

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C AND INDUSTRY CANADA RSS 247 REQUIREMENT

	OF
Applicant:	Quanta Computer Inc.
	No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City
	33377, Taiwan
Product Name:	Clover Flex
Brand Name:	clover
Model No.:	C403
Model Difference:	N/A
FCC ID:	HFS-C403U
IC:	1787B-C403U
Report Number:	T190816W02-RP6
FCC Rule Part:	§15.247, Cat: DTS
IC Rule Part:	RSS-247 issue 2 Feb 2017
Issue Date:	Sep. 09, 2019
Date of Test:	Aug. 16, 2019 ~ Aug. 23, 2019
Date of EUT Received:	Aug. 16, 2019
Issued by	Compliance Certification Services Inc.Wugu Lab.
-	No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891,
	Taiwan. (R.O.C.)

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

The test results of this report relate only to the tested sample (EUT) identified in this report. The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Tested By:

Approved By:

Hone Hsieh / Engineer

Low

Kevin Tsai / Deputy Manager



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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190816W02-RP6	Rev.00	Initial creation of document	All	Aug. 30, 2019	Elle Chang
T190816W02-RP6	Rev.01	Update the information	8	Sep. 09, 2019	Elle Chang

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GENERAL INFORMATION 1

1.1 Product Description

Product Name:	Clover Fle	×	
Brand Name:	clover		
Model No.:	C403		
Model Difference:	N/A		
Product SW/HW version:	N/A / N/A		
Radio SW/HW version:	N/A / N/A		
Test SW Version:	N/A		
RF power setting in TEST SW:	N/A		
Micro Hub:	Model No.: H400, Supplier: clover		
Docking:	Model No.: K400, Supplier: clover		
	7.6V from Li-ion Polymer rechargeable battery or 12V from Adapter		
Power Supply:	Battery:	Model No.: CA355772HV_POS5, Supplier: CosMX Battery Co., Ltd.	
	Adapter:	Model No.: FSP040-RHBN3, Supplier: FSP	

Bluetooth Low Energy:

Bluetooth Version:	Bluetooth V5.0 Dual Mode
Bluetootii version.	
Channel number:	40 channels
Modulation type:	GFSK
Transmit Power:	1.52dBm (BLE 1M) 1.67dBm (BLE 2M)
Frequency Range:	2402 – 2480MHz
Antenna Designation:	PIFA Antenna, Peak Gain: -1.47dBi P/N: DQ60AYF0002, Supplier: SAA

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance v05.

RSS-Gen. issue 5 Apr. 2018

RSS-247 issue 2 Feb. 2017

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) (TAF code 1309)

FCC Designation number: TW1309

Canada Registration Number: 2324G

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 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 as turn table which is 0.8 m above ground plan. 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 according to §15.207 & RSS-Gen §8.8. The two LISNs provide 50 ohm/ 50uH 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 a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. 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

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 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration



Fig. 2-2 Conducted Emission Configuration

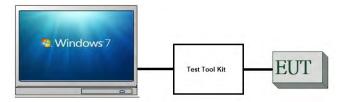


Fig 2-3 Conduction (AC Power Line) Configuration

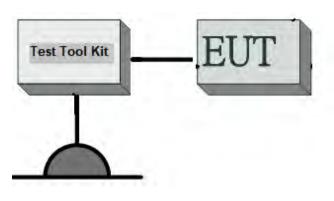


Table 2-1 Equipment Used in Tested System

ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Ca- ble	Power Cord
1	Bluetooth Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	T420	S0012483	Shielded	Unshielded
3	Test Tool Kit	N/A	N/A	N/A	N/A	N/A

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SUMMARY OF TEST RESULTS 3

FCC Rules	IC Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §5.4(4)	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 (1) RSS-Gen §6.7	6dB & 99% Emission Bandwidth	Compliant
§15.247(d)	RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	RSS-247 §5.2(2)	Peak Power Density	Compliant
§15.203 §15.247(b)	RSS- Gen §6.8	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES 4

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		

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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.

AC POWER LINE CONDUCTED EMISSION TEST:

Test Condition	AC Power line conducted emission for line and neutral		
Worst Case	Operation in normal mode		

RADIATED EMISSION TEST:

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
Bluetooth LE	2402 to 2480	2442	GFSK	2
RADIATED EMISSION TEST (ABOVE 1 GHz)				
Bluetooth LE	2402 to 2480	2402, 2442, 2480	GFSK	1
Bluetooth LE	2402 to 2480	2402, 2442, 2480	GFSK	2
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.

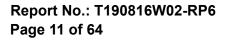
ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST					
MODE	AVAILABLE FREQUENCY (MHz)	TESTED FREQUENCY (MHz)	MODULATION	DATA RATE (Mbps)	
Bluetooth LE	2402 to 2480	2402, 2442, 2480	GFSK	1	
Bluetooth LE	2402 to 2480	2402, 2442, 2480	GFSK	2	

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MEASUREMENT UNCERTAINTY 5

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575 dB
Peak Output Power	+/- 1.92 dB
6dB Bandwidth	+/- 61.248 Hz
100 kHz Bandwidth of Frequency Band Edges	+/- 1.92 dB
Peak Power Density	+/- 1.996 dB
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12 dB
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68 dB
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18 dB
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47 dB
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81 dB
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87 dB

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	Lin dB(nits uV)						
MHz	Quasi-peak	Average						
0.15 to 0.50	66 to 56	56 to 46						
0.50 to 5	56	46						
5 to 30	60	50						
Note								
1.The lower limit shall apply at th								
2. The limit decreases linearly wit	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.				
	ENIO		-						
CABLE	EMCI	CFD300-NL	CERF	06/27/2019	06/26/2020				
EMI Test Receiver	R&S	ESCI	101203	10/29/2018	10/28/2019				
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020				
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020				
Software		EZ-EMC(CO	CS-3A1-CE)						

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.

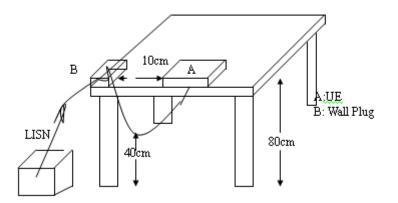
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6.4 Test SET-UP (Block Diagram of Configuration)



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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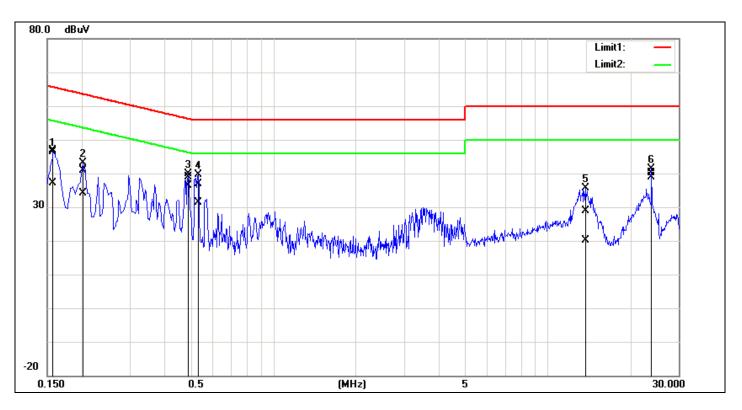
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Description:	Operation	Date:	2019/8/23
Line:	L1	Temp.(℃)/Hum.(%):	25.3(℃)/65%
Test Voltage: Job No.:	AC 120V/60Hz T190816W02	Test By:	Henry



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1580	36.66	26.98	10.14	46.80	37.12	65.56	55.57	-18.76	-18.45	Pass
2	0.2020	30.87	24.06	10.13	41.00	34.19	63.52	53.53	-22.52	-19.34	Pass
3*	0.4900	28.72	26.23	10.14	38.86	36.37	56.17	46.17	-17.31	-9.80	Pass
4	0.5340	26.84	21.35	10.14	36.98	31.49	56.00	46.00	-19.02	-14.51	Pass
5	13.7220	18.52	9.83	10.36	28.88	20.19	60.00	50.00	-31.12	-29.81	Pass
6	23.9260	29.76	28.49	10.28	40.04	38.77	60.00	50.00	-19.96	-11.23	Pass

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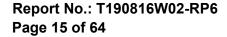
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30.000



Description: Line: Test Voltage: Job No.:	Operation N AC 120V/60Hz T190816W02	Date: Temp.(℃)/Hum.(%): Test By:	2019/8/23 25.3(℃)/65% Henry
80.0 dBuV			nit1: — nit2: —
1			
30		5	6 *

No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1620	37.63	28.97	10.02	47.65	38.99	65.36	55.36	-17.71	-16.37	Pass
2	0.1940	29.16	19.40	10.02	39.18	29.42	63.86	53.86	-24.68	-24.44	Pass
3	0.4900	27.79	24.84	10.03	37.82	34.87	56.17	46.17	-18.35	-11.30	Pass
4*	0.5265	28.73	24.78	10.03	38.76	34.81	56.00	46.00	-17.24	-11.19	Pass
5	14.0900	15.91	6.33	10.25	26.16	16.58	60.00	50.00	-33.84	-33.42	Pass
6	23.9260	29.51	28.36	10.36	39.87	38.72	60.00	50.00	-20.13	-11.28	Pass

5

(MHz)

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-20



7 PEAK OUTPUT POWER MEASUREMENT

7.1 Standard Applicable:

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

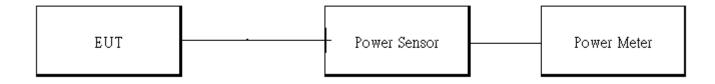
If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

7.2 Measurement Equipment Used:

	Conducted Emission Test Site									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.					
Power Meter	Anritsu	ML2496A	1242004	10/23/2018	10/22/2019					
Power Sensor	Anritsu	MA2411B	1207365	10/23/2018	10/22/2019					
Power Sensor	Anritsu	MA2411B	1207368	10/24/2018	10/23/2019					
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020					
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019					

7.3 Test Set-up:



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7.4 Measurement Procedure:

- 1.Place the EUT on the table and set it in transmitting mode.
- 2.The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas Guidance & ANSI C63.10..
- 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:

It is used as the auxiliary test equipment to conduct the output power measurement.

4.Record the max. Reading as observed from Power Meter.

5.Repeat above procedures until all test default channel measured was complete.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Duty Factor:

Please refer to next page.

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(BLE 1M)

	Duty Cycle (%)	Duty Factor (dB)	1/T (kHz)	VBW setting (kHz)
BLE	62.30	2.06	2.56	3.00

Duty Cycle_BLE_1M_MidCH20-2442

🔤 Ke	eysight	Spect	trum /	Analyz	er - Swe	ept SA													
uxu ⊪ Cer		Fre	RF eq 2		50 Ω 200					Tria	SENSE:	Avg	Туре	e: Voltage	TF	7 PM Aug 19, 2 RACE 1 2 3 4	56	F	requency
10 d	B/div					.6 dB		IO: Fas ain:Lo			: 20 dB					626.0 0.17 c	un n us		Auto Tune
Log 10.0 0.00					×2			- () } 1∆2		^{3∆4} -	 · · ·	1		-				Center Freq 2000000 GHz
-20.0 -30.0 -40.0		(ba bi	- Alularly					li Aintin	hill-allerer			Jan 164	(D-14-12.14-mark-14)) Vlv	2.44	Start Freq 2000000 GHz
-50.0 -60.0 -70.0))	, null							1 11 - 111	kolonates d.			, dan.	<u>Ми. М.</u> . и. и			<u> </u>	2.44	Stop Freq 2000000 GHz
Res	s BW	8	MH	z	00 G			#\	/BW	8.0 M	Hz			Sweep 2		Span 0 (1001 p		Auto	CF Step 8.000000 MHz Man
1 2 3 4 5 6	MOD F Δ4 F	1 1 1 1	t t t			×	308 620	0.0 µs 8.0 µs 6.0 µs 8.0 µs		1.68 0.	24 dB 3 dBm 17 dB 3 dBm	CTION	FUN	ICTION WIDTH		TION VALUE	-		Freq Offset 0 Hz
7 8 9 10 11																	-	Log	Scale Type <u>Lin</u>
I < MSG			_							m		 		STATU	s				

Duty Cycle Factor:10*log(1/(62.3/100))=2.06

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(BLE 2M):

	Duty Cycle (%)	Duty Factor (dB)	1/T (kHz)	VBW setting (kHz)
BLE 2M	32.69	4.86	4.90	5.00

Duty Cycle_BLE_2M_ MidCH20-2442

Keysight Spectrum Analyzer - Swept SA			
R R R S Ω D C Center Freq 2.442000000	GHz	03:59:45 PM Aug 19, 2 Avg Type: Voltage TRACE 12 3 4	5 6 Frequency
Ref Offset 11.6 dB 10 dB/div Ref 20.00 dBm	PNO: Fast +++ Trig: Free Run IFGain:Low Atten: 20 dB	ΔMkr3 624.0 μ -0.23 c	Auto Tune
10.0 0.00 10.0	1 <u>0</u> 2 3 <u>0</u> 4 		Center Freq 2.442000000 GHz
-20.0 -30.0 -40.0 	a	Lefterlingerungelige	Start Freq 2.442000000 GHz
-50.0 -60.0 -70.0	h l h lan 4 Ann. un a l Ann. aust a .		Stop Freq 2.442000000 GHz
Center 2.442000000 GHz Res BW 8 MHz	#VBW 8.0 MHz	Span 0 Sweep 2.000 ms (1001 p FUNCTION FUNCTION WALUE	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	204.0 μs (Δ) 0.09 dB 324.0 μs 1.91 dBm 624.0 μs (Δ) -0.23 dB 324.0 μs 1.91 dBm		Freq Offset
7 8 9 10 11			Scale Type
MSG		STATUS	

Duty Cycle Factor:10*log(1/(32.69/100))=4.86

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7.5 Measurement Result:

(BLE 1M)

СН	Frequency (MHz)	Peak Power Output (dBm)	Required Limit
Low	2402	1.01	1 Watt = 30 dBm
Mid	2442	0.98	1 Watt = 30 dBm
High	2480	1.52	1 Watt = 30 dBm
СН	Frequency (MHz)	Max. Avg. Output include tune up tolerance Power (dBm)	Required Limit
Low	2402	0.81	1 Watt = 30 dBm
Low Mid	2402 2442	0.81	1 Watt = 30 dBm 1 Watt = 30 dBm

*Note: Measured by power meter, cable loss as 12.6 dB that offsets on the power meter in Peak *Note: Measured by power meter, as cable loss+ Duty cycle factor that offsets on the power meter

*Note: Max. Output include tune up tolerance Power is average power

EIRP

СН	Frequency (MHz)	Max. Avg. Output include tune up tolerance Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	L	.imi	t
Low	2402	0.81	-1.47	-0.66	4W=	36	dBm
Mid	2442	0.77	-1.47	-0.70	4W=	36	dBm
High	2480	1.20	-1.47	-0.27	4W=	36	dBm

* Note: EIRP = Average Power + Gain

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(BLE 2M)

СН	Frequency (MHz)	Peak Power Output (dBm)	Required Limit
Low	2402	1.10	1 Watt = 30 dBm
Mid	2442	1.18	1 Watt = 30 dBm
High	2480	1.67	1 Watt = 30 dBm
	-	Max. Avg. Output include	
СН	Frequency (MHz)	tune up tolerance Power (dBm)	Required Limit
CH Low		•	Required Limit 1 Watt = 30 dBm
	(MHz)	(dBm)	

*Note: Measured by power meter, cable loss as 12.6 dB that offsets on the power meter in Peak *Note: Measured by power meter, as cable loss+ Duty cycle factor that offsets on the power meter

*Note: Max. Output include tune up tolerance Power is average power

EIRP

СН	Frequency (MHz)	Max. Avg. Output include tune up tolerance Power (dBm) (dBi) (dBi)		L	.imit	t	
Low	2402	0.66	-1.47	-0.81	4W=	36	dBm
Mid	2442	0.75	-1.47	-0.72	4W=	36	dBm
High	2480	1.22	-1.47	-0.25	4W=	36	dBm

* Note: EIRP = Average Power + Gain

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8 6DB & 99% BANDWIDTH MEASUREMENT

8.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2 Measurement Equipment Used

	Conducted Emission Test Site										
EQUIPMENT	MFR	MFR MODEL SERIAL LAST CAL D									
TYPE		NUMBER	NUMBER	CAL.							
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020						
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019						

8.3 Test Set-up:



8.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance & ANSI C63.10.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. For 6dB Bandwidth:

Set the spectrum analyzer as RBW=100 kHz, VBW= 3*RBW, Span = 5MHz, Detector=Peak, Sweep=auto.

- 5. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. For 99% Bandwidth:

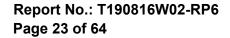
Set the spectrum analyzer as RBW=1%, VBW=3*RBW, Span = 2MHz, Detector=Sample, Sweep=auto.

- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all test default channel is completed

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8.5 Measurement Result:

BLE 1M mode

Frequency (MHz)	6dB BW (MHz)	BW (MHz)	Result
2402	0.6854	> 0.5	PASS
2442	0.6896	> 0.5	PASS
2480	0.6864	> 0.5	PASS

BLE 1M mode

Frequency (MHz)	99%Bandwidth (MHz)
2402	1.0282
2442	1.0303
2480	1.0305

BLE 2M mode

Frequency	6dB BW	BW	Result	BLE 2M mode		
(MHz)	(MHz)	(MHz)	Result	Frequency (MHz)	99%Bandwidth (MHz)	
2402	1.158	> 0.5	PASS			
2402	1.100	· 0.0	17,00	2402	2.0364	
2442	1.165	> 0.5	PASS			
2112	1.100	. 0.0	17,00	2442	2.0363	
2480	1.164	> 0.5	PASS	2480	2.0365	

Note: Refer to next page for plots.

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OBW 6dB_BLE_1M_LowCH00-2402

Feysight Spectrum multiplet - Occupied EV	M	ineu marcina di	07:20:38 PM Aug 19, 2018	
Center Freq 2.40200000	Trig.	er Freq: 2.402000000 GHz Free Run Avg Hold:>100 m: 30 dB	Radio Std: None	Frequency
Ref Offset 12.6 d 10 dB/div Ref 20.00 dBr				
Log 10.0 				Center Free 2.402000000 GH
30.0	A			
20 0				1.71
Center 2.402 GHz #Res BW 100 kHz	,	≠VBW 300 kHz	Span 5 MHz Sweep 1 ms	CF Ster 500.000 kH
Occupied Bandwidt 1.	n 0587 MHz	Total Power	8.84 dBm	Auto Mar Freg Offse
Transmit Freq Error x dB Bandwidth	24.300 kHz 685.4 kHz	% of OBW Power x dB	99.00 % -6.00 dB	0H
und j			17A102	-

OBW 6dB_BLE_1M_MidCH20-2442

Ferset Spectru	um might + Occupied EW						
Center Free	q 2.442000000	-B- Tr	nter Freq: 2.44200 ig: Free Run tten: 30 dB	COOD GHz AvgiHold: 100/100	Radio Std		Frequency
10 dB/div	Ref Offset 12.6 dE Ref 20.00 dBm						
10.0 0.00			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Center Free 2.442000000 GH
20.0		A		1			
20 0 X							
Center 2.44 Res BW 1			#VBW 300 k	Hz		an 5 MHz ep 1 ms	CF Ste
Occupie	ed Bandwidt 1.	h 0606 MHz	Total P	ower 8.9	94 dBm		Auto Mar Freq Offse
Transmit x dB Bar	t Freg Error ndwidth	23.985 kHz 689.6 kHz	% of OE x dB		99.00 % 5.00 dB		01
							-

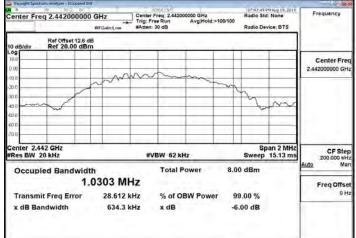
OBW 6dB_BLE_1M_HighCH39-2480

Second Spectrum and Jet - Occupied EW		INC. INC.			Sile is
Center Freq 2.480000000 GH	Hann Ing. I	r Freq: 2.480000000 GH	1z told: 100/100	Radio Std: None Radio Device: BTS	Frequency
10 dB/div Ref 20.00 dBm					
Log 10.0		~			Center Free 2.480000000 GH:
-200			_		
400			-	mound	
700 Center 2.48 GHz				Span 5 MH	
#Res BW 100 kHz	#	VBW 300 kHz		Sweep 1 m	500.000 kH
Occupied Bandwidth		Total Power	9.4	1 dBm	Auto Mar
1.06	05 MHz				Freq Offsel
Transmit Freq Error x dB Bandwidth	22.071 kHz 686.4 kHz	% of OBW Po x dB		9.00 % .00 dB	0H
wegi			17/10	12	

IC OBW 99%_BLE_1M_LowCH00-2402

Frequency		Radio Std	00/100	AvgiHold:	Freq: 2.4020 ee Run 30 dB	Center Trig: F	Hz FGain:Low		q 2.40200	enter Fre
								12.6 dB 0 dBm	Ref Offset Ref 20.0	dB/div
Center Free 2.402000000 GH				~	~	m	w			
	m	Z	N		-			1	~ /	0
÷									(Jan)	0
CF Ster 200.000 kH	an 2 MHz 15.13 ms	Sp Sweep	-	łz	BW 62 k	#\	-			enter 2.4 tes BW
Auto Mar Freq Offse		3 dBm	7.83	ower	Total F	Hz	282 M		ed Banc	Occup
он		9.00 % .00 dB		BW Powe	% of O x dB		28.381 634.5	ror	t Freq En ndwidth	
-		e.	37483							

IC OBW 99%_BLE_1M_MidCH20-2442



IC OBW 99%_BLE_1M_HighCH39-2480

Center Fre	eq 2.480000000	Trig:	r Freq: 2.480000000 GHz Free Run Avg/Hold n: 30 dB	100/100	Radio St	Maug 19, 2019 d: None wice: BTS	Frequency
10 dB/div	Ref Offset 12.6 de Ref 20.00 dBm						
10.0 0.00			han				Center Free 2.480000000 GH
300 300 400				n d	Z	m	
60 0 60 0 70 0						-	12.1
Center 2.4 Res BW		#	VBW 62 kHz			pan 2 MHz 15.13 ms	CF Ster 200.000 kH
Occup	ied Bandwidt	h 0305 MHz	Total Power	8.49	dBm		Auto Mar Freq Offse
	it Freq Error Indwidth	26.490 kHz 633.1 kHz	% of OBW Powe x dB		.00 % 00 dB		он
105				174805		-	

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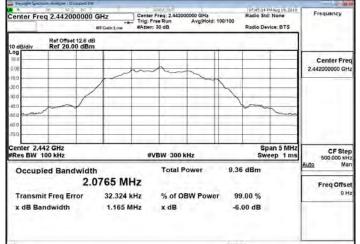
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OBW 6dB_BLE_2M_LowCH00-2402

Center Freq 2.402000000	GHz Cente	w Freq: 2.402000000 GHz Free Run Avg Hold: 100/100 n: 30 dB		dio Std: None dio Device: BTS	Frequency
10 dB/div Ref 20.00 dBn		1			
Log 10.0 0.00					Center Freq 2.402000000 GHz
300	1				1
400					
Center 2.402 GHz #Res BW 100 kHz	#	VBW 300 kHz		Span 5 MHz Sweep 1 ms	CF Step 500.000 kHz
Occupied Bandwidt 2.	h 0783 MHz	Total Power	9.33 df	3m	Auto Man Freg Offset
Transmit Freq Error x dB Bandwidth	34.584 kHz 1.158 MHz	% of OBW Powe x dB	r 99.00 -6.00	15	0 Hz
web i			0.7640.2		-

OBW 6dB_BLE_2M_MidCH20-2442



OBW 6dB_BLE_2M_HighCH39-2480

Fernand Spectrum multiplet - Cocupied EW					and a late	
Center Freq 2.480000000 GH	Trig:	r Freq: 2.480000000 GHz Free Run Avg/Hold: 1: 30 dB	100/100 F	0/35219940019-2019 Radio Std: None Radio Device: BTS	Frequency	
Ref Offset 12.6 dB 10 dB/div Ref 20.00 dBm						
10.0					Center Fred 2.480000000 GH:	
300		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
40.0						
Center 2.48 GHz		VBW 300 kHz		Span 5 MHz Sweep 1 ms	CF Step	
Occupied Bandwidth		Total Power	9.98 c		500,000 kHz Auto Mar	
2.07	74 MHz				Freq Offse	
Transmit Freq Error 28.652 k x dB Bandwidth 1.164 M		Sectory and a read		0 %) dB	ÓH	
wing (194032		-	

IC OBW 99%_BLE_2M_LowCH00-2402



IC OBW 99%_BLE_2M_MidCH20-2442



IC OBW 99%_BLE_2M_HighCH39-2480



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CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT 9

9.1 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, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.8.

9.2 Measurement Equipment Used:

Conducted Emission Test Site										
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.					
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020					
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019					

9.3 Test SET-UP:



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9.4 Measurement Procedure

Reference Level of Emission Limit:

- Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance & ANSI C63.10.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 100kHz & VBW = 300 kHz.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.

Conducted Band Edge:

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance & ANSI C63.10.
- 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 start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- 7. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 8. Repeat above procedures until all default test channel (low, middle, and high) was complete.

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Conducted Spurious Emission:

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance & ANSI C63.10.
- Set RBW = 100 kHz & VBW=300 kHz, Detector =Peak, Sweep = Auto
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.

9.5 Measurement Result

(BLE 1M)

Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
2402	2.01	-17.99
2442	2.04	-17.96
2480	2.57	-17.43

NOTE: cable loss as 12.6dB that offsets in the spectrum *NOTE: Refer to next page for plots.*

(BLE 2M)

Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
2402	2.08	-17.92
2442	2.05	-17.95
2480	2.70	-17.30

NOTE: cable loss as 12.6dB that offsets in the spectrum NOTE: Refer to next page for plots.

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Reference Level BLE 1M LowCH00-2402

Frequency	10/-21-1 00 400 18-2019 TRACE 1 2 3 4 5 5 TOPE NUMBER N	Avg Type: Log-Pwr	Trig: Free Run	PNO: Wide	req 2.402000000	Center F
Auto Tun	402 021 0 GHz 2.01 dBm	Mkr1 2.	#Atten: 30 tlB	IFGain.Low dB	Ref Offset 12.6 dB Ref 20.00 dBm	10 dB/div
Center Free 2.402000000 GH			A1			10.0
Start Fre 2.401250000 GH		\sim				0.00
Stop Fre 2.402750000 GH						0.00
CF Step 150.000 NH Auto Mar						40.0
Freq Offse				_		80.Q
Scale Type						70.0
Log <u>Ll</u>	Span 1,500 MHz 000 ms (1001 pts)	Sweep 1.	00 kHz	#VBW	4020000 GHz 100 kHz	Center 2. #Res BW

Reference Level BLE 1M MidCH20-2442

			-		eltrum mattern - Sorp(St	Second Sp
Frequency	10/31/35 20/400 18, 2012 70425 1 2 3 4 5 5 FOR RUMANN	Avg Type: Log-Pwr	Trig: Free Run	PNO: Wide	req 2.44200000	Center F
Auto Tune	442 022 5 GHz 2.04 dBm	Mkr1 2.	#Atten: 30 dB		Ref Offset 12.6 dB Ref 20.00 dBm	10 dB/div
Center Free 2.442000000 GH			1			10.0
Start Free 2.441250000 GH			-	\sim		0.00
Stop Fre 2.442750000 GH	X					0.00
CF Ster 150.000 NH Auto Ma						40.0
Freq Offse 0 H						- 50 Q
Scale Type	Span 1,500 MHz	Sweep 1	300 kHz	IVEW	4420000 GHz	Center 2
-	ou na troo (bray	17/1/1C			in the second	MOS

Reference Level_BLE_1M_HighCH39-2480

				9	eitrum margare ; Sorp(St	Secolar Sec
Frequency	70427 12 34 600 18,7018 70427 12 3 4 5 5 7077 HWWWWW	Avg Type: Log-Pwr	Trig: Free Run	PNO: Wide	req 2.48000000	Center Fr
Auto Tun	480 024 0 GHz 2.57 dBm	Mkr1 2.4	#Atten: 30 dB		Ref Offset 12.6 dB Ref 20.00 dBm	10 dB/div
Center Free 2.480000000 GH			-			10.0
Start Fre 2.479250000 GH		\sim		\wedge		0.00
Stop Fre 2.480750000 GH						00
CF Ste 150.000 kH Auto Ma						a.o
Freq Offse 0 H						(7). Q
Scale Typ	Span 1.500 MHz	Sweep 1.0	300 kHz	#VBW	4800000 GHz	Center 2.4
	and the tree they	BRANCE I				495

Reference Level_BLE_2M_LowCH00-2402

Frequency	101 (4 (3 20 400 13 2012) 704 (4 (3 20 40 0) 704 (1 2 3 4 5 6) 707 (1 2 3 4 5 6)	və Type: Log-Pwr	Free Run	MO Wide - Inc	402000000 G	enter Fre
Auto Tun	402 027 0 GHz 2.08 dBm	Mkr1 2.			ffset 12.6 dB 20.00 dBm	
Center Free 2.402000000 GH						
Start Free 2.401250000 GH			1		~	10
Stop Free 2.402750000 GH						10
CF Step 150,000 MH Auto Ma						10
Freq Offse						10
Scale Typ					_)a
Log <u>Ll</u>	Span 1,500 MHz 000 ms (1001 pts)	Sweep 1.	KHZ	#VBW 300		enter 2.40 Res BW 10

Reference Level BLE 2M MidCH20-2442

Frequency	551 30 400 13.701P TRACE 1 2 3 4 5 5 TOTE MWWWWWW	g-Pwr	Аνа Туре	g: Free Run		PNO: Wide +9		eq 2.4420	enter F
Auto Tune	027 0 GHz 2.05 dBm	kr1 2.4	-	tien: 30 tiB	#Ane	FGaintow	2.6 dB	Ref Offset 1: Ref 20.00	0 dB/div
Center Fred 2.442000000 GHz									10.0
Start Fred 2.441250000 GH;		-	-	1	-	-		~	0.00
Stop Free 2.442750000 GH									0.0 0.0
CF Step 150.000 MH Auto Ma			1						40.0 50.0
Freq Offse 0 H									en ()
Scale Type	an 1.500 MHz ms (1001 pts)	aan 10			N 300 k	-	lz .	420000 GH	center 2.4

Reference Level BLE 2M HighCH39-2480

Frequency	10/36 3 3M Aug 18 M1P TRACE 1 2 3 4 5 6 TVRE MWWWWW 201 P MININ N	Avg Type: Log-Pwr	Trig: Free Run	DO GHz PNO; Wide	req 2.480000000	Center F
Auto Tune	480 028 5 GHz 2.70 dBm	Mkr1 2.			Ref Offset 12.6 dB Ref 20.00 dBm	10 dB/div
Center Free 2.480000000 GH						10.0
Start Fred 2.479250000 GH;			~			10.00
Stop Fred 2.480750000 GH:						-20.0
CF Step 150,000 kH Auto Mar						40.0
Freq Offse 0 Hi						-80.0
Scale Type					_	70 a
	Span 1.500 MHz 000 ms (1001 pts)	Sweep 1.	300 kHz	#VBW	1800000 GHz 100 kHz	Center 2.4 #Res BW

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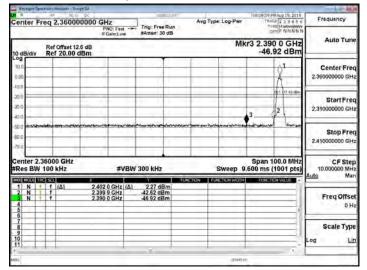
Band Edge_BLE_1M_LowCH00-2402

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2360	000000 GH
Det 1.7700 dBm	
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and a state of the	_
	Stop Fre
#VBW 300 kHz Span 100.0 MHz 100 pt 10	CF Ste
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2.402 GHz (A) 2.12 dBm 2.399 9 GHz 48.69 dBm 2.390 0 GHz 47.59 dBm	Freq Offs
	Scale Typ
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and the second sec	_

Band Edge_BLE_1M_HighCH39-2480

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Frequency	107:34 29 PM aug 10, 2010 TRACE 1 2 3 4 5 6 TYPE MWWWWW	ype: Log-Pwr		Trig: Free Run	Fast ->	0000 GHz	2.48750	req	nter	Cer
Auto Tune	2.483 600 GHz -48.46 dBm	Mkr3		#Atten: 30 dB	cLow	IFGaint	Offset 12.		Bídiv	10.0
Center Fred 2.487500000 GHz						1	10.000		F	10.0 0.00
Start Fred 2.475000000 GH:	SLI-1743d5n				.3	Ì.	1			-10,0 -20,0 -30,0 -40,0
Stop Free 2:500000000 GH:	manyur manana i		~~~~	and the second s		hund	~		~	-50.0 -60.0
CF Step 2.500000 MH Auto Mar	Span 25.00 MHz 100 ms (1001 pts)	Sweep 2.4	FUNCTION	300 kHz	#VBW			4875	s BV	#Re
Freq Offse 0 H:				2.76 dBm -48.70 dBm -48.46 dBm	Hz	2 480 025 GH 2 483 500 GH 2 483 600 GH	(4)	1	222	12345
Scale Type Log Lit										6 7 8 9 10 11
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Band Edge_BLE_2M_LowCH00-2402



Band Edge_BLE_2M_HighCH39-2480

Keysiget Spectrum manyou - Boopt SA				
Center Freq 2.487500000		Avg Type: Lo	OB:01:14 PM Aug 19, 2019	Frequency
and they critere and	PNO: Fast Trig: Free IFGain:Low BAtten: 3		DET P NNNN 1	- CF -
Ref Offset 12.6 dB 0 dB/div Ref 20.00 dBm	F1		48.35 dBm	
100				Center Fre 2.487500000 GH
	h .3		261-1730 dbn	Start Fre 2.475000000 GH
00	. Indennitieren	and the second	**************	Stop Fre 2.50000000 GH
enter 2.48750 GHz Res BW 100 kHz	#VBW 300 kHz	SWe	Span 25.00 MHz ep 2.400 ms (1001 pts)	2.500000 MH
2 WODE THE SEE 1 N1 (Δ)2.48	30 025 GHz (Δ) 2.91 dl	FUNCTION FUNCTION	NWEITH FEMCTION WALKE	Auto Ma
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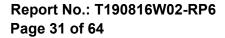
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Spurious Emission _BLE_1M_LowCH00-2402

					_			1 50-D	anum a	et Spece	E my pe
Frequency	107:27:22 PM sug 10, 2010 TRACE 1 2 3 4 5 6	e: Log-Pwr	Avg	Eree Run	1	Hz	0000 G			r Fre	nte
	PET P NNNN N			en: 30 dB		0: Fast Sain:Low	PN	21.62	1		
Auto Tun	25.684 0 GHz -39.50 dBm	Mkr4						offset 12.0 20.00 d		liv	dB
Center Free				1	1	-		_	1		
13.015000000 GH	-	1	-	-		-	1.1		-Y		20
	DL1-17-03-08-0	1				-		-			0
Start Free 30.000000 MH	4	1	-	1.1.1			1.11				0
	-					2.2	- 4 A3	02		-	0
Stop Free									1	-	0
26.00000000 GH						-		_			10
CF Ster	Span 25.97 GHz						-			r 13.	
2.597000000 GH Auto Mar	482 s (30001 pts)	Sweep 2	ACTON 1	KHZ	BW 30	#V		HZ		SW 1	_
_	EDUCTION VILLE	NETION WILTH	METEW	49 dBm 25 dBm	(A)		2.401 9	(A)	1	1	
Freq Offse			_	25 dBm 59 dBm 50 dBm		0 GHz	4.804 0 7.206 0 25.684 0	_	1	1	
*/					_			_			
Scale Type				-		_	-	_			
Log Li		-	_			_				-	-
	1			-	_				, .,		

Spurious Emission _BLE_1M_MidCH20-2442

~~~ (A)			-	-				strance	y Highert Spee	2 2
Frequency	07343:16 PM Aug 19, 2019 TRACE 1 2 3 4 5 6	ype: Log-Pwr	Avg	Trig: Free Rue	Z Fast ->	00000 GH		req 1	ter Fr	Cer
Auto Tune	OFT P NNNN	-		#Atten: 30 dB	ic Fast	IFG		_		1.
Auto Fune	25.901 3 GHz -39.58 dBm	Mkr4					Offset 12.6 20.00 di		Bídiv	
Center Free				1		1	-	A		10.0
13.015000000 GH:	-	-	-			1.1	-	-Y	-	0.00
	Cut in ac day								-	-10.6
Start Fred 30.000000 MHz	4				_		_			-30.0
50.000000 Miris	and the second states of the	. Inn an antidate				13	- A- Q2	-		-40.0
Stop Free			and the second second				-	-	-	50.0
26.00000000 GH						100				-60.0
CF Step 2.59700000 GH	Span 25.97 GHz 482 s (30001 pts)	Swaap 2	-	300 kHz	#VR1				ter 13	
Auto Mar		HUNGHON WORK	SCALE TELLY	500 KH2	#101	x				-
				0.44 dBm	GHZ (A)	2.4417	(Δ1		NI	1
Freq Offse				46,85 dBm -39.58 dBm	GHz	7.326 0 25.901 3		1	N 1	3
					-			-	-	6
Scale Type										8
Log Lin		-								10 11
		gravius		-				-	-	MIG

#### Spurious Emission _BLE_1M_HighCH39-2480

Keysiget Spe	strum	-po + 2 - pt	1		_						~ 10040
Center Fr	req 1	3.01500	0000 G	Hz	131.54	Run I	Avg Type	Log-Pwr	TRAC	F123456	Frequency
		fiset 12.5	dB	0:Fast -+ ale:Low	#Atten: 30			Mkr4	1 25.55	4 GHz	Auto Tune
10 dB/div	Ref	20.00 dE	3m	_	1 4			-	-39,	74 dBm	
10.0 0.00	q1	_	1						_		Center Fre 13.015000000 GH
-10.0			1	_			-	-		bul-17A3dbn	
-30.0	-						-		_	+	Start Fre 30.000000 MH
-40.0	-	where we	-	-	-	-	-		فاناتهمن		-
-60.0											Stop Fre 26.00000000 GH
Center 13 Res BW				#VBI	W 300 kHz			Sweep 2	Span 2 .482 s (3	5.97 GHz 0001 pts)	CF Ste 2.597000000 GH
MAN MODEL TH			x		Y		ETON   FU	CTION WEITH	EUNC/R	IN WALKE	<u>Auto</u> Ma
1 N 1 2 N 1 3 N 1 4 N 1	11	A)	2 479 8 4 960 0 7 440 0 25 559 4	GHz	2.31 dB -46.21 dB -48.54 dB -39.74 dB	m			-		Freq Offse 0 H
6 7 8 9								_	-		Scale Typ
10	++	_			_	-	-	-	-		Log Li
								STATUS		- T .	

#### Spurious Emission _BLE_2M_LowCH00-2402

- ARE	108:10:01 PM Aug 19, 2019		SEMERINA	DC 2	F 130-0		-
Frequency	TRACE 1 23456	Avg Type: Log-Pwr	Trig: Free Run	enter Freq 13.015000000 GHz PN0: Fast			
Auto Tur	25.548 1 GHz -39.09 dBm	Mkr4	avtien: 30 0B		f Offset 12.		Bídiv
Center Fre			1		1	0	
	Cikit - 17 33 dibis						
Start Fre 30.000000 Mi	+				~		
Stop Fre 26.000000000 GI			New Yorks		-		-
CF Ste 2.597000000 G	Span 25.97 GHz 482 s (30001 pts)	Sweep 2	300 kHz	#VBW	GHz kHz	13.02 V 10	ter 1
Auto Mi	FUNCTION WALKE	TON FUNCTION WOTH	-1.01 dBm	2.401 9 GHz (A)	(Δ)	TREES	N
Freq Offs 0)			-1.01 dBm -47.37 dBm -48.32 dBm -39.09 dBm	24019 GH2 (A) 4.804 0 GHz 7.206 0 GHz 25.548 1 GHz			NNN
Scale Typ							-
Log						-	-

#### Spurious Emission _BLE_2M_MidCH20-2442

Keypiget Spectrum	report + Breept Sal						
enter Freq 13	Fred 13 01500000 GHz Avg Type: Log-Pwr Thirty				07:51:147M Aug 19, 2010 TRACE 1 2 3 4 5 6	Frequency	
		0: Fest Ing. Fr sinclow BAtten:		100		SET P NNNN	A
dBidiv Ref	ffset 12.6 dB 20.00 dBm				Mkr4	25.531 7 GHz -38.92 dBm	Auto Tune
0.0 /1	100		1				Center Free
00		-	-				13.015000000 GH
00						CLE it as den	
0.0	_	_	-				Start Free 30.000000 MH
0.0	A. 02	and a second designed				-	-
0.0							Stop Free 26.000000000 GH
enter 13.02 Gl Res BW 100 ki		#VBW 300 kH	2			Span 25.97 GHz 82 s (30001 pts)	2.597000000 GH
	X	GHz (A) 2.12 (		ETEN FUN	TION WOTH	FUNCTION WALLE	Auto Ma
2 N 1 F 3 N 1 F	4.884 0 7.326 0 25.531 7	GHz -46.04 ( GHz -46.92 (	18m 18m	_		]	Freq Offse 0 H
5 6 7 8 9					-		Scale Type
9			_		-		Log Li
an and the							

#### Spurious Emission _BLE_2M_HighCH39-2480

and the second second	108:02:07 #Maug 19, 2019		-	SEMERINA					-The second	office office	
Frequency	TRACE 1 2 3 4 5 6 THE MUNICIPAL PARTY	pe: Log-Pwr	AvgT	Free Run		enter Freq 13.015000000 GHz			en		
Auto Tur	25.935 1 GHz -38.82 dBm	Mkr4	_	n: 30 dB	#Atter	GaincLow	2.6 dB	Offset 1		lidiv	0 dE
Center Fre 13.015000000 GH					-				9		0.00
Start Fre 30.000000 MH	26.1-17.50 abs 4					3	2				
Stop Fre 26.00000000 GH		and the second						-	-	-	20 20
CF Ste 2.597000000 GH	Span 25.97 GHz 482 s (30001 pts)	Sweep 2	1	Hz	W 300 k	#VB				er 13. BW	
Auto Ma	HUNCTION WALLS	UNCTION WIDTH	FUNCTION	4 dBm	, Y	7 GHz (A	8 100	(Δ1		N 1	
Freq Offs 0)	]			4 dBm 7 dBm 9 dBm 2 dBm	45.57	0 GHz 0 GHz	4.960	101	1	N 1 N 1 N 1	23
Scale Typ											5 6 7 8 9 0

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### **10 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT**

#### 10.1 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 & RSS-Gen §8.8, 8.9 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13(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 ( $dB\mu V/m$ ) = 20 log Emission level ( $dB\mu V/m$ )

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 程智科技股份有限公司
 t:(886-2) 2299-9720
 f:(886-2) 2298-1882
 www.sgs.tw
 www.ccsrf.com



#### **Measurement Equipment Used** 10.2

		966A Chambe	r		
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Low Pass Filter	EWT	EWT-56-0019	RF46	02/26/2019	02/25/2020
High Pass Filter	R&S	F13 HPF 3GHz	RF64	02/26/2019	02/25/2020
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/26/2019	02/25/2020
Bilog Antenna	Sunol Sciences	JB3	A030105	07/26/2019	07/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	02/26/2019	02/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
Loop Antenna	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Horn Antenna	SCHWARZBECK	BBHA 9120D	779	03/09/2019	03/08/2020
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software		e3 V6.	11-20180413		

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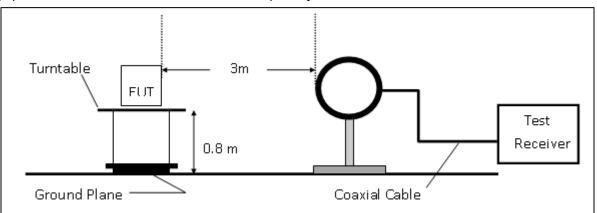
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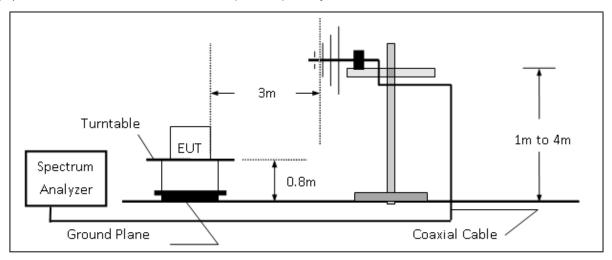


### 10.3 Test SET-UP

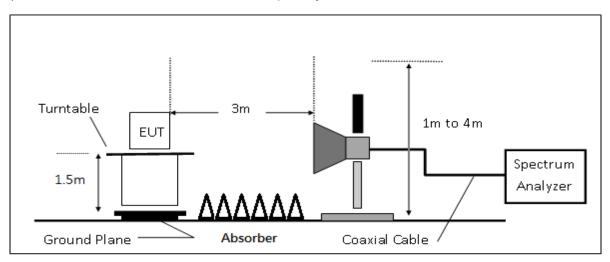
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



#### (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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#### 10.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance & ANSI C63.10.
- 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.
- 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.</li>
- 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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#### 10.5 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	

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

#### 10.6 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.

#### 10.7 Measurement Result:

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

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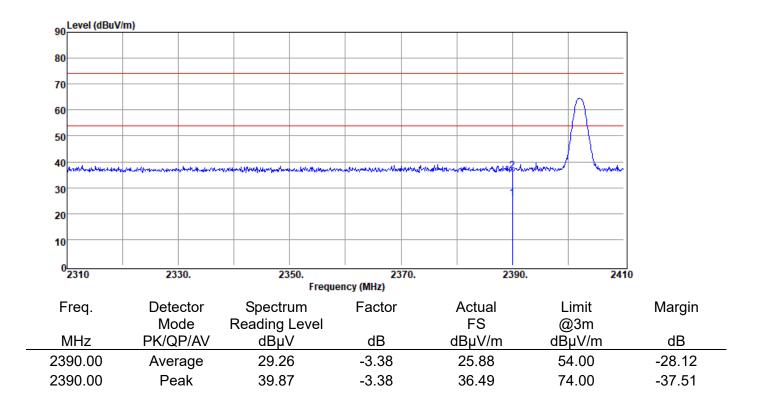
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## **Radiated Band Edge Measurement Result**

(BLE 1M)	
Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2402 MHz
Operation Mode	:BE CH LOW
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/61
Antenna Pol.	:VERTICAL
Engineer	:Kailin



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Report Number	:T190816V	V02		Test Date	:2019-08-2	2
<b>Operation Band</b>	:BLE 1M			Temp./Hum	i. :23.5/61	
Frequency	:2402 MHz	<u>.</u>		Antenna Po	J. :HORIZON	TAL
Operation Mode	:BE CH LC	W		Engineer	:Kailin	
EUT Pol.	:H Plan					
90 Level (dBuV/m)						
80						
70						
60					— <u> </u>	
50						
40 Martin Martin	and the second stand on the second	An R day do an tar an Handa at tar an an a	dan kada sa da sa da sa d	www.mar.mar.mar.mar.mar.	and the second second	
30						
20						
10						
0 <mark></mark> 2310	2330.	2350. Freque	2370. ency (MHz)	2390.	2410	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level	15	FS	@3m	
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	29.21	-3.38	25.83	54.00	-28.17

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41.00

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-3.38

37.62

2390.00

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Peak

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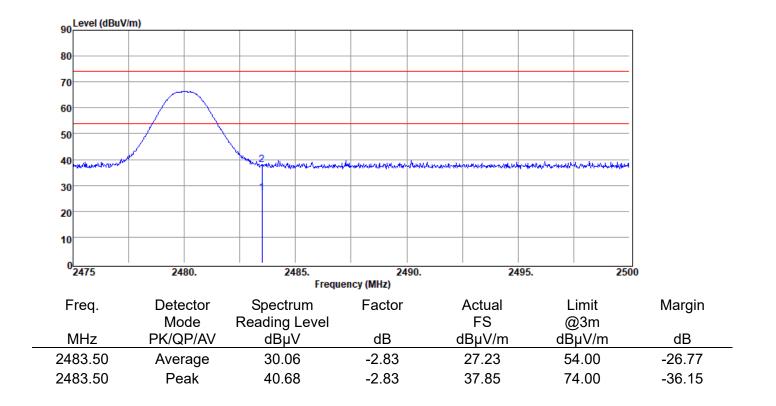
74.00

-36.38



Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2480 MHz
Operation Mode	:BE CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/61
Antenna Pol.	:VERTICAL
Engineer	:Kailin



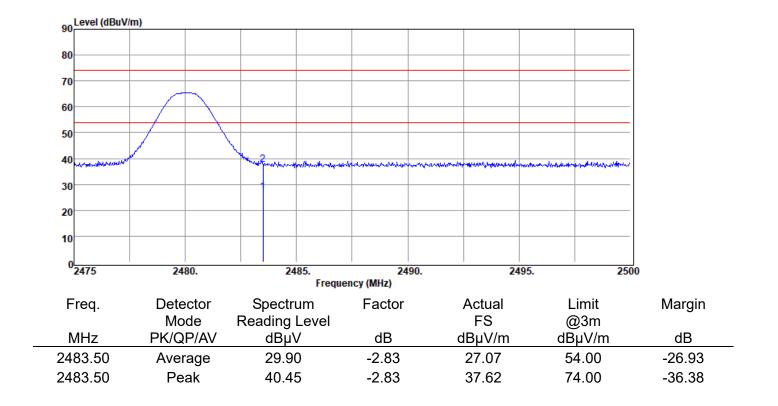
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Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2480 MHz
Operation Mode	:BE CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/61
Antenna Pol.	:HORIZONTAL
Engineer	:Kailin



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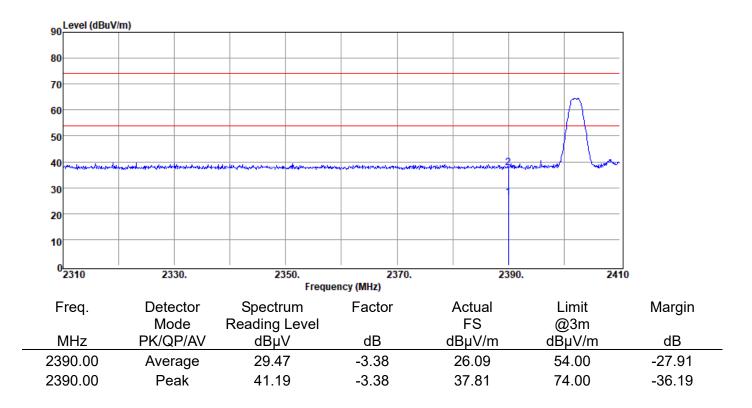
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# (BLE 2M)

Report Number	:T190816W02
Operation Band	:BLE 2M
Frequency	:2402 MHz
Operation Mode	:BE CH LOW
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.1/65
Antenna Pol.	:VERTICAL
Engineer	:Kailin



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:2019-08-22

Test Date



:T190816W02

**Report Number** 

				1031 Date	.2015-00-2	2
Operation Ba	nd :BLE 2M			Temp./Hu	ımi. :23.1/65	
Frequency	:2402 MHz	7		Antenna l		ται
Operation Mo	de :BE CH LC	)W		Engineer	:Kailin	
EUT Pol.	:H Plan					
90 Level (dBu)	V/m)					
80						
70						
60					$\cap$	
00						
50						
40						
40 marshall	web	man water and the property that the	and and an other second second	how many many many the many th	market market	
30						
20						
20						
10						
0						
⁰ 2310	2330.	2350. Freque	2370. ency (MHz)	239	0. 2410	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
Fieq.	Mode	Reading Level	Facili	FS	@3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00		29.10	-3.38	25.72	<u>54.00</u>	-28.28
	Average					
2390.00	Peak	40.17	-3.38	36.79	74.00	-37.21

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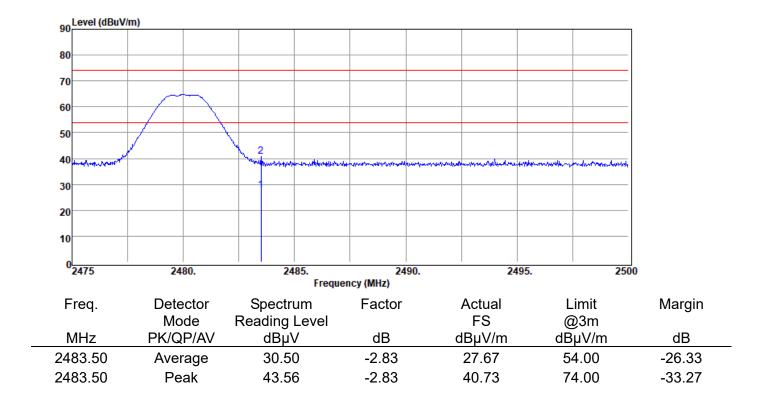
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Report Number	:T190816W02
Operation Band	:BLE 2M
Frequency	:2480 MHz
Operation Mode	:BE CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/71
Antenna Pol.	:VERTICAL
Engineer	:Kailin



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2500

Limit

@3m

dBµV/m

54.00

74.00

Margin

dB

-26.07

-35.07



10

0 2475

Freq.

MHz

2483.50

2483.50

2480.

Detector

Mode

PK/QP/AV

Average

Peak

. . . . . . .

Report Numb	er :T1	:T190816W02					Test Date		:2019-08-22	
Operation Ba	nd :Bl	E 2M					Temp./H	łumi.	:23.5/71	
Frequency	:24	80 MHz					Antenna	a Pol.	:HORIZON	NT
Operation Mo	ode :BE	E CH HIG	Н				Enginee	er	:Kailin	
EUT Pol.	:H	Plan								
oo Level (dBu	V/m)									
90										
80										
70										
60	+									
50										
40 water + worthlast	4		manne	******	ant have made and a state of the			hahumun	how was a second and a second	
30										
20										

2485.

Spectrum

**Reading Level** 

dBµV

30.76

41.76

Frequency (MHz)

2490.

Factor

dB

-2.83

-2.83

2495.

Actual

FS

dBµV/m

27.93

38.93

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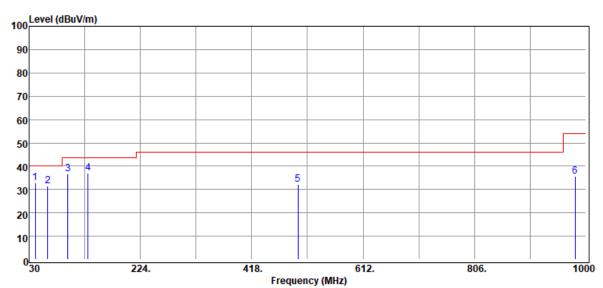
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## Radiated Spurious Emission Measurement Result For Frequency form 30MHz to 1000MHz

(BLE 1M)Report Number:T190816W02Operation Band:BLE 1MFrequency:2442 MHzOperation Mode:TX CH MIDEUT Pol.:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/64
Antenna Pol.	:VERTICAL
Engineer	:Kailin



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
40.67	Peak	43.01	-10.14	32.87	40.00	-7.13
62.98	Peak	47.05	-15.49	31.56	40.00	-8.44
97.90	Peak	49.77	-13.24	36.53	43.50	-6.97
132.82	Peak	46.22	-9.25	36.97	43.50	-6.53
498.51	Peak	35.29	-3.03	32.26	46.00	-13.74
981.57	Peak	29.98	5.67	35.65	54.00	-18.35

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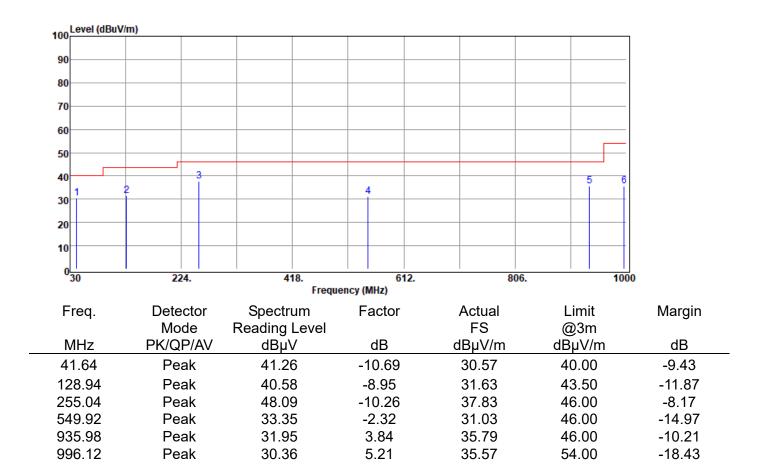
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Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2442 MHz
Operation Mode	:TX CH MID
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/64
Antenna Pol.	:HORIZONTAL
Engineer	:Kailin



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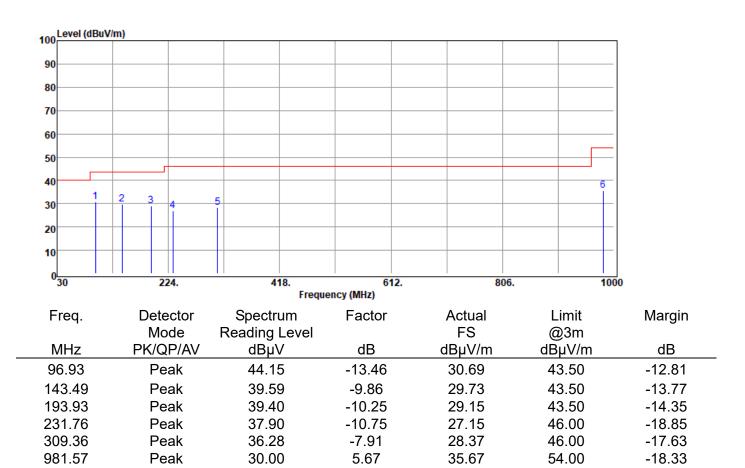
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## (BLE 2M)

Report Number	:T190816W02
Operation Band	:BLE 2M
Frequency	:2442 MHz
Operation Mode	:TX CH MID
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.5/67
Antenna Pol.	:HORIZONTAL
Engineer	:Kailin



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:2019-08-22 :23.5/67 :VERTICAL

1000

:Kailin



40

30 20 10

0<u>____</u>

3

224.

Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190816W02 :BLE 2M :2442 MHz :TX CH MID :H Plan	Test Date Temp./Humi. Antenna Pol. Engineer		
100 Level (dBuV/m)				
90				
80				
70				
60				
50				

418.

		Freque	ency (MHZ)			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
30.00	Peak	34.01	-1.51	32.50	40.00	-7.50
43.58	Peak	42.74	-12.05	30.69	40.00	-9.31
63.95	Peak	46.94	-15.28	31.66	40.00	-8.34
99.84	Peak	46.73	-12.75	33.98	43.50	-9.52
134.76	Peak	38.53	-9.39	29.14	43.50	-14.36
935.98	Peak	33.26	3.84	37.10	46.00	-8.90

Eronuoney (MUz)

612.

806.

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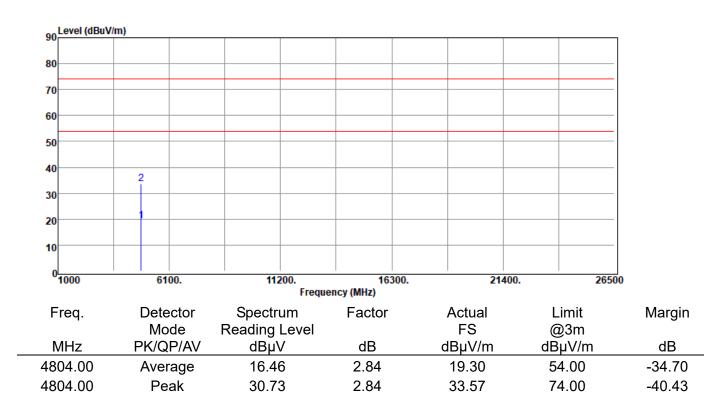
Report No.: T190816W02-RP6 Page 49 of 64



# Radiated Spurious Emission Measurement Result For Frequency above 1GHz

(BLE 1M)<br/>Report Number:T190816W02Operation Band:BLE 1MFrequency:2402 MHzOperation Mode:TX CH LOWEUT Pol.:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.3/68
Antenna Pol.	:VERTICAL
Engineer	:Kailin



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SGS Compliance Certification Services Inc.

程智科技股份有限公司

-34.30

-42.01



Report Number Operation Band Frequency Operation Mode EUT Pol.	:T190816\ :BLE 1M :2402 MHz :TX CH LC :H Plan	<u>z</u>		Test Date Temp./Humi. Antenna Pol. Engineer		AL.
90 Level (dBuV/m)						
80						
70						
60						
50						
40	2					
30						
20	1					
10						
0 <mark></mark> 1000	6100.	11200. Freque	16300. ncy (MHz)	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB

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16.86

29.15

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2.84

2.84

SGS Compliance Certification Services Inc.

4804.00

4804.00

Average

Peak

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan / 新北市五股區五工六路 11 號 t:(886-2) 2299-9720 f:(886-2) 2298-1882 www.sgs.tw www.ccsrf.com

54.00

74.00

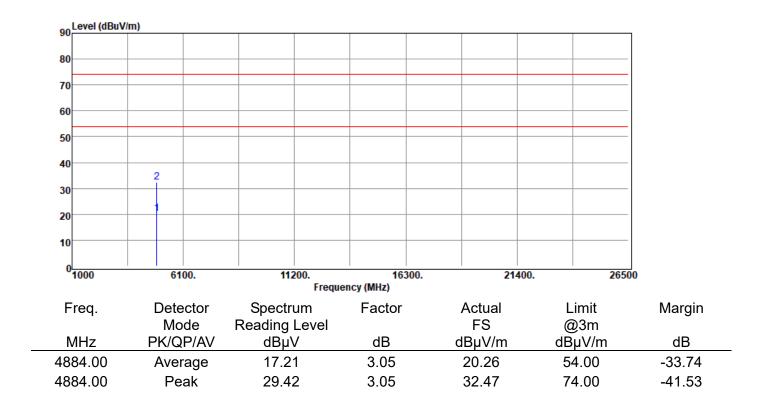
19.70

31.99



Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2442 MHz
Operation Mode	:TX CH MID
EUT Pol.	:H Plan

Test Date	:2019-08-22			
Temp./Humi.	:23.3/62			
Antenna Pol.	:VERTICAL			
Engineer	:Kailin			



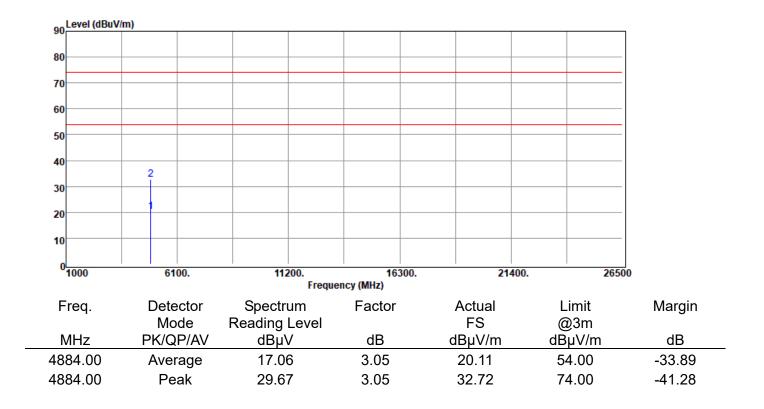
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Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2442 MHz
Operation Mode	:TX CH MID
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.3/62
Antenna Pol.	:HORIZONTAL
Engineer	:Kailin



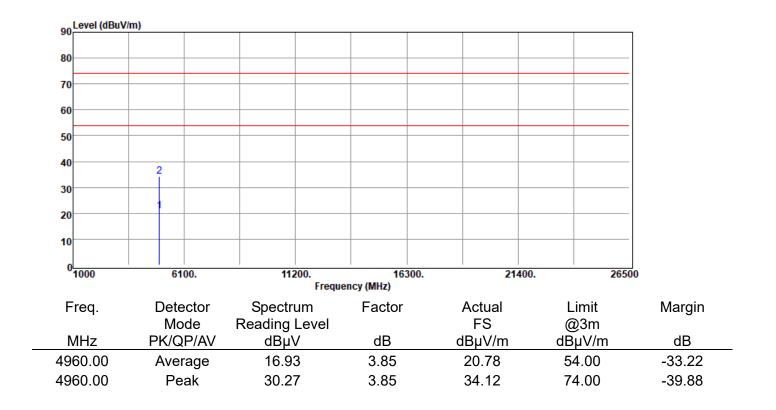
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Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2480 MHz
Operation Mode	:TX CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22			
Temp./Humi.	:23.1/59			
Antenna Pol.	:VERTICAL			
Engineer	:Kailin			



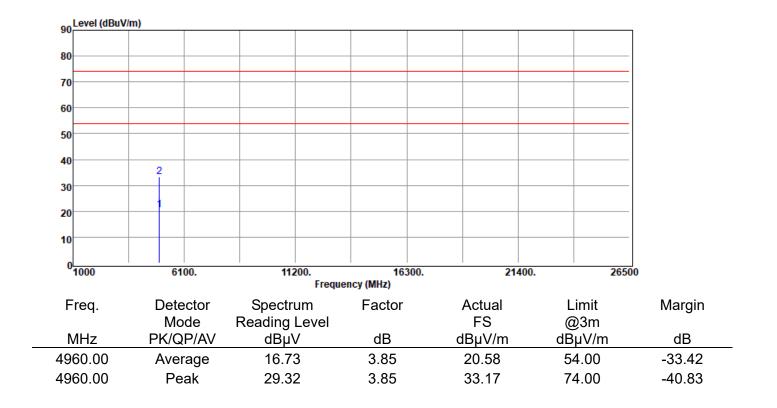
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Report Number	:T190816W02
Operation Band	:BLE 1M
Frequency	:2480 MHz
Operation Mode	:TX CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.1/59
Antenna Pol.	:HORIZONTAL
Engineer	:Kailin



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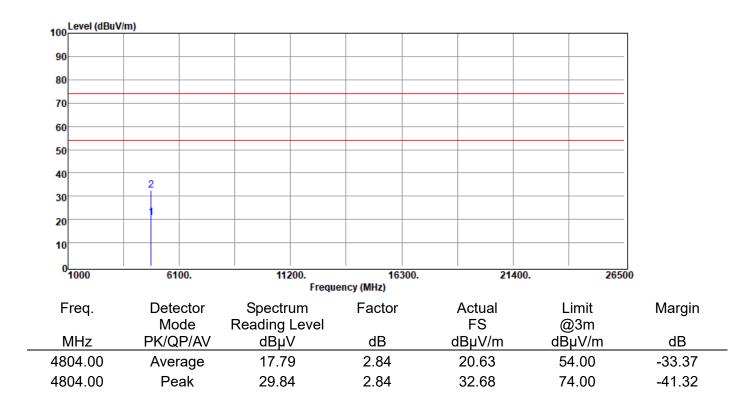
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### (BLE 2M)

Report Number:T190816W02Operation Band:BLE 2MFrequency:2402 MHzOperation Mode:TX CH LOWEUT Pol.:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.4/63
Antenna Pol.	:VERTICAL
Engineer	:Kailin



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Operati Freque	ion Mode	:T190816V :BLE 2M :2402 MHz :TX CH LC :H Plan	<u>z</u>		Test Date Temp./Hur Antenna P Engineer		
to-Le	evel (dBuV/m)						
100							]
90							
80							
70							
60							
50							
40							
30		2					
20							
10							
0 <mark></mark>	000	6100.	11200. Freque	16300. ency (MHz)	21400	. 2650	] ]0
Fre	eq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
	Hz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	4.00	Average	18.92	2.84	21.76	54.00	-32.24
480	4.00	Peak	30.83	2.84	33.67	74.00	-40.33

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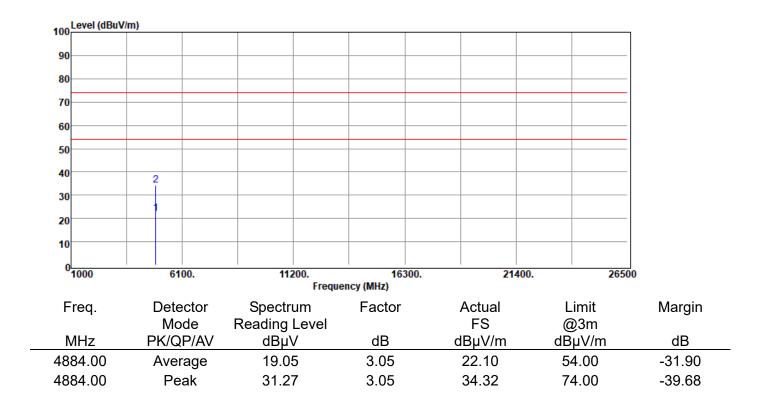
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Member of the SGS Group (SGS SA)



:T190816W02
:BLE 2M
:2442 MHz
:TX CH MID
:H Plan

Test Date	:2019-08-22			
Temp./Humi.	:23.2/58			
Antenna Pol.	:VERTICAL			
Engineer	:Kailin			



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·2010_08_22

Test Date



:T190816W02

Report Number

4884.00

4884.00

Average

Peak

Report Numbe		V02		lest Date	:2019-08-22	
Operation Ban	d :BLE 2M			Temp./Humi.	:23.2/58	
Frequency	:2442 MHz	2		Antenna Pol.	:HORIZONTA	L
Operation Mod	e :TX CH MI	D		Engineer	:Kailin	
EUT Pol.	:H Plan					
Level (dBuV/	m)					
100						
90						
80						
70						
60						
50						
40	2					
30						
20						
10						
0						
0 ¹ 1000	6100.	11200. Freque	16300. ency (MHz)	21400.	26500	
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4004.00	•	40.00	0.05	00.07	- 4 - 0 - 0	04.00

3.05

3.05

22.07

33.60

54.00

74.00

-31.93

-40.40

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19.02

30.55

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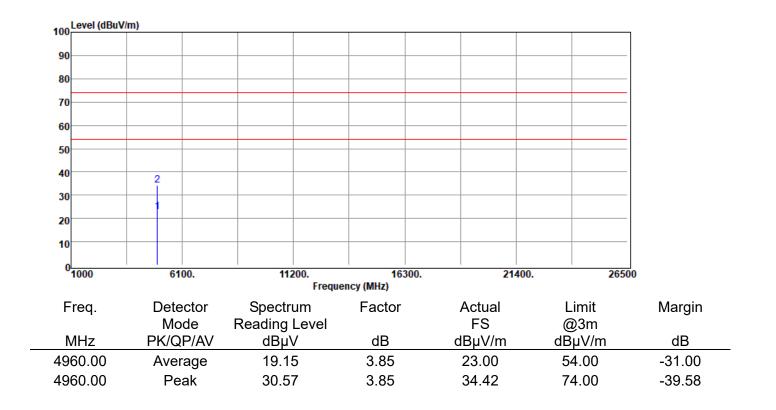
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程智科技股份有限公司



Report Number	:T190816W02
Operation Band	:BLE 2M
Frequency	:2480 MHz
Operation Mode	:TX CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.1/64
Antenna Pol.	:VERTICAL
Engineer	:Kailin



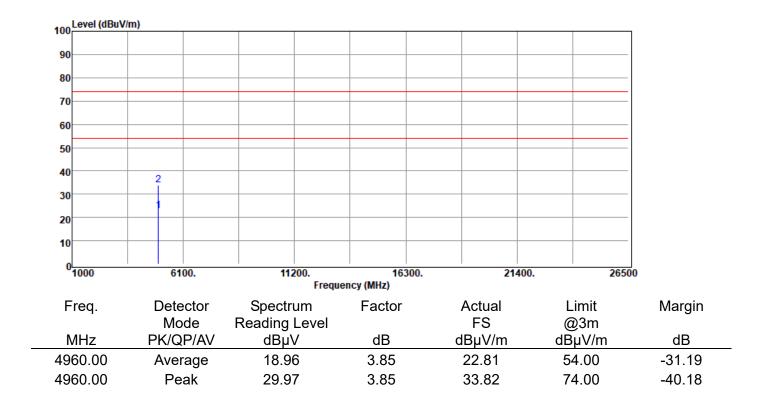
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Report Number	:T190816W02
Operation Band	:BLE 2M
Frequency	:2480 MHz
Operation Mode	:TX CH HIGH
EUT Pol.	:H Plan

Test Date	:2019-08-22
Temp./Humi.	:23.1/64
Antenna Pol.	:HORIZONTAL
Engineer	:Kailin



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# 11 PEAK POWER SPECTRAL DENSITY

#### 11.1 Standard Applicable:

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

#### **Measurement Equipment Used:** 11.2

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019

## 11.3 Test Set-up:



### 11.4 Measurement Procedure:

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance & ANSI C63.10.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz. & the VBW = 10 kHz
- 5. For defining Restricted Band Edge Limit: Set the RBW = 100kHz & VBW = 300 kHz.
- 6. Detector = peak.
- 7. Sweep time = auto couple.
- Trace mode = max hold.
- 9. Allow trace to fully stabilize.
- 10. Use the peak marker function to determine the maximum amplitude level.

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#### 11.5 **Measurement Result:**

#### BLE 1M mode

Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result
2402	-12.38	8	PASS
2442	-12.36	8	PASS
2480	-11.78	8	PASS

NOTE: cable loss as 12.6dB that offsets in the spectrum

### BLE 2M mode

Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result
2402	-15.89	8	PASS
2442	-15.83	8	PASS
2480	-15.20	8	PASS

NOTE: cable loss as 12.6dB that offsets in the spectrum

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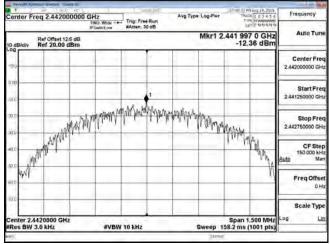
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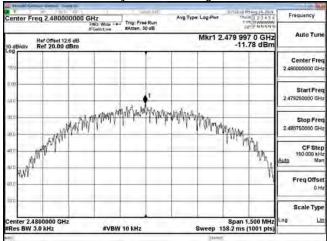
### Power Density_BLE_1M_LowCH00-2402

Frequency	107.23 34 PH 402 19,2019 TALCE 1 2 3 4 5 6 TOE MANNAW	Log-Pwr	Avg Type	rig: Free Run	FND: Wide - #+	2.402000000 G	Center Fre
Auto Tune	401 997 0 GHz -12.38 dBm	Mkr1 2.		Atten: 30 dB	IFG4in:Los	of Offset 12.6 dB	10 dBidiy
Center Freq 2 402000000 GHz			-				180
Start Free 2.401250000 GH				1			0.00
Stop Free 2.402750000 GH	Antonia -	Marin	and the	(performance)	nt (with an	MAMMAN	30.0
CF Step 150 000 kHz Auto Mar	In the second	-				A MANNY	
Freq Offse 0 Ha	N						ean AM
Scale Type	Span 1.500 MHz	_				0000 001	Center 2.40
	8.2 ms (1001 pts)	weep 15	1	kHz	#VBW		Res BW 3.

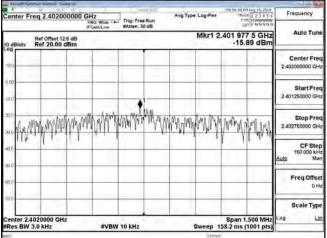
#### Power Density_BLE_1M_MidCH20-2442



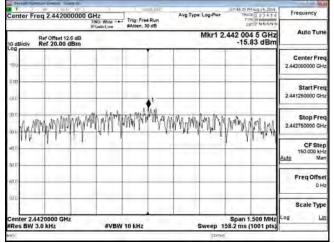
#### Power Density_BLE_1M_HighCH39-2480



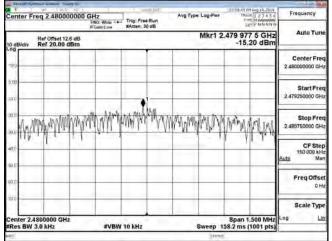
### Power Density_BLE_2M_LowCH00-2402



### Power Density_BLE_2M_MidCH20-2442



### Power Density_BLE_2M_HighCH39-2480



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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SGS Compliance Certification Services Inc.

程智科技股份有限公司

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan / 新北市五股區五工六路 11 號 t:(886-2) 2299-9720 f:(886-2) 2298-1882 www.sgs.tw www.ccsrf.com

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# **12 ANTENNA REQUIREMENT**

# 12.1 Standard Applicable:

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

In case of point-to-point operation, the power shall be reduced by the one dB for every 3 dB that the directional gain of antenna exceeds 6dBi.

# 12.2 Antenna Connected Construction:

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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