

**Estech Co., Ltd.**347-69, Jungbu-daero 147beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do 467-811, R. O. Korea

TEL : +82 31 6318037 FAX : +82 31 6318039 www.estech.co.kr

**Test Report for FCC**

FCC ID : W6YPT200

Report Number		ESTF151505-001		
Applicant	Company name	PASSTECH CO., LTD		
	Address	1305, Kranz Techno, 388, Dunchon-daero, Jungwon-go , Seongnam-si, Gyeonggi-do , South Korea , 462-120		
	Telephone	82-31-743-7277		
	Contact person	Hyung-Mo Park		
Product	Product name	LOCKER LOCK		
	Model No.	PT200	Manufacturer	PASSTECH CO., LTD
	Serial No.	None	Country of origin	KOREA
Test date	2015-05-14 ~ 2015-05-22		Date of issue	28-May-15
Testing location	347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do 467-811, R. O. Korea			
Standard	FCC PART 15 Subpart C (15.247), ANSI C 63.10(2009) , KDB 558074 D01(2014)			
Measurement facility registration number		659627		
Tested by	Senior Engineer K.H. Chung		(Signature)	
Reviewed by	Engineering Manager J.M. Yang		(Signature)	
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable			
<b>* Note</b> - This test report is not permitted to copy partly without our permission - This test result is dependent on only equipment to be used - This test result based on a single evaluation of one sample of the above mentioned				

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## Contents

1. Laboratory Information .....	3
2. Description of EUT .....	4
3. Test Standards .....	5
4. Measurement condition .....	6
5. DTS bandwidth .....	10
5.1 Test procedure .....	10
5.2 Test instruments and measurement setup .....	10
5.3 Measurement results .....	10
5.4 Trace data .....	11
6. Maximum Peak Output Power .....	13
6.1 Test procedure .....	13
6.2 Test instruments and measurement setup .....	13
6.3 Measurement results .....	13
7. Maximum conducted (average) output power .....	14
7.1 Test procedure .....	14
7.2 Test instruments and measurement setup .....	14
7.3 Measurement results .....	14
7.4 Trace data(Peak, Average).....	15
8. Maximum power spectral density level in the fundamental emission .....	18
8.1 Test procedure .....	18
8.2 Test instruments and measurement setup .....	18
8.3 Measurement results .....	18
8.4 Trace data .....	19
9. Emissions in non-restricted frequency bands .....	21
9.1 Test procedure .....	21
9.2 Test instruments and measurement setup .....	21
9.3 Measurement results .....	21
9.4 Trace data of band-edge & out of emissioin .....	22
10. Measurement of radiated emission .....	26
10.1 Measurement equipment .....	26
10.2 Environmental conditions .....	26
10.3 Measurement Instrument setting for Radiated Emission .....	27
10.4 Test Data for fully mode.....	28
11. Measurement of conducted emission .....	36
11.1 Measurement equipment .....	36
11.2 Environmental conditions .....	36
11.3 Test Data .....	37
12. Photographs of test setup .....	38
12.1.Setup for Radiated Test : (30 ~ 1 000) MHz .....	38
12.2.Setup for Radiated Test : Above 1 GHz .....	39
12.3. Setup for Conducted Test : (0.15 ~ 30) MHz.....	40
12.4. Photographs of EUT .....	41

Appendix 1. Special diagram

Appendix 2. Antenna Requirement



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## 1. Laboratory Information

### 1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.

ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

### 1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu, Seoul 153-759, R. O. Korea

EMC/Telecom/Safety Test Lab : 347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si,  
Gyeonggi-do 467-811, R. O. Korea

### 1.3 Official Qualification(s)

MSIP : Granted Accreditation from Ministry of Information & Communication for EMC, Safety  
and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC  
requirements

FCC : Conformity Assessment Body(CAB) with registration number 659627 under  
APEC TEL MRA between the RRA and the FCC

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

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## 2. Description of EUT

### 2.1 Summary of Equipment Under Test (Bluetooth)

Modulation Type	: SRD (DSSS)
Transfer Rate	: 1 Mbps
Number of Channel	: 15 ch
PEAK Output Power	: - 5.56 dBm
Rating	: DC 6.0 V (1.5 V, AA Battery x 4 EA)
Receipt Date	: 5-Feb-15
X-tal list(s) or Frequencies generated	: The highest operating frequency is 2 475 MHz (32.786 kHz, 3.57 MHz, 8 MHz, 27.12 MHz)

### 2.2 General descriptions of EUT

- ▶ Dimension(touch pad main body only) : (52 x 86 x 16) mm, (W x H x D) mm
- ▶ Weight(without battery and battery pack) : ≒ 180 g
- ▶ Power : DC 6.0 V(1.5 V, alkaline batteries AA Size, 4 EA) & battery pack in port





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## 3. Test Standards

### Test Standard : FCC PART 15 Subpart C (15.247)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

### Test Method : ANSI C 63.10 (2009) & KDB558074 D01(2014)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.

### Summary of Test Results

Applied Standard : 47 CFR Part 15 Subpart C				remark
Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	N/A	Meet the requirement	
15.205 & 15.209	Restricted band / Intentional Radiated Emission	Pass	Meet the requirement	
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement	Min. 500 kHz
	99 % Bandwidth			
15.247(b)(3)	Maximum Peak/average output power	Pass	Meet the requirement	Max. 30 dBm
15.247(c)	Transmitter Radiated Emission	Pass	Meet the requirement	Table 15.209
15.247(e)	Power Spectral Density	Pass	Meet the requirement	Max. 8 dBm
15.247(d)	Band Edge Measurement	Pass	Meet the requirement	20 dB less

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## 4. Measurement Condition

### 4.1 EUT Operation

#### a. Channel

Ch.	Frequency	Ch.	Frequency
11	2 405 MHz	19	2 445 MHz
12	2 410 MHz	20	2 450 MHz
13	2 415 MHz	21	2 455 MHz
14	2 420 MHz	22	2 460 MHz
15	2 425 MHz	23	2 465 MHz
16	2 430 MHz	24	2 470 MHz
17	2 435 MHz	25	2 475 MHz
18	2 440 MHz		

b. Measurement Channel : SRD : Low(2 405 MHz), Middle(2 440 MHz),High(2 475 MHz)

c. Test Mode : Continuous Output, DSSS

d. Test rate : 1 Mbps



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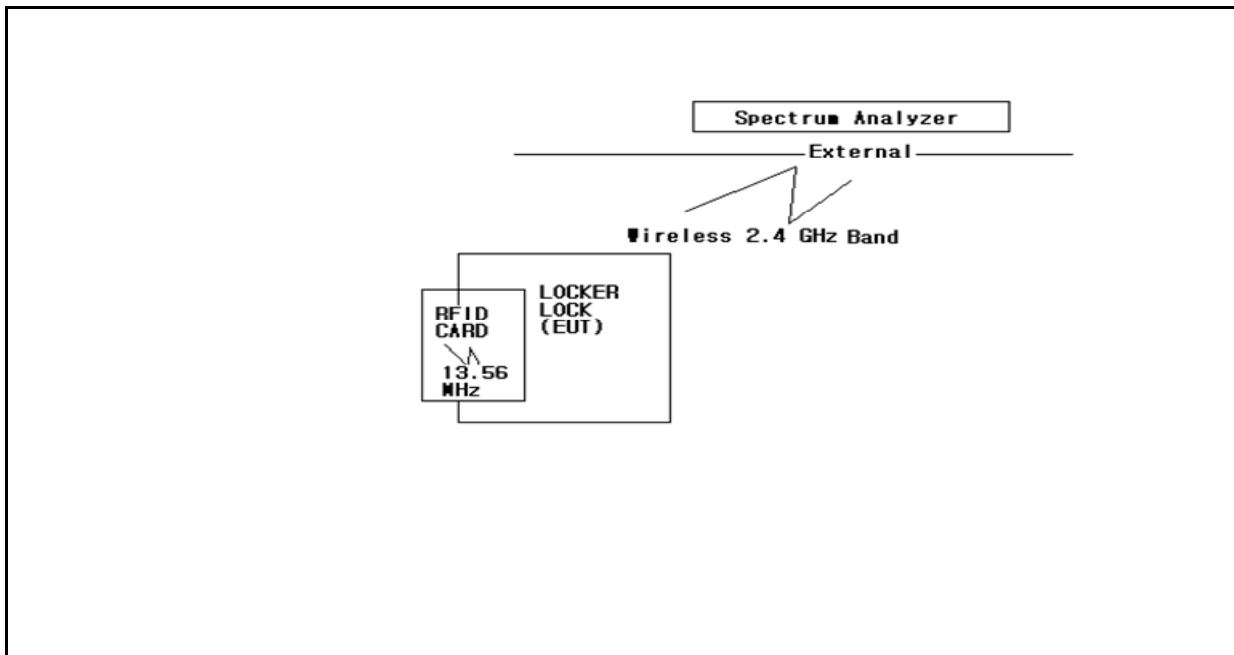
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### 4.2 EUT Operation.

-The EUT was tested, tested under transmission/receiving condition continuously between the EUT

1. Check normal communication with RF OUT Frequency(13.56 MHz / 2.4 GHz Band).
2. The EUT is connected to the external wireless Spectrum Analyzer operation test.

### 4.3 Configuration and Peripherals



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#### 4.4 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
LOCKER LOCK	PT200	NONE	PASSTECH CO., LTD	EUT
RFID CARD	NONE	NONE	PASSTECH CO., LTD	

#### 4.5 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
LOCKER LOCK	WIRELESS (2.4 GHz)	Spectrum Analyzer (External)	WIRELESS (2.4 GHz)	-	-	
LOCKER LOCK	RFID(13.56 MHz)	RFID CARD	RFID(13.56 MHz)	-	-	





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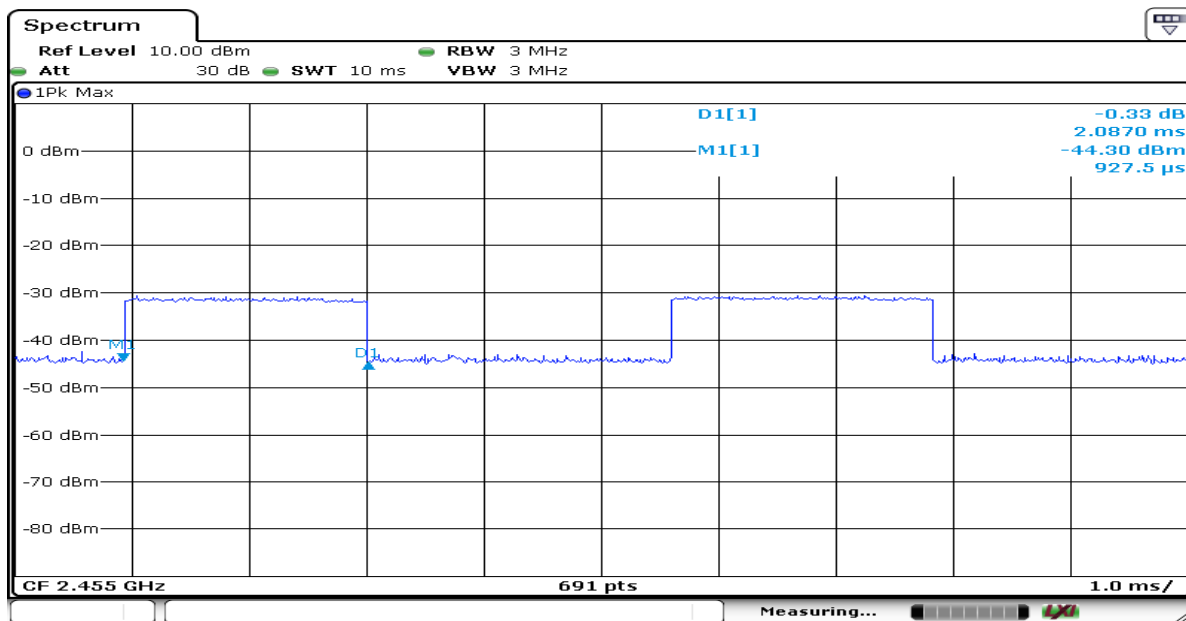
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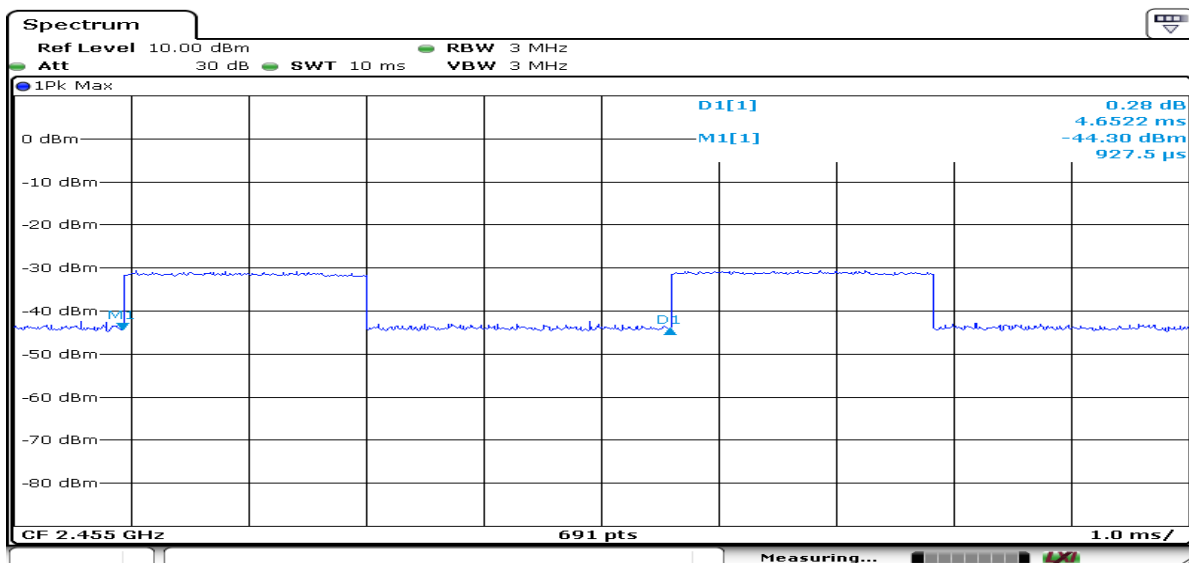
### 4.6 DUTY CYCLE OF TEST SIGNAL

Duty cycle is < 98%, duty factor shall be considered.

duty cycle =  $2.087/4.652=0.449$ , duty factor =  $10 \cdot \log(1/0.449)=3.48$



Date: 22.MAY.2015 15:49:20



Date: 22.MAY.2015 15:50:03

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## 5. DTS bandwidth

### 5.1 Test procedure

558074 D01 DTS Meas Guidance v03v02 8.2 Option 2 :The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e.,  $RBW = 100\text{ kHz}$ ,  $VBW \geq 3 \times RBW$ , peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq 6\text{ dB}$ .

### 5.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

- .  $RBW = 100\text{ kHz}$
- .  $VBW \geq 3 \times RBW$
- . Span =  $10\text{ MHz}$
- . Sweep = suitable duration based on the EUT specification.

Limits : FCC § 15.247(a)(2)

#### 6dB Bandwidth Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	15-Jan-16
RF Cable	Length: 10 cm	–	
–Spectrum Analyzer $\Leftrightarrow$ EUT	Loss: 1.0dB	–	

### 5.3 Measurement results

EUT	LOCKER LOCK	MODEL	PT200
MODE	DSSS	ENVIRONMENTAL CONDITION	24.0 °C, 44.0 % R.H.
INPUT POWER	6.0 Vd.c.		

Channel Frequency (MHz)	Emission bandwidth	Bandwidth at 6dB below(MHz)	Minimum Limit (MHz)	PASS/FAIL
2 405	2.64 MHz	1.62	0.5	PASS
2 440	2.62 MHz	1.62	0.5	PASS
2 475	2.60 MHz	1.62	0.5	PASS



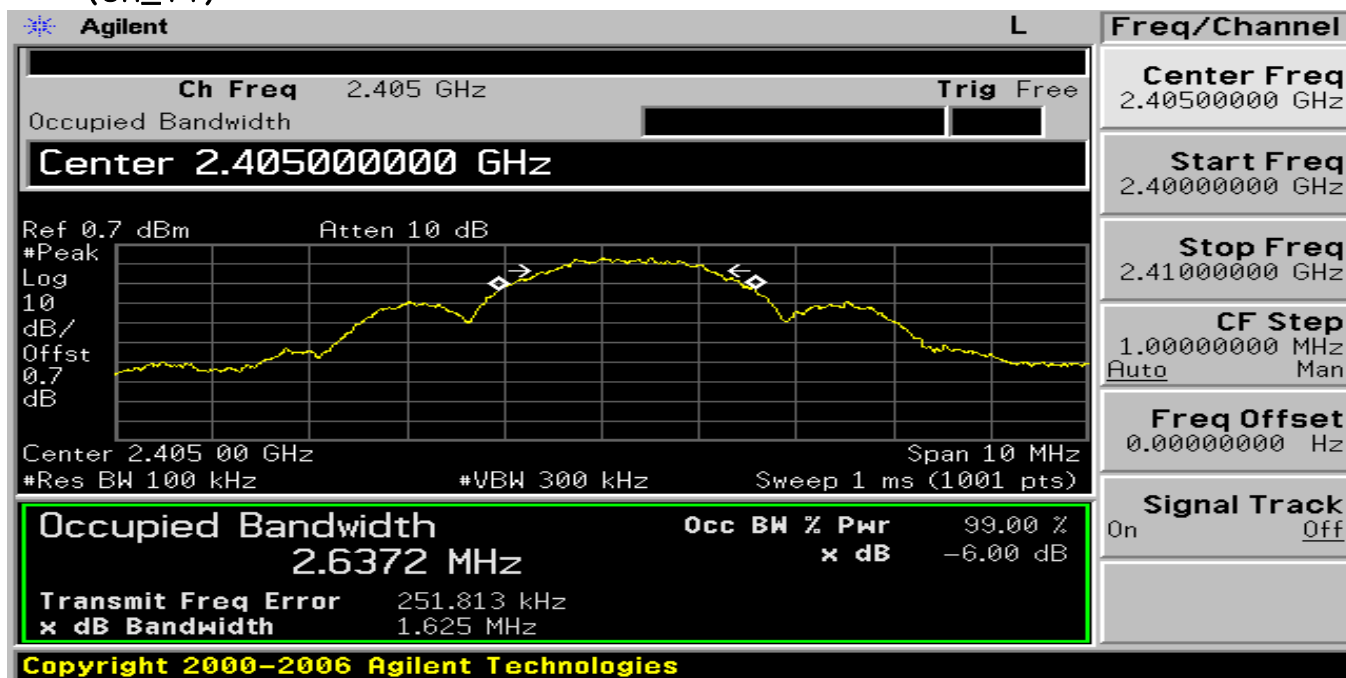
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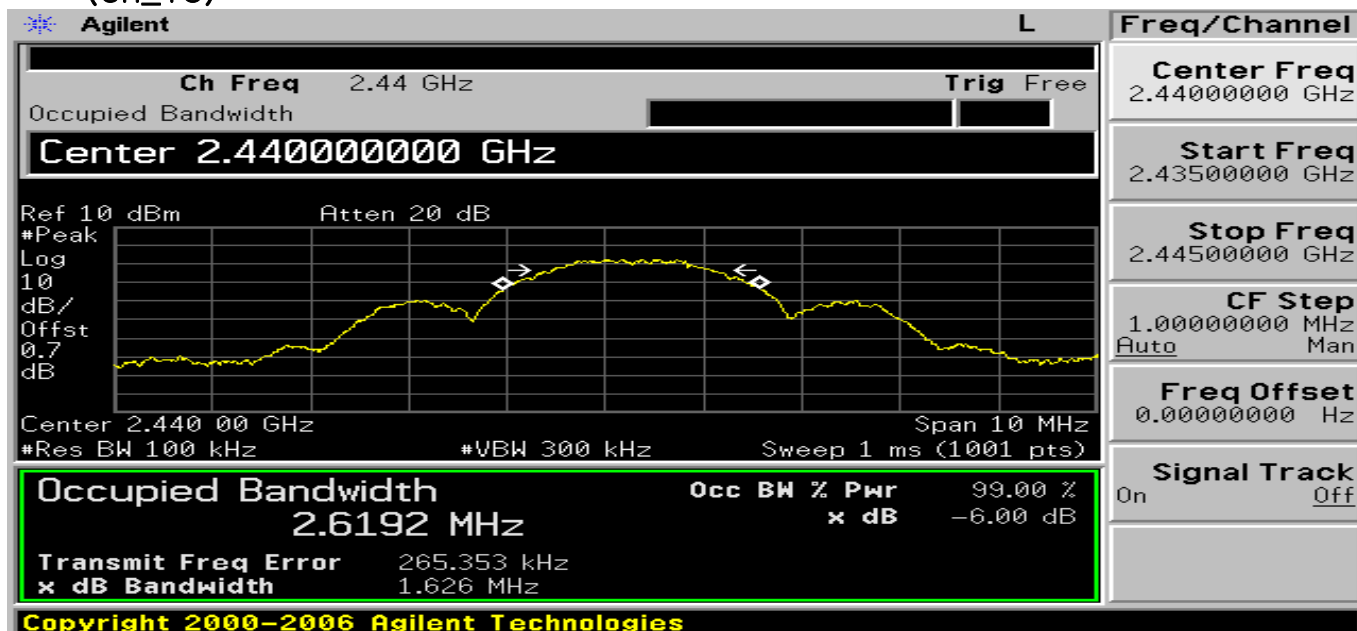
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## 5.4 Trace data

(ch\_11)



(ch\_18)



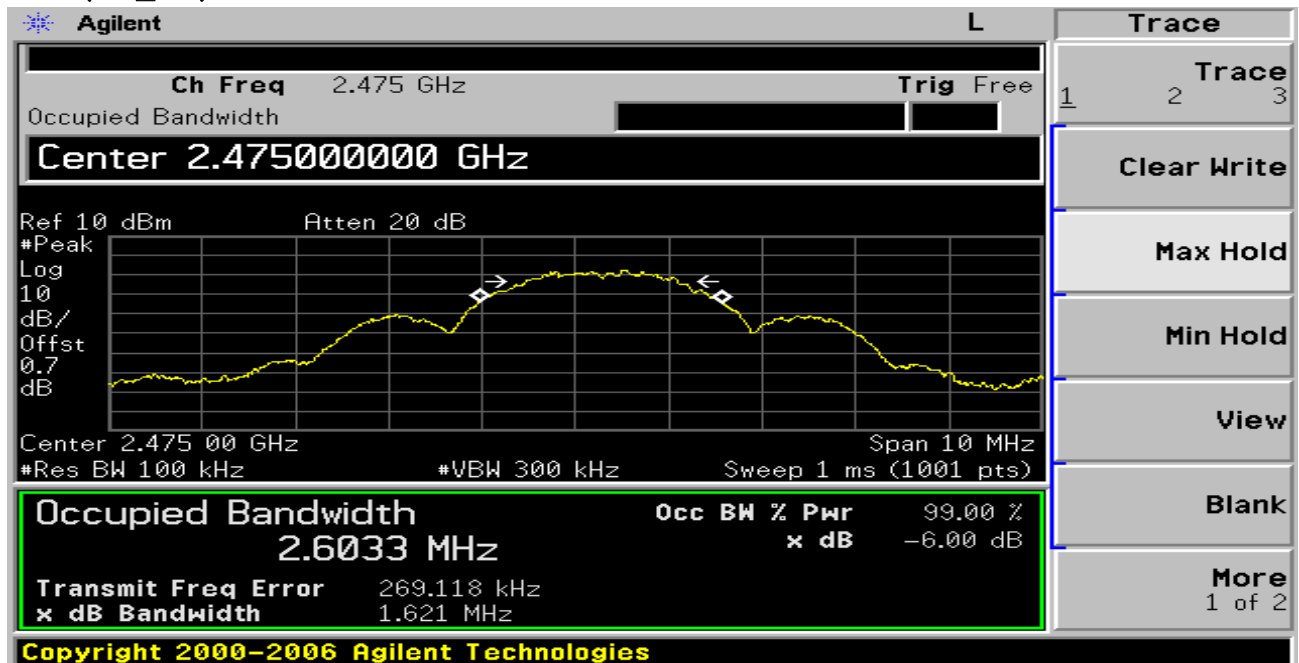


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(ch\_25)



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## 6. Maximum peak conducted output power

### 6.1 Test procedure

KDB 558074 D01 DTS Meas Guidance V03r02 9.1.1 Integrated band power method

### 6.2 Test instruments and measurement setup

- Set the RBW = 1 MHz.
- Set VBW  $\geq 3 \times$  RBW.
- Set span  $\geq 3 \times$  RBW
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.

Limits : FCC § 15.247

#### Maximum Peak Output Power Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	15-Jan-16
RF Cable	Length: 10 cm	–	
–Spectrum Analyzer <=> EUT	Loss: 1.0 dB	–	

### 6.3 Measurement results

EUT	LOCKER LOCK	MODEL	PT200
MODE	DSSS	ENVIRONMENTAL CONDITION	24.0 °C, 43.0 % R.H.
INPUT POWER	6.0 Vd.c.		

CHANNEL	Channel frequency (MHz)	Conducted Power Output(dBm)			Limit[1W] (dBm)	PASS/FAIL
		Detector	(dBm)	(mW)		
11	2 405	PEAK	–5.56	0.28	30.0	PASS
18	2 440	PEAK	–6.18	0.24	30.0	PASS
25	2 475	PEAK	–6.51	0.22	30.0	PASS

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**7. Maximum conducted (average) output power****7.1 Test procedure**

KDB 558074 D01 DTS Meas Guidance V03r02 9.2.2.4 Method AVGSA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction)

**7.2 Test instruments and measurement setup**

- Measure the duty cycle,  $x$ , of the transmitter output signal as described in 6.0.
- Set span to at least 1.5 times the OBW.
- Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- Set VBW  $\geq 3 \times$  RBW.
- Number of points in sweep  $\geq 2 \times$  span / RBW. (This gives bin-to-bin spacing  $\leq$  RBW/2, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- Do not use sweep triggering. Allow the sweep to "free run".
- Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.
- Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- Add  $10 \log (1/x)$ , where  $x$  is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \log (1/0.25) = 6$  dB if the duty cycle is 25 %.

**Maximum Peak Output Power Test Instruments**

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	15-Jan-16
RF Cable	Length: 10 cm	-	
-Spectrum Analyzer <=> EUT	Loss: 1.0 dB	-	

**7.3 Measurement results**

EUT	LOCKER LOCK	MODEL			PT200	
MODE	DSSS	ENVIRONMENTAL CONDITION			24 °C, 43 % R.H.	
INPUT POWER	5Vdc					
CHANNEL	Channel frequency (MHz)	Conducted Power Output(dBm)			Measured + Duty Cycle(dBm)	Measured + Duty Cycle(mW)
		Detector	(dBm)	Duty Cycle		
11	2402	AVG	-5.73	0.449	-5.281	0.296
18	2442	AVG	-6.31	0.449	-5.861	0.259
25	2480	AVG	-6.71	0.449	-6.261	0.237



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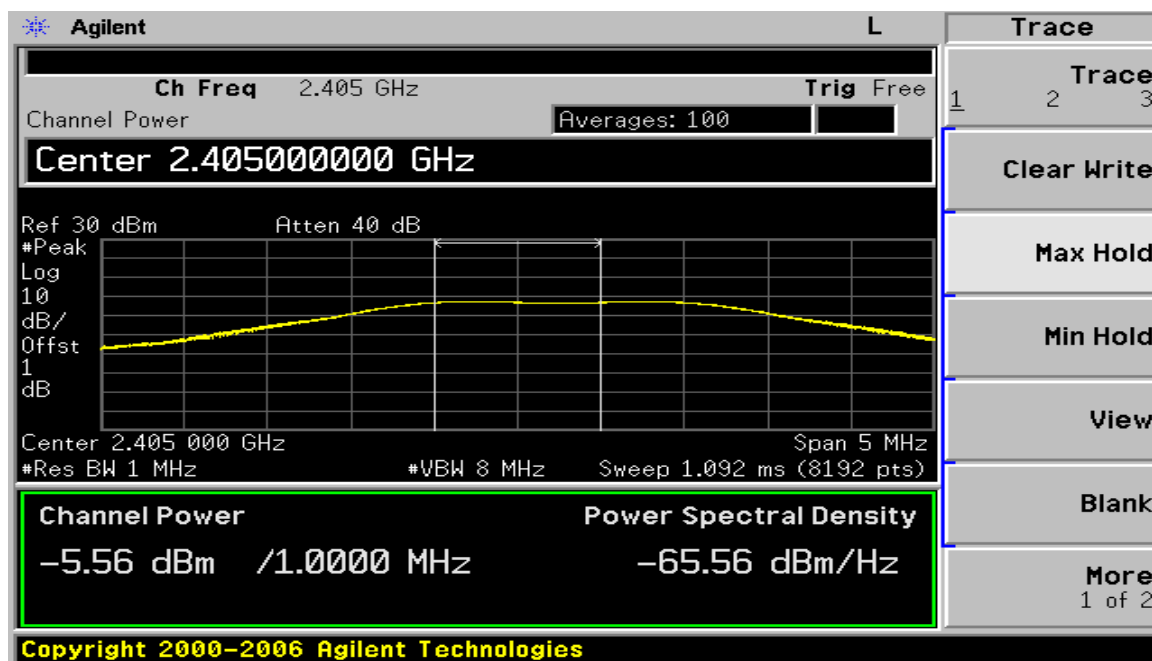
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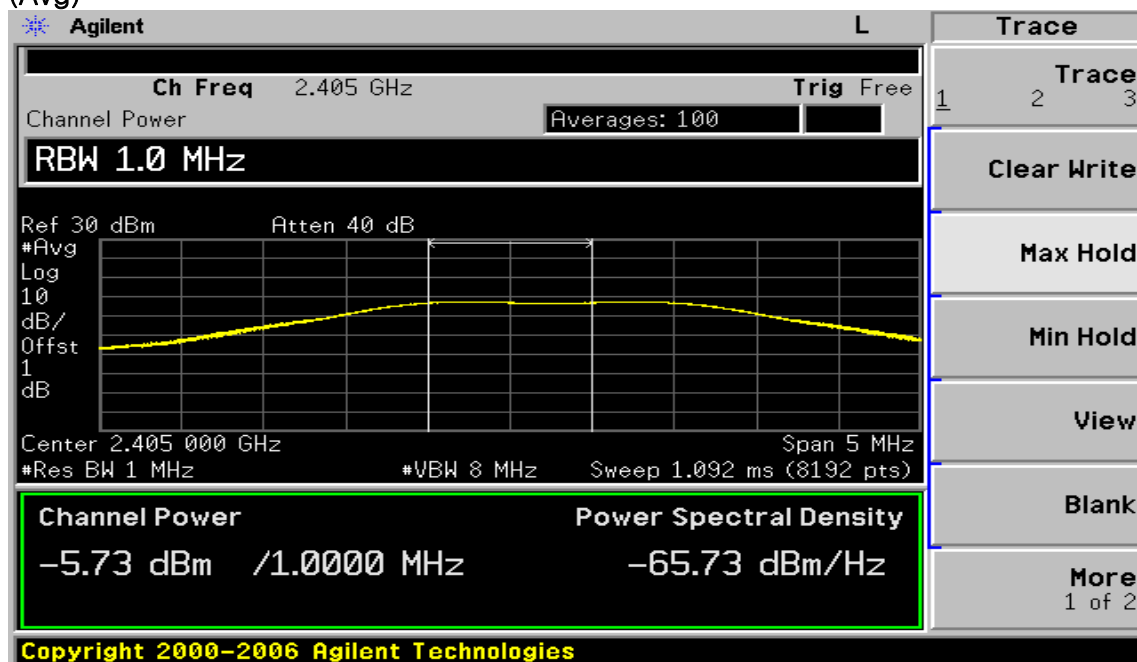
### 7.4 Trace data (Peak, Average)

(ch\_11)

(Peak)



(Avg)





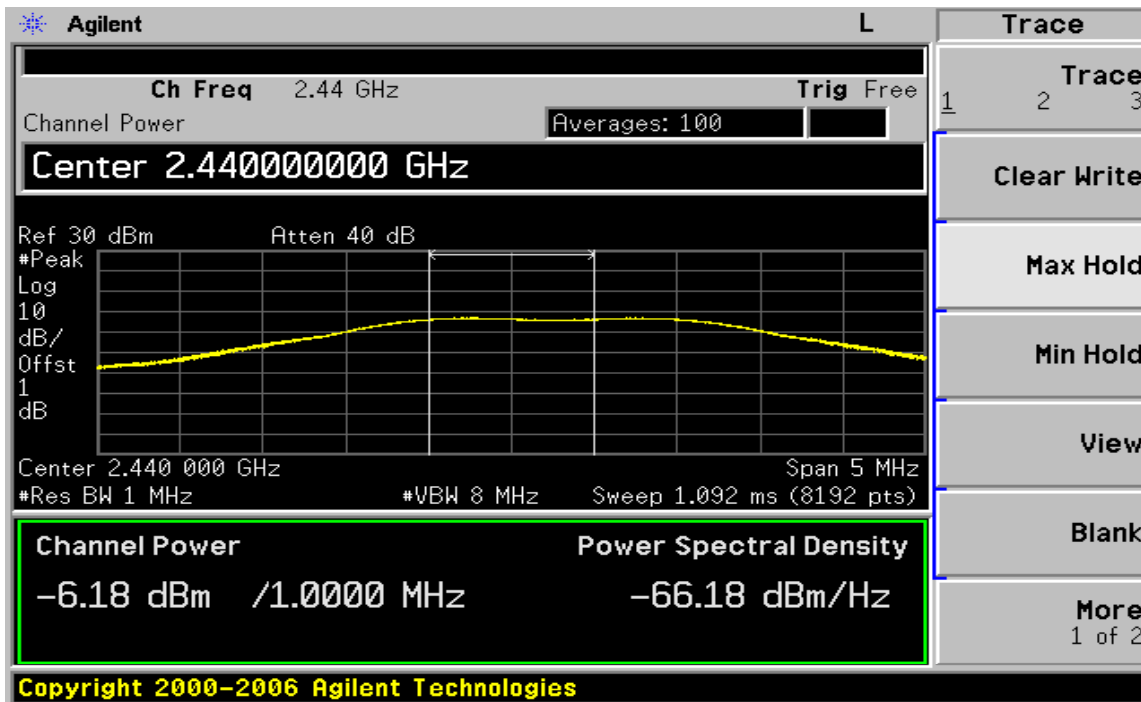
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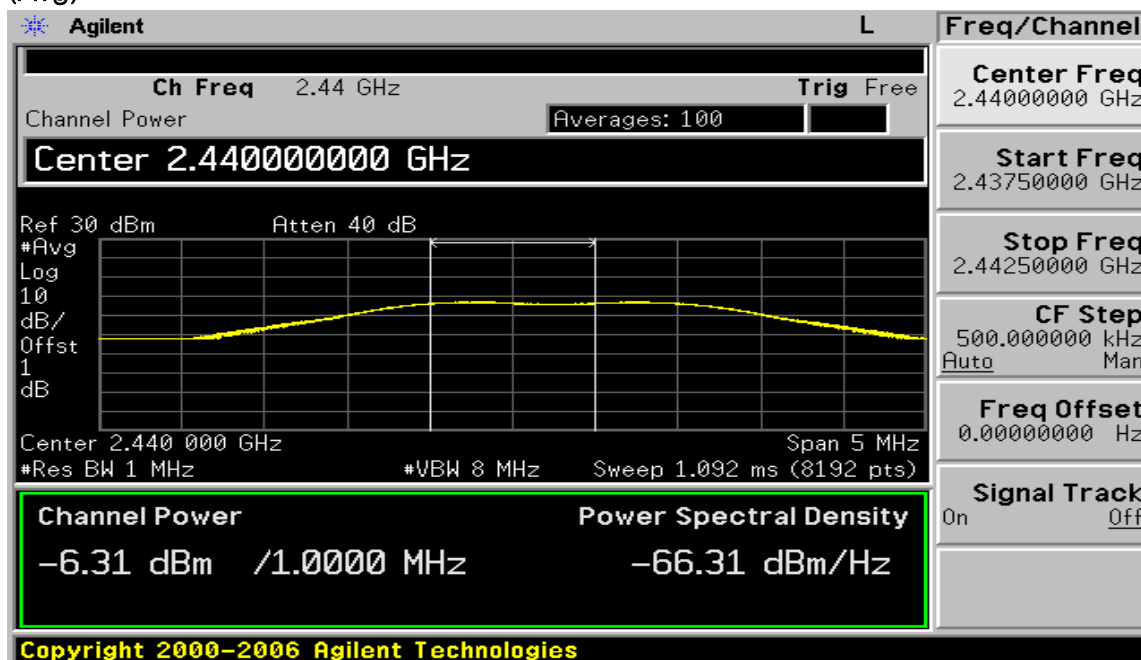
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(ch\_18)

(Peak)



(Avg)







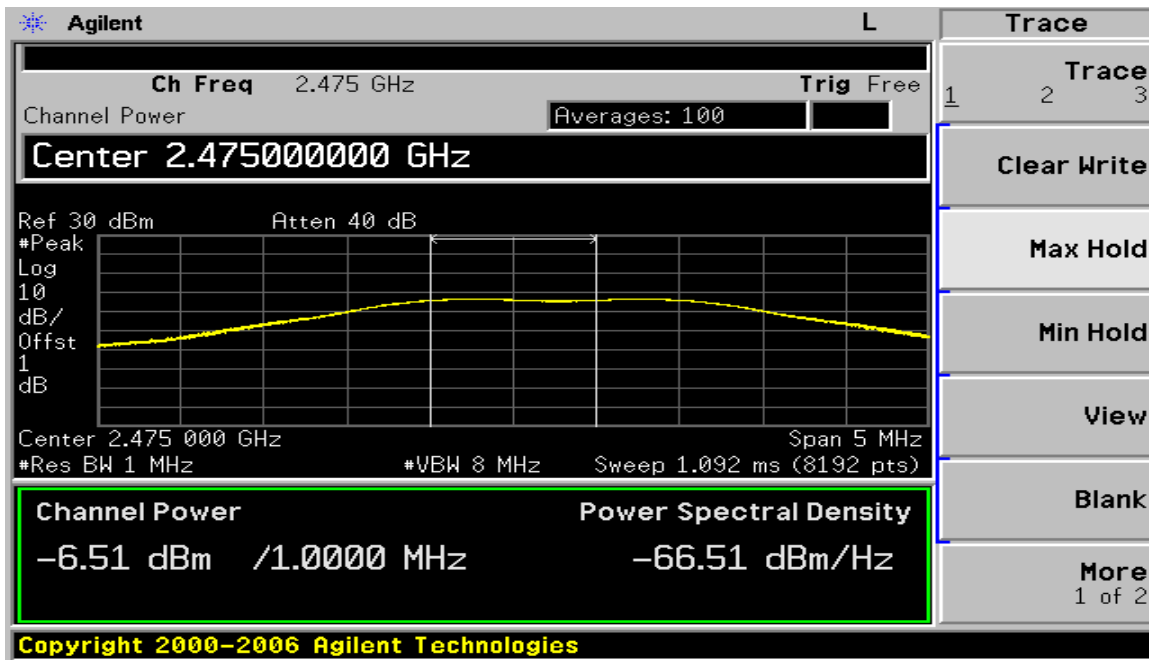
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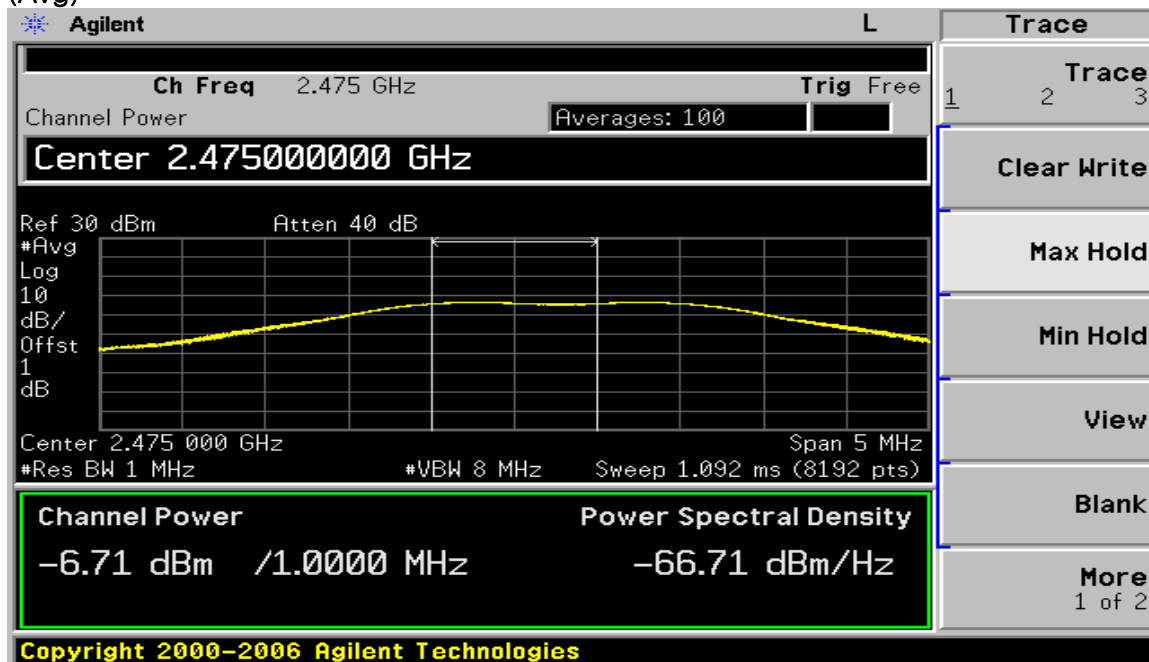
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(ch\_25)

(Peak)



(Avg)



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## 8. Maximum power spectral density level in the fundamental emission

### 8.1 Test procedure

KDB 558074 D01 DTS Meas Guidance V03r02 10.2 Method PKPSD (peak PSD)

### 8.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set the VBW  $\geq 3 \times \text{RBW}$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Limits FCC § 15.247

#### The peak power density Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E440A	US42041291	15-Jan-16
RF Cable	Length: 10 cm	–	
–Spectrum Analyzer $\Leftrightarrow$ EUT	Loss: 1.0 dB	–	

### 8.3 Measurement results

EUT	LOCKER LOCK	MODEL	PT200	
MODE	DSSS	ENVIRONMENTAL CONDITION	23.0 °C, 43.0 % R.H.	
INPUT POWER	5Vd.c.			
CHANNEL	Channel Frequency (MHz)	Measured Power Spectral Density (dBm)	Maximum Permissible Power Density (dBm/3kHz)	Margin
11	2 405	−17.85	8.0	25.85
18	2 440	−18.22	8.0	26.22
25	2 475	−18.40	8.0	26.40

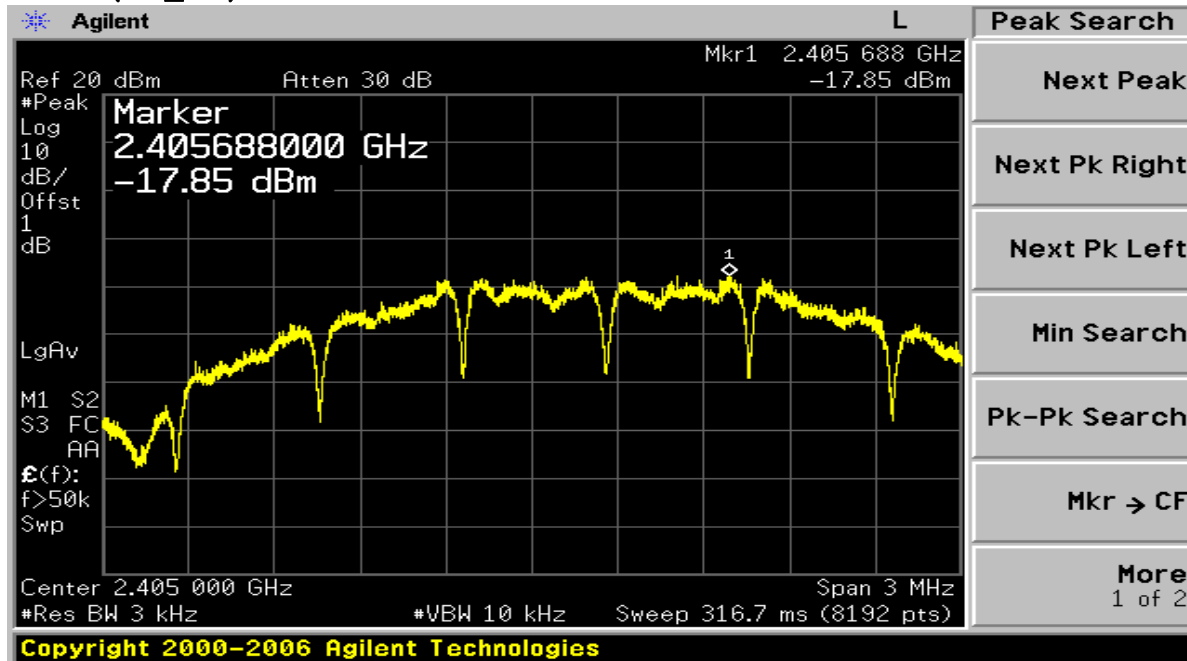


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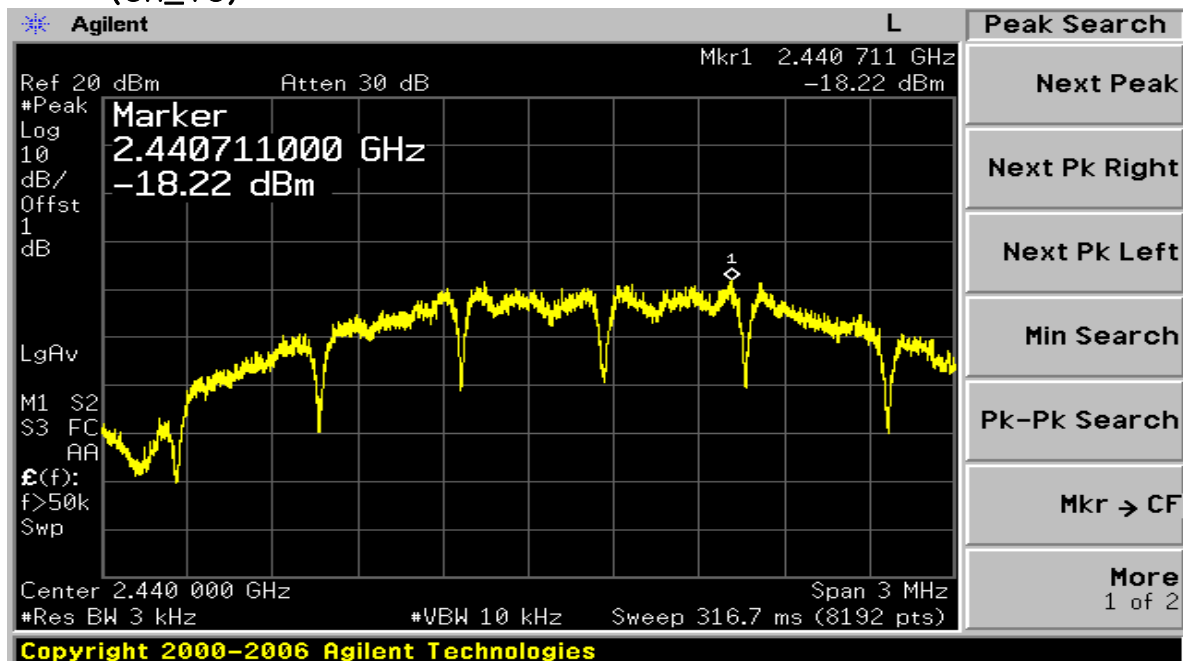
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### 8.4 Trace data (ch\_11)



### (ch\_18)

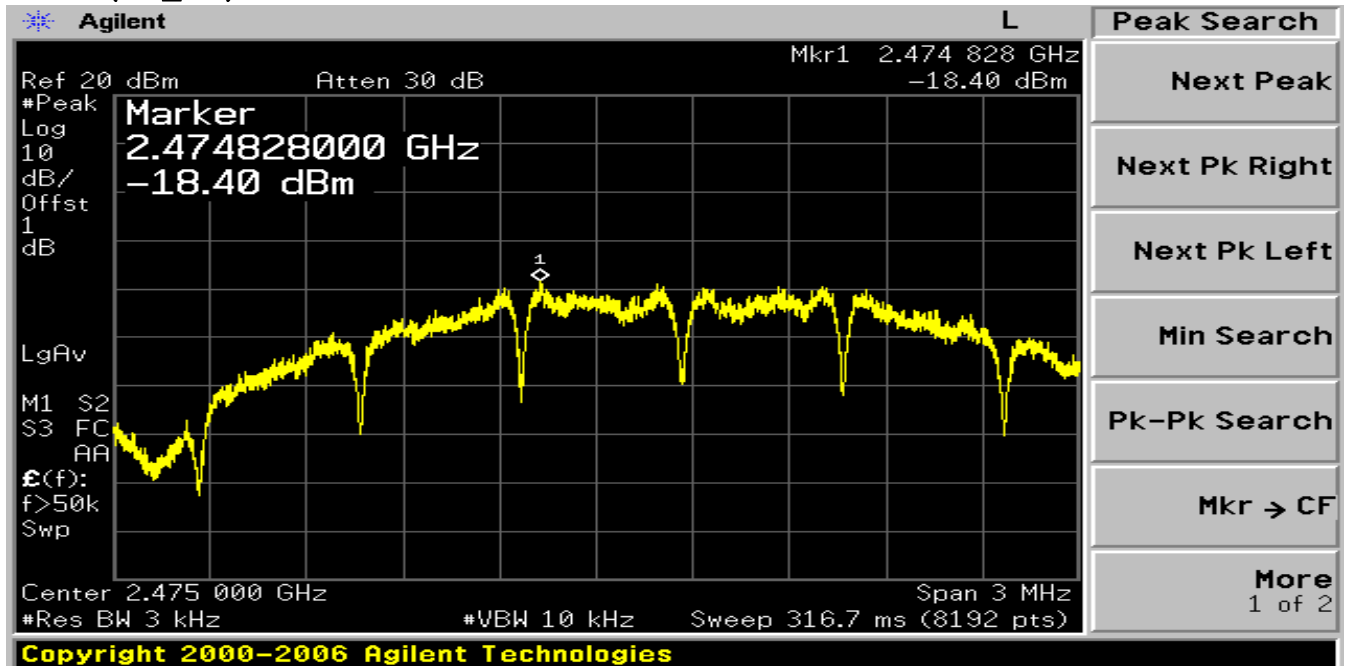




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(ch\_25)



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## 9. Emissions in non-restricted frequency bands

### 9.1 Test procedure

KDB 558074 D01 DTS Meas Guidance V03r02 11.0 Emissions in non-restricted frequency

### 9.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

- Set instrument center frequency to DTS channel center frequency.
- Set the span to  $\geq 1.5$  times the DTS bandwidth.
- Set the RBW = 100 kHz.
- Set the VBW  $\geq 3 \times$  RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.

Limits FCC § 15.247

**Band Edge&Out of Emission Test Instruments**

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	15-Jan-16
Spectrum Analyzer	FSV40	100939	19-Jan-16
RF Cable	Length: 6cm		—
-Spectrum Analyzer <=> EUT	Loss: 1.0dB		—

### 9.3 Measurement results of band-edge & out of emission

EUT	LOCKER LOCK	MODEL	PT200
MODE	DSSS	ENVIRONMENTAL CONDITION	23.0 °C, 43.0 % R.H.
INPUT POWER	6.0 Vd.c.		

CHANNEL	Channel Frequency (MHz)	limit	PASS/FAIL
11	2 405	20dBc	PASS
25	2 475	20dBc	PASS

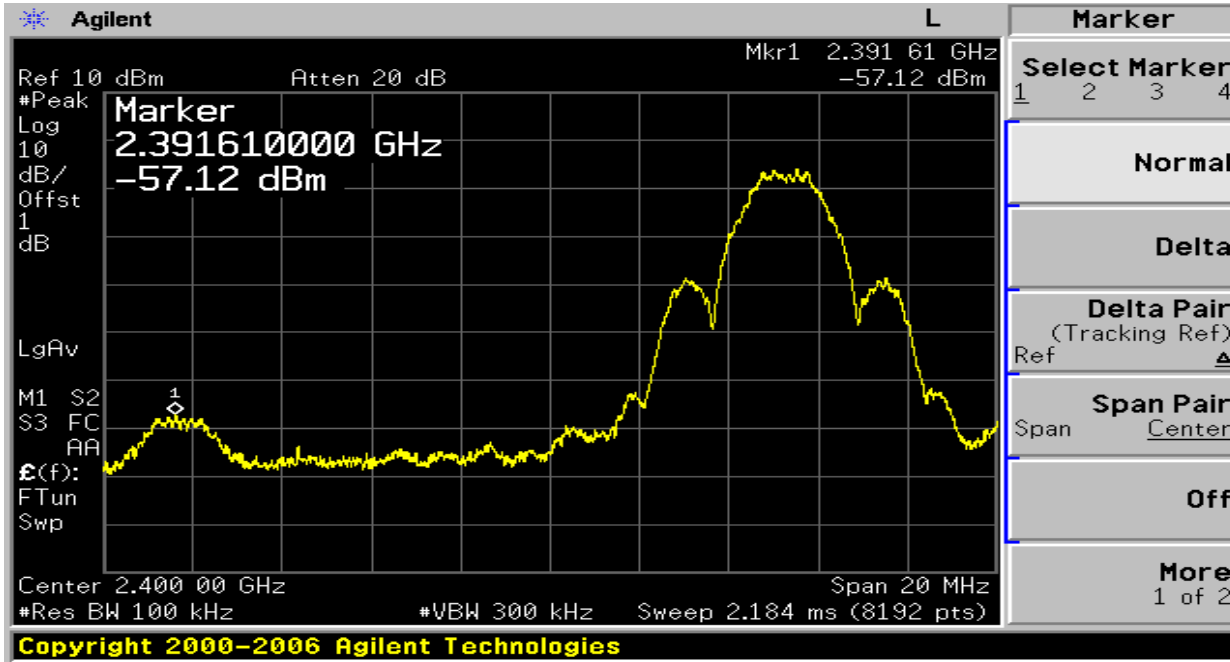


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### 9.4 Trace data of band-edge & Out of Emission (ch\_11)



### (ch\_25)

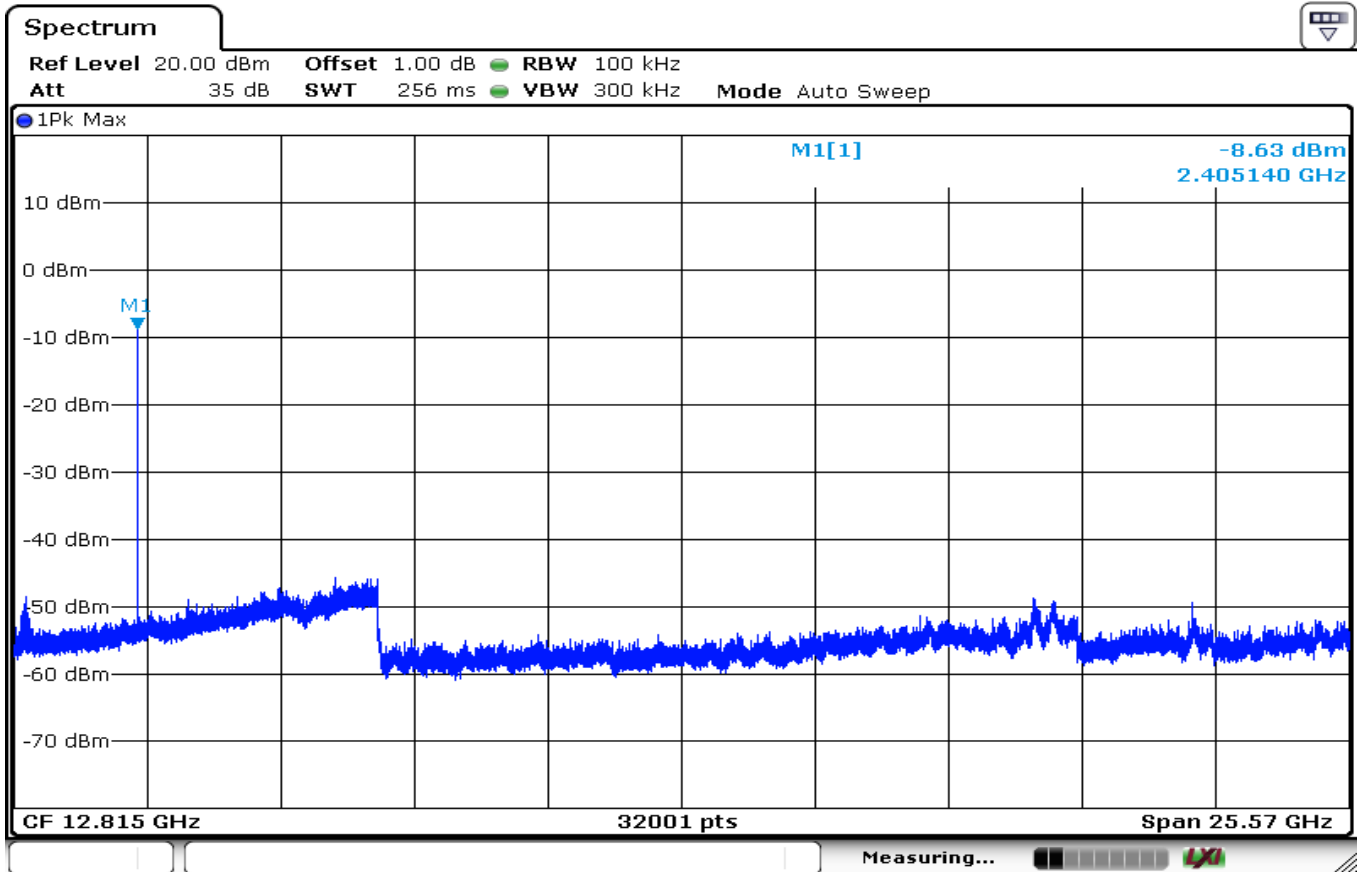


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(ch\_11)



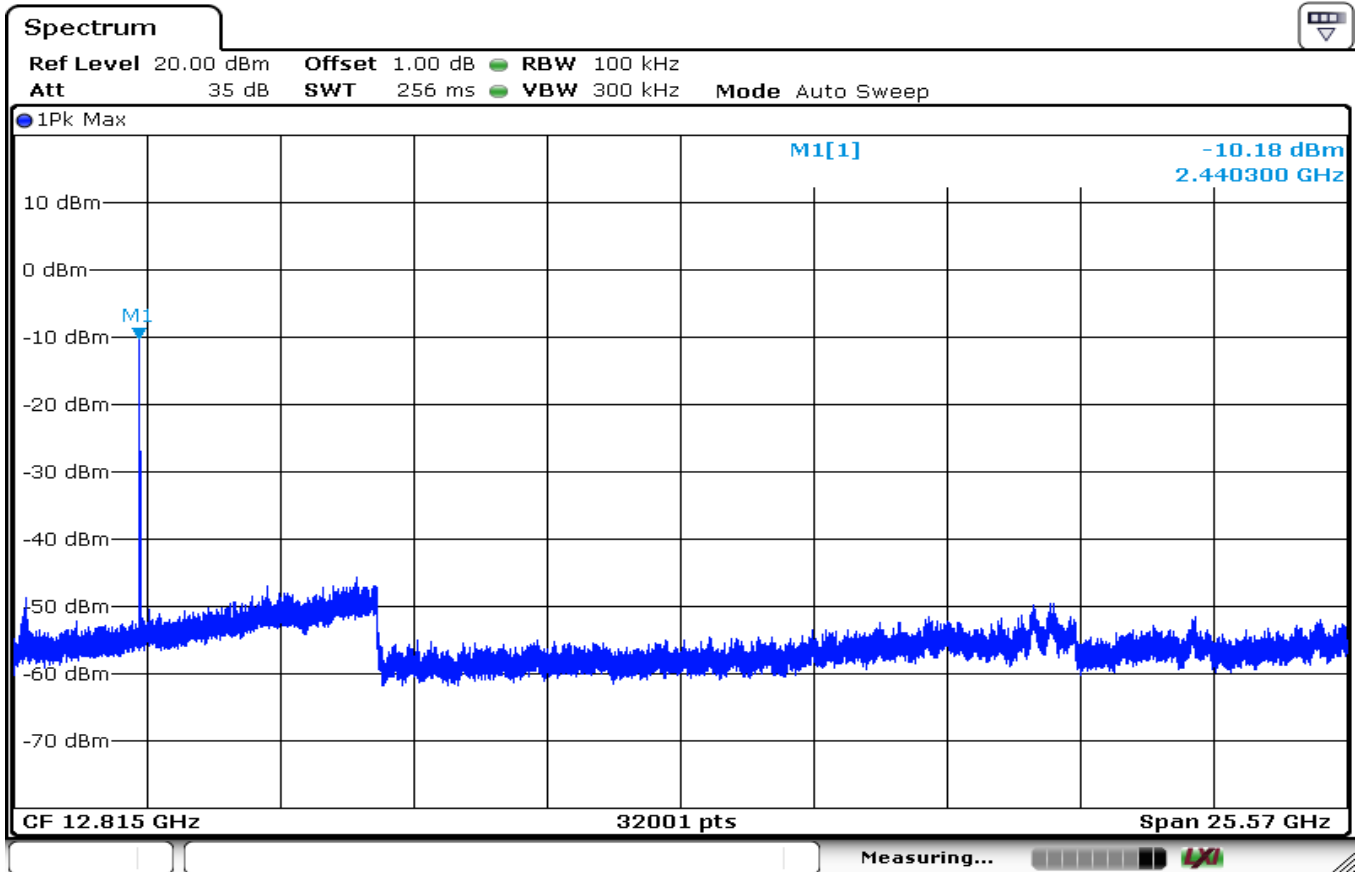
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(ch\_18)



Date: 18.MAY.2015 17:23:42

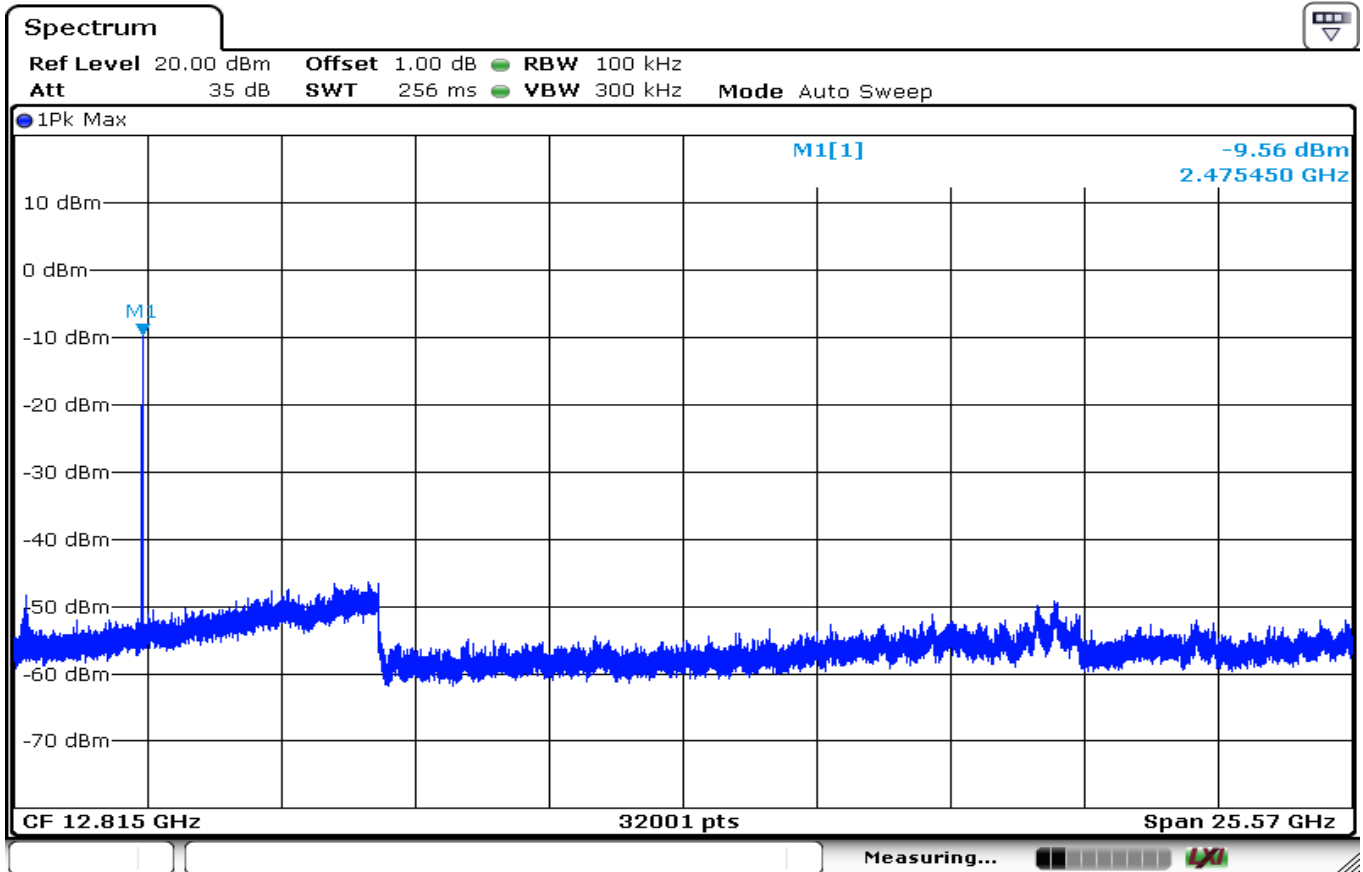


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(ch\_25)



Date: 18.MAY.2015 16:24:38

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## 10. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC PART 15.205, 15.209 . The test setup was made according to ANSI C 63.1 (2009) & KDB 558074 D01 Semi-anechoic chamber, which allows a 3 m distance measurement. The EUT was placed in the center of styrofoam. turntable. The height of this table was 0.8 m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

### 10.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESC17	ROHDE & SCHWARZ	100916	13-Jan-16
Logbicon Antenna	VULB 9168	SCHWARZBECK	193	18-Sep-15
Turn Table	DT3000-2t	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
PREAMPLIFIER	8449B	AGILENT	3008A00595	13-Jan-16
Horn Antenna	BBHA9120D	SCHWARZBECK	469	16-Oct-15
Test Receiver	ESPI7	ROHDE & SCHWARZ	100185	13-Jan-16
Spectrum Analyzer	R3273	ADVANTEST	110600592	13-Jan-16
Turn Table	DT1500-S	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
Pyramidal Horn Antenna	3160-09-01	EST-LINDGREN	102642	14-Nov-15
Antenna Master & Turn table controller	C02000-P	Innco System GmbH	CO2000/642 /28051111/L	-

### 10.2 Environmental Condition

Below 1 GHz -Test Place : 10 m Semi-anechoic chamber

**Bluetooth LE Mode**

Temperature (°C) : 20.2 °C

Humidity (% R.H.) : 54.4 % R.H.

Above 1 GHz-Test Place : 3 m Semi-anechoic chamber

**Bluetooth LE Mode**

Temperature (°C) : (20.3 ~ 20.9) °C

Humidity (% R.H.) : (51.8 ~ 56.1) % R.H.

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## 10.3 Measurement Instrument setting for Radiated Emission

### 10.3.1 Frequency range below 1 GHz

Detector : Quasi-Peak

### 10.3.2 Frequency range above 1 GHz

#### Peak Power Measurement Procedure (KDB 558074 section 12.2.4)

- a. RBW : 1 MHz , VBW : 3 MHz
- b. Trace mode = max hold
- c. Detector : Peak
- d. Sweep time = auto

#### Average Power Measurement Procedures (KDB 558074 section 12.2.5.3)

- a. Set analyzer center frequency to the frequency associated with the emission
- b. RBW : 1 MHz , VBW : 1 kHz
- c. Detector : Peak
- d. Sweep time = auto

Note

Band	Duty cycle(%)	Ton (ms)	Ton + Toff (ms)	DCF=10*log(1/Duty) (dB)
SRD	44.9	2.087	4.652	3.48

\*This was applied of duty cycle factor for average value because of measured with the EUT transmitting continuously less than 98% duty cycle at its maximum power control level.



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## 10.4 Test Data for SRD

Test Date : 14-May-15

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB $\mu$ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB $\mu$ V/m)	Result (dB $\mu$ V/m)	Margin (dB)
455.40	21.32	H	2.1	17.04	3.66	46.00	42.02	3.98
479.20	21.00	H	1.8	17.39	3.73	46.00	42.11	3.89
621.10	17.20	H	2.4	20.00	4.25	46.00	41.45	4.55
669.30	17.52	H	1.4	20.68	4.44	46.00	42.64	3.36
706.50	17.28	H	2.1	21.13	4.55	46.00	42.96	3.04
721.60	16.65	H	2.0	21.34	4.60	46.00	42.59	3.41
768.10	14.83	H	2.0	22.04	4.76	46.00	41.63	4.37
Remark	H : Horizontal, V : Vertical TEST MODE : SRD (CH : 11 - 2 405 MHz, 13.56 MHz RF OUT)  *CL = Cable Loss(In case of below 1 000 MHz) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz.							



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## 10.4-1 Test Data for SRD

Test Date : 14-May-15

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB $\mu$ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dB $\mu$ V/m)	Result (dB $\mu$ V/m)	Margin (dB)
PEAK(RBW: 1 MHz    VBW: 3 MHz)									
4804.00	45.55	H	1.0	30.72	-24.20	0.00	74.00	52.07	21.93
4804.00	45.96	V	1.1	30.72	-24.20	0.00	74.00	52.48	21.52
AV(RBW: 1 MHz    VBW: 1 kHz)									
4804.00	35.66	H	1.0	30.72	-24.20	3.48	54.00	45.66	8.34
4804.00	36.13	V	1.1	30.72	-24.20	3.48	54.00	46.13	7.87
Remark	H : Horizontal,    V : Vertical    TEST MODE : CH : 11 – 2 405 MHz								
	*The TX signal wasn't detected from 3th harmonics.								
	*Total = Reading Value + Antenna Factor + Cable Loss – Amp Gain + Duty Cycle Correction								
	FYI								
	a. Ton Time : 2.087 ms								
	b. duty cycle : 44.9 %								
	c. DCF : 3.48 dB								



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## 10.4-2 Test Data for SRD

Test Date : 15-May-15

Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW: 1 MHz    VBW: 3 MHz)									
4882.00	44.67	H	1.0	30.85	-23.97	0.00	74.00	51.55	22.45
4882.00	44.23	V	1.0	30.85	-23.97	0.00	74.00	51.11	22.89
AV(RBW: 1 MHz    VBW: 1 kHz)									
4882.00	34.59	H	1.0	30.85	-23.97	3.48	54.00	44.95	9.05
4882.00	33.96	V	1.0	30.85	-23.97	3.48	54.00	44.32	9.68
Remark	H : Horizontal,    V : Vertical    TEST MODE : CH : 18 – 2 440 MHz								
	*The TX signal wasn't detected from 3th harmonics.								
	*Total = Reading Value + Antenna Factor + Cable Loss – Amp Gain + Duty Cycle Correction								
	FYI								
	a. Ton Time : 2.087 ms								
	b. duty cycle : 44.9 %								
	c. DCF : 3.48 dB								



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## 10.4-3 Test Data for SRD

Test Date : 15-May-15

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB $\mu$ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dB $\mu$ V/m)	Result (dB $\mu$ V/m)	Margin (dB)
PEAK(RBW: 1 MHz    VBW: 3 MHz)									
2483.50	26.99	H	1.1	26.74	5.80	0.00	74.00	59.53	14.47
2483.50	25.88	V	1.0	26.74	5.80	0.00	74.00	58.42	15.58
2489.50	26.41	H	1.0	26.75	5.80	0.00	74.00	58.96	15.04
2489.50	26.98	V	1.1	26.75	5.80	0.00	74.00	59.53	14.47
AV(RBW: 1 MHz    VBW: 1 kHz)									
2483.50	14.85	H	1.1	26.74	5.80	3.48	54.00	50.87	3.13
2483.50	14.86	V	1.0	26.74	5.80	3.48	54.00	50.88	3.12
2489.50	14.77	H	1.0	26.75	5.80	3.48	54.00	50.80	3.20
2489.50	14.58	V	1.1	26.75	5.80	3.48	54.00	50.61	3.39
Remark	H : Horizontal,    V : Vertical    TEST MODE : CH : 25 – 2 475 MHz								
	*There is no detected the harmonic emission.								
	*Total = Reading Value + Antenna Factor + Cable Loss – Amp Gain + Duty Cycle Correction								
	FYI								
	a. Ton Time : 2.087 ms b. duty cycle : 44.9 % c. DCF : 3.48 dB								



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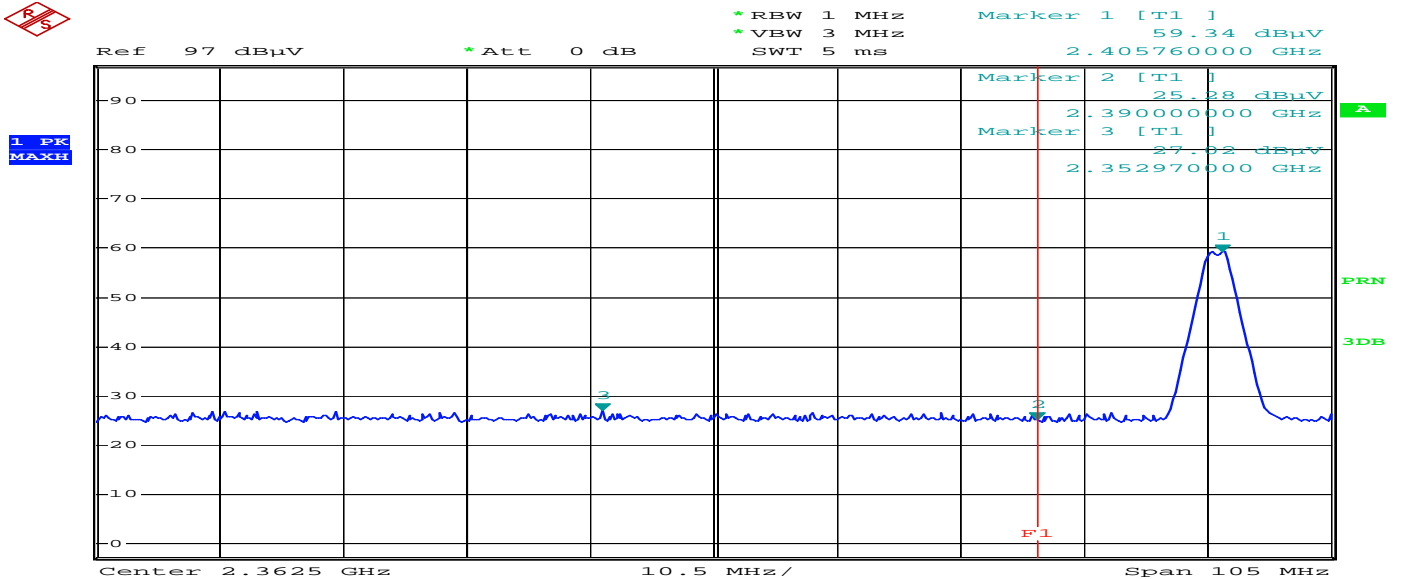
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### 10.4-4 Restricted Band Edges for SRD

Band Edges(CH Low)

Detector mode:Peak

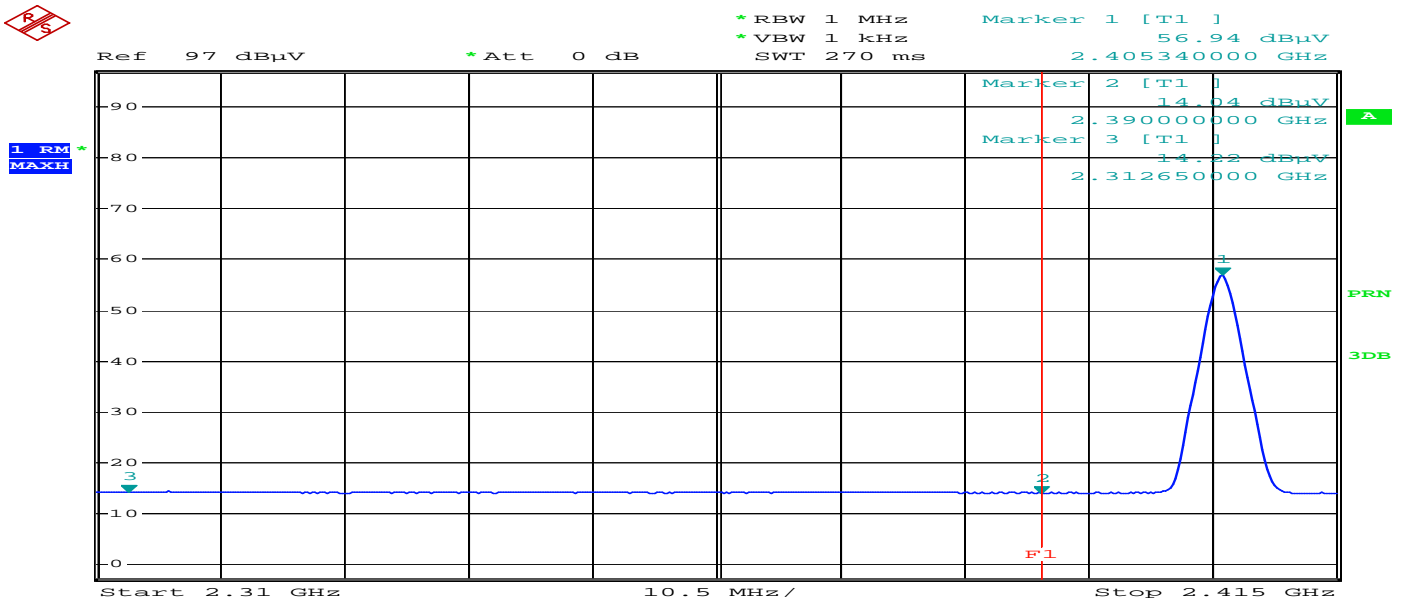
Polarity:Horizontal



Comment: PT200\_HOR(LOW 11 CH)  
Date: 17.MAY.2015 10:59:11

Detector mode:Average

Polarity:Horizontal



Comment: 15-00344\_HOR AV(LOW)  
Date: 17.MAY.2015 11:31:58





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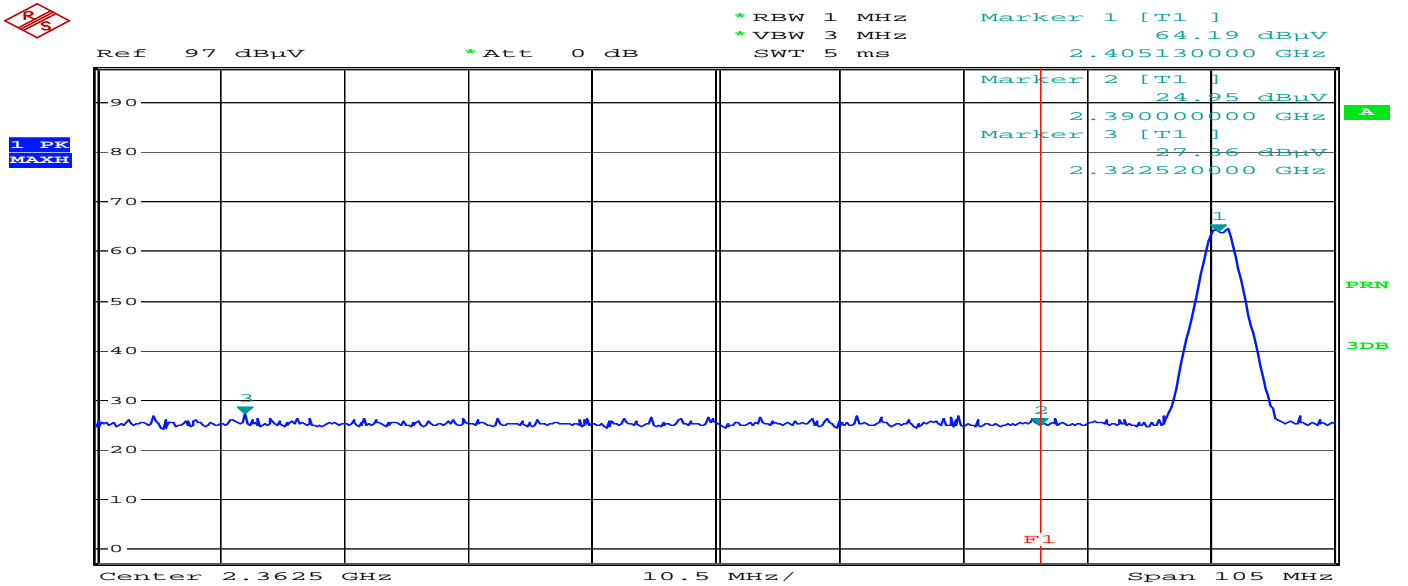
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Band Edges(CH Low)

Detector mode:Peak

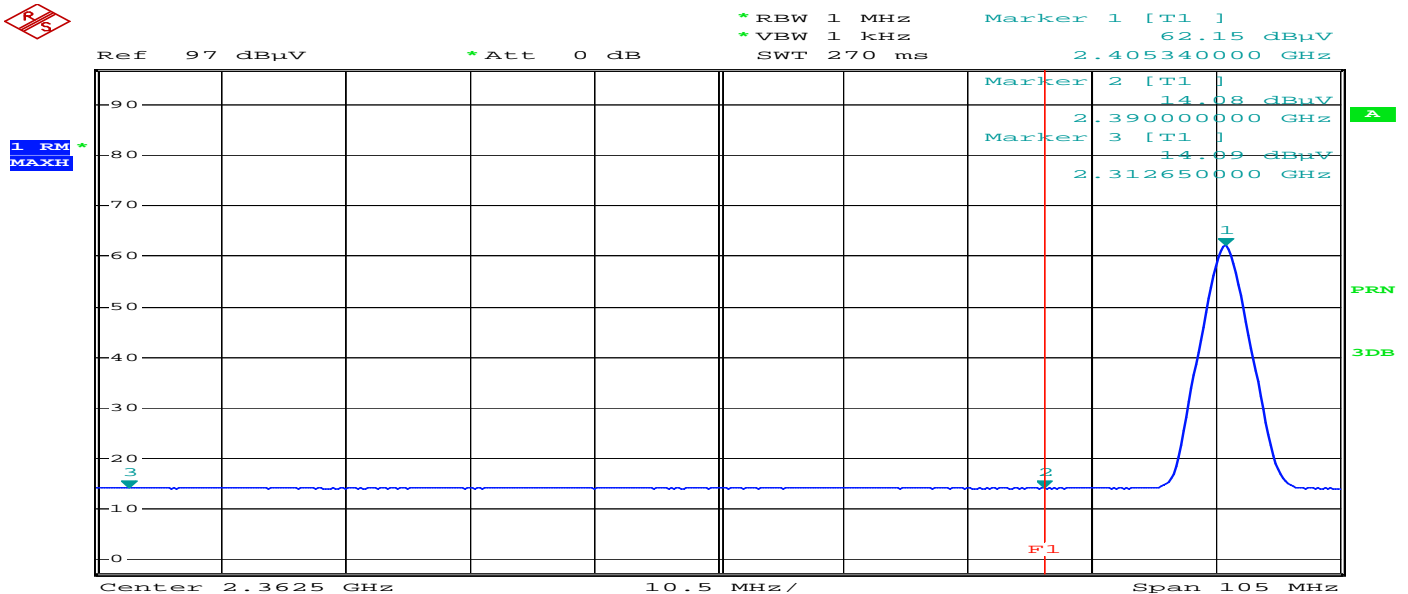
Polarity:Vertical



Comment: 15-00344\_VER PK(LOW)  
Date: 17.MAY.2015 11:52:22

Detector mode:Average

Polarity:Vertical



Comment: 15-00344\_VER AV(LOW)  
Date: 17.MAY.2015 11:50:13



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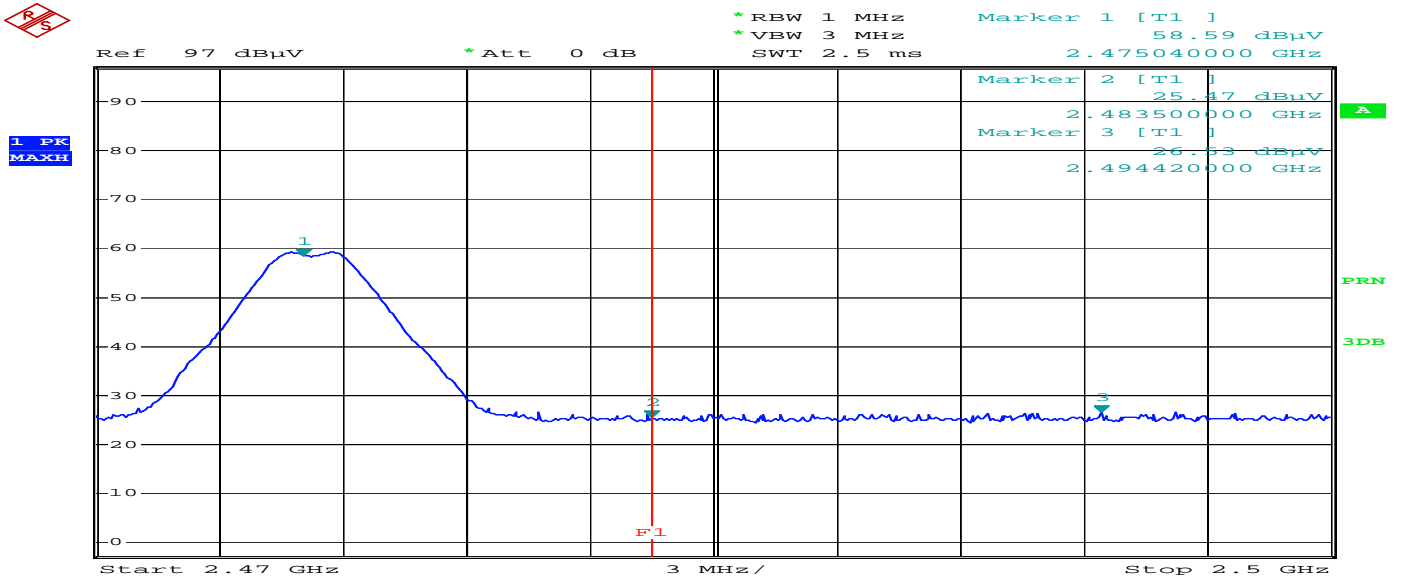
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Band Edges(CH High)

Detector mode:Peak

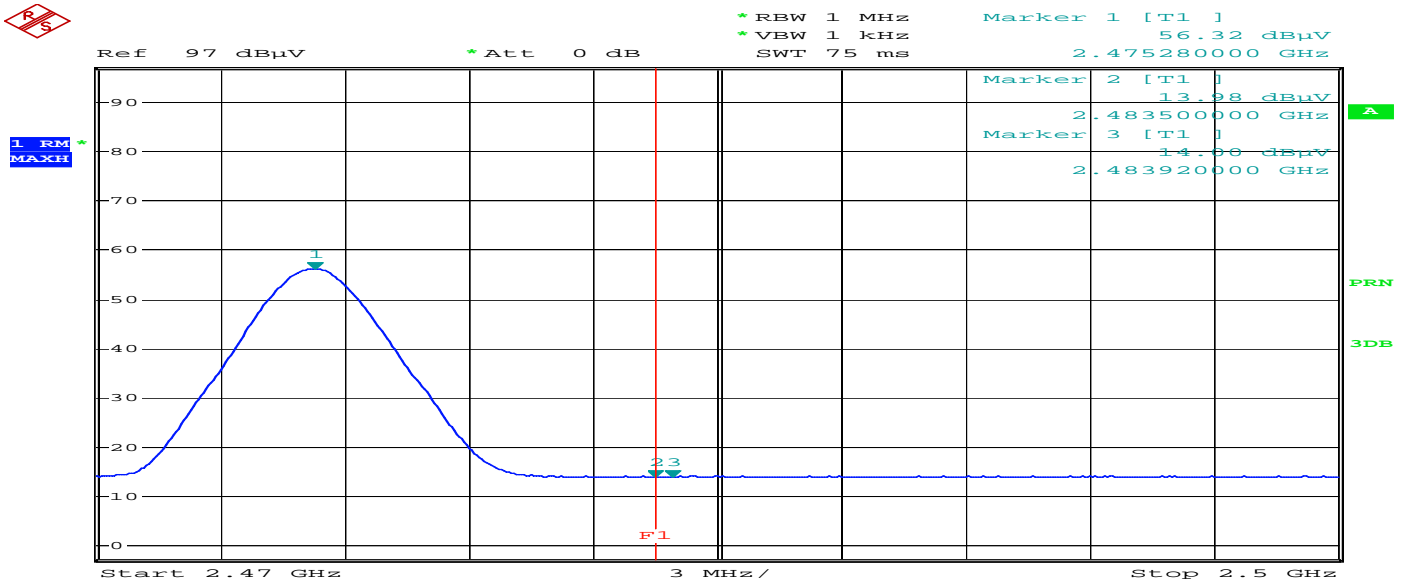
Polarity:Horizontal



Comment: 15-00344\_HOR PK(HI)  
Date: 17.MAY.2015 12:15:13

Detector mode:Average

Polarity:Horizontal



Comment: 15-00344\_HOR AV(HI)  
Date: 17.MAY.2015 12:09:14

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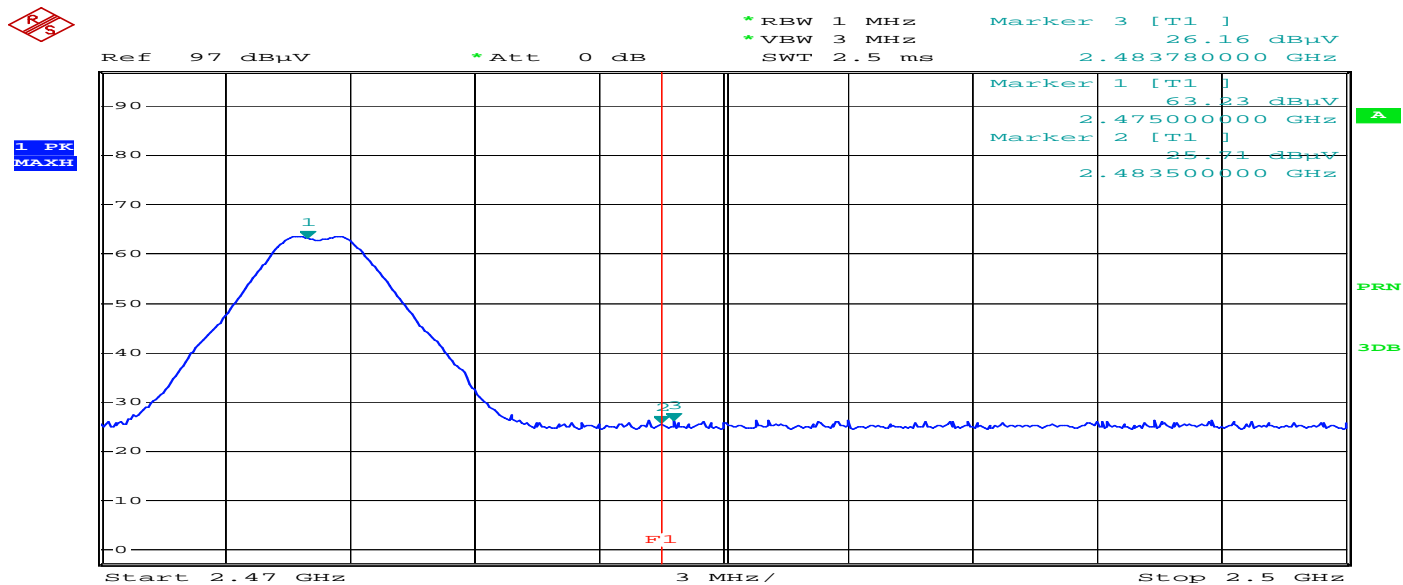
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Band Edges(CH High)

Detector mode:Peak

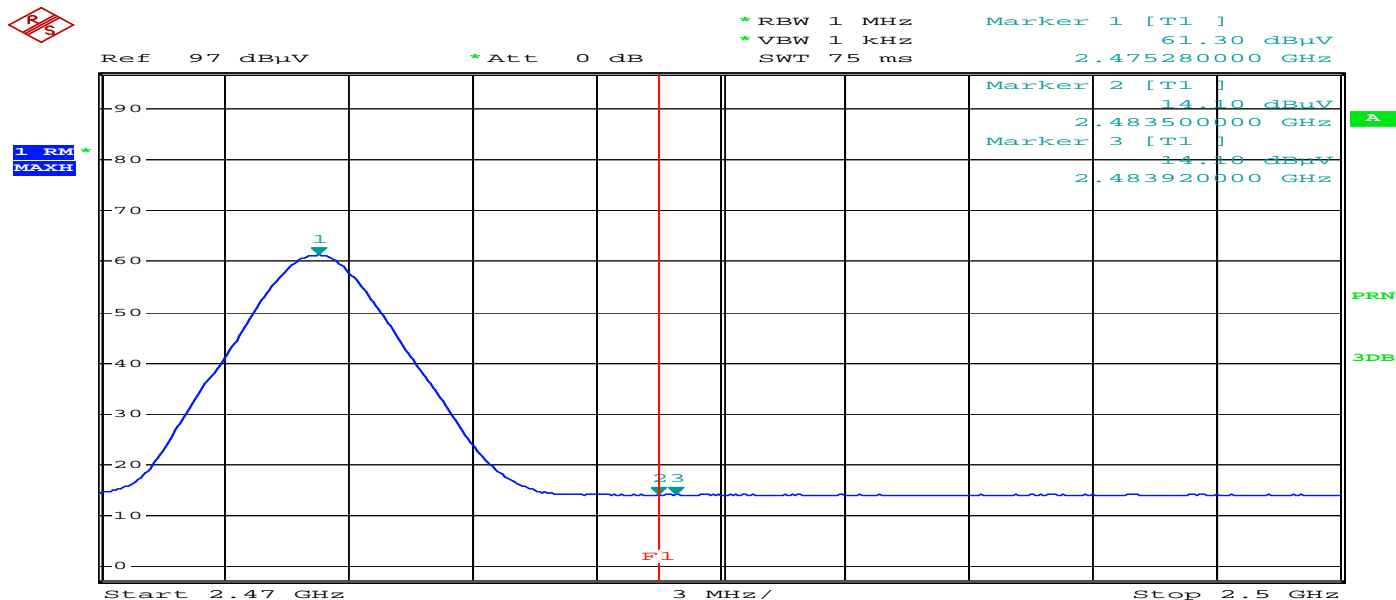
Polarity:Vertical



Comment: 15-00344\_VER PK(HI)  
Date: 17.MAY.2015 12:02:44

Detector mode:Average

Polarity:Vertical



Comment: 15-00344\_VER AV(HI)  
Date: 17.MAY.2015 12:05:07

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## 11. Measurement of conducted disturbance-N/A

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC PART 15.207. The test setup was made according to ANSI C 63.1 (2009) in a shielded room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

### 11.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST RECEIVER	ESPI	Rohde & Schwarz	100005	13-Jan-16
LISN	ENV216	Rohde & Schwarz	101231	18-Aug-15
LISN	ESH3-Z5	Rohde & Schwarz	836679/025	13-Jan-16
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	13-Jan-16

### 11.2 Environmental Condition

Test Place : Shielded Room

Temperature (°C) :

Humidity (% R.H.) :



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## 11.3 Test Data-N/A

Test Date :

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dB $\mu$ V)	Reading (dB $\mu$ V)	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Reading (dB $\mu$ V)	Result (dB)
Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading								



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## 12. Photographs of test setup

### 12.1. Setup for Radiated Test : (30 ~ 1 000) MHz

[ Front ]



[ Rear ]







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## 12.2. Setup for Radiated Test : Above 1 GHz

[ Front ]



[ Rear ]





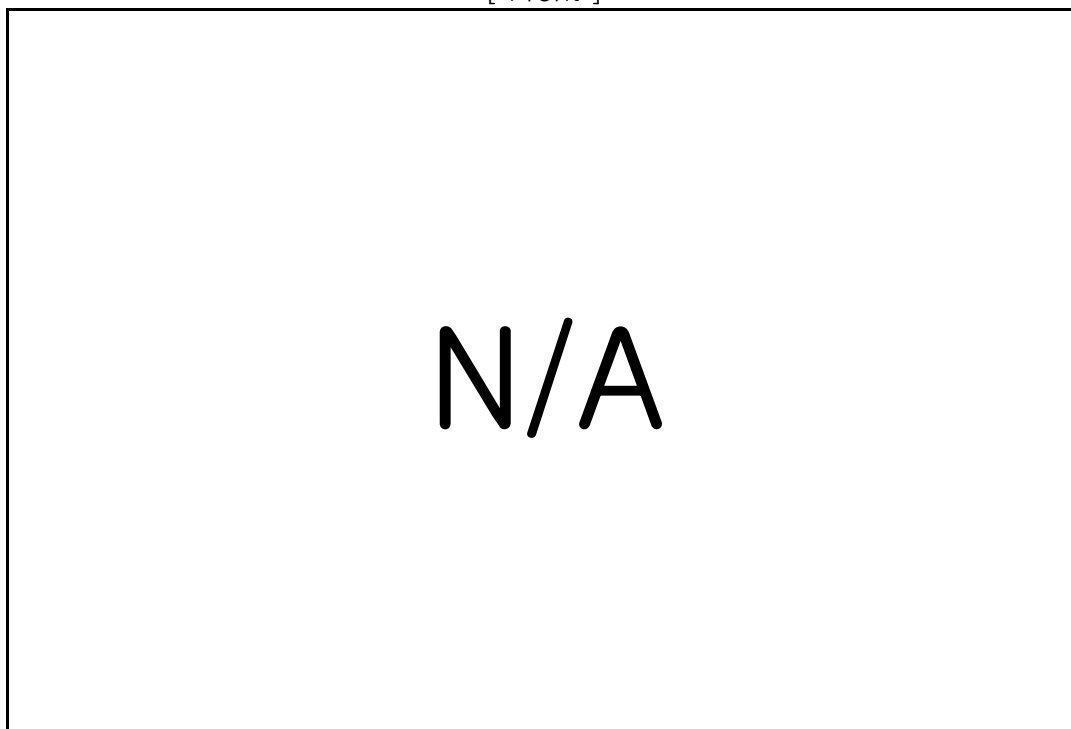
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### 12.3. Setup for Conducted Test : (0.15 ~ 30) MHz

[ Front ]



[ Rear ]







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## 12.4. Photographs of EUT

[ Front ]



[ Rear ]



## Appendix 1. Special diagram–N/A

\* HOT LINE

\* NEUTRAL LINE

## Appendix 2. Antenna Requirement

### 1. Antenna Requirement

#### 1.1 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 15.204

#### 1.2 Antenna Connected Construction

The antenna types used in this product are Intergrated SMD antenna . The maximum Gain of this antenna is 2.88 dBi.