



FCC PART 27

TEST AND MEASUREMENT REPORT

For

Cellphone-Mate, Inc.

48820 Kato Road, Suite 300B,

Fremont, CA 94539, USA

FCC ID: RSNCM700A Model: CM700A

Report Type: Original Report		Product Type 700 MHz Bi-Di	: rection Amplifier
			Lional Lars
Report Number:	R1109014-27		
Report Date:	2011-09-21		
Reviewed By:	Victor Zhang EMC/RF Lead		bor my
Prepared By: (SP)	Bay Area Comp 1274 Anvilwoo Sunnyvale, CA Tel: (408) 732-9 Fax: (408) 732 9	liance Laboratories d Avenue, 94089, USA 9162 9164	Corp.

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government. * This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" Cellphone-Mate, Inc.

TABLE OF CONTENTS

1.1 PRODUCT DESCRIPTION NOR EQUIPMENT UNDER TEST (EUT)	1	GE	NERAL INFORMATION	5
1.2 MECHANICAL DESCRIPTION 5 1.3 OBJECTIVE 5 1.4 RELETED SUBMITTAL(S)/GRANT(S) 5 1.5 TIST METHODOLOGY 6 1.6 MEASUREMENT LUCERTAINTY 6 1.7 TEST FACILITY 6 2 SUSTEM TEST CONFIGURATION 7 2.1 JUSTIFICATION 7 2.2 EUT EXERCISE SOFTWARE 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.5 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERNACE PORTS AND CABLES 7 2.7 TIST STETUP BLOCK DIAGRAM 8 3 SUMMARY OF TEST RESULTS 10 4 TEST PROCEDURE 11 4.1 APPLICABLE STANDARD 11 4.2 TIST PROCEDURE 11 4.3 TEST PROCEDURE 11 4.4 TEST PROCEDURE 11 4.5 TEST RESULTS 12 5 FCC \$2.1047 & MODULATION CHARACTERISTI		1.1	PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.3 OBJECTIVE 5 1.4 RELATED SUBMITTAL(S)/GRANT(S) 5 1.5 TEST METHODOLOGY 6 1.6 MEASUREMENT UNCERTAINTY 6 2 SYSTEM TEST CONFIGURATION 7 2.1 JUSTIFICATION 7 2.2 EUT EXERCISE SOFTWARE 7 2.3 EQUIPMENT MODIFICATIONS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.5 INTERAL CONFIGURATIONS OF EUT 7 2.6 INTERACE PORTS AND CABLES 7 2.7 TEST EFUP BLOCK DIAGRAM 8 3 SUMMARY OF TEST RESULTS 10 4 FCC \$2.1046 & \$27.50 - RF OUTPUT POWER 11 4.1 APPLICABLE STANDARD 11 4.2 TEST ENCORDINE 11 4.3 TEST ENVIRONMENTAL CONDITIONS 11 4.4 TEST ENVIRONMENTAL CONDITIONS 11 4.5 TEST ENVIRONMENTAL CONDITIONS 12 5 FCC \$2.1047 • MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 15		1.2	MECHANICAL DESCRIPTION	.5
1.4 ReLATED SUBMITTAL(S)/GRANT(S)		1.3	Objective	.5
1.5 TEST METHODOLOGY 6 1.6 MEASUREMENT UNCERTAINTY 6 2 SYSTEM TEST CONFIGURATION 7 2.1 JUSTIFICATION 7 2.2 EUT EXERCISE SOFTWARE 7 2.3 EQUPMENT MODIFICATIONS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.5 INTERFACE PORTS AND CABLES 7 2.6 INTERFACE PORTS AND CABLES 7 2.6 INTERFACE PORTS AND CABLES 7 2.7 TEST SETUP BLOCK DIAGRAM 8 3 SUMMARY OF TEST RESULTS 10 4 FCC \$2.1046 & \$27.50 - RF OUTPUT POWER 11 4.1 APPLICABLE STANDARD 11 4.2 TEST RESULTS 10 4.3 TEST RESULTS 11 4.4 TEST RESULTS 12 5 FCC \$2.1046 & \$27.53 - OCCUPIED BANDWIDTH 14 5.1 APPLICABLE STANDARD 14 5.1 APPLICABLE STANDARD 15 6.2 TEST RESULT 14 6 FCC \$2.1049 & \$27.53 - O		1.4	RELATED SUBMITTAL(S)/GRANT(S)	.5
1.6 MEASUREMENT UNCERTAINTY		1.5	Test Methodology	.6
1.7 TEST FACILITY		1.0	MEASUREMENT LINCERTAINTY	6
SYSTEM TEST CONFIGURATION 7 2.1 JUSTIFICATION 7 2.1 JUSTIFICATION 7 2.2 EUT EXERCISE SOFTWARE 7 2.3 EQUIPMENT MODIFICATIONS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.5 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERACE PORTS AND CABLES 7 2.7 TEST SETUP BLOCK DIAGRAM 8 3 SUMMARY OF TEST RESULTS 10 4 FEST RESULTS 10 4 FEST RESULTS 10 4 TEST FOOCEDURE 11 4.1 APPLICABLE STANDARD 11 4.3 TEST EQUIPMENT LIST AND DETAILS 11 4.3 TEST ENDURT 12 5 FCC \$2.1047 - MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT 14 6 FCC \$2.1047 - MODULATION CHARACTERISTIC 14 6.1 APPLICABLE STAN		1.0	TEST FACILITY	6
2.1 JUSTIFICATION 7 2.2 EUT EXERCISE SOFTWARE 7 2.3 EQUIPMENT MODIFICATIONS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.5 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERNAL CONFIGURATIONS OF EUT 7 2.7 TEST SETUP BLOCK DIAGRAM 8 3 SUMMARY OF TEST RESULTS 10 4 FCC \$2.1046 & \$27.50 - RF OUTPUT POWER 11 4.1 APPLICABLE STANDARD 11 4.1 APPLICABLE STANDARD 11 4.3 TEST FEQUEPMENT LIST AND DETAILS 11 4.4 TEST RESULTS 12 5 FCC \$2.1047 - MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULTS 12 5 FCC \$2.1047 - MODULATION CHARACTERISTIC 14 6 FCC \$2.1047 - MODULATION CHARACTERISTIC 14 6.1 APPLICABLE STANDARD	2	SYS	STEM TEST CONFIGURATION	.7
2.2 EUT EXERCISE SOFTWARE		21	TUSTIFICATION	7
2.3 EQUIPMENT MODIFICATIONS 7 2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS 7 2.5 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERPACE PORTS AND CABLES 7 2.7 TEST SETUP BLOCK DIAGRAM. 8 3 SUMMARY OF TEST RESULTS. 10 4 FCC §2.1046 & §27.50 - RF OUTPUT POWER. 11 4.1 APPLICABLE STANDARD 11 4.2 TEST EQUIPMENT LIST AND DETAILS 11 4.3 TEST EQUIPMENT LIST AND DETAILS 11 4.4 TEST EQUIPMENT LIST AND DETAILS 11 4.5 TEST RESULTS 12 5 FCC §2.1047 - MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT 14 6 FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH 15 6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST EQUIPMENT LIST AND DETAILS 15 6.5 TEST ENVIRONMENTAL C		2.2	EUT EXERCISE SOFTWARE	7
2.4 LOCAL SUPPORT EQUIPMENT AND SOFTWARE LIST AND DETAILS		23	FOUIPMENT MODIFICATIONS	7
2.5 INTERNAL CONFIGURATIONS OF EUT 7 2.6 INTERRAL CONFIGURATIONS OF EUT 7 2.7 TEST SETUP BLOCK DIAGRAM. 8 3 SUMMARY OF TEST RESULTS. 10 4 FCC §2.1046 & §27.50 - RF OUTPUT POWER. 11 4.1 APPLICABLE STANDARD 11 4.2 TEST EQUIPMENT LIST AND DETAILS 11 4.3 TEST EQUIPMENT LIST AND DETAILS 11 4.4 TEST ENVIRONMENTAL CONDITIONS 11 4.5 TEST RESULTS 12 5 FCC §2.1047 - MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT 14 6.1 APPLICABLE STANDARD 15 6.1 APPLICABLE STANDARD 15 6.2 TEST EQUIPMENT LIST AND DETAILS 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST EQUIPMENT LIST AND DETAILS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDAR		2.3 2.4	LOCAL SUPPORT FOURPMENT AND SOFTWARE LIST AND DETAILS	7
2.6 INTERFACE PORTS AND CABLES		2.5	INTERNAL CONFIGURATIONS OF EUT	7
2.7 TEST SETUP BLOCK DIAGRAM		2.6	INTERFACE PORTS AND CABLES	7
3 SUMMARY OF TEST RESULTS		2.7	TEST SETUP BLOCK DIAGRAM	
4 FCC \$2.1046 & \$27.50 - RF OUTPUT POWER	3	SUI	MMARY OF TEST RESULTS	10
1.1 Cot subset and construction of a second construction of a sec	4	FC	C 82 1046 & 827 50 - RF OUTPUT POWER	11
4.2 TEST PROCEDURE 11 4.3 TEST PROCEDURE 11 4.4 TEST EQUIPMENT LIST AND DETAILS 11 4.4 TEST EQUIPMENT LIST AND DETAILS 11 4.5 TEST RESULTS 12 5 FCC \$2.1047 · MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT 14 6 FCC \$2.1049 & \$27.53 · OCCUPIED BANDWIDTH 15 6.1 APPLICABLE STANDARD 14 6.2 TEST PROCEDURE 15 6.3 TEST PROCEDURE 15 6.4 TEST PROCEDURE 15 6.5 TEST RESULTS 16 7 FCC \$2.1053 & \$27.53 · SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 15 6.5 TEST RESULTS 16 7 FCC \$2.1053 & \$27.53 · SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.4 TEST PROCEDURE 41 7.5 SUMMARY OF TEST RESULTS		11	A DDI ICADI = STANDADD	11
4.3 TEST EQUIPMENT LIST AND DETAILS 11 4.4 TEST EQUIPMENT LIST AND DETAILS 11 4.4 TEST EQUIPMENT LIST AND DETAILS 11 4.4 TEST EQUIPMENT LIST AND DETAILS 11 4.5 TEST RESULTS 12 5 FCC \$2.1047 - MODULATION CHARACTERISTIC 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT 14 6 FCC \$2.1049 & \$27.53 - OCCUPIED BANDWIDTH 15 6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST EQUIPMENT LIST AND DETAILS 15 6.5 TEST RESULTS 16 7 FCC \$2.1053 & \$27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST EQUIPMENT LIST AND DETAILS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 <		4.1		11 11
4.4 TEST ENVIRONMENTAL CONDITIONS. 11 4.5 TEST RESULTS. 12 5 FCC §2.1047 - MODULATION CHARACTERISTIC. 14 5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT. 14 6 FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH 15 6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST COCEDURE 41 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 <th></th> <td>4.2</td> <td>TEST FOULDMENT LIST AND DETAILS</td> <td>11 11</td>		4.2	TEST FOULDMENT LIST AND DETAILS	11 11
4.5 TEST RESULTS 12 5 FCC §2.1047 • MODULATION CHARACTERISTIC		4.5 1 1	TEST EQUIPMENT LIST AND DETAILS	11 11
4.5 TEST RESULTS 12 5 FCC §2.1047 - MODULATION CHARACTERISTIC		4.4 1 5	TEST ENVIRONMENTAL CONDITIONS	12
5 FCC §2.1047 - MODULATION CHARACTERNISTIC	5	ч.5 ЕС	C \$2 1047 MODUL ATION CILLADA CTEDISTIC	12
5.1 APPLICABLE STANDARD 14 5.2 TEST RESULT 14 6.1 APPLICABLE STANDARD 15 6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST EQUIPMENT LIST AND DETAILS 41 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST PROCEDURE 43 8.4 TEST ENVIRONME	5	FU 7 1	C §2.1047 - MODULATION CHARACTERISTIC	14
5.2 TEST RESULT. 14 6 FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH 15 6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST PROCEDURE 41 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST PROCEDURE 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		5.1	APPLICABLE STANDARD	14
6 FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH 15 6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST PROCEDURE 41 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST PROCEDURE 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		5.2	TEST RESULT	14
6.1 APPLICABLE STANDARD 15 6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST PROCEDURE 41 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST PROCEDURE 43 8.4 TEST EQUIPMENT LIST AND DETAILS 43	6	FC	C §2.1049 & §27.53 - OCCUPIED BANDWIDTH	15
6.2 TEST PROCEDURE 15 6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST EQUIPMENT LIST AND DETAILS 41 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		6.1	APPLICABLE STANDARD	15
6.3 TEST EQUIPMENT LIST AND DETAILS 15 6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST ENVIRONMENTAL CONDITIONS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		6.2	TEST PROCEDURE	15
6.4 TEST ENVIRONMENTAL CONDITIONS 15 6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST ENVIRONMENTAL CONDITIONS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		6.3	TEST EQUIPMENT LIST AND DETAILS	15
6.5 TEST RESULTS 16 7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST ENVIRONMENTAL CONDITIONS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		6.4	TEST ENVIRONMENTAL CONDITIONS	15
7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS 41 7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST ENVIRONMENTAL CONDITIONS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		6.5	TEST RESULTS	16
7.1 APPLICABLE STANDARD 41 7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST ENVIRONMENTAL CONDITIONS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43	7	FC	C §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS	41
7.2 TEST PROCEDURE 41 7.3 TEST EQUIPMENT LIST AND DETAILS 41 7.4 TEST ENVIRONMENTAL CONDITIONS 42 7.5 SUMMARY OF TEST RESULTS 42 7.6 TEST RESULTS 42 8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 43 8.1 APPLICABLE STANDARD 43 8.2 TEST PROCEDURE 43 8.3 TEST EQUIPMENT LIST AND DETAILS 43 8.4 TEST ENVIRONMENTAL CONDITIONS 43		7.1	APPLICABLE STANDARD	41
7.3TEST EQUIPMENT LIST AND DETAILS417.4TEST ENVIRONMENTAL CONDITIONS427.5SUMMARY OF TEST RESULTS427.6TEST RESULTS428FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS438.1APPLICABLE STANDARD438.2TEST PROCEDURE438.3TEST EQUIPMENT LIST AND DETAILS438.4TEST ENVIRONMENTAL CONDITIONS43		7.2	TEST PROCEDURE	41
7.4TEST ENVIRONMENTAL CONDITIONS427.5SUMMARY OF TEST RESULTS427.6TEST RESULTS428FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS438.1APPLICABLE STANDARD438.2TEST PROCEDURE438.3TEST EQUIPMENT LIST AND DETAILS438.4TEST ENVIRONMENTAL CONDITIONS43		7.3	TEST EQUIPMENT LIST AND DETAILS	41
7.5SUMMARY OF TEST RESULTS		7.4	TEST ENVIRONMENTAL CONDITIONS	42
7.6TEST RESULTS428FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS438.1APPLICABLE STANDARD438.2TEST PROCEDURE438.3TEST EQUIPMENT LIST AND DETAILS438.4TEST ENVIRONMENTAL CONDITIONS43		7.5	SUMMARY OF TEST RESULTS	42
8FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS		7.6	TEST RESULTS	42
8.1APPLICABLE STANDARD438.2TEST PROCEDURE438.3TEST EQUIPMENT LIST AND DETAILS438.4TEST ENVIRONMENTAL CONDITIONS43	8	FC	C §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	43
8.2TEST PROCEDURE438.3TEST EQUIPMENT LIST AND DETAILS438.4TEST ENVIRONMENTAL CONDITIONS43		8.1	APPLICABLE STANDARD	43
8.3 Test Equipment List and Details 43 8.4 Test Environmental Conditions 43		8.2	TEST PROCEDURE	43
8.4 TEST ENVIRONMENTAL CONDITIONS		8.3	TEST EQUIPMENT LIST AND DETAILS	43
		8.4	TEST ENVIRONMENTAL CONDITIONS	43

8.5	Test Results	43
9 FC	CC §27.53 – BAND EDGE	48
9.1	APPLICABLE STANDARD	48
9.2	Test Procedure	48
9.3	TEST EQUIPMENT LIST AND DETAILS	48
9.4	TEST ENVIRONMENTAL CONDITIONS	48
9.5	Test Results	48
10 FC	CC §2.1055 & §27.54 – FREQUENCY STABILITY	73
10.1	APPLICABLE STANDARD	73
10.2	TEST PROCEDURE	73
10.3	Test Results	73
11 FC	CC §1.1307(B), §27.52 & §2.1091 - RF EXPOSURE INFORMATION	74
11.1	APPLICABLE STANDARD	74
11.2	MPE PREDICTION	74
12 EX	XHIBIT A - FCC ID LABEL REQUIREMENTS	76
12.1	FCC ID LABEL REQUIREMENTS	76
12.2	FCC ID LABEL CONTENTS	76
12.3	FCC LABEL LOCATION ON EUT	76
13 EX	XHIBIT B - TEST SETUP PHOTOGRAPHS	77
13.1	RADIATED EMISSIONS - FRONT VIEW	77
13.2	RADIATED EMISSIONS 30 MHz TO 1 GHz- REAR VIEW	77
13.3	RADIATED EMISSIONS ABOVE 1 GHZ- REAR VIEW	78
14 EX	XHIBIT C - EUT PHOTOGRAPHS	79
14.1	EUT - TOP VIEW	79
14.2	EUT - BOTTOM VIEW	79
14.3	EUT - Side View 1	80
14.4	EUT - SIDE VIEW 2	80
14.5	EUT – UPLINK PORT VIEW	81
14.6	EUT – DOWNLINK PORT VIEW	18
14./ 14 0	EUT COVER OFF VIEW	ð2
14.0 14 Q	EUT – COVER OFF CLOSE OF VIEW	02 83
14 1	0 EUT – MAINT CB BOARD FRONT VIEW	05
14.1	1 AC/DC Power Supply View	84

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1109014-27	Original Report	2011-09-21

1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Cellphone-Mate Inc*. and their product, model: *CM700A*, *FCC ID: RSNCM700A*, which will henceforth be referred to as the EUT (Equipment Under Test). The EUT is a LTE Bi-directional amplifier with N type female antenna connectors that operates in the Lower 700 MHz band. The LTE Band support three modulations: QPSK, 16QAM, 64QAM.

Amplifier Specification

Parameters		Specification
Frequency	Downlink	728-746 MHz
	Uplink	698-716 MHz
Outp	ut Power	Maximum, 2 Watt
AC Power		110 V, 60Hz
Power Consumption		15 Watt

1.2 Mechanical Description

The EUT measures 14cm (L) x 12cm (W) x 3cm (H), and weighs approximately 802.5 g.

The test data gathered are from production sample, sample number: CM110815-Z0046 provided by the manufacturer.

1.3 Objective

This type approval report is prepared on behalf of *Cellphone-Mate, Inc.* in accordance with Part 2, Subpart J, and Part 27 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristic, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation, band edge, and conducted and radiated margin.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 27 - Miscellaneous Wireless Communications Services Applicable Standards: TIA/EIA-603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values ranging from +2.0 dB for Conducted Emissions tests and +4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and

December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <u>http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm</u>

2 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was configured for testing according to TIA/EIA-603-C.

The final qualification test was performed with the EUT operating at normal mode.

2.2 EUT Exercise Software

N/A, signal was sent through EUT using a signal generator, device was set to normal operating mode.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Local Support Equipment and Software List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746
Dell	Laptop	PP05L	37140867901
Agilent	ESG-D Series Signal Generator	E4438C	MY45091309
Agilent	Signal Studio for 3GPP LTE	N7624B	-

2.5 Internal Configurations of EUT

Manufacturer	Description	Model	Serial Number
Cellphone-Mate Inc	Main PCB Board	CM700A	-

2.6 Interface Ports and Cables

Cable Description	Length (m)	То	From
RF Cable	< 1	EUT	Spectrum Analyzer
RF Cable	< 1	EUT	Signal Generator

2.7 Test Setup Block Diagram

Conducted Emissions



Radiated Emissions



3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Tests	Results
§2.1046, §27.50(d)(i)	RF Output Power	Compliant
§2.1047	Modulation Characteristics	N/A*
§2.1049, §27.53 (c)	Occupied Bandwidth	Compliant
§2.1053, §27.53 (c)(g)	Spurious Radiated Emissions	Compliant
§2.1051, §27.53 (c)(g)	Spurious Emissions at Antenna Terminals	Compliant
§27.53 (c)(g)	Band Edge	Compliant
§2.1055, §27.54	Frequency Stability	Note ¹
§2.1091, §27.52	RF Exposure	Compliant

N/A*: Not applicable. Note¹: EUT is an amplifier; frequency stability testing is not required.

4 FCC §2.1046 & §27.50 – RF OUTPUT POWER

4.1 Applicable Standard

According to FCC §27.50, the maximum effective radiated power (ERP) of fixed and base station must not exceed 1000 Watts.

4.2 Test Procedure

Conducted:

The RF output of the transmitter was connected to the signal generator and the spectrum analyzer through sufficient attenuation.

4.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	ESG-D Series Signal Generator	E4438C	MY45091309	2011-04-28
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

4.4 Test Environmental Conditions

Temperature:	20-25°C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Lionel Lara from 2011-09-12 to 2011-09-16 at RF Site.

4.5 Test Results

Mode	Modulation	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
	QPSK (1.4 MHz)	729	-59.50	6.25
	QPSK (1.4 MHz)	737	-63.00	5.49
	QPSK (1.4 MHz)	745	-60.50	7.14
	16QAM (1.4 MHz)	729	-59.50	6.32
	16QAM (1.4 MHz)	737	-63.00	5.50
	16QAM (1.4 MHz)	745	-61.00	6.72
	64QAM (1.4 MHz)	729	-59.20	6.56
	64QAM (1.4 MHz)	737	-63.00	5.50
	64QAM (1.4 MHz)	745	-60.30	7.26
	QPSK (3 MHz)	730	-61.20	5.99
	QPSK (3 MHz)	737	-64.00	4.69
	QPSK (3 MHz)	744	-63.00	5.69
	16QAM (3 MHz)	730	-61.00	6.15
	16QAM (3 MHz)	737	-64.00	4.70
	16QAM (3 MHz)	744	-64.00	4.82
Downlink	64QAM (3 MHz)	730	-61.00	6.15
	64QAM (3 MHz)	737	-64.00	4.69
728-746 MHz	64QAM (3 MHz)	744	-64.20	4.63
	QPSK (5 MHz)	731	-60.20	7.05
	QPSK (5 MHz)	737	-61.40	6.93
	QPSK (5 MHz)	743	-61.60	7.13
	16QAM (5 MHz)	731	-60.30	6.97
	16QAM (5 MHz)	737	-61.50	6.85
	16QAM (5 MHz)	743	-61.60	7.12
	64QAM (5 MHz)	731	-60.20	7.05
	64QAM (5 MHz)	737	-61.30	7.00
	64QAM (5 MHz)	743	-61.40	7.27
	QPSK (10 MHz)	733	-60.40	7.13
	QPSK (10 MHz)	741	-63.40	5.67
	16QAM (10 MHz)	733	-60.30	7.21
	16QAM (10 MHz)	741	-63.00	6.00
	64QAM (10 MHz)	733	-60.20	7.28
	64QAM (10 MHz)	741	-63.00	6.00

Maximum Output Power (LTE) – Downlink

Mode	Modulation	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)
	QPSK (1.4 MHz)	699	-41.00	23.20
	QPSK (1.4 MHz)	709	-45.00	21.26
	QPSK (1.4 MHz)	715	-40.00	21.64
	16QAM (1.4 MHz)	699	-41.00	23.05
	16QAM (1.4 MHz)	709	-45.40	20.81
	16QAM (1.4 MHz)	715	-39.70	21.77
	64QAM (1.4 MHz)	699	-41.30	22.83
	64QAM (1.4 MHz)	709	-45.70	20.56
	64QAM (1.4 MHz)	715	-40.20	21.36
	QPSK (3 MHz)	700	-42.80	22.75
	QPSK (3 MHz)	709	-46.00	20.52
	QPSK (3 MHz)	714	-41.00	21.96
	16QAM (3 MHz)	700	-43.00	22.55
	16QAM (3 MHz)	709	-46.60	20.04
	16QAM (3 MHz)	714	-41.00	21.98
Uplink	64QAM (3 MHz)	700	-43.00	22.51
	64QAM (3 MHz)	709	-46.50	20.09
698-716 MHz	64QAM (3 MHz)	714	-41.50	21.52
	QPSK (5 MHz)	701	-41.70	24.29
	QPSK (5 MHz)	709	-44.30	21.98
	QPSK (5 MHz)	713	-40.70	23.04
	16QAM (5 MHz)	701	-42.10	23.81
	16QAM (5 MHz)	709	-44.60	21.61
	16QAM (5 MHz)	713	-41.10	22.62
	64QAM (5 MHz)	701	-42.50	23.47
	64QAM (5 MHz)	709	-45.00	21.29
	64QAM (5 MHz)	713	-41.50	22.31
	QPSK (10 MHz)	703	-42.90	23.52
	QPSK (10 MHz)	711	-42.70	22.42
	16QAM (10 MHz)	703	-43.20	23.15
	16QAM (10 MHz)	711	-43.20	21.92
	64QAM (10 MHz)	703	-43.40	22.97
	64QAM (10 MHz)	711	-43.30	21.77

Maximum Output Power (LTE) – Uplink

5 FCC §2.1047 - MODULATION CHARACTERISTIC

5.1 Applicable Standard

According to FCC §2.1047(d) and Part 27, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

5.2 Test Result

N/A

6 FCC §2.1049 & §27.53 - OCCUPIED BANDWIDTH

6.1 Applicable Standard

Requirements: FCC §2.1049 and §27.53.

6.2 Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 kHz and the 26 dB & 99% bandwidth was recorded.

6.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	ESG-D Series Signal Generator	E4438C	MY45091309	2011-04-28
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

6.4 Test Environmental Conditions

Temperature:	20-25°C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Lionel Lara from 2011-09-12 to 2011-09-16 at RF Site.

6.5 Test Results

Mode	Modulation	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
	QPSK (1.4 MHz)	737	1.1727	1.1662
	16QAM (1.4 MHz)	737	1.1723	1.1664
	64QAM (1.4 MHz)	737	1.1727	1.1663
	QPSK (3 MHz)	737	2.7320	2.7308
	16QAM (3 MHz)	737	2.7335	2.7332
Downlink	64QAM (3 MHz)	737	2.7310	2.7317
728-746 MHz	QPSK (5 MHz)	737	4.5007	4.4992
	16QAM (5 MHz)	737	4.5047	4.5012
	64QAM (5 MHz)	737	4.5029	4.5003
	QPSK (10 MHz)	733	8.9338	8.9057
	16QAM (10 MHz)	733	8.9375	8.9034
	64QAM (10 MHz)	733	8.9362	8.9055

Occupied Bandwidth (LTE) – Downlink

Occupied Bandwidth (LTE) – Uplink

Mode	Modulation	Frequency (MHz)	Emission Bandwidth Input (MHz)	Emission Bandwidth Output (MHz)
	QPSK (1.4 MHz)	709	1.1500	1.1542
	16QAM (1.4 MHz)	709	1.1486	1.1537
	64QAM (1.4 MHz)	709	1.1505	1.1536
	QPSK (3 MHz)	709	2.7211	2.7190
Unlink	16QAM (3 MHz)	709	2.7196	2.7208
Opinik	64QAM (3 MHz)	709	2.7153	2.7161
698-716 MHz	QPSK (5 MHz)	709	4.4749	4.4797
	16QAM (5 MHz)	709	4.4799	4.4864
	64QAM (5 MHz)	709	4.4794	4.4805
	QPSK (10 MHz)	703	8.9068	8.8668
	16QAM (10 MHz)	703	8.9130	8.8735
	64QAM (10 MHz)	703	8.9170	8.8784

Please refer to the following plots.

DL: 728-746 MHz

LTE-QPSK (1.4 MHz), Frequency: 737 MHz



Input

Output



LTE-16QAM (1.4 MHz), Frequency: 737 MHz

* Agilent R T	Trace
Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 737.000 MHz Spân 3 MHz +Pos BU 100 kHz UBU 300 kHz +Sweep 1 s (601 pts)	View
Occupied Bandwidth Осс ВИ % Риг 99.00 % 1 1723 МН-7 × dB -26.00 dB	Blank
Transmit Freq Error -342.702 Hz x dB Bandwidth 1.401 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-64QAM (1.4 MHz), Frequency: 737 MHz

* Agilent R T	Trace
Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 737.000 MHz	View
Image: Constraint of the second state Occ вн % Рыг 99.00 % 0cc вн % Рыг 99.00 % 1 1727 МН-7 × dB -26.00 dB	Blank
Transmit Freq Error -319.433 Hz x dB Bandwidth 1.399 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-QPSK (3 MHz), Frequency: 737 MHz

Ch Freq 737 MHz Trig Free 0ccupied Bandwidth 1 2 3 Ref Level -18.00 dBm Clear Write #Avg #Atten 0 dB #Max Hold 10 0 0 0 0 10 0 0 0 0 0 10 0 0 0 0 0 10 0 0 0 0 0 0 10 0 0 0 0 0 0 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	₩ Agilent R T	Trace
Ref Level -18.00 dBm Clear Write Ref -18 dBm *Atten 0 dB *Hvg Max Hold Log Max Hold 10 Max Hold dB/ Max Hold View Span 5 MHz *Res BW 100 kHz VBW 300 kHz *Sweep 1 s (601 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % Z.7320 MHz x dB -26.00 dB Transmit Freq Error -1.842 kHz More x dB Bandwidth 3.006 MHz* 1 of 2	Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
Ref -18 dBm #Atten 0 dB #Avg	Ref Level -18.00 dBm	Clear Write
dB/ Center 737.000 MHz #Res BW 100 kHz VBW 300 kHz Center 737.000 MHz #Res BW 100 kHz Center 737.000 MHz WBW 300 kHz WBW 300 kH	Ref -18 dBm #Atten 0 dB #Avg Log 10	Max Hold
Center 737.000 MHz Span 5 MHz *Res BW 100 kHz VBW 300 kHz *Sweep 1 s (601 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 2.7320 MHz × dB -26.00 dB Transmit Freq Error -1.842 kHz 1 of 2 × dB Bandwidth 3.006 MHz* 0 cc BW % Pwr	dB/	Min Hold
Occupied Bandwidth Occ BW % Pwr 99.00 % Blank 2.7320 MHz × dB -26.00 dB More Transmit Freq Error -1.842 kHz More 1 of 2 × dB Bandwidth 3.006 MHz* 0 of 2 0 of 2 0 of 2	Center 737.000 MHz Span 5 MHz' #Res BW 100 kHz VBW 300 kHz #Sween 1 s (601 nts)	View
Transmit Freq Error-1.842 kHzMorex dB Bandwidth3.006 MHz*1 of 2	Occupied Bandwidth Осс ВМ % Рмг 99.00 % 2.7320 MHz × dB -26.00 dB	Blank
	Transmit Freq Error -1.842 kHz × dB Bandwidth 3.006 MHz*	More 1 of 2

Input

Output



LTE-16QAM (3 MHz), Frequency: 737 MHz

∦ Agilent R T	Trace
Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
Sweep Time 1.000 s	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 737.000 MHz Span 5 MHz #Page BW 100 kHz UBW 300 kHz #Sweep 1 c (601 ptc)	View
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 2 7335 MHz × dB -26.00 dB	Blank
Transmit Freq Error -2.230 kHz x dB Bandwidth 3.007 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-64QAM (3 MHz), Frequency: 737 MHz

	Trace
Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
Sweep Time 1.000 s	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 737.000 MHz Span 5 MHz' Span 5 MHz'	View
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 27310 MHz × dB -26.00 dB	Blank
Transmit Freq Error -431.429 Hz x dB Bandwidth 3.004 MHz*	More 1 of 2

Input

Output



LTE-QPSK (5 MHz), Frequency: 737 MHz

₩ Agilent R T	Trace
Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
Sweep Time 1.000 s	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 737.000 MHz Span 8 MHz ²	View
•кез Би 100 кнг vби 300 кнг •зweep 1 s (601 pts) Occupied Bandwidth осс ВИ % Риг 99.00 % 4 5007 МН-7 × dB -26.00 dB	Blank
Transmit Freq Error -1.843 kHz x dB Bandwidth 4.992 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-16QAM (5 MHz), Frequency: 737 MHz

Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace 2 3
Sweep Time 1.000 s c Ref -18 dBm #Atten 0 dB *Avg	lear Write
Ref -18 dBm #Atten 0 dB #Avg	
	Max Hold
	Min Hold
Center 737.000 MHz Span 8 MHz #Res BW 100 kHz #Sweep 1 s (601 pts)	View
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 4.5047 MHz × dB -26.00 dB	Blank
Transmit Freq Error -2.897 kHz x dB Bandwidth 4.997 MHz*	More 1 of 2

Input

Output



LTE-64QAM (5 MHz), Frequency: 737 MHz

	Trace
Ch Freq 737 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 737.000 MHz Span 8 MHz	View
•кез Би 100 кн2 •Кн2 •Зибер 1 s (601 ртз) Occupied Bandwidth Осс ВИ % Риг 99.00 % 4 Б029 МН-7 × dB -26.00 dB	Blank
Transmit Freq Error -1.886 kHz x dB Bandwidth 5.003 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-QPSK (10 MHz), Frequency: 733 MHz

∦ Agilent R T	Trace
Ch Freq 733 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 733.00 MHz Span 14 MHz Par Bl 199 HHz Span 14 MHz	View
•Кез Би 100 кн2 •Ком 500 кн2 •Sweep 1 s (601 pts) Occupied Bandwidth Осс ВИ % Риг 99.00 % 8 9338 мн- × dB -26.00 dB	Blank
Transmit Freq Error -1.166 kHz x dB Bandwidth 9.922 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-16QAM (10 MHz), Frequency: 733 MHz

₩ Agilent R T	Trace
Ch Freq 733 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 733.00 MHz Span 14 MHz *Poo BU 100 kHz +Sucon 1 c (601 ptc)	View
Occupied Bandwidth Occ BW % Pwr 99.00 % 8 9375 MHz × dB -26.00 dB	Blank
Transmit Freq Error 532.189 Hz x dB Bandwidth 9.890 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-64QAM (10 MHz), Frequency: 733 MHz

∦ Agilent R T	Trace
Ch Freq 733 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 733.00 MHz Span 14 MHz ²	View
Image: Constraint of the state of	Blank
Transmit Freq Error -1.030 kHz x dB Bandwidth 9.919 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



UL: 698-716 MHz

LTE-QPSK (1.4 MHz), Frequency: 709 MHz



Input

Output



LTE-16QAM (1.4 MHz), Frequency: 709 MHz



Input

Output



LTE-64QAM (1.4 MHz), Frequency: 709 MHz



Input

Output



LTE-QPSK (3 MHz), Frequency: 709 MHz

* Agilent R T	Trace
Ch Freq 709 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten Ø dB #Avg	Max Hold
$dB/$ \rightarrow \leftarrow	Min Hold
Center 709.000 MHz Span 5 MHz Span 5 MHz +VRU 300 kHz +Sweep 1 c (601 ptc)	View
Occupied Bandwidth Осс ВН % Рыг 99.00 % 2 7211 МНт × dB -26.00 dB	Blank
Transmit Freq Error 2.075 kHz x dB Bandwidth 2.985 MHz*	More 1 of 2

Input

Output



LTE-16QAM (3 MHz), Frequency: 709 MHz

∦ Agilent R T	Trace
Ch Freq 709 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 709.000 MHz Span 5 MH2	View
Image: Constraint of the second se	Blank
Transmit Freq Error -287.113 Hz x dB Bandwidth 2.988 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-64QAM (3 MHz), Frequency: 709 MHz

∦ Agilent R L	Trace
Ch Freq 709 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg Log 10	Max Hold
dB/	Min Hold
Center 709.000 MHz Span 5 MHz *Page Bil 100 kHz #Swaap 1 c (601 ptc)	View
Occupied Bandwidth Осс ВМ % Рыг 99.00 % 2.7153 MHz × dB -26.00 dB	Blank
Transmit Freq Error −616.838 Hz x dB Bandwidth 2.984 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-QPSK (5 MHz), Frequency: 709 MHz

₩ Agilent R T	Trace
Ch Freq 709 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
Span 8.00000000 MHz	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 709.000 MHz Span 8 MHž	View
Image: Constraint of the state of	Blank
Transmit Freq Error 872.122 Hz x dB Bandwidth 4.847 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output



LTE-16QAM (5 MHz), Frequency: 709 MHz

🔆 Agilent R T	Trace
Ch Freq 709 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 709.000 MHz Span 8 MHz #Dee PU 100 MHz #Super 1 c (601 ptc)	View
•Кез Би 100 кн2 •Ком 300 кн2 •Змеер 1 s (601 pts) Occupied Bandwidth Осс ВИ % Рыг 99.00 % 4 4799 МН-7 × dB -26.00 dB	Blank
Transmit Freq Error 2.636 kHz x dB Bandwidth 4.878 MHz*	More 1 of 2
Copyright 2000–2006 Agilent Technologies	

Input

Output


LTE-64QAM (5 MHz), Frequency: 709 MHz

Ch Freq 709 MHz Trig Free 1 Occupied Bandwidth	Trace <u>1</u> 2 3
	Clear Write
Ref -18 dBm #Atten 0 dB #Avg	Max Hold
dB/	Min Hold
Center 709.000 MHz Span 8 MHz	View
Occupied Bandwidth Occ BW % Pwr 99.00 % 44794 MHz × dB -26.00 dB	Blank
Transmit Freq Error 215.018 Hz x dB Bandwidth 4.877 MHz*	More 1 of 2

Input

Output



LTE-QPSK (10 MHz), Frequency: 703 MHz

Ch Freq 703 MHz Trig Free 0ccupied Bandwidth 1 2 Center 703.0000000 MHz Clear Writ Ref -18 dBm #Atten 0 dB #Avg Image: Comparison of the state of	₩ Agilent R T	Trace
Center 703.0000000 MHz Clear Writ Ref -18 dBm #Atten 0 dB #Avg Max Hol Log Max Hol 10 Max Hol dB/ Span 14 MHz Vie Span 14 MHz *Res BW 100 kHz *VBW 300 kHz *Sweep 1 s (601 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 8.9068 MHz x dB -26.00 dB Transmit Freq Error -1.697 kHz x dB Bandwidth 9.452 MHz*	Ch Freq 703 MHz Trig Free Occupied Bandwidth	Trace <u>1</u> 2 3
Ref -18 dBm #Atten 0 dB #Avg Log 10 dB/ Center 703.00 MHz #Res BW 100 kHz #Res BW 100 kHz #Re	Center 703.0000000 MHz	Clear Write
Image: Center 703.00 MHz Image: Weight of the second s	Ref -18 dBm #Atten 0 dB #Avg	Max Hold
Center 703.00 MHz Span 14 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 1 s (601 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 8.9068 MHz x dB -26.00 dB Transmit Freq Error -1.697 kHz Mor x dB Bandwidth 9.452 MHz* 1 of	dB/	Min Hold
Occupied Bandwidth Occ BW % Pwr 99.00 % Blandwidth 8.9068 MHz × dB -26.00 dB Mor Transmit Freq Error -1.697 kHz Mor 1 of	Center 703.00 MHz Span 14 MHz	View
Transmit Freq Error -1.697 kHz Mor x dB Bandwidth 9.452 MHz* 1 of	Occupied Bandwidth Осс вн % Рыг 99.00 % 8.9068 MHz × dB -26.00 dB	Blank
	Transmit Freq Error -1.697 kHz x dB Bandwidth 9.452 MHz*	More 1 of 2

Input

Output



LTE-16QAM (10 MHz), Frequency: 703 MHz



Output



Input

LTE-64QAM (10 MHz), Frequency: 703 MHz



Output



Input

7 FCC §2.1053 & §27.53 - SPURIOUS RADIATED EMISSIONS

7.1 Applicable Standard

Requirements: FCC §2.1053, §27.53.

7.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in $dB = 10 \log (TX \text{ Power in Watts}/0.001) - \text{the absolute level}$ Spurious attenuation limit in $dB = 43 + 10 \log_{10}$ (power out in Watts)

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09
Agilent	Signal Generator	al Generator E4438C		2011-04-28
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB1	A020106-1	2011-05-17
Hewlett Packard	Pre amplifier	8447D	2944A06639	2011-06-09
A.R.A Inc	Horn antenna	DRG-1181A	1132	2010-11-29
Mini-Circuits	Pre Amplifier	ZVA-183-S	570400946	2011-05-09

7.3 Test Equipment List and Details

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

7.4 Test Environmental Conditions

Temperature:	20-25°C
Relative Humidity:	39-44 %
ATM Pressure:	101-102 kPa

The testing was performed by Lionel Lara from 2011-09-12 to 2011-09-16 at Chamber3.

7.5 Summary of Test Results

The worst case reading as follows:

Technology	Frequency Bands	Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Frequency Range
LTE	DL: 728-746 MHz	Note ¹	-	-	30 MHz – 10 GHz
	UL: 698-716 MHz	Note 1	-	-	30 MHz – 10 GHz

Note ¹: All harmonics were on the noise floor level and/or 20 dB below the limit. All digital signals were tested on another standard.

7.6 Test Results

DL: 728-746 MHz

Modulation: CW Signal - 737 MHz (Scan from 30 MHz to 10 GHz @ 3 Meter Distance)

Indic	Indicated			Test Antenna Substituted							
Frequency (MHz)	S.A. Amp. (dBuV)	Azimuth (degree)	Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
-	-	-	-	-	-	-	-	-	-	-	Note 1

UL: 698-716 MHz

Modulation: CW Signal – 709 MHz (Scan from 30 MHz to 10 GHz @ 3 Meter Distance)

Indic	Indicated			Intenna		Substituted					
Frequency (MHz)	S.A. Amp. (dBuV)	Azimuth (degree)	Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
-	-	-	-	-	-	-	-	-	-	-	Note 1

Note ¹: All harmonics were on the noise floor level and/or 20 dB below the limit. All digital signals were tested on another standard.

8 FCC §2.1051 & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

8.1 Applicable Standard

Requirements: FCC §2.1051 & §27.53.

The spectrum shall be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P) dB$

8.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

8.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	ESG-D Series Signal Generator	E4438C	MY45091309	2011-04-28
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2010-03-31
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

8.4 Test Environmental Conditions

Temperature:	20-25°C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Lionel Lara from 2011-09-12 to 2011-09-16 at RF Site.

8.5 Test Results

Please refer to the following plots.

Cellphone-Mate, Inc.

DL: 728-746 MHz

Modulation: CW Signal, Frequency: 737 MHz



Plot 1: 30 MHz to 1 GHz

Plot 2: Above 1 GHz



Inter-Modulation:

Middle Channel

Input



Output

🔆 Ag	ilent								R	Т	Freq/Channel
Ref 35 #Peak	dBm Cen 1	ter	Atten	30 dB				Mkra	2 737. 7.0	00 MHz 4 dBm	Center Freq 737.000000 MHz
LOG 10 dB/ Offst	-737.	0000	000	MHz-		2-3					Start Freq 712.000000 MHz
19.8 dB DI					*	Ŷ					Stop Freq 762.000000 MHz
-13.0 dBm LgAv	hadaa ahaa ahaa ahaa ahaa ahaa ahaa aha		*****	mantan		UVU	ehshar,	·	~~~~~	*,**** ,,,,,	CF Step 5.00000000 MHz Auto Man
- Center #Res B	737.00 W 100	0 MHz kHz		#VE	3W 300	kHz	*	Sweep 1	Span 5 Is (60:	0 MHz l pts)	Freq Offset
Mark 1 2 3 4	er T	race (1) (1) (1) (1)	Type Fred Fred Fred Fred		X 735. 737. 738. 739.	Axis .58 MHz .00 MHz .42 MHz .83 MHz			Amplitu -13.69 c 7.04 c 7.04 c -14.86 c	ide IBm IBm IBm	Signal Track
			196 0 -	ilent T							
Copyri	ight 20	000-20	100 Hg	lient i	ecnnoi	ugres					

UL: 698-716 MHz

Modulation: CW Signal, Frequency: 709 MHz



Plot 1: 30 MHz to 1 GHz

Plot 2: Above 1 GHz



Inter-modulation:

Middle Channel

Input



🔆 Agilent			RT	Trace
Ref 35 dBm ^{#Peak} Marker	Atten 30 dB		Mkr4 711.83 MHz _13.25 dBm	Trace <u>1</u> 2 3
Log 10 711.830 dB/ 0ffst -13.25 0	000 MHz dBm			Clear Write
19.8 dB DI		\$ \$		Max Hold
dBm				Min Hold
Center 709.00 MHz #Res BW 100 kHz Marker Trace	#VBW Type	^ 300 kHz X Axis	Span 50 MHz #Sweep 1 s (601 pts) Amplitude	View
$ \begin{array}{cccc} 1 & (1) \\ 2 & (1) \\ 3 & (1) \\ 4 & (1) \end{array} $	Freq Freq Freq Freq	707.58 MHz 709.00 MHz 710.42 MHz 711.83 MHz	-13.29 dBm 16.99 dBm 17.00 dBm -13.25 dBm	Blank
				More 1 of 2
Copyright 2000-2	1006 Agilent Te	chnologies		

Output

9 FCC §27.53 – BAND EDGE

9.1 Applicable Standard

According to FCC 27.53, the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

9.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.

9.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Agilent	ESG-D Series Signal Generator	E4438C	MY45091309	2011-04-28
Agilent	Spectrum Analyzer	E4446A	US44300386	2011-08-11

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

9.4 Test Environmental Conditions

Temperature:	20-25°C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Lionel Lara from 2011-09-12 to 2011-09-16 at RF Site.

9.5 Test Results

Please refer to the following plots.

DL: 728-746 MHz

Modulation: LTE-QPSK (1.4 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-16QAM (1.4 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-64QAM (1.4 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-QPSK (3 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-16QAM (3 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-64QAM (3 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-QPSK (5 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-16QAM (5 MHz):



Plot 1: Lowest Edge



Modulation: LTE-64QAM (5 MHz):



Plot 1: Lowest Edge



Modulation: LTE-QPSK (10 MHz):



Plot 1: Lowest Edge



Modulation: LTE-16QAM (10 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-64QAM (10 MHz):



Plot 1: Lowest Edge



UL: 698-716 MHz

Modulation: LTE-QPSK (1.4 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-16QAM (1.4 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-64QAM (1.4 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-QPSK (3 MHz):



Plot 1: Lowest Edge



Modulation: LTE-16QAM (3 MHz):



Plot 1: Lowest Edge



Modulation: LTE-64QAM (3 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-QPSK (5 MHz):



Plot 1: Lowest Edge



Modulation: LTE-16QAM (5 MHz):



Plot 1: Lowest Edge



Modulation: LTE-64QAM (5 MHz):



Plot 1: Lowest Edge



Modulation: LTE-QPSK (10 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-16QAM (10 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge



Modulation: LTE-64QAM (10 MHz):



Plot 1: Lowest Edge

Plot 2: Highest Edge


10 FCC §2.1055 & §27.54 – FREQUENCY STABILITY

10.1 Applicable Standard

According to FCC §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

10.2 Test Procedure

The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.
b.) Primary Supply Voltage: The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within \pm 0.000 25 %(\pm 2.5 ppm) of the center frequency.

10.3 Test Results

Not applicable, EUT is an amplifier; the signal source is from the signal generator, so no frequency stability applied.

Cellphone-Mate, Inc.

11 FCC §1.1307(b), §27.52 & §2.1091 - RF EXPOSURE INFORMATION

11.1 Applicable Standard

According to FCC §1.1310 and §2.1091 (Mobile Devices) RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)	
Limits for General Population/Uncontrolled Exposure					
0.3-1.34	614	1.63	¹ (100)	30	
1.34-30	824/f	2.19/f	1 (180/f ²)	30	
30-300	27.5	0.073	0.2	30	
300-1500	/	/	f/1500	30	
1500-100,000	/	/	1.0	30	

f = frequency in MHz

 1 = Plane-wave equivalent power density

11.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

 $\mathbf{R} =$ distance to the center of radiation of the antenna

DL: 728-746 MHz

- Maximum peak output power at antenna input terminal (dBm): <u>7.28</u>
- Maximum peak output power at antenna input terminal (mW): 5.346
 - Prediction distance (cm): 25
 - Prediction frequency (MHz): 733
 - Antenna Gain, typical (dBi): 14
 - Maximum Antenna Gain (numeric): 25.11
- Power density at predication frequency and distance (mW/cm^2) : <u>0.017</u>
- MPE limit for uncontrolled exposure at predication frequency (mW/cm^2): 0.489

(Note: The MPE was calculated assuming the cable loss between EUT and the antenna was 0 dB.)

UL: 698-716 MHz

24.29
268.534
<u>60</u>
701
<u>14</u>
<u>25.11</u>
<u>0.149</u>
0.467

(Note: The MPE was calculated assuming the cable loss between EUT and the antenna was 0 dB.)

Test Result

For downlink, the indoor antenna with 14 dBi gain should have at least 25 cm prediction distance to meet the MPE limit. For uplink, the outdoor antenna with 14 dBi gain should have at least 60 cm prediction distance to meet the MPE limit. The distance needs to be addressed in the user manual.