

ELECTROMAGNETIC EMISSIONS **COMPLIANCE REPORT**



FCC Applicant:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
FCC Manufacturer:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Product Name:	ASUS Phone (Mobile Phone)
Brand Name:	ASUS
Model No.:	ASUSAI2501E
Family Model No.:	ASUSAI2501D
Model Difference:	Refer to section1.2
Report Number:	TERF2407002101ER
FCC ID	MSQAI2501
Date of EUT Received:	July 01, 2024
Date of Test:	July 17, 2024 ~ November 4, 2024
Issue Date:	November 13, 2024

Marcus Tseng

Approved By

Marcus Tseng

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI ANSI C63.26-2015 and the energy emitted by the sample EUT comply with FCC rule part 2, 22H & 24E & 27 C.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History						
Report Number	Revision	Description	Issue Date	Revised By	Remark	
TERF2407002101ER	00	Original	November 13, 2024	Yuri Tsai		

Note:

- 1 . The remark "*" indicates modification of the report upon requests from certification body.
- 2 · Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received. And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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GENERAL PRODUCT INFORMATION 1

1.1 **Product Description**

Product Name:	ASUS Phone(Mobile Phone)
Brand Name:	ASUS
Model No.:	ASUSAI2501E
Family Model No.:	ASUSAI2501D
Hardware Version:	R2.0C
Firmware Version:	35.1400.1400.10
EUT Series No.:	S7AIOCN13359SCN
Power Supply:	7.8 Vdc from Battery
Test Software (Name/Version)	Connect with Callbox

1.2 Model Difference

Model Name	ASUSAI2501D	ASUSAI2501E			
3rd Camera	5MP Macro	32 MP Tele			
LED Light	mini LED (85 pcs)	mini LED (648 pcs)			
Memory	12/256, 12/512, 16/512	16/512, 24/1TB			
Side USB port	Y				
Air trigger	Y				
Power	5800mAh, 65W				
Refresh Rate	185Hz				

1.3 **Operation Frequency Range**

Operating Frequency (MHz)			Operating Frequency (MHz)		
GSM/GPRS/EDGE 850	824.2 -	848.8	WCDMA / HSPA+ Band II 1852.4 - 1907.6	3	
GSM/GPRS/EDGE 1900	1850.2 -	1909.8	WCDMA / HSPA+ Band IV 1712.4 - 1752.6		
			WCDMA / HSPA+ Band V 826.4 - 846.6	1	

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Antenna Designation 1.4

Antenna Type	Antenna Model No.
	Ant0
PIFA	Ant1
	Ant2
Note: Transmission	frequencies in this test report are only available by the above antenna(s).

Modulation	Frequency	Peak Antenna Gain (dBi)		dBi)
	(MHz)	Ant0	Ant1	Ant2
GSM/GPRS/EDGE 850	824.2 - 848.8	-2.4		
GSM/GPRS/EDGE 1900	1850.2 - 1909.8		-0.2	
WCDMA / HSPA+ Band II	1852.4 - 1907.6		-0.2	-1.9
WCDMA / HSPA+ Band IV	1712.4 - 1752.6		-1.5	-1.9
WCDMA / HSPA+ Band V	826.4 - 846.6	-2.4		-3.3

Note: Antenna information is provided by the applicant.

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Type of Emission & Max ERP/EIRP Power Measurement Result: 1.5

Mode	ERP / EIR	P (dBm)	W	99%	Type of Emission
GSM 850	29.00	ERP	0.794	0.2447	245KGXW
GPRS 850	28.96	ERP	0.787	0.2458	246KGXW
EDGE 850	22.00	ERP	0.158	0.2481	248KG7W
GSM 1900	29.98	EIRP	0.995	0.2451	245KGXW
GPRS 1900	29.98	EIRP	0.995	0.2449	245KGXW
EDGE 1900	25.17	EIRP	0.329	0.2472	247KG7W
Mode	ERP / EIR	P (dBm)	W	99%	Type of Emission
WCDMA Band II	25.13	EIRP	0.326	4.1535	4M15F9W
HSDPA Band II	24.92	EIRP	0.310	4.1534	4M15F9W
HSUPA Band II	24.92	EIRP	0.310	4.1471	4M15F9W
WCDMA Band IV	23.50	EIRP	0.224	4.1532	4M15F9W
HSDPA Band IV	23.41	EIRP	0.219	4.1498	4M15F9W
HSUPA Band IV	23.31	EIRP	0.214	4.1543	4M15F9W
WCDMA Band V	20.70	ERP	0.117	4.1380	4M14F9W
HSDPA Band V	20.51	ERP	0.112	4.1320	4M13F9W
HSUPA Band V	20.55	ERP	0.114	4.1382	4M14F9W

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Test Methodology of Applied Standards 1.6

FCC 47 CFR Part 2, 22H, 24E, 27C

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

KDB412172 D01 Determining ERP and EIRP v01r01

TS 151 010-1 is used to set, and measure the output power.

1.7 **Test Facility**

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
		SAC 1		
		SAC 2		
		SAC 3		
	No. 124 Mu Kung Dood Now Toingi	Conduction 1		
	No.134, Wu Kung Road, New Taipei	Conducted 1	TW0007	
	Industrial Park, Wuku District, New	Conducted 2	TW0027	
	Taipei City, Taiwan.	Conducted 3		TW3702
		Conducted 4	-	
		Conducted 5		
SGS Taiwan Ltd.		Conducted 6		
Central RF Lab.		Conduction C		
(TAF code 3702)		SAC C		
		SAC D		
		SAC G		
		Conducted A		
	No.2, Keji 1st Rd., Guishan District,	Conducted B	TW0028	
	Taoyuan City, Taiwan 333	Conducted C		
		Conducted D		
		Conducted E		
		Conducted F	-	
		Conducted G		
	ame is remarked on the equipmen measurements occurred in specil			s an indica

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Special Accessories 1.8

No special accessories were used during testing.

1.9 Equipment Modifications

There was no modifications incorporated into the EUT.

1.10 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber. the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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SYSTEM TEST CONFIGURATION 2

2.1 **EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 **EUT Exercise**

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3 **Test Procedure**

2.3.1 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 **Measurement Results Explanation Example**

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level. Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

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2.5 Final Amplifier Voltage and Current Information:

Test mode	DC voltage (V)	DC current (mA)
GSM 850	7.8	425
GPRS 850	7.8	404
EDGE 850	7.8	411
GSM 1900	7.8	415
GPRS 1900	7.8	418
EDGE 1900	7.8	422
WCDMA B2	7.8	419
HSUPA B2	7.8	426
HSDPA B2	7.8	430
WCDMA B4	7.8	424
HSUPA B4	7.8	417
HSDPA B4	7.8	407
WCDMA B5	7.8	409
HSUPA B5	7.8	415
HSDPA B5	7.8	422

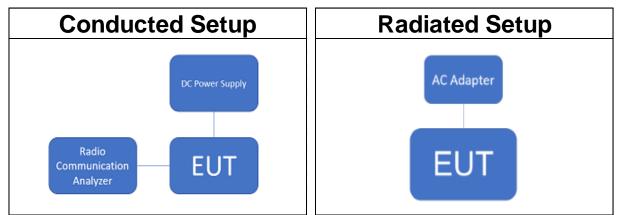
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TEST CONFIGURATION 3



Note: Radio Communication Analyzer is placed in remote side for radiated test.

3.1 Control Unit(s)

Radiated Emission Test Site: SAC 3							
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
AC Adapter	Shenzhen JingQuanHua & Everrise Intelligent Electric Co., Ltd.	NSA65EU-20032500	N/A	N/A	N/A		
USB Cable	ASAP	LA9U2030-CS-H	N/A	N/A	N/A		

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SUMMARY OF TEST RESULTS 4

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§22.913(a)(5) §24.232(c) §27.50(d)(4)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a) §27.53(h)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	Compliant
§22.913(d) §24.232(d) §27.50(d)(5)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant

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DESCRIPTION OF TEST MODES 5

5.1 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

5.2 **Measurement Configuration**

RADIATED EMISSION	GSM	Tes	st Char	nnel		WCDMA /	Tes	st Char	inel
RADIATED EMISSION	Bands	L	М	Н	Test Items	HSPA	L	м	н
ERP	850	V	V	V		Bands			
EIRP	1900	V	V	V	ERP	Band V	V	V	V
	850	-	v	-	EIRP	Bnad II	V	V	V
FREQUENCY STABILITY	1900	-	V	-		Band IV	V	V	V
	850	v	v	v		Bnad II	-	V	-
OCCUPIED BANDWIDTH	1900	V	v	v	FREQUENCY STABILITY	Band IV	-	V	-
PEAK TO AVERAGE			•			Band V	-	V	-
	850	V	V	V		Bnad II	V	V	V
RATIO	1900	V	V	V	OCCUPIED BANDWIDTH	Band IV	V	V	V
BAND EDGE	850	V	-	V		Band V	V	V	۷
B/110 2002	1900	V	-	V	PEAK TO AVERAGE	Bnad II	V	V	V
CONDCUDETED	850	V	V	v	RATIO	Band IV	V	V	V
EMISSION	1900	٧	٧	V		Band V	V	V	V
	850	v	v	v		Bnad II	V	-	V
RADIATED EMISSION	1900	V	V	v	BAND EDGE	Band IV	V	-	V
	1000					Band V	V	-	V
					CONDCUDETED	Bnad II	v	V	V
					EMISSION	Band IV	v	V	V
						Band V	V	٧	٧
						Bnad II	V	٧	٧
					RADIATED EMISSION	Band IV	V	٧	٧
						Band V	V	٧	٧

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MEASUREMENT UNCERTAINTY 6

Test Items	Une	certair	nty
Power Density	+/-	0.61	dB
RF Power Output	+/-	0.97	dB
ERP/ EIRP measurement	+/-	2.15	dB
	+/-	2.15	dB
Emission Bandwidth	+/-	1.38	Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/-	0.77	dB
Peak to Average Ratio	+/-	0.97	dB
Frequency Stability vs. Temperature	+/-	1.48	Hz
Frequency Stability vs. Voltage	+/-	1.48	Hz
Temperature	+/-	0.6	°C
Humidity	+/-	3	%
DC / AC Power Source	+/-	1	%

Radiated Spurious Emission Measurement Uncertainty								
	+/-	1.89	dB	9kHz~30MHz				
Polarization: Vertical	+/-	4.15	dB	30MHz - 1000MHz				
	+/-	3.43	dB	1GHz - 18GHz				
	+/-	3.86	dB	18GHz - 40GHz				
	+/-	1.89	dB	9kHz~30MHz				
Polarization: Horizontal	+/-	4.02	dB	30MHz - 1000MHz				
Folarization. Horizontai	+/-	3.43	dB	1GHz - 18GHz				
	+/-	3.86	dB	18GHz - 40GHz				
	+/-	2	dB	33GHz-50GHz				
	+/-	1.59	dB	50GHz-60GHz				
Radiated Spurious Emission	+/-	1.7	dB	60GHz-90GHz				
	+/-	1.64	dB	90GHz-140GHz				
	+/-	3.83	dB	140GHz-220GHz				

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

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MEASUREMENT EQUIPMENT USED 7

7.1 **Conducted Measurement**

	Conducted Emission Test Site: Conducted 3									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.					
Attenuator	Mini-Circuits	BW-S10W2+	16	12/12/2023	12/11/2024					
DC Block	Mini-Circuits	BLK-18-S+	11	12/12/2023	12/11/2024					
DC Power Supply	Gwinstek	SPS-3610	GEV856733	12/04/2023	12/03/2024					
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	03/22/2024	03/21/2025					
Radio Communication Analyzer	Anritsu	MT8815B	6200711454	04/21/2024	04/20/2025					
Radio Communication Analyzer	Anritsu	MT8820C	6201061014	09/23/2023	09/22/2024					
Radio Communication Analyzer	Anritsu	MT8820C	6201061014	08/29/2024	08/28/2025					
Splitter	Titan	T0510E2W118Q	22015158	12/12/2023	12/11/2024					
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	06/05/2024	06/04/2025					
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R					

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7.2 **Radiated Measurement**

		Radiated Emissio	n Test Site: SAC 3		
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
1G High Pass Filter	Micro-Tronics	HPM50108	32	12/12/2023	12/11/2024
2G High Pass Filter	Micro-Tronics	HPM50110	36	12/12/2023	12/11/2024
Attenuator	Mini-Circuits	BW-S10W2+	16	12/12/2023	12/11/2024
Band Reject Filter 1700-2000	EWT	EWT-54-0038	M1	12/12/2023	12/11/2024
Band Reject Filter 800-1000	EWT	EWT-54-0037	M3R	12/12/2023	12/11/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/17/2024	07/16/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/09/2024	08/08/2025
Coaxial Cables	EMCI+Huber Suhner	EMC107-SM-SM- 1000 +SUCOFLEX 104PEA +EMC107-SM-SM- 1500 +SUCOFLEX 106	RX Cable 9K-18G (221110+MY4251/4 PEA+221106+76096 /6)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/ 2	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102+SUCOFLEX 106	TX Cable 30M-40G 23051/2+76096/6+2 2962/2	08/30/2024	08/29/2025
EMI Test Receiver	R&S	ESCI 7	100759	08/28/2024	08/27/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY63440386	02/06/2024	02/05/2025
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	09/23/2024	09/22/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/15/2024	05/14/2025
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/28/2023	12/27/2024
Network Analyzer	R&S	ZNB 40	101842	05/16/2024	05/15/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980868	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Pre-Amplifier	HP	8447D	2944A07676	08/30/2024	08/29/2025
Radio Communication Analyzer	Anritsu	MT8820C	6201465317	03/26/2024	03/25/2025
Radio Communication Analyzer	Anritsu	MT8815B	6200711454	04/21/2024	04/20/2025
Site Cal	SGS	SAC 3	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

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MAXIMUM OUTPUT POWER 8

8.1 Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

According to FCC §2.1046

FCC 22.913(a)

(5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

FCC 24.232(c)

Mobile and portable stations are limited to 2 W EIRP.

FCC 27.50(d)

(4) Mobile, and portable (hand-held) stations operating in the 1710-1755 MHz, 1695-1710 MHz and 1755-1780 MHz bands are limited to 1W EIRP.

8.2 **Test Set-up**



Note: Measurement setup for testing on Antenna connector

Output Power Measurement Applicable Guideance 8.3

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a communication tester.

Transmitter output was read off the communication tester in dBm.

The power output at the transmitter antenna port was determined by adding the value of the attenuator to the communication tester reading.

TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and RMC 12.2kps is used for Base station setting.

KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results.

Conducted average power is obtained from the simulator telecommunication test set.

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8.4 Determining ERP and/or EIRP from conducted RF output power measurements

According to KDB 412172 D01 Power Approach,

 $EIRP = P_T + G_T - L_c,$

ERP= EIRP-2.15,

Where:

ERP or EIRP	 effective radiated power or equivalent isotropically radiated power (expressed in the same units as PT, typically dBW, dBm, or power spectral density (PSD)2), relative to either a dipole antenna (ERP) or an isotropic antenna (EIRP);
Ρτ	= transmitter output power, expressed in dBW, dBm, or PSD;
G⊤ Lc	 gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP); signal attenuation in the connecting cable between the transmitter and antenna, in dB.

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8.5 **Measurement Results**

GSM 8.5.1

GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
0014	824.2	128	33.00	-2.40	28.45	30.60	38.50	-7.90
GSM 850	836.6	190	33.55	-2.40	29.00	31.15	38.50	-7.35
000	848.8	251	33.37	-2.40	28.82	30.97	38.50	-7.53
	1850.2	512	30.18	-0.20	27.83	29.98	33.00	-3.02
GSM 1900	1880.0	661	30.00	-0.20	27.65	29.80	33.00	-3.20
1500	1909.8	810	30.18	-0.20	27.83	29.98	33.00	-3.02
0000	824.2	128	32.97	-2.40	28.42	30.57	38.50	-7.93
GPRS 850	836.6	190	33.51	-2.40	28.96	31.11	38.50	-7.39
000	848.8	251	33.35	-2.40	28.80	30.95	38.50	-7.55
0.000	1850.2	512	30.15	-0.20	27.80	29.95	33.00	-3.05
GPRS 1900	1880.0	661	29.99	-0.20	27.64	29.79	33.00	-3.21
1300	1909.8	810	30.18	-0.20	27.83	29.98	33.00	-3.02
	824.2	128	26.22	-2.40	21.67	23.82	38.50	-14.68
EDGE 850	836.6	190	26.41	-2.40	21.86	24.01	38.50	-14.49
000	848.8	251	26.55	-2.40	22.00	24.15	38.50	-14.35
	1850.2	512	25.37	-0.20	23.02	25.17	33.00	-7.83
EDGE 1900	1880.0	661	25.32	-0.20	22.97	25.12	33.00	-7.88
1000	1909.8	810	25.34	-0.20	22.99	25.14	33.00	-7.86

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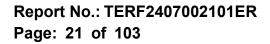
EUT Mode	Frequency (MHz)	СН	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)
0000	824.2	128	32.97	32.68
GPRS 850	836.6	190	33.51	33.30
000	848.8	251	33.35	33.15
0000	1850.2	512	30.15	29.74
GPRS 1900	1880.0	661	29.99	29.61
1000	1909.8	810	30.18	29.83
	824.2	128	26.22	26.04
EDGE 850	836.6	190	26.41	26.22
000	848.8	251	26.55	26.37
	1850.2	512	25.37	25.18
EDGE 1900	1880.0	661	25.32	25.24
1000	1909.8	810	25.34	25.02

8.5.2 WCDMA & HSPA Measurement Results:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm. RMC 12.2kps is used for this testing.

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WCDMA/HSUPA/HSDPA Band II Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	1852.4	9262	25.33	-0.20	22.98	25.13	33.00	-7.87
WCDMA	1880.0	9400	24.52	-0.20	22.17	24.32	33.00	-8.68
	1907.6	9538	24.17	-0.20	21.82	23.97	33.00	-9.03
	1852.4	9262	25.12	-0.20	22.77	24.92	33.00	-8.08
HSDPA	1880.0	9400	24.38	-0.20	22.03	24.18	33.00	-8.82
	1907.6	9538	24.02	-0.20	21.67	23.82	33.00	-9.18
	1852.4	9262	25.12	-0.20	22.77	24.92	33.00	-8.08
HSUPA	1880.0	9400	24.37	-0.20	22.02	24.17	33.00	-8.83
	1907.6	9538	24.00	-0.20	21.65	23.80	33.00	-9.20
WCDMA/H	ISUPA/HS	SDPA Ba	nd IV Result:					
EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	1712.4	1312	24.79	-1.50	21.14	23.29	30.00	-6.71
WCDMA	1732.6	1413	25.00	-1.50	21.35	23.50	30.00	-6.50
	1752.6	1513	24.46	-1.50	20.81	22.96	30.00	-7.04
	1712.4	1312	24.64	-1.50	20.99	23.14	30.00	-6.86
HSDPA	1732.6	1413	24.91	-1.50	21.26	23.41	30.00	-6.59
	1752.6	1513	24.36	-1.50	20.71	22.86	30.00	-7.14

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24.67

24.81

24.29

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-1.50

-1.50

-1.50

21.02

21.16

20.64

23.17

23.31

22.79

30.00

30.00

30.00

-6.83

-6.69

-7.21

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1712.4

1732.6

1752.6

HSUPA

1312

1413

1513



WCDMA/HSUPA/HSDPA Band V Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	826.4	4132	25.09	-2.40	20.54	22.69	38.50	-15.81
WCDMA	836.6	4183	25.15	-2.40	20.60	22.75	38.50	-15.75
	846.6	4233	25.25	-2.40	20.70	22.85	38.50	-15.65
	826.4	4132	24.97	-2.40	20.42	22.57	38.50	-15.93
HSDPA	836.6	4183	24.99	-2.40	20.44	22.59	38.50	-15.91
	846.6	4233	25.06	-2.40	20.51	22.66	38.50	-15.84
	826.4	4132	24.95	-2.40	20.40	22.55	38.50	-15.95
HSUPA	836.6	4183	24.99	-2.40	20.44	22.59	38.50	-15.91
	846.6	4233	25.10	-2.40	20.55	22.70	38.50	-15.80

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8.5.3 HSPA (HSDPA & HSUPA) Release 6:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1. RMC 12.2kps is used for this testing.

8.5.4 **HSDPA SUB-TEST Setting**

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	βc	βa	β₀ (SF)	βc/βd	βнs (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

	Sub	Αν	g. Power (d	Bm)				
Mode	test		Channel					
		9262	9400	9538				
	1	25.12	24.38	24.02				
HSDPA II	2	25.24	24.34	24.00				
ISUPA II	3	24.68	23.88	23.52				
	4	24.63	23.87	23.57				
		Avg. Power (dBm)						
		Αν	g. Power (dl	Bm)				
Mode	Sub test	Ανς	g. Power (dl Channel	Bm)				
Mode	Sub test	Avg 1312		Bm) 1513				
Mode			Channel	,				
	test	1312	Channel 1413	1513				
Mode HSDPA IV	test 1	1312 24.64	Channel 1413 24.91	1513 24.36				

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Mode	Sub	Ανς	g. Power (d Channel	Bm)
	test	4132	4183	4233
	1	24.97	24.99	25.06
HSDPA V	2	24.88	24.92	25.06
	3	24.47	24.48	24.51
	4	24.44	24.51	24.54

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8.5.5 HSPA SUB-TEST Setting

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub- test	βc	βa	βd (SF)	βc/βd	βнs	ßec	βed	β _{ed} (SF)	β _{ed} (Code s)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/22 5	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	β _{ed} 1: 47/15 β _{ed} 2: 47/15	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.

		Av	g. Power (dE	Sm)				
Mode	Sub test		Channel					
	1051	9262	9400	9538				
	1	25.12	24.37	24.00				
	2	23.26	22.43	22.05				
HSUPA II	3	24.13	23.38	23.02				
	4	23.23	22.39	22.03				
	5	25.17	24.36	24.03				
		Avg. Power (dBm)						
		Av	g. Power (dE	Bm)				
Mode	Sub test	Av	g. Power (dE Channel	Sm)				
Mode	Sub test	Av <u>,</u> 1312	•	8m) 1513				
Mode			Channel	,				
Mode	test	1312	Channel 1413	1513				
Mode HSUPA IV	test 1	1312 24.67	Channel 1413 24.81	1513 24.29				
	test 1 2	1312 24.67 22.65	Channel 1413 24.81 22.94	1513 24.29 22.28				

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Mode	Sub test	Av	g. Power (dE Channel	3m)
	ເຮວເ	4132	4183	4233
	1	24.95	24.99	25.10
	2	23.02	23.00	23.07
HSUPA V	3	24.00	23.96	24.12
	4	22.93	22.97	23.11
	5	24.93	24.99	25.11

8.5.6 WCDMA/HSDPA/HSUPA band II, IV, V

The EUT output power was controlled by simulator and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm then record the read. The min. power was measures by a function key "minimum power" then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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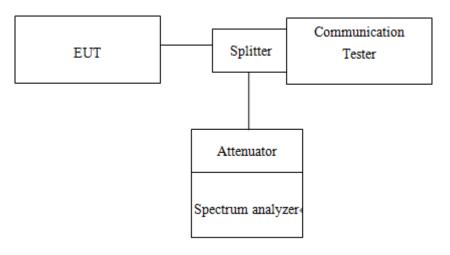


9 OCCUPIED BANDWIDTH MEASUREMENT

9.1 Standard Applicable

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.

9.2 Test Set-up



9.3 Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 * RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about $1\% \sim 5\%$ of emission BW, VBW= 3 times RBW.

Set RBW= 1% ~ 5%, VBW= 3 * RBW, with span > 2 * Signal BW, set % Power = 99%.

9.4 Measurement Result

	Iroa		99	% BW (Mł	lz)	26	dB BW (M	Hz)
	⁻ req. MHz)	СН	GSM	GPRS	EDGE	GSM	GPRS	EDGE
ų	vinz)		850	850	850	850	850	850
8	24.2	128	0.24383	0.24405	0.23762	0.3187	0.3181	0.3045
8	36.6	190	0.24467	0.24584	0.23970	0.3155	0.3184	0.3035
84	48.8	251	0.24457	0.24324	0.24811	0.3138	0.3194	0.3080

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Eroa			99%	6 BW (MH	z)	26	dB BW (M	Hz)
Freq.	СН		GSM	GPRS	EDGE	GSM	GPRS	EDGE
(MHz)			1900	1900	1900	1900	1900	1900
1850.2	512	C).24345	0.24263	0.24422	0.3167	0.3203	0.3141
1880.0	661	C).24508	0.24490	0.24320	0.3171	0.3161	0.3101
1909.8	810	C	.24764	0.24196	0.24724	0.3157	0.3124	0.3059
Eroa			99	9% BW (M	Hz)	26	dB BW (M	Hz)
Freq.	СН	I	WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA
(MHz)				I	I	I	I	I
1852.40	926	2	4.14350	4.13880	4.13970	4.670	4.685	4.687
1880.00	940	0	4.15350	4.14400	4.14710	4.664	4.690	4.685
1907.60	953	8	4.14230	4.15340	4.14120	4.684	4.683	4.706
Гиол			9	9% BW (M	Hz)	26	dB BW (M	H7)
					114	20		112)
Freq.	СН	I	WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA
Freq. (MHz)	СН	I		,	· /		· · ·	, <i>'</i>
_	СН 131		WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA
(MHz)		2	WCDMA IV	HSDPA IV	HSUPA IV	WCDMA IV	HSDPA IV	HSUPA IV
(MHz) 1712.40	131	2 3	WCDMA IV 4.15270	HSDPA IV 4.14490	HSUPA IV 4.14520	WCDMA IV 4.712	HSDPA IV 4.697	HSUPA IV 4.698
(MHz) 1712.40 1732.60 1752.60	131 141	2 3	WCDMA IV 4.15270 4.15320 4.14980	HSDPA IV 4.14490 4.14980	HSUPA IV 4.14520 4.14950 4.15430	WCDMA IV 4.712 4.713 4.693	HSDPA IV 4.697 4.707	HSUPA IV 4.698 4.691 4.700
(MHz) 1712.40 1732.60 1752.60 Freq.	131 141	2 3 3	WCDMA IV 4.15270 4.15320 4.14980	HSDPA IV 4.14490 4.14980 4.14330	HSUPA IV 4.14520 4.14950 4.15430	WCDMA IV 4.712 4.713 4.693	HSDPA IV 4.697 4.707 4.685	HSUPA IV 4.698 4.691 4.700
(MHz) 1712.40 1732.60 1752.60	131 141 151	2 3 3	WCDMA IV 4.15270 4.15320 4.14980 99	HSDPA IV 4.14490 4.14980 4.14330 9% BW (M	HSUPA IV 4.14520 4.14950 4.15430 Hz)	WCDMA IV 4.712 4.713 4.693 26	HSDPA IV 4.697 4.707 4.685 dB BW (M	HSUPA IV 4.698 4.691 4.700 Hz)
(MHz) 1712.40 1732.60 1752.60 Freq.	131 141 151	2 3 3	WCDMA IV 4.15270 4.15320 4.14980 99 WCDMA	HSDPA IV 4.14490 4.14980 4.14330 9% BW (M HSDPA	HSUPA IV 4.14520 4.14950 4.15430 Hz) HSUPA	WCDMA IV 4.712 4.713 4.693 26 WCDMA	HSDPA IV 4.697 4.707 4.685 dB BW (M HSDPA	HSUPA IV 4.698 4.691 4.700 Hz) HSUPA
(MHz) 1712.40 1732.60 1752.60 Freq. (MHz)	131 141 151 CH	2 3 1	WCDMA IV 4.15270 4.15320 4.14980 99 WCDMA V	HSDPA IV 4.14490 4.14980 4.14330 5% BW (M HSDPA V	HSUPA IV 4.14520 4.14950 4.15430 Hz) HSUPA V	WCDMA IV 4.712 4.713 4.693 26 WCDMA V	HSDPA IV 4.697 4.707 4.685 dB BW (M HSDPA V	HSUPA IV 4.698 4.691 4.700 Hz) HSUPA V

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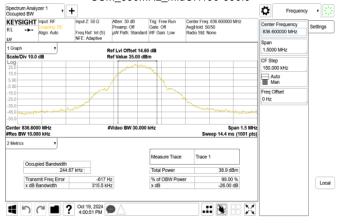
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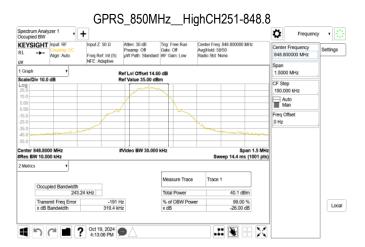


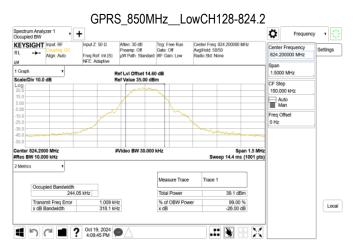
GSM_850MHz_LowCH128-824.2 ectrum Anal cupied BW zer 1 Ö Frequency . 1 + KEYSIGHT Input RF Atten: 30 dB Preamp: Off µW Path: Stand Trig: Free Run Gate: Off d #IF Gain: Low Center Freq. 824.20 Avg[Hold: 50/50 Ratio Std. Norce Settings -Sente 824. lign: Auto U0 span 1.5000 MH: 1 Graph Ref Lvi Offset 14.60 dE Ref Value 35.00 dBm Scale/Div 10.0 dB CF Ster 150.000 kHz Auto Man Freq Offset 0 Hz Center 824.2000 MHz #Res BW 10.000 kHz o BW 30.000 kH Span 1.5 MHz eep 14.4 ms (1001 pts) Measure Trace Trace 1 Occupied Bandwidth 243.83 kHz Total Po 38.8 dBn Transmit Freq Error x dB Bandwidth % of OBW Power x dB 99.00 % -26.00 dB -284 Hz 318.7 kHz Local

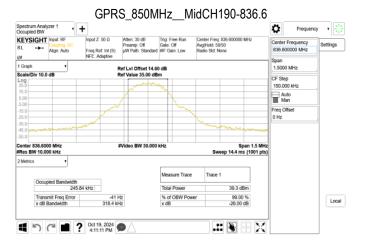
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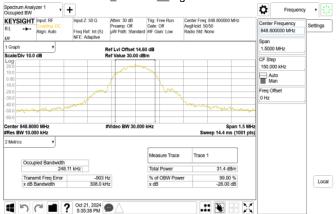
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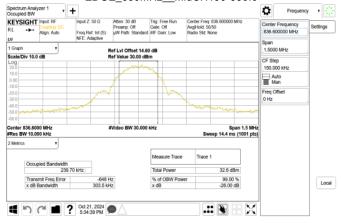
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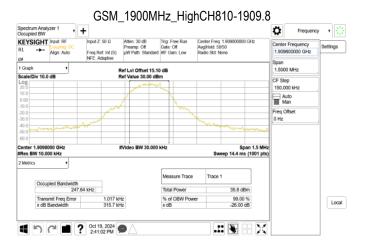


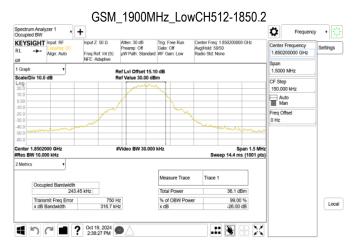
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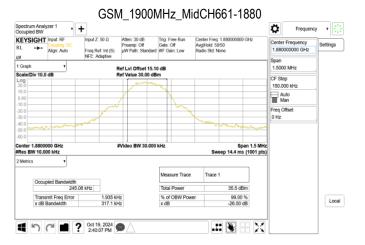


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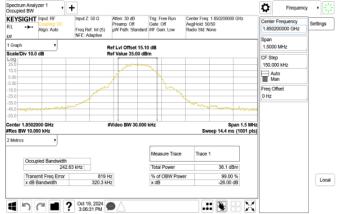
Report No.: TERF2407002101ER Page: 31 of 103



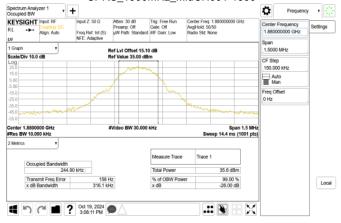
GPRS_1900MHz_HighCH810-1909.8

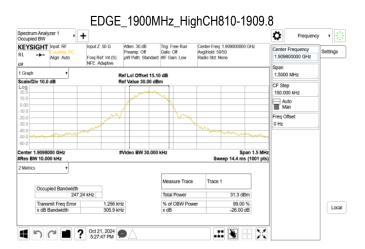


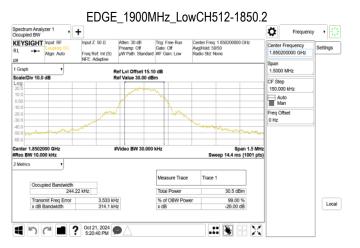
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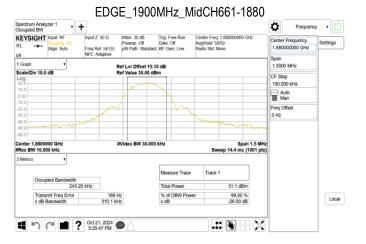


GPRS_1900MHz_MidCH661-1880









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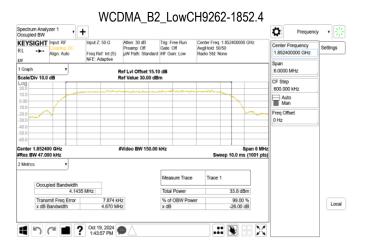
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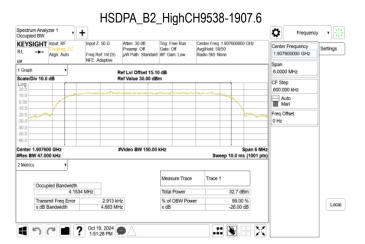
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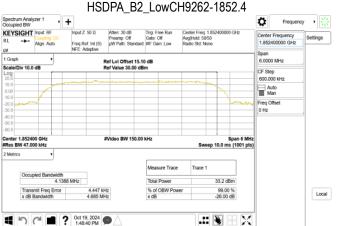




WCDMA_B2_MidCH9400-1880







HSDPA_B2_MidCH9400-1880



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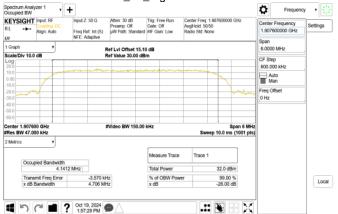
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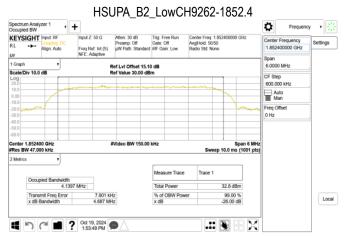
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HSUPA_B2_HighCH9538-1907.6

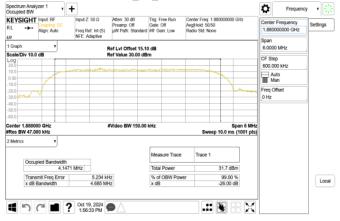


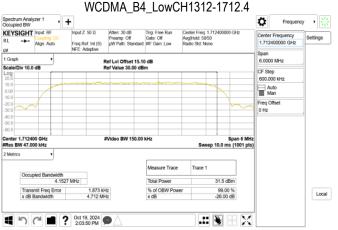
Ö Frequency • · + RL Couping Trig: Free Run Gate: Off d #F Gain: Low Atten: 30 dB Preamp: Off µW Path: Sta Center Fre 1.752600 Settings Avg|H Align: Auto IJØ 1 Graph 6.0000 MH Ref Lvi Offset 15.10 dB ale/Div 10.0 dB CF Step 600.000 kHz Auto Man Freq Offse 0 Hz nter 1.752600 GH #Video BW 150.00 kHz pan 6 MH #Res BW 47.000 kHz ep 10.0 ms (1001) Measure Trace Trace 1 Occupied Bandwidth 4.1498 MHz 33.0 dBr Transmit Freq Error x dB Bandwidth -2.973 kHz 4.693 MHz % of OBW Power x dB 99.00 % 26.00 dB Local C ● ● ? Oct 19, 2024 ● 2:05:49 PM

WCDMA_B4_HighCH1513-1752.6



HSUPA_B2_MidCH9400-1880





WCDMA_B4_MidCH1413-1732.6



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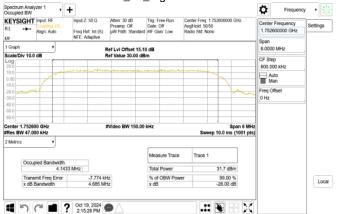
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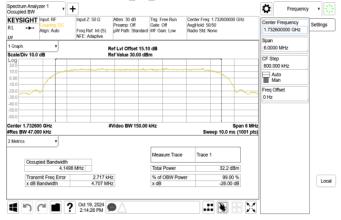
HSDPA_B4_HighCH1513-1752.6



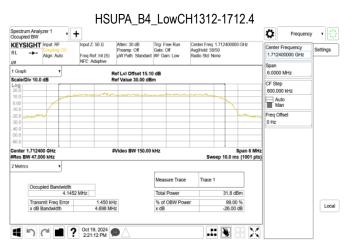
HSDPA B4 LowCH1312-1712.4

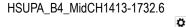


HSDPA_B4_MidCH1413-1732.6

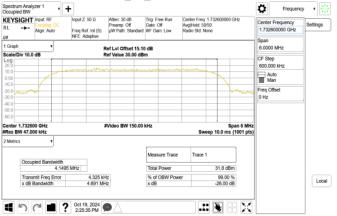


HSUPA B4 HighCH1513-1752.6 Ö Frequency • · + RL Couping Trig: Free Run Gate: Off Atten: 30 dB Preamp: Off µW Path: Sta Center Fre 1.752600 Settings Avg|H Align: Auto IJØ 1 Graph 6.0000 MH Ref LvI Offset 15.10 dB Ref Value 30.00 dBm ale/Div 10.0 dB CF Step 600.000 kHz Auto Man Freq Offse 0 Hz nter 1.752600 GH #Video BW 150.00 kHz pan 6 MH #Res BW 47.000 kHz eep 10.0 ms (1001 p Measure Trace Trace 1 Occupied Bandwidth 4.1543 MHz 31.3 dB(Transmit Freq Error x dB Bandwidth -832 Hz 4.700 MHz % of OBW Power x dB 99.00 % 26.00 dB Local C 19, 2024 .# 🕃 🗄 🗙





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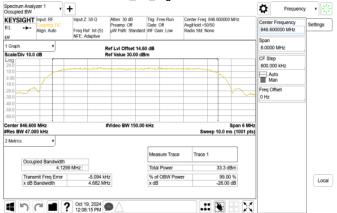
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WCDMA_B5_HighCH4233-846.6



ø Frequency + • + Atten: 30 dB Trig: Free Run Preamp: Off Gate: Off µW Path: Standard #IF Gain: Low RL Couping Center Freq: 846.600 Avg(Hold: 50/50 Uency MHz Settings 846.6 Align: Auto Span 6.0000 MH; 1 Graph Ref LvI Offset 14.60 dB Ref Value 30.00 dBm Scale/Div 10.0 dB CF Step 600.000 kHz Auto Man Freq Offse 0 Hz Center 846.600 MHz #Res BW 47.000 kHz #Video BW 150.00 kHz Span 6 MHz 10.0 ms (1001 pts) Trace 1 Measure Trace Occupied Bandwidth 4.1320 MHz

Total Power

% of OBW Power x dB

32.2 dBr

99.00 % 26.00 dB

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Local

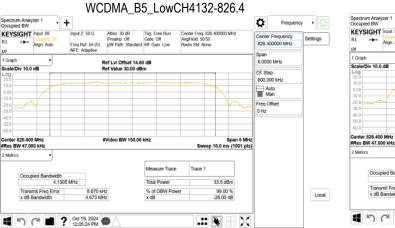
HSDPA B5 HighCH4233-846.6

U0

Transmit Freq Error x dB Bandwidth

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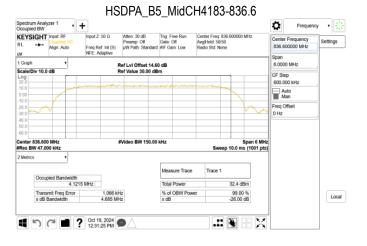
-8.203 kHz 4.675 MHz



WCDMA_B5_MidCH4183-836.6



HSDPA B5 LowCH4132-826.4 · + ۵ 212 Frequency RL + Align: Aug Atten: 30 dB Preamp: Off Freq Ref: Int (S) NFE: Adaptive Trig: Free Run Gate: Off ard #IF Gain: Low Center Frequency 826.400000 MHz Settings Avg(Hold: 50) Radio Std: N Align: Auto Span 6.0000 MHa Ref LvI Offset 14.60 dB Ref Value 30.00 dBm CF Step 600.000 kHz Auto Man Freq Offset 0 Hz o BW 150.00 kH Span 6 MHz Sweep 10.0 ms (1001 pts) Measure Trace Trace 1 Occupied Bandwidth 4.1300 MHz Total Powe 31.8 dBr Transmit Freq Error x dB Bandwidth % of OBW Pov x dB 99.00 % 26.00 dB 3.069 kHz 4.667 MHz Local C 19, 2024 .# 🕃 🗄 🗙



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HSUPA_B5_HighCH4233-846.6



HSUPA_B5_LowCH4132-826.4 ectrum Analyzer 1 cupied BW ø - 2 1 + Frequency KEYSIGHT Input: RF RL Atten: 30 dB Preamp: Off µW Path: Standa Trig: Free Run Gate: Off rd #IF Gain: Low Center Freq. 826.4000 Avg[Hold: 50/50 Radio Std Marco Settings Center 826.4 Int (S) lign: Auto U0 Span 6.0000 MHz I Graph Ref Lvi Offset 14.60 dB Ref Value 30.00 dBm Scale/Div 10.0 dE CF Step 600.000 kHz Auto Man Freq Offset 0 Hz Center 826.400 MHz #Res BW 47.000 kHz #Video BW 150.00 kHz Span 6 MHz eep 10.0 ms (1001 pts) Measure Trace Trace 1 Occupied Bandwidth 4.1354 MHz Total Po 31.9 dBr Transmit Freq Error x dB Bandwidth 7.415 kHz 4.684 MHz % of OBW Power x dB 99.00 % -26.00 dB Local C 19, 2024 .# 🕷 🗄 🗙

HSUPA_B5_MidCH4183-836.6



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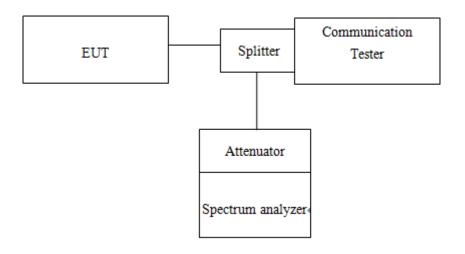
10 OUT OF BAND EMISSION AT ANTENNA TERMINALS

Standard Applicable 10.1

FCC §22.917(a), §24.238(a), §27.53(h)

Out of band emissions. 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.

10.2 Test SET-UP



10.3 Measurement Procedure

10.3.1 **Conducted Emission**

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

- 1. To connect Antenna Port of EUT to Spectrum.
- Set RBW = 1MHz & VBW = 1MHz on Spectrum.
- Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

10.3.2 **Band Edge**

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW \geq 1% EBW.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

10.4 Measurement Result:

Refer to next pages.

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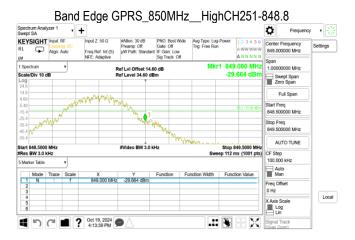


Band Edge GSM_850MHz_LowCH128-824.2













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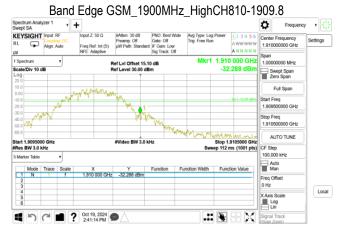
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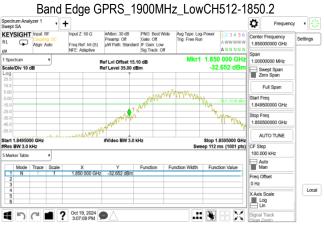
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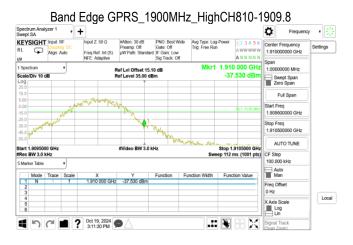


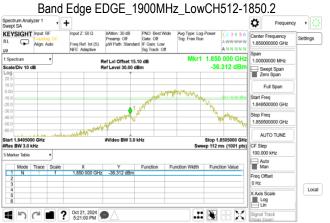
Band Edge GSM_1900MHz_LowCH512-1850.2















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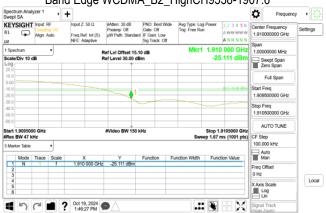
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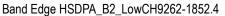


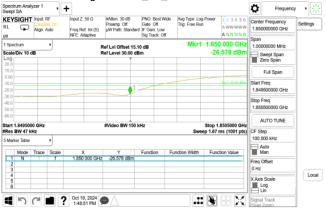
Band Edge WCDMA_B2_LowCH9262-1852.4

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Spectrum Ref Lvi offset 15.10 dB Mkr1 1.850 000 GHz Spectrum	۹L	SIGHT			Freq Ref: Int (S)	Preamp: Off	Gate: Off rd IF Gain: Low			AWWWWW			Settings
09 0 0 0 2000 Splan Full Span 00 0 0 0 0 Sant Freq	Spec			•	F		10 dB	Mkr1			1.000	000000 MHz	
190 000.00 Full Span 100 000.00 Start Freq 100 000 Start Freq 100 1 Start Fr	.og	Div 10 d	1B		,	tef Level 30.00 d	Bm		-28.	181 GBM			
1 1 1 1945500000 GHz Stop Freq 159550000 GHz 11 149550000 GHz Stop Freq Stop Freq 1000000 GHz AUTO TUNE 11 149550000 GHz Stop 1,3555000 GHz AUTO TUNE CF Stop 100,000 Hz AUTO TUNE 11 14950000 GHz 14950000 GHz Stop 1,3555000 GHz AUTO TUNE AUTO TUNE 11 1350000 GHz 28,181 dBm Function Vidth Function Vidth Main Fige Othed Main Fige Othed Fige Othed <t< td=""><td>10.0</td><td></td><td></td><td>_</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td>Full Span</td><td></td></t<>	10.0			_				-				Full Span	
000 Stop Freq Stop Freq Stop Freq Stop Freq Stop Freq AUTO TUNE Attract #Video BW 150 bHz Stop 1,850000 GHz AUTO TUNE CF Stop AUTO TUNE Mode Trace Y Function Function Width Function Vidte F	20.0		-	-		1				QL1-13.09.d8m			
Sart 1.2495000 GHz #Video BW 150 kHz Stop 1.3505000 GHz AUTO TUNE Bes BW 471 kHz Sweep 1.87 ms (1001 pb) GF Step GF Step Moter Table V Function Function Watth Function Watth Function Watth Function Watth Final Additional Price (State 1) GF Step Final Addition Planction Watth Function Value Final Addition Planction Va	40.0			_									
Sweep 187 ms (1001 pbs) CF Skep 10000 bitz Mode Trace Scale X Y Function Width Function Width <td< td=""><td>60.0</td><td>849500</td><td>0 GH7</td><td></td><td></td><td>#Video BW 150</td><td>kliv</td><td></td><td>Stop 11</td><td>505000 GHz</td><td></td><td>UTO TUNE</td><td></td></td<>	60.0	849500	0 GH7			#Video BW 150	kliv		Stop 11	505000 GHz		UTO TUNE	
Mode Trace Scale X Y Function Function Wath Freq Offset Offset <thoffset< th=""> Offset Offset</thoffset<>	Res I	BW 47 k				511000 511 130	ru sz.	Swe			CF St		
1 N 1 1880 000 GHz 28.181 dBm Freq Offset 04z			Trace	0	x	Y	Function	Function Width	Funct	ion Value			
	1	N	1	f	1.850 000 GHz	-28.181 dBm					Ener d	-	
												Juset	
											UHZ		
6		_											
1 5 C = 2 Oct 19, 2024 6 A Signal Track	6										J	og	
	_			200								.in	
		5	C1	. 2	Oct 19, 2024					M	Signa	l Track	1

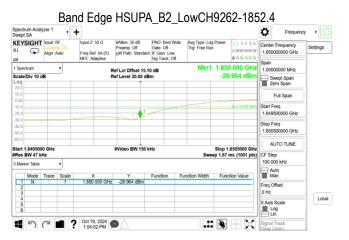


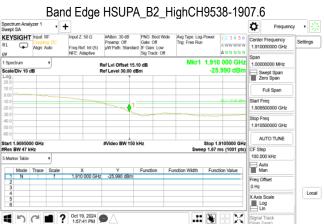
Band Edge WCDMA B2 HighCH9538-1907.6





Band Edge HSDPA_B2_HighCH9538-1907.6 Ö 21 ectrum ept SA Frequency + KEYSIGHT Inpu Settings ANNNN 1.910 000 GHz Ref Lvi Offset 15.10 dB Ref Level 30.00 dBm 1.00000000 MHz Scale/Div 10 d -24.893 dE Swept Span Zero Span Full Span lart Freq 1.90950 Stop Freq AUTO TUNE o BW 150 kHz Start 1.9095000 0 #Res BW 47 kHz Stop 1.9105000 GHz ep 1.67 ms (1001 pts) CF Step 100.000 k Auto Man Mode Trace Scale X Y 1.910 000 GHz -24.893 dBm Freq Offset 0 Hz Local X Axis Scal .# 🖌 🗄 🗶 C 19, 2024 Signal Trac





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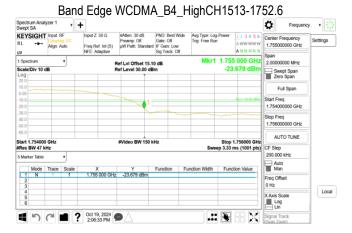
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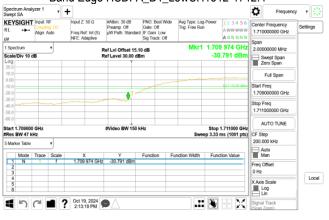


Band Edge WCDMA B4 LowCH1312-1712.4

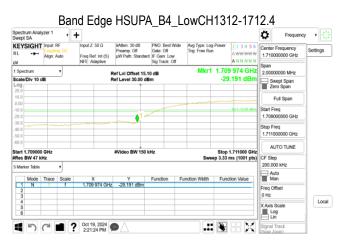
vectrum Ai vept SA	nalyzer 1	• -	+					Frequence	y • 🗦
EYSIGI	T Input F Couple Align: /		Input Z: 50 Ω Freq Ref: Int (S) NFE: Adaptive	#Atten: 30 dB Preamp: Off µW Path: Standard	PNO: Best Wide Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Log-Pow Trig: Free Run	er 123456 AWWWWW ANNNNN	Center Frequency 1.710000000 GHz	Settings
r Spectrum		•	R	ef Lvi Offset 15.1	0 dB	Mkr1 1.	709 974 GHz	Span 2.00000000 MHz	
cale/Div 1	0 dB		R	ef Level 30.00 dB	im		28.974 dBm	Swept Span Zero Span	
0.0								Full Span	Ĩ
0.0		_		1-			QL1-13.00 dBm	Start Freq 1.709000000 GHz	
0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					Stop Freq 1.711000000 GHz	
nt 1.7090	00.04*			#Video BW 150 k			op 1.711000 GHz	AUTO TUNE	
es BW 4 Aarker Tab	/ kHz	•		2410E0 BW 130 K	nz.		33 ms (1001 pts)		
Mod		<u> </u>	x	Y	Function Fi	unction Width F	unction Value	Auto	
1 N	1	f	1.709 974 GHz	-28.974 dBm	Tuncton T	incoort that i	uncour value		
2								Freq Offset	
3	-							0 Hz	Los
5	-							X Axis Scale	
6								Log	
0									
	1000	2	Oct 19, 2024				D 00 🔽	Signal Track	-

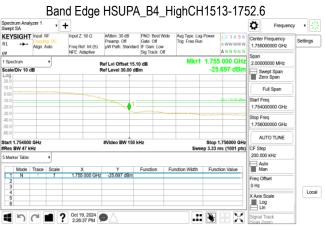


Band Edge HSDPA_B4_LowCH1312-1712.4



Band Edge HSDPA_B4_HighCH1513-1752.6 Ö 21 ectrum ept SA Frequency + KEYSIGHT Inpu Settings -ANNNN 1.755 000 GHz Ref Lvi Offset 15.10 dB Ref Level 30.00 dBm 2.00000000 MHz -26.317 dE Scale/Div 10 d Swept Span Zero Span Full Span art Freq 1.75400 Stop Freq AUTO TUNE o BW 150 kHz Start 1.754000 GH #Res BW 47 kHz Stop 1.756000 GHz ep 3.33 ms (1001 pts) CF Step 200.000 k Auto Man Mode Trace Scale X Y 1.755 000 GHz -26.317 dBm Freq Offset 0 Hz Local X Axis Scal .# 💽 🗄 🗙 €) (I I ? Oct 19, 2024 ● Signal Trac





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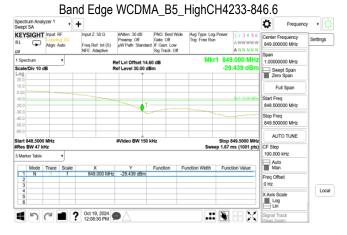
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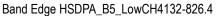
Report No.: TERF2407002101ER Page: 42 of 103

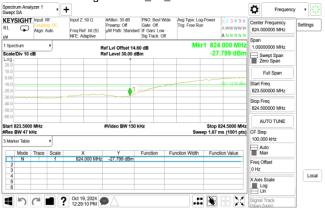


Band Edge WCDMA B5 LowCH4132-826.4

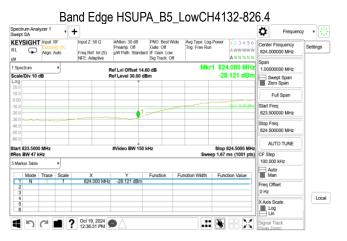
pectri wept	um Anal SA	yzer 1	•	+						Ö	Frequency	•	
EYS L	GHT G	linput F Couplin Align: A		Input Z: 50 Ω Freq Ref: Int (S) NFE: Adaptive	#Atten: 30 dB Preamp: Off µW Path: Standar	PNO: Best Wide Gate: Off d IF Gain: Low Sig Track: Off	Avg Type: Log-F Trig: Free Run	Power	1 2 3 4 5 6 A WW WW W A N N N N N	824.0	r Frequency 000000 MHz	Settin	-
Spec	trum Div 10 c		•		Ref Lvi Offset 14.6		Mkr1		.000 MHz 225 dBm	1.000	000000 MHz		
	010 10 0				ter Level 30.00 de	sm		-2.5	225 0011		awept Span Jero Span		
0.0			_								Full Span		
).0).0			_		1				QL1-13.00 dBm	Start 823.5	Freq 500000 MHz		
0.0			_							Stop # 824.5	Freq 500000 MHz		
0.0	23.5000				#Video BW 150				24.5000 MHz		UTO TUNE		
es E	23.5000 BW 47 k				#VIDEO BW 1501	unz	Sweep		ns (1001 pts)	CF St	ep 100 kHz		
		Trace	<u> </u>	X	Y	Function	unction Width	Fund	ion Value		iuto fan		
1 2 3	N	1	f	824.000 MHz	-29.225 dBm					Freq (0 Hz	Dffset		
4 5 6											s Scale .og .in		Loc
	5	C		Oct 19, 2024 12:05:38 PM				N.	\mathbb{H}		I Track		

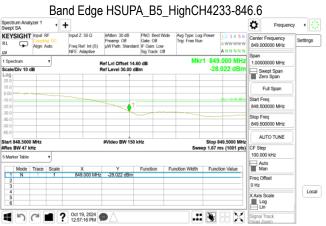






Band Edge HSDPA_B5_HighCH4233-846.6 Ö 1.1 ectrum ept SA Frequency KEYSIGHT Settings 849 ANNNN 849.000 MHz Ref Lvi Offset 14.60 dB Ref Level 30.00 dBm 1.00000000 MHz Scale/Div 10 d -27.536 dB Swept Span Zero Span Full Span Start Freq 848.500000 MHz Stop Freq 849.500000 MHz AUTO TUNE o BW 150 kHz Start 848.5000 MH #Res BW 47 kHz Stop 849.5000 MHz ep 1.67 ms (1001 pts) Auto Man Mode Trace Scale X Y 849.000 MHz -27.536 dBm Freq Offset 0 Hz Local X Axis Scale C 19, 2024 Signal Track





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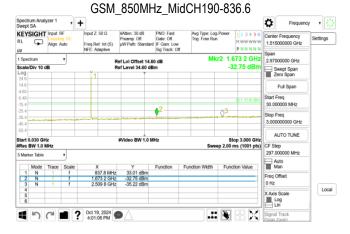
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GSM 850MHz LowCH128-824.2

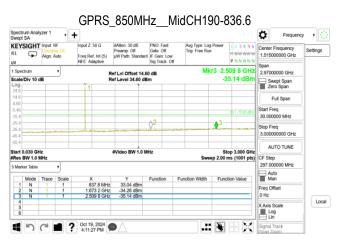
wept			•	+	ut Z: 50 Ω	#Atlen: 30 dB	PNO: Fas		Ava Type: Lo		_	٥	Frequency	
EY: L ,	SIGHT	Couplin Align: A		Fre	q Ref: Int (S) E: Adaptive	Preamp: Off µW Path: Standa	Gate: Off	ow	Avg Type: Lo Trig: Free Ru		123456 MWWWWW PNNNNN		r Frequency 5000000 GHz	Settings
Spec	trum		,	NF		Ref Lvi Offset 14.	60 dB	UI	м		648 4 GHz		000000 GHz	
ale/	'Div 10 d	B			1	Ref Level 34.60 d	Bm			-3	5.10 dBm		Swept Span Zero Span	
1.6													Full Span	
10											QL1-13.00 dBm	Start 30.0	Freq 00000 MHz	
4	مار بيانو سن	4.Jarran			-		∮ ²	, jacobile		0 ³	****	Stop 3.00	Freq 0000000 GHz	
:4 - rt 0	.030 GH	2				#Video BW 1.0	MHz			S	top 3.000 GHz		NUTO TUNE	
is I	BW 1.0 M								Swe		ms (1001 pts)	CF St	ep 300000 MHz	
		Trace	Scale		х	Y	Function	Fun	ction Width	Fund	tion Value		Auto Aan	
1	N	1	f	-	823.0 MHz 1.648 4 GHz			_				Freq	Offset	1
3	N	1	f		2.472 6 GHz					-		0 Hz		
4 5 6													s Scale .og .in	Lo
				_	ct 19, 2024 🖌				1.	1.0000			í Track	1

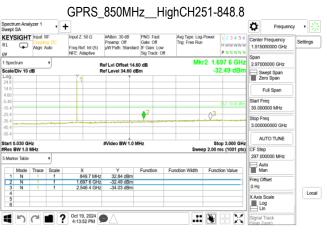


GSM 850MHz HighCH251-848.8

EYSIG		Input: F Couplir Align: A		Input Z: 50 Ω Freq Ref: Int (S) NFE: Adaptive	#Atten: 30 dB Preamp: Off µW Path: Standard	PNO: Fast Gate: Off IF Gain: Lo Sig Track: (· ;	2 3 4 5 6 WWWWW NNNNN	1.518	r Frequency 000000 GHz	Setting
Spectrum			•		Ref Lvi Offset 14.6		Mk		7 6 GHz	2.5/1	00000 GHz	
cale/Div	10 de	3	_	Ύ1	Ref Level 34.60 dE	m		-34.	13 dBm		wept Span ero Span	
4.6		-	-								Full Span	
5.4		-	_			-		0	L1 -13 00 dBm	Start 1 30.00	Freq 10000 MHz	
5.4 5.4 5.4						<u></u>		. (³	***	Stop # 3.000	req 000000 GHz	
5.4	0 GH				#Video BW 1.0 M	Hz		Stor	3.000 GHz		UTO TUNE	
tes BW Marker Ta	1.0 M						Swee		(1001 pts)	CF St 297.0	ep IOOOOO MHz	
Mo		Trace	Scale	x	Y	Function	Function Width	Functio	n Value		uto fan	
1 N 2 N 3 N	Ň	1	f f f	849.7 MH 1.697 6 GH 2.546 4 GH	z -34.13 dBm				_	Freq (0 Hz	Offset	
4 5 6									_		Scale og in	

GPRS_850MHz_LowCH128-824.2 Ö • + 21 ctrum/ ept SA Frequency KEYSIGHT Input: R ings Ģ RI Align: A PNNNN 1.648 4 GHz 2.97000000 GHz Ref Lvi Offset 14.60 dB Ref Level 34.60 dBm Scale/Div 10 d -35.42 di Swept Span Zero Span Full Span tart Freq 30.000000 MHz Stop Freq ٢ AUTO TUNE o BW 1.0 MH Start 0.030 GHz #Res BW 1.0 MH Stop 3.000 GHz eep 2.00 ms (1001 pts) CF Step 297.000 Auto Man Euroction Va 32.50 dBm -35.42 dBm -35.23 dBm Freq Offset 0 Hz 1.648 4 GHz 2.472 6 GHz X Axis Sc Log Lin Local .# 💽 🗄 🗙 €) (I I ? Oct 19, 2024 ●





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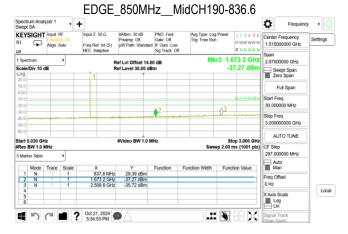
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EDGE 850MHz LowCH128-824.2

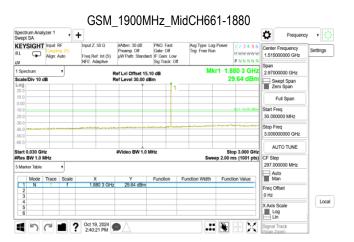
vept			۲	+						٥	Frequency	•
EYS	Sight Sight	Input: F Coupir Align: A		Input Z: 50 Ω Freq Ref: Int (S) NFE: Adaptive	#Atten: 30 dB Preamp: Off µW Path: Standar	PNO: Fast Gate: Off IF Gain: Lov Sig Track: C		-Power	123456 MWWWWW PNNNNN	1.51	r Frequency 5000000 GHz	Settings
Spec	trum	-	•	F	Ref Lvi Offset 14.	i0 dB	Mk		48 4 GHz	2.5/1	000000 GHz	
og 🗆	Div 10 d	B	_	Ĭ1	tef Level 30.00 dl	Bm		-3	7.46 dBm		Swept Span Zero Span	
0.0 - 0.0 -		-									Full Span	
0			_					∧3	QL1-13.00 dBm	Start 30.0	Freq 00000 MHz	
0	an a					∮ ²	and the second sec	Q		Stop 3.00	Freq 0000000 GHz	
0.0 -	.030 GH				#Video BW 1.0 M	147		Sh	op 3.000 GHz		NUTO TUNE	
as E	er Table		•				Swe		ns (1001 pts)		000000 MHz	
	Mode	Trace	Scale	х	Y	Function	Function Width	Funct	ion Value		Auto Aan	
1	N		f	823.0 MHz	28.75 dBm					Francis	Official	
2	N	1	1	1.648 4 GHz						Freq	Uniset	
3	N	1	1	2.472 6 GHz	-36.04 dBm					0 Hz		Lo
5											s Scale Log Lin	
1	5	a		Oct 21, 2024 5:33:40 PM					HX	Signa	(Track Zoom)	

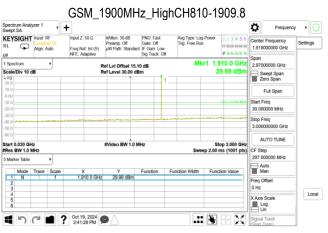


EDGE 850MHz HighCH251-848.8

EYSIGHT		Couple Align: A		Input Z: 50 Ω Freq Ref: Int (S) NFE: Adaptive	#Atten: 30 dB Preamp: Off µW Path: Standar	PNO: Fast Gate: Off IF Gain: Low Sig Track: C		n M	2 3 4 5 6	Center Frequency 1.515000000 GHz		Setting
I Spectrum V			•	Ref Lvi Offset 14.60 dB Ref Level 30.00 dBm			Mk	Mkr2 1.697 6 GHz -38.42 dBm			2.9/00000 GHz	
.og	DIV 10 C	в		7.4	Ref Level 30.00 d	BW		-30.	42 UDIII		wept Span ero Span	
20.0 10.0		-	-								Full Span	
0.00 10.0 20.0		-	-			_			.1-13.00 dBm	Start F	Freq 10000 MHz	
30.0 40.0 50.0	e e manada e m					2	and a state of the second	3		Stop F 3.000	req 000000 GHz	
60.0 - tart 0	.030 GH	z			#Video BW 1.0	MHz		Stop	3.000 GHz		UTO TUNE	
	BW 1.0 M	MHz	•				Swe	ep 2.00 ms	(1001 pts)		ep 100000 MHz	
	Mode	Trace	Scale	х	Y	Function	Function Width	Function	Value		uto fan	
1 2 3	N N N	1	f f f	849.7 MH 1.697 6 GH 2.546 4 GH	iz -38.42 dBm				_	Freq 0 0 Hz	Offset	
4 5 6										X Axis	og	

GSM_1900MHz_LowCH512-1850.2 Ö • + 215 ctrum/ ept SA Frequency KEYSIGHT Input: R Settings Ģ RI Align: A PNNNN 1.850 6 GHz Span 2.97000000 GHz Ref Lvi Offset 15.10 dB Ref Level 30.00 dBm Scale/Div 10 d 29.91 dE Swept Span Zero Span Full Span tart Freq 30.000000 MHz Stop Freq AUTO TUNE #Video BW 1.0 MHz Start 0.030 GHz #Res BW 1.0 MH Stop 3.000 GHz eep 2.00 ms (1001 pts) CF Step 297.000 Auto Man Mode Trace Scale X Y 1.850 6 GHz 29.91 dBm Freq Offset 0 Hz Local X Axis Scal .# 🖌 🗄 🗶 €) (I I ? Oct 19, 2024 ●





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