

Page 1 of 69



# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION CLASS II PERMISSIVE CHANGE TEST REPORT

**Product Name: Embedded wireless module** 

**Brand Name:** Silex

Model No.: SX-SDMAC-2832S, SX-SDMAC-2832S+

**Model Difference:** For market segmentation

FCC ID: **N6C-PMACS** 

**Report No.:** ER/2017/70042-01

**Issue Date:** Sep. 29, 2017

**FCC Rule Part:** §15.247, Cat: DTS

**Prepared for:** silex technology,Inc

2-3-1Hikaridai, Seika-cho, Souraku-gun, Kyoto

619-0237

Prepared by: SGS Taiwan Ltd.

**Electronics & Communication Laboratory** 

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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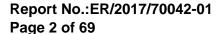
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VERIFICATION OF COMPLIANCE

Applicant: silex technology, Inc

2-3-1Hikaridai, Seika-cho, Souraku-gun, Kyoto 619-0237

**Product Name:** Embedded wireless module

**Brand Name:** Silex

Model No.: SX-SDMAC-2832S, SX-SDMAC-2832S+

**Model Difference:** For market segmentation

FCC ID: N6C-PMACS

ER/2017/70042-01 **Report Number:** 

Date of test: Sep. 07, 2017~Sep. 08, 2017

Date of EUT Received: Sep. 06, 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.

Test By:	Cooper HSU	Date:	Sep. 29, 2017	
Prepared By:	Cooper Hsu/Engineer Allen Tsai	Date:	Sep. 29, 2017	
Approved By: _	Allen Tsai / Engineer  Lang  Jim Chang / Asst. Manager	Date:	Sep. 29, 2017	

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# **Revision History**

Report Number	Revision	Description	Issue Date
ER/2017/70042-01	Rev.00	Initial creation of document	Sep. 29, 2017

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# **GENERAL INFORMATION**

# 1.1 Product description

#### General:

Product Name: Embedded wireless module	
Brand Name:	Silex
Model No.:	SX-SDMAC-2832S, SX-SDMAC-2832S+
Model Difference:	For market segmentation
Software version:	N/A
Hardware version:	N/A
Power Supply:	3.3Vdc from Power supply

#### WLAN 2.4GHz:

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (dBm)	Modulation Technology		
b			20.56 (Peak) / 17.98 (Avg.)	DSSS		
g	2412-2462	11	22.72 (Peak) / 16.47 (Avg.)	OFDM		
n_HT20			22.66 (Peak) / 16.25 (Avg.)	OFDM		
n_HT40	2422-2452	7	22.91 (Peak) / 16.29 (Avg.)	OFDM		
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				
		_	_20MHz: 6.5 – 72.2Mbps			
		802.11 n_40MHz: 13.5 - 150.0Mbps				

Class II Pmissive Change

٠.	ace in Thissive Change						
	Scope:	The test report covers the radiated emissions requirements of the standards referenced in the report to allow new antennas to be included in this authorization.					
	Class II Permissive change:	Adding New antennas to this certified module under FCC ID: N6C-PMACS					

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Antenna Type	Supplier	Antenna Part No.	Freq.	Peak Antenna Gain (dBi)	Worst Antenna Gain
		ANTB98-061A0		1.50	
	Sansei Denki	ANTDP-027A0		1.50	
ROD		ANTDP-039A0		1.50	
		ANTDC-081A0		2.00	V
antenna		ANTDC-081B0	2.4GHz	2.00	V
antenna		GRF1763		1.50	
	VSO	GRF1765		1.50	
	V 30	GRF1762		2.00	V
		GRF1802		2.00	V

Note: Pre-scanned was done on the above 9 antennas, the ANTDC-081A0 results higher emission at 2.4GHz. Therefore, the completed set of measurement was done on the antenna to be presented on this test report.

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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

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.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Number and Designation Number are: 509634 / TW0001

### 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 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 plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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# 2.4 Configuration of Tested System

Fig. 2-1 Conducted Emission Configuration



Fig. 2-2 Radiated Emission Configuration



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

Ī			Madel/Tures				
	ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
	1	Notebook	DELL	E5400	3704625136	Shielded	Unshielded
	2	Bluetooth Test Software	N/A	N/A	N/A	N/A	N/A

# **SUMMARY OF TEST RESULTS**

FCC Rules	Description Of Test	Result
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.203 §15.247(b)	Antenna Requirement	Compliant

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**DESCRIPTION OF TEST MODES** 

# 4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b. 802.11g and 802.11n HT20

are provided for 602.11b, 602.11g and 602.11n_11120					
CHANNEL FREQUENCY		CHANNEL	FREQUENCY		
1	2412 MHz	7	2442 MHz		
2	2417 MHz	8	2447 MHz		
3	2422 MHz	9	2452 MHz		
4	2427 MHz	10	2457 MHz		
5	2432 MHz	11	2462 MHz		
6	2437 MHz				

7 channels are provided for 802.11n HT40

٠.	210 provided for 66211 III_111 16						
	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY			
ſ	3	2422 MHz	7	2442 MHz			
ſ	4	2427 MHz	8	2447 MHz			
Ī	5	2432 MHz	9	2452 MHz			
	6	2437 MHz					

#### 4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

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

RADIATED EMIGOION TEOT.							
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)			
RADIATED EMISSION TEST (BELOW 1 GHz)							
802.11g	1 to 11	1,6,11	OFDM	6			
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 0			
	RADIA	ATED EMISS	ION TEST (ABO	VE 1 GHz)			
802.11b	1 to 11	1, 6, 11	DSSS	1			
802.11g	1 to 11	1, 6, 11	OFDM	6			
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 0			
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 0			

### Note:

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

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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 : <b>Vertical</b> )	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 : <b>Horizontal</b> )	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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#### 6 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

# 6.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 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.
- 2. Emission level  $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

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f (886-2) 2298-0488



# 6.2 Measurement Equipment Used:

966 Chamber										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
TYPE		NUMBER	NUMBER	CAL.						
EMI Test Receiver	R&S	ESCI7	100760	05/11/2017	05/10/2018					
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/25/2017	04/24/2018					
Loop Antenna	ETS-Lindgren	6502	148045	09/20/2016	09/19/2017					
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/19/2016	12/18/2017					
Horn Antenna	Schwarzbeck	BBHA9120D	1441	08/04/2017	08/03/2018					
Pre-Amplifier	Agilent	8447D	2944A07676	01/05/2017	01/04/2018					
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/05/2017	01/04/2018					
Turn Table	HD	DT420	N/A	N.C.R	N.C.R					
Antenna Tower	ChamPro	AM-BS-4500-B	060776-ABS	N.C.R	N.C.R					
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R					
Low Loss Cable	Huber Suhner	966_RX	9	01/05/2017	01/04/2018					
3m Site NSA	SGS	966 chamber	N/A	07/01/2017	06/30/2018					
Low Loss Cable	Huber Suhner	966 TX	1	01/05/2017	01/04/2018					
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017					
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/05/2017	01/04/2018					

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

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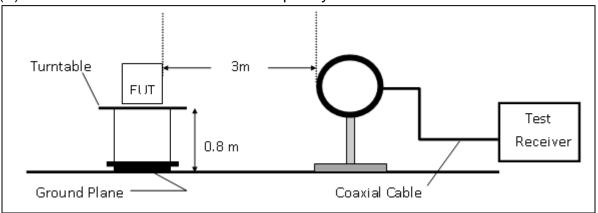
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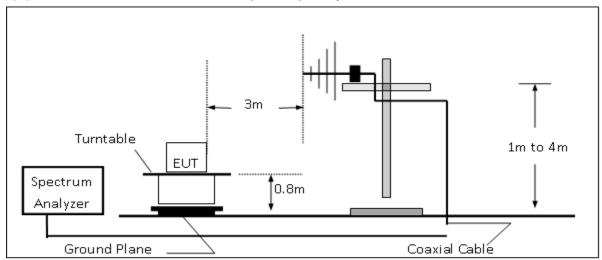


#### 6.3 Test SET-UP

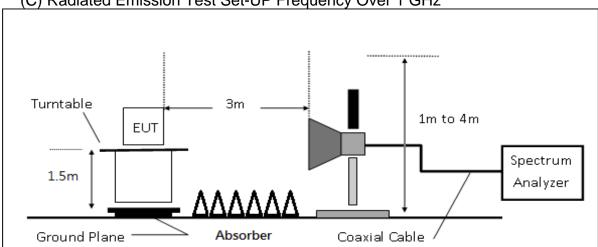
# (A) Radiated Emission Test Set-UP Frequency Below 30MHz.



# (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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#### 6.4 Measurement Procedure

- 1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guid-
- 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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6.5 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	S .	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)

#### Note:

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

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

### 6.6 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.

#### 6.7 Measurement Result

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

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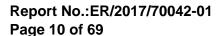
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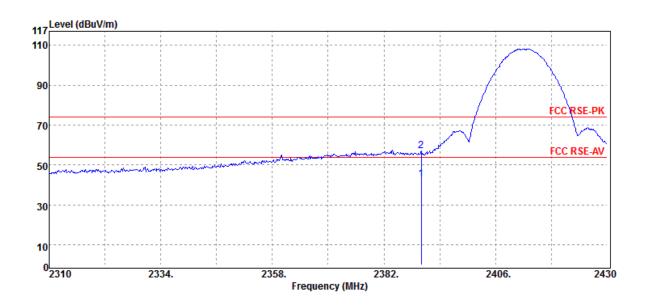
# **Radiated Band Edge Measurement Result**

:802.11b **Test Date Operation Band** :2017-09-07

Fundamental Frequency Temp./Humi. :2412 MHz :22 deg\_C / 61 RH

Operation Mode :Bandedge CH LOW Engineer

EUT Pol. :E2 Plane :VERTICAL Measurement Antenna Pol.

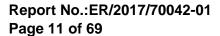


Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
2390.00	E	Average	44.80	-1.74	43.06	54.00	-10.94	
2390.00	Ε	Peak	58.65	-1.74	56.91	74.00	-17.09	

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:2412 MHz

**Operation Mode** 

EUT Pol.

:E2 Plane

:802.11b

:Bandedge CH LOW

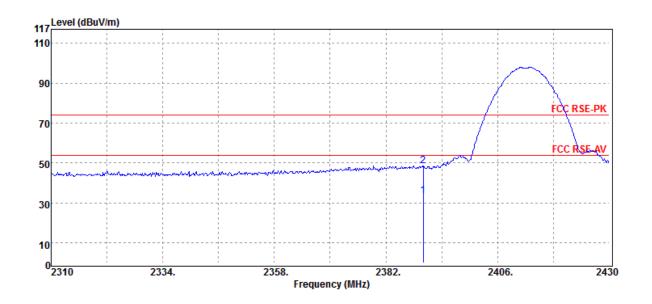
**Test Date** Temp./Humi. Engineer

Measurement Antenna Pol.

:HORIZONTAL

:22 deg\_C / 61 RH

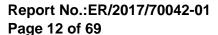
:2017-09-07



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2390.00	E	Average	35.28	-1.74	33.54	54.00	-20.46
2390.00	Е	Peak	50.25	-1.74	48.51	74.00	-25.49

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:802.11b :2462 MHz

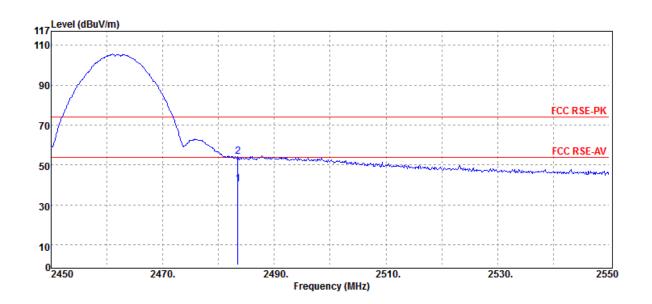
:Bandedge CH HIGH

EUT Pol. :E2 Plane **Test Date** :2017-09-07

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



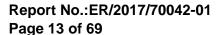
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	E	Average	42.10	-1.62	40.48	54.00	-13.52
2483.50	Е	Peak	55.75	-1.62	54.13	74.00	-19.87

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:802.11b :2462 MHz

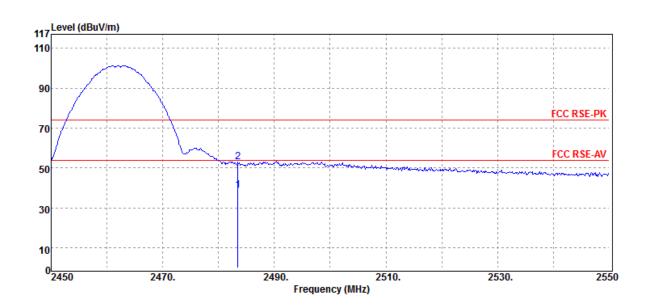
:Bandedge CH HIGH

EUT Pol. :E2 Plane **Test Date** :2017-09-07

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



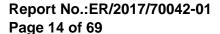
	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
_	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
	2483.50	E	Average	40.50	-1.62	38.88	54.00	-15.12	
	2483.50	Е	Peak	54.52	-1.62	52.90	74.00	-21.10	

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:802.11g :2412 MHz :Bandedge CH LOW

**Operation Mode** 

EUT Pol.

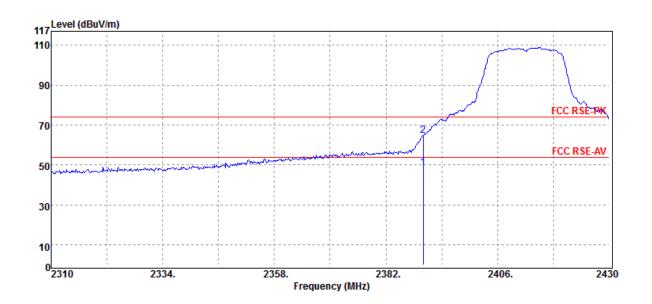
:E2 Plane

**Test Date** :2017-09-07

:22 deg\_C / 61 RH Temp./Humi.

Engineer

:VERTICAL Measurement Antenna Pol.

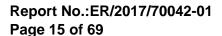


Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	E	Average	50.28	-1.74	48.54	54.00	-5.46
2390.00	Е	Peak	66.56	-1.74	64.82	74.00	-9.18

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:802.11g :2412 MHz :Bandedge CH LOW

**Operation Mode** 

EUT Pol.

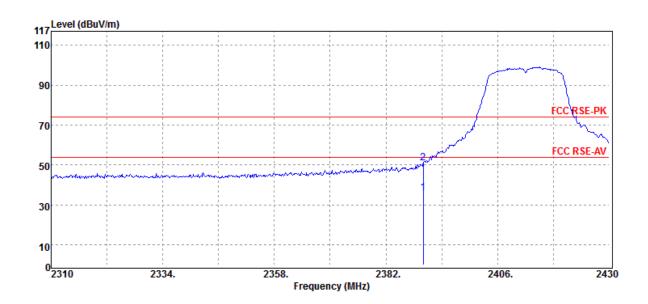
:E2 Plane

**Test Date** Temp./Humi.

:2017-09-07 :22 deg\_C / 61 RH

Engineer

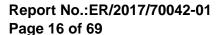
:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2390.00	E	Average	37.60	-1.74	35.86	54.00	-18.14
2390.00	Е	Peak	52.95	-1.74	51.21	74.00	-22.79

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:802.11g :2462 MHz

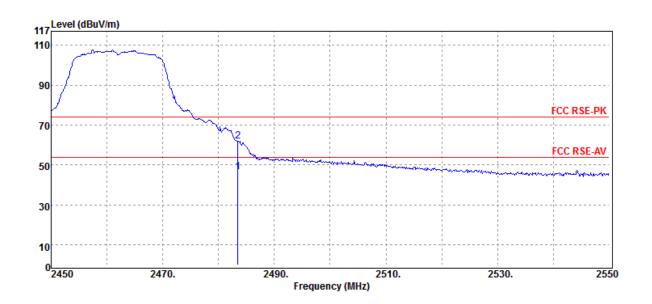
:Bandedge CH HIGH

EUT Pol. :E2 Plane **Test Date** :2017-09-07

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	E	Average	48.06	-1.62	46.44	54.00	-7.56
2483.50	Е	Peak	63.67	-1.62	62.05	74.00	-11.95

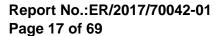
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**Operation Mode** 

EUT Pol.

:802.11g :2462 MHz

:Bandedge CH HIGH

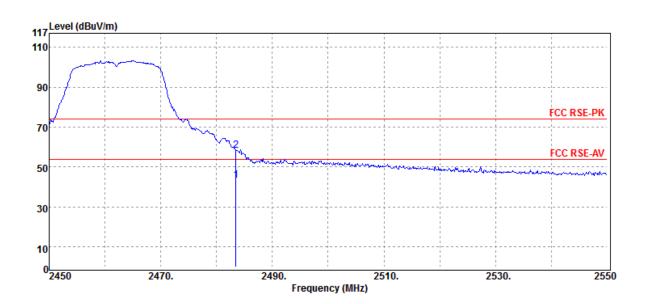
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



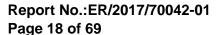
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	E	Average	45.07	-1.62	43.45	54.00	-10.55
2483.50	Е	Peak	59.80	-1.62	58.18	74.00	-15.82

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:802.11n20 :2412 MHz

**Operation Mode** 

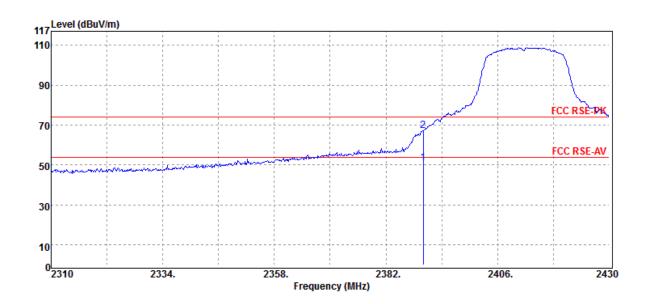
:Bandedge CH LOW

EUT Pol. :E2 Plane **Test Date** :2017-09-07

:22 deg\_C / 61 RH Temp./Humi.

Engineer

:VERTICAL Measurement Antenna Pol.

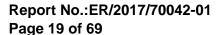


Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
2390.00	E	Average	52.85	-1.74	51.11	54.00	-2.89
2390.00	Е	Peak	68.84	-1.74	67.10	74.00	-6.90

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:802.11n20 :2412 MHz :Bandedge CH LOW

EUT Pol.

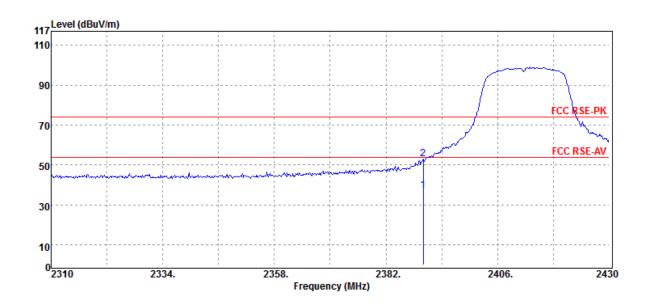
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :22 deg\_C / 61 RH

Engineer

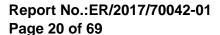
:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2390.00	E	Average	39.13	-1.74	37.39	54.00	-16.61
2390.00	Е	Peak	54.82	-1.74	53.08	74.00	-20.92

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:802.11n20 :2462 MHz

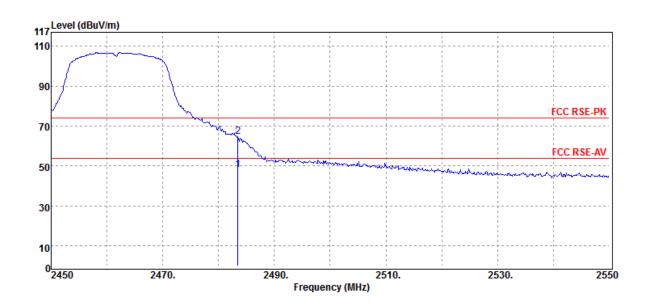
**Operation Mode** :Bandedge CH HIGH

EUT Pol. :E2 Plane **Test Date** :2017-09-07

:22 deg\_C / 61 RH Temp./Humi.

Engineer

:VERTICAL Measurement Antenna Pol.



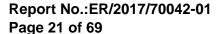
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Е	Average	49.96	-1.62	48.34	54.00	-5.66
2483.50	Е	Peak	66.56	-1.62	64.94	74.00	-9.06

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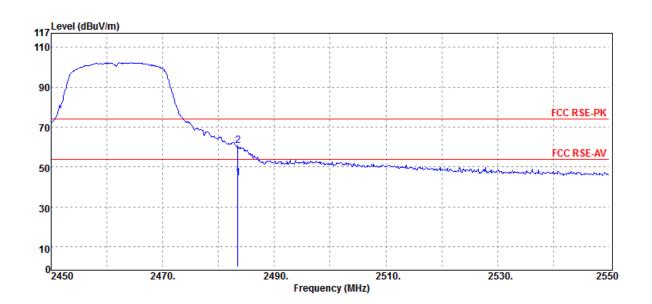
:802.11n20 :2462 MHz

:Bandedge CH HIGH

EUT Pol. :E2 Plane **Test Date** :2017-09-07 Temp./Humi. :22 deg\_C / 61 RH

Engineer

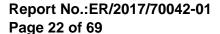
:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	E	Average	46.22	-1.62	44.60	54.00	-9.40
2483.50	Е	Peak	62.18	-1.62	60.56	74.00	-13.44

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:802.11n40 :2422 MHz :Bandedge CH LOW

**Operation Mode** 

EUT Pol.

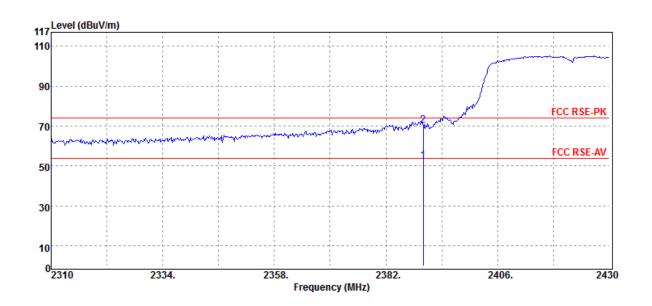
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

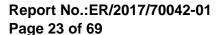
:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2390.00	Е	Average	54.42	-1.74	52.68	54.00	-1.32
2390.00	Е	Peak	72.01	-1.74	70.27	74.00	-3.73

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:802.11n40 :2422 MHz :Bandedge CH LOW

EUT Pol.

:E2 Plane

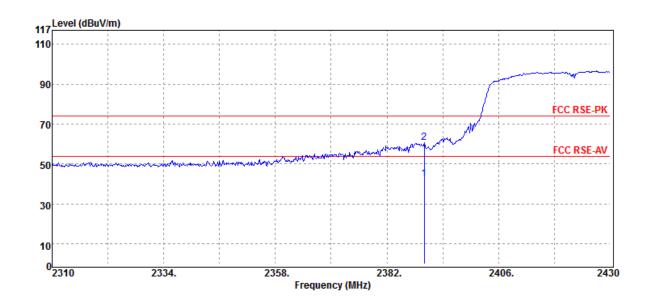
**Test Date** Temp./Humi. :2017-09-07

:21 deg\_C / 62 RH

Engineer

Measurement Antenna Pol.

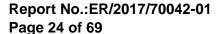
:HORIZONTAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2390.00	E	Average	44.20	-1.74	42.46	54.00	-11.54
2390.00	Е	Peak	62.65	-1.74	60.91	74.00	-13.09

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:802.11n40 :2422 MHz

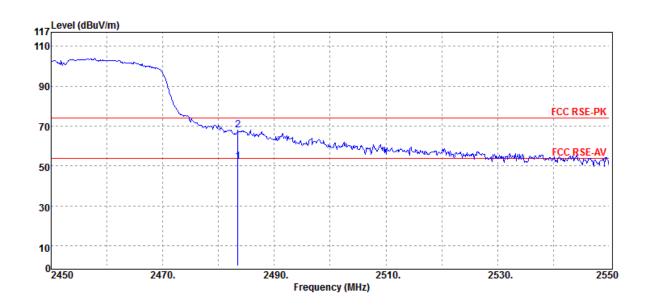
:Bandedge CH HIGH

EUT Pol. :E2 Plane **Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



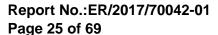
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Е	Average	54.00	-1.62	52.38	54.00	-1.62
2483.50	Е	Peak	69.74	-1.62	68.12	74.00	-5.88

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**Operation Mode** 

EUT Pol.

:802.11n40 :2422 MHz

:Bandedge CH HIGH

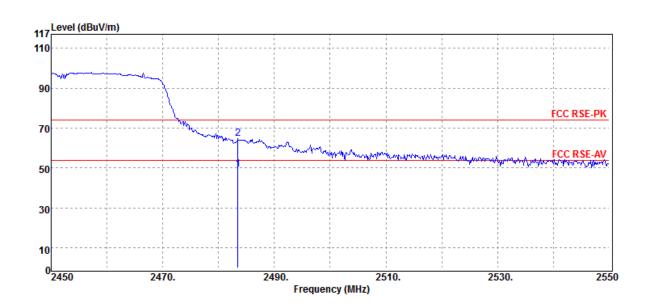
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



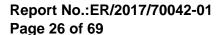
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
2483.50	Е	Average	50.90	-1.62	49.28	54.00	-4.72
2483.50	Е	Peak	66.57	-1.62	64.95	74.00	-9.05

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**Below 1GHz Worst-Case Data:** 

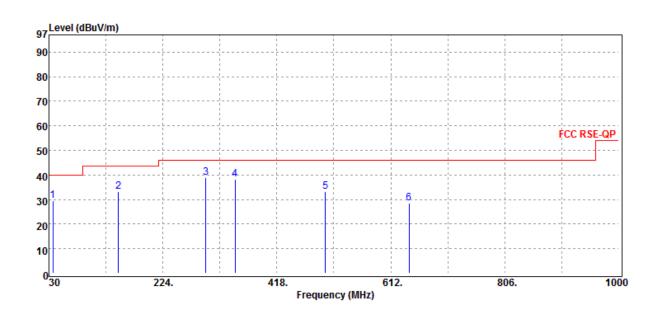
# **Radiated Spurious Emission Measurement Result**

**Operation Band** :802.11g **Test Date** :2017-09-08

Fundamental Frequency :2412 MHz Temp./Humi. :22 deg C / 61 RH

**Operation Mode** :Tx CH LOW Engineer

EUT Pol. :E2 Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	38.30	-8.84	29.46	40.00	-10.54
148.34	S	Peak	41.03	-7.89	33.14	43.50	-10.36
296.75	S	Peak	44.94	-5.98	38.96	46.00	-7.04
347.19	S	Peak	43.17	-4.95	38.22	46.00	-7.78
500.45	S	Peak	35.77	-2.68	33.09	46.00	-12.91
643.04	S	Peak	27.90	0.65	28.55	46.00	-17.45

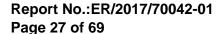
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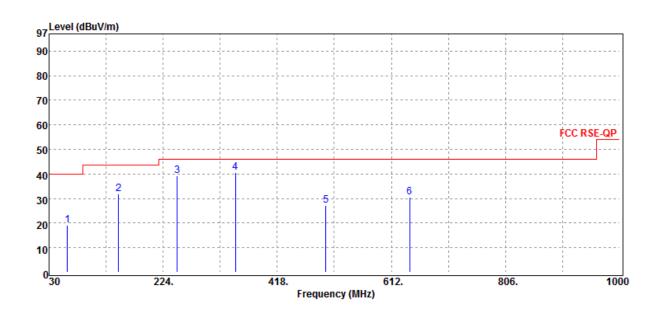
**Operation Band** :802.11g Fundamental Frequency :2412 MHz **Operation Mode** :Tx CH LOW

EUT Pol. :E2 Plane **Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



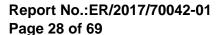
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
61.04	S	Peak	27.55	-8.25	19.30	40.00	-20.70
148.34	S	Peak	39.76	-7.89	31.87	43.50	-11.63
248.25	S	Peak	47.28	-7.98	39.30	46.00	-6.70
347.19	S	Peak	45.47	-4.95	40.52	46.00	-5.48
500.45	S	Peak	29.80	-2.68	27.12	46.00	-18.88
643.04	S	Peak	29.92	0.65	30.57	46.00	-15.43

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**Operation Mode** 

EUT Pol. :E2 Plane

:802.11g

:2437 MHz

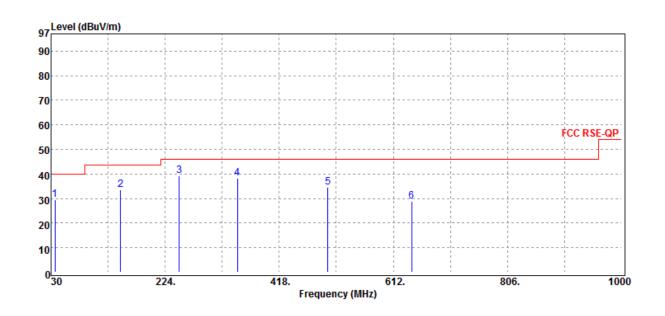
:Tx CH MID

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



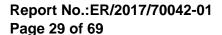
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	38.53	-8.84	29.69	40.00	-10.31
148.34	S	Peak	41.50	-7.89	33.61	43.50	-9.89
248.25	S	Peak	47.23	-7.98	39.25	46.00	-6.75
347.19	S	Peak	43.13	-4.95	38.18	46.00	-7.82
500.45	S	Peak	37.36	-2.68	34.68	46.00	-11.32
643.04	S	Peak	28.15	0.65	28.80	46.00	-17.20

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EUT Pol.

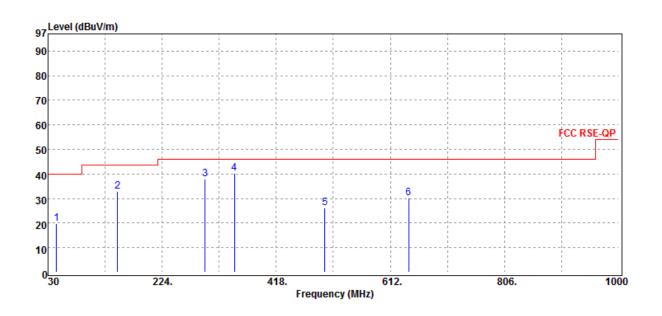
:802.11g :2437 MHz :Tx CH MID :E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



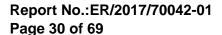
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
44.55	S	Peak	27.94	-8.09	19.85	40.00	-20.15
148.34	S	Peak	40.74	-7.89	32.85	43.50	-10.65
296.75	S	Peak	44.00	-5.98	38.02	46.00	-7.98
347.19	S	Peak	45.38	-4.95	40.43	46.00	-5.57
500.45	S	Peak	28.90	-2.68	26.22	46.00	-19.78
643.04	S	Peak	29.43	0.65	30.08	46.00	-15.92

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EUT Pol.

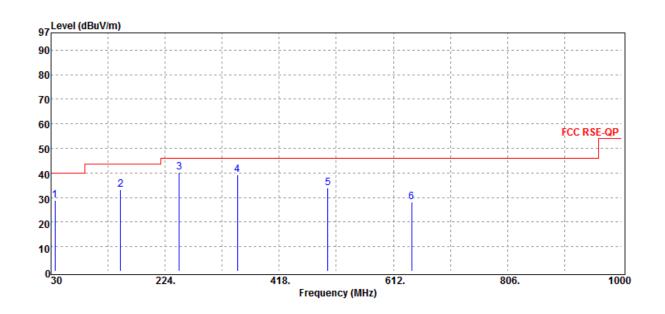
:802.11g :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



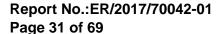
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
36.79	S	Peak	37.75	-8.84	28.91	40.00	-11.09	
148.34	S	Peak	41.15	-7.89	33.26	43.50	-10.24	
248.25	S	Peak	48.21	-7.98	40.23	46.00	-5.77	
347.19	S	Peak	44.09	-4.95	39.14	46.00	-6.86	
500.45	S	Peak	36.52	-2.68	33.84	46.00	-12.16	
643.04	S	Peak	27.61	0.65	28.26	46.00	-17.74	

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EUT Pol.

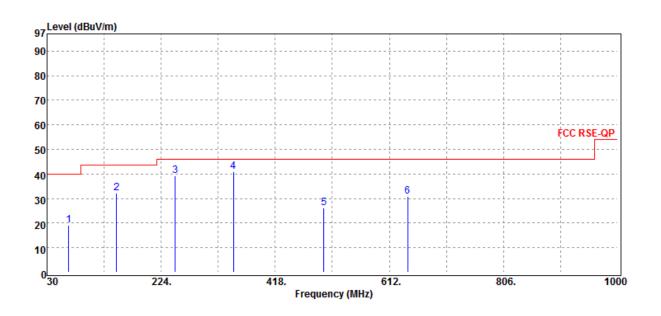
:802.11g :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



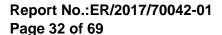
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
66.86	S	Peak	28.55	-9.58	18.97	40.00	-21.03
148.34	S	Peak	40.03	-7.89	32.14	43.50	-11.36
248.25	S	Peak	47.35	-7.98	39.37	46.00	-6.63
347.19	S	Peak	45.75	-4.95	40.80	46.00	-5.20
500.45	S	Peak	28.86	-2.68	26.18	46.00	-19.82
643.04	S	Peak	30.19	0.65	30.84	46.00	-15.16

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**Operation Band** Fundamental Frequency

**Operation Mode** EUT Pol.

:802.11n40 :2422 MHz :Tx CH LOW

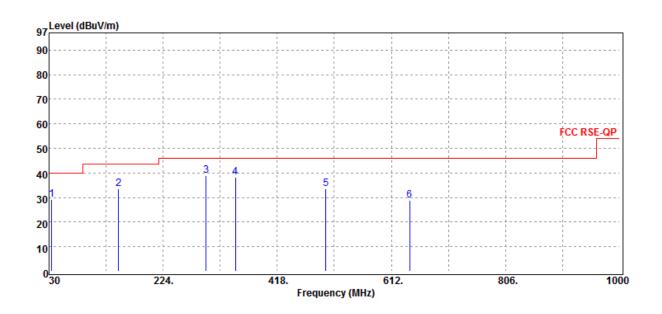
:E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



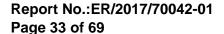
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBµV/m	dBμV/m	dB
34.85	S	Peak	38.17	-8.99	29.18	40.00	-10.82
148.34	S	Peak	41.46	-7.89	33.57	43.50	-9.93
296.75	S	Peak	45.03	-5.98	39.05	46.00	-6.95
347.19	S	Peak	43.12	-4.95	38.17	46.00	-7.83
500.45	S	Peak	36.40	-2.68	33.72	46.00	-12.28
643.04	S	Peak	28.07	0.65	28.72	46.00	-17.28

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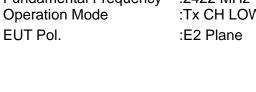
**Operation Band** Fundamental Frequency

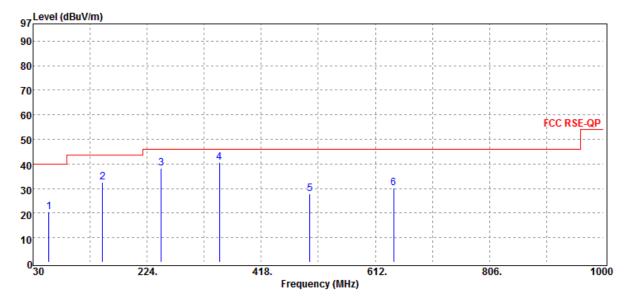
:802.11n40 :2422 MHz :Tx CH LOW **Test Date** Temp./Humi. :2017-09-08

:22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.





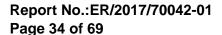
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
57.16	S	Peak	28.38	-7.98	20.40	40.00	-19.60
148.34	S	Peak	40.35	-7.89	32.46	43.50	-11.04
248.25	S	Peak	46.32	-7.98	38.34	46.00	-7.66
347.19	S	Peak	45.67	-4.95	40.72	46.00	-5.28
500.45	S	Peak	30.51	-2.68	27.83	46.00	-18.17
643.04	S	Peak	29.71	0.65	30.36	46.00	-15.64

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EUT Pol.

:802.11n40 :2437 MHz :Tx CH MID

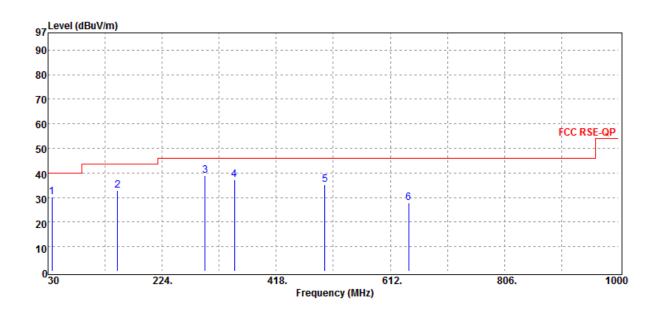
:E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



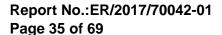
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	39.19	-8.84	30.35	40.00	-9.65
148.34	S	Peak	40.88	-7.89	32.99	43.50	-10.51
296.75	S	Peak	44.75	-5.98	38.77	46.00	-7.23
347.19	S	Peak	42.08	-4.95	37.13	46.00	-8.87
500.45	S	Peak	37.76	-2.68	35.08	46.00	-10.92
643.04	S	Peak	27.11	0.65	27.76	46.00	-18.24

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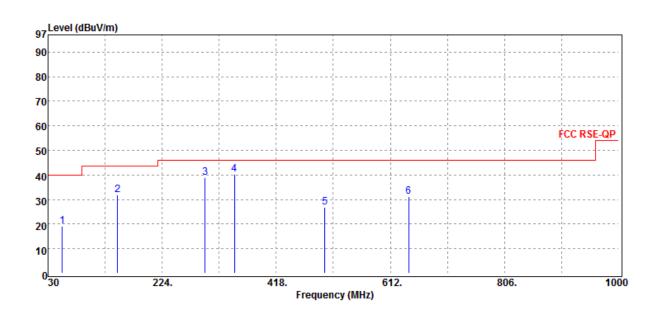
:2437 MHz :Tx CH MID :E2 Plane

**Test Date** Temp./Humi. :2017-09-08

:22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



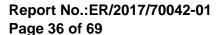
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
54.25	S	Peak	27.06	-7.82	19.24	40.00	-20.76
148.34	S	Peak	39.76	-7.89	31.87	43.50	-11.63
296.75	S	Peak	44.97	-5.98	38.99	46.00	-7.01
347.19	S	Peak	45.33	-4.95	40.38	46.00	-5.62
500.45	S	Peak	29.61	-2.68	26.93	46.00	-19.07
643.04	S	Peak	30.61	0.65	31.26	46.00	-14.74

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EUT Pol.

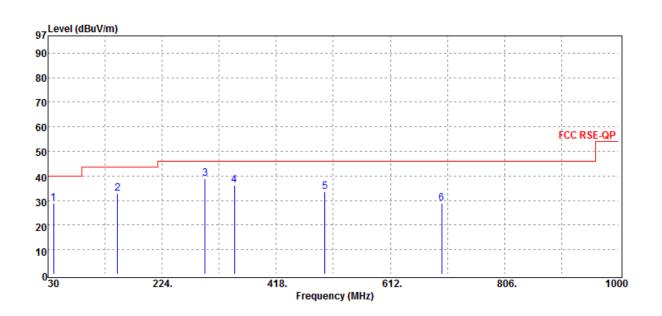
:802.11n40 :2452 MHz :Tx CH HIGH :E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:VERTICAL Measurement Antenna Pol.



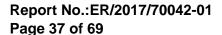
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
39.70	S	Peak	37.53	-8.56	28.97	40.00	-11.03
148.34	S	Peak	40.83	-7.89	32.94	43.50	-10.56
296.75	S	Peak	44.91	-5.98	38.93	46.00	-7.07
347.19	S	Peak	41.23	-4.95	36.28	46.00	-9.72
500.45	S	Peak	36.33	-2.68	33.65	46.00	-12.35
699.30	S	Peak	27.45	1.44	28.89	46.00	-17.11

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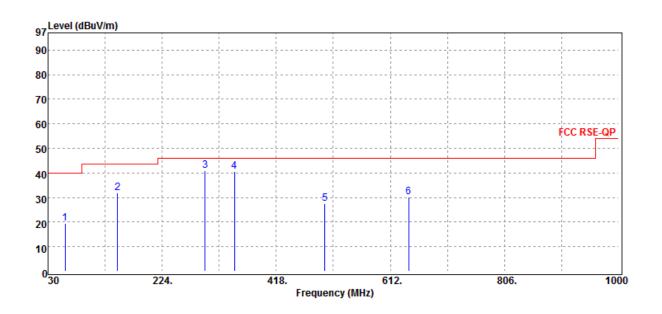
:802.11n40 :2452 MHz :Tx CH HIGH :E2 Plane

**Test Date** :2017-09-08

Temp./Humi. :22 deg\_C / 61 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



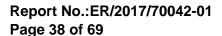
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{dB}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
59.10	S	Peak	27.36	-8.03	19.33	40.00	-20.67
148.34	S	Peak	39.92	-7.89	32.03	43.50	-11.47
296.75	S	Peak	47.05	-5.98	41.07	46.00	-4.93
347.19	S	Peak	45.52	-4.95	40.57	46.00	-5.43
500.45	S	Peak	30.33	-2.68	27.65	46.00	-18.35
643.04	S	Peak	29.46	0.65	30.11	46.00	-15.89

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## **Above 1GHz Data:**

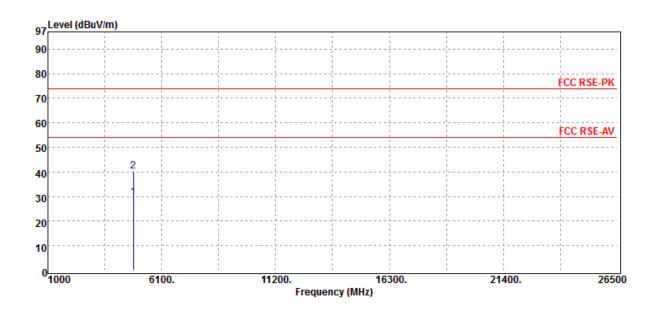
## **Radiated Spurious Emission Measurement Result**

**Operation Band** :802.11b Test Date :2017-09-07

Fundamental Frequency :2412 MHz Temp./Humi. :21 deg\_C / 62 RH

**Operation Mode** :Tx CH LOW Engineer

EUT Pol. :E2 Plane :VERTICAL Measurement Antenna Pol.

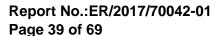


	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
			Mode	Reading Level		FS	@3m	Margin	
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
4	824.00	Н	Average	24.56	4.93	29.49	54.00	-24.51	
4	824.00	Н	Peak	35.40	4.93	40.33	74.00	-33.67	

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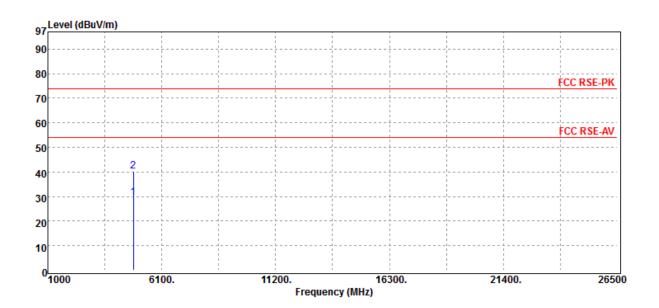
EUT Pol.

:802.11b :2412 MHz :Tx CH LOW :E2 Plane

**Test Date** Temp./Humi. :2017-09-07

:21 deg\_C / 62 RH Engineer

:HORIZONTAL Measurement Antenna Pol.



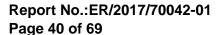
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
4824.00	Н	Average	24.68	4.93	29.61	54.00	-24.39	
4824.00	Н	Peak	35.19	4.93	40.12	74.00	-33.88	

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EUT Pol.

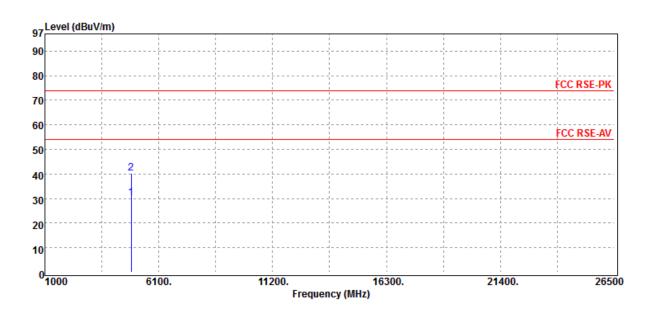
:802.11b :2437 MHz :Tx CH MID :E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



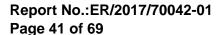
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Average	25.02	5.13	30.15	54.00	-23.85
4874.00	Н	Peak	35.14	5.13	40.27	74.00	-33.73

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EUT Pol.

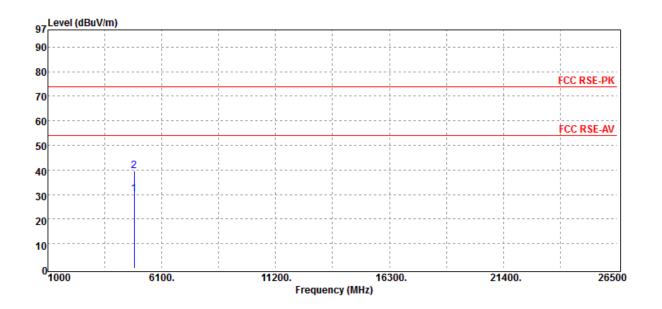
:802.11b :2437 MHz :Tx CH MID :E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	$dB\mu V/m$	dB
4874.00	Н	Average	25.13	5.13	30.26	54.00	-23.74
4874.00	Н	Peak	34.59	5.13	39.72	74.00	-34.28

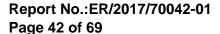
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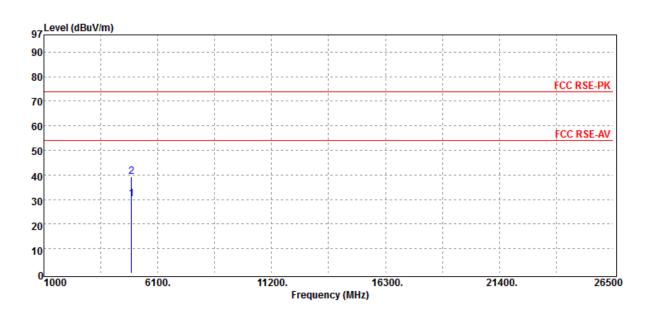
EUT Pol.

:802.11b :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** :2017-09-07 Temp./Humi. :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



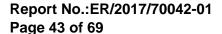
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4924.00	Н	Average	24.87	5.25	30.12	54.00	-23.88
4924.00	Н	Peak	34.13	5.25	39.38	74.00	-34.62

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**Operation Band** Fundamental Frequency

:2462 MHz **Operation Mode** 

:Tx CH HIGH EUT Pol. :E2 Plane

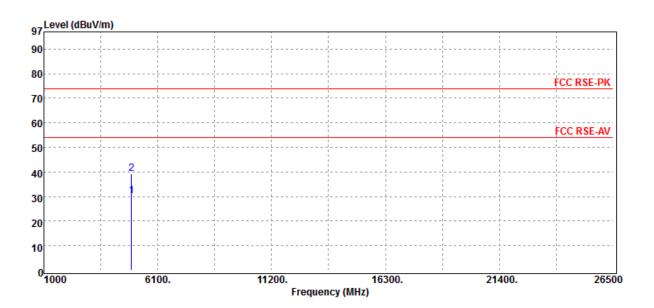
:802.11b

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



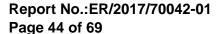
m Margin
/m dB
00 -23.82
00 -34.66
)

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EUT Pol.

:802.11g :2412 MHz :Tx CH LOW

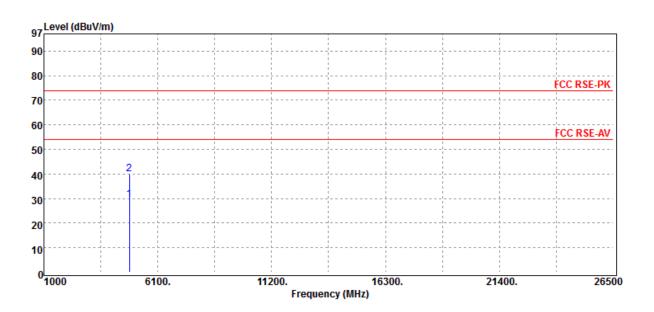
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



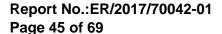
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4824.00	Н	Average	24.75	4.93	29.68	54.00	-24.32
4824.00	Н	Peak	35.09	4.93	40.02	74.00	-33.98

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EUT Pol.

:802.11g :2412 MHz :Tx CH LOW

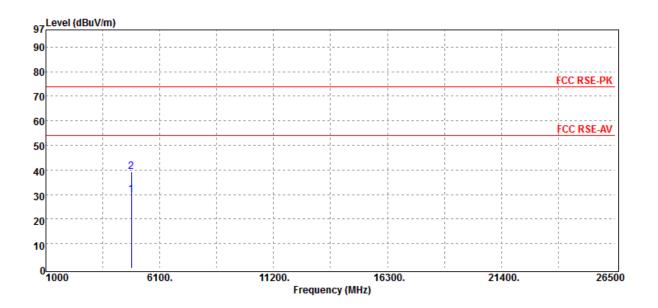
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



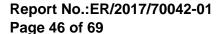
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	_
4824.00	Н	Average	24.86	4.93	29.79	54.00	-24.21	
4824.00	Н	Peak	34.21	4.93	39.14	74.00	-34.86	

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EUT Pol.

:802.11g :2437 MHz :Tx CH MID :E2 Plane

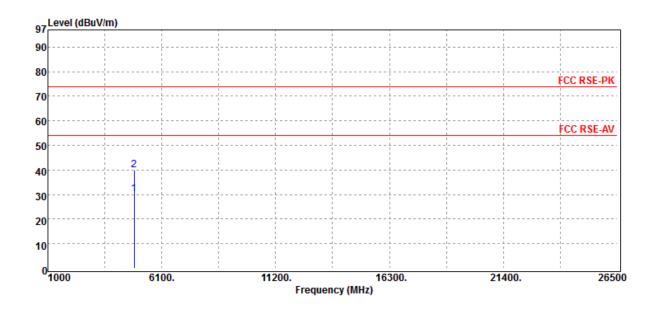
**Test Date** Temp./Humi. :2017-09-07

:21 deg\_C / 62 RH

Engineer

Measurement Antenna Pol.

:VERTICAL



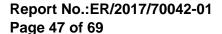
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Average	25.14	5.13	30.27	54.00	-23.73
4874.00	Н	Peak	34.89	5.13	40.02	74.00	-33.98

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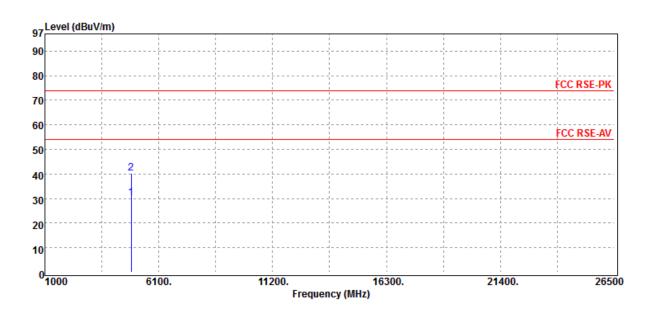
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:802.11g :2437 MHz :Tx CH MID :E2 Plane

**Test Date** :2017-09-07 Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Average	25.19	5.13	30.32	54.00	-23.68
4874.00	Н	Peak	35.18	5.13	40.31	74.00	-33.69

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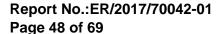
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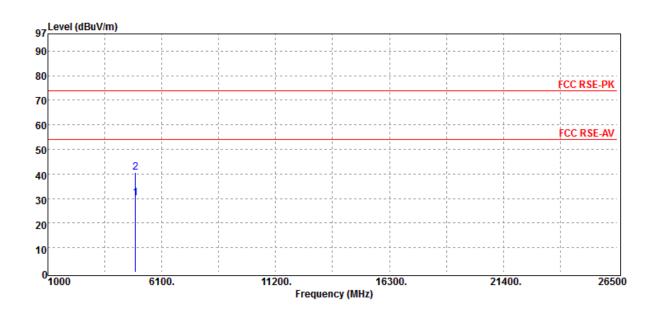
EUT Pol.

:802.11g :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** Temp./Humi. :2017-09-07 :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



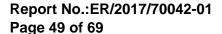
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
4924.00	Н	Average	25.04	5.25	30.29	54.00	-23.71
4924.00	Н	Peak	35.43	5.25	40.68	74.00	-33.32

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EUT Pol.

:802.11g :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** :2017-09-07 Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
4924.00	Н	Average	25.21	5.25	30.46	54.00	-23.54
4924.00	Н	Peak	34.86	5.25	40.11	74.00	-33.89

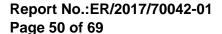
Frequency (MHz)

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EUT Pol.

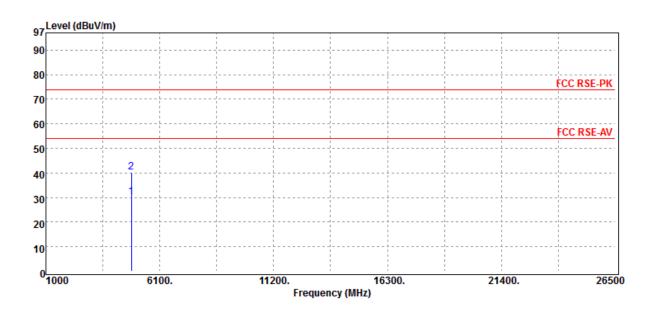
:802.11n20 :2412 MHz :Tx CH LOW :E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4824.00	Н	Average	25.19	4.93	30.12	54.00	-23.88
4824.00	Н	Peak	35.30	4.93	40.23	74.00	-33.77

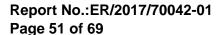
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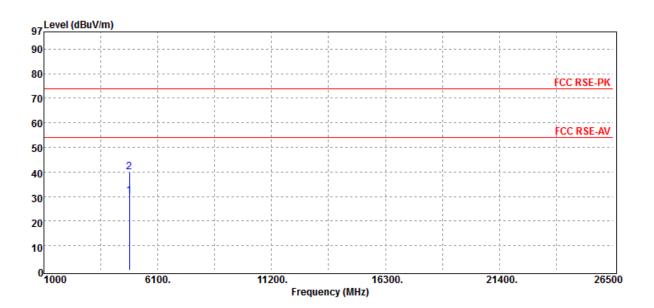
EUT Pol.

:802.11n20 :2412 MHz :Tx CH LOW :E2 Plane

**Test Date** :2017-09-07 Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
4824.00	Н	Average	25.26	4.93	30.19	54.00	-23.81
4824.00	Н	Peak	34.92	4.93	39.85	74.00	-34.15

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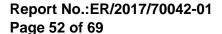
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EUT Pol.

:802.11n20 :2437 MHz :Tx CH MID :E2 Plane

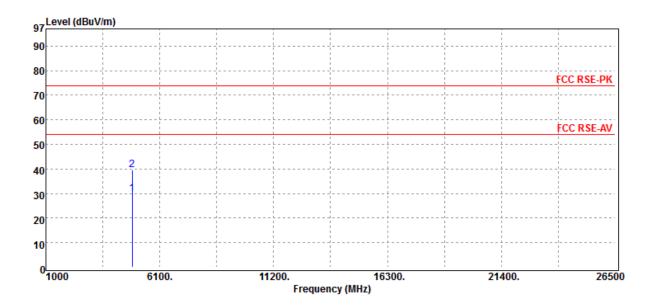
**Test Date** Temp./Humi. :2017-09-07

Engineer

:21 deg\_C / 62 RH

Measurement Antenna Pol.

:VERTICAL



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Average	24.74	5.13	29.87	54.00	-24.13
4874.00	Н	Peak	34.31	5.13	39.44	74.00	-34.56

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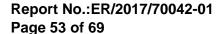
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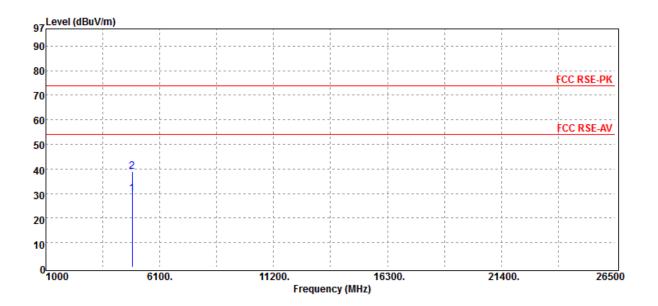
EUT Pol.

:802.11n20 :2437 MHz :Tx CH MID :E2 Plane

**Test Date** Temp./Humi. :2017-09-07 :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



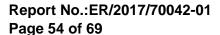
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	$\mathrm{dB}\mu\mathrm{V/m}$	dB
4874.00	Н	Average	24.83	5.13	29.96	54.00	-24.04
4874.00	Н	Peak	33.86	5.13	38.99	74.00	-35.01

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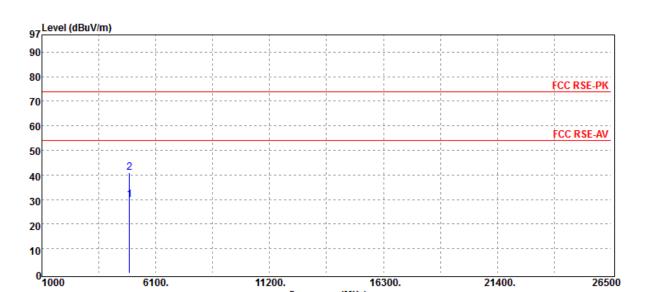
EUT Pol.

:802.11n20 :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** Temp./Humi. :2017-09-07 :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
4924.00	Н	Average	24.69	5.25	29.94	54.00	-24.06	
4924.00	Н	Peak	35.61	5.25	40.86	74.00	-33.14	

Frequency (MHz)

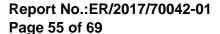
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EUT Pol.

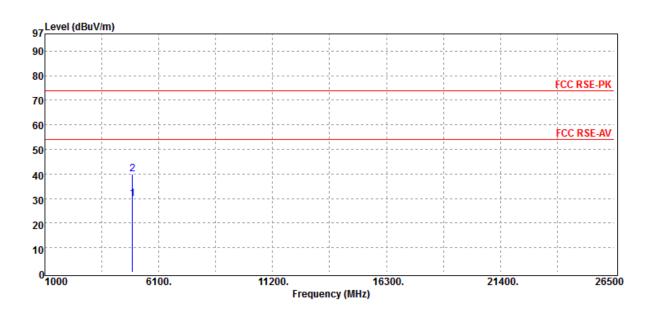
:802.11n20 :2462 MHz :Tx CH HIGH :E2 Plane

**Test Date** Temp./Humi. :2017-09-07

:21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



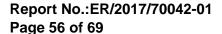
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
4924.00	Н	Average	24.77	5.25	30.02	54.00	-23.98
4924.00	Н	Peak	34.68	5.25	39.93	74.00	-34.07

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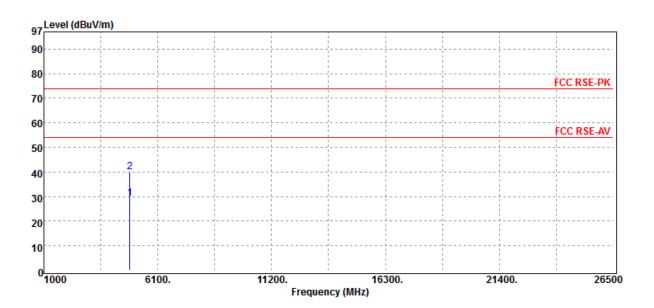
:802.11n40 :2422 MHz :Tx CH LOW :E2 Plane

**Test Date** :2017-09-07

:21 deg\_C / 62 RH Temp./Humi.

Engineer

:VERTICAL Measurement Antenna Pol.



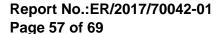
eq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe	
		Mode	Reading Level		FS	@3m	Margin	
lHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	$dB\mu V/m$	dB	
4.00	Н	Average	24.38	4.97	29.35	54.00	-24.65	
4.00	Н	Peak	35.00	4.97	39.97	74.00	-34.03	
1	req. 1Hz 14.00 14.00	1Hz F/H/E/S 14.00 H	Mode  Hz F/H/E/S PK/QP/AV  14.00 H Average	Mode Reading Level  Hz F/H/E/S PK/QP/AV dBμV  14.00 H Average 24.38	Mode Reading Level  IHz F/H/E/S PK/QP/AV dBμV dB  14.00 H Average 24.38 4.97	Mode         Reading Level         FS           IHz         F/H/E/S         PK/QP/AV         dBμV         dB         dBμV/m           14.00         H         Average         24.38         4.97         29.35	Mode         Reading Level         FS         @3m           IHz         F/H/E/S         PK/QP/AV         dBμV         dB         dBμV/m         dBμV/m           14.00         H         Average         24.38         4.97         29.35         54.00	Mode         Reading Level         FS         @3m         Margin           IHz         F/H/E/S         PK/QP/AV         dBμV         dB         dBμV/m         dBμV/m         dB           14.00         H         Average         24.38         4.97         29.35         54.00         -24.65

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EUT Pol.

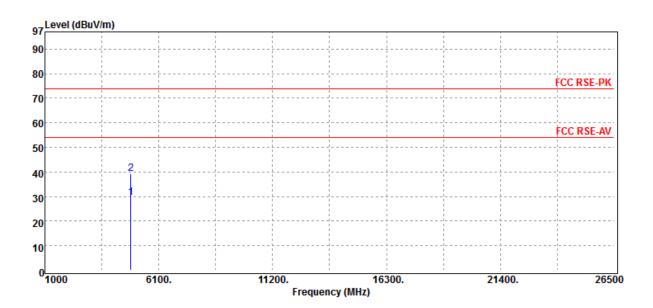
:802.11n40 :2422 MHz :Tx CH LOW :E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



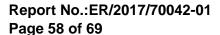
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
4844.00	Н	Average	24.66	4.97	29.63	54.00	-24.37
4844.00	Н	Peak	34.35	4.97	39.32	74.00	-34.68

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EUT Pol.

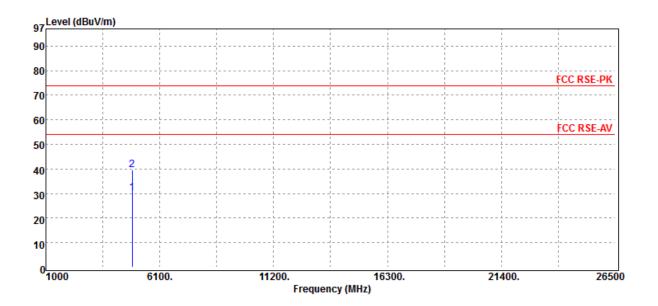
:802.11n40 :2437 MHz :Tx CH MID :E2 Plane

**Test Date** Temp./Humi. :2017-09-07

:21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



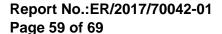
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Average	25.01	5.13	30.14	54.00	-23.86
4874.00	Н	Peak	34.38	5.13	39.51	74.00	-34.49

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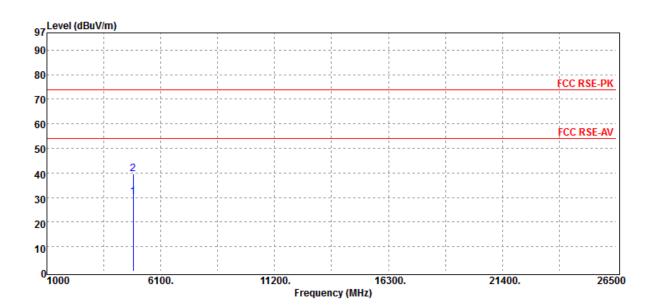
EUT Pol.

:802.11n40 :2437 MHz :Tx CH MID :E2 Plane

**Test Date** :2017-09-07 Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



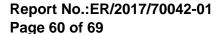
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4874.00	Н	Average	25.11	5.13	30.24	54.00	-23.76
4874.00	Н	Peak	34.62	5.13	39.75	74.00	-34.25

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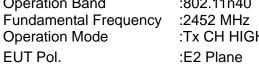


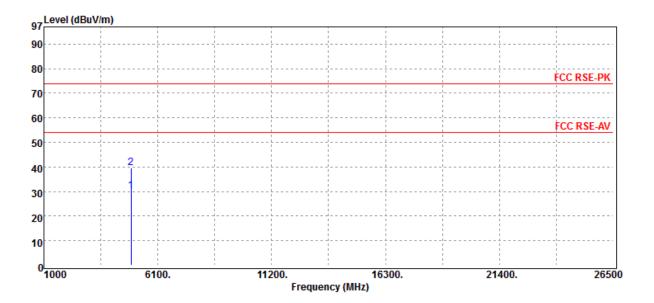


**Operation Band** Fundamental Frequency :802.11n40 :Tx CH HIGH **Test Date** :2017-09-07 Temp./Humi. :21 deg\_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.





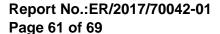
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
4904.00	Н	Average	24.87	5.24	30.11	54.00	-23.89
4904.00	Н	Peak	34.44	5.24	39.68	74.00	-34.32

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EUT Pol.

:802.11n40 :2452 MHz :Tx CH HIGH

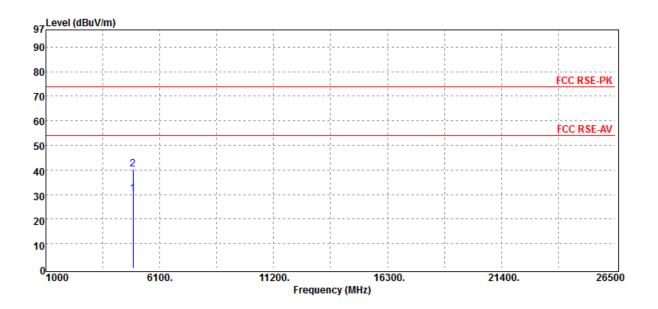
:E2 Plane

**Test Date** :2017-09-07

Temp./Humi. :21 deg\_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



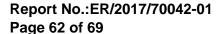
Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	$\mathrm{dB}\mu\mathrm{V/m}$	dB
4904.00	Н	Average	24.94	5.24	30.18	54.00	-23.82
4904.00	Н	Peak	35.12	5.24	40.36	74.00	-33.64

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ANTENNA REQUIREMENT

## 7.1 Standard Applicable

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

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

## 7.2 Antenna Connected Construction

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

~ End of Report ~

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