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# Appendix B

# GSM850&1900



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# 1. Effective (Isotropic) Radiated Power Output Data

#### 1.1.Test Result

BAND	Channel	Power(dBm)	ERP(dBm)	Limit(dBm)	Verdict
GSM850	128	32.41	25.16	38.45	PASS
GSM850	190	32.62	25.37	38.45	PASS
GSM850	251	32.46	25.21	38.45	PASS
EGPRS850	128	27.00	19.75	38.45	PASS
EGPRS850	190	27.08	19.83	38.45	PASS
EGPRS850	251	27.14	19.89	38.45	PASS

BAND	Channel	Power(dBm)	EIRP(dBm)	Limit(dBm)	Verdict
GSM1900	512	29.30	24.50	33.00	PASS
GSM1900	661	28.67	23.87	33.00	PASS
GSM1900	810	28.57	23.77	33.00	PASS
EGPRS1900	512	26.20	21.40	33.00	PASS
EGPRS1900	661	25.55	20.75	33.00	PASS
EGPRS1900	810	25.20	20.40	33.00	PASS

Remark:

a: For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should be taken to calculate it,

ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]

EIRP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBi]

b: SGP=Signal Generator Level

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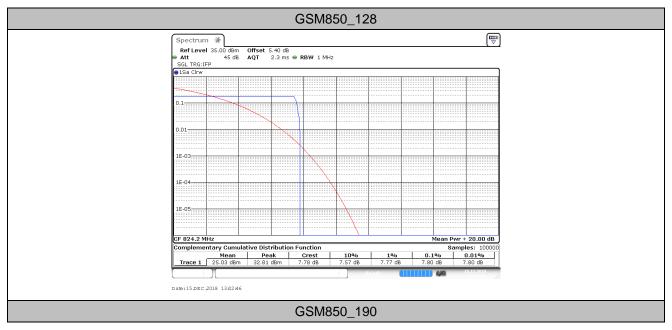
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## 2. Peak-to-Average Ratio

#### 2.1.Test Result

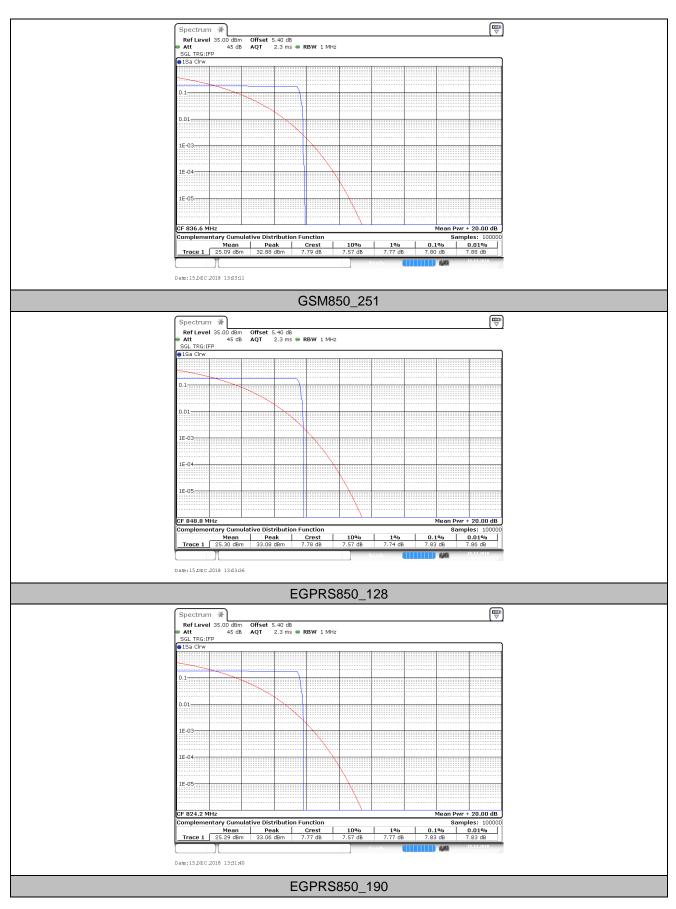
BAND	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
GSM850	128	7.80	13	PASS
GSM850	190	7.80	13	PASS
GSM850	251	7.83	13	PASS
EGPRS850	128	7.83	13	PASS
EGPRS850	190	7.86	13	PASS
EGPRS850	251	7.80	13	PASS
GSM1900	512	7.71	13	PASS
GSM1900	661	7.71	13	PASS
GSM1900	810	7.71	13	PASS
EGPRS1900	512	10.55	13	PASS
EGPRS1900	661	10.61	13	PASS
EGPRS1900	810	10.61	13	PASS

#### 2.2. Part II - Test Plots



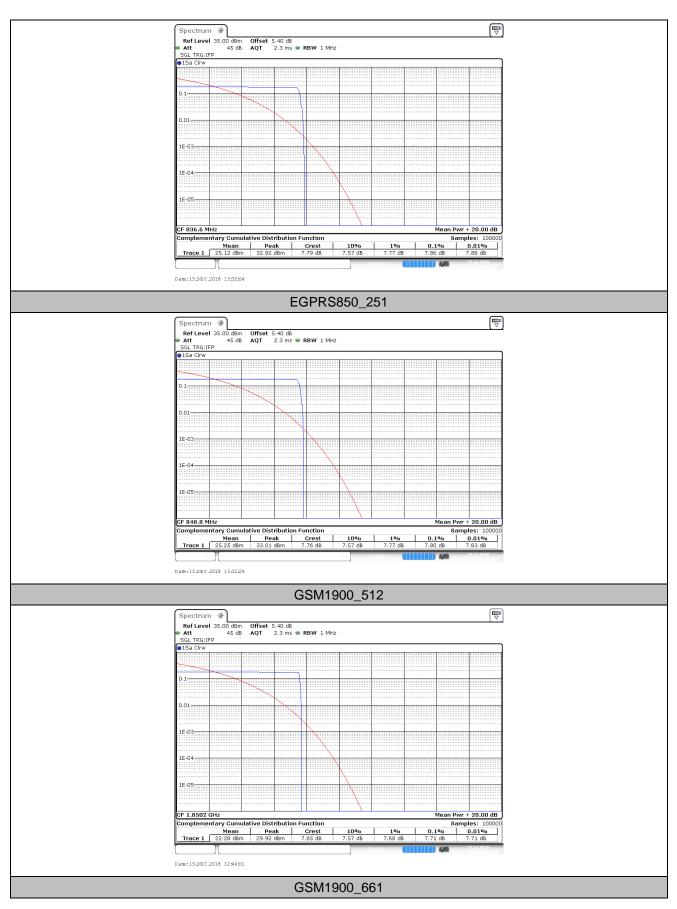


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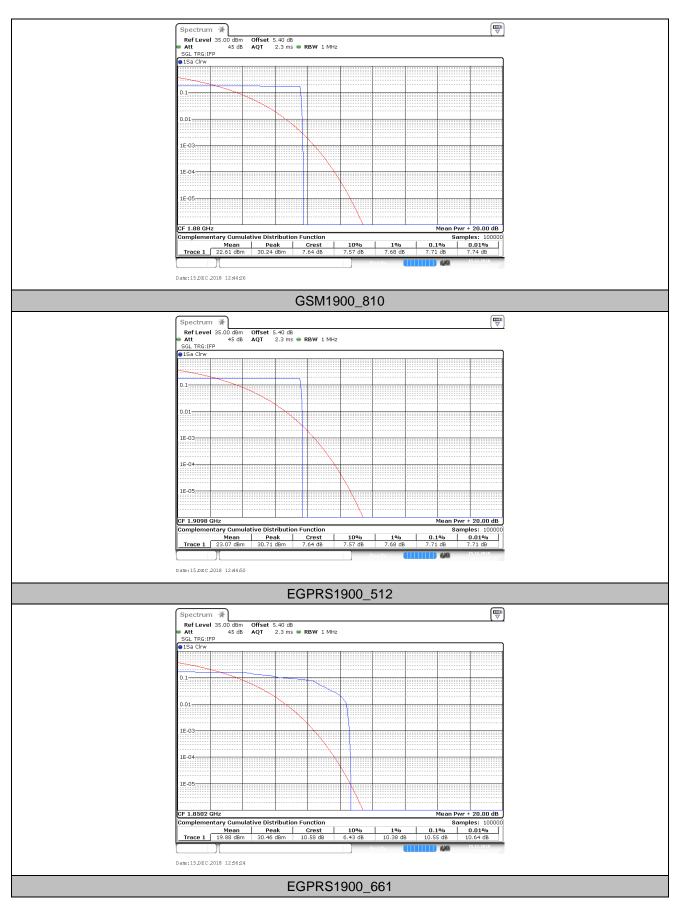


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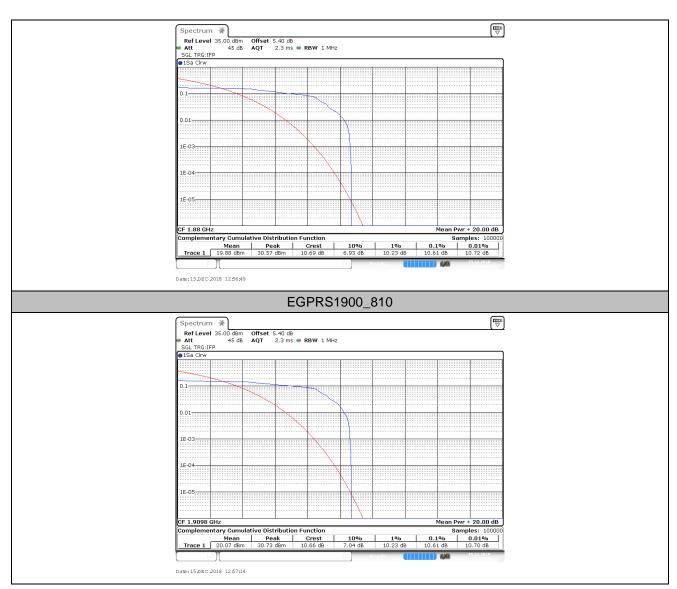


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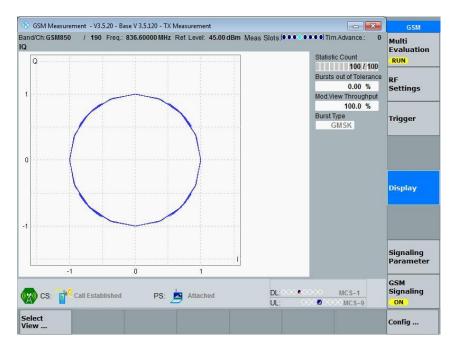
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# 3. Modulation Characteristics

- 3.1. For GSM
- 3.1.1. Test BAND = GSM 850
- 3.1.1.1. Test Mode = GSM/TM1

#### 3.1.1.1.1. Test Channel = MCH

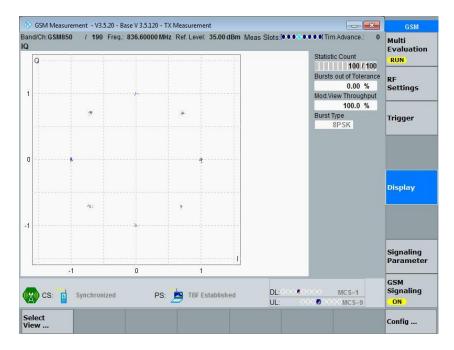




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#### 3.1.1.2. Test Mode = GSM/TM2

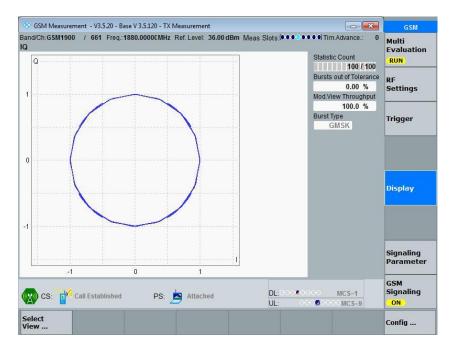
#### 3.1.1.2.1. Test Channel = MCH



#### 3.1.2. Test BAND = GSM 1900

#### 3.1.2.1. Test Mode = GSM/TM1

#### 3.1.2.1.1. Test Channel = MCH

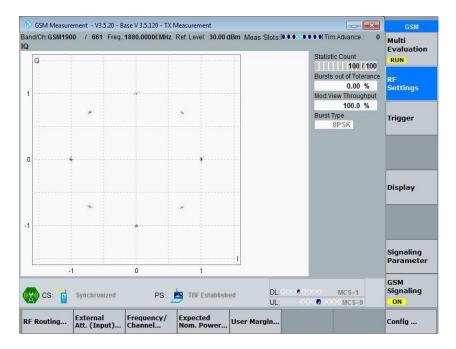




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#### 3.1.2.2. Test Mode = GSM/TM2

#### 3.1.2.2.1. Test Channel = MCH



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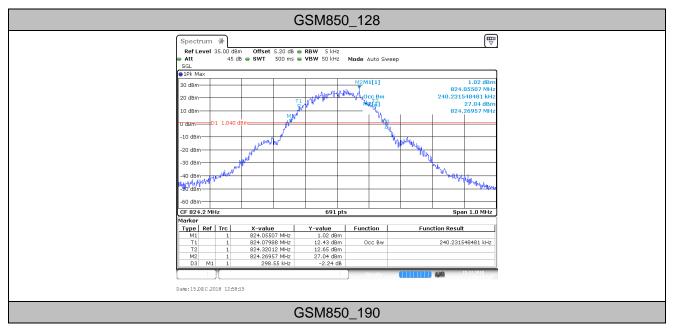
# 4. 26dB Bandwidth and Occupied Bandwidth

#### 4.1.Test Result

SG

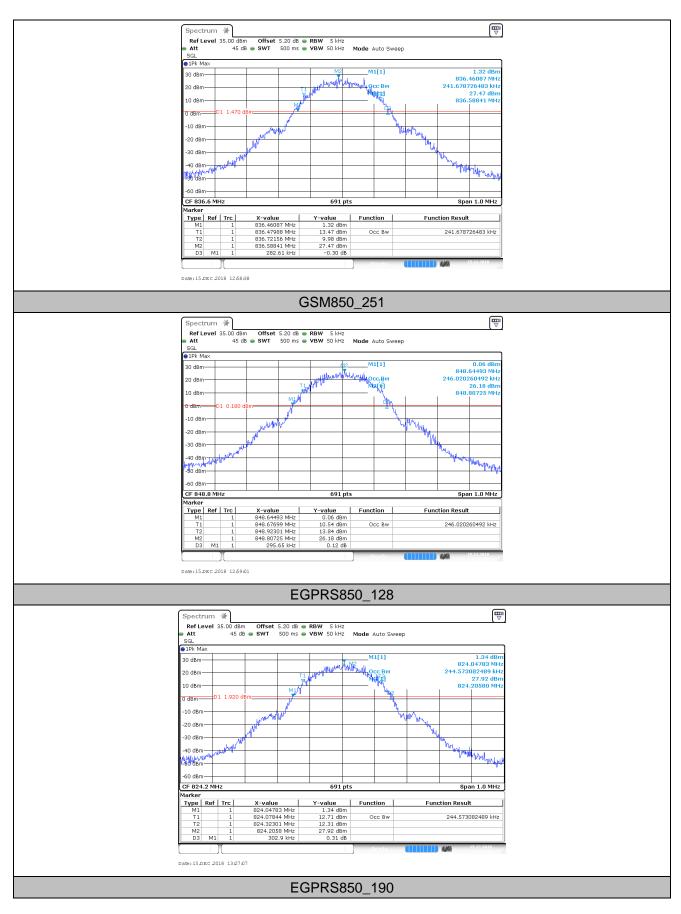
BAND	Channel	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)	Limit(kHz)	Verdict
GSM850	128	240.23	298.55		PASS
GSM850	190	241.68	282.61		PASS
GSM850	251	246.02	295.65		PASS
EGPRS850	128	244.57	302.9		PASS
EGPRS850	190	243.13	315.9		PASS
EGPRS850	251	243.13	305.8		PASS
GSM1900	512	244.57	301.45		PASS
GSM1900	661	247.47	307.25		PASS
GSM1900	810	244.57	311.59		PASS
EGPRS1900	512	244.57	305.80		PASS
EGPRS1900	661	246.02	291.30		PASS
EGPRS1900	810	244.57	295.65		PASS

#### 4.2. Test Plots



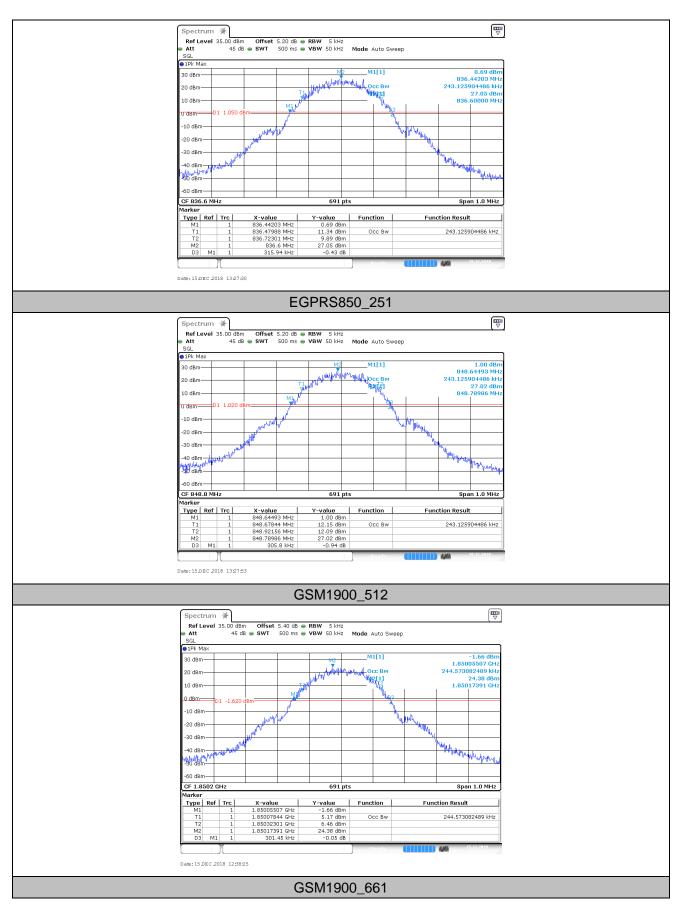


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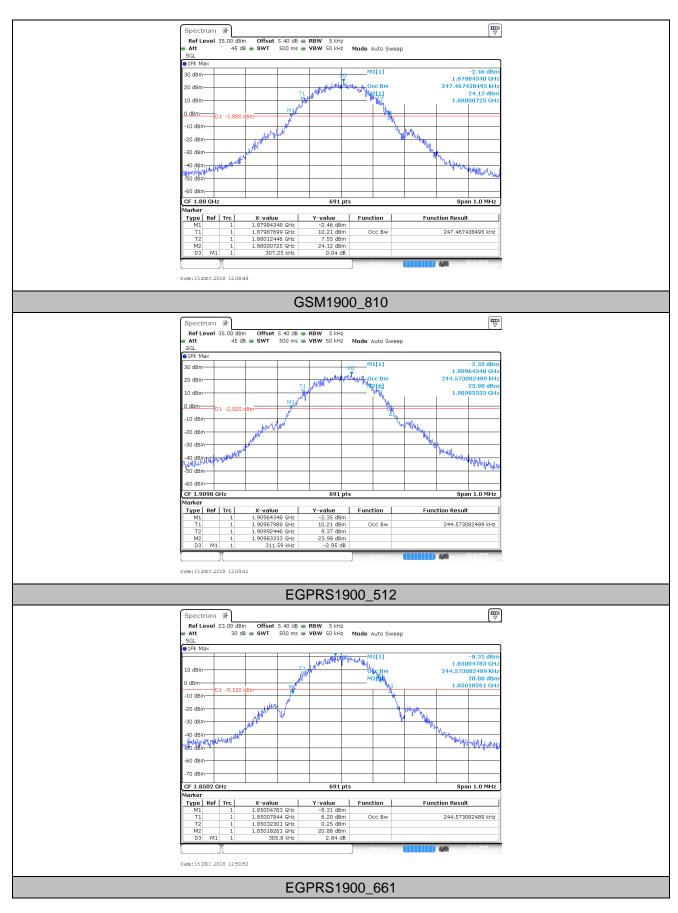


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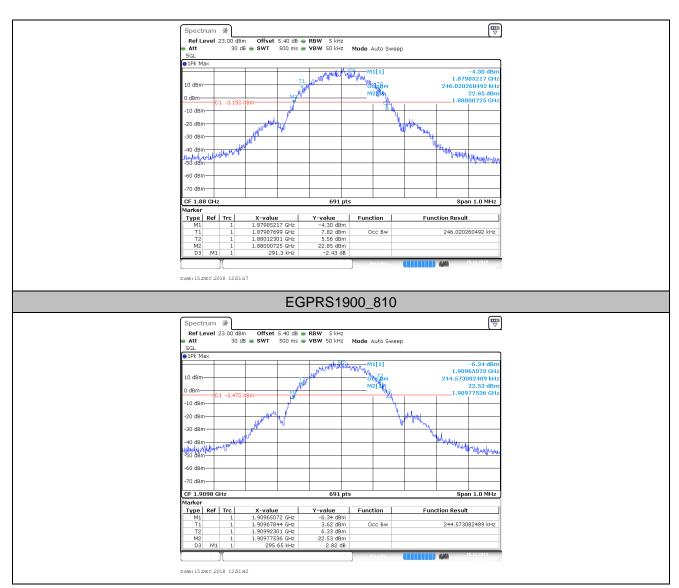


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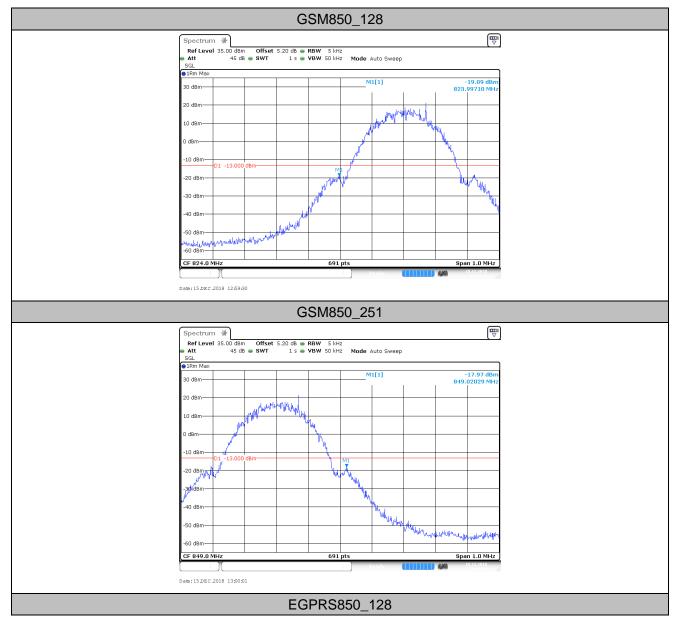




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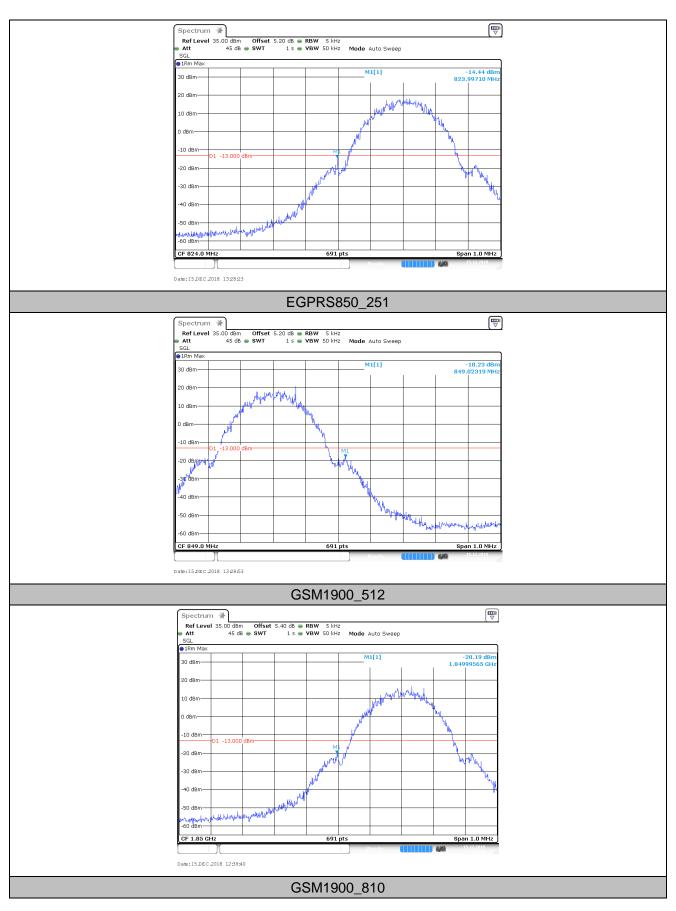
# 5. Band Edge Compliance

#### 5.1.Test Plots



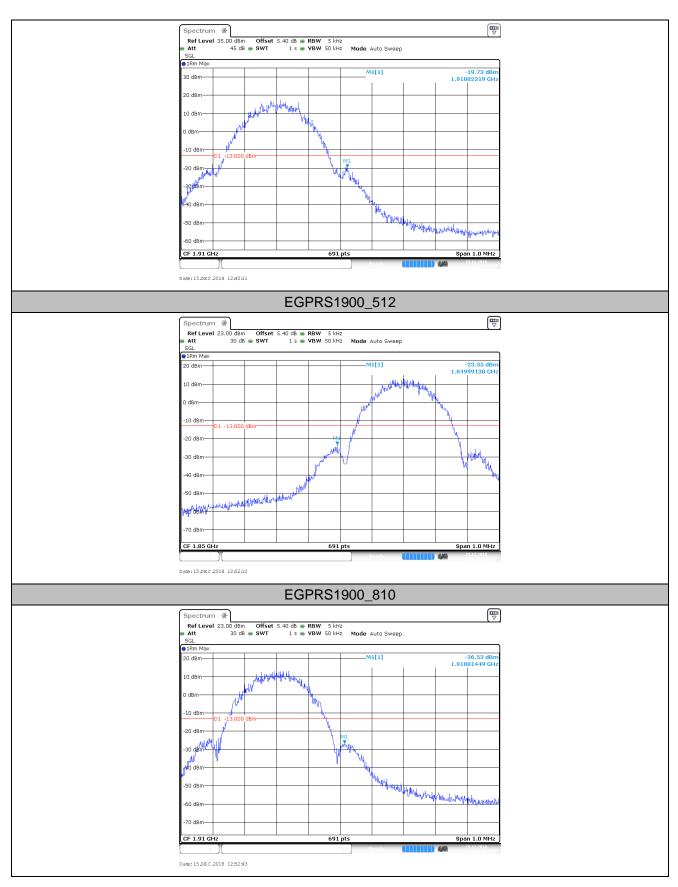


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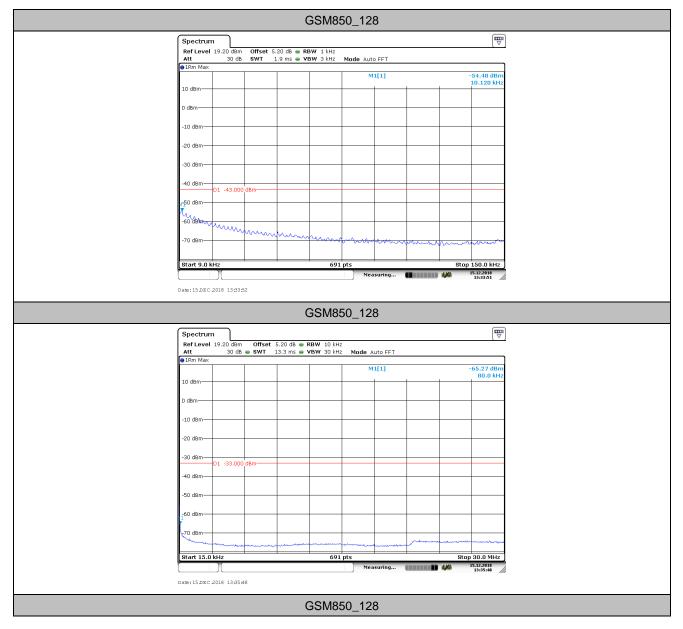
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### 6. Spurious Emission at Antenna Terminal

Remark1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of < RBW/2 so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = k \* (Span / RBW)" with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

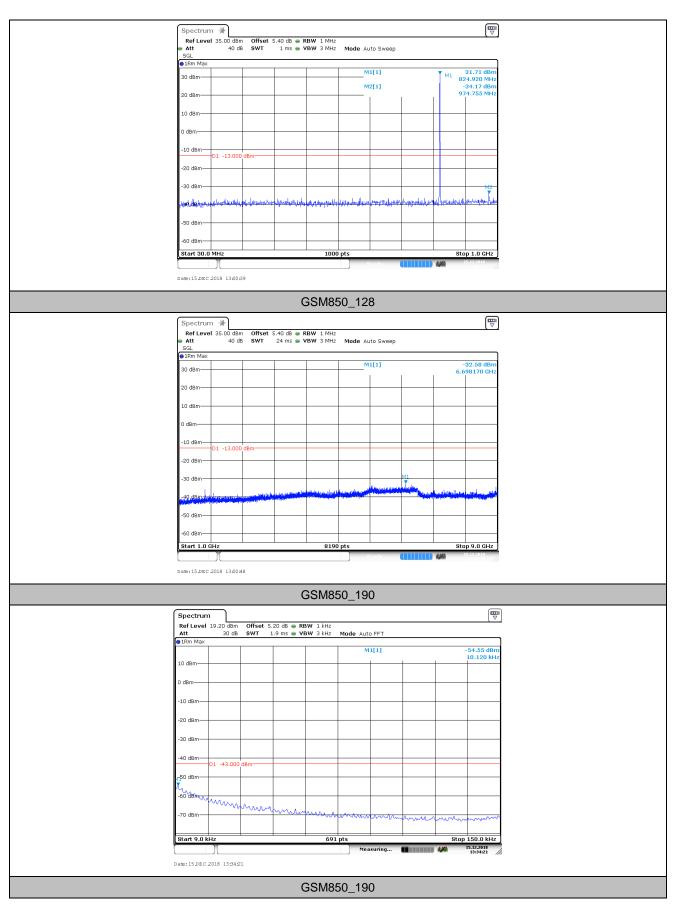
Remark2: only the worst case data displayed in this report.

#### 6.1. Test Plots



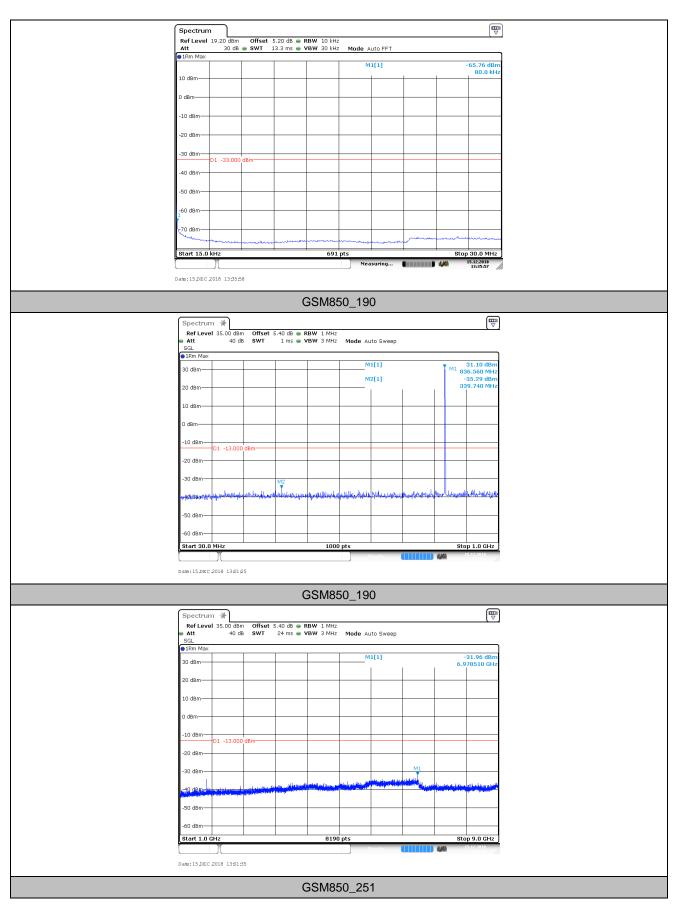


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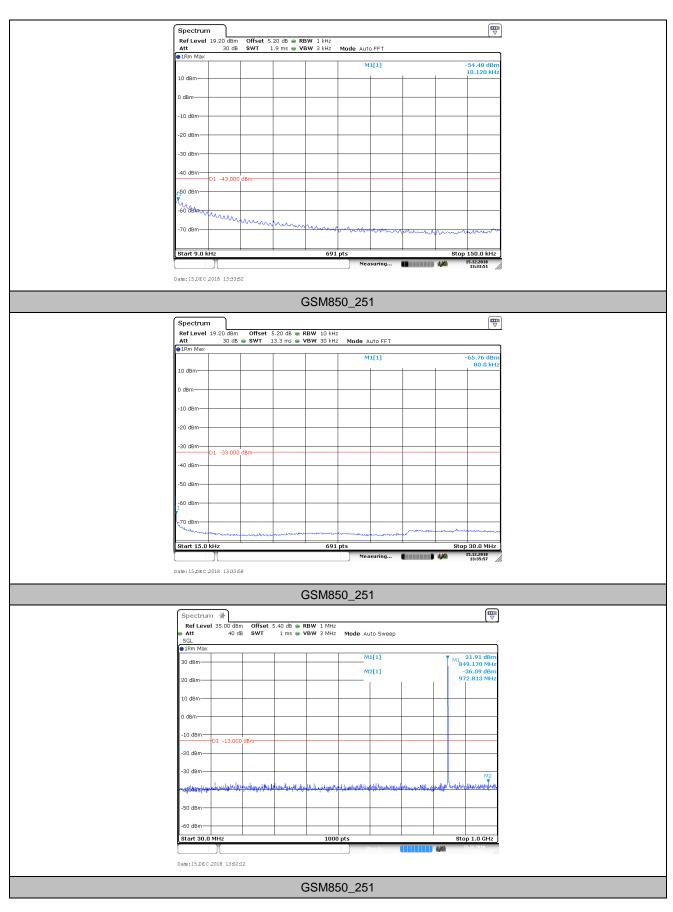


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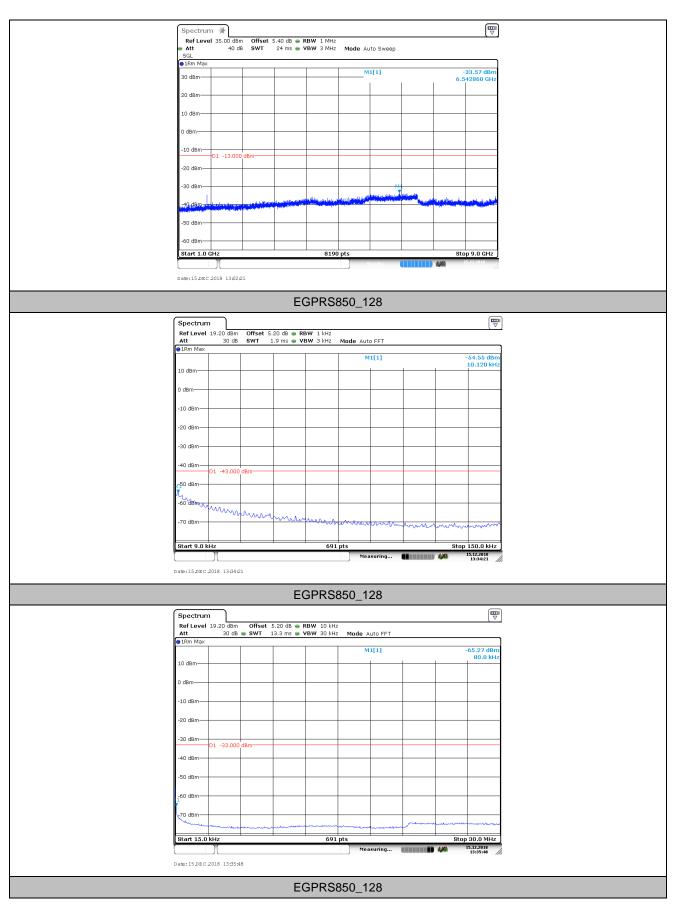


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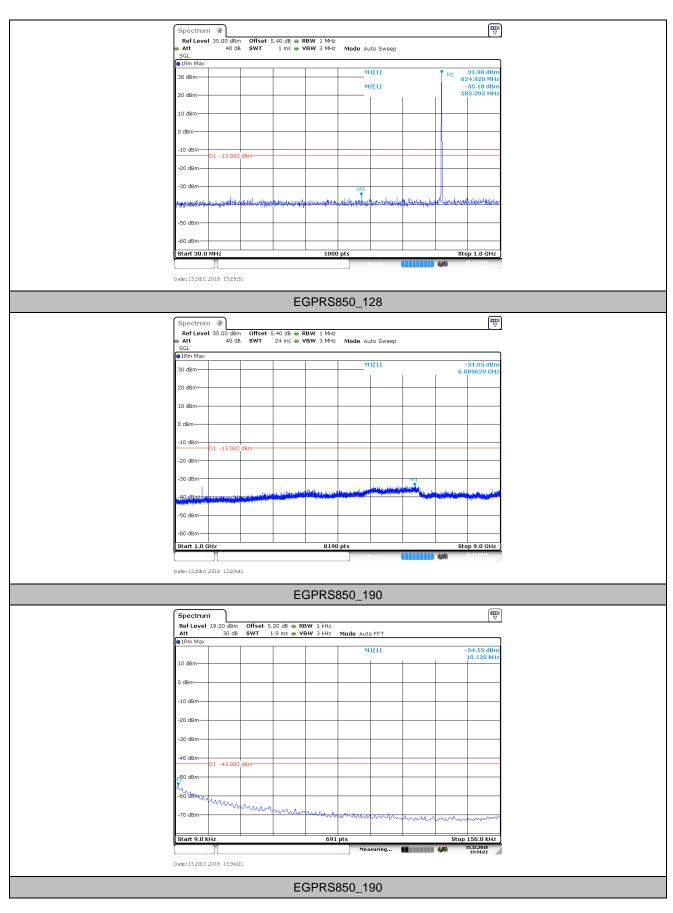


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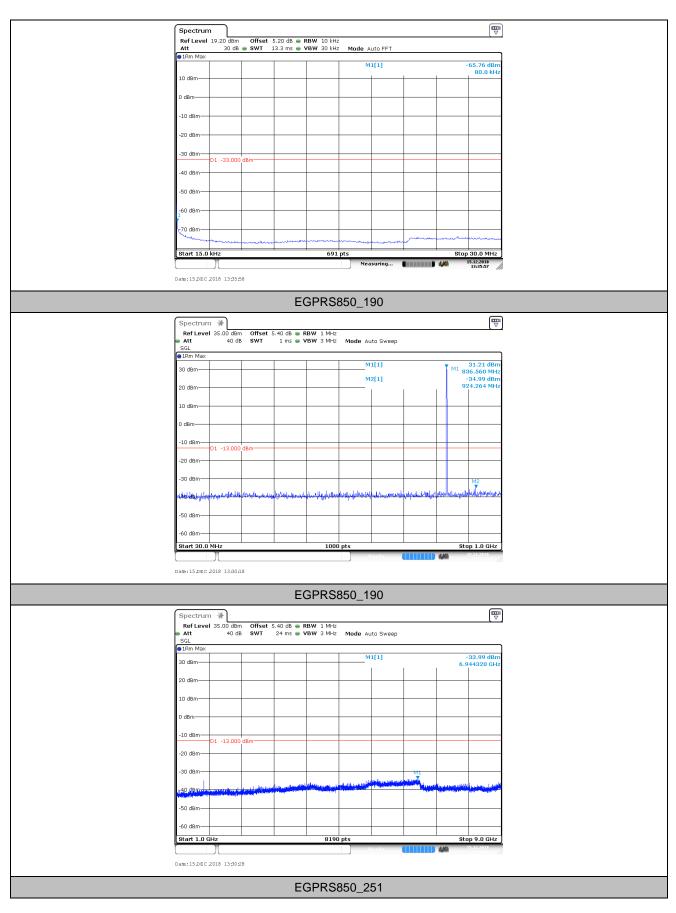


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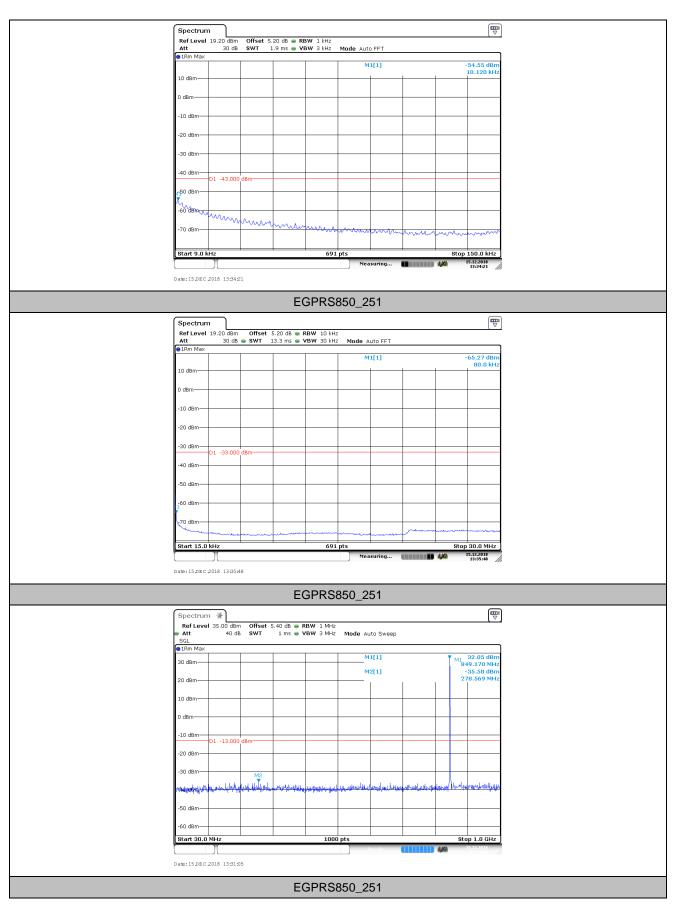


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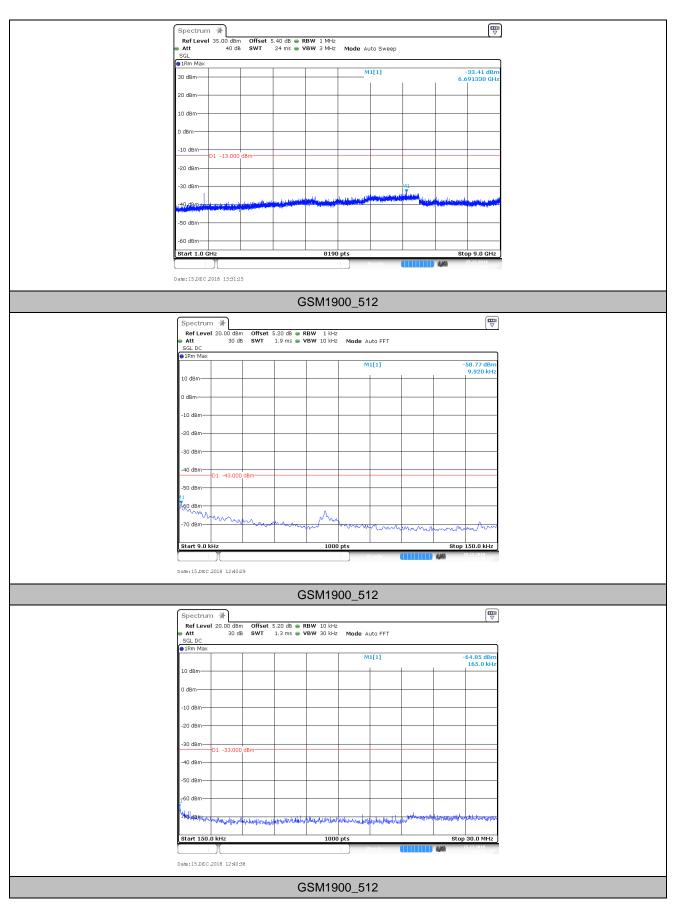


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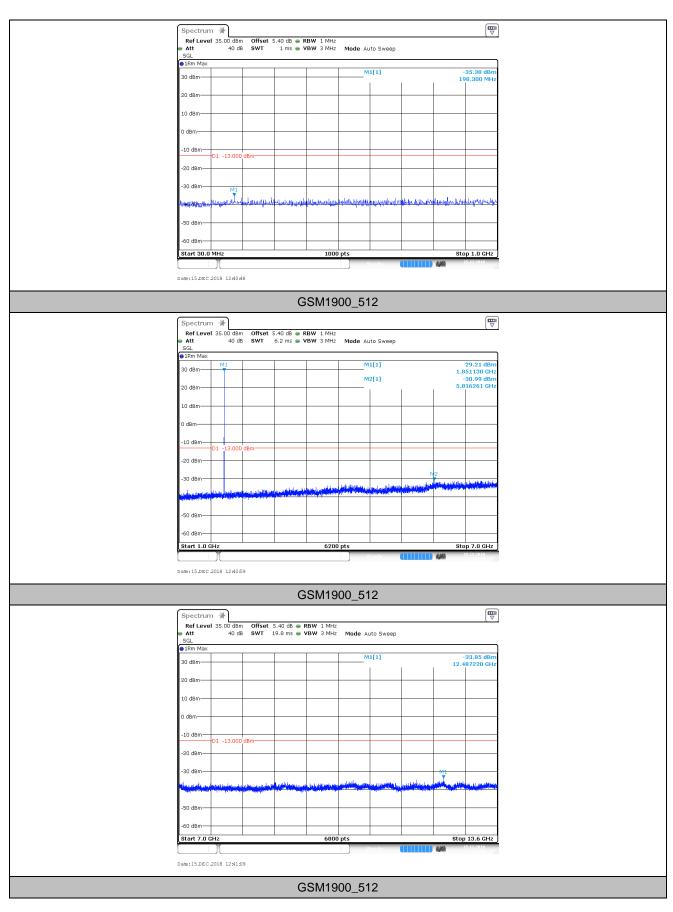


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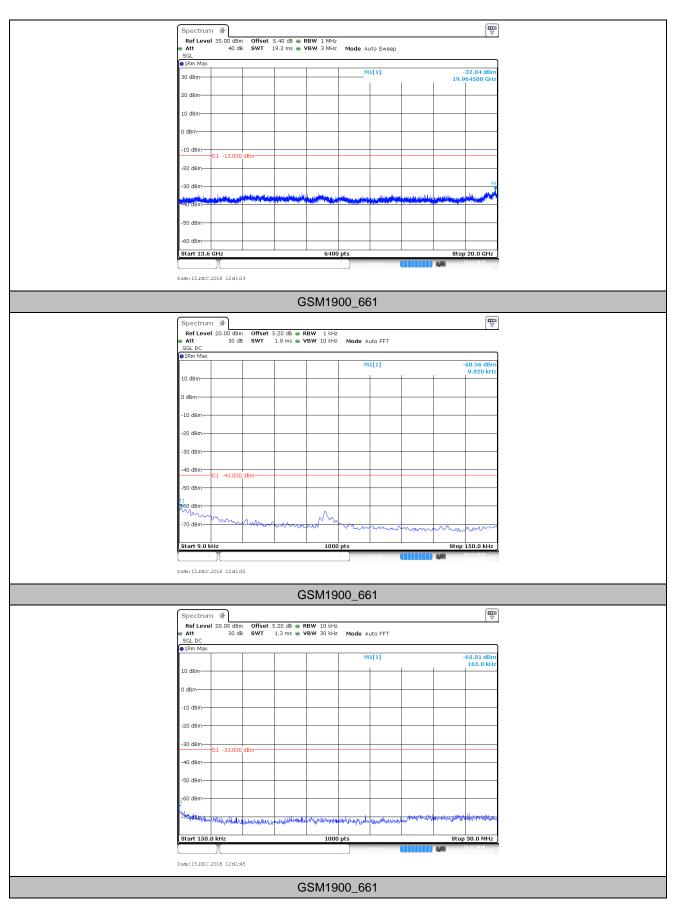


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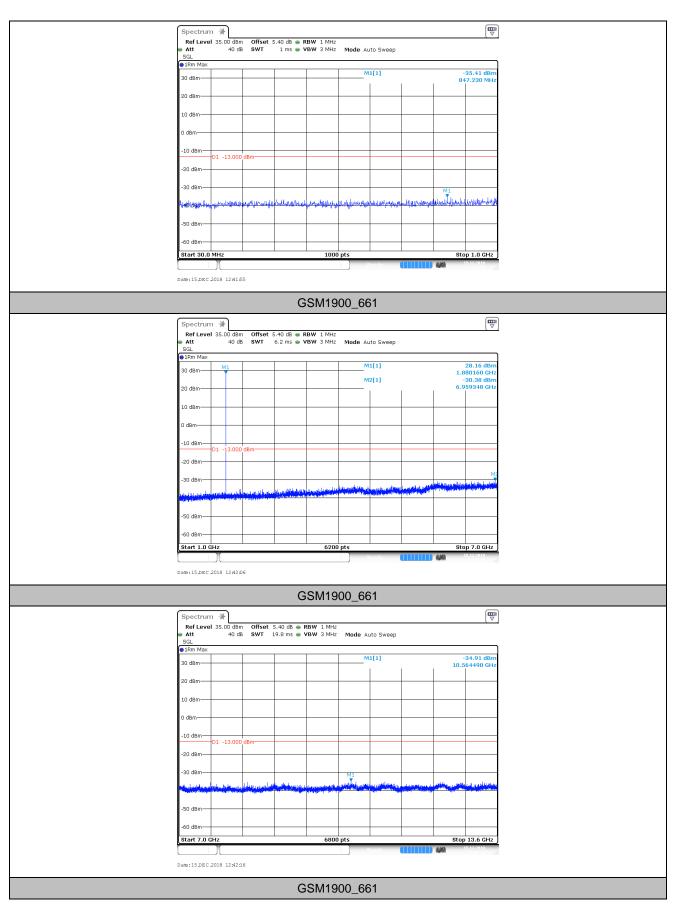


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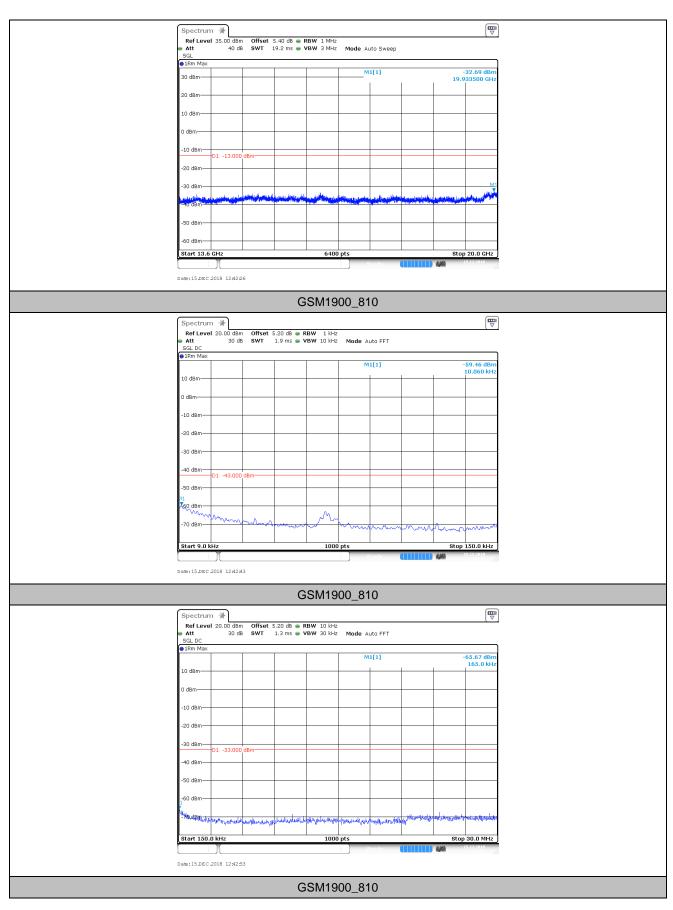


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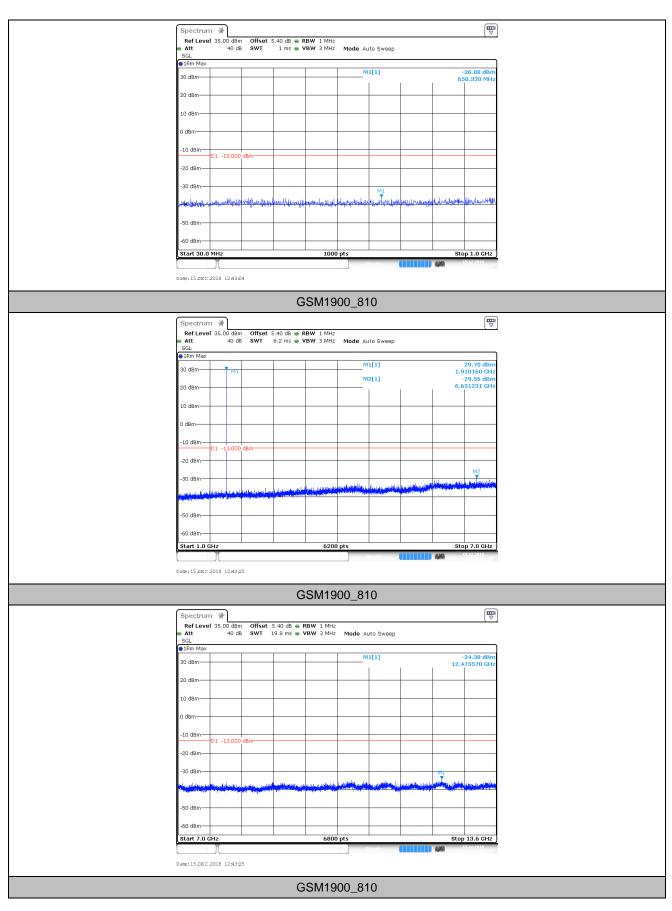


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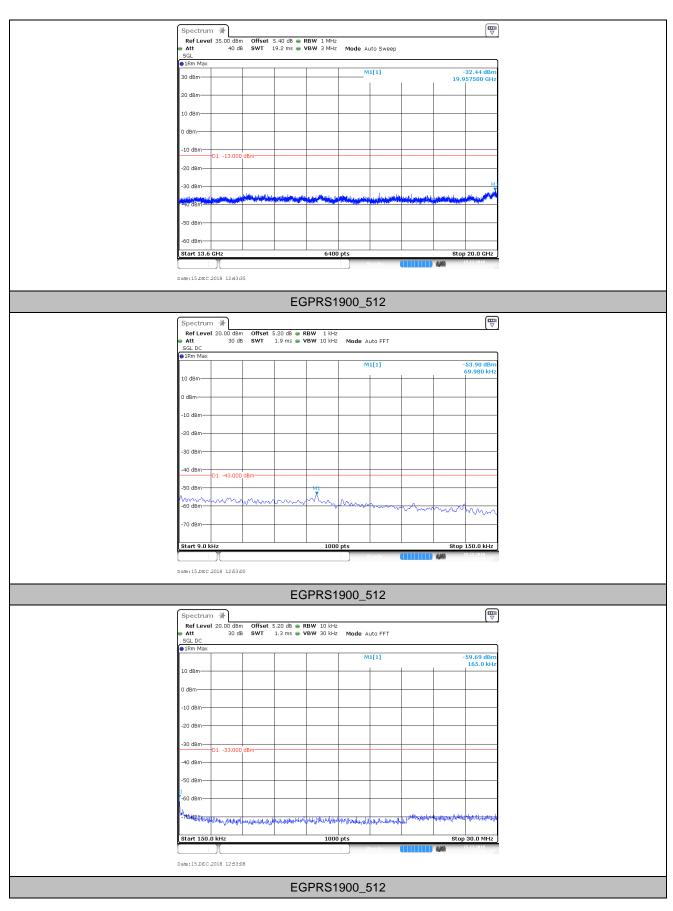


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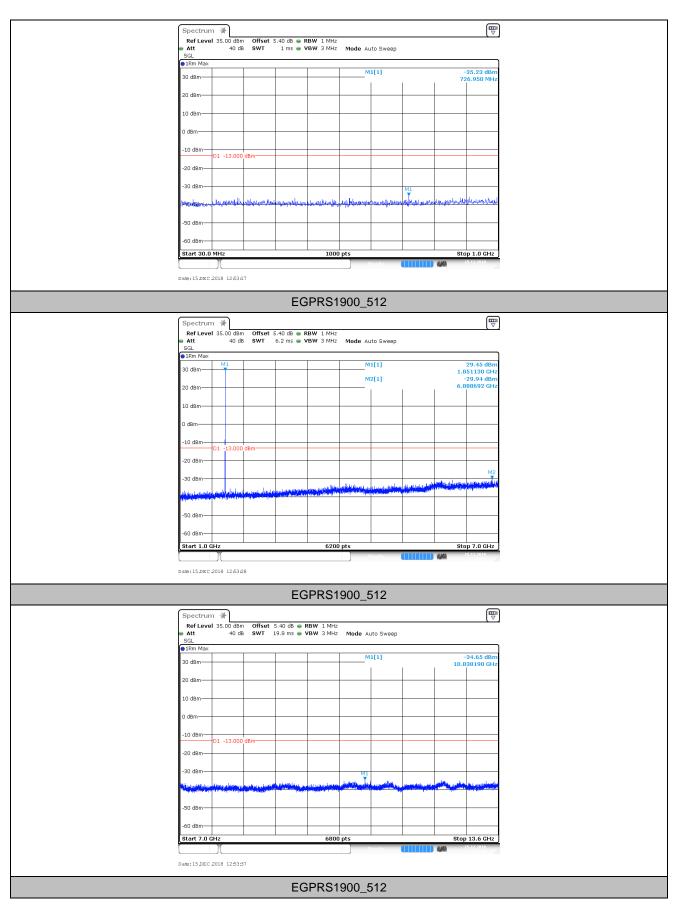


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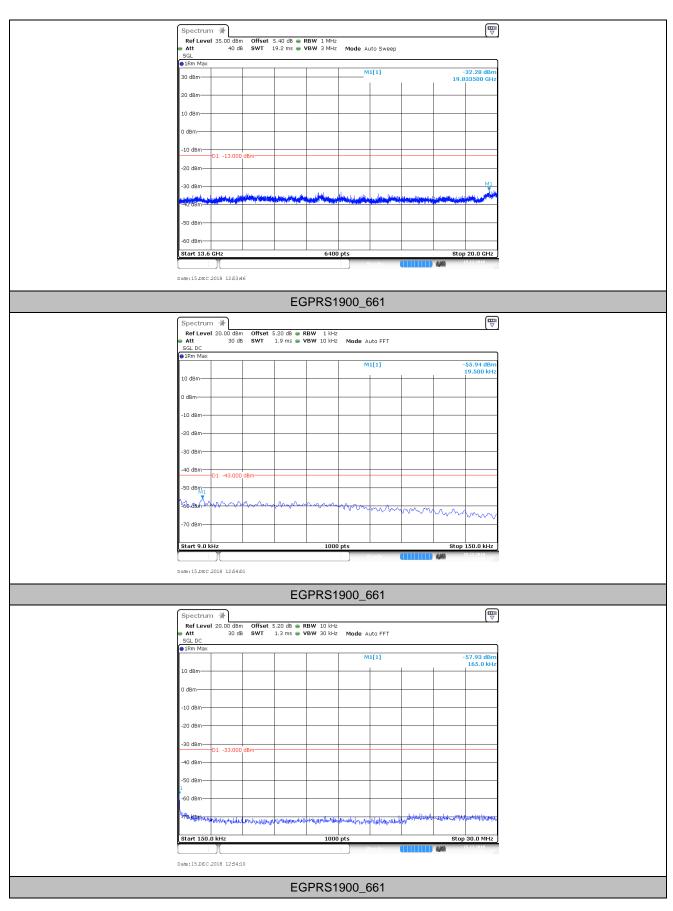


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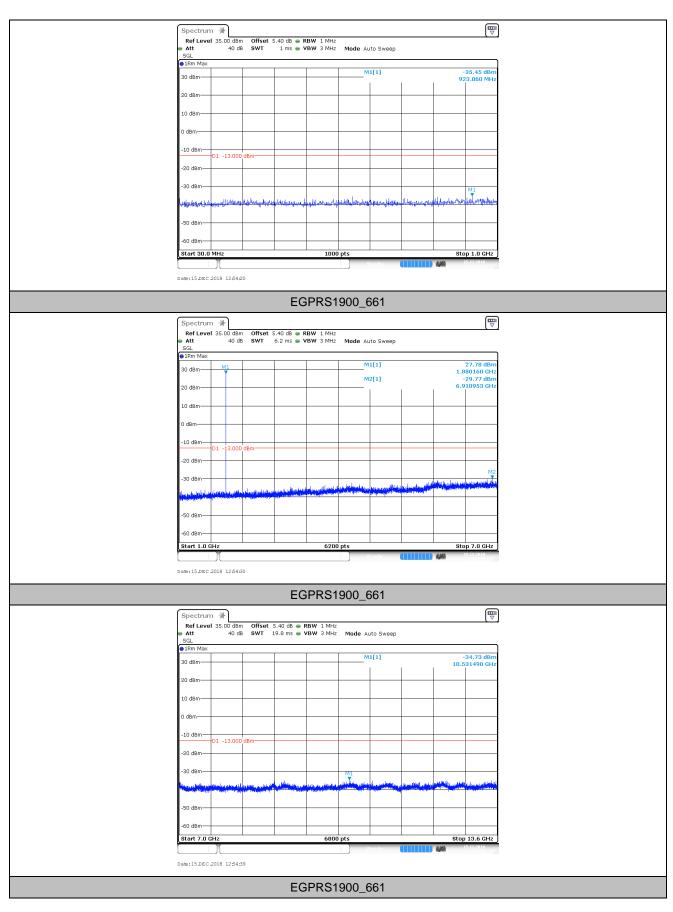


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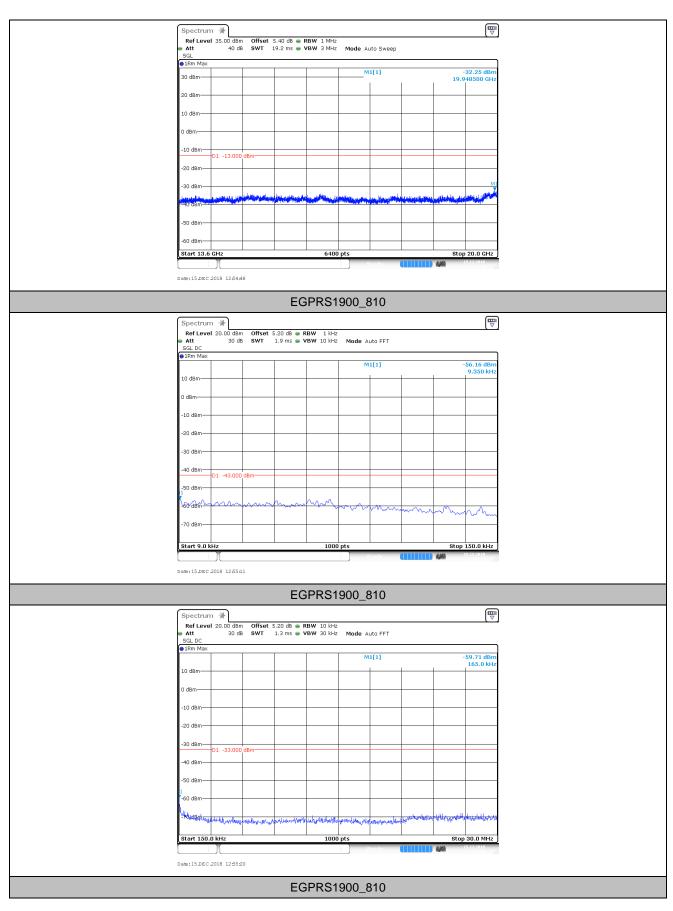


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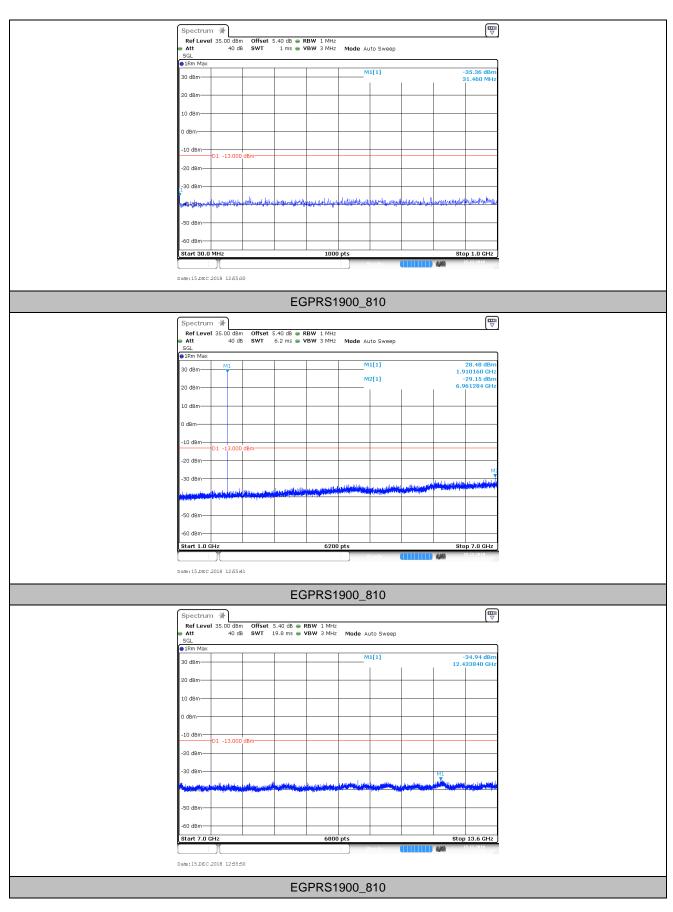


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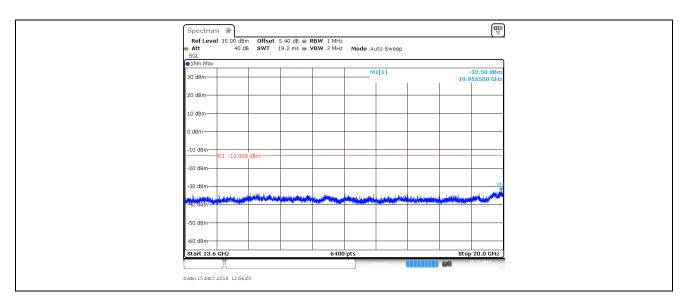


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### 7. Field Strength of Spurious Radiation

#### 7.1. Test Band = GSM 1900

S

#### 7.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
73.456000	-68.79	-13.00	55.79	Vertical
131.898500	-66.01	-13.00	53.01	Vertical
449.961500	-74.01	-13.00	61.01	Vertical
3996.450000	-55.69	-13.00	42.69	Vertical
5551.150000	-52.47	-13.00	39.47	Vertical
7401.250000	-44.40	-13.00	31.40	Vertical
62.058500	-68.82	-13.00	55.82	Horizontal
131.995500	-67.67	-13.00	54.67	Horizontal
437.497000	-72.84	-13.00	59.84	Horizontal
4138.550000	-54.72	-13.00	41.72	Horizontal
5549.750000	-44.97	-13.00	31.97	Horizontal
7401.250000	-28.69	-13.00	15.69	Horizontal

### 7.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
73.213500	-68.75	-13.00	55.75	Vertical
131.365000	-66.14	-13.00	53.14	Vertical
549.968500	-73.83	-13.00	60.83	Vertical
3759.500000	-56.84	-13.00	43.84	Vertical
6056.200000	-53.36	-13.00	40.36	Vertical
7520.250000	-50.14	-13.00	37.14	Vertical
61.476500	-69.85	-13.00	56.85	Horizontal
132.044000	-67.48	-13.00	54.48	Horizontal
550.017000	-71.93	-13.00	58.93	Horizontal
3760.200000	-56.69	-13.00	43.69	Horizontal
5640.050000	-39.44	-13.00	26.44	Horizontal
7519.900000	-34.28	-13.00	21.28	Horizontal

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Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
73.456000	-68.96	-13.00	55.96	Vertical	
125.981500	-66.36	-13.00	53.36	Vertical	
550.065500	-73.21	-13.00	60.21	Vertical	
3820.050000	-52.00	-13.00	39.00	Vertical	
5729.300000	-51.26	-13.00	38.26	Vertical	
8881.750000	-52.80	-13.00	39.80	Vertical	
61.961500	-68.48	-13.00	55.48	Horizontal	
132.189500	-67.99	-13.00	54.99	Horizontal	
437.497000	-73.56	-13.00	60.56	Horizontal	
3819.000000	-53.17	-13.00	40.17	Horizontal	
5729.650000	-37.47	-13.00	24.47	Horizontal	
7639.250000	-37.08	-13.00	24.08	Horizontal	

### 7.1.3. Test Channel = HCH

#### 7.2. Test Band = GSM 850

#### 7.2.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
73.019500	-69.38	-13.00	56.38	Vertical
132.577500	-67.17	-13.00	54.17	Vertical
1648.050000	-41.84	-13.00	28.84	Vertical
2472.525000	-37.51	-13.00	24.51	Vertical
4045.450000	-54.91	-13.00	41.91	Vertical
6150.000000	-54.71	-13.00	41.71	Vertical
62.058500	-70.08	-13.00	57.08	Horizontal
131.898500	-68.38	-13.00	55.38	Horizontal
1648.200000	-49.69	-13.00	36.69	Horizontal
2472.675000	-41.54	-13.00	28.54	Horizontal
4121.750000	-53.73	-13.00	40.73	Horizontal
7417.700000	-42.77	-13.00	29.77	Horizontal

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### 7.2.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
72.631500	-69.29	-13.00	56.29	Vertical
131.947000	-66.81	-13.00	53.81	Vertical
1673.100000	-39.32	-13.00	26.32	Vertical
2509.650000	-36.71	-13.00	23.71	Vertical
3346.850000	-50.19	-13.00	37.19	Vertical
8885.250000	-51.78	-13.00	38.78	Vertical
60.943000	-69.96	-13.00	56.96	Horizontal
131.898500	-68.76	-13.00	55.76	Horizontal
1673.250000	-41.27	-13.00	28.27	Horizontal
2509.875000	-37.45	-13.00	24.45	Horizontal
3346.500000	-52.35	-13.00	39.35	Horizontal
7528.650000	-41.43	-13.00	28.43	Horizontal

### 7.2.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
73.650000	-68.73	-13.00	55.73	Vertical
132.141000	-66.32	-13.00	53.32	Vertical
1697.175000	-43.72	-13.00	30.72	Vertical
2546.325000	-39.21	-13.00	26.21	Vertical
3395.150000	-53.67	-13.00	40.67	Vertical
5985.150000	-54.65	-13.00	41.65	Vertical
61.864500	-70.33	-13.00	57.33	Horizontal
131.850000	-68.33	-13.00	55.33	Horizontal
1697.325000	-45.49	-13.00	32.49	Horizontal
2546.400000	-41.83	-13.00	28.83	Horizontal
3395.150000	-54.97	-13.00	41.97	Horizontal
7638.900000	-45.34	-13.00	32.34	Horizontal

Remark:

1) The disturbance above 12.75GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the worst case data had been displayed.

2) We have tested all modulation and all Bandwidth, but only the worst case data presented in this report.

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### 8. Frequency Stability

SG

#### 8.1. Frequency Error Vs Voltage

Voltage								
BAND	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict	
GSM850	128	VL	TN	-2.91	-0.003527	±2.5	PASS	
GSM850	128	VN	TN	0.26	0.000315	±2.5	PASS	
GSM850	128	VH	TN	8.68	0.010529	±2.5	PASS	
GSM850	190	VL	TN	-5.10	-0.006092	±2.5	PASS	
GSM850	190	VN	TN	0.07	0.000083	±2.5	PASS	
GSM850	190	VH	TN	-0.91	-0.001091	±2.5	PASS	
GSM850	251	VL	TN	-1.71	-0.002010	±2.5	PASS	
GSM850	251	VN	TN	1.64	0.001927	±2.5	PASS	
GSM850	251	VH	TN	-4.04	-0.004758	±2.5	PASS	
EGPRS850	128	VL	TN	-4.33	-0.005258	±2.5	PASS	
EGPRS850	128	VN	TN	4.04	0.004903	±2.5	PASS	
EGPRS850	128	VH	TN	7.39	0.008963	±2.5	PASS	
EGPRS850	190	VL	TN	2.56	0.003057	±2.5	PASS	
EGPRS850	190	VN	TN	-12.93	-0.015454	±2.5	PASS	
EGPRS850	190	VH	TN	9.27	0.011086	±2.5	PASS	
EGPRS850	251	VL	TN	7.87	0.009276	±2.5	PASS	
EGPRS850	251	VN	TN	3.35	0.003946	±2.5	PASS	
EGPRS850	251	VH	TN	-12.74	-0.015011	±2.5	PASS	
GSM1900	512	VL	TN	2.11	0.001143	±2.5	PASS	
GSM1900	512	VN	TN	-5.83	-0.003149	±2.5	PASS	
GSM1900	512	VH	TN	-13.40	-0.007243	±2.5	PASS	
GSM1900	661	VL	TN	4.38	0.002331	±2.5	PASS	
GSM1900	661	VN	TN	-9.49	-0.005048	±2.5	PASS	
GSM1900	661	VH	TN	13.08	0.006956	±2.5	PASS	
GSM1900	810	VL	TN	14.55	0.007621	$\pm 2.5$	PASS	
GSM1900	810	VN	TN	1.46	0.000763	$\pm 2.5$	PASS	
GSM1900	810	VH	TN	-11.35	-0.005945	±2.5	PASS	
EGPRS1900	512	VL	TN	-11.57	-0.006255	$\pm 2.5$	PASS	
EGPRS1900	512	VN	TN	7.93	0.004288	±2.5	PASS	
EGPRS1900	512	VH	TN	2.81	0.001518	±2.5	PASS	
EGPRS1900	661	VL	TN	-1.44	-0.000765	±2.5	PASS	
EGPRS1900	661	VN	TN	13.19	0.007015	±2.5	PASS	
EGPRS1900	661	VH	TN	8.91	0.004739	±2.5	PASS	
EGPRS1900	810	VL	TN	-11.28	-0.005904	±2.5	PASS	
EGPRS1900	810	VN	TN	-1.88	-0.000982	±2.5	PASS	
EGPRS1900	810	VH	TN	-11.24	-0.005884	±2.5	PASS	

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### 8.2. Frequency Error Vs Temperature

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	Temperature								
BAND	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict		
GSM850	128	VN	-30	-10.84	-0.013150	±2.5	PASS		
GSM850	128	VN	-20	0.27	0.000323	±2.5	PASS		
GSM850	128	VN	-10	2.19	0.002661	±2.5	PASS		
GSM850	128	VN	0	5.19	0.006299	±2.5	PASS		
GSM850	128	VN	10	12.16	0.014759	±2.5	PASS		
GSM850	128	VN	20	-5.95	-0.007221	±2.5	PASS		
GSM850	128	VN	30	-11.34	-0.013761	±2.5	PASS		
GSM850	128	VN	40	-5.31	-0.006440	±2.5	PASS		
GSM850	128	VN	50	-13.64	-0.016545	±2.5	PASS		
GSM850	190	VN	-30	14.73	0.017603	±2.5	PASS		
GSM850	190	VN	-20	9.56	0.011430	±2.5	PASS		
GSM850	190	VN	-10	-14.14	-0.016905	±2.5	PASS		
GSM850	190	VN	0	11.24	0.013432	±2.5	PASS		
GSM850	190	VN	10	1.20	0.001429	±2.5	PASS		
GSM850	190	VN	20	-1.41	-0.001681	±2.5	PASS		
GSM850	190	VN	30	13.56	0.016211	±2.5	PASS		
GSM850	190	VN	40	14.93	0.017848	±2.5	PASS		
GSM850	190	VN	50	-6.31	-0.007541	±2.5	PASS		
GSM850	251	VN	-30	0.96	0.001131	±2.5	PASS		
GSM850	251	VN	-20	-10.41	-0.012264	±2.5	PASS		
GSM850	251	VN	-10	-10.41	-0.012269	±2.5	PASS		
GSM850	251	VN	0	-10.86	-0.012794	±2.5	PASS		
GSM850	251	VN	10	-5.62	-0.006621	±2.5	PASS		
GSM850	251	VN	20	11.55	0.013603	±2.5	PASS		
GSM850	251	VN	30	-9.39	-0.011058	±2.5	PASS		
GSM850	251	VN	40	-0.36	-0.000428	±2.5	PASS		
GSM850	251	VN	50	-7.35	-0.008659	±2.5	PASS		
EGPRS850	128	VN	-30	-11.16	-0.013540	±2.5	PASS		
EGPRS850	128	VN	-20	8.31	0.010084	±2.5	PASS		
EGPRS850	128	VN	-10	-0.46	-0.000554	±2.5	PASS		
EGPRS850	128	VN	0	14.57	0.017675	±2.5	PASS		
EGPRS850	128	VN	10	11.69	0.014180	±2.5	PASS		
EGPRS850	128	VN	20	13.17	0.015980	±2.5	PASS		
EGPRS850	128	VN	30	3.96	0.004807	±2.5	PASS		
EGPRS850	128	VN	40	14.24	0.017281	±2.5	PASS		
EGPRS850	128	VN	50	-0.18	-0.000215	±2.5	PASS		
EGPRS850	190	VN	-30	6.69	0.007997	±2.5	PASS		
EGPRS850	190	VN	-20	3.34	0.003990	±2.5	PASS		
EGPRS850	190	VN	-10	-12.55	-0.014997	±2.5	PASS		
EGPRS850	190	VN	0	4.61	0.005506	±2.5	PASS		
EGPRS850	190	VN	10	0.58	0.000694	±2.5	PASS		
EGPRS850	190	VN	20	-11.22	-0.013413	±2.5	PASS		
EGPRS850	190	VN	30	-13.33	-0.015939	±2.5	PASS		
EGPRS850	190	VN	40	-11.80	-0.014109	±2.5	PASS		
EGPRS850	190	VN	50	-7.17	-0.008566	±2.5	PASS		

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EGPRS850	251	VN	-30	-14.68	-0.017292	±2.5	PASS
	-	VN					
EGPRS850	251		-20	-4.56	-0.005373	±2.5	PASS
EGPRS850 EGPRS850	251	VN	-10	4.11	0.004840	±2.5	PASS
	251	VN	0	8.78	0.010341	±2.5	PASS
EGPRS850	251	VN	10	-2.01	-0.002372	±2.5	PASS
EGPRS850	251	VN	20	4.37	0.005146	±2.5	PASS
EGPRS850	251	VN	30	0.13	0.000156	±2.5	PASS
EGPRS850	251	VN	40	8.19	0.009645	±2.5	PASS
EGPRS850	251	VN	50	-13.50	-0.015901	±2.5	PASS
GSM1900	512	VN	-30	-13.39	-0.007237	±2.5	PASS
GSM1900	512	VN	-20	-10.26	-0.005545	±2.5	PASS
GSM1900	512	VN	-10	-6.72	-0.003634	±2.5	PASS
GSM1900	512	VN	0	-11.51	-0.006223	±2.5	PASS
GSM1900	512	VN	10	-12.00	-0.006485	±2.5	PASS
GSM1900	512	VN	20	-3.38	-0.001827	±2.5	PASS
GSM1900	512	VN	30	1.08	0.000586	±2.5	PASS
GSM1900	512	VN	40	-10.43	-0.005636	±2.5	PASS
GSM1900	512	VN	50	-8.07	-0.004359	±2.5	PASS
GSM1900	661	VN	-30	3.24	0.001723	±2.5	PASS
GSM1900	661	VN	-20	-11.17	-0.005940	±2.5	PASS
GSM1900	661	VN	-10	3.35	0.001783	±2.5	PASS
GSM1900	661	VN	0	-1.54	-0.000817	$\pm 2.5$	PASS
GSM1900	661	VN	10	6.50	0.003458	$\pm 2.5$	PASS
GSM1900	661	VN	20	6.80	0.003619	±2.5	PASS
GSM1900	661	VN	30	-14.69	-0.007812	±2.5	PASS
GSM1900	661	VN	40	7.67	0.004078	±2.5	PASS
GSM1900	661	VN	50	0.77	0.000412	±2.5	PASS
GSM1900	810	VN	-30	-7.11	-0.003723	±2.5	PASS
GSM1900	810	VN	-20	-6.34	-0.003321	±2.5	PASS
GSM1900	810	VN	-10	8.65	0.004527	±2.5	PASS
GSM1900	810	VN	0	-10.81	-0.005658	±2.5	PASS
GSM1900	810	VN	10	-5.87	-0.003074	±2.5	PASS
GSM1900	810	VN	20	-2.63	-0.001376	±2.5	PASS
GSM1900	810	VN	30	-12.43	-0.006509	±2.5	PASS
GSM1900	810	VN	40	14.24	0.007454	±2.5	PASS
GSM1900	810	VN	50	1.11	0.000580	±2.5	PASS
EGPRS1900	512	VN	-30	5.84	0.003154	±2.5	PASS
EGPRS1900	512	VN	-20	-11.79	-0.006372	±2.5	PASS
EGPRS1900	512	VN	-10	5.46	0.002953	±2.5	PASS
EGPRS1900	512	VN	0	10.12	0.005471	±2.5	PASS
EGPRS1900	512	VN	10	6.01	0.003250	±2.5	PASS
EGPRS1900	512	VN	20	-4.07	-0.002202	±2.5	PASS
EGPRS1900	512	VN	30	14.67	0.007926	±2.5	PASS
EGPRS1900	512	VN	40	-0.92	-0.000498	±2.5	PASS
EGPRS1900	512	VN	50	8.01	0.004327	±2.5	PASS
EGPRS1900	661	VN	-30	8.44	0.004327	±2.5	PASS
EGPRS1900 EGPRS1900	661	VN	-20	11.65	0.006198	$\pm 2.5$ $\pm 2.5$	PASS
EGPRS1900 EGPRS1900	661	VN	-20	-3.04	-0.001618	±2.5 ±2.5	PASS
EGPRS1900 EGPRS1900	661	VN	-10	-3.04	-0.001618		PASS
						±2.5	
EGPRS1900	661	VN	10	8.86	0.004712	±2.5	PASS
EGPRS1900	661	VN	20	8.52	0.004533	±2.5	PASS

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EGPRS1900	661	VN	30	-5.79	-0.003079	$\pm 2.5$	PASS
EGPRS1900	661	VN	40	-2.25	-0.001195	±2.5	PASS
EGPRS1900	661	VN	50	2.42	0.001287	±2.5	PASS
EGPRS1900	810	VN	-30	4.33	0.002270	±2.5	PASS
EGPRS1900	810	VN	-20	0.51	0.000265	±2.5	PASS
EGPRS1900	810	VN	-10	-11.49	-0.006016	±2.5	PASS
EGPRS1900	810	VN	0	-5.20	-0.002723	±2.5	PASS
EGPRS1900	810	VN	10	0.11	0.000059	±2.5	PASS
EGPRS1900	810	VN	20	-10.96	-0.005739	±2.5	PASS
EGPRS1900	810	VN	30	4.45	0.002332	±2.5	PASS
EGPRS1900	810	VN	40	-4.99	-0.002614	±2.5	PASS
EGPRS1900	810	VN	50	14.62	0.007658	±2.5	PASS

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The End