

**ELECTROMAGNETIC EMISSIONS  
COMPLIANCE REPORT**

**Applicant:** Realtek Semiconductor Corp.  
No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu  
300, Taiwan

**Manufacturer:** Realtek Semiconductor Corp.  
No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu  
300, Taiwan

**Product Name:** 11ax RTL8852CE Combo module

**Brand Name:** REALTEK

**Model No.:** RTL8852CE

**FCC Host Model:** GA63H, GA6xxx ("x" means 20 alphanumeric, maybe 0-9, A-Z, -, \_, + or blank)

**Report Number:** TERF2503001178E2

**FCC ID** TX2-RTL8852CE

**Date of EUT Received:** March 25, 2025

**Date of Test:** March 26, 2025 ~ April 15, 2025

**Issue Date:** May 9, 2025

**Approved By****Aken Huang****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 §15.247.

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

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## Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2503001178E2	00	Original	May 9, 2025	Susan Lin	

**Note:**

- 1、The remark "" indicates modification of the report upon requests from certification body.
- 2、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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# 1 GENERAL INFORMATION

## 1.1 Product Description

EUT Description:	Wireless module installed in Notebook
Brand Name:	REALTEK
Model No.:	RTL8852CE
Host Brand Name:	GIGABYTE
FCC Host Model:	GA63H, GA6xxx ("x" means 20 alphanumeric, maybe 0-9, A-Z, -, _, + or blank)
Family FCC Host Model Difference:	For marketing purposes only
Hardware Version:	N/A
Firmware Version:	v0.27.109.1
EUT Series No.:	EC016EEE-B7B9-487C-A828-F75F824F0D3D
Power Supply:	15.56 Vdc from Rechargeable Li-ion Battery 20 Vdc from AC/DC Adapter
Test Software (Name/Version):	Realtek Bluetooth RF Test Tool RtlBluetoothMP.dll Version:5.3.2.24 RTLBTAPP Version:5.2.3.77

## 1.2 RF Specification

Radio Technology:	BT BR+EDR
Channel number:	79 channels
Modulation type:	GFSK + $\pi/4$ DQPSK + 8DPSK
Transmit Power:	12.34 dBm
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	$\leq 0.4s$

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### 1.3 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)
PIFA	High-tek	0ACCN024022N (DC33002YL30)	2402~2480	2.77
	PULSE	TZ3138E (DC330031410)		2.58

**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.

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## 1.4 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 15.247 Meas. Guidance v05r02

ANSI C63.10:2013

## 1.5 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
Conducted G				

**Note:** Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

## 1.6 Special Accessories

There is no special accessory used while test was conducted.

## 1.7 Equipment Modifications

There was no modification incorporated into the EUT.

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## 2 SYSTEM TEST CONFIGURATION

### 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 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 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.

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## 2.5 Test Configuration

Conducted Setup	Radiated Setup
	

## 2.6 Control Unit(s)

N/A

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### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(d) §15.209	Radiated Band Edge and Spurious Emission	Compliant

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## 4 DESCRIPTION OF TEST MODES

### 4.1 Operated in 2400 ~ 2483.5MHz Band

ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY
0	2402 MHz	20	2422 MHz	40	2442 MHz	60	2462 MHz
1	2403 MHz	21	2423 MHz	41	2443 MHz	61	2463 MHz
2	2404 MHz	22	2424 MHz	42	2444 MHz	62	2464 MHz
3	2405 MHz	23	2425 MHz	43	2445 MHz	63	2465 MHz
4	2406 MHz	24	2426 MHz	44	2446 MHz	64	2466 MHz
5	2407 MHz	25	2427 MHz	45	2447 MHz	65	2467 MHz
6	2408 MHz	26	2428 MHz	46	2448 MHz	66	2468 MHz
7	2409 MHz	27	2429 MHz	47	2449 MHz	67	2469 MHz
8	2410 MHz	28	2430 MHz	48	2450 MHz	68	2470 MHz
9	2411 MHz	29	2431 MHz	49	2451 MHz	69	2471 MHz
10	2412 MHz	30	2432 MHz	50	2452 MHz	70	2472 MHz
11	2413 MHz	31	2433 MHz	51	2453 MHz	71	2473 MHz
12	2414 MHz	32	2434 MHz	52	2454 MHz	72	2474 MHz
13	2415 MHz	33	2435 MHz	53	2455 MHz	73	2475 MHz
14	2416 MHz	34	2436 MHz	54	2456 MHz	74	2476 MHz
15	2417 MHz	35	2437 MHz	55	2457 MHz	75	2477 MHz
16	2418 MHz	36	2438 MHz	56	2458 MHz	76	2478 MHz
17	2419 MHz	37	2439 MHz	57	2459 MHz	77	2479 MHz
18	2420 MHz	38	2440 MHz	58	2460 MHz	78	2480 MHz
19	2421 MHz	39	2441 MHz	59	2461 MHz		

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#### 4.2 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 and receiving mode is programmed.
- 3 The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.
- 4 Investigation has been done on all the possible configurations for searching the worst case.

ANTNNA PORT CONDUCTED TEST				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	PACKET TYPE
<b>Peak Output Power, 20dB Band Width, Spurious Emission</b>				
Bluetooth	0 to 78	0,39,78	GFSK	DH5
	0 to 78	0,39,78	$\pi/4$ -DQPSK	2DH5
	0 to 78	0,39,78	8-DPSK	3DH5
<b>Time of Occupancy(Dwell time)</b>				
Bluetooth	0 to 78	39	GFSK	DH1/DH3/DH5
			$\pi/4$ -DQPSK	2DH1/2DH3/2DH5
			8-DPSK	3DH1/3DH3/3DH5

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	PACKET TYPE
<b>TRANSMIT RADIATED EMISSION TEST (BELOW 1 GHz)</b>				
Bluetooth	0 to 78	38	GFSK	DH5
<b>TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)</b>				
Bluetooth	0 to 78	0,38,78	GFSK,8-DPSK	DH5,3DH5
Note: The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for channel Low, Mid and High, the worst case position was reported.				

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## 5 MEASUREMENT UNCERTAINTY

Test Items	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
Frequency Separation	+/- 1.48 Hz
Number of hopping frequency	+/- 1.48 Hz
Time of Occupancy	+/- 1.48 Hz
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	1.89 dB	9kHz~30MHz
	+/-	4.1 dB	30MHz - 1000MHz
	+/-	3.37 dB	1GHz - 18GHz
	+/-	3.83 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	1.89 dB	9kHz~30MHz
	+/-	4.1 dB	30MHz - 1000MHz
	+/-	3.37 dB	1GHz - 18GHz
	+/-	3.83 dB	18GHz - 40GHz
Radiated Spurious Emission	+/-	2 dB	33GHz-50GHz
	+/-	1.59 dB	50GHz-60GHz
	+/-	1.71 dB	60GHz-90GHz
	+/-	1.64 dB	90GHz-140GHz
	+/-	3.84 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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## 6 MEASUREMENT EQUIPMENT USED

### 6.1 Conducted Measurement

Conducted Emission Test Site: Conducted E					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Marvelous	MVE2213-10	RF06	11/14/2024	11/13/2025
DC Block	PASTERNAK	PE8210	RF157	11/14/2024	11/13/2025
Power Meter	Anritsu	ML2496A	1512003	09/04/2024	09/03/2025
Power Sensor	Anritsu	MA2411B	1339378	09/04/2024	09/03/2025
Power Sensor	Anritsu	MA2411B	1339379	09/04/2024	09/03/2025
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	09/18/2024	09/17/2025

### 6.2 Radiated Measurement

Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
3m Site NSA	SGS	966 chamber G	N/A	03/30/2025	03/29/2026
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/11/2024	12/10/2025
Broadband Antenna	SCHWARZBECK	VULB 9168	1206	01/16/2025	01/15/2026
Coaxial Cable	EMCI+Huber Suhner	EMCCFD400-NM-NM-8000+EMCCFD400-NM-NM-5000+SUCOFLEX100+EMC104-SM-SM-2000+EMC104-SM-SM-8000+EMC104-SM-SM-5000	210216+210217+84103701/15+160105+210217+210220	11/14/2024	11/13/2025
High Pass Filter	WI	WHKX10-2624-3200-18000-80SS	RF176	11/14/2024	11/13/2025
Horn Antenna	RF SPIN	DRH18-E	210105A18E	04/12/2024	04/11/2025
Horn Antenna	Schwarzbeck	BBHA9170	184	12/20/2024	12/19/2025
Lowpass Filter	Woken	EWI-56-0019	RF163	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC118A45SE	980815	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC184045SEE	980881	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC330N	980781	11/14/2024	11/13/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071574	06/28/2024	06/27/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

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

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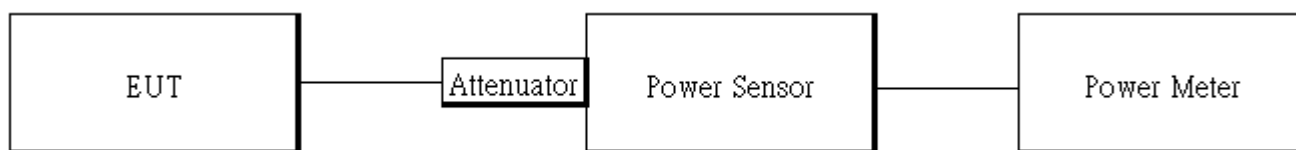
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## 7 PEAK OUTPUT POWER MEASUREMENT

### 7.1 Standard Applicable

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, The Limit: 1Watt. For all other frequency hopping systems in the 2400 – 2483.5MHz band: The Limit: 0.125 Watts. The power limit for 1Mbps is 1watt, and 2Mbps, 3Mbps and AFH mode are 0.125 watts.

### 7.2 Test Setup



### 7.3 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows ANSI C63.10 Measurement Guidelines.
3. Duty cycle of test signal is < 98 %, duty factor shall be considered.
4. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Max Hold, Detector = Peak, RBW >=20dB bandwidth)
5. Record the max. reading.
6. Repeat above procedures until all default test channel is completed.

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## 7.4 Peak & Average Power Measurement Result

Mode	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log ( 1/Duty Cycle )
DH5	77.42	1.11
2DH5	77.51	1.11
3DH5	77.11	1.13

1M BR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x50	12.08	16.144	1000
38	2440	0x50	12.34	17.140	1000
78	2480	0x50	11.75	14.962	1000

1M BR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x50	11.84	15.281	1000
38	2440	0x50	12.19	16.563	1000
78	2480	0x50	11.70	14.796	1000

2M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x50	12.09	16.181	125
38	2440	0x50	11.98	15.776	125
78	2480	0x50	11.76	14.997	125

2M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x50	9.48	8.864	125
38	2440	0x50	9.75	9.433	125
78	2480	0x50	9.54	8.988	125

3M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x50	11.95	15.668	125
38	2440	0x50	11.91	15.524	125
78	2480	0x50	11.63	14.555	125

3M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x50	9.45	8.808	125
38	2440	0x50	9.18	8.277	125
78	2480	0x50	8.98	7.905	125

\*Note: Avg. output power has been calculated with duty factor.

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## 8 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

### 8.1 Standard Applicable

#### 8.1.1 Duty Cycle Correction Factor

According to 15.35(c), the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification.

#### 8.1.2 Spurious Emission

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. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 and limit as below. And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

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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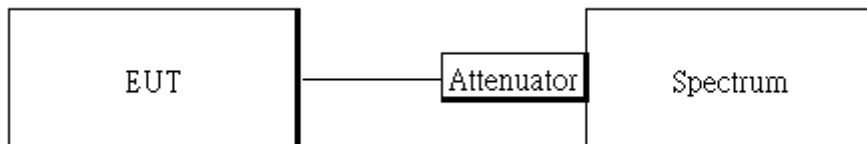
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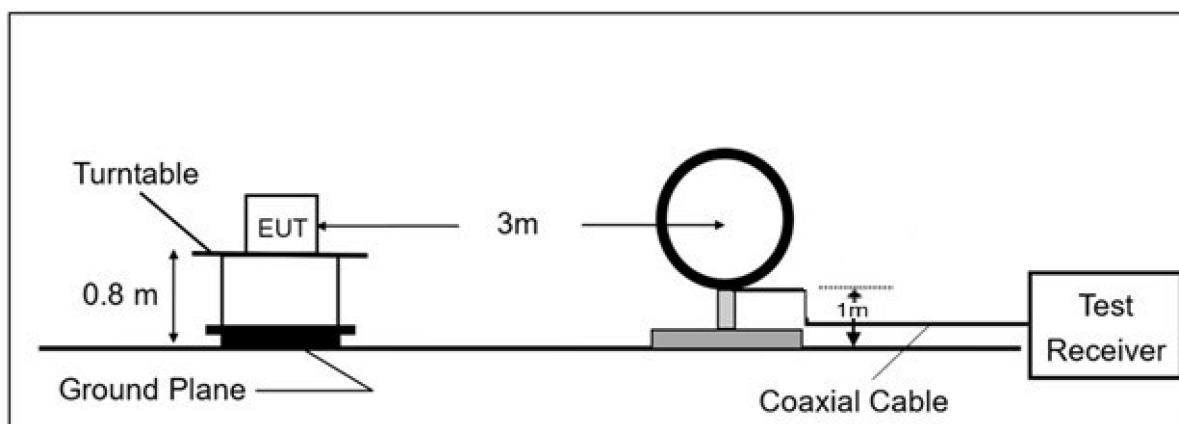
## 8.2 Test Setup

### 8.2.1 Duty Cycle Correction Factor

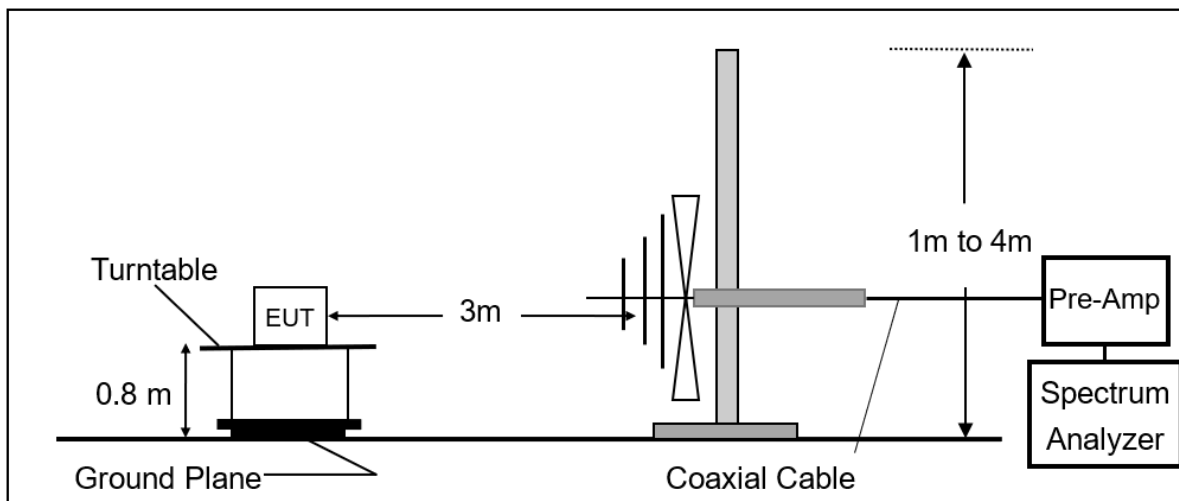


### 8.2.2 Radiated Emission

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



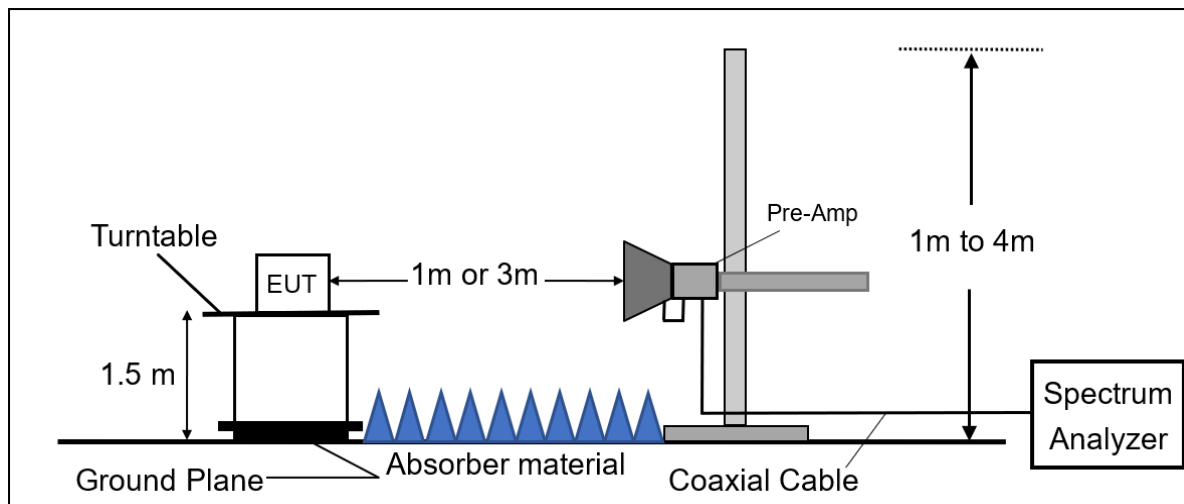
(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



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



## 8.3 Measurement Procedure

### 8.3.1 Duty Cycle Correction Factor

1. Adjust and configure any EUT switches, controls, or input data streams to ensure that the EUT is transmitting or encoded to obtain the “worst-case” pulse ON time.
2. The testing follows ANSI C63.10:2013.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set center frequency of spectrum analyzer = operating frequency.
5. Set the spectrum analyzer as RBW, VBW=1MHz, 3MHz, Span = 0Hz , Detector = Peak, Adjust Sweep=100ms.
6. Repeat above procedures until all frequency of the interest measured were complete.

### 8.3.2 Radiated Emission

1. The testing follows the Measurement Procedure of ANSI C63.10:2013.
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.

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7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Maximum Emission Measurements at frequency above 1 GHz.
8. According to C63.10:2013 Section 7.5 Procedure for determining the average value of pulsed emissions with duty cycle correction factor  $20 \log (T_{on}/100ms)$ .
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 default test channel measured were complete.

#### 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*

*CL = Cable Attenuation Factor (Cable Loss)*

*RA = Reading Amplitude*

*AG = Amplifier Gain*

*AF = Antenna Factor*

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

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dB/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Average value(dBμV/m)=Peak Actual FS(dBμV/m)+ Duty Cycle Correction Factor(dB)

Duty Cycle Correction Factor(dB) =  $20 \log (T_{on}/100 \text{ ms})$

#### 8.5 Test Results of Radiated Spurious Emissions form 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.

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## 8.6 Measurement Result:

### 8.6.1 Duty Cycle Correction Factor

#### Bluetooth 1M

Time ON of 100ms: 2.900 ms
Duty Cycle=2.9ms / 100ms= 0.029
Duty Cycle correction factor=20 LOG 0.029 = -30.75 dB

#### Bluetooth 3M

Time ON of 100ms: 2.700 ms
Duty Cycle=2.7ms / 100ms= 0.027
Duty Cycle correction factor=20 LOG 0.027 = -31.37 dB

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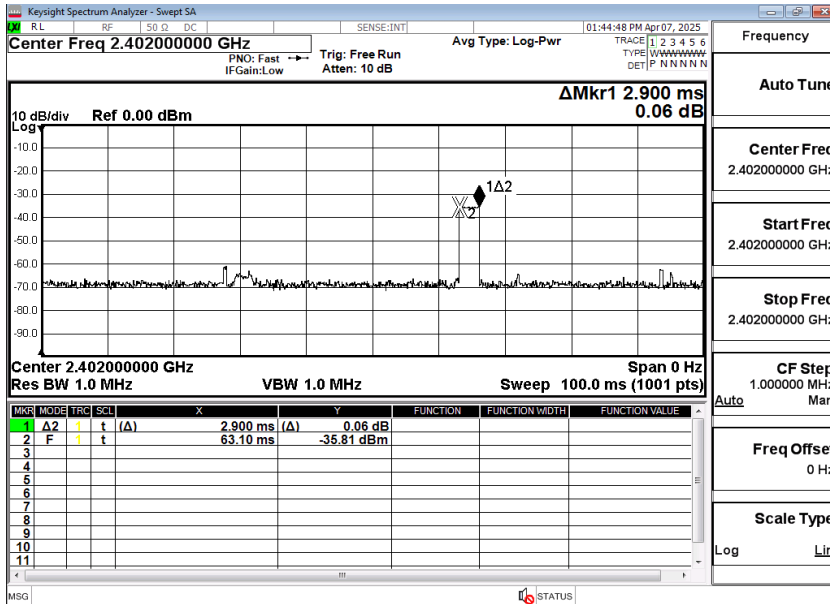
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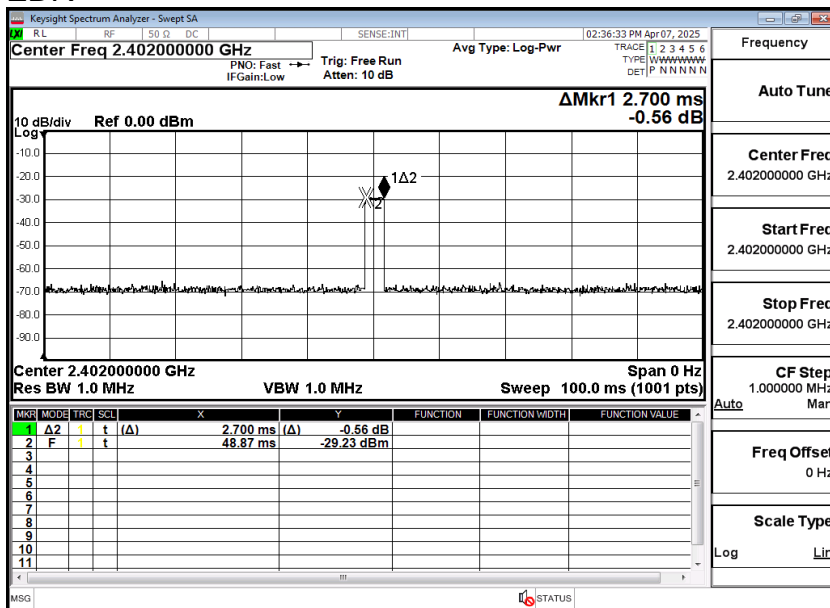
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## 8.6.2 Duty Cycle test plot

BR



EDR



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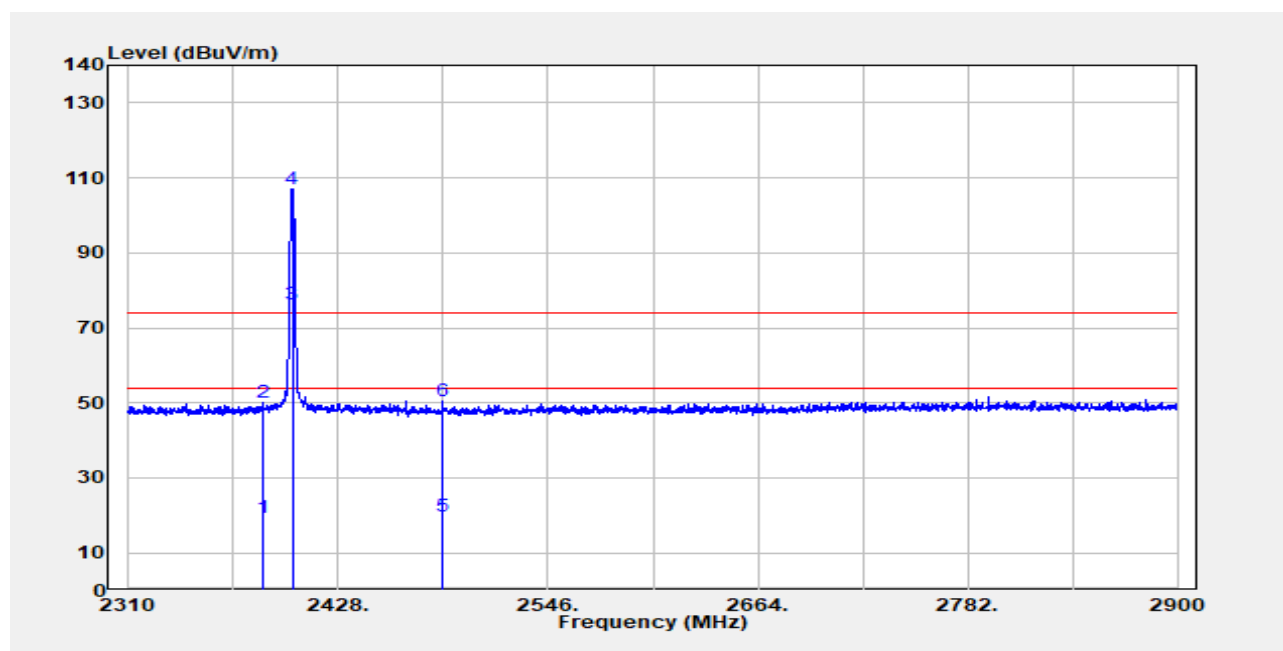
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## 8.6.3 Bandedge Result

Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2402  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2385.74	Average	-	-	19.32	54.00	-34.68
2385.74	Peak	53.24	-3.17	50.07	74.00	-23.93
2402.00	Average	-	-	76.32	-	-
2402.00	Peak	110.30	-3.23	107.07	-	-
2486.47	Average	-	-	19.60	54.00	-34.40
2486.47	Peak	53.72	-3.37	50.35	74.00	-23.65

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

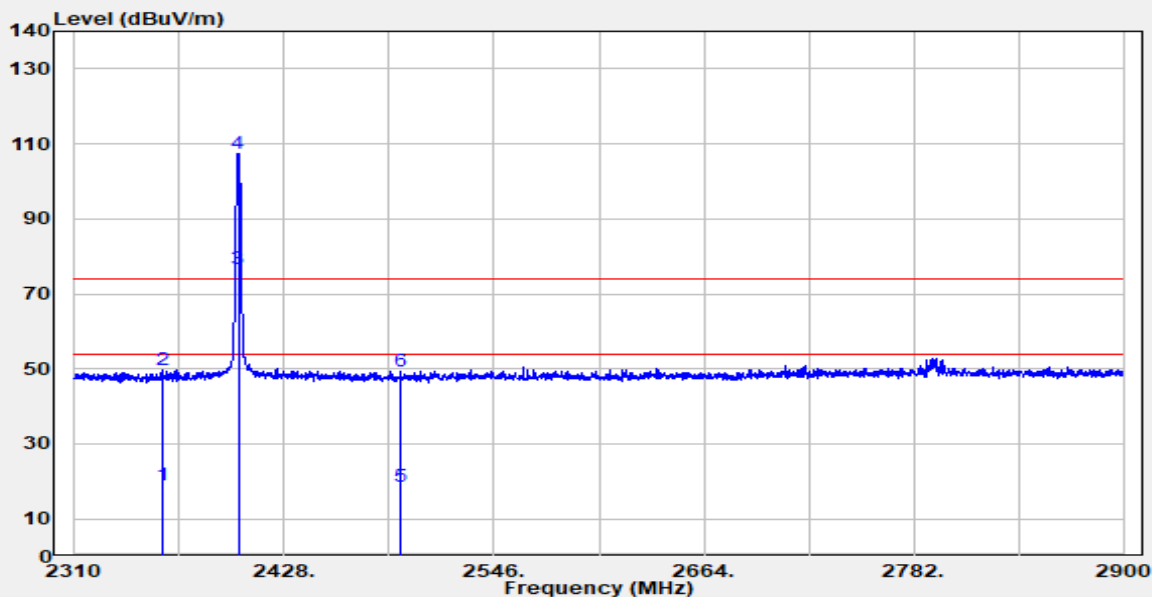
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Report Number :TERF2503001178E2  
Operation Mode :BR  
Test Frequency :2402  
Test Mode :Bandedge  
EUT Pol :NB Mode

Test Site :SAC G  
Test Date :2025-04-07  
Temp./Humi. :23.1°C/58%  
Antenna Pol. :Horizontal  
Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2359.58	Average	-	-	19.05	54.00	-34.95
2359.58	Peak	52.96	-3.16	49.80	74.00	-24.20
2402.00	Average	-	-	76.71	-	-
2402.00	Peak	110.69	-3.23	107.46	-	-
2493.75	Average	-	-	18.53	54.00	-35.47
2493.75	Peak	52.66	-3.38	49.28	74.00	-24.72

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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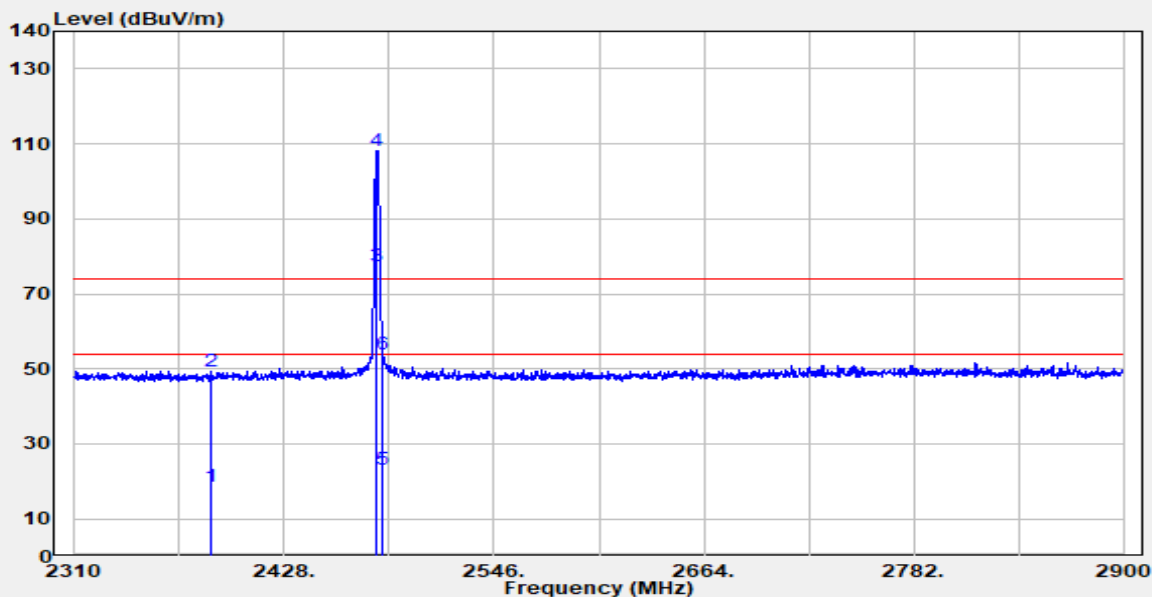
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Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2386.33	Average	-	-	18.69	54.00	-35.31
2386.33	Peak	52.61	-3.17	49.44	74.00	-24.56
2480.00	Average	-	-	77.27	-	-
2480.00	Peak	111.39	-3.37	108.02	-	-
2483.52	Average	-	-	23.07	54.00	-30.93
2483.52	Peak	57.19	-3.37	53.82	74.00	-20.18

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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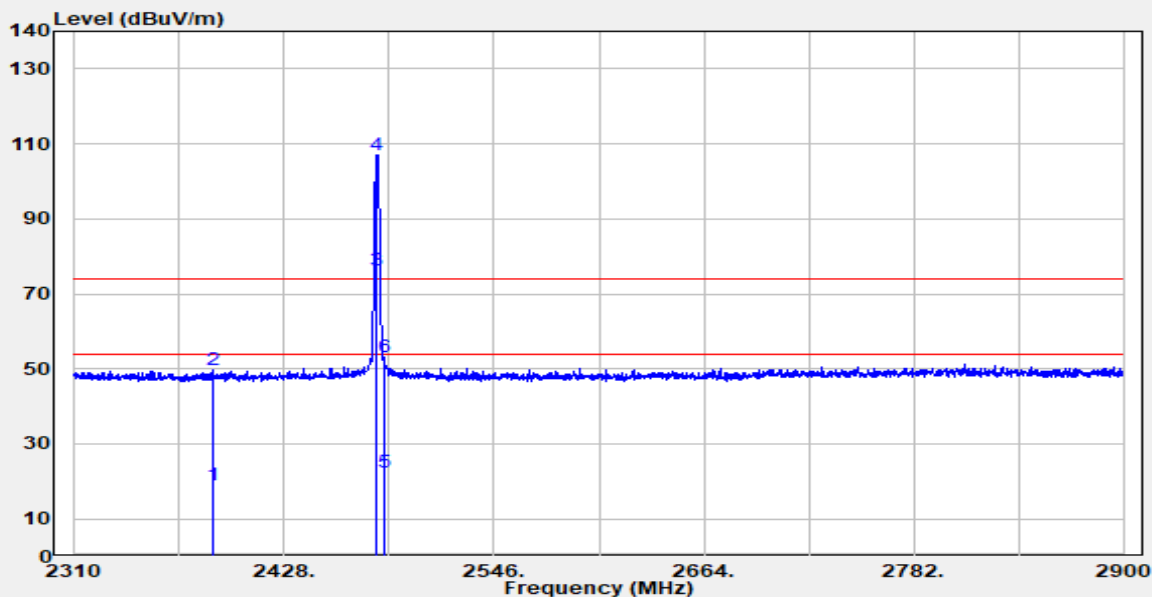
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Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Horizontal  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2388.30	Average	-	-	19.09	54.00	-34.91
2388.30	Peak	52.98	-3.14	49.84	74.00	-24.16
2480.00	Average	-	-	76.39	-	-
2480.00	Peak	110.51	-3.37	107.14	-	-
2483.72	Average	-	-	22.44	54.00	-31.56
2483.72	Peak	56.56	-3.37	53.19	74.00	-20.81

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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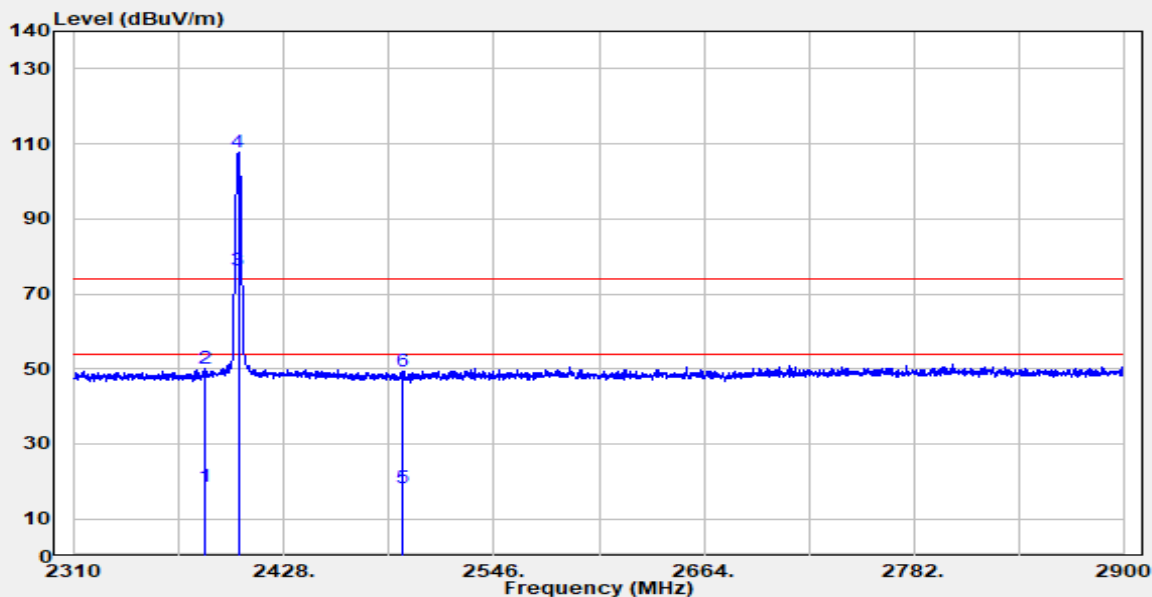
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Report Number :TERF2503001178E2  
 Operation Mode :EDR 3M  
 Test Frequency :2402  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2382.99	Average	-	-	18.71	54.00	-35.29
2382.99	Peak	53.28	-3.20	50.08	74.00	-23.92
2402.00	Average	-	-	76.33	-	-
2402.00	Peak	110.93	-3.23	107.70	-	-
2494.34	Average	-	-	18.08	54.00	-35.92
2494.34	Peak	52.82	-3.37	49.45	74.00	-24.55

Average Duty Cycle Factor=-31.37 (dB)

Average Level= Peak Level+ Duty Cycle Factor

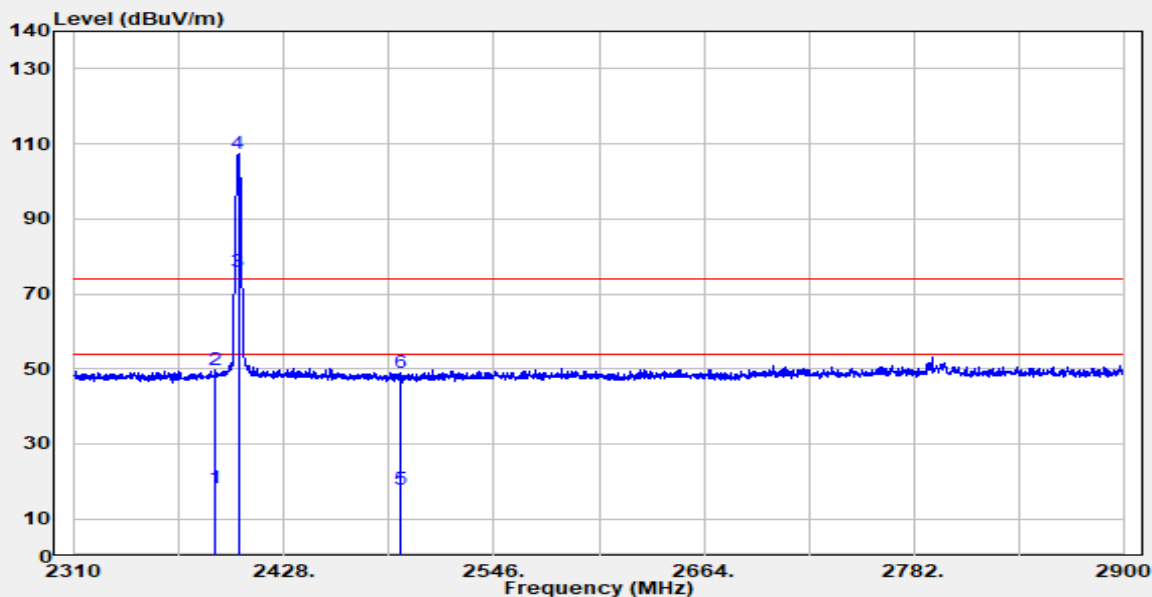
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Report Number :TERF2503001178E2  
Operation Mode :EDR 3M  
Test Frequency :2402  
Test Mode :Bandedge  
EUT Pol :NB Mode

Test Site :SAC G  
Test Date :2025-04-07  
Temp./Humi. :23.1°C/58%  
Antenna Pol. :Horizontal  
Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2388.69	Average	-	-	18.37	54.00	-35.63
2388.69	Peak	52.87	-3.13	49.74	74.00	-24.26
2402.00	Average	-	-	75.94	-	-
2402.00	Peak	110.54	-3.23	107.31	-	-
2493.16	Average	-	-	17.74	54.00	-36.26
2493.16	Peak	52.49	-3.38	49.11	74.00	-24.89

Average Duty Cycle Factor=-31.37 (dB)

Average Level= Peak Level+ Duty Cycle Factor

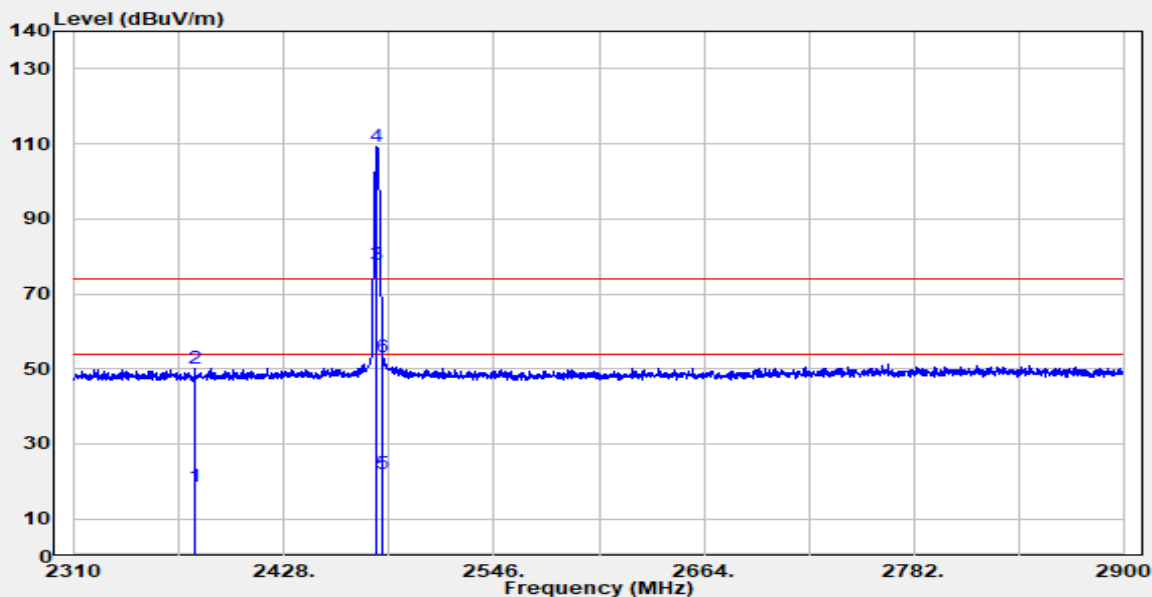
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Report Number :TERF2503001178E2  
 Operation Mode :EDR 3M  
 Test Frequency :2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2377.28	Average	-	-	18.73	54.00	-35.27
2377.28	Peak	53.34	-3.24	50.10	74.00	-23.90
2480.00	Average	-	-	77.72	-	-
2480.00	Peak	112.46	-3.37	109.09	-	-
2483.52	Average	-	-	21.86	54.00	-32.14
2483.52	Peak	56.60	-3.37	53.23	74.00	-20.77

Average Duty Cycle Factor=-31.37 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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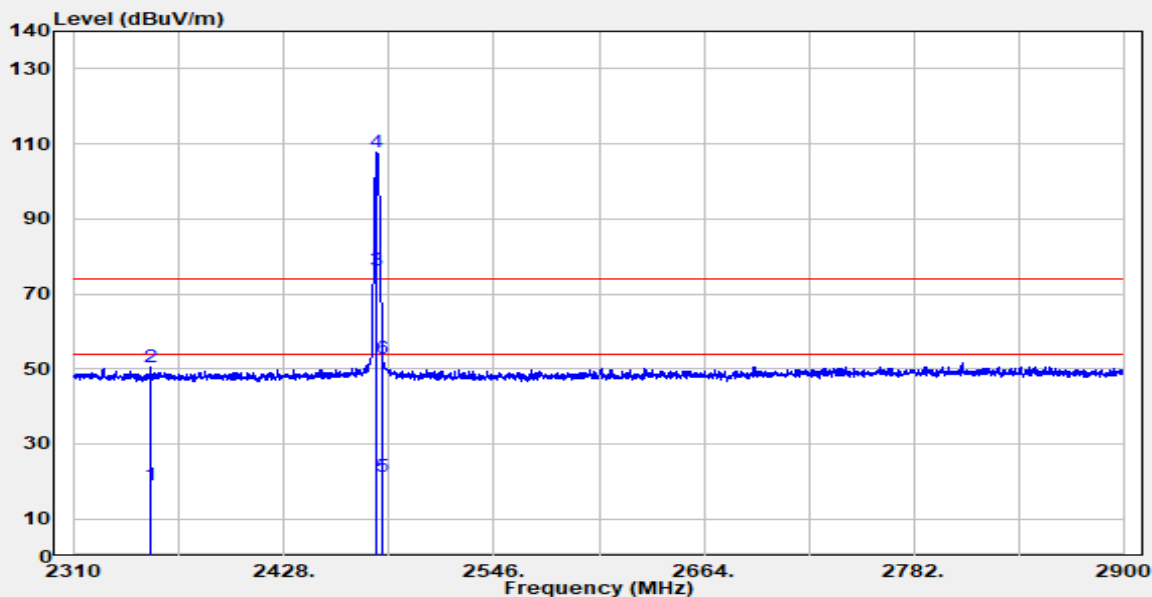
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Report Number :TERF2503001178E2  
 Operation Mode :EDR 3M  
 Test Frequency :2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Horizontal  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2352.49	Average	-	-	18.96	54.00	-35.04
2352.49	Peak	53.50	-3.17	50.33	74.00	-23.67
2480.00	Average	-	-	76.30	-	-
2480.00	Peak	111.04	-3.37	107.67	-	-
2483.52	Average	-	-	21.41	54.00	-32.59
2483.52	Peak	56.15	-3.37	52.78	74.00	-21.22

Average Duty Cycle Factor=-31.37 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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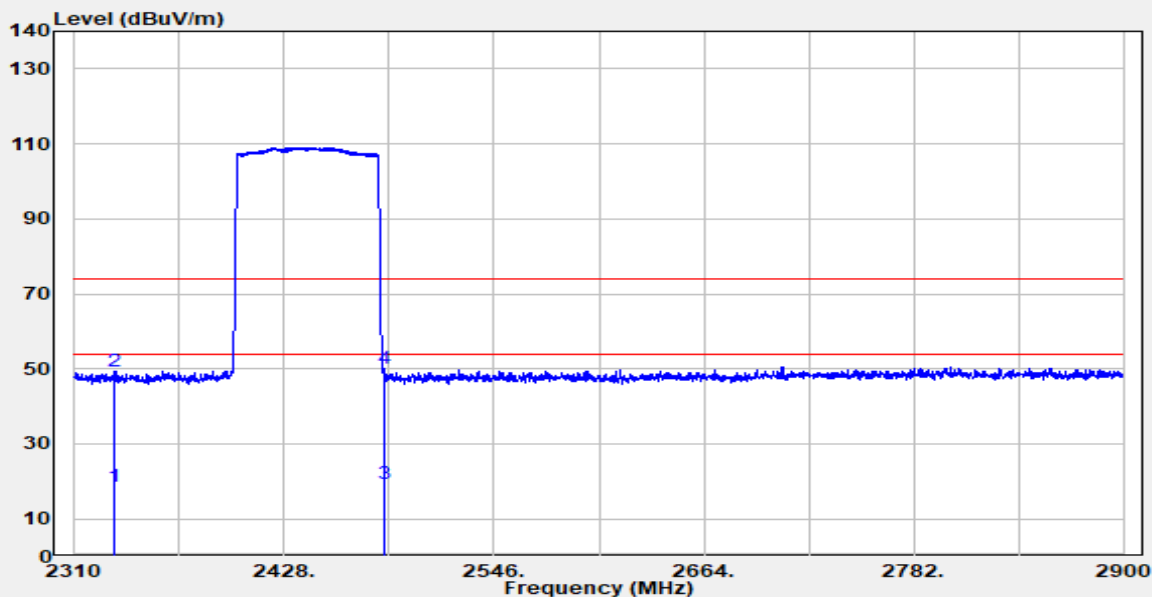
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Report Number :TERF2503001178E2  
 Operation Mode :BR Hopping  
 Test Frequency :2402~2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit @3m dBUV/m	Margin dB
2332.03	Average	-	-	18.68	54.00	-35.32
2332.03	Peak	52.62	-3.19	49.43	74.00	-24.57
2483.72	Average	-	-	19.21	54.00	-34.79
2483.72	Peak	53.33	-3.37	49.96	74.00	-24.04

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

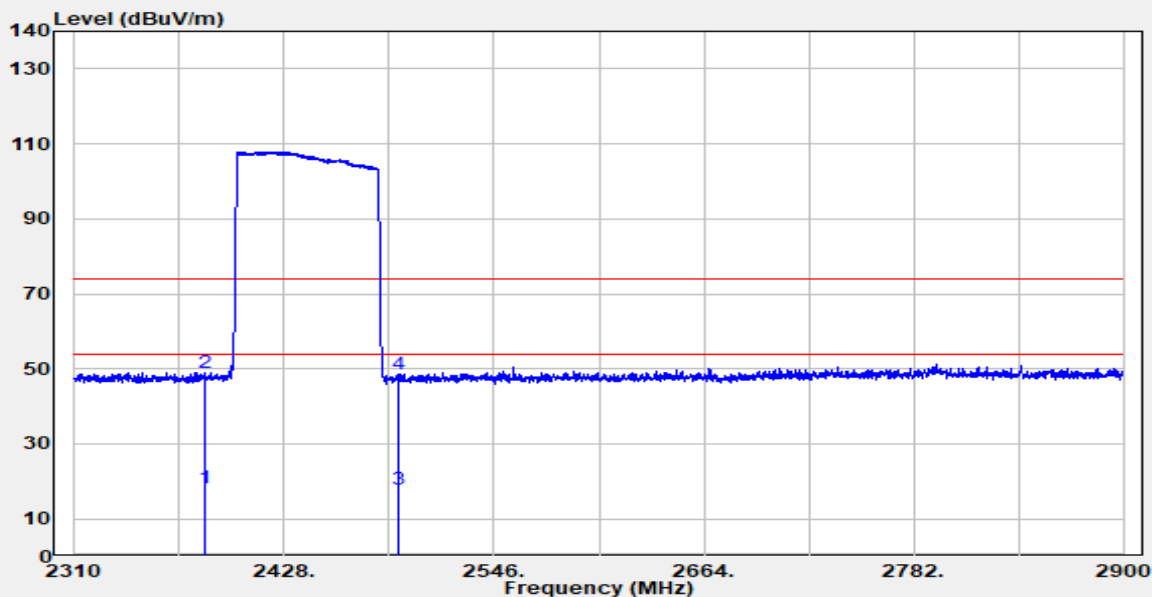
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Report Number :TERF2503001178E2  
 Operation Mode :BR Hopping  
 Test Frequency :2402~2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Horizontal  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2383.18	Average	-	-	18.26	54.00	-35.74
2383.18	Peak	52.21	-3.20	49.01	74.00	-24.99
2492.57	Average	-	-	18.00	54.00	-36.00
2492.57	Peak	52.13	-3.38	48.75	74.00	-25.25

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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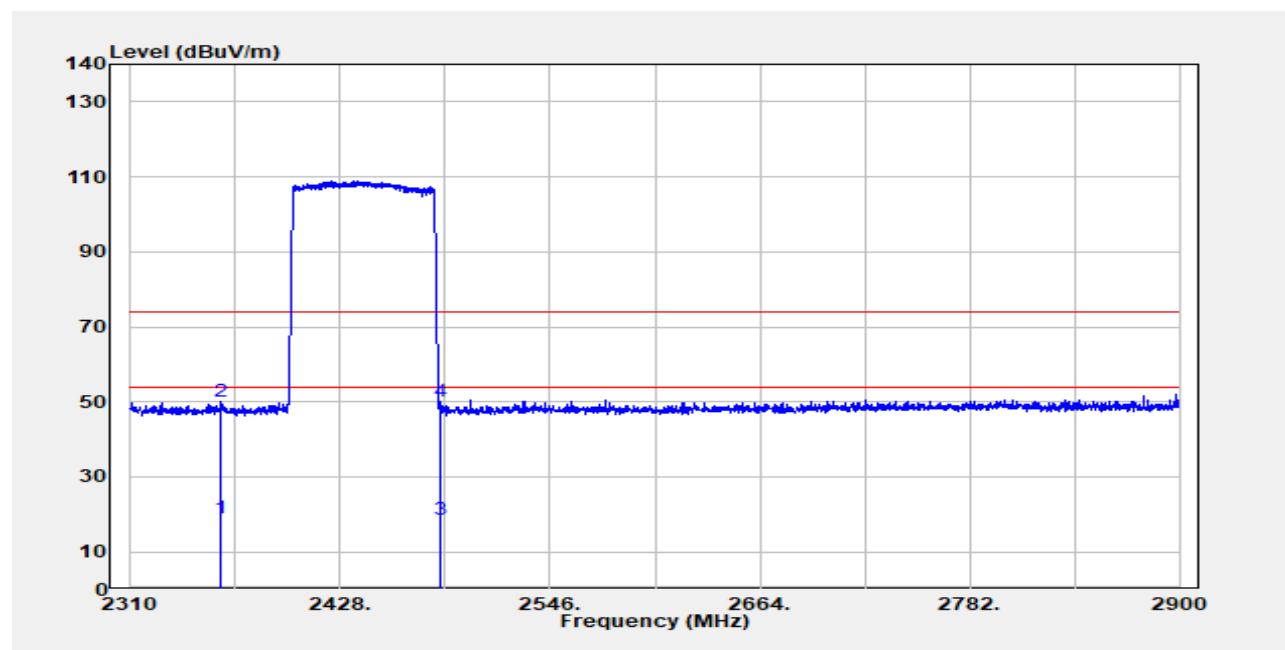
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Report Number :TERF2503001178E2  
Operation Mode :EDR 3M Hopping  
Test Frequency :2402~2480  
Test Mode :Bandedge  
EUT Pol :NB Mode

Test Site :SAC G  
Test Date :2025-04-07  
Temp./Humi. :23.1°C/58%  
Antenna Pol. :Vertical  
Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2360.56	Average	-	-	18.78	54.00	-35.22
2360.56	Peak	53.32	-3.17	50.15	74.00	-23.85
2484.50	Average	-	-	18.56	54.00	-35.44
2484.50	Peak	53.30	-3.37	49.93	74.00	-24.07

Average Duty Cycle Factor=-31.37 (dB)

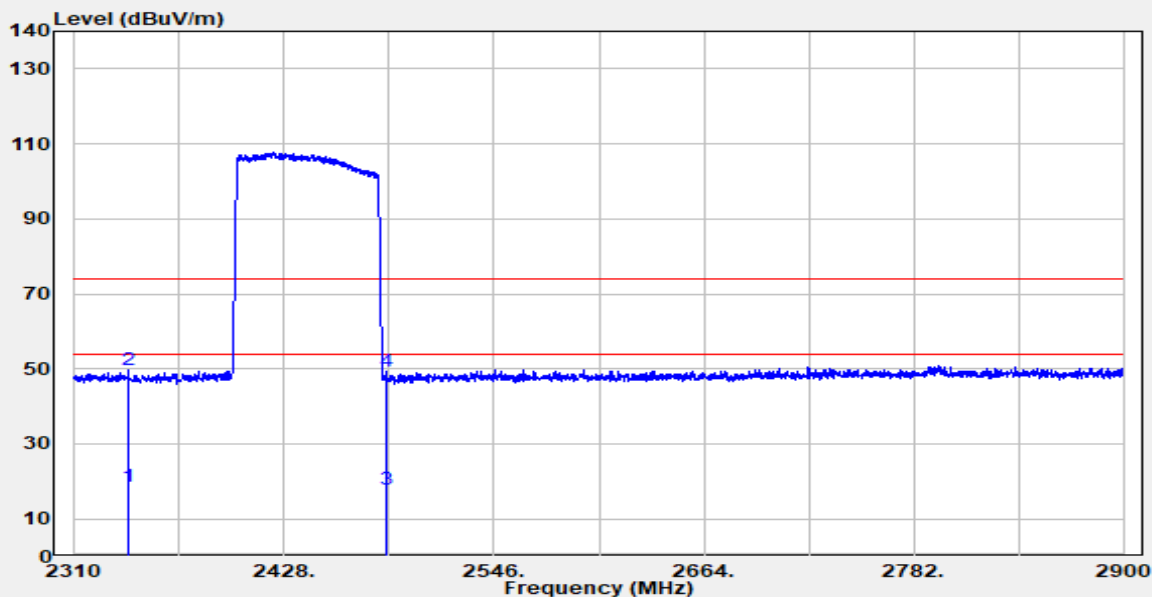
Average Level= Peak Level+ Duty Cycle Factor

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Report Number :TERF2503001178E2  
 Operation Mode :EDR 3M Hopping  
 Test Frequency :2402~2480  
 Test Mode :Bandedge  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-07  
 Temp./Humi. :23.1°C/58%  
 Antenna Pol. :Horizontal  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit @3m dBUV/m	Margin dB
2340.49	Average	-	-	18.42	54.00	-35.58
2340.49	Peak	52.97	-3.18	49.79	74.00	-24.21
2485.09	Average	-	-	17.94	54.00	-36.06
2485.09	Peak	52.68	-3.37	49.31	74.00	-24.69

Average Duty Cycle Factor=-31.37 (dB)

Average Level= Peak Level+ Duty Cycle Factor

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.

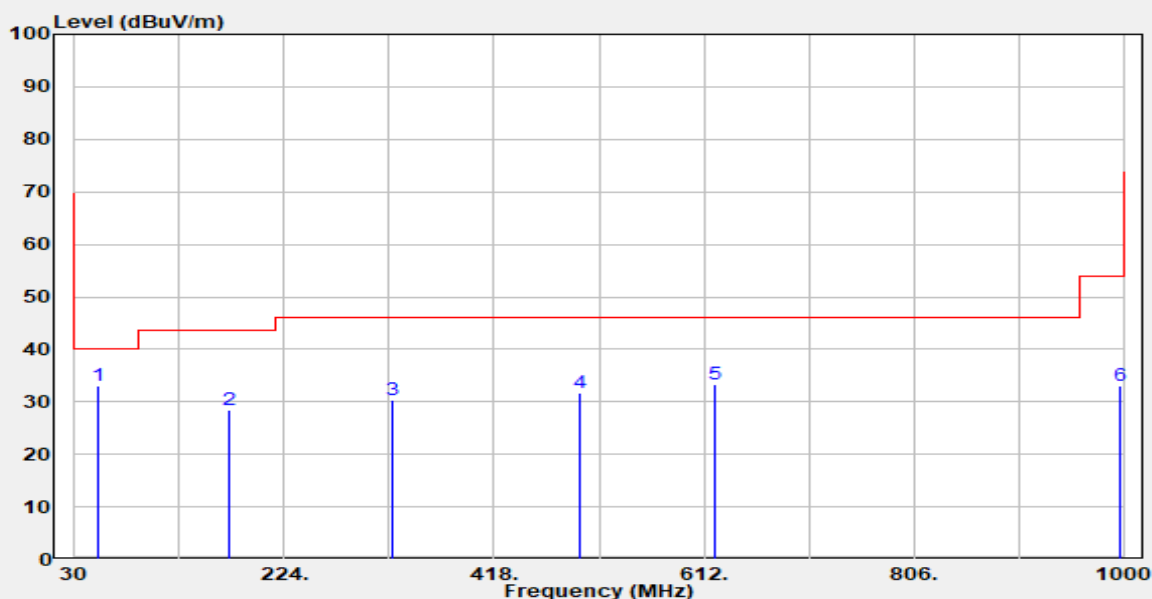
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## 8.6.4 Radiated Spurious Emission

Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2440  
 Test Mode :Tx  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-11  
 Temp./Humi. :22.5°C/59%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



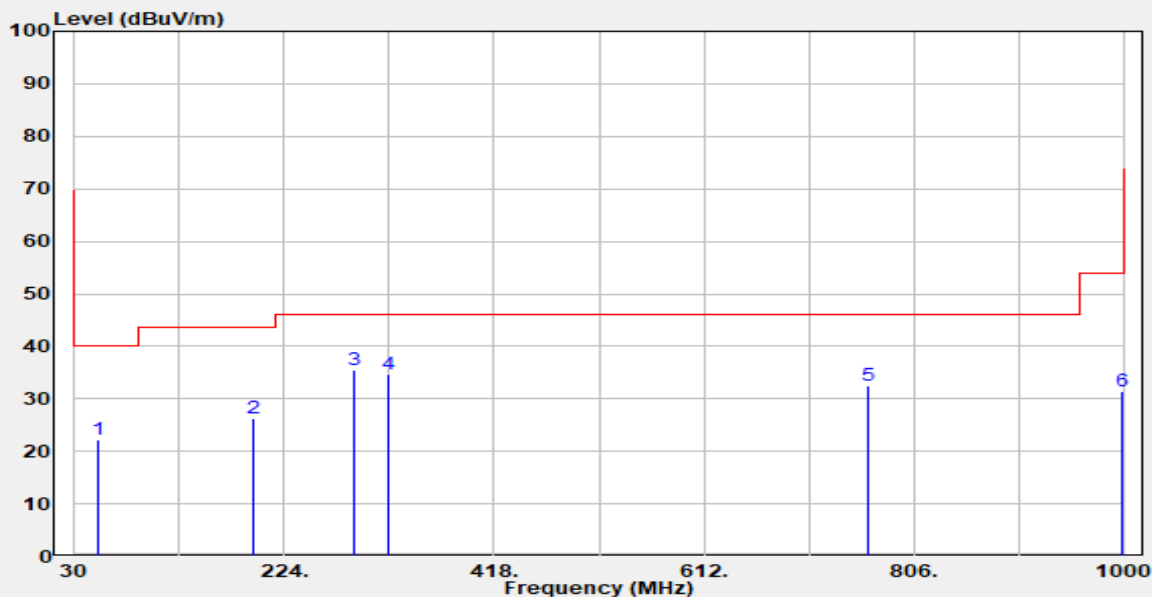
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
52.31	Peak	45.80	-12.66	33.14	40.00	-6.86
172.59	Peak	42.04	-13.59	28.45	43.50	-15.05
323.91	Peak	41.46	-11.14	30.32	46.00	-15.68
497.54	Peak	38.82	-7.20	31.62	46.00	-14.38
621.70	Peak	37.78	-4.42	33.36	46.00	-12.64
997.09	Peak	31.92	1.05	32.97	54.00	-21.03

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Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2440  
 Test Mode :Tx  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-11  
 Temp./Humi. :22.5°C/59%  
 Antenna Pol. :Horizontal  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
52.31	Peak	34.94	-12.66	22.28	40.00	-17.72
195.87	Peak	41.97	-15.57	26.40	43.50	-17.10
288.02	Peak	47.57	-12.17	35.40	46.00	-10.60
320.03	Peak	45.80	-11.23	34.57	46.00	-11.43
763.32	Peak	34.40	-1.87	32.53	46.00	-13.47
998.06	Peak	30.50	1.04	31.54	54.00	-22.46

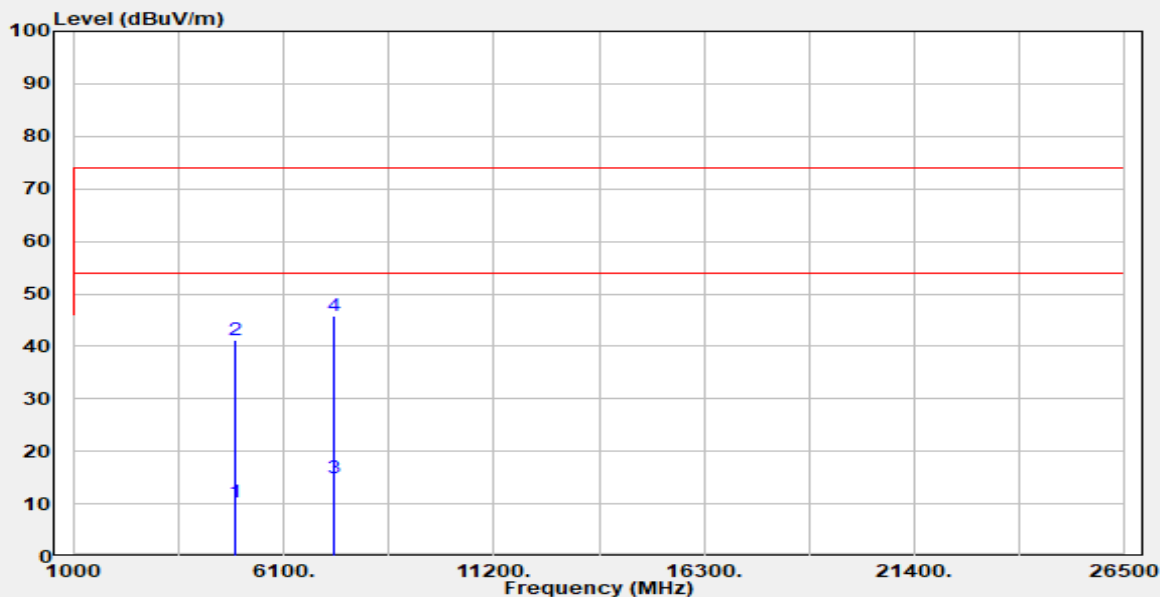
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Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2440  
 Test Mode :Tx  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-10  
 Temp./Humi. :22.5°C/59%  
 Antenna Pol. :Vertical  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4880.00	Average	-	-	10.43	54.00	-43.57
4880.00	Peak	37.34	3.84	41.18	74.00	-32.82
7320.00	Average	-	-	15.00	54.00	-39.00
7320.00	Peak	36.07	9.68	45.75	74.00	-28.25

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

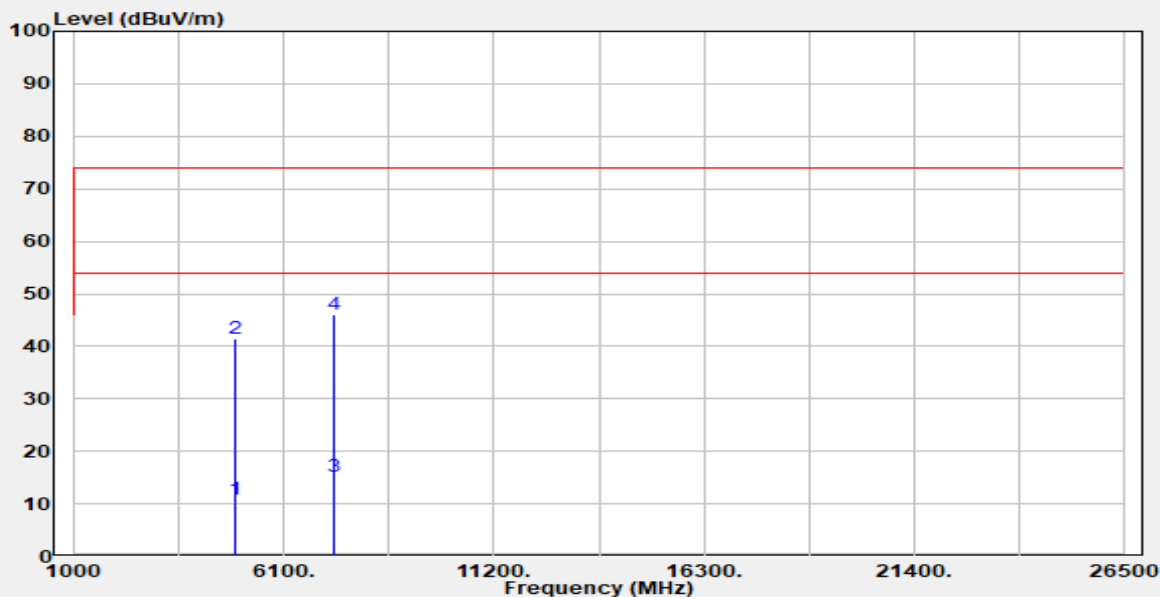
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Report Number :TERF2503001178E2  
 Operation Mode :BR  
 Test Frequency :2440  
 Test Mode :Tx  
 EUT Pol :NB Mode

Test Site :SAC G  
 Test Date :2025-04-10  
 Temp./Humi. :22.5°C/59%  
 Antenna Pol. :Horizontal  
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4880.00	Average	-	-	10.77	54.00	-43.23
4880.00	Peak	37.68	3.84	41.52	74.00	-32.48
7320.00	Average	-	-	15.19	54.00	-38.81
7320.00	Peak	36.26	9.68	45.94	74.00	-28.06

Average Duty Cycle Factor=-30.75 (dB)

Average Level= Peak Level+ Duty Cycle Factor

~ End of Report ~

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