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# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

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

OF

Acer Incorporated

Applicant: 8F, 88, Sec 1, Hsin Tai Wu Rd Hsichih, Taipei Hsien, 221

Taiwan

**Product Name:** WLAN and BT, 2x2 PCIe M.2 1216 SD adapter card

**Brand Name:** acer 9560D2W Model No.:

**Model Difference:** N/A

FCC ID: HLZ9560D2W IC: 1754F-9560D2W **Report Number:** E2/2018/90030 FCC Rule Part: §15.247, Cat: DTS

RSS-247 issue 2 Feb 2017 IC Rule Part:

Oct. 12, 2018 **Issue Date:** 

Date of Test: Aug. 29, 2018 ~ Oct. 05, 2018

Aug. 29, 2018 Date of EUT Received:

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

CHUN, CHIEH, CFIFN

Approved By:

CHUN-CHIEH, CHEN / Asst. Supervisor





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# **Revision History**

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
E2/2018/90030	Rev.00	Initial creation of document	All	Oct. 12, 2018	Yuri Tsai

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# **GENERAL INFORMATION**

# 1.1 Product description

#### General:

Product Name of Host:	Notebook Computer		
Brand Name:	acer		
Marketing Name of Host:	SF515-51T, SF515-51TP, SF515-51		
Model No. of Host:	N18P2		
Model Difference:	N/A		
Hardware Version:	N/A		
Software Version:	N/A		
Model No. of BT/WLAN Module:	9560D2W		
Module FCC ID:	HLZ9560D2W		
Module IC:	1754F-9560D2W		
Scope:	The test report covers the radiated emissions requirements of the standards referenced in the report to allow system level ap- proval of the module in this specific host.		
Class II & Class IV Permissive change:	WLAN and BT, 2x2 PCIe M.2 1216 SD adapter card INSTALLED IN Notebook Computer		
	11.55Vdc from Rechargeable Li-ion Battery Pack or 19V by AC/DC Power Adapter		
Power Supply:	Battery:	Model No.: AP1505L, Supplier: acer	
	Adapter:	Model No.: A13-045N2A, Supplier: acer	

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#### WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Peak) / EIRP	Modulation Technology	Type of Emission
11b/g	2412-2472	13	b: 20.36dBm b: 16.30dBm (EIRP) g: 22.03dBm g: 16.32dBm (EIRP)	DSSS OFDM	b: 14M9D2W g: 24M8D7W
11n (2.4GHz)	HT20 / VHT20 2412-2472	13	HT20: 25.03dBm (MIMO) HT20: 21.85dBm (EIRP)	OFDM	25M1D7W
11n (2.4GHz)	HT40 / VHT40 2422-2462	9	HT40: 22.83dBm (MIMO) HT40: 18.69dBm (EIRP)	OFDM	36M5D7W
Antenna Designation:		1. P/N: 1	enna, Supplier: WNC 415-06VV0PB (81EAAL15. 415-06W40PB (81EAAL15.		
Modulation type		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM			
Transition Rate:		802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144.4Mbps 802.11 n_40MHz: 13.5 – 300.0Mbps			

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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

FCC KDB 662911 D01 Multiple Transmitter Output

ANSI C63.10:2013

Canada RSS-247 issue 2 Feb. 2017

Canada RSS-Gen issue 5 Apr. 2018

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 Number and Designation number are: 735305 / TW0002

Canada Registration Number: 4620E-1

# Special Accessories

There is no special accessory used while test was conducted.

# **Equipment Modifications**

There was no modification incorporated into the EUT.

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#### SYSTEM TEST CONFIGURATION

#### **EUT Configuration** 2.1

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. 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 hand-held 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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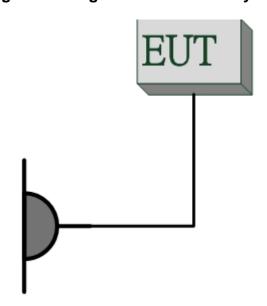
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# 2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System



**Table 2-1 Equipment Used in Tested System** 

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A

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# **SUMMARY OF TEST RESULTS**

FCC Rules	IC Rules	Description Of Test	Result
§15.247(b) (3)	RSS-247 §5.4 (2)	Peak Output Power	Compliant
§15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.203 §15.247(b)	-	Antenna Requirement	Compliant

# **DESCRIPTION OF TEST MODES**

# 4.1 Operated in 2400 ~ 2483.5MHz Band

13 channels are provided for 802.11b, 802.11g and 802.11n HT20

3.1 5 p. 5 . 1 3. 5 3. 1 5		<u> </u>	
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	8	2447 MHz
2	2417 MHz	9	2452 MHz
3	2422 MHz	10	2457 MHz
4	2427 MHz	11	2462 MHz
5	2432 MHz	12	2467 MHz
6	2437 MHz	13	2472 MHz
7	2442 MHz		

#### 9 channels are provided for 802.11n HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422 MHz	8	2447 MHz
4	2427 MHz	9	2452 MHz
5	2432 MHz	10	2457 MHz
6	2437 MHz	11	2462 MHz
7	2442 MHz		

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#### **RADIATED EMISSION TEST:**

DIXTED LIMITORIO	SIATED EMILOGICATEOT:					
	RADIATED BAND EDGE EMISSION TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11b	1 to 13	1,11,12,13	DSSS	1	MAIN	
802.11g	1 to 13	1,11,12,13	OFDM	6	MAIN	
802.11n (HT20)	1 to 13	1,11,12,13	OFDM	MCS8	MIMO	
802.11n (HT40)	3 to 11	3,9,10,11	OFDM	MCS8	MIMO	
	RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11b	1 to 13	7	DSSS	1	MAIN	

#### Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case H mode position was tested as resulted in pre-scanned measurement.

Pre-scanned was done on Antenna Main and Antenna Aux, and Antenna MIMO results higher emission at 2.4GHz. Therefore, the completed set of measurement was done on Antenna MIMO (2.4GHz) to be presented on this test report.

#### Remark:

The device will not operate in 2467/2472MHz for 20MHz BW & 2457/2462MHz for 40MHz BW

#### ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 13	1,7,11,12,13	DSSS	1	MAIN
802.11g	1 to 13	1,7,11,12,13	OFDM	6	MAIN
802.11n (HT20)	1 to 13	1,7,11,12,13	OFDM	MCS8	MIMO
802.11n (HT40)	3 to 11	3,7,9,10,11	OFDM	MCS8	MIMO

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# **MEASUREMENT UNCERTAINTY**

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 1.55dB (for Spectrum) +/- 1.42 dB (for Power Meter)
6dB Bandwidth	+/- 123.36 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 1.55 dB
Peak Power Density	+/- 1.55 dB
99% Power Bandwidth	+/- 123.36 Hz
Temperature	+/- 0.8 °C
Humidity	+/- 4.7 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 0.2%

# Radiated Spurious Emission:

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

	9kHz-30MHz: +/-2.87dB			
Management consentaints	30MHz - 167MHz: +/- 4.22dB			
Measurement uncertainty (Polarization : <b>Horizontal</b> )	167MHz -500MHz: +/- 3.44dB			
(Foldinzation : Florizontal)	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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# PEAK OUTPUT POWER MEASUREMENT

#### 6.1 **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.

#### 6.2 **Measurement Equipment Used:**

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due				
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/06/19				
Power Meter	Anritsu	ML2496A	1326001	2018/07/25	2019/07/24				
Power Sensor	Anritsu	MA2411B	1315048	2018/07/25	2019/07/24				
Power Sensor	Anritsu	MA2411B	1315049	2018/07/25	2019/07/24				
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25				
Attenuator	Marvelous	MVE2213-10	RF31	2017/12/26	2018/12/25				
DC Block	PASTER- NACK	PE8210	RF29	2017/12/26	2018/12/25				

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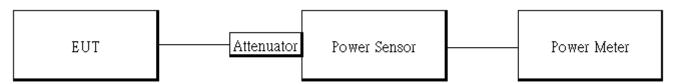
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#### 6.3 Test Set-up:

Power Meter:



#### 6.4 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 Spectrum or Power Meter.
- 5. For MIMO operation, measurement is done per chain basis, and then sum the simultaneous transmitting output in linear.

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# 6.5 Measurement Result (Worst Case Data Rate):

#### 802.11b

<u> </u>					
СН	Frequency (MHz)	Data Rate   Peak Output Power (dBm)   Peak Output Power (mW)		Peak Output Power (mW)	Limit
1	2412	1	20.02	100.46	1 Watt = 30 dBm
7	2442	1	20.36	108.64	1 Watt = 30 dBm
11	2462	1	19.94	98.63	1 Watt = 30 dBm
12	2467	1	18	63.10	1 Watt = 30 dBm
13	2472	1	16.21	41.78	1 Watt = 30 dBm

СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit
1	2412	1	18.48	70.47	1 Watt = 30 dBm
7	2442	1	18.96	78.70	1 Watt = 30 dBm
11	2462	1	18.29	67.45	1 Watt = 30 dBm
12	2467	1	16.58	45.50	1 Watt = 30 dBm
13	2472	1	14.48	28.05	1 Watt = 30 dBm

802.11a

СН	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit
1	2412	6	21.24	133.05	1 Watt = 30 dBm
6	2437	6	22.03	159.59	1 Watt = 30 dBm
11	2462	6	21.12	129.42	1 Watt = 30 dBm
12	2467	6	17.96	62.52	1 Watt = 30 dBm
13	2472	6	-1.76	0.67	1 Watt = 30 dBm

СН	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit
1	2412	6	16.26	42.27	1 Watt = 30 dBm
6	2437	6	18.98	79.07	1 Watt = 30 dBm
11	2462	6	15.96	39.45	1 Watt = 30 dBm
12	2467	6	12.47	17.66	1 Watt = 30 dBm
13	2472	6	-7.07	0.20	1 Watt = 30 dBm

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# 802.11n HT20

		DATA	Peak Outout	Power (dBm)	TOTAL	TOTAL	REQUIRED	
СН	Frequency (MHz)	DATA RATE	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
1	2412	MCS8	20.18	19.94	23.07	202.860	30dBm	PASS
7	2442	MCS8	22.17	21.86	25.03	318.278	30dBm	PASS
11	2462	MCS8	19.73	19.54	22.65	183.922	30dBm	PASS
12	2467	MCS8	17.29	17.04	20.18	104.162	30dBm	PASS
13	2472	MCS8	-3.95	-4.02	-0.97	0.799	30dBm	PASS

	_	DATA	Avg. Outout	Power (dBm)	TOTAL	TOTAL	REQUIRED	
СН	Frequency (MHz)	DATA RATE	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
1	2412	MCS8	14.13	14.24	17.95	52.428	30dBm	PASS
7	2442	MCS8	16.7	16.6	20.41	92.482	30dBm	PASS
11	2462	MCS8	13.64	13.76	17.46	46.889	30dBm	PASS
12	2467	MCS8	11.28	11.09	14.95	26.281	30dBm	PASS
13	2472	MCS8	-9.81	-9.85	-6.07	0.208	30dBm	PASS

#### 802.11n HT40

		•						
	_	D.1-1	Peak Outout	Power (dBm)	TOTAL	TOTAL	REQUIRED	
СН	Frequency DATA (MHz) RATE	DATA RATE	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
3	2422	MCS8	18.8	18.58	21.70	147.969	30 dBm	PASS
7	2442	MCS8	19.85	19.78	22.83	191.666	30 dBm	PASS
9	2452	MCS8	15.7	15.41	18.57	71.907	30 dBm	PASS
10	2457	MCS8	13.9	13.38	16.66	46.324	30 dBm	PASS
11	2462	MCS8	9.31	9	12.17	16.474	30 dBm	PASS

		DATA	Avg. Outout	Power (dBm)	TOTAL	TOTAL	REQUIRED	
СН	Frequency (MHz)	DATA RATE	CHAIN 0	CHAIN 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)	RESULT
3	2422	MCS8	12.48	12.47	16.26	35.361	30 dBm	PASS
7	2442	MCS8	13.55	13.38	17.25	44.424	30 dBm	PASS
9	2452	MCS8	9.2	9.1	12.94	16.446	30 dBm	PASS
10	2457	MCS8	5.68	5.73	9.49	7.439	30 dBm	PASS
11	2462	MCS8	0.4	0.2	4.09	2.144	30 dBm	PASS

<sup>\*</sup> Note: The duty cycle factor is compensated back to obtain the maximum value of the measurement in average.

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# **EIRP Measurement:** 802.11b

		Avg. Outp	out Power			REQUIRED	
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	GAIN (dBi)	EIRP	LIMIT (dBm)	RESULT
1	2412	18.48	70.469	-2.66	15.82	36	PASS
7	2442	18.96	78.705	-2.66	16.30	36	PASS
11	2462	18.29	67.453	-2.66	15.63	36	PASS
12	2467	16.58	45.499	-2.66	13.92	36	PASS
13	2472	14.48	28.054	-2.66	11.82	36	PASS

#### 802.11g

		Avg. Outp	out Power			REQUIRED	
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	GAIN (dBi)	EIRP	LIMIT (dBm)	RESULT
1	2412	16.26	42.267	-2.66	13.60	36	PASS
6	2437	18.98	79.068	-2.66	16.32	36	PASS
11	2462	15.96	39.446	-2.66	13.30	36	PASS
12	2467	12.47	17.660	-2.66	9.81	36	PASS
13	2472	-7.07	0.196	-2.66	-9.73	36	PASS

# 802.11n\_HT20 (MIMO)

		Avg. Out	out Power			REQUIRED	
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	GAIN (dBi)	EIRP	LIMIT (dBm)	RESULT
1	2412	17.95	62.373	1.44	19.39	36	PASS
7	2442	20.41	109.901	1.44	21.85	36	PASS
11	2462	17.46	55.719	1.44	18.90	36	PASS
12	2467	14.95	31.261	1.44	16.39	36	PASS
13	2472	-6.07	0.247	1.44	-4.63	36	PASS

# 802.11n\_HT40 (MIMO)

		Avg. Outp	itput Power			REQUIRED	
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	GAIN (dBi)	EIRP	LIMIT (dBm)	RESULT
3	2422	16.26	42.267	1.44	17.70	36	PASS
7	2442	17.25	53.088	1.44	18.69	36	PASS
9	2452	12.94	19.679	1.44	14.38	36	PASS
10	2457	9.49	8.892	1.44	10.93	36	PASS
11	2462	4.09	2.564	1.44	5.53	36	PASS

Note: EIRP = Average Power + Gain, where the nominal gain of the antenna 1.44dBi for 2.4GHz (MIMO), where MIMO gain = directive gain + nominal gain.

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#### RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

# 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 limit as below.

And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

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

#### Note:

- 1. The lower limit shall apply at the transition frequencies.
- Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

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# 7.2 Measurement Equipment Used:

EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Broadband Antenna	TESEQ	CBL 6112D	35243	2017/11/10	2018/11/09
Horn Antenna	Schwarzbeck	BBHA9120D	1187	2018/01/04	2019/01/03
Horn Antenna	SCHWAZBECK	BBHA9170	184	2017/12/12	2018/12/11
Loop Antenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/09/25
EMI Test Receiver	R&S	ESU 40	100363	2018/04/11	2019/04/10
Pre-Amplifier	EMC Instruments	EMC330	980096	2017/12/26	2018/12/25
Pre-Amplifier	EMC Instruments	EMC0011830	980199	2017/12/26	2018/12/25
Pre-Amplifier	EMC Instruments	EMC184045B	980135	2017/10/27	2018/10/26
Attenuator	Marvelous	WATT-218FS-10	RF246	2017/12/26	2018/12/25
Highpass Filter	Micro Tronics	BRM50701-01	G008	2017/12/26	2018/12/25
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	2017/12/26	2018/12/25
Coaxial Cable	Huber Suhner	EMC106-SM-SM-72 00	150703	2017/12/26	2018/12/25
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	2017/12/26	2018/12/25
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	2017/12/26	2018/12/25

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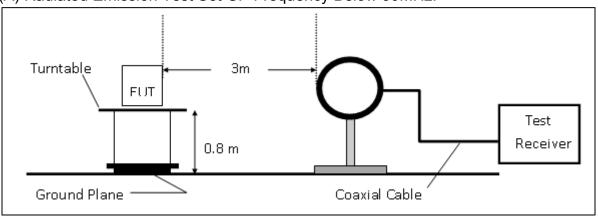
台灣檢驗科技股份有限公司



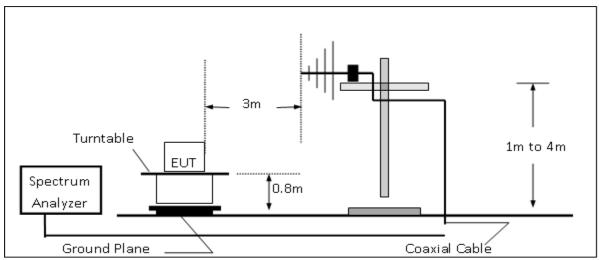
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#### Test SET-UP:

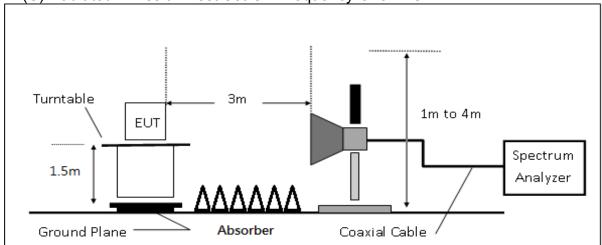
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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



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



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#### 7.4 Measurement Procedure:

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. 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.
- 6. 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.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. 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.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- 10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

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#### 7.5 Field Strength Calculation:

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

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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)

# 7.6 Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

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

#### **Measurement Result:** 7.7

Note: Refer to next page tabular data sheets.

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

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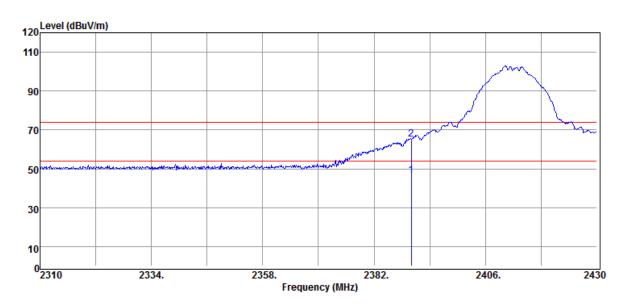
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# **Radiated Band Edge Measurement Result:**

Operation Mode **Test Date** :802.11b :2018-09-04 Test Mode :BE CH LOW Temp./Humi. :25/60 **EUT Pol** :H Plan Antenna Pol. :VERTICAL **Test Channel** :2412 MHz Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB	
2390.00	Average	43.21	3.39	46.60	54.00	-7.40	
2390.00	Peak	61.97	3.39	65.36	74.00	-8.64	

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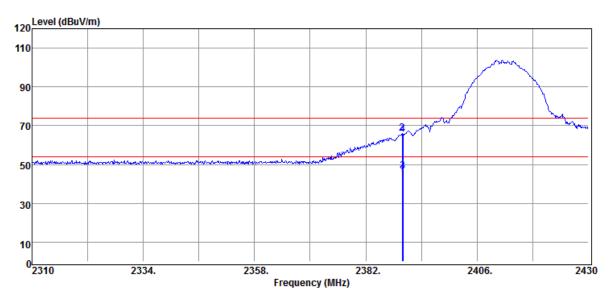


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**Operation Mode** :802.11b Test Mode :BE CH LOW **EUT Pol** :H Plan **Test Channel** :2412 MHz

**Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :HORIZONTAL





Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2389.80	Average	41.28	3.39	44.67	54.00	-9.33
2389.80	Peak	62.45	3.39	65.84	74.00	-8.16
2390.00	Average	42.93	3.39	46.32	54.00	-7.68
2390.00	Peak	62.09	3.39	65.48	74.00	-8.52

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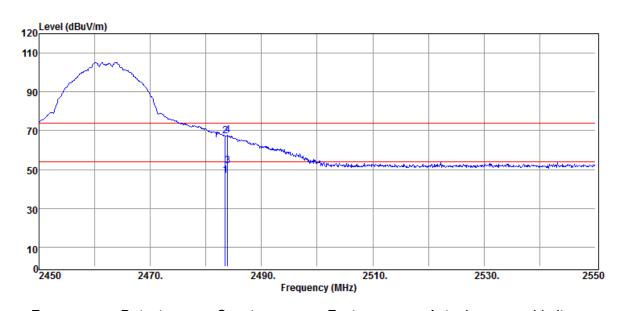
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**Operation Mode** :802.11b Test Mode :BE CH HIGH **EUT Pol** :H Plan **Test Channel** :2462 MHz

**Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	43.02	3.96	46.98	54.00	-7.02
2483.50	Peak	63.19	3.96	67.15	74.00	-6.85
2483.90	Average	47.76	3.96	51.72	54.00	-2.28
2483.90	Peak	63.74	3.96	67.70	74.00	-6.30

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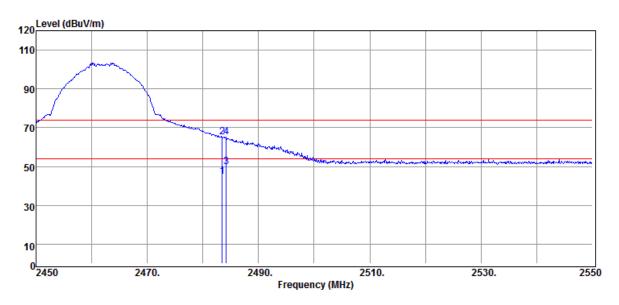
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**Operation Mode** :802.11b Test Mode :BE CH HIGH **EUT Pol** :H Plan **Test Channel** :2462 MHz

**Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :HORIZONTAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	40.85	3.96	44.81	54.00	-9.19
2483.50	Peak	61.04	3.96	65.00	74.00	-9.00
2484.20	Average	45.92	3.96	49.88	54.00	-4.12
2484.20	Peak	61.09	3.96	65.05	74.00	-8.95

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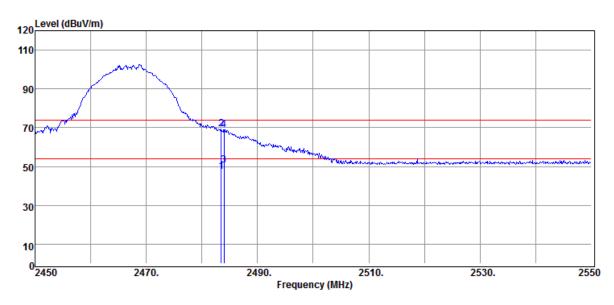
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**Operation Mode** :802.11b Test Mode :BE CH 12 **EUT Pol** :H Plan **Test Channel** :2467 MHz

**Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	43.19	3.96	47.15	54.00	-6.85
2483.50	Peak	65.46	3.96	69.42	74.00	-4.58
2484.00	Average	46.84	3.96	50.80	54.00	-3.20
2484.00	Peak	65.15	3.96	69.11	74.00	-4.89

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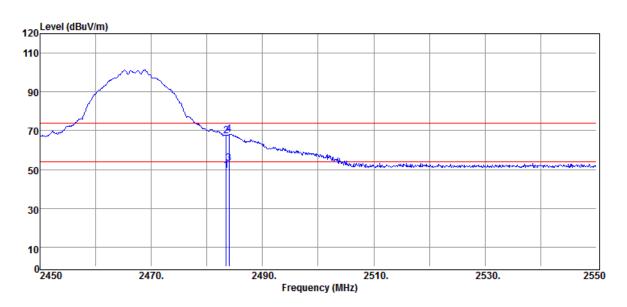
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**Operation Mode** :802.11b Test Mode :BE CH 12 **EUT Pol** :H Plan **Test Channel** :2467 MHz **Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :HORIZONTAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	45.25	3.96	49.21	54.00	-4.79
2483.50	Peak	63.48	3.96	67.44	74.00	-6.56
2484.00	Average	49.04	3.96	53.00	54.00	-1.00
2484.00	Peak	64.25	3.96	68.21	74.00	-5.79

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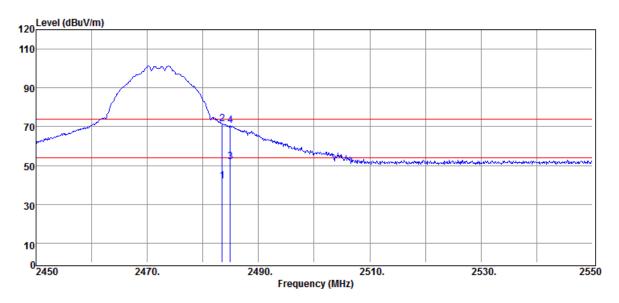
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**Operation Mode** :802.11b Test Mode :BE CH 13 **EUT Pol** :H Plan **Test Channel** :2472 MHz **Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	38.06	3.96	42.02	54.00	-11.98
2483.50	Peak	67.35	3.96	71.31	74.00	-2.69
2484.90	Average	47.98	3.96	51.94	54.00	-2.06
2484.90	Peak	66.58	3.96	70.54	74.00	-3.46

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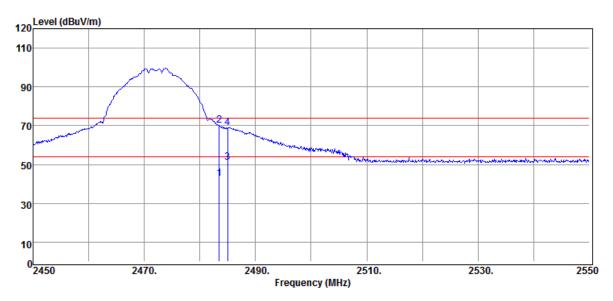
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**Operation Mode** :802.11b Test Mode :BE CH 13 **EUT Pol** :H Plan

:2472 MHz

**Test Date** :2018-09-04 Temp./Humi. :25/60 Antenna Pol. :HORIZONTAL





Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	39.01	3.96	42.97	54.00	-11.03
2483.50	Peak	66.16	3.96	70.12	74.00	-3.88
2485.00	Average	47.09	3.96	51.05	54.00	-2.95
2485.00	Peak	64.99	3.96	68.95	74.00	-5.05

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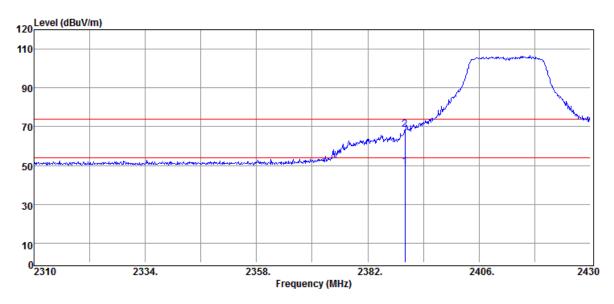
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**Operation Mode** :802.11g Test Mode :BE CH LOW **EUT Pol** :H Plan **Test Channel** :2412 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	46.08	3.39	49.47	54.00	-4.53
2390.00	Peak	65.31	3.39	68.70	74.00	-5.30

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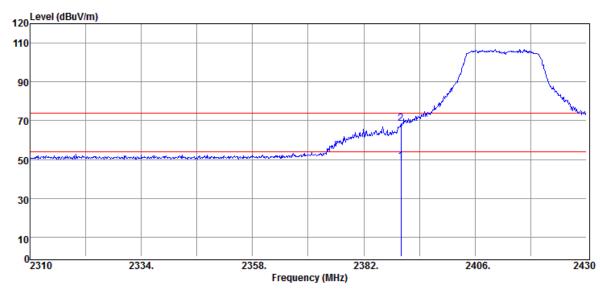
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**Operation Mode** :802.11g Test Mode :BE CH LOW **EUT Pol** 

:H Plan **Test Channel** :2412 MHz **Test Date** :2018-09-05 Temp./Humi. :26/58

Antenna Pol. :HORIZONTAL

Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
 MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	Average	45.77	3.39	49.16	54.00	-4.84
2390.00	Peak	65.16	3.39	68.55	74.00	-5.45

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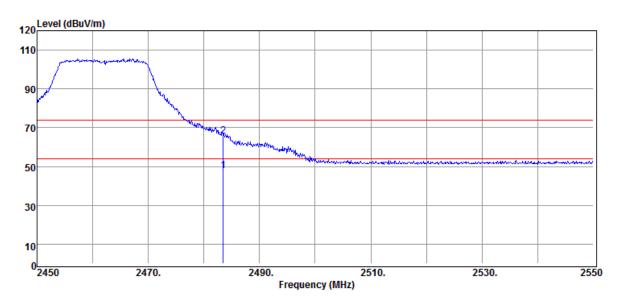
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**Operation Mode** :802.11g Test Mode :BE CH HIGH **EUT Pol** :H Plan **Test Channel** :2462 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
 MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	43.74	3.96	47.70	54.00	-6.30
2483.50	Peak	61.60	3.96	65.56	74.00	-8.44

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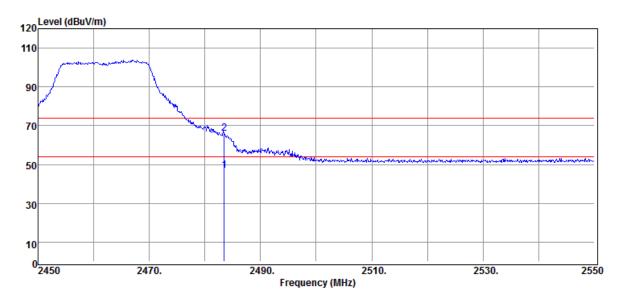


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**Operation Mode** :802.11g Test Mode :BE CH HIGH **EUT Pol** :H Plan **Test Channel** :2462 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :HORIZONTAL

Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	43.09	3.96	47.05	54.00	-6.95
2483.50	Peak	62.17	3.96	66.13	74.00	-7.87

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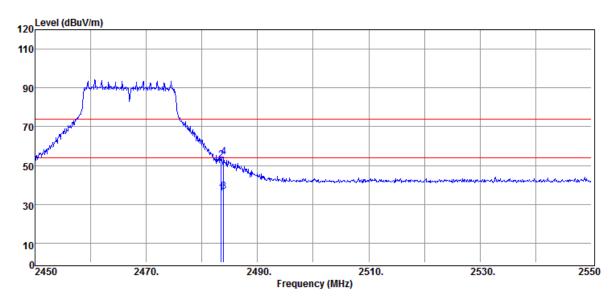
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**Operation Mode** :802.11g Test Mode :BE CH 12 **EUT Pol** :H Plan **Test Channel** :2467 MHz **Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
 MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	31.80	3.96	35.76	54.00	-18.24
2483.50	Peak	48.82	3.96	52.78	74.00	-21.22
2483.90	Average	32.56	3.96	36.52	54.00	-17.48
2483.90	Peak	50.39	3.96	54.35	74.00	-19.65

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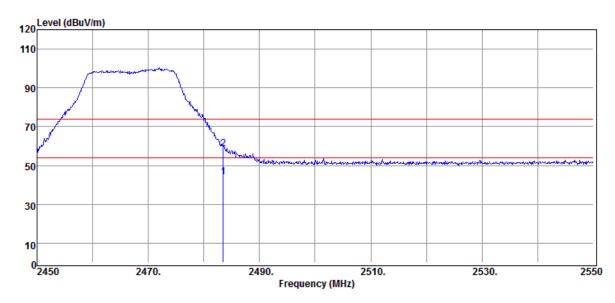
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**Operation Mode** :802.11g Test Mode :BE CH 12 **EUT Pol** :H Plan **Test Channel** :2467 MHz **Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :HORIZONTAL

Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	39.87	3.96	43.83	54.00	-10.17
2483.50	Peak	54.78	3.96	58.74	74.00	-15.26

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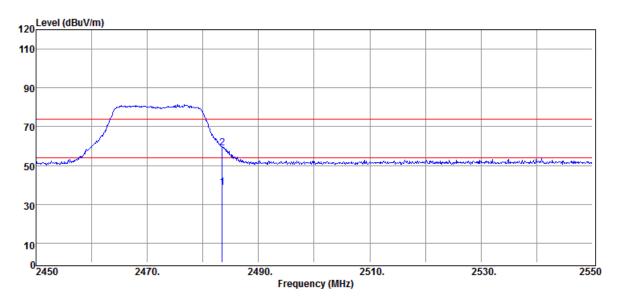
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**Operation Mode** :802.11g Test Mode :BE CH 13 **EUT Pol** :H Plan **Test Channel** :2472 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	34.82	3.96	38.78	54.00	-15.22
2483.50	Peak	55.08	3.96	59.04	74.00	-14.96

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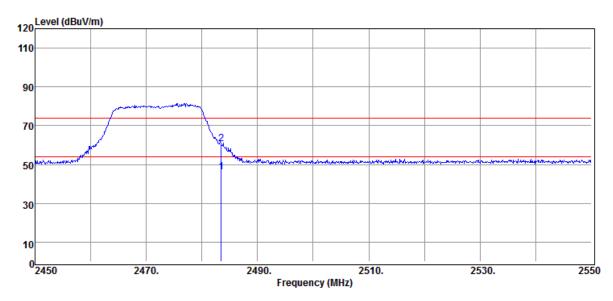
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**Operation Mode** :802.11g Test Mode :BE CH 13 **EUT Pol** 

:H Plan **Test Channel** :2472 MHz **Test Date** :2018-09-05 Temp./Humi. :26/58

Antenna Pol. :HORIZONTAL

Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	41.98	3.96	45.94	54.00	-8.06
2483.50	Peak	56.48	3.96	60.44	74.00	-13.56

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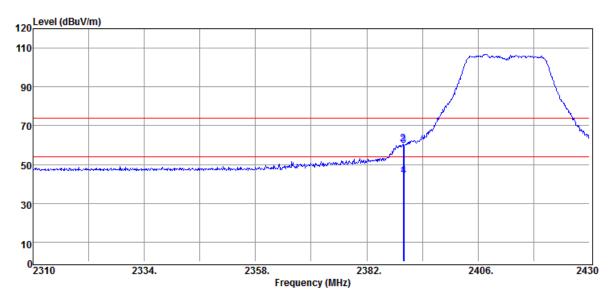


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**Operation Mode** :802.11n20 Test Mode :BE CH LOW **EUT Pol** :H Plan **Test Channel** :2412 MHz

**Test Date** : 2018-09-05 Temp./Humi. :25/60 Antenna Pol. :VERTICAL

Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2389.80	Average	40.75	3.39	44.14	54.00	-9.86
2389.80	Peak	57.29	3.39	60.68	74.00	-13.32
2390.00	Peak	56.45	3.39	59.84	74.00	-14.16
2390.04	Average	40.63	3.39	44.02	54.00	-9.98

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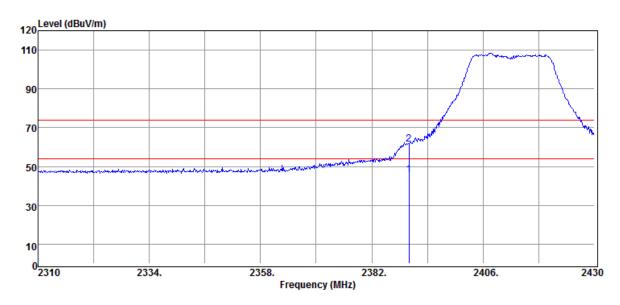


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**Operation Mode** :802.11n20 **Test Date** : 2018-09-05

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

**Test Channel** :2412 MHz Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2390.00	Average	42.24	3.39	45.63	54.00	-8.37
2390.00	Peak	58.21	3.39	61.60	74.00	-12.40

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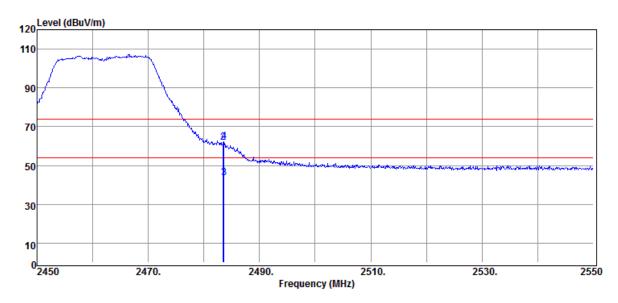


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**Operation Mode** :802.11n20 Test Mode :BE CH HIGH **EUT Pol** :H Plan **Test Channel** :2462 MHz

**Test Date** : 2018-09-05 Temp./Humi. :25/60 Antenna Pol. :VERTICAL

Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2483.50	Average	40.02	3.96	43.98	54.00	-10.02
2483.50	Peak	57.86	3.96	61.82	74.00	-12.18
2483.60	Average	39.62	3.96	43.58	54.00	-10.42
2483.60	Peak	58.24	3.96	62.20	74.00	-11.80

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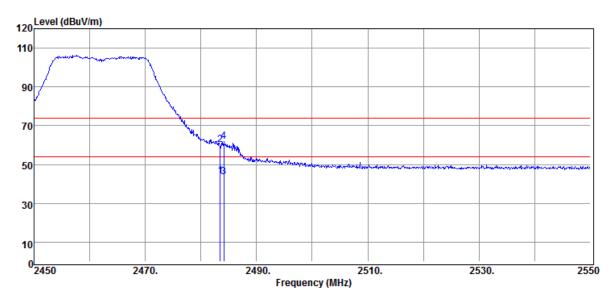
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**Operation Mode** :802.11n20 Test Mode :BE CH HIGH

**EUT Pol** :H Plan **Test Channel** :2462 MHz **Test Date** : 2018-09-05

Temp./Humi. :25/60 Antenna Pol. :HORIZONTAL

Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	40.16	3.96	44.12	54.00	-9.88
2483.50	Peak	56.33	3.96	60.29	74.00	-13.71
2484.10	Average	39.44	3.96	43.40	54.00	-10.60
2484.10	Peak	57.81	3.96	61.77	74.00	-12.23

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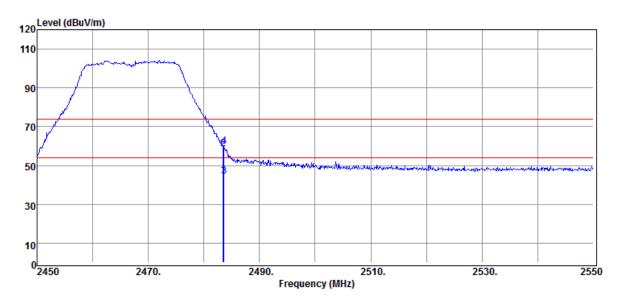
**Operation Mode** :802.11n20 Test Mode :BE CH 12 **EUT Pol** :H Plan **Test Channel** :2467 MHz

**Test Date** : 2018-09-05 Temp./Humi. :25/60

:VERTICAL

Engineer :Enzo

Antenna Pol.



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	40.72	3.96	44.68	54.00	-9.32
2483.50	Peak	54.67	3.96	58.63	74.00	-15.37
2483.60	Average	40.66	3.96	44.62	54.00	-9.38
2483.60	Peak	55.92	3.96	59.88	74.00	-14.12

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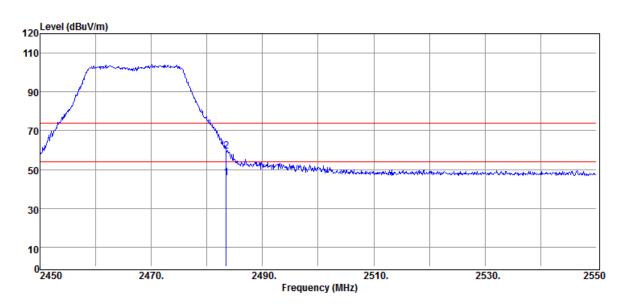


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**Operation Mode** :802.11n20 **Test Date** : 2018-09-05

Test Mode :BE CH 12 Temp./Humi. :25/60 **EUT Pol** Antenna Pol. :H Plan :HORIZONTAL

**Test Channel** :2467 MHz Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	41.69	3.96	45.65	54.00	-8.35
2483.50	Peak	55.30	3.96	59.26	74.00	-14.74

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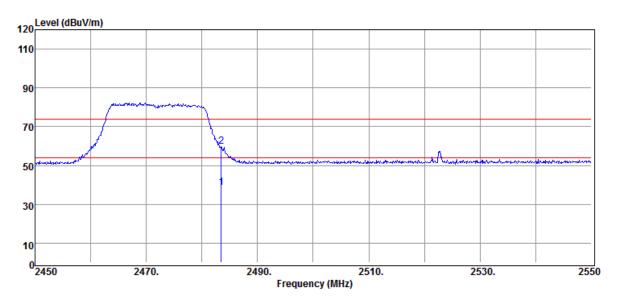
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**Operation Mode** :802.11n20 Test Mode :BE CH 13 **EUT Pol** :H Plan **Test Channel** :2472 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	34.76	3.96	38.72	54.00	-15.28
2483.50	Peak	56.02	3.96	59.98	74.00	-14.02

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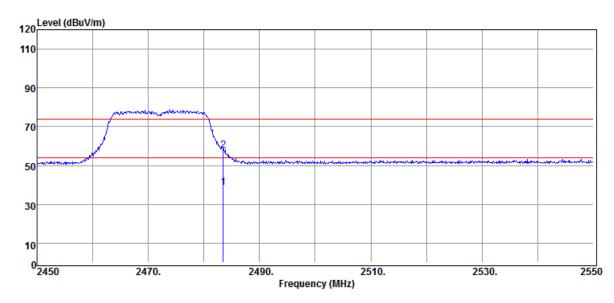
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**Operation Mode** :802.11n20 Test Mode :BE CH 13 **EUT Pol** :H Plan **Test Channel** :2472 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58

Antenna Pol. :HORIZONTAL

Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
2483.50	Average	34.83	3.96	38.79	54.00	-15.21
2483.50	Peak	53.71	3.96	57.67	74.00	-16.33

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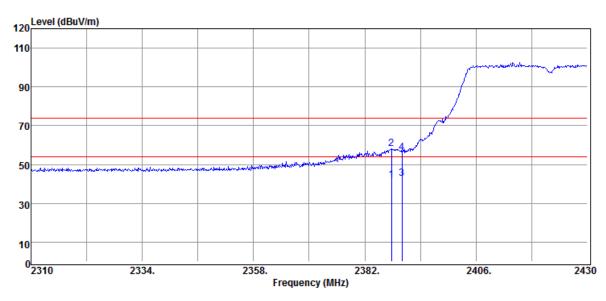
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**Operation Mode** :802.11n40 Test Mode :BE CH LOW **EUT Pol** :H Plan **Test Channel** :2422 MHz

**Test Date** :2018-09-05 Temp./Humi. :25/60 Antenna Pol. :VERTICAL Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2387.76	Average	38.64	3.38	42.02	54.00	-11.98
2387.76	Peak	54.66	3.38	58.04	74.00	-15.96
2390.00	Average	39.27	3.39	42.66	54.00	-11.34
2390.00	Peak	52.66	3.39	56.05	74.00	-17.95

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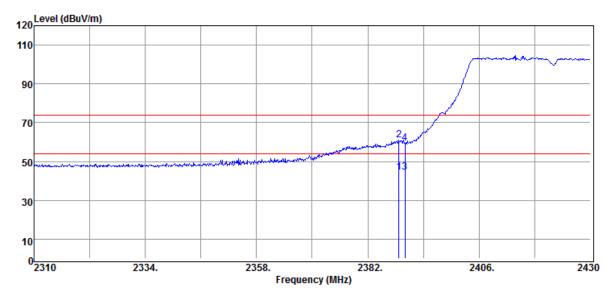
**Operation Mode** :802.11n40 Test Mode :BE CH LOW

**EUT Pol** :H Plan **Test Channel** :2422 MHz

**Test Date** :2018-09-05 Temp./Humi. :25/60 Antenna Pol.

:HORIZONTAL





Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2388.72	Average	40.90	3.38	44.28	54.00	-9.72
2388.72	Peak	57.59	3.38	60.97	74.00	-13.03
2390.00	Average	41.07	3.39	44.46	54.00	-9.54
2390.00	Peak	55.88	3.39	59.27	74.00	-14.73

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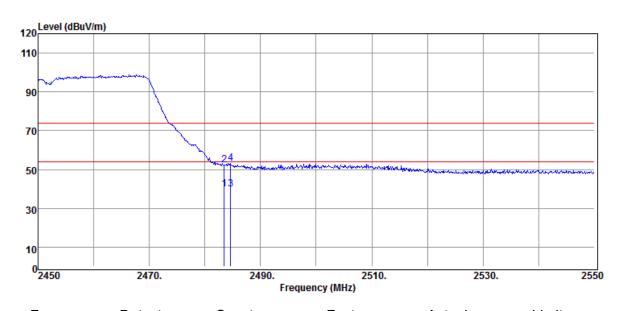
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**Operation Mode** :802.11n40 Test Mode :BE CH HIGH **EUT Pol** :H Plan **Test Channel** :2452 MHz

**Test Date** :2018-09-05 Temp./Humi. :25/60 Antenna Pol. :VERTICAL Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
2483.50	Average	35.97	3.96	39.93	54.00	-14.07	
2483.50	Peak	48.56	3.96	52.52	74.00	-21.48	
2484.60	Average	35.85	3.96	39.81	54.00	-14.19	
2484.60	Peak	49.37	3.96	53.33	74.00	-20.67	

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**Test Channel** 

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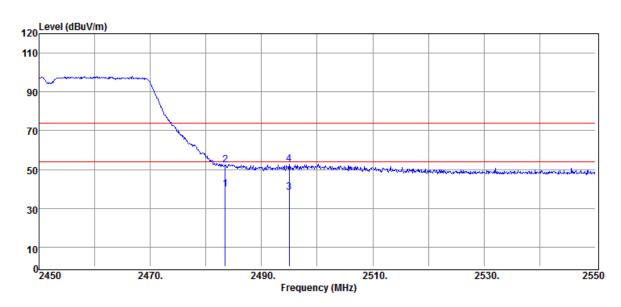
**Operation Mode** :802.11n40 Test Mode :BE CH HIGH **EUT Pol** :H Plan

:2452 MHz

**Test Date** Temp./Humi. Antenna Pol. :2018-09-05

:25/60 :HORIZONTAL

Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin	
	Mode	Reading Level		FS	@3m		
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB	
2483.50	Average	35.71	3.96	39.67	54.00	-14.33	
2483.50	Peak	48.18	3.96	52.14	74.00	-21.86	
2495.00	Average	33.98	4.04	38.02	54.00	-15.98	
2495.00	Peak	48.72	4.04	52.76	74.00	-21.24	

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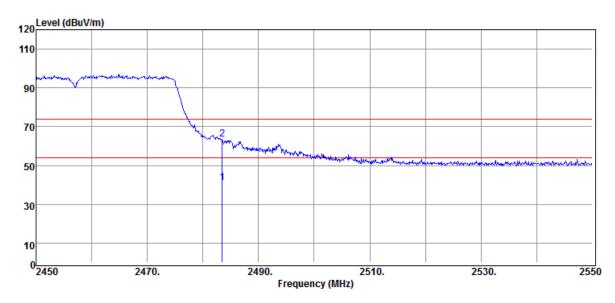
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**Operation Mode** :802.11n40 Test Mode :BE CH 10 **EUT Pol** :H Plan **Test Channel** :2457 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58 Antenna Pol. :VERTICAL Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	37.25	3.96	41.21	54.00	-12.79
2483.50	Peak	59.50	3.96	63.46	74.00	-10.54

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**Test Channel** 

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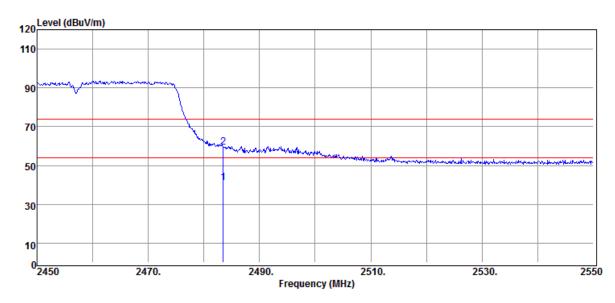
**Operation Mode** :802.11n40 Test Mode :BE CH 10 **EUT Pol** :H Plan

:2457 MHz

**Test Date** :2018-09-05 Temp./Humi. :26/58

Antenna Pol. :HORIZONTAL

Engineer :Ashton



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Average	37.28	3.96	41.24	54.00	-12.76
2483.50	Peak	55.46	3.96	59.42	74.00	-14.58

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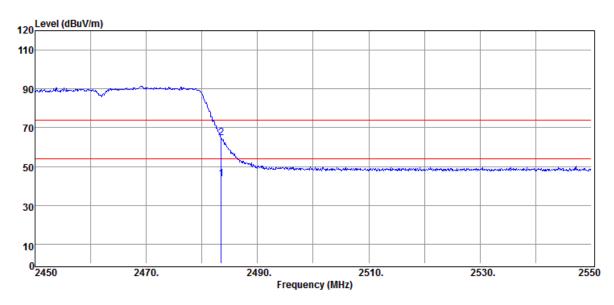
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**Operation Mode** :802.11n40 Test Mode :BE CH 11 **EUT Pol** :H Plan **Test Channel** :2462 MHz

**Test Date** :2018-09-05 Temp./Humi. :25/60 Antenna Pol. :VERTICAL Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
 MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	39.74	3.96	43.70	54.00	-10.30
2483.50	Peak	60.80	3.96	64.76	74.00	-9.24

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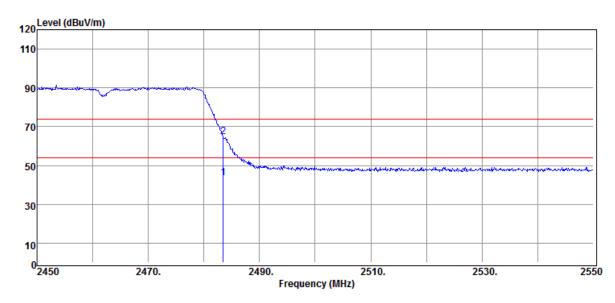


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**Operation Mode** :802.11n40 **Test Date** :2018-09-05 Test Mode :BE CH 11 Temp./Humi. :25/60

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

**Test Channel** :2462 MHz Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dΒμV/m	dB
2483.50	Average	39.54	3.96	43.50	54.00	-10.50
2483.50	Peak	60.95	3.96	64.91	74.00	-9.09

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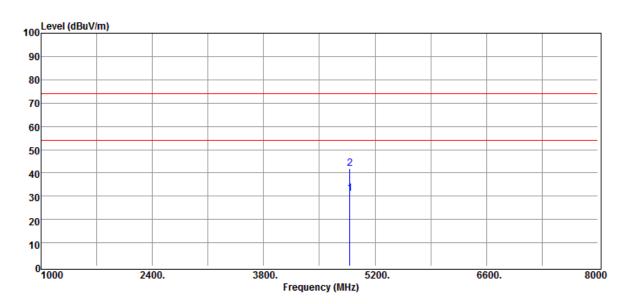
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## Radiated Spurious Emission Measurement Result (802.11 b) **Above 1GHz Data:**

**Operation Mode** :802.11b **Test Date** :2018-08-29 Test Mode :TX CH MID Temp./Humi. :25/60 **EUT Pol** Antenna Pol. :H Plan :VERTICAL **Test Channel** :2442 MHz Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4884.00	Average	18.42	12.63	31.05	54.00	-22.95
4884.00	Peak	29.22	12.63	41.85	74.00	-32.15

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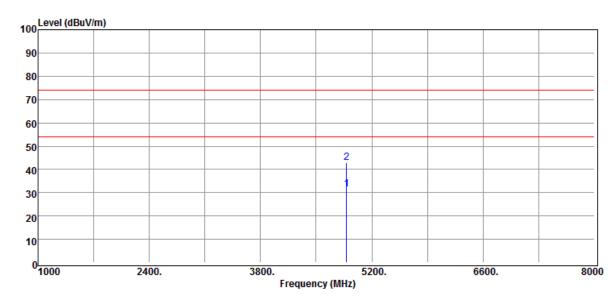


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**Operation Mode** :802.11b **Test Date** :2018-08-29 Test Mode :TX CH MID Temp./Humi. :25/60

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

**Test Channel** :2442 MHz Engineer :Enzo



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	Mode	Reading Level		FS	@3m	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
4884.00	Average	18.73	12.63	31.36	54.00	-22.64
4884.00	Peak	30.12	12.63	42.75	74.00	-31.25

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## ANTENNA REQUIREMENT

## **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.

## 8.2 Antenna Connected Construction:

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

~ End of Report ~

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