



Appendix B

Test Report for SZEM160200075301



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1 Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Part 1 – RF Conducted Power of Transmitter for GSM850

TEST CONDITIONS	RF Output Power(Conducted)					
	Channel128(L)		Channel190(M)		Channel251(H)	
	824.2MHz		836.6 MHz		848.8 MHz	
Tnom/ Vnom	Measured (dBm)	Limit (dBm)	Measured (dBm)	Limit (dBm)	Measured(dBm)	Limit (dBm)
GSM/TM1 (GPRS)	33.14	38.5	33.43	38.5	33.41	38.5

Part 2– Effective Radiated Power of Transmitter (ERP) for GSM850

Test Mode	Freq. (MHz)	Meas. Level (dBm)	SGP (dBm)	Substitution Gain(dBd)	Cable Loss (dB)	Substitution Level(ERP) / dBm	Limit (dBm)	Result
GSM/TM1 (GPRS)	824.2	33.21	27.85	5.95	0.6	33.2	38.5	Pass
GSM/TM1 (GPRS)	836.6	33.5	27.43	6.65	0.6	33.48	38.5	Pass
GSM/TM1 (GPRS)	848.8	33.48	27.21	6.85	0.6	33.46	38.5	Pass

Note:

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

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS



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Part 3 – RF Conducted Power of Transmitter for GSM1900

TEST CONDITIONS	RF Output Power(Conducted)					
	Channel512(L)		Channel661(M)		Channel810(H)	
	1850.2MHz		1880.0 MHz		1909.8 MHz	
Tnom/ Vnom	Measured (dBm)	Limit (dBm)	Measured (dBm)	Limit (dBm)	Measured(dBm)	Limit (dBm)
GSM/TM1 (GPRS)	30.14	38.5	30.07	38.5	30.02	38.5

Part 4– Effective Isotropic Radiated Power of Transmitter (EIRP) for GSM1900

Test Mode	Freq. (MHz)	Meas. Level (dBm)	SGP (dBm)	Substitution Gain(dBi)	Cable Loss (dB)	Substitution Level(EIRP)/ dBm	Limit (dBm)	Result
GSM/TM1 (GPRS)	1850.2	30.42	23.51	7.9	1	30.41	38.5	Pass
GSM/TM1 (GPRS)	1880.0	30.35	23.43	7.9	1	30.33	38.5	Pass
GSM/TM1 (GPRS)	1909.8	30.3	23.39	7.9	1	30.29	38.5	Pass

Note:

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

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS



2 Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM1900	GSM/TM1	LCH	8.94	13	PASS
		MCH	8.41	13	PASS
		HCH	8.59	13	PASS

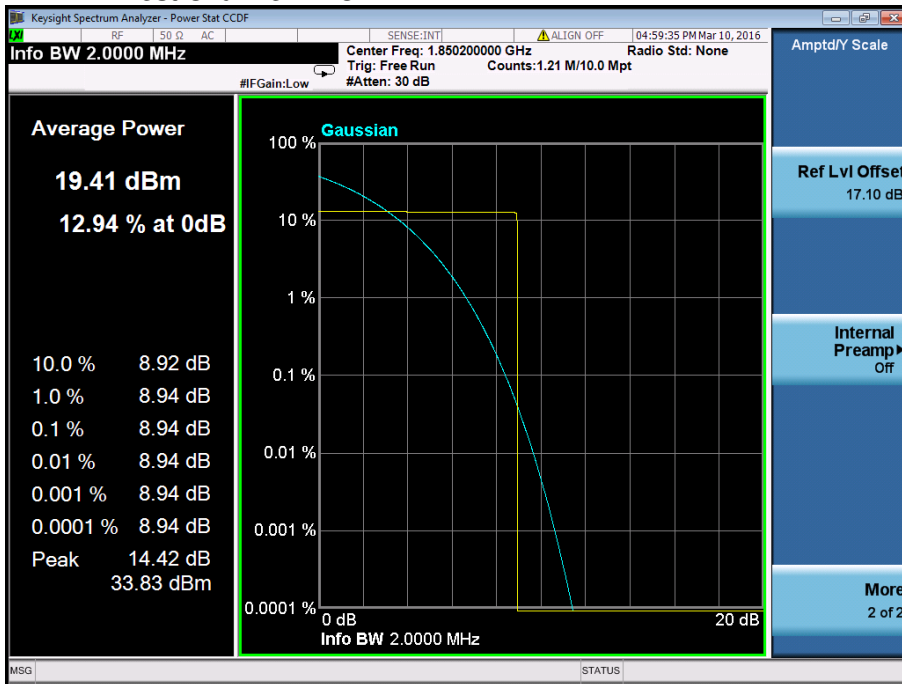


2.1 For GSM

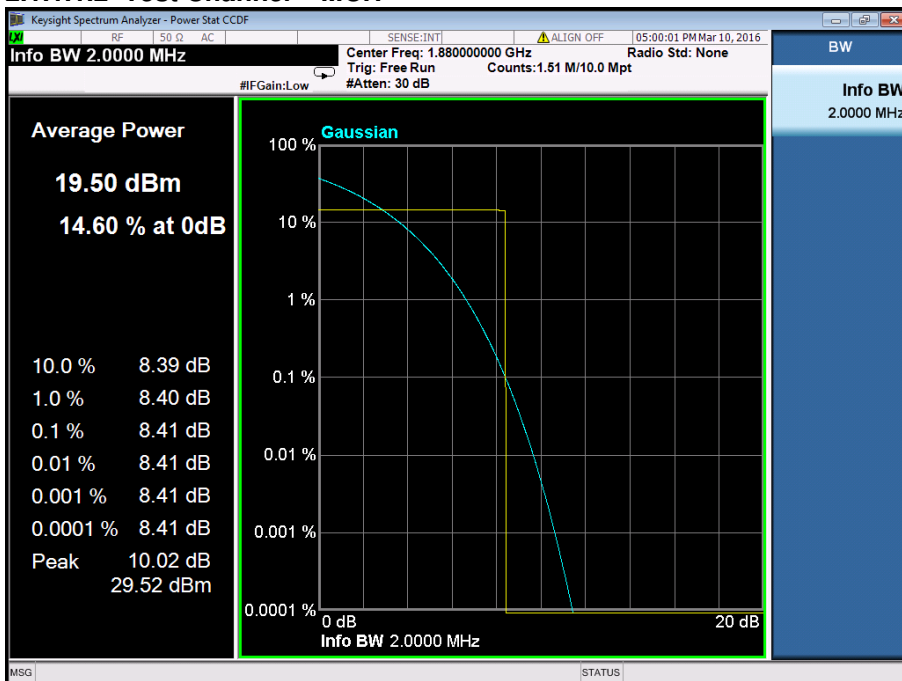
2.1.1 Test Band = GSM1900

2.1.1.1 Test Mode = GSM/TM1

2.1.1.1.1 Test Channel = LCH

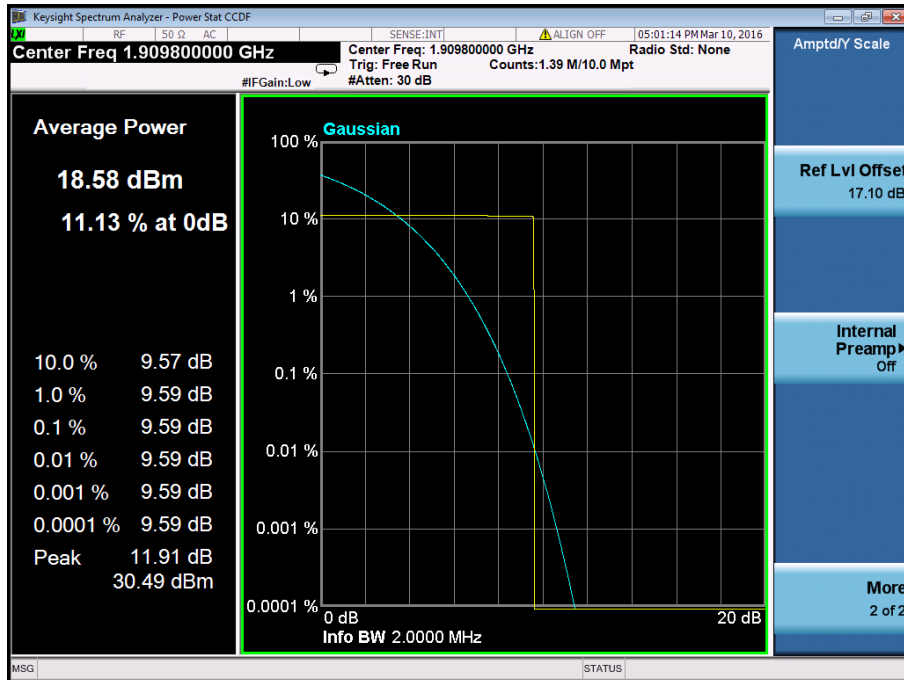


2.1.1.1.2 Test Channel = MCH





2.1.1.1.3 Test Channel = HCH





3 Modulation Characteristics

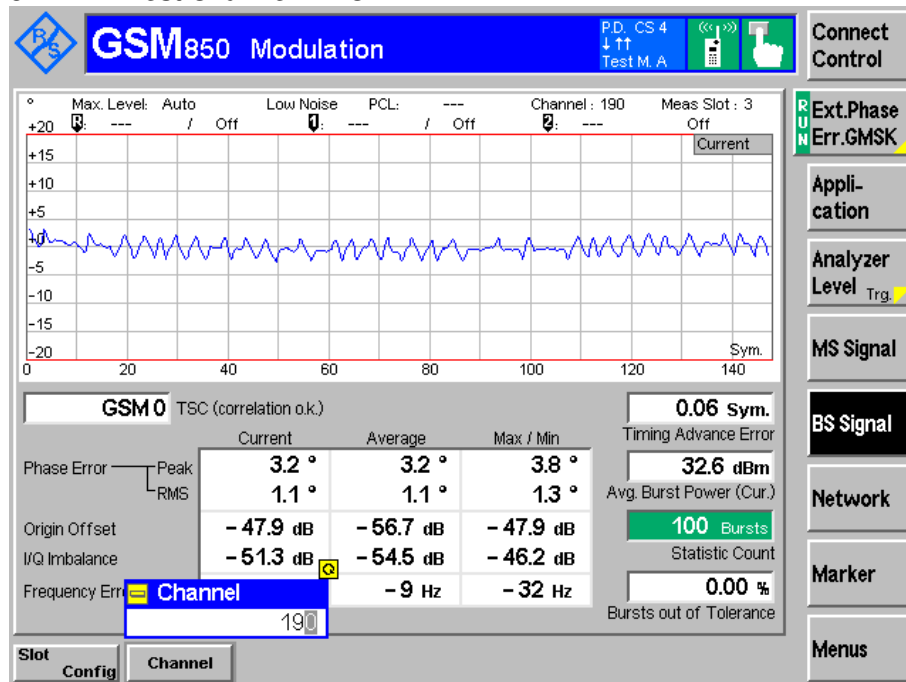
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH

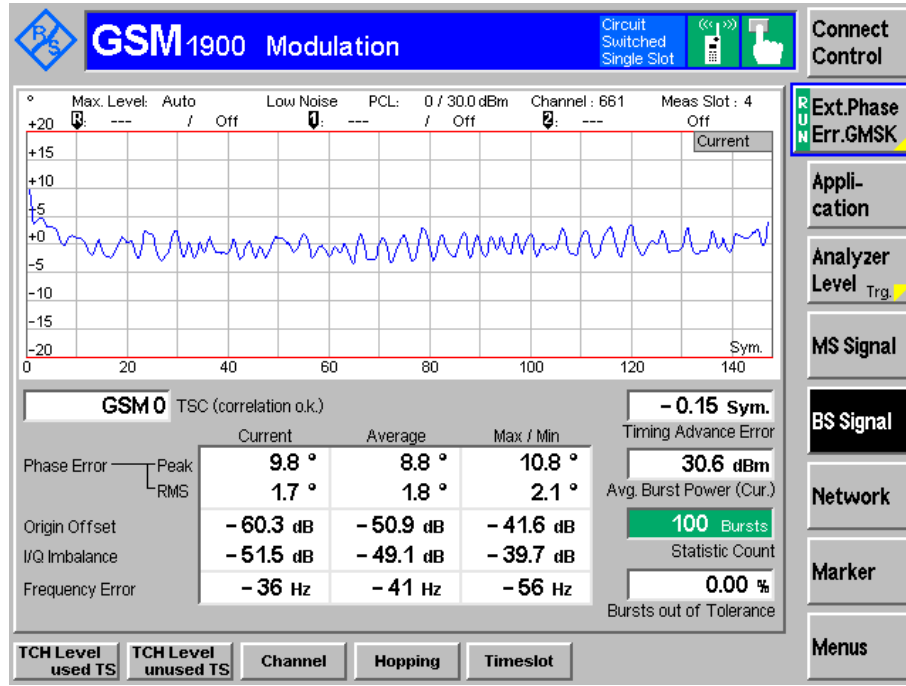




3.1.2 Test Band = GSM1900

3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH





4 Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	242.45	307.1	PASS
		MCH	238.66	310.3	PASS
		HCH	244.21	307.1	PASS

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM1900	GSM/TM1	LCH	244.64	307.1	PASS
		MCH	250.08	307.0	PASS
		HCH	244.97	310.2	PASS

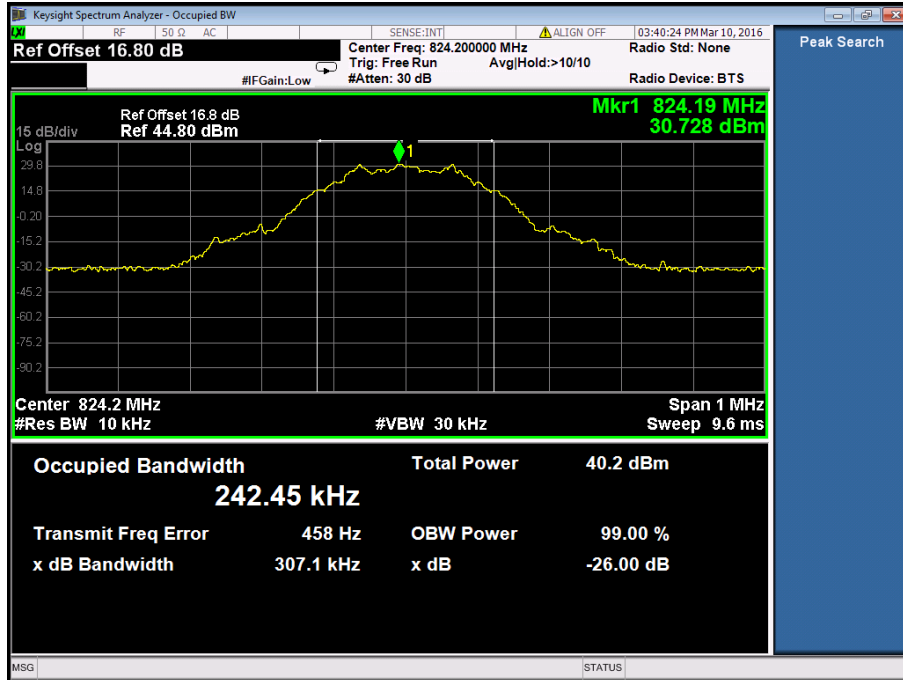


4.1 For GSM

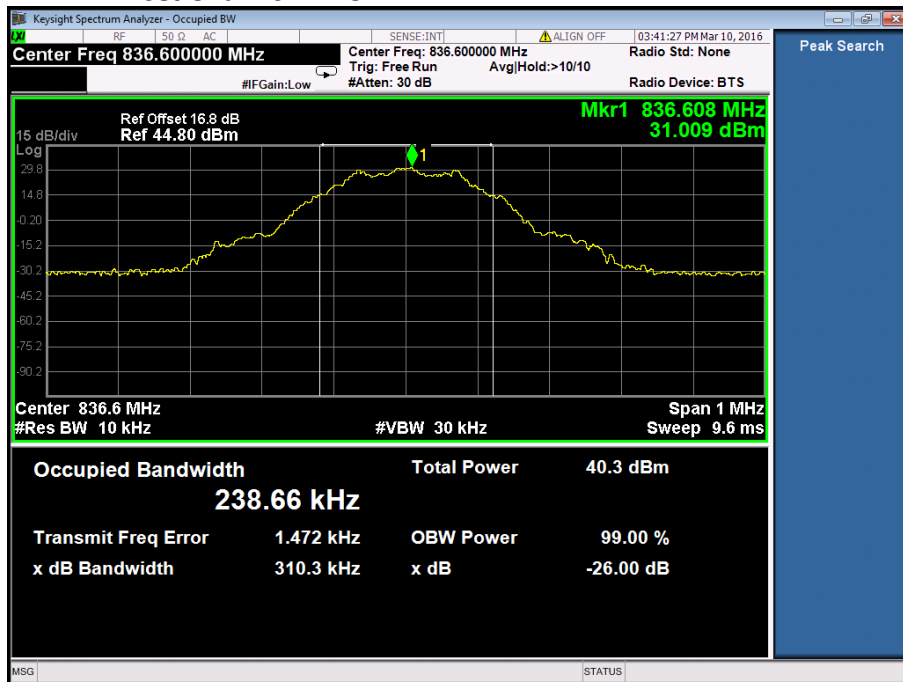
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4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH

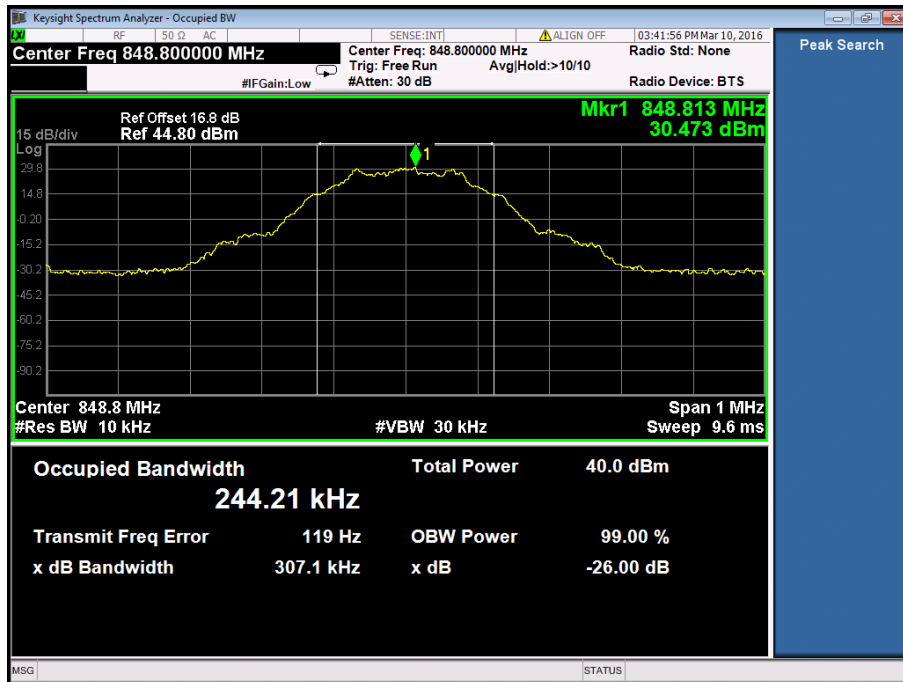


4.1.1.1.2 Test Channel = MCH





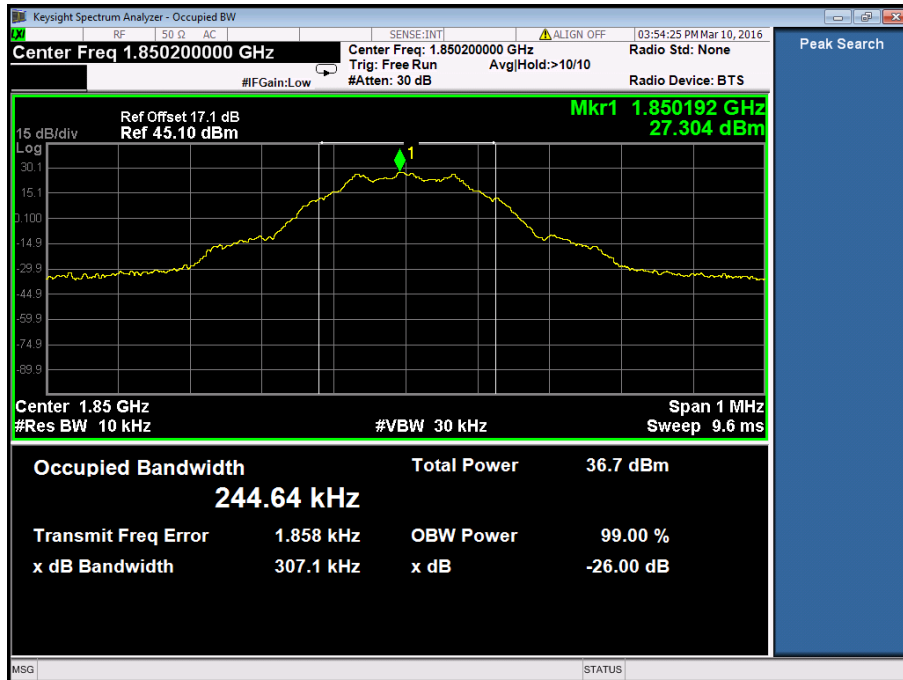
4.1.1.1.3 Test Channel = HCH



4.1.2 Test Band = GSM1900

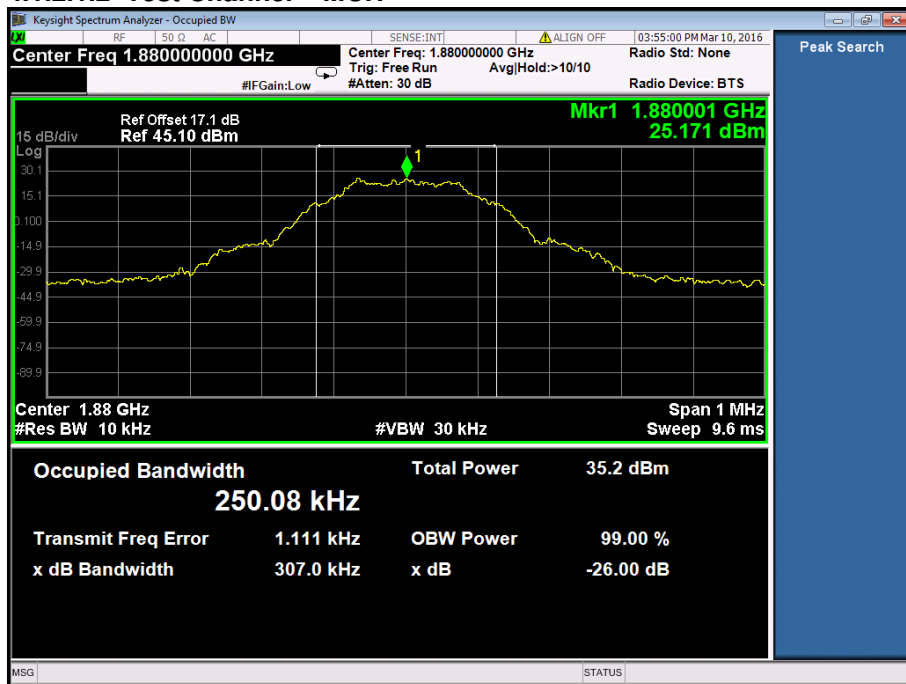
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH

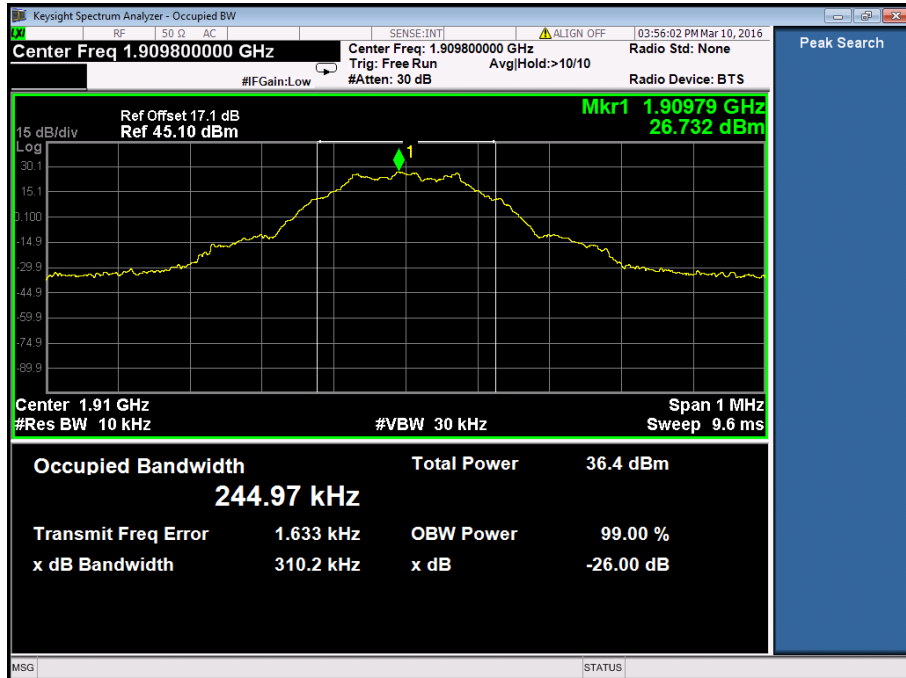




4.1.2.1.2 Test Channel = MCH



4.1.2.1.3 Test Channel = HCH



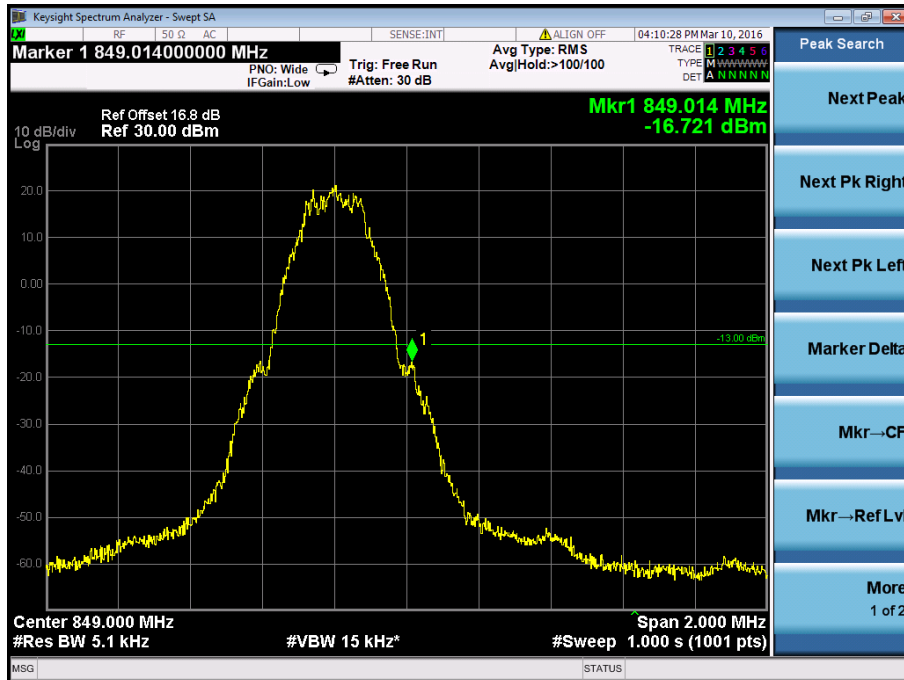


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5.1.1.1.2 Test Channel = HCH



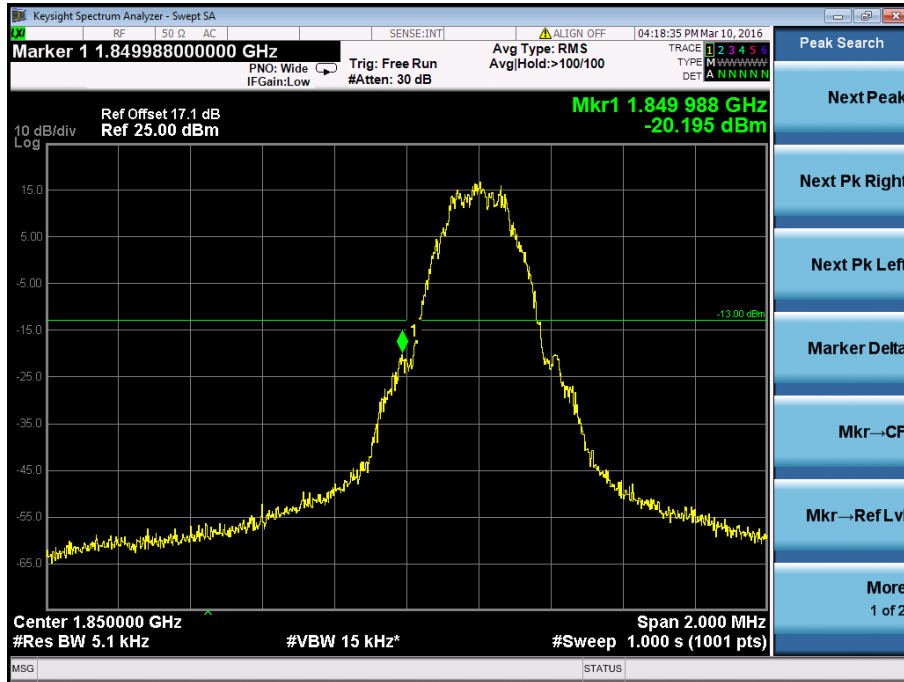
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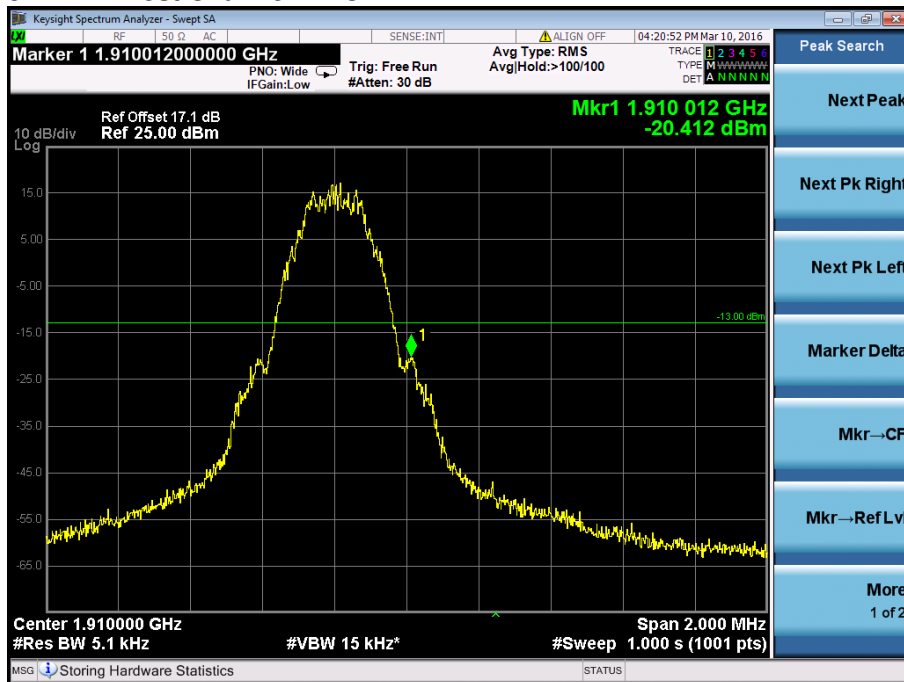
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



5.1.2.1.2 Test Channel = HCH





6 Spurious Emission at Antenna Terminal

NOTE: 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.

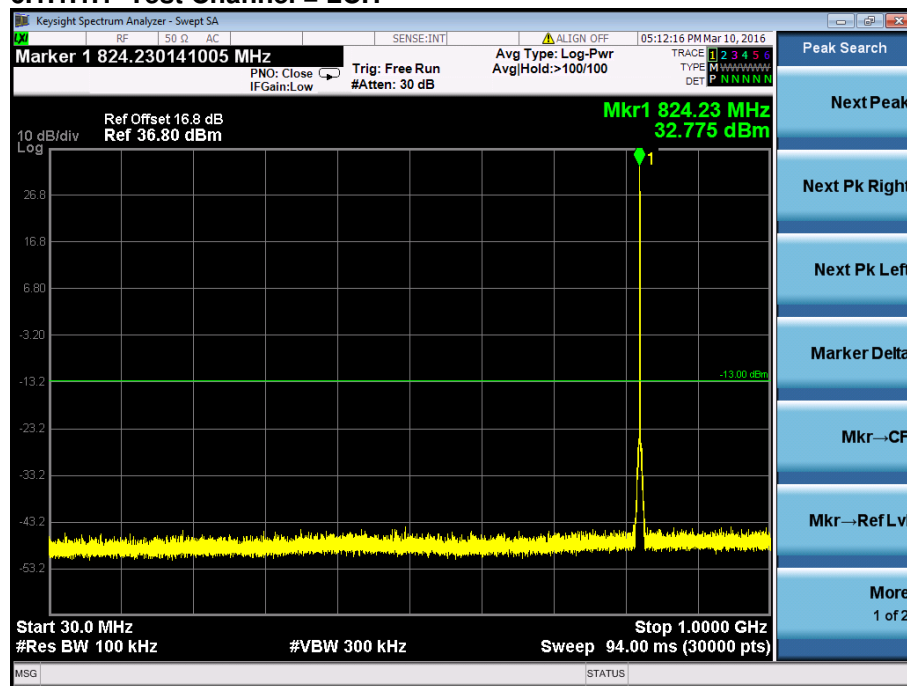
Part I - Test Plots

6.1 For GSM

6.1.1 Test Band = GSM850

6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

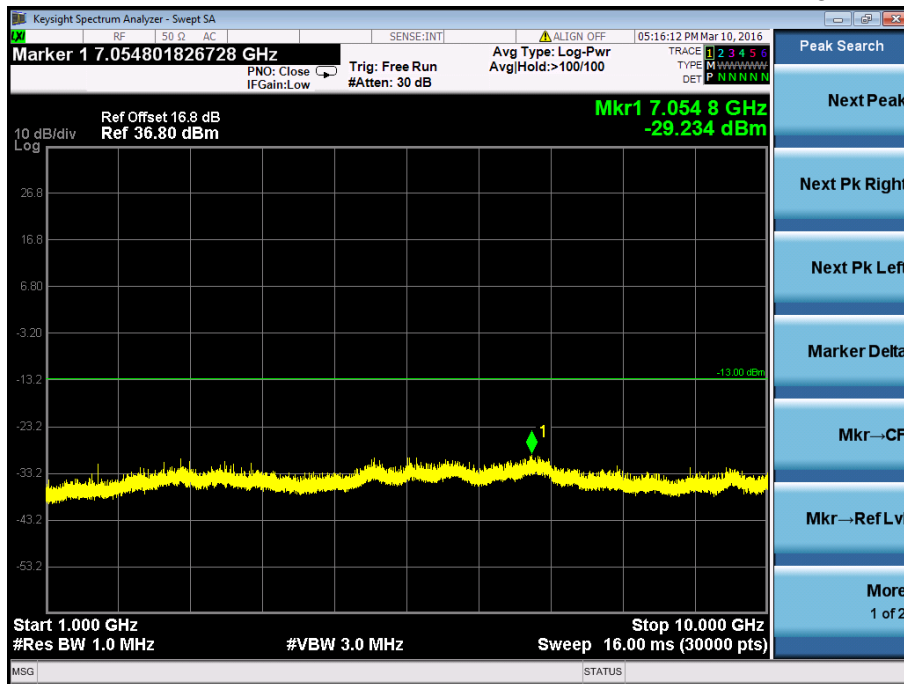




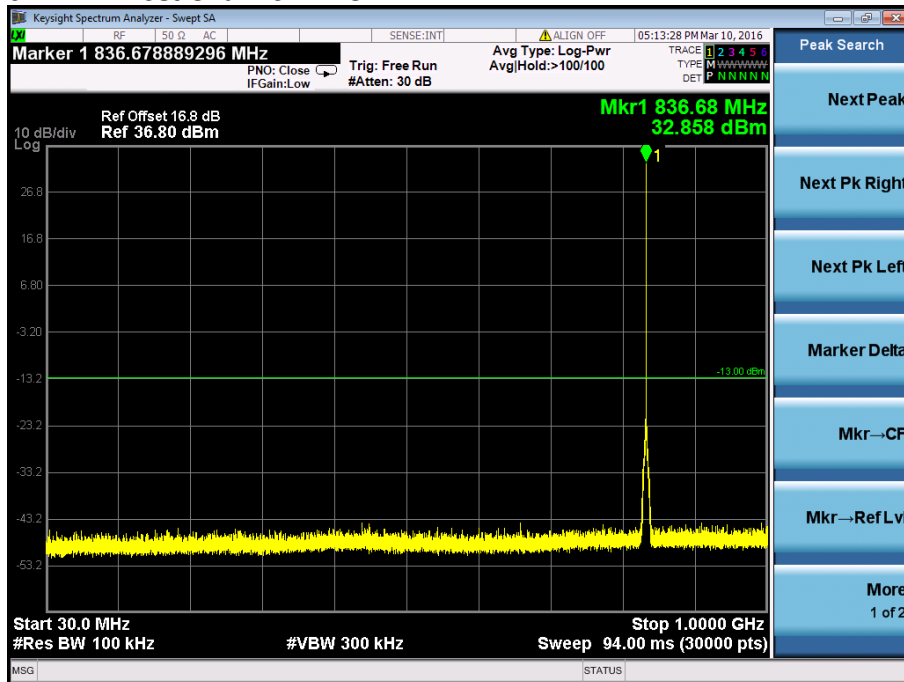
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6.1.1.1.2 Test Channel = MCH



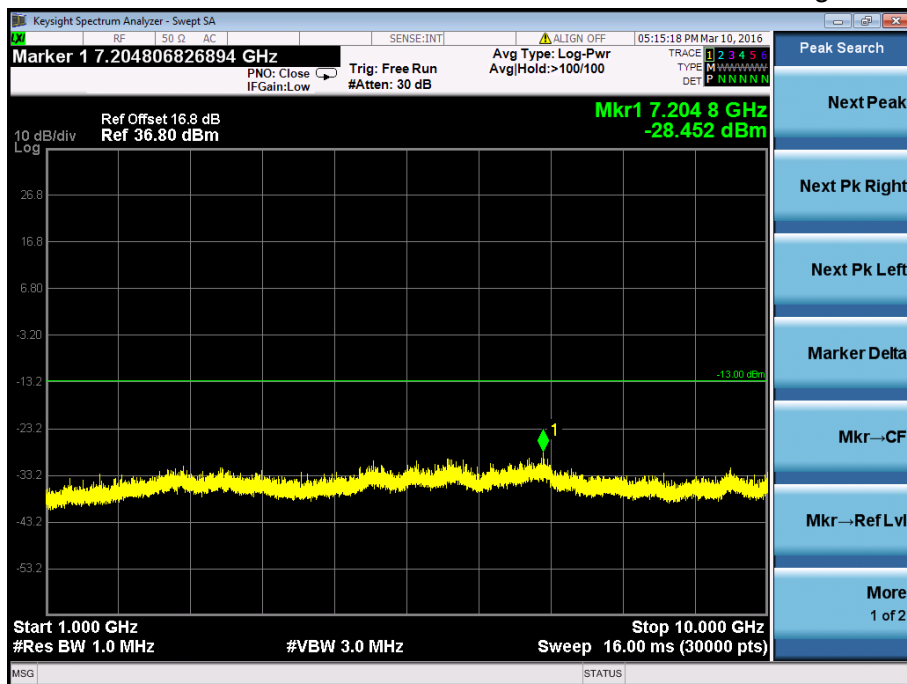
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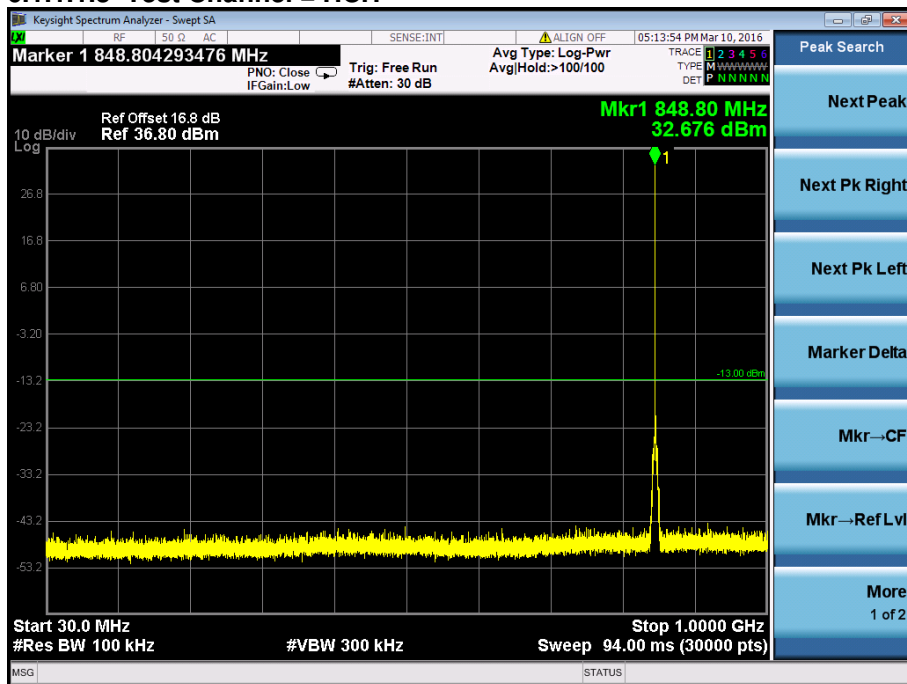
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6.1.1.1.3 Test Channel = HCH



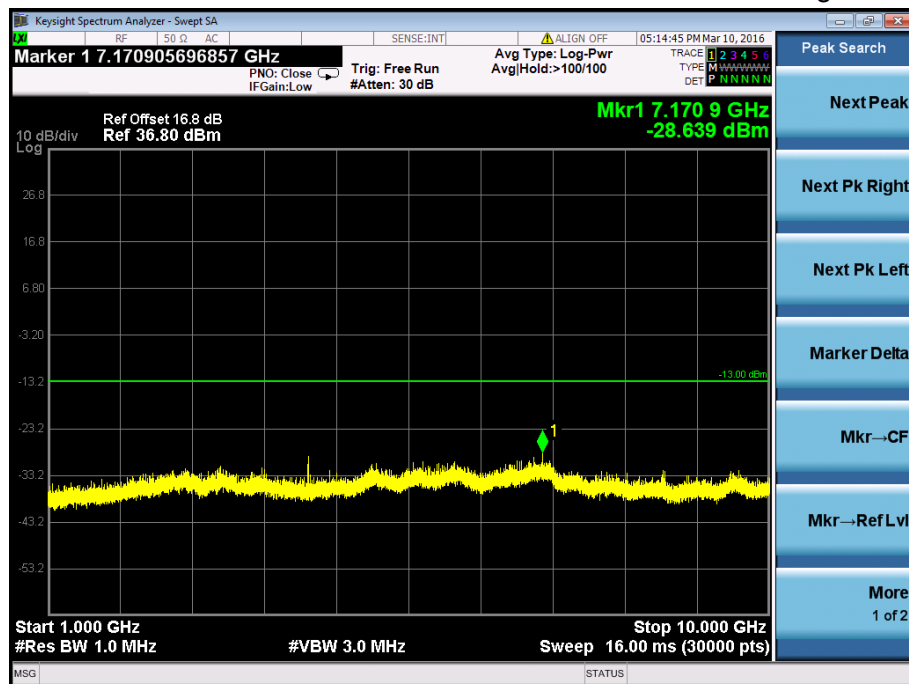
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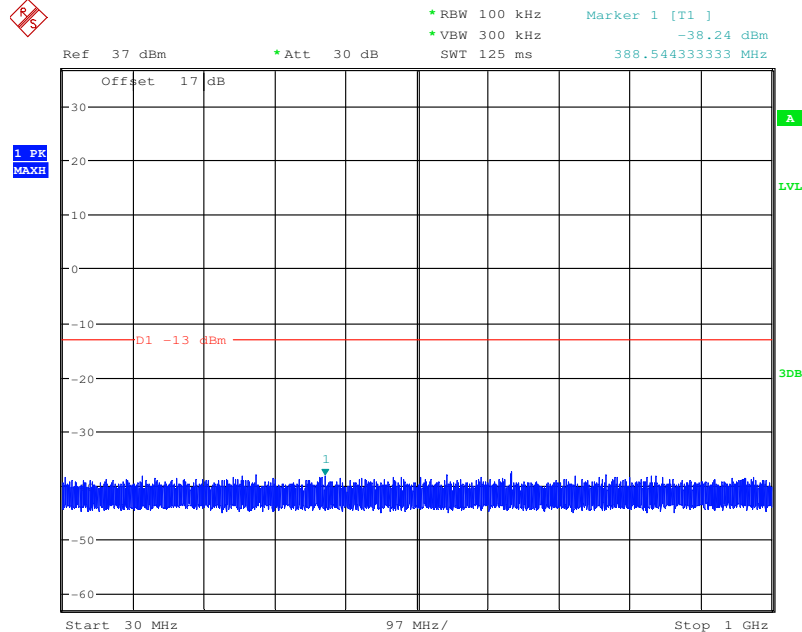
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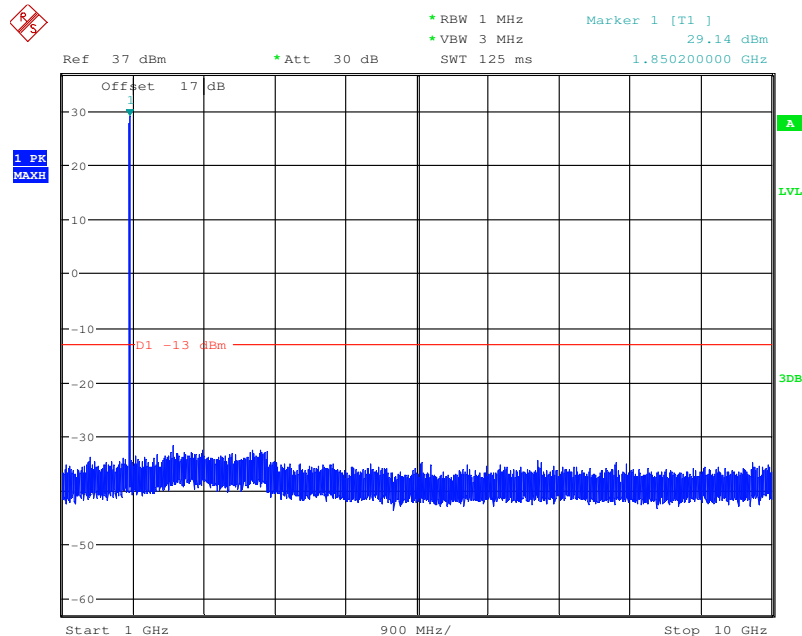
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



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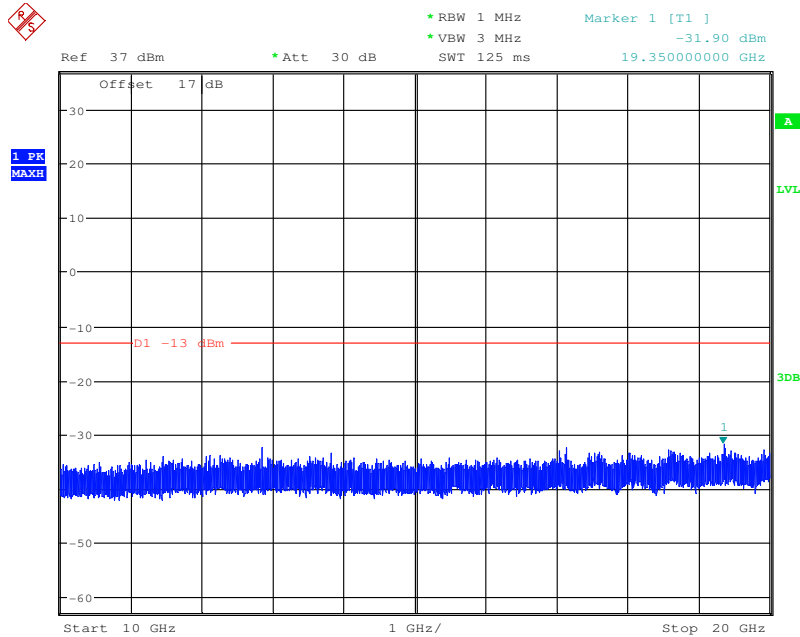
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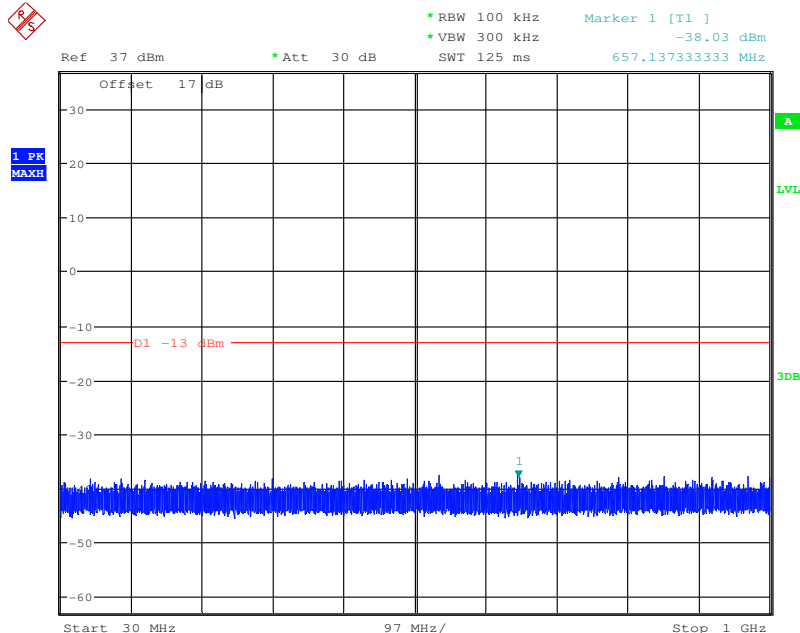
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6.1.2.1.2 Test Channel = MCH



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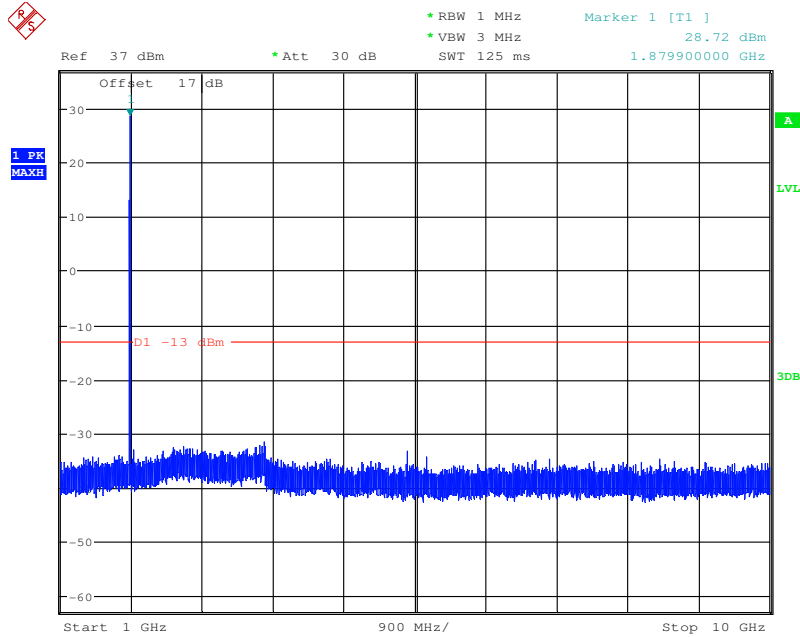
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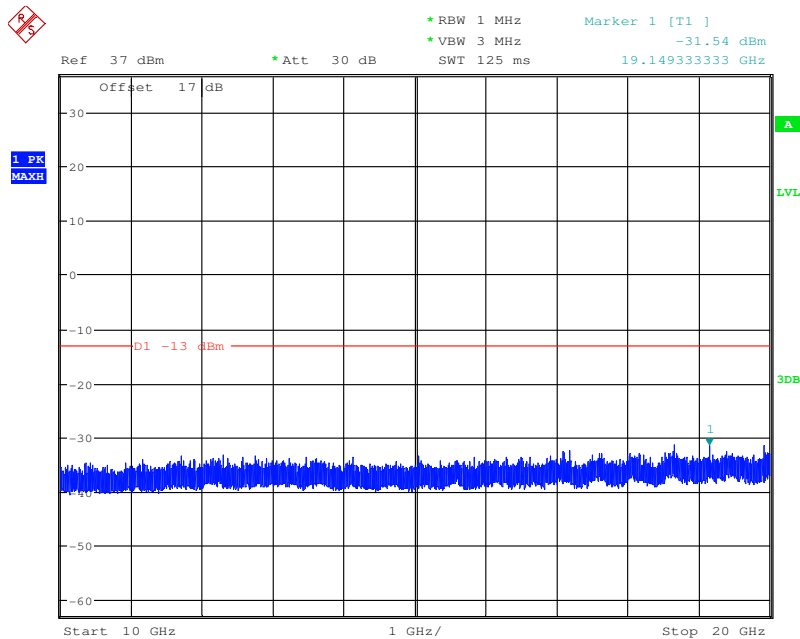
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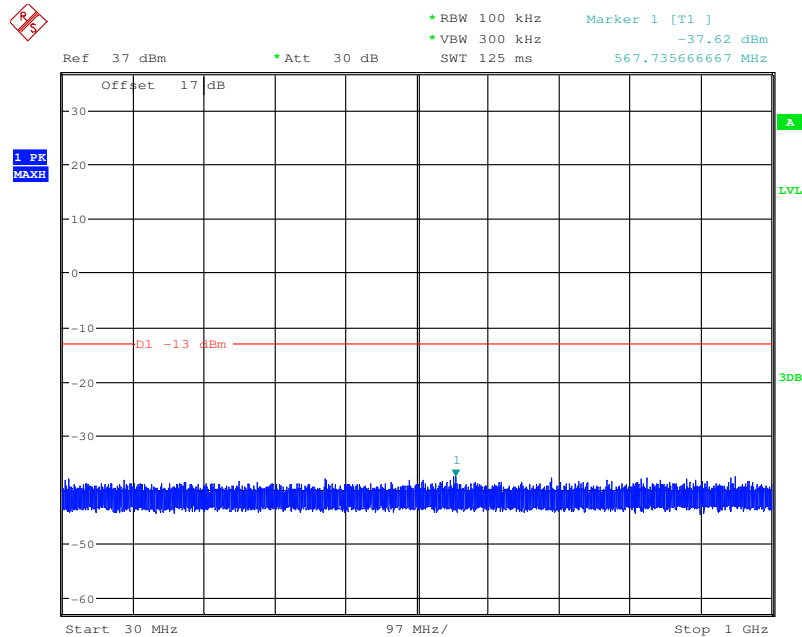


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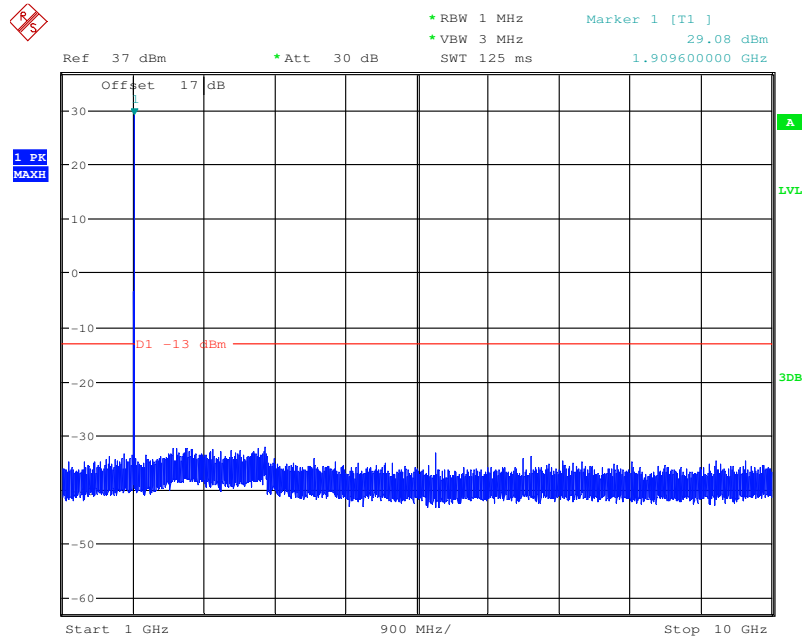
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6.1.2.1.3 Test Channel = HCH



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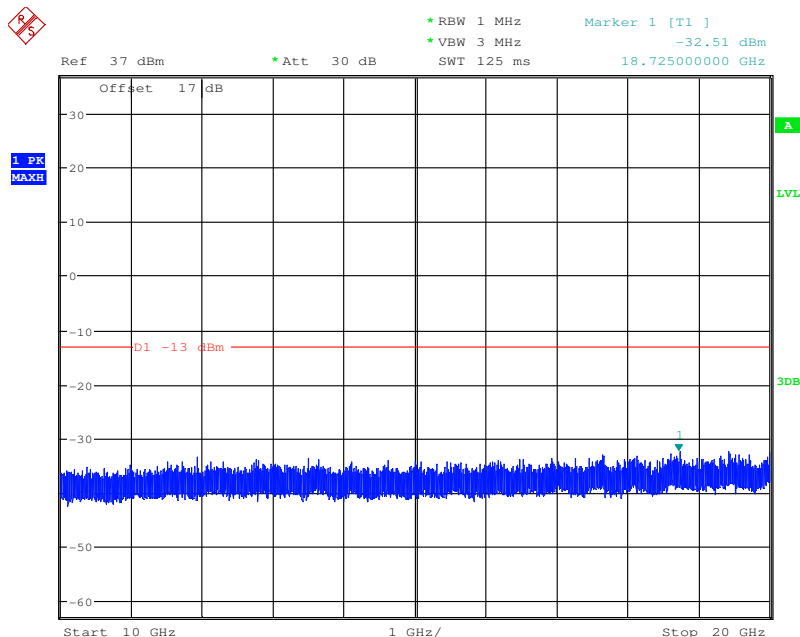
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7 Field Strength of Spurious Radiation

Part I - Test Plots

7.1 For GSM

7.1.1 Test Band = GSM850

7.1.1.1 Test Mode = GSM/TM1

7.1.1.1.1 Test Channel = LCH

Frequency	Spurious Emission Level		Limit	Over limit
(MHz)	Polaxis	(dBm)	dBm	(dB)
1242.500000	H	-51.87	-13.00	38.87
1584.750000	H	-49.01	-13.00	36.01
2502.750000	H	-42.19	-13.00	29.19
1275.000000	V	-51.23	-13.00	38.23
1674.000000	V	-48.54	-13.00	35.54
4879.875000	V	-50.47	-13.00	37.47

7.1.1.1.2 Test Channel = MCH

Frequency	Spurious Emission Level		Limit	Over limit
(MHz)	Polaxis	(dBm)	dBm	(dB)
1186.666667	H	-52.77	-13.00	39.77
1812.000000	H	-47.25	-13.00	34.25
4459.125000	H	-51.31	-13.00	38.31
2792.250000	V	-41.29	-13.00	28.29
3550.500000	V	-53.73	-13.00	40.73
4512.000000	V	-51.88	-13.00	38.88

7.1.1.1.3 Test Channel = HCH

Frequency	Spurious Emission Level		Limit	Over limit
(MHz)	Polaxis	(dBm)	dBm	(dB)
1765.500000	H	-47.25	-13.00	34.25
3608.625000	H	-53.21	-13.00	40.21
4730.625000	H	-50.55	-13.00	37.55
2649.000000	V	-41.78	-13.00	28.78
3344.250000	V	-53.29	-13.00	40.29
4006.875000	V	-51.32	-13.00	38.32



7.1.2 Test Band = GSM1900

7.1.2.1 Test Mode = GSM/TM1

7.1.2.1.1 Test Channel = LCH

Frequency	Spurious Emission Level		Limit	Over limit
(MHz)	Polaxis	(dBm)	dBm	(dB)
1434.066667	H	-50.65	-13.00	37.65
3957.750000	H	-51.61	-13.00	38.61
4647.375000	H	-51.03	-13.00	38.03
1548.533333	V	-50.87	-13.00	37.87
2842.395000	V	-42.32	-13.00	29.32
3656.625000	V	-51.95	-13.00	38.95

7.1.2.1.2 Test Channel = MCH

Frequency	Spurious Emission Level		Limit	Over limit
(MHz)	Polaxis	(dBm)	dBm	(dB)
1970.235000	H	-47.01	-13.00	34.01
3402.750000	H	-52.95	-13.00	39.95
3899.625000	H	-51.47	-13.00	38.47
2099.400000	V	-46.37	-13.00	33.37
3394.125000	V	-52.77	-13.00	39.77
4290.000000	V	-50.25	-13.00	37.25

7.1.2.1.3 Test Channel = HCH

Frequency	Spurious Emission Level		Limit	Over limit
(MHz)	Polaxis	(dBm)	dBm	(dB)
2213.160000	H	-44.85	-13.00	31.85
3116.250000	H	-52.68	-13.00	39.68
5547.375000	H	-50.62	-13.00	37.62
2216.715000	V	-44.85	-13.00	31.85
4648.125000	V	-50.87	-13.00	37.87
5244.750000	V	-50.71	-13.00	37.71

NOTE:

- 1) The disturbance above 10GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



8 Frequency Stability

8.1 For GSM

8.1.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	TN	VL	-8.65	-0.00468	PASS
				VN	-10.20	-0.00551	PASS
				VH	-12.85	-0.00695	PASS
		MCH	TN	VL	-1.80	-0.00096	PASS
				VN	-2.51	-0.00134	PASS
				VH	-7.49	-0.00398	PASS
		HCH	TN	VL	-19.04	-0.00997	PASS
				VN	-8.39	-0.00439	PASS
				VH	-1.16	-0.00061	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM1900	GSM/TM1	LCH	TN	VL	-10.20	-0.00551	PASS
				VN	-12.85	-0.00695	PASS
				VH	-8.65	-0.00468	PASS
		MCH	TN	VL	-2.51	-0.00134	PASS
				VN	-7.49	-0.00398	PASS
				VH	-1.80	-0.00096	PASS
		HCH	TN	VL	-1.16	-0.00061	PASS
				VN	-19.04	-0.00997	PASS
				VH	-8.39	-0.00439	PASS



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8.1.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	VN	-30	-4.64	-0.00563	PASS
				-20	-1.38	-0.00167	PASS
				-10	-5.38	-0.00653	PASS
				0	-4.19	-0.00508	PASS
				10	-3.35	-0.00406	PASS
				20	-2.05	-0.00249	PASS
				30	-10.19	-0.01236	PASS
				40	0.66	0.00080	PASS
				50	0.88	0.00107	PASS
		MCH	VN	-30	0.14	0.00017	PASS
				-20	-0.51	-0.00061	PASS
				-10	-8.67	-0.01036	PASS
				0	-2.28	-0.00273	PASS
				10	-2.02	-0.00241	PASS
				20	-3.83	-0.00458	PASS
				30	0.04	0.00005	PASS
				40	-5.70	-0.00681	PASS
				50	-6.41	-0.00766	PASS
		HCH	VN	-30	-5.74	-0.00676	PASS
				-20	-7.22	-0.00851	PASS
				-10	-5.09	-0.00600	PASS
				0	-3.83	-0.00451	PASS
				10	-10.26	-0.01209	PASS
				20	-9.67	-0.01139	PASS
				30	-1.54	-0.00181	PASS
				40	-8.61	-0.01014	PASS
				50	-3.67	-0.00432	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM1900	GSM/TM1	LCH	VN	-30	-15.00	-0.00811	PASS
				-20	-8.93	-0.00483	PASS
				-10	-14.10	-0.00762	PASS
				0	-2.28	-0.00123	PASS
				10	1.59	0.00086	PASS
				20	-5.12	-0.00277	PASS
				30	-13.90	-0.00751	PASS
				40	-10.48	-0.00566	PASS
				50	1.27	0.00069	PASS
		MCH	VN	-30	-5.83	-0.00310	PASS
				-20	-7.45	-0.00396	PASS
				-10	-13.19	-0.00702	PASS
				0	-0.73	-0.00039	PASS
				10	-15.39	-0.00819	PASS
				20	-7.70	-0.00410	PASS
				30	2.37	0.00126	PASS
				40	-8.93	-0.00475	PASS
				50	-11.97	-0.00637	PASS
		HCH	VN	-30	-14.74	-0.00772	PASS
				-20	-5.25	-0.00275	PASS
				-10	-6.80	-0.00356	PASS
				0	-11.77	-0.00616	PASS
				10	1.01	0.00053	PASS
				20	2.56	0.00134	PASS
				30	-6.35	-0.00332	PASS
				40	-13.65	-0.00715	PASS
				50	-2.22	-0.00116	PASS

The End

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