



CERTIFICATION TEST REPORT

Report Number. : 12118543-E5V2

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 E (EXCEPT DFS)

Date Of Issue:

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Prepared by:

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Revision History

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

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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: BH9000A9AY, BH90009SAY, & BH900096AY

DATE TESTED: MARCH 20 to 21, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 SUBPART E (EXCEPT DFS)	Complies

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, FCC KDB 662911 D01 v02r01, FCC KDB 789033 D02 v02r01, 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 checked="" type="checkbox"/> Chamber A(ISED: 2324B-1)	<input type="checkbox"/> Chamber D(ISED: 22541-1)
<input type="checkbox"/> Chamber B(ISED: 2324B-2)	<input type="checkbox"/> Chamber E(ISED: 22541-2)
<input type="checkbox"/> Chamber C(ISED: 2324B-3)	<input type="checkbox"/> Chamber F(ISED: 22541-3)
	<input type="checkbox"/> Chamber G(ISED: 22541-4)
	<input type="checkbox"/> Chamber H(ISED: 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:

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
RF Preamplifier, 1 - 8GHz	Miteq	AMF-4D-01000800-30-29P	T1573	06/24/18
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	11/25/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	06/09/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T119	04/03/19
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1113	12/21/18

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 date.

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
NII (UNII WLAN)	PY7-72474U	12097277-E5V2 FCC Report UNII WLAN

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.

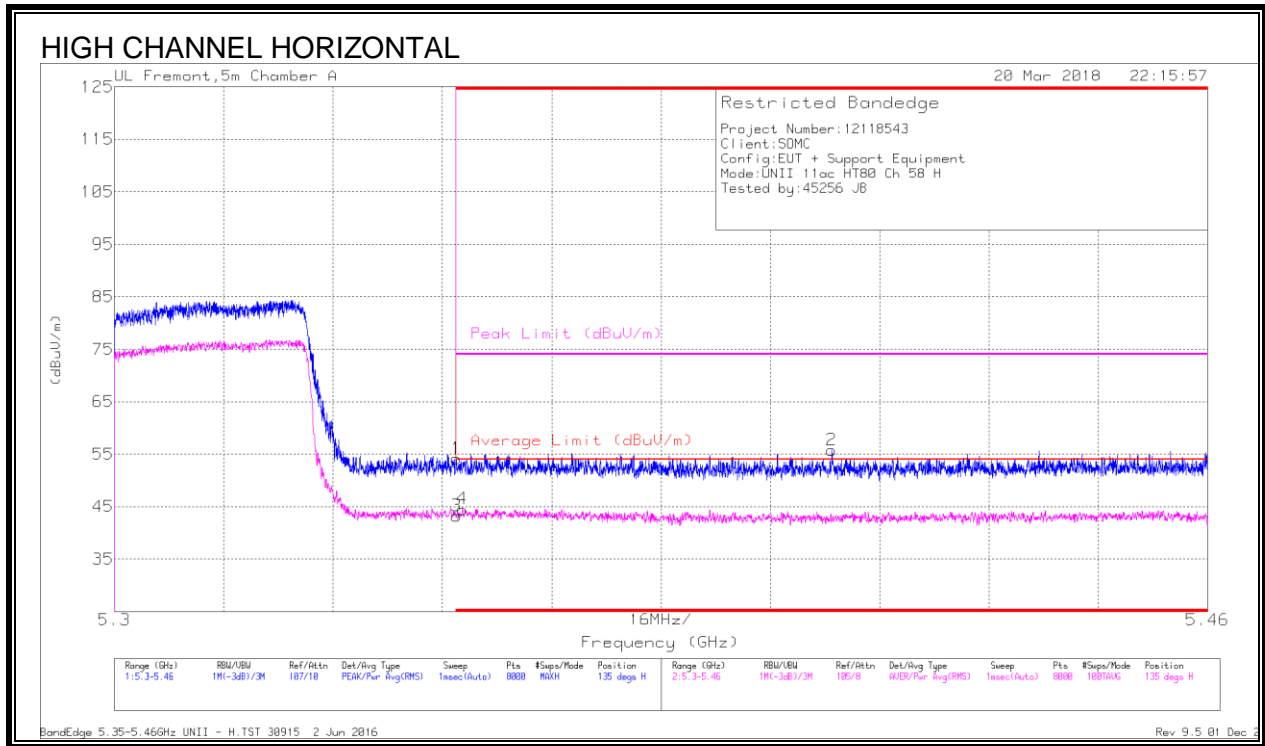
For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to worst case mode 11acHT80 for band edge and 11a for radiated spurious emission.

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. 11ac HT80 2TX CDD MIMO MODE IN THE 5.3GHZ BAND

8.1.1. BANDEDGE (HIGH CHANNEL)



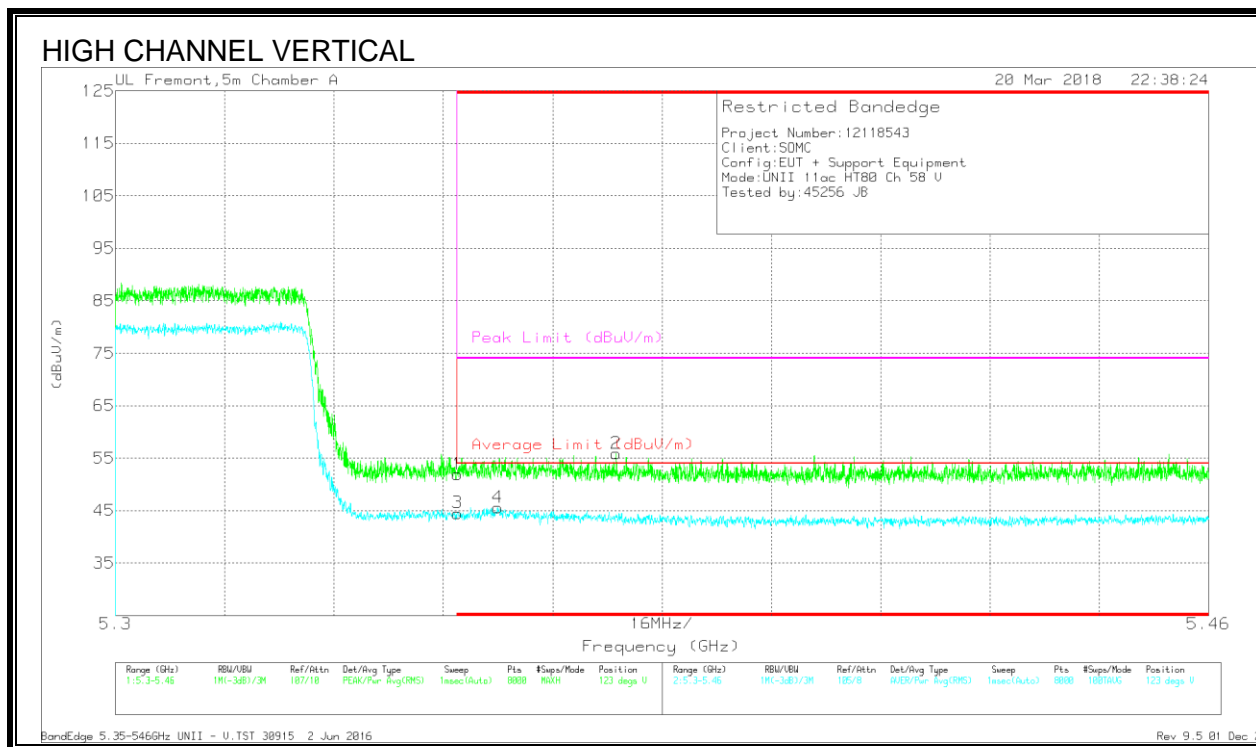
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (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
1	* 5.35	38.01	Pk	34.6	-18.5	0	54.11	-	-	74	-19.89	135	397	H
2	* 5.405	39.65	Pk	34.6	-18.5	0	55.75	-	-	74	-18.25	135	397	H
3	* 5.35	26.34	RMS	34.6	-18.5	.73	43.17	54	-10.83	-	-	135	397	H
4	* 5.351	27.69	RMS	34.6	-18.5	.73	44.52	54	-9.48	-	-	135	397	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection



Trace Markers

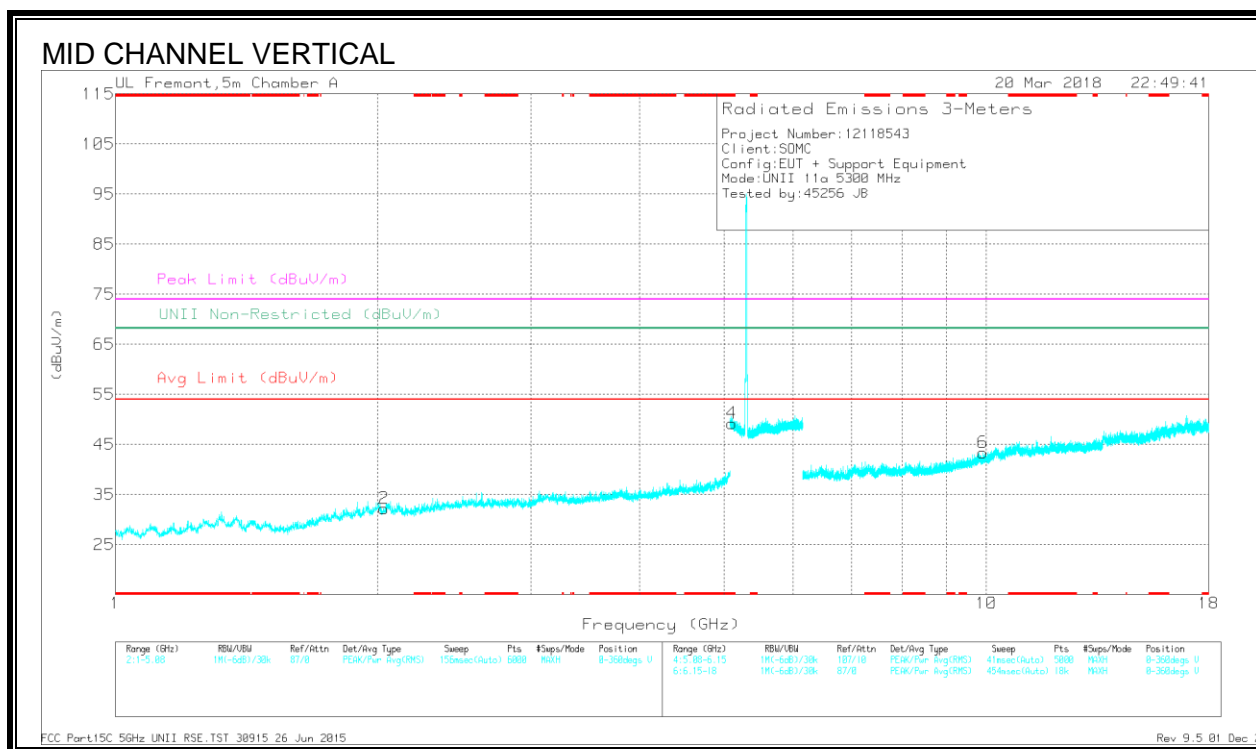
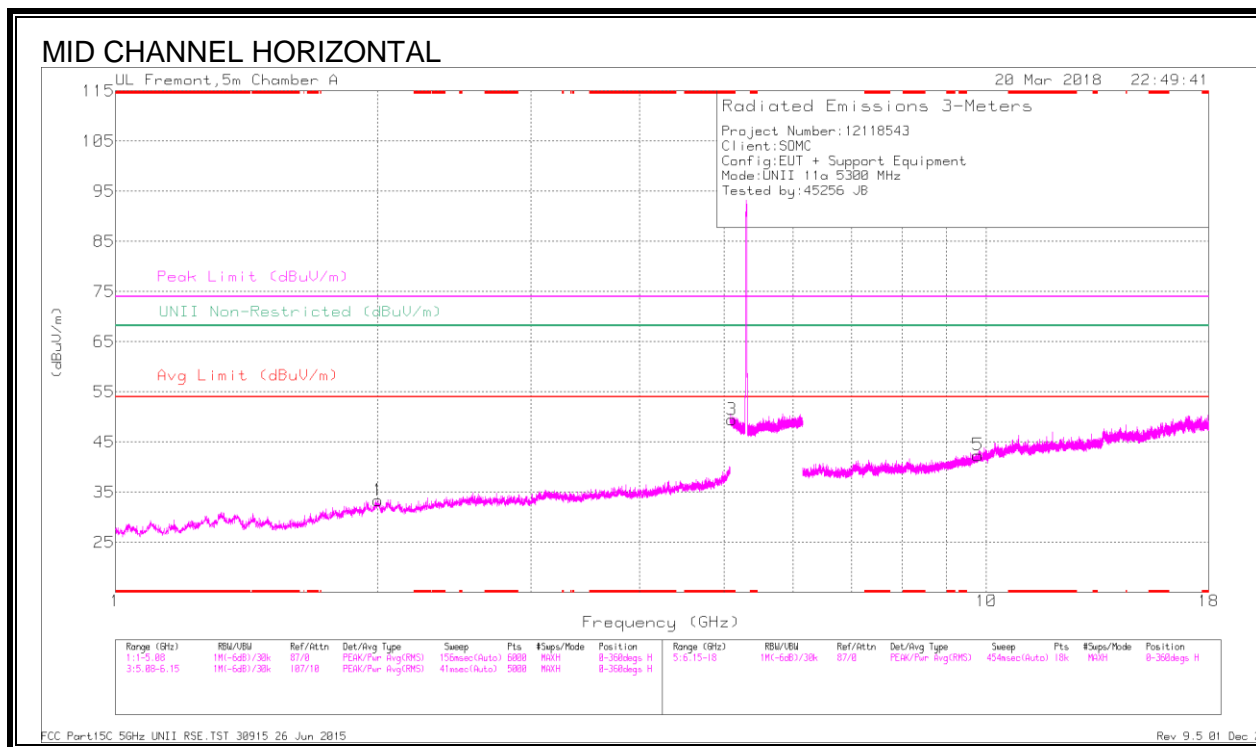
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	35.86	Pk	34.6	-18.5	0	51.96	-	-	74	-22.04	123	112	V
3	* 5.35	27.69	RMS	34.6	-18.5	.73	44.52	54	-9.48	-	-	123	112	V
4	* 5.356	28.8	RMS	34.6	-18.5	.73	45.63	54	-8.37	-	-	123	112	V
2	* 5.373	39.71	Pk	34.6	-18.4	0	55.91	-	-	74	-18.09	123	112	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

8.1.2. HARMONICS AND SPURIOUS EMISSIONS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cb/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 5.107	33.41	Pk	34.4	-18.3	0	49.51	-	-	74	-24.49	-	-	0-360	199	H
4	* 5.105	33.16	Pk	34.4	-18.3	0	49.26	-	-	74	-24.74	-	-	0-360	200	V
1	2.004	32.62	Pk	31.4	-30.7	0	33.32	-	-	-	-	68.2	-34.88	0-360	101	H
2	2.034	31.47	Pk	31.4	-30.7	0	32.17	-	-	-	-	68.2	-36.03	0-360	101	V
5	9.782	26.59	Pk	36.9	-21.1	0	42.39	-	-	-	-	68.2	-25.81	0-360	199	H
6	9.904	27.35	Pk	37.2	-21.2	0	43.35	-	-	-	-	68.2	-24.85	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cb/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 5.108	39.64	PK-U	34.4	-18.3	0	55.74	-	-	74	-18.26	-	-	180	113	H
* 5.106	28.17	ADR	34.4	-18.3	0	44.27	54	-9.73	-	-	-	-	180	113	H
* 5.104	40.4	PK-U	34.4	-18.2	0	56.6	-	-	74	-17.4	-	-	73	253	V
* 5.107	28.1	ADR	34.4	-18.3	0	44.2	54	-9.8	-	-	-	-	73	253	V
2.004	39.07	PK-U	31.4	-30.7	0	39.77	-	-	-	-	68.2	-28.43	98	228	H
2.034	38.1	PK-U	31.4	-30.7	0	38.8	-	-	-	-	68.2	-29.4	249	113	V
9.781	33.39	PK-U	36.9	-21.2	0	49.09	-	-	-	-	68.2	-19.11	273	116	H
9.904	32.8	PK-U	37.2	-21.2	0	48.8	-	-	-	-	68.2	-19.4	181	132	V

* - indicates frequency in CFR47 Pt 15 Restricted Band
 PK-U - U-NII: Maximum Peak
 ADR - U-NII AD primary method, 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
UNII	11ac HT80	RBE	58	5352MHz	61.3	51.82	55.91	45.63	-5.39	-6.19
	11a	RSE	60	5106MHz	57.26	45.32	56.6	44.2	-0.66	-1.12
Note:										

END OF REPORT