



ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C AND RSS 247 REQUIREMENT **CLASS II & IV PC REPORT**

0F

Applicant: STARVR CORPORATION

25F, 88, Sec. 1, Xintai 5th Rd. Xizhi, New Taipei City, Taiwan

Product Name: Head mounted display

Brand Name: STARVR

Marketing Name: SH500

Model No.: H7101

Model Difference: N/A

FCC ID: 2AOJDH7101

IC: 23448-H7101

Report Number: E2/2018/60007

FCC Rule Part: §15.247, Cat: DTS

IC Rule: RSS-247 issue 2 Feb. 2017

Issue Date: Jun. 27, 2018

Date of Test: Jun. 12, 2018(Conducted);

Jun. 14, 2018(Radiated)

Dec. 04, 2017~Jan. 10, 2018 (Conduction)

Date of EUT Received: Nov. 03, 2017

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory 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.

Tested By:

Aken Huang / Engineer

Approved By:

Jim Chang / Manager



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.

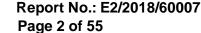
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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
E2/2018/60007	Rev.00	Initial creation of docu- ment	All	Jun. 27, 2018	Stefanie Yu

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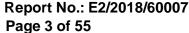




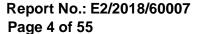
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GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	Head mounted display		
Brand Name:	STARVR		
Marketing Name:	SH500		
Model No.:	H7101		
Model difference:	N/A		
Hardware Version:	N/A		
Software Version:	N/A		
Dawer Cumbu	12Vdc from Adapter		
Power Supply:	Adapter: 1. Model No.: ADP-18HW B, Supplier: DELTA 2. Model No.: ADP-18TB C, Supplier: DELTA		

ESB 2.4GHz:

Bluetooth Version:	ESB mode
Channel number:	79 channels
Modulation type:	GFSK
Transmit Power:	3.34 dBm
Frequency Range:	2402 – 2480MHz

Antenna Designation

Antenna Type	Part Number	Supplier	Peak Gain (dBi)	
Chip	N/A	N/A	-1.72	

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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

RSS-247 issue 2 Feb. 2017

Canada RSS-Gen issue 5-Apr. 2018

ANSI C63.10:2013

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

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305 / TW 0002

Canada Registration Number: 4620A-5

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

2.1 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. 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

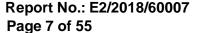
For all conducted test items:

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 Conducted (Antenna Port) Configuration



Fig 2-2 Conducted (AC power line) Configuration

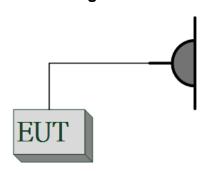


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	ESB 2.4G Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	L430	PK-OCGFF	Shielded	Un-shielded

SUMMARY OF TEST RESULTS

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% Bandwidth	Compliant
§15.247(d)	RSS-247 §5.5	§5.5 Conducted Band Edge and Spurious Emission	
§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

4.1 Operated in 2400 ~ 2483.5MHz Band

79 channels are provided for ESB 2.4G

Item	FREQUENCY	Item	FREQUENCY	Item	FREQUENCY	Item	FREQUENCY
1	2402 MHz	21	2422 MHz	41	2442 MHz	71	2462 MHz
2	2403 MHz	22	2423 MHz	42	2443 MHz	72	2463 MHz
3	2404 MHz	23	2424 MHz	43	2444 MHz	73	2464 MHz
4	2405 MHz	24	2425 MHz	44	2445 MHz	74	2465 MHz
5	2406 MHz	25	2426 MHz	45	2446 MHz	75	2466 MHz
6	2407 MHz	26	2427 MHz	46	2447 MHz	76	2467 MHz
7	2408 MHz	27	2428 MHz	47	2448 MHz	77	2468 MHz
8	2409 MHz	28	2429 MHz	48	2449 MHz	78	2469 MHz
9	2410 MHz	29	2430 MHz	49	2450 MHz	79	2470 MHz
10	2411 MHz	30	2431 MHz	50	2451 MHz	70	2471 MHz
11	2412 MHz	31	2432 MHz	51	2452 MHz	71	2472 MHz
12	2413 MHz	32	2433 MHz	52	2453 MHz	72	2473 MHz
13	2414 MHz	33	2434 MHz	53	2454 MHz	73	2474 MHz
14	2415 MHz	34	2435 MHz	54	2455 MHz	74	2475 MHz
15	2416 MHz	35	2436 MHz	55	2456 MHz	75	2476 MHz
16	2417 MHz	36	2437 MHz	56	2457 MHz	76	2477 MHz
17	2418 MHz	37	2438 MHz	57	2458 MHz	77	2478 MHz
18	2419 MHz	38	2439 MHz	58	2459 MHz	78	2479 MHz
19	2420 MHz	39	2440 MHz	59	2460 MHz	79	2480 MHz
20	2421 MHz	40	2441 MHz	60	2461 MHz	-	

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4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE AVAILABLE TESTED MODULATION DATA RATE (Mbps)						
ESB 2.4G	2 to 80	2,42,80	GFSK	2		
	RADI	ATED EMISSIC	N TEST (ABOVE 1	GHz)		
MODE AVAILABLE TESTED MODULATION DATA RATE (Mbps)						
ESB 2.4G	2 to 80	2,42,80	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 E2 position was reported.

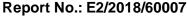
ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST							
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)			
ESB 2.4G	2 to 80	2,42,80	GFSK	2			

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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:

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB
(Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

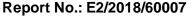
	9kHz – 30MHz: +/- 2.87 dB			
	30MHz - 167MHz: +/- 4.22dB			
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB			
(Polarization : Horizontal)	0.5GHz-1GHz: +/- 3.39dB			
	1GHz - 18GHz: +/- 4.08dB			
	18GHz - 40GHz: +/- 4.08dB			

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

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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(
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

6.2 Measurement Equipment Used:

	Conducted Emission Test Site										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.						
TYPE		NUMBER	NUMBER	CAL.							
EMI Test Receiver	R&S	ESCI 7	100950	12/12/2016	12/11/2017						
EMI Test Receiver	R&S	ESCI7	100760	05/11/2017	05/10/2018						
Coaxial Cables	N/A	N30N30-1042-150cm	N/A	08/30/2017	08/29/2018						
LISN	Schwarzbeck	NSLK 8127	8127-648	06/18/2017	06/17/2018						
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.						

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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^{1.} The lower limit shall apply at the transition frequencies

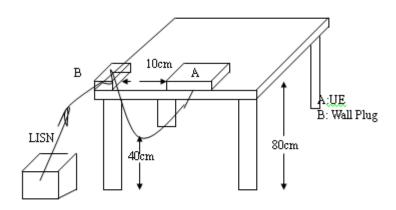
^{2.} The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.



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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

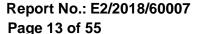
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Model No.: ADP-18HW B

L1 Temperature: 23 °C Site: Conduction Room Phase: Humidity: 60 % Limit: FCC Class B Conduction(QP) Power:

Mode:

Note: Acer VR

Conducted Emission File :A0130 Data :#4 Date: 2017/12/4 Time: 下午 05:31:06 80.0 dBuV FCC Class B Conduction(QP) FCC Class B Conduction(AVG) 0.0 0.150 0.5 (MHz) 5 30 000

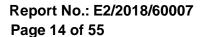
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1700	46.60	0.04	46.64	64.96	-18.32	QP	
2		0.1700	35.41	0.04	35.45	54.96	-19.51	AVG	
3	•	0.1980	46.23	0.03	46.26	63.69	-17.43	QP	
4		0.1980	35.61	0.03	35.64	53.69	-18.05	AVG	
5		0.2260	40.49	0.03	40.52	62.60	-22.08	QP	
6		0.2260	28.79	0.03	28.82	52.60	-23.78	AVG	
7		0.3660	39.75	0.04	39.79	58.59	-18.80	QP	
8		0.3660	30.70	0.04	30.74	48.59	-17.85	AVG	
9		6.3420	33.95	0.49	34.44	60.00	-25.56	QP	
10		6.3420	21.70	0.49	22.19	50.00	-27.81	AVG	
11		15.2020	36.22	0.84	37.06	60.00	-22.94	QP	
12		15.2020	22.23	0.84	23.07	50.00	-26.93	AVG	

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Temperature: 23 °C Conduction Room Phase:

Limit: FCC Class B Conduction(QP)

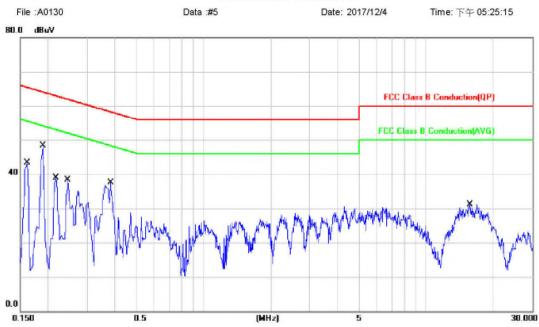
Power:

Humidity:

Mode:

Note: Acer VR

Conducted Emission



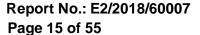
Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
	0.1620	43.25	0.12	43.37	65.36	-21.99	QP	
	0.1620	35.91	0.12	36.03	55.36	-19.33	AVG	
	0.1900	48.17	0.11	48.28	64.04	-15.76	QP	
	0.1900	36.20	0.11	36.31	54.04	-17.73	AVG	
	0.2180	38.81	0.11	38.92	62.89	-23.97	QP	
	0.2180	40.14	0.11	40.25	52.89	-12.64	AVG	
	0.2460	38.13	0.11	38.24	61.89	-23.65	QP	
•	0.2460	40.14	0.11	40.25	51.89	-11.64	AVG	
	0.3820	37.45	0.12	37.57	58.24	-20.67	QP	
	0.3820	26.20	0.12	26.32	48.24	-21.92	AVG	
	15.6740	40.26	0.63	40.89	60.00	-19.11	QP	
	15.6740	22.20	0.63	22.83	50.00	-27.17	AVG	
		MHz 0.1620 0.1620 0.1900 0.1900 0.2180 0.2180 0.2460 * 0.2460 0.3820 0.3820	Mk. Freq. Level MHz dBuV 0.1620 43.25 0.1620 35.91 0.1900 48.17 0.1900 36.20 0.2180 38.81 0.2180 40.14 0.2460 38.13 * 0.2460 40.14 0.3820 37.45 0.3820 26.20 15.6740 40.26	Mk. Freq. Level Factor MHz dBuV dB 0.1620 43.25 0.12 0.1620 35.91 0.12 0.1900 48.17 0.11 0.1900 36.20 0.11 0.2180 38.81 0.11 0.2180 40.14 0.11 0.2460 38.13 0.11 * 0.2460 40.14 0.11 0.3820 37.45 0.12 0.3820 26.20 0.12 15.6740 40.26 0.63	Mk. Freq. Level Factor ment MHz dBuV dB dBuV 0.1620 43.25 0.12 43.37 0.1620 35.91 0.12 36.03 0.1900 48.17 0.11 48.28 0.1900 36.20 0.11 36.31 0.2180 38.81 0.11 38.92 0.2180 40.14 0.11 40.25 0.2460 38.13 0.11 38.24 * 0.2460 40.14 0.11 40.25 0.3820 37.45 0.12 37.67 0.3820 26.20 0.12 26.32 15.6740 40.26 0.63 40.89	Mk. Freq. Level Factor ment Limit MHz dBuV dB dBuV dBuV 0.1620 43.25 0.12 43.37 65.36 0.1620 35.91 0.12 36.03 55.36 0.1900 48.17 0.11 48.28 64.04 0.1900 36.20 0.11 36.31 54.04 0.2180 38.81 0.11 38.92 62.89 0.2180 40.14 0.11 40.25 52.89 0.2460 38.13 0.11 38.24 61.89 * 0.2460 40.14 0.11 40.25 51.89 0.3820 37.45 0.12 37.57 58.24 0.3820 26.20 0.12 26.32 48.24 15.6740 40.26 0.63 40.89 60.00	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB 0.1620 43.25 0.12 43.37 65.36 -21.99 0.1620 35.91 0.12 36.03 55.36 -19.33 0.1900 48.17 0.11 48.28 64.04 -15.76 0.1900 36.20 0.11 36.31 54.04 -17.73 0.2180 38.81 0.11 38.92 62.89 -23.97 0.2180 40.14 0.11 40.25 52.89 -12.64 0.2460 38.13 0.11 38.24 61.89 -23.65 0.2460 40.14 0.11 40.25 51.89 -11.64 0.3820 37.45 0.12 37.57 58.24 -20.67 0.3820 26.20 0.12 26.32 48.24 -21.92 15.6740 40.26 0.63 40.89 60.00 -19.	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB Detector 0.1620 43.25 0.12 43.37 65.36 -21.99 QP 0.1620 35.91 0.12 36.03 55.36 -19.33 AVG 0.1900 48.17 0.11 48.28 64.04 -15.76 QP 0.1900 36.20 0.11 36.31 54.04 -17.73 AVG 0.2180 38.81 0.11 38.92 62.89 -23.97 QP 0.2180 40.14 0.11 40.25 52.89 -12.64 AVG 0.2460 38.13 0.11 38.24 61.89 -23.65 QP * 0.2460 40.14 0.11 40.25 51.89 -11.64 AVG 0.3820 37.45 0.12 37.67 58.24 -20.67 QP 0.3820 26.20 0.

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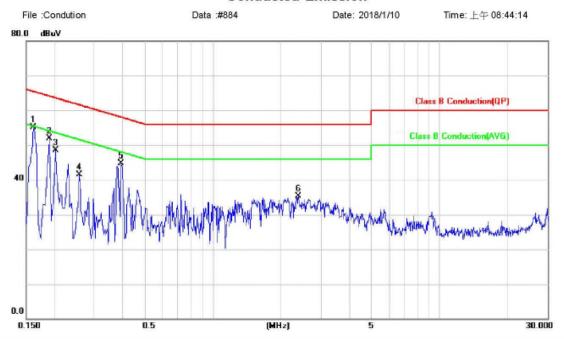


Model No.: ADP-18TB C

21 °C Conduction Room Phase: L1 Temperature: Humidity: 63 % Limit: FCC Class B Conduction(QP) Power:

Mode: Note:

Conducted Emission

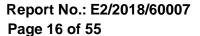


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	•	0.1620	35.39	19.65	55.04	65.36	-10.32	peak	
2		0.1900	32.33	19.64	51.97	64.04	-12.07	peak	
3		0.2020	28.90	19.64	48.54	63.53	-14.99	peak	
4		0.2580	21.75	19.74	41.49	61.50	-20.01	peak	
5		0.3940	24.84	19.95	44.79	57.98	-13.19	peak	
6		2.3900	14.88	20.49	35.37	56.00	-20.63	peak	

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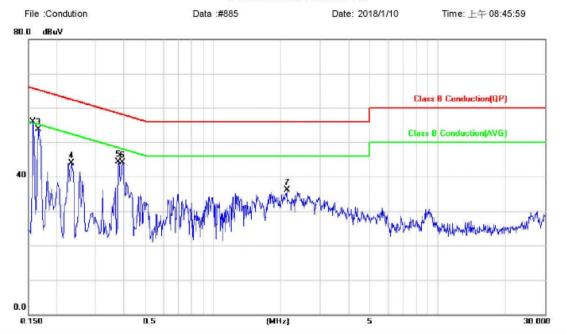




Phase: Temperature: 21 % Site : Conduction Room N Humidity: 63 % Limit: FCC Class B Conduction(QP) Power:

Mode: Note:

Conducted Emission



Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
MHz	₫BüV	dB	dBuV	dBuV	d₿	Detector	Comment
0.1580	33.66	19.50	53.16	65.57	-12.41	QP	
0.1580	16.48	19.50	35.98	55.57	-19.59	AVG	
0.1660	34.26	19.50	53.76	65.16	-11.40	peak	
0.2340	24.34	19.55	43.89	62.31	-18.42	peak	
0.3780	24.56	19.79	44.35	58.32	-13.97	peak	
0.3940	24.38	19.81	44.19	57.98	-13.79	peak	
2.1220	15.61	20.40	36.01	56.00	-19.99	peak	
	MHz 0.1580 0.1580 0.1660 0.2340 0.3780 0.3940	Freq. Level MHz dBuV 0.1580 33.66 0.1580 16.48 0.1660 34.26 0.2340 24.34 0.3780 24.56 0.3940 24.38	Freq. Level Factor MHz dBuV dB 0.1580 33.66 19.50 0.1580 16.48 19.50 0.1660 34.26 19.50 0.2340 24.34 19.55 0.3780 24.56 19.79 0.3940 24.38 19.81	Freq. Level Factor ment MHz dBuV dB dBuV 0.1580 33.66 19.50 53.16 0.1580 16.48 19.50 35.98 0.1660 34.26 19.50 53.76 0.2340 24.34 19.55 43.89 0.3780 24.56 19.79 44.35 0.3940 24.38 19.81 44.19	Freq. Level Factor ment Limit MHz dBuV dB dBuV dBuV 0.1580 33.66 19.50 53.16 65.57 0.1580 16.48 19.50 35.98 55.57 0.1660 34.26 19.50 53.76 65.16 0.2340 24.34 19.55 43.89 62.31 0.3780 24.56 19.79 44.35 58.32 0.3940 24.38 19.81 44.19 57.98	Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB 0.1580 33.66 19.50 53.16 65.57 -12.41 0.1580 16.48 19.50 35.98 55.57 -19.59 0.1660 34.26 19.50 53.76 65.16 -11.40 0.2340 24.34 19.55 43.89 62.31 -18.42 0.3780 24.56 19.79 44.35 58.32 -13.97 0.3940 24.38 19.81 44.19 57.98 -13.79	Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB Detector 0.1580 33.66 19.50 53.16 65.57 -12.41 QP 0.1580 16.48 19.50 35.98 55.57 -19.59 AVG 0.1660 34.26 19.50 53.76 65.16 -11.40 peak 0.2340 24.34 19.55 43.89 62.31 -18.42 peak 0.3780 24.56 19.79 44.35 58.32 -13.97 peak 0.3940 24.38 19.81 44.19 57.98 -13.79 peak

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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 and the e.i.r.p. shall not exceed 4W.

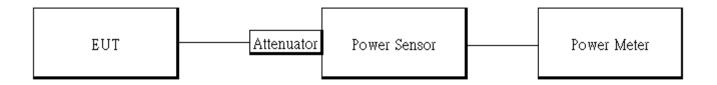
If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

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.							
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018							
Power Meter	Anritsu	ML2496A	1326001	07/26/2017	07/25/2018							
Power Sensor	Anritsu	MA2411B	1315048	07/26/2017	07/25/2018							
Power Sensor	Anritsu	MA2411B	1315049	07/26/2017	07/25/2018							
Coaxial Cable 30cm	WOKEN	00100A1F1A195 C	RF01	12/24/2017	12/23/2018							
DC Block	PASTERNACK	PE8210	RF29	12/24/2017	12/23/2018							
Splitter	RF-LAMBAD	RFLT2W1G18G	RF35	12/24/2017	12/23/2018							
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018							
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2018	05/01/2019							

7.3 Test Set-up:

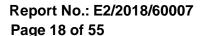


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7.4 Measurement Procedure:

- 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. Guid-
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

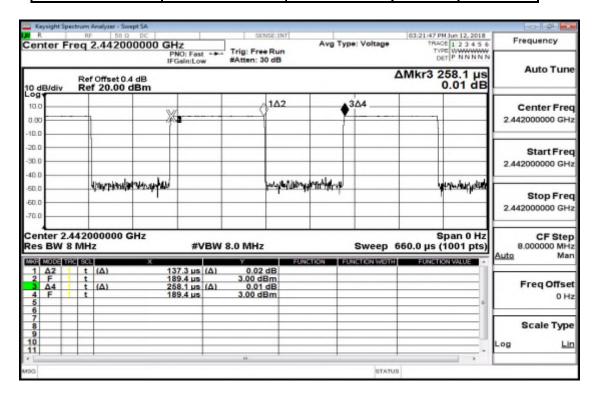
Power Meter:

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.

Duty Factor:

	Duty Cycle (%)	Duty Factor (dB)	1/T (kHz)	VBW setting (kHz)
2.4G ESB	53.20	2.74	7.28	8.00



Duty Cycle Factor:10*log(1/(53.1964/100))=2.74

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7.5 Measurement Result:

2.4G ESB mode:

Z.TO EC	illoue.		
СН	Frequency (MHz)	Peak Power Output (dBm)	Required Limit
2	2402	3.34	1 Watt = 30 dBm
42	2442	3.14	1 Watt = 30 dBm
80	2480	2.94	1 Watt = 30 dBm
2.4G ES	B mode:		
CH Frequency (MHz)		Max. Avg. Output include tune up tolerance Power (dBm)	Required Limit
2	2402	0.66	1 Watt = 30 dBm
42	2442	0.46	1 Watt = 30 dBm
80	2480	0.25	1 Watt = 30 dBm

*Note: Measured by power meter, ca2.4G ESB loss as 0.4 dB that offsets on the power meter in Peak

EIRP

СН	Frequency (MHz)	Max. Avg. Output include tune up tolerance Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
2	2402	0.66	-1.72	-1.06	4W= 36 dBm
42	2442	0.46	-1.72	-1.26	4W= 36 dBm
80	2480	0.25	-1.72	-1.47	4W= 36 dBm

* Note: EIRP = Average Power + Gain

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^{*}Note: Measured by power meter, as ca2.4G ESB loss+ Duty cycle factor that offsets on the power meter

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



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6DB & 99% BANDWIDTH MEASUREMENT

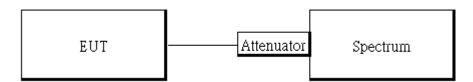
8.1 Standard Applicable

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

8.2 Measurement Equipment Used

	Conducted Emission Test Site										
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.						
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018						
Power Meter	Anritsu	ML2496A	1326001	07/26/2017	07/25/2018						
Power Sensor	Anritsu	MA2411B	1315048	07/26/2017	07/25/2018						
Power Sensor	Anritsu	MA2411B	1315049	07/26/2017	07/25/2018						
Coaxial Cable 30cm	WOKEN	00100A1F1A195 C	RF01	12/24/2017	12/23/2018						
DC Block	PASTERNACK	PE8210	RF29	12/24/2017	12/23/2018						
Splitter	RF-LAMBAD	RFLT2W1G18G	RF35	12/24/2017	12/23/2018						
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018						
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2018	05/01/2019						

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

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8.5 Measurement Result:

2 4G FSB mode

Frequency (MHz)	6dB BW (MHz)	BW (MHz)	Result	
2402	0.718	> 0.5	PASS	
2442	0.694	> 0.5	PASS	
2480	0.65	> 0.5	PASS	

2.4G ESB mode

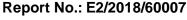
Frequency (MHz)	99%Bandwidth (MHz)
2402	1.8431
2442	1.7871
2480	1.7558

Note: Refer to next page for plots.

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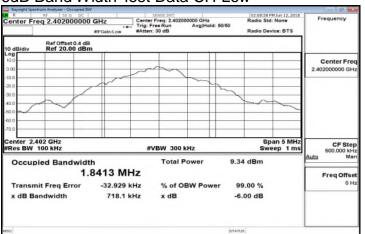
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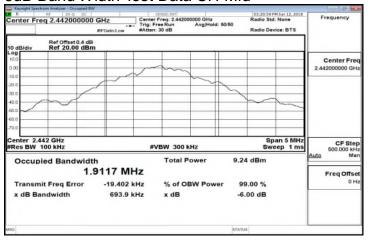
6dB Band Width Test Data CH-Low



99% Band Width Test Data CH-Low



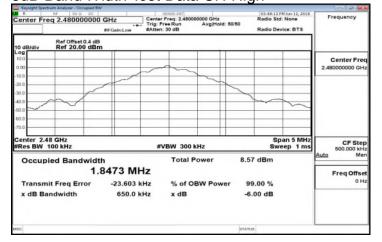
6dB Band Width Test Data CH-Mid



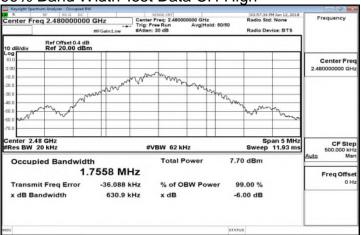
99% Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



99% Band Width Test Data CH-High



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CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

9.1 Standard Applicable

As per KDB 558074 D01 11.1 a)

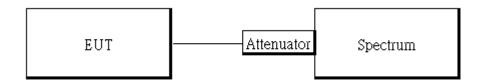
If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc)

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), must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.10 Table 6.

9.2 Measurement Equipment Used:

Conducted Emission Test Site						
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.	
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/21/2018	06/20/2019	
Power Meter	Anritsu	ML2496A	1326001	07/26/2017	07/25/2018	
Power Sensor	Anritsu	MA2411B	1315048	07/26/2017	07/25/2018	
Power Sensor	Anritsu	MA2411B	1315049	07/26/2017	07/25/2018	
Coaxial Cable 30cm	WOKEN	00100A1F1A195 C	RF01	12/24/2017	12/23/2018	
DC Block	PASTERNACK	PE8210	RF29	12/24/2017	12/23/2018	
Splitter	RF-LAMBAD	RFLT2W1G18G	RF35	12/24/2017	12/23/2018	
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018	
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2018	05/01/2019	
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/21/2018	06/20/2019	

9.3 Test SET-UP:



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9.4 Measurement Procedure

Conducted Band Edge 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.
- 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.
- 8. Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Conducted Band Edge:

- To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
- 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 =
- 6. Mark the highest reading of the emission as the reference level measurement.
- Set DL as the limit = reading on marker 1 20dBm
- 8. 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.
- 9. 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.
- 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

Reference Level of Limit

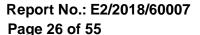
Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limi = PSD - 20dB (dBm)	
2402	3.11	-16.89	
2442	2.94	-17.07	
2480	2.56	-17.44	

NOTE: Refer to next page for plots.

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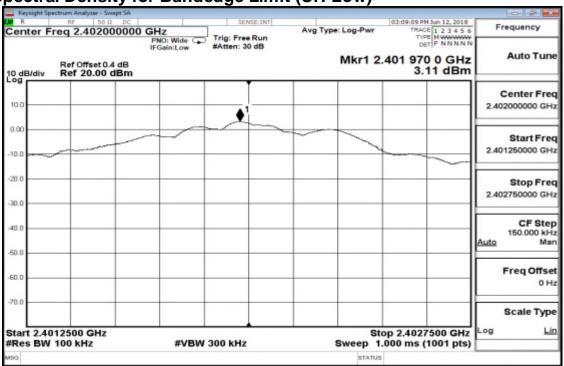
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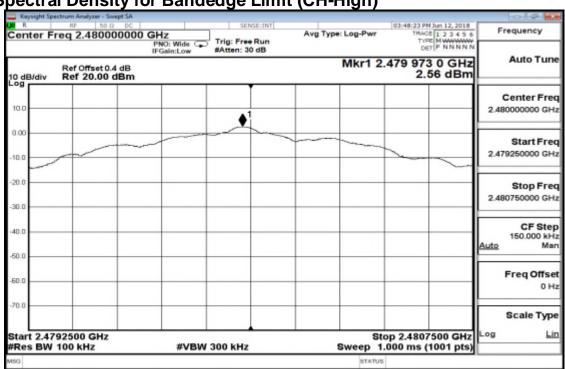




Power Spectral Density for Bandedge Limit (CH-Low)



Power Spectral Density for Bandedge Limit (CH-High)

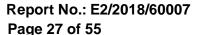


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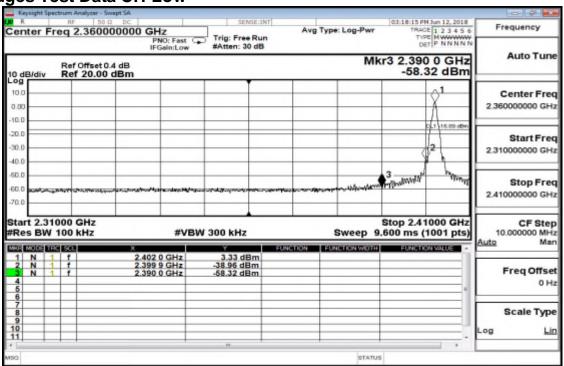
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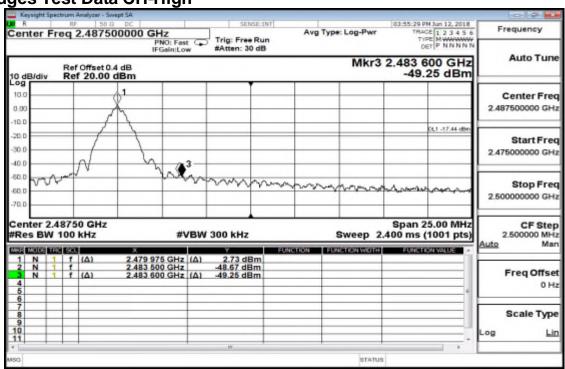




Band Edges Test Data CH-Low



Band Edges Test Data CH-High

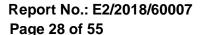


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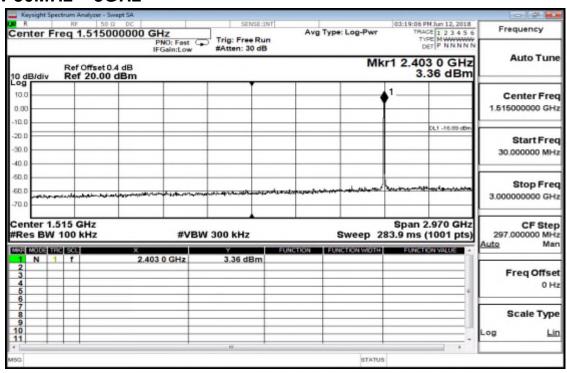
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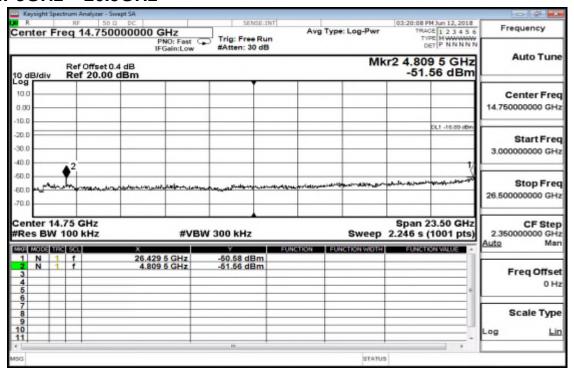




Conducted Spurious Emission Measurement Result CH-Low 30MHz - 3GHz



CH-Low 3GHz – 26.5GHz



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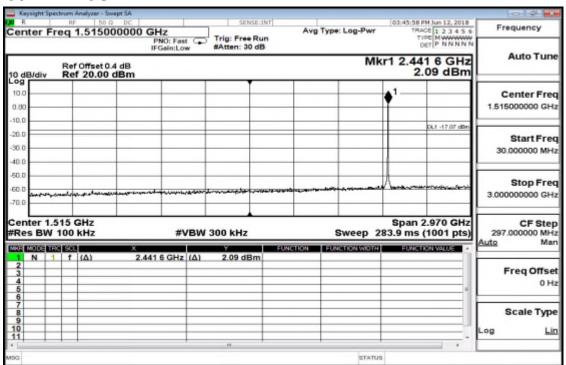
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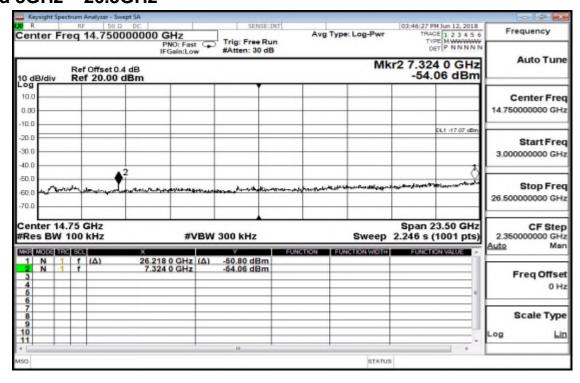
t (886-2) 2299-3279



CH-Mid 30MHz - 3GHz



CH-Mid 3GHz - 26.5GHz



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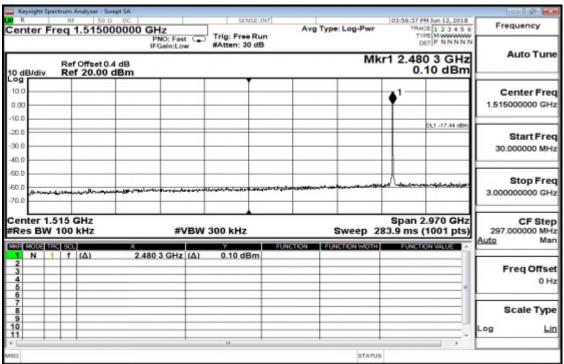
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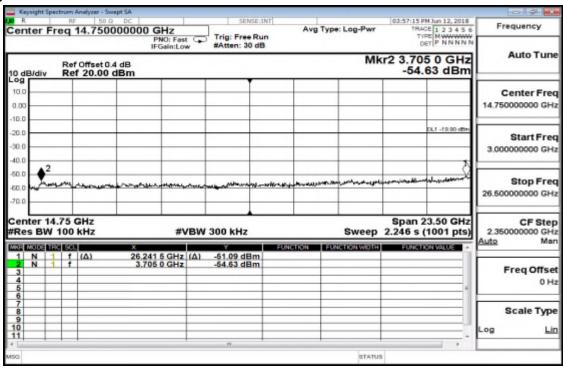
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CH-High 30MHz – 3GHz



CH- High 3GHz - 26.5GHz



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10 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

Standard Applicable 10.1

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 §8.10 Table 6 limit as below.

And according to §15.33(a) (1) & RSS-Gen §8.9 Table 4 & 5, 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.
- Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

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10.2 Measurement Equipment Used

966 Chamber						
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.	
Broadband Antenna	TESEQ	CBL 6112D	35243	10/11/2017	09/11/2018	
Horn Antenna	Schwarzbeck	BBHA9120D	1187	04/01/2018	03/01/2019	
Horn Antenna	SCHWAZBECK	BBHA9170	184	12/12/2017	11/12/2018	
Loop Antenna	ETS.LINDGREN	6502	148045	26/09/2017	25/09/2018	
EMI Test Receiver	R&S	ESU 40	100363	11/04/2018	10/04/2019	
Pre-Amplifier	EMC Instruments	EMC330	980096	26/12/2017	25/12/2018	
Pre-Amplifier	EMC Instruments	EMC0011830	980199	26/12/2017	25/12/2018	
Pre-Amplifier	EMC Instruments	EMC184045B	980135	27/10/2017	26/10/2018	
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	26/12/2017	25/12/2018	
Coaxial Cable	Huber Suhner	EMC106-SM-SM-7 200	150703	26/12/2017	25/12/2018	
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	26/12/2017	25/12/2018	

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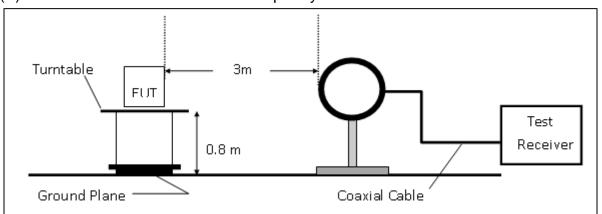
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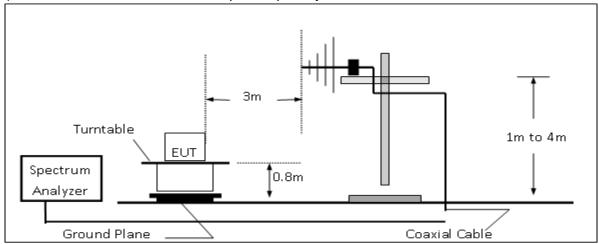


10.3 Test SET-UP

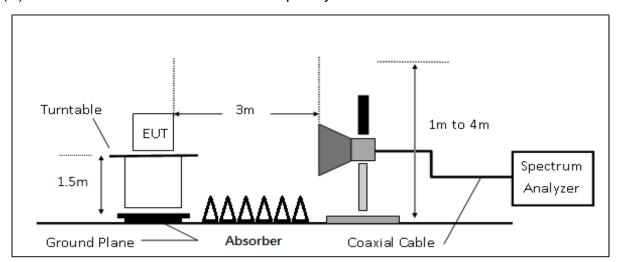
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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 .
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 0.8m for frequency> 1GHz above ground plan.
- The turn table shall rotate 360 degrees to determine the position of maximum emission level. 3.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) 5. and Quasi-peak (QP) at frequency below 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency 6. 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.
- When measurement procedures for electric field radiated emissions above 1 GHz the EUT 8. 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.
- Maximum procedure was performed on the six highest emissions to ensure EUT compli-9. ance.
- 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	G	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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

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

Note:

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

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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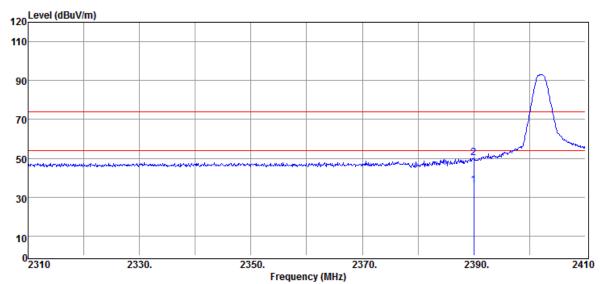




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Radiated Band Edge Measurement Result

:2.4G **Operation Mode Test Date** :2018-07-05 :BE CH Low Test Mode :25/60 Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol. :VERTICAL :2402 MHz :Enzo Test Channel Engineer

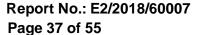


Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	Average	32.66	3.39	36.05	54.00	-17.95
2390.00	Peak	46.86	3.39	50.25	74.00	-23.75

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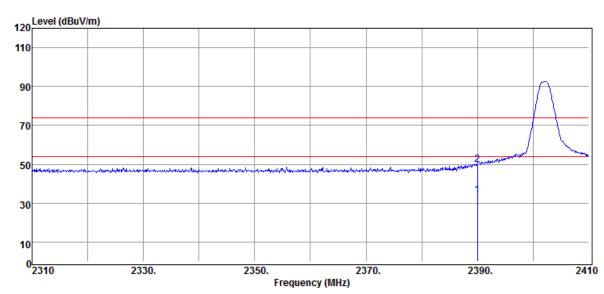




:2.4G **Operation Mode Test Date** :2018-07-05 :BE CH Low Test Mode Temp./Humi. :25/60

:E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2402 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	Average	30.63	3.39	34.02	54.00	-19.98
2390.00	Peak	46.49	3.39	49.88	74.00	-24.12

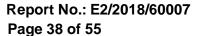
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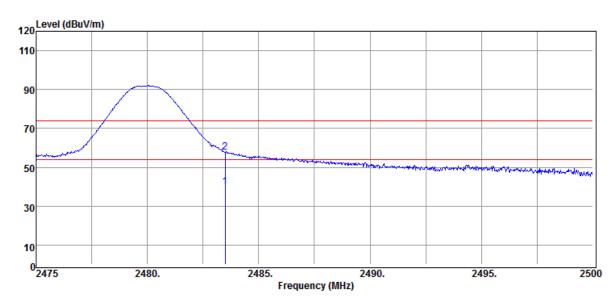
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:BE CH High Test Mode Temp./Humi. :25/60 :E2 Plan **EUT Pol** Antenna Pol. :VERTICAL

:2480 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	35.86	3.96	39.82	54.00	-14.18
2483.50	Peak	53.72	3.96	57.68	74.00	-16.32

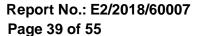
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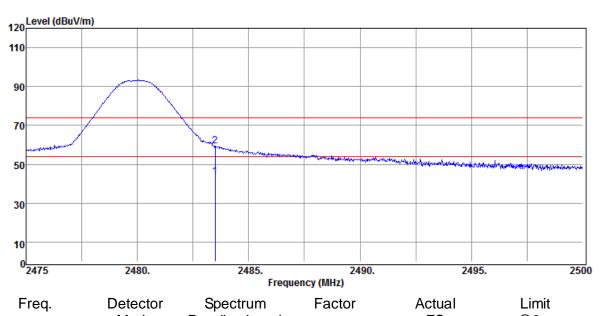
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:BE CH High Test Mode Temp./Humi. :25/60 :E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2480 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	39.59	3.96	43.55	54.00	-10.45
2483.50	Peak	55.61	3.96	59.57	74.00	-14.43

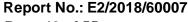
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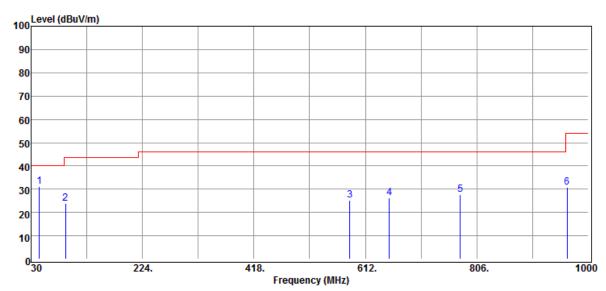




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Radiated Spurious Emission Measurement Result For Frequency form 30MHz to 1000MHz

:2.4G **Operation Mode Test Date** :2018-07-05 :TX CH LOW :25/60 Test Mode Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol. :VERTICAL :2402 MHz :Enzo **Test Channel** Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
44.55	Peak	43.34	-12.15	31.19	40.00	-8.81
90.14	Peak	40.38	-16.36	24.02	43.50	-19.48
584.84	Peak	28.42	-3.20	25.22	46.00	-20.78
653.71	Peak	28.54	-2.28	26.26	46.00	-19.74
776.90	Peak	28.50	-0.80	27.70	46.00	-18.30
963.14	Peak	28.38	2.39	30.77	54.00	-23.23

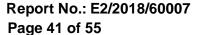
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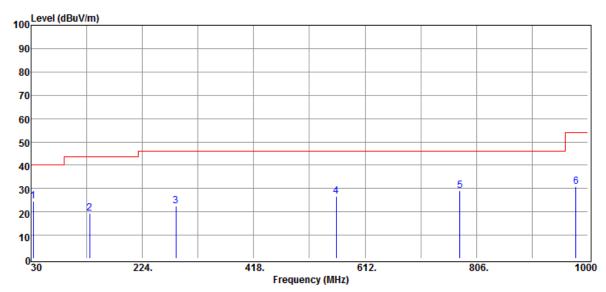




:2.4G **Operation Mode Test Date** :2018-06-08 :TX CH LOW Test Mode Temp./Humi. :25/60

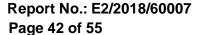
:E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2402 MHz Engineer :Enzo Test Channel



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
33.88	Peak	30.22	-5.73	24.49	40.00	-15.51
131.85	Peak	30.90	-11.52	19.38	43.50	-24.12
282.20	Peak	32.71	-10.17	22.54	46.00	-23.46
561.56	Peak	29.73	-3.16	26.57	46.00	-19.43
776.90	Peak	29.95	-0.80	29.15	46.00	-16.85
979.63	Peak	28.16	2.80	30.96	54.00	-23.04

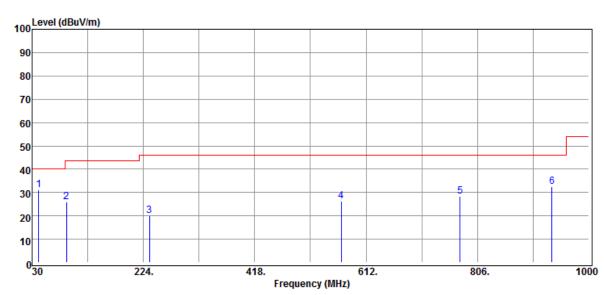
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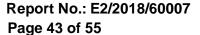
:TX CH MID Test Mode Temp./Humi. :25/60 :E2 Plan **EUT Pol** Antenna Pol. :VERTICAL

:2442 MHz Engineer :Enzo Test Channel



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
41.64	Peak	41.22	-9.94	31.28	40.00	-8.72
90.14	Peak	42.39	-16.36	26.03	43.50	-17.47
234.67	Peak	32.10	-12.06	20.04	46.00	-25.96
568.35	Peak	29.30	-3.17	26.13	46.00	-19.87
775.93	Peak	29.06	-0.82	28.24	46.00	-17.76
935.98	Peak	30.63	1.81	32.44	46.00	-13.56

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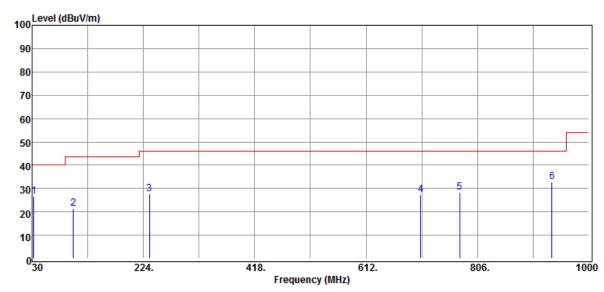




:2.4G **Operation Mode Test Date** :2018-07-05 :TX CH MID Test Mode Temp./Humi. :25/60

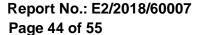
:E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2442 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
32.91	Peak	31.73	-5.23	26.50	40.00	-13.50
101.78	Peak	36.05	-14.49	21.56	43.50	-21.94
234.67	Peak	39.80	-12.06	27.74	46.00	-18.26
707.06	Peak	28.93	-1.55	27.38	46.00	-18.62
774.96	Peak	29.05	-0.84	28.21	46.00	-17.79
935.98	Peak	31.19	1.81	33.00	46.00	-13.00

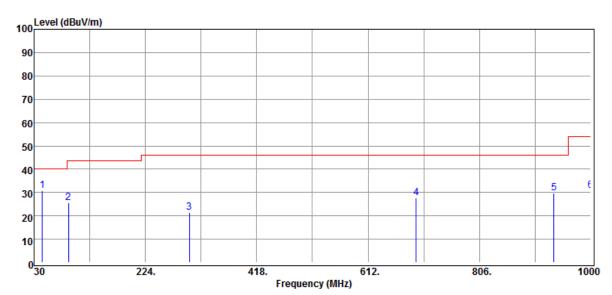
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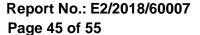
:TX CH HIGH Test Mode :25/60 Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol. :VERTICAL

:2480 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
44.55	Peak	43.07	-12.15	30.92	40.00	-9.08
90.14	Peak	42.12	-16.36	25.76	43.50	-17.74
300.63	Peak	31.42	-9.87	21.55	46.00	-24.45
695.42	Peak	29.22	-1.65	27.57	46.00	-18.43
935.98	Peak	27.91	1.81	29.72	46.00	-16.28
1000.00	Peak	27.52	3.30	30.82	54.00	-23.18

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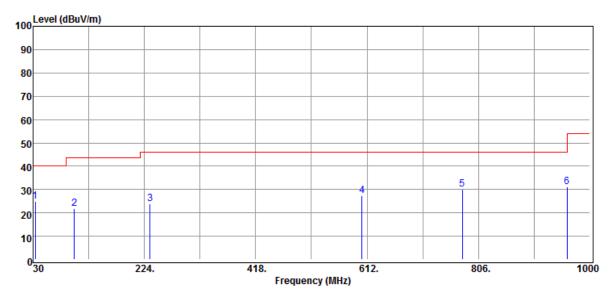




:2.4G **Operation Mode Test Date** :2018-07-05 :TX CH HIGH Test Mode Temp./Humi. :25/60

:E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2480 MHz Engineer :Enzo Test Channel



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
33.88	Peak	30.64	-5.73	24.91	40.00	-15.09
101.78	Peak	36.38	-14.49	21.89	43.50	-21.61
233.70	Peak	36.13	-12.15	23.98	46.00	-22.02
603.27	Peak	30.36	-3.17	27.19	46.00	-18.81
777.87	Peak	30.78	-0.78	30.00	46.00	-16.00
960.23	Peak	28.99	2.32	31.31	54.00	-22.69

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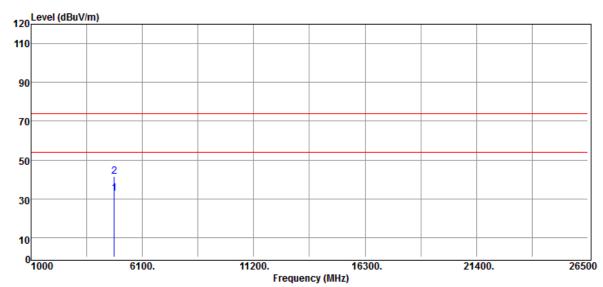
Radiated Spurious Emission Measurement Result

For Frequency above 1GHz

Operation Mode :2.4G **Test Date** :2018-06-13

Test Mode :TX CH LOW :25/60 Temp./Humi. :E2 Plan

EUT Pol Antenna Pol. :VERTICAL :2402 MHz :Enzo **Test Channel** Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4804.00	Average	20.62	12.29	32.91	54.00	-21.09
4804.00	Peak	29.43	12.29	41.72	74.00	-32.28

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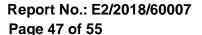
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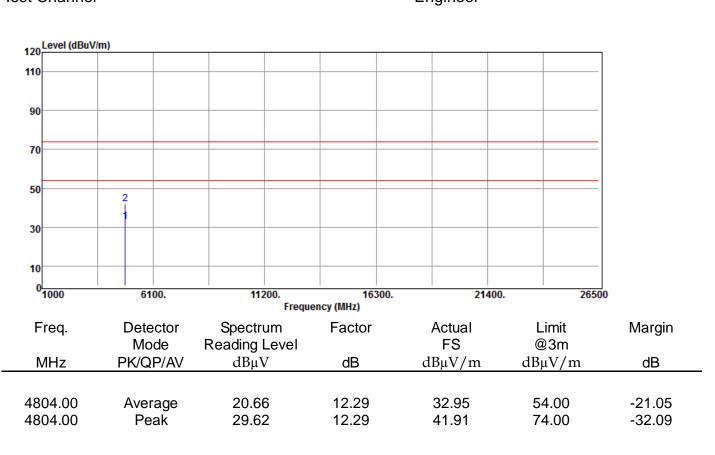
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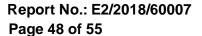


:TX CH LOW Test Mode :25/60 Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2402 MHz Engineer :Enzo Test Channel



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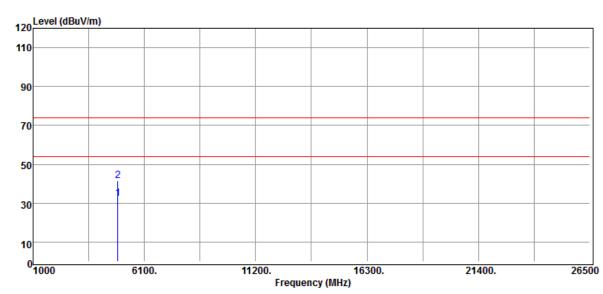




:2.4G **Operation Mode Test Date** :2018-06-13 :TX CH MID

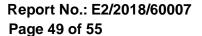
Test Mode :25/60 Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol. :VERTICAL

:2442 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4884.00	Average	19.87	12.64	32.51	54.00	-21.49
4884.00	Peak	28.72	12.64	41.36	74.00	-32.64

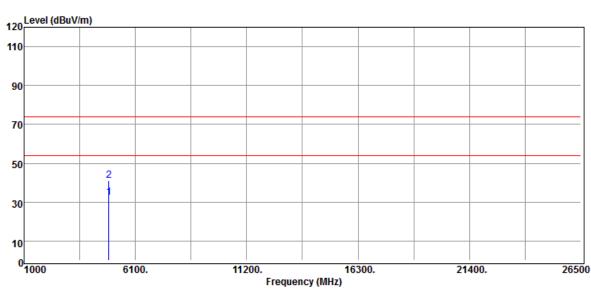
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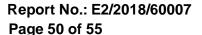
:TX CH MID Test Mode :25/60 Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:2442 MHz :Enzo Test Channel Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4884.00 4884.00	Average Peak	19.56 28.60	12.63 12.64	32.19 41.24	54.00 74.00	-21.81 -32.76

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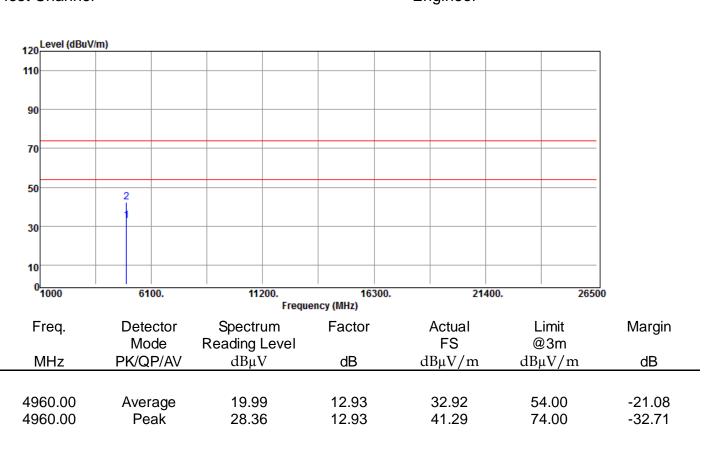
:VERTICAL



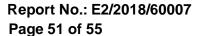
:2.4G **Operation Mode Test Date** :2018-06-13

:TX CH HIGH Test Mode :25/60 Temp./Humi. :E2 Plan **EUT Pol** Antenna Pol.

:2480 MHz Engineer :Enzo Test Channel



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:HORIZONTAL



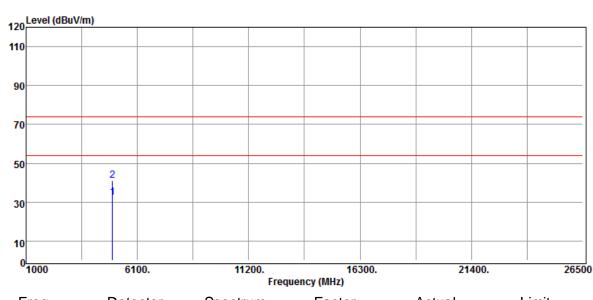
EUT Pol

:2.4G **Operation Mode Test Date** :2018-06-13

Antenna Pol.

:TX CH HIGH Test Mode Temp./Humi. :25/60 :E2 Plan

:2480 MHz :Enzo Test Channel Engineer



	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin		
	MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB		
	4960.00	Average	19.50	12.93	32.43	54.00	-21.57		
	4960.00	Peak	28.03	12.93	40.96	74.00	-33.04		

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11 PEAK POWER SPECTRAL DENSITY

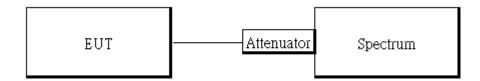
Standard Applicable: 11.1

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.

11.2 **Measurement Equipment Used:**

	Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.	
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/21/2018	06/20/2019	
Coaxial Cable 30cm	WOKEN	00100A1F1A 195C	RF01	12/24/2017	12/23/2018	
DC Block	PASTERNACK	PE8210	RF29	12/24/2017	12/23/2018	
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018	

11.3 Test Set-up:



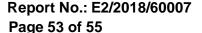
11.4 Measurement Procedure:

- 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.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz. & the VBW = 10 kHz
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.

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11.5 Measurement Result:

BLE mode

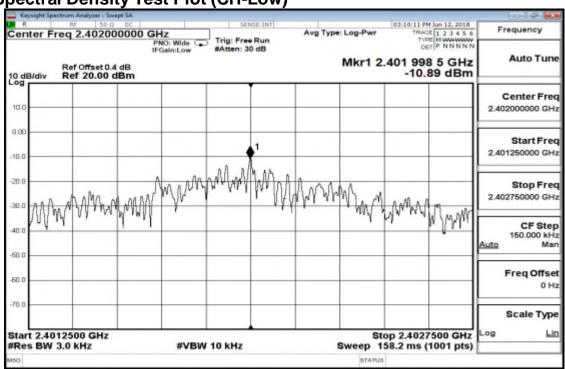
2.4G ESB mode

Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result	
2402	-10.89	8	PASS	
2442	-12.48	8	PASS	
2480	-13.42	8	PASS	

NOTE: ca2.4G ESB loss as 0.4dB that offsets in the spectr

BLE mode

Power Spectral Density Test Plot (CH-Low)



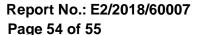
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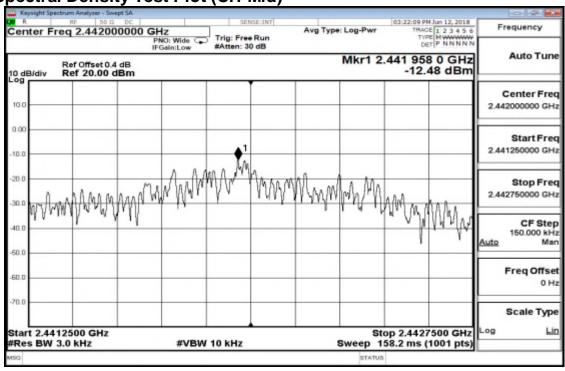
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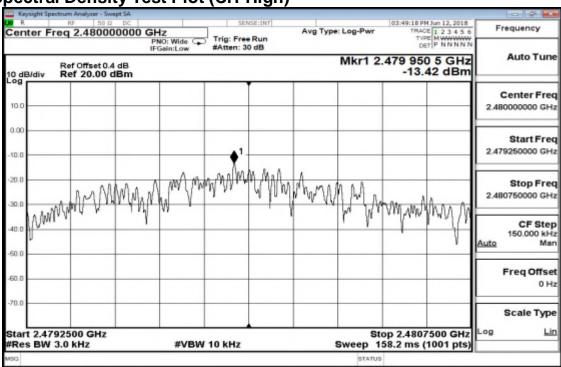




Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



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12 ANTENNA REQUIREMENT

Standard Applicable: 12.1

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 is designed as permanently attached and has no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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