



TEST REPORT

APPLICANT	: Power lo (Shenzh	dea Technology nen) Co., Ltd.
PRODUCT NAME	: LTE SM	ARTPHONE
MODEL NAME	: RG170	
BRAND NAME	: RugGea	ır
FCC ID	: ZLE-RG	170
STANDARD(S)	47 CFR : 47 CFR 47 CFR	Part 22 Subpart H Part 24 Subpart E Part 27 Subpart L
RECEIPT DATE	: 2019-08	-22
TEST DATE	: 2019-08	-23 to 2019-09-02
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Edited by:

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Change History			
Version Date Reason for change		Reason for change	
1.0	2019-09-09	First edition	



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1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Power Idea Technology (Shenzhen) Co., Ltd.	
Applicant Address:	4th Floor, A Section, Languang Science&technology Building, No.7 Xinxi RD, Hi-Tech Industrial Park North, Nanshan District, ShenZhen, P.R.C.	
Manufacturer:	Power Idea Technology (Shenzhen) Co., Ltd.	
ManufacturerAddress:	4th Floor, A Section, Languang Science&technology Building, No.7 Xinxi RD, Hi-Tech Industrial Park North, Nanshan District, ShenZhen, P.R.C.	

1.2. Equipment Under Test (EUT) Description

Product Name:	LTE SMARTPHONE	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	V1.0	
Software Version:	RG170_US_1.0.0.0_1_20190903	
	GSM/GPRS Mode with GMSK Modulation	
	EDGE Mode with 8PSK Modulation	
Modulation Type	WCDMA Mode with QPSK Modulation	
Modulation Type.	HSDPA Mode with QPSK Modulation	
	HSUPA Mode with QPSK Modulation	
	HSUPA Mode with QPSK Modulation	
	GSM 850MHz:	
	Tx: 824.20 - 848.80MHz	
	Rx: 869.20 - 893.80MHz	
	GSM 1900MHz:	
	Tx: 1850.20 - 1909.80MHz	
Operating Frequency Range:	Rx: 1930.20 - 1989.80MHz	
	WCDMA Band V	
	Tx: 826.4 - 846.6MHz	
	Rx: 871.4 - 891.6MHz	
	WCDMA Band II	
	Tx: 1852.4 - 1907.6MHz	





Rx: 1932.4 - 1987.6MHz **WCDMA Band IV** Tx: 1712.4 – 1752.6MHz Rx: 2112.4 - 2152.6MHz

Antenna Type:	PIFA Antenna		
	GSM 850:	-0.5 dBi	
	GSM1900:	0.8 dBi	
	WCDMA Band V:	-0.5 dBi	
	WCDMA Band II:	0.8 dBi	
	WCDMA Band IV:	0.5 dBi	
	Battery 1		
	Brand Name:	(N/A, marked #1 by test site)	
	Model No.:	BL280MP	
	Serial No.:	(N/A, marked #1 by test site)	
	Capacity:	2800mAh	
	Rated Voltage:	3.7V	
	Charge Limit:	4.2V	
	Battery 2		
	Brand Name:	(N/A, marked #1 by test site)	
Accessory Information	Model No.:	BL312NP	
Accessory mormation:	Serial No.:	(N/A, marked #1 by test site)	
	Capacity:	3120mAh	
	Rated Voltage:	3.6V	
	Charge Limit:	4.2V	
	AC Adapter 1		
	Brand Name:	(N/A, marked #1 by test site)	
	Model No.:	HKC0055010-2D	
	Serial No.:	(N/A, marked #1 by test site)	
	Rated Input:	100-240V~50/60Hz 0.2A	
	Rated Output:	5V=1.0A	

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula F(n)=824.2+0.2*(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190(836.6MHz) and 251 (848.8MHz).</p>





- Note 2: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula F(n)=1850.2+0.2*(n-512), 512<=n<=810; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).</p>
- Note 3: The transmitter (Tx) frequency arrangement of the WCDMA Band V used by the EUT can be represented with the formula F(n)=826.4+0.2*(n-4132), 4132<=n<=4233; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4182(836.4MHz) and 4233 (846.6MHz).
- Note 4: The transmitter (Tx) frequency arrangement of the WCDMA Band II used by the EUT can be represented with the formula F(n)=1852.4+0.2*(n-9262), 9262<=n<=9538; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).
- **Note 5:** The transmitter (Tx) frequency arrangement of the WCDMA 1700MHz band used by the EUT can be represented with the formula F(n)=1712.4+0.2*(n-1312), 1312<=n<=1513; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 1312 (1712.4MHz), 1413 (1732.6MHz) and 1513 (1752.6MHz).
- **Note 6:** All modes and data rates were considered and evaluated respectively by performing full test. Test modes are chosen to be reported as the worst case below:

GPRS mode and EDGE mode for GSM 850;

GPRS mode and EDGE mode for GSM 1900;

WCDMA mode for WCDMA band V;

WCDMA mode for WCDMA band II;

WCDMA mode for WCDMA band IV;

Note 7: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.





1.3. Maximum ERP/EIRP and Emission Designator

System	Emission Designator		
GSM850	0.845	249KGXW	
EDGE850	0.638	247KG7W	
GSM1900	1.069	248KGXW	
EDGE1900	0.472	247KG7W	
WCDMA Band V	0.106	4M16F9W	
WCDMA Band II	0.189	4M17F9W	
WCDMA Band IV	0.187	4M17F9W	



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1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CEP Part 2(10, 1, 12 Edition)	Frequency Allocations and Radio Treaty Matters;
I	47 CFR Part 2(10-1-12 Edition)	General Rules and Regulations
2	47 CFR Part 22(10-1-12 Edition)	Public Mobile Services
3	47 CFR Part 24(10-1-12 Edition)	Personal Communications Services
4	47 CFR Part 27(10-1-12 Edition)	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	2.1046	Conducted RF Output Power	Aug 26, 2019	Gao Mingzhou	PASS
2	24.232(d),27.50(d)	Peak -Average Ratio	Aug 27, 2019	Gao Mingzhou	PASS
3	2.1049	99% Occupied Bandwidth	Aug 27, 2019	Gao Mingzhou	PASS
4	2.1055,22.355, 24.235, 27.54	Frequency Stability	Sept 1, 2019	Gao Mingzhou	PASS
5	2.1051,22.917(a),2 4.238(a), 27.53(h)	Conducted Out of Band Emissions	Aug 27, 2019 Sept 2, 2019	Gao Mingzhou	PASS
6	2.1051,22.917(a),2 4.238(a), 27.53(h)	Band Edge	Aug 30, 2019	Gao Mingzhou	PASS
7	22.913(a),24.232(a)	Transmitter Radiated Power (EIPR/ERP)	Aug 23&24, 2019	Wang Dalong	PASS
8	2.1051,22.917(a),2 4.238(a), 27.53(h)	Radiated Out of Band Emissions	Aug 23&24, 2019	Wang Dalong	PASS

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 (Oct 27, 2017)and ANSI/TIA-603-E-2016.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 26.5dB contains two parts that cable loss 16.5dB and Attenuator 10dB.





1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106



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2.47 CFR Part 2, Part 22H , 24E&27L Requirements

2.1. Conducted RF Output Power

2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2. Test Description

Test Setup:



The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.





2.1.3. Test Results

GSM850	Average Power (dBm)		
TX Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GSM 1 Tx slot	31.67	31.55	31.49
GPRS 1 Tx slot	31.75	31.62	31.57
GPRS 2 Tx slots	30.48	30.41	30.48
GPRS 3 Tx slots	28.47	28.44	28.32
GPRS 4 Tx slots	27.39	27.29	27.27
EDGE 1 Tx slot	26.77	26.11	26.65
EDGE 2 Tx slots	24.16	23.98	24.07
EDGE 3 Tx slots	22.05	21.85	21.90
EDGE 4 Tx slots	21.45	21.18	21.28

GSM1900	Average Power (dBm)		
TX Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GSM 1 Tx slot	29.46	29.49	29.35
GPRS 1 Tx slot	29.20	29.20	29.10
GPRS 2 Tx slots	28.40	28.50	28.40
GPRS 3 Tx slots	26.60	26.70	26.60
GPRS 4 Tx slots	25.50	25.61	25.60
EDGE 1 Tx slot	25.94	25.69	25.65
EDGE 2 Tx slots	24.61	24.35	24.46
EDGE 3 Tx slots	22.45	22.13	22.06
EDGE 4 Tx slots	21.15	20.78	20.68





WCDMA Band V	A	verage Power (dBm)	
TX Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
AMR 12.2Kbps	22.81	22.82	22.88
RMC 12.2Kbps	22.84	22.83	22.89
HSDPA Subtest-1	21.45	21.44	21.46
HSDPA Subtest-2	21.43	21.4	21.46
HSDPA Subtest-3	20.97	20.95	20.95
HSDPA Subtest-4	20.91	20.96	20.98
HSUPA Subtest-1	19.46	19.49	19.46
HSUPA Subtest-2	19.45	19.45	19.47
HSUPA Subtest-3	20.39	20.45	20.44
HSUPA Subtest-4	19	18.99	18.98
HSUPA Subtest-5	20.37	20.39	20.36
HSPA+ (16QAM) Subtest-1	19.29	19.28	19.27

WCDMA Band II	Α	verage Power (dBm)	
TX Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
AMR 12.2Kbps	22.23	22.25	22.23
RMC 12.2Kbps	22.24	22.26	22.24
HSDPA Subtest-1	21.58	21.61	21.58
HSDPA Subtest-2	21.55	21.59	21.58
HSDPA Subtest-3	21.02	21.1	21.11
HSDPA Subtest-4	21	21.1	21.07
HSUPA Subtest-1	19.45	19.52	19.51
HSUPA Subtest-2	19.47	19.52	19.51
HSUPA Subtest-3	20.42	20.48	20.47
HSUPA Subtest-4	18.99	19.02	19.03
HSUPA Subtest-5	20.37	20.43	20.43
HSPA+ (16QAM) Subtest-1	19.28	19.51	19.26



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WCDMA Band IV	Average Power (dBm)			
TX Channel	1312	1413	1513	
Frequency (MHz)	1712.4	1732.6	1752.6	
AMR 12.2Kbps	22.20	22.12	22.01	
RMC 12.2Kbps	22.21	22.13	22.03	
HSDPA Subtest-1	21.23	21.34	21.23	
HSDPA Subtest-2	21.24	21.32	21.2	
HSDPA Subtest-3	20.74	20.82	20.7	
HSDPA Subtest-4	20.7	20.81	20.69	
HSUPA Subtest-1	19.28	19.32	19.25	
HSUPA Subtest-2	19.28	19.29	19.21	
HSUPA Subtest-3	20.21	20.25	20.21	
HSUPA Subtest-4	18.8	18.85	18.76	
HSUPA Subtest-5	20.2	20.22	20.16	
HSPA+ (16QAM) Subtest-1	19.21	19.32	19.09	





2.2. Peak to Average Ratio

2.2.1. Requirement

According to FCC 24.232(d) the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2. Test Description

Test Setup:



The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.2.3. Test procedure

- 1 .For GSM/EDGE operating mode:
- a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.
- b. Set EUT in maximum output power, and triggered the bust signal.
- c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.
- 2.For UMTS operating mode:
- a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.





2.2.4. Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

A. Test Verdict:

Dand	Channel	Frequency	Peak to Average ratio	Limit	\/ardiat
Band	Channel	(MHz)	dB	dB	veralct
COMPENN	128	824.2	0.004		PASS
	190	836.6	0.006		PASS
ΠZ	251	848.8	0.016		PASS
CSM	512	1850.2	0.012		PASS
1000MH-7	661	1880.0	0.009		PASS
	810	1909.8	0.006	12	PASS
	128	824.2	0.012	13	PASS
EDGE850	190	836.6	0.003		PASS
IVITIZ	251	848.8	0.015		PASS
EDCE	512	1850.2	0.007		PASS
	661	1880.0	0.022		PASS
	810	1909.8	0.003		PASS

Band Channel		Frequency	Peak to Average ratio	Limit	Vardiat
Danu	Danu Channel		dB	dB	verdici
	4132	826.4	3.04		PASS
Rond V	4182	836.4	3.05		PASS
Banu v	4233	846.6	3.05		PASS
	9262	1852.4	2.99		PASS
Band II	9400	1880.0	3.03	13	PASS
	9538	1907.6	2.90		PASS
	1312	1712.4	2.83		PASS
Rond IV	1413	1732.6	2.90		PASS
Danu IV	1513	1752.6	2.84		PASS



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		GSM 8	50MHz CH	128 824.2M	Hz			
Aglieot Spectrum Analyzer - Swept SA 12 85 50 p. AC Marker 1 828.467 µs	PNO: Fast Trig: Free Run If Gain:Low Atten: 24 dB	Avg Type: Log-Pur TXXE Deal Avg Type: Log-Pur TXXE Deal Avg Hold>100100 TYPE Deal Control TXXE Deal	2019 Peak Search	Agliest Spectrum Analyzer - Swept SA BE S0.2 40 Marker 1 25,7333 μs	PNO: Fast IF Galact.ov PNO: Fast Atten: 24 dB	ALISN OFF Avg Type: RMS Avg Hold>100/100	01:39:13PM Aug 27, 2019 TRACE A CONCEPTOR TRACE A CONCEPTOR TRACE A CONCEPTOR	Peak Search
Ref Offset 26.5 dB 10 dB/div Ref 40.00 dBm	3 1	Mkr1 828.5 31.397 dB	us NextPeak Sm	Ref Offset 26.5 dB			Mkr1 25.73 µs 31.393 dBm	Next Peak
30.0		▲ ¹	Next Pk Right	30.0				Next Pk Right
10.0			Next Pk Left	10.0				Next Pk Left
-10.0			Marker Delta	-10.0				Marker Delta
-30.0			Mkr→CF	-30.0				Mkr→CF
-50.0			Mkr→RefLvl	-50.0				Mkr→RefLvi More
Center 824.200000 MHz Res BW 1.0 MHz MSG	#VBW 3.0 MHz	Span 0 Sweep 1.333 ms (20001 p status	Hz 1 of 2 ots)	Center 824.200000 MHz Res BW 1.0 MHz MSG	#VBW 3.0 MHz*	Sweep 1.	Span 0 Hz 333 ms (20001 pts) s	1 of 2
		GSM 8	50MHz CH	190 836.6MI	Hz			
Agilent Spectrum Analyzer - Swept SA Social Spectrum Analyzer - Swept SA Social Spectrum Analyzer - Swept SA Marker 1 124.733 µs	PNO: Fast (Trig: Free Run IF Gaint.ow Atten: 24 dB	AL301 OFF 0022757 PM AUg27, 82 Avg Type: Log-Pwr Avg[Hold>100/100 TMC 1022	950MHz CH	190 836.6MI	PNO: Fast D Trig: Free Run Atten: 24 dB	AUGH OFF Avg Type: RMS Avg[Hold>100/100	02:28:1194 Aug 27, 2019 TRACE DE 24 4 5 TVRE MOMMAN AU DET A 11111111	Peak Search
Agilent Spectrum Analyzer Smight St 12 100 20 20 Marker 1 124,733 µs Ref Offset 26.5 dB 10 dB/div Ref 40.00 dBm	PRO: Fast Carl Trig: Free Run If Galactew Atten: 24 dB	Av3101 CFF 02.2757/FMA0g27,8 Avg1Held>100/100 TMACE Mvg1Held>100/100 TMACE MKrt1 124.7 31.373 dB	Pesk Search Next Peak	190 836.6MI	PIO: Fast FGalact.ow Atten: 24 dB	AAJGN OFF Avg Type: RMS Avg Held>100/100	02:29:119M Aug 27, 2019 TRACE (B.D.) a contract	Peak Search Next Peak
Adlest Spectrum Analyzer - Swept M D EF 1950 42 Marker 1 124.733 µs 10 dB/dIV Ref 0ffset 28.5 dB 10 dB/dIV Ref 40.00 dBm 00	PRO: Fast Carl IFGalctow Atten: 24 dB	At 121 CF 02.22 07 M App 7, 20 Arg Type: Log Phr The phr Arg Type: Log Phr The phr Mr: I 124.7 31.373 dB	Peak Search Next Peak Next Peak	190 836.6MI	HZ	AvgType: RMS AvgType: RMS AvgHold>100/100	0220119440927,2019 Prace 22.3.5 Press Pres	Peak Search Next Peak Next Pk Right
Addrest Spectrum Analyzer - Sweet M D	A SPOEL 201 PNO: Feat Can Trig: Free Run Fiscale.tew Atten: 24 dB	Av3/4/0F 02:27:5794 Avg77,8 Avg17ype: Log-Pur Pixe: Avg11vield> to0100 Pixe: Mkr11124.71 31.373 dB	Peak Search Peak Search Peak Search Next Peak Next Pk Right Next Pk Left	190 836.6MI	HZ	Avg Type: RMS Avg Held> 100/100	02201104Aug27,2019 THAC BARK STRUCTURE THAC	Peak Search Next Peak Next Pk Right Next Pk Left
Adlent Spectrum Analyzer - Swept M 0	PRO: Fast Carl Trig: Free Run Fiscalic.tow Atten: 24 dB	At 13/07 02.2757974 Apr; 7-2 Arg Type: Log-Pur Avg Hold>100100 Tax: Type: Log-Pur Type: Log	Peak Search Next Peak Next Peak Next Pk Right Next Pk Left Marker Delta	190 836.6MI	HZ	Avg Type: RMS Avg Hold=100100	1022811194 Aug 27, 2019 Trade 124 8 Em 104 124 124 124 124 124 124 124 124 124 12	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta
Addient Spectrum Analyzer - Sweet SA D BP 1930 ac Marker 1 124.733 µs 10 dBARIW Ref 40.00 dBm 20 0 10 0	A STAR 201 PRO: Fast Car Trig: Free Run FGalectew Atten: 24 dB	Alt2107 0227079440277.2 Avg Type: Log-Pur AvgHold>100100 Three	Peak Search Next Peak Next Peak Next Pk Right Next Pk Left Marker Delta MkrCF	190 836.6MI	Hz	Avg Type: RMS Avg Held>100/100	022811194 Aug 27, 2019 Texa 22, 2019 Mr 1 364.0 µs 31.367 dBm	Peak Search Next Peak Next Pk Right Next Pk Left Marker Deta MkrCF
Addrest Spectrum Analyzer - Sweet M C I IP 900 AC Marker 1 124.733 µs Marker 1 124.733 µs Ref 0diset 26.5 db 10 dBAdiv Ref 40.00 dBm 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A SAVE 201 PRO: Fast Carl Trig: Free Run Fical:Low Atten: 24 dB	Avg Type: 02/25/07 02/25/07 02/25/07 02/25 <th0 25<="" th=""> 02/25 02/25</th0>	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta MkrCF MkrRef Lvi	190 836.6MI	Hz	A=371000 Avg Type: RMS Avg Held>100/100	02281194 Aug 27,2017	Pesk Search Next Peak Next Pk Right Next Pk Left Marker Delta MkrCF MkrRef Lvi
Addrest Spectrum Analyzer - Sweet M C 1 12 102 102 102 Marker 1 124-733 µs Marker 1 124-733 µs Ref 00ffset 26.50 dbm 10 db/div 20 0 10 0	PRO: Feet Control Trig: Free Run PRO: Feet Control Trig: Free Run Recalcow Atten: 24 dB Atten: 2	CSSM 8	Peak Search Peak Search Next Peak Next Peak Next Peak Next Peak Marker Delta MkrCF MkrCF	190 836.6MI	HZ	Avg Type: RMS Avg Hold>100100	1022011194 Aug 27, 2019 Texas	Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta MkrCF MkrRef Lvi More 1 of 2

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EDGE 1900MHz CH810 1909.8MHz

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2.3.99% Occupied Bandwidth

2.3.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.Occupied bandwidth is also known as the 99% emission bandwidth.

2.3.2. Test Description

Test Setup:

The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.3.3. Test Result

The lowest, middle and highest channels are selected to perform testing to record the 99% occupied bandwidth.

GSM Test Verdict:

Band Channel		Frequency	99% Occupied Bandwidth	26dB Bandwidth
Dallu	Channel	(MHz)	(kHz)	(kHz)
COM	128	824.2	247.49	317.5
	190	836.6	249.47	317.3
ODUNITZ	251	848.8	243.63	317.8
COM	512	1850.2	246.03	313.5
	661	1880.0	241.86	318.5
190010112	810	1909.8	247.90	318.1
EDCE	128	824.2	247.06	319.2
	190	836.6	245.76	317.0
ODUNITZ	251	848.8	247.83	310.4
	512	1850.2	241.31	322.9
	661	1880.0	247.34	318.9
TBOOMINZ	810	1909.8	243.76	315.8

WCDMA Test Verdict:

Dand	Channel	Frequency	99% Occupied Bandwidth	26dB Bandwidth
Danu	Channel	(MHz)	(MHz)	(MHz)
	4132	826.4	4.166	4.696
Rond V	4182	836.4	4.154	4.689
Dallu V	4233	846.6	4.159	4.694
	9262	1852.4	4.170	4.677
Rond II	9400	1880.0	4.153	4.683
Danu II	9538	1907.6	4.175	4.748
	1312	1712.4	4.163	4.703
	1413	1732.6	4.176	4.663
Danu IV	1513	1752.6	4.160	4.688

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2.4. Frequency Stability

2.4.1. Requirement

According to FCC section 22.355, 24.235 and 27.54 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.4.2. Test Description

Test Setup:

The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

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2.4.3. Test Result

A. Test Verdict:

GSM 850MHz, Channel 190, Frequency 836.6MHz							
	Limit =±2.5ppm						
Voltage(%)	Power(V	Temn(°C)	Fre. Dev.	Deviation	Rosult		
Voltage(70)	DC)		(Hz)	(ppm)	Result		
100		+20(Ref)	23	0.027			
100		-10	-49	-0.059			
100		0	-27	-0.032			
100	2 7\/	+10	15	0.018			
100	3.7 V	+20	25	0.030	DAGG		
100		+30	75	0.090	FASS		
100		+40	64	0.077			
100		+50	84	0.100			
115	4.2V	+20	-6	-0.007			
85	3.0V	+20	-71	-0.085			

GSM 1900MHz, Channel 661, Frequency 1880.0MHz							
	Limit =Within Authorized Band						
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result		
100		+20(Ref)	97	0.052			
100		-10	-26	-0.014			
100		0	-29	-0.015			
100	2 7\/	+10	-53	-0.028			
100	3.7 V	+20	42	0.022	DAGG		
100		+30	73	0.039	FA33		
100		+40	31	0.016			
100		+50	82	0.044			
115	4.2V	+20	16	0.009			
85	3.0V	+20	-58	-0.031			

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EDGE 850MHz, Channel 190, Frequency 836.6MHz							
	Limit =±2.5ppm						
Voltage(%)	Power(V	Temp(°C)	Fre. Dev.	Deviation	Result		
	DC)		(Hz)	(ppm)			
100		+20(Ref)	25	0.030			
100		-10	-74	-0.088			
100		0	-25	-0.030			
100	2 71	+10	54	0.065			
100	3.7V	+20	15	0.018	DASS		
100		+30	26	0.031	PASS		
100		+40	25	0.030			
100		+50	74	0.088			
115	4.2V	+20	-36	-0.043			
85	3.0V	+20	-47	-0.056			

EDGE 1900MHz, Channel 661, Frequency 1880.0MHz Limit =Within Authorized Band						
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result	
100		+20(Ref)	42	0.022		
100		-10	-26	-0.014	-	
100		0	-85	-0.045		
100	0.7\/	+10	-84	-0.045		
100	3.7V	+20	27	0.014		
100		+30	84	0.045	PASS	
100		+40	16	0.009	-	
100		+50	15	0.008	-	
115	4.2V	+20	16	0.009		
85	3.0V	+20	-25	-0.013		

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WCDMA Band V, Channel 4182, Frequency 836.4MHz									
Limit =±2.5ppm									
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result				
100	3.7V	+20(Ref)	31	0.037	-				
100		-10	-28	-0.034					
100		0	-35	-0.042					
100		+10	32	0.038					
100		+20	16	0.019	DAGG				
100		+30	26	0.031	PASS				
100		+40	47	0.056					
100		+50	62	0.074	-				
115	4.2V	+20	-65	-0.078					
85	3.0V	+20	-35	-0.042					

WCDMA Band II, Channel 9400, Frequency 1880.0MHz									
Limit =Within Authorized Band									
Voltage(%)	Power(V	Temp(°C)	Fre. Dev.	Deviation	Result				
	DC)		(Hz)	(ppm)					
100	3.7V	+20(Ref)	25	0.013	-				
100		-10	-85	-0.045					
100		0	-37	-0.020					
100		+10	-26	-0.014					
100		+20	86	0.046	DASS				
100		+30	83	0.044	PASS				
100		+40	52	0.028					
100		+50	15	0.008	-				
115	4.2V	+20	43	0.023					
85	3.0V	+20	-86	-0.046					

WCDMA Band IV, Channel 1413, Frequency 1732.6MHz								
Limit =Within Authorized Band								
Voltage(%)	Power(V DC)	Temp(°C)	Fre. Dev.	Deviation	Result			
			(Hz)	(ppm)				
100	- 3.7V	+20(Ref)	-54	-0.031	_			
100		-10	-68	-0.039				
100		0	-53	-0.031				
100		+10	-39	-0.023				
100		+20	-64	-0.037	DASS			
100		+30	-37	-0.021	FA33			
100		+40	67	0.039				
100		+50	15	0.009	-			
115	4.2V	+20	15	0.009				
100	3.0V	+20	-54	-0.031				

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2.5. Conducted Out of Band Emissions

2.5.1. Requirement

According to FCC section 22.917(a), 24.238(a) and 27.53(h) 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. This calculated to be -13dBm.

2.5.2. Test Description

Test Setup:

The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.5.3. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

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