



CERTIFICATION TEST REPORT

Report Number. : 12118543-E3V2

Applicant : SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA -KU, TOKYO, 140-0002, JAPAN

FCC ID : PY7-24117Q

EUT Description : GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

May 11, 2018

Prepared by:

UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888



Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	04/12/18	Initial Review	
V2	05/11/18	Updated Section 2 & 8.1.2	Kiya Kedida

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	6
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	6
4.2. <i>SAMPLE CALCULATION</i>	6
4.3. <i>MEASUREMENT UNCERTAINTY.....</i>	6
5. EQUIPMENT UNDER TEST.....	7
5.1. <i>DESCRIPTION OF EUT</i>	7
6. TEST AND MEASUREMENT EQUIPMENT	8
7. REUSE OF TEST DATA.....	9
7.1. <i>INTRODUCTION</i>	9
7.2. <i>DEVICES DIFFERENCES.....</i>	9
7.3. <i>SPOT CHECK VERIFICATION RESULTS SUMMARY</i>	9
7.4. <i>REFERENCE DETAIL</i>	9
8. SPOT CHECK DATA.....	10
8.1. <i>TRANSMITTER ABOVE 1GHz.....</i>	11
8.1.1. <i>BANDEDGE HIGH CHANNEL 2Mbps</i>	11
8.1.2. <i>HARMONICS AND SPURIOUS EMISSIONS 2Mbps.....</i>	13
9. SETUP PHOTOS.....	15

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA -KU, TOKYO, 140-0002, JAPAN

EUT DESCRIPTION: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac &
NFC

SERIAL NUMBER: BH90001XB2, BH90001WB2, & BH900083AY

DATE TESTED: MARCH 20 to 21, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc By:

Reviewed By:



Dan Corona
Operations Leader
UL Verification Services Inc.

Kiya Kedida
Project Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013 and KDB 484596 D01 Referencing Test Data v01.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
<input type="checkbox"/> Chamber A(IC: 2324B-1)	<input type="checkbox"/> Chamber D(IC: 22541-1)
<input type="checkbox"/> Chamber B(IC: 2324B-2)	<input type="checkbox"/> Chamber E(IC: 22541-2)
<input checked="" type="checkbox"/> Chamber C(IC: 2324B-3)	<input type="checkbox"/> Chamber F(IC: 22541-3)
	<input type="checkbox"/> Chamber G(IC: 22541-4)
	<input type="checkbox"/> Chamber H(IC: 22541-5)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC.

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	ID Num	Cal Due
Antenna, Horn 1-18GHz	Miteq	3117	T863	06/09/18
Antenna, Horn 1-18GHz	Miteq	3117	T120	06/26/18
RF Preamp, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T931	06/21/18
RF Preamp, 1 - 7GHz	Miteq	AMF-4D-01000800-30-29P	T1574	06/21/18
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T905	02/03/19

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, Dec 1, 2016

NOTE: *testing is completed before equipment calibration expiration

7. REUSE OF TEST DATA

7.1. INTRODUCTION

According to the manufacturer, FCC ID: PY7-72474U and FCC ID: PY7-24117Q unlicensed radios (WLAN/BT/BLE/NFC) are electrically identical. The FCC ID: PY7-72474U test data shall remain representative of FCC ID: PY7-24117Q so, FCC ID: PY7-24117Q leverages test data from FCC ID: PY7-72474U.

The applicant takes full responsibility that the test data as referenced in this section represents compliance for this FCC ID.

7.2. DEVICES DIFFERENCES

Difference between PY7-72474U and PY7-24117Q:

Sony Mobile Communications Inc. hereby declares that the difference between PY7-72474U and PY7-24117Q is related only to the cellular part and no change in non-cellular (WLAN/Bluetooth/NFC) parts. The non-cellular parts which are electrically identical, and therefore the following report/data of PY7-72474U may represent for PY7-24117Q.

7.3. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device PY7-24117Q for radiated harmonic spurious. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary and appendix A.

7.4. REFERENCE DETAIL

Equipment Class	Reference FCC ID	Report Title/Section
DTS (BLE)	PY7-72474U	12097277-E3V2 FCC Report BLE

8. SPOT CHECK DATA

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

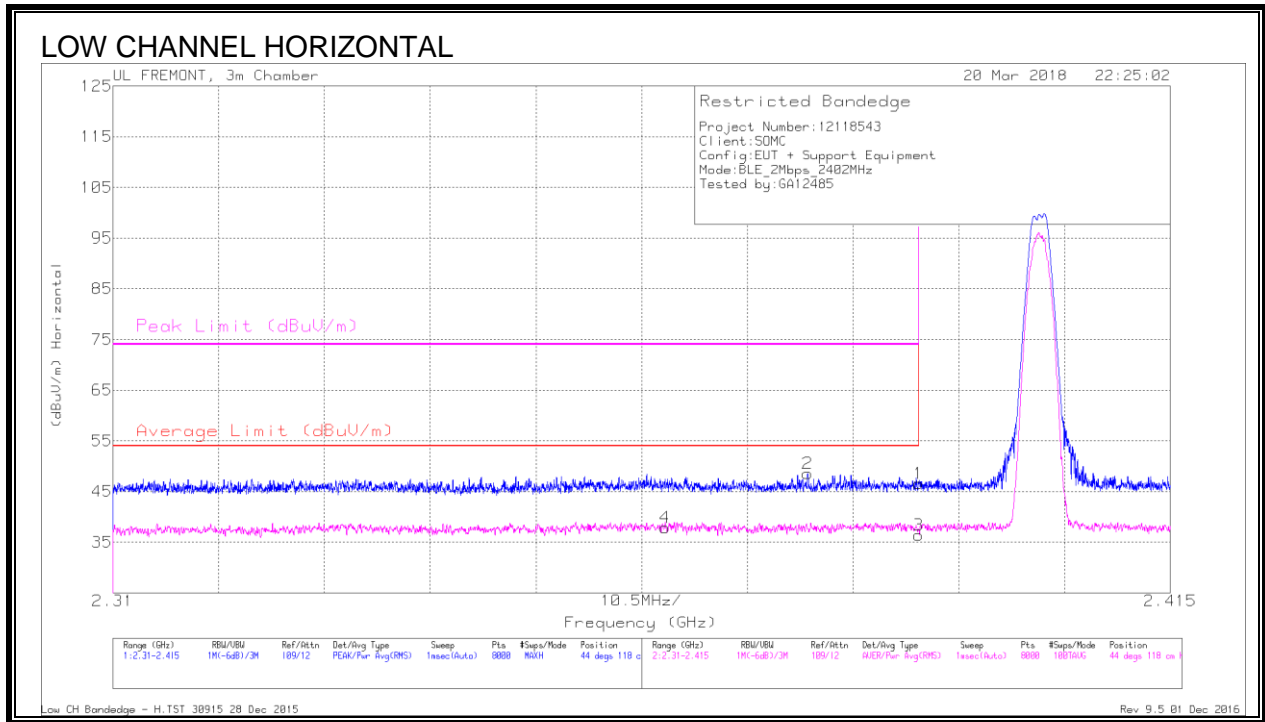
For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to worst case mode BLE (2Mbps).

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

8.1. TRANSMITTER ABOVE 1GHz

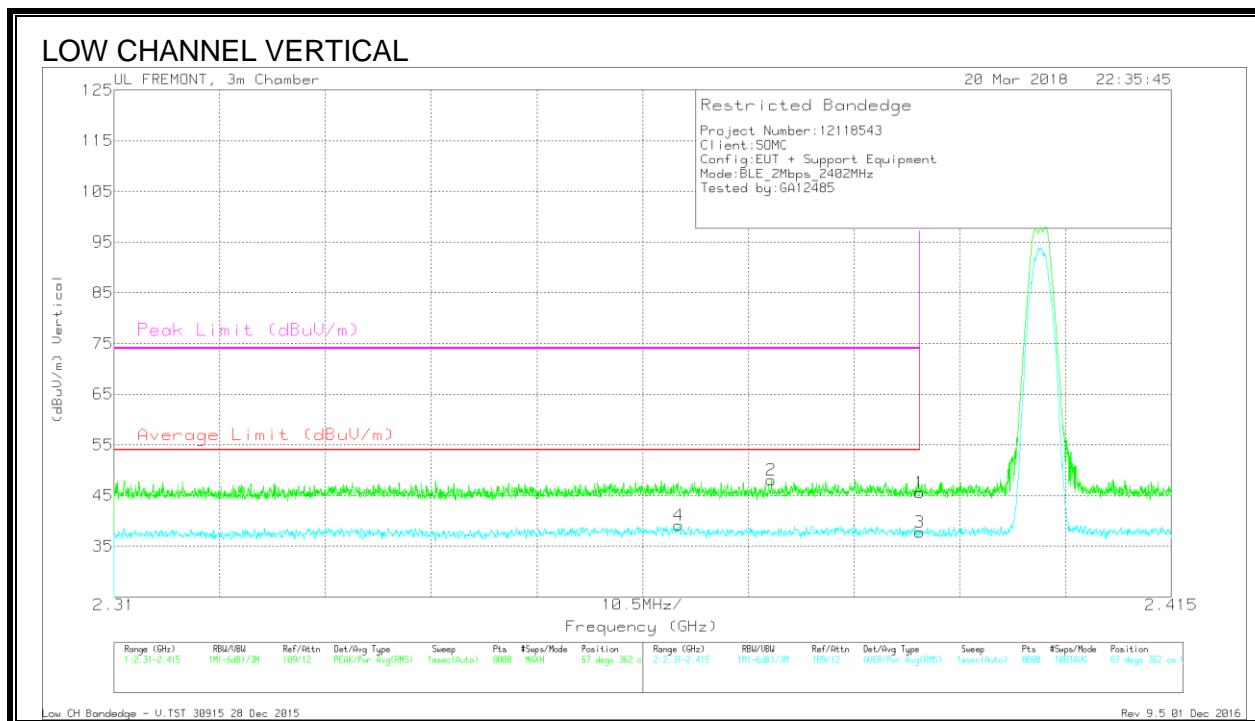
8.1.1. BANDEDGE HIGH CHANNEL 2Mbps



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cb/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.365	27.29	RMS	31.8	-21.2	1.14	39.03	54	-14.97	-	-	44	118	H
2	2.379	38.19	Pk	31.8	-21.4	0	48.59	-	-	74	-25.41	44	118	H
1	2.39	36.07	Pk	31.9	-21.4	0	46.57	-	-	74	-27.43	44	118	H
3	2.39	25.91	RMS	31.9	-21.4	1.14	37.55	54	-16.45	-	-	44	118	H

Pk - Peak detector
 RMS - RMS detection

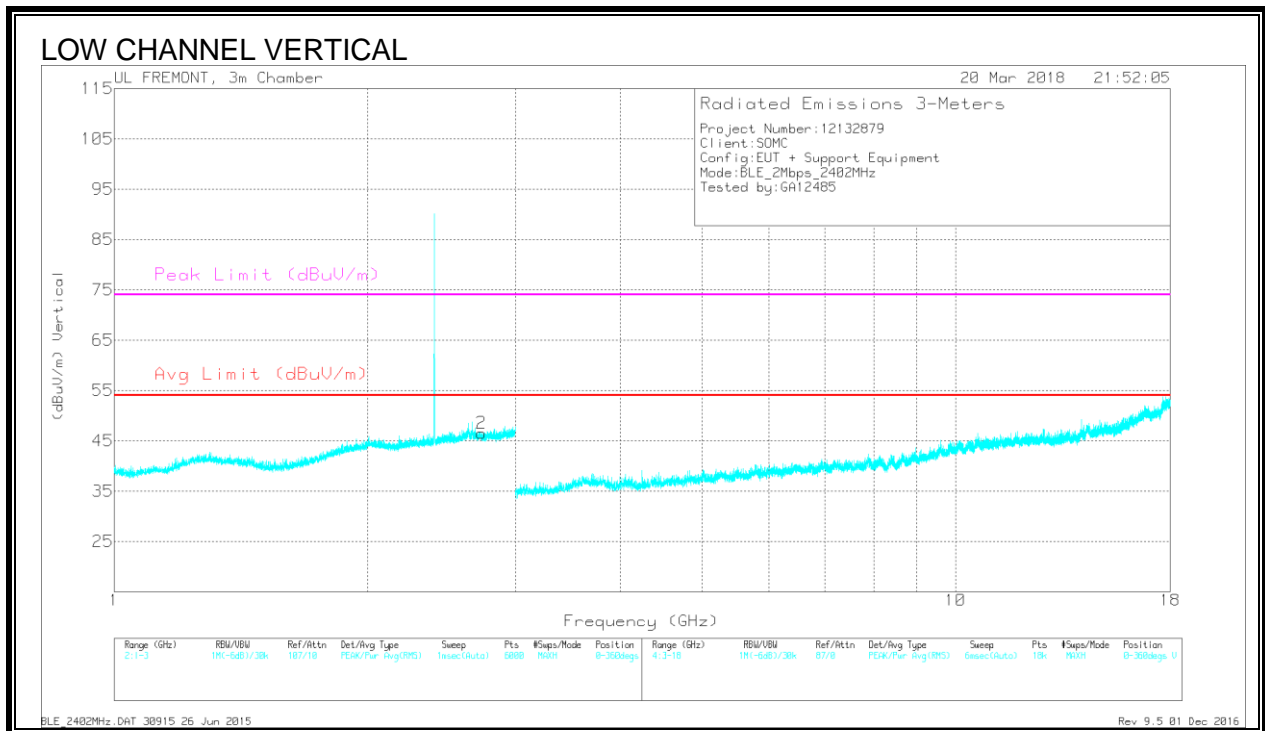
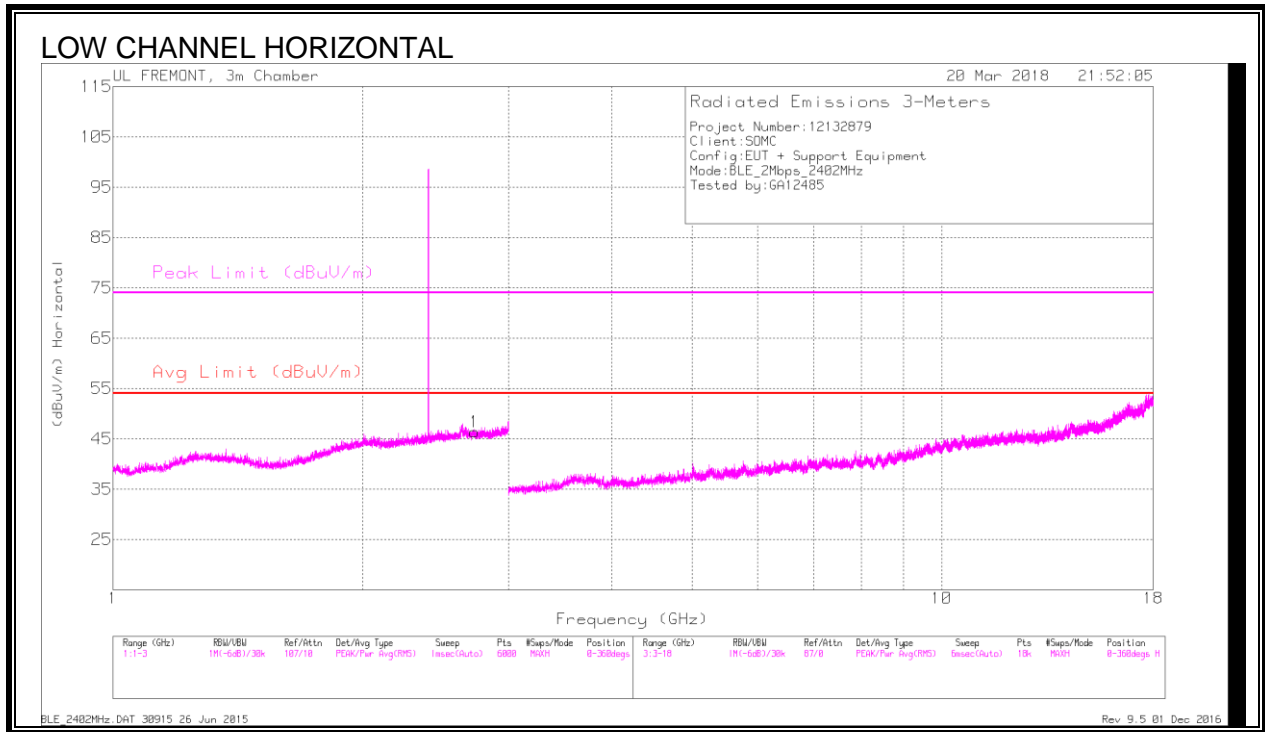


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cb/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.366	27.35	RMS	31.8	-21.2	1.14	39.09	54	-14.91	-	-	67	362	V
2	2.375	37.77	Pk	31.8	-21.5	0	48.07	-	-	74	-25.93	67	362	V
1	2.39	35.12	Pk	31.9	-21.4	0	45.62	-	-	74	-28.38	67	362	V
3	2.39	26.16	RMS	31.9	-21.4	1.14	37.8	54	-16.2	-	-	67	362	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 Pk - Peak detector
 RMS - RMS detection

8.1.2. HARMONICS AND SPURIOUS EMISSIONS 2Mbps



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Fitr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.729	34.01	Pk	32.5	-20.2	0	46.31	-	-	74	-27.69	0-360	200	H
2	* 2.733	34.51	Pk	32.5	-20.5	0	46.51	-	-	74	-27.49	0-360	100	V

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Fitr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.728	40.05	PK2	32.5	-20.1	0	52.45	-	-	74	-21.55	41	234	H
* 2.731	28.62	MAv1	32.5	-20.4	1.14	41.86	54	-12.14	-	-	41	234	H
* 2.732	40.8	PK2	32.5	-20.5	0	52.8	-	-	74	-21.2	28	115	V
* 2.735	28.74	MAv1	32.5	-20.5	1.14	41.88	54	-12.12	-	-	28	115	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

APPENDIX A

PY7-24117Q SPOT CHECK RESULTS										
Technology	Mode	Test Item	Channel	Measured Frequency	PY7-72474U		PY7-24117Q		Delta (dB)	
					Peak	Ave	Peak	Ave	Peak	Ave
BLE	2Mbps	RBE	1	2363MHz	52.9	44.95	48.59	39.09	-4.31	-5.86
	2Mbps	RSE	1	2732MHz	52.92	42.75	52.8	41.88	-0.12	-0.87
Note:										

END OF REPORT