gain of the antenna. 2. For the 10 log B, B is the 26 dB emission bandwidth.

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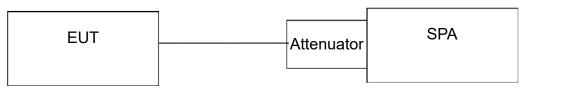
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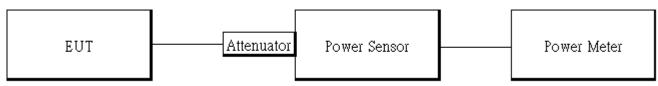


7.2 Test Setup

7.2.1 **Duty Cycle**



7.2.2 **Output Power**



7.3 **Measurement Procedure**

7.3.1 **Duty Cycle Measurements**

- 1. Set span = Zero
- 2. RBW = 8MHz
- VBW = 8MHz,
- 4. Detector = Peak

7.3.2 **Output Power Measurements**

- 1 Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules . 2.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- Power Meter is used as the auxiliary test equipment to conduct the output power meas-4. urement.
- Record the max. reading and add 10 log(1/duty cycle). 5.
- Repeat above procedures until all frequency (low, middle, and high channel) measured 6. were complete.
- MIMO mode: offset is set with "measure and add 10 Log (N)" to measurement for MIMO mode. Offset = 7. cable loss + 10 log (N), where N is number of transmitting antenna, cable loss is specified below.

Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

www.sqs.com.tw

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• DirectionalGain =
$$10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream; NSS = the number of independent spatial streams of data; NANT = the total number of antennas $g_{j,k}$ = / 20 10Gk if the kth antenna is being fed by spatial stream j, or zero if it is not; G_k is the gain in dBi of the kth antenna.

The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

7.4 **Duty Cycle Measurement Result**

Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11n_40	99.62	0.02	0.21	0.01
802.11ac_80	98.71	0.06	0.73	0.01
802.11ac_160	97.84	0.09	1.23	2.00

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4 5 C 1 224

802.11n 40MHz Chain0 5190MHz Spectrum Analyzer 1 Swept SA • + Frequency . Ö KEYSIGHT Input RF at 7 50 0 30 49 FNO: Fast Gate: Off Aug Type N Trig: Free R Center Fr 5.190000000 GHz Corrections: Off Freq Ref. Int (S) Settings ++ Align: Auto Track Of PNNNN LUT . Span 0.00000000 Hz 1 Spectrum kr3 4.746 m Ref Lvi Offset 11.50 dB A Scale/Div 10 dB 0.95 d Swept Span Zero Span Full Span Start Freq 5.1900 IN CH Stop Freq 5.190000 AUTO TUNE #Video BW 8.0 MHz 00 GH Span 0 Hz Sweep 20.0 ms (10001 pts) Center 5.190000 Res BW 8 MHz CF Step 8.000000 MHz Auto Man Mode Trace Scale Function Function Width Function Value X Y 4.728 ms (Δ) 5.55 4.678 ms 8.752 4.746 ms (Δ) 0.947 4.678 ms 8.752 (Δ) 12 Freq Offse 0 Hz (Δ) 44 X Axis Sca Log Lin xis Scale 4 10 C 1 2024 10:32:48 AM X .:: 📎 802.11ac_80MHz_Chain0_5210MHz Spectrum Analyzer 1 Swept SA • + Ö Frequency . KEYSIGHT Input RF PNO: Fast Gate: Off IF Gain: Low Sig Track: Of in 30 dB Avg Type Voltage Trig: Free Run Center Frequency 5.210000000 GHz Settings Corrections: Off Freq Ref: Int (S) -Align: Auto PNNNN LUT . Span 1 394 Ref Lvi Offset 11.50 dB Ref Level 30.00 dBm 0.00000000 Hz Scale/Div 10 dB 6.51 d Swept Span Full Spa X art Freq 5.210000000 GHz Stop Freq 5,210000000 GHz AUTO TUNE r 5 210 EVideo BW 8.0 MHz Snan 0 k Res BW 8 MHz eep 20.0 ms (10001 p CF Ster 8.000000 MH Marker Table Auto Man Mode Trace Sci Function Function Width Function Value X 1.376 ms (Δ) 12.53 dB (Δ) Freq Offset 550.0 μs -0.6187 dBm 1.394 ms (Δ) 6.514 dB 550.0 μs -0.6187 dBm 0 Hz 3 44

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23.98

PASS

17.20



7.5 **Output Power Measurement Result**

7.5.1 FCC Output power

5570

114

802.11n_HT40_2TX

СН	Frequency	Data	Power	Avg. POW	/ER (dBm)	TOTAL POWER	TOTAL POWER	REQUIRED LIMIT	RESULT
GIT	(MHz)	Rate	Setting		Ch1	(mW)	(dBm)	(dBm)	RESOLT
151	5755	MCS0	12	15.90	13.27	60.137	17.79	29.97	PASS
159	5795	MCS0	12	15.73	13.50	59.798	17.77	29.97	PASS
802.11ac_VH	T80_2TX								
	Frequency	Data	Power	Avg. POW	/ER (dBm)	TOTAL	TOTAL	REQUIRED	
СН	(MHz)	Rate	Setting		. ,	POWER	POWER	LIMIT	RESULT
	(IVITIZ)	Rale	Setting	Ch0	Ch1	(mW)	(dBm)	(dBm)	
42	5210	MCS0	6	15.58	14.10	61.845	17.91	23.98	PASS
58	5290	MCS0	6.5	15.42	13.80	58.822	17.70	23.98	PASS
106	5530	MCS0	6.5	15.41	13.79	58.687	17.69	23.98	PASS
122	5610	MCS0	6.5	15.53	13.85	59.993	17.78	23.98	PASS
155	5775	MCS0	11.5	15.71	13.78	61.117	17.86	29.97	PASS
802.11ac_VH	IT160_2TX								
	Fraguanay	Dete	Douror	Ava. POW	/ER (dBm)	TOTAL	TOTAL	REQUIRED	
СН		Frequency Data (MHz) Rate	Power		· ,	POWER	POWER	LIMIT	RESULT
	(MHz)		Setting	Ch0	Ch1	(mW)	(dBm)	(dBm)	
50	5250	MCS0	7.5	14.20	12.76	45.183	16.55	23.98	PASS

7

14.91

13.32

52.452

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MCS0

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UNDESIRABLE RADIATED EMISSION MEASUREMENT 8

8.1 Standard Applicable

 $EIRP = ((E^*d)^2) / 30$, where E is the field strength in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

8.1.1 5150~5850 MHz

Applicable	Operation	EIRP		Field Strength	
to	Freq. (MHz)	Freq. (MHz)	Limits (dBm/MHz)	@ 3m	
15.407(b)(1) RSS-247 §6.2.1.2	5150~5250	f ≤ 5150			
15.407(b)(2) RSS-247 §6.2.2.2	5250~5350	f ≥ 5350	PK: -27	PK: 68.2	
15.407(b)(3) RSS-247 §6.2.3.2	5475~5725	f ≤ 5470 f ≥ 5725			
		at 75 MHz or more above or be- low the band edge	PK:-27	PK: 68.2	
15.407(b)(4)(i) RSS-247 §6.2.4.3	5725~5850	increasing linearly from 75~25MHz above or below the band edge	PK:-27~10		
ROO-241 90.2.4.3		increasing linearly from 25~5MHz above or below the band edge	PK:10~15.6	PK: 105.2~110.8	
		increasing linearly from 5~0 MHz above or below the band edge	PK: 15.6~27	PK:110.8~122.2	

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8.1.2 5850~5925 MHz

Annliaghla	Operation		EIRP		Field
Applicable to	Freq. (MHz)	ETU categories	Freq. (MHz)	Limits (dBm/MHz)	Strength @ 3m (dBµV/m)
15.407(b)(5)(i)		indoor AP or subordinate device			PK:110~102
15.407(b)(5)(ii)		Client device	5895 ~ 5925MHz and above	PK:-5~-27	PK:90~68
	5850~5895 or channel span cross 5725~5895		At 5650	PK:-27	PK:68
		Client / indoor AP / subordinate device	increasing linearly from 5650~5700	PK:-27~10	PK:68~105
15.407(b)(5)(iii)			increasing linearly from 5700~5720	PK:10~15.6	PK:105~110.6
			increasing linearly from 5720~5725	PK:15.6~27	PK:110.6~122

8.1.3 **Spurious Emission**

Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.

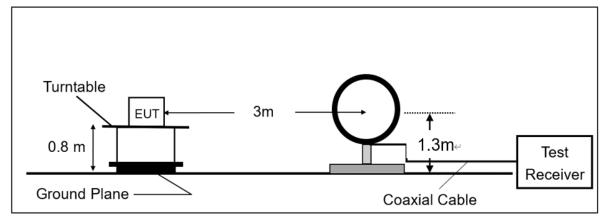
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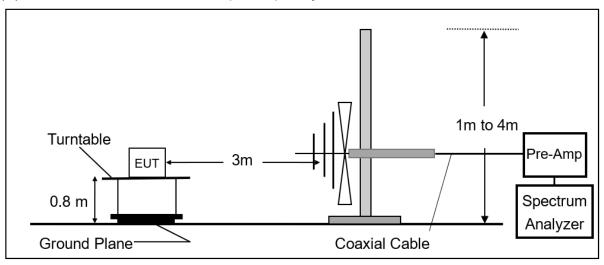


8.2 Test Setup

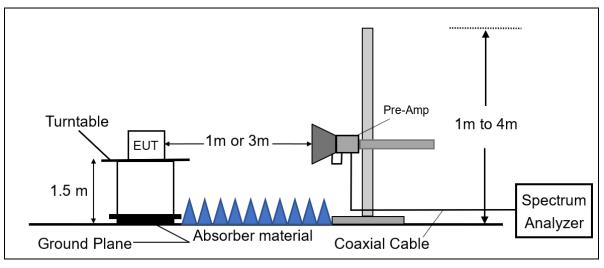
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz



(C) Radiated Emission Test Set-Up, Frequency Above 1GHz



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8.3 Measurement Procedure

- 1. The testing follows FCC KDB 789033 D02.
- **2.** The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- **3.** The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- **4.** EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- **5.** Set the spectrum analyzer as RBW=100 kHz and VBW=300 kHz for Peak Detector (PK) at frequency between 30MHz and 1 GHz
- **6.** Use receiver mode as RBW=120 kHz for Quasi-peak (QP) at frequency between 30MHz and 1 GHz.
- **7.** Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Maximum Emission Measurements at frequency above 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Emission Measurements at frequency above 1 GHz.
- **9.** When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- **10.** Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- **11.** And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- **12.** Repeat above procedures until all frequency measured were complete.

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8.4 **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = *Field Strength*

RA = Reading Amplitude AF = Antenna Factor

CL = *Cable Attenuation Factor (Cable Loss)* AG = Amplifier Gain

The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB) Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

8.5 Test Results of Radiated Spurious Emissions from 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

Pre-scan was done at frequency 5.47 GHz and 5.85 GHz for bandedge measurement of straddle channels 138, 142 and 144 which was 20dB lower than the limit per 15.31(o) was not reported.

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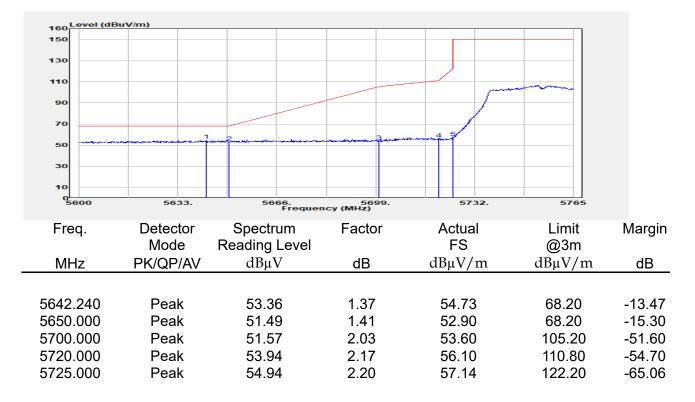




Radiated Spurious Emission Measurement Result 8.6

8.6.1 Band edge falling to restricted band

Report Number	:TERF2403000774E2	Test Site	:SAC C
Operation Mode	:802.11n40	Test Date	:2024-04-08
Test Frequency	:5755 MHz	Temp./Humi.	:19.9°C/69%
Test Mode	:Bandedge	Antenna Pol.	:Vertical
EUT Pol	:NB Plane	Engineer	:Howard Haung



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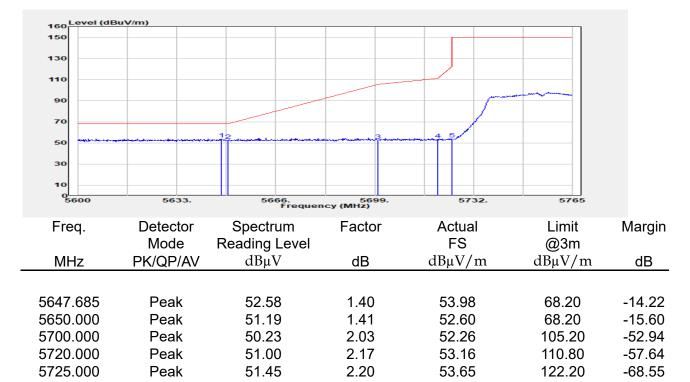
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Report No.: TERF2403000774E2 Page: 25 of 47



Report Number	:TERF2403000774E2
Operation Mode	:802.11n40
Test Frequency	:5755 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



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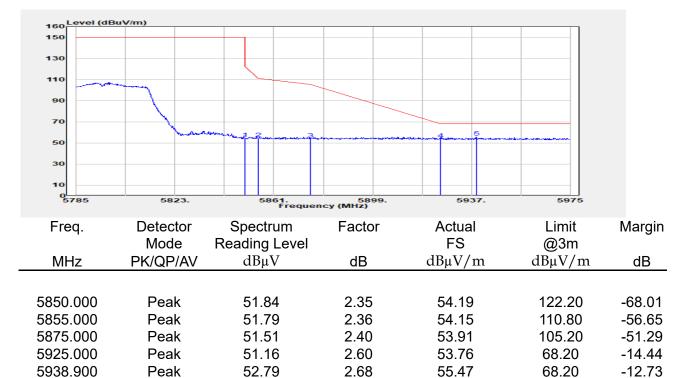
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Report Number	:TERF2403000774E2
Operation Mode	:802.11n40
Test Frequency	:5795 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



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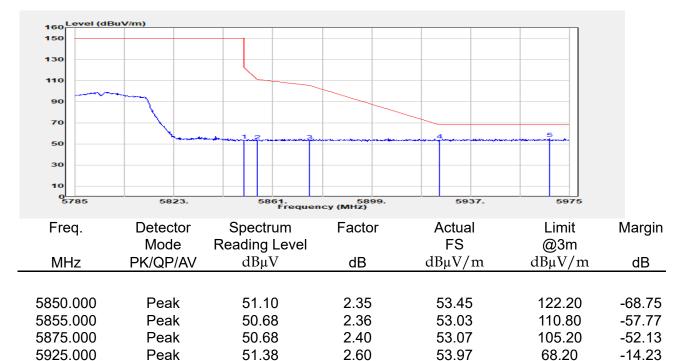
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Report Number	:TERF2403000774E2
Operation Mode	:802.11n40
Test Frequency	:5795 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



2.78

55.03

68.20

-13.17

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52.25

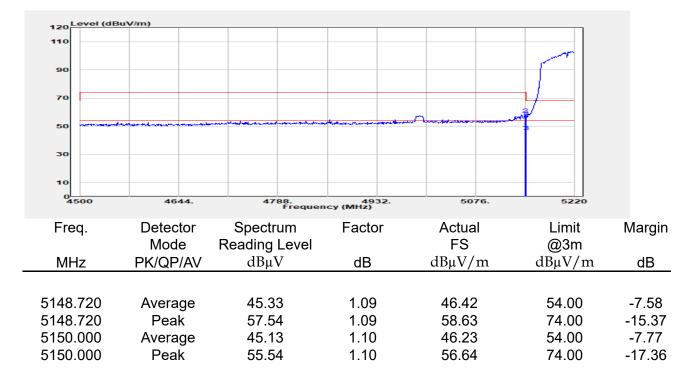
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5967.400



Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5210 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



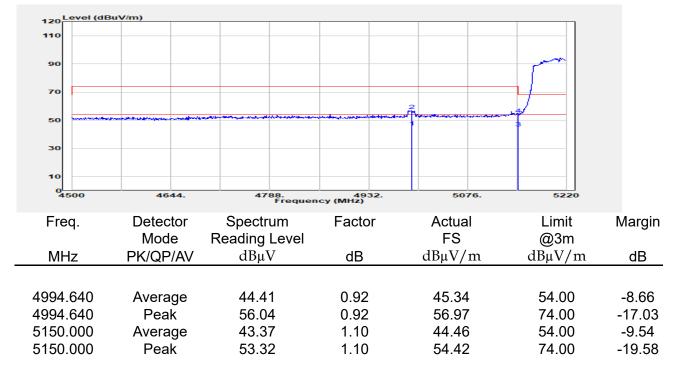
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5210 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



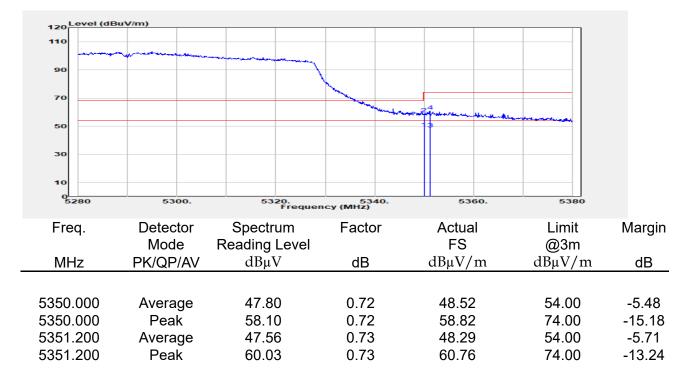
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5290 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



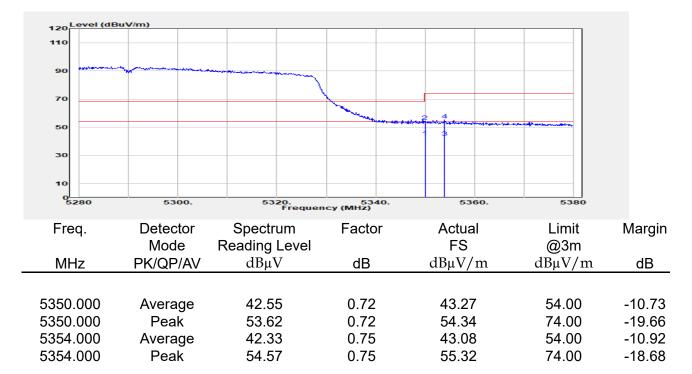
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5290 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



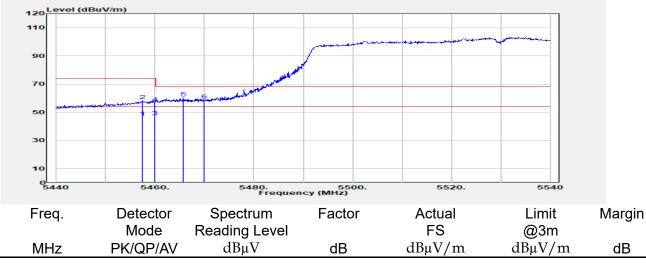
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5530 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



5457.500	Average	45.14	1.52	46.66	54.00	-7.34
5457.500	Peak	56.74	1.52	58.26	74.00	-15.75
5460.000	Average	45.40	1.54	46.94	54.00	-7.06
5460.000	Peak	55.11	1.54	56.65	74.00	-17.35
5465.700	Peak	58.42	1.60	60.02	68.20	-8.18
5470.000	Peak	56.85	1.65	58.50	68.20	-9.70

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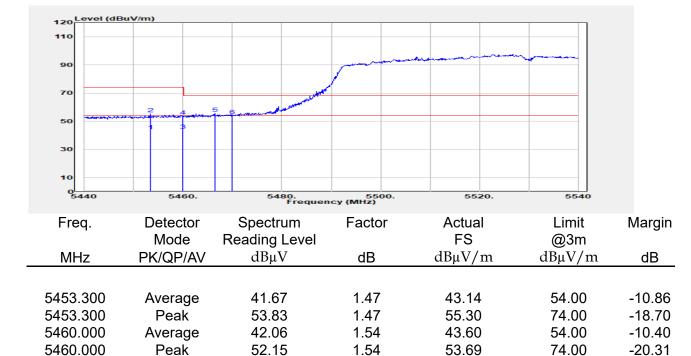


Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5530 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



1.61

1.65

55.69

53.97

68.20

68.20

-12.51 -14.23

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54.08

52.33

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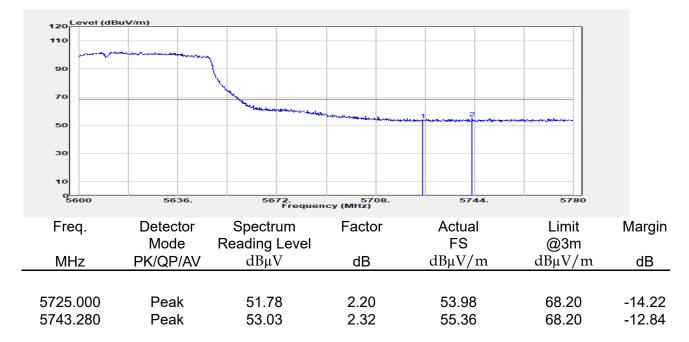
5466.400

5470.000



Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5610 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



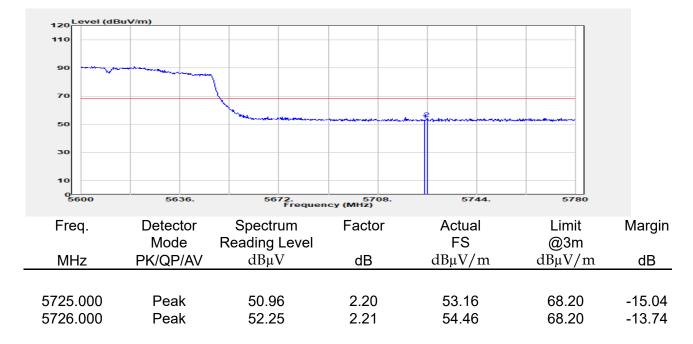
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5610 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



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-57.29

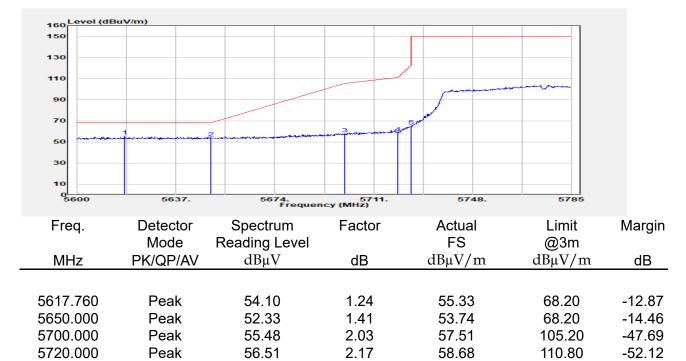
122.20



Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5775 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



2.20

64.91

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62.71

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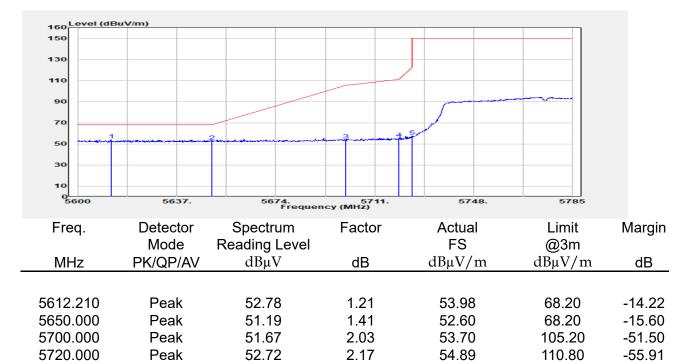
5725.000



Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5775 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



2.20

57.12

122.20

-65.08

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.

54.92

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5725.000

-14.95

-12.90

68.20

68.20



5925.000

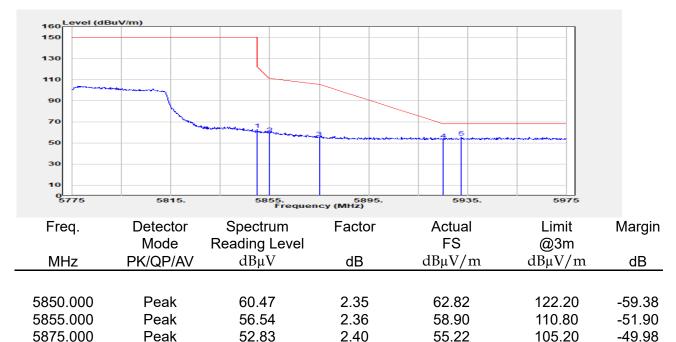
5932.600

Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5775 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



2.60

2.64

53.25

55.30

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50.65

52.66

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-15.02

-12.87

68.20

68.20



5925.000

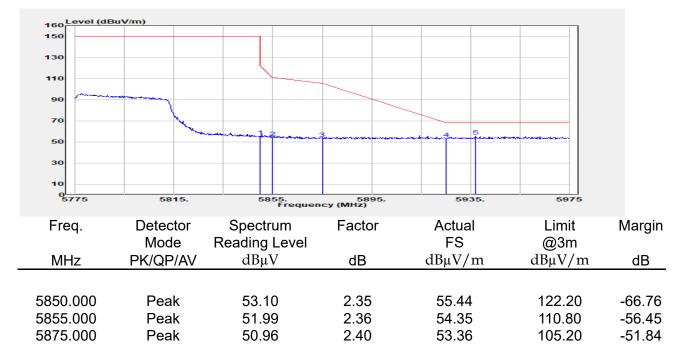
5937.200

Report Number	:TERF2403000774E2
Operation Mode	:802.11ac80
Test Frequency	:5775 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



2.60

2.67

53.18

55.33

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50.59

52.66

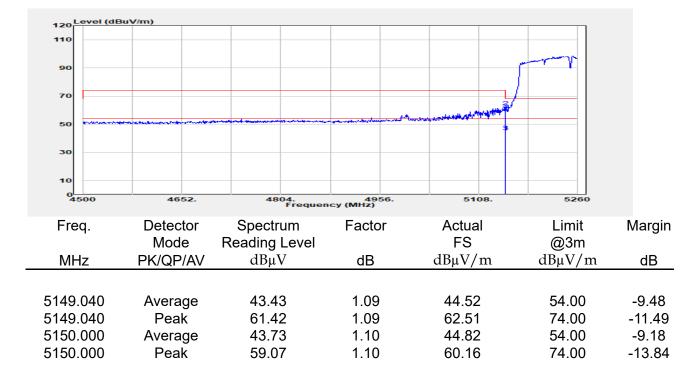
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5250 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



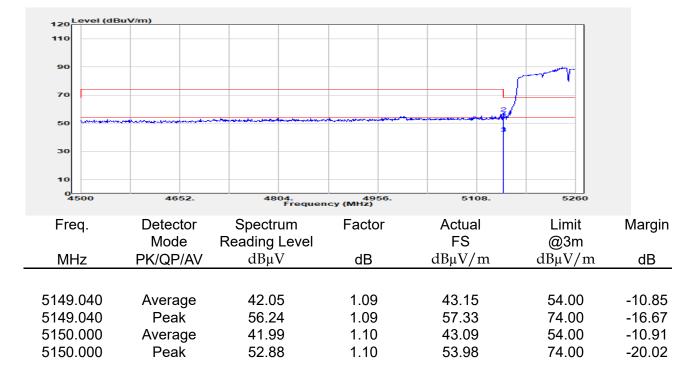
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5250 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



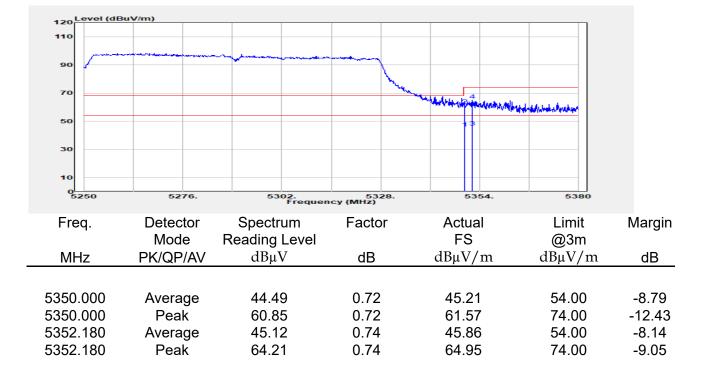
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5250 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



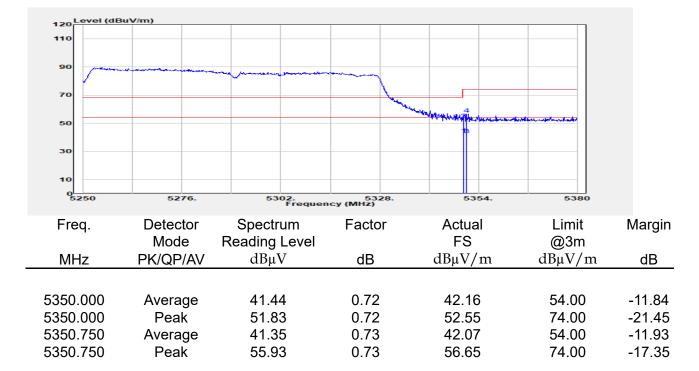
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5250 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



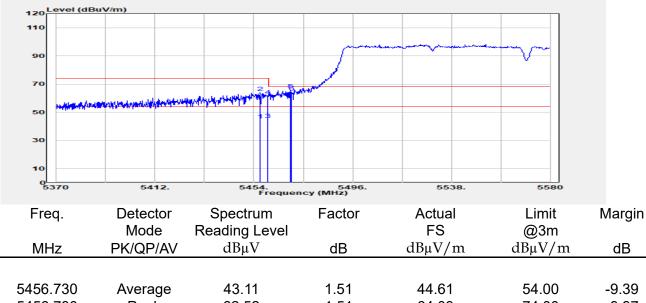
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5570 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



0100.100	7.001ug0	10.11	1.01	11.01	01.00	0.00
5456.730	Peak	62.52	1.51	64.03	74.00	-9.97
5460.000	Average	43.48	1.54	45.02	54.00	-8.98
5460.000	Peak	60.09	1.54	61.63	74.00	-12.37
5469.540	Peak	64.39	1.64	66.03	68.20	-2.17
5470.000	Peak	62.63	1.65	64.28	68.20	-3.92

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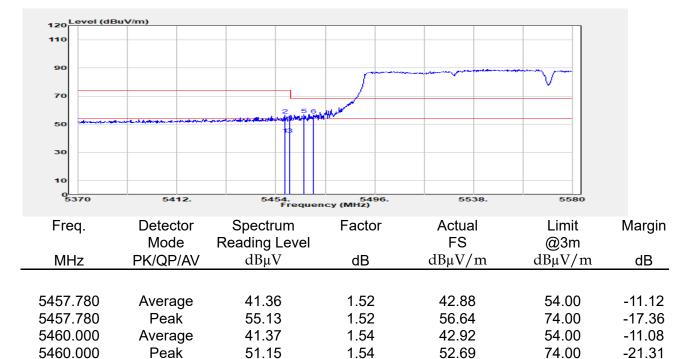


Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5570 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Peak

Peak

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



1.61

1.65

56.98

56.62

68.20

68.20

-11.22

-11.58

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.

55.37

54.97

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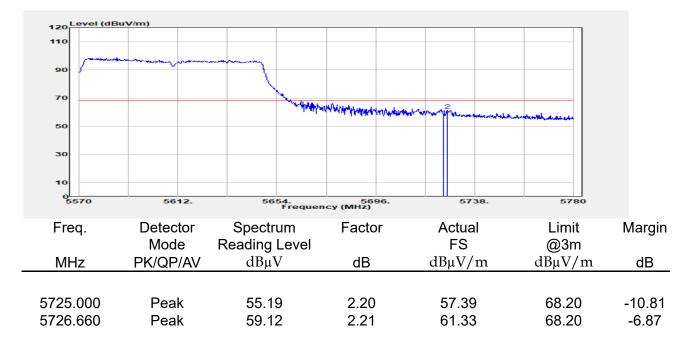
5465.970

5470.000



Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5570 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Vertical
Engineer	:Howard Haung



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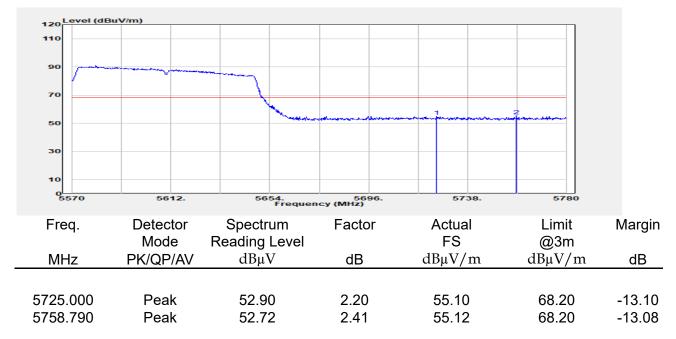
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Report Number	:TERF2403000774E2
Operation Mode	:802.11ac160
Test Frequency	:5570 MHz
Test Mode	:Bandedge
EUT Pol	:NB Plane

Test Site	:SAC C
Test Date	:2024-04-08
Temp./Humi.	:19.9°C/69%
Antenna Pol.	:Horizontal
Engineer	:Howard Haung



~ End of Report ~

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