

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

### INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

**Product Name:** SmartSense Staff Tag  
**Brand Name:** SmartSense Staff Tag  
**Model No.:** STG-821(919), STG-821(925)  
**Model Difference:** Different in frequency (919.8MHz & 925MHz)  
**FCC ID:** VPE-STG-821  
**Report No.:** E2/2016/90060  
**Issue Date:** Nov. 15, 2016  
**FCC Rule Part:** §15.249  
**Prepared for:** CADI SCIENTIC PTE LTD  
31, Ubi Road 1, Aztech Building, #07-01A,  
408694, Singapore  
**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
No.2, Keji 1st Rd., Guishan District, Taoyuan  
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**VERIFICATION OF COMPLIANCE**

**Applicant:** CADI SCIENTIC PTE LTD  
31, Ubi Road 1, Aztech Building, #07-01A, 408694, Singapore

**Product Description:** SmartSense Staff Tag

**Brand Name:** SmartSense Staff Tag

**FCC ID:** VPE-STG-821

**Model No.:** STG-821(919), STG-821(925)

**Model Difference:** Different in frequency (919.8MHz & 925MHz)

**File Number:** E2/2016/90060

**Date of test:** Sep. 23, 2016 ~ Nov. 9, 2016

**Date of EUT Received:** Sep. 23, 2016

**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 of FCC Rules Part 15.249. The test results of this report relate only to the tested sample identified in this report.

**Test By:****Date:**

Nov. 15, 2016

**Jerry Lu / Asst. Supervisor****Prepared By:****Date:**

Nov. 15, 2016

**Violetta Tang / Clerk****Approved By:****Date:**

Nov. 15, 2016

**Jim Chang / Asst. Manager**

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## Revision History

Report Number	Revision	Description	Issue Date
E2/2016/90060	Rev.00	Initial creation of document	Nov. 15, 2016

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## 1. GENERAL INFORMATION

### 1.1 Product Description

Product Name:	SmartSense Staff Tag	
Brand Name:	SmartSense Staff Tag	
Model No.:	STG-821(919), STG-821(925)	
Model Difference:	Different in frequency (919.8MHz & 925MHz)	
Hardware Version:	V3.1	
Software Version	V6	
Power Supply:	3.7Vdc from Rechargeable Lithium Ion Polymer Battery or 5Vdc from USB Port	
	Battery:	Model No.: N/A; Supplier: N/A

#### Transmitter:

Operating Frequency:	919.8MHz and 925.0MHz
Transmit Power:	80.03dBuV/m and 80.67dBuV/m
Number of Channels:	1
Operating Mode:	Point-to-Point

This report complies with FCC 15.249

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## 1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.249

ANSI C63.10:2013

Note:

1. All test items have been performed and record as per the above standards.
2. The composite system is compliance with FCC Subpart B is authorized under the certification procedure.
3. The EUT was placed 1.5m height for frequency above 1GHz in accordance with ANSI C63.10:2013.

## 1.3 Test Facility

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

FCC Registration Numbers are: 735305

Canada Registration Number: 4620A-5

## 1.4 Special Accessories

There are no special accessories used while test was conducted.

## 1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107. 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 placed on a turn table which is 0.8 m above ground plane. 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.

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## 2.4 Limitation

### (1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 - 56	56 - 46
0.5 – 5	56	46
5 - 30	60	50

### (2) Radiated Emission 15.249(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
24.0 – 24.25 GHz	250 mV/m (107.95dBuV/m)	2500 uV/m (67.95dBuV/m)	3

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### (3) Radiated Emission 15.249 (d)

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 as below, whichever is the lesser attenuation.

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance (m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

### (4) Radiated Emission 15.249(e)

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

Remark 1. Emission level in  $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$

: 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of  $\xi$  15.205

4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of  $\xi$  15.205, then the general radiated emission limits in  $\xi$  15.209 apply.

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## 2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Table 2-2 Equipment Used in Tested System

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

**Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

**Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

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### 3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207 (a)	AC Power Line Conducted Emission	Compliant
§15.249(a)(e)	Radiated Emission	Compliant
§15.249(d)	20dB band width Measurement	Compliant

### 4. Description of test modes

The EUT has been tested under operating condition.

The EUT is staying in continuous transmitting mode.

919.8MHz and 925MHz with highest data rate are chosen for full testing.

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## 5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : <b>Vertical</b> )	9kHz - 30MHz: +/- 2.3dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : <b>Horizontal</b> )	9kHz - 30MHz: +/- 2.3dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

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. Conducted Emissions Test

### 6.1 Standard Applicable:

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

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

**Note**

1. The lower limit shall apply at the transition frequencies

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

### 6.2 Measurement Equipment Used:

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 7	100950	12/12/2015	12/11/2016
Coaxial Cables	N/A	N30N30-1042-150cm	N/A	02/07/2016	02/06/2017
LISN	Schwarzbeck	NSLK 8127	8127-648	03/11/2016	03/10/2017
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

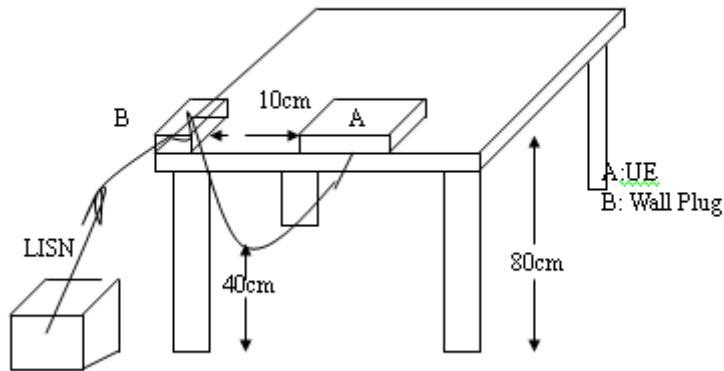
### 6.3 EUT Setup:

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

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## 6.4 Test SET-UP (Block Diagram of Configuration)



## 6.5 Measurement Procedure:

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

## 6.6 Measurement Result:

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

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

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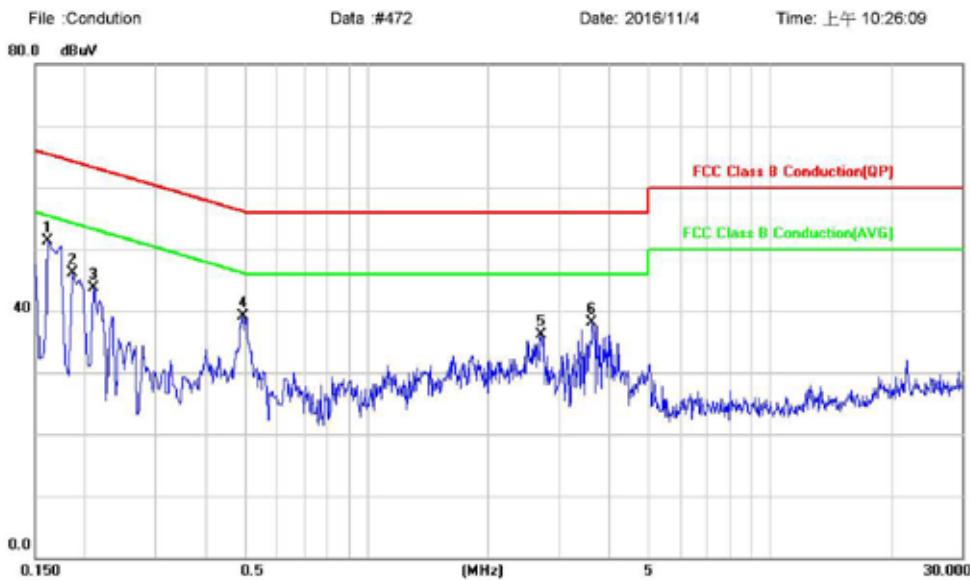
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## AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode			Test Date:	Nov. 04, 2016
Temperature:	23	Humidity:	60 %	Test By:	Jerry
Probe:	L1 / N				

Site : Conduction Room Phase: **L1** Temperature: 23 °C  
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60 %  
 Mode: CADI  
 Note:

## Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Comment
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1 *		0.1620	31.64	19.72	51.36	65.36	-14.00	peak
2		0.1860	26.36	19.71	46.07	64.21	-18.14	peak
3		0.2100	24.03	19.72	43.75	63.21	-19.46	peak
4		0.4940	19.27	19.90	39.17	56.10	-16.93	peak
5		2.7180	16.24	19.94	36.18	56.00	-19.82	peak
6		3.6380	18.20	19.95	38.15	56.00	-17.85	peak

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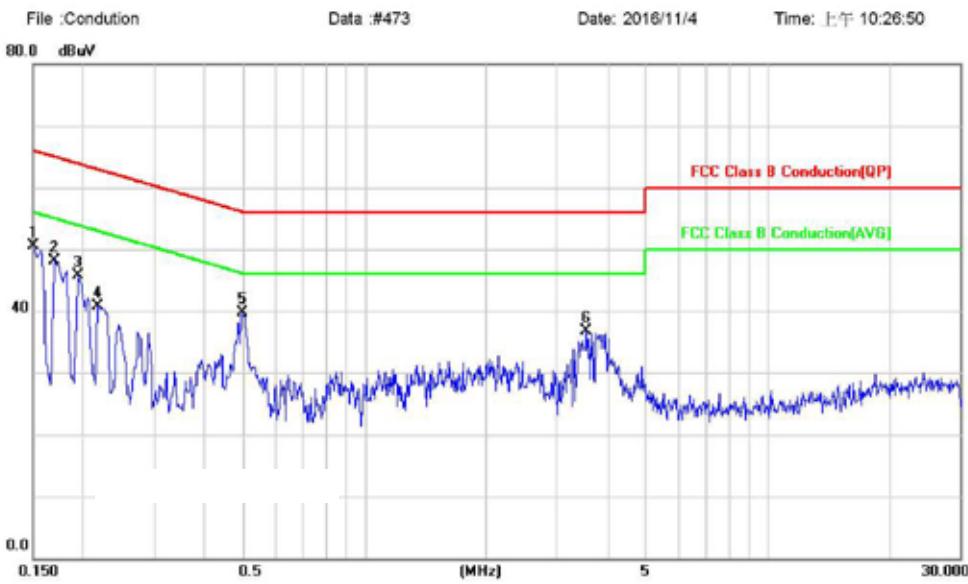
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Site : Conduction Room Phase: **N** Temperature: 23 °C  
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60 %  
 Mode: CADI  
 Note:

### Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
1 *		0.1500	30.83	19.73	50.56	66.00	-15.44	peak	
2		0.1700	28.47	19.73	48.20	64.96	-16.76	peak	
3		0.1940	26.05	19.72	45.77	63.86	-18.09	peak	
4		0.2180	20.95	19.73	40.68	62.89	-22.21	peak	
5		0.4980	19.82	19.91	39.73	56.03	-16.30	peak	
6		3.5620	16.71	19.96	36.67	56.00	-19.33	peak	

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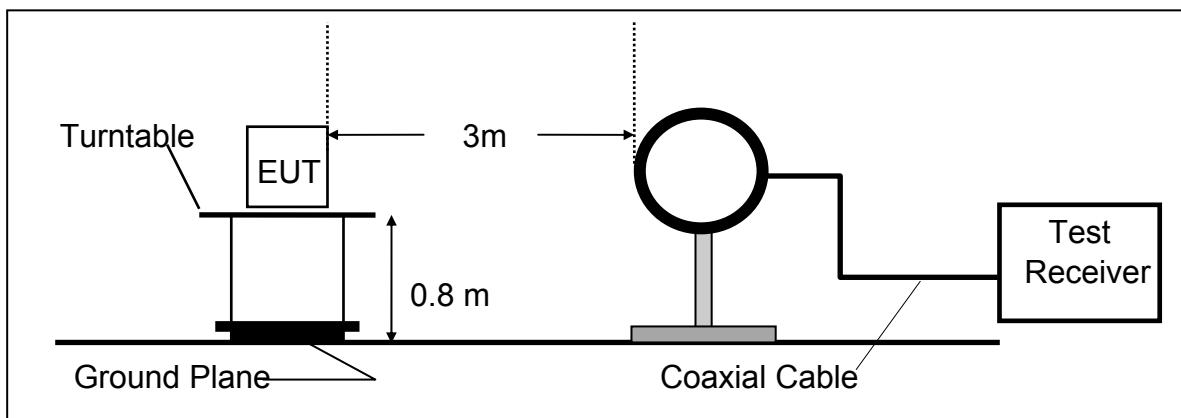
## 7. Radiated Emission Test

### 7.1 Measurement Procedure

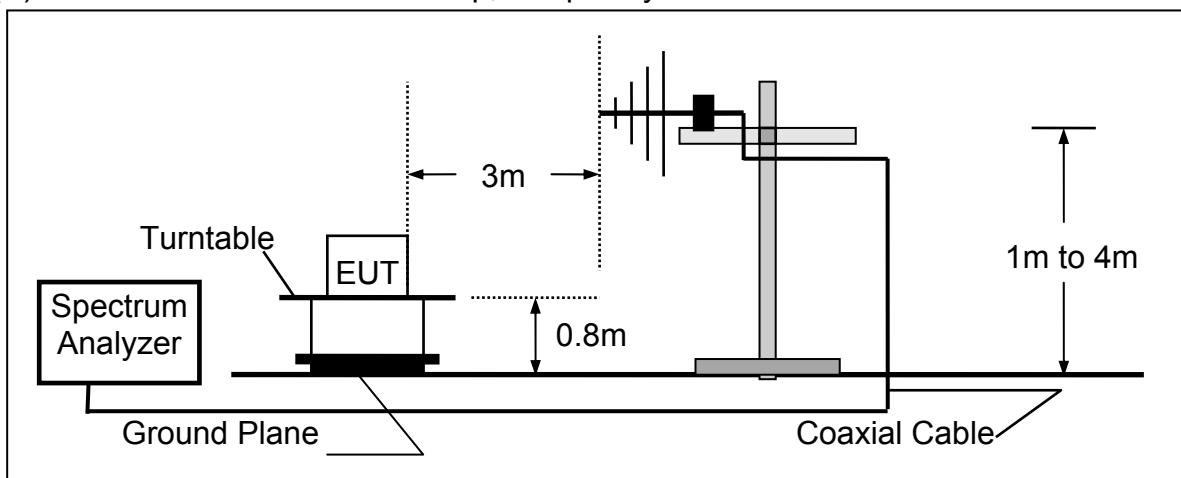
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 7.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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## 7.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESU 40	100363	04/12/2016	04/11/2017
Loop Antenna	ETS-Lindgren	6502	00143303	12/23/2015	12/22/2016
Broadband Antenna	TESEQ	CBL 6112D	35240	10/28/2016	10/27/2017
Horn Antenna	ETS-Lindgren	3117	00143272	12/16/2015	12/15/2016
Horn Antenna	Schwarzbeck	BBHA9170	185	07/18/2016	07/17/2017
Pre Amplifier	EMC Instruments	EMC330	980096	12/12/2015	12/11/2016
Pre Amplifier	EMC Instruments	EMC0011830	980199	12/12/2015	12/11/2016
Pre Amplifier	R&S	SCU-18	10204	12/12/2015	12/11/2016
Pre Amplifier	R&S	SCU-26	100780	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx SUCAFLEX 104	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	SUCAFLEX 104	966Rx 1G-18G	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	mini 141-12	966Rx SUCAFLEX 104	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	SUCAFLEX 104	966Tx 30M-18G	12/12/2015	12/11/2016
Coaxial Cable	Huber+Suhner	SUCAFLEX 102	966Tx 18G-40G	12/12/2015	12/11/2016
Attenuator	WOKEN	218FS-10	RF27	12/12/2015	12/11/2016
Site NSA	SGS	966 Chamber C	SAC-C	03/04/2016	03/03/2017
Site VSWR	SGS	966 Chamber C	SAC-C	03/04/2016	03/03/2017
DC Power Supply	HOLA	DP-3003	D7070035	05/04/2016	05/03/2017
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.

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## 7.4 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:

$$\mathbf{FS = RA + AF + CL - AG}$$

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(dB $\mu$ V/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.

“---” : denotes Noise Floor.

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## 7.5 Measurement Result

Operation Mode :	919.8 MHz	Test Date :	2016/11/2
Fundamental Frequency :	919.8 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Main CH Mid	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical

Freq.	Note	Detector Mode	Spectrum Reading	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	Level dB $\mu$ V	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB
919.70	F	Peak	70.58	-1.82	68.76	114	-45.24
919.70	F	Average	70.45	-1.82	68.63	94	-25.37

Operation Mode :	919.8 MHz	Test Date :	2016/11/2
Fundamental Frequency :	919.8 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Main CH Mid	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	Level dB $\mu$ V	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB
919.81	F	Peak	81.85	-1.82	80.03	114	-33.97
919.81	F	Average	81.77	-1.82	79.95	94	-14.05

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Operation Mode : 925 MHz Test Date : 2016/11/2  
Fundamental Frequency : 925 MHz Temp. / Humi. : 22.7deg\_C/57RH  
Operation Band : Main CH Mid Test Engineer : Ashton  
EUT Pol. : E2 Measurement Antenna Pol. : Vertical

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dB $\mu$ V	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB
925.01	F	Peak	70.68	-1.63	69.05	114	-44.95
925.01	F	Average	70.56	-1.63	68.93	94	-25.07

Operation Mode : 925 MHz Test Date : 2016/11/2  
Fundamental Frequency : 925 MHz Temp. / Humi. : 22.7deg\_C/57RH  
Operation Band : Main CH Mid Test Engineer : Ashton  
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dB $\mu$ V	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB
925.01	F	Peak	82.30	-1.63	80.67	114	-33.33
925.01	F	Average	82.22	-1.63	80.59	94	-13.41

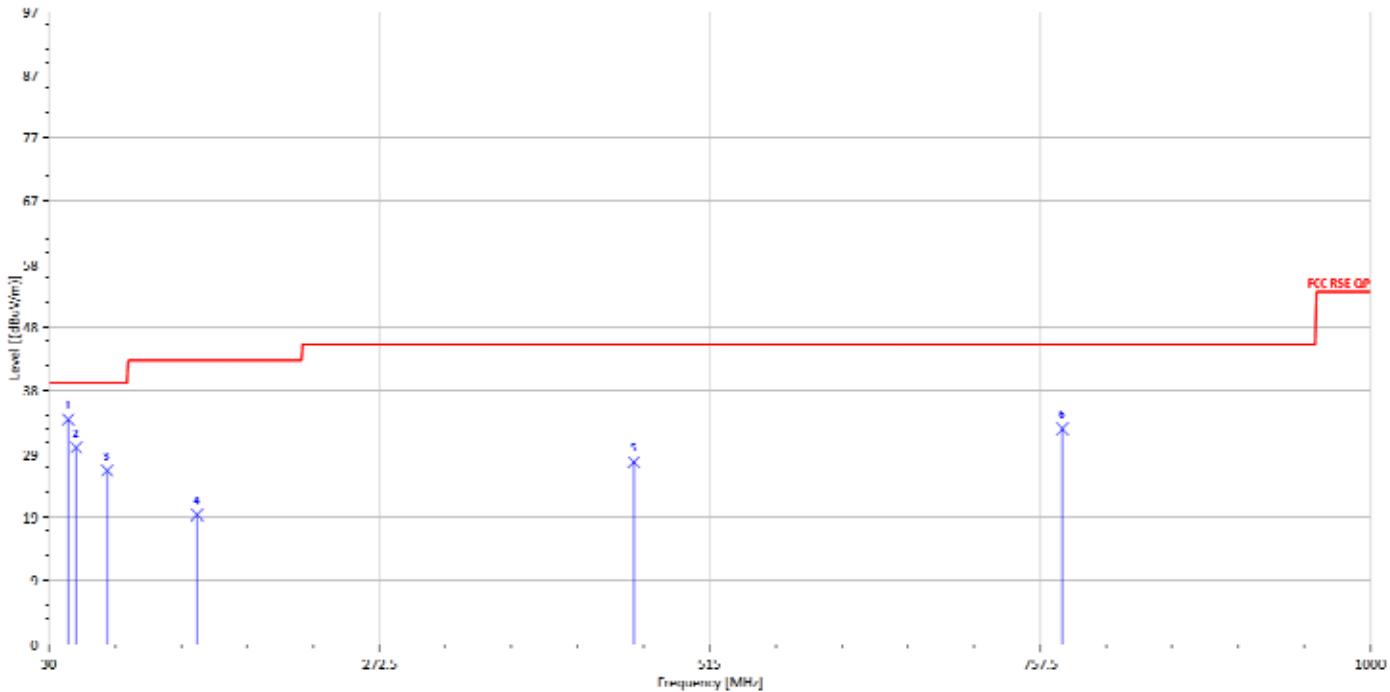
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## (30MHz~1GHz)

Operation Mode : 919.8 MHz Test Date : 2016/10/14  
 Fundamental Frequency : 919.8 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
44.55	S	Peak	50.41	-16.05	34.36	40	-5.64
50.37	S	Peak	49.70	-19.55	30.15	40	-9.85
72.68	S	Peak	48.12	-21.55	26.57	40	-13.43
138.64	S	Peak	35.73	-15.97	19.76	43.5	-23.74
459.71	S	Peak	36.02	-8.13	27.90	46	-18.10
773.99	S	Peak	37.70	-4.72	32.98	46	-13.02

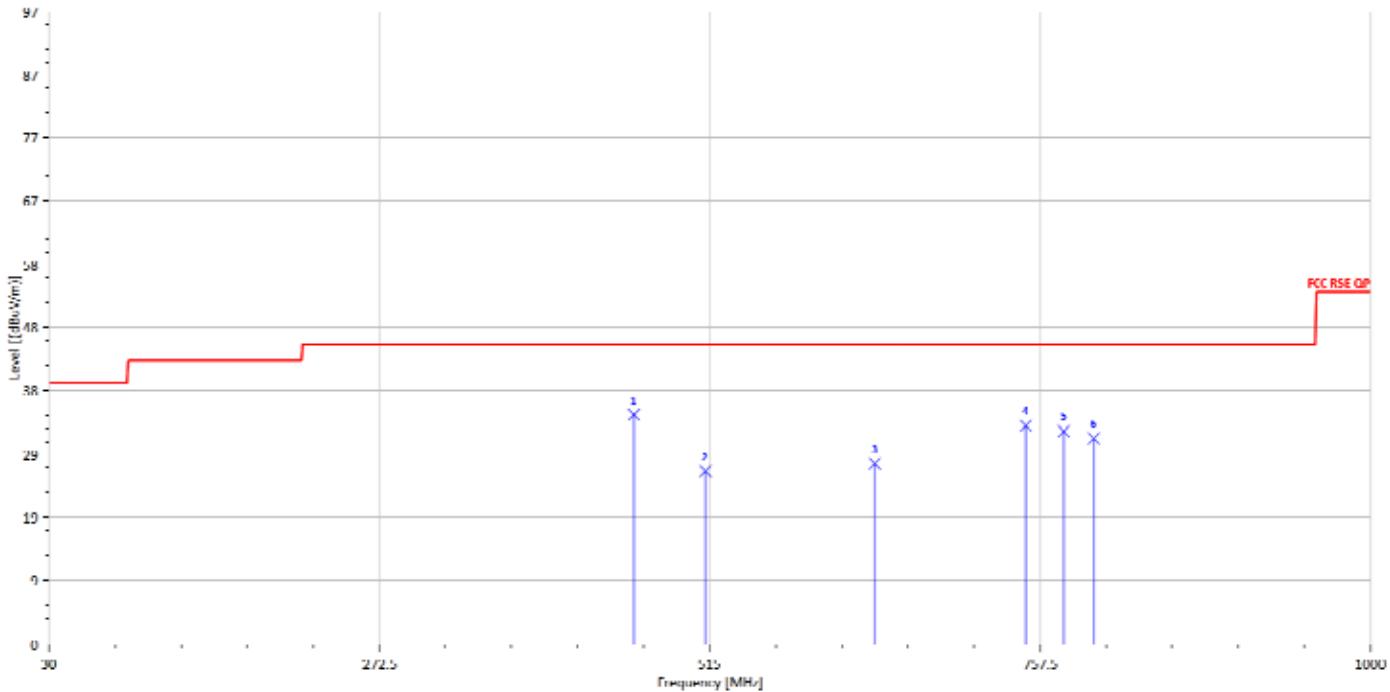
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Operation Mode : 919.8 MHz Test Date : 2016/10/14  
 Fundamental Frequency : 919.8 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
459.71	S	Peak	43.23	-8.13	35.10	46	-10.90
512.09	S	Peak	34.01	-7.51	26.50	46	-19.50
636.25	S	Peak	32.92	-5.25	27.68	46	-18.32
746.83	S	Peak	37.69	-4.23	33.45	46	-12.55
774.96	S	Peak	37.36	-4.75	32.61	46	-13.39
797.27	S	Peak	35.57	-4.01	31.56	46	-14.44

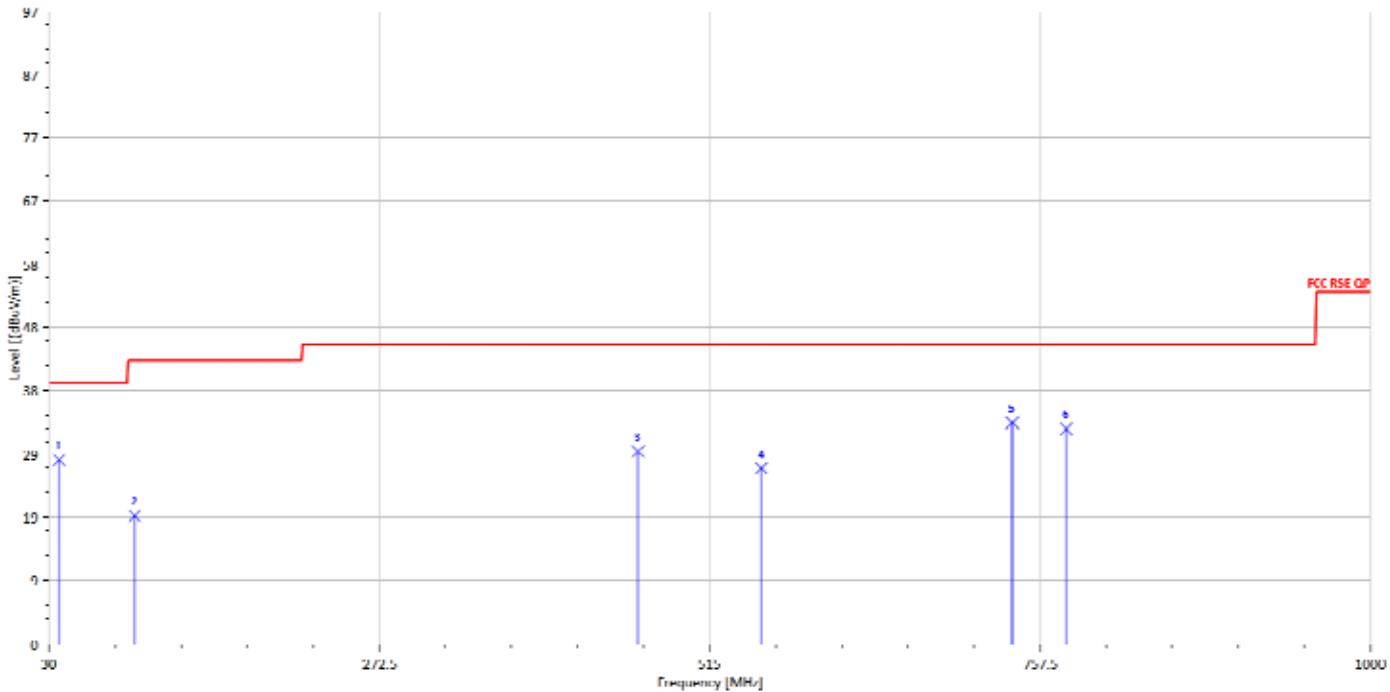
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Operation Mode : 925 MHz Test Date : 2016/10/14  
 Fundamental Frequency : 925 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Vertical



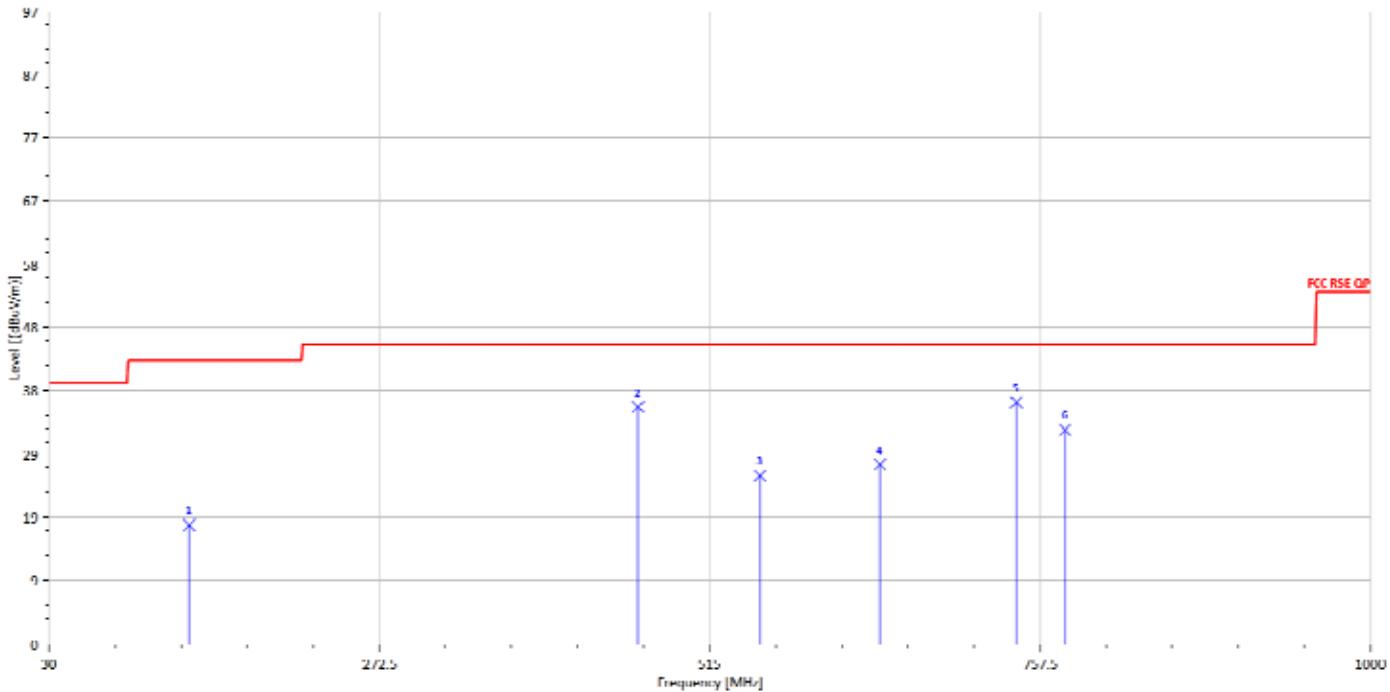
Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
37.76	S	Peak	39.75	-11.49	28.26	40	-11.74
93.05	S	Peak	38.56	-18.95	19.61	43.5	-23.89
462.62	S	Peak	37.67	-8.14	29.53	46	-16.47
552.83	S	Peak	33.73	-6.78	26.94	46	-19.06
737.13	S	Peak	38.32	-4.42	33.90	46	-12.10
776.90	S	Peak	37.74	-4.77	32.97	46	-13.03

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 Fundamental Frequency : 925 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
132.82	S	Peak	34.01	-15.76	18.25	43.5	-25.25
462.62	S	Peak	44.44	-8.14	36.30	46	-9.70
551.86	S	Peak	32.45	-6.66	25.79	46	-20.21
640.13	S	Peak	32.90	-5.37	27.53	46	-18.47
740.04	S	Peak	41.12	-4.09	37.03	46	-8.97
775.93	S	Peak	37.62	-4.80	32.82	46	-13.18

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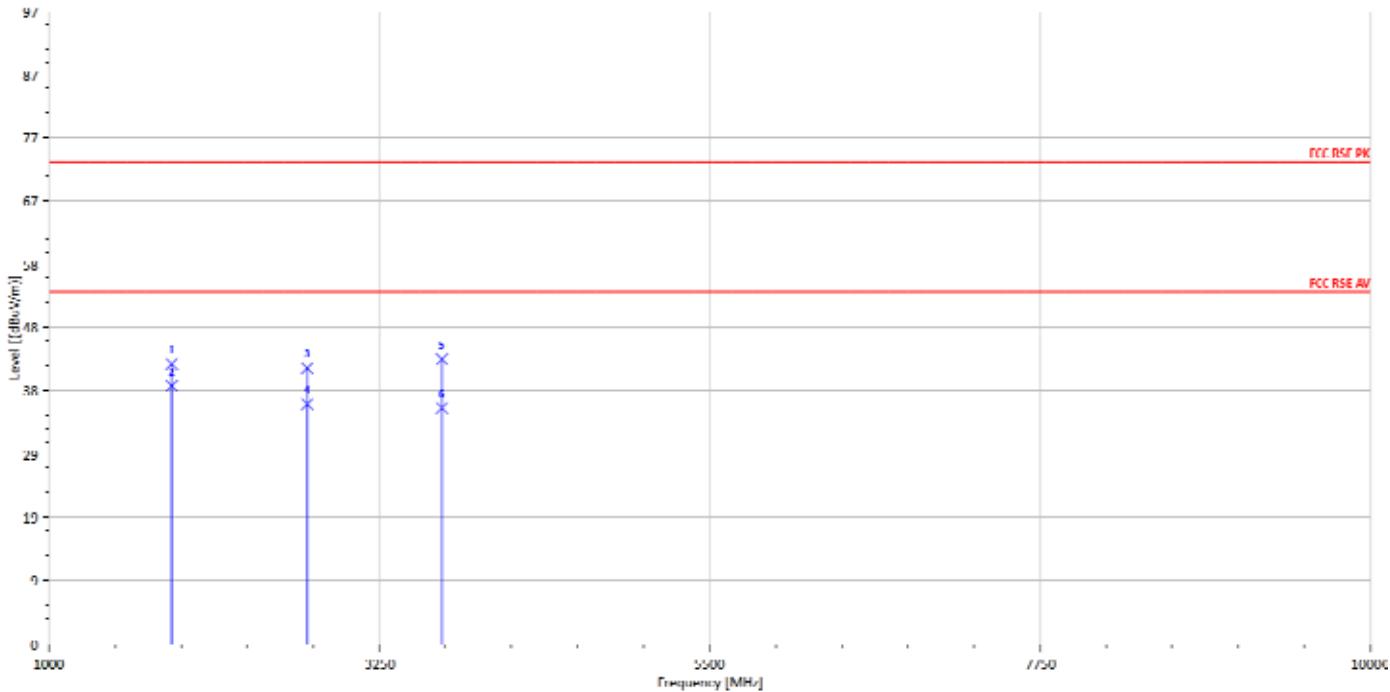
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## (1GHz~10GHz)

Operation Mode : 919.8 MHz Test Date : 2016/11/2  
 Fundamental Frequency : 919.8 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
1839.60	H	Peak	44.15	-1.19	42.96	74	-31.04
1839.60	H	Average	40.76	-1.19	39.57	54	-14.43
2759.40	H	Peak	39.84	2.48	42.32	74	-31.68
2759.40	H	Average	34.26	2.48	36.74	54	-17.26
3679.20	H	Peak	38.98	4.71	43.69	74	-30.31
3679.20	H	Average	31.43	4.71	36.14	54	-17.86

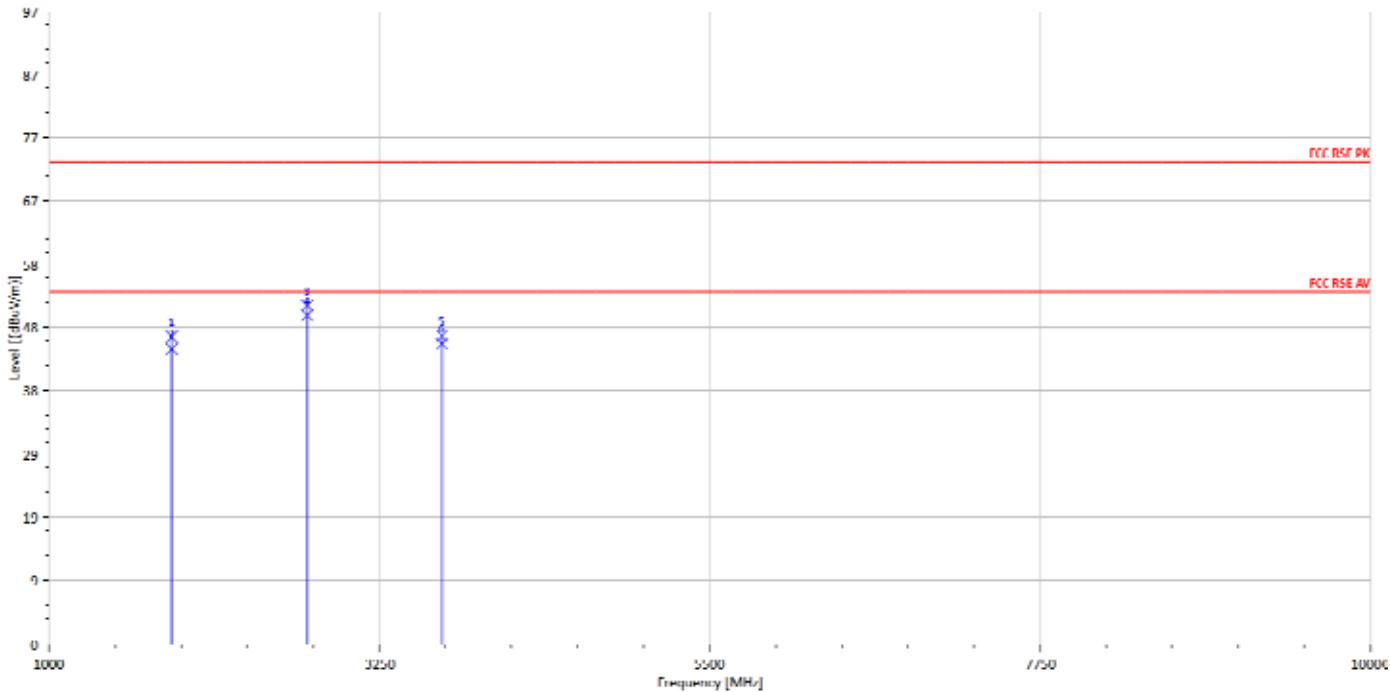
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Operation Mode : 919.8 MHz Test Date : 2016/11/2  
 Fundamental Frequency : 919.8 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



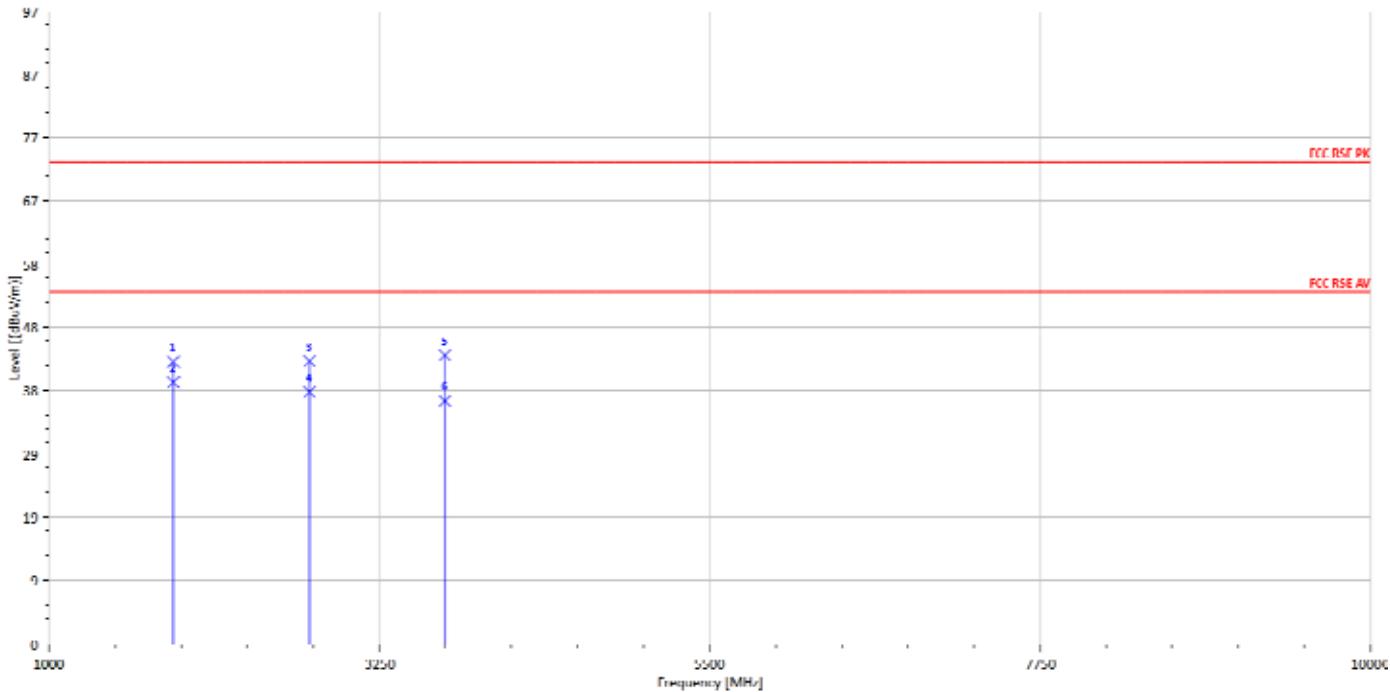
Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
1839.60	H	Peak	48.28	-1.19	47.09	74	-26.91
1839.60	H	Average	46.46	-1.19	45.27	54	-8.73
2759.40	H	Peak	49.40	2.48	51.88	74	-22.12
2759.40	H	Average	47.87	2.48	50.35	54	-3.65
3679.20	H	Peak	42.51	4.71	47.22	74	-26.78
3679.20	H	Average	41.37	4.71	46.08	54	-7.92

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Operation Mode : 925 MHz Test Date : 2016/11/2  
 Fundamental Frequency : 925 MHz Temp. / Humi. : 22.7deg\_C/57RH  
 Operation Band : Tx CH Mid Test Engineer : Ashton  
 EUT Pol. : E2 Measurement Antenna Pol. : Vertical



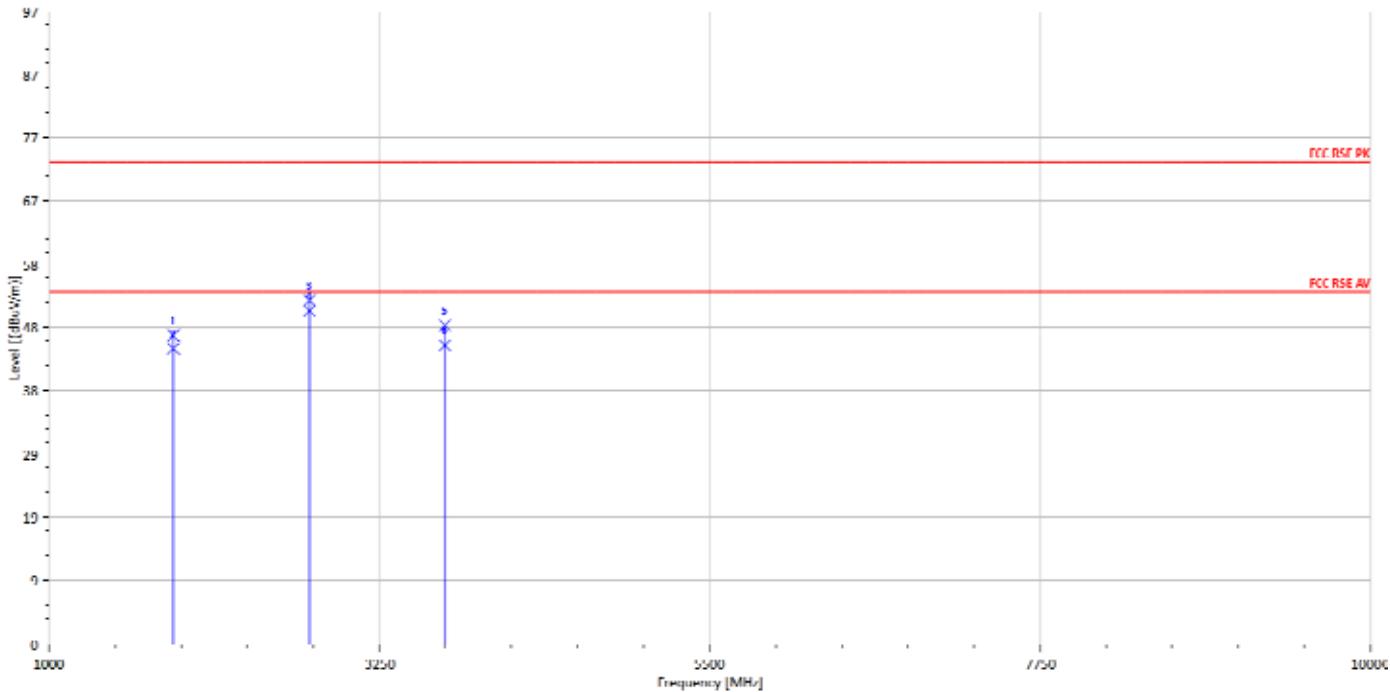
Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
1850.00	H	Peak	44.35	-1.05	43.30	74	-30.70
1850.00	H	Average	41.16	-1.05	40.11	54	-13.89
2775.00	H	Peak	40.79	2.60	43.39	74	-30.61
2775.00	H	Average	36.02	2.60	38.62	54	-15.38
3700.00	H	Peak	39.61	4.71	44.32	74	-29.68
3700.00	H	Average	32.52	4.71	37.23	54	-16.77

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Operation Band : Tx CH Mid Test Engineer : Ashton  
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
						74	54
1850.00	H	Peak	48.34	-1.05	47.29	74	-26.71
1850.00	H	Average	46.40	-1.05	45.35	54	-8.65
2775.00	H	Peak	50.07	2.60	52.67	74	-21.33
2775.00	H	Average	48.45	2.60	51.05	54	-2.95
3700.00	H	Peak	44.10	4.71	48.81	74	-25.19
3700.00	H	Average	41.15	4.71	45.86	54	-8.14

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## 8. 20 dB Band Width Measurement

### 8.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW = 100kHz, VBW = 300kHz, Span =1MHz.
4. Set SPA Max hold. Mark peak, -20dB.

### 8.2 Test SET-UP (Block Diagram of Configuration)

Refer to section 7.2 for the plots.

### 8.3 Measurement Equipment Used:

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2016	04/13/2017
Power Meter	Anritsu	ML2496A	1326001	06/23/2016	06/22/2017
Power Sensor	Anritsu	MA2411B	1315048	06/23/2016	06/22/2017
Power Sensor	Anritsu	MA2411B	1315049	06/23/2016	06/22/2017
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	RF01	12/12/2015	12/11/2016
DC Block	PASTERNAK	PE8210	RF29	12/12/2015	12/11/2016
Splitter	RF-LAMBAD	RFLT2W1G18G	RF35	12/12/2015	12/11/2016
Attenuator	WOKEN	218FS-10	RF23	12/12/2015	12/11/2016
DC Power Supply	Agilent	E3640A	MY53140006	05/04/2016	05/03/2017

### 8.4 Measurement Results:

919.8 MHz = 372.4 kHz

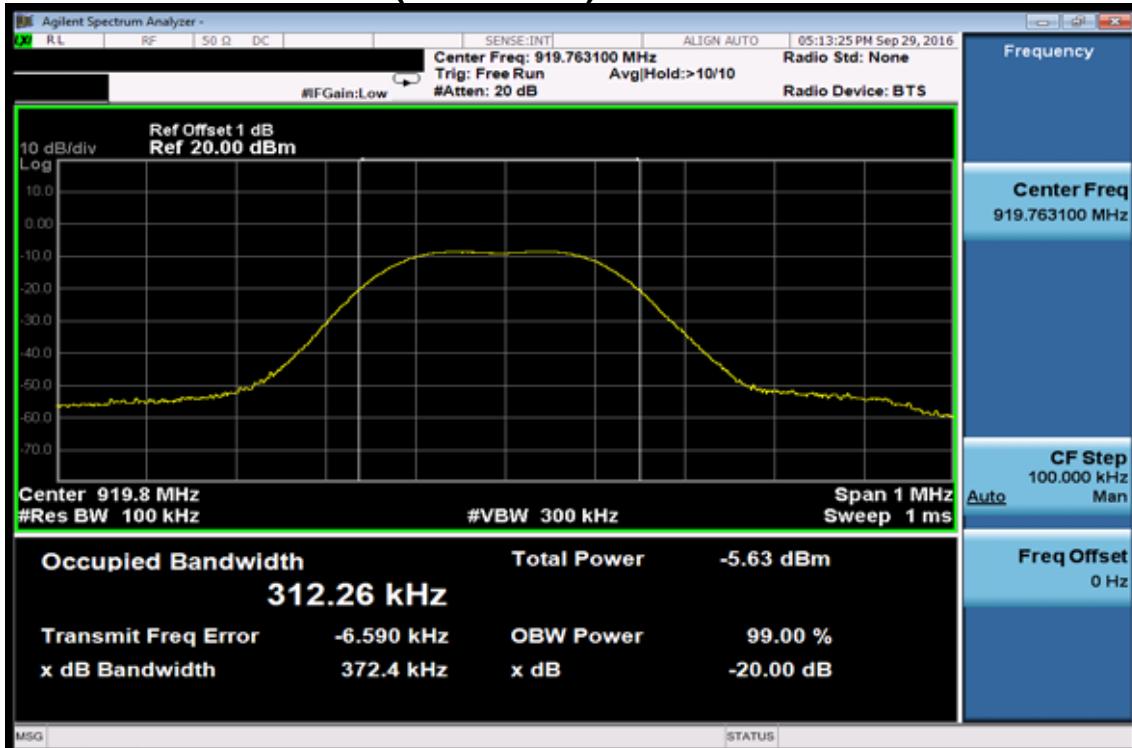
925.0 MHz = 375.5 kHz

Refer to attached data chart.

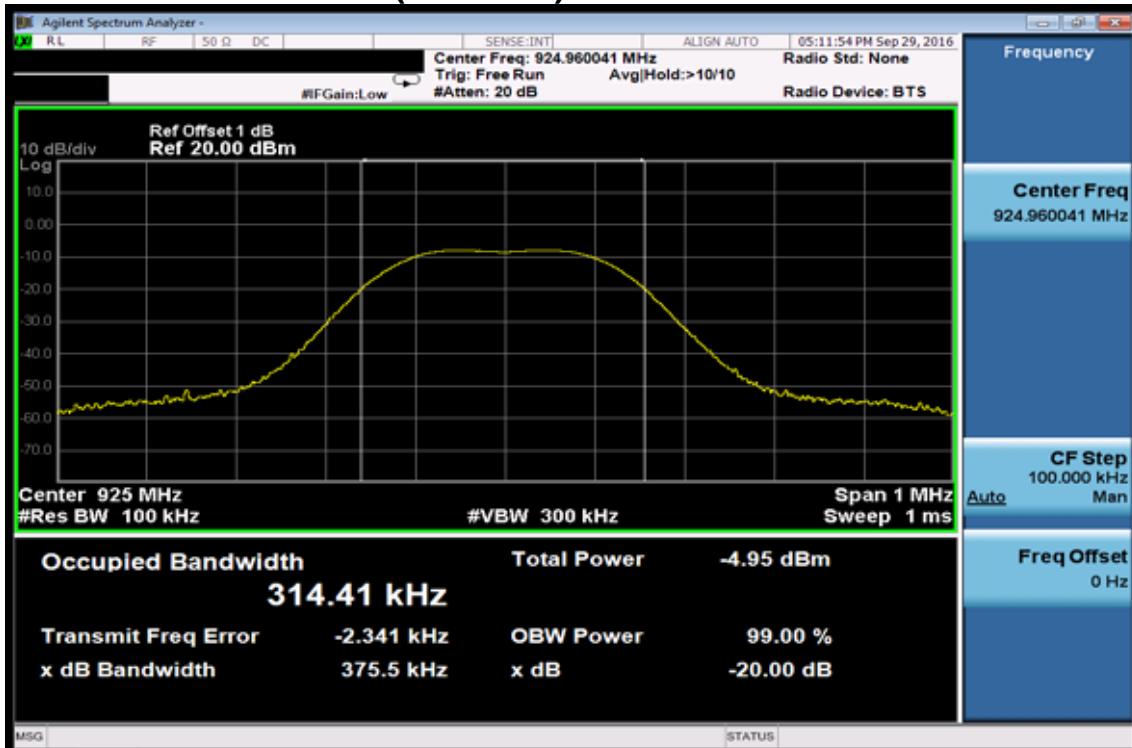
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## 20dB Band Width Test Plot (919.8 MHz)



## 20dB Band Width Test Plot (925 MHz)



*~ End of Report ~*

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