Page: 1 of 50

# Appendix B

**GSM 850 & 1900** 



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Page: 2 of 50

### CONTENT

	F	Page
1.	EFFECTIVE (ISOTROPIC) RADIATED POWER OUTPUT DATA	4
	1.1. Test Result	4
2.	Peak-to-Average Ratio	6
	2.1. Test Result	6
	2.2. Part II - Test Plots	7
3.	Modulation Characteristics	13
	3.1. For GSM	13
	3.1.1. Test Band = GSM 850	13
	3.1.1.1. Test Mode = GSM/TM1	13
	3.1.1.1.1. Test Channel = MCH	13
	3.1.1.2. Test Mode = GSM/TM2	14
	3.1.1.2.1. Test Channel = MCH	14
	3.1.2. Test Band = GSM 1900	15
	3.1.2.1. Test Mode = GSM/TM1	15
	3.1.2.1.1. Test Channel = MCH	15
	3.1.2.2. Test Mode = GSM/TM2	16
	3.1.2.2.1. Test Channel = MCH	16
4.	26dB Bandwidth and Occupied Bandwidth	17
	4.1. Test Result	17
	4.2. Test Plots	17
5.	BAND EDGE COMPLIANCE	24
	5.1. Test Plots	24
6.	Spurious Emission at Antenna Terminal	29
	6.1. Test Plots	29
7.	FIELD STRENGTH OF SPURIOUS RADIATION	42
	7.1. Test Band = GSM 1900	42
	7.1.1. Test Channel = LCH	42
	7.1.2. Test Channel = MCH	42
	7.1.3. Test Channel = HCH	43
	7.2. Test Band = GSM 850	44
	7.2.1. Test Channel = LCH	44
	7.2.2. Test Channel = MCH	44
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Report No.: ZR/2020/9004101

Page: 3 of 50

	7.2.3.	Test Channel = HCH	.45
8.	FRE	QUENCY STABILITY	.46
	8.1.	Frequency Error Vs Voltage	.46
	8.2.	Frequency Error Vs Temperature	.47



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Page: 4 of 50

### 1. Effective (Isotropic) Radiated Power Output Data

#### 1.1. Test Result

2. Band	Channel	Slot	Conducted Power (dBm)	ERP (dBm)	Limit(dBm)	Verdict
GSM850	128		32.64	23.49	38.45	PASS
GSM850	190		32.60	23.45	38.45	PASS
GSM850	251		32.31	23.16	38.45	PASS
EGPRS850	128	1	26.45	17.3	38.45	PASS
EGPRS850	128	2	24.10	14.95	38.45	PASS
EGPRS850	128	3	23.48	14.33	38.45	PASS
EGPRS850	128	4	22.31	13.16	38.45	PASS
EGPRS850	190	1	26.46	17.31	38.45	PASS
EGPRS850	190	2	24.06	14.91	38.45	PASS
EGPRS850	190	3	23.40	14.25	38.45	PASS
EGPRS850	190	4	22.24	13.09	38.45	PASS
EGPRS850	251	1	26.38	17.23	38.45	PASS
EGPRS850	251	2	23.94	14.79	38.45	PASS
EGPRS850	251	3	23.29	14.14	38.45	PASS
EGPRS850	251	4	22.10	12.95	38.45	PASS

Band	Channel	Slot	Conducted Power (dBm)	EIRP (dBm)	Limit(dBm)	Verdict
GSM1900	512		29.39	23.39	33.00	PASS
GSM1900	661		29.92	23.92	33.00	PASS
GSM1900	810		30.02	24.02	33.00	PASS
EGPRS1900	512	1	24.73	18.73	33.00	PASS
EGPRS1900	512	2	22.61	16.61	33.00	PASS
EGPRS1900	512	3	21.47	15.47	33.00	PASS
EGPRS1900	512	4	20.36	14.36	33.00	PASS
EGPRS1900	661	1	25.32	19.32	33.00	PASS
EGPRS1900	661	2	23.15	17.15	33.00	PASS
EGPRS1900	661	3	22.02	16.02	33.00	PASS
EGPRS1900	661	4	20.91	14.91	33.00	PASS
EGPRS1900	810	1	25.59	19.59	33.00	PASS
EGPRS1900	810	2	23.41	17.41	33.00	PASS
EGPRS1900	810	3	22.30	16.3	33.00	PASS
EGPRS1900	810	4	21.14	15.14	33.00	PASS



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Page: 5 of 50

#### Remark:

a: For getting the EIRP (Efficient Isotropic Radiated Power), the following formula should be taken to calculate it,

ERP [dBm] = Conducted Power [dBm] + Gain [dBd]

EIRP [dBm] = Conducted Power [dBm] + Gain [dBi]



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### 2. Peak-to-Average Ratio

#### 2.1. Test Result

Band	Channel	Result(dB)	Limit(dB)	Verdict
GSM850	128	8.99	13	PASS
GSM850	190	8.93	13	PASS
GSM850	251	8.99	13	PASS
EGPRS850	128	11.88	13	PASS
EGPRS850	190	12	13	PASS
EGPRS850	251	11.74	13	PASS
GSM1900	512	8.93	13	PASS
GSM1900	661	8.96	13	PASS
GSM1900	810	8.96	13	PASS
EGPRS1900	512	11.94	13	PASS
EGPRS1900	661	12.72	13	PASS
EGPRS1900	810	12.03	13	PASS

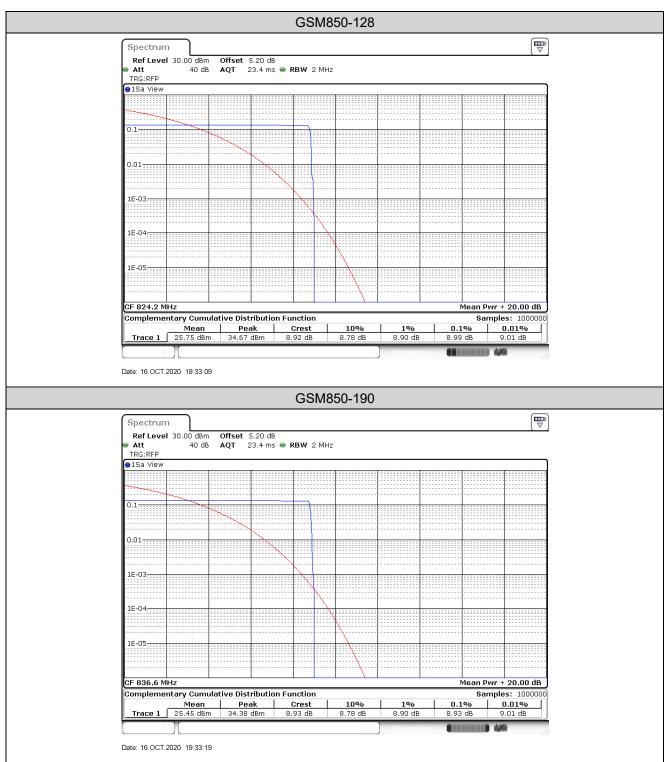


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#### 2.2. Part II - Test Plots



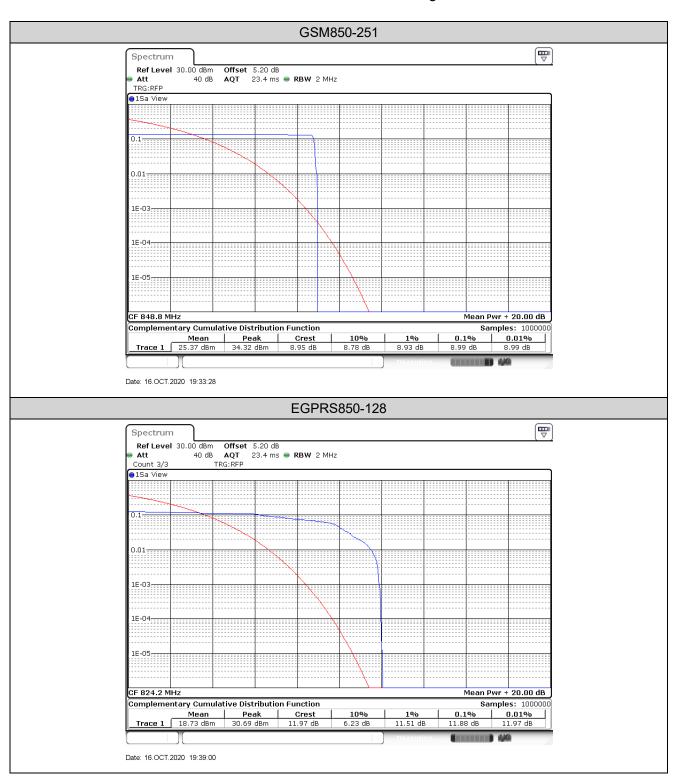


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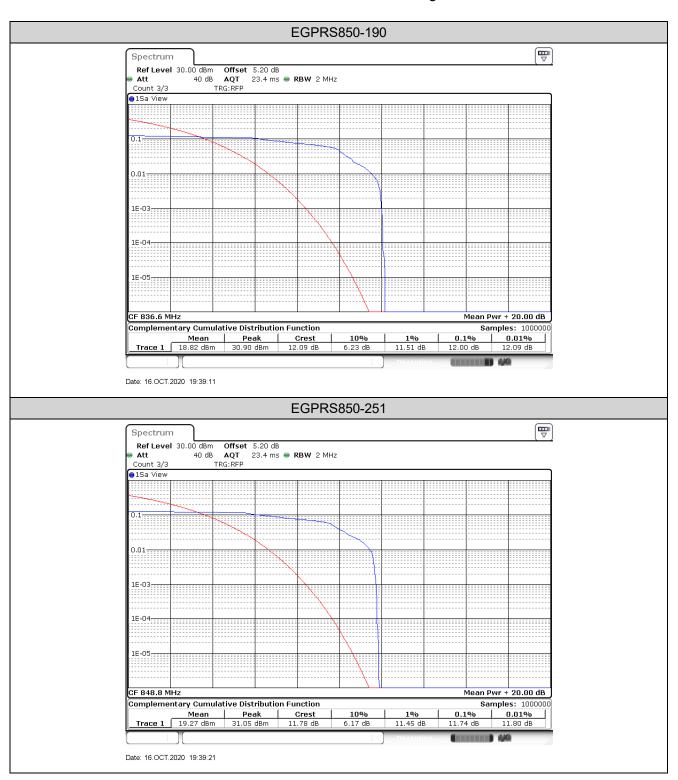
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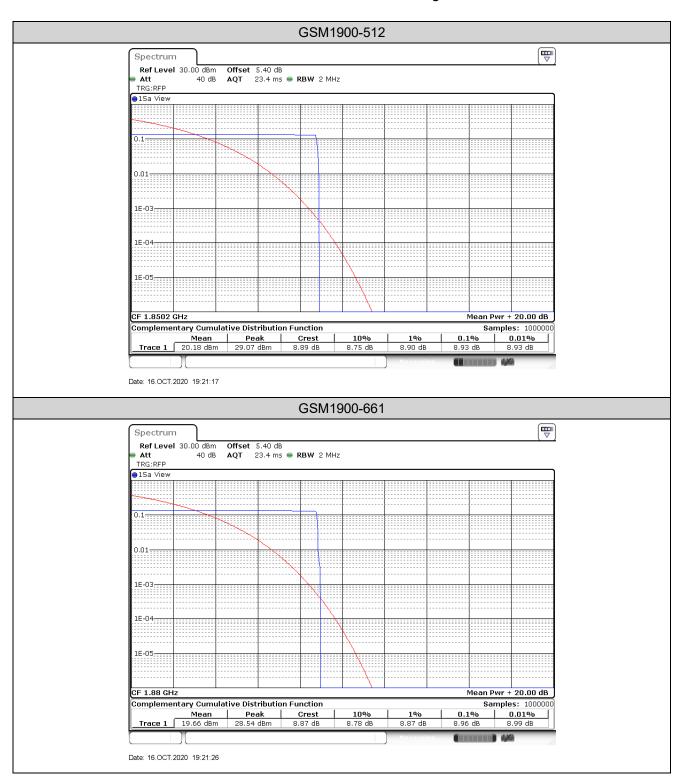
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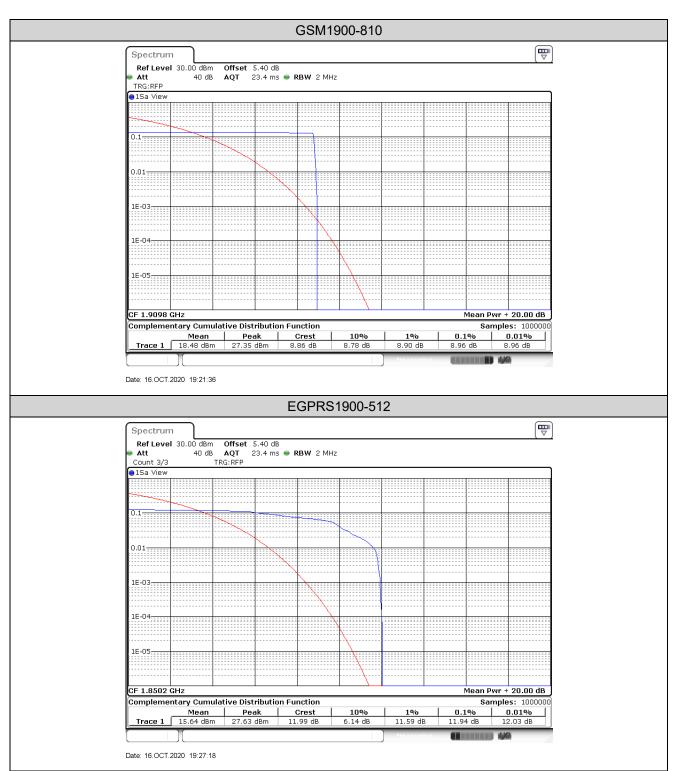
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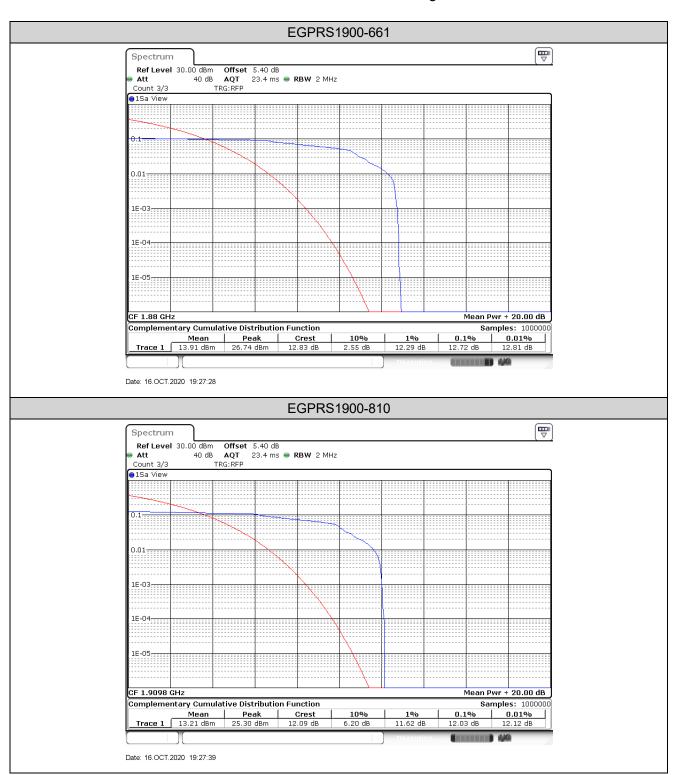
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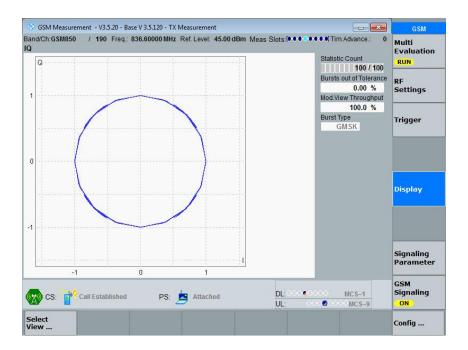
#### 3. Modulation Characteristics

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

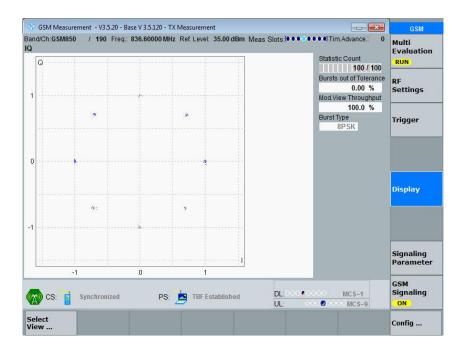




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#### 3.1.1.2. Test Mode = GSM/TM2

#### 3.1.1.2.1. Test Channel = MCH





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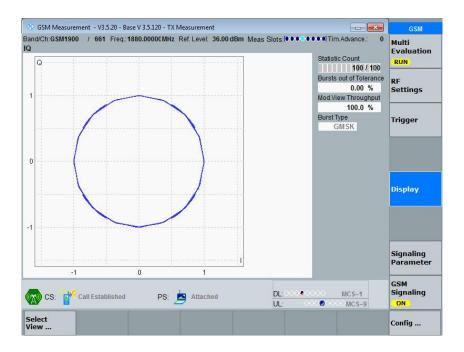
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#### 3.1.2. Test Band = GSM 1900

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

#### 3.1.2.1.1. Test Channel = MCH





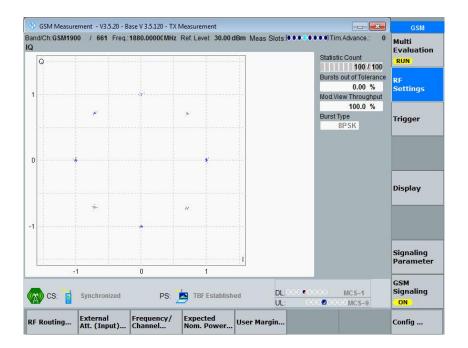
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#### 3.1.2.2. Test Mode = GSM/TM2

#### 3.1.2.2.1. Test Channel = MCH





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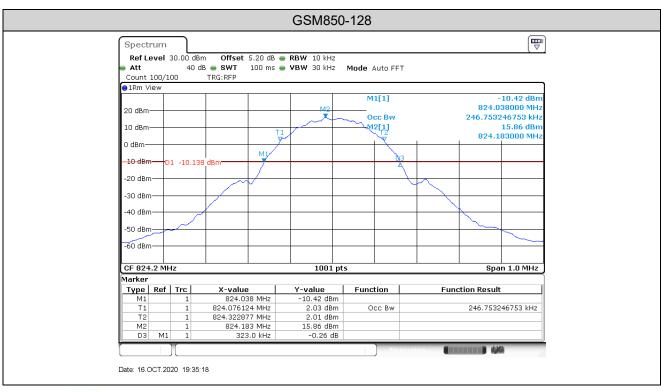
Page: 17 of 50

### 4. 26dB Bandwidth and Occupied Bandwidth

### 4.1. Test Result

Dond	Channel	Occupied	26dB Bandwidth	Limit	\/aval:at
Band		Bandwidth (MHz)	(MHz)	(MHz)	Verdict
GSM850	128	0.247	0.323		PASS
GSM850	190	0.248	0.323		PASS
GSM850	251	0.247	0.323		PASS
EGPRS850	128	0.246	0.320		PASS
EGPRS850	190	0.245	0.318		PASS
EGPRS850	251	0.245	0.317		PASS
GSM1900	512	0.247	0.323		PASS
GSM1900	661	0.247	0.322		PASS
GSM1900	810	0.249	0.323		PASS
EGPRS1900	EGPRS1900 512		0.315		PASS
EGPRS1900	661	0.244	0.317		PASS
EGPRS1900	810	0.245	0.318		PASS

#### 4.2. Test Plots





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18 of 50 Page:





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Report No.: ZR/2020/9004101

19 of 50 Page:





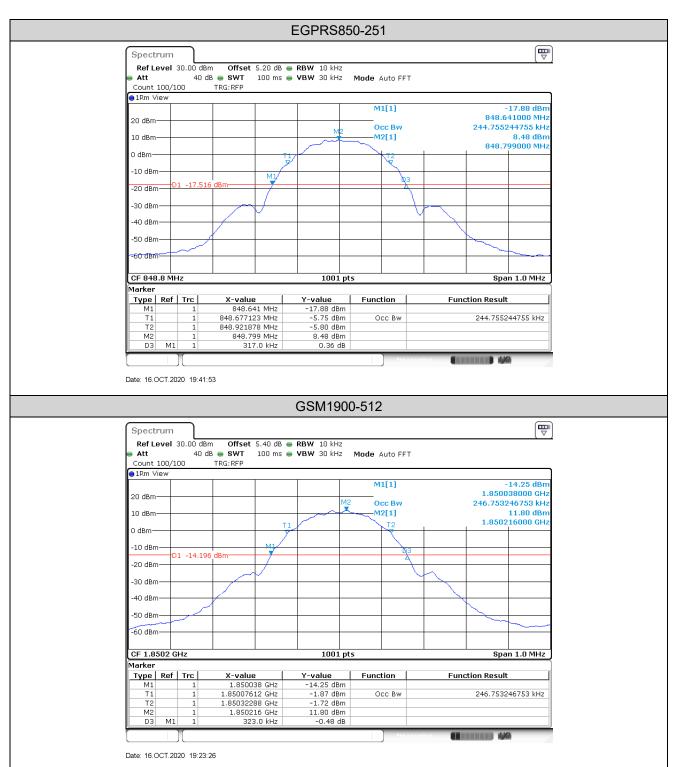
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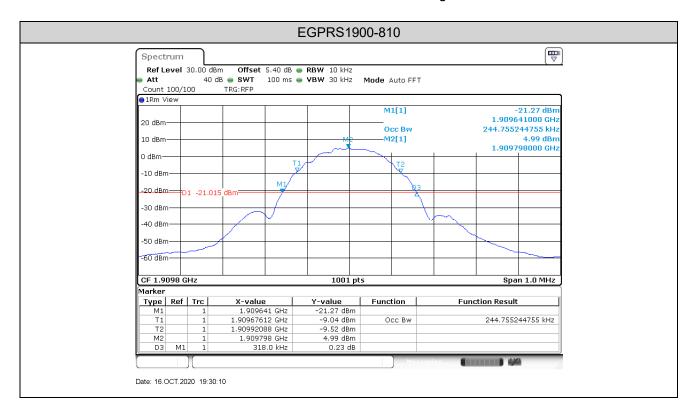
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23 of 50 Page:





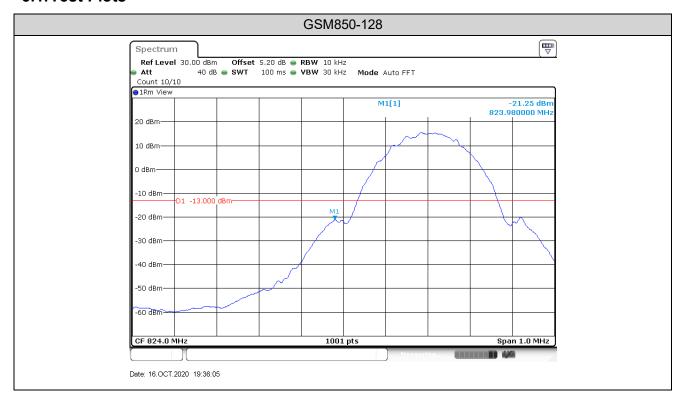
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### 5. Band Edge Compliance

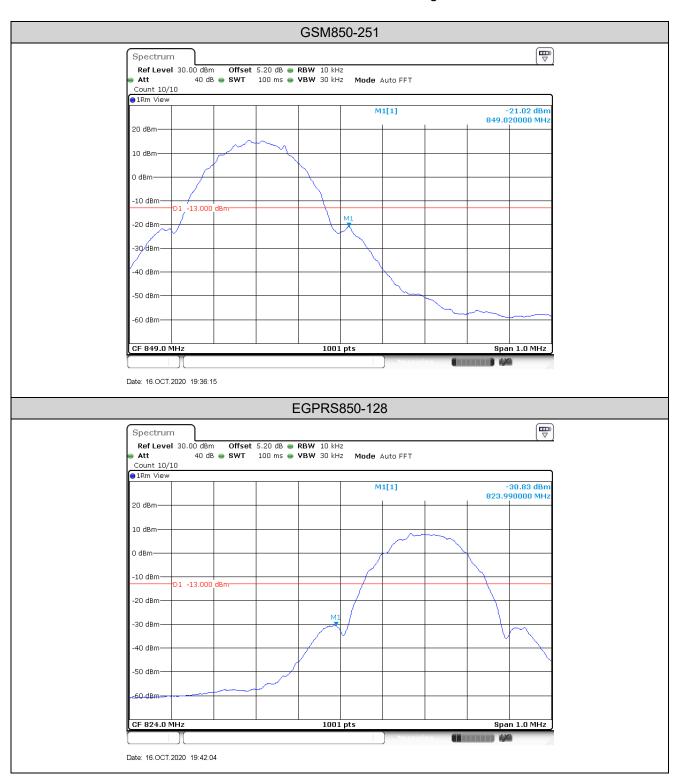
#### 5.1. Test Plots





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25 of 50 Page:





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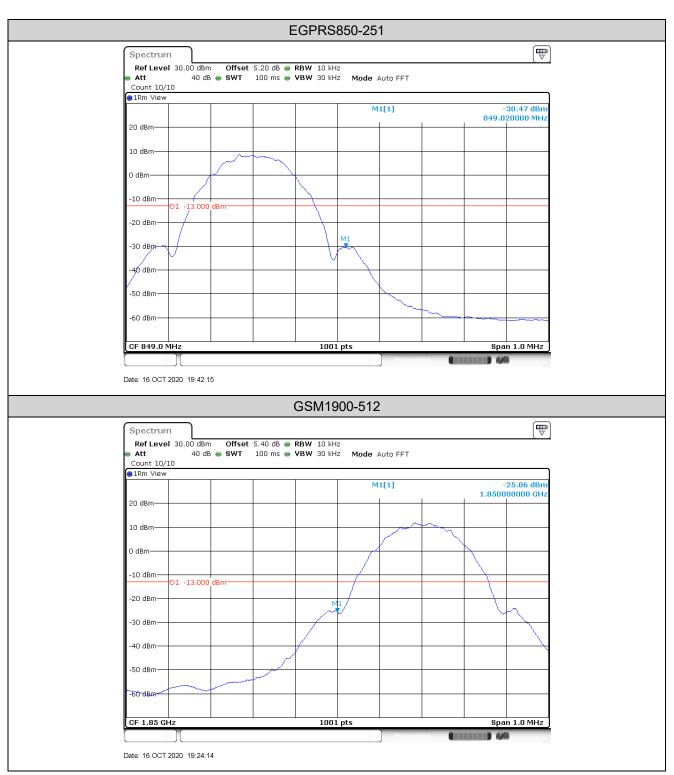
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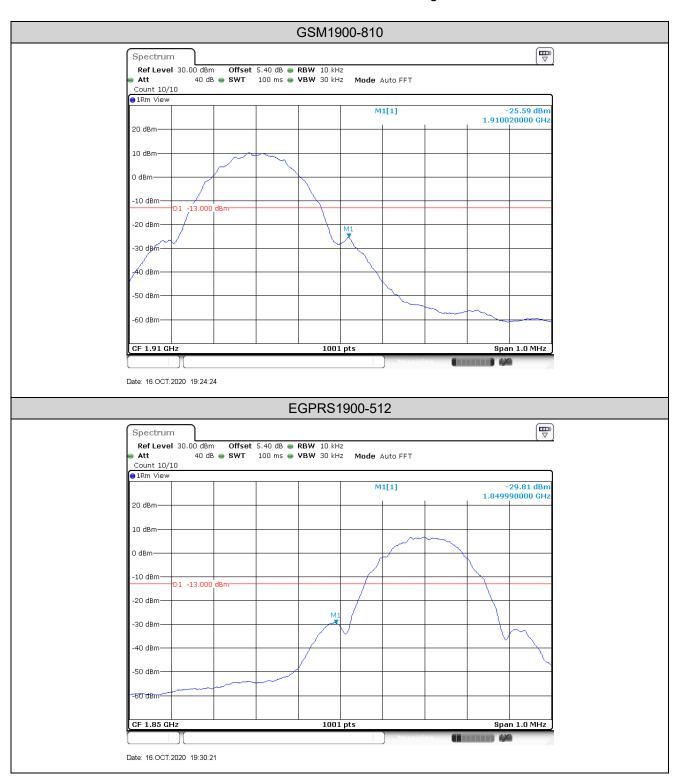
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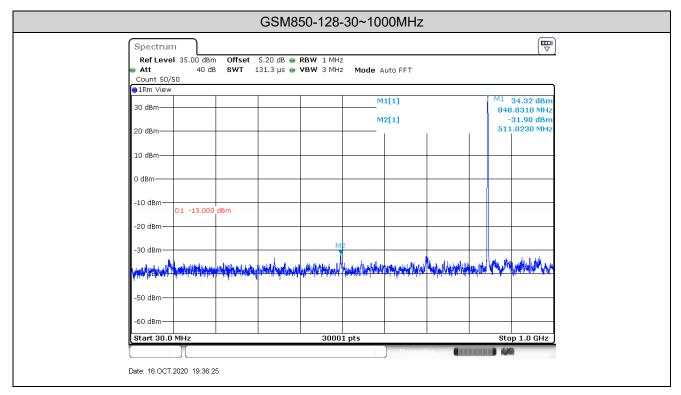
29 of 50 Page:

### 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.

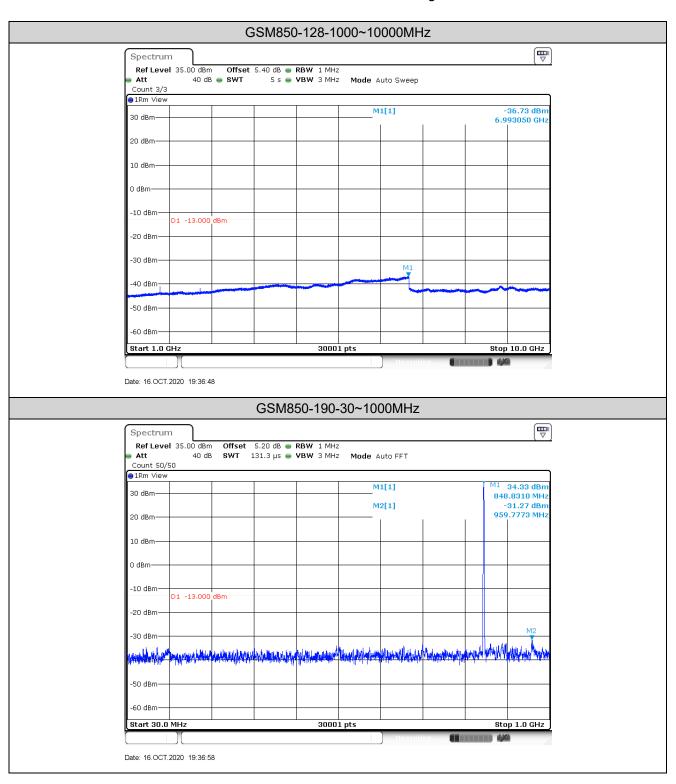
#### 6.1. Test Plots





Report No.: ZR/2020/9004101

Page: 30 of 50





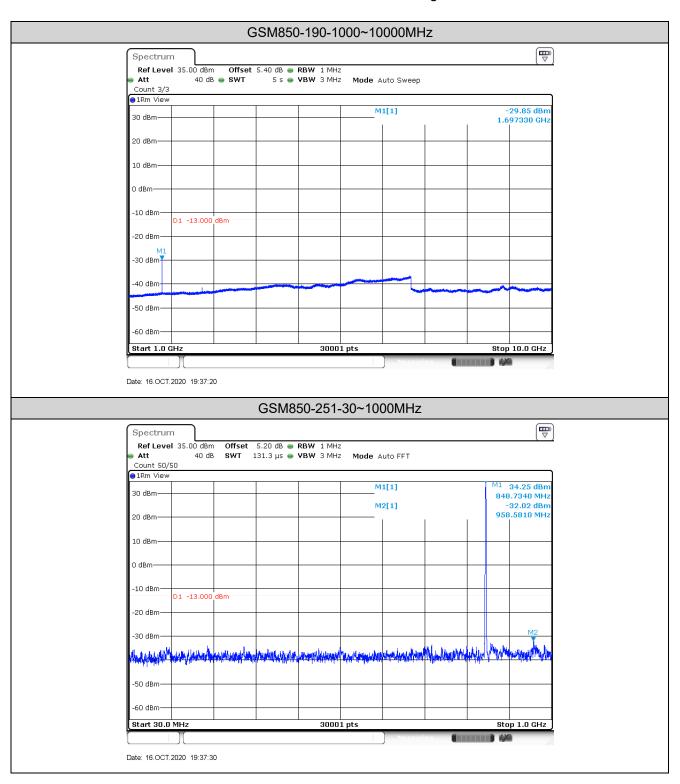
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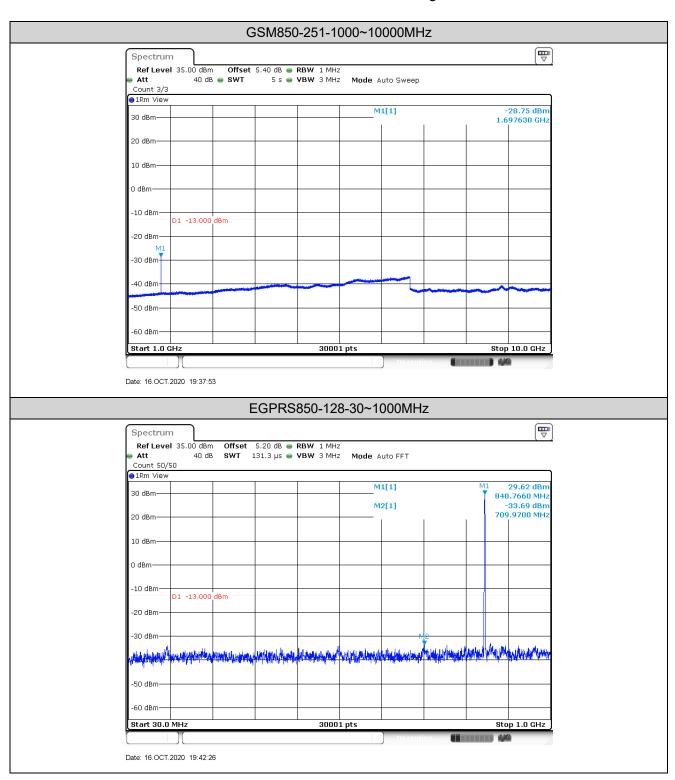
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Report No.: ZR/2020/9004101

32 of 50 Page:





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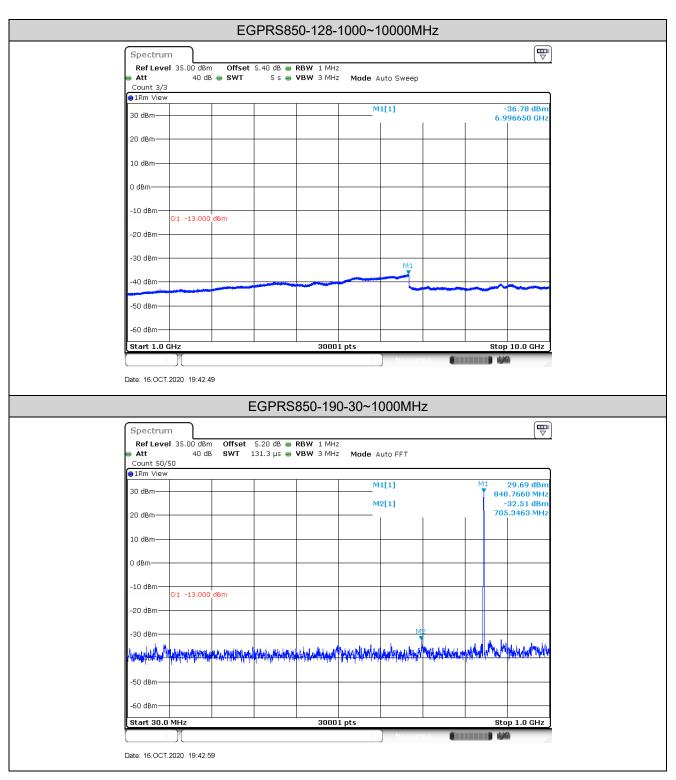
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Page: 33 of 50





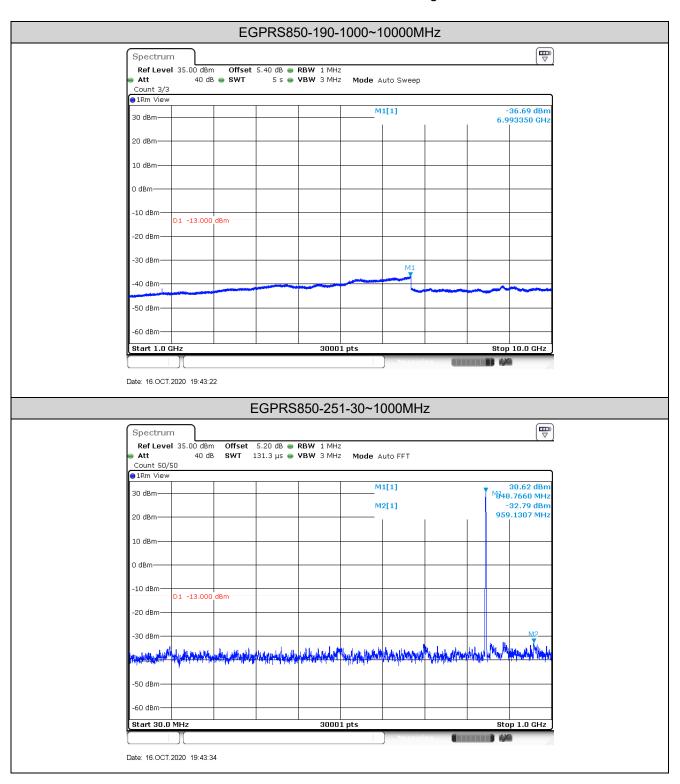
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Report No.: ZR/2020/9004101

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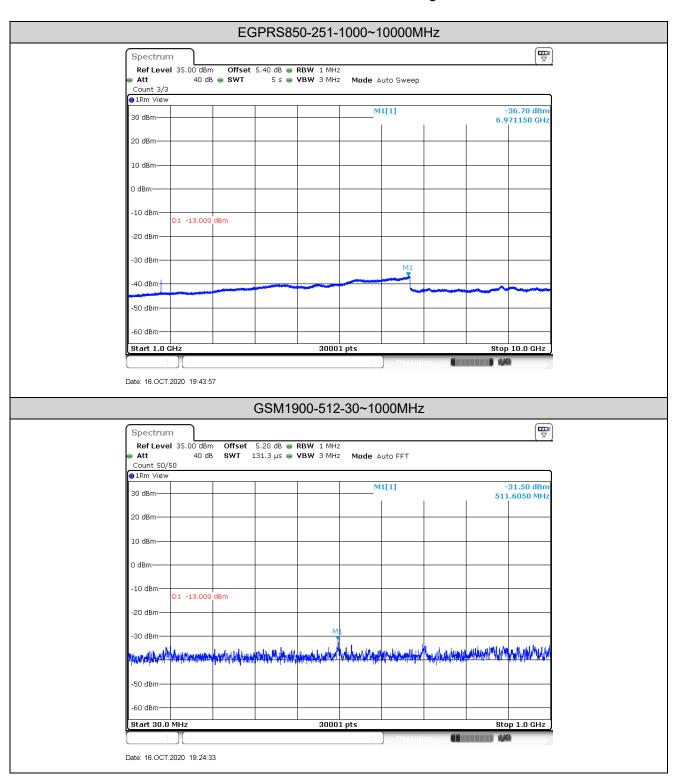
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Page: 35 of 50





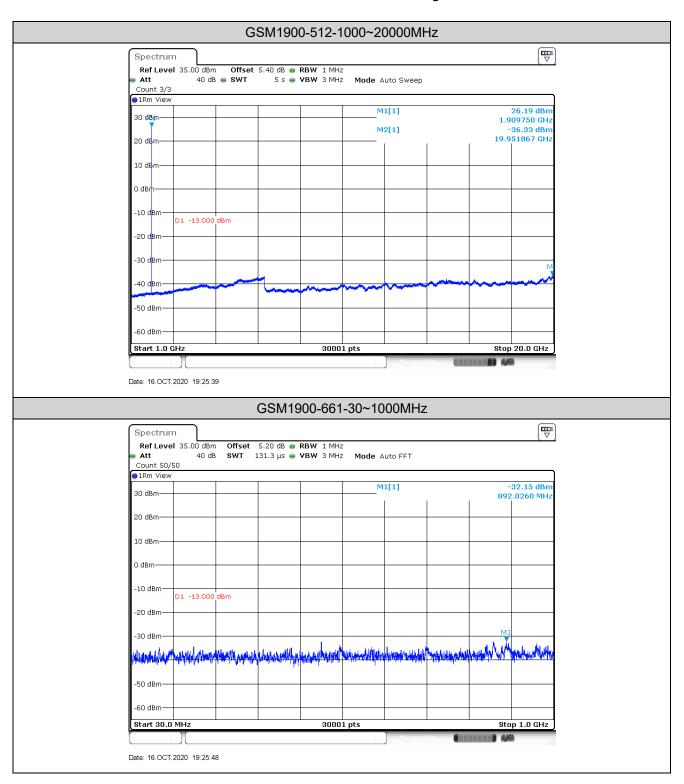
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36 of 50 Page:





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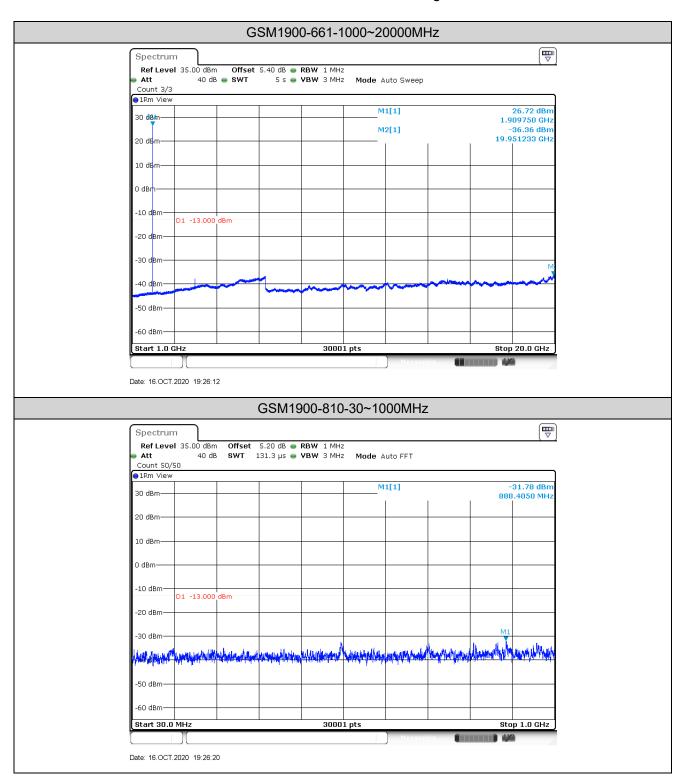
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37 of 50 Page:



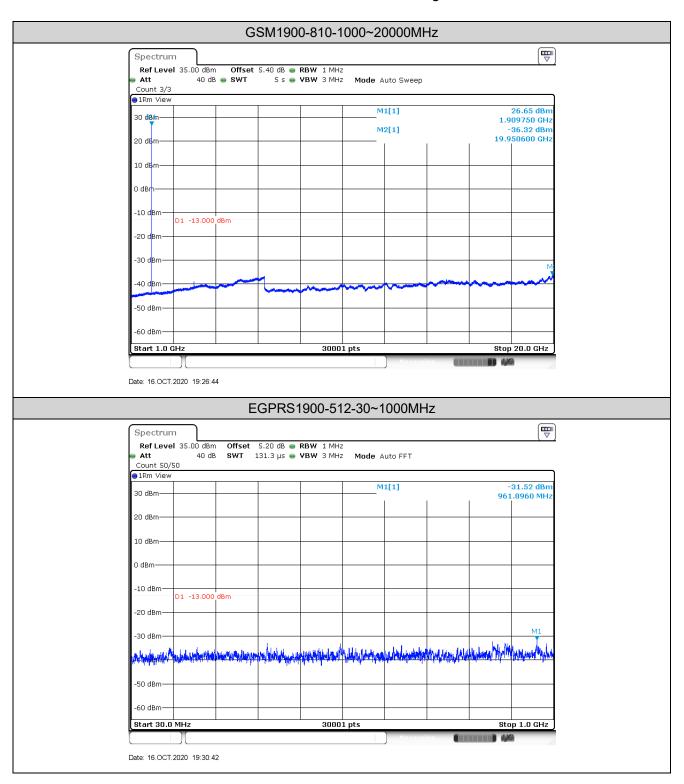


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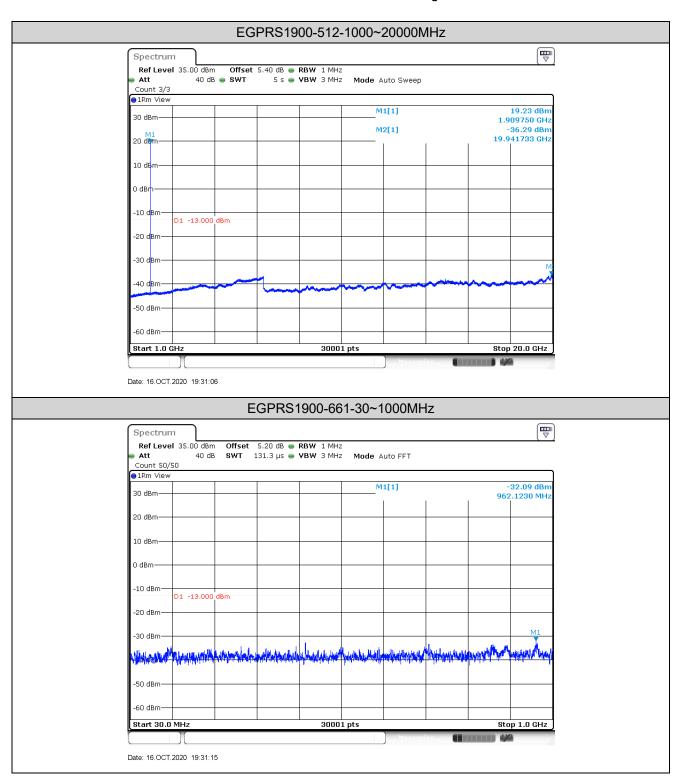
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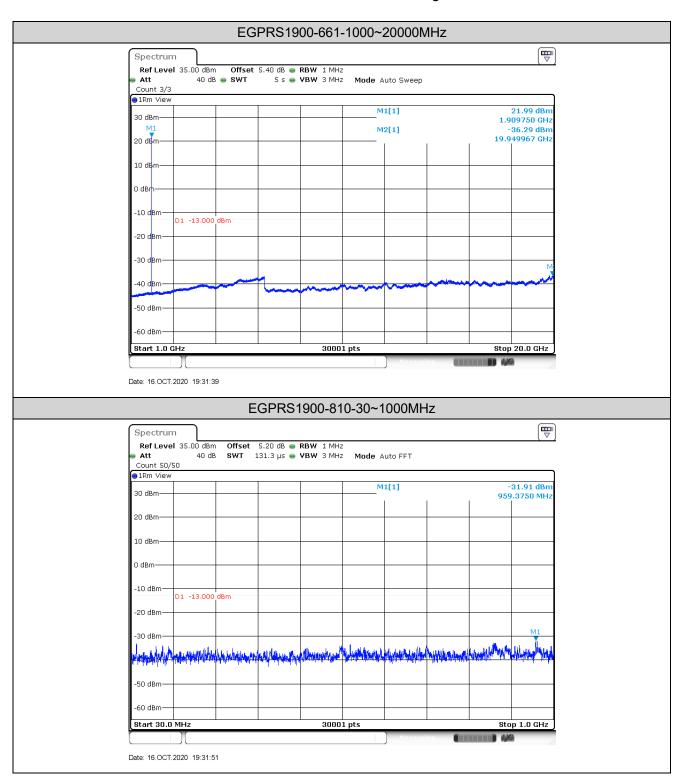
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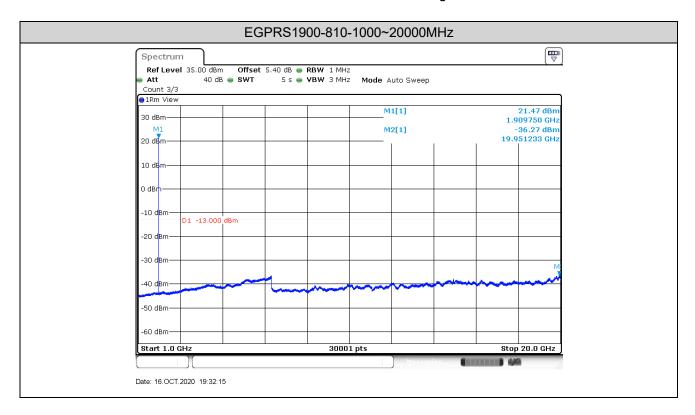
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Page: 42 of 50

### 7. Field Strength of Spurious Radiation

### 7.1. Test Band = GSM 1900

#### 7.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
30.8245	-66.69	-13.00	53.69	Vertical
116.5768	-64.95	-13.00	51.95	Vertical
596.5083	-64.15	-13.00	51.15	Vertical
3886.0295	-61.80	-13.00	48.80	Vertical
7365.1455	-56.01	-13.00	43.01	Vertical
17998.5000	-40.32	-13.00	27.32	Vertical
44.1627	-64.53	-13.00	51.53	Horizontal
85.6808	-75.73	-13.00	62.73	Horizontal
232.2066	-67.64	-13.00	54.64	Horizontal
3593.0198	-60.71	-13.00	47.71	Horizontal
7360.1453	-56.66	-13.00	43.66	Horizontal
16399.4466	-43.91	-13.00	30.91	Horizontal

### 7.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
30.8730	-67.30	-13.00	54.30	Vertical
111.8236	-64.89	-13.00	51.89	Vertical
603.6867	-63.84	-13.00	50.84	Vertical
3757.0252	-62.08	-13.00	49.08	Vertical
7382.1461	-55.57	-13.00	42.57	Vertical
17994.9998	-39.84	-13.00	26.84	Vertical
41.7861	-64.01	-13.00	51.01	Horizontal
102.5111	-74.13	-13.00	61.13	Horizontal
232.7886	-67.84	-13.00	54.84	Horizontal
3632.0211	-60.94	-13.00	47.94	Horizontal
7477.1492	-56.52	-13.00	43.52	Horizontal
16401.4467	-43.17	-13.00	30.17	Horizontal



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#### 7.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
30.6305	-69.91	-13.00	56.91	Vertical
115.5583	-65.06	-13.00	52.06	Vertical
478.9384	-66.24	-13.00	53.24	Vertical
5051.5684	-62.20	-13.00	49.20	Vertical
7356.6452	-55.60	-13.00	42.60	Vertical
17999.5000	-40.29	-13.00	27.29	Vertical
41.6891	-63.79	-13.00	50.79	Horizontal
98.7764	-75.49	-13.00	62.49	Horizontal
233.5647	-67.67	-13.00	54.67	Horizontal
3623.0208	-61.56	-13.00	48.56	Horizontal
7483.6495	-56.75	-13.00	43.75	Horizontal
16398.4466	-43.95	-13.00	30.95	Horizontal



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#### 7.2. Test Band = GSM 850

#### 7.2.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
30.7760	-64.97	-13.00	51.97	Vertical
110.9020	-63.81	-13.00	50.81	Vertical
337.6024	-67.49	-13.00	54.49	Vertical
1764.1528	-62.19	-13.00	49.19	Vertical
3000.0000	-55.50	-13.00	42.50	Vertical
9893.5965	-52.29	-13.00	39.29	Vertical
44.7932	-61.97	-13.00	48.97	Horizontal
97.2729	-74.51	-13.00	61.51	Horizontal
241.8101	-67.56	-13.00	54.56	Horizontal
1779.3559	-60.38	-13.00	47.38	Horizontal
2699.9400	-55.15	-13.00	42.15	Horizontal
9331.7111	-52.69	-13.00	39.69	Horizontal

### 7.2.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
31.1156	-66.08	-13.00	53.08	Vertical
109.8350	-64.09	-13.00	51.09	Vertical
372.3786	-66.90	-13.00	53.90	Vertical
1777.3555	-61.20	-13.00	48.20	Vertical
2473.4947	-56.41	-13.00	43.41	Vertical
9871.1957	-51.91	-13.00	38.91	Vertical
42.9016	-63.86	-13.00	50.86	Horizontal
98.4369	-74.72	-13.00	61.72	Horizontal
232.2066	-67.57	-13.00	54.57	Horizontal
1779.3559	-61.23	-13.00	48.23	Horizontal
2693.9388	-55.39	-13.00	42.39	Horizontal
9305.5769	-52.75	-13.00	39.75	Horizontal



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Page: 45 of 50

#### 7.2.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
31.1641	-67.26	-13.00	54.26	Vertical
111.3386	-64.20	-13.00	51.20	Vertical
383.8737	-65.91	-13.00	52.91	Vertical
1773.3547	-61.22	-13.00	48.22	Vertical
2687.9376	-56.33	-13.00	43.33	Vertical
9795.8265	-52.22	-13.00	39.22	Vertical
43.6292	-63.66	-13.00	50.66	Horizontal
82.7706	-74.35	-13.00	61.35	Horizontal
233.6132	-67.29	-13.00	54.29	Horizontal
1779.3559	-61.48	-13.00	48.48	Horizontal
2699.9400	-55.25	-13.00	42.25	Horizontal
9340.8114	-52.87	-13.00	39.87	Horizontal

#### Remark:

- 1) According to 971168 D01 Power Meas License Digital Systems, The amplitudes of unwanted emissions that are attenuated more than 20 dB below the applicable limit are not required to be reported.
- 2) 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.



Page: 46 of 50

### 8. Frequency Stability

### 8.1. Frequency Error Vs Voltage

	Voltage								
Band	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict		
GSM850	128	VL	NT	19.24	0.023344	±2.5	PASS		
GSM850	128	VN	NT	19.08	0.023150	±2.5	PASS		
GSM850	128	VH	NT	16.63	0.020177	±2.5	PASS		
GSM850	190	VL	NT	19.82	0.023691	±2.5	PASS		
GSM850	190	VN	NT	18.50	0.022113	±2.5	PASS		
GSM850	190	VH	NT	16.63	0.019878	±2.5	PASS		
GSM850	251	VL	NT	20.24	0.023845	±2.5	PASS		
GSM850	251	VN	NT	20.79	0.024493	±2.5	PASS		
GSM850	251	VH	NT	18.98	0.022361	±2.5	PASS		
EGPRS850	128	VL	NT	31.77	0.038546	±2.5	PASS		
EGPRS850	128	VN	NT	31.19	0.037843	±2.5	PASS		
EGPRS850	128	VH	NT	29.96	0.036350	±2.5	PASS		
EGPRS850	190	VL	NT	29.06	0.034736	±2.5	PASS		
EGPRS850	190	VN	NT	29.77	0.035585	±2.5	PASS		
EGPRS850	190	VH	NT	29.41	0.035154	±2.5	PASS		
EGPRS850	251	VL	NT	27.96	0.032941	±2.5	PASS		
EGPRS850	251	VN	NT	29.41	0.034649	±2.5	PASS		
EGPRS850	251	VH	NT	33.25	0.039173	±2.5	PASS		
GSM1900	512	VL	NT	5.59	0.003021	±2.5	PASS		
GSM1900	512	VN	NT	7.97	0.004308	±2.5	PASS		
GSM1900	512	VH	NT	12.69	0.006859	±2.5	PASS		
GSM1900	661	VL	NT	7.33	0.003899	±2.5	PASS		
GSM1900	661	VN	NT	8.65	0.004601	±2.5	PASS		
GSM1900	661	VH	NT	6.78	0.003606	±2.5	PASS		
GSM1900	810	VL	NT	12.91	0.006760	±2.5	PASS		
GSM1900	810	VN	NT	10.49	0.005493	±2.5	PASS		
GSM1900	810	VH	NT	11.95	0.006257	±2.5	PASS		
EGPRS1900	512	VL	NT	19.37	0.010469	±2.5	PASS		
EGPRS1900	512	VN	NT	20.18	0.010907	±2.5	PASS		
EGPRS1900	512	VH	NT	25.76	0.013923	±2.5	PASS		
EGPRS1900	661	VL	NT	20.24	0.010766	±2.5	PASS		



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Report No.: ZR/2020/9004101

Page: 47 of 50

EGPRS1900	661	VN	NT	16.56	0.008809	±2.5	PASS
EGPRS1900	661	VH	NT	23.76	0.012638	±2.5	PASS
EGPRS1900	810	VL	NT	22.37	0.011713	±2.5	PASS
EGPRS1900	810	VN	NT	23.15	0.012122	±2.5	PASS
EGPRS1900	810	VH	NT	22.86	0.011970	±2.5	PASS

### 8.2. Frequency Error Vs Temperature

	Temperature								
Band	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict		
GSM850	128	NV	-30	14.79	0.017945	±2.5	PASS		
GSM850	128	NV	-20	18.79	0.022798	±2.5	PASS		
GSM850	128	NV	-10	19.37	0.023502	±2.5	PASS		
GSM850	128	NV	0	19.86	0.024096	±2.5	PASS		
GSM850	128	NV	10	14.69	0.017823	±2.5	PASS		
GSM850	128	NV	20	15.11	0.018333	±2.5	PASS		
GSM850	128	NV	30	16.82	0.020408	±2.5	PASS		
GSM850	128	NV	40	17.60	0.021354	±2.5	PASS		
GSM850	128	NV	50	16.27	0.019740	±2.5	PASS		
GSM850	190	NV	-30	18.27	0.021838	±2.5	PASS		
GSM850	190	NV	-20	18.21	0.021767	±2.5	PASS		
GSM850	190	NV	-10	18.69	0.022340	±2.5	PASS		
GSM850	190	NV	0	19.24	0.022998	±2.5	PASS		
GSM850	190	NV	10	17.95	0.021456	±2.5	PASS		
GSM850	190	NV	20	16.92	0.020225	±2.5	PASS		
GSM850	190	NV	30	19.21	0.022962	±2.5	PASS		
GSM850	190	NV	40	16.59	0.019830	±2.5	PASS		
GSM850	190	NV	50	15.72	0.018790	±2.5	PASS		
GSM850	251	NV	-30	21.99	0.025907	±2.5	PASS		
GSM850	251	NV	-20	19.18	0.022597	±2.5	PASS		
GSM850	251	NV	-10	16.53	0.019475	±2.5	PASS		
GSM850	251	NV	0	16.18	0.019062	±2.5	PASS		
GSM850	251	NV	10	22.47	0.026473	±2.5	PASS		
GSM850	251	NV	20	19.79	0.023315	±2.5	PASS		
GSM850	251	NV	30	19.63	0.023127	±2.5	PASS		
GSM850	251	NV	40	19.31	0.022750	±2.5	PASS		
GSM850	251	NV	50	22.44	0.026437	±2.5	PASS		



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Report No.: ZR/2020/9004101

Page: 48 of 50

	1	1			1	ı	1
EGPRS850	128	NV	-30	31.28	0.037952	±2.5	PASS
EGPRS850	128	NV	-20	26.99	0.032747	±2.5	PASS
EGPRS850	128	NV	-10	28.96	0.035137	±2.5	PASS
EGPRS850	128	NV	0	30.41	0.036896	±2.5	PASS
EGPRS850	128	NV	10	30.96	0.037564	±2.5	PASS
EGPRS850	128	NV	20	30.93	0.037527	±2.5	PASS
EGPRS850	128	NV	30	31.06	0.037685	±2.5	PASS
EGPRS850	128	NV	40	31.93	0.038741	±2.5	PASS
EGPRS850	128	NV	50	29.09	0.035295	±2.5	PASS
EGPRS850	190	NV	-30	29.67	0.035465	±2.5	PASS
EGPRS850	190	NV	-20	30.74	0.036744	±2.5	PASS
EGPRS850	190	NV	-10	29.15	0.034843	±2.5	PASS
EGPRS850	190	NV	0	29.93	0.035776	±2.5	PASS
EGPRS850	190	NV	10	27.96	0.033421	±2.5	PASS
EGPRS850	190	NV	20	30.12	0.036003	±2.5	PASS
EGPRS850	190	NV	30	27.73	0.033146	±2.5	PASS
EGPRS850	190	NV	40	29.12	0.034808	±2.5	PASS
EGPRS850	190	NV	50	28.31	0.033839	±2.5	PASS
EGPRS850	251	NV	-30	30.61	0.036063	±2.5	PASS
EGPRS850	251	NV	-20	31.19	0.036746	±2.5	PASS
EGPRS850	251	NV	-10	29.57	0.034837	±2.5	PASS
EGPRS850	251	NV	0	30.70	0.036169	±2.5	PASS
EGPRS850	251	NV	10	30.12	0.035485	±2.5	PASS
EGPRS850	251	NV	20	32.32	0.038077	±2.5	PASS
EGPRS850	251	NV	30	29.44	0.034684	±2.5	PASS
EGPRS850	251	NV	40	30.06	0.035415	±2.5	PASS
EGPRS850	251	NV	50	32.38	0.038148	±2.5	PASS
GSM1900	512	NV	-30	11.11	0.006005	±2.5	PASS
GSM1900	512	NV	-20	7.33	0.003962	±2.5	PASS
GSM1900	512	NV	-10	3.42	0.001848	±2.5	PASS
GSM1900	512	NV	0	11.56	0.006248	±2.5	PASS
GSM1900	512	NV	10	9.65	0.005216	±2.5	PASS
GSM1900	512	NV	20	6.84	0.003697	±2.5	PASS
GSM1900	512	NV	30	10.62	0.005740	±2.5	PASS
GSM1900	512	NV	40	5.23	0.002827	±2.5	PASS
GSM1900	512	NV	50	12.72	0.006875	±2.5	PASS
GSM1900	661	NV	-30	3.81	0.002027	±2.5	PASS



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Report No.: ZR/2020/9004101

Page: 49 of 50

					1		
GSM1900	661	NV	-20	7.81	0.004154	±2.5	PASS
GSM1900	661	NV	-10	5.59	0.002973	±2.5	PASS
GSM1900	661	NV	0	-0.03	-0.000016	±2.5	PASS
GSM1900	661	NV	10	3.33	0.001771	±2.5	PASS
GSM1900	661	NV	20	4.16	0.002213	±2.5	PASS
GSM1900	661	NV	30	6.97	0.003707	±2.5	PASS
GSM1900	661	NV	40	5.10	0.002713	±2.5	PASS
GSM1900	661	NV	50	3.68	0.001957	±2.5	PASS
GSM1900	810	NV	-30	9.14	0.004786	±2.5	PASS
GSM1900	810	NV	-20	10.07	0.005273	±2.5	PASS
GSM1900	810	NV	-10	13.53	0.007085	±2.5	PASS
GSM1900	810	NV	0	16.82	0.008807	±2.5	PASS
GSM1900	810	NV	10	10.78	0.005645	±2.5	PASS
GSM1900	810	NV	20	16.40	0.008587	±2.5	PASS
GSM1900	810	NV	30	15.21	0.007964	±2.5	PASS
GSM1900	810	NV	40	12.07	0.006320	±2.5	PASS
GSM1900	810	NV	50	11.14	0.005833	±2.5	PASS
EGPRS1900	512	NV	-30	23.12	0.012496	±2.5	PASS
EGPRS1900	512	NV	-20	22.99	0.012426	±2.5	PASS
EGPRS1900	512	NV	-10	23.54	0.012723	±2.5	PASS
EGPRS1900	512	NV	0	24.21	0.013085	±2.5	PASS
EGPRS1900	512	NV	10	21.63	0.011691	±2.5	PASS
EGPRS1900	512	NV	20	24.15	0.013053	±2.5	PASS
EGPRS1900	512	NV	30	22.99	0.012426	±2.5	PASS
EGPRS1900	512	NV	40	21.37	0.011550	±2.5	PASS
EGPRS1900	512	NV	50	19.50	0.010539	±2.5	PASS
EGPRS1900	661	NV	-30	21.05	0.011197	±2.5	PASS
EGPRS1900	661	NV	-20	21.83	0.011612	±2.5	PASS
EGPRS1900	661	NV	-10	22.83	0.012144	±2.5	PASS
EGPRS1900	661	NV	0	20.11	0.010697	±2.5	PASS
EGPRS1900	661	NV	10	24.76	0.013170	±2.5	PASS
EGPRS1900	661	NV	20	20.95	0.011144	±2.5	PASS
EGPRS1900	661	NV	30	23.28	0.012383	±2.5	PASS
EGPRS1900	661	NV	40	21.76	0.011574	±2.5	PASS
EGPRS1900	661	NV	50	19.82	0.010543	±2.5	PASS
EGPRS1900	810	NV	-30	26.89	0.014080	±2.5	PASS
EGPRS1900	810	NV	-20	22.37	0.011713	±2.5	PASS



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Report No.: ZR/2020/9004101

Page: 50 of 50

EGPRS1900	810	NV	-10	24.63	0.012897	±2.5	PASS
EGPRS1900	810	NV	0	24.89	0.013033	±2.5	PASS
EGPRS1900	810	NV	10	22.96	0.012022	±2.5	PASS
EGPRS1900	810	NV	20	23.47	0.012289	±2.5	PASS
EGPRS1900	810	NV	30	20.34	0.010650	±2.5	PASS
EGPRS1900	810	NV	40	22.63	0.011849	±2.5	PASS
EGPRS1900	810	NV	50	25.47	0.013336	±2.5	PASS

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