FCC RADIO TEST REPORT

Applicant	:	Shenzhen ORVIBO Electronics Co., Ltd.
Address	:	7F, Block A7, Nanshan I Park, No.1001 Xueyuan Road, Nanshan District, Shenzhen, 518055, PRC
Equipment	:	Door&Window sensor
Model No.	:	SM11
Trade Name	:	ORVIBO
FCC ID	:	2ACLPSM11

I HEREBY CERTIFY THAT :

The sample was received on Oct. 08, 2016 and the testing was carried out on Oct. 18, 2016 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Ray Chou

Assistant Manager

Laboratory Accreditation:

☒ Cerpass Technology Corporation Test Laboratory

NVLAP LAB Code:	**200954-0**
TAF LAB Code:	**1439**

☐ Cerpass Technology(SuZhou) Co., Ltd.

NVLAP LAB Code:	**200814-0**
CNAS LAB Code:	**L5515**

CONTENTS

History of this test report

■ ORIGINAL

☐ Additional attachment as following record:

Attachment No.	Issue Date	Description

1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.10: 2013

KDB 558074 D01 DTS Meas Guidance v03r05

FCC Rules and Regulations Part 15 Subpart C §15.247

FCC Rule	. Description of Test	Result
FCC CFR Title 47 Part 15 Subpart C: Section 15.203/15.247 (b)	. Antenna Requirement	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.207	. AC Power Line Conducted Emission	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.205/15.209; Part2 section 2.1051, 2.1053, 2.1057	. Spurious Emission(Radiated)	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(d); Part2 section 2.1051 and 2.1057	. Spurious Emission(Conducted)	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(a)(2); Part2 section 2.1049	. 6dB Bandwidth	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(b); Part2 section 2.1046	. Maximum Peak Output Power	Pass
FCC CFR Title 47 Part 15 Subpart C: Section 15.247(e)	. Power Spectral Density	Pass

2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Equipment	Door&Window sensor
Model No.	SM11
Modulation Type	O-QPSK
Frequency Range	2405~2475MHz
Channel Number	15 Channels
Antenna Type/ gain	Multilayer Chip Antenna/1.3dBi
Power Rating	DC: 3 V

2.2 Carrier Frequency of Channels

Channel	Frequency(MHz)	Channel	Frequency(MHz)
***11**	**2405**	***19**	**2445**
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	***25**	**2475**
18	2440		

Note: Channels remarked * are selected to perform test.

2.3 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
b. The complete test system included EUT for the RF test.
c. An executive program, “JN51xxProgrammer.exe” which transmits and receives data through ZigBee.
d. The EUT had been tested under operating condition
. After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.
EUT staying in continuous transmitting mode was programmed.
e. Test modes:
Mode 1: Channel Low (2405MHz)
Mode 2: Channel Mid (2445MHz)
Mode 3: Channel High (2475MHz)
.

2.4 Description of Test System

The EUT has been tested as an independent unit together without any other necessary accessories or support units.

2.5 General Information of Test

☒	Test Site	**Cerpass Technology Corporation Test Laboratory** Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582
	FCC	TW1079, TW1061,390316, 228391, 641184
	IC	4934B-1, 4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-3428, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz
☐	Test Site	**Cerpass Technology (Suzhou) Co.,Ltd** Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666
	FCC	916572, 331395
	IC	7290A-1, 7290A-2
	VCCI	T-343 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 for radiated disturbance above 1GHz
Frequency Range Investigated:		Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25000MHz
Test Distance:		The test distance of radiated emission from antenna to EUT is 3 M.

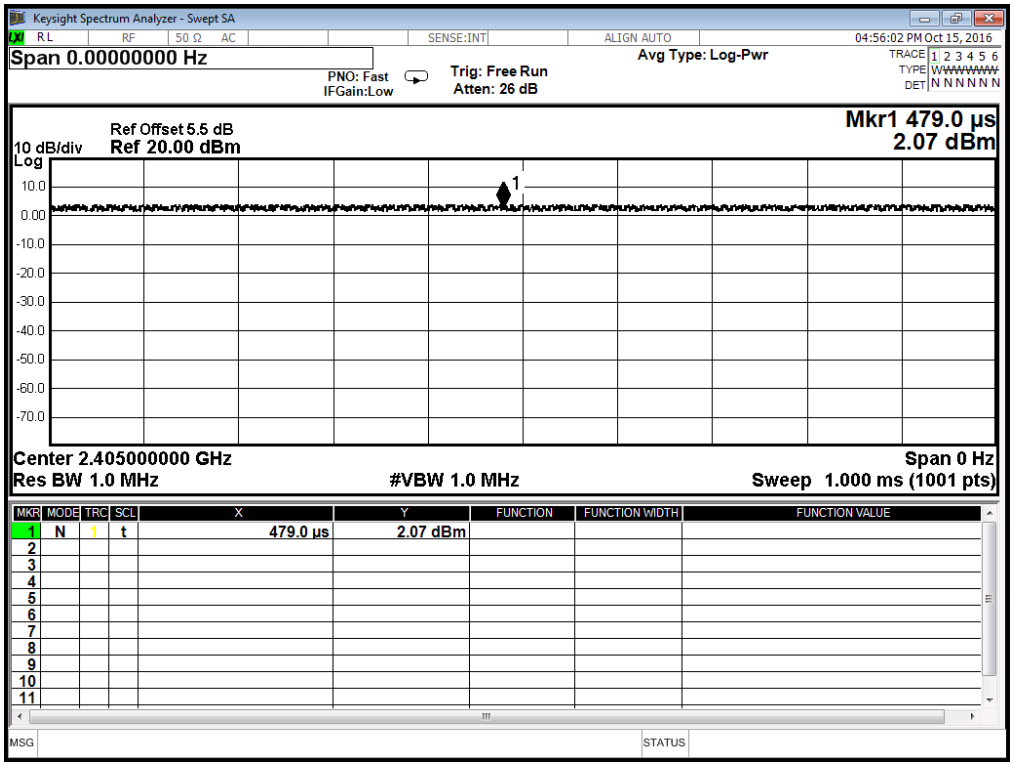
2.6 Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE/NEUTRAL	±2.71 dB
Radiated Emission	9 kHz ~ 30 MHz	Vertical	±3.65dB
		Horizontal	±3.89dB
Radiated Emission	30 MHz ~ 25GHz	Vertical	±4.11 dB
		Horizontal	±4.10 dB
Occupied Bandwidth	---	---	±7500 Hz
Maximum Peak Output Power	---	---	±1.4 dB
Power Spectral Density	---	---	±2.2 dB

2.7 Duty cycle

Test Item	Duty cycle
Test Date	2016-10-15

Frequency (MHz)	Measurement (%)
2405	100
O-QPSK :Channel Low (2405MHz)	



3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Test Receiver	R&S	ESCI	100564	2016.02.22	2017.02.21
LISN	SCHWARZBECK	NSLK 8127	8127748	2016.03.28	2017.03.27
LISN	SCHWARZBECK	NSLK 8127	8127749	2016.03.28	2017.03.27
Pulse Limiter with 10dB Attenuation	SCHWARZBECK	VTSD 9561-F	9561-F106	2016.02.22	2017.02.21
Temperature/ Humidity Meter	mingle	ETH529	N/A	2016.02.22	2017.02.21
AMPLIFIER	HP	8447F	3113A05915	2016.02.22	2017.02.21
Loop Antenna	R&S	HFH2-Z2	100150	2016.04.16	2017.04.15
BILOG Antenna	SCHAFFNER	CBL6112D	22241	2016.02.24	2017.02.23
Horn Antenna	Sunol	DRH-118	A072913	2016.10.12	2017.10.11
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	9170-347	2016.04.16	2017.04.15
Preamplifier	COM-POWER	PA-840	711885	2016.03.26	2017.03.25
Temp&Humidity&barometer	mingle	ETH529	N/A	2016.02.19	2017.02.18
Preamplifier	Fleld	AFS44-00101800-25-10P-44	1579008	2016.09.30	2017.09.29
ESG VECTOR SIGNAL GENERATOR	Agilent	E4438C	MY45092582	2016.06.06	2017.06.05
MXG VECTOR SIGNAL GENERATOR	Agilent	N5182B	MY53050127	2016.06.06	2017.06.05
EXA Signal Analyzer	Agilent	N9020A	US46220290	2016.06.06	2017.06.05
Power sensor	e-channel	ERS-180T-24	TW5451026	2016.06.25	2017.06.24
Series Power Meter	ANRITSU	ML24958A	1224005	2016.03.27	2017.03.26

4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Antenna Construction and Directional Gain

No.	Antenna Type	Antenna Gain
1	Multilayer Chip Antenna	1.3dBi

5. Test of AC Power Line Conducted Emission

5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 6.2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

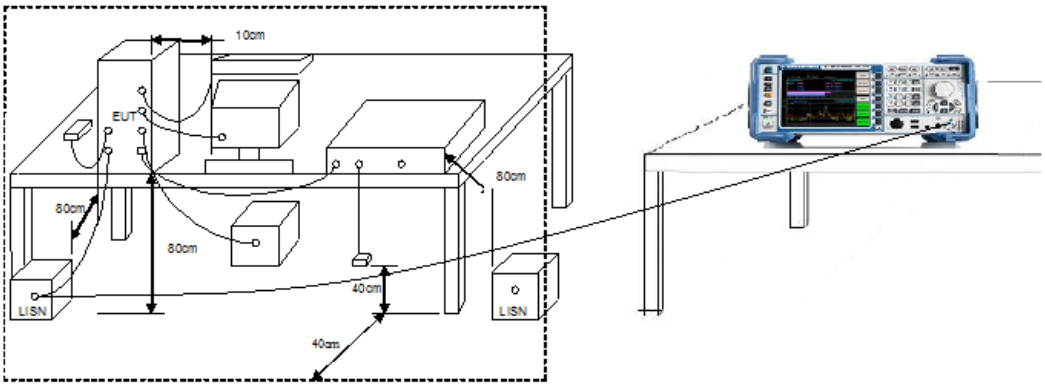
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

5.2 Test Procedures

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of Oct 2014 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

5.3 Typical Test Setup



5.4 Test Result and Data

Non applicable

6. Test of Spurious Emission (Radiated)

6.1 Test Limit

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

FREQUENCIES(MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

6.2 Test Procedures

KDB 558074 D01v03r02 - Section 12.2.3 (quasi-peak measurements)
KDB 558074 D01v03r02 - Section 12.2.4 (peak power measurements)
KDB 558074 D01v03r02 - Section 12.2.5 (average power measurements)

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

RBW as a function of frequency

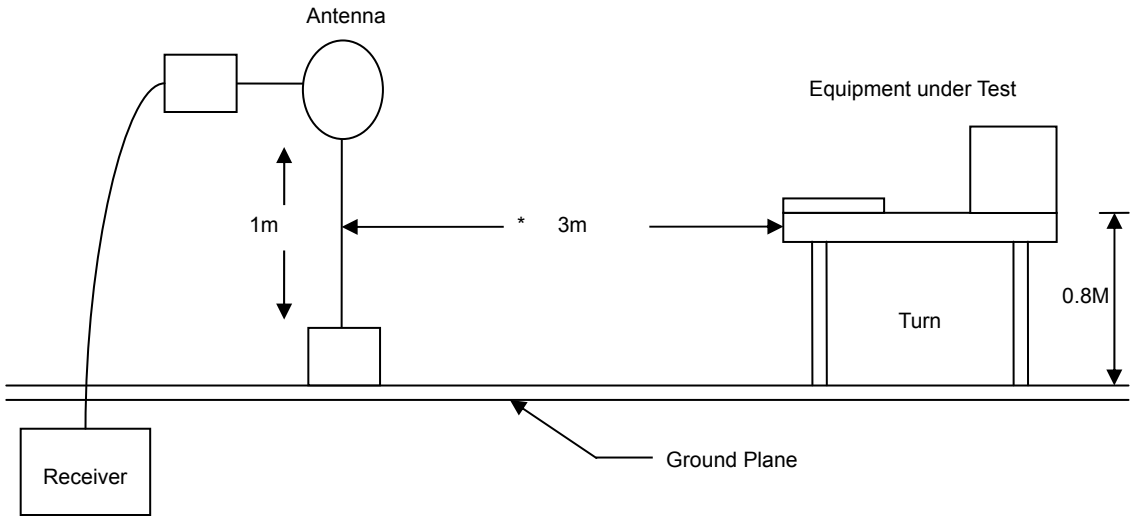
Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

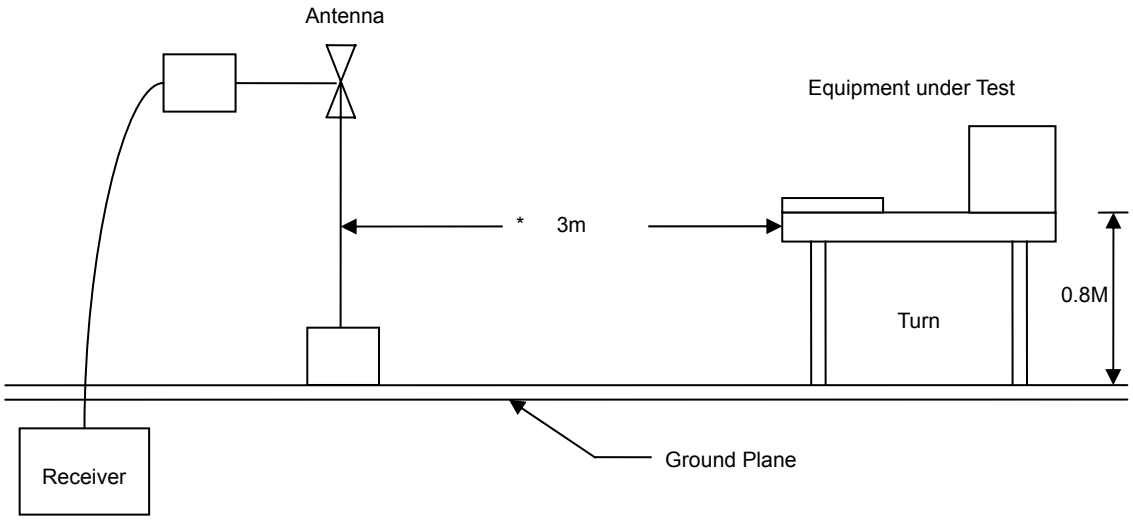
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.3 Typical Test Setup

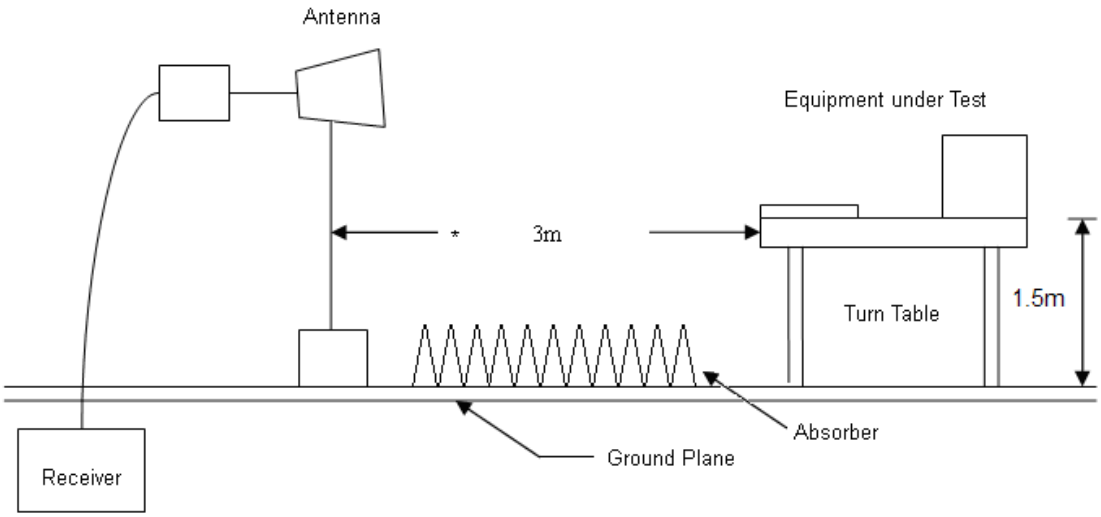
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



6.4 Test Result and Data (9KHz ~ 30MHz)

The 9kHz-30MHz spurious emission is under limit 20dB more.

6.5 Test Result and Data (30MHz ~ 1GHz)

Power	:	DC 3V	Temperature	:	24 °C
Test Mode	:	Normal Link	Humidity	:	54 %
Test date	:	Oct. 15, 2016	Atmospheric Pressure	:	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/QP)
30.0000	H	-3.01	27.93	24.92	40.00	-15.08	QP
90.1400	H	-11.37	30.07	18.70	43.50	-24.80	QP
123.1200	H	-8.27	28.04	19.77	43.50	-23.73	QP
133.7899	H	-9.38	30.10	20.72	43.50	-22.78	QP
382.1099	H	-5.24	26.86	21.62	46.00	-24.38	QP
476.1999	H	-1.25	23.99	22.74	46.00	-23.26	QP
30.0000	V	-3.01	28.38	25.37	40.00	-14.63	QP
44.5500	V	-12.12	35.25	23.13	40.00	-16.87	QP
79.4700	V	-13.56	36.79	23.23	40.00	-16.77	QP
154.1600	V	-11.53	40.93	29.40	43.50	-14.10	QP
166.7700	V	-12.11	37.89	25.78	43.50	-17.72	QP
468.4400	V	-1.73	26.96	25.23	46.00	-20.77	QP

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

6.6 Test Result and Data (1GHz ~ 25GHz)

Power :	DC 3V	Temperature :	24 °C
Test Mode1	Channel Low (2405MHz)	Humidity :	54 %
Test date :	Oct. 15, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/AV)
1467.500	H	-7.91	45.93	38.02	74.00	-35.98	peak
2955.000	H	0.47	41.01	41.48	74.00	-32.52	peak
4485.000	H	7.58	32.14	39.72	74.00	-34.28	peak
4825.000	H	8.27	35.99	44.26	74.00	-29.74	peak
6270.000	H	10.37	32.08	42.45	74.00	-31.55	peak
7247.500	H	13.05	43.09	56.14	74.00	-17.86	peak
7247.500	H	13.05	32.18	45.23	54.00	-8.77	AVG
1807.500	V	-5.84	45.05	39.21	74.00	-34.79	peak
2020.000	V	-4.64	43.80	39.16	74.00	-34.84	peak
3975.000	V	5.02	32.46	37.48	74.00	-36.52	peak
4825.000	V	8.27	40.35	48.62	74.00	-25.38	peak
6822.500	V	11.50	32.26	43.76	74.00	-30.24	peak
7247.500	V	13.05	45.15	58.20	74.00	-15.80	peak
7247.500	V	13.05	35.61	48.66	54.00	-5.34	AVG

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power :	DC 3V	Temperature :	24 °C
Test Mode2	Channel Mid (2445MHz)	Humidity :	54 %
Test date :	Oct. 15, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/AV)
1637.500	H	-6.82	43.96	37.14	74.00	-36.86	peak
2955.000	H	0.47	41.34	41.81	74.00	-32.19	peak
4910.000	H	8.43	35.04	43.47	74.00	-30.53	peak
6227.500	H	10.35	31.71	42.06	74.00	-31.94	peak
6950.000	H	11.92	33.36	45.28	74.00	-28.72	peak
7375.000	H	13.54	39.13	52.67	74.00	-21.33	peak
1637.500	V	-6.82	49.41	42.59	74.00	-31.41	peak
2870.000	V	-0.10	42.07	41.97	74.00	-32.03	peak
4527.500	V	7.71	33.34	41.05	74.00	-32.95	peak
4910.000	V	8.43	40.31	48.74	74.00	-25.26	peak
6270.000	V	10.37	31.52	41.89	74.00	-32.11	peak
7375.000	V	13.54	39.69	53.23	74.00	-20.77	peak

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

Power :	DC 3V	Temperature :	24 °C
Test Mode3	Channel High (2475MHz)	Humidity :	54 %
Test date :	Oct. 15, 2016	Atmospheric Pressure :	1010 hpa

Frequency (MHz)	AntPol. H/V	Correct Factor (dB)	Reading level (dBuV)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector mode (PK/AV)
1425.000	H	-8.29	45.88	37.59	74.00	-36.41	peak
2870.000	H	-0.10	42.10	42.00	74.00	-32.00	peak
4952.500	H	8.51	35.87	44.38	74.00	-29.62	peak
6057.500	H	10.28	31.68	41.96	74.00	-32.04	peak
6950.000	H	11.92	32.45	44.37	74.00	-29.63	peak
7460.000	H	13.87	35.27	49.14	74.00	-24.86	peak
1637.500	V	-6.82	48.72	41.90	74.00	-32.10	peak
2020.000	V	-4.64	46.13	41.49	74.00	-32.51	peak
2870.000	V	-0.10	41.56	41.46	74.00	-32.54	peak
4952.500	V	8.51	40.00	48.51	74.00	-25.49	peak
6482.500	V	10.45	31.59	42.04	74.00	-31.96	peak
7460.000	V	13.87	37.05	50.92	74.00	-23.08	peak

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor

6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.250
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

6.8 Restrict Band Emission Measurement Data

Test Date: Oct. 15, 2016 Temperature: 26℃

Atmospheric pressure: 1018 hPa Humidity: 47%

Channel Low				Fundamental Frequency: 2405 MHz			
Frequency (MHz)	**Factor (dB/m)**	**Reading (dBuV)**	**Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Det.**	**Ant-Pol H/V**
2390.000	-3.05	53.68	50.63	74.00	-23.37	peak	H
2390.000	-3.05	38.76	35.71	54.00	-18.29	AVG	H
2390.000	-3.05	52.36	49.31	74.00	-24.69	peak	V
2390.000	-3.05	37.94	34.89	54.00	-19.11	AVG	V
Channel High				Fundamental Frequency: 2475 MHz			
2483.500	-2.65	52.01	49.36	74.00	-24.64	peak	H
2483.500	-2.65	37.22	34.57	54.00	-19.43	AVG	H
2483.500	-2.65	51.54	48.89	74.00	-25.11	peak	V
2483.500	-2.65	35.85	33.20	54.00	-20.80	AVG	V

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector peak mode) for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3 MHz (detector sample mode) for Average detection at frequency above 1GHz.

7. Test of Spurious Emission (Conducted)

7.1 Test Limit

Below 30dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

KDB 558074 D01v03r02 - Section 11.2 & Section 11.3

1. Reference level measurement

(a) Set instrument center frequency to DTS channel center frequency

(b) Set the span to ≥ 1.5 times the DTS bandwidth

(c) Set the RBW = 100 kHz

(d) Set the VBW ≥ 3 x RBW

(e) Detector = peak

(f) Sweep time = auto couple

(g) Trace mode = max hold

(h) Allow trace to fully stabilize

2. Emission level measurement

(a) Set the center frequency and span to encompass frequency range to be measured

(b) RBW = 100kHz

(c) VBW = 300kHz

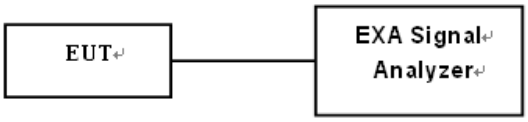
(d) Detector = Peak

(e) Trace mode = max hold

(f) Sweep time = auto couple

(g) The trace was allowed to stabilize

7.3 Test Setup Layout



7.4 Test Result and Data

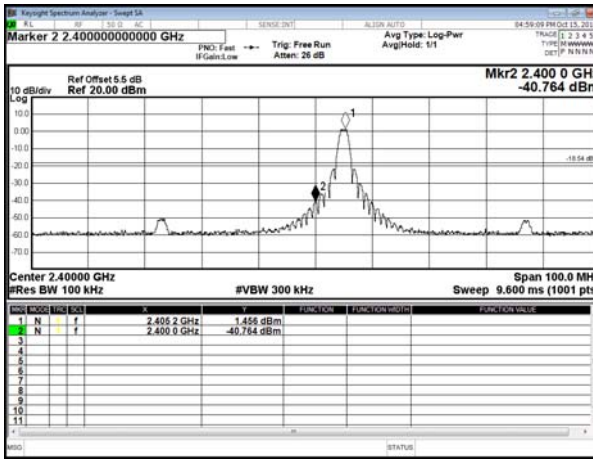
Test Date: Oct. 15, 2016 Temperature: 24℃

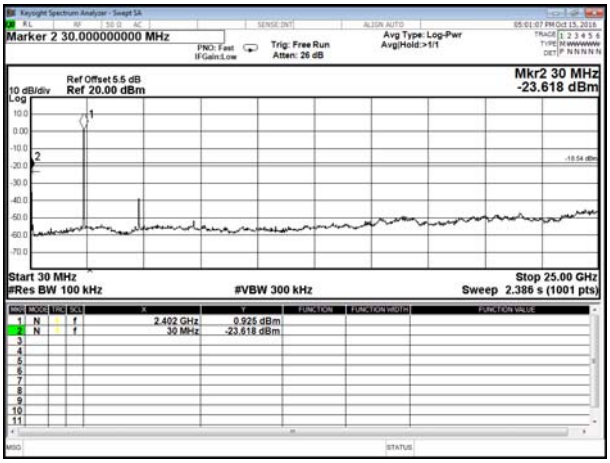
Atmospheric pressure: 1014 hPa Humidity: 47%

Modulation Standard	Channel	Frequency (MHz)	Test Result
O-QPSK	Low	2405	Pass
	Middle	2445	Pass
	High	2475	Pass

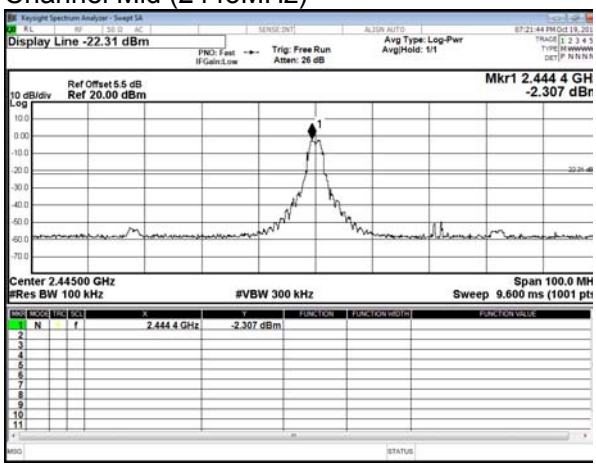
Note: Test plots refer to the following pages.

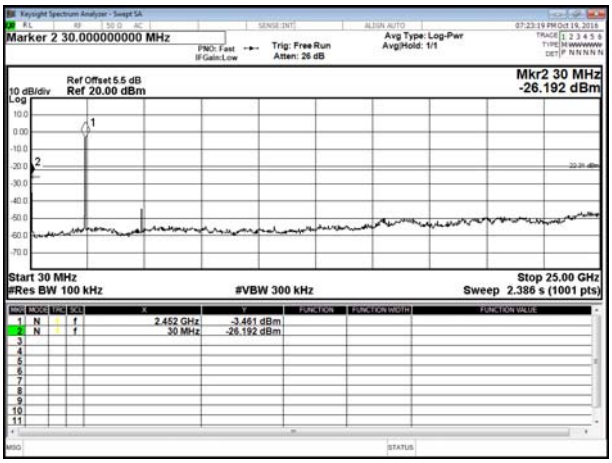
Channel Low (2405MHz)
CH01



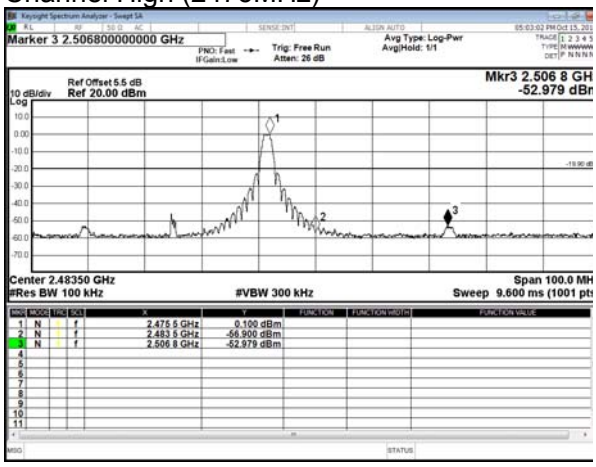


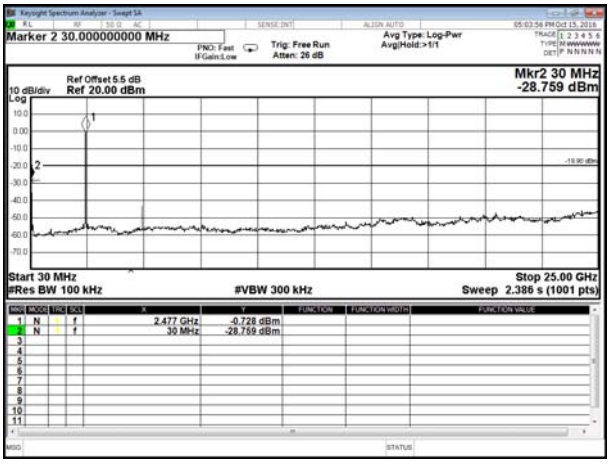
Channel Mid (2445MHz)





Channel High (2475MHz)





8. 6dB Bandwidth Measurement Data

8.1 Test Limit

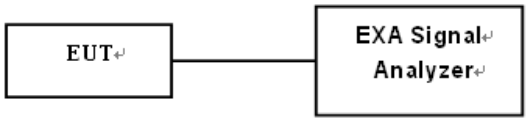
The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

Per KDB558074 D01v03r05, section8.2 option2, test procedure

a. The transmitter output was connected to the spectrum analyzer.
b. Set RBW of spectrum analyzer to 100 KHz and VBW to 300 KHz.
c. Set spectrum analyzer X dB to 6 dB.
d. Set spectrum analyzer peak detector with maximum hold.

8.3 Test Setup Layout



8.4 Test Result and Data

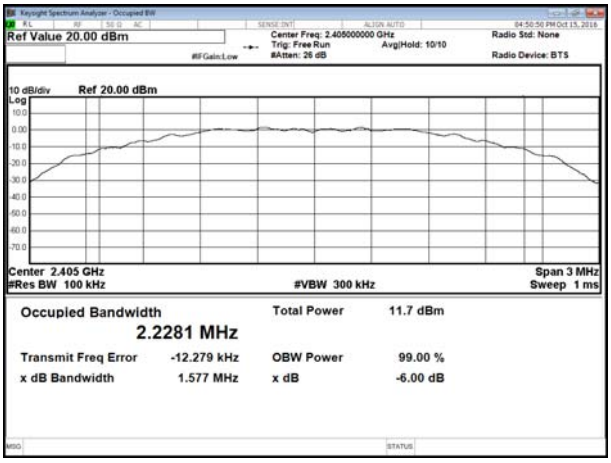
Test Date: Oct. 15, 2016 Temperature: 24℃

Atmospheric pressure: 1016 hPa Humidity: 46%

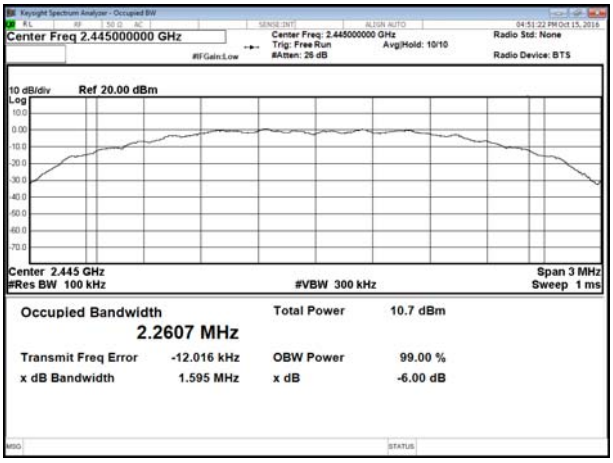
Modulation Standard	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
O-QPSK	Low	2405	1.577
	Middle	2445	1.595
	High	2475	1.589

Modulation Type: O-QPSK

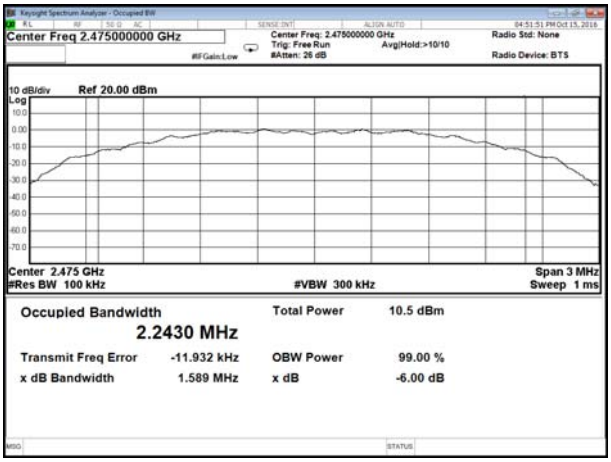
CH Low



CH Middle



CH High



9. Maximum Peak Output Power

9.1 Test Limit

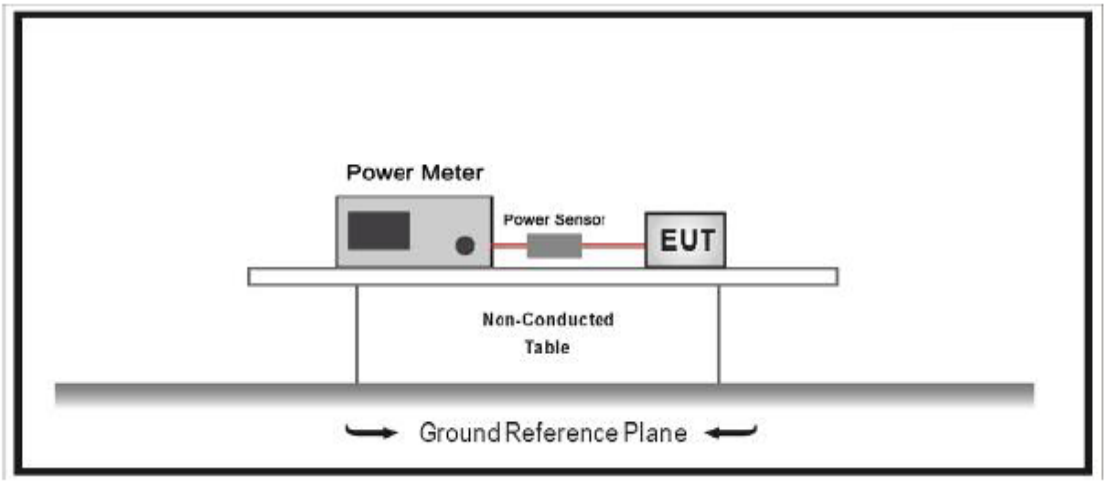
The Maximum Peak Output Power Measurement is 30dBm.

9.2 Test Procedures

Test procedure refers to KDB558074 D01v03r05, section9.1.2 PKPM1 Peak power meter method.

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

9.3 Test Setup Layout



9.4 Test Result and Data

Test Date: Oct. 15, 2016 Temperature: 24℃

Atmospheric pressure: 1016 hPa Humidity: 46%

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
			Peak	Peak
O-QPSK	Low	2405	2.64	1.84
	Middle	2445	1.76	1.50
	High	2475	1.89	1.55

10. Power Spectral Density

10.1 Test Limit

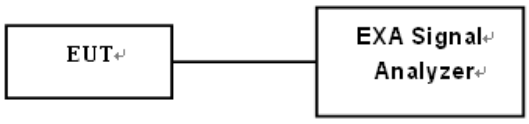
The Maximum of Power Spectral Density Measurement is 8dBm.

10.2 Test Procedures

Test procedure refers to section 10.3 Method AVGPSD-1.

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

10.3 Test Setup Layout



10.4 Test Result and Data

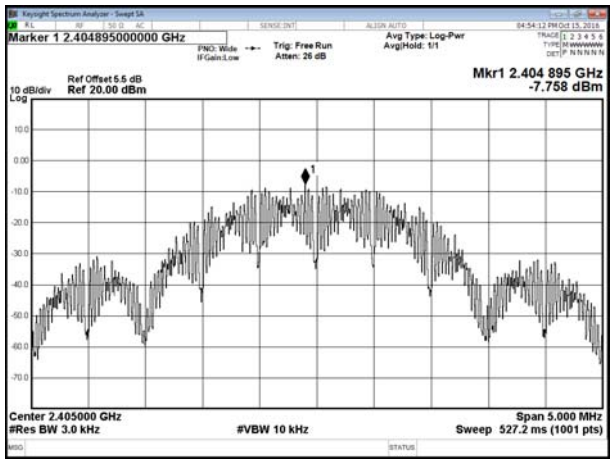
Test Date: Oct. 15, 2016 Temperature: 24℃

Atmospheric pressure: 1014 hPa Humidity: 47%

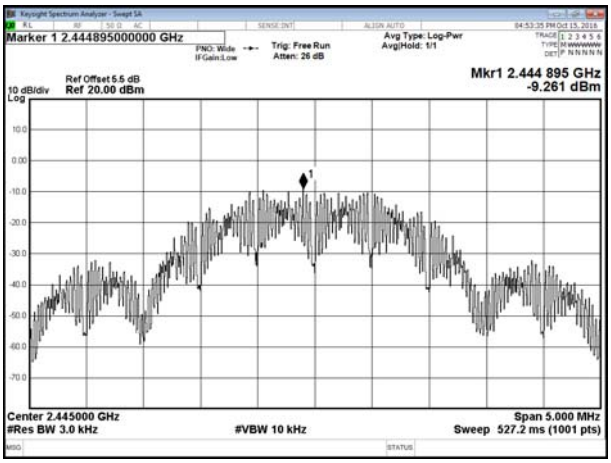
Modulation Standard	Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)
O-QPSK	Low	2405	-7.758
	Middle	2445	-9.261
	High	2475	-9.742

Modulation Type: O-QPSK

CH Low



CH Middle



CH High