FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

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

FCC ID: PY7-76486O

REPORT NUMBER: 11589096AP-E5V1

ISSUE DATE: 2017-02-24

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

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Revision History

Ver.	Issue Date	Revisions	Revised By
1	2017-02-24	Initial Issue	Brian Kiewra

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1. REUSE OF TEST DATA

1.1. INTRODUCTION

According to manufacturer, FCC ID: PY7-29752M and FCC ID: PY7-764860 licensed and unlicensed radios (WWAN/WLAN/BT/BLE) are electrically identical, except the NFC which has a new chipset and LTE B7/41 network matching. With the exception of the NFC, FCC ID: PY7-29752M and FCC ID: PY7-764860 share the same chipsets, same power and same antenna performance including antenna gain. The FCC ID: PY7-29752M test data shall remain representative of FCC ID: PY7-764860, and therefore FCC ID: FCC ID: PY7-76846O leverages test data from FCC ID: PY7-29752M.

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

1.2. DEVICES DIFFERENCES

Difference between PY7-29752M and FCC ID: PY7-76846O:

Identical except the NFC chipset is new in PY7-76846O. Refer to Report 11589096AP-E2 for PY7-76846O NFC data.

1.3. SPOT CHECK VERIFICATION

Spot check verification has been done on device FCC ID: PY7-764860 for the WLAN Radiated Spurious Emissions. Note, the WLAN and BT are part of the same chipset and 802.11b was considered worst-case for the 2.4 GHz band. Test results were consistent with FCC ID: PY7-29752M.

Technology	Test Items	Configurations	PY7-29752M	PY7-21831Z
			Worst Case Result	Spot Check Result
WLAN DTS	Radiated Spurious	802.11b, 2412 MHz Chain 0	> 10 dB Margin*	-13.71 dB Margin*

*This frequency was considered Noise Floor.

1.4. REFERENCE DETAIL

Equipment Class	Reference FCC ID	Report Title/Section
DSS	PY7-29752M	16J23633A-E2V3 FCC Report BT

The following test pages are the test data from FCC ID: PY7-29752M.

2. 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: Conducted: CB512AP7SV, CB512AP7UK
Radiated: CB512AP7SN

DATE TESTED: 2016-07-13 to 2016-08-02

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

UL LLC 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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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, or any agency of the U.S. Government.

Approved & Released
For UL LLC By:

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EMC Program Manager
UL – Consumer Technology Division

Prepared By:

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UL – Consumer Technology Division

3. 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.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Suite B, Perimeter Park Drive, Morrisville, NC 27560.

12 Laboratory Dr., RTP, NC 27709
☐ Chamber A
☐ Chamber C

2800 Suite B Perimeter Park Dr., Morrisville, NC 27560
☐ Chamber NORTH
☒ Chamber SOUTH

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at http://www.nist.gov/nvlap/

5. CALIBRATION AND UNCERTAINTY

5.1. 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.

5.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	±3.52 dB
Radiated Disturbance, 9KHz to 30 MHz	±3.15 dB
Radiated Disturbance, 30 to 1000 MHz	±5.36 dB
Radiated Disturbance, 1000 to 18000 MHz	±4.32 dB
Radiated Disturbance,18000 to 26000 MHz	±4.45 dB
Radiated Disturbance,26000 to 40000 MHz	±5.24 dB

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

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

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

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	10.80	12.02
2402 - 2480	DQPSK	9.40	8.71
2402 - 2480	Enhanced 8PSK	9.70	9.33

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two integrated antennas, with the following maximum gains:

Frequency Range (MHz)	Antenna Gain (dBi)
	Ant 0 (Main)
2402 – 2480	-6.2

6.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was SONY, s_atp_1_600_7_9
The test utility software used during testing was Tera Term ver 4.89 (SVN# 6182).

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X-Axis orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X-Axis orientation.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Desktop	Lenovo	ThinkCentre	MG00ADEN	NA
Laptop	Lenovo	T450	RTP0116PC0A2UQT	NA
Headphones	Sony	MH410x	12271A100010396	NA
PowerSupply	Sony	1300-7146.1B	5816W02400051	NA

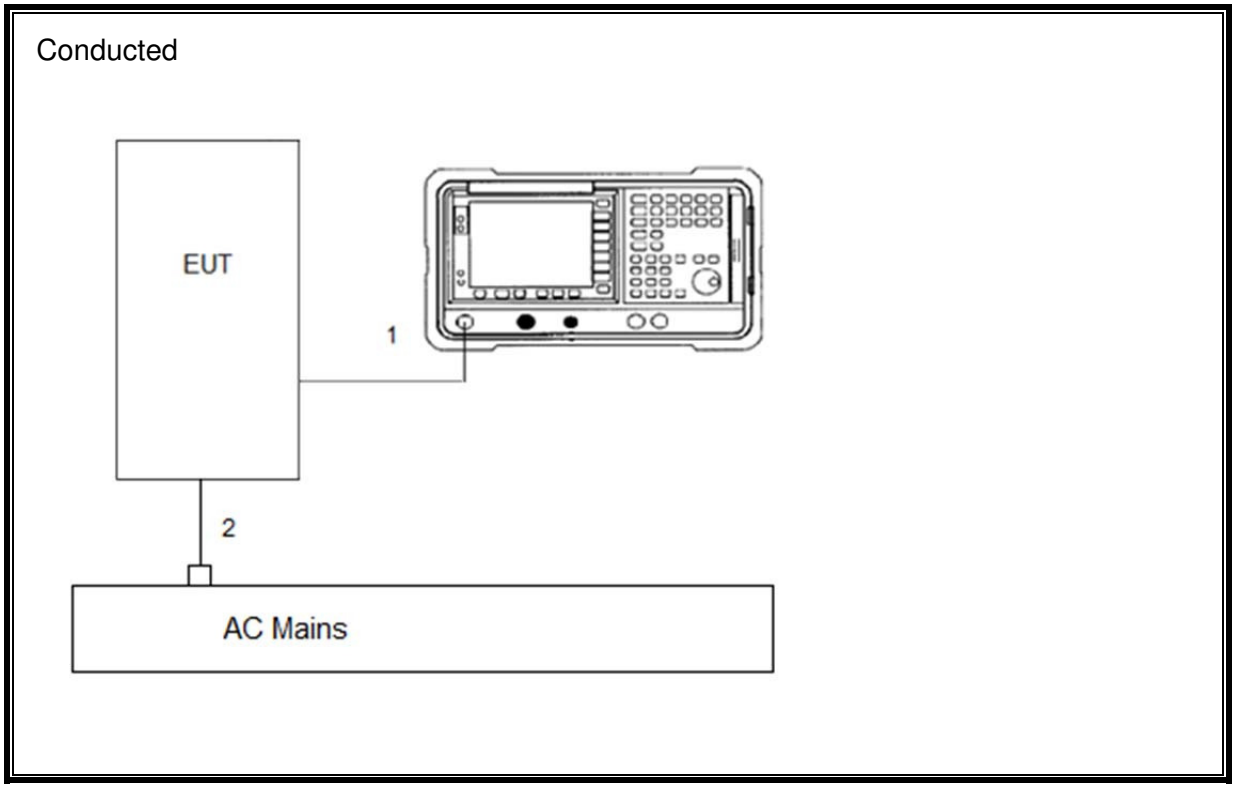
I/O CABLES

I/O Cable List					
Cable No	**Port**	**# of Identical ports**	**Connector Type**	**Cable Length (m)**	**Remarks**
1	Antenna Port	1	RF	<1m	NA
2	DC Mains	1	Mini-USB	>1m	NA
3	Audio	1	3.5mm	>1m	Headphone

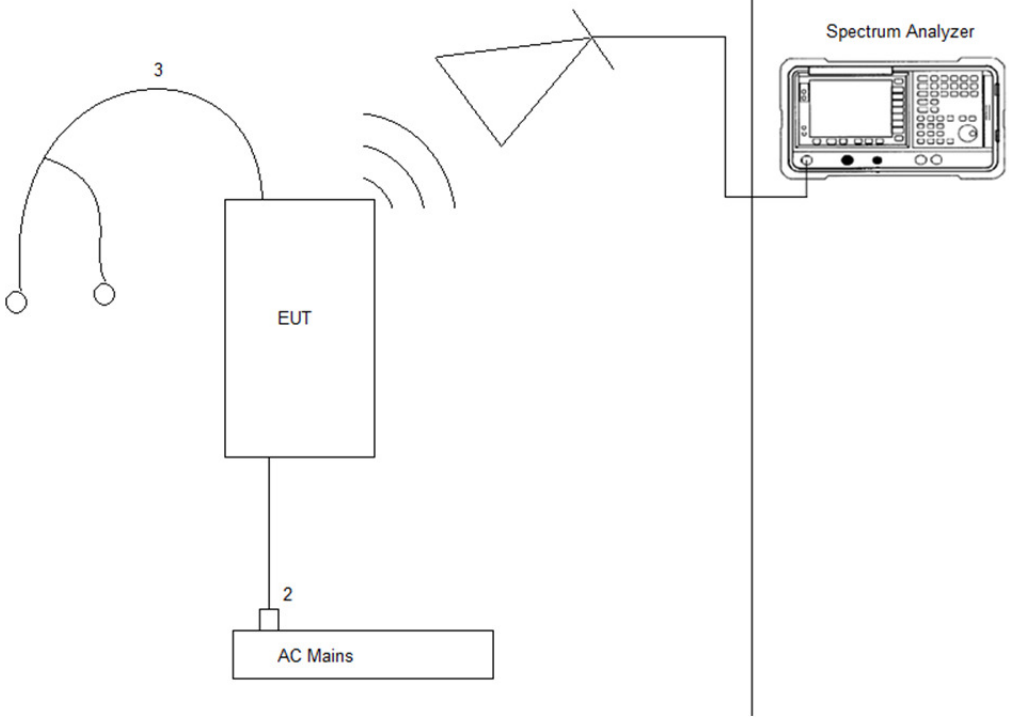
TEST SETUP

The EUT is setup as a standalone device. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



Radiated



7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2016-03-07	2017-03-31
	Gain-Loss Chains				
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2016-08-28	2017-08-28
	Receiver & Software				
SA0026	Spectrum Analyzer	Agilent	N9030A	2017-02-17	2018-02-17
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

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 below 1GHz measurements and 1.5 m above the ground plane for above 1GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements for the 30-1000 MHz range, 9 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements for the 0.15-30 MHz range and 200 Hz for peak detection measurements or 200 Hz for quasi-peak detection measurements for the 9 to 150 kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For peak measurements above 1 GHz, the resolution bandwidth is set to 1 MHz and the video bandwidth is set to 3 MHz. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. The particular averaging method used for this test program was by measuring using a Peak detector with the resolution bandwidth set to 1MHz and a reduced video bandwidth, based on $1/T_{on}$ where T_{on} is the transmit on time (calculated to approx. 2.9 ms).

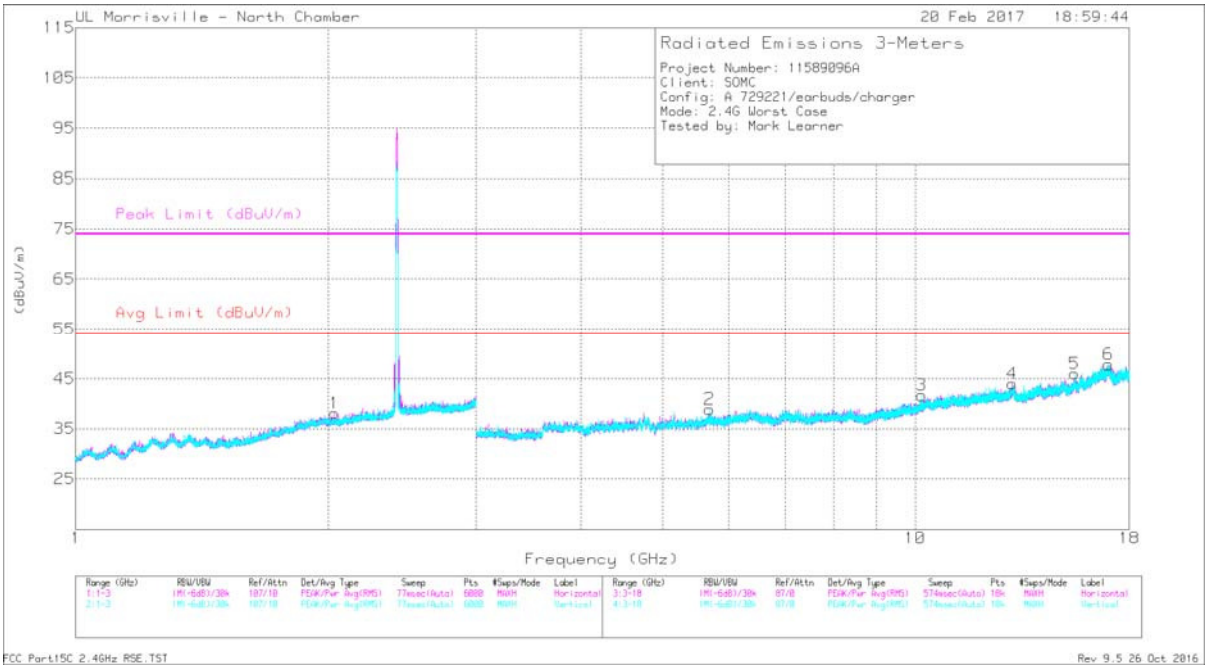
The spectrum from 9 kHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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.

8.2. TRANSMITTER ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS

2.4 GHz 802.11b



Trace Markers

Marker	Freq. (GHz)	Meter Reading (dBuV)	Det	AF AT0072 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 15.48	35.89	PK2	40.1	-24.4	51.59	-	-	74	-22.41	332	116	V
	* 15.48	24.59	MAv1	40.1	-24.4	40.29	54	-13.71	-	-	332	116	V
1	2.033	31.26	Pk	31.3	-24.5	38.06	-	-	-	-	0-360	199	H
2	5.689	35.68	Pk	34.7	-31.5	38.88	-	-	-	-	0-360	102	V
3	10.18	31.77	Pk	37.2	-27.3	41.67	-	-	-	-	0-360	102	V
4	13.054	30.37	Pk	39.2	-25.6	43.97	-	-	-	-	0-360	101	H
6	16.982	31.02	Pk	41.9	-25.1	47.82	-	-	-	-	0-360	102	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average
FCC Part15C 2.4GHz RSE.TST
Rev 9.5 26 Oct 2016