

# SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

EMC-TRF-01 Rev 1.0

Report No.: GZCR210802082105

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FCC ID: 2AGQ6-QPOS-PLUS

# TEST REPORT

Application No.: GZCR2108020821AT

Applicant: Dspread Technology (Beijing) Inc

Address of Applicant: Rm.407, B12C, #10 (Universal Business Park), Jiuxianqiao Road,

Chaoyang District, Beijing, China

Manufacturer: Dspread Technology (Beijing) Inc

Address of Manufacturer: Rm.407, B12C, #10 (Universal Business Park) Jiuxiangiao Road, Chaoyang

District, Beijing, China

Factory: SHENZHEN WINSTAR PRECISION ELECTRONICS CO., LTD.

Address of factory: The East Side of the Floor 6, Floor 5, Building 28, Shancheng Industrial

Park, Shixin Community, Langxin Community, Shiyan Street, Bao'an

District, Shenzhen City, Guangdong Province, P. R. China

**Equipment Under Test (EUT):** 

EUT Name: Mobile POS
Model No.: QPOS Plus
Trade mark: DSPREAD
Standard(s): 47 CFR Part 2

47 CFR Part 22 subpart H 47 CFR Part 24 subpart E

Date of Receipt: 2021-08-05

**Date of Test:** 2021-08-06 to 2021-08-27

**Date of Issue:** 2021-09-01

Test Result: Pass\*

Kobe Jian EMC Laboratory Manager



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record						
Version	Chapter	Date	Modifier	Remark			
01		2021-09-01		Original			

Authorized for issue by		
	Cof Vlu	
	Curry Wu/Project Engineer	
	Riday Liu	
	Ricky Liu/Reviewer	



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# 2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913,	ERP≤7W(GSM850) EIRP≤2W(GSM1900)	PASS
Peak-Average Ratio	§24.232 §24.232	≤13dB	PASS
Modulation Characteristics	§2.1047	Digital modulation	PASS
Bandwidth	§2.1049(h)	OBW: No limit EBW: No limit	PASS
Band Edge Compliance	§2.1051, §22.917, §24.238	≤ -13dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	PASS
Spurious emissions at antenna terminals	§2.1051, §22.917, §24.238	≤ -13dBm	PASS
Field strength of spurious radiation	§2.1051, §22.917, §24.238	≤ -13dBm	PASS
Frequency stability	§2.1055, §22.355, §24.235	≤ ±2.5ppm.	PASS



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#### **General Information**

#### 4.1 Details of E.U.T.

Power supply: DC 3.7V by rechargeable lithium battery.

> Adapter model: TPA-46B050100UU Input: AC 100-240V 50/60Hz 0.2A

Output: DC 5V 1A

Cable(s): USB type C cable: 1m shielded cable without ferrite core

Sample Type: Portable production Support Network: GPRS, EGPRS

Operation Frequency

Band:

GSM850/GSM1900

GMSK for GPRS/EGPRS: Modulation Type:

8PSK for EGPRS;

Supported Channel

Bandwidth:

200KHz for GSM

12 **GPRS Class: EGPRS Class:** 12 **UMTS Power Class:** Level 3

Antenna Type: PIFA antenna

Antenna Gain: GSM850: 0.33dBi; GSM1900:-0.33dBi

This device has dual SIM Card sockets. Both the SIM sockets have been SIM Card:

tested. SIM1 was worst case, only record SIM1.

Extreme temp.

Tolerance:

-30°C to +50°C

3.4VDC to 4.2VDC (nominal: 3.7VDC) Extreme vol. Limits:



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4.2 Test Frequency

n= rootrioquency					
Took mode:		RF Channel			
Test mode:	Low (L)	Middle (M)	High (H)		
CCMOEO	Channel 128	Channel 190	Channel 251		
GSM850	824.2MHz	2MHz 836.6 MHz	848.8 MHz		
Took made.		RF Channel			
Test mode:	Low (L)	Middle (M)	High (H)		
CSM1000	Channel 512	Channel 661	Channel 810		
GSM1900	1850.2MHz	1880.0 MHz	1909.8 MHz		

#### 4.3 Test Environment

Environment Parameter	Selected Values During Tests		
Relative Humidity	52%		
Atmospheric Pressure:	1015Pa		
Temperature:	TN	20 °C	
	VL	3.4 V	
Voltage:	VN	3.7 V	
	VH	4.2 V	

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

TN= normal temperature



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#### 4.4 Description of Support Units

The EUT has been tested independent unit.

#### 4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10 <sup>-8</sup>
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	DE Dadiated navor	5.14dB (below 1GHz)
,	RF Radiated power	5.08dB (above 1GHz)
8	Padiated Spurious emission test	5.14dB (below 1GHz)
0	Radiated Spurious emission test	5.08dB (above 1GHz)
9	Temperature test	1°C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



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#### 4.6 Test Location

All tests were performed at:

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No tests were sub-contracted.



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#### 4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### NVLAP (Lab Code: 200611-0)

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

#### ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

#### SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

#### CNAS (Lab Code: L0167)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

#### FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

#### ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

#### VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

#### CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

#### 4.8 Deviation from Standards

#### 4.9 Abnormalities from Standard Conditions

None



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# 5 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Wideband Radio Communication Tester(CMW500)	R&S	CMW500	EMC2215	2020-09-20	2021-09-19
Power Meter (U2021XA_Ch2)	Agilent Technologies	U2021XA_Ch 2	SEM009-02	2021-05-19	2022-05-18

RE in Chamber(below 1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)- Lab	SCHWARZBECK MESS- ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver(1Hz- 8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)	SCHWARZBECK	VULB 9160	EMC2025	2020-09-24	2023-09-23
Signal Generator (10MHz-20GHz)	Rohde & Schwarz	SMR20	EMC0516	2021-01-11	2022-01-10
Wideband Radio Communication Tester(CMW500)	R&S	CMW500	EMC2215	2020-09-20	2021-09-19



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RE in Chamber(above 1GHz)						
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date	
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08	
Horn Antenna(1GHz- 18GHz)	SCHWARZBECK MESS- ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24	
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07	
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19	
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16	
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A	
Horn Antenna(14- 40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27	
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2020-09-09	2021-09-08	
Wideband Radio Communication Tester(CMW500)	R&S	CMW500	EMC2215	2020-09-20	2021-09-19	
Substitution Antenna	SCHWARZBECK MESS- ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24	
Signal Generator (10MHz-20GHz)	Rohde & Schwarz	SMR20	EMC0516	2021-01-11	2022-01-10	

General used equipment									
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date				
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-04				
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-04				



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# 6 Radio Spectrum Matter Test Results

#### 6.1 Effective (Isotropic) Radiated Power Output Data

Test Requirement: §2.1046, §22.913, §24.232

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ERP  $\leq$  7W(GSM850) EIRP  $\leq$  2W(GSM1900)

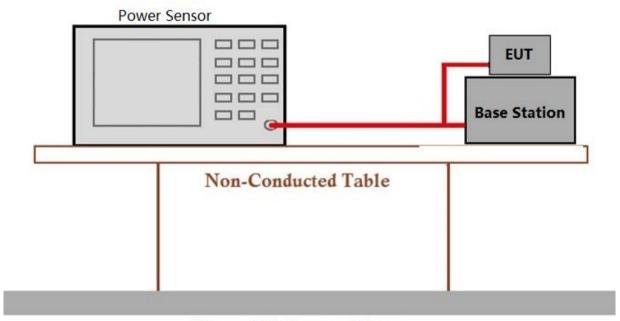
#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode\_Keep the EUT in transmitting mode

#### 6.1.2 Test Setup Diagram



Ground Reference Plane

#### 6.1.3 Measurement Data



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	Test Band: GSM850										
T M. I.		Conducted Power (dBm)		Antenna gain		ERP(dBm)		Limit	N/ P . (		
res	st Mode	LCH	MCH	HCH	(dBd)	) (dBi) LCH MCH HCH		(dBm)	Verdict		
	1 TX Slot	32.42	32.33	32.13	-1.82	0.33	30.6	30.51	30.31	38.45	PASS
FORRE	2 TX Slots	32.29	32.24	32.03	-1.82	0.33	30.47	30.42	30.21	38.45	PASS
EGPRS	3 TX Slots	31.06	31.04	30.80	-1.82	0.33	29.24	29.22	28.98	38.45	PASS
	4 TX Slots	29.17	29.11	28.77	-1.82	0.33	27.35	27.29	26.95	38.45	PASS
	1 TX Slot	32.40	32.25	32.05	-1.82	0.33	30.58	30.43	30.23	38.45	PASS
CDDC	2 TX Slots	32.28	32.19	31.96	-1.82	0.33	30.46	30.37	30.14	38.45	PASS
GPRS	3 TX Slots	30.94	30.90	30.67	-1.82	0.33	29.12	29.08	28.85	38.45	PASS
	4 TX Slots	29.08	28.99	28.63	-1.82	0.33	27.26	27.17	26.81	38.45	PASS

#### Note:

1) dBd = dBi - 2.15

2) EIRP = Conducted output power + Antenna gain (dBi)

3) ERP = Conducted output power + Antenna gain (dBd)

	Test Band: PCS1900										
		Conducted Power (dBm)		Antenna gain		EIRP(dBm)		Limit	.,		
res	st Mode	LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	· · · · · · · · · · · · · · · · · · ·		Verdict
	1 TX Slot	21.02	20.97	22.43	/	-0.33	20.69	20.64	22.1	33.01	PASS
EGPRS	2 TX Slots	20.87	20.82	22.33	/	-0.33	20.54	20.49	22	33.01	PASS
	3 TX Slots	20.70	20.69	22.21	/	-0.33	20.37	20.36	21.88	33.01	PASS
	4 TX Slots	20.57	20.55	22.05	/	-0.33	20.24	20.22	21.72	33.01	PASS
	1 TX Slot	21.06	20.75	22.27	/	-0.33	20.73	20.42	21.94	33.01	PASS
GPRS	2 TX Slots	20.95	20.75	22.22	/	-0.33	20.62	20.42	21.89	33.01	PASS
	3 TX Slots	21.30	20.65	22.13	/	-0.33	20.97	20.32	21.8	33.01	PASS
	4 TX Slots	20.32	20.53	22.02	/	-0.33	19.99	20.2	21.69	33.01	PASS

#### Note:

1) dBd = dBi - 2.15

2) EIRP = Conducted output power + Antenna gain (dBi)



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#### 6.2 Peak-Average Ratio

Test Requirement: §24.232

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤13dB

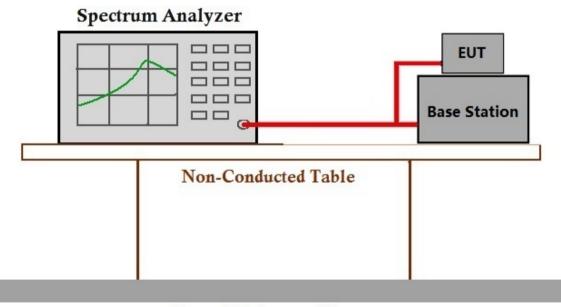
#### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode\_Keep the EUT in transmitting mode

#### 6.2.2 Test Setup Diagram



#### Ground Reference Plane

#### 6.2.3 Measurement Data



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Test Band: GSM850								
Took Mode		Test result (dB)	Limpit (dD)	\/o.w.di.o.t				
Test Mode	LCH	MCH	HCH	Limit (dB)	Verdict			
EGPRS	3.92	3.85	3.95	13	PASS			
GPRS	3.99	4.00	3.97	13	PASS			

Test Band: PCS1900							
Toot Mode		Test result (dB)	Limit (dD)	\/ovdiet			
Test Mode	LCH	MCH	HCH	Limit (dB)	Verdict		
EGPRS	3.77	3.87	3.81	13	PASS		
GPRS	3.97	3.84	3.85	13	PASS		



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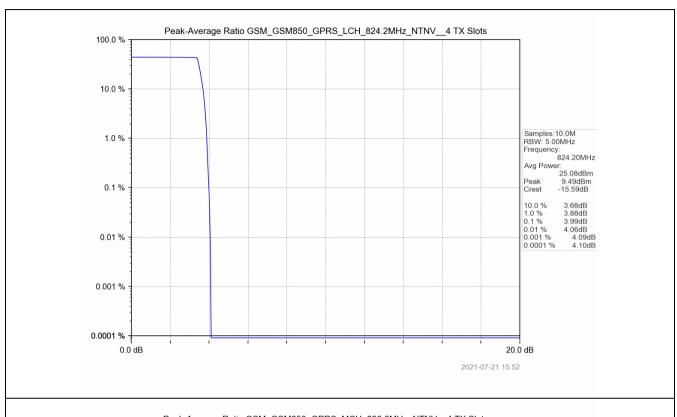
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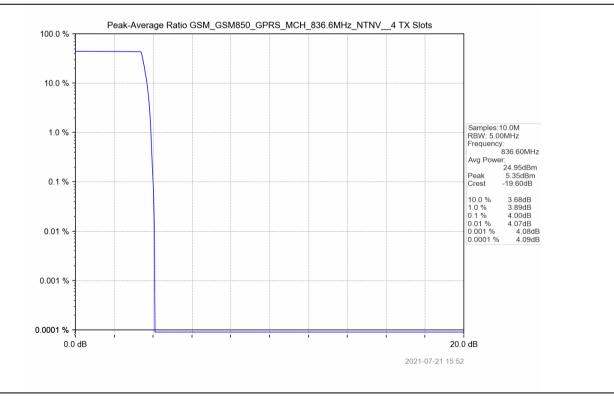


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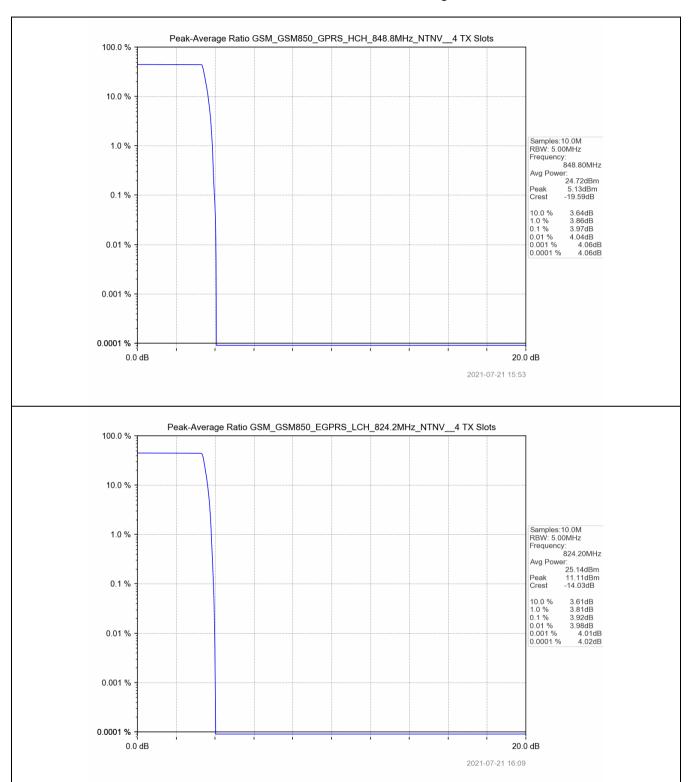
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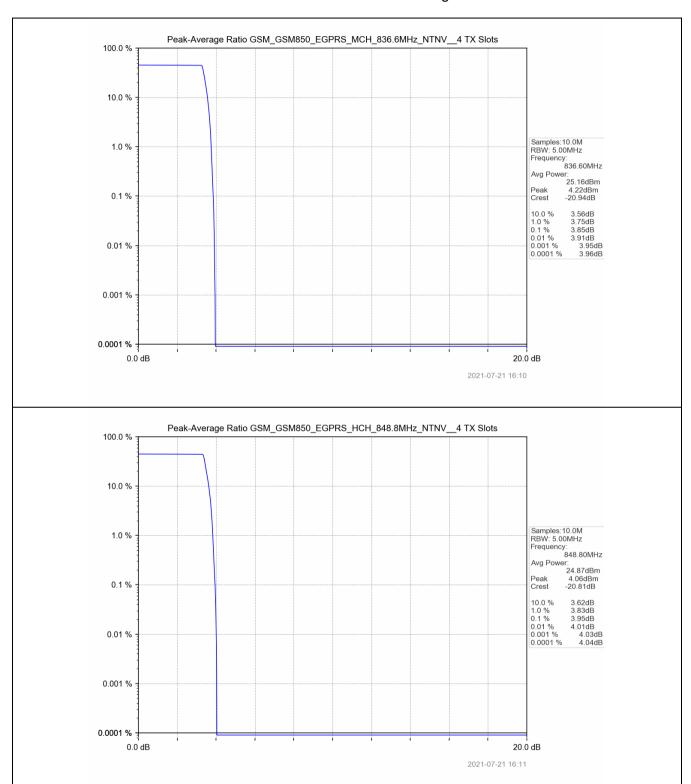
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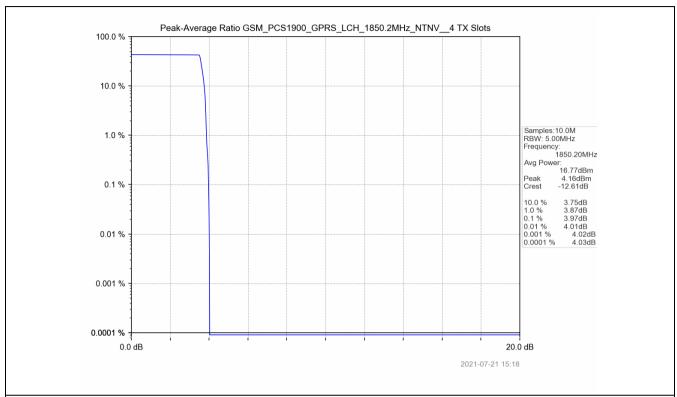
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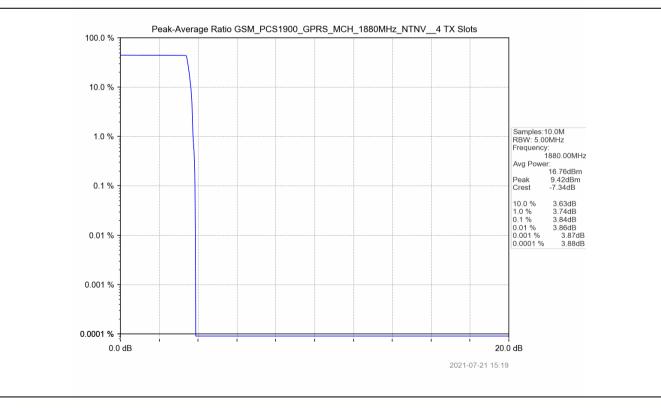


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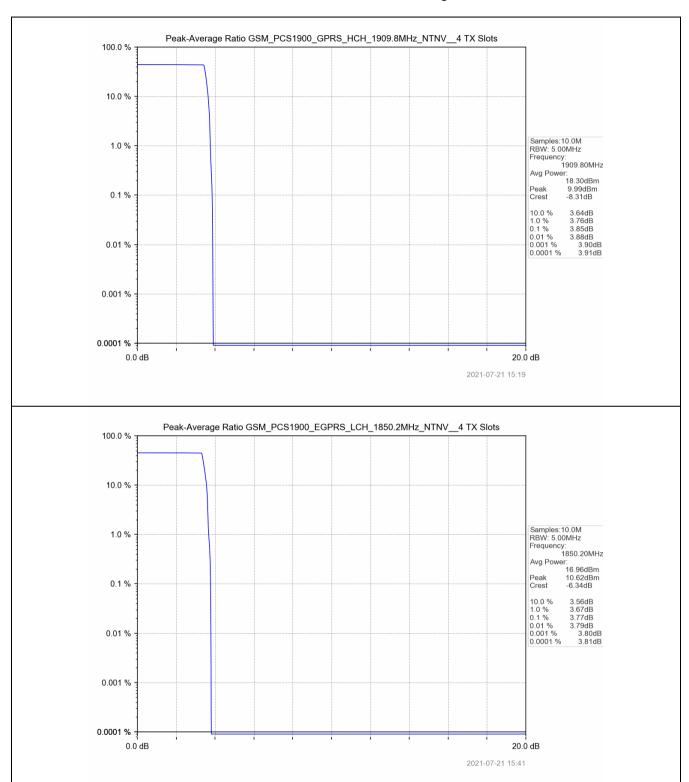
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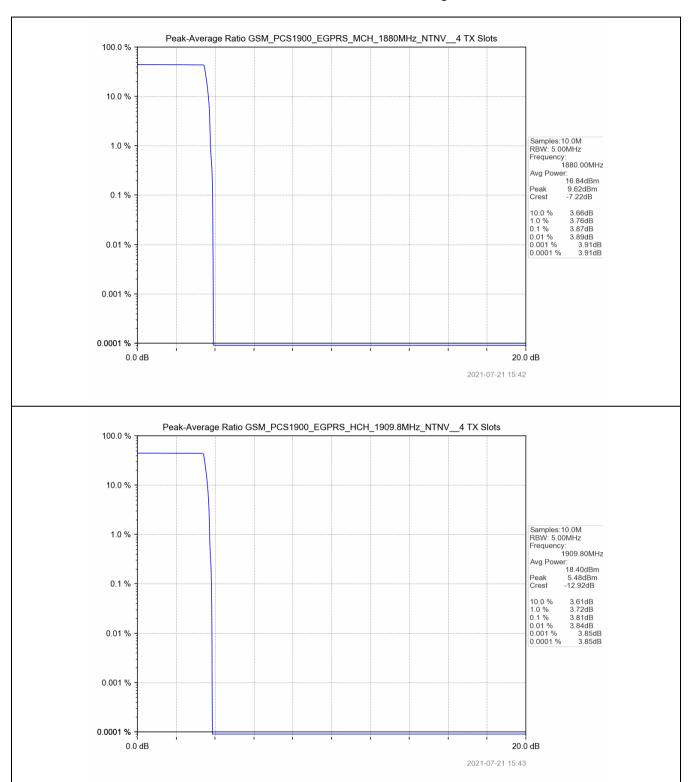
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#### 6.3 Bandwidth

Test Requirement: §2.1049(h), §22.917, §24.238

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: OBW: No limit

EBW: No limit

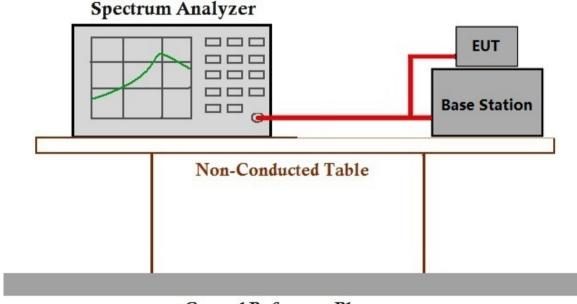
#### 6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode\_Keep the EUT in transmitting mode

#### 6.3.2 Test Setup Diagram



**Ground Reference Plane** 

#### 6.3.3 Measurement Data



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Test Band: GSM850							
Toot Mode	99% O	ccupied Bandwidth	Limit	\/oudiet			
Test Mode	LCH	MCH	HCH	Limit	Verdict		
EGPRS	0.244	0.246	0.247	N/A	PASS		
GPRS	0.249	0.245	0.249	N/A	PASS		

Test Band: PCS1900								
Test Mode	99% O	ccupied Bandwidth	Limit	Vordict				
	LCH	MCH	HCH	Limit	Verdict			
EGPRS	0.245	0.247	0.247	N/A	PASS			
GPRS	0.246	0.244	0.246	N/A	PASS			

Test Band: GSM850								
Toot Mode	26	dB Bandwidth (MH	Limeit	\/andiat				
Test Mode	LCH	MCH	HCH	Limit	Verdict			
EGPRS	0.315	0.317	0.326	N/A	PASS			
GPRS	0.325	0.316	0.318	N/A	PASS			

Test Band: PCS1900								
Toot Mode	26	6dB Bandwidth (MF	Limit	\				
Test Mode	LCH	MCH	HCH	Limit	Verdict			
EGPRS	0.320	0.312	0.322	N/A	PASS			
GPRS	0.317	0.318	0.319	N/A	PASS			



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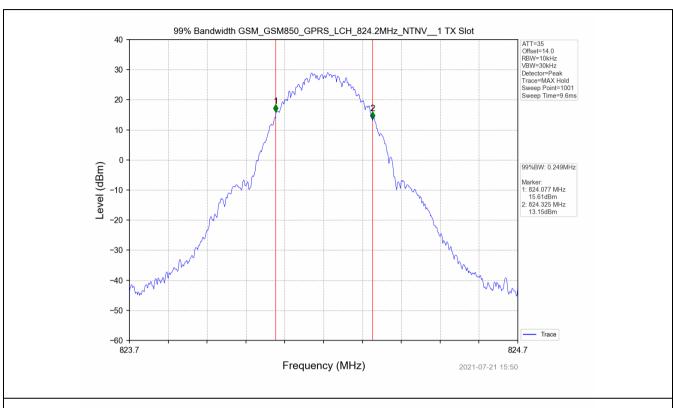
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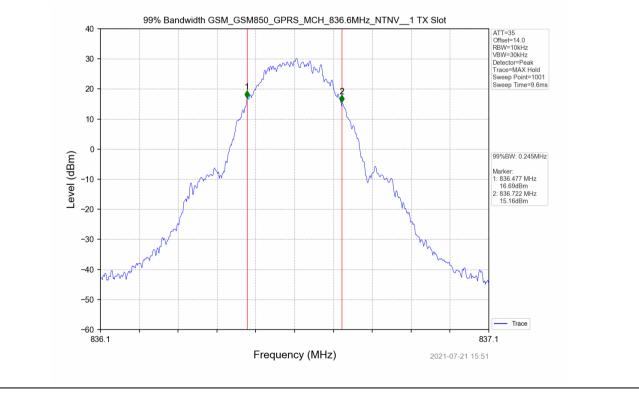


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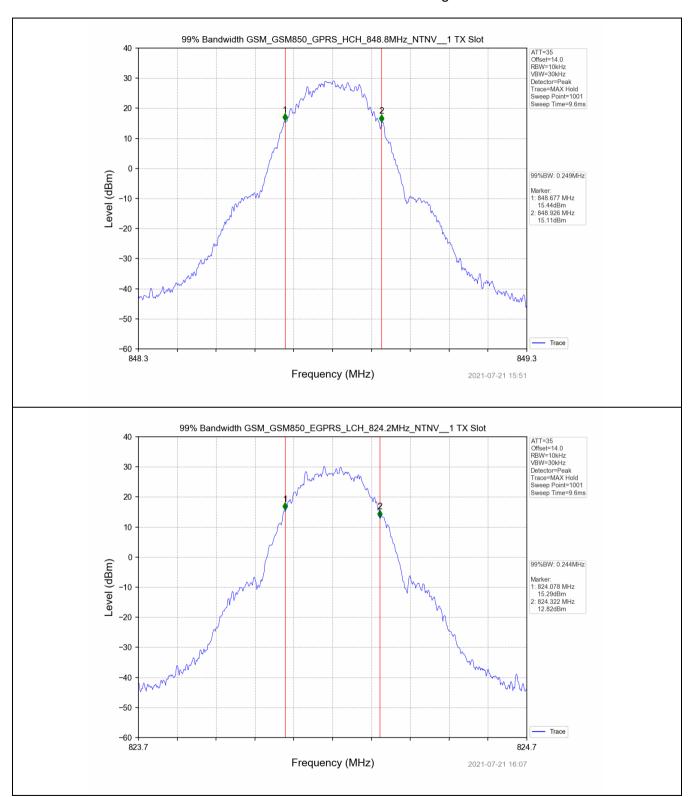
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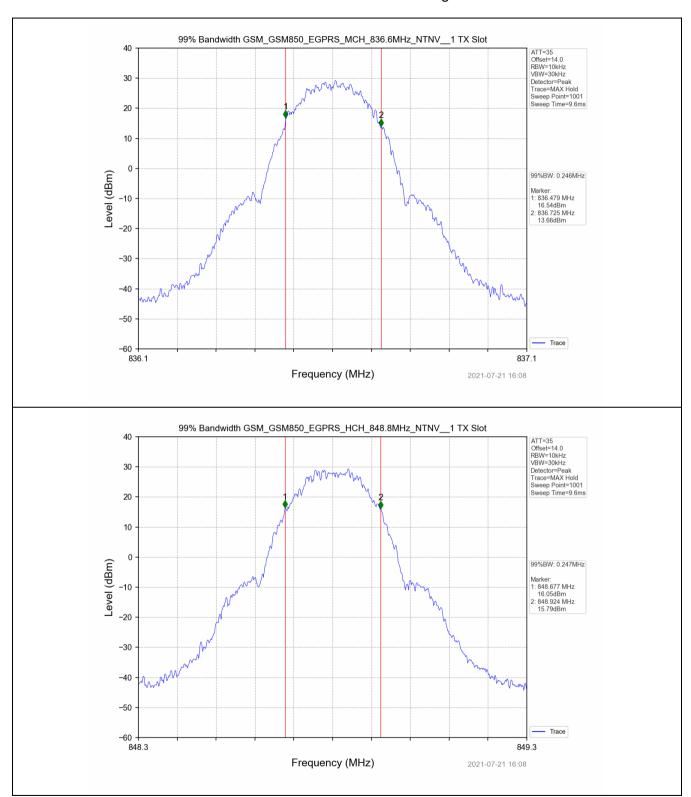
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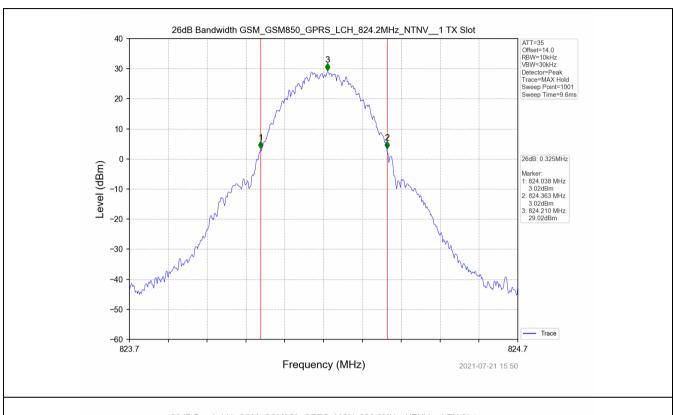
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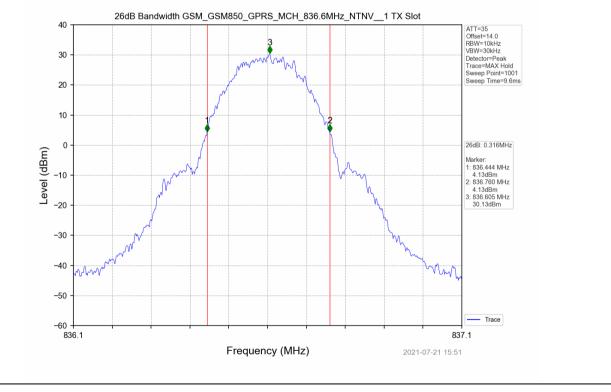


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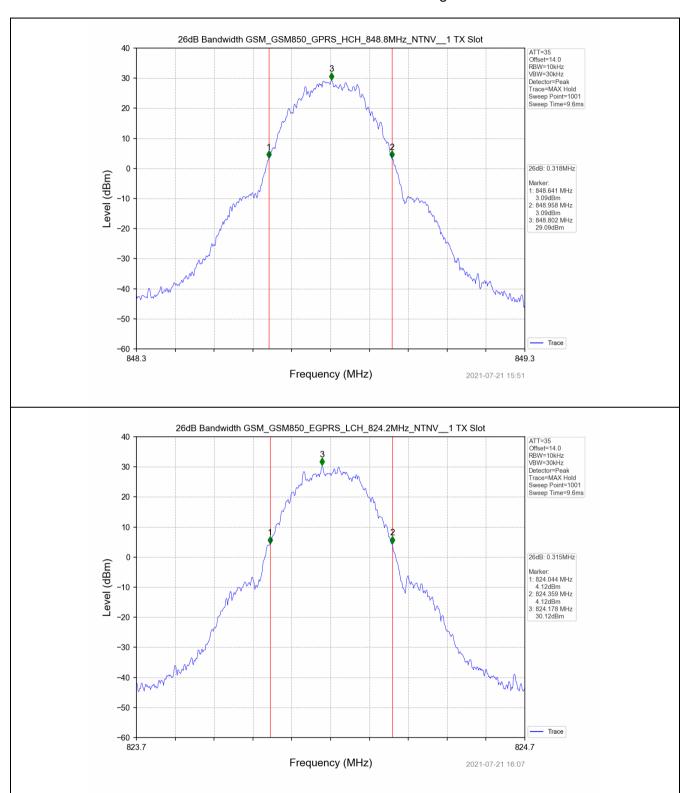
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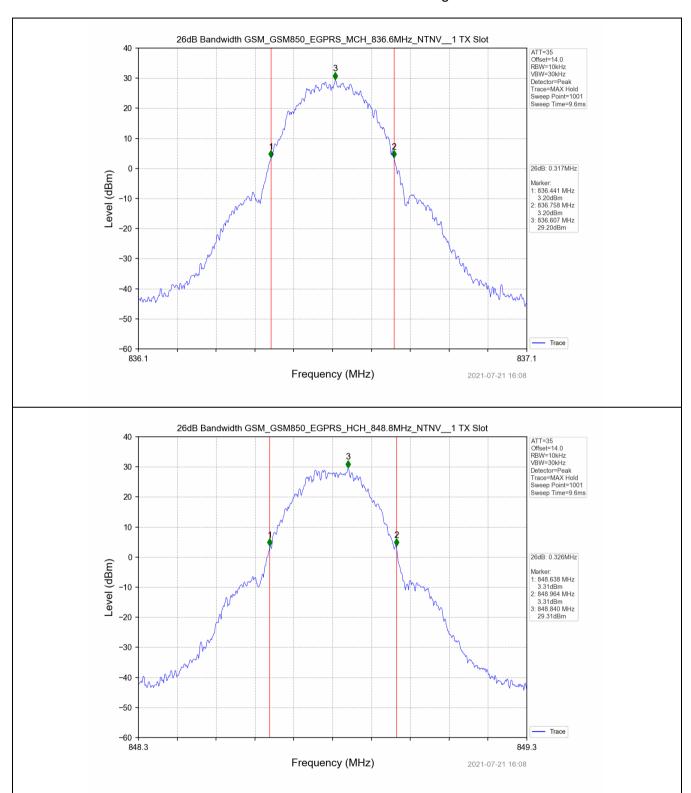
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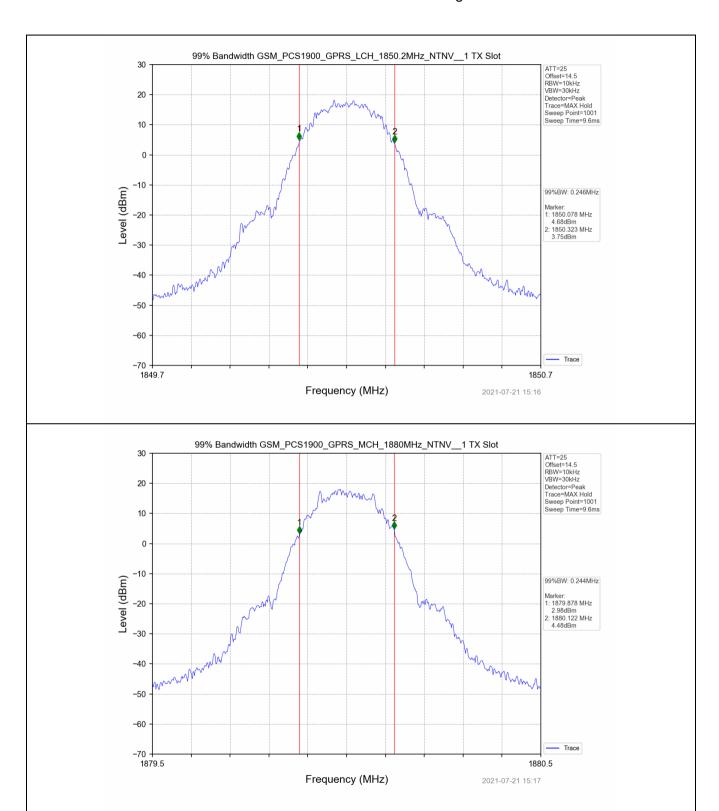
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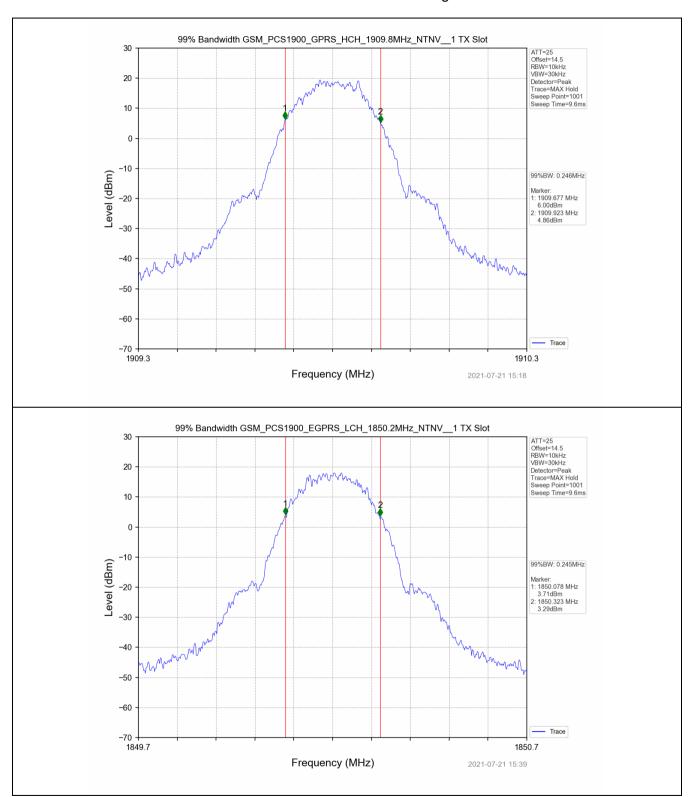
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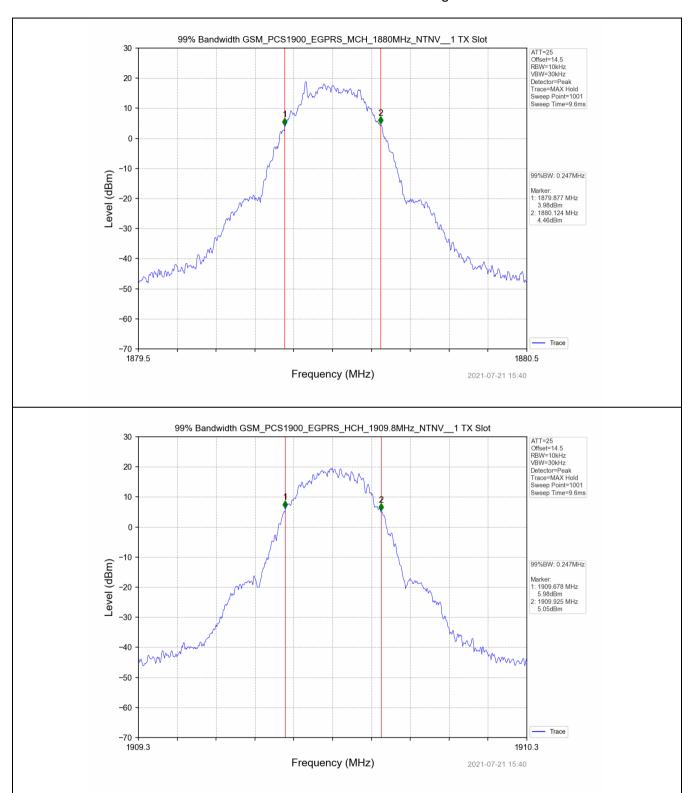
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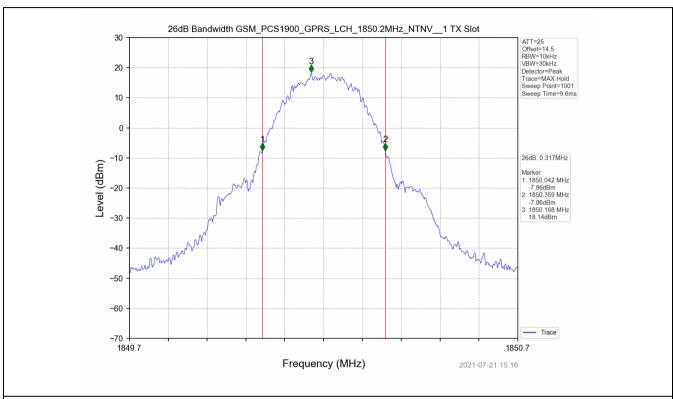
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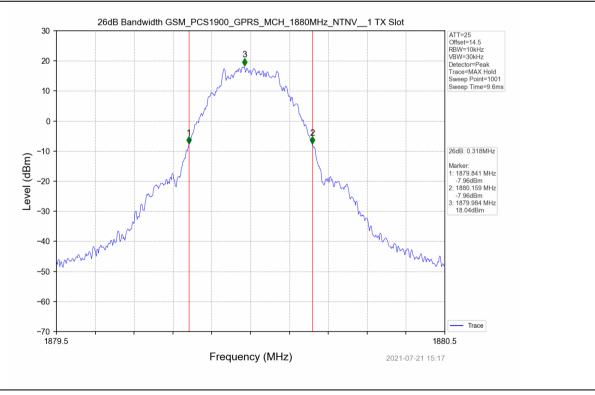


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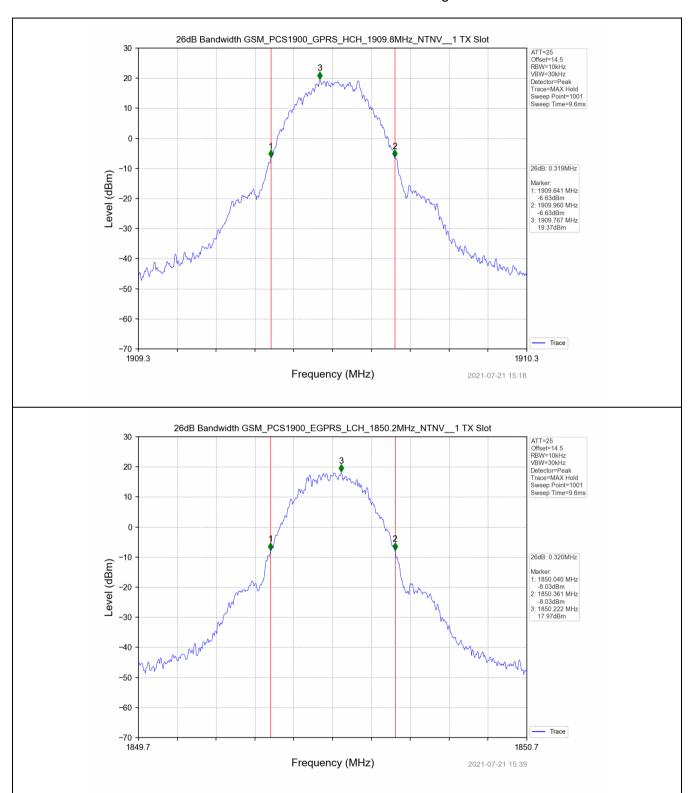
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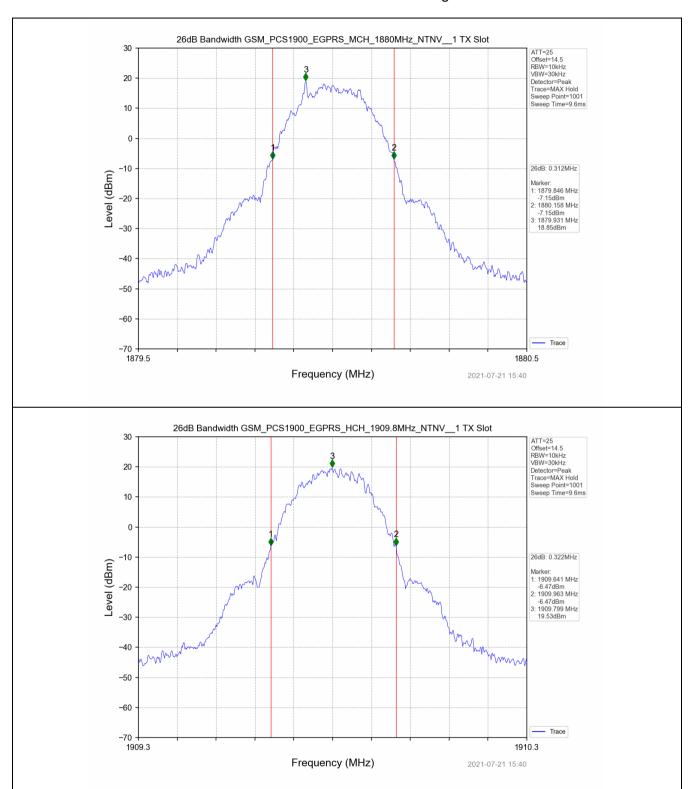
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#### 6.4 Band Edge Compliance

Test Requirement: §2.1051, §22.917, §24.238

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ -13dBm/1%\*EBW, in 1 MHz bands immediately outside and adjacent to

the frequency block.

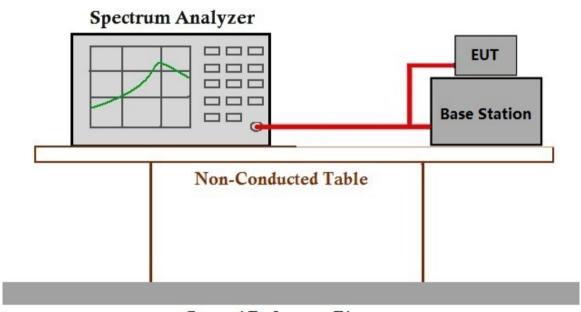
#### 6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode Keep the EUT in transmitting mode

#### 6.4.2 Test Setup Diagram



Ground Reference Plane

#### 6.4.3 Measurement Data



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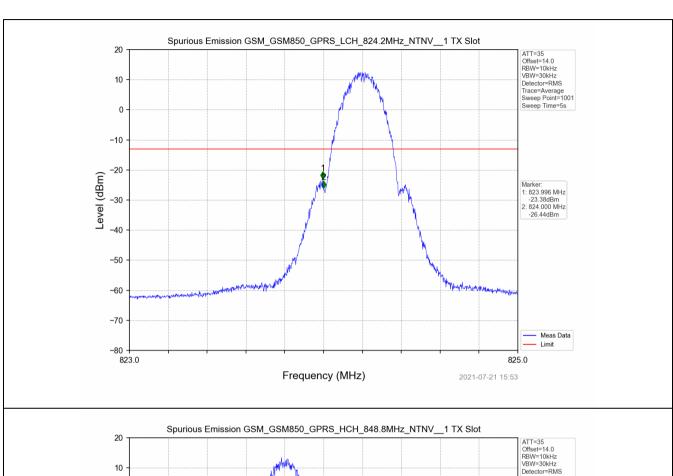
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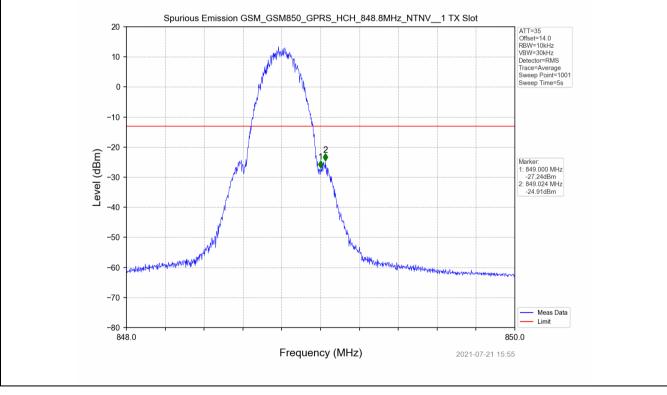


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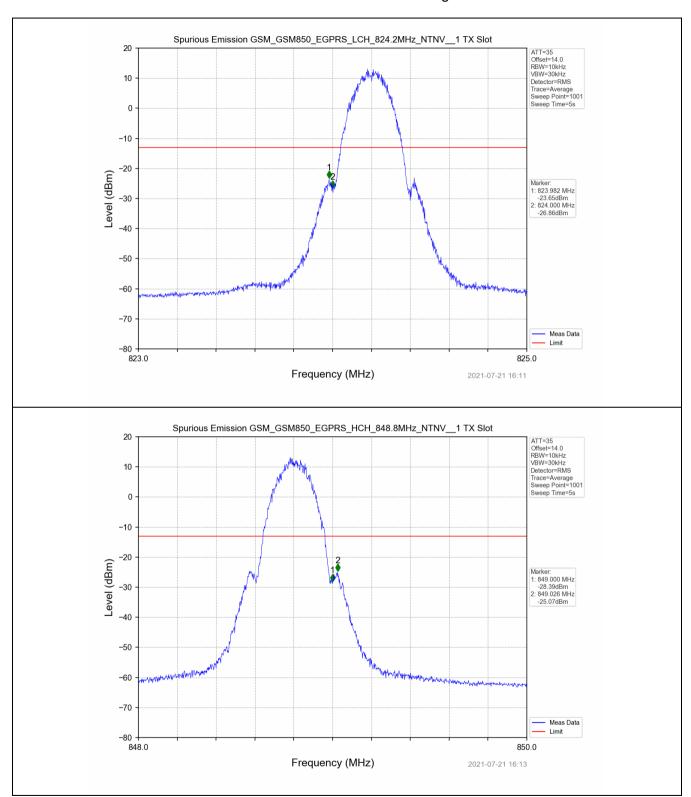
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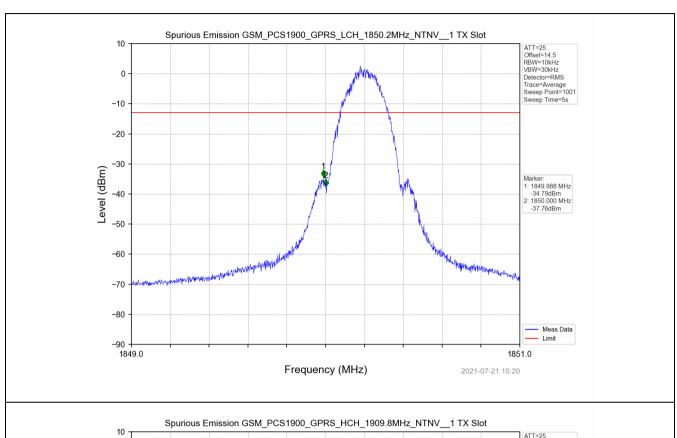
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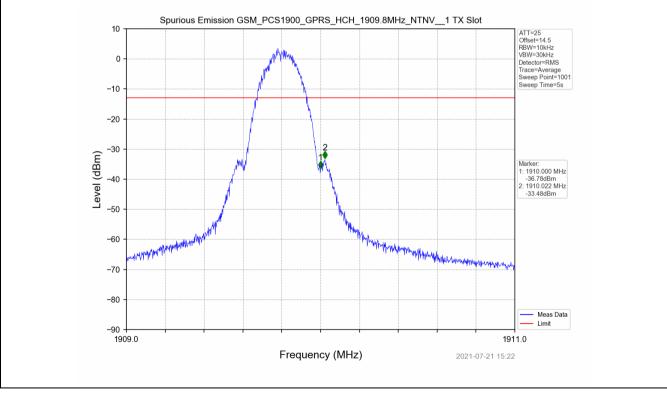


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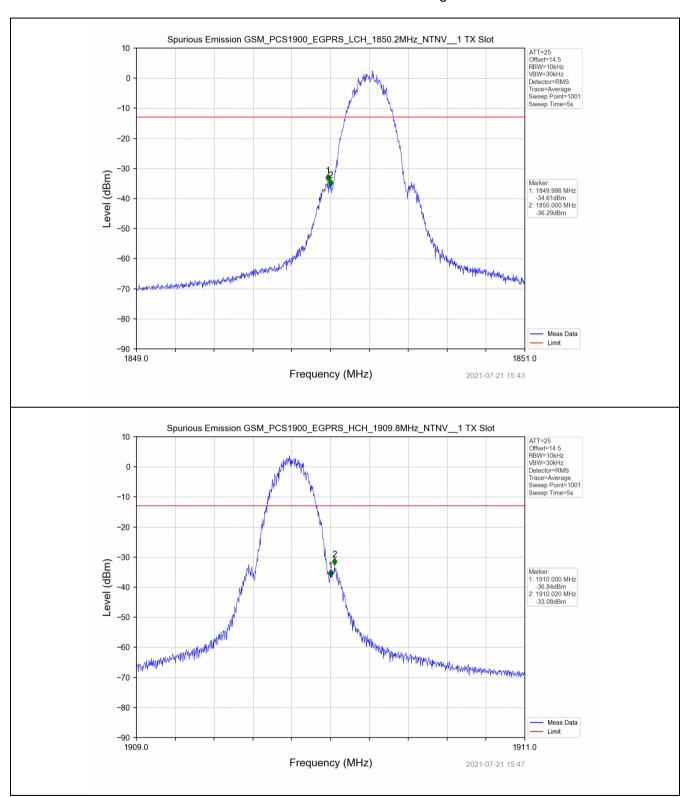
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#### 6.5 Spurious emissions at antenna terminals

Test Requirement: §2.1051, §22.917, §24.238

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ -13dBm

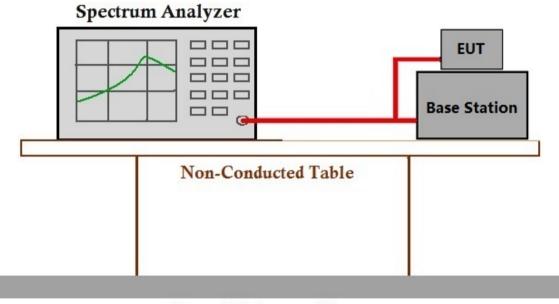
#### 6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode Keep the EUT in transmitting mode

#### 6.5.2 Test Setup Diagram



#### Ground Reference Plane

#### 6.5.3 Measurement Data



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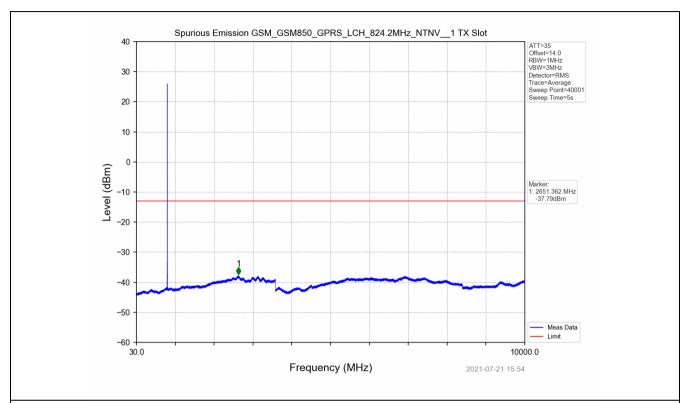
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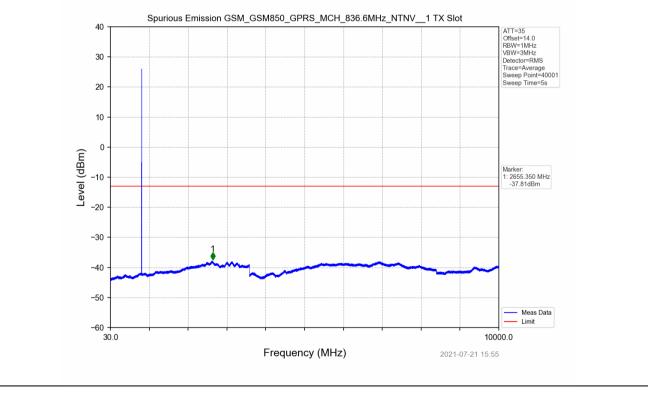


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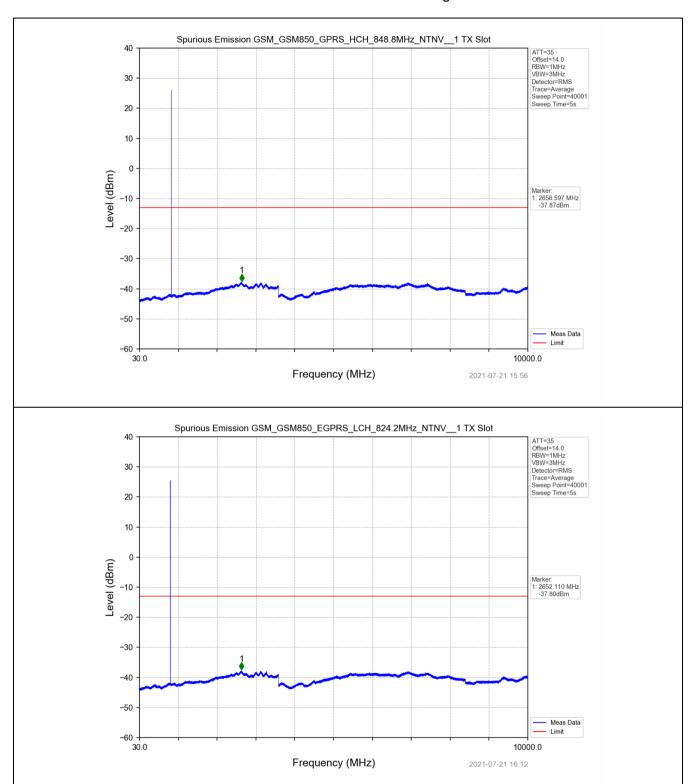
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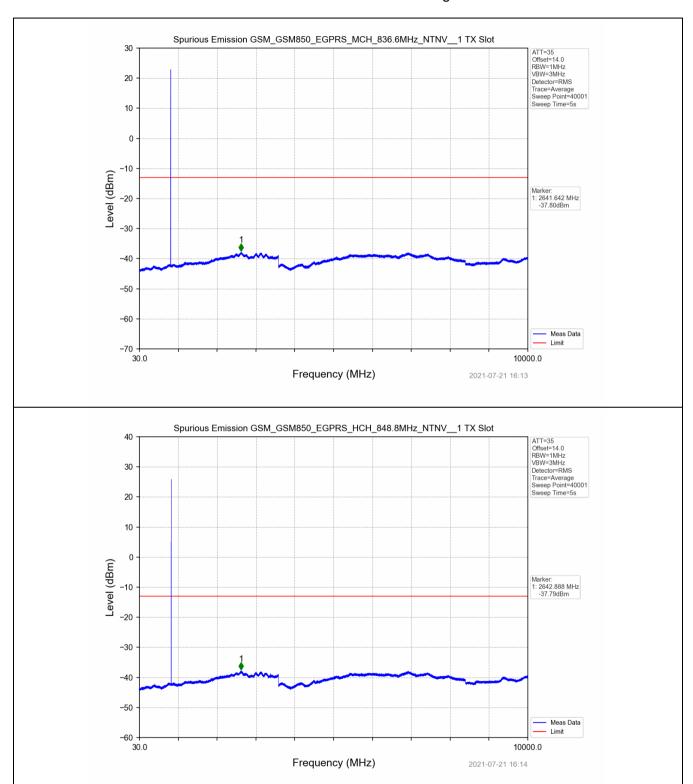
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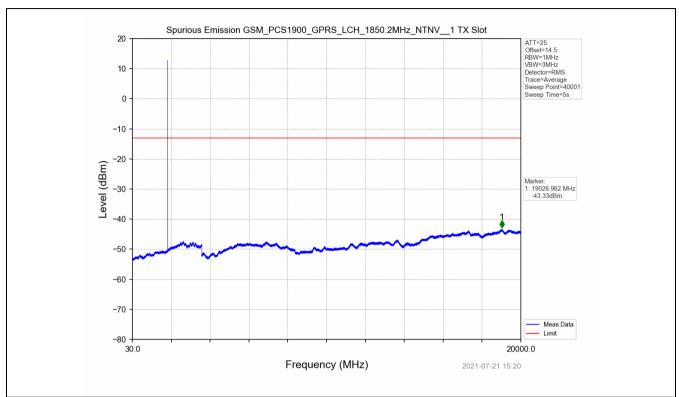
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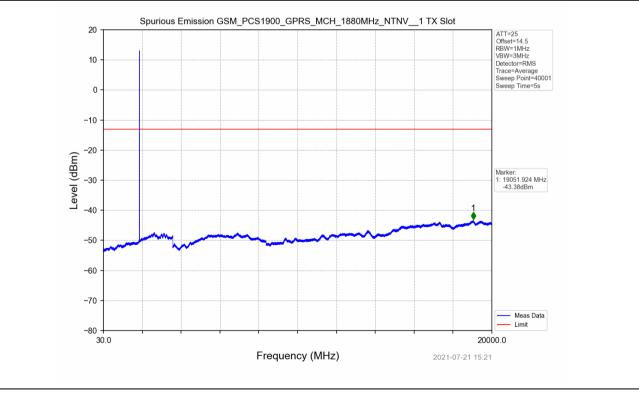


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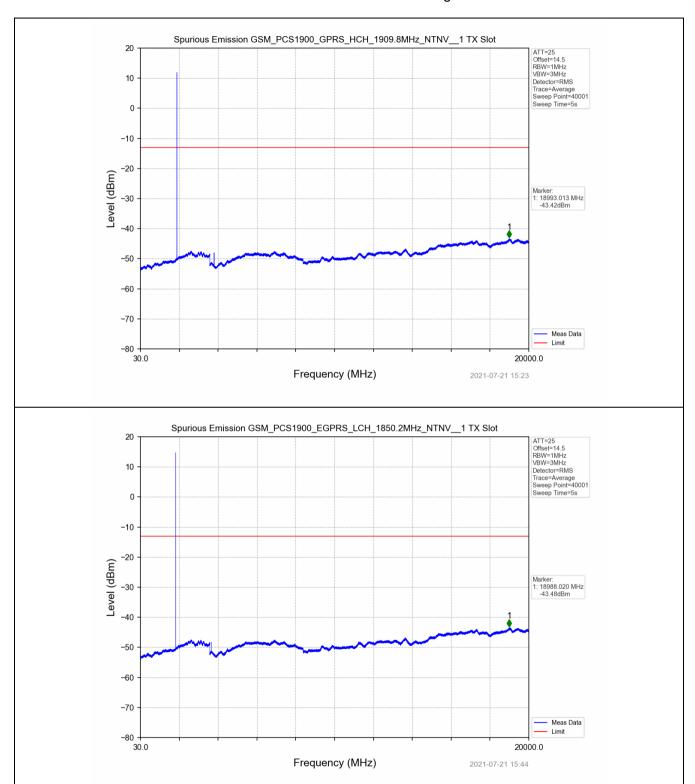
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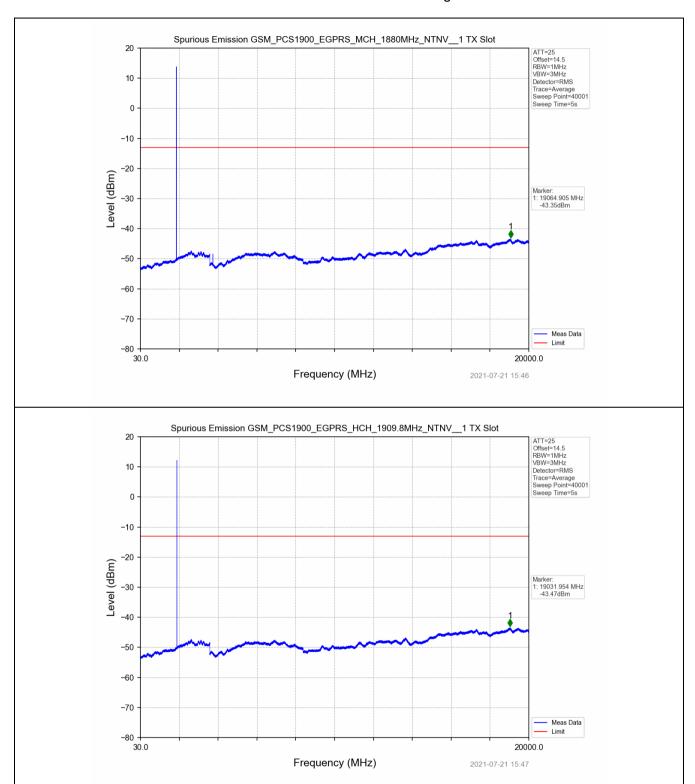
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#### 6.6 Field strength of spurious radiation

Test Requirement: §2.1051, §22.917, §24.238,

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ -13dBm

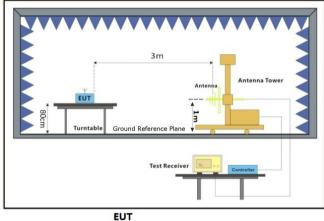
#### 6.6.1 E.U.T. Operation

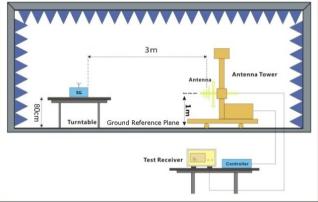
Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode\_Keep the EUT in transmitting mode

#### 6.6.2 Test Setup Diagram





Substitue Antenna+Signal Generator



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#### 6.6.3 Measurement Procedure and Data

#### **Test Procedure:**

- (1)On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- (2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3)The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- (4) The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- (5) The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- (6)The transmitter shall than be rotated through 360 in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- (8) The maximum signal level detected by the measuring receiver shall be noted.
- (9) The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10) Replace the antenna with a proper Antenna (substitution antenna).
- (11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12) The substitution antenna shall be connected to a calibrated signal generator.
- (13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.



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	GPRS850-Low channel											
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	- Power loss Gain		Polarization (H/V)	Result					
1652.8	-54.18	-13	-41.18	-59.66	0.52	6	Horizontal	Pass				
2479.2	-49.7	-13	-36.7	-54.97	0.53	5.8	Horizontal	Pass				
3305.6	-46.2	-13	-33.2	-51.75	0.65	6.2	Horizontal	Pass				
1652.8	-54.21	-13	-41.21	-59.69	0.52	6	Vertical	Pass				
2479.2	-49.02	-13	-36.02	-54.29	0.53	5.8	Vertical	Pass				
3305.6	-45.37	-13	-32.37	-50.92	0.65	6.2	Vertical	Pass				

	GPRS850-Middle channel												
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result					
1672.8	-52.43	-13	-39.43	-57.91	0.52	6	Horizontal	Pass					
2509.2	-49.39	-13	-36.39	-54.1	0.59	5.3	Horizontal	Pass					
3345.6	-46.4	-13	-33.4	-51.95	0.65	6.2	Horizontal	Pass					
1672.8	-53.22	-13	-40.22	-58.7	0.52	6	Vertical	Pass					
2509.2	-49.29	-13	-36.29	-54	0.59	5.3	Vertical	Pass					
3345.6	-43.37	-13	-30.37	-48.92	0.65	6.2	Vertical	Pass					

	GPRS850-High channel												
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result					
1693.2	-50.52	-13	-37.52	-56	0.52	6	Horizontal	Pass					
2539.8	-49.19	-13	-36.19	-53.9	0.59	5.3	Horizontal	Pass					
3386.4	-45.39	-13	-32.39	-50.94	0.65	6.2	Horizontal	Pass					
1693.2	-52.28	-13	-39.28	-57.76	0.52	6	Vertical	Pass					
2539.8	-47.63	-13	-34.63	-52.34	0.59	5.3	Vertical	Pass					
3386.4	-44.43	-13	-31.43	-49.98	0.65	6.2	Vertical	Pass					



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	GPRS1900-Low channel												
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result					
3704.8	-46.03	-13	-33.03	-52.92	0.71	7.6	Horizontal	Pass					
5557.2	-41.07	-13	-28.07	-50.52	0.85	10.3	Horizontal	Pass					
7409.6	-41.29	-13	-28.29	-53.19	1	12.9	Horizontal	Pass					
3704.8	-45.84	-13	-32.84	-52.73	0.71	7.6	Vertical	Pass					
5557.2	-41.45	-13	-28.45	-50.9	0.85	10.3	Vertical	Pass					
7409.6	-37.77	-13	-24.77	-49.67	1	12.9	Vertical	Pass					

	GPRS1900-Middle channel												
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result					
3760	-43.73	-13	-30.73	-50.62	0.71	7.6	Horizontal	Pass					
5640	-44.21	-13	-31.21	-53.66	0.85	10.3	Horizontal	Pass					
7520	-39.83	-13	-26.83	-52.04	0.99	13.2	Horizontal	Pass					
3760	-43.68	-13	-30.68	-50.57	0.71	7.6	Vertical	Pass					
5640	-41.01	-13	-28.01	-50.46	0.85	10.3	Vertical	Pass					
7520	-39.17	-13	-26.17	-51.38	0.99	13.2	Vertical	Pass					

	GPRS1900-High channel												
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result					
3815.2	-45.06	-13	-32.06	-51.95	0.71	7.6	Horizontal	Pass					
5722.8	-40.02	-13	-27.02	-49.47	0.85	10.3	Horizontal	Pass					
7630.4	-37.71	-13	-24.71	-49.92	0.99	13.2	Horizontal	Pass					
3815.2	-46.58	-13	-33.58	-53.47	0.71	7.6	Vertical	Pass					
5722.8	-44.82	-13	-31.82	-54.27	0.85	10.3	Vertical	Pass					
7630.4	-43.87	-13	-30.87	-56.08	0.99	13.2	Vertical	Pass					

Note: EIRP= S.G. Power- Cable loss+ Antenna Gain

For GSM, all modes have been tested and we found GPRS Test mode has the worst test result. Only record the worst test result.



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#### 6.7 Frequency stability

Test Requirement: §2.1055, §22.355, §24.235

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit:  $\leq \pm 2.5$ ppm.

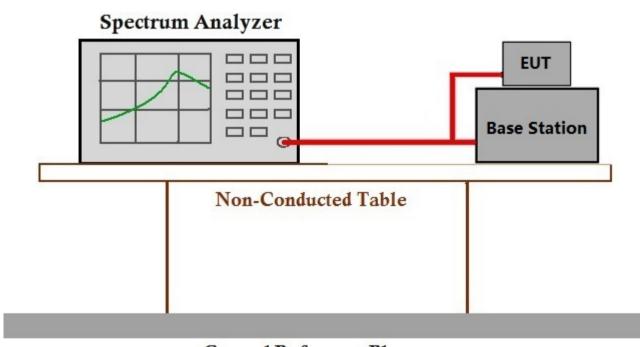
#### 6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode Keep the EUT in transmitting mode

#### 6.7.2 Test Setup Diagram



#### Ground Reference Plane

#### 6.7.3 Measurement Data



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# SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

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Test Band: GSM850 (Frequency Error VS. Voltage)												
Test Mode	Test	Toot Volt	Fre	q. Error (	Hz)	Freq.	vs. rated (	ppm)	Limit	Vordict		
	Temp.	Test Volt.	LCH	MCH	HCH	LCH	MCH	HCH	(ppm)	Verdict		
	NT	LV	-10.0086	-13.7538	-8.9109	-0.0121	-0.0164	-0.0105	2.50	PASS		
EGPRS		NV	-11.4292	-9.3629	-13.2372	-0.0139	-0.0112	-0.0156	2.50	PASS		
		HV	-14.0121	-10.0409	-12.5592	-0.0170	-0.0120	-0.0148	2.50	PASS		
	NT	LV	-13.3341	-1.4529	-13.3018	-0.0162	-0.0017	-0.0157	2.50	PASS		
GPRS		NV	-10.9126	-6.2635	-6.5217	-0.0132	-0.0075	-0.0077	2.50	PASS		
		HV	-9.8795	-2.7766	-10.4283	-0.0120	-0.0033	-0.0123	2.50	PASS		

	Te	est Band: (	GSM850 (	Frequenc	y Error V	S. Temper	ature)			
Test Mode	Test Volt.	Test	Fre	q. Error (	Hz)	Freq. vs. rated (ppm)			Limit	Verdict
rest Mode	rest voit.	Temp.	LCH	MCH	HCH	LCH	MCH	HCH	(ppm)	verdict
		-30.00	-11.2032	-11.3969	-12.6560	-0.0136	-0.0136	-0.0149	2.50	PASS
		-20.00	-13.5278	-11.6229	-15.2066	-0.0164	-0.0139	-0.0179	2.50	PASS
		-10.00	-9.3629	-12.9143	-14.3672	-0.0114	-0.0154	-0.0169	2.50	PASS
		0.00	-10.8803	-12.3978	-12.4946	-0.0132	-0.0148	-0.0147	2.50	PASS
EGPRS	NV	10.00	-8.5558	-12.0103	-10.7189	-0.0104	-0.0144	-0.0126	2.50	PASS
		20.00	-9.9118	-14.9161	-11.0740	-0.0120	-0.0178	-0.0130	2.50	PASS
		30.00	-9.2015	-9.6535	-11.0740	-0.0112	-0.0115	-0.0130	2.50	PASS
		40.00	-16.1106	-11.3969	-12.3655	-0.0195	-0.0136	-0.0146	2.50	PASS
		50.00	-15.2712	-10.2669	-12.2363	-0.0185	-0.0123	-0.0144	2.50	PASS
		-30.00	-10.2023	-10.6866	-12.9466	-0.0124	-0.0128	-0.0153	2.50	PASS
		-20.00	-14.6578	-12.0426	-10.8803	-0.0178	-0.0144	-0.0128	2.50	PASS
		-10.00	-12.1718	-12.2363	-8.7495	-0.0148	-0.0146	-0.0103	2.50	PASS
		0.00	-14.3349	-13.0435	-10.5898	-0.0174	-0.0156	-0.0125	2.50	PASS
GPRS	NV	10.00	-6.9415	-7.9423	-10.5898	-0.0084	-0.0095	-0.0125	2.50	PASS
		20.00	-4.8752	-10.0409	-10.2346	-0.0059	-0.0120	-0.0121	2.50	PASS
		30.00	-12.0749	-14.5609	-7.6840	-0.0147	-0.0174	-0.0091	2.50	PASS
		40.00	-5.8760	-8.5235	-4.9397	-0.0071	-0.0102	-0.0058	2.50	PASS
		50.00	-7.0706	-12.9143	-12.3978	-0.0086	-0.0154	-0.0146	2.50	PASS



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	Test Band: PCS1900 (Frequency Error VS. Voltage)												
Toot Mode	Test	Test Volt.	Fre	q. Error (	Hz)	Freq.	vs. rated (	Limit	\/ordiot				
Test Mode	Temp.	rest voit.	LCH	MCH	HCH	LCH	MCH	HCH	(ppm)	Verdict			
		LV	-25.6350	-26.4098	-30.9298	-0.0139	-0.0140	-0.0162	2.50	PASS			
EGPRS	NT	NV	-15.6909	-31.1881	-24.4404	-0.0085	-0.0166	-0.0128	2.50	PASS			
		HV	-25.7641	-31.6078	-27.1524	-0.0139	-0.0168	-0.0142	2.50	PASS			
		LV	1.4851	-4.6814	3.5514	0.0008	-0.0025	0.0019	2.50	PASS			
GPRS	NT	NV	8.7495	-4.6492	4.2617	0.0047	-0.0025	0.0022	2.50	PASS			
		HV	3.8097	-4.8752	-18.1446	0.0021	-0.0026	-0.0095	2.50	PASS			

	Test Band: PCS1900 (Frequency Error VS. Temperature)											
Test Mode	Test Volt.	Test	Fre	q. Error (	Hz)	Freq. vs. rated (ppm)			Limit	Verdict		
rest Mode	Test voit.	Temp.	LCH	MCH	HCH	LCH	MCH	HCH	(ppm)	verdict		
		-30.00	-29.6061	-35.6436	-24.8278	-0.0160	-0.0190	-0.0130	2.50	PASS		
		-20.00	-22.2127	-27.6367	-24.2467	-0.0120	-0.0147	-0.0127	2.50	PASS		
		-10.00	-20.2432	-32.4796	-27.8950	-0.0109	-0.0173	-0.0146	2.50	PASS		
		0.00	-24.2790	-34.5781	-25.8610	-0.0131	-0.0184	-0.0135	2.50	PASS		
EGPRS	NV	10.00	-26.1838	-29.6061	-36.1924	-0.0142	-0.0157	-0.0190	2.50	PASS		
		20.00	-26.1838	-30.8976	-21.5024	-0.0142	-0.0164	-0.0113	2.50	PASS		
		30.00	-25.2798	-26.4744	-31.0267	-0.0137	-0.0141	-0.0162	2.50	PASS		
		40.00	-20.3724	-23.7301	-27.9273	-0.0110	-0.0126	-0.0146	2.50	PASS		
		50.00	-14.3349	-32.0276	-29.9290	-0.0077	-0.0170	-0.0157	2.50	PASS		
		-30.00	2.1632	-2.2277	-2.4860	0.0012	-0.0012	-0.0013	2.50	PASS		
		-20.00	1.9049	-0.9686	0.7749	0.0010	-0.0005	0.0004	2.50	PASS		
		-10.00	2.2600	3.5514	-17.4344	0.0012	0.0019	-0.0091	2.50	PASS		
		0.00	1.1623	-2.0663	-0.4197	0.0006	-0.0011	-0.0002	2.50	PASS		
GPRS	NV	10.00	4.1649	1.3560	-0.5489	0.0023	0.0007	-0.0003	2.50	PASS		
		20.00	3.2932	4.8752	-21.5024	0.0018	0.0026	-0.0113	2.50	PASS		
		30.00	4.6492	-2.3246	-6.8123	0.0025	-0.0012	-0.0036	2.50	PASS		
		40.00	3.8420	4.3263	-0.0646	0.0021	0.0023	0.0000	2.50	PASS		
		50.00	3.8420	-3.7774	-1.2269	0.0021	-0.0020	-0.0006	2.50	PASS		



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#### 6.8 Modulation Characteristics

Test Requirement: §2.1047

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: Digital modulation

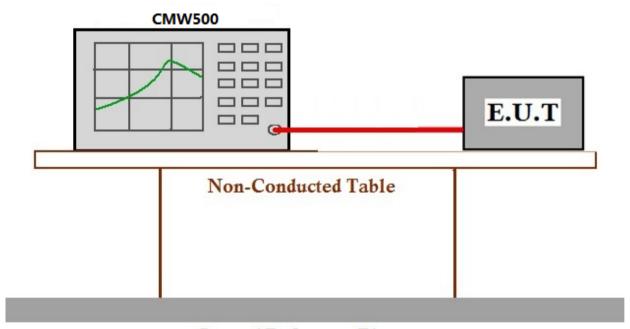
#### 6.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 65.0 % RH Atmospheric Pressure: 1015 mbar

Test mode: f:TX mode\_Keep the EUT in transmitting mode

#### 6.8.2 Test Setup Diagram



#### Ground Reference Plane

#### 6.8.3 Measurement Data



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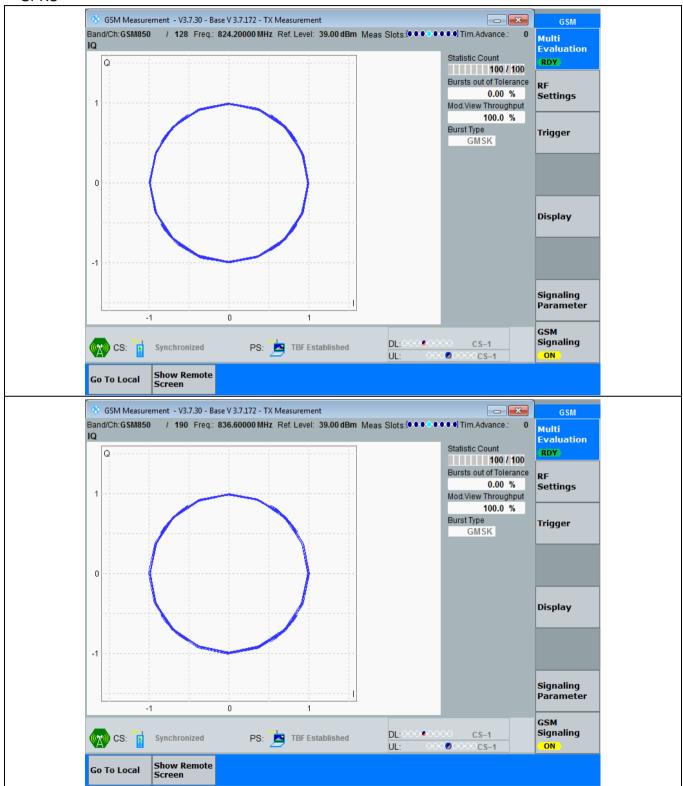


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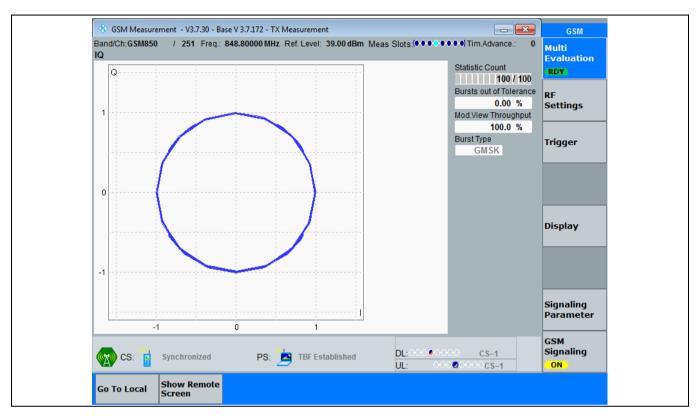
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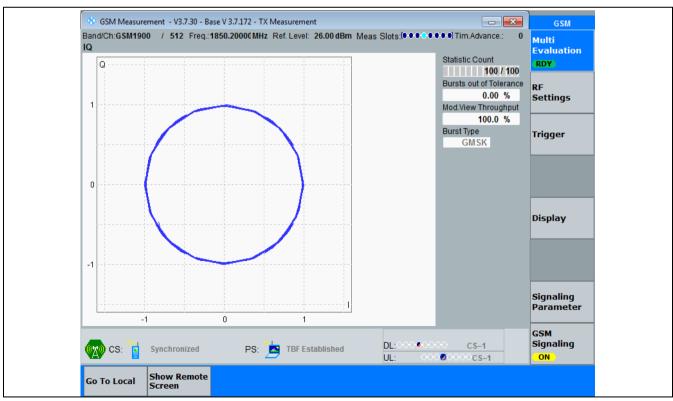


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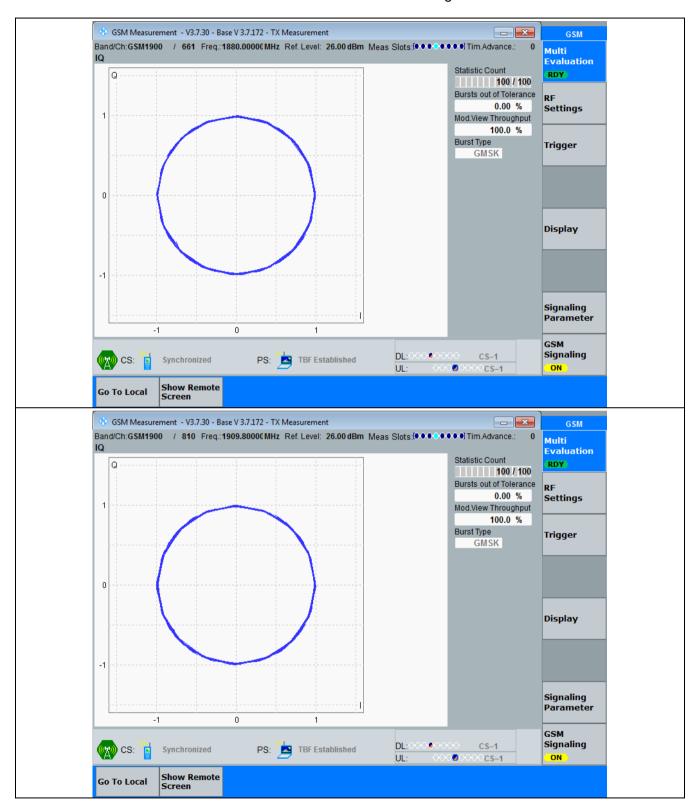
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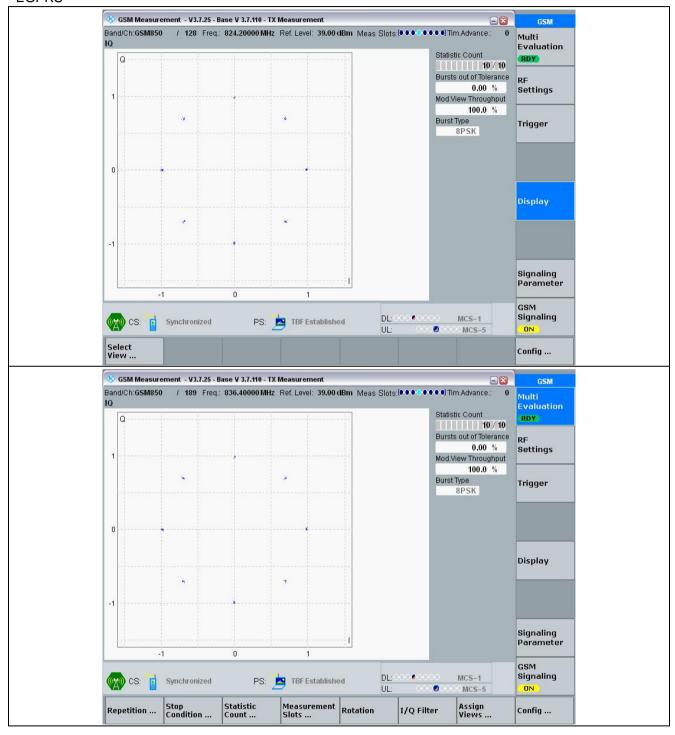


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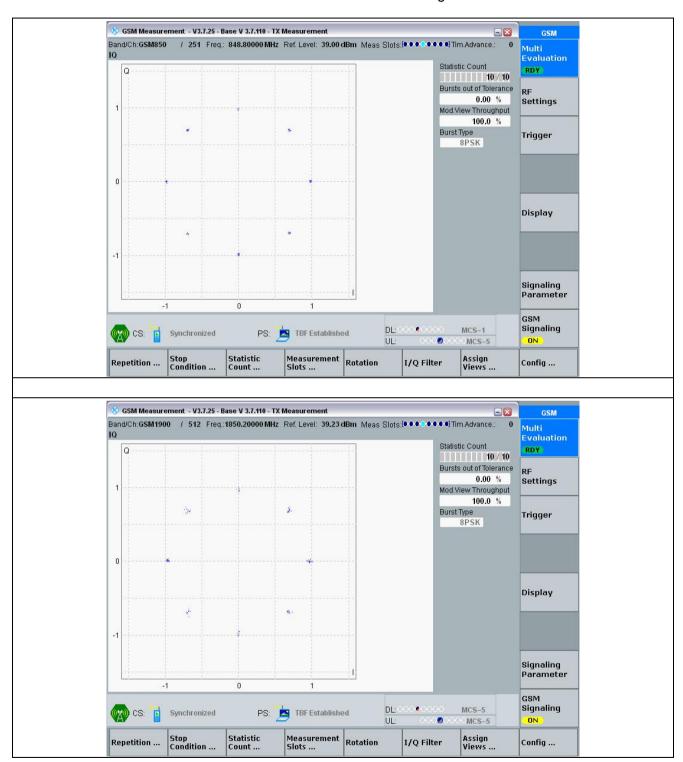
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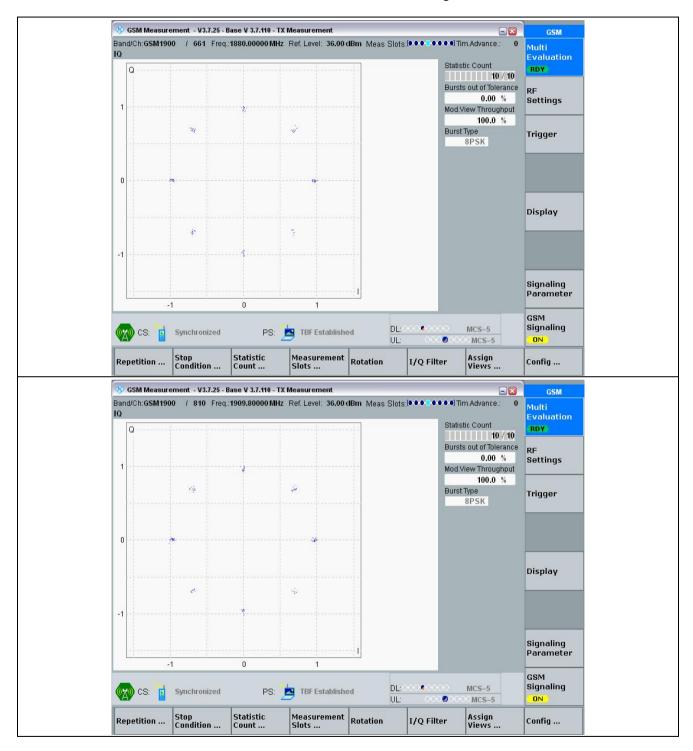
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## **Test Setup Photo**

Refer to Appendix – Test Setup Photos for GZCR2108020821AT

#### **EUT Constructional Details (EUT Photos)** 8

Refer to Appendix - external and internal photos for GZCR2108020821AT

- End of the Report -



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