

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

CLASS II PC REPORT

OF

Applicant: TomTom International B.V.
De Ruijterkade 154, 1011 AC Amsterdam, 1011 AC, The Netherlands

Product Name: GPS Navigation System

Brand Name: TomTom

Model No.: 4BA53A

Model Difference: N/A

Report Number: E2/2018/10190-01

FCC ID S4L4BA53

IC: 5767A-4BA53

FCC Rule Part: §15.247, Cat: DTS

IC RSS: RSS-247 issue 2 Feb 2017

Issue Date: Dec. 30, 2020

Date of Test: Nov. 23, 2020 ~ Dec. 23, 2020

Date of EUT Received: Nov. 23, 2020

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 tested as described in this report is in compliance with conducted and radiated emission limits.

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

Approved By: _____



Jim Chang / Manager



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Revision History

Report Number	Revision	Description	Issue Date	Remark
E2/2018/10190	Rev.00	Original.	Feb. 14, 2018	Revised By: Violetta Tang
E2/2018/10190-01	Rev.01	Class II Permissive change	Dec. 30, 2020	Revised By: Yuri Tsai

Note:

1、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 GENERAL INFORMATION

1.1 Product Description

Product Name:	GPS Navigation System
Brand Name:	TomTom
Model No.:	4BA53A
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
EUT Series No.:	G52430100029
Class II Permissive change:	PCB layout change in non RF section and a new HVIN 4BA53A is designated for this modification
Power Supply:	3.7Vdc from Rechargeable Li-ion Battery

Radio Technology:	Bluetooth LE Single mode
Frequency Range:	2402 – 2480MHz
Channel number:	40 channels
Modulation type:	GFSK

1.2 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
PIFA	N/A	N/A	2402-2480	-3	V

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1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247
FCC KDB 558074 D01 DTS Meas. Guidance v05r02
RSS-247 issue 2 Feb. 2017
RSS-Gen. issue 5, Amendment 1, March 2019
ANSI C63.10:2013

1.4 Test Facility

SGS Taiwan Ltd. Central RF Lab (TAF code 3702)
Central RF Lab

FCC Designation number: TW0028

ISED CAB identifier: TW3702

1.5 Special Accessories

There are no special accessories used while test was conducted.

1.6 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 30 MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50 μ H/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 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.

2.4 Measurement Results Explanation Example

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

Radiated emission below 30 MHz is measured in a 9m*9m*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.

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2.5 Configuration of Tested System

Fig 2-2 Radiated Emission

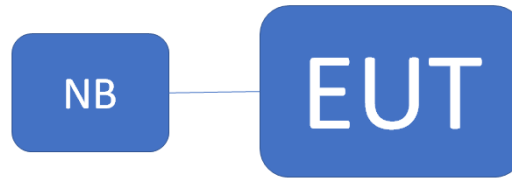


Fig 2-3 Conduction (AC Power Line) Radiated Emission



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	Bluetooth Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	T420	S0012599	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(d) §15.205	RSS-247 §5.5 RSS-Gen §8.10	Radiated Band Edge	Compliant
§15.247(d) §15.209	RSS-247 §5.5 RSS-Gen §8.9	Radiated Spurious Emission	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operated in 2400 ~ 2483.5MHz Band

40 channels are provided for Bluetooth LE

ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY
1	2402 MHz	15	2430 MHz	29	2458 MHz
2	2404 MHz	16	2432 MHz	30	2460 MHz
3	2406 MHz	17	2434 MHz	31	2462 MHz
4	2408 MHz	18	2436 MHz	32	2464 MHz
5	2410 MHz	19	2438 MHz	33	2466 MHz
6	2412 MHz	20	2440 MHz	34	2468 MHz
7	2414 MHz	21	2442 MHz	35	2470 MHz
8	2416MHz	22	2444 MHz	36	2472 MHz
9	2418 MHz	23	2446 MHz	37	2474 MHz
10	2420 MHz	24	2448 MHz	38	2476 MHz
11	2422 MHz	25	2450 MHz	39	2478 MHz
12	2424 MHz	26	2452 MHz	40	2480 MHz
13	2426 MHz	27	2454 MHz		
14	2428 MHz	28	2456 MHz		

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. Investigation has been done on all the possible configurations for searching the worst case.

MODE	AVAILABLE FREQUENCY (MHz)	TESTED FREQUENCY (MHz)	MODULATION	DATA RATE (Mbps)
RADIATED EMISSION TEST (BELOW 1 GHz)				
Bluetooth LE	2402 to 2480	2442	GFSK	1
RADIATED EMISSION TEST (ABOVE 1 GHz)				
Bluetooth LE	2402 to 2480	2402, 2442, 2480	GFSK	1
Note: The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth LE Transmitter for channel Low, Mid and High, the worst case H position was reported.				

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
6dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Peak Power Density	+/- 1.3 dB
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission Measurement Uncertainty	
Polarization: Vertical	9kHz~30MHz: +/-2.3dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB
Polarization: Horizontal	9kHz~30MHz: +/-2.3dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

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 CONDUCTED EMISSION TEST

6.1 Standard Applicable:

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(μV)	
	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
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

6.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
LISN	SCHWARZ-BECK Mess-Elektro nik	NSLK8127	974	03/25/2020	03/24/2021
EMI Test Receiver	R&S	ESCI	101342	04/28/2020	04/27/2021

6.3 EUT Setup:

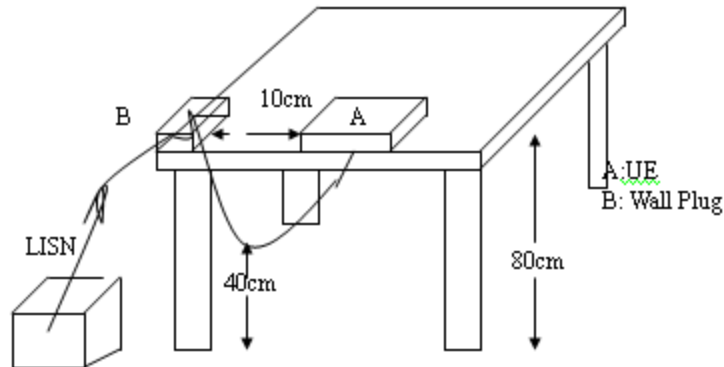
1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

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6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plan.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

6.6 Measurement Result:

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :E2/2018/10190-01

Test Site :Conduction Room C

Test Mode :BLE 1M

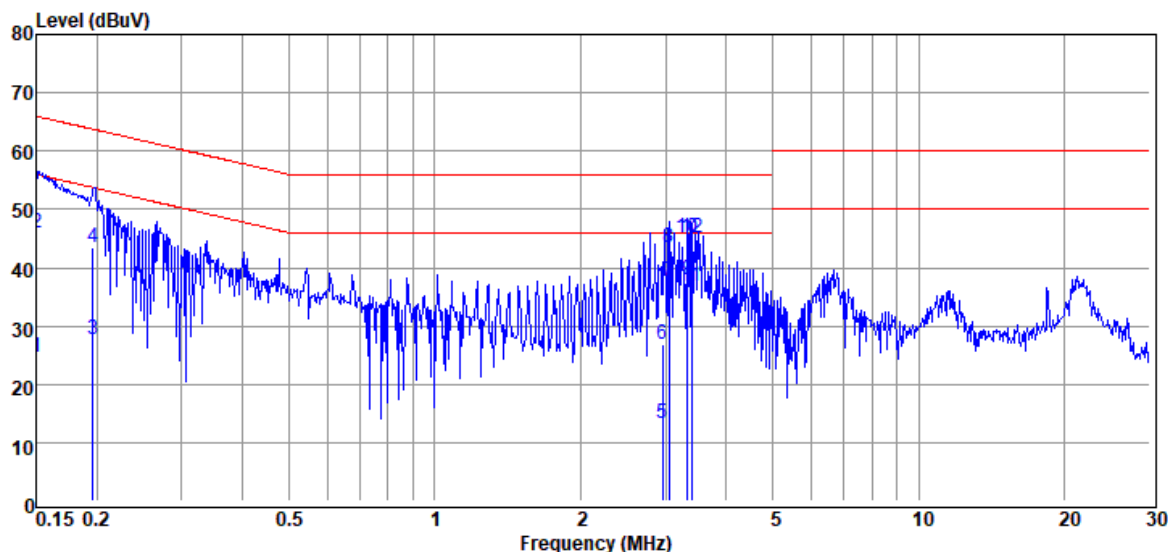
Test Date :2020-12-23

Power :120V/60Hz

Temp./Humi. :23.6/65

Probe :L1

Engineer :Ashton chiu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.15	Average	14.54	10.22	24.76	55.97	-31.21
0.15	QP	35.75	10.22	45.97	65.97	-20.00
0.20	Average	17.38	10.22	27.60	53.76	-26.16
0.20	QP	33.26	10.22	43.48	63.76	-20.28
2.96	Average	2.82	10.47	13.29	46.00	-32.71
2.96	QP	16.40	10.47	26.87	56.00	-29.13
3.05	Average	27.13	10.47	37.60	46.00	-8.40
3.05	QP	32.87	10.47	43.34	56.00	-12.66
3.33	Average	27.39	10.47	37.86	46.00	-8.14
3.33	QP	34.70	10.47	45.17	56.00	-10.83
3.39	Average	26.38	10.47	36.85	46.00	-9.15
3.39	QP	34.73	10.47	45.20	56.00	-10.80

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Report Number :E2/2018/10190-01

Test Site :Conduction Room C

Test Mode :BLE 1M

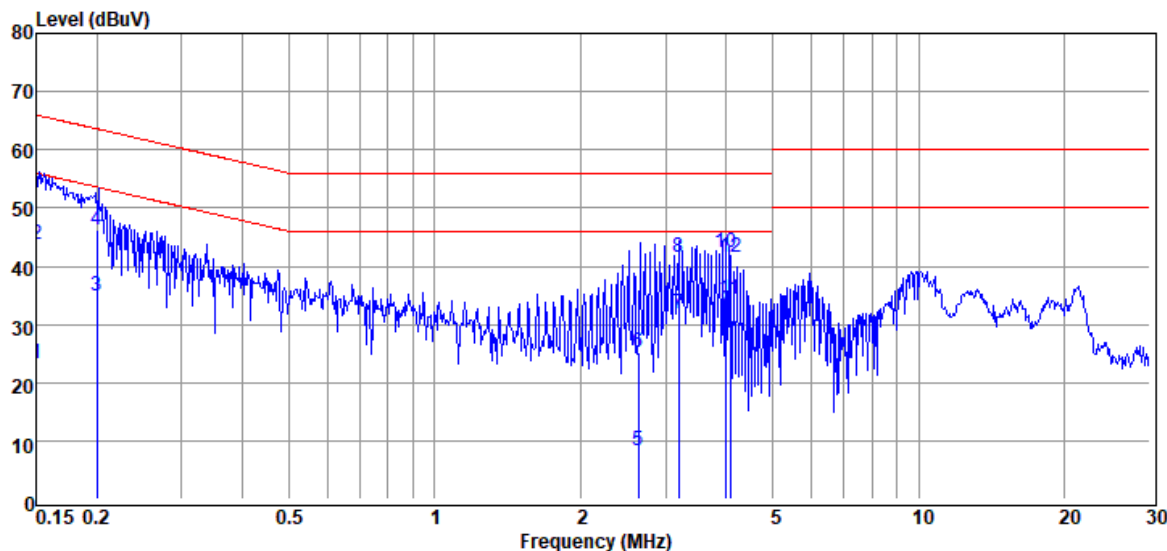
Test Date :2020-12-23

Power :120V/60Hz

Temp./Humi. :23.6/65

Probe :N

Engineer :Ashton chiu



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.15	Average	12.98	10.21	23.19	55.98	-32.79
0.15	QP	33.60	10.21	43.81	65.98	-22.17
0.20	Average	24.56	10.21	34.77	53.59	-18.82
0.20	QP	36.06	10.21	46.27	63.59	-17.32
2.64	Average	-2.05	10.47	8.42	46.00	-37.58
2.64	QP	14.78	10.47	25.25	56.00	-30.75
3.19	Average	21.24	10.48	31.72	46.00	-14.28
3.19	QP	31.15	10.48	41.63	56.00	-14.37
4.01	Average	21.96	10.49	32.45	46.00	-13.55
4.01	QP	31.79	10.49	42.28	56.00	-13.72
4.08	Average	23.85	10.49	34.34	46.00	-11.66
4.08	QP	30.97	10.49	41.46	56.00	-14.54

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7 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

7.1 Standard Applicable

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 RSS-Gen §8.9 Table 5 and 6 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13.2.a 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.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

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7.2 Measurement Equipment Used

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	TESEQ	CBL 6112D	35240	09/08/2020	09/07/2021
Horn Antenna	Schwarzbeck	BBHA9120D	1341	06/22/2020	06/21/2021
Horn Antenna	Schwarzbeck	BBHA9170	185	07/30/2020	07/29/2021
Loop Antenna	ETS.LINDGREN	6502	143303	04/28/2020	04/27/2021
3m Site NSA	SGS	966 chamber D	N/A	07/12/2020	07/11/2021
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	07/08/2020	07/07/2021
Pre-Amplifier	EMC Instruments	EMC184045B	980135	10/27/2020	10/26/2021
Pre-Amplifier	EMC Instruments	EMC9135	980234	11/19/2020	11/18/2021
Pre-Amplifier	EMC Instruments	EMC12630SE	980271	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF25	11/19/2020	11/18/2021
High Pass Filter	R&S	F13 HPF 3GHz	RF175	11/19/2020	11/18/2021
Lowpass Filter	Woken	EWT-56-0019	RF173	11/19/2020	11/18/2021
Notch Filter	Woken	EWT-54-0038	RF178	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	EMC106-SM-SM-7200	150703	11/19/2020	11/18/2021
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17413/4	11/19/2020	11/18/2021

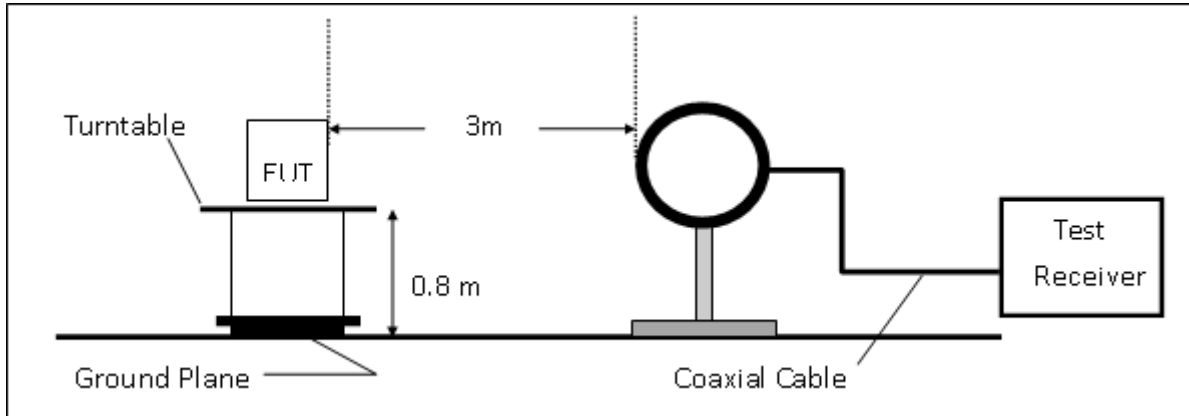
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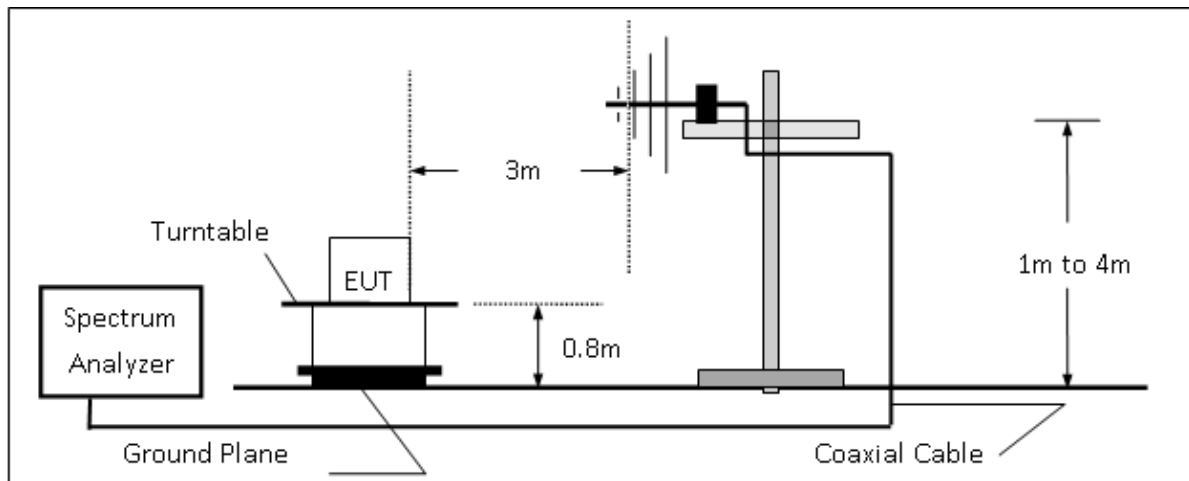
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7.3 Test SET-UP

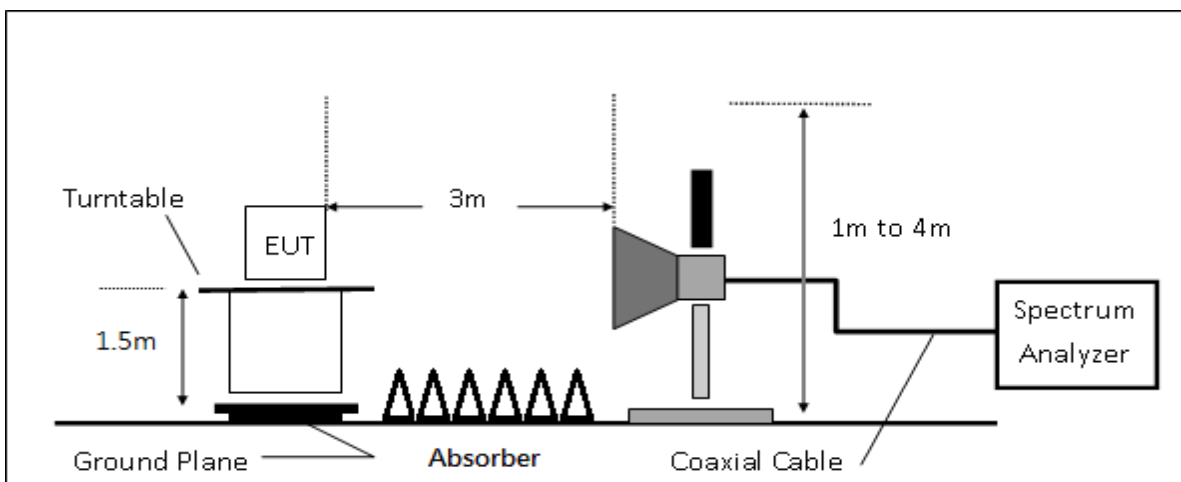
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-UP, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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7.4 Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
2. The EUT was placed on a turn table with 0.8m for frequency < 1GHz and 1.5m for frequency > 1GHz above ground plan.
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=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
6. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
8. 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.
9. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
11. Repeat above procedures until all default test channel measured were complete.

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7.5 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(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

7.6 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.

7.7 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

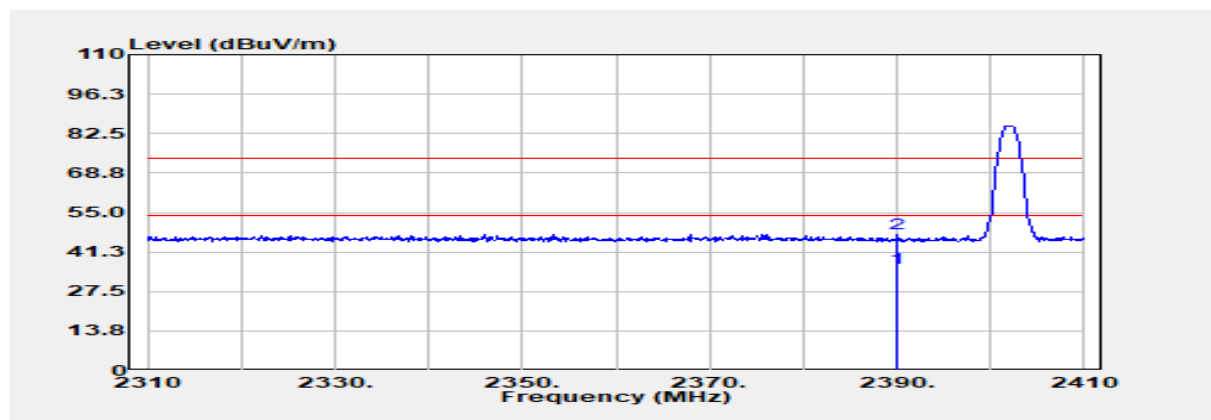
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7.7.1 Radiated Band Edge Measurement Result

Report Number	:E2/2018/10190-01	Test Site	:966 Chamber D
Operation Mode	:BLE 1M	Test Date	:2020-12-16
Test Frequency	:2402 MHz	Temp./Humi.	:20.9/62
Test Mode	:BE CH LOW	Antenna Pol.	:Vertical
EUT Pol	:H plan	Engineer	:Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
2390.000	Average	43.75	-7.99	35.76	54.00	-18.24
2390.000	Peak	55.62	-7.99	47.63	74.00	-26.37

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-16

Test Frequency :2402 MHz

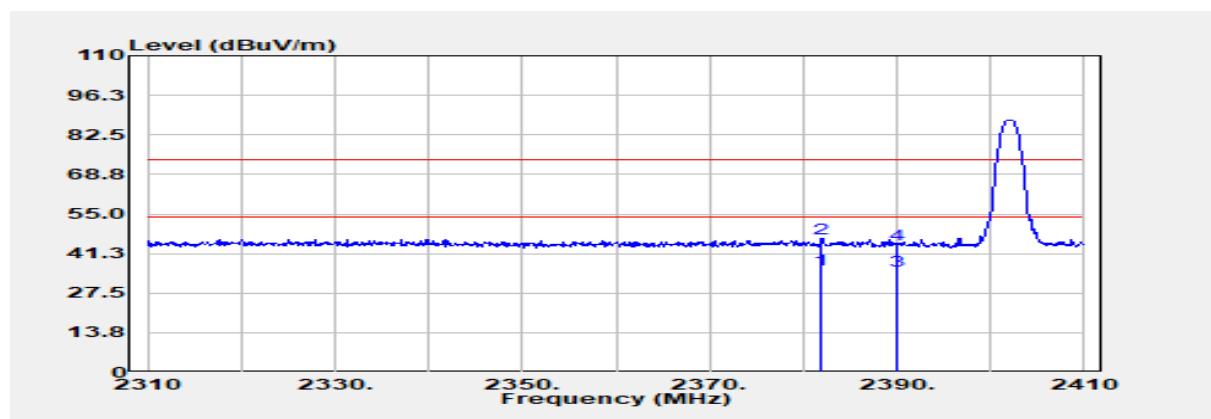
Temp./Humi. :20.9/62

Test Mode :BE CH LOW

Antenna Pol. :Horizontal

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
2382.000	Average	43.42	-7.75	35.67	54.00	-18.33
2382.000	Peak	54.05	-7.75	46.30	74.00	-27.70
2390.000	Average	43.47	-7.99	35.48	54.00	-18.52
2390.000	Peak	52.20	-7.99	44.21	74.00	-29.79

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-16

Test Frequency :2480 MHz

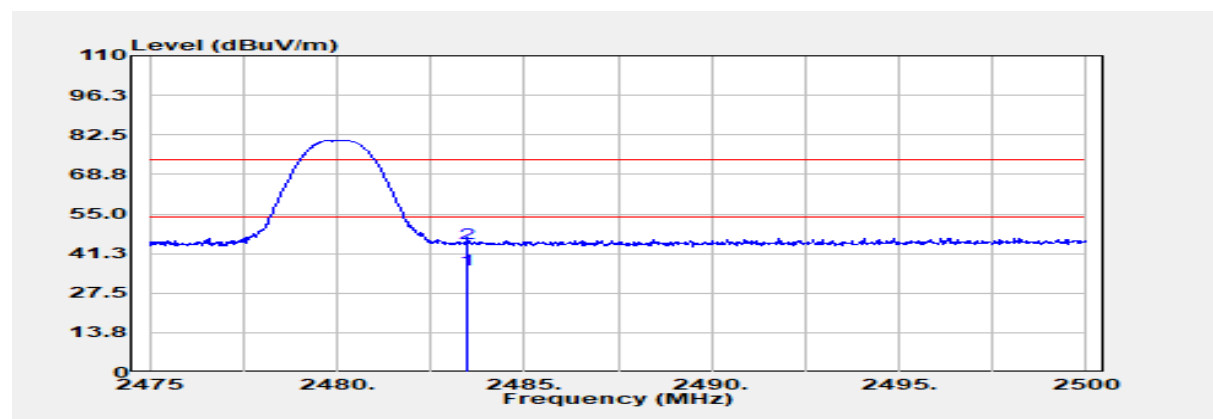
Temp./Humi. :20.9/62

Test Mode :BE CH HIGH

Antenna Pol. :Vertical

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
2483.500	Average	43.78	-8.12	35.66	54.00	-18.34
2483.500	Peak	52.89	-8.12	44.77	74.00	-29.23

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-16

Test Frequency :2480 MHz

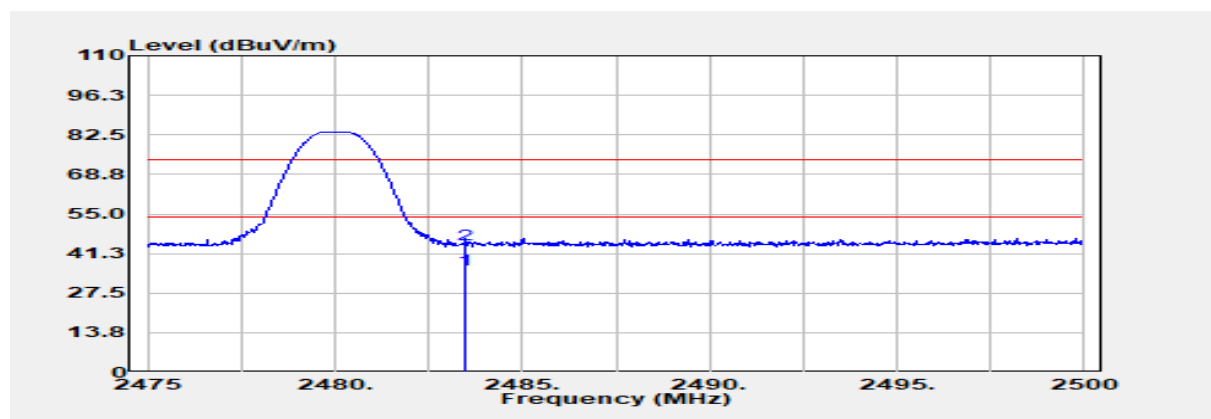
Temp./Humi. :20.9/62

Test Mode :BE CH HIGH

Antenna Pol. :Horizontal

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
2483.500	Average	43.64	-8.12	35.52	54.00	-18.48
2483.500	Peak	52.61	-8.12	44.50	74.00	-29.50

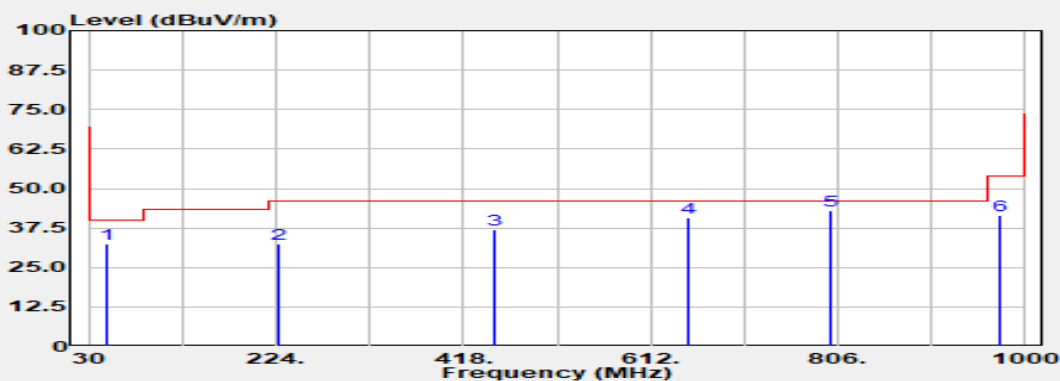
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7.7.2 Radiated Spurious Emission from 30MHz to 1000MHz

Report Number	:E2/2018/10190-01	Test Site	:966 Chamber D
Operation Mode	:BLE 1M	Test Date	:2020-12-17
Test Frequency	:2442 MHz	Temp./Humi.	:21.2/64
Test Mode	:TX CH MID	Antenna Pol.	:Vertical
EUT Pol	:H plan	Engineer	:Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
48.430	Peak	50.06	-17.64	32.42	40.00	-7.58
225.940	Peak	52.37	-19.89	32.48	46.00	-13.52
450.980	Peak	49.22	-12.40	36.82	46.00	-9.18
649.830	Peak	49.37	-8.54	40.83	46.00	-5.17
798.240	Peak	49.74	-6.66	43.08	46.00	-2.92
972.840	Peak	45.62	-4.16	41.46	54.00	-12.54

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2442 MHz

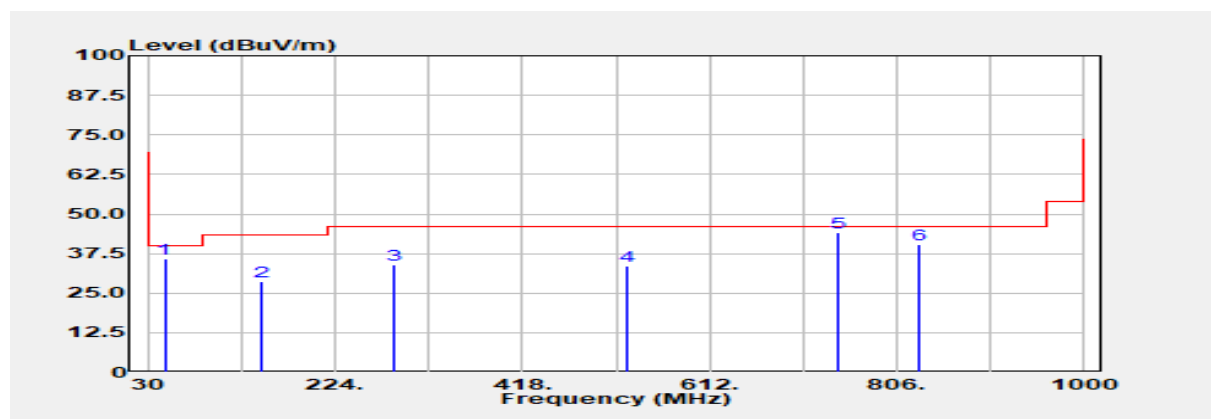
Temp./Humi. :21.2/64

Test Mode :TX CH MID

Antenna Pol. :Horizontal

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
47.460	Peak	53.30	-17.54	35.76	40.00	-4.24
147.370	Peak	45.47	-16.81	28.66	43.50	-14.84
286.080	Peak	50.40	-16.54	33.86	46.00	-12.14
525.670	Peak	44.53	-11.05	33.48	46.00	-12.52
744.890	Peak	52.05	-8.08	43.97	46.00	-2.03
829.280	Peak	46.95	-6.45	40.50	46.00	-5.50

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7.7.3 Radiated Spurious Emission above 1GHz

Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2402 MHz

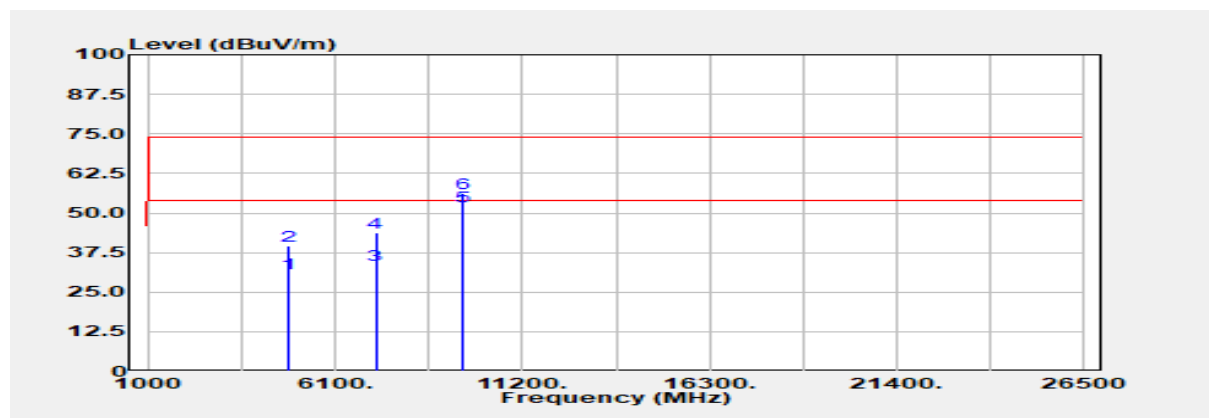
Temp./Humi. :20.9/62

Test Mode :TX CH LOW

Antenna Pol. :Vertical

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4804.000	Average	34.10	-3.03	31.07	54.00	-22.93
4804.000	Peak	42.58	-3.03	39.55	74.00	-34.45
7206.000	Average	30.77	2.98	33.75	54.00	-20.25
7206.000	Peak	40.83	2.98	43.82	74.00	-30.18
9608.000	Average	46.18	5.74	51.92	54.00	-2.08
9608.000	Peak	50.53	5.74	56.26	74.00	-17.74

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2402 MHz

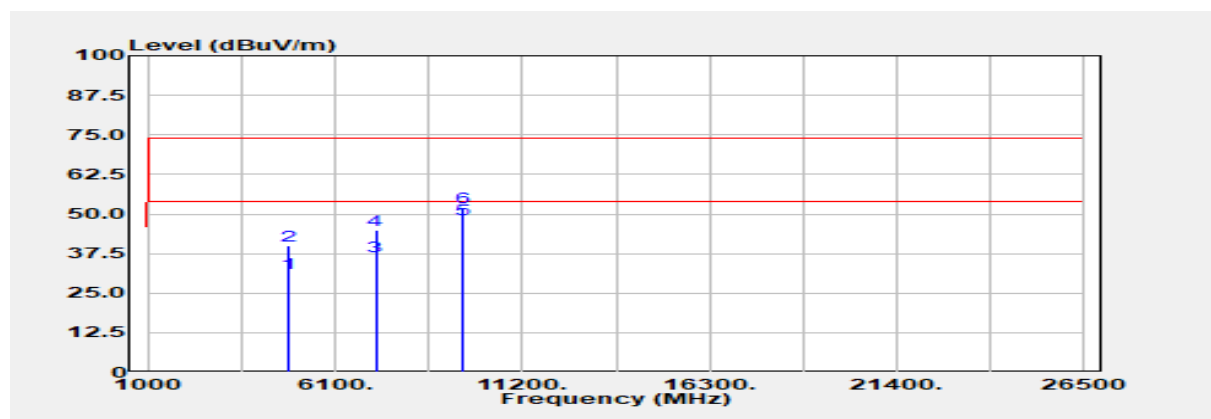
Temp./Humi. :20.9/62

Test Mode :TX CH LOW

Antenna Pol. :Horizontal

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4804.000	Average	34.26	-3.03	31.22	54.00	-22.78
4804.000	Peak	42.86	-3.03	39.82	74.00	-34.18
7206.000	Average	33.61	2.98	36.59	54.00	-17.41
7206.000	Peak	41.98	2.98	44.96	74.00	-29.04
9608.000	Average	42.50	5.74	48.24	54.00	-5.76
9608.000	Peak	46.18	5.74	51.92	74.00	-22.08

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2441 MHz

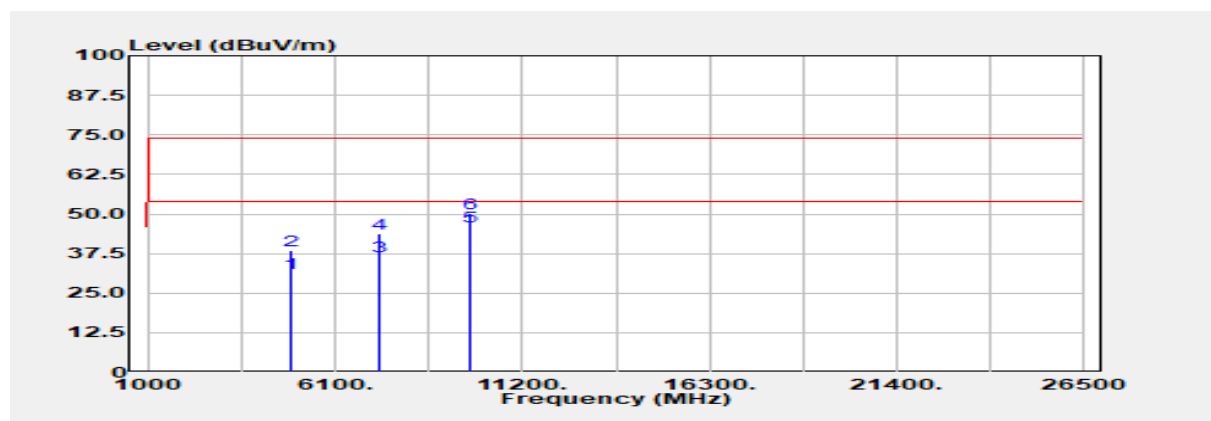
Temp./Humi. :20.9/62

Test Mode :TX CH MID

Antenna Pol. :Vertical

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4882.000	Average	34.26	-3.02	31.24	54.00	-22.76
4882.000	Peak	41.69	-3.02	38.67	74.00	-35.33
7323.000	Average	33.42	3.28	36.70	54.00	-17.30
7323.000	Peak	40.63	3.28	43.91	74.00	-30.09
9764.000	Average	39.56	6.44	46.00	54.00	-8.00
9764.000	Peak	43.79	6.44	50.23	74.00	-23.77

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2441 MHz

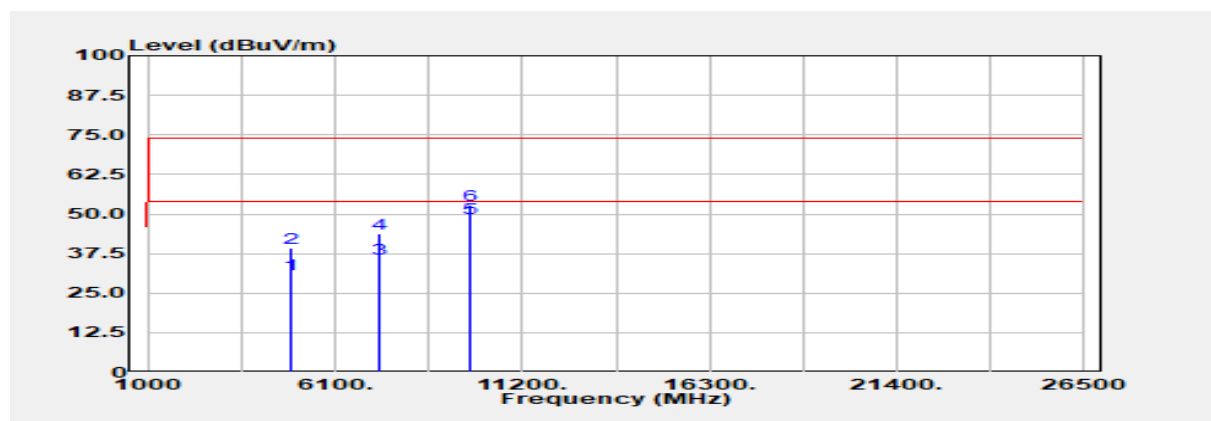
Temp./Humi. :20.9/62

Test Mode :TX CH MID

Antenna Pol. :Horizontal

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4882.000	Average	34.10	-3.02	31.08	54.00	-22.92
4882.000	Peak	42.34	-3.02	39.32	74.00	-34.68
7323.000	Average	32.49	3.28	35.77	54.00	-18.23
7323.000	Peak	40.32	3.28	43.60	74.00	-30.40
9764.000	Average	42.39	6.44	48.83	54.00	-5.17
9764.000	Peak	46.36	6.44	52.80	74.00	-21.20

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2480 MHz

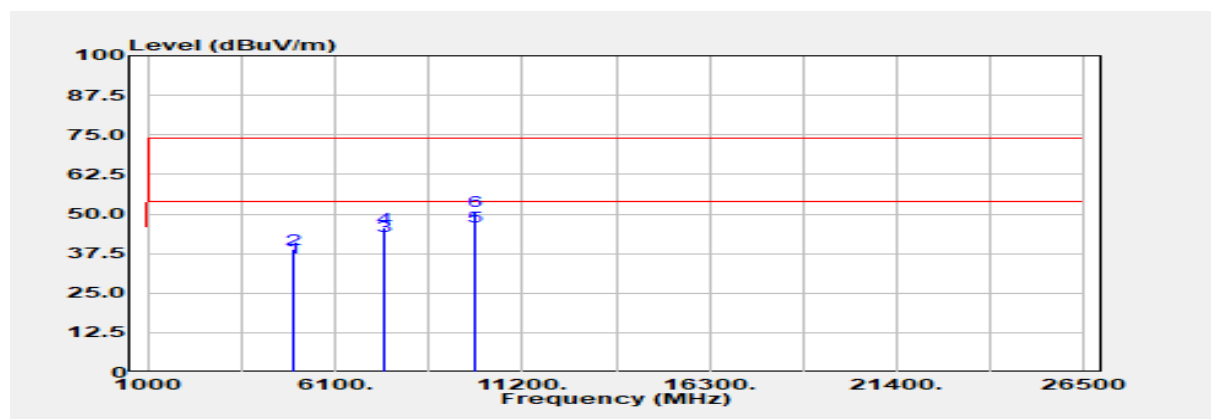
Temp./Humi. :20.9/62

Test Mode :TX CH HIGH

Antenna Pol. :Vertical

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4960.000	Average	38.98	-2.89	36.08	54.00	-17.92
4960.000	Peak	41.66	-2.89	38.77	74.00	-35.23
7440.000	Average	39.23	3.65	42.88	54.00	-11.12
7440.000	Peak	41.95	3.65	45.60	74.00	-28.40
9920.000	Average	39.27	6.90	46.17	54.00	-7.83
9920.000	Peak	43.93	6.90	50.83	74.00	-23.17

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Report Number :E2/2018/10190-01

Test Site :966 Chamber D

Operation Mode :BLE 1M

Test Date :2020-12-17

Test Frequency :2480 MHz

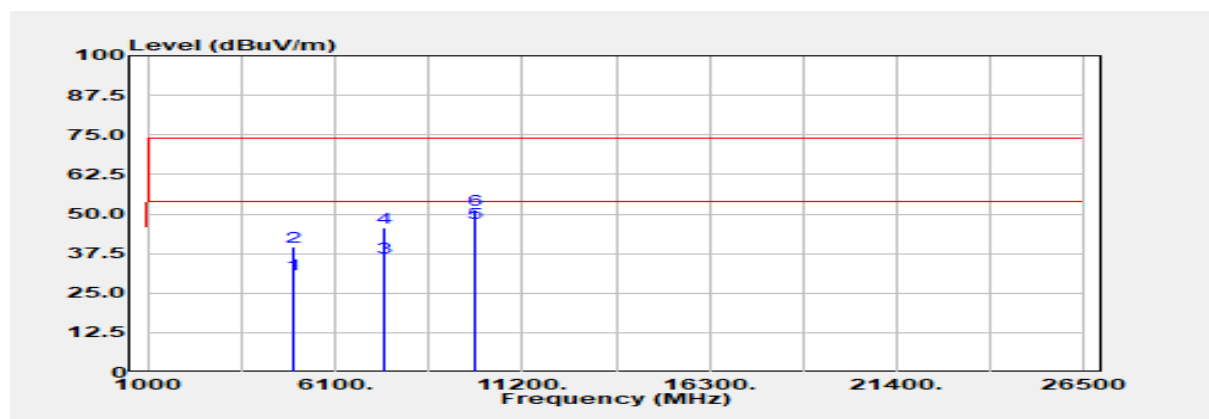
Temp./Humi. :20.9/62

Test Mode :TX CH HIGH

Antenna Pol. :Horizontal

EUT Pol :H plan

Engineer :Kailin Lee



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
4960.000	Average	33.92	-2.89	31.03	54.00	-22.97
4960.000	Peak	42.57	-2.89	39.68	74.00	-34.32
7440.000	Average	32.68	3.65	36.33	54.00	-17.67
7440.000	Peak	41.84	3.65	45.49	74.00	-28.51
9920.000	Average	40.23	6.90	47.13	54.00	-6.87
9920.000	Peak	44.53	6.90	51.43	74.00	-22.57

~ End of Report ~

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