



CFR 47 FCC PART 22 H CFR 47 FCC PART 24 E

TEST REPORT

For

Payment terminal

MODEL NUMBER: SOLO

FCC ID: 2A39U-SOLO002

REPORT NUMBER: 4790095248-1

ISSUE DATE: March 29, 2022

Prepared for

SumUp Inc 2000 Central Ave Ste 100 Boulder Colorado 80301 United States

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	03/29/2022	Initial Issue	

Note:

- 1. This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
- 2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 22 H >< CFR 47 FCC PART 24 E> when <Accuracy Method> decision rule is applied.



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: SumUp Inc

Address: 2000 Central Ave Ste 100 Boulder Colorado 80301 United

States

Manufacturer Information

Company Name: SumUp Inc

Address: 2000 Central Ave Ste 100 Boulder Colorado 80301 United

States

EUT Information

EUT Name: Payment terminal

Model: SOLO

Sample Received Date: January 06, 2022

Sample Status: Normal Sample ID: 4405274

Date of Tested: January 06~Mar 29, 2022

APPLICABLE STANDARDS					
STANDARD	TEST RESULTS				
CFR 47 FCC PART 22 H	PASS				
CFR 47 FCC PART 24 E	PASS				

Prepared By:	Checked By:	
kebo. zhang.	Shemmalier	
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Approved By:

Stephen Guo Laboratory Manager



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26-2015, 971168 D01 Power Meas License Digital Systems v03r01, 971168 D02 Misc Rev Approv License Devices v02r01, 412172 D01 v01r01 Determining ERP and EIRP, CFR 47 FCC Part 2, Part 22 H, Part 24 E.

3. FACILITIES AND ACCREDITATION

	A2LA (Certificate No.: 4102.01)
	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
	has been assessed and proved to be in compliance with A2LA.
	FCC (FCC Designation No.: CN1187)
	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
	Has been recognized to perform compliance testing on equipment subject
	to the Commission's Delcaration of Conformity (DoC) and Certification
	rules
	ISED (Company No.: 21320)
	,
Accreditation	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Certificate	has been registered and fully described in a report filed with ISED.
	The Company Number is 21320 and the test lab Conformity Assessment
	Body Identifier (CABID) is CN0046.
	VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)
	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
	has been assessed and proved to be in compliance with VCCI, the
	Membership No. is 3793.
	Facility Name:
	Chamber D, the VCCI registration No. is G-20019 and R-20004
	Shielding Room B, the VCCI registration No. is C-20012 and T-20011
	Gilleruling Nooth B, tile vool registration No. is C-20012 and 1-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.



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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 recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

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

Test Item	Uncertainty	
Conduction emission	3.62 dB	
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB	
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB	
	5.78 dB (1 GHz-18 GHz)	
Radiated Emission (Included Fundamental Emission) (1 GHz to 40 GHz)	5.23dB (18 GHz-26 GHz)	
	5.64 dB (26 GHz-40 GHz)	
Bandwidth	1.1 %	
(Included Fundamental Emission) (1 GHz to 40 GHz) Bandwidth	5.64 dB (26 GHz-40 GHz) 1.1 %	

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.



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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name Payment terminal	
Model Name	SOLO
Battery	Li-ion 1.6 Ah, 3,8 Vdc
Ratings	5 Vdc via USB Type C

Item	Support Equipment	Brand Name	Model Name	Description
1	Adapter	SAMSUNG	ETA-U90CBC	5Vdc,2A

Item	Accessory	Brand Name	Model Name	Description
1	Type-C Cable	N/A	N/A	Length: 1.0 m No Ferrite Core shield

5.2. TEST CHANNEL CONFIGURATION

Band	Mode	Low	Middle	High
GSM850	GRPS/EGPRS	128	190	251
GSIVIOSO	GRPS/EGPRS	824.2 MHz	836.6 MHz	848.8 MHz
CSM1000	GRPS/EGPRS	512	661	810
GSM1900	GRPS/EGPRS	1850.2 MHz	1880.0 MHz	1909.8 MHz
WCDMA Band 2	Rel99/HSDPA/HSUPA	9262	9400	9538
WCDIVIA Bariu 2	Keiss/HSDPA/HSOPA	1852.4 MHz	1880.0 MHz	1907.6 MHz
WCDMA Band 5	Rel99/HSDPA/HSUPA	4132	4182	4233
WCDIVIA Ballu 3	Relaa/HODPA/HODPA	826.4 MHz	836.4 MHz	846.6 MHz



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5.3. MAXIMUM AVERAGE OUTPUT POWER

GSM 850						
Part 22H						
ERP Limit(W) 7						
Antenna Gain (dBi)	-0.3					
			Conducted Average	ERP	99%	Emission
Mode	Ch	Freq(MHz)	power (dBm)	(W)	OBW	Designator
					(MHz)	
GRPS(GMSK)	190	836.6	31.4	0.79	0.246	246KGXW
EGPRS(8PSK)	251	848.8	26.19	0.24	0.246	246KG7W

GSM 1900						
Part 24						
EIRP Limit(W) 2						
Antenna Gain (dBi)	-1.2					
			Conducted Average	EIRP	99%	Emission
Mode	Ch	Freq(MHz)	power (dBm)	(W)	OBW	Designator
					(MHz)	
GRPS(GMSK)	661	1880.0	25.99	0.30	0.246	246KGXW
EGPRS(8PSK)	810	1909.8	22.68	0.14	0.246	246KG7W

WCDMA Band	12]				
Part 24]				
EIRP Limit(W)	2					
Antenna Gain (dBi)	-1.2					
			Conducted Average	EIRP	99%	Emission
Mode	Ch	Freq(MHz)	power (dBm)	(W)	OBW	Designator
					(MHz)	
Rel99	9538	1907.6	19.42	0.07	4.077	4M08F9W
HSDPA	9400	1800.0	18.91	0.06	4.073	4M07F9W
HSUPA	9400	1800.0	18.88	0.06	4.075	4M08F9W



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WCDMA Band	15					
Part 22						
ERP Limit(W)	7					
Antenna Gain (dBi)	-0.3					
			Conducted Average	ERP	99%	Emission
Mode	Ch	Freq(MHz)	power (dBm)	(W)	OBW	Designator
					(MHz)	
Rel99	4182	836.4	22.83	0.11	4.136	4M14F9W
HSDPA	4132	826.4	22.81	0.11	4.134	4M13F9W
HSUPA	4132	826.4	21.91	0.09	4.165	4M17F9W

5.4. WORST-CASE CONFIGURATION AND MODE

The radiated spurious emissions measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that X orientation was the worst-case orientation.

Radiated spurious emissions were investigated below 30 MHz, 30 MHz - 1 GHz and above 1 GHz. There were no emissions found on below 1GHz and above 18 GHz, the emissions between 1 GHz – 18 GHz were tested the highest transmitting power channel and the worse configuration.

For GSM850/1900, GPRS worst results are shown in test report. For WCDMA, HSDPA worst results are shown in test report.



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5.5. **DESCRIPTION OF AVAILABLE ANTENNAS**

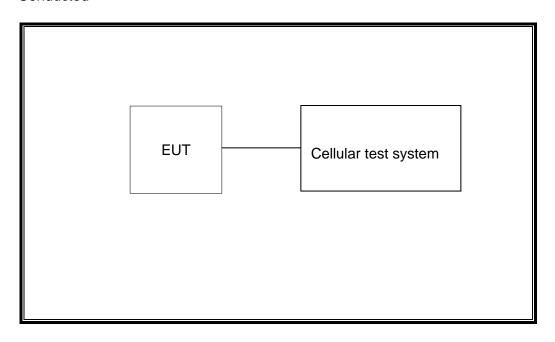
Antenna	Band	Antenna Type	MAX Antenna Gain (dBi)
1	GSM850	MID	-0.3
1	GSM1900	MID	-1.2
1	WCDMA Band 2	MID	-1.2
1	WCDMA Band 5	MID	-0.3

Band	Transmit and Receive Mode	Description
GSM850	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
GSM1900	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
WCDMA Band 2	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
WCDMA Band 5	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.

Note: The value of the antenna gain was declared by customer.

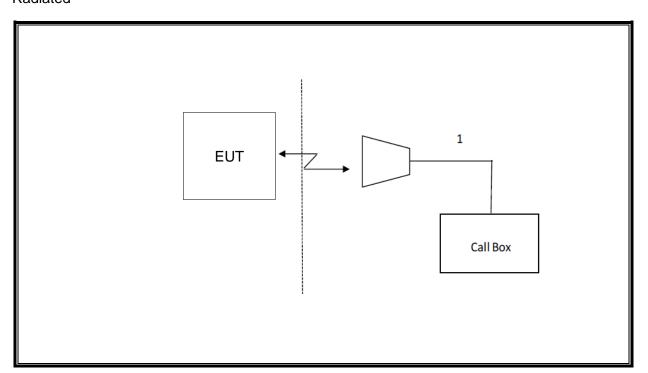
DESCRIPTION OF TEST SETUP 5.6.

Conducted





Radiated





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6. MEASURING INSTRUMENT AND SOFTWARE USED

		Antei		ermin		est			
			Inst	rumen	t				
Used	Equipment	Manufacturer	Mod	el No.	Serial No.		No.	Last Cal.	Next Cal.
\checkmark	Spectrum Analyzer	R&S	FS'	W40	S42	2103	35420	Oct.30, 2021	Oct.29, 2022
\checkmark	Wideband Radio Communication Tester	R&S	CM\	W500	1	1555	523	Oct.30, 2021	Oct.29, 2022
\checkmark	DC Power Supply	Array	36	62A	A1	1512	2015	Oct.30, 2021	Oct.29, 2022
			Sof	ftware					
Used	Descript	ion	Man	ufactu	rer		١	Name	Version
V	Tonsend Cellular	Test System	To	onsenc	ŀ	JS		RF Auto Test ystem	2.6.9.0826
	Radiated Test								
			Inst	rumen	t				
Used	Equipment	Manufacturer	Mod	el No.	Serial No.		No.	Last Cal.	Next Cal.
V	MXE EMI Receiver	KESIGHT	N90)38A	MY	5640	00036	Oct.30, 2021	Oct.29, 2022
V	Hybrid Log Periodic Antenna	TDK		LP- 03C	130960		960	Aug.02, 2021	Aug.01, 2024
\checkmark	Preamplifier	HP	84	47D	294	4A0	9099	Oct.30, 2021	Oct.29, 2022
V	EMI Measurement Receiver	R&S	ES	R26	1	1013	377	Oct.30, 2021	Oct.29, 2022
\checkmark	Horn Antenna	TDK	HRN	l-0118	1	309	939	July 20, 2021	July 19, 2024
V	High Gain Horn Antenna	Schwarzbeck	91	HA- 170		69		July 20, 2021	July 19, 2024
V	Preamplifier	TDK		02- 118	(000		Oct.31, 2021	Oct.30, 2022
V	Preamplifier	TDK	PA-	-02-2		RS-3	307- 03	Oct.31, 2021	Oct.30, 2022
\checkmark	Loop antenna	Schwarzbeck	15	19B		000	80	Jan.17,2022	Jan.17,2025
V	High Pass Filter	Wi	WHKX10- 2700- 3000- 18000- 40SS			23	3	Oct.31, 2021	Oct.30, 2022
			So	ftware					
Used	Descr	ription		Manuf	facturer Name Ve		Version		
V	Test Software for R	adiated disturba	ance	Fa	rad	EZ-EMC Ver. UL-3A1			Ver. UL-3A1



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7. ANTENNA TERMINAL TEST RESULTS

7.1. EFFECTIVE (ISOTROPIC) RADIATED POWER OF TRANSMITTER

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

RSS-132

The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

RSS-133

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits 2W

In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

TEST PROCEDURE

Refer to ANSI C63.26:2015 and KDB 971168 D01 Section 5.6 ERP/ EIRP = PMeas + GT - LC

where:

ERP or EIRP = effective or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

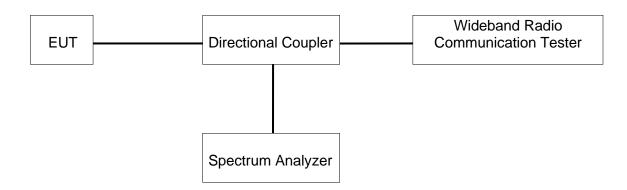
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB

The transmitter has a maximum radiated ERP / EIRP output powers as follows:



TEST SETUP



TEST ENVIRONMENT

Temperature	22.7°C	Relative Humidity	65.6%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.8 V

RESULTS

GSM 850				
Part 22H				
ERP Limit(W)	7			
Antenna Gain (dBi)	-0.3			
Mode	Ch	Freq(MHz)	Conducted Average	ERP
Mode	CII	Freq(MHZ)	power (dBm)	(W)
GRPS(GMSK)	128	824.2	31.4	0.79
GSM 1900				
Part 24				
EIRP Limit(W)	2			
Antenna Gain (dBi)	-1.2			
			Conducted Average	EIRP
Mode	Ch	Freq(MHz)	power (dBm)	(W)
GRPS(GMSK)	810	1909.8	25.99	0.30



WCDMA Band2				
Part 24				
EIRP Limit(W)	2			
Antenna Gain (dBi)	-1.2			
			Conducted Average	EIRP
Mode	Ch	Freq(MHz)	power (dBm)	(W)
Rel99	9538	1907.6	19.42	0.07

WCDMA Band5				
Part 22				
ERP Limit(W)	7			
Antenna Gain (dBi)	-0.3			
			Conducted Average	ERP
Mode	Ch	Freq(MHz)	power (dBm)	(W)
Rel99	4132	826.4	22.83	0.11

GSM 850

		Conducted Average Power (dBm)				
Band		Channel	Channel	Channel		
		128	190	251		
	TestSlot 1	31.38	31.38	31.28		
CDDC050	TestSlot 2	31.39	31.40	31.30		
GPRS850	TestSlot 3	30.56	30.58	30.47		
	TestSlot 4	29.38	29.43	29.34		
	TestSlot 1	26.12	26.17	26.19		
EGPRS850	TestSlot 2	26.11	26.12	26.18		
	TestSlot 3	25.29	25.32	25.37		
	TestSlot 4	24.13	24.13	24.16		

GSM 1900

		Conducted Average Power (dBm)			
Bar	nd	Channel	Channel	Channel	
		512	661	810	
	TestSlot 1	25.26	25.99	25.82	
GPRS1900	TestSlot 2	25.31	25.76	25.83	
	TestSlot 3	24.47	24.72	24.68	
	TestSlot 4	23.31	23.79	23.61	
	TestSlot 1	22.19	22.57	22.64	
EGPRS1900	TestSlot 2	22.49	22.59	22.68	
	TestSlot 3	21.79	21.86	22.12	



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	TestSlot 4	20.88	20.93	21.46
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WCDMA Band2

UMTS 1900MHz		Average Power (dBm)			
(B	(Band II)		9400CH	9538CH	
	12.2kbps RMC	19.26	19.38	19.42	
WCDMA	64kbps RMC	18.71	18.86	19.01	
VVCDIVIA	144kbps RMC	18.51	18.63	18.84	
	384kbps RMC	18.42	18.66	18.78	
	Subtest 1	18.41	18.8	18.89	
HSDPA	Subtest 2	18.86	18.86	18.78	
ПОДРА	Subtest 3	18.74	18.77	18.76	
	Subtest 4	18.71	18.91	18.74	
	Subtest 1	17.79	17.9	18.11	
	Subtest 2	17.76	18.88	18.03	
HSUPA	Subtest 3	17.94	17.91	18.01	
	Subtest 4	18.02	17.94	18	
	Subtest 5	18.15	18.86	18.41	

WCDMA Band5

UMTS	8 850MHz	Average Power (dBm)			
(Band V)		4132CH	4182CH	4233CH	
	12.2kbps RMC	22.78	22.83	22.54	
WCDMA	64kbps RMC	22.18	22.38	22.04	
VVCDIVIA	144kbps RMC	21.56	21.55	21.52	
	384kbps RMC	21.19	21.67	21.47	
	Subtest 1	22.81	22.61	22.45	
HSDPA	Subtest 2	22.07	21.89	21.72	
ПОДРА	Subtest 3	21.73	21.88	21.68	
	Subtest 4	21.68	21.91	21.72	
	Subtest 1	21.5	21.36	21.16	
	Subtest 2	21.5	21.35	21.17	
HSUPA	Subtest 3	21.16	21.36	21.17	
	Subtest 4	21.14	21.31	21.12	
	Subtest 5	21.91	21.67	21.44	

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7.2. PEAK TO AVERAGE RADIO

LIMITS

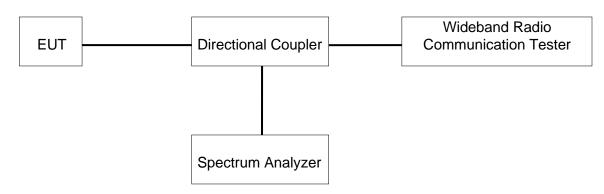
In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

TEST PROCEDURE

Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR was measured on the Spectrum Analyzer.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.7°C	Relative Humidity	65.6%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.8 V

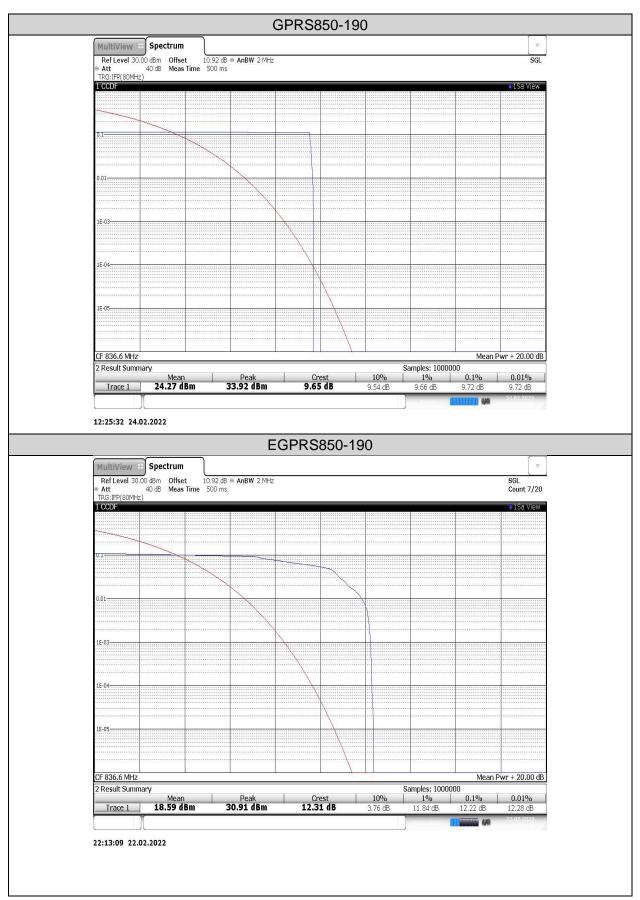
Note: All the modes subtest 1/2/3/4 and channels had been tested, but only the worst data was recorded in the report.

RESULTS

Band	Channel	Result(dB)	Limit(dB)	Verdict
GPRS850	190	9.72	13	PASS
EGPRS850	190	12.22	13	PASS
GPRS1900	661	9.70	13	PASS
EGPRS1900	512	12.56	13	PASS



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GPRS1900-661 Spectrum Mean 19.83 dBm Peak 29.46 dBm Trace 1 11:28:29 23.02.2022 EGPRS1900-512 Spectrum | Ref Level 30.00 dBm | Offset | 11.71 dB | Att | 40 dB | Meas Time | 500 ms Samples: 1000000 Mean 15.88 dBm Peak 28.67 dBm 11:51:38 23.02.2022

WCDMA

WODINA					
Band	Channel	SubTest	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
Band2	9262	Rel99	2.94	13	PASS
	9400	HSDPA	3.32	13	PASS
	9400	HSUPA	4.70	13	PASS
	4182	Rel99	3.70	13	PASS
Band5	4132	HSDPA	3.70	13	PASS
	4182	HSUPA	4.74	13	PASS



Band2-9262-Rel Peak 26.47 dBm 10:14:12 23.02.2022 Band2-9400-HSDPA Peak 26.80 dBn Trace 1 23.18 dBm 14:50:30 23.02.2022 Band2-9400-HSUPA Mean 22.95 dBm Peak 26.37 dBn

14:49:00 23.02.2022



Band5-4182-Rel99 Crest 3.54 dB Mean 25.71 dBm Peak 29.26 dBm 15:17:43 12.11.2021 Band5-4132-HSDPA 15:17:43 12.11.2021 Band5-4182-HSUPA Peak 29.03 dBm Mean 23.99 dBm 19:48:19 23.02.2022



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OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049.

LIMITS

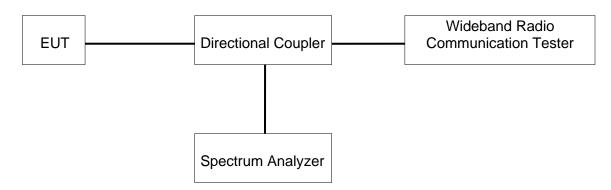
For reporting purposes only.

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01)

TEST SETUP



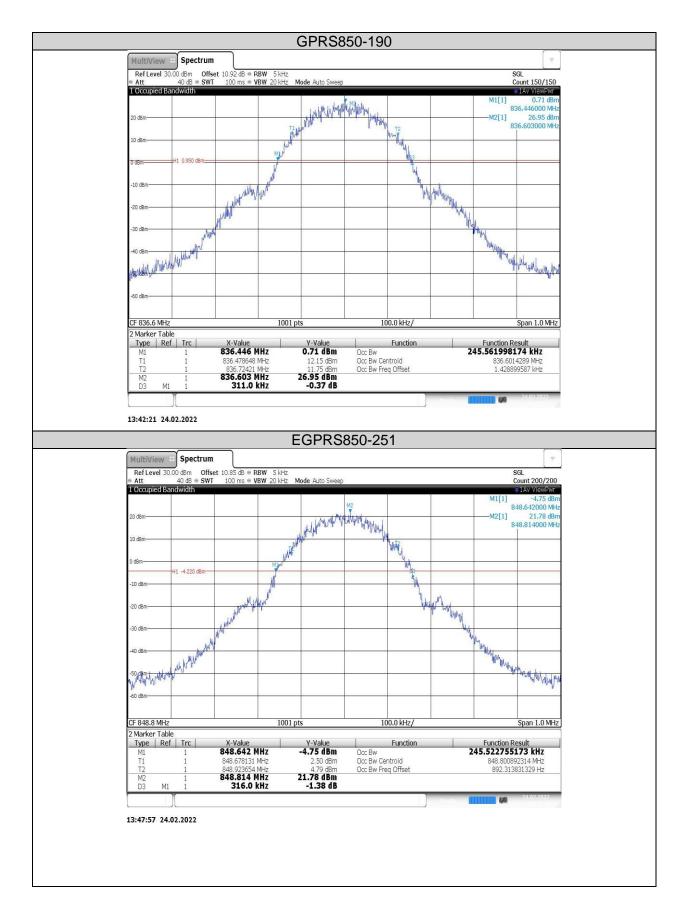
TEST ENVIRONMENT

Temperature	22.7°C	Relative Humidity	65.6%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.8 V

RESULTS

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
GPRS850	190	0.246	0.31		PASS
EGPRS850	251	0.246	0.32		PASS
GPRS1900	661	0.246	0.31		PASS
EGPRS1900	512	0.246	0.31		PASS





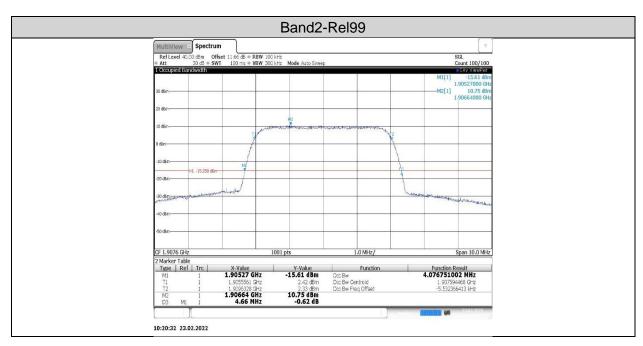


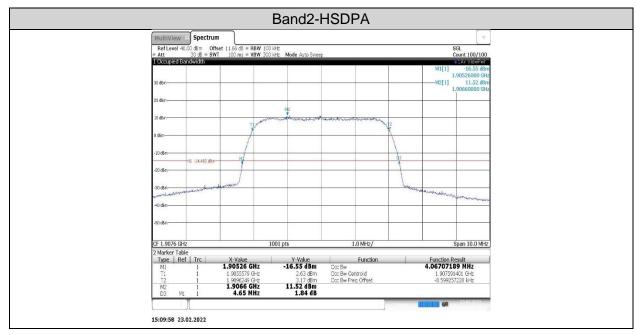
GPRS1900-661 SGL Count 200/200 Mode Auto Sw -4.31 dBr 1.879846000 GH 22,48 dBi 1,880026000 GH M2[1] 41 -3.520 dBn CF 1.88 GHz 2 Marker Table Type | Ref | Trc X-Value 1.879846 GHz Y-Value -4.31 dBm Function Result 245.74676479 kHz Occ Bw Occ Bw Centroid Occ Bw Freq Offset 7.49 dBm 6.66 dBm **22.48 dBm** -**1.92 dB** 1.880000224 GHz 223.813820839 Hz 1.8801231 GHz 1.880026 GHz 313.0 kHz 13:23:48 24.02.2022 EGPRS1900-512 SGL Count 200/200 -6,43 dBr 1.850045000 GHz 19.63 dBn 1.850185000 GH 11 -6 370 dBr -50 April militarid CF 1.8502 GHz 1001 pts 100.0 kHz/ 2 Marker Table Type | Ref | Trc Y-Value -**6.43 dBm** Function Result 245.890103925 kHz X-Value 1.850045 GHz Occ Bw Occ Bw Centroid Occ Bw Freq Offset 1.850200184 GHz 183.629555225 Hz 2.87 dBm 1.850185 GHz 313.0 kHz 19.63 dBm 0.05 dB M1 D3 13:20:10 24.02.2022



WCDMA(only worst case recorded)

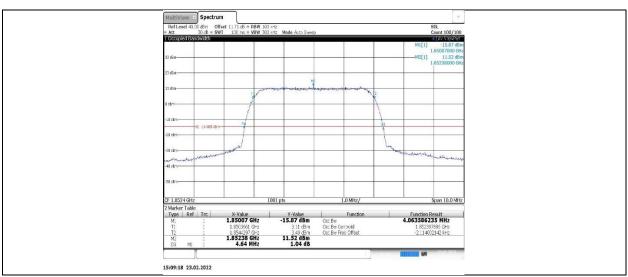
Weblin (only worst case recorded)						
Band	Channel	SubTest	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)		
Band2	High	Rel99	4.077	4.66		
	Mid	HSDPA	4.067	4.65		
	Low	HSUPA	4.064	4.64		
Band5	Mid	Rel99	4.057	4.62		
	Low	HSDPA	4.061	4.63		
	Low	HSUPA	4.075	4.63		

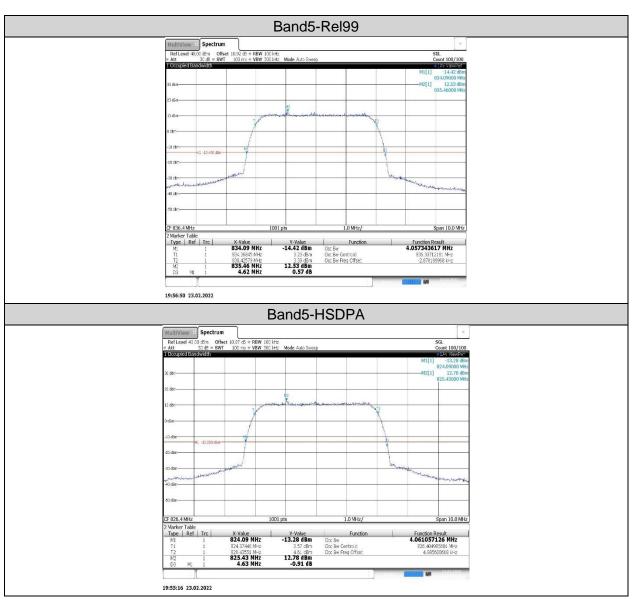




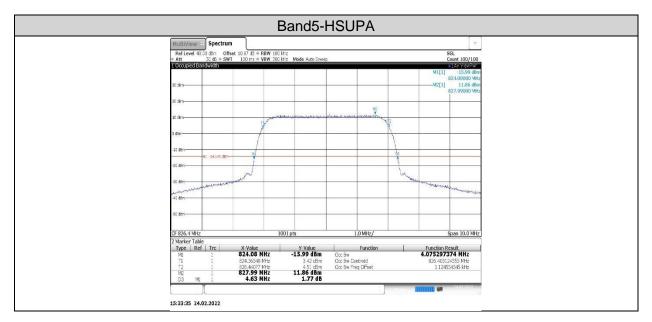
Band2-HSUPA













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7.4. BAND EDGE EMISSIONS

RULE PART(S)

FCC §2.1051, §22.917, §24.238, §27.53, §90,

LIMITS

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.

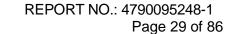
TEST PROCEDURE

Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01 The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

- a) Set the RBW = 1 ~ 1.5 % of OBW (Typically limited to a minimum RBW of 1% of the OBW)
- b) Set VBW ≥ 3 × RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points ≥ 2*Span/RBW;
- g) Trace mode = Average (100);

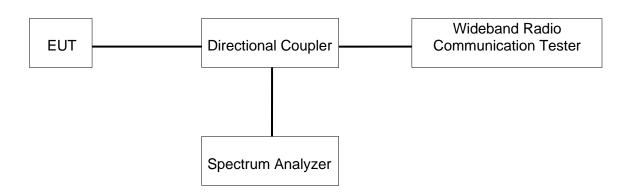
Test procedure for LTE Band 41

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.





TEST SETUP



TEST ENVIRONMENT

Temperature	22.7°C	Relative Humidity	65.6%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.8 V

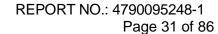
RESULTS

GSM

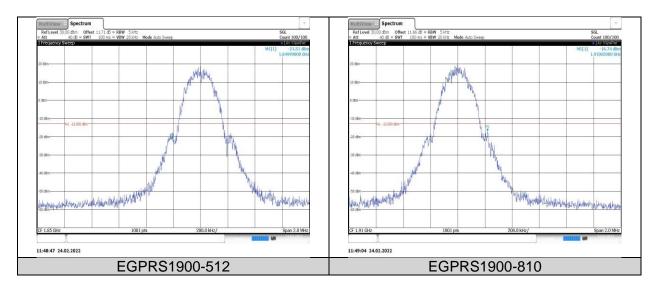
Band	Channel	Freq (MHz)	Result (dBm)	Limit(dBm)	Verdict
GPRS850	128	823.98	-23.64	-13	PASS
GPRS850	251	849.02	-22.84	-13	PASS
EGPRS850	128	823.98	-19.15	-13	PASS
EGPRS850	251	849.02	-17.05	-13	PASS
GPRS1900	512	1849.99	-16.26	-13	PASS
GPRS1900	810	1910.02	-15.26	-13	PASS
EGPRS1900	512	1849.99	-21.51	-13	PASS
EGPRS1900	810	1910.02	-16.74	-13	PASS



13:43:37 24.02.2022 13:54:23 24.02.2022 GPRS850-128 GPRS850-251 Mary Call Control of the M The spending and the transfer of the second section of the second 13:49:00 24.02.2022 13:49:18 24.02.2022 EGPRS850-128 EGPRS850-251 AND POPULATION OF THE PARTY OF apharing by the particular strong to the society waleria para hadu aren jaliji agaale galula jalaladad A THAT HAVE THE 13:24:55 24.02.2022 GPRS1900-512 GPRS1900-810









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Rel99

Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1850.00	-28.11	-13	PASS
Band2	9538	1910.00	-28.50	-13	PASS
Band5	4132	823.87	-29.87	-13	PASS
Band5	4233	849.10	-31.05	-13	PASS

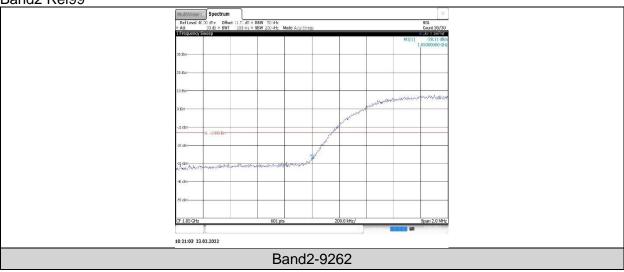
HSDPA

Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1849.91	-30.9	-13	PASS
Band2	9538	1910.15	-32.65	-13	PASS
Band5	4132	823.87	-29.87	-13	PASS
Band5	4233	849.11	-29.35	-13	PASS

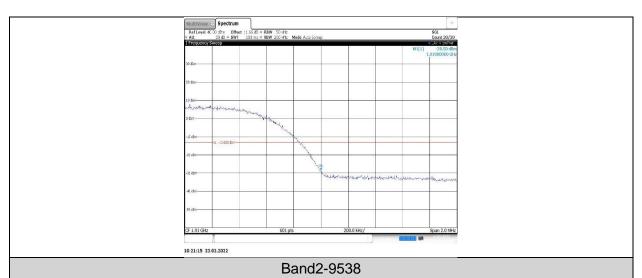
HSUPA

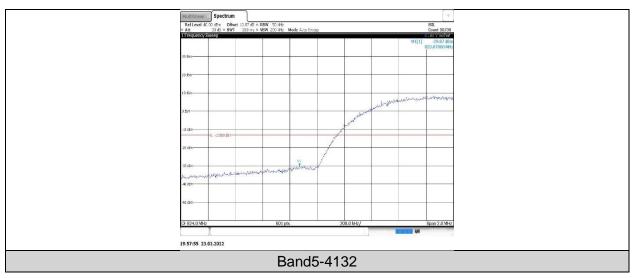
Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1849.91	-30.93	-13	PASS
Band2	9538	1910.12	-30.44	-13	PASS
Band5	4132	823.93	-28.65	-13	PASS
Band5	4233	849.13	-30.93	-13	PASS

Band2 Rel99







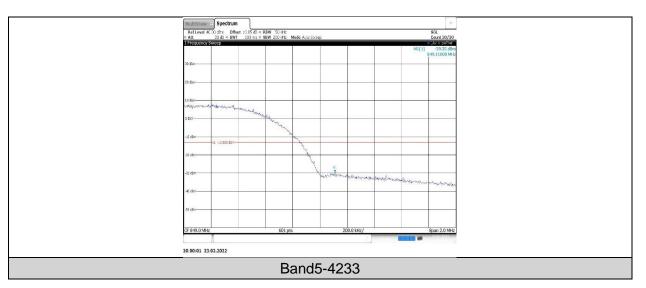




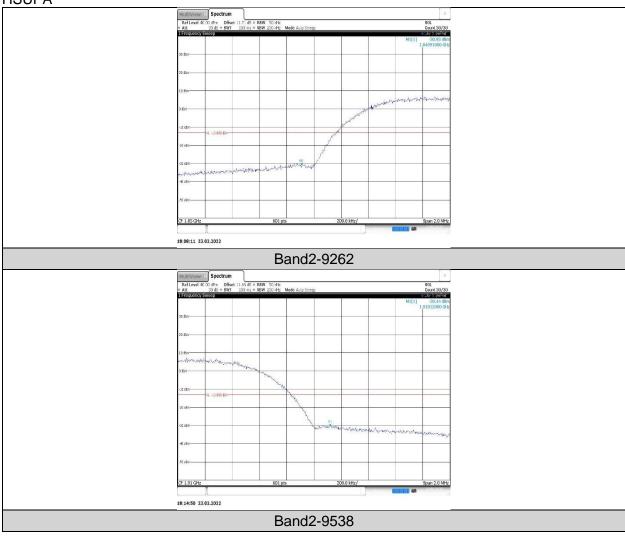


HSDPA 15:14:26 23.02.2022 Band2-9262 15:16:32 23.02.2022 Band2-9538 19:57:55 23.02.2022 Band5-4132











| Section | Sect

Band5-4233

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7.5. SPURIOUS EMISSION AT ANTENNA TERMINAL

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53, §90,

RSS-132, RSS-133, RSS-139

LIMITS

FCC: §22.901, §22.917, §24.238

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.

FCC: §27.53(m)(Band 41)

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 55 + 10 log (P) dB.

TEST PROCEDURE

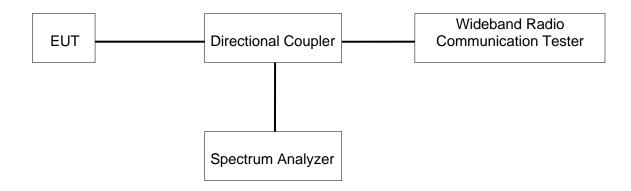
Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

- a) Set the RBW = 100 kHz for emission below 1GHz and 1MHz for emissions above 1GHz (Tests were performed 1 MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW \geq 3 × RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points = Max (40001);
- g) Trace mode = average (LTE 5), Maxhold (LTE Band7);

Note: Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

TEST SETUP





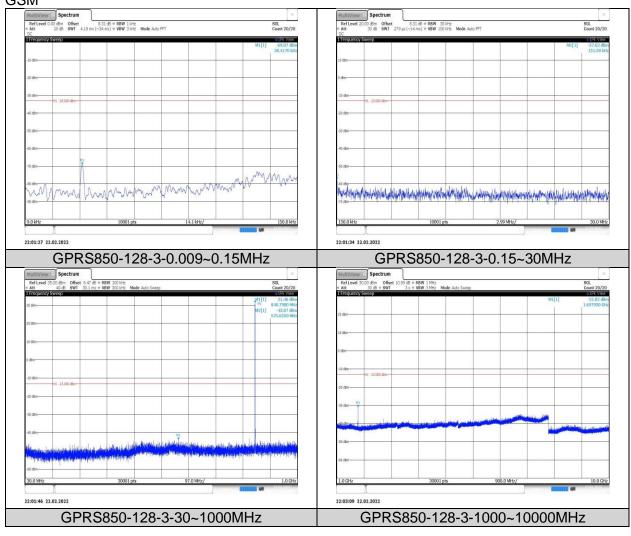
TEST ENVIRONMENT

Temperature	22.7°C	Relative Humidity	65.6%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.8 V

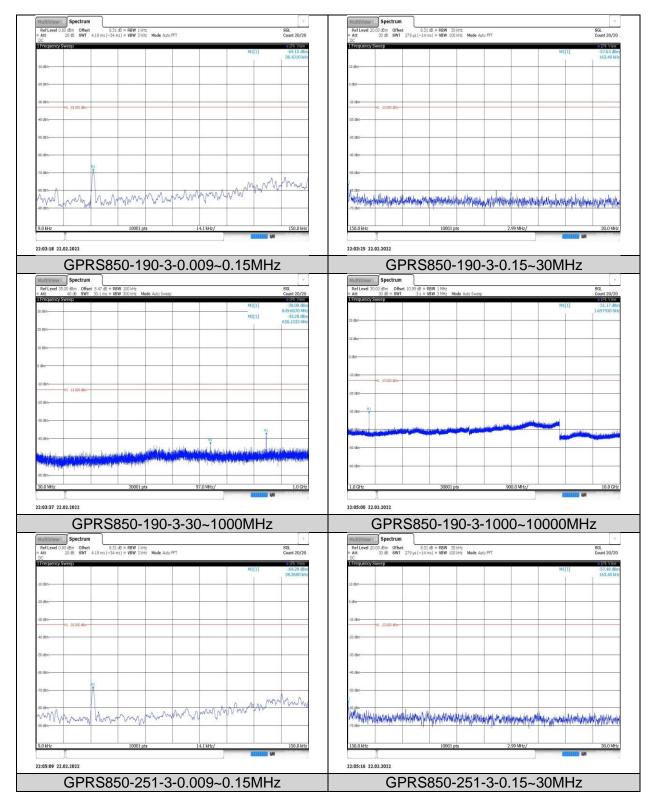
Note:For GSM1900&WCDMA Band 2,The low frequency, which started from 18 GHz to 20 GHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

RESULTS

GSM









GPRS850-251-3-1000~10000MHz GPRS850-251-3-30~1000MHz | Spectrum | | S Meritanian karintan perintahan mentahan mentahan keritan kentahan kentahan kerangan berasah menjadi kelalah bankah 22:20:36 22.02.2022 22:20:43 22.02.2022 EGPRS850-128-8-0.009~0.15MHz EGPRS850-128-8-0.15~30MHz EGPRS850-128-8-1000~10000MHz EGPRS850-128-8-30~1000MHz



dBm Offset 8.31 dB = RBW 1 kHz 10 dB SWT 4.19 ms (~34 ms) = VBW 3 kHz Mode Auto FFT SGL Count 20/20 SGL Count 20/20 humphan Ammander territarian describe la tilense det i kelemine privil preprior had en les beskult en serve de deministrat, el maneri especialisme, e 22:22:34 22.02.202 EGPRS850-190-8-0.009~0.15MHz EGPRS850-190-8-0.15~30MHz 22:22:46 22.02.2022 22:24:09 22.02.2022 EGPRS850-190-8-30~1000MHz EGPRS850-190-8-1000~10000MHz SGL Count 20/20 SGL Count 20/20 t Carrier to the second to the second state of the second 22:24:25 22.02.2022 EGPRS850-251-8-0.009~0.15MHz EGPRS850-251-8-0.15~30MHz



EGPRS850-251-8-30~1000MHz EGPRS850-251-8-1000~10000MHz | Spectrum | Spectrum | RefLevel 20.00 dbm Offset | 8.31 db = RBW 30 kHz | 8 Att | 30 db | SWT | 279 µs (~14 ms) + VBW 100 kHz | Mode Auto FFT artici destinated by the seal formation and the content of the model of the state of the common plant and a spin for successful and analysis 11:35:15 23.02.2022 11:35:22 23.02.2022 GPRS1900-512-0-0.009~0.15MHz GPRS1900-512-0-0.15~30MHz GPRS1900-512-0-30~1000MHz GPRS1900-512-0-1000~18000MHz



SGL Count 20/20 dBm Offset 8.31 dB = RBW 1 kHz 10 dB SWT 4.19 ms (~34 ms) = VBW 3 kHz Mode Auto FFT SGL Count 20/20 ldBm Offset 8.31 dB = RBW 30 kHz 30 dB SWT 279 µs (~14 ms) = VBW 100 kHz Mode Auto FFT entering of the state of the first of the state of the st 11:37:12 23.02.2023 GPRS1900-661-0-0.009~0.15MHz GPRS1900-661-0-0.15~30MHz 11:37:21 23.02.2022 11:38:46 23.02.2022 GPRS1900-661-0-30~1000MHz GPRS1900-661-0-1000~18000MHz SGL Count 20/20 SGL Count 20/20 00 dBm Offset 20 dB SWT 4.19 ms (~ obaranisty marakatiya dha qibi a qibilla bi dalahiy karanisty, iyotiya qibaya, biliya dii gadi ya kidi faqoratiya iyotiya kabi 11:38:55 23.02.2022 11:39:02 23.02.2022 GPRS1900-810-0-0.009~0.15MHz GPRS1900-810-0-0.15~30MHz



GPRS1900-810-0-30~1000MHz GPRS1900-810-0-1000~18000MHz | Spectrum | | S | MultiView | Spectrum | Ref Level 20:00 dbm | Offset | 8.31 db = RBW | 30 kHz | e Att | 30 db | SWT | 279 µs (~14 ms) = VBW | 100 kHz | Mode Auto FF Kantenen, folksin lan formline formali elikala hersin forsan interesse suran personan hast sinessesti associate 11:59:20 23.02.2022 11:59:27 23.02.2022 EGPRS1900-512-2-0.009~0.15MHz EGPRS1900-512-2-0.15~30MHz EGPRS1900-512-2-30~1000MHz EGPRS1900-512-2-1000~18000MHz