

# FCC Test Report

Product Name	LVL50 Wireless Dongle for PS4
Model No	051-049T
FCC ID.	X5B-051049T

Applicant	Performance Designed Products, LLC
Address	14144 Ventura Blvd., Suite 200 Sherman Oaks, CA91423 USA

Date of Receipt	Oct. 02, 2018
Issue Date	Oct. 18, 2018
Report No.	18A0023R-RFUSP25V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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The test report shall not be reproduced without the written approval of QuieTek Corporation.

# Test Report

Issue Date: Oct. 18, 2018

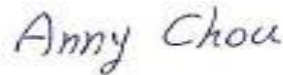
Report No.: 18A0023R-RFUSP25V00



Product Name	LVL50 Wireless Dongle for PS4
Applicant	Performance Designed Products, LLC
Address	14144 Ventura Blvd., Suite 200 Sherman Oaks, CA91423 USA
Manufacturer	Performance Designed Products, LLC
Model No.	051-049T
EUT Rated Voltage	DC 5V (Power by USB)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	PDP
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v05
Test Result	Complied

Documented By

:



( Senior Adm. Specialist / Anny Chou )

Tested By

:



( Assistant Engineer / Boris Hsu )

Approved By

:



( Director / Vincent Lin )

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	LVL50 Wireless Dongle for PS4
Trade Name	PDP
Model No.	051-049T
FCC ID.	X5B-051049T
Frequency Range	2405.35 – 2477.35MHz
Channel Control	Auto
Channel Separation	2MHz
Antenna Gain	Refer to the table “Antenna List”
Channel Number	37
Type of Modulation	Pi/4 DQPSK
Antenna Type	Chip Antenna

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	Walsin	RFANT3216120A5T	2.12dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2405.35 MHz	Channel 11:	2425.35 MHz	Channel 21:	2445.35 MHz	Channel 31:	2465.35 MHz
Channel 2:	2407.35 MHz	Channel 12:	2427.35 MHz	Channel 22:	2447.35 MHz	Channel 32:	2467.35 MHz
Channel 3:	2409.35 MHz	Channel 13:	2429.35 MHz	Channel 23:	2449.35 MHz	Channel 33:	2469.35 MHz
Channel 4:	2411.35 MHz	Channel 14:	2431.35 MHz	Channel 24:	2451.35 MHz	Channel 34:	2471.35 MHz
Channel 5:	2413.35 MHz	Channel 15:	2433.35 MHz	Channel 25:	2453.35 MHz	Channel 35:	2473.35 MHz
Channel 6:	2415.35 MHz	Channel 16:	2435.35 MHz	Channel 26:	2455.35 MHz	Channel 36:	2475.35 MHz
Channel 7:	2417.35 MHz	Channel 17:	2437.35 MHz	Channel 27:	2457.35 MHz	Channel 37:	2477.35 MHz
Channel 8:	2419.35 MHz	Channel 18:	2439.35 MHz	Channel 28:	2459.35 MHz		
Channel 9:	2421.35 MHz	Channel 19:	2441.35 MHz	Channel 29:	2461.35 MHz		
Channel 10:	2423.35 MHz	Channel 20:	2443.35 MHz	Channel 30:	2463.35 MHz		

Note:

1. The EUT is an LVL50 Wireless Dongle for PS4 with a built-in 2.4GHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 2.4GHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices

Test Mode:	Mode 1: Transmit
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## 1.2. Operational Description

The EUT is a LVL50 Wireless Dongle for PS4 with a built-in 2.4GHz transceiver, It uses the latest 2.4GHz wireless audio solution which can provide high quality wide-band audio and robust wireless audio transmission. Total numbers of channels supported by this device are 37 channels operating from 2405.35 to 2477.35MHz with 2MHz channel spacing. The antenna type is Chip Antenna and the modulation type is Pi/4 DQPSK (Differential Quadrature Phase Shift Keying).The device can receive wireless signal and transmit signal for associate device.

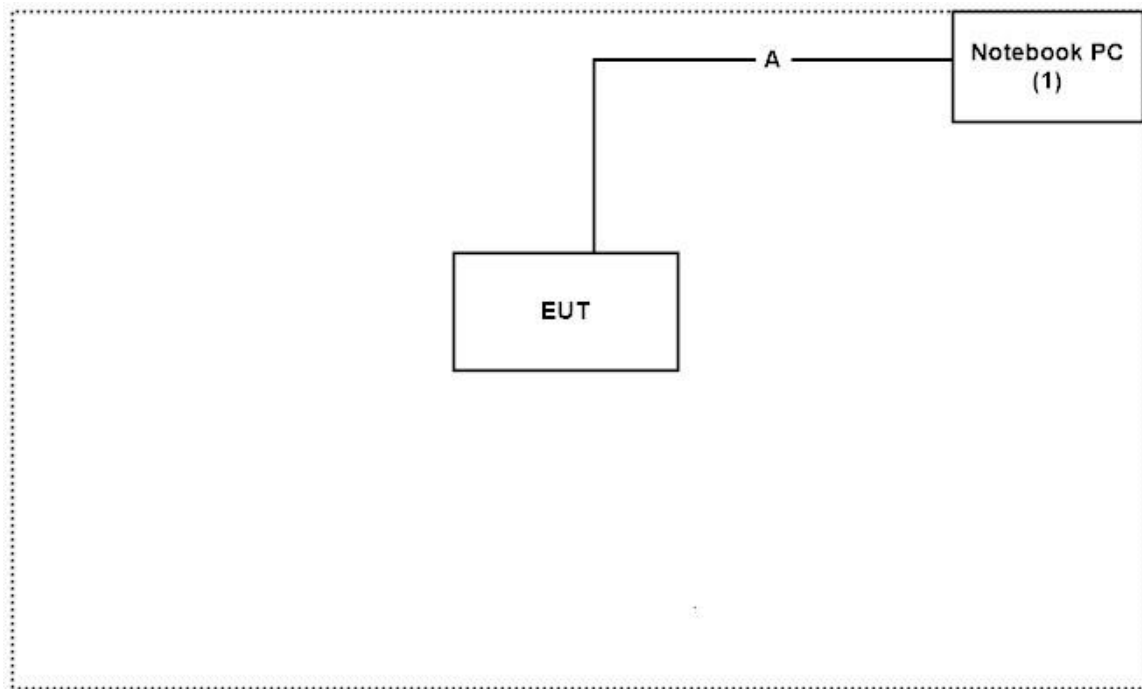
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-shielded, 0.8m

	Signal Cable Type	Signal cable Description
A	USB Cable	Shielded, 1.7m

### 1.4. Configuration of Tested System



### 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute “Avnrea Continue Power (v2018.5.18)” on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.



## 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: [http://www.dekra.com.tw/index\\_en.aspx](http://www.dekra.com.tw/index_en.aspx)

Site Description: Accredited by TAF  
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd  
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,  
Taiwan, R.O.C.  
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789  
E-Mail : [info.tw@dekra.com](mailto:info.tw@dekra.com)

FCC Accreditation Number: TW3023

## 1.7. List of Test Equipment

### For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/02/12	2019/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2018/10/13	2019/10/12
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2017/11/07	2018/11/06
X	LISN	R&S	ESH3-Z5	836679/017	2018/02/09	2019/02/08
X	LISN	R&S	ENV216	100097	2018/02/09	2019/02/08

### For Radiated measurements /Site3/CB8

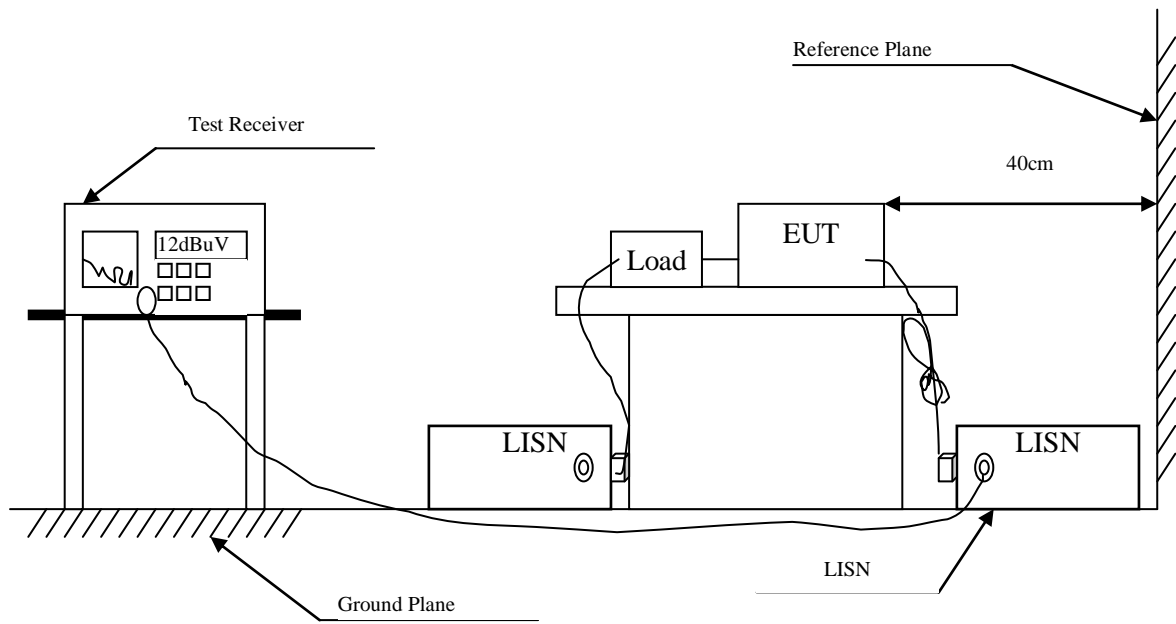
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/06/14	2019/06/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2017/11/30	2018/11/29
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
X	Horn Antenna	Com-Power	AH-840	101043	2018/01/09	2019/01/08
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
X	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version :QuieTek EMI 2.0 V2.1.113.

## 2. Conducted Emission

### 2.1. Test Setup



## 2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

## 2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

## 2.4. Uncertainty

± 2.26 dB

## 2.5. Test Result of Conducted Emission

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Date : 2018/10/09  
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.173	9.742	40.060	49.802	-15.541	65.343
0.205	9.738	32.520	42.258	-22.171	64.429
0.509	9.750	33.600	43.350	-12.650	56.000
1.275	9.792	14.500	24.292	-31.708	56.000
3.935	9.889	19.560	29.449	-26.551	56.000
9.064	10.045	17.320	27.365	-32.635	60.000
<b>Average</b>					
0.173	9.742	23.880	33.622	-21.721	55.343
0.205	9.738	21.430	31.168	-23.261	54.429
0.509	9.750	24.700	34.450	-11.550	46.000
1.275	9.792	7.430	17.222	-28.778	46.000
3.935	9.889	8.890	18.779	-27.221	46.000
9.064	10.045	11.800	21.845	-28.155	50.000

### Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Date : 2018/10/09  
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.162	9.736	36.260	45.996	-19.661	65.657
0.275	9.741	24.540	34.281	-28.148	62.429
0.513	9.741	29.040	38.781	-17.219	56.000
1.295	9.783	14.200	23.983	-32.017	56.000
3.623	9.872	22.820	32.692	-23.308	56.000
3.623	9.872	22.680	32.552	-23.448	56.000
9.353	10.070	14.840	24.910	-35.090	60.000
<b>Average</b>					
0.162	9.736	22.180	31.916	-23.741	55.657
0.275	9.741	16.800	26.541	-25.888	52.429
0.513	9.741	21.610	31.351	-14.649	46.000
1.295	9.783	6.810	16.593	-29.407	46.000
3.623	9.872	10.140	20.012	-25.988	46.000
3.623	9.872	9.910	19.782	-26.218	46.000
9.353	10.070	6.480	16.550	-33.450	50.000

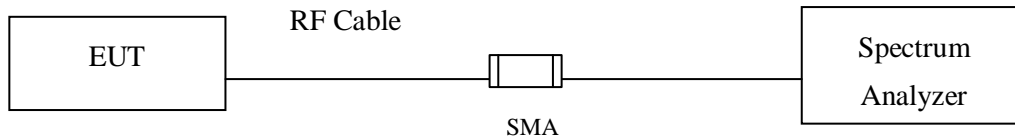
## Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

### 3. Peak Power Output

#### 3.1. Test Setup

Conducted Measurement



#### 3.2. Limits

The maximum peak power shall be less 1 Watt.

#### 3.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 section 8.3.1.3 PKPM1 Peak-reading power meter method for compliance to FCC 47CFR 15.247 requirements.

#### 3.4. Uncertainty

$\pm 1.19$  dB

### 3.5. Test Result of Peak Power Output

Product : LVL50 Wireless Dongle for PS4  
Test Item : Peak Power Output Data  
Test Site : No.3 OATS  
Test Date : 2018/10/08  
Test Mode : Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
01	2405.35	5.49	<30dBm	Pass
19	2441.35	4.81	<30dBm	Pass
37	2477.35	3.93	<30dBm	Pass

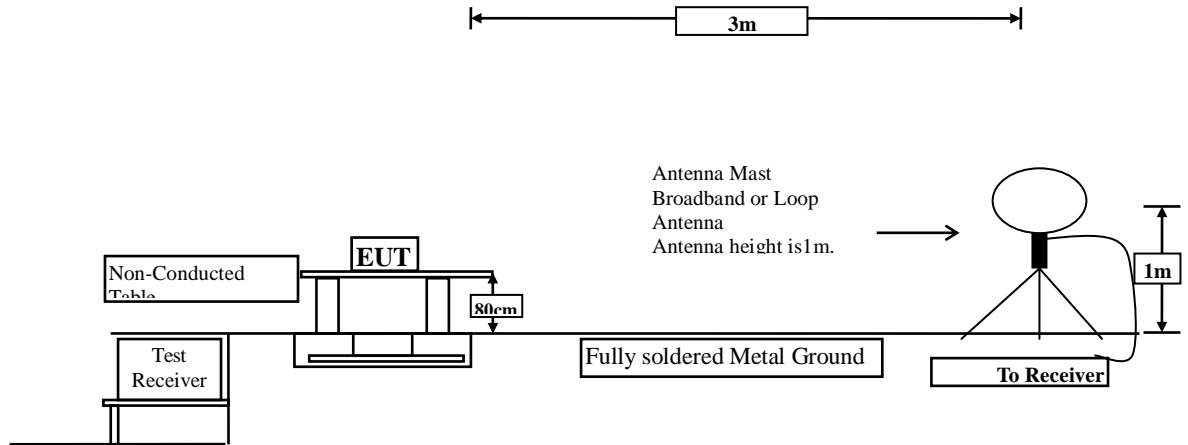
Note: Measurement Level =Reading value on power meter + cable loss



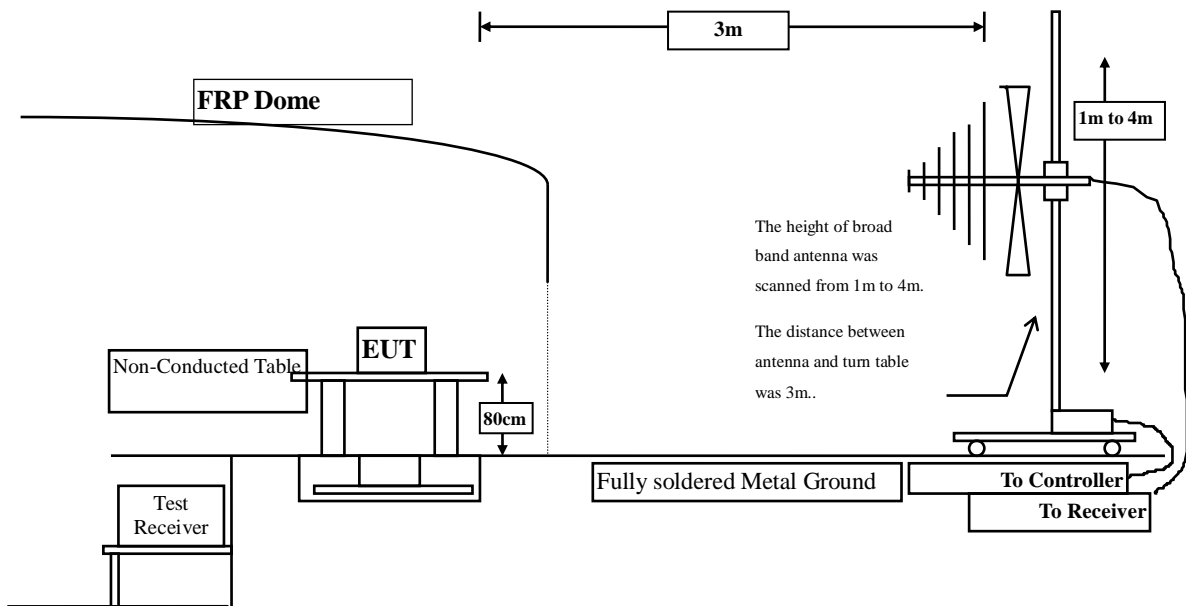
#### 4. Radiated Emission

##### 4.1. Test Setup

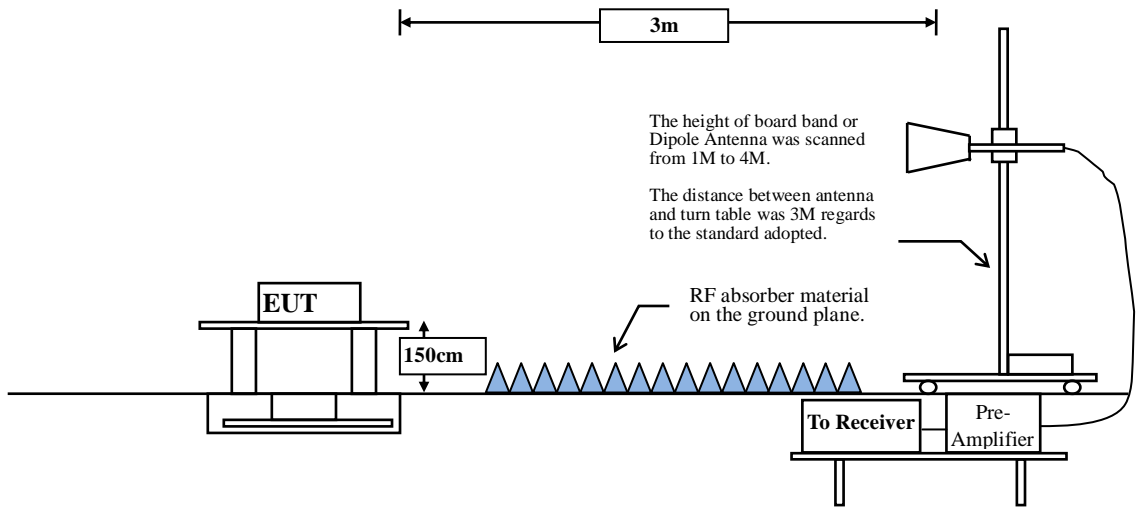
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

### 4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

### RBW and VBW Parameter setting:

According to KDB 558074 section 8.3.2.1 Peak power measurement procedure

RBW = as specified in Table 1.

$VBW \geq 3 \times RBW$ .

**Table 1 —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

According to KDB 558074 section 8.3.2.1 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle  $\geq 98\%$

$VBW \geq 1/T$ , when duty cycle  $< 98\%$

( T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
Pi/4 DQPSK	100	--	--	10

Note: Duty Cycle Refer to Section 9

### 4.4. Uncertainty

$\pm 4.08$  dB above 1GHz

$\pm 4.22$  dB below 1GHz

#### 4.5. Test Result of Radiated Emission

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Date : 2018/10/08  
 Test Mode : Mode 1: Transmit (2405.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4810.700	2.526	40.309	42.836	-31.164	74.000
7216.050	9.399	37.161	46.560	-27.440	74.000
9621.400	10.269	37.057	47.326	-26.674	74.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4810.700	2.922	40.009	42.932	-31.068	74.000
7216.050	9.884	38.225	48.109	-25.891	74.000
9621.400	10.750	37.913	48.663	-25.337	74.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Date : 2018/10/08  
 Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4882.700	2.021	39.084	41.105	-32.895	74.000
7324.050	9.783	38.065	47.848	-26.152	74.000
9765.400	9.687	38.119	47.806	-26.194	74.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4882.700	2.484	38.840	41.324	-32.676	74.000
7324.050	10.399	38.558	48.957	-25.043	74.000
9765.400	10.320	37.667	47.987	-26.013	74.000

## Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Date : 2018/10/08  
 Test Mode : Mode 1: Transmit (2477.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4954.700	2.529	39.577	42.107	-31.893	74.000
7432.050	10.524	37.575	48.099	-25.901	74.000
9909.400	10.189	38.758	48.947	-25.053	74.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4954.700	3.316	39.654	42.970	-31.030	74.000
7432.050	11.221	37.102	48.323	-25.677	74.000
9909.400	11.240	38.403	49.643	-24.357	74.000

## Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : LVL50 Wireless Dongle for PS4  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Date : 2018/10/15  
 Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
253.100	-5.669	40.943	35.274	-10.726	46.000
419.940	-0.254	35.040	34.786	-11.214	46.000
559.620	2.147	31.147	33.294	-12.706	46.000
630.430	1.193	31.088	32.281	-13.719	46.000
800.180	6.417	28.969	35.386	-10.614	46.000
839.950	6.032	32.568	38.600	-7.400	46.000
<b>Vertical</b>					
175.500	-1.842	26.394	24.552	-18.948	43.500
383.080	0.195	25.185	25.380	-20.620	46.000
631.400	-1.454	27.737	26.283	-19.717	46.000
798.240	2.629	29.437	32.065	-13.935	46.000
833.160	1.716	33.635	35.351	-10.649	46.000
928.220	3.640	26.204	29.844	-16.156	46.000

## Note:

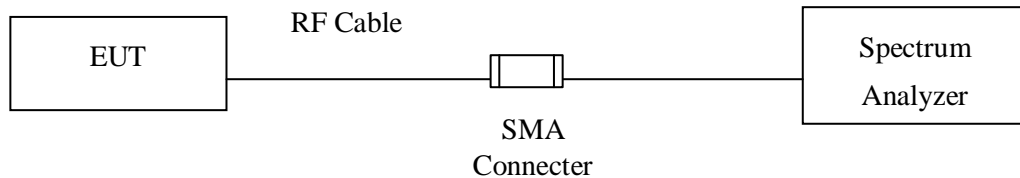
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..



## 5. RF Antenna Conducted Test

### 5.1. Test Setup

#### RF antenna Conducted Measurement:



### 5.2. Limits

According to FCC Section 15.247(d). 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### 5.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

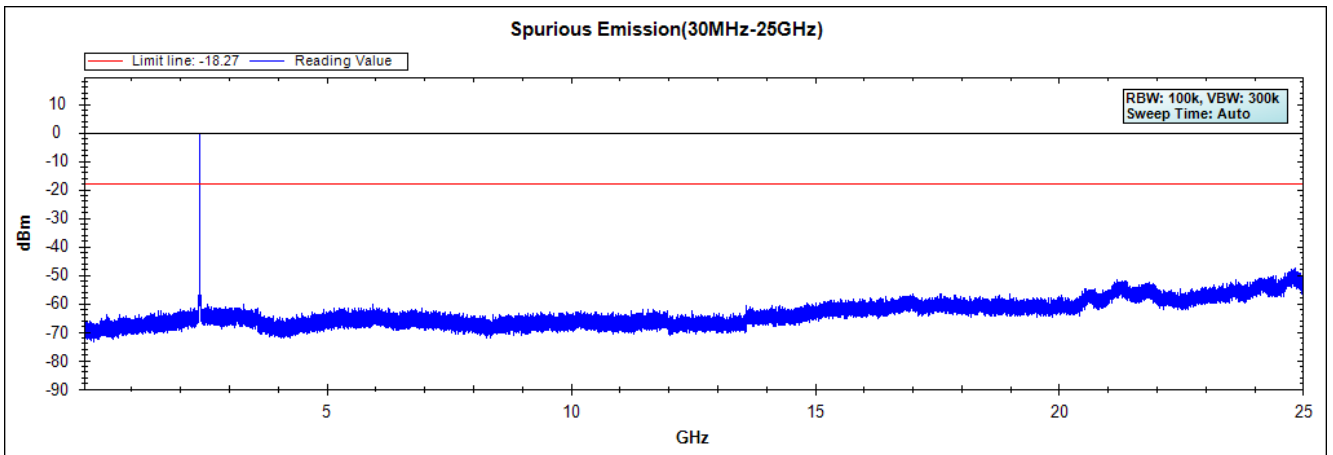
### 5.4. Uncertainty

The measurement uncertainty  
Conducted is defined as  $\pm 1.20\text{dB}$

**5.5. Test Result of RF antenna conducted test**

Product : LVL50 Wireless Dongle for PS4  
 Test Item : RF antenna conducted test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit

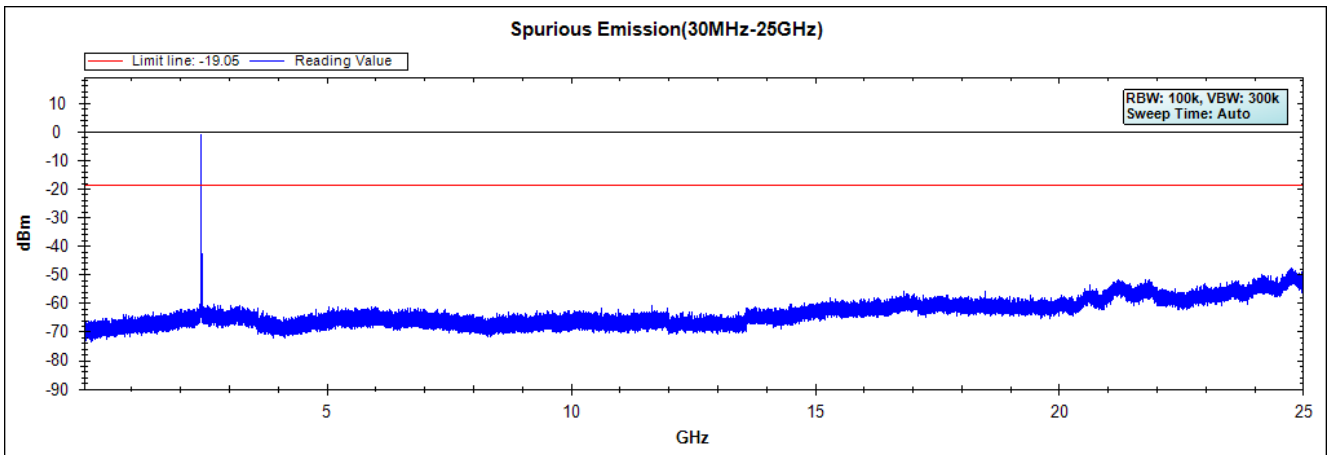
**Channel 01 (2405.35MHz) 30M-25GHz**



Note: The above test pattern is synthesized by multiple of the frequency range.

Product : LVL50 Wireless Dongle for PS4  
Test Item : RF antenna conducted test  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmit

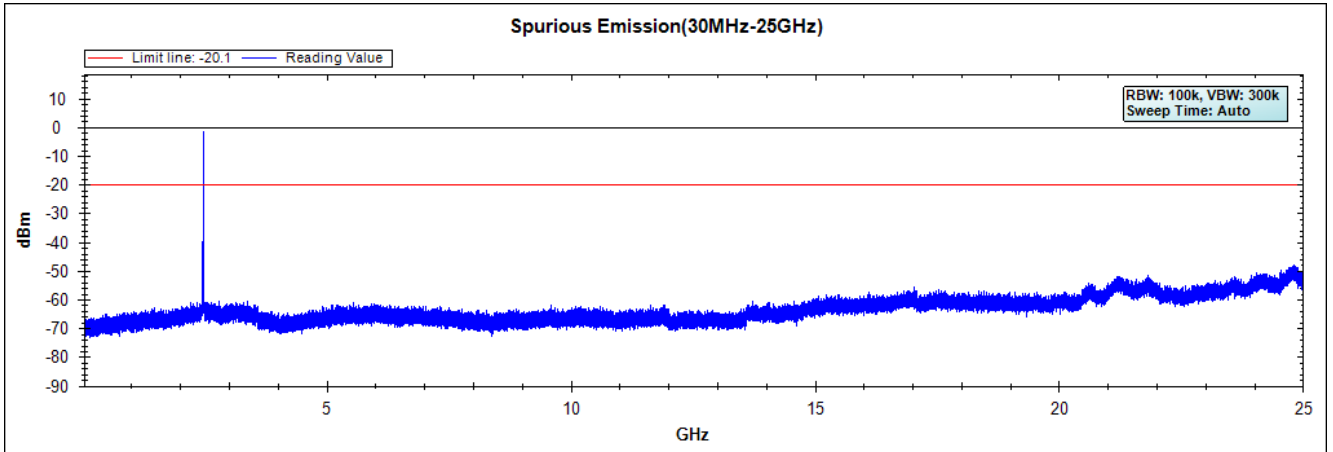
**Channel 19 (2441.35MHz) 30M-25GHz**



Note: The above test pattern is synthesized by multiple of the frequency range.

Product : LVL50 Wireless Dongle for PS4  
Test Item : RF antenna conducted test  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmit

**Channel 37 (2477.35MHz) 30M-25GHz**

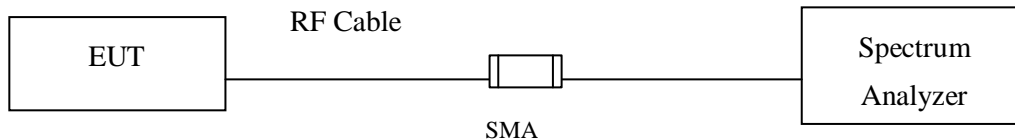


Note: The above test pattern is synthesized by multiple of the frequency range.

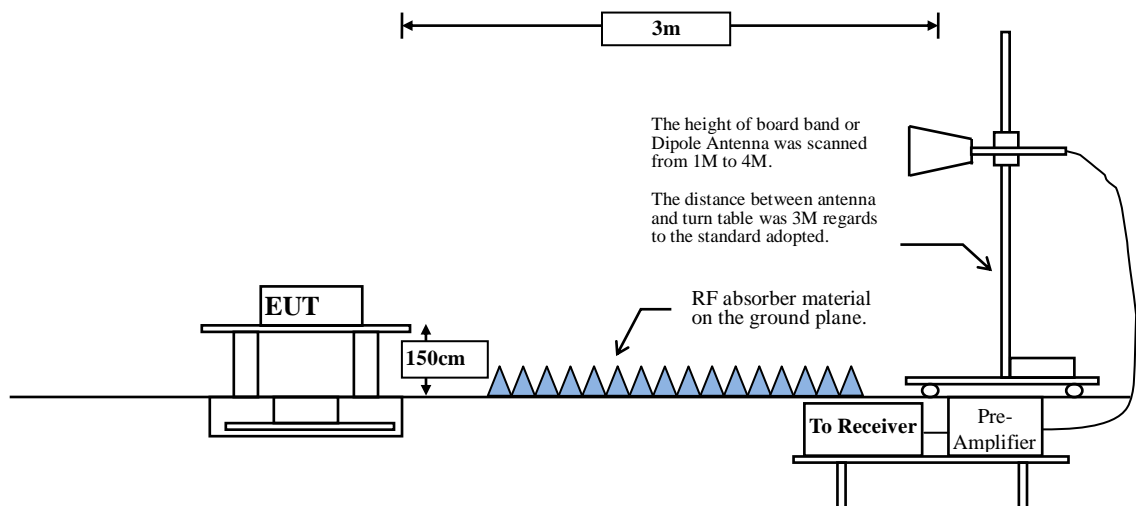
## 6. Band Edge

### 6.1. Test Setup

#### RF Conducted Measurement



#### RF Radiated Measurement:



### 6.2. Limits

According to FCC Section 15.247(d). 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

#### RBW and VBW Parameter setting:

According to KDB 558074 section 8.3.2.1 Peak power measurement procedure

RBW = as specified in Table 1.

VBW  $\geq$  3 x RBW.

**Table 1 —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

According to KDB 558074 section 8.3.2.1 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle  $\geq$  98 %

VBW  $\geq$  1/T, when duty cycle < 98 %

( T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
Pi/4 DQPSK	100	--	--	10

Note: Duty Cycle Refer to Section 9

#### **6.4. Uncertainty**

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

### 6.5. Test Result of Band Edge

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405.35MHz)

#### RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	6.474	40.361	46.836	74.00	54.00	Pass
01 (Peak)	2400.000	6.528	53.326	59.854	--	--	Pass
01 (Peak)	2405.350	6.561	87.076	93.637	--	--	--
01 (Average)	2390.000	6.474	23.867	30.342	74.00	54.00	Pass
01 (Average)	2400.000	6.528	45.639	52.167	--	--	Pass
01 (Average)	2405.350	6.561	85.962	92.523	--	--	--

Figure Channel 01: Horizontal (Peak)

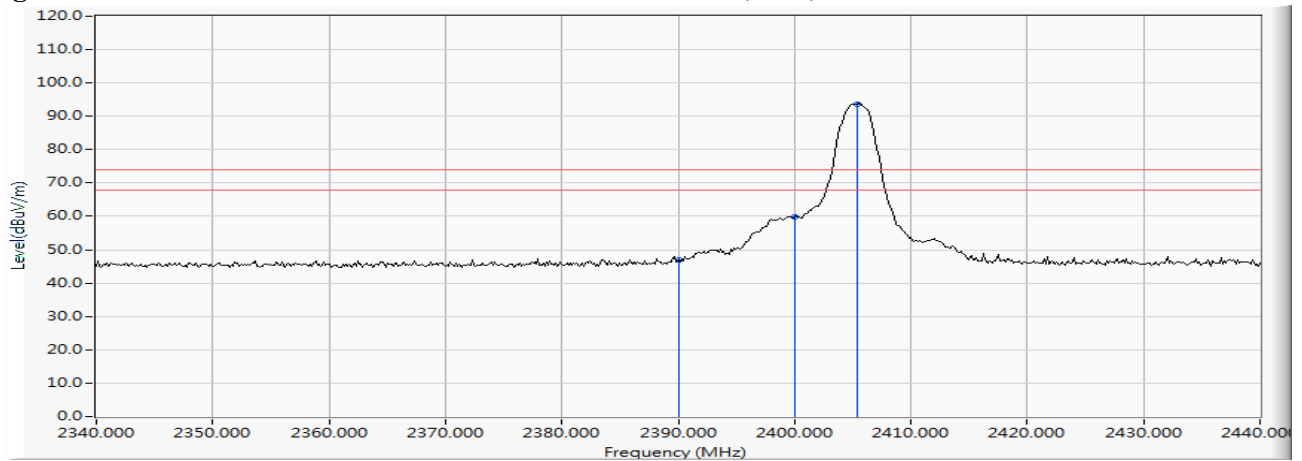
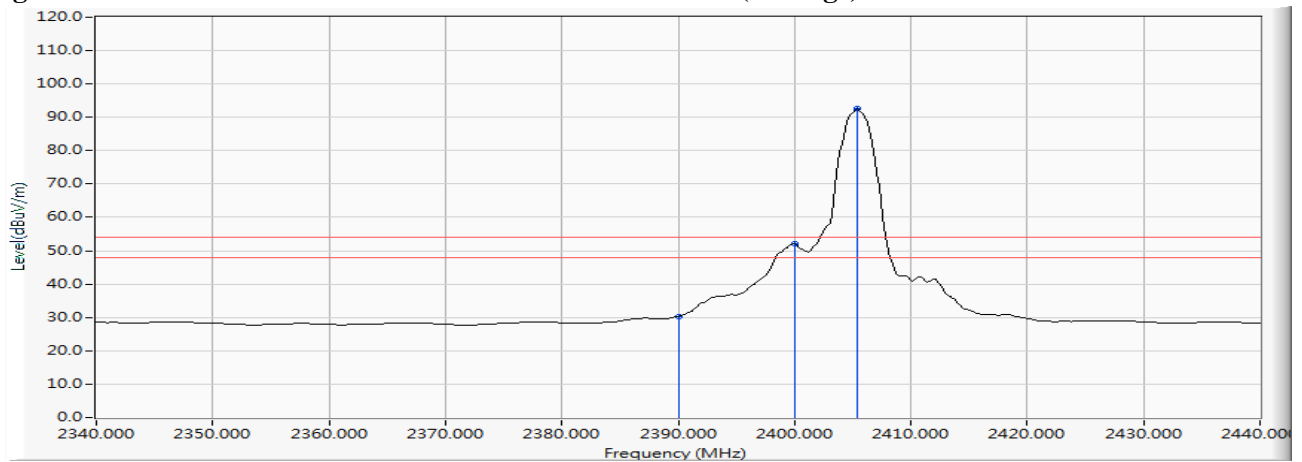


Figure Channel 01: Horizontal (Average)



Note :

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.



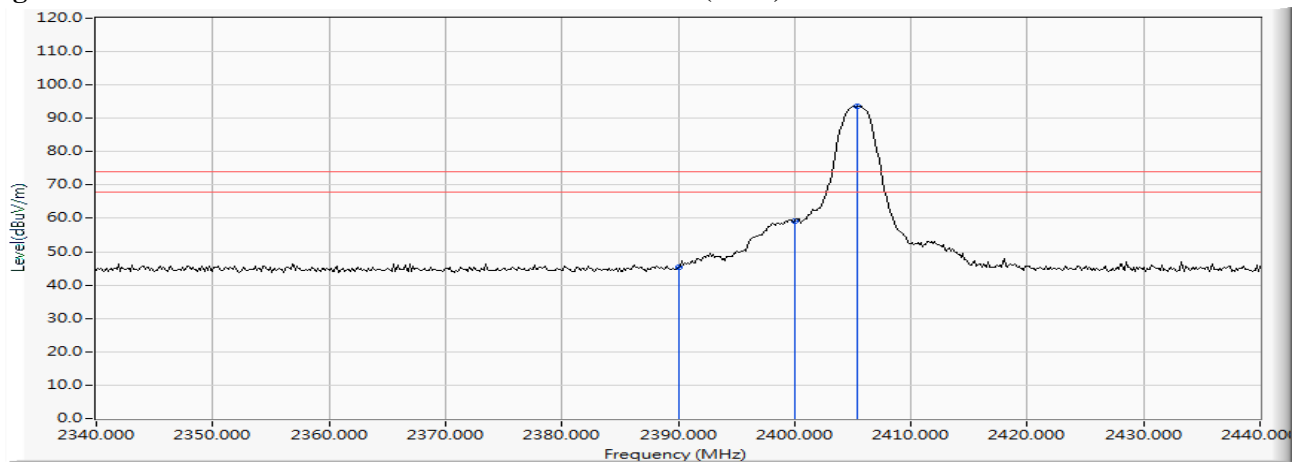
Product : LVL50 Wireless Dongle for PS4  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405.35MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	5.880	39.384	45.265	74.00	54.00	Pass
01 (Peak)	2400.000	5.879	53.194	59.073	--	--	Pass
01 (Peak)	2405.350	5.893	87.682	93.575	--	--	--
01 (Average)	2390.000	5.880	23.916	29.797	74.00	54.00	Pass
01 (Average)	2400.000	5.879	45.911	51.790	--	--	Pass
01 (Average)	2405.350	5.893	86.561	92.454	--	--	--

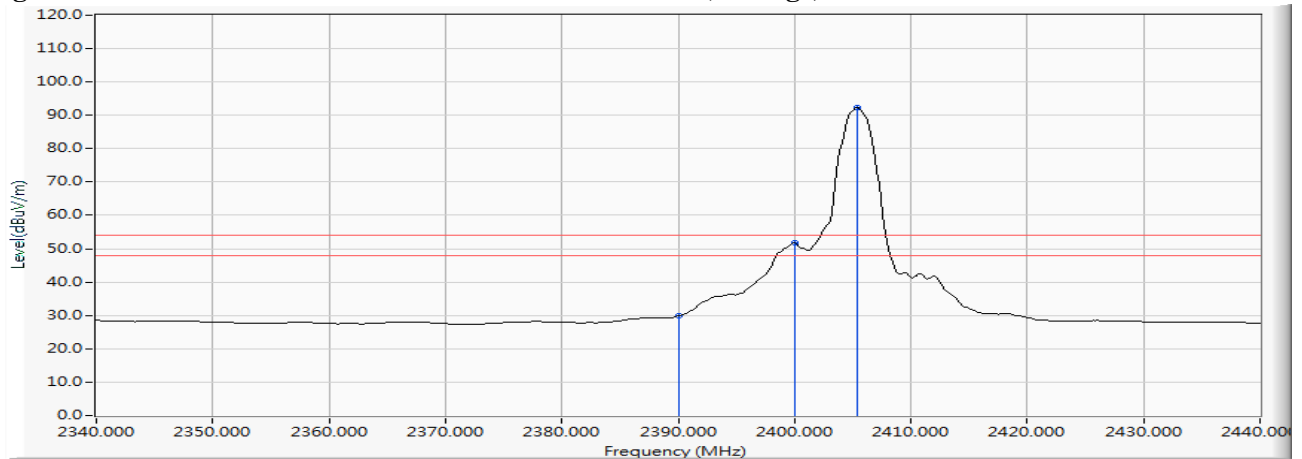
**Figure Channel 01:**

**Vertical (Peak)**



**Figure Channel 01:**

**Vertical (Average)**



Note:

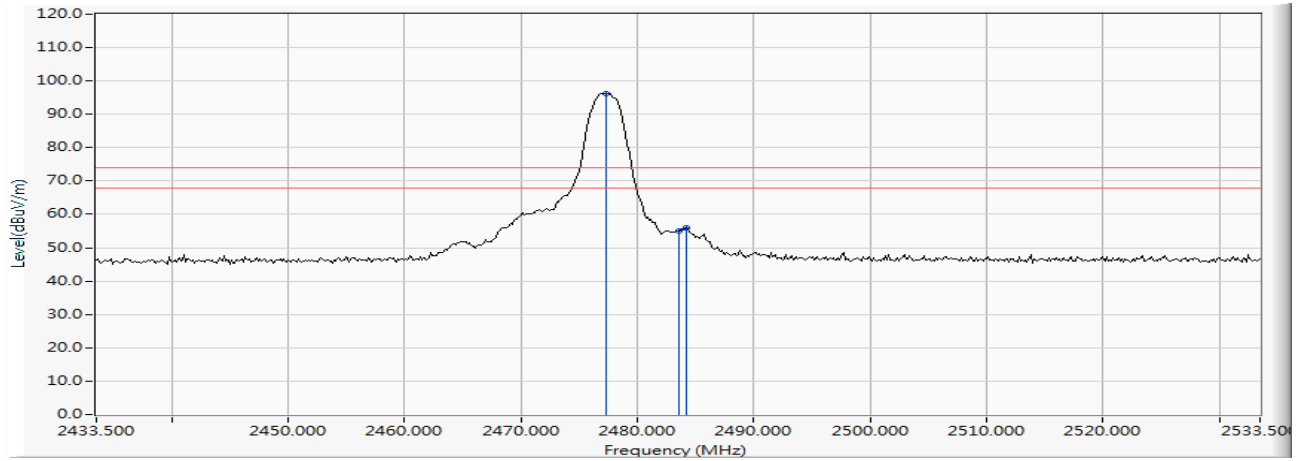
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477.35MHz)

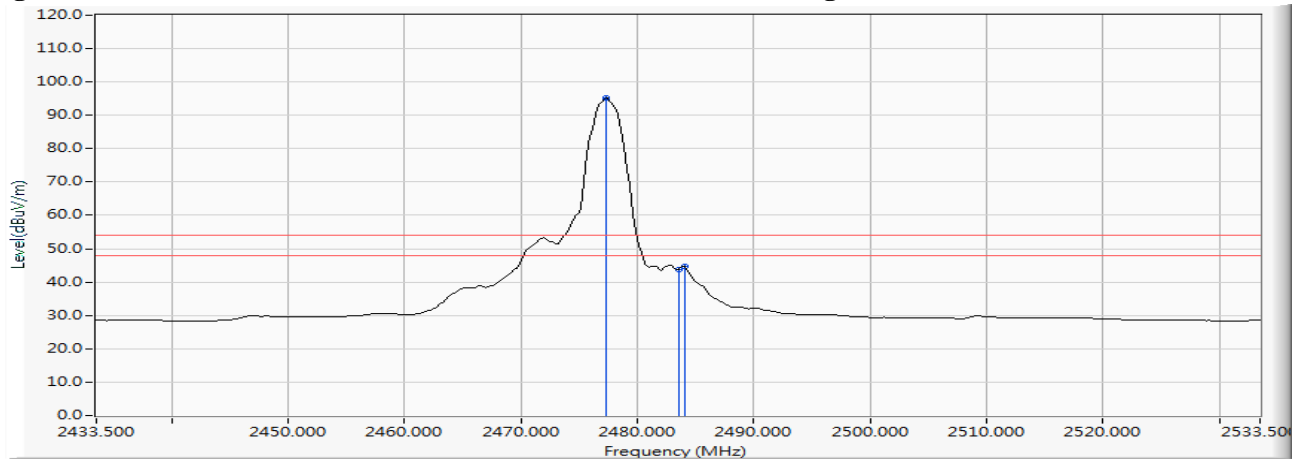
**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
39 (Peak)	2477.350	7.066	89.061	96.127	--	--	--
39 (Peak)	2483.500	7.110	47.972	55.082	74.00	54.00	Pass
39 (Peak)	2484.225	7.115	48.719	55.834	74.00	54.00	Pass
39 (Average)	2477.350	7.066	88.068	95.134	--	--	--
39 (Average)	2483.500	7.110	36.636	43.746	74.00	54.00	Pass
39 (Average)	2484.080	7.114	37.511	44.625	74.00	54.00	Pass

**Figure Channel 39: Horizontal (Peak)**



**Figure Channel 39: Horizontal (Average)**



**Note:**

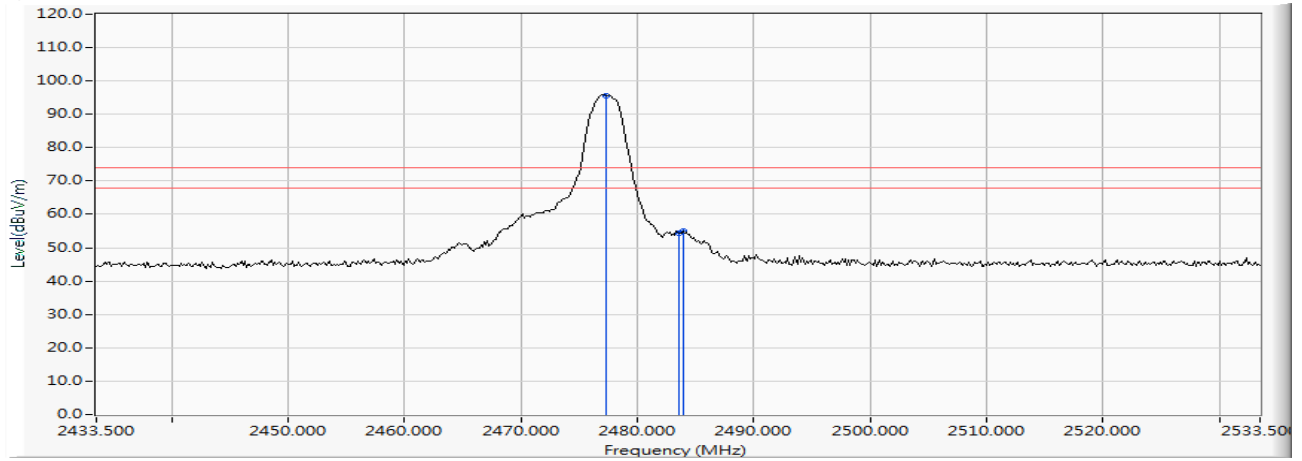
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477.35MHz)

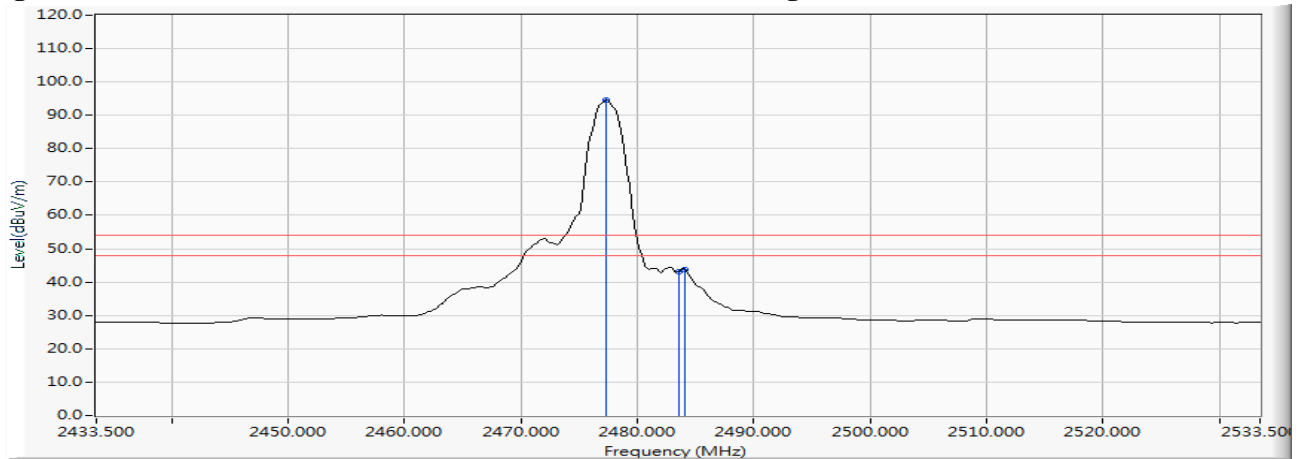
**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
39 (Peak)	2477.350	6.325	89.288	95.613	--	--	--
39 (Peak)	2483.500	6.363	47.973	54.336	74.00	54.00	Pass
39 (Peak)	2483.935	6.366	48.631	54.997	74.00	54.00	Pass
39 (Average)	2477.350	6.325	88.373	94.698	--	--	--
39 (Average)	2483.500	6.363	36.637	43.000	74.00	54.00	Pass
39 (Average)	2484.080	6.367	37.514	43.881	74.00	54.00	Pass

**Figure Channel 39: Vertical (Peak)**



**Figure Channel 39: Vertical (Average)**

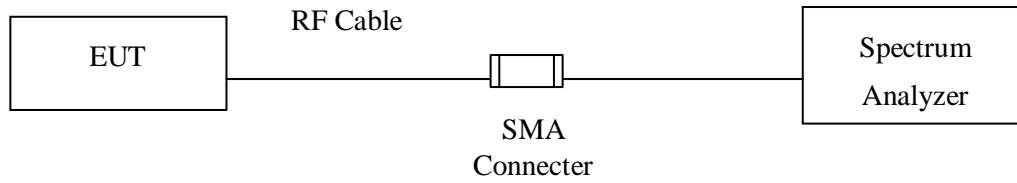


**Note:**

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

## 7. Occupied Bandwidth

### 7.1. Test Setup



### 7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.3. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth,  $VBW \geq 3 * RBW$

### 7.4. Uncertainty

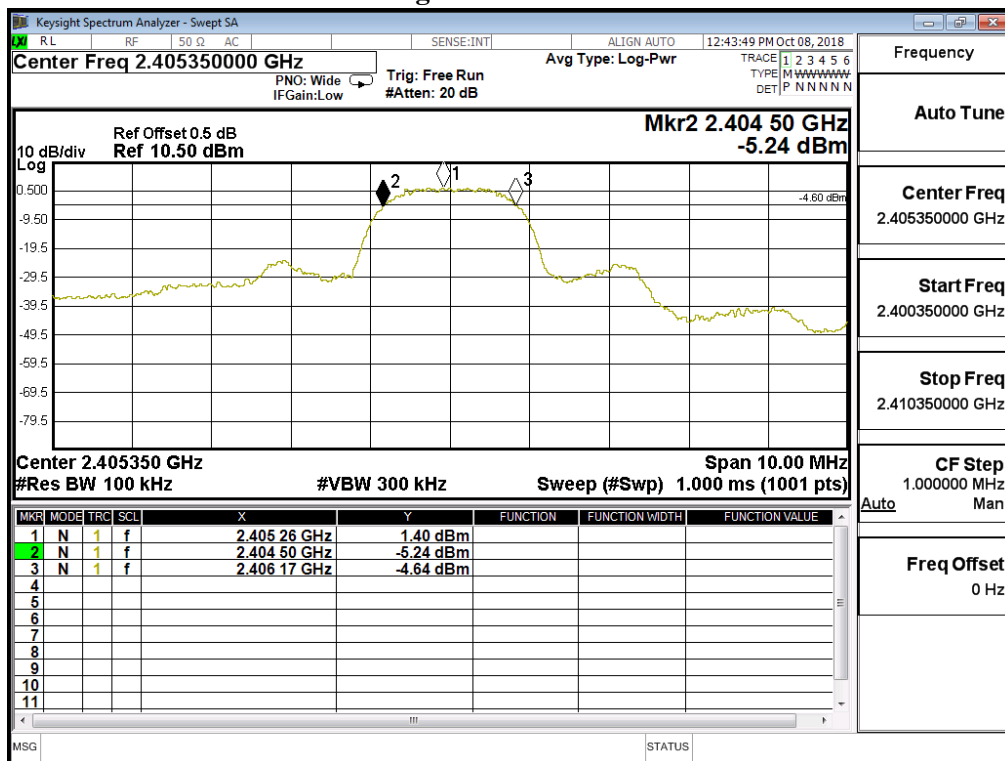
$\pm 283\text{Hz}$

### 7.5. Test Result of Occupied Bandwidth

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2405.35	1670	>500	Pass

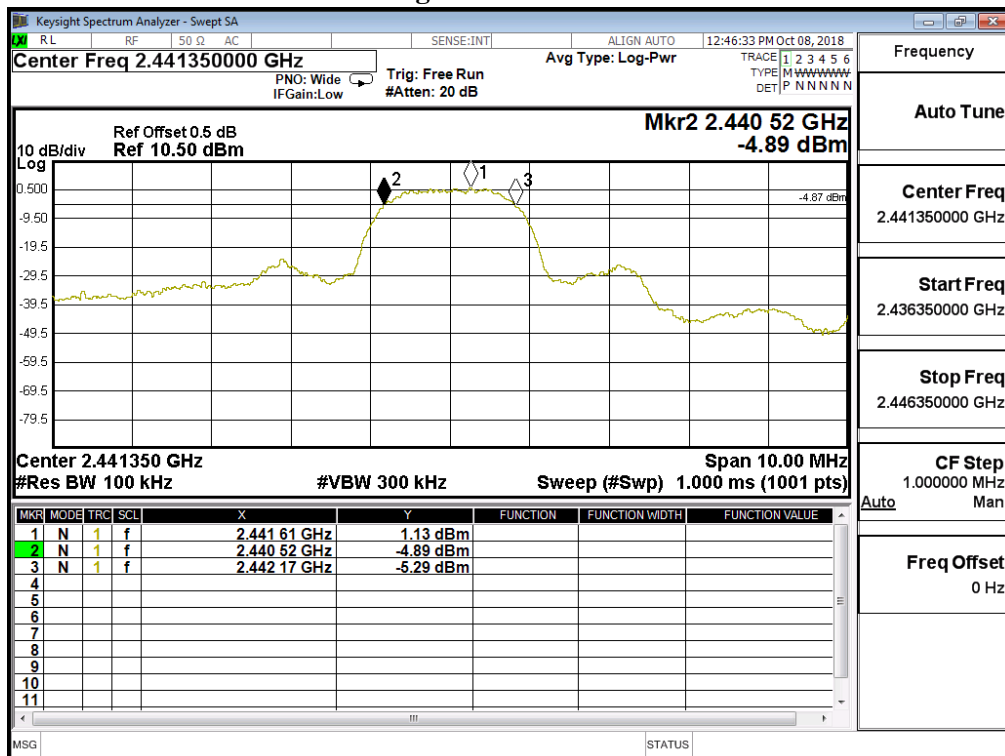
Figure Channel 01:



Product : LVL50 Wireless Dongle for PS4  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2441.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
19	2441.35	1650	>500	Pass

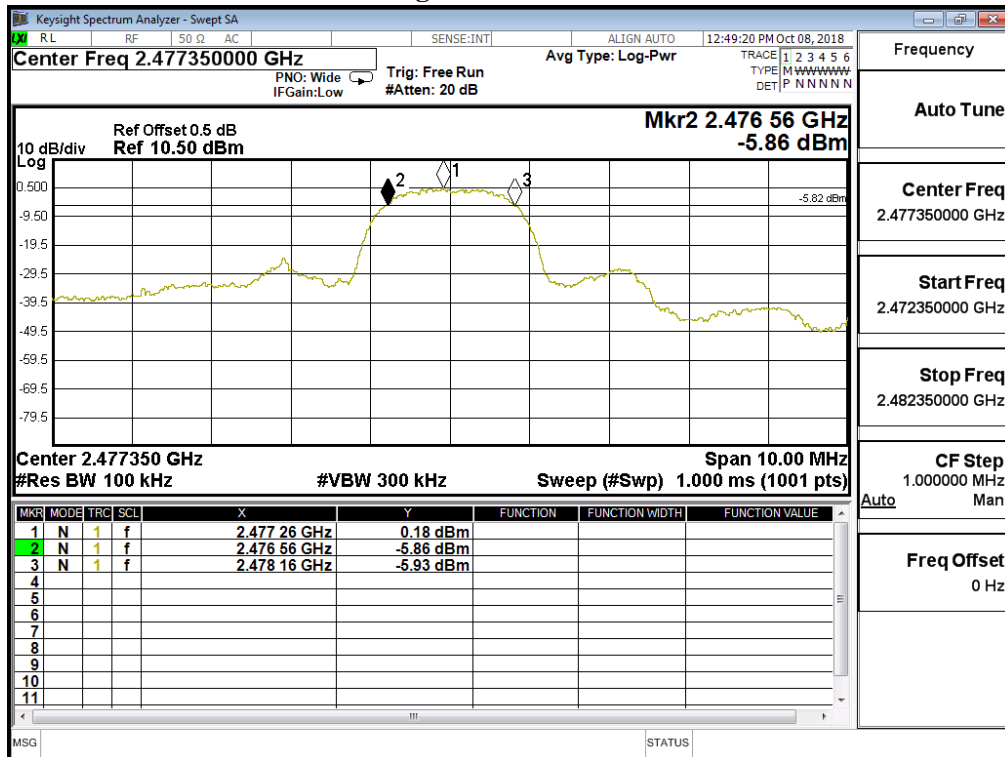
Figure Channel 20:



Product : LVL50 Wireless Dongle for PS4  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477.35MHz)

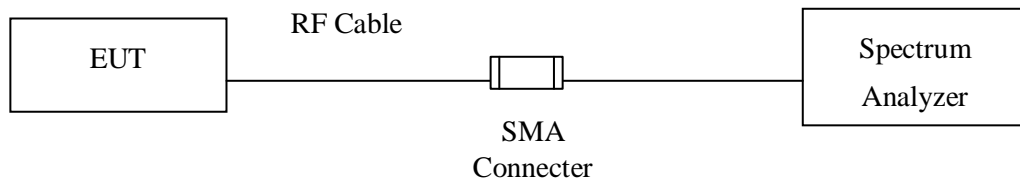
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
37	2477.35	1600	>500	Pass

Figure Channel 39:



## 8. Power Density

### 8.1. Test Setup



### 8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

### 8.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013, the maximum power spectral density using KDB 558074 section 8.4 PKPSD (peak PSD) method.

### 8.4. Uncertainty

$\pm 1.20$  dB

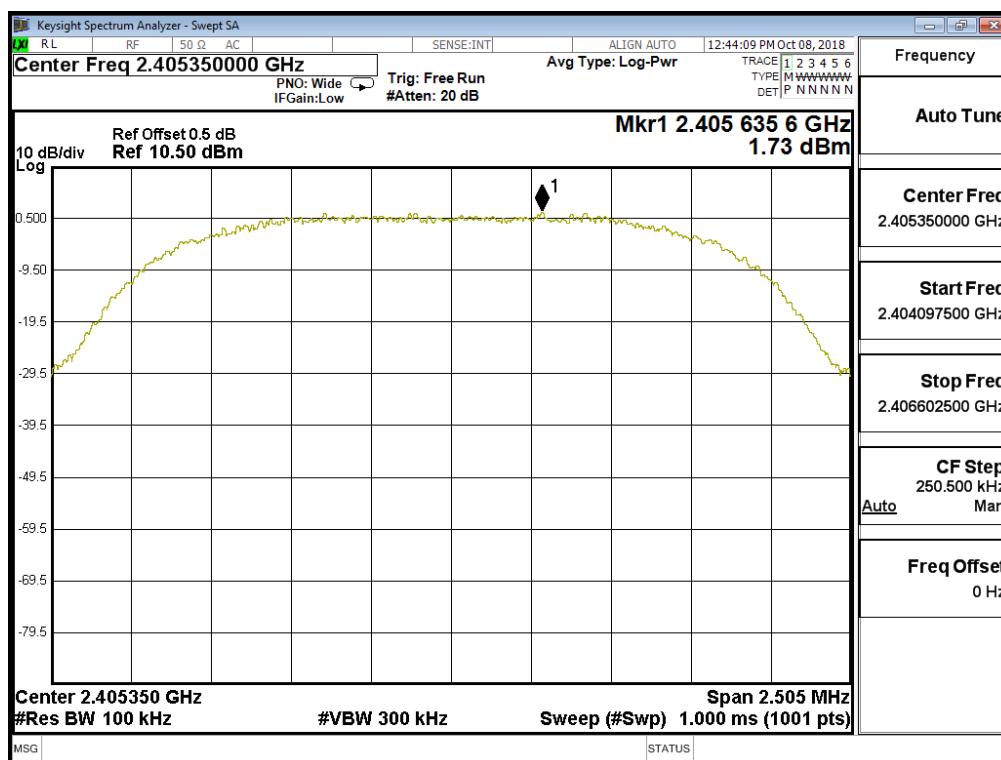


### 8.5. Test Result of Power Density

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit(2405.35MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2405.35	1.730	< 8dBm	Pass

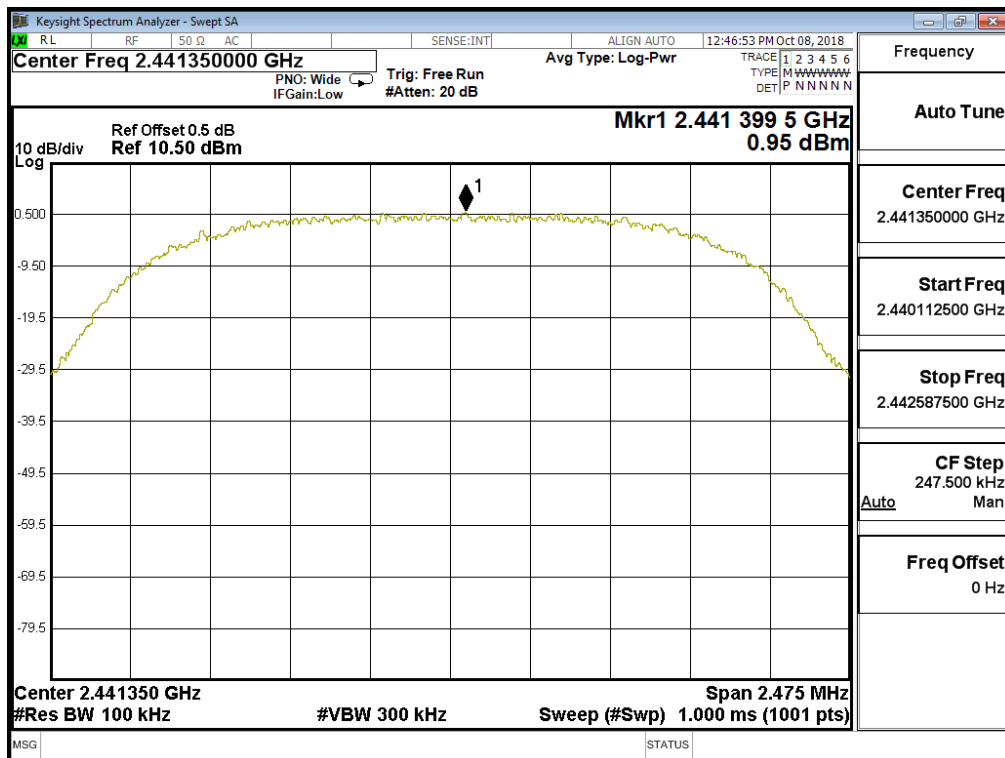
Figure Channel 01:



Product : LVL50 Wireless Dongle for PS4  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit (2441.35MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
19	2441.35	0.950	< 8dBm	Pass

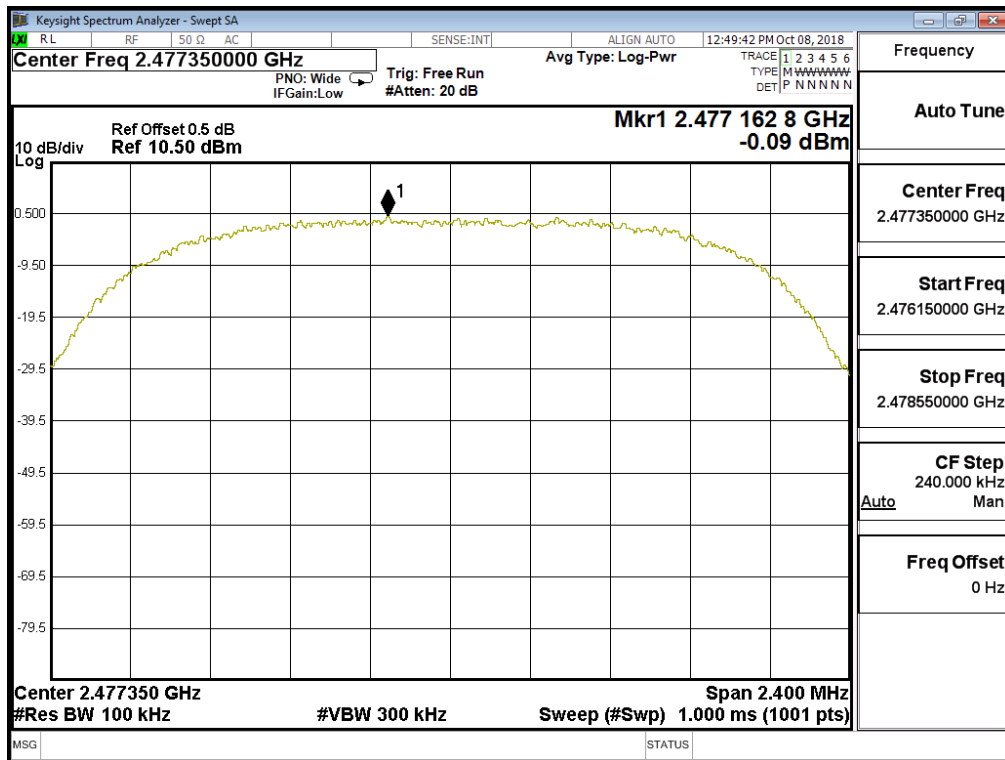
Figure Channel 20:



Product : LVL50 Wireless Dongle for PS4  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477.35MHz)

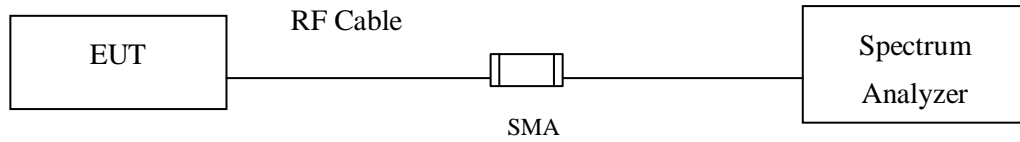
Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
37	2477.35	-0.090	< 8dBm	Pass

Figure Channel 39:



## 9. Duty Cycle

### 9.1. Test Setup



### 9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

### 9.3. Uncertainty

$\pm 2.31\text{msec}$

### 9.4. Test Result of Duty Cycle

Product : LVL50 Wireless Dongle for PS4  
 Test Item : Duty Cycle  
 Test Mode : Mode 1: Transmit

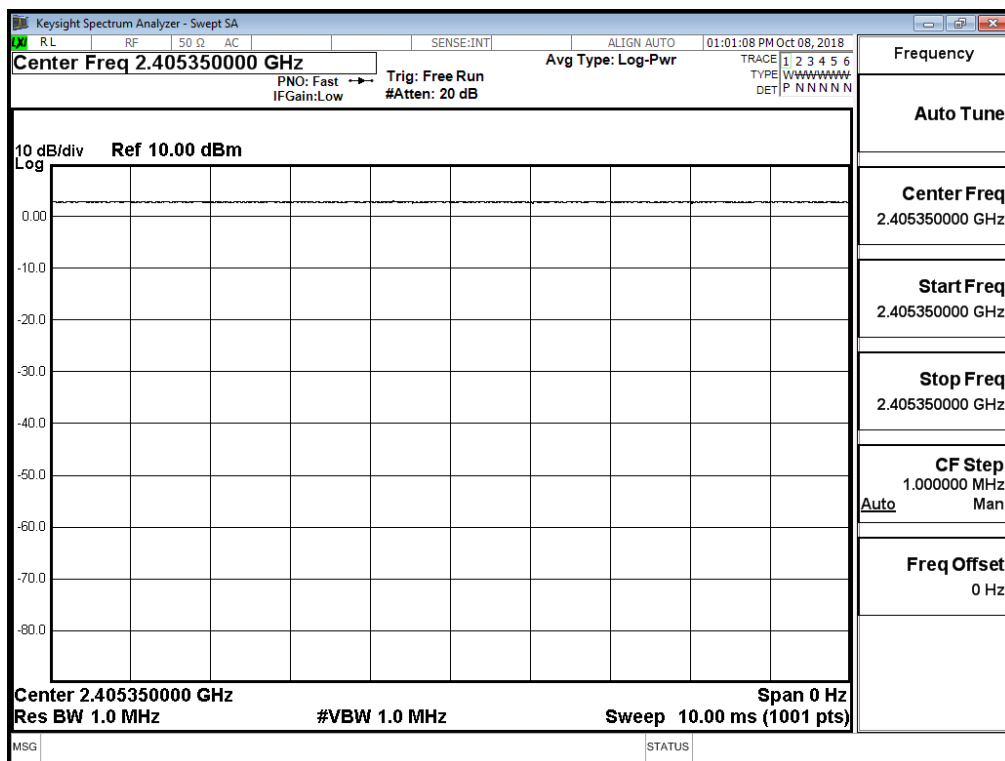
Duty Cycle Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

$$\text{Duty Factor} = 10 \text{ Log} (1/\text{Duty Cycle})$$

Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
Pi/4 DQPSK	--	--	100	0



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**10. EMI Reduction Method During Compliance Testing**

No modification was made during testing.