FCC

RF Test Report

Applicant	:	Shenzhen Tuge Information Limited Inc
Product Type	:	4G Wireless Data Terminal
Trade Name	:	MASTER ROAM
Model Number	:	T3
Test Specification	:	FCC 47 CFR PART 22H FCC 47 CFR PART 24E ANSI/TIA-603-D 2010
Receive Date	:	Mar. 18, 2017
Test Period	:	Mar. 23 ~ Apr. 18, 2017
Issue Date	:	May 22, 2017

Issue by

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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	May 09, 2017	Initial Issue	Snow Wang
01	May 22, 2017	Revised report information.	Snow Wang

Verification of Compliance

Issued Date: May 22, 2017

Applicant	:	Shenzhen Tuge Information Limited Inc
Product Type	:	4G Wireless Data Terminal
Trade Name	:	MASTER ROAM
Model Number	:	T3
FCC ID	:	2AIC4-TGT3
EUT Rated Voltage	:	DC 5V, 1A
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 22H FCC 47 CFR PART 24E ANSI/TIA-603-D 2010
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C) Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By	: Fly Lu	Reviewed By	: Eric Ou Yang
(Manager)	(Fly Lu)	(Testing Engineer)	(Eric Ou Yang)

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1 General Information

1.1. EUT Description

Applicant	Shenzhen Tuge Information Limited Inc Room 406,25 Building ,Nanshan Science Park west industrial area, Shenzhen, Guangdong Province,China			
Manufacturer	Shenzhen Tuge Information Limited Inc Room 406,25 Building ,Nanshan Science Park west industrial area, Shenzhen, Guangdong Province,China			
Product Type	4G Wireless Data Terminal			
Trade Name	MASTER ROAM			
Model Number	T3			
FCC ID	2AIC4-TGT3			
Module use	Module 1:QUALCOMM, MSM6290 Module 2:QUALCOMM, MSM8916			
IMEI No.	869666028468484 (for Module: MSM6290) 869666028463824 (for Module: MSM8916)			
Mode	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation
GPRS/EGPRS	850	824.2 ~ 848.8	869.2 ~ 893.8	GMSK/8PSK
	1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8	GMSK/8PSK
WCDMA(RMC12.2K)/ HSDPA/ HSUPA	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation
	II	1852.4 ~ 1907.6	1932.4 ~ 1987.6	QPSK
	V	826.4 ~ 846.6	871.4 ~ 891.6	QPSK
Channel Control	Auto			

Antenna information	Module name	Antenna Model	Antenna Type	Antenna Max. Gain (dBi)	
	MSM6290	A26-FT2-3G-Main	Internal Antenan	WCDMA/ HSDPA/ HSUPA Band II	-1.3
				WCDMA/ HSDPA/ HSUPA Band V	-1.5
	MSM8916	A26-FT1-4G-Main	Internal Antenan	GPRS/EGPRS 850	-1.4
				GPRS/EGPRS 1900	-1.1
				WCDMA/ HSDPA/ HSUPA Band II	-1.1
				WCDMA/ HSDPA/ HSUPA Band V	-1.4

Module 1:QUALCOMM , MSM6290			
Frequency Band	Max. RF Output Power (W)	E.R.P. /E.I.R.P. (W)	
WCDMA/ HSDPA/ HSUPA Band II	0.415	0.226	(E.I.R.P.)
WCDMA/ HSDPA/ HSUPA Band V	0.429	0.251	(E.I.R.P.)
Frequency Band	Occupied Bandwidth (MHz)	Emission Designator	
WCDMA/ HSDPA/ HSUPA Band II	4.1667	4M17F9W	
WCDMA/ HSDPA/ HSUPA Band V	4.1827	4M18F9W	

Module 2:QUALCOMM , MSM8916			
Frequency Band	Max. RF Output Power (W)	E.R.P. /E.I.R.P. (W)	
GPRS 850	2.004	2.244	(E.I.R.P.)
EGPRS 850	0.986	0.810	(E.I.R.P.)
GPRS 1900	1.047	0.687	(E.I.R.P.)
EGPRS 1900	0.834	0.364	(E.I.R.P.)
WCDMA/ HSDPA/ HSUPA Band II	0.414	0.230	(E.I.R.P.)
WCDMA/ HSDPA/ HSUPA Band V	0.418	0.374	(E.I.R.P.)
Frequency Band	Occupied Bandwidth (MHz)	Emission Designator	
GPRS 850	0.24840	248KG7W	
EGPRS 850	0.24679	247KG7W	
GPRS 1900	0.24359	244KG7W	
EGPRS 1900	0.24840	248KG7W	
WCDMA/ HSDPA/ HSUPA Band II	4.1667	4M17F9W	
WCDMA/ HSDPA/ HSUPA Band V	4.1827	4M18F9W	

1.2. Mode of Operation

ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

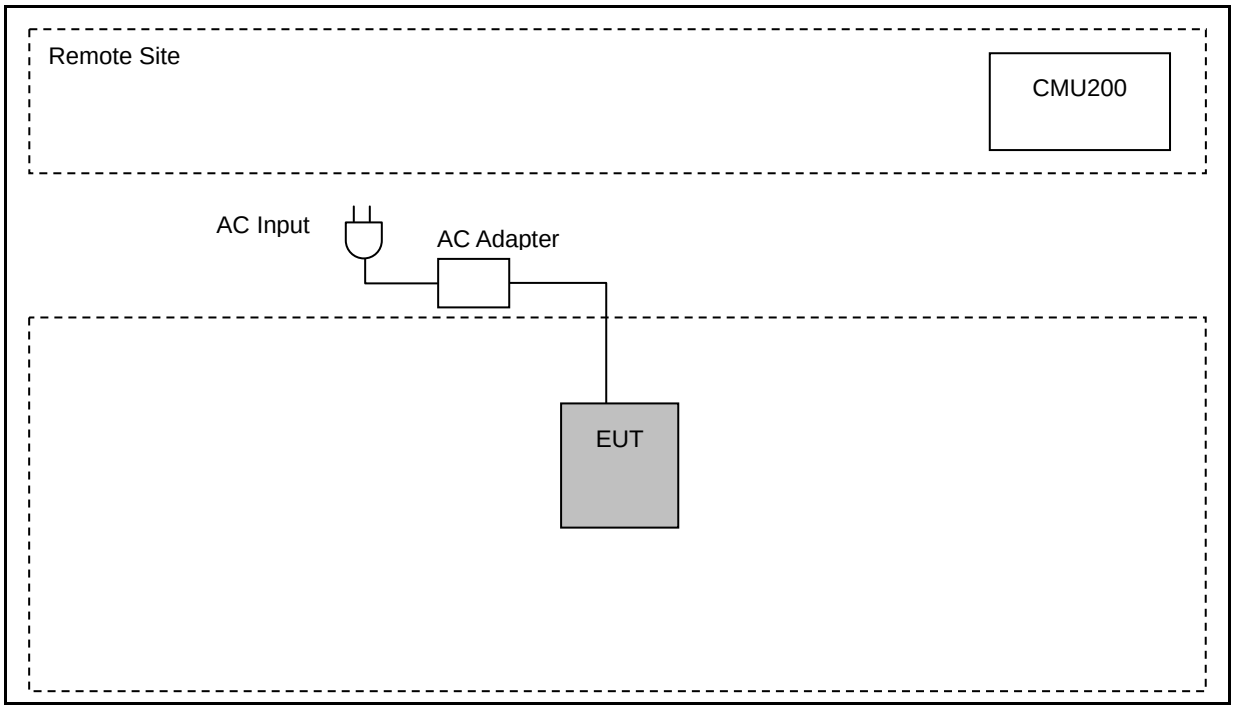
Test Mode
Mode 1: GPRS 850 Link Mode
Mode 2: GPRS 1900 Link Mode
Mode 3: EGPRS 850 Link Mode
Mode 4: EGPRS 1900 Link Mode
Mode 5: WCDMA Band II Link Mode
Mode 6: WCDMA Band V Link Mode

Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

1.3. EUT Exercise Software

1	Setup the EUT and Base Station (CMU200) as shown on 1.4.
2	Turn on the power of all equipment.

1.4. Configuration of Test System Details



1.5. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

1.6. Summary of Test Result

FCC Rule	IC Rule	Description	Result
§2.1046	RSS-132 (5.4) RSS-133 (6.4)	Conducted Output Power	Pass
§22.913(a)(2)	NA	Effective Radiated Power	Pass
§24.232(c)	RSS-132(5.4) SRSP-503(5.1.3) RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	Pass
§24.232(d) KDB 971168 D01 (5.7.1)	RSS-132 (5.4) RSS-133 (6.4)	Peak to average ratio	Pass
§2.1049 §22.917(b) §24.238(b)	RSS-GEN(6.6) RSS-132(3.1) RSS-133(3.1)	Emission Bandwidth & Occupied Bandwidth	Pass
§2.1051 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Band Edge Measurement	Pass
§2.1051 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Conducted Spurious Emission	Pass
§2.1053 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Field Strength of Spurious Radiation	Pass
§2.1055 §22.355 §24.235	RSS-GEN(6.11) RSS-132 (5.3) RSS-GEN(6.11) RSS-133 (6.3)	Frequency Stability for Temperature & Voltage	Pass

2 Test Results

2.1. RF Output Power Test

■ **Limit**

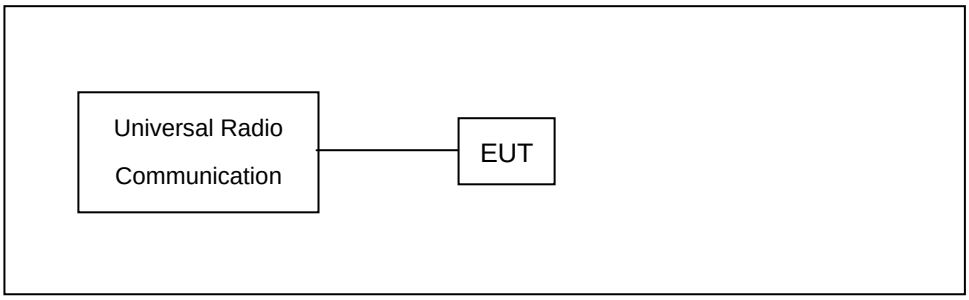
N/A

■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	03/02/2017	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Test Setup**



■ **Test Procedure**

a. The EUT was set up for the maximum power with with simulator.

b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

■ **Uncertainty**

The measurement uncertainty is defined as for RF output power measurement is 1.2 dB.

■ **Test Result**

RF Power setting in Test Software	Test Software Version
N/A, RF power setting was not able to alter during testing.	N/A, no test SW was used during testing.

Module 1:QUALCOMM , MSM6290

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band II	QPSK	-----	1852.4	22.89	0.195	**26.18**	**0.415**
			1880.0	22.60	0.182	25.90	0.389
			1907.6	22.89	0.195	26.16	0.413
HSDPA Band II	QPSK	1	1852.4	22.29	0.169	25.53	0.357
			1880.0	22.10	0.162	25.35	0.343
			1907.6	21.98	0.158	25.22	0.333
		2	1852.4	21.61	0.145	24.85	0.305
			1880.0	21.29	0.135	24.53	0.284
			1907.6	21.58	0.144	24.83	0.304
		3	1852.4	21.46	0.140	24.74	0.298
			1880.0	21.22	0.132	24.47	0.280
			1907.6	21.42	0.139	24.69	0.294
		4	1852.4	21.80	0.151	25.05	0.320
			1880.0	21.78	0.151	25.05	0.320
			1907.6	21.98	0.158	25.27	0.337
HSUPA Band II	QPSK	1	1852.4	21.52	0.142	24.78	0.301
			1880.0	21.32	0.136	24.56	0.286
			1907.6	21.46	0.140	24.71	0.296
		2	1852.4	19.57	0.091	22.80	0.191
			1880.0	19.27	0.085	22.51	0.178
			1907.6	19.64	0.092	22.89	0.195
		3	1852.4	20.47	0.111	23.70	0.234
			1880.0	20.47	0.111	23.72	0.236
			1907.6	20.59	0.115	23.83	0.242
		4	1852.4	19.39	0.087	22.63	0.183
			1880.0	19.12	0.082	22.36	0.172
			1907.6	19.71	0.094	22.96	0.198
		5	1852.4	21.43	0.139	24.67	0.293
			1880.0	21.38	0.137	24.63	0.290
			1907.6	21.63	0.146	24.84	0.305

Note: The peak power testing result was used peak detector.

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band V	QPSK	-----	826.4	23.03	0.201	**26.32**	**0.429**
			836.6	22.74	0.188	26.02	0.400
			846.6	22.95	0.197	26.24	0.421
HSDPA Band V	QPSK	1	826.4	22.24	0.167	25.47	0.352
			836.6	21.89	0.155	25.15	0.327
			846.6	22.30	0.170	25.56	0.360
		2	826.4	21.64	0.146	24.87	0.307
			836.6	21.32	0.136	24.57	0.286
			846.6	21.53	0.142	24.76	0.299
		3	826.4	21.60	0.145	24.87	0.307
			836.6	21.49	0.141	24.73	0.297
			846.6	21.83	0.152	25.11	0.324
		4	826.4	22.08	0.161	25.36	0.344
			836.6	21.93	0.156	25.19	0.330
			846.6	21.98	0.158	25.27	0.337
HSUPA Band V	QPSK	1	826.4	21.47	0.140	24.71	0.296
			836.6	21.48	0.141	24.72	0.296
			846.6	21.69	0.148	24.95	0.313
		2	826.4	19.71	0.094	22.97	0.198
			836.6	19.48	0.089	22.72	0.187
			846.6	19.58	0.091	22.80	0.191
		3	826.4	20.62	0.115	23.83	0.242
			836.6	20.52	0.113	23.73	0.236
			846.6	20.71	0.118	23.92	0.247
		4	826.4	19.64	0.092	22.90	0.195
			836.6	19.65	0.092	22.88	0.194
			846.6	19.57	0.091	22.82	0.191
		5	826.4	21.27	0.134	24.50	0.282
			836.6	21.32	0.136	24.54	0.284
			846.6	21.45	0.140	24.67	0.293

Note: The peak power testing result was used peak detector.

Module 2:QUALCOMM , MSM8916

Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GRRS 850 Multi Class :33 Max Up:5 Max Down:4 Sum:6	GMSK	5Down1Up (Duty Factor 1/8)	824.2	32.51	1.782	32.70	1.862
			836.6	32.54	1.795	32.73	1.875
			848.8	32.83	1.919	**33.02**	**2.004**
		4Down2Up (Duty Factor 2/8)	824.2	30.37	1.089	30.55	1.135
			836.6	30.46	1.112	30.64	1.159
			848.8	30.65	1.161	30.83	1.211
		3Down3Up (Duty Factor 3/8)	824.2	27.96	0.625	28.13	0.650
			836.6	28.21	0.662	28.38	0.689
			848.8	28.46	0.701	28.63	0.729
		2Down4Up (Duty Factor 4/8)	824.2	27.11	0.514	27.27	0.533
			836.6	27.32	0.540	27.48	0.560
			848.8	27.49	0.561	27.65	0.582
EGPRS 850 Multi Class :33 Max Up:5 Max Down:4 Sum:6	8PSK	5Down1Up (Duty Factor 1/8)	824.2	26.42	0.439	29.67	0.927
			836.6	26.57	0.454	29.82	0.959
			848.8	26.69	0.467	**29.94**	**0.986**
		4Down2Up (Duty Factor 2/8)	824.2	24.12	0.258	27.38	0.547
			836.6	24.38	0.274	27.64	0.581
			848.8	24.57	0.286	27.83	0.607
		3Down3Up (Duty Factor 3/8)	824.2	22.13	0.163	25.37	0.344
			836.6	22.34	0.171	25.58	0.361
			848.8	22.49	0.177	25.73	0.374
		2Down4Up (Duty Factor 4/8)	824.2	21.19	0.132	24.41	0.276
			836.6	21.28	0.134	24.50	0.282
			848.8	21.41	0.138	24.63	0.290

Note: The peak power testing result was used peak detector.

Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GRRS 1900 Multi Class :33 Max Up:5 Max Down:4 Sum:6	GMSK	5Down1Up (Duty Factor 1/8)	1850.20	30.01	1.002	**30.20**	**1.047**
			1880.00	29.98	0.995	30.17	1.040
			1909.80	29.89	0.975	30.08	1.019
		4Down2Up (Duty Factor 2/8)	1850.20	27.96	0.625	28.14	0.652
			1880.00	27.84	0.608	28.02	0.634
			1909.80	27.71	0.590	27.89	0.615
		3Down3Up (Duty Factor 3/8)	1850.20	25.73	0.374	25.90	0.389
			1880.00	25.66	0.368	25.83	0.383
			1909.80	25.54	0.358	25.71	0.372
		2Down4Up (Duty Factor 4/8)	1850.20	24.33	0.271	24.49	0.281
			1880.00	24.21	0.264	24.37	0.274
			1909.80	24.19	0.262	24.35	0.272
EGPRS 1900 Multi Class :33 Max Up:5 Max Down:4 Sum:6	8PSK	5Down1Up (Duty Factor 1/8)	1850.20	25.62	0.365	28.87	0.771
			1880.00	25.84	0.384	29.09	0.811
			1909.80	25.96	0.394	**29.21**	**0.834**
		4Down2Up (Duty Factor 2/8)	1850.20	23.48	0.223	26.74	0.472
			1880.00	23.69	0.234	26.95	0.495
			1909.80	23.74	0.237	27.00	0.501
		3Down3Up (Duty Factor 3/8)	1850.20	21.27	0.134	24.51	0.282
			1880.00	21.39	0.138	24.63	0.290
			1909.80	21.52	0.142	24.76	0.299
		2Down4Up (Duty Factor 4/8)	1850.20	20.43	0.110	23.65	0.232
			1880.00	20.56	0.114	23.78	0.239
			1909.80	20.66	0.116	23.88	0.244

Note: The peak power testing result was used peak detector.

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band II	QPSK	-----	1852.4	22.83	0.192	26.09	0.406
			1880.0	22.66	0.185	25.92	0.391
			1907.6	22.91	0.195	**26.17**	**0.414**
HSDPA Band II	QPSK	1	1852.4	22.11	0.163	25.35	0.343
			1880.0	21.94	0.156	25.18	0.330
			1907.6	22.16	0.164	25.40	0.347
		2	1852.4	21.59	0.144	24.81	0.303
			1880.0	21.44	0.139	24.66	0.292
			1907.6	21.63	0.146	24.85	0.305
		3	1852.4	21.54	0.143	24.79	0.301
			1880.0	21.38	0.137	24.63	0.290
			1907.6	21.59	0.144	24.84	0.305
		4	1852.4	21.96	0.157	25.23	0.333
			1880.0	21.81	0.152	25.08	0.322
			1907.6	22.01	0.159	25.28	0.337
HSUPA Band II	QPSK	1	1852.4	21.54	0.143	24.79	0.301
			1880.0	21.37	0.137	24.62	0.290
			1907.6	21.59	0.144	24.84	0.305
		2	1852.4	19.52	0.090	22.76	0.189
			1880.0	19.31	0.085	22.55	0.180
			1907.6	19.57	0.091	22.81	0.191
		3	1852.4	20.51	0.112	23.73	0.236
			1880.0	20.33	0.108	23.55	0.226
			1907.6	20.57	0.114	23.79	0.239
		4	1852.4	19.48	0.089	22.73	0.187
			1880.0	19.28	0.085	22.53	0.179
			1907.6	19.53	0.090	22.78	0.190
		5	1852.4	21.36	0.137	24.59	0.288
			1880.0	21.22	0.132	24.45	0.279
			1907.6	21.43	0.139	24.66	0.292

Note: The peak power testing result was used peak detector.

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band V	QPSK	-----	826.4	22.91	0.195	26.17	0.414
			836.6	22.86	0.193	26.12	0.409
			846.6	22.95	0.197	**26.21**	**0.418**
HSDPA Band V	QPSK	1	826.4	22.19	0.166	25.43	0.349
			836.6	22.06	0.161	25.30	0.339
			846.6	22.22	0.167	25.46	0.352
		2	826.4	21.67	0.147	24.89	0.308
			836.6	21.52	0.142	24.74	0.298
			846.6	21.72	0.149	24.94	0.312
		3	826.4	21.63	0.146	24.88	0.308
			836.6	21.49	0.141	24.74	0.298
			846.6	21.66	0.147	24.91	0.310
		4	826.4	22.08	0.161	25.35	0.343
			836.6	21.93	0.156	25.20	0.331
			846.6	22.13	0.163	25.40	0.347
HSUPA Band V	QPSK	1	826.4	21.61	0.145	24.86	0.306
			836.6	21.53	0.142	24.78	0.301
			846.6	21.64	0.146	24.89	0.308
		2	826.4	19.55	0.090	22.79	0.190
			836.6	19.50	0.089	22.74	0.188
			846.6	19.63	0.092	22.87	0.194
		3	826.4	20.61	0.115	23.83	0.242
			836.6	20.52	0.113	23.74	0.237
			846.6	20.66	0.116	23.88	0.244
		4	826.4	19.51	0.089	22.76	0.189
			836.6	19.47	0.089	22.72	0.187
			846.6	19.58	0.091	22.83	0.192
		5	826.4	21.44	0.139	24.67	0.293
			836.6	21.37	0.137	24.60	0.288
			846.6	21.51	0.142	24.74	0.298

Note: The peak power testing result was used peak detector.

2.2. Effective Radiated Power / Equivalent Isotropic Radiated Power Test

- **Limit**

For FCC Part 22.913(a)(2): The E.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(c): The E.I.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

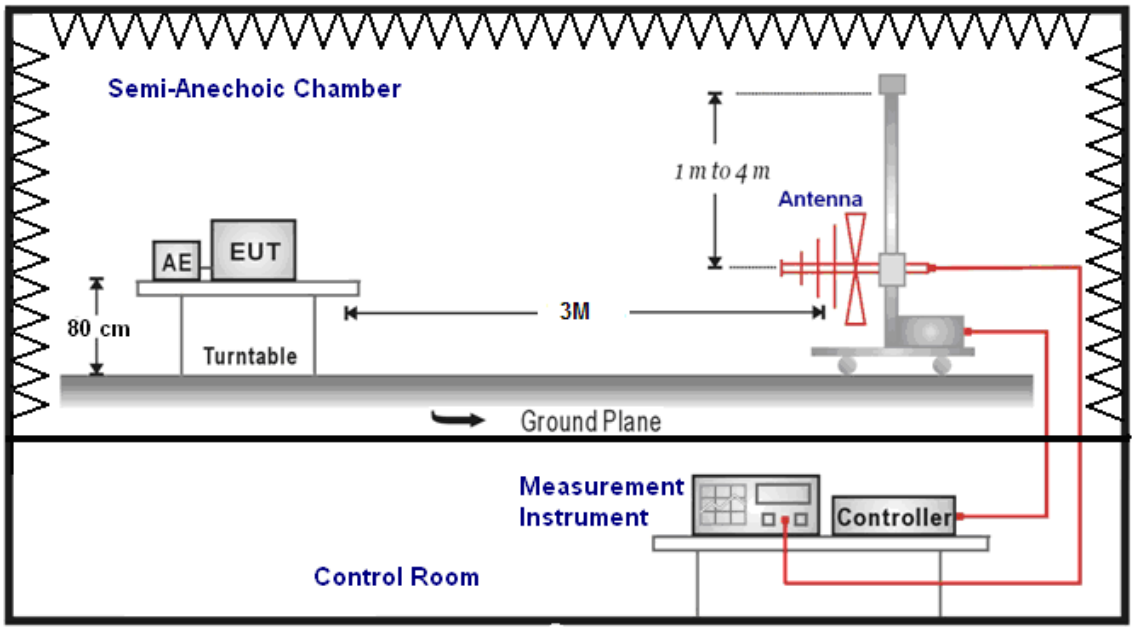
- **Test Instruments**

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
RF Pre-selector	Agilent	N9039A	MY46520256	03/30/2016	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	03/30/2016	1 year
Pre Amplifier	Agilent	8449B	3008A02237	10/11/2016	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/12/2017	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	416	10/13/2016	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	419	11/03/2016	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Horn Antenna (18~40GHz)	ETS	3116	00086467	09/05/2016	1 year
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/18/2016	1 year
Microwave Cable	EMCI	EMC102-KM-KM-14000	151001	02/20/2017	1 year
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	02/20/2017	1 year
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	02/20/2017	1 year
Signal Generator	Agilent	E8257D	MY44320425	03/02/2017	1 year
Test Site	ATL	TE01	888001	08/29/2016	1 year

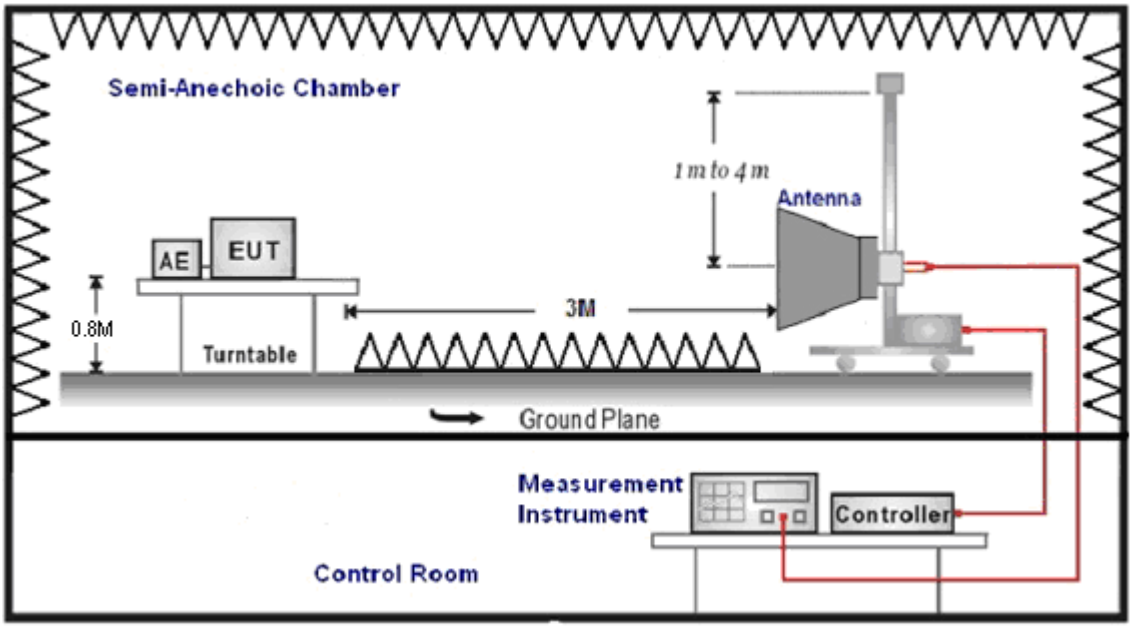
Note: N.C.R. = No Calibration Request.

■ **Setup**

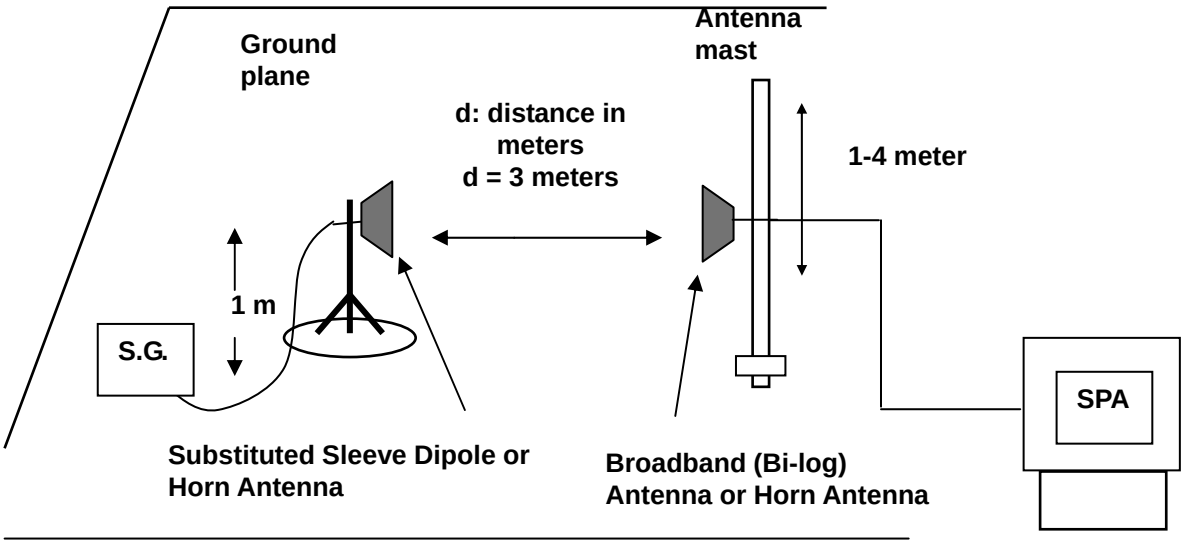
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



■ Test Procedure

a. The EUT was set up for the maximum power with WWAN link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 5MHz for WWAN mode.

b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.

d. E.I.R.P. = Output power level of S.G - TX cable loss + Antenna gain of substitution horn

e. E.R.P. = E.I.R.P.- 2.15 dB

Note: 1. Below 1 GHz Substituted Method Test：Sleeve dipole antenna to Bi-Log Antenna

2. Above 1 GHz Substituted Method Test：Horn antenna to Horn Antenna

■ Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.

■ **Test Result**

Module 1:QUALCOMM , MSM6290

Band 2								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit (W)
						(dBm)	(W)	
WCDMA	QPSK	1852.4	H	10.52	9.56	20.08	0.102	< 2
			V	13.98	9.56	**23.54**	**0.226**	< 2
		1880.0	H	10.69	9.68	20.37	0.109	< 2
			V	13.75	9.67	23.42	0.220	< 2
		1907.6	H	10.45	9.79	20.24	0.106	< 2
			V	13.58	9.79	23.37	0.217	< 2

Band 5								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit (W)
						(dBm)	(W)	
WCDMA	QPSK	826.4	H	9.84	11.25	21.09	0.129	< 7
			V	11.42	11.27	22.69	0.186	< 7
		836.6	H	9.36	11.44	20.80	0.120	< 7
			V	11.89	11.42	**23.31**	**0.214**	< 7
		846.6	H	8.89	11.57	20.46	0.111	< 7
			V	11.30	11.55	22.85	0.193	< 7

Note: 1. E.R.P./E.I.R.P. = Read Level + Correction factor.

2. For WCDMA and CDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

Module 2:QUALCOMM , MSM8916

850								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit (W)
						(dBm)	(W)	
GPRS 850	GMSK	824.2	H	17.77	11.24	29.01	0.796	< 7
			V	19.81	11.24	31.05	1.274	< 7
		836.6	H	17.18	11.42	28.60	0.724	< 7
			V	19.51	11.42	30.93	1.239	< 7
		848.8	H	16.99	11.60	28.59	0.723	< 7
			V	19.76	11.60	**31.36**	**1.368**	< 7
EGPRS 850	8PSK	824.2	H	13.66	11.24	24.90	0.309	< 7
			V	15.69	11.25	**26.94**	**0.494**	< 7
		836.6	H	13.34	11.42	24.76	0.299	< 7
			V	15.08	11.42	26.50	0.447	< 7
		848.8	H	12.76	11.59	24.35	0.272	< 7
			V	14.82	11.60	26.42	0.439	< 7

1900								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit (W)
						(dBm)	(W)	
GPRS 1900	GMSK	1850.2	H	15.62	9.56	25.18	0.330	< 2
			V	18.61	9.56	28.17	0.656	< 2
		1880.0	H	15.56	9.67	25.23	0.333	< 2
			V	18.58	9.67	28.25	0.668	< 2
		1909.8	H	15.25	9.80	25.05	0.320	< 2
			V	18.57	9.80	**28.37**	**0.687**	< 2
EGPRS 1900	8PSK	1850.2	H	13.91	9.56	23.47	0.222	< 2
			V	15.79	9.56	25.35	0.343	< 2
		1880.0	H	13.97	9.67	23.64	0.231	< 2
			V	15.94	9.67	**25.61**	**0.364**	< 2
		1909.8	H	13.56	9.80	23.36	0.217	< 2
			V	15.68	9.80	25.48	0.353	< 2

Note: 1. E.R.P./E.I.R.P. = Read Level + Correction factor.

2. For WCDMA and CDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

Band 2								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit (W)
						(dBm)	(W)	
WCDMA	QPSK	1852.4	H	10.68	9.56	20.24	0.106	< 2
			V	14.06	9.56	**23.62**	**0.230**	< 2
		1880.0	H	10.72	9.68	20.40	0.110	< 2
			V	13.84	9.67	23.51	0.224	< 2
		1907.6	H	10.85	9.78	20.63	0.116	< 2
			V	13.66	9.79	23.45	0.221	< 2

Band 5								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit (W)
						(dBm)	(W)	
WCDMA	QPSK	826.4	H	9.89	11.27	21.16	0.131	< 7
			V	12.08	11.27	23.35	0.216	< 7
		836.6	H	9.56	11.42	20.98	0.125	< 7
			V	12.15	11.42	**23.57**	**0.228**	< 7
		846.6	H	9.34	11.57	20.91	0.123	< 7
			V	11.70	11.57	23.27	0.212	< 7

Note: 1. E.R.P./E.I.R.P. = Read Level + Correction factor.

2. For WCDMA and CDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

2.3. Peak to Average Ratio Test

■ **Limit**

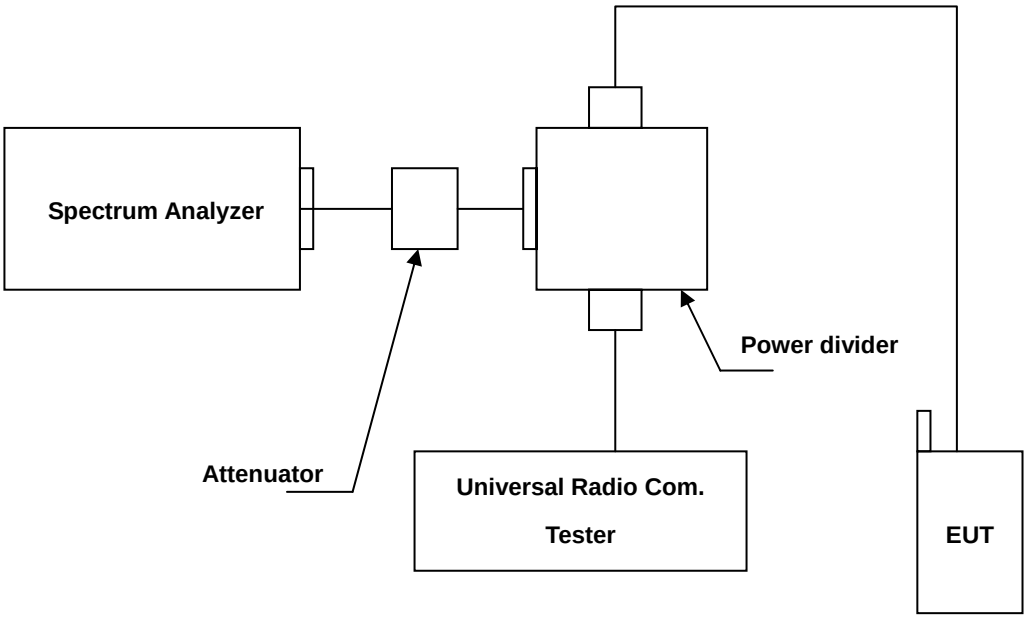
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

■ **Test Instruments**

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	03/02/2017	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Setup**



Test Procedure

The measurement is made according to FCC rules:

a. Set resolution/measurement bandwidth signal's occupied bandwidth;

b. Set the number of counts to a value that stabilizes the measured CCDF curve;

c. Record the maximum PAPR level associated with a probability of 0.1%.

Uncertainty

The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

Test Result

Module 1:QUALCOMM , MSM6290

Bands	Channel	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
WCDMA Band II	9262	1852.4	3.20	< 13
	9400	1880.0	3.56	< 13
	9538	1907.6	3.49	< 13

Module 2:QUALCOMM , MSM8916

Bands	Channel	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
GRRS 1900	512	1850.20	0.45	< 13
	661	1880.00	0.50	< 13
	810	1909.80	0.53	< 13
EGRRS 1900	512	1850.20	3.30	< 13
	661	1880.00	3.25	< 13
	810	1909.80	3.26	< 13
WCDMA Band II	9262	1852.4	3.20	< 13
	9400	1880.0	3.58	< 13
	9538	1907.6	3.48	< 13

2.4. Emission Bandwidth & Occupied Bandwidth Test

■ **Limit**

The Occupied Bandwidth Limit:

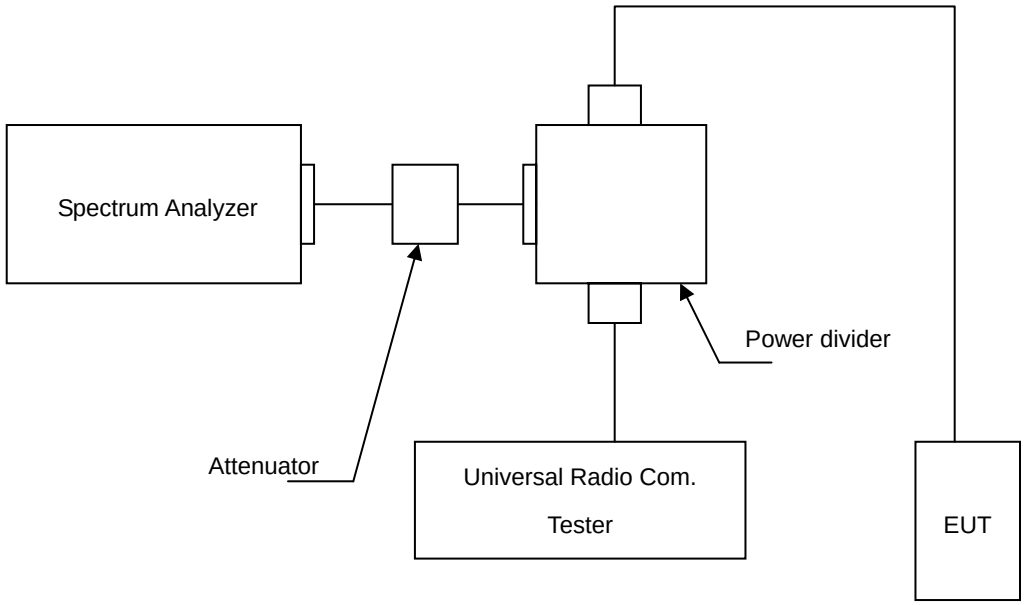
N/A.

■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Universal Radio Communication Tester	R & S	CMU200	112387	03/02/2017	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Setup**



Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.

Uncertainty

The measurement uncertainty is defined as ± 10Hz

■ **Test Result**

Module 1:QUALCOMM , MSM6290

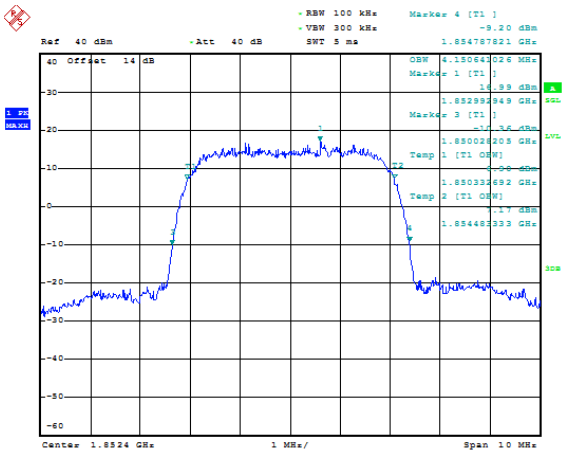
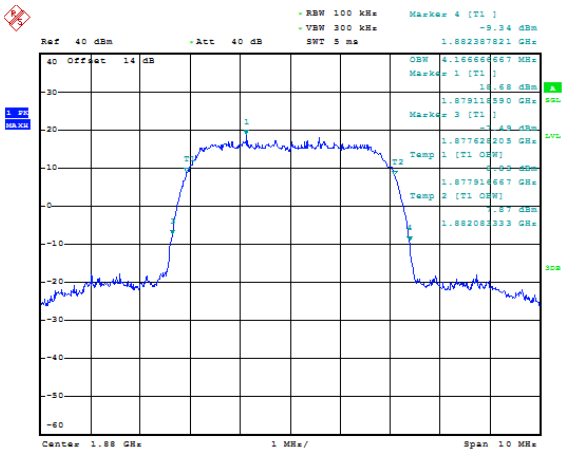
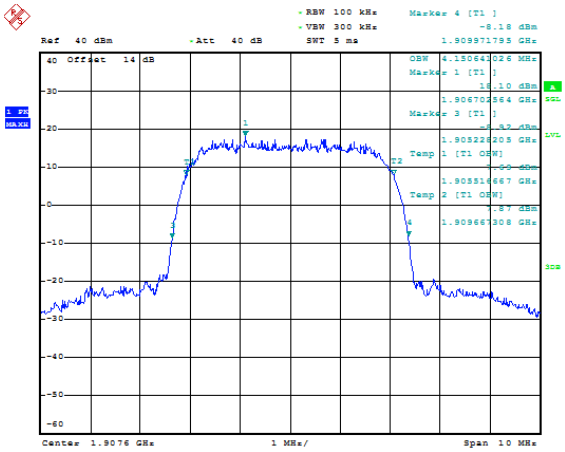
Bands	Channel	Frequency (MHz)	-26dB Bandwidth (kHz)	99% Bandwidth (kHz)	Note
WCDMA Band II	9262	1852.4	4760	4150.6	RBW:100KHz , VBW:300KHz
	9400	1880.0	4760	4166.7	RBW:100KHz , VBW:300KHz
	9538	1907.6	4744	4150.6	RBW:100KHz , VBW:300KHz
WCDMA Band V	4132	826.4	4728	4150.6	RBW:100KHz , VBW:300KHz
	4183	836.6	4744	4166.7	RBW:100KHz , VBW:300KHz
	4233	846.6	4760	4182.7	RBW:100KHz , VBW:300KHz

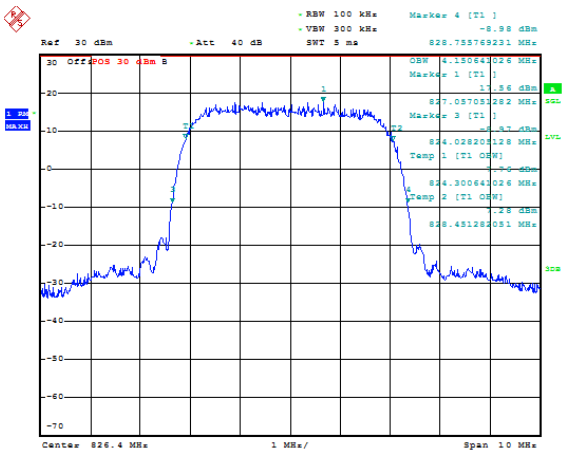
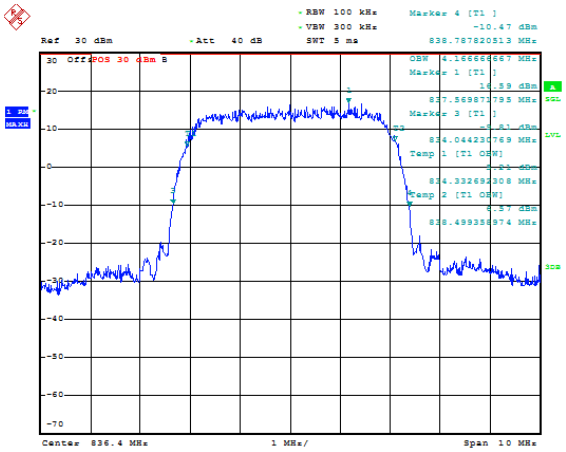
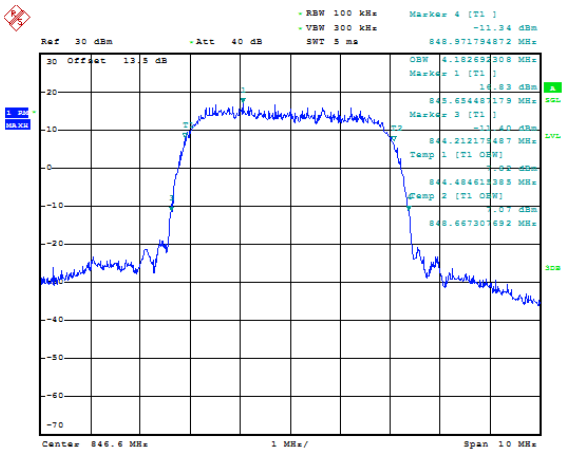
Module 2:QUALCOMM , MSM8916

Bands	Channel	Frequency (MHz)	-26dB Bandwidth (kHz)	99% Bandwidth (kHz)	Note
GPRS 850	128	824.2	301.28	243.59	RBW:10KHz , VBW:30KHz
	190	836.6	306.09	248.40	RBW:10KHz , VBW:30KHz
	251	848.8	309.29	245.19	RBW:10KHz , VBW:30KHz
GPRS 1900	512	1850.20	318.91	243.59	RBW:10KHz , VBW:30KHz
	661	1880.00	314.10	246.79	RBW:10KHz , VBW:30KHz
	810	1909.80	296.47	246.79	RBW:10KHz , VBW:30KHz
EGPRS 850	128	824.2	302.88	243.59	RBW:10KHz , VBW:30KHz
	190	836.6	299.68	240.38	RBW:10KHz , VBW:30KHz
	251	848.8	306.09	243.59	RBW:10KHz , VBW:30KHz
EGPRS 1900	512	1850.20	309.29	248.40	RBW:10KHz , VBW:30KHz
	661	1880.00	299.68	246.79	RBW:10KHz , VBW:30KHz
	810	1909.80	298.08	241.99	RBW:10KHz , VBW:30KHz
WCDMA Band II	9262	1852.4	4776	4166.7	RBW:100KHz , VBW:300KHz
	9400	1880.0	4744	4166.7	RBW:100KHz , VBW:300KHz
	9538	1907.6	4744	4150.6	RBW:100KHz , VBW:300KHz
WCDMA Band V	4132	826.4	4663	4166.7	RBW:100KHz , VBW:300KHz
	4183	836.6	4696	4182.7	RBW:100KHz , VBW:300KHz
	4233	846.6	4679	4150.6	RBW:100KHz , VBW:300KHz

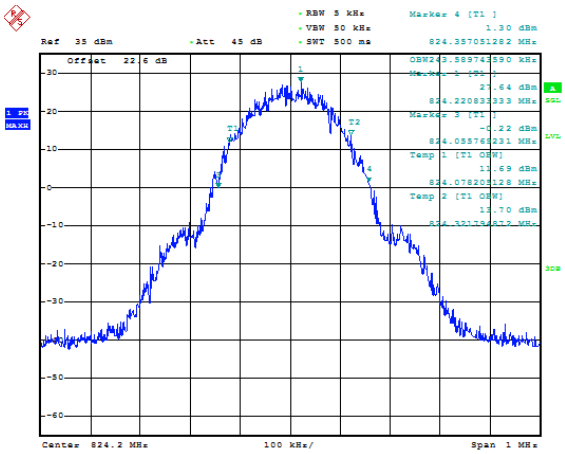
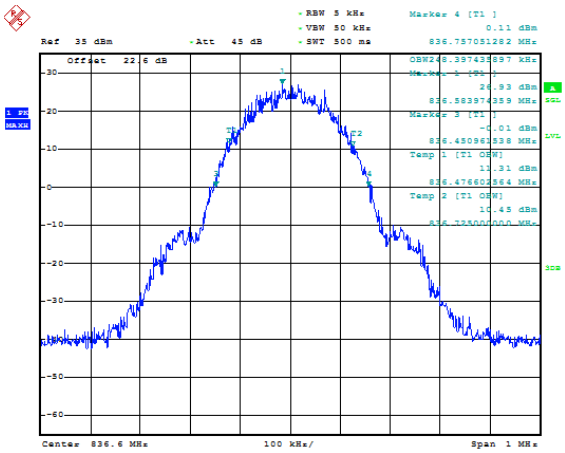
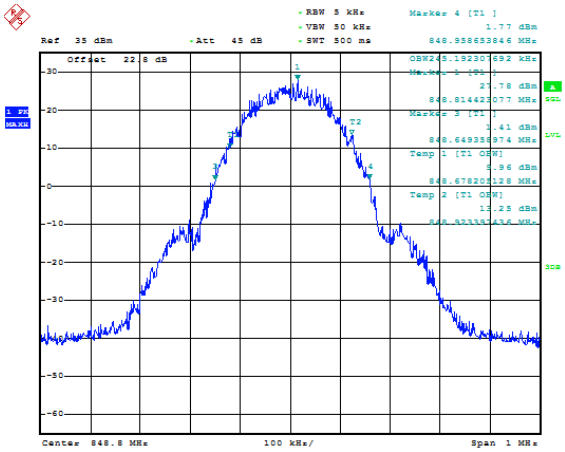
■ **Test Graphs**

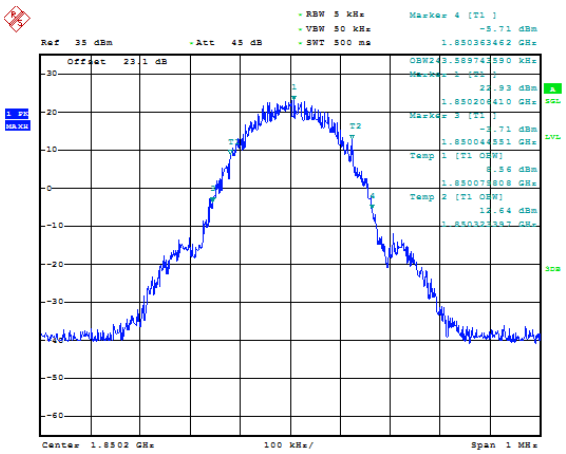
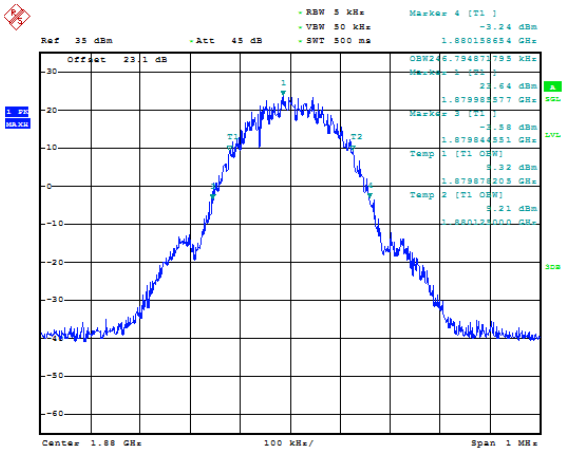
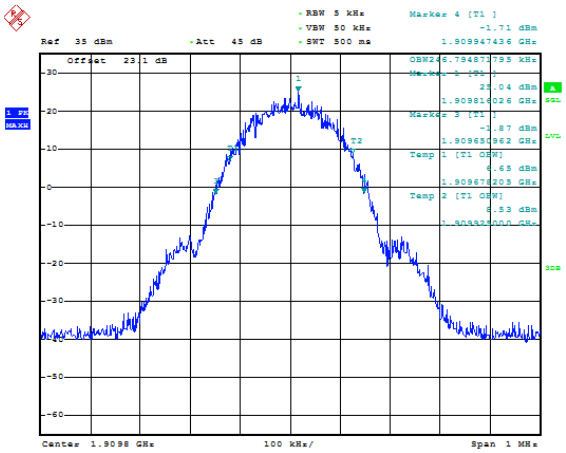
Module 1:QUALCOMM , MSM6290

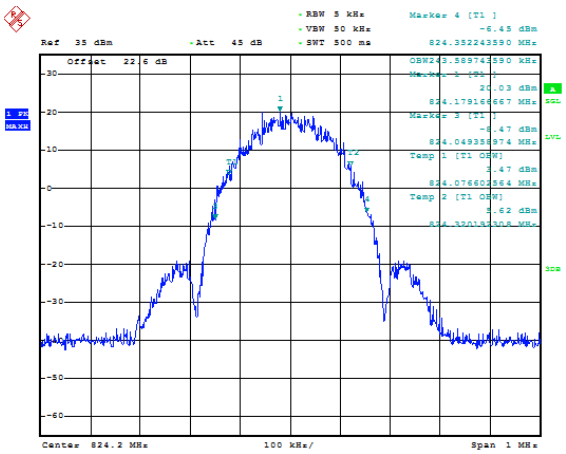
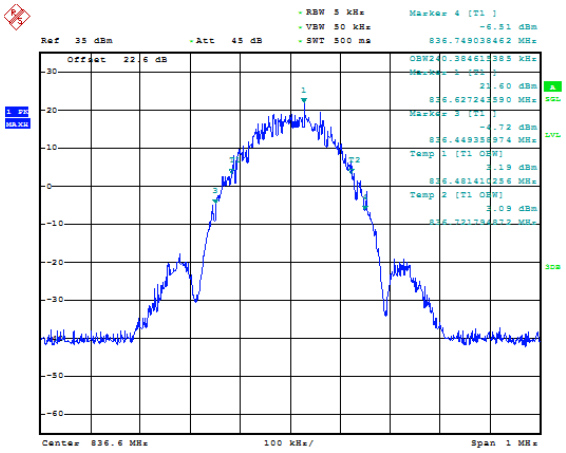
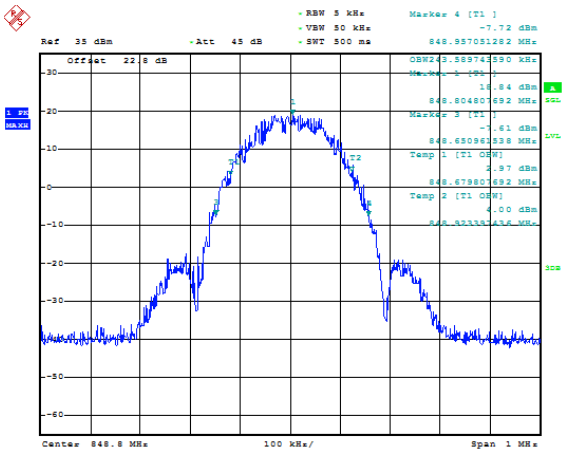
Mode 5: WCDMA Band II Link Mode	
1850.20 MHz	
1880.00 MHz	
1909.80 MHz	

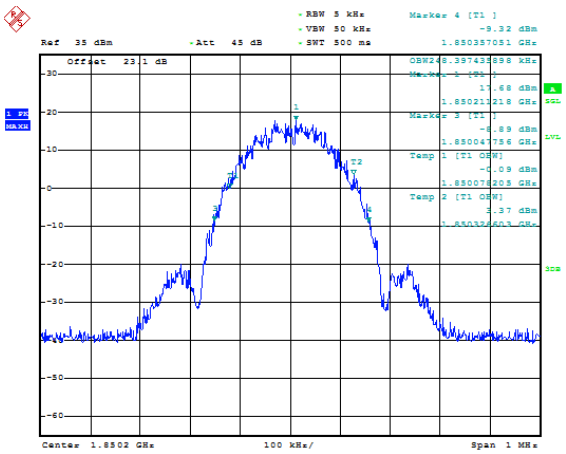
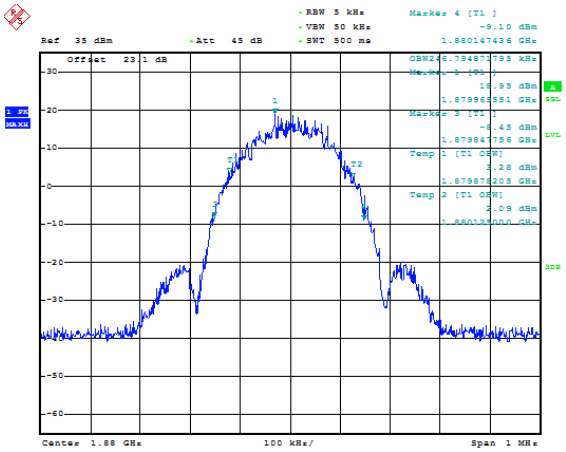
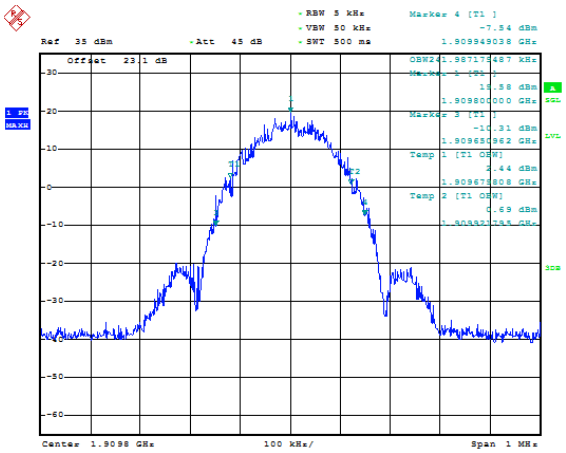
Mode 6: WCDMA Band V Link Mode	
826.4 MHz	
836.6 MHz	
846.6 MHz	

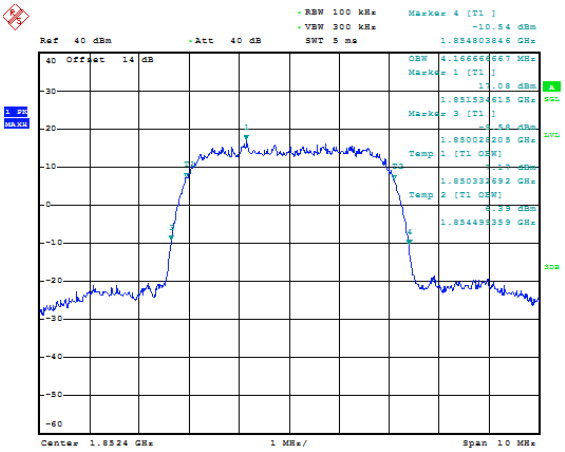
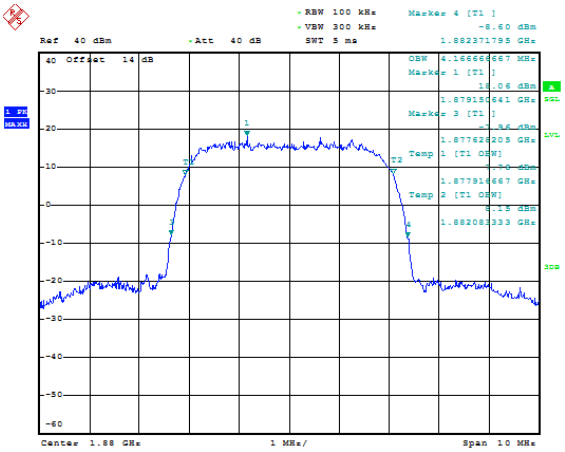
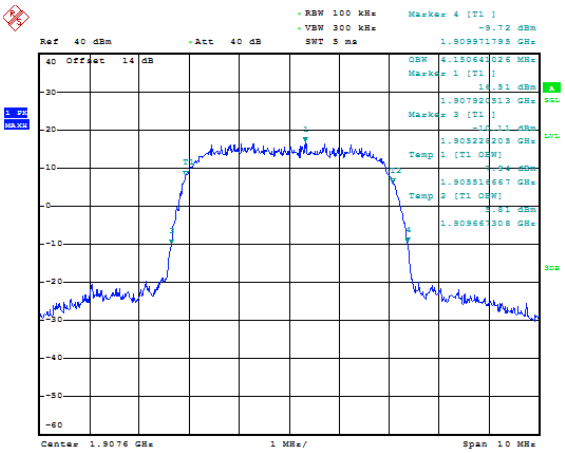
Module 2:QUALCOMM , MSM8916

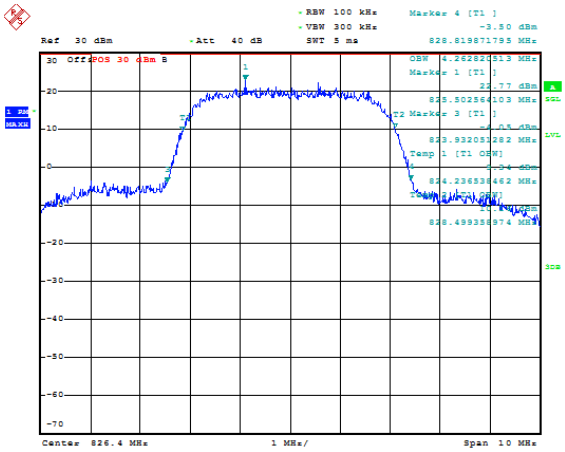
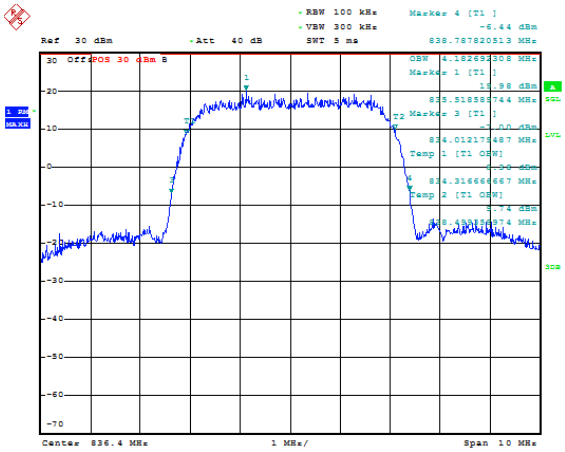
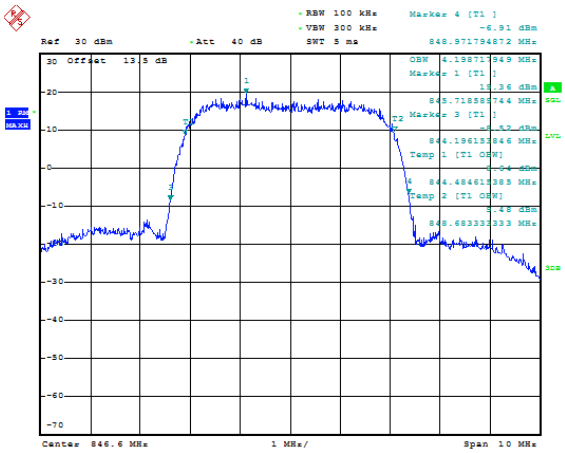
Mode 1: GPRS 850 Link Mode	
824.2 MHz	
836.6 MHz	
848.8 MHz	

Mode 2: GPRS 1900 Link Mode	
1850.20 MHz	
1880.00 MHz	
1909.80 MHz	

Mode 3: EGPRS 850 Link Mode	
824.2 MHz	
836.6 MHz	
848.8 MHz	

Mode 4: EGPRS 1900 Link Mode	
1850.20 MHz	
1880.00 MHz	
1909.80 MHz	

Mode 5: WCDMA Band II Link Mode	
1850.20 MHz	
1880.00 MHz	
1909.80 MHz	

Mode 6: WCDMA Band V Link Mode	
826.4 MHz	
836.6 MHz	
846.6 MHz	

2.5. Band Edge Test

Limit

The Band Edge Limit:

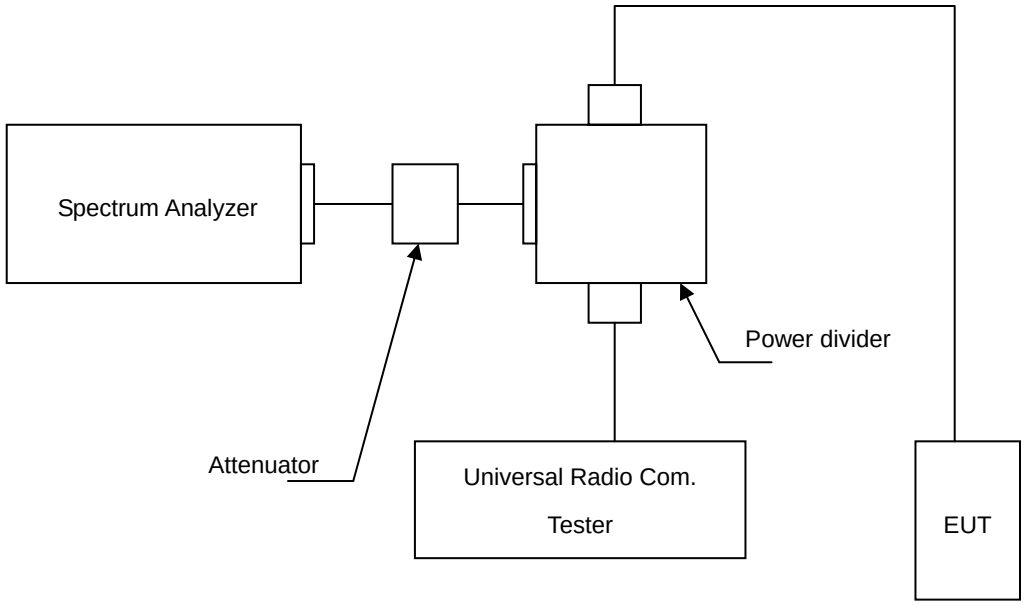
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	03/02/2017	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

Setup



Test Procedure

The measurement is made according to FCC rules part 22 and 24:

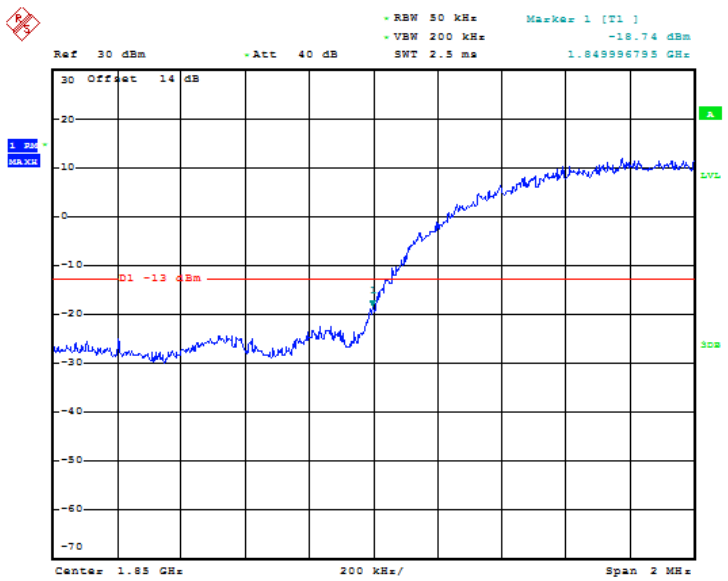
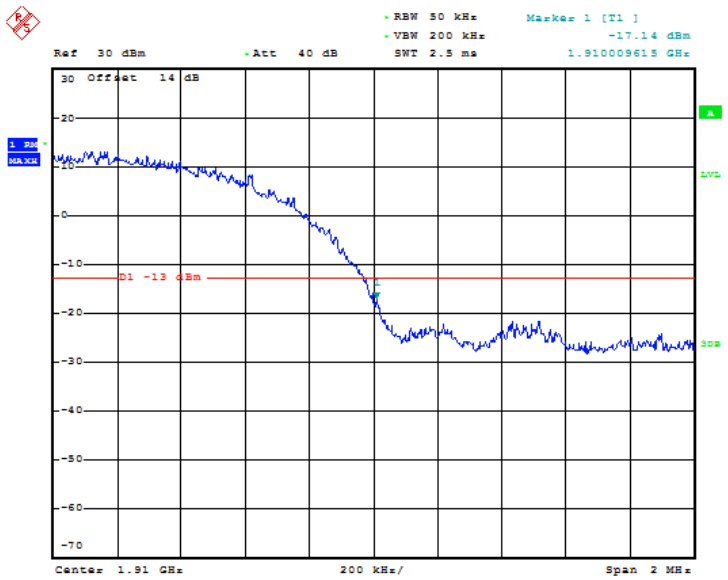
1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
3. The band edge setting:
   a. RB=10 kHz; VB=30 kHz for GSM 850 and PCS 1900.
   b. RB=51 kHz; VB=160 kHz for WCDMA Band V and WCDMA Band II.

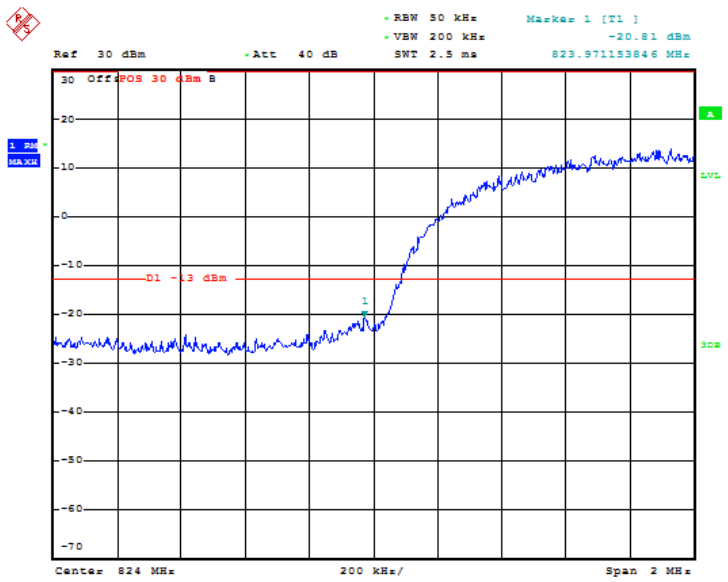
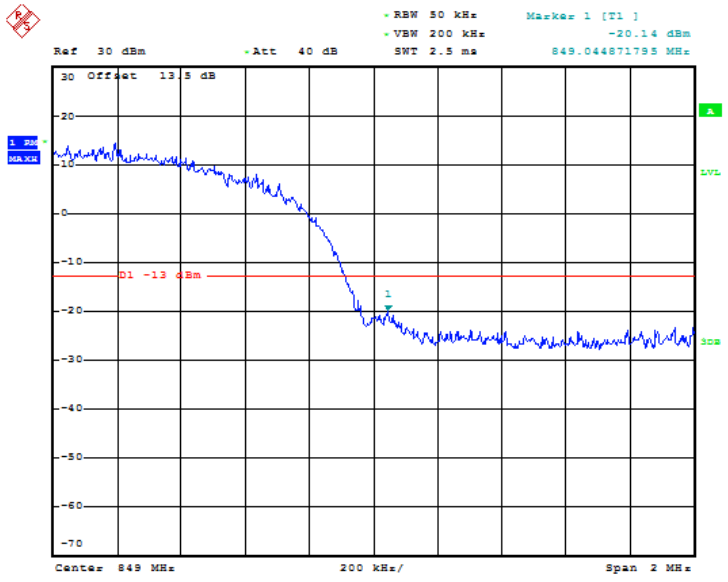
Uncertainty

The measurement uncertainty is defined as ± 10Hz

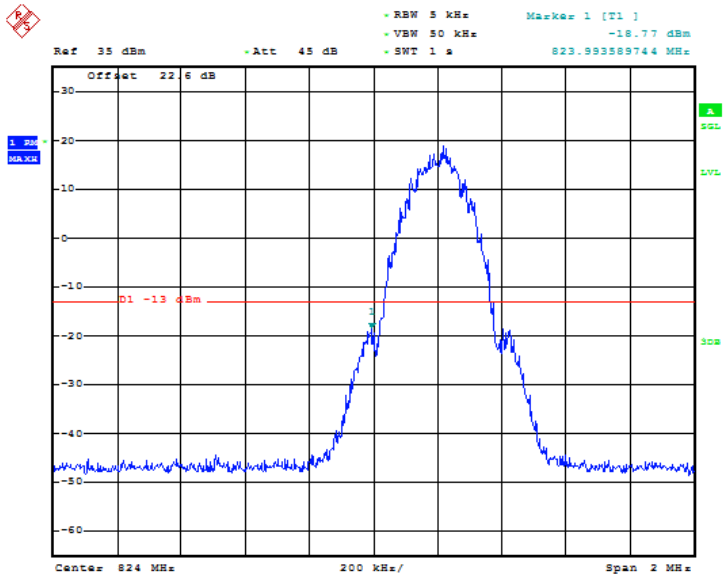
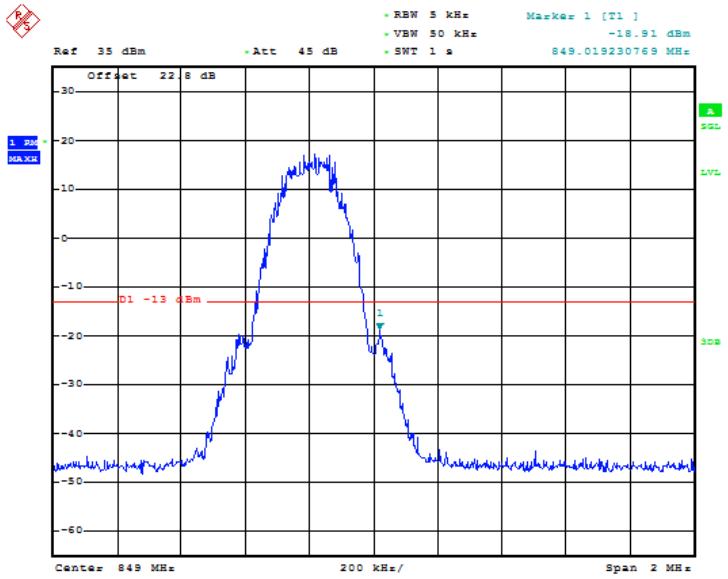
■ **Test Graphs**

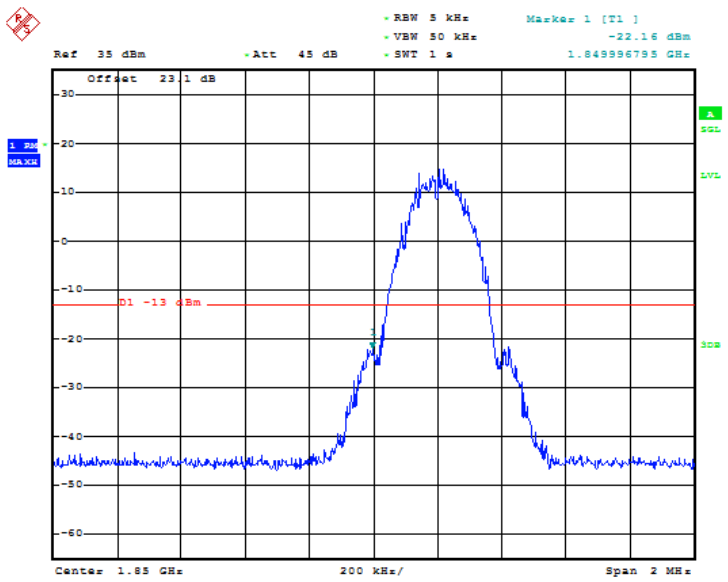
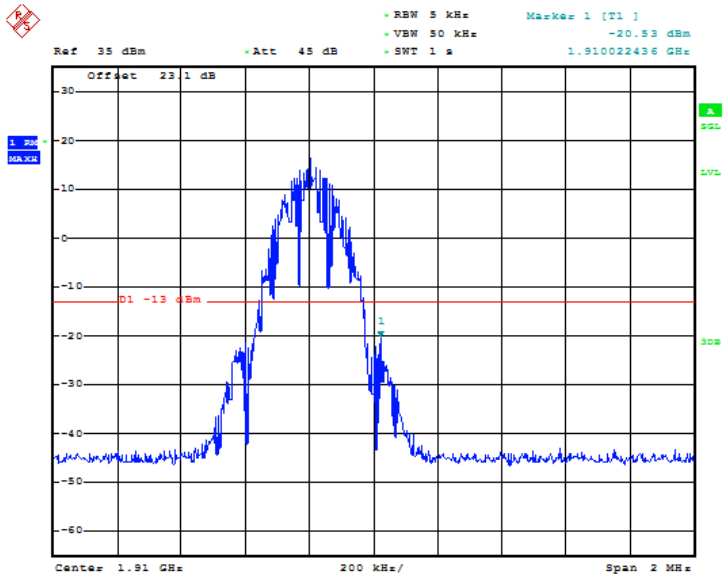
Module 1:QUALCOMM , MSM6290

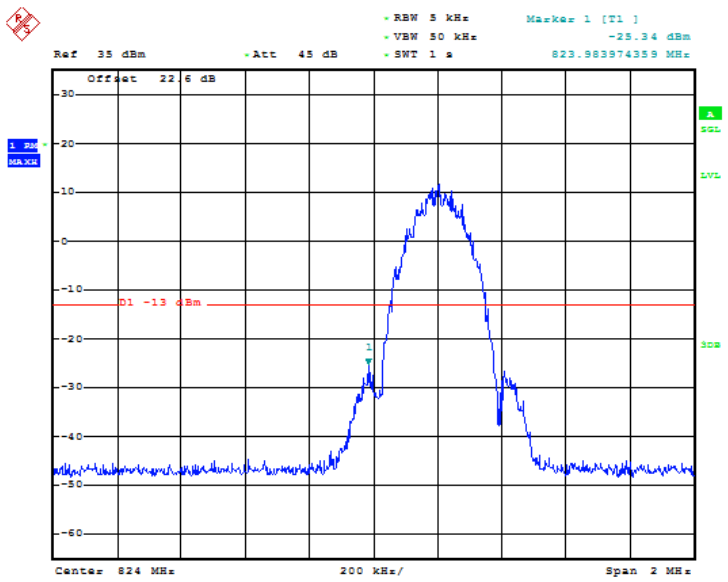
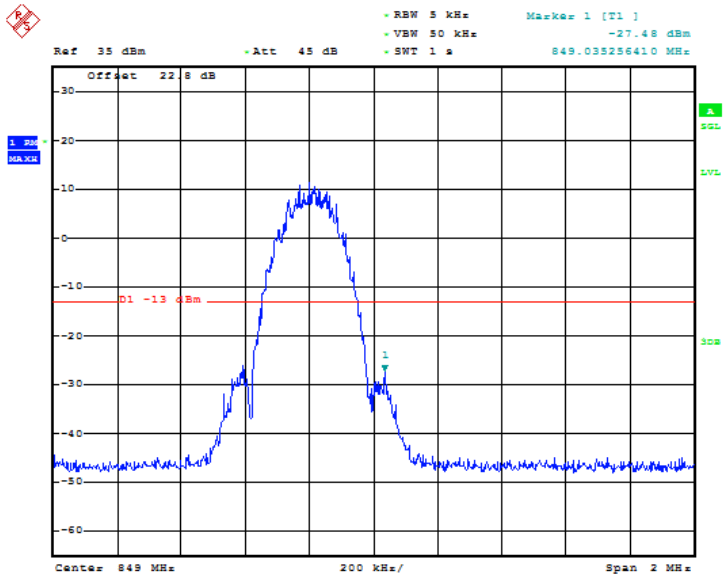
Mode 5: WCDMA Band II Link Mode	
Lower Band	
Higher Band	

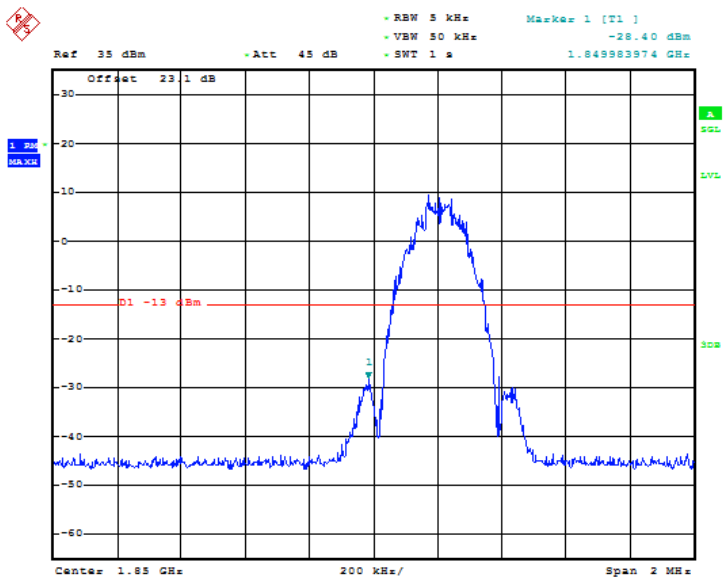
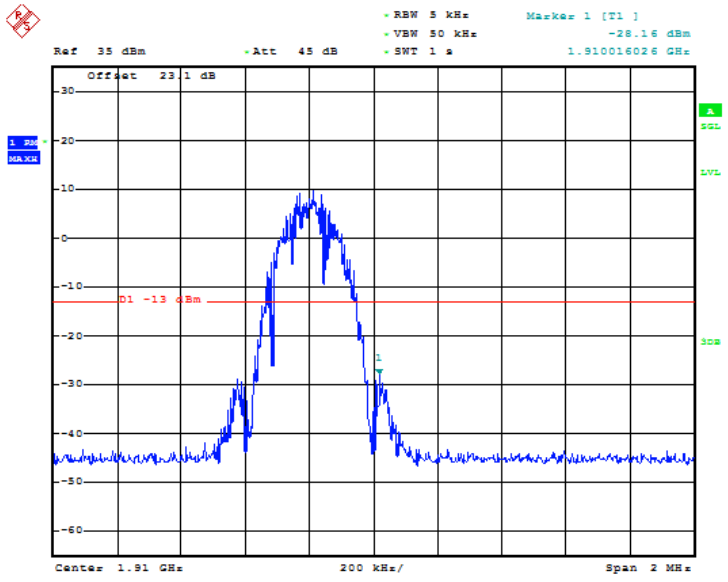
Mode 6: WCDMA Band V Link Mode	
Lower Band	
Higher Band	

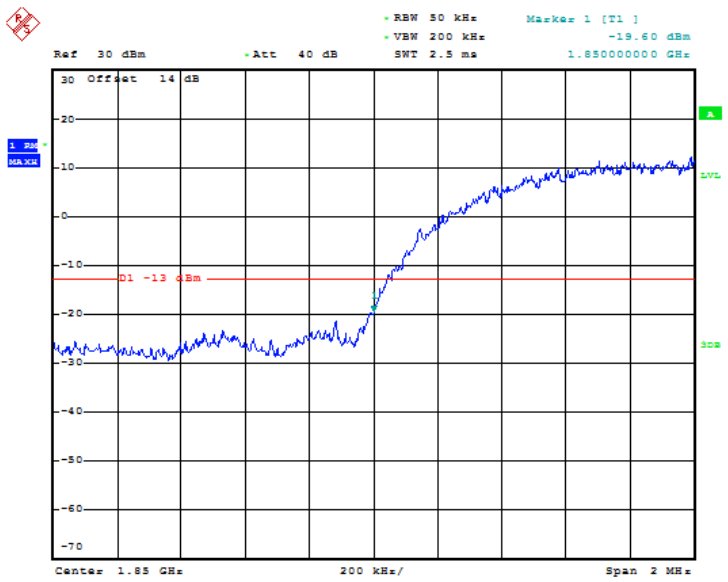
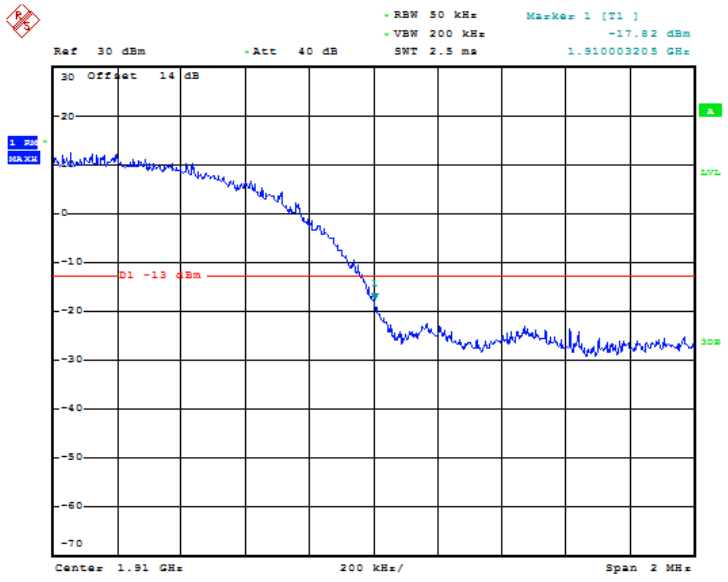
Module 2:QUALCOMM , MSM8916

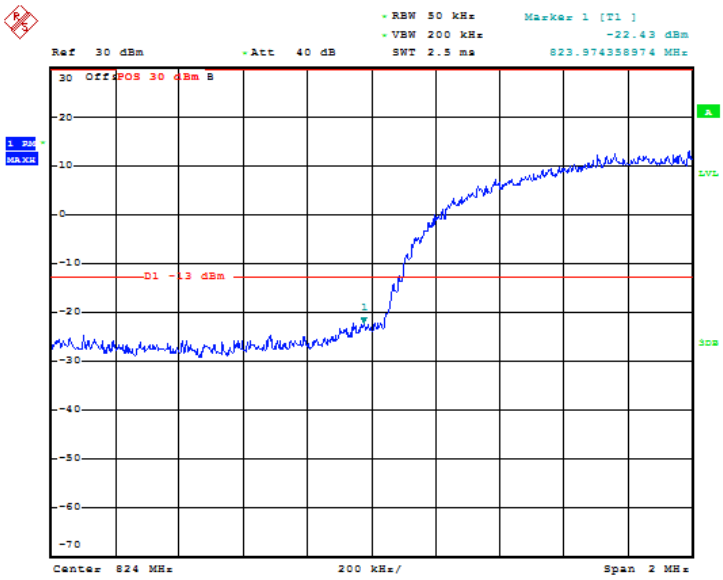
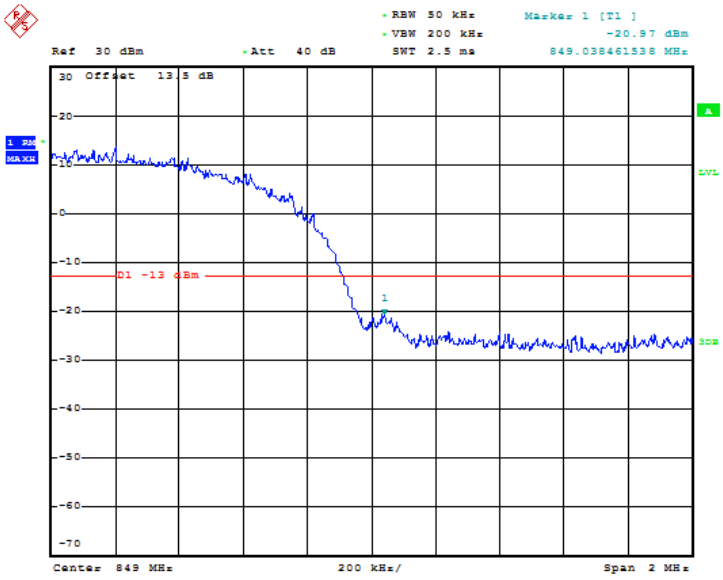
Mode 1: GPRS 850 Link Mode	
Lower Band	
Higher Band	

Mode 2: GPRS 1900 Link Mode	
Lower Band	
Higher Band	

Mode 3: EGPRS 850 Link Mode	
Lower Band	
Higher Band	

Mode 4: EGPRS 1900 Link Mode	
Lower Band	
Higher Band	

Mode 5: WCDMA Band II Link Mode	
Lower Band	
Higher Band	

Mode 6: WCDMA Band V Link Mode	
Lower Band	
Higher Band	

2.6. Conducted Spurious Emission Test

Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

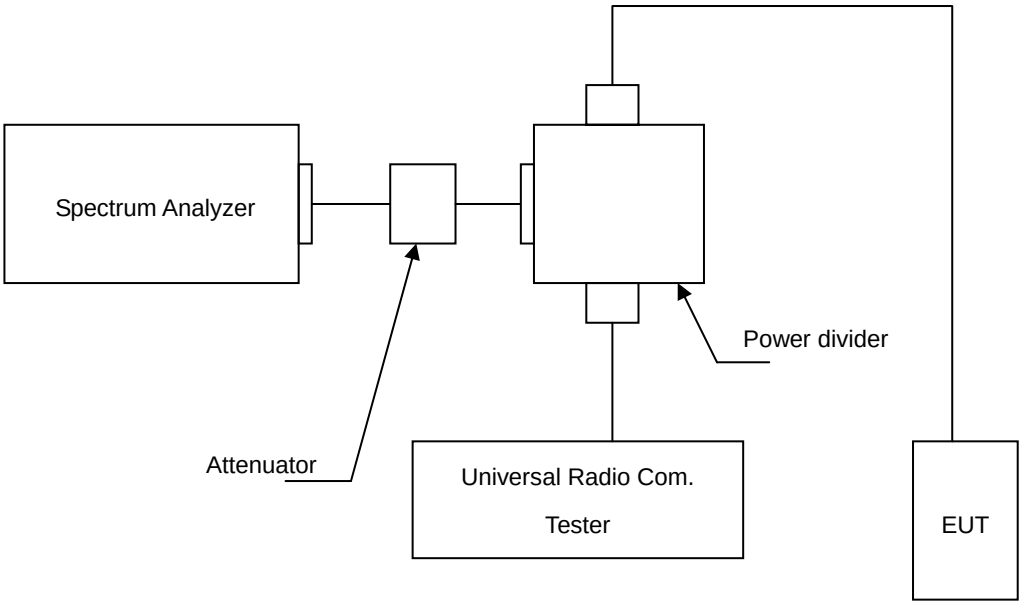
Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	03/02/2017	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2016	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/22/2016	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE02	TE02	N.C.R.	-----

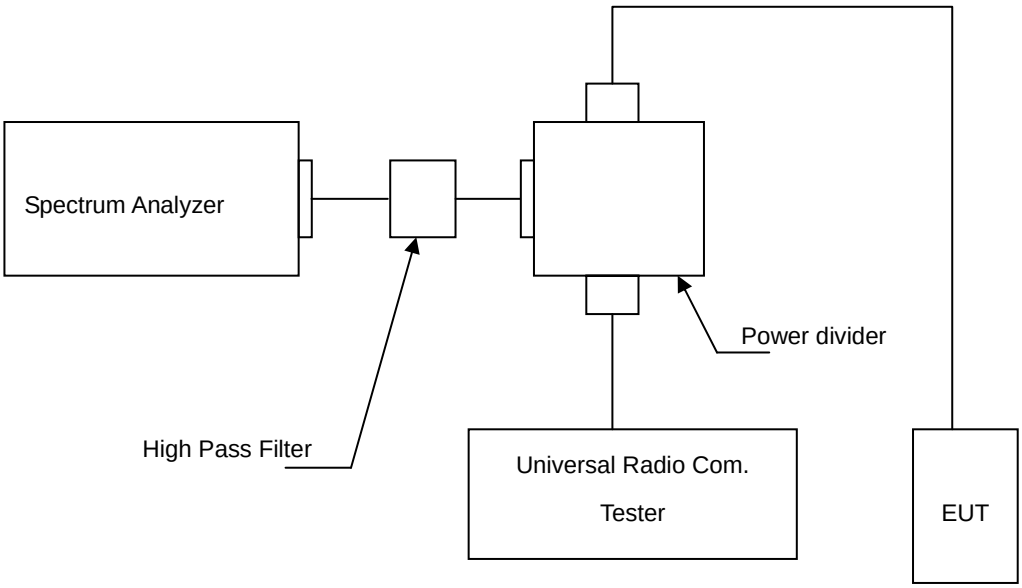
Note: N.C.R. = No Calibration Request.

Setup

Below 2.8GHz



Above 2.8GHz



Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

Uncertainty

The measurement uncertainty is evaluated as ± 2.24 dB.

■ **Test Result**

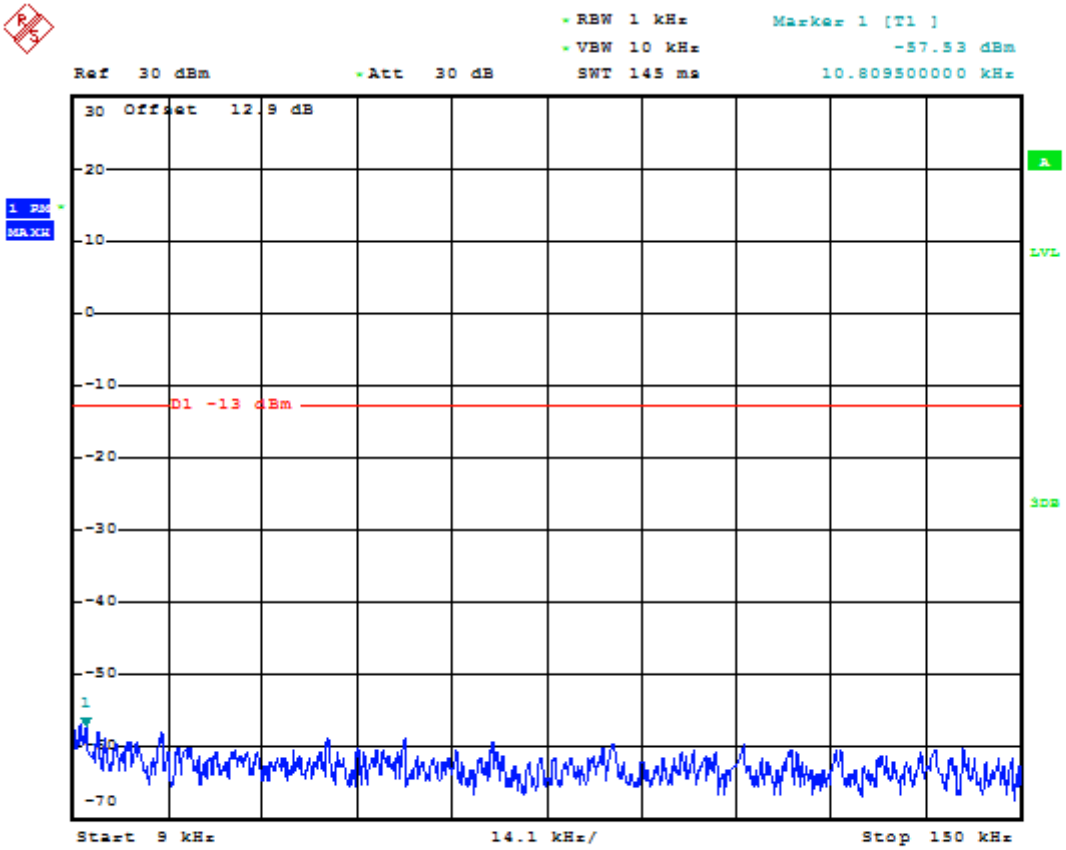
Module 1:QUALCOMM , MSM6290

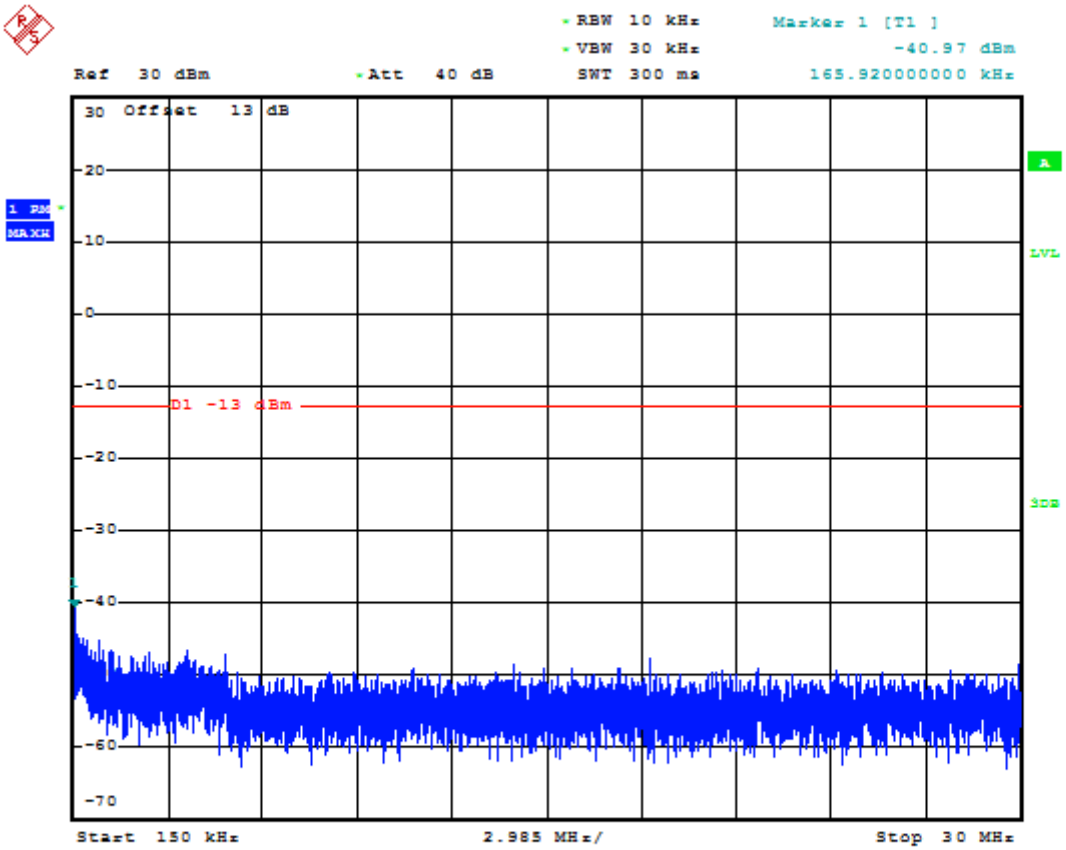
For WCDMA

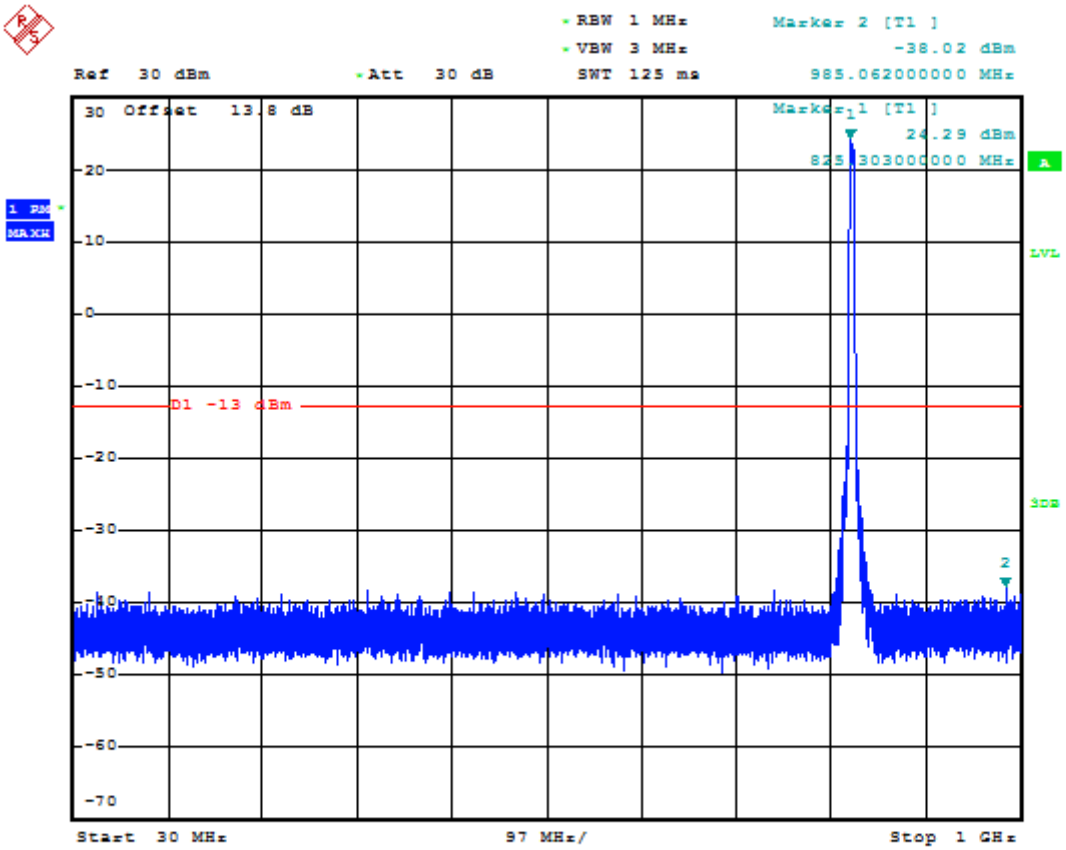
Test Band=WCDMA850

Test Mode=UMTS/TM1

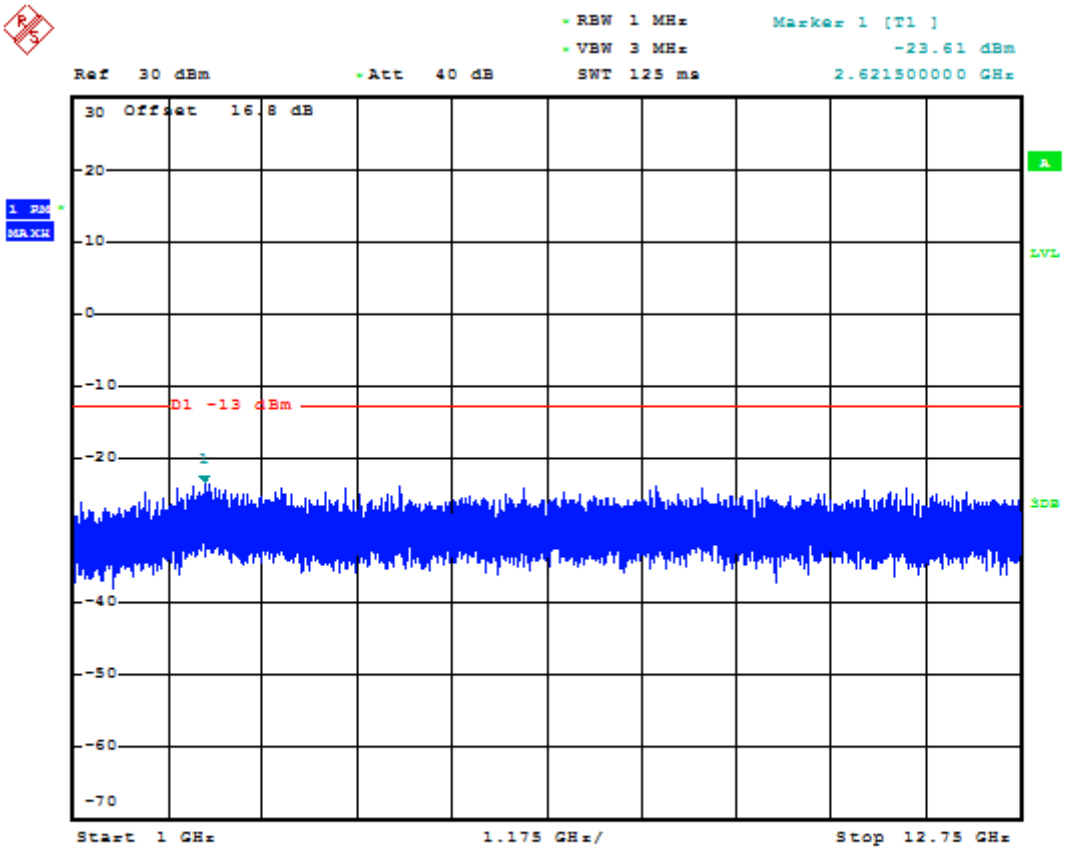
Test Channel=LCH




RBW 10 kHz
VBW 30 kHz
SWT 300 ms
Marker 1 [T1]
-40.97 dBm
165.920000000 kHz
Ref 30 dBm
Att 40 dB
Offset 13 dB
D1 -13 dBm
Start 150 kHz
2.985 MHz/
Stop 30 MHz
Date: 13.APR.2017 08:22:20

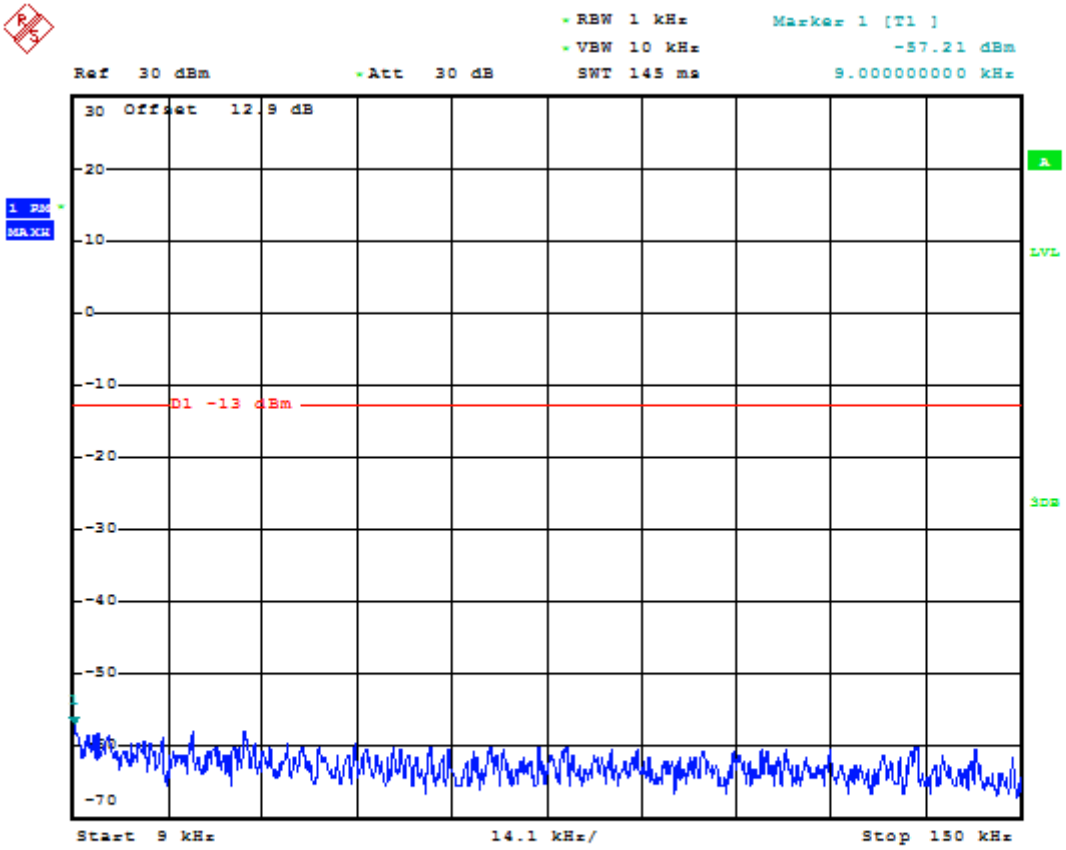


Date: 13.APR.2017 08:22:30

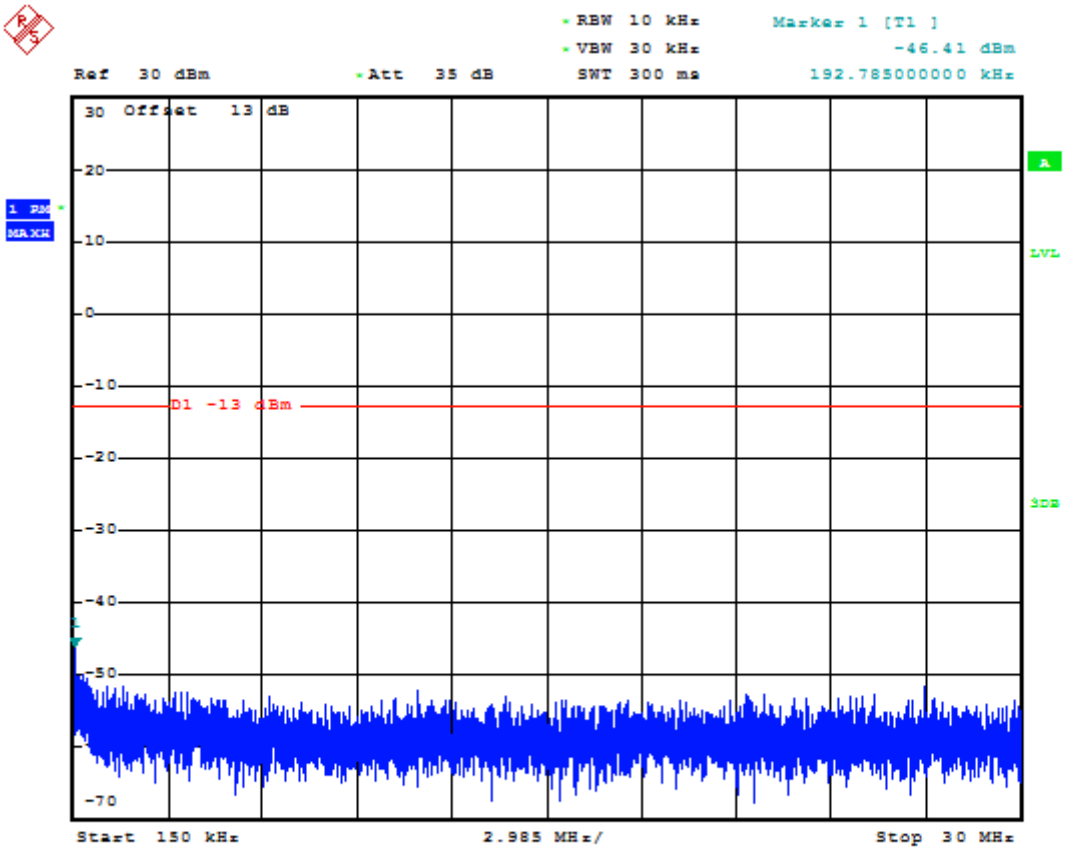


Date: 13.APR.2017 08:22:39

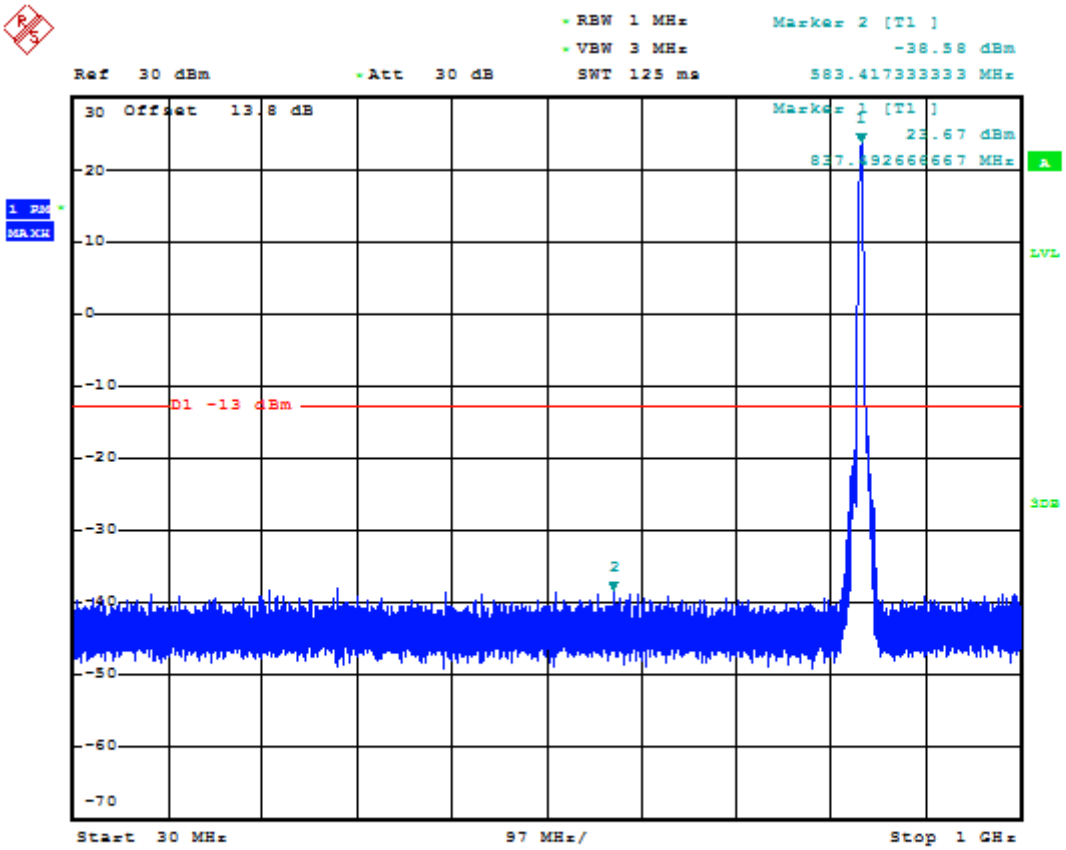
Test Channel=MCH



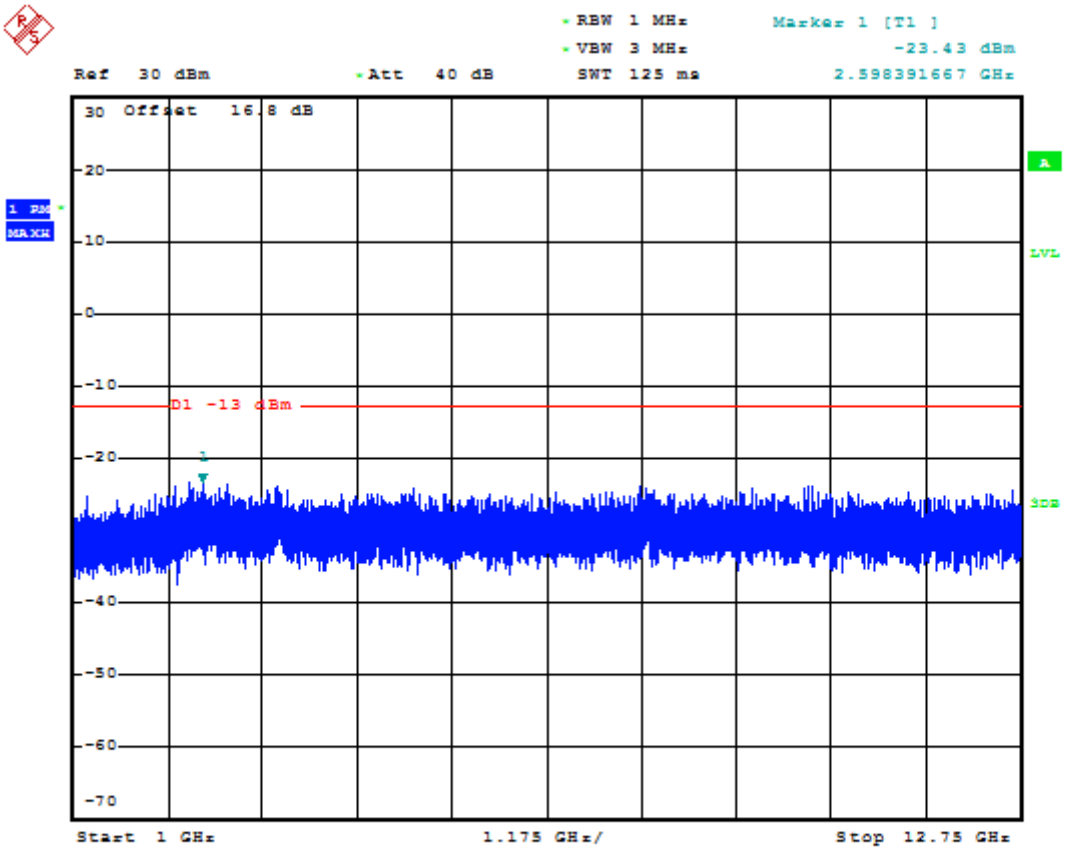
Date: 13.APR.2017 08:22:51



Date: 13.APR.2017 08:23:06

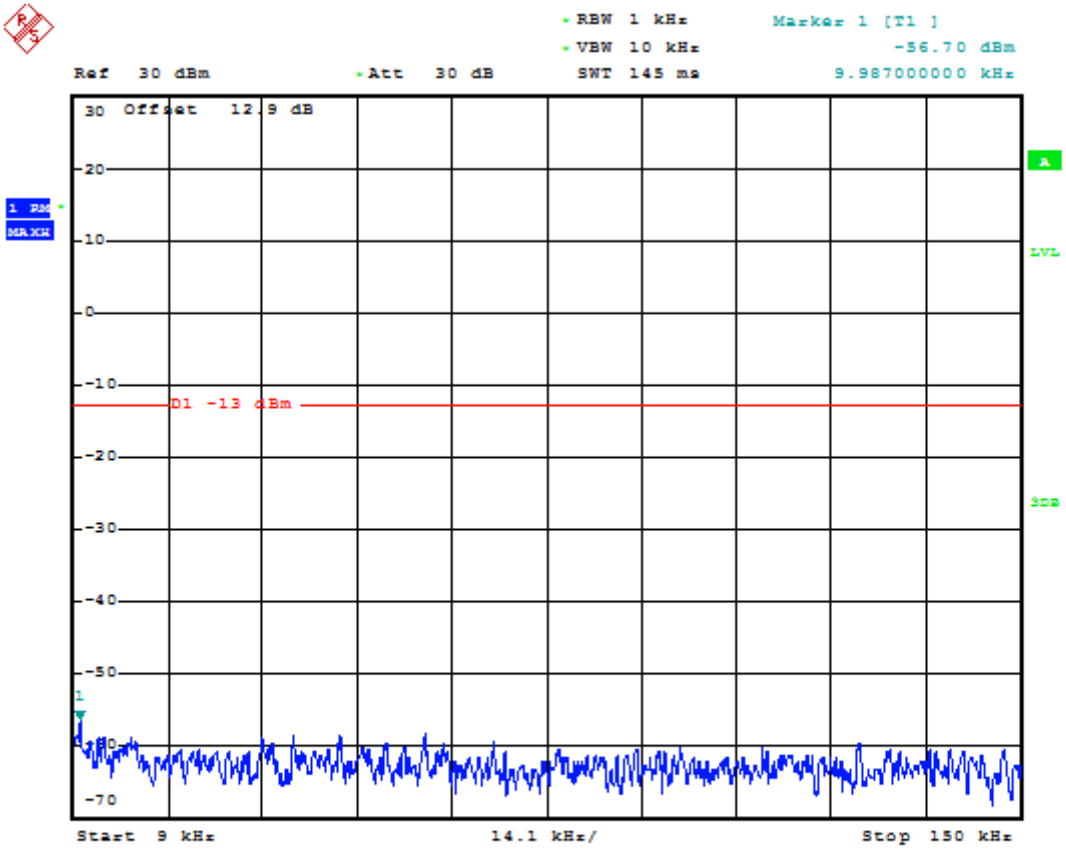


Date: 13.APR.2017 08:23:17

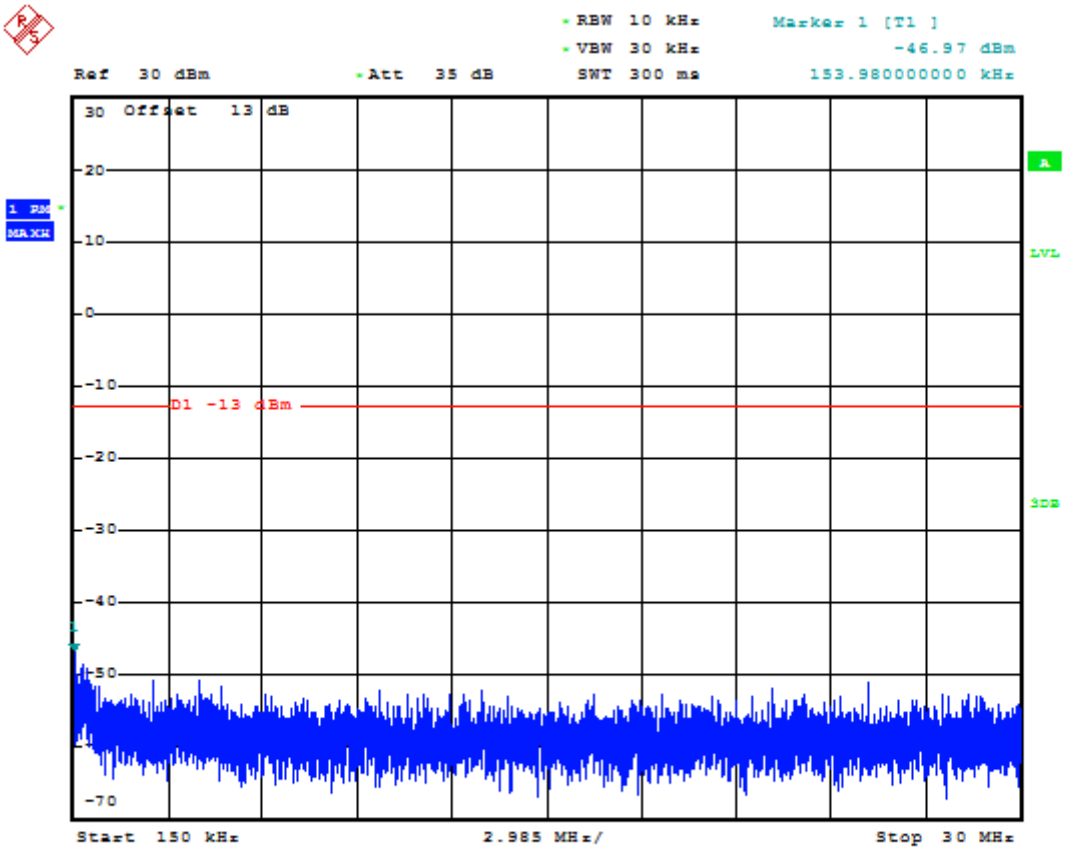


Date: 13.APR.2017 08:23:25

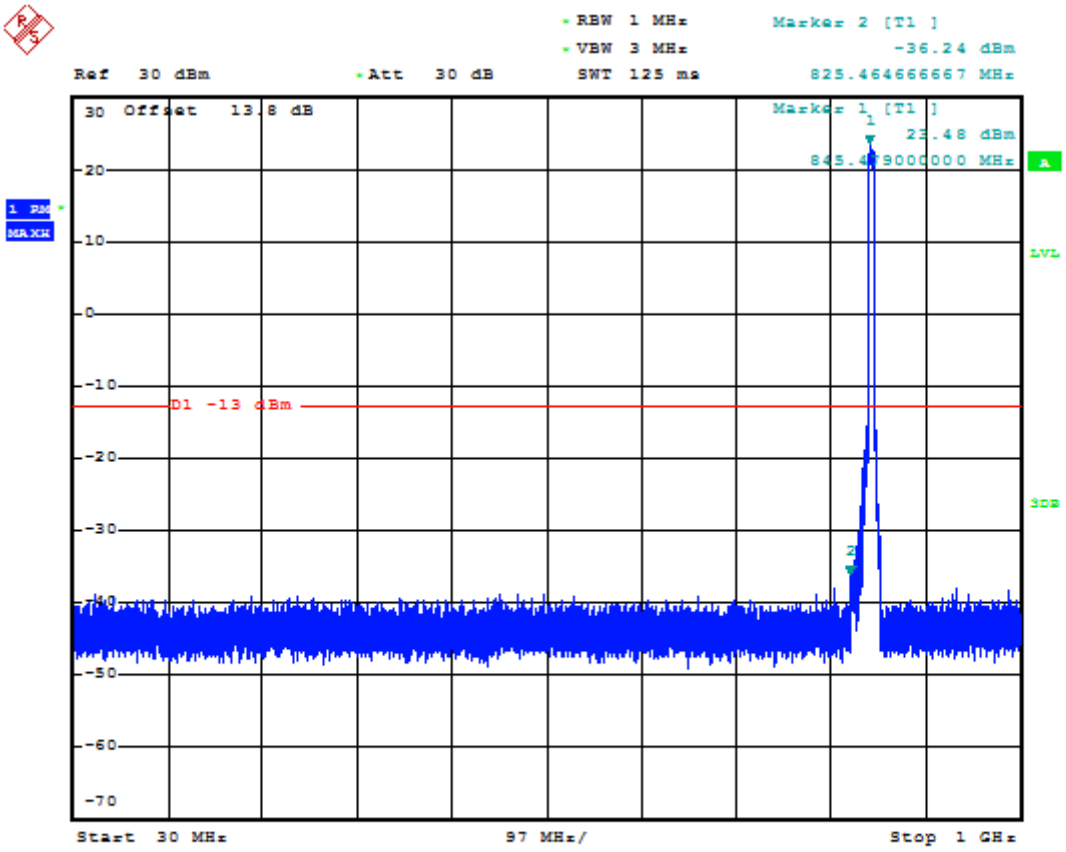
Test Channel=HCH



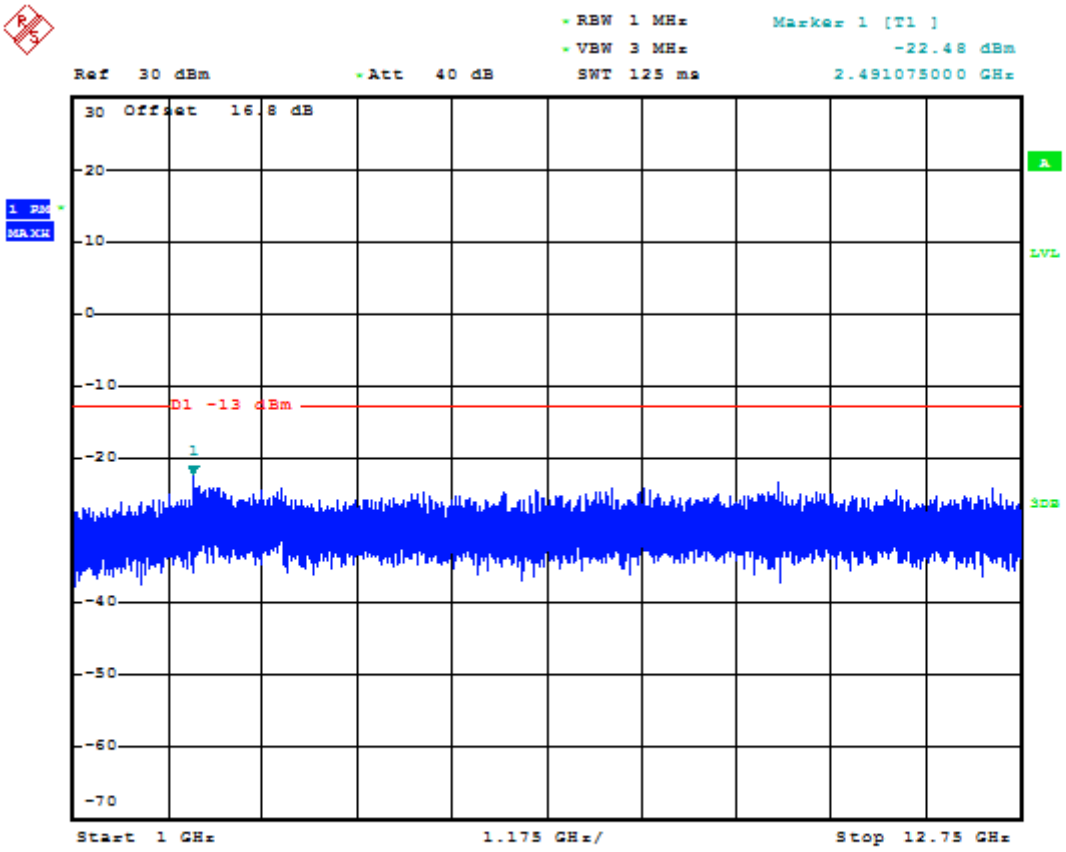
Date: 13.APR.2017 08:23:37



Date: 13.APR.2017 08:23:53



Date: 13.APR.2017 08:24:03

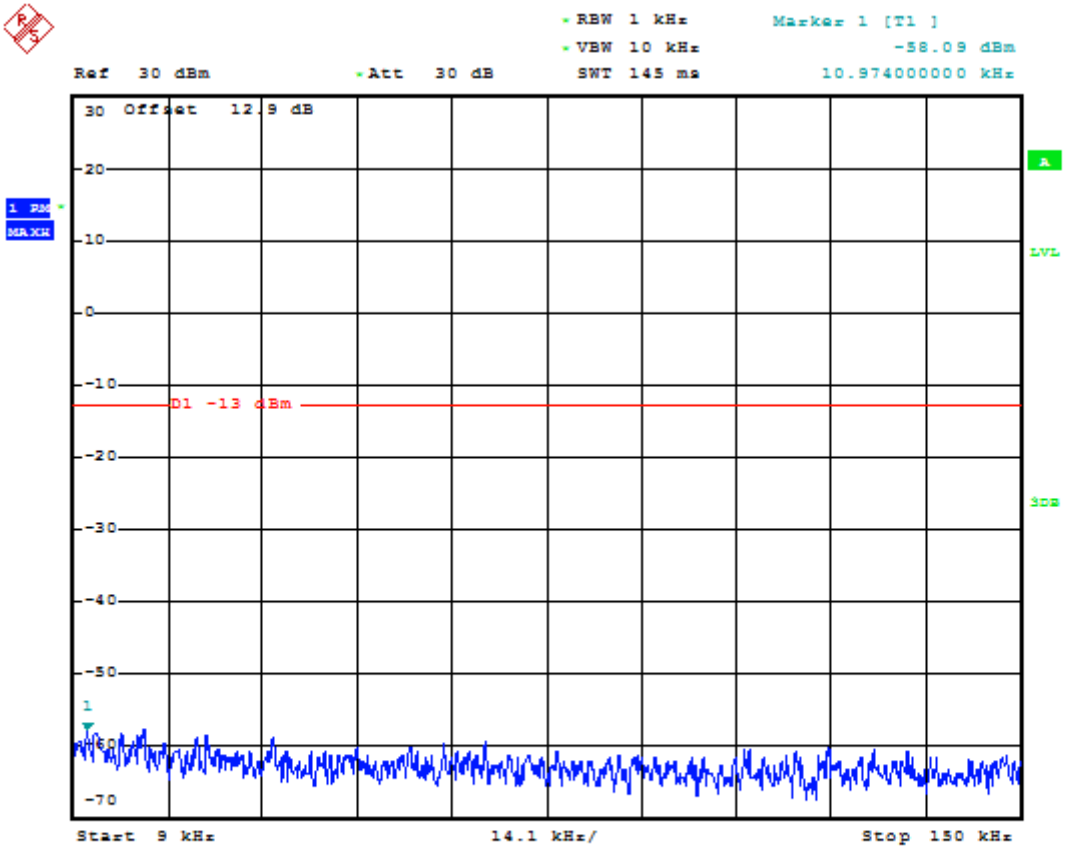


Date: 13.APR.2017 08:24:12

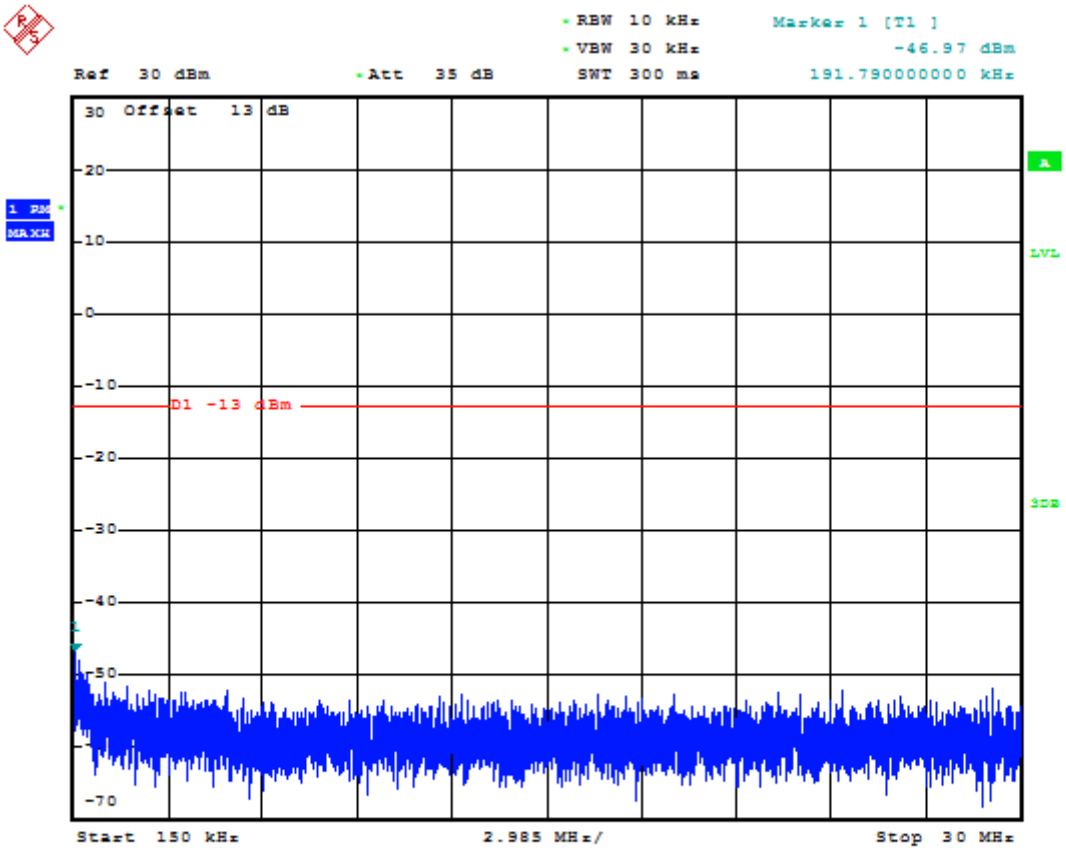
Test Band=WCDMA1900

Test Mode=UMTS/TM1

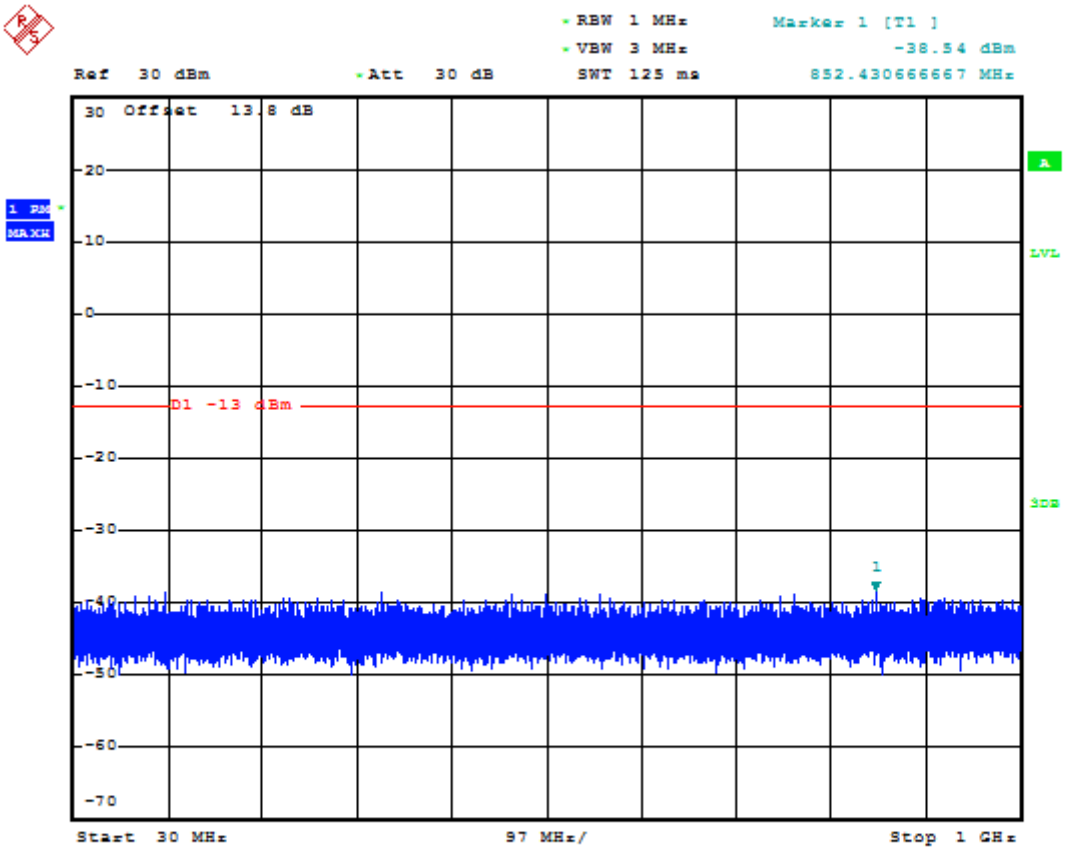
Test Channel=LCH



Date: 13.APR.2017 08:17:24



Date: 13.APR.2017 08:17:40



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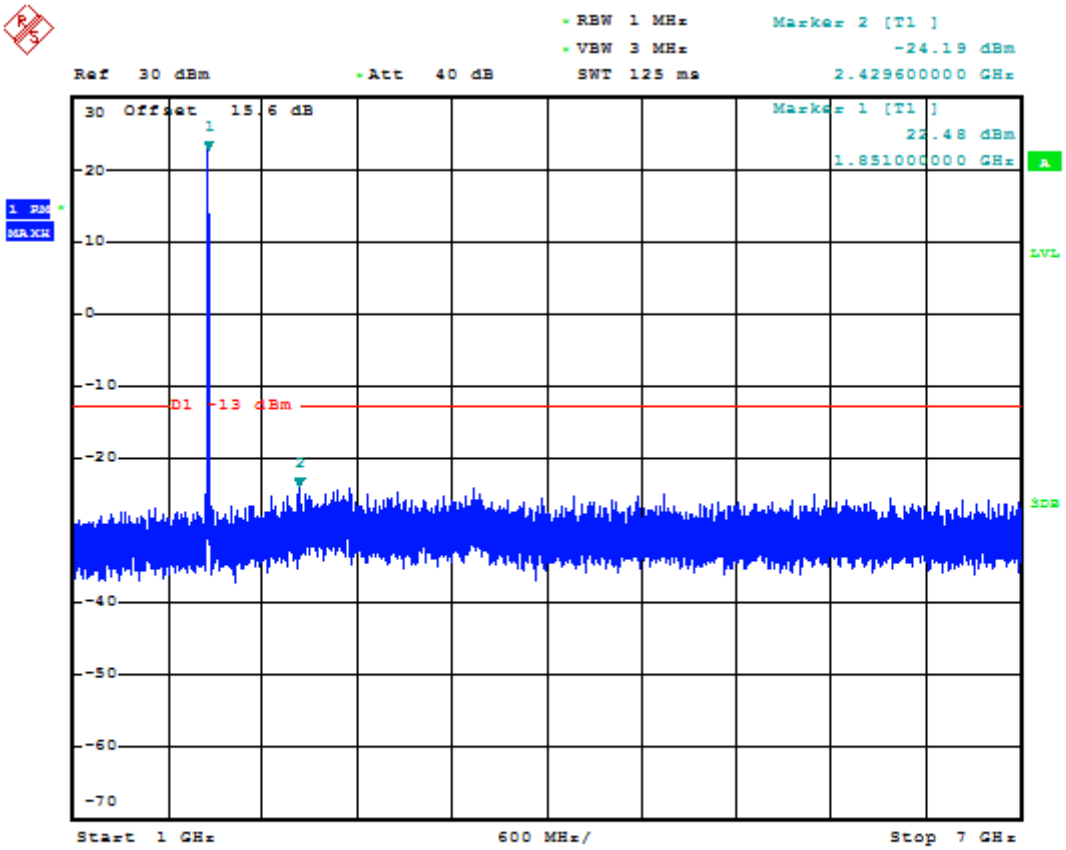

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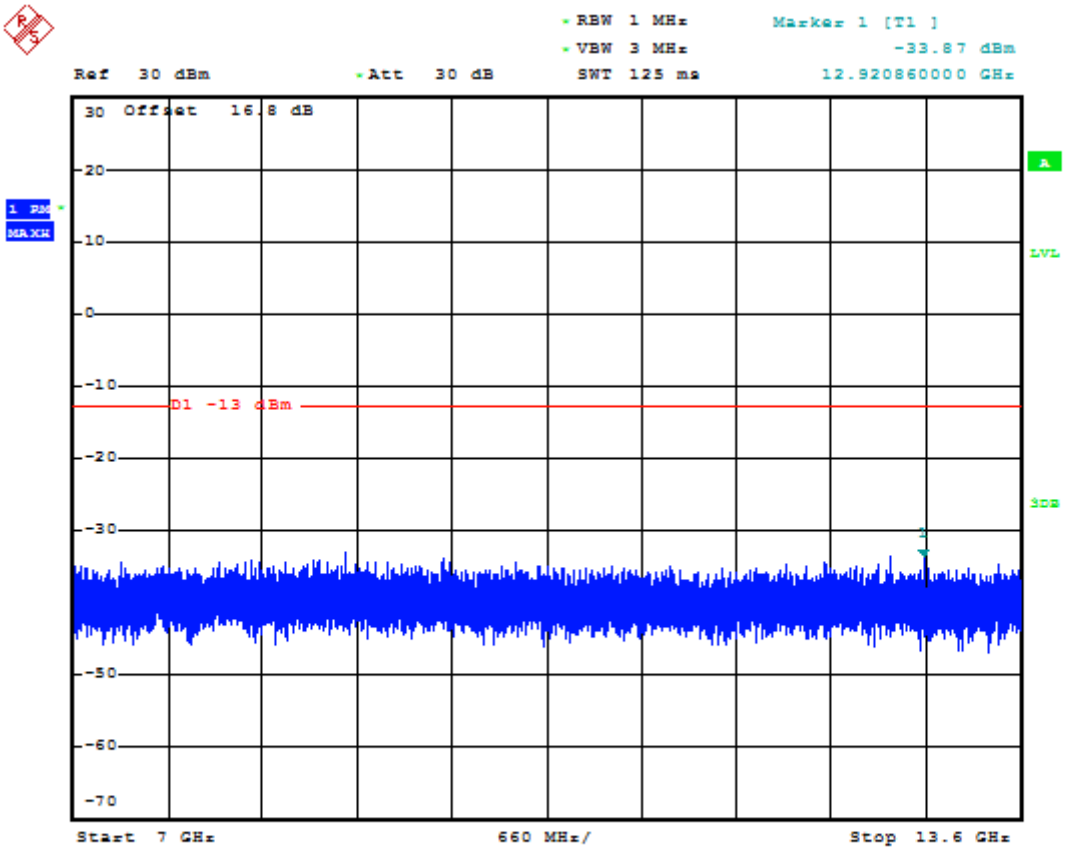

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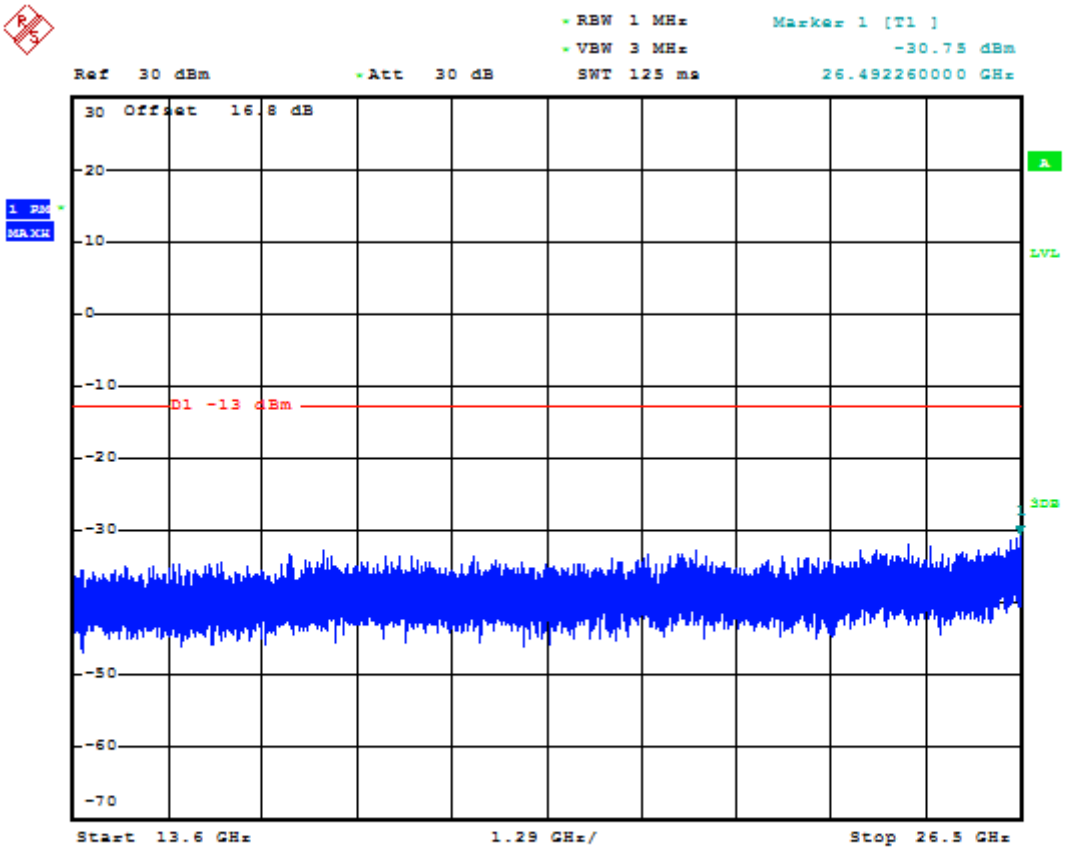
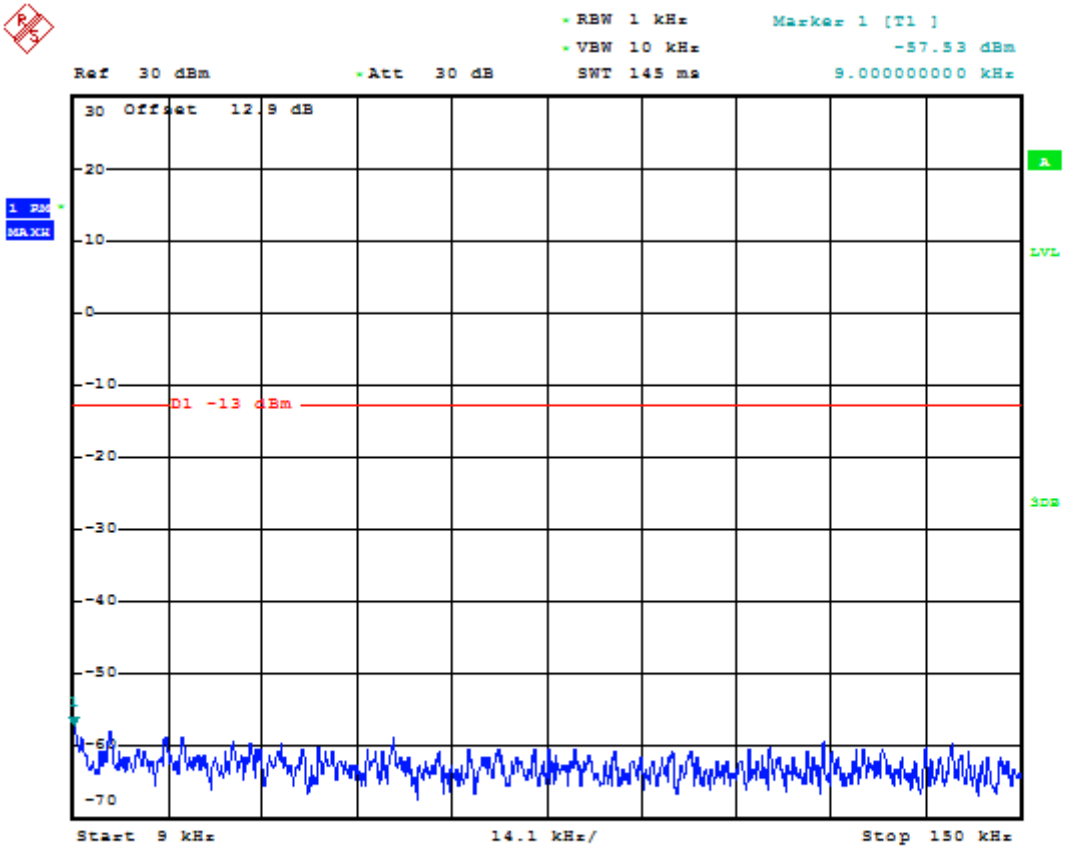
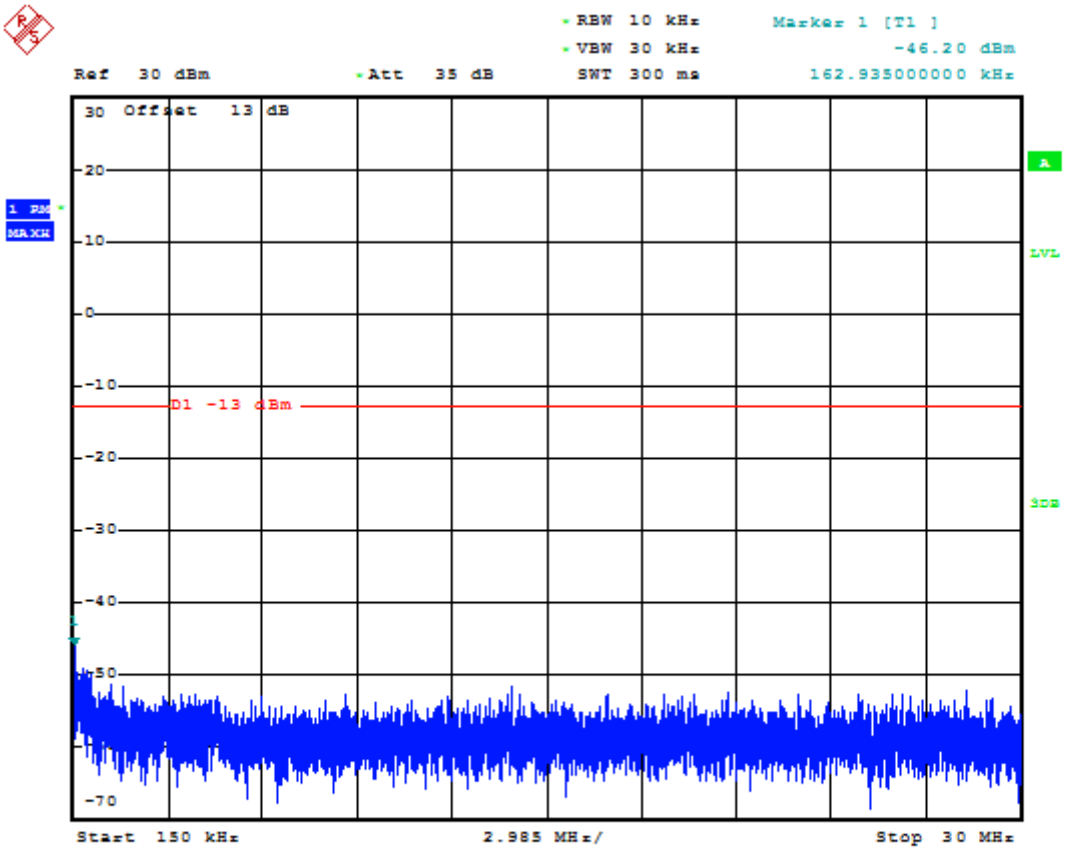


Date: 13.APR.2017 08:18:15

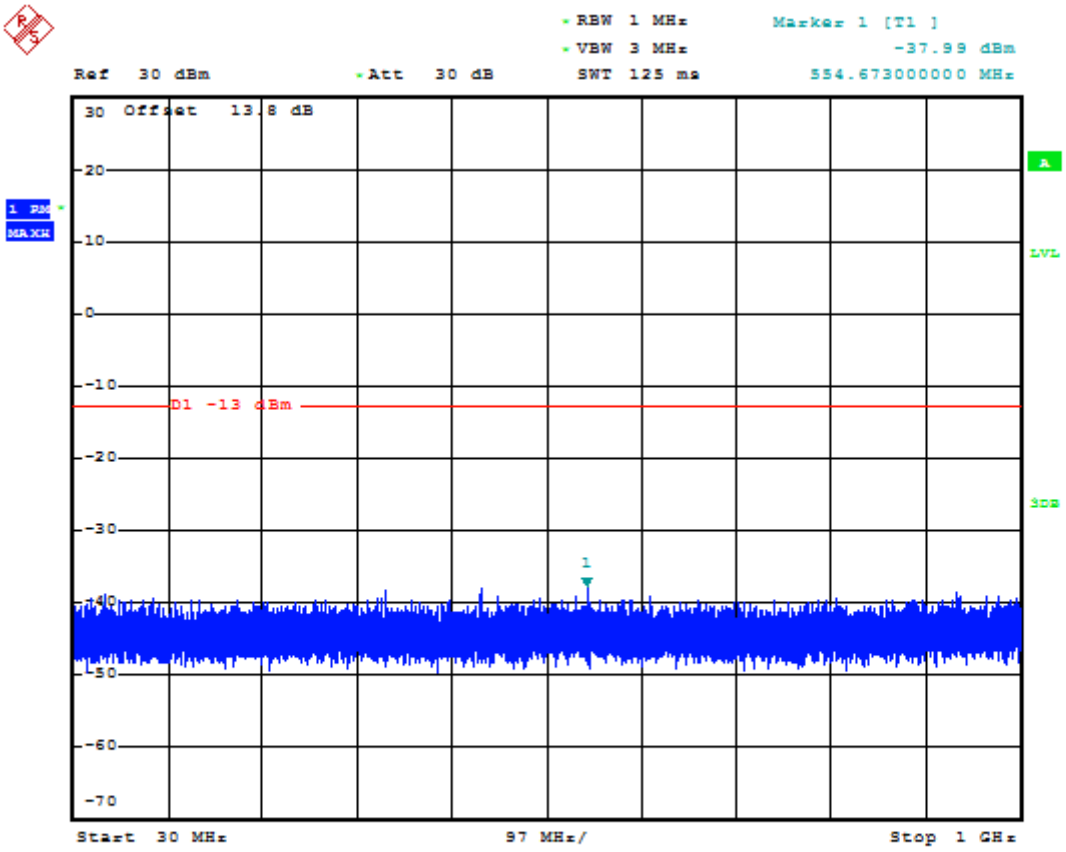
Test Channel=MCH



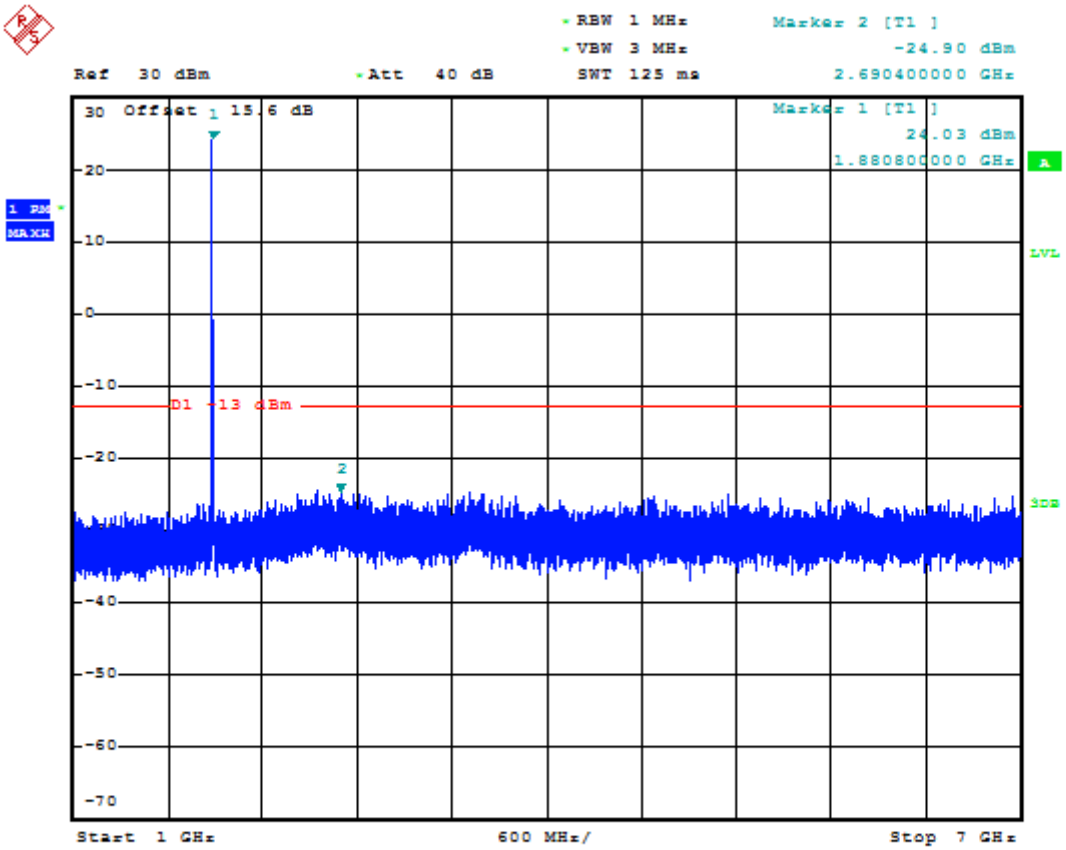
Date: 13.APR.2017 08:18:28



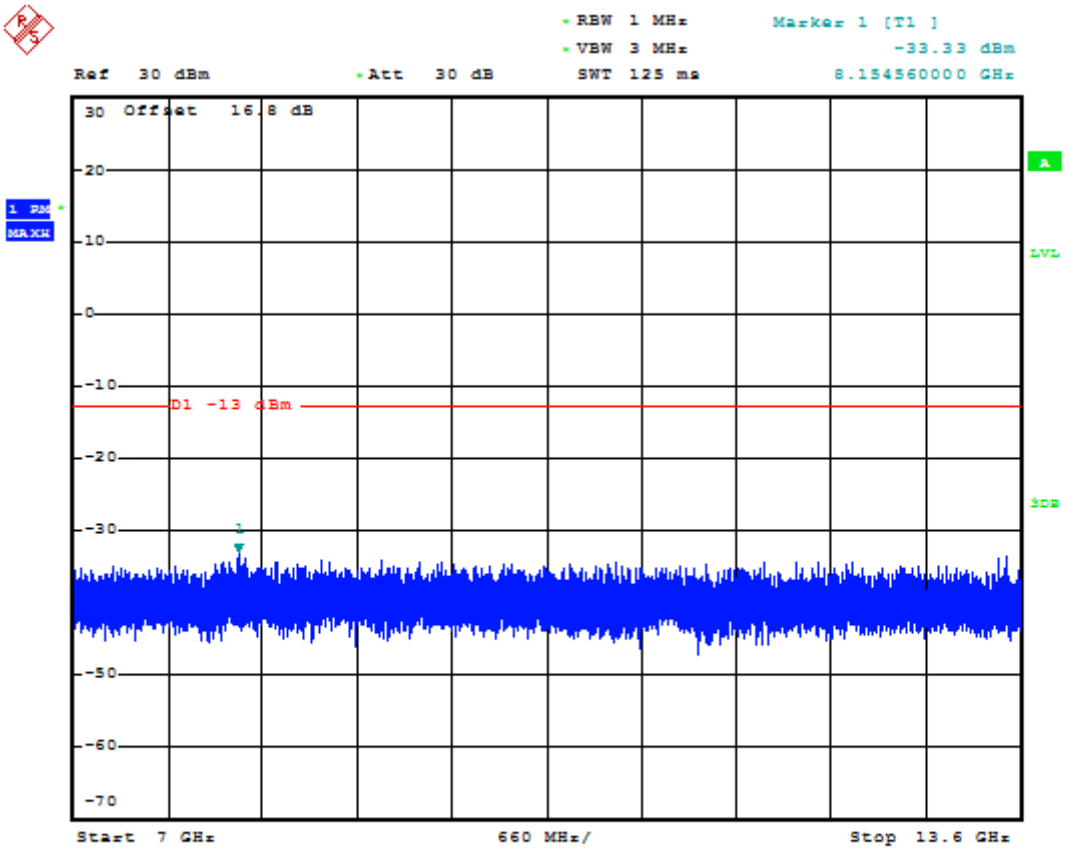
Date: 13.APR.2017 08:18:43



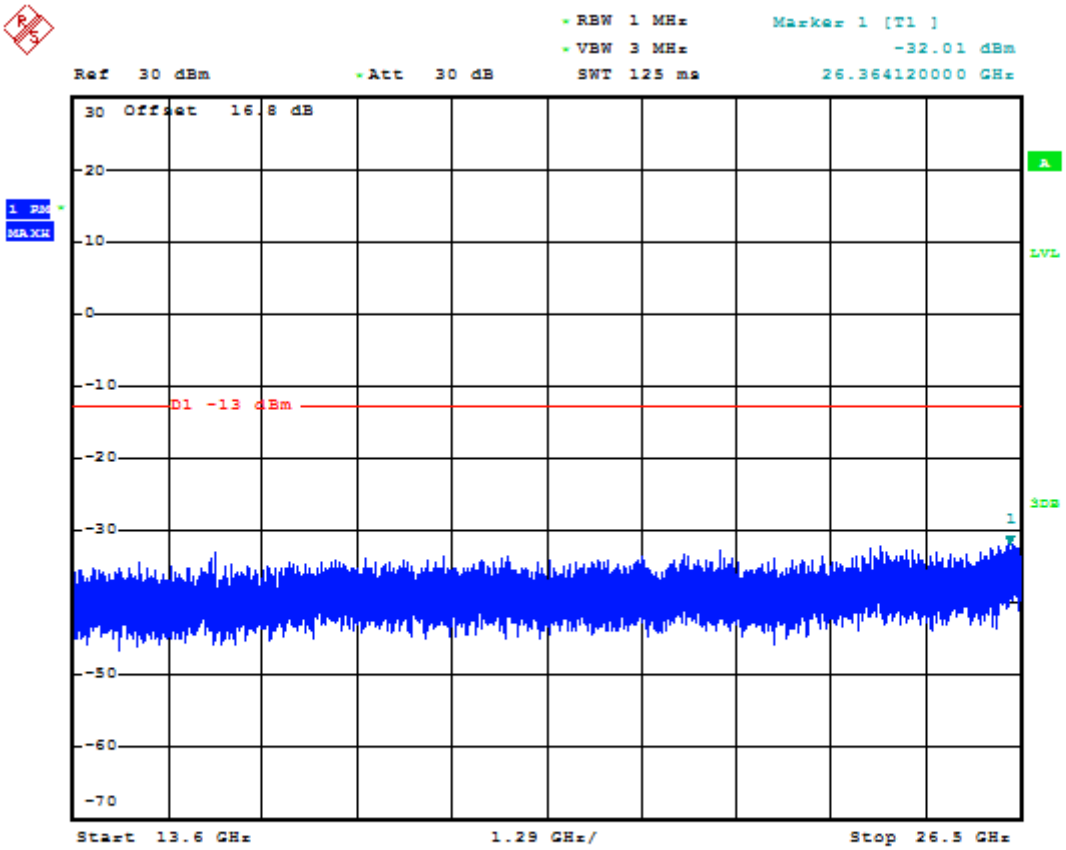
Date: 13.APR.2017 08:18:52



Date: 13.APR.2017 08:19:02

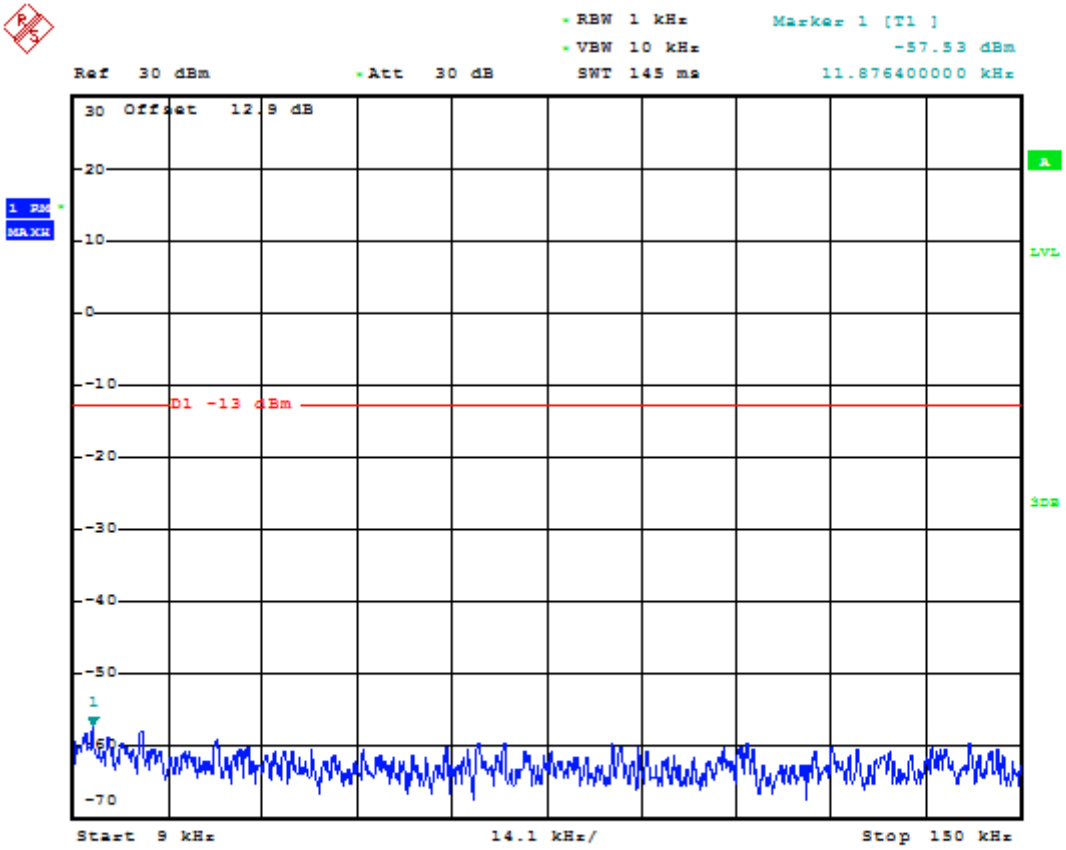


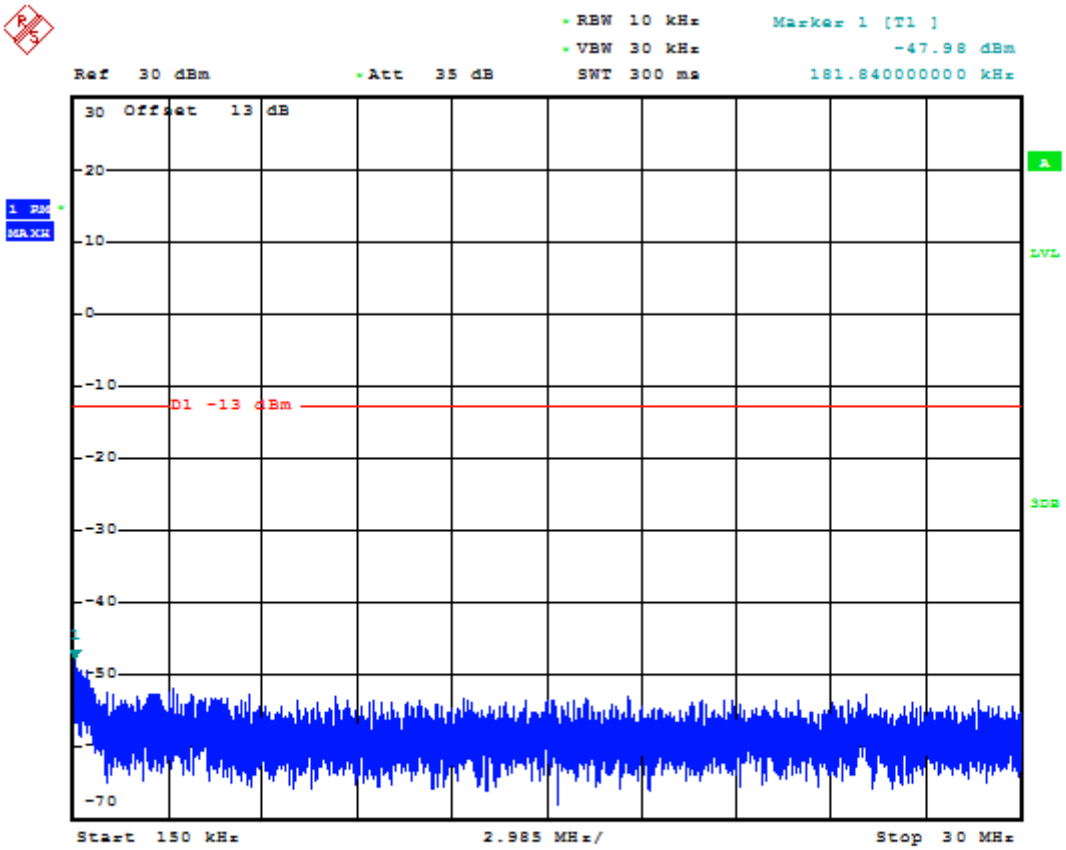
Date: 13.APR.2017 08:19:11



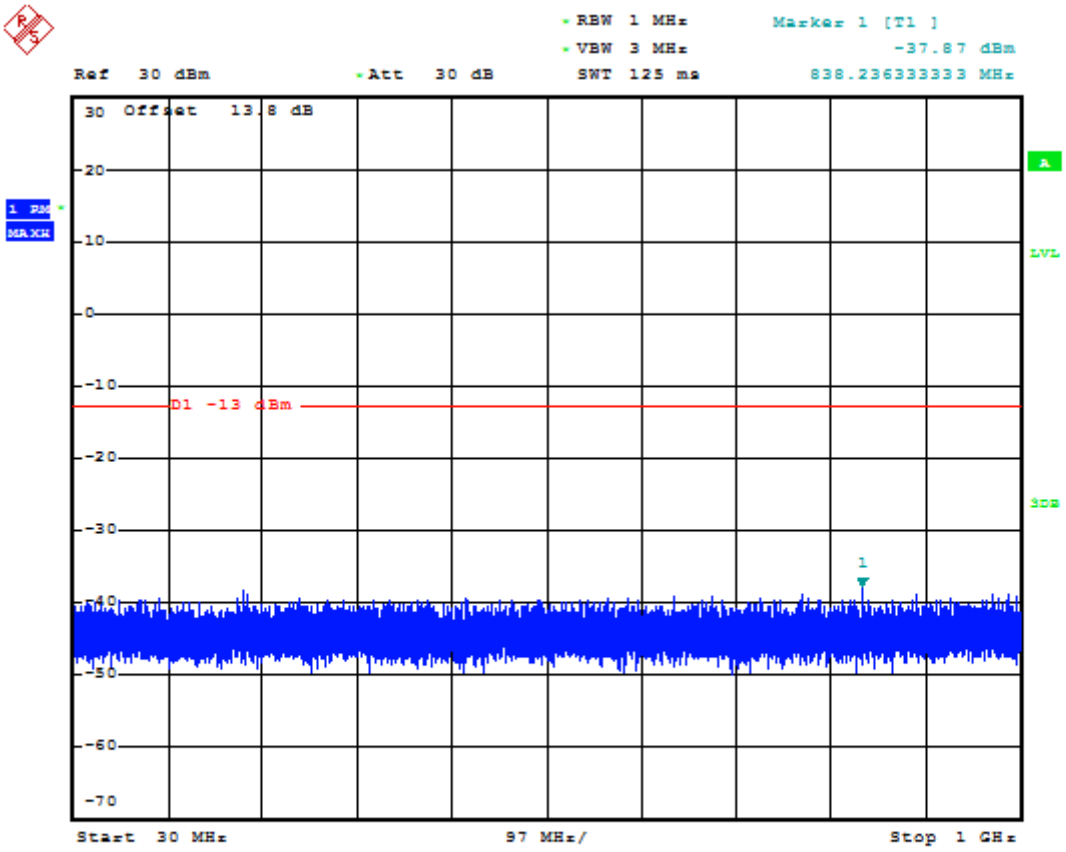
Date: 13.APR.2017 08:19:19

Test Channel=HCH





Date: 13.APR.2017 08:19:47



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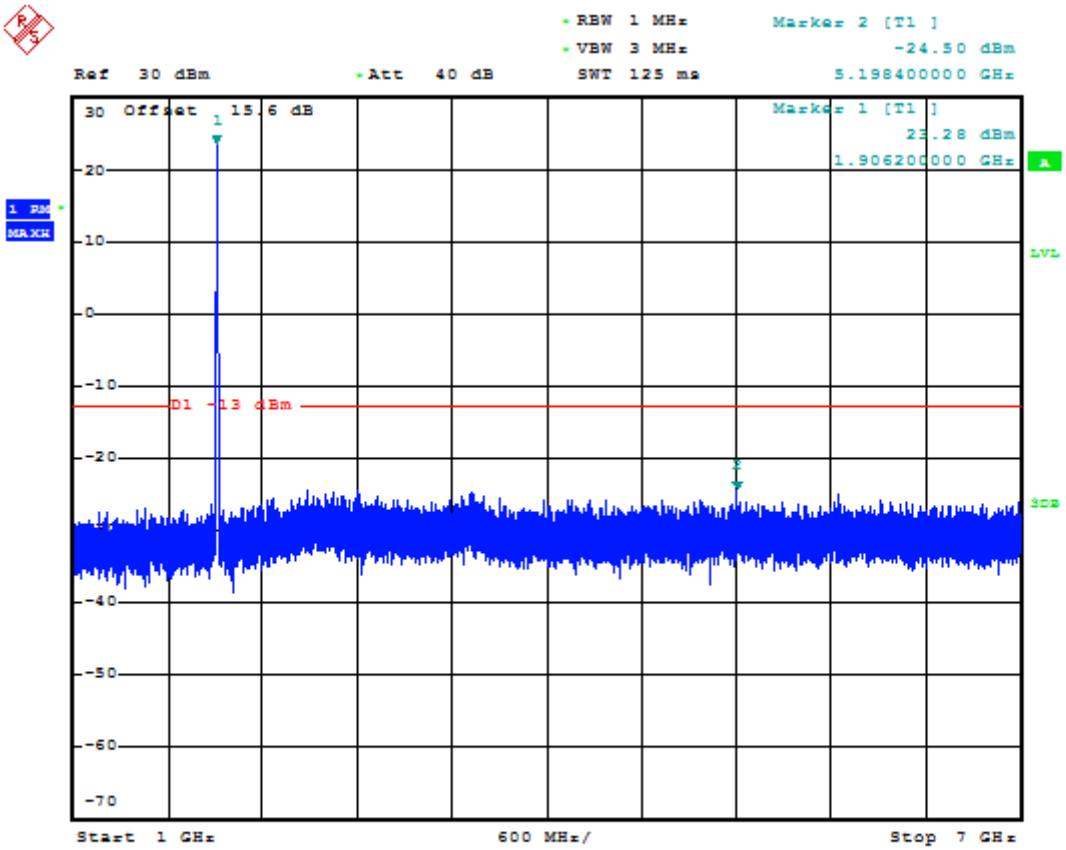
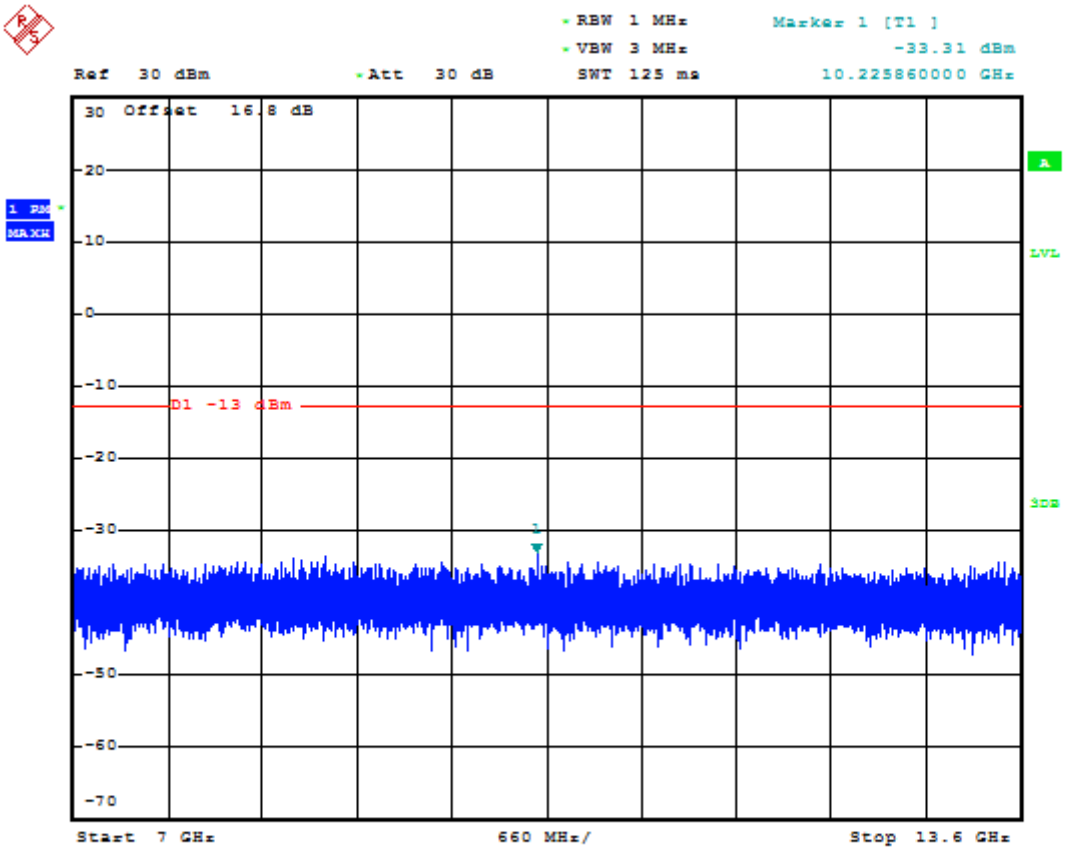
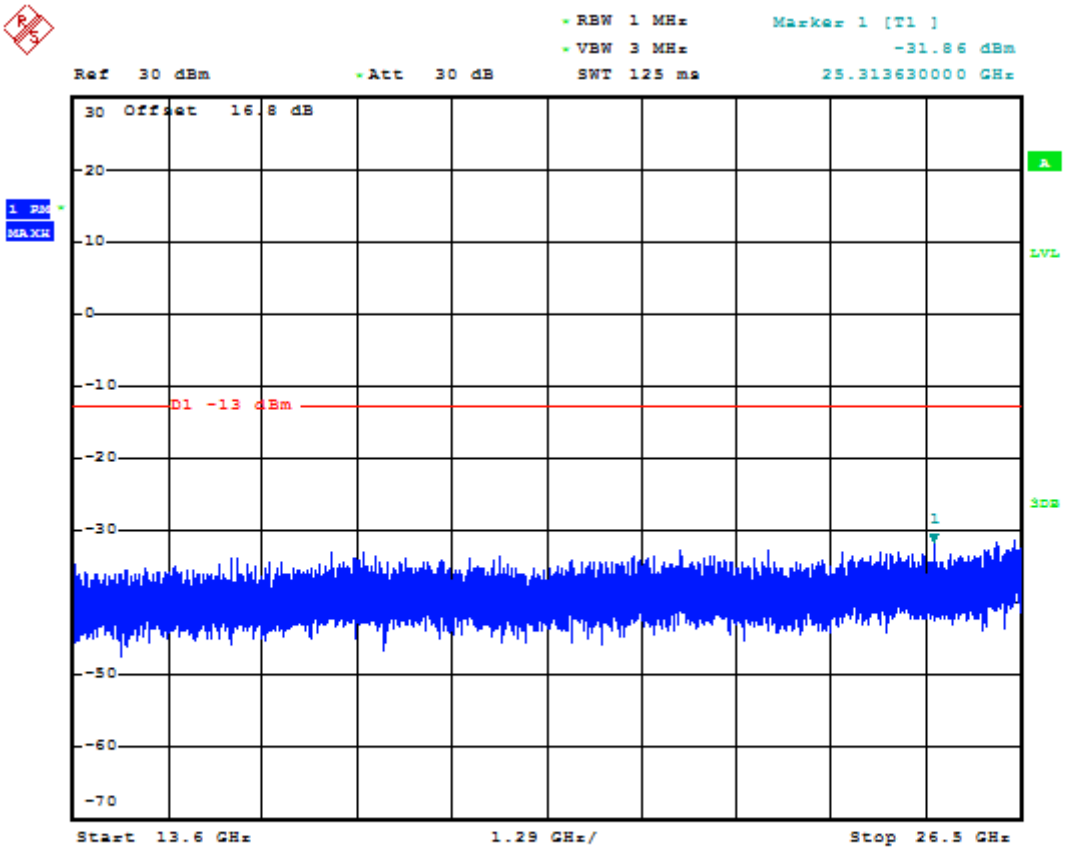


Date: 13.APR.2017 08:20:05



Date: 13.APR.2017 08:20:14



Date: 13.APR.2017 08:20:23

Module 2:QUALCOMM , MSM8916

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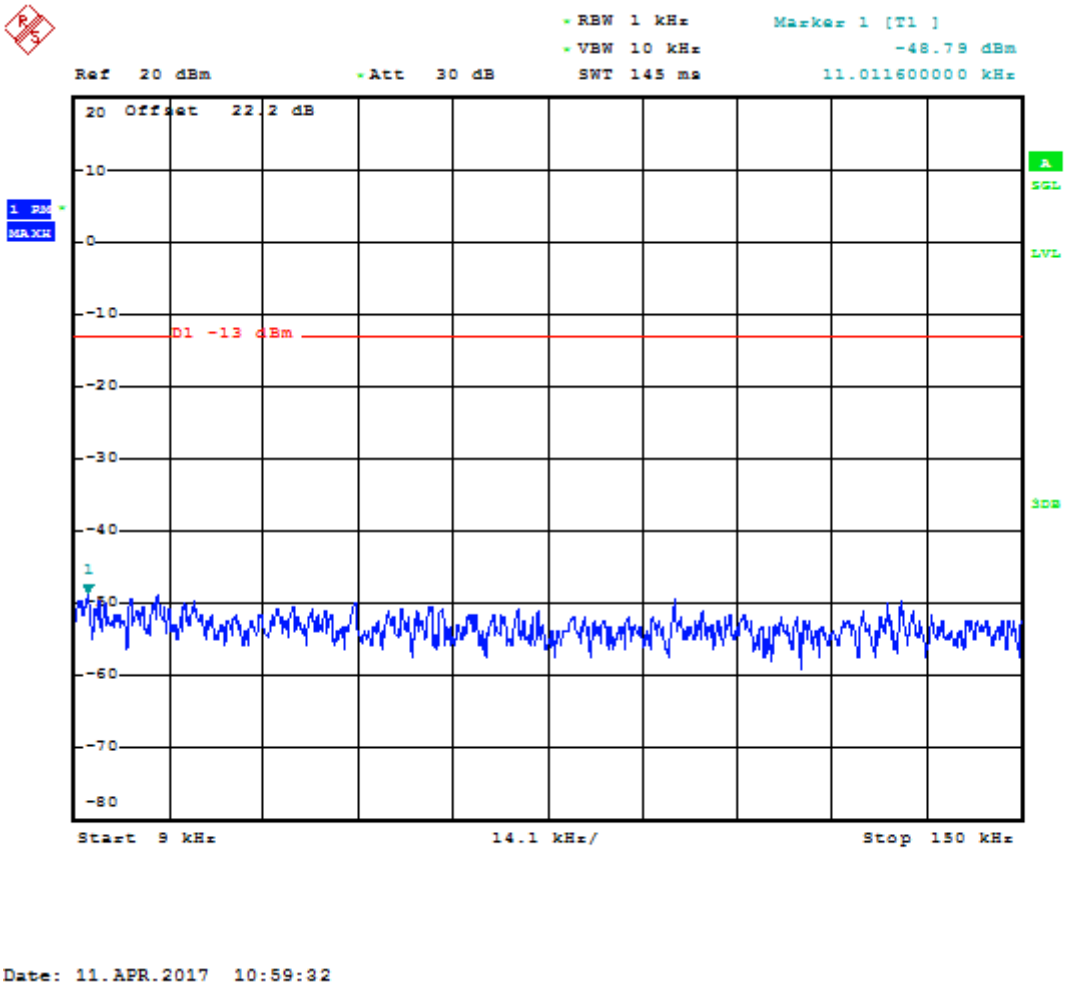
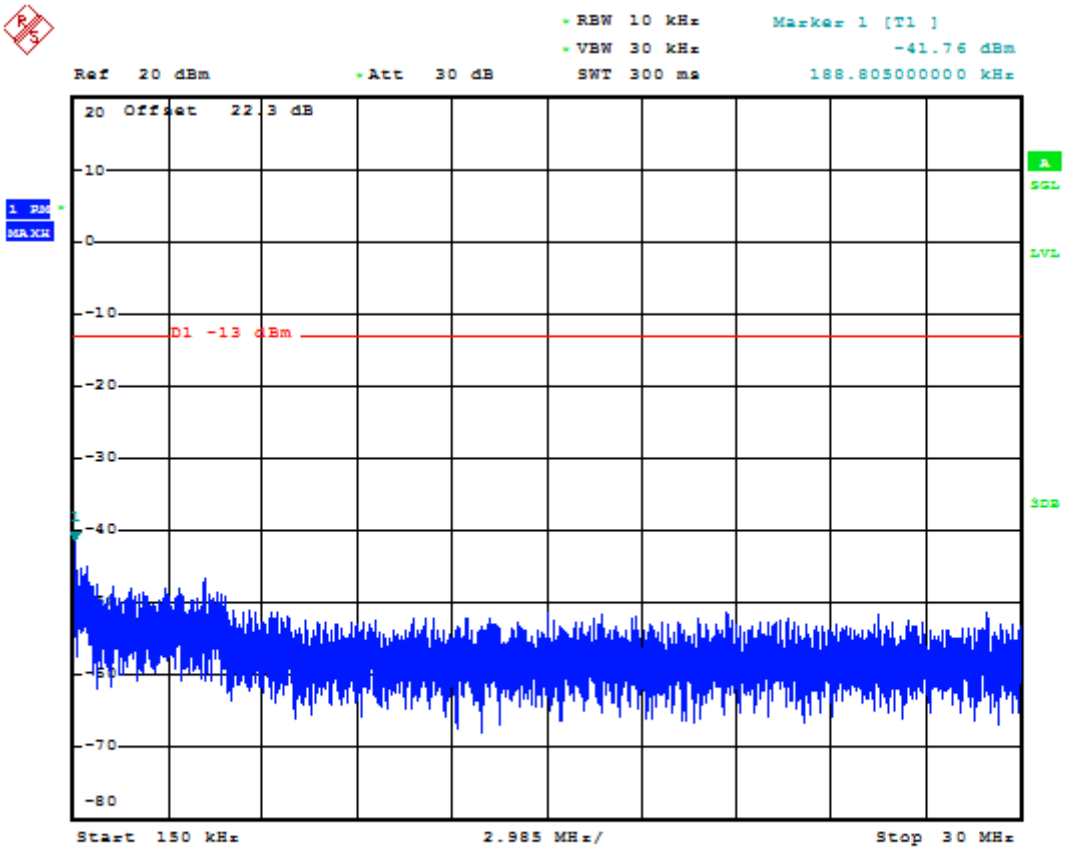
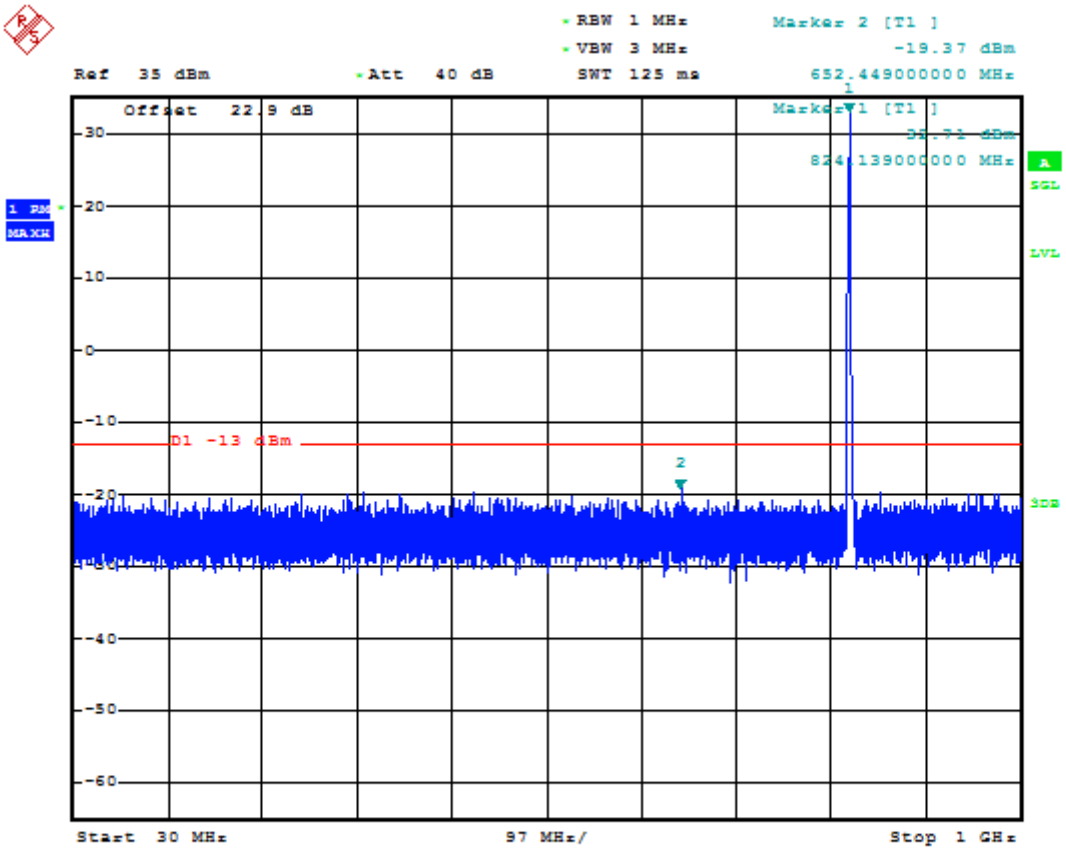
Test Channel=LCH





Date: 11.APR.2017 10:59:41



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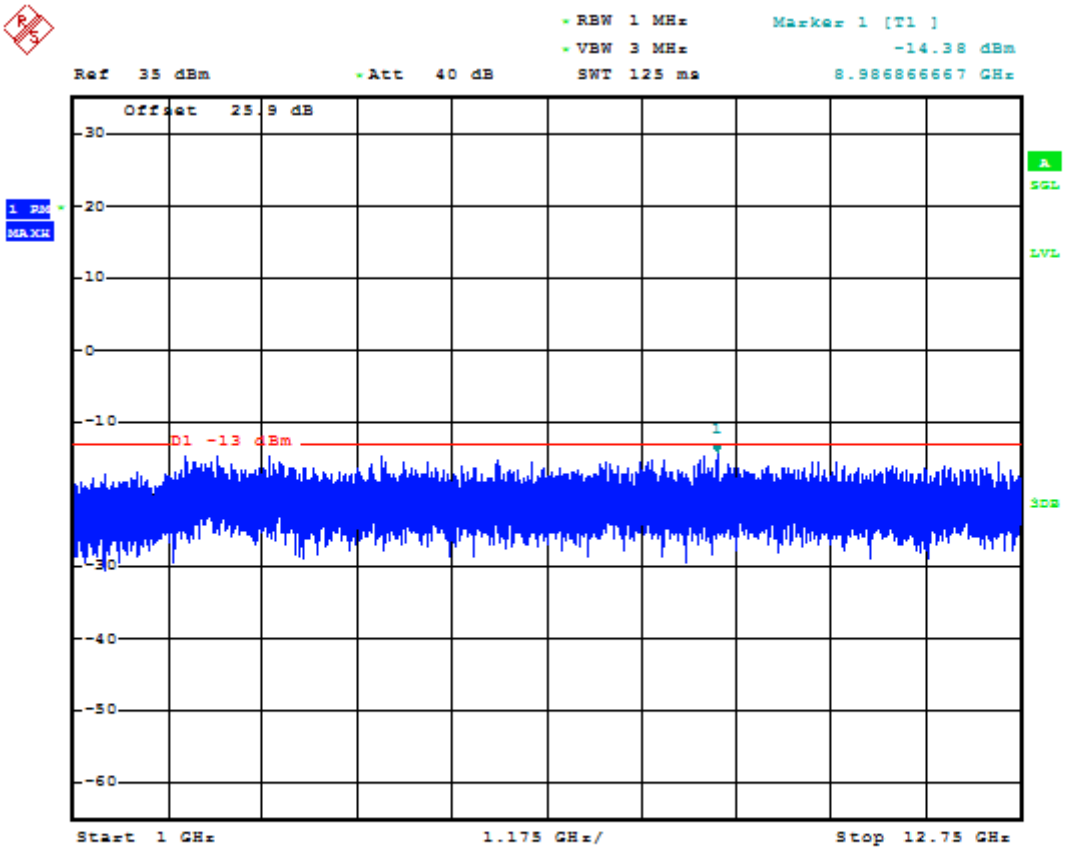

Date: 11.APR.2017 11:00:00

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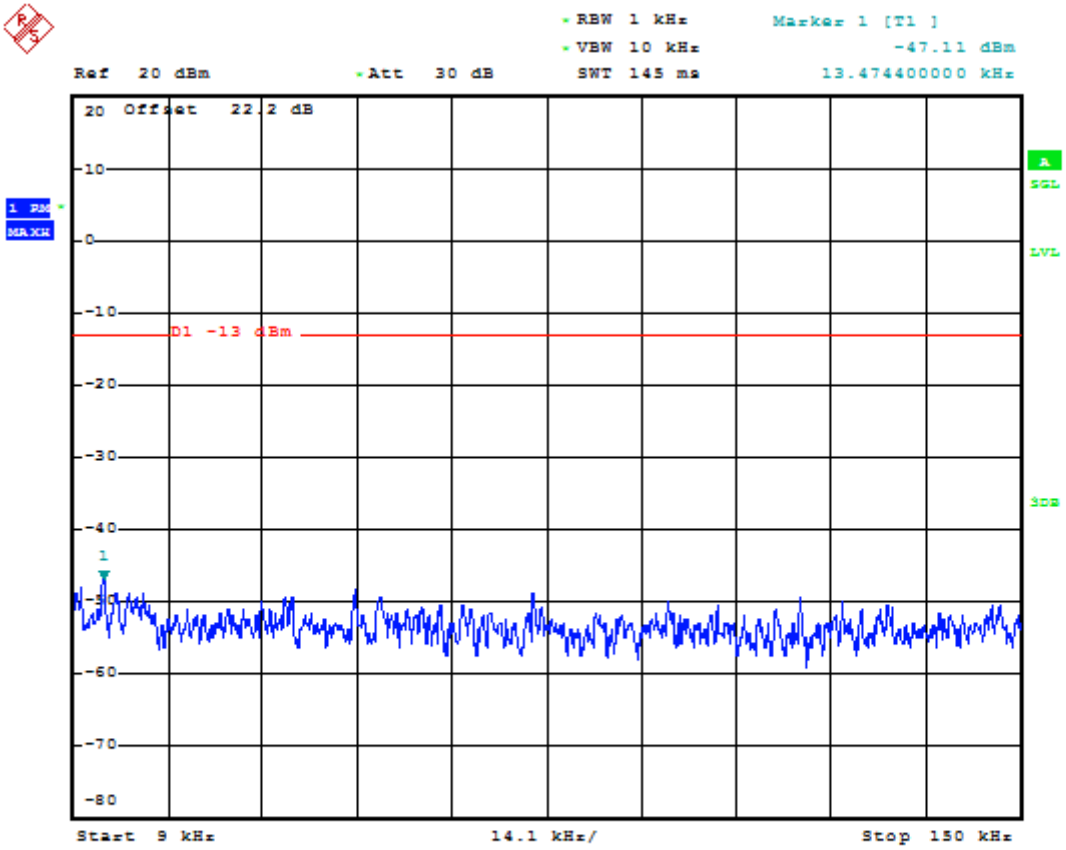

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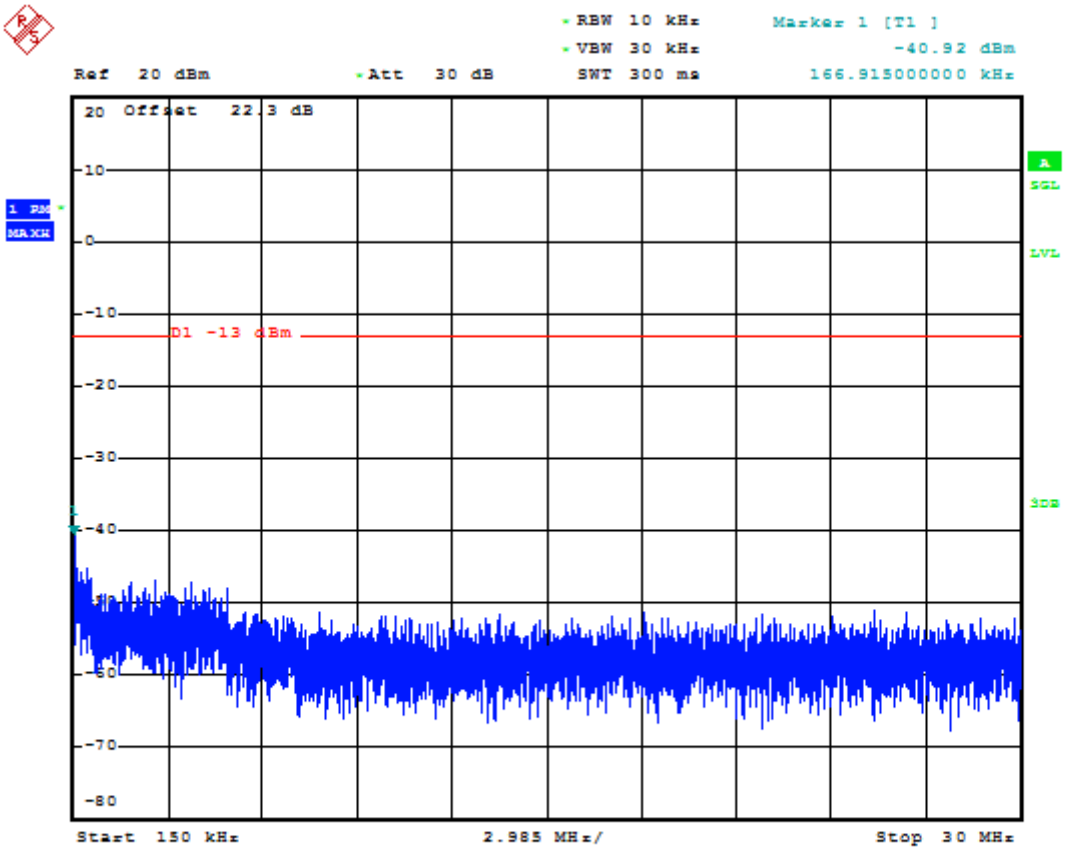

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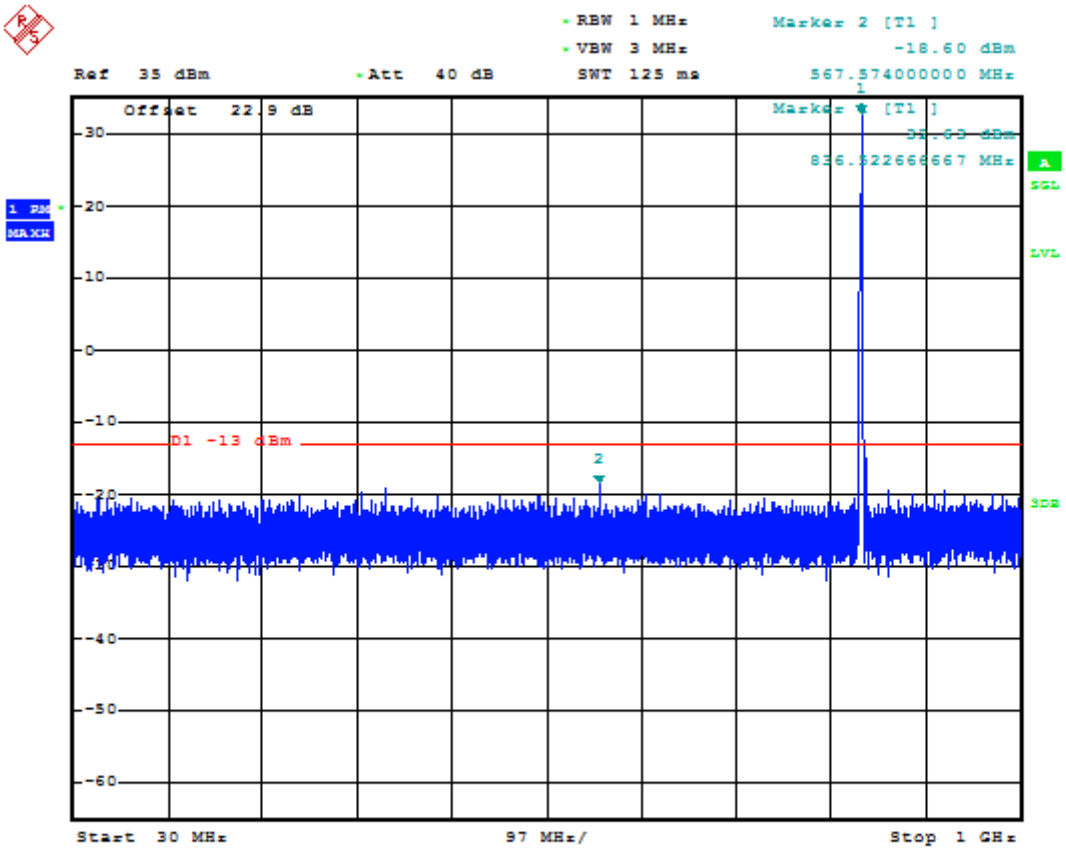
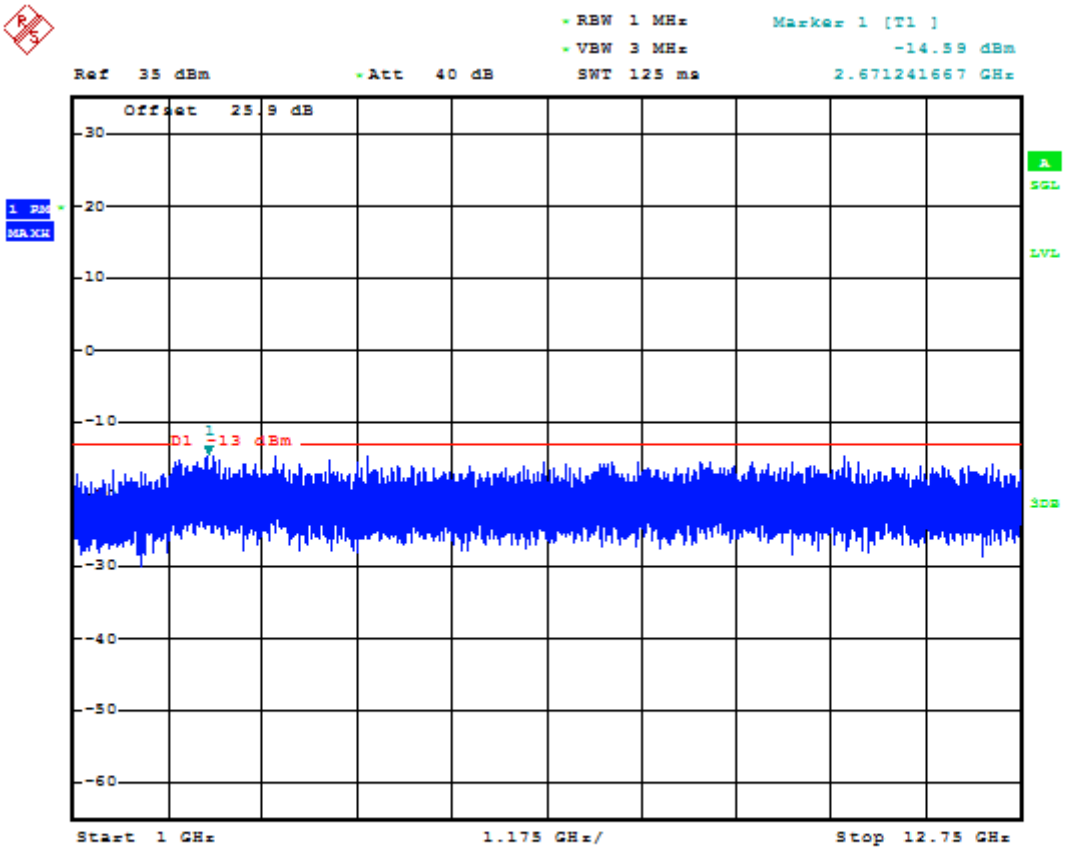


Date: 11.APR.2017 11:00:36



Date: 11.APR.2017 11:00:45

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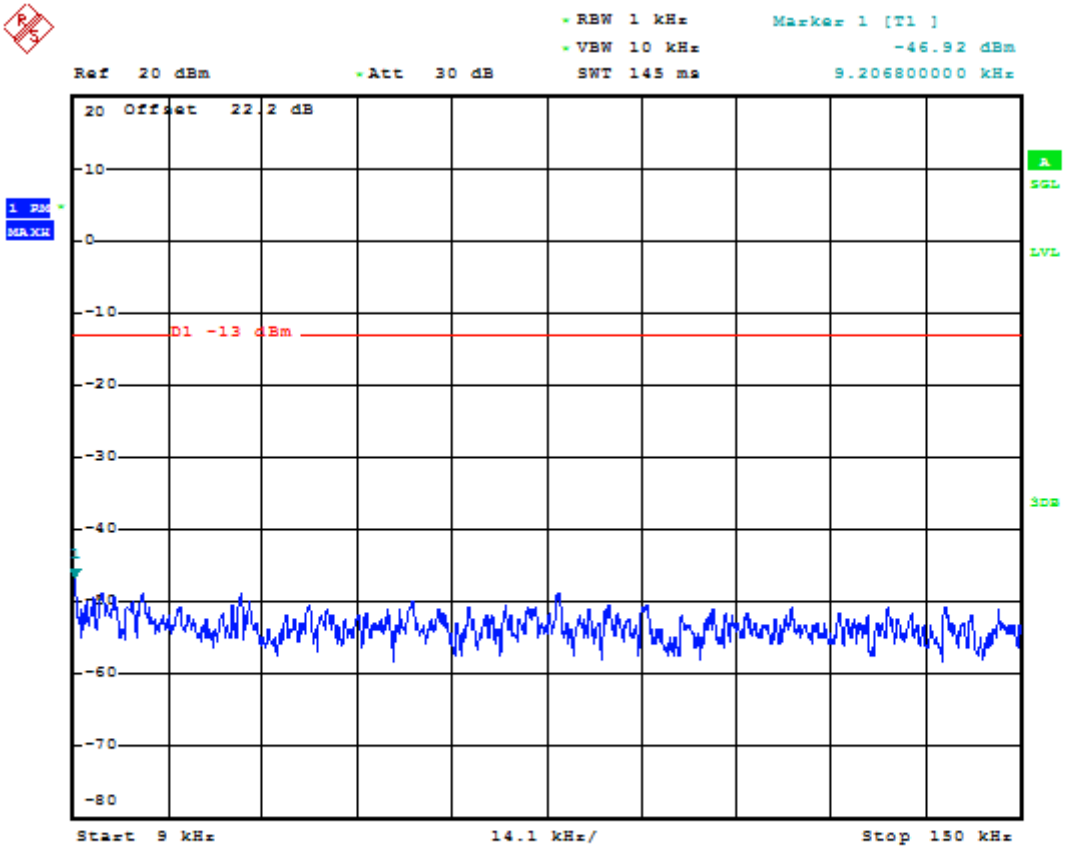

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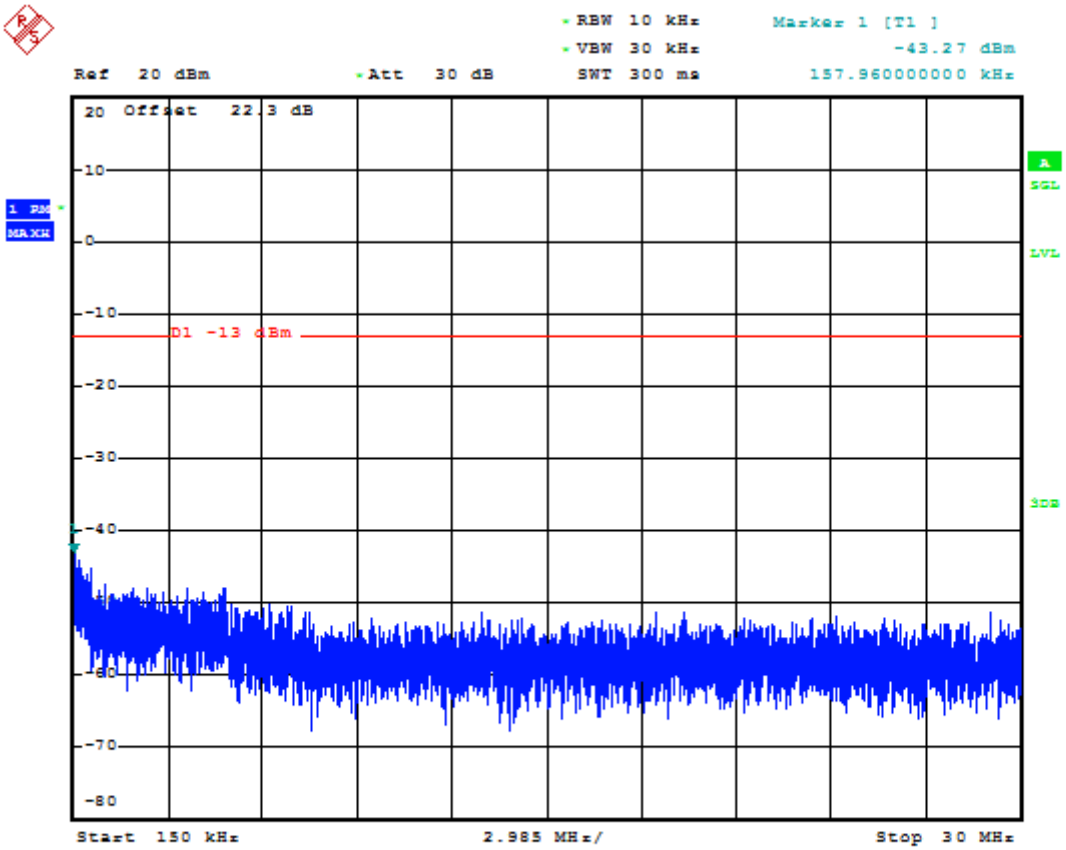

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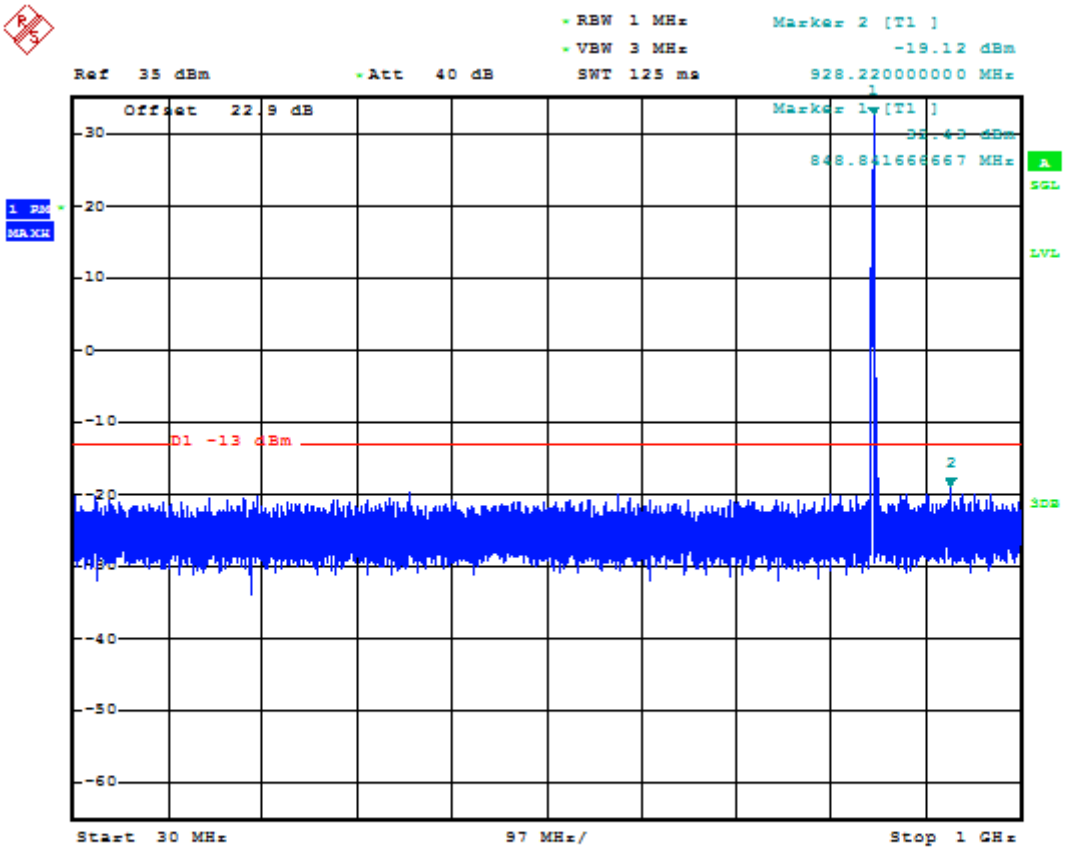

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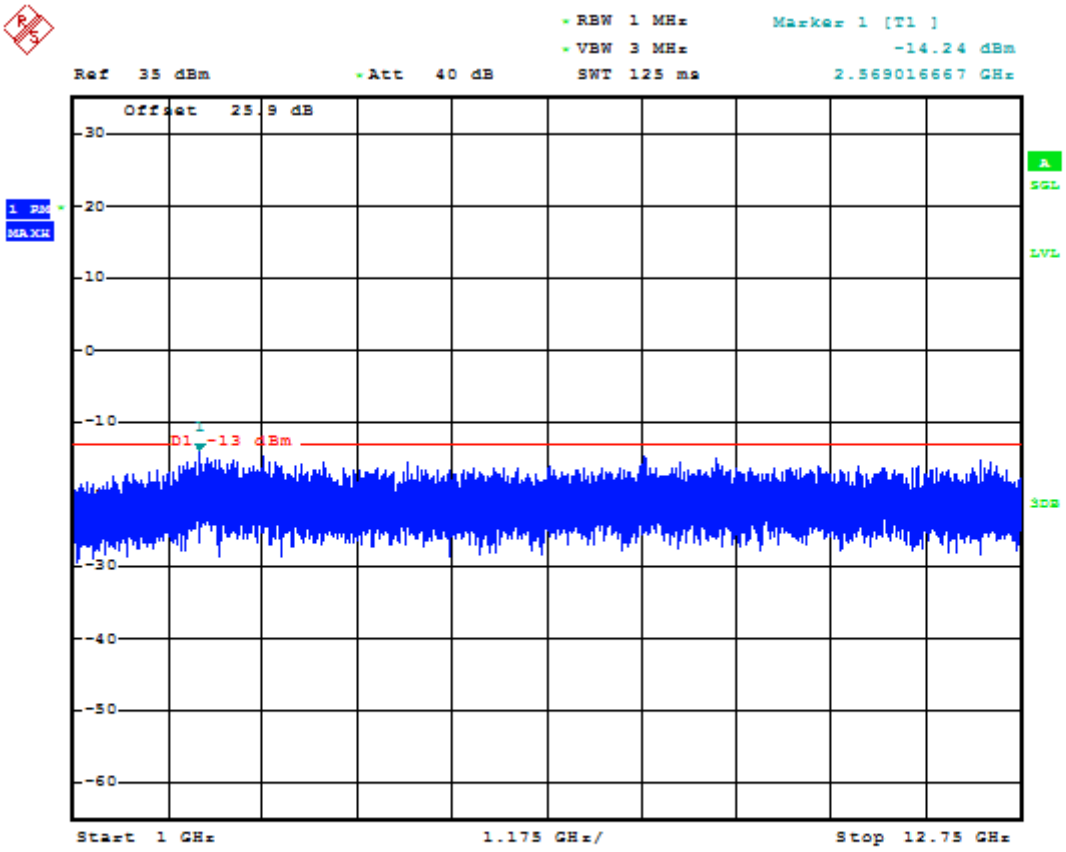

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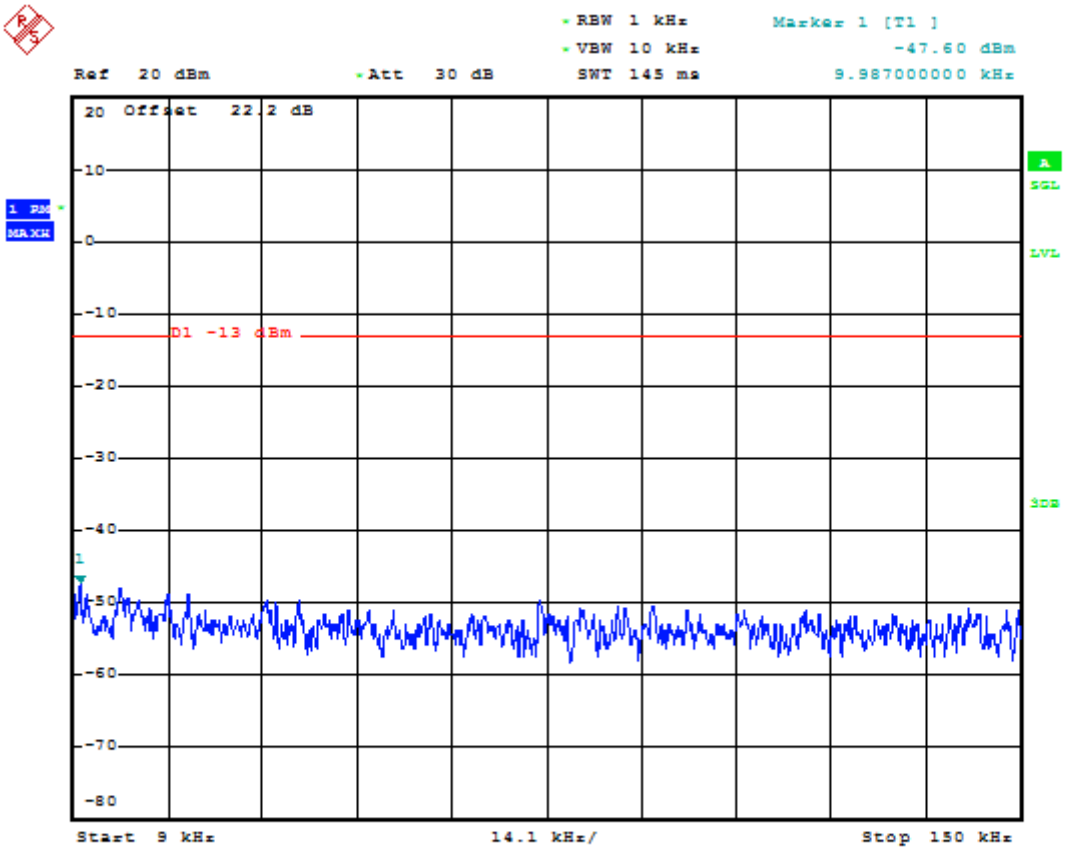
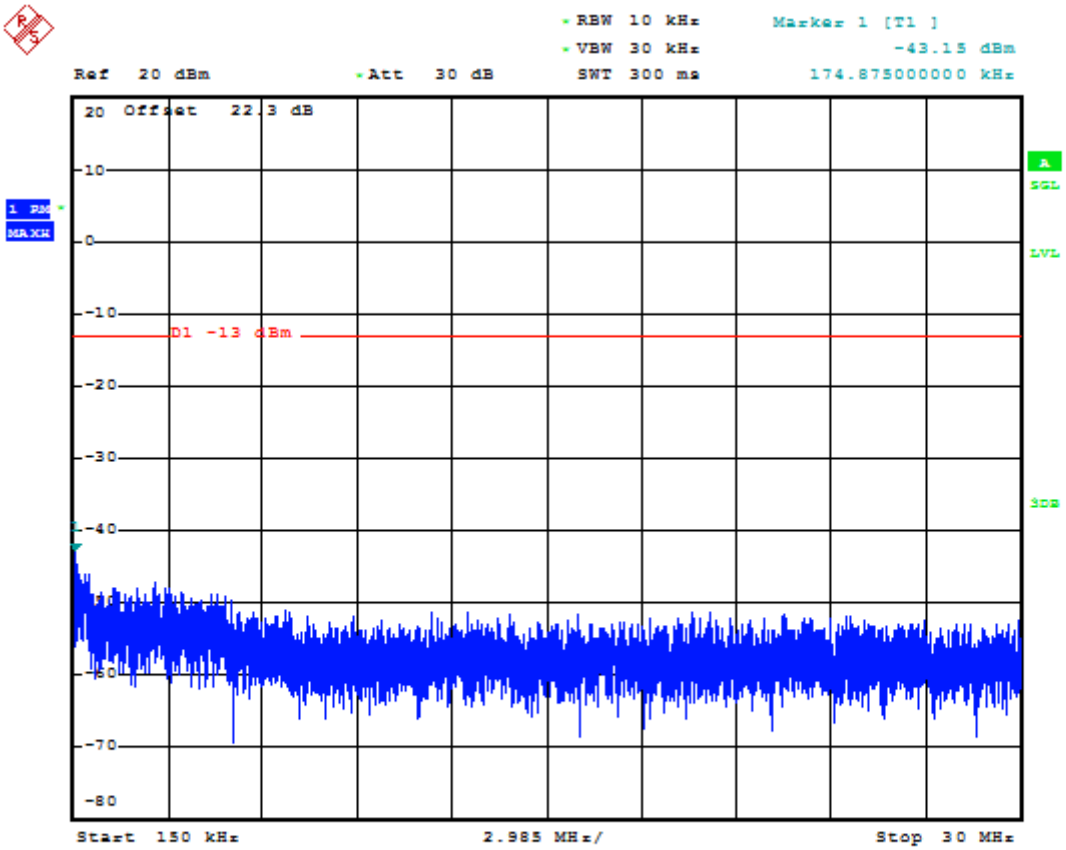
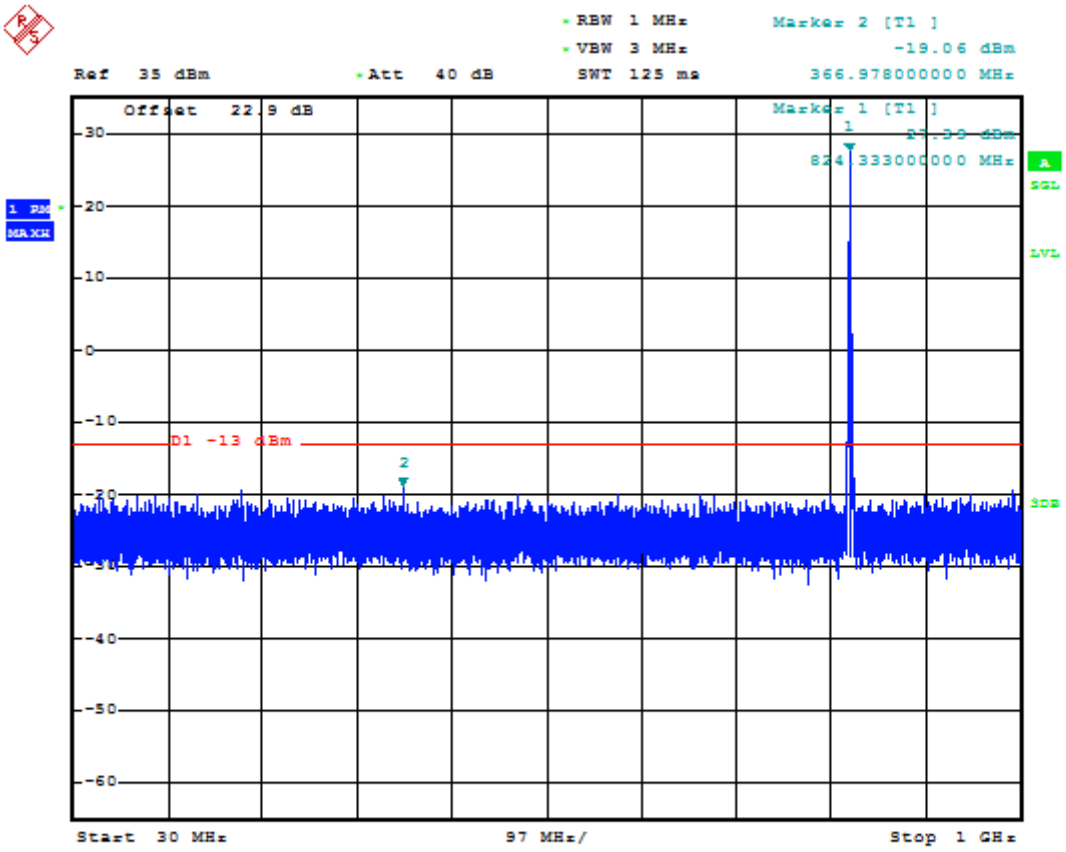
Test Channel=LCH





Date: 11.APR.2017 12:07:30



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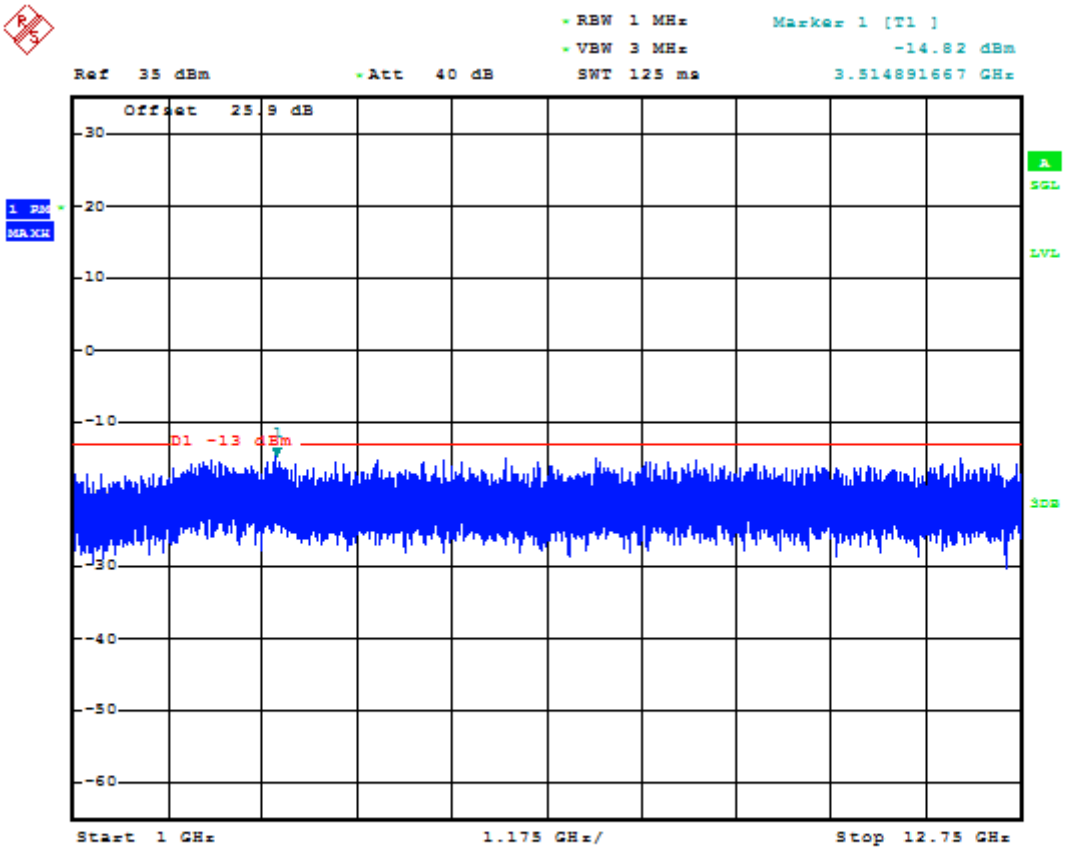

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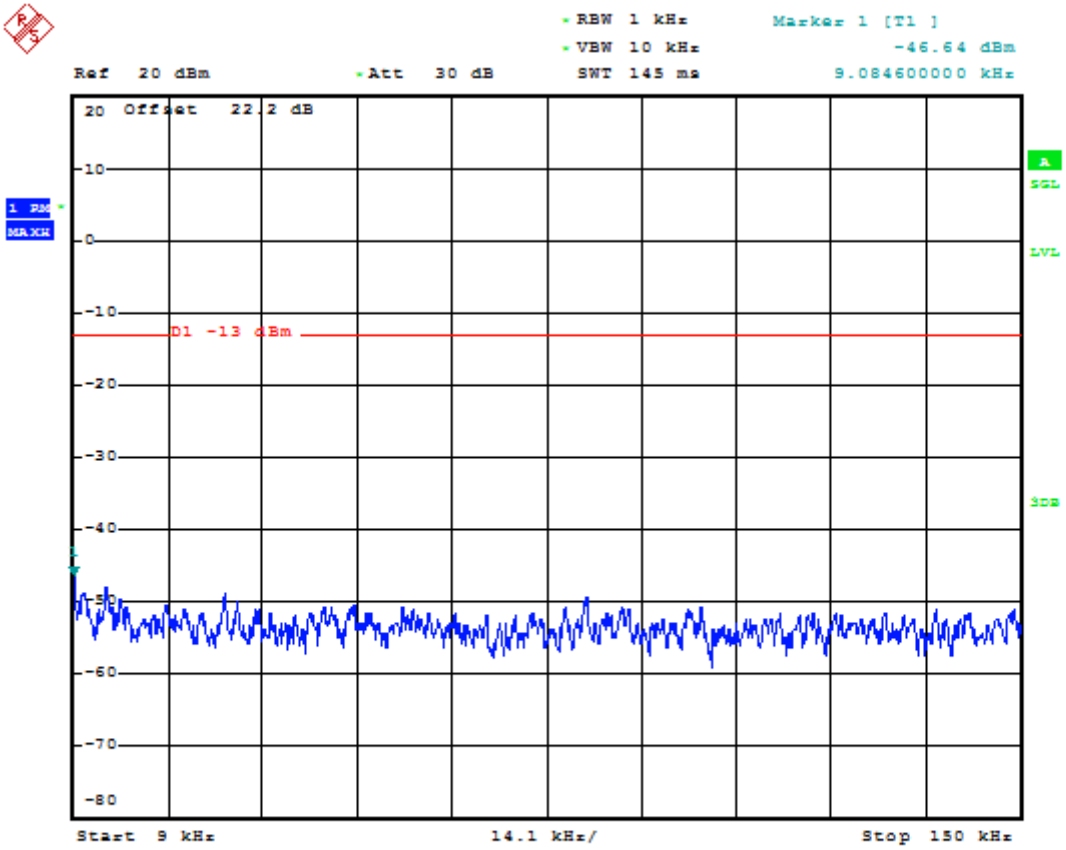
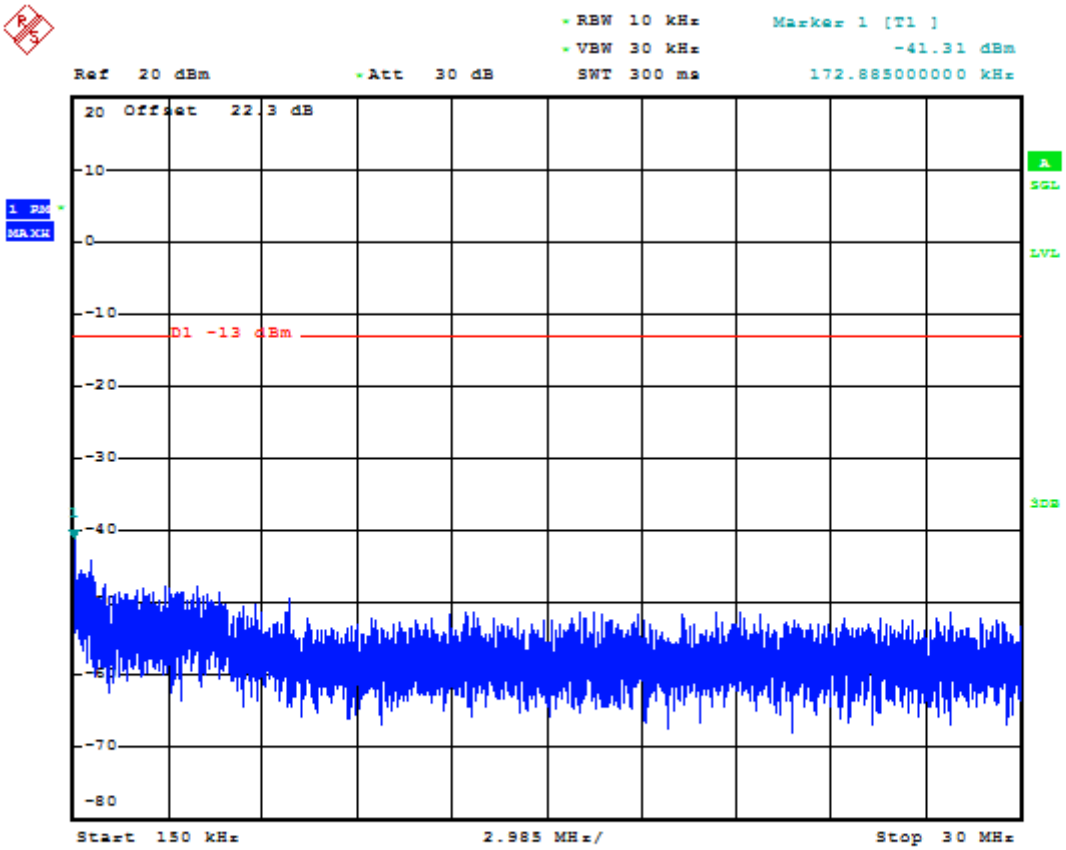
Test Channel=MCH



Date: 11.APR.2017 12:08:08



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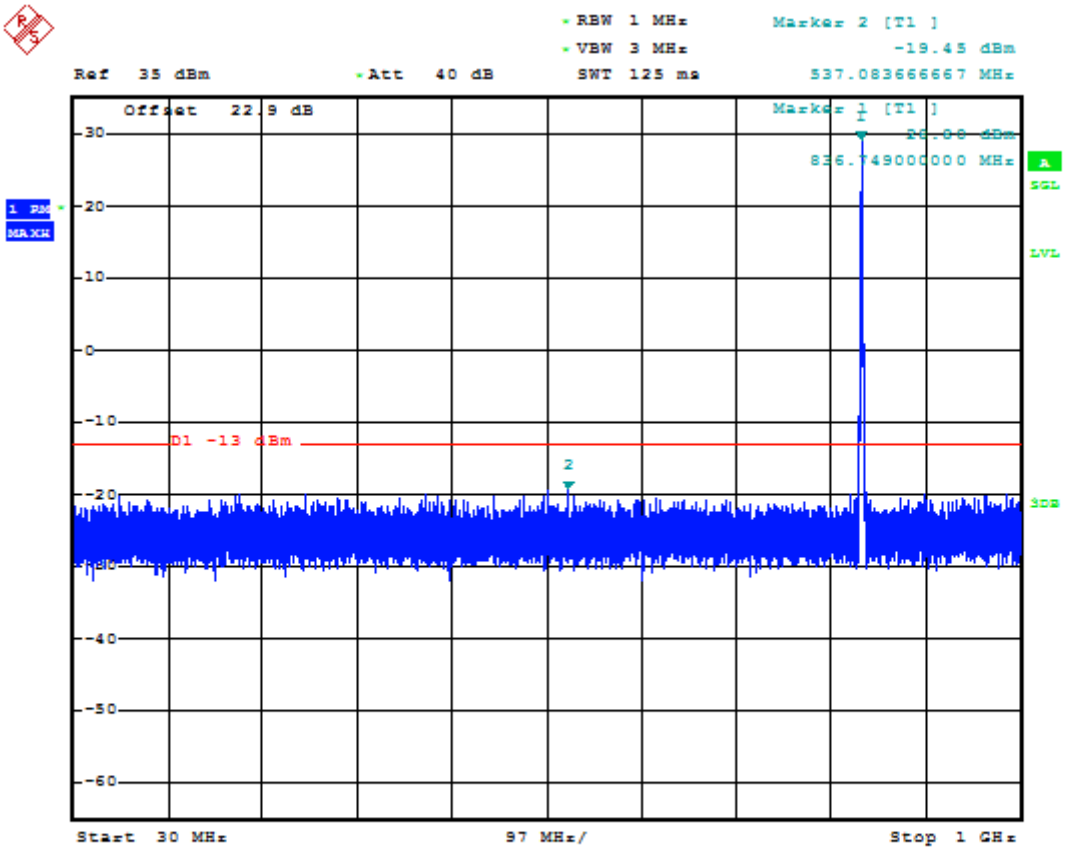

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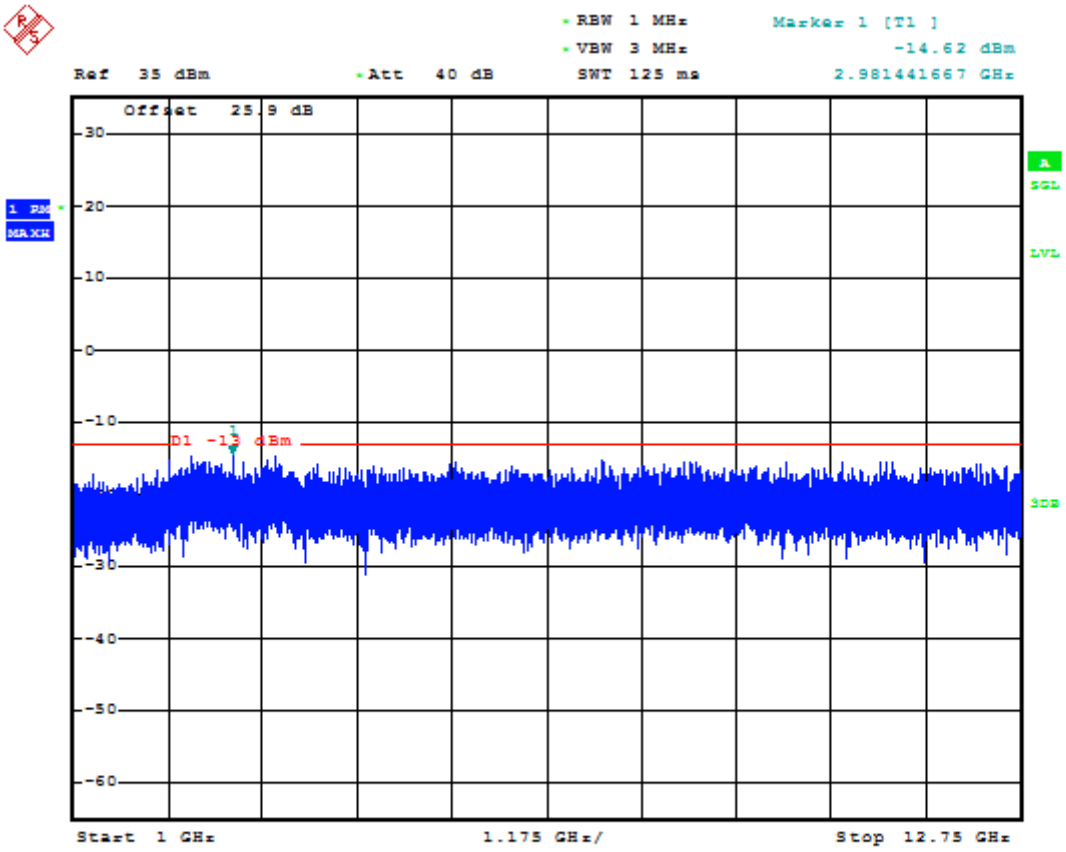

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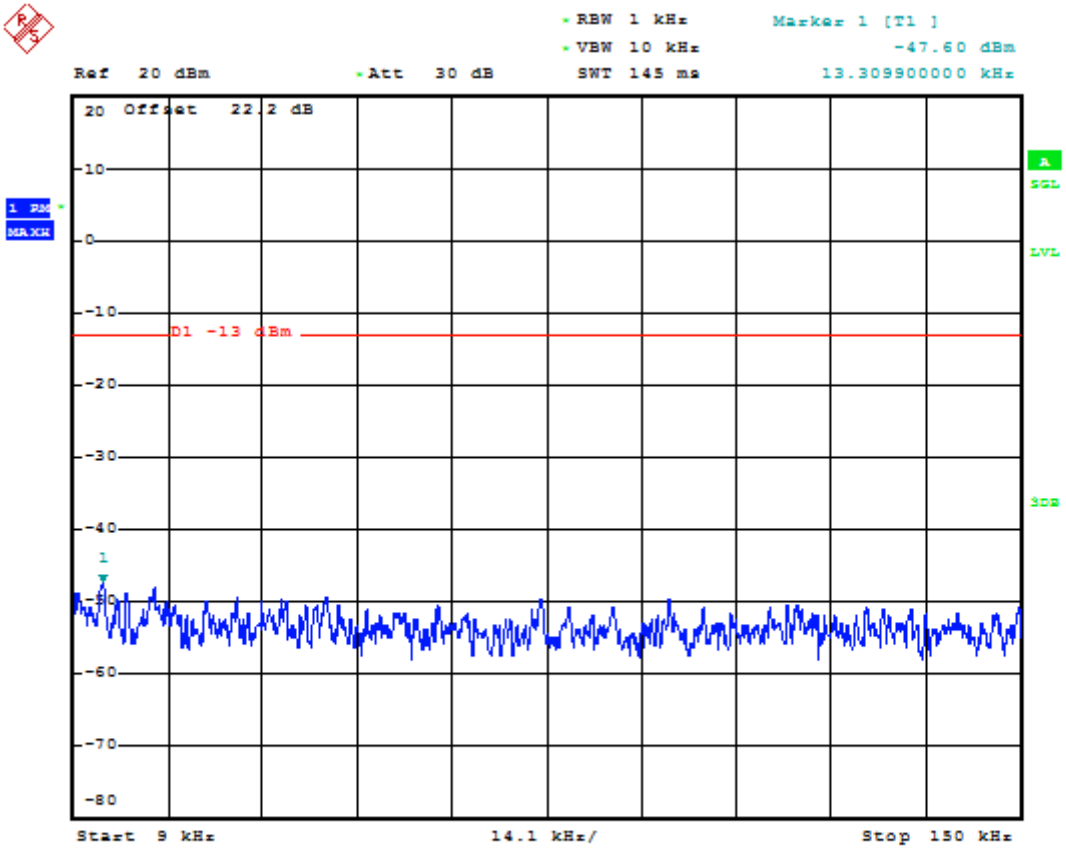
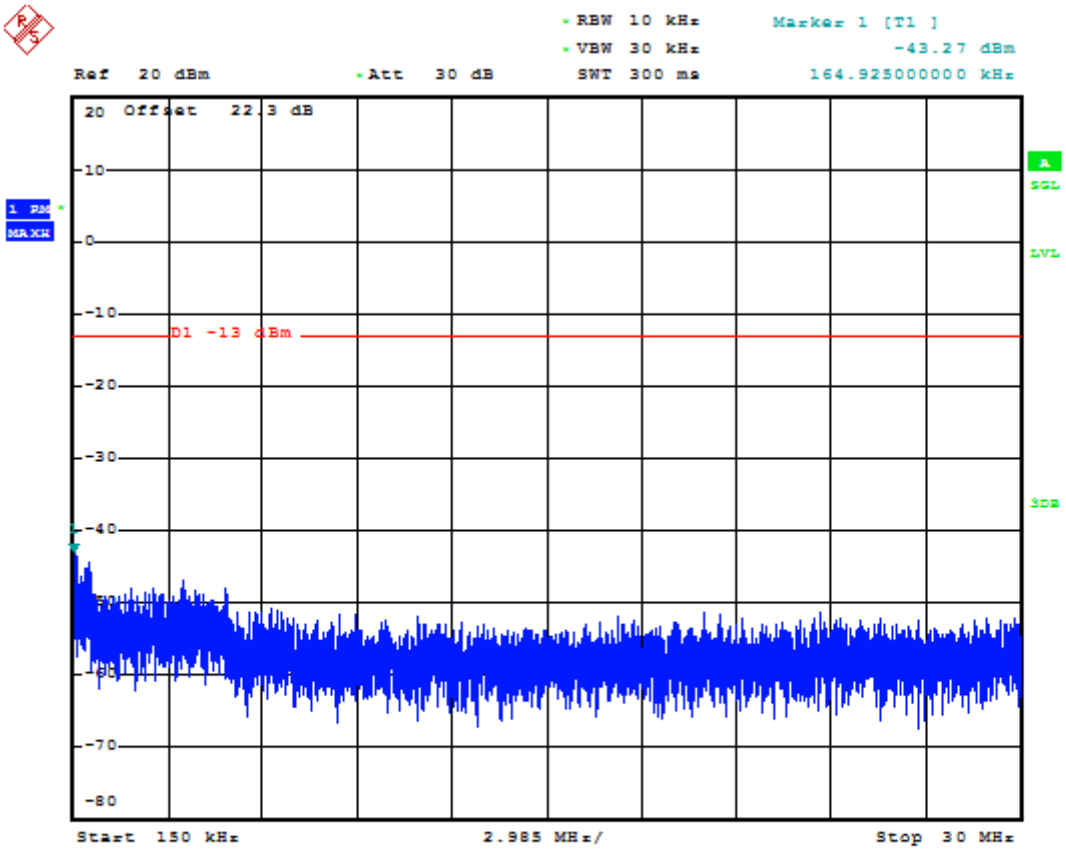
Test Channel=HCH



Date: 11.APR.2017 12:08:55



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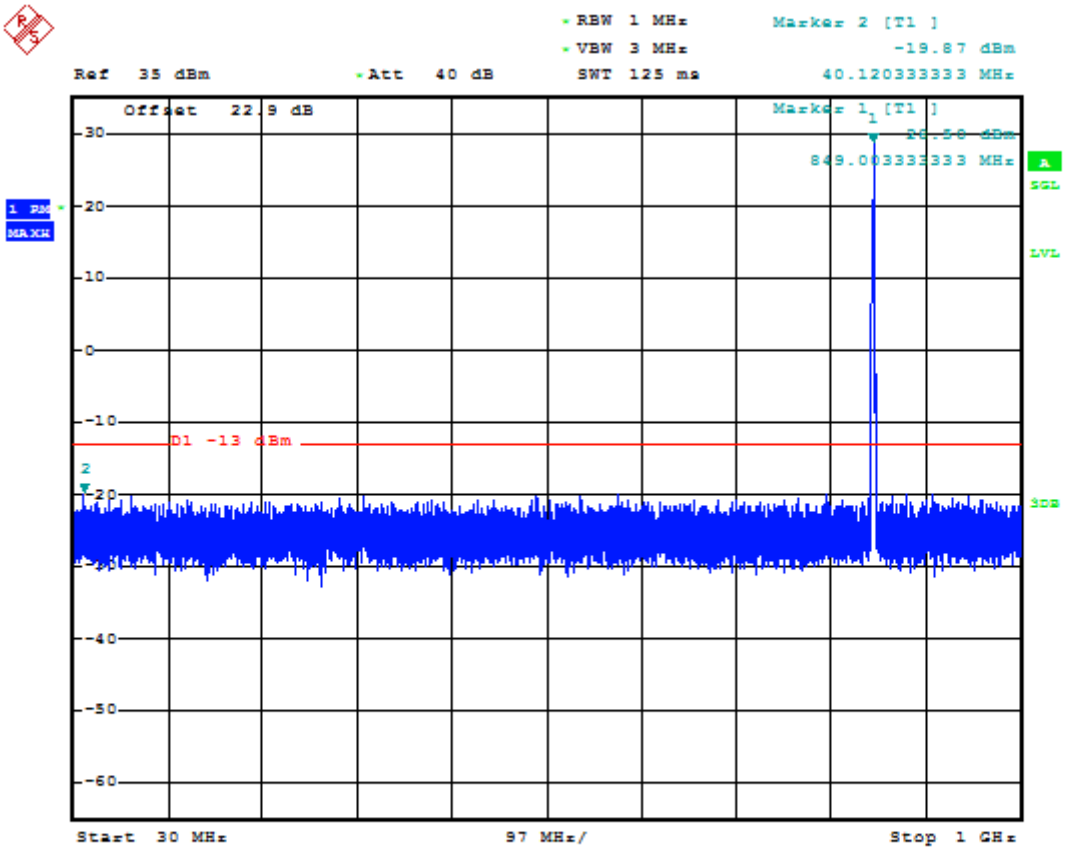

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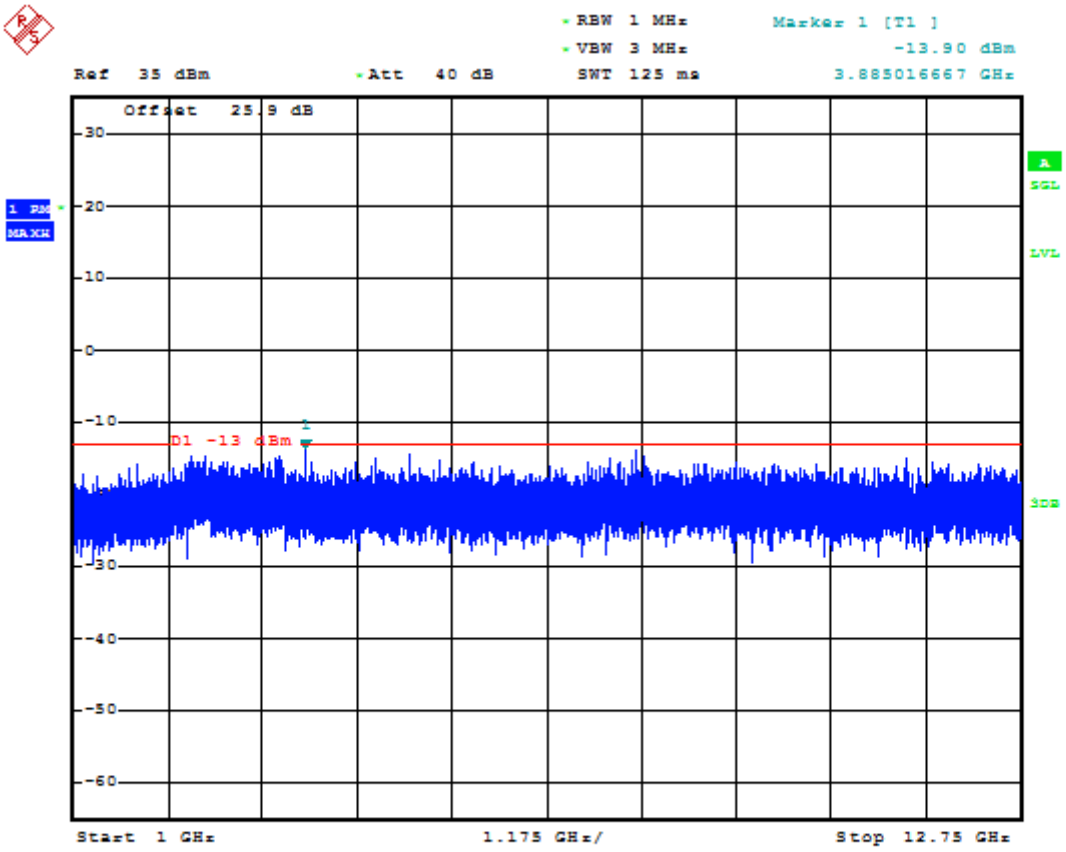
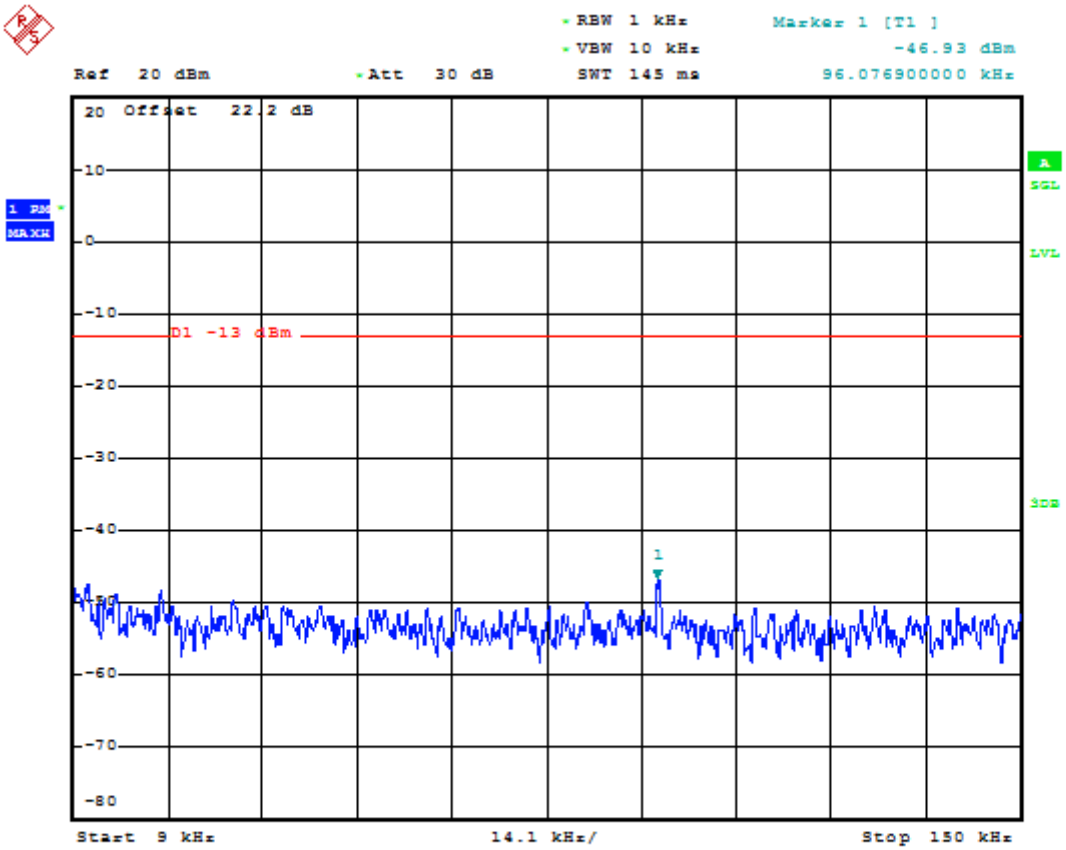


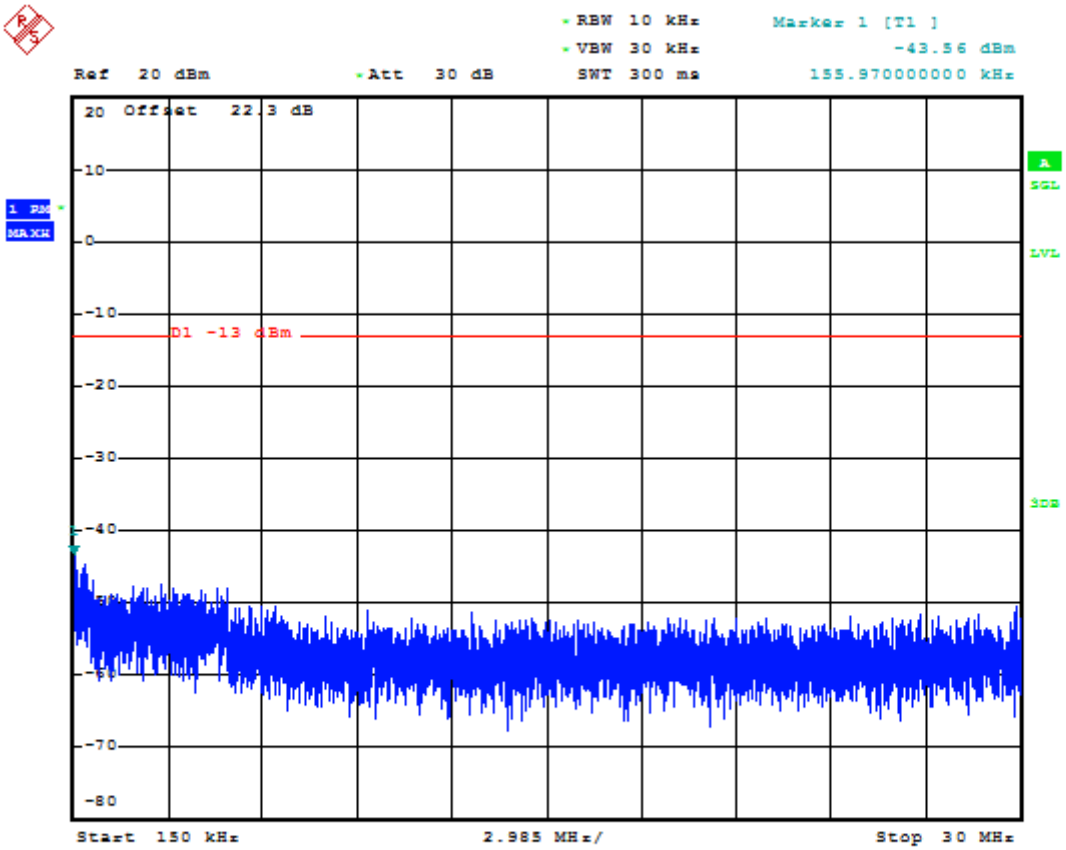
Date: 11.APR.2017 12:09:24

Test Mode=GSM/TM2

Test Channel=LCH



Date: 11.APR.2017 11:02:25



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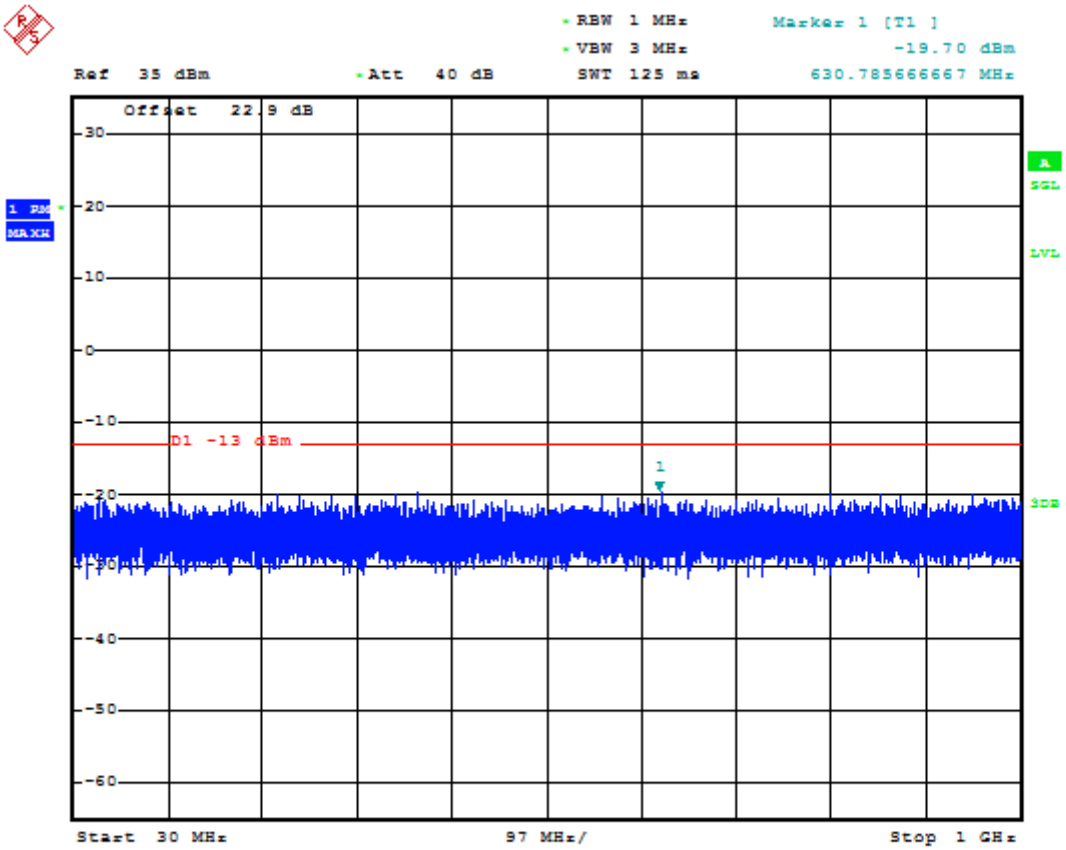

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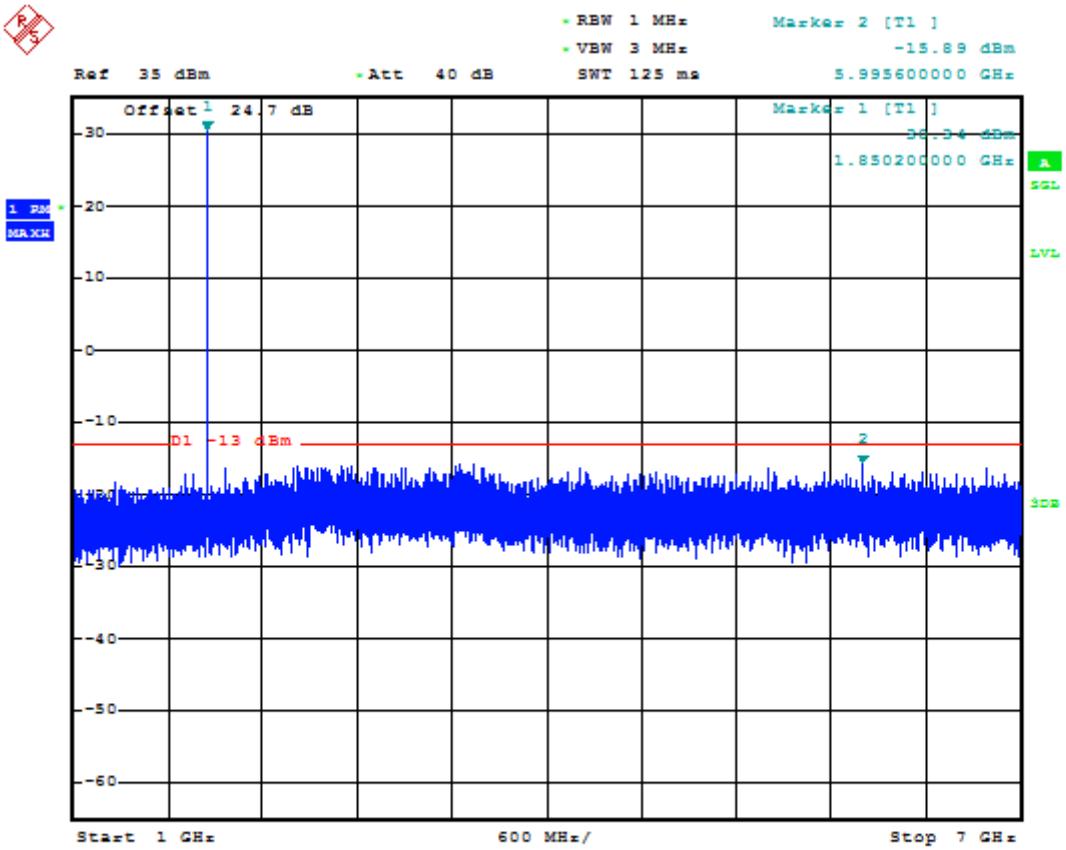

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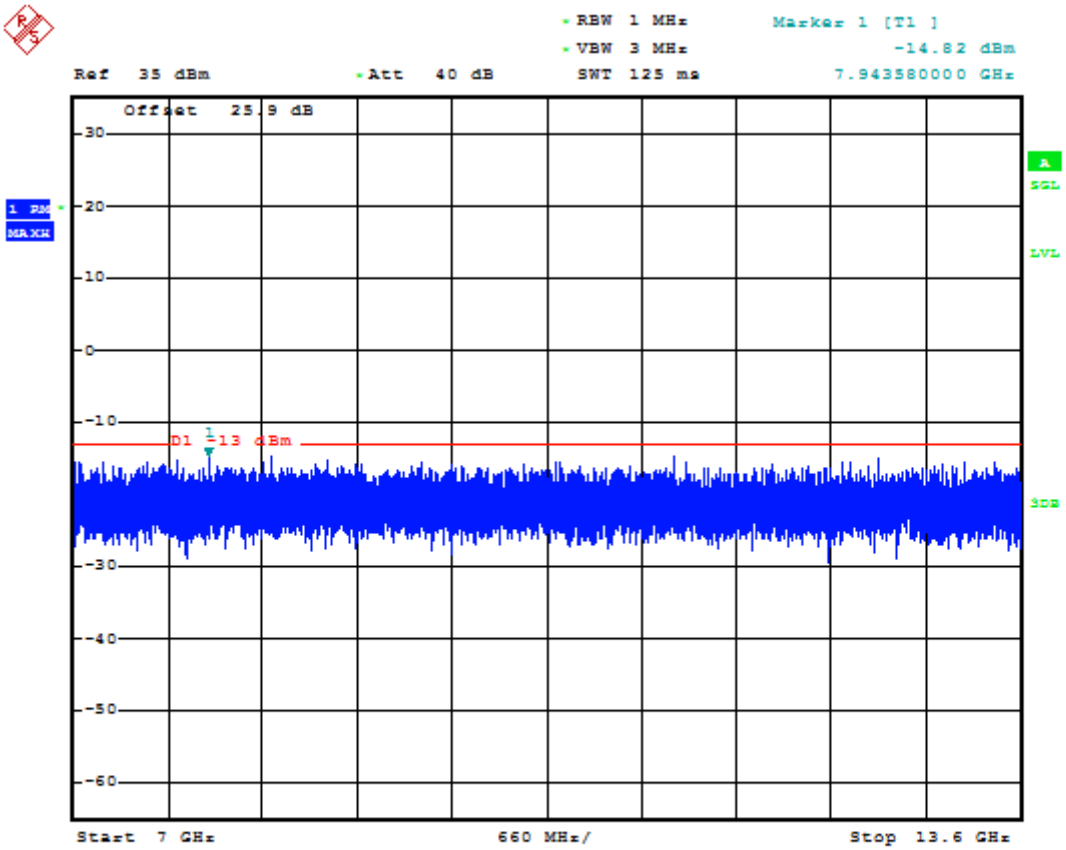

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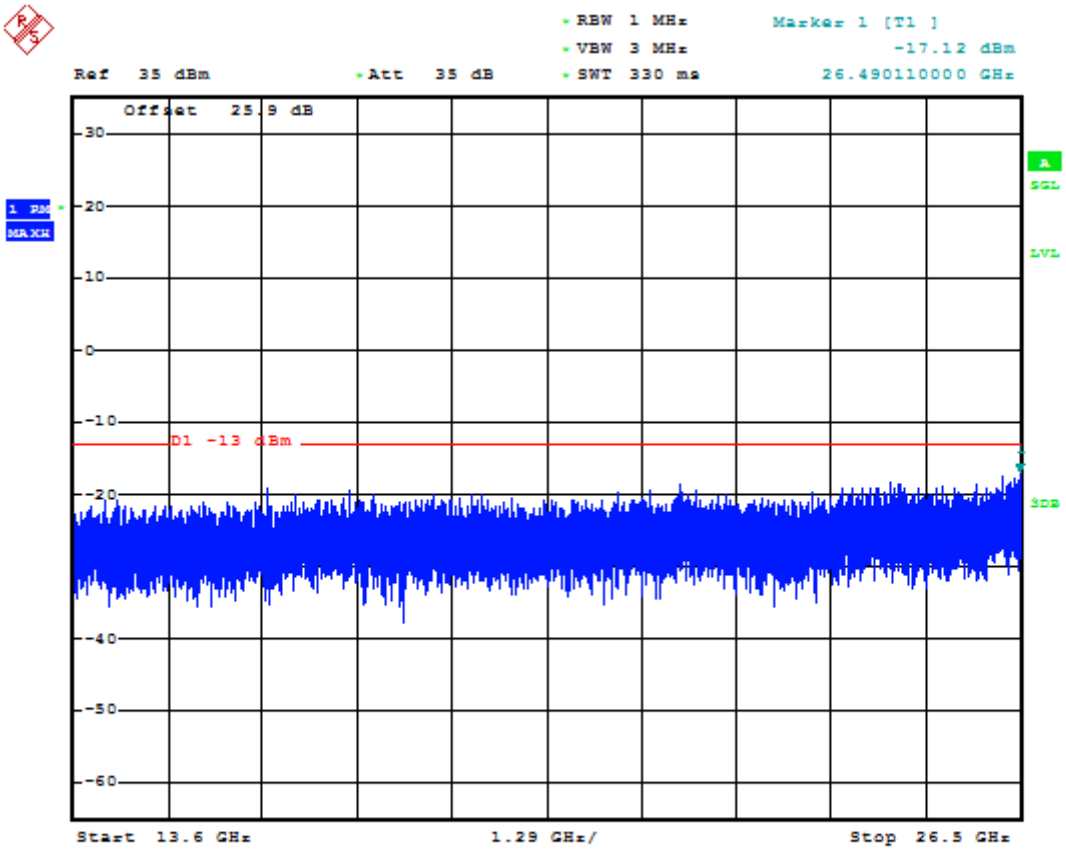

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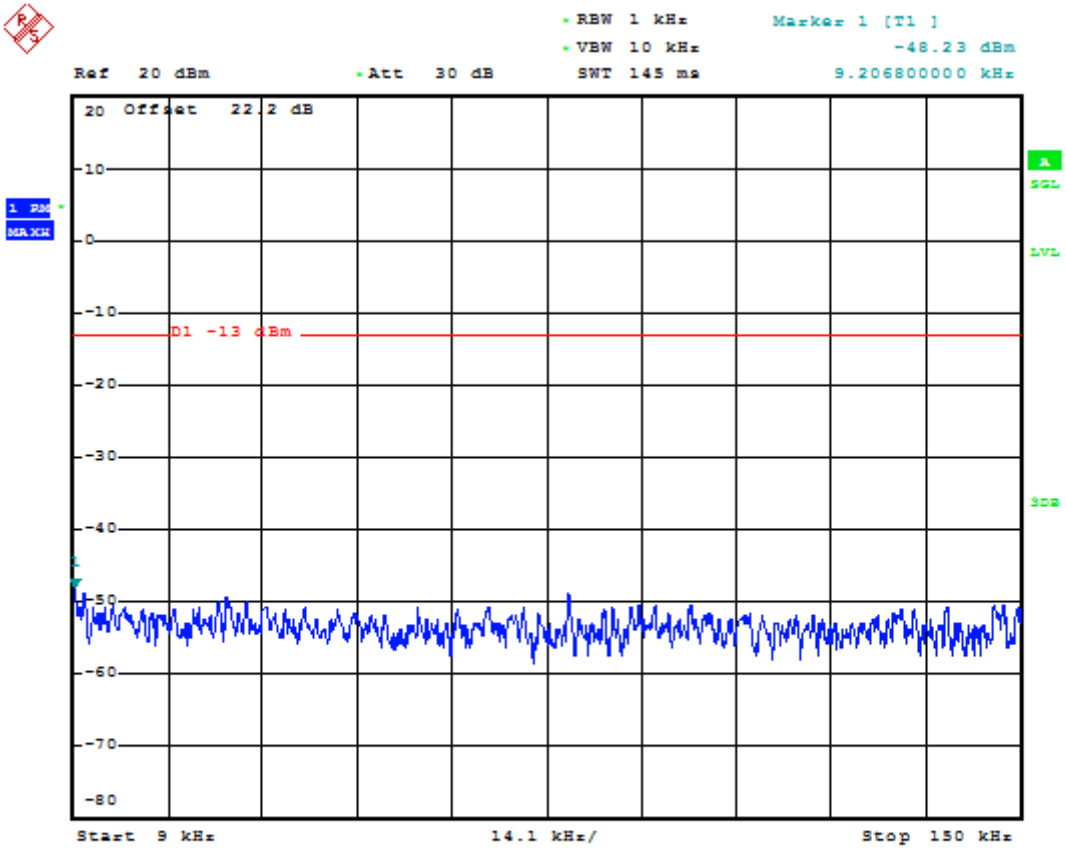

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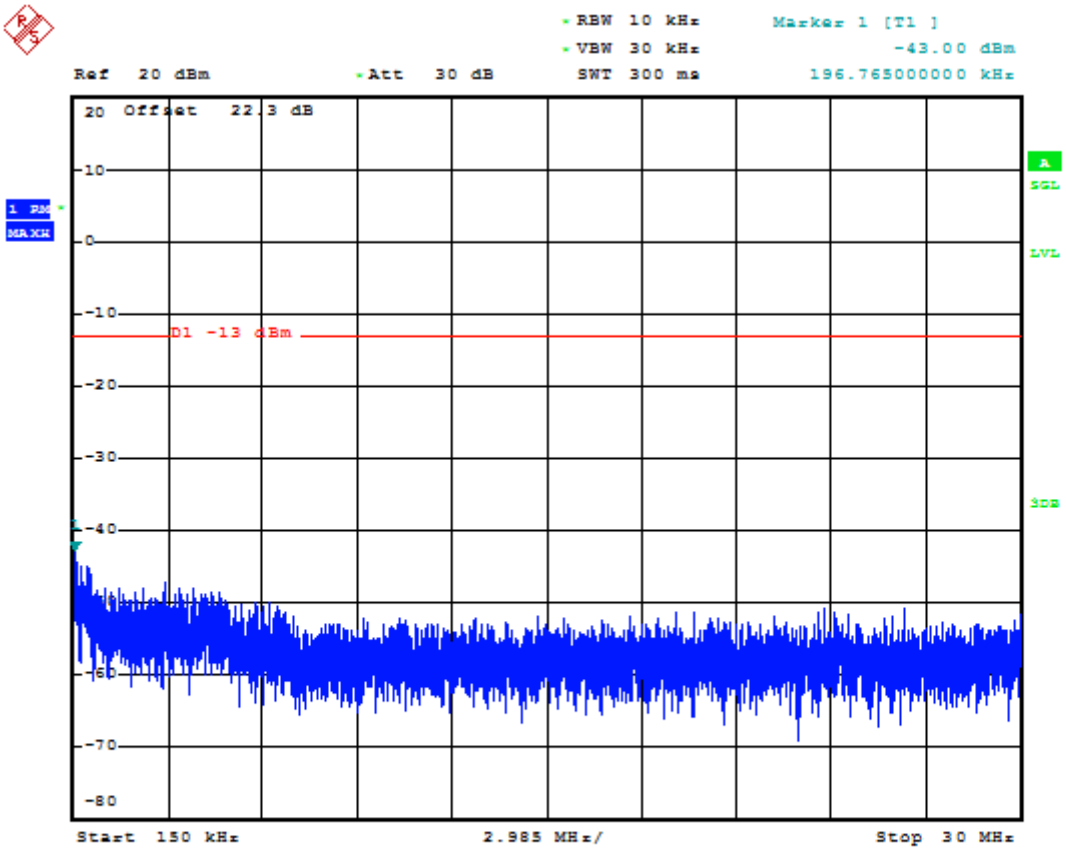

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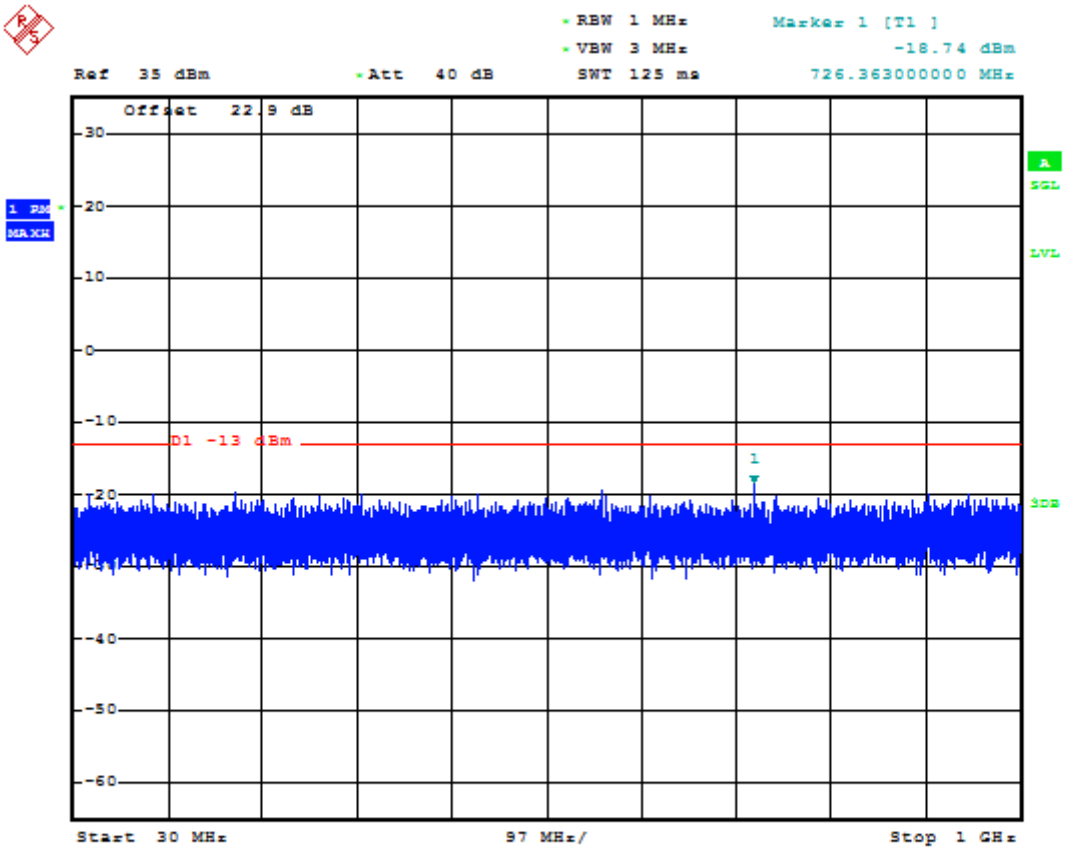

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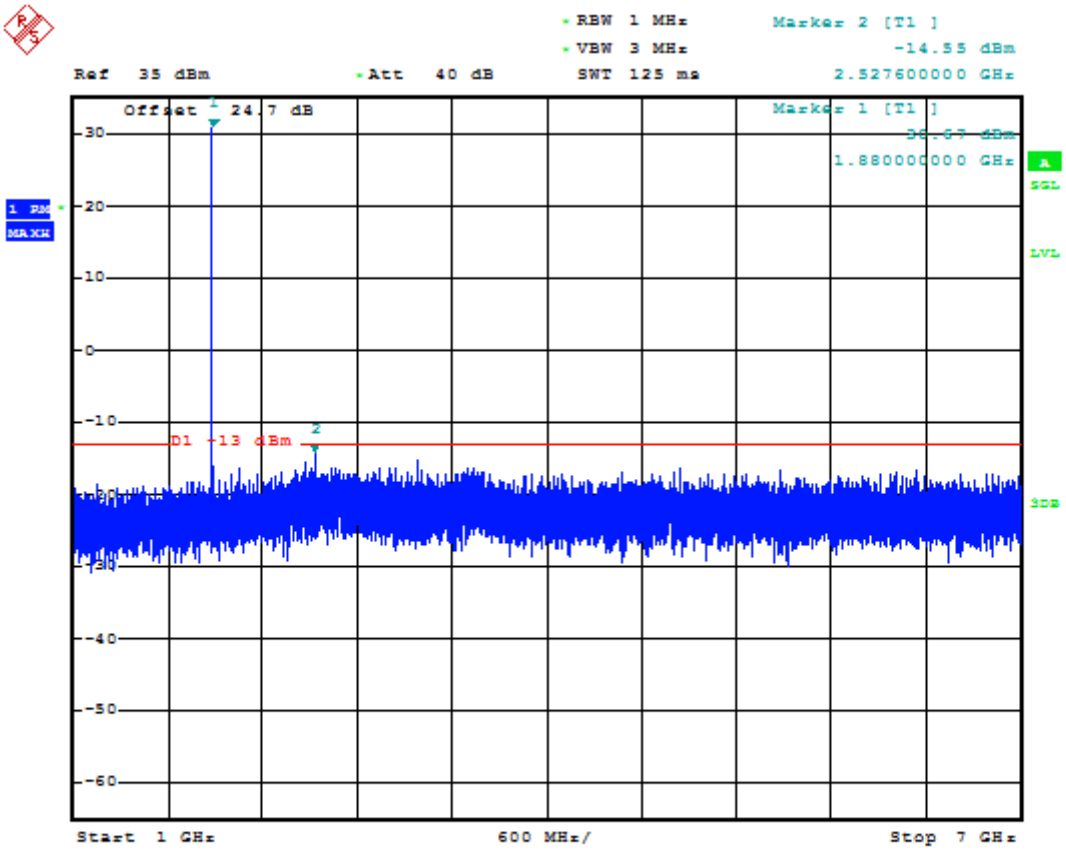
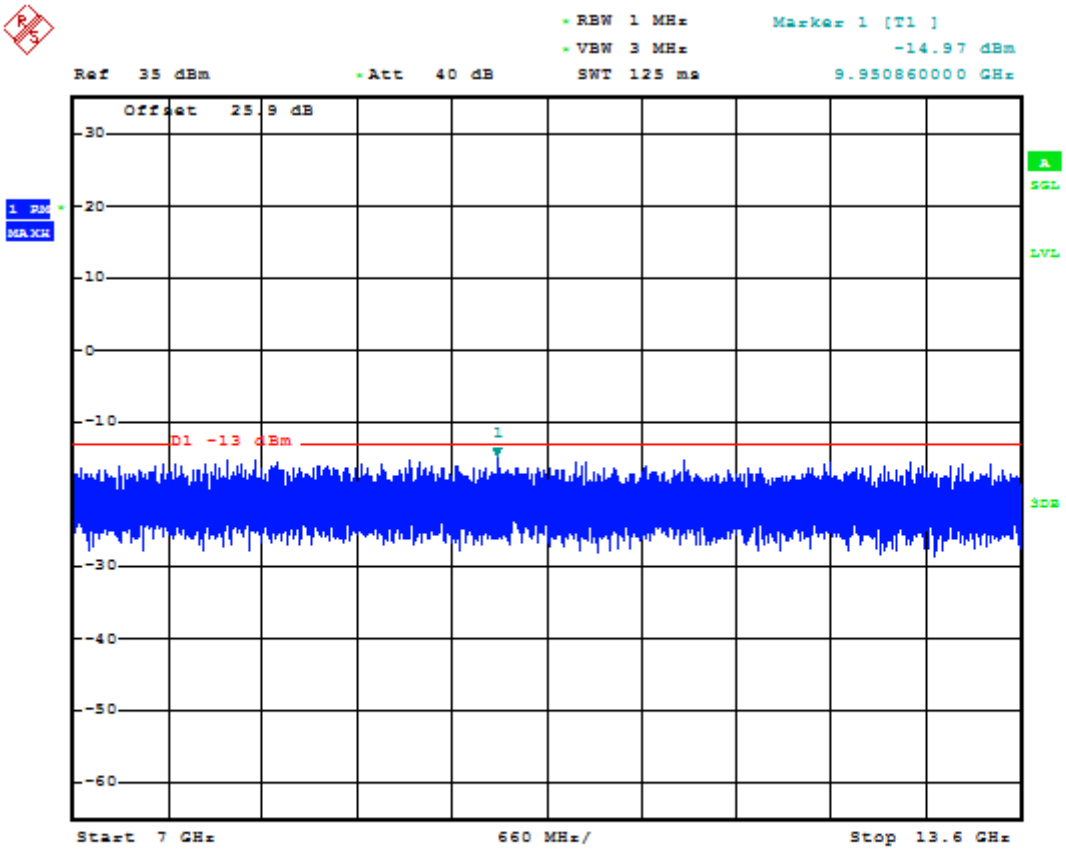


Date: 11.APR.2017 11:04:05



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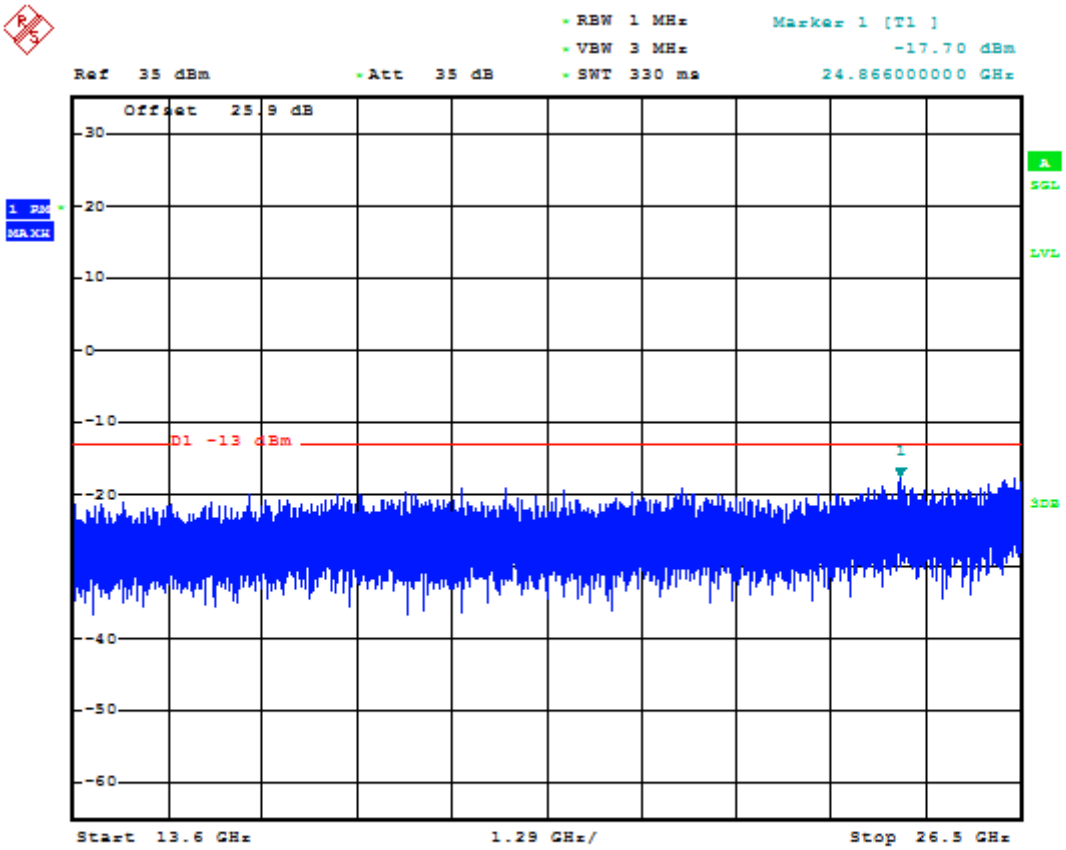

Date: 11.APR.2017 11:04:30

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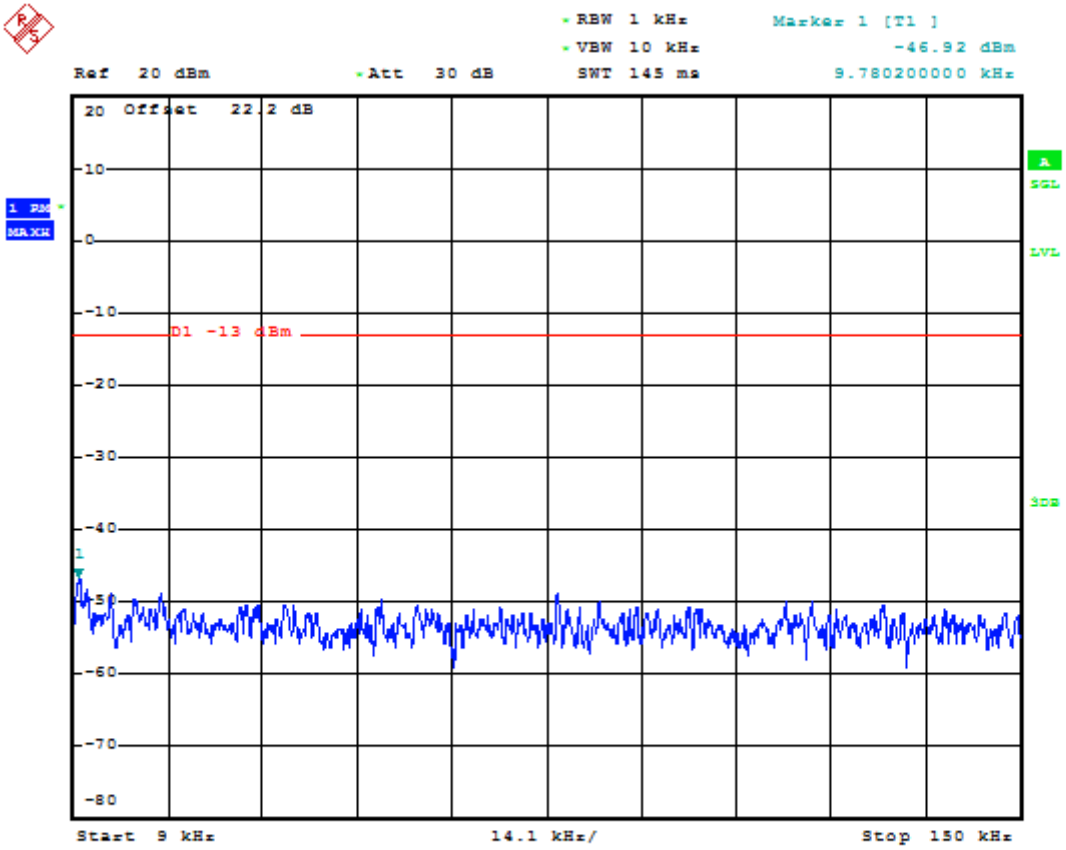

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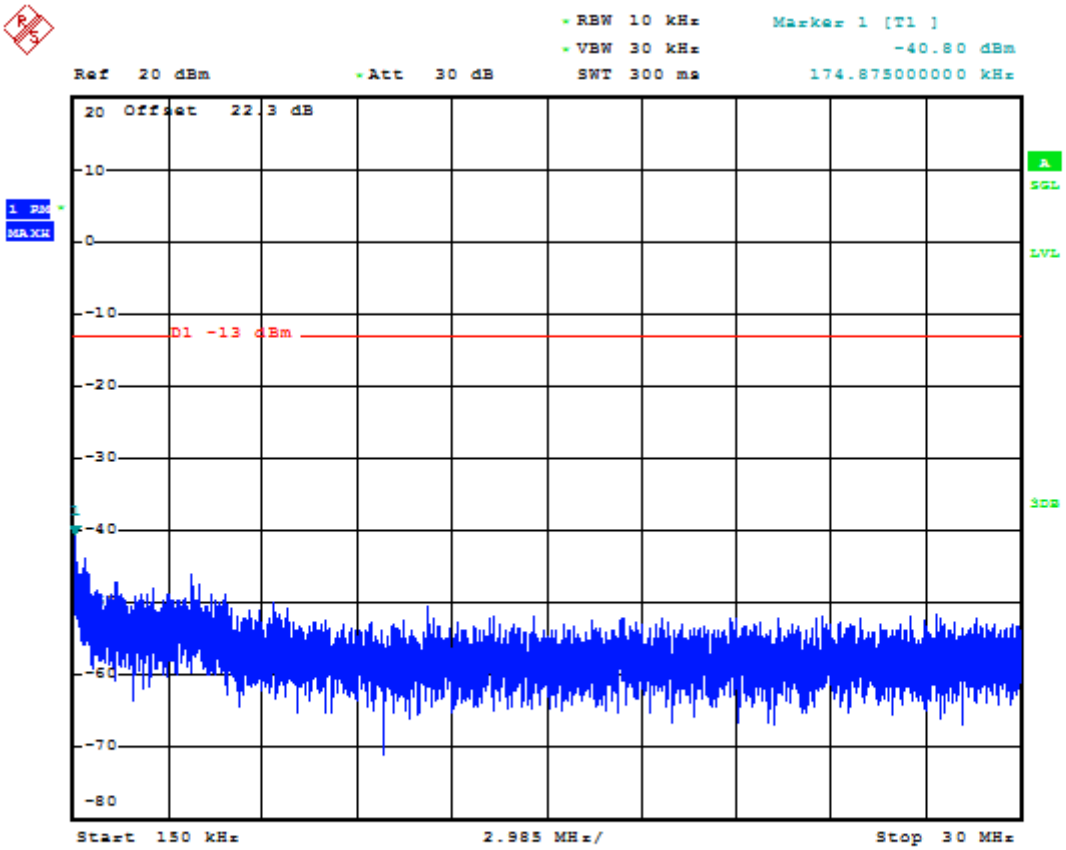

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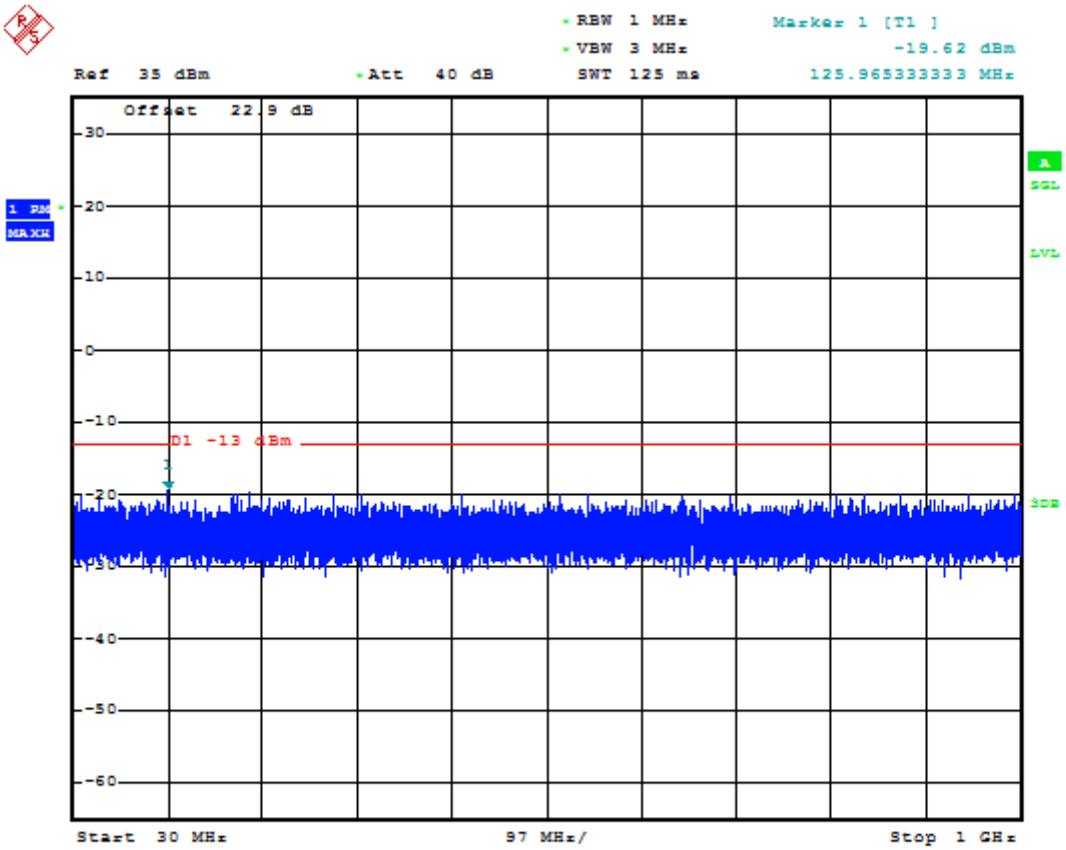
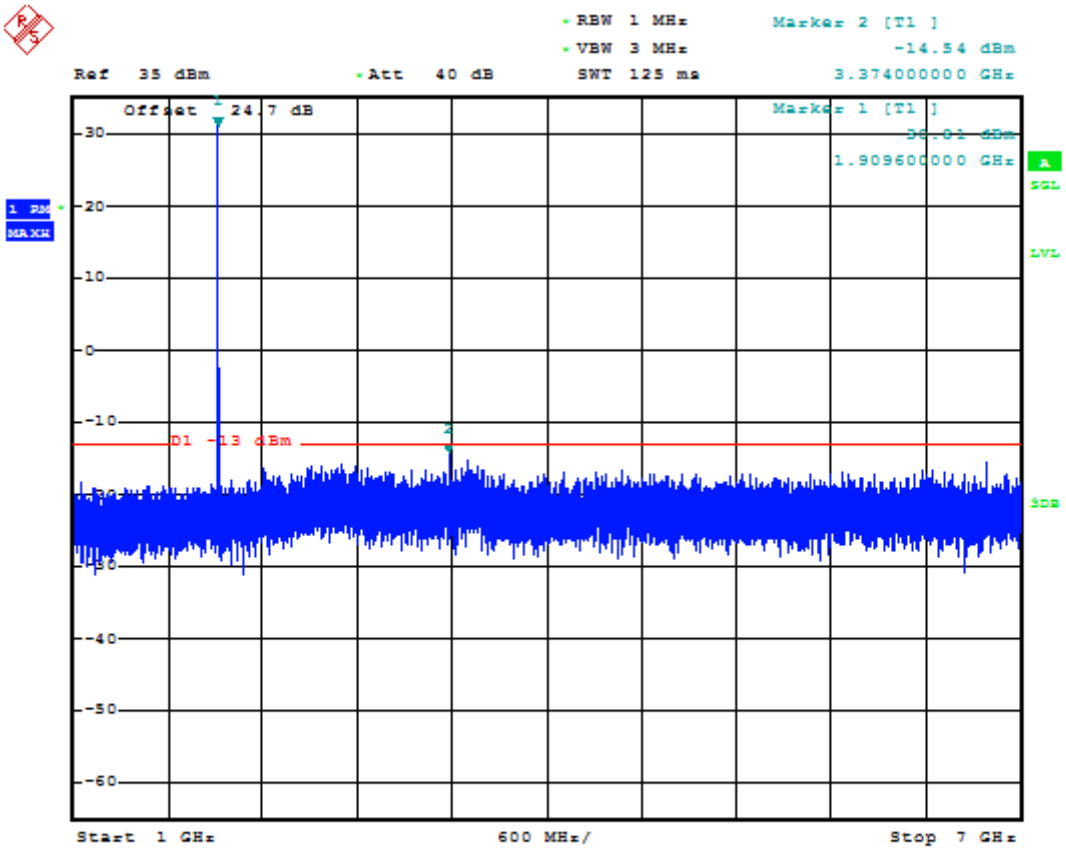
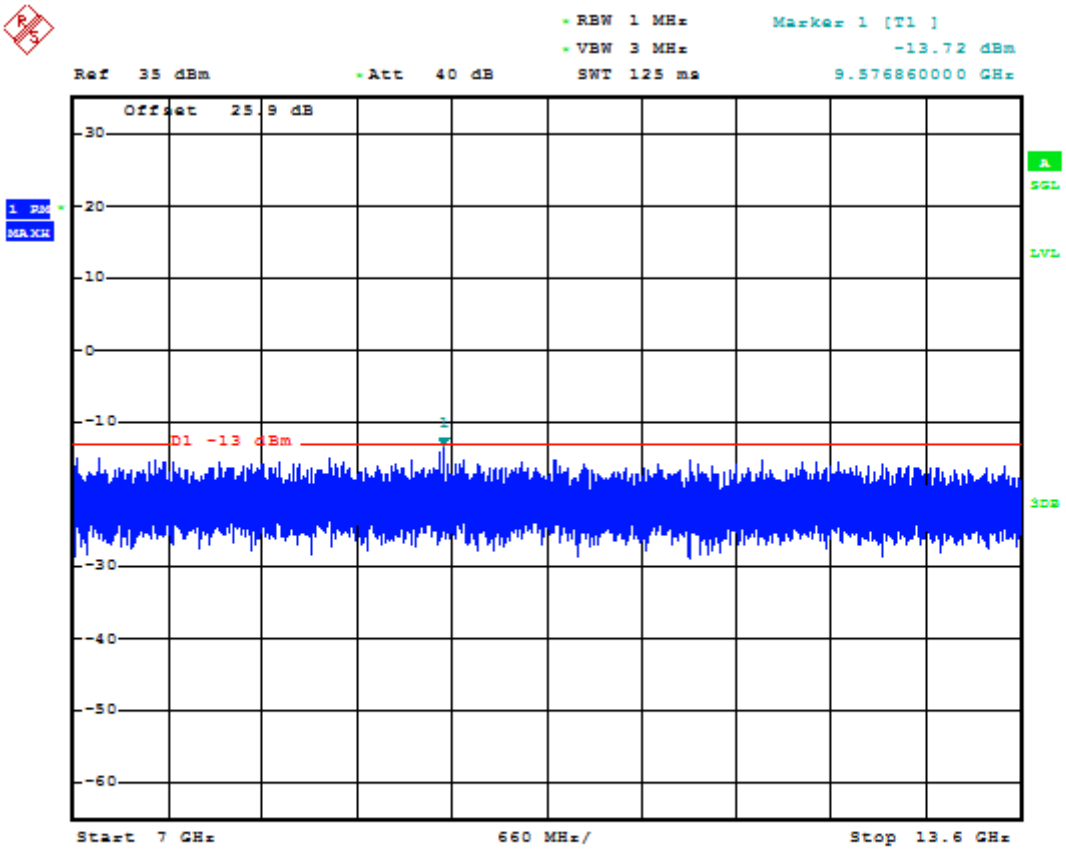


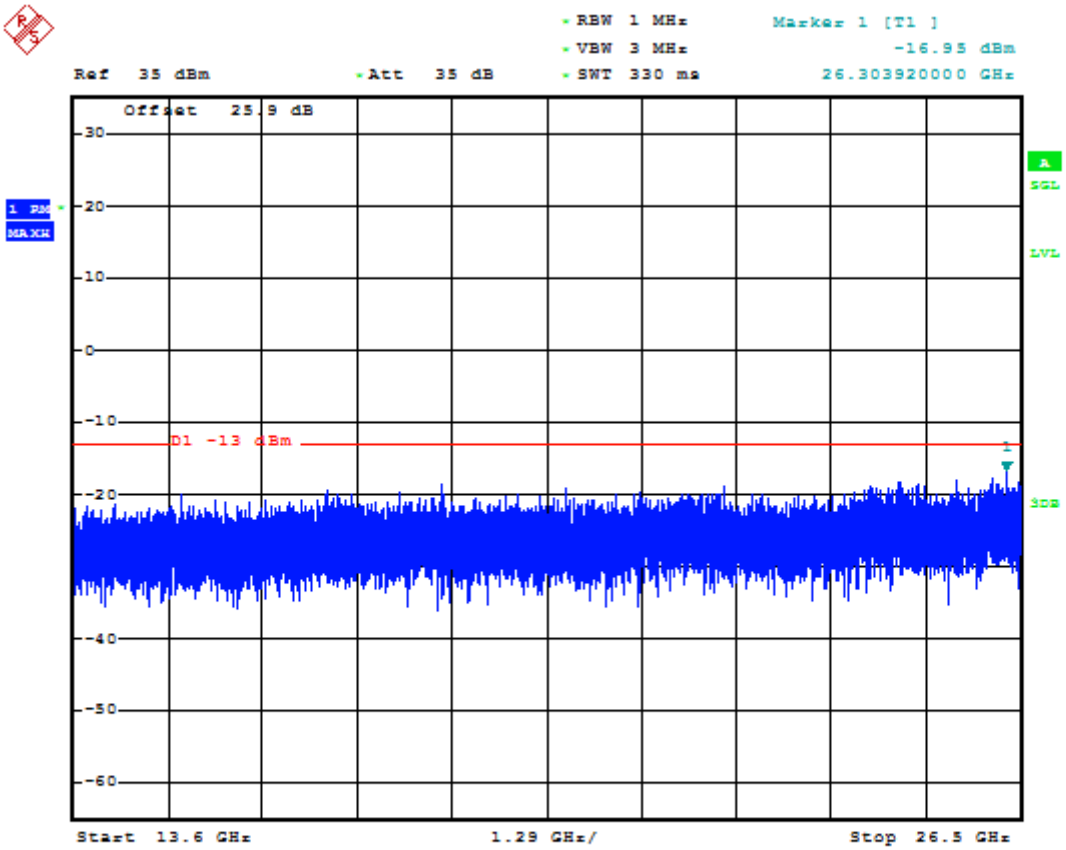
Date: 11.APR.2017 11:05:05



Date: 11.APR.2017 11:05:16



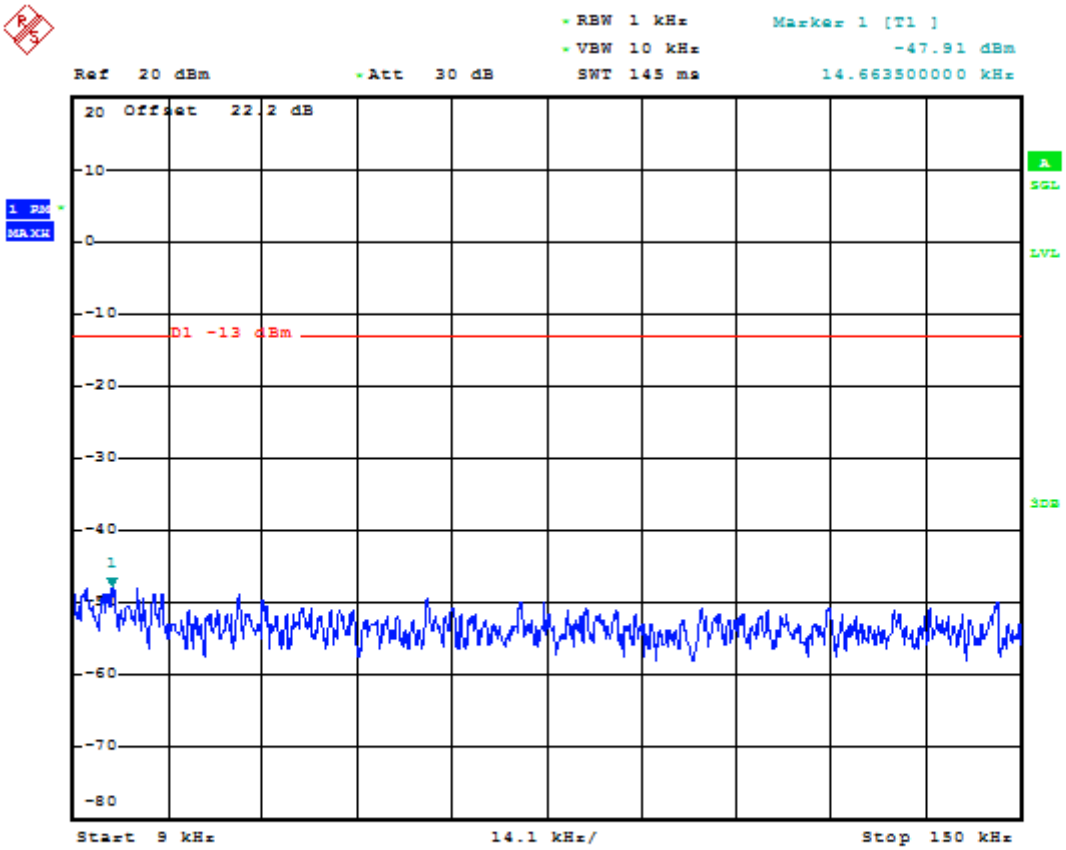
Date: 11.APR.2017 11:05:24

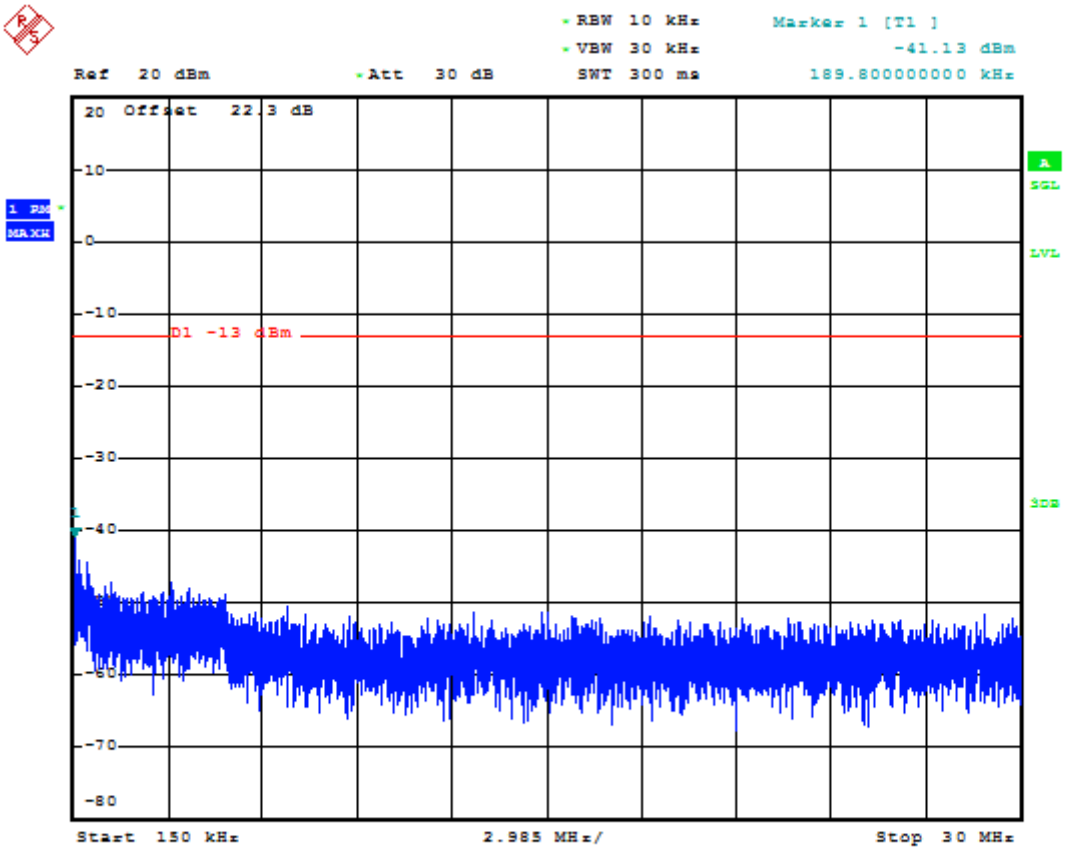


Date: 11.APR.2017 11:05:41

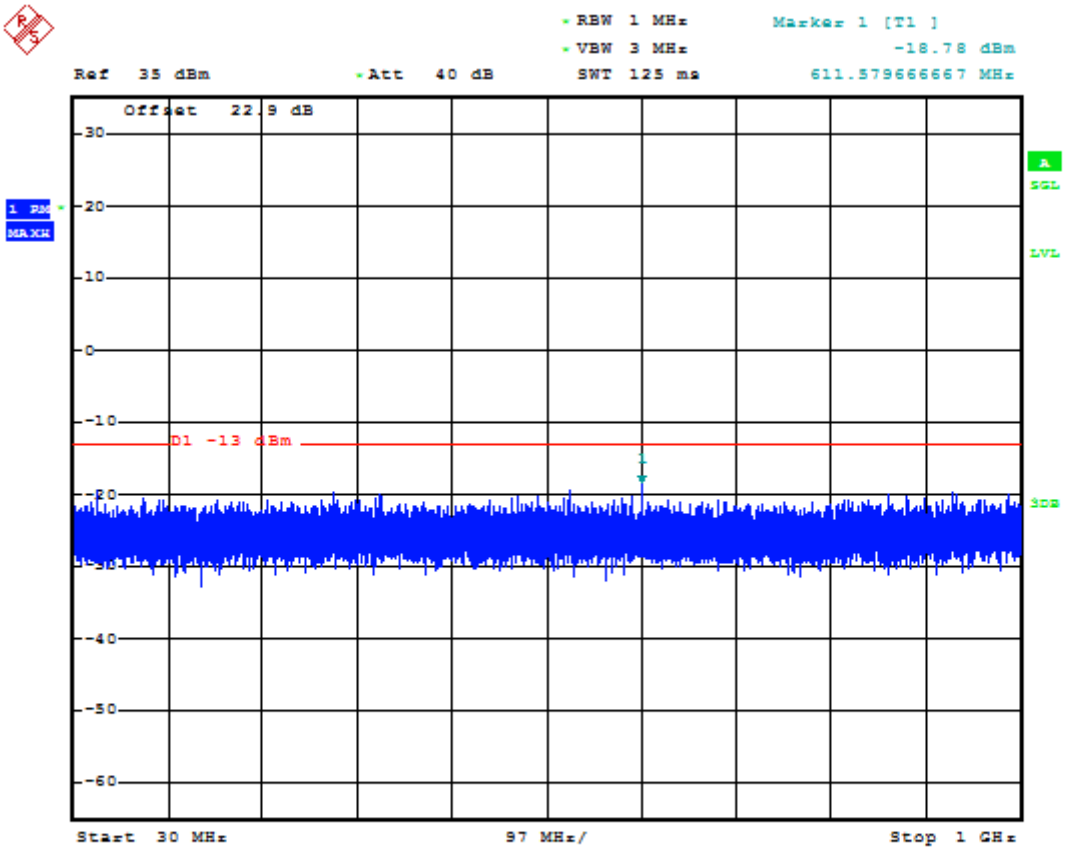
Test Mode=GSM/TM3

Test Channel=LCH

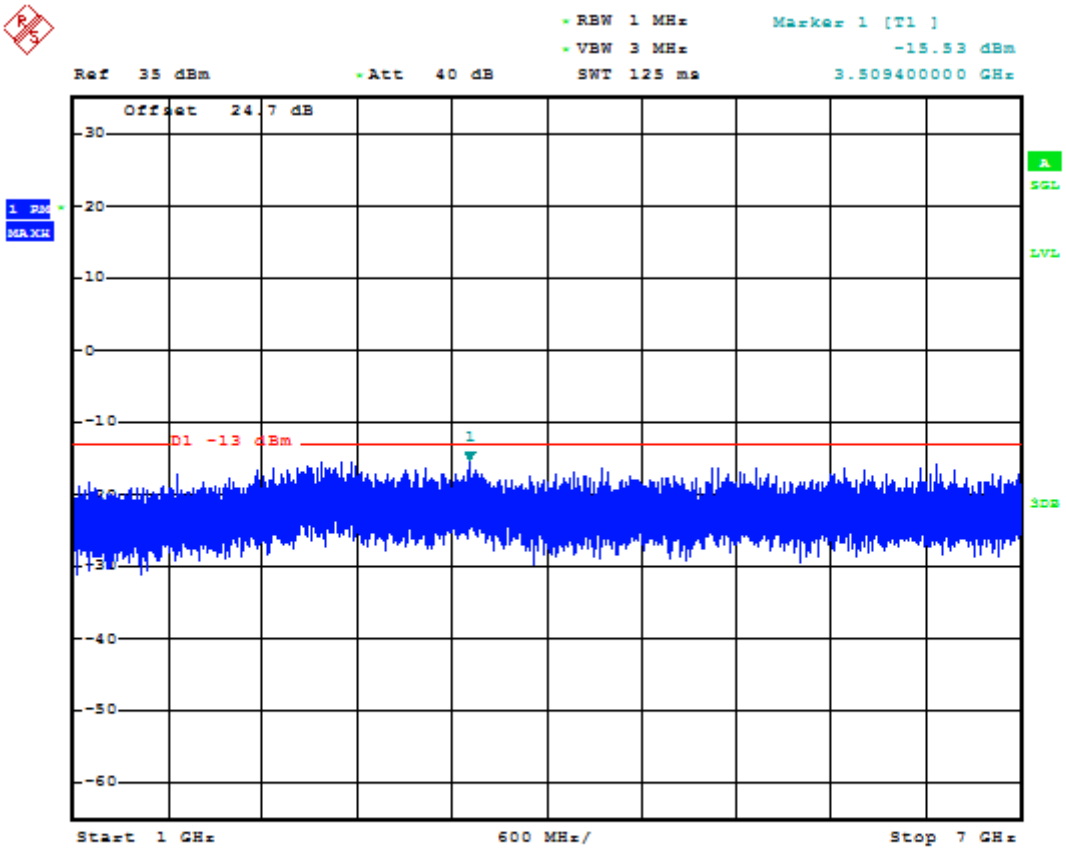




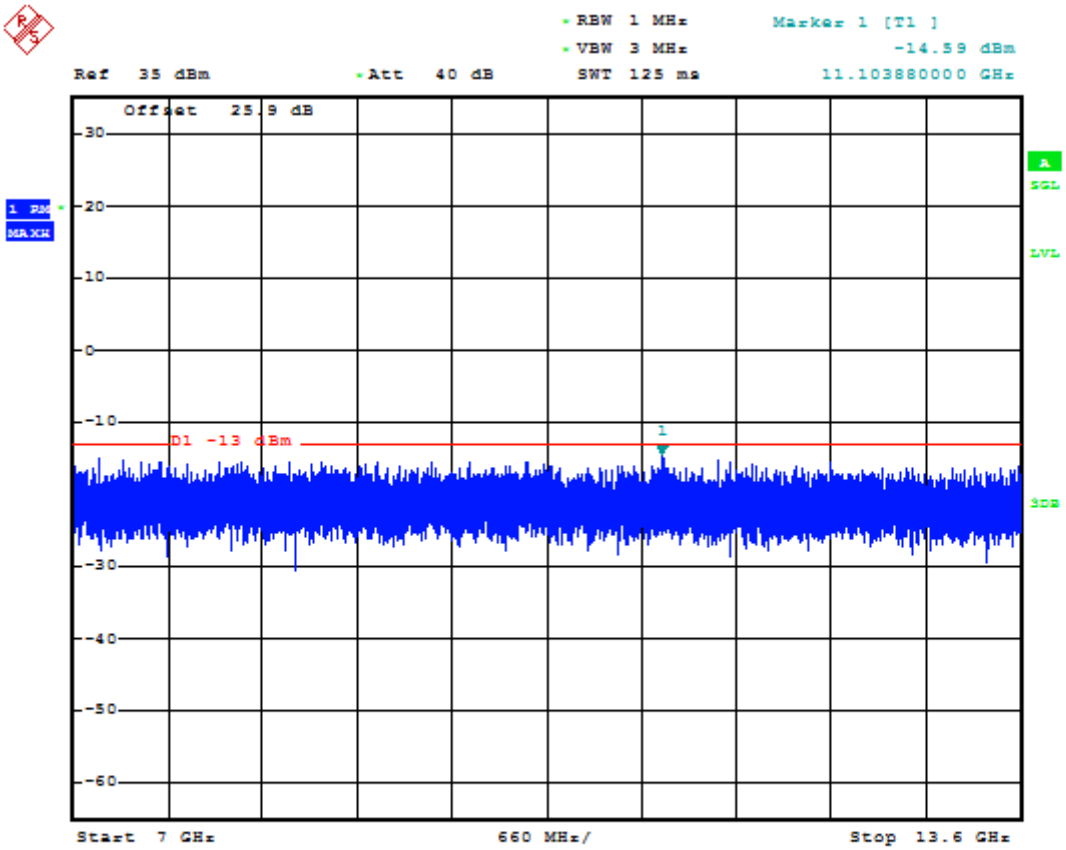
Date: 11.APR.2017 12:14:31



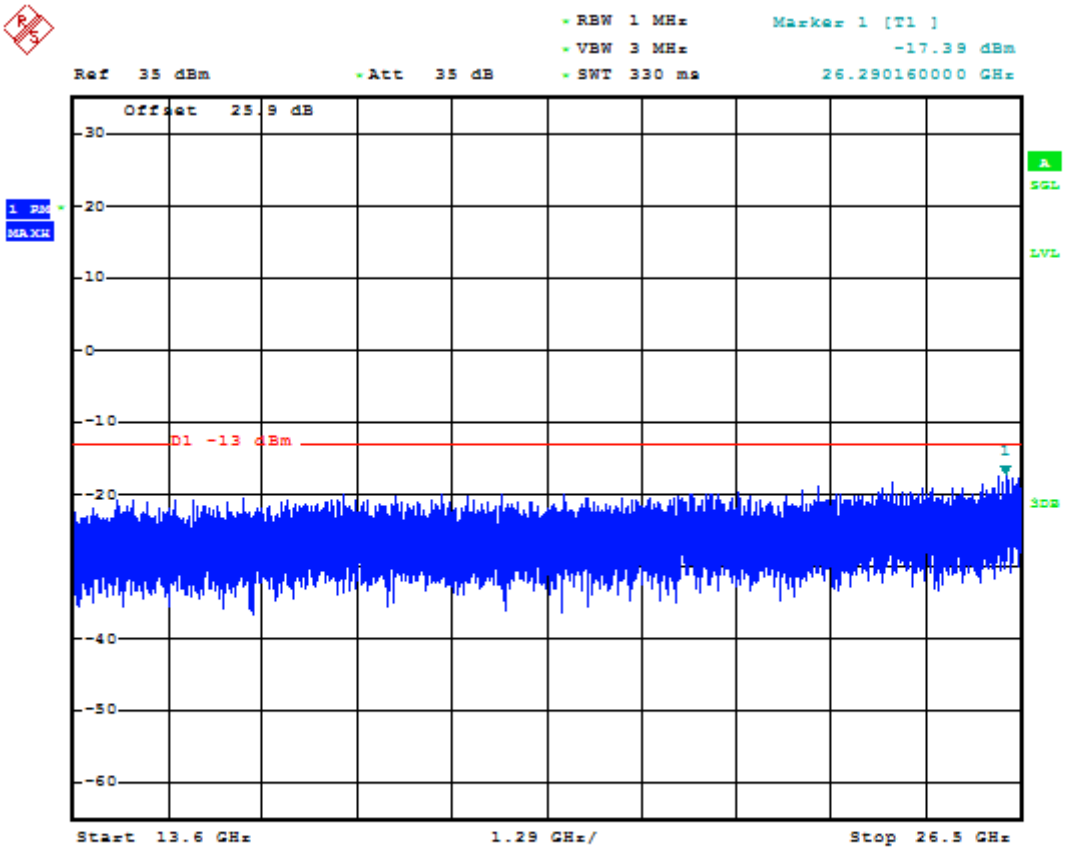
Date: 11.APR.2017 12:14:40



Date: 11.APR.2017 12:14:49

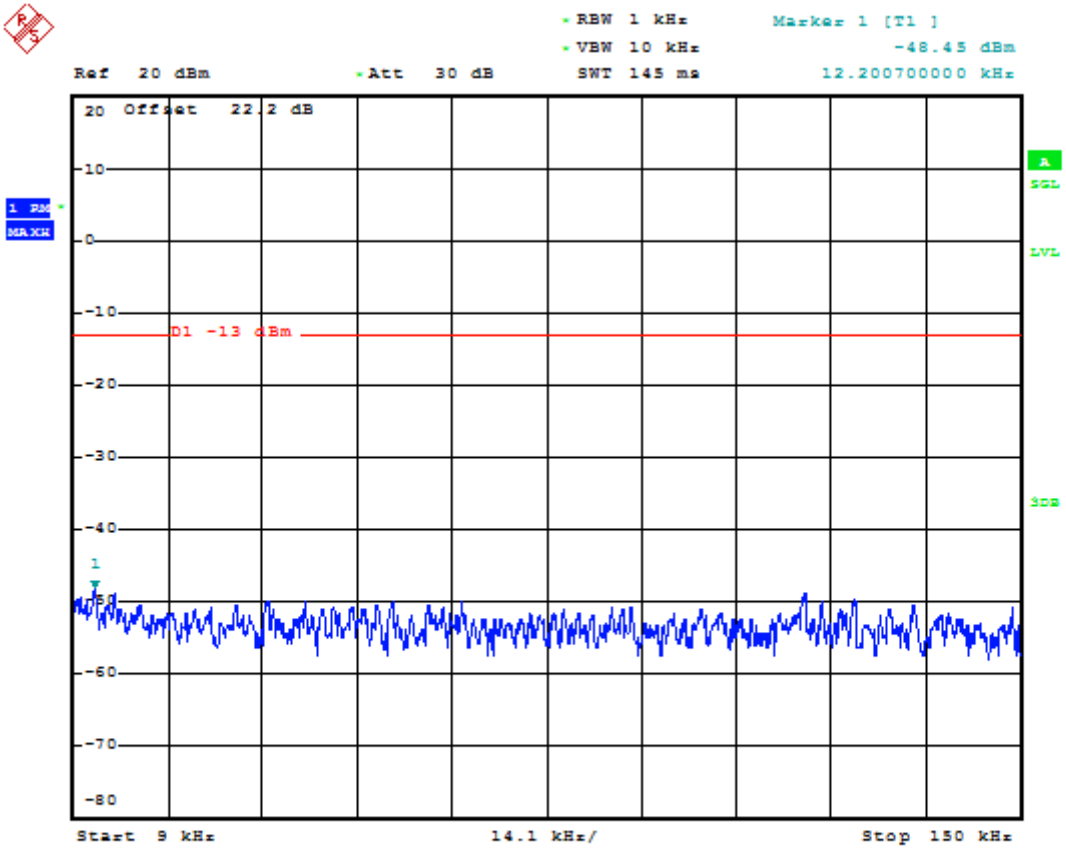


Date: 11.APR.2017 12:14:59

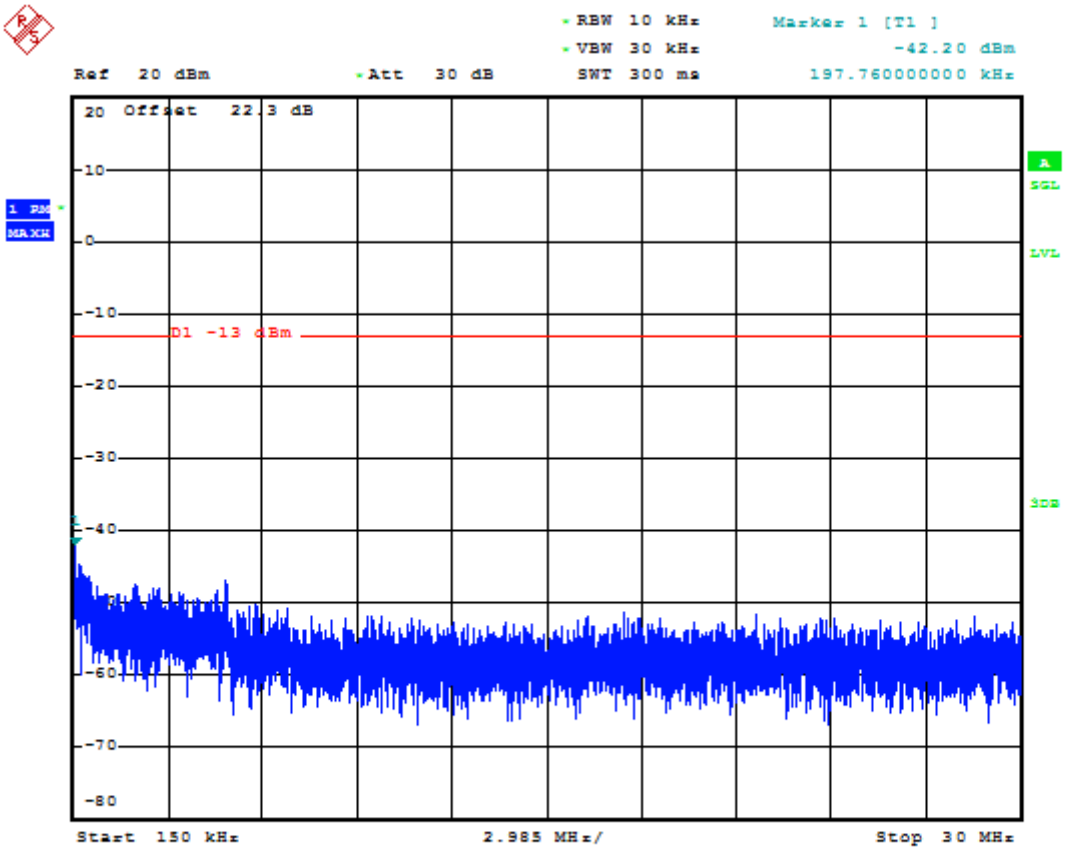


Date: 11.APR.2017 12:15:16

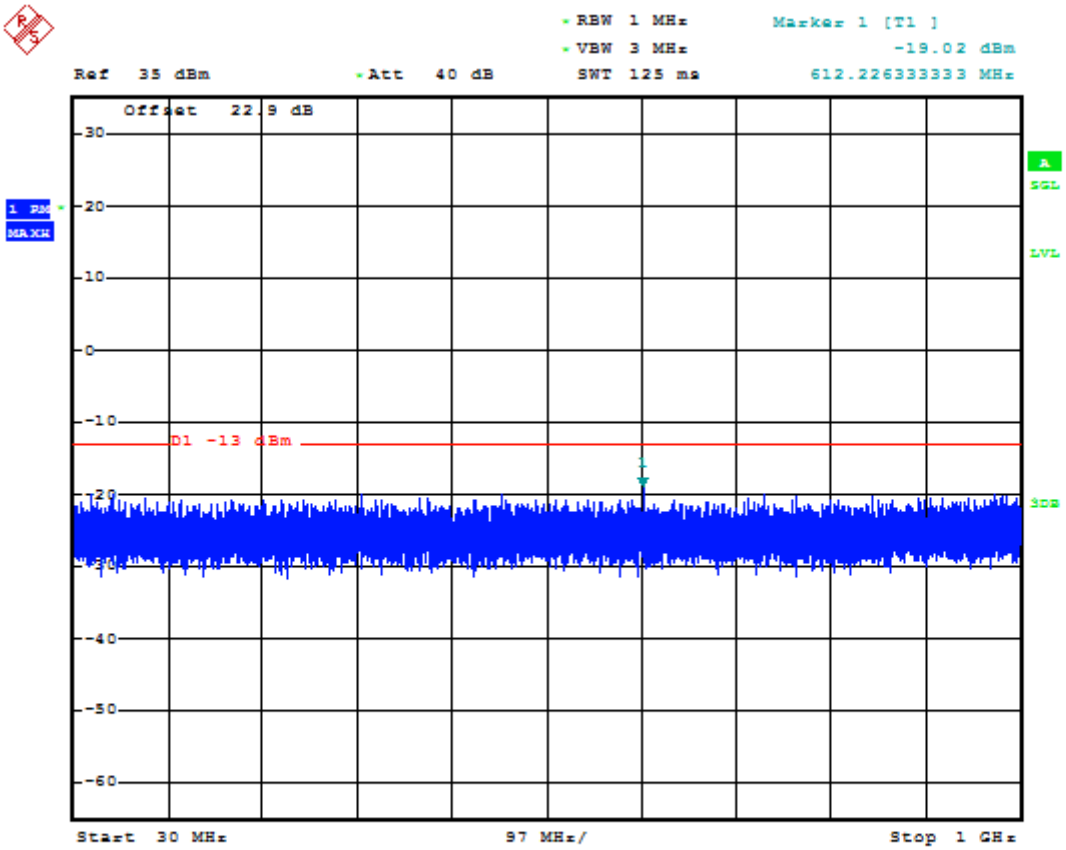
Test Channel=MCH



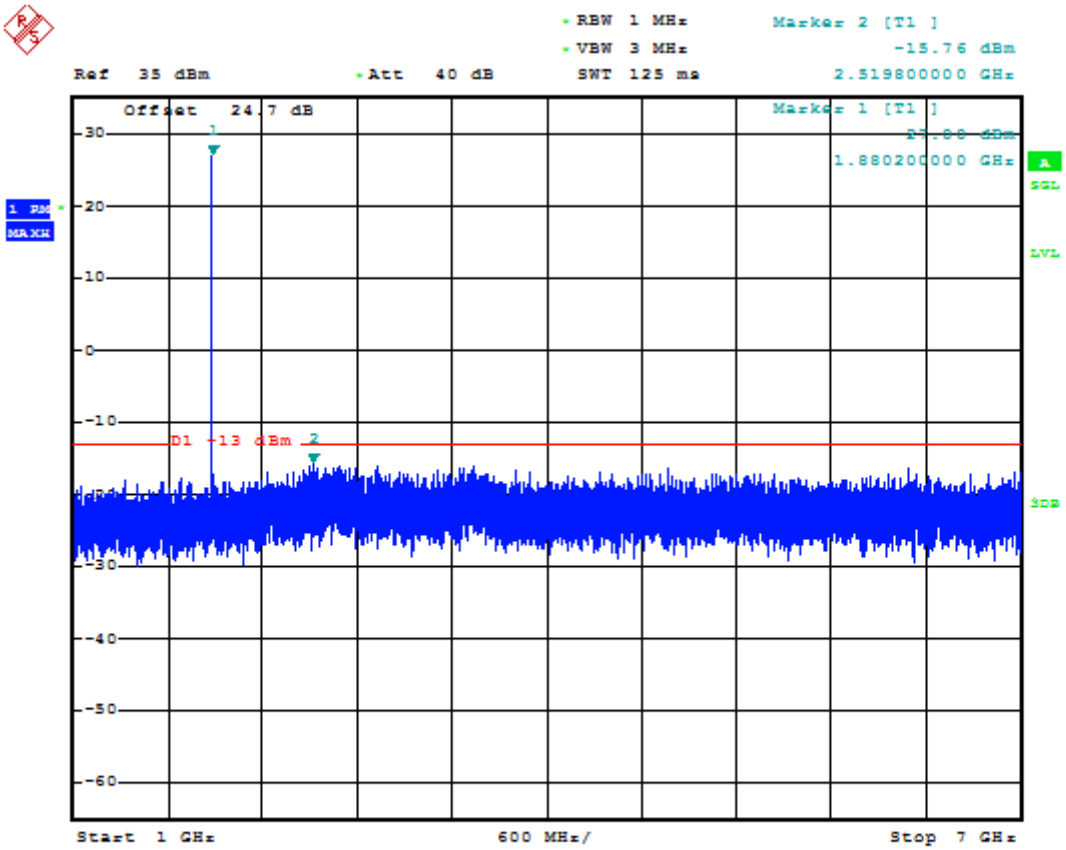
Date: 11.APR.2017 12:15:34



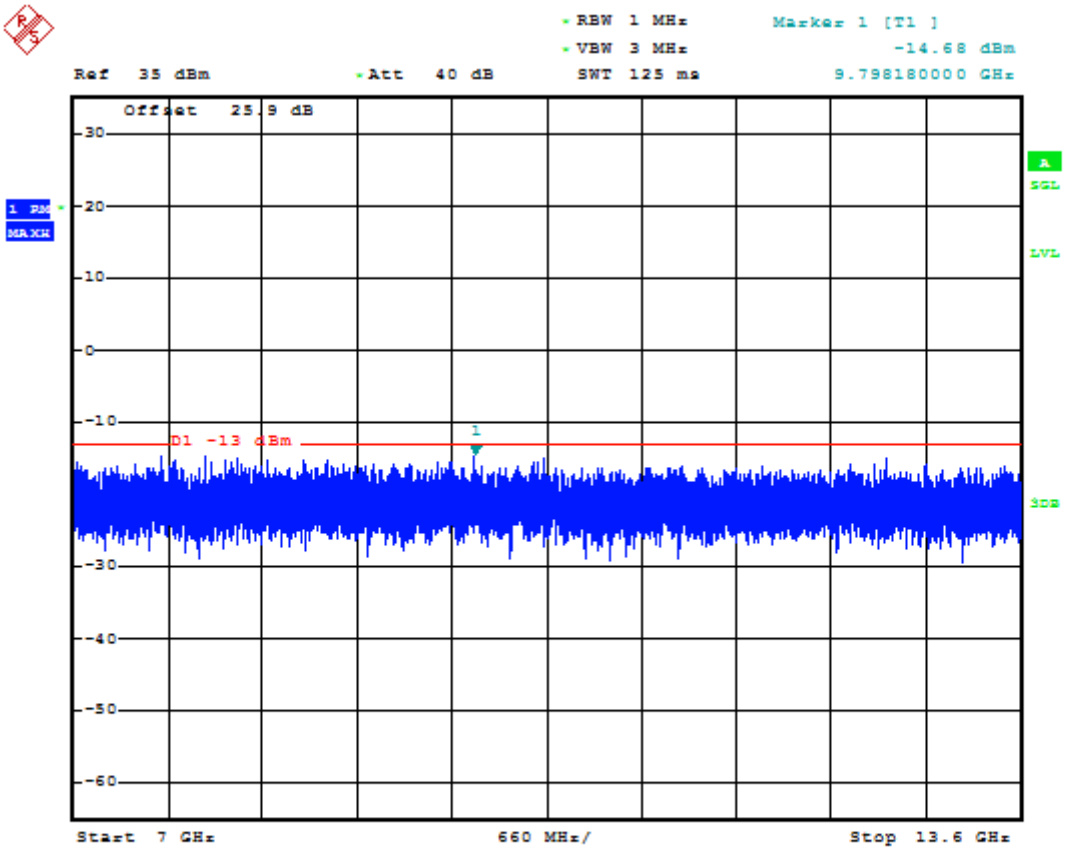
Date: 11.APR.2017 12:15:43



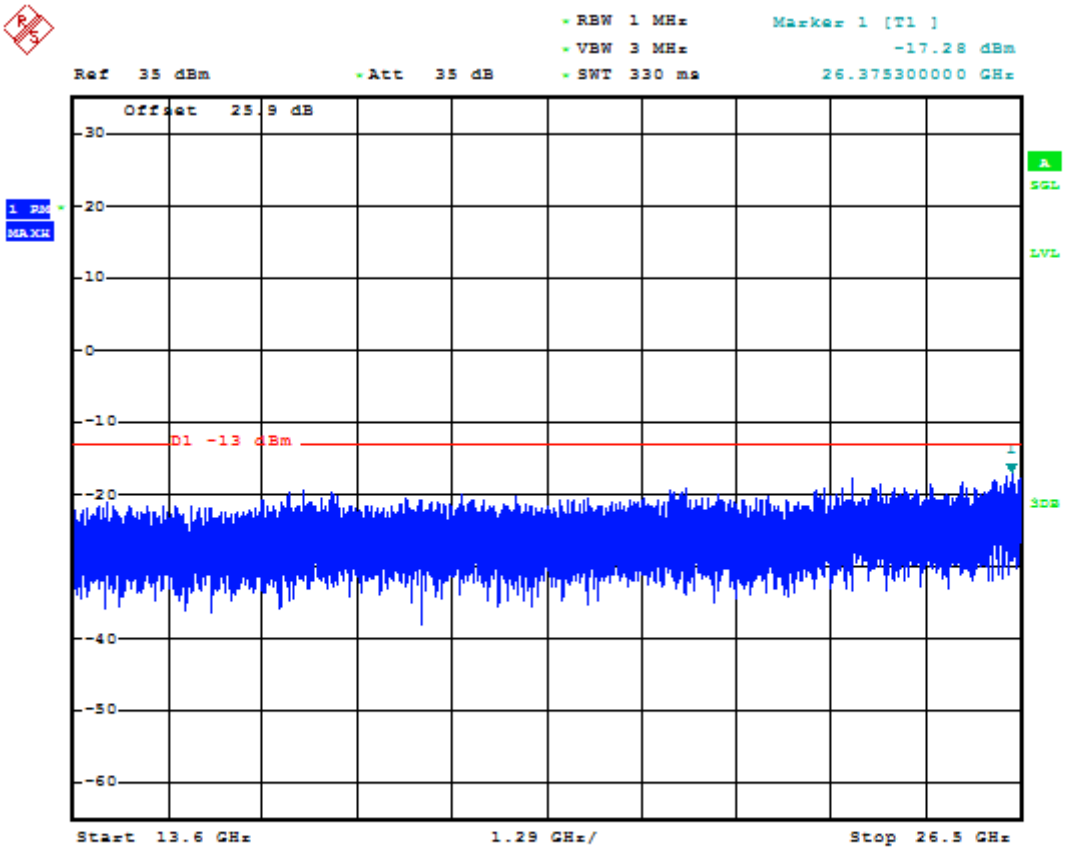
Date: 11.APR.2017 12:15:53



Date: 11.APR.2017 12:16:03

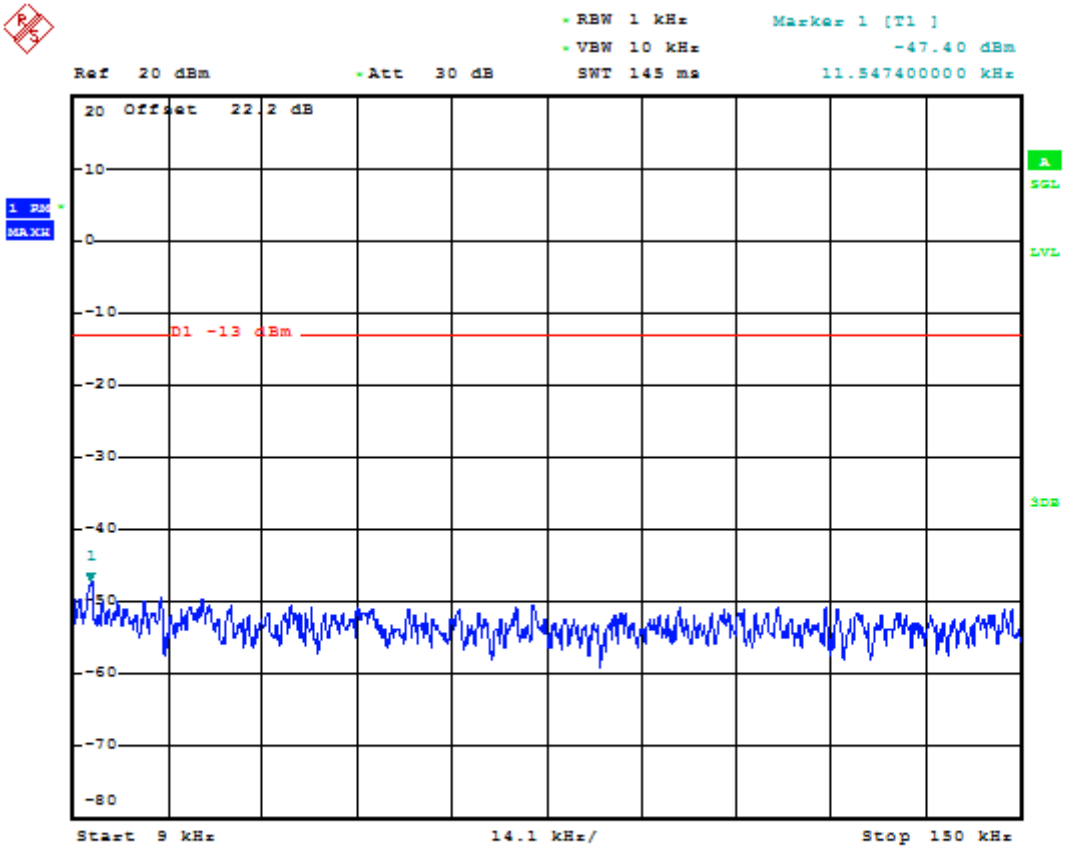


Date: 11.APR.2017 12:16:13

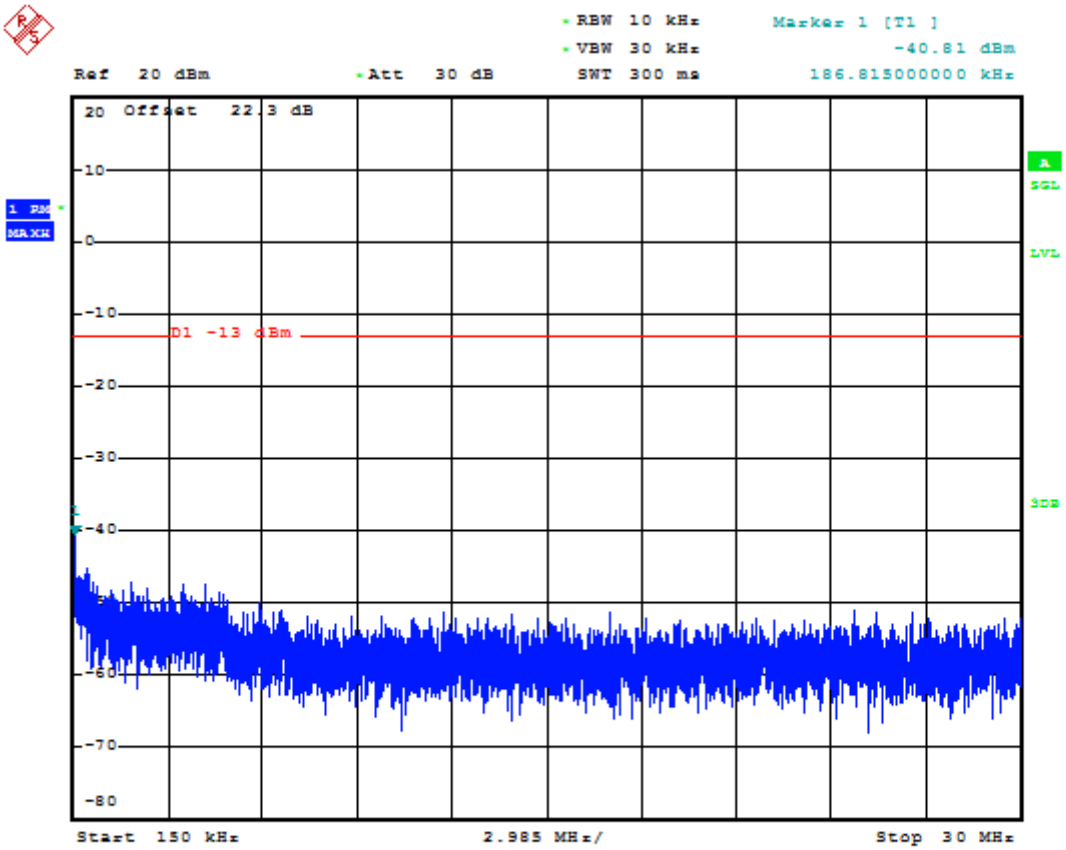


Date: 11.APR.2017 12:16:30

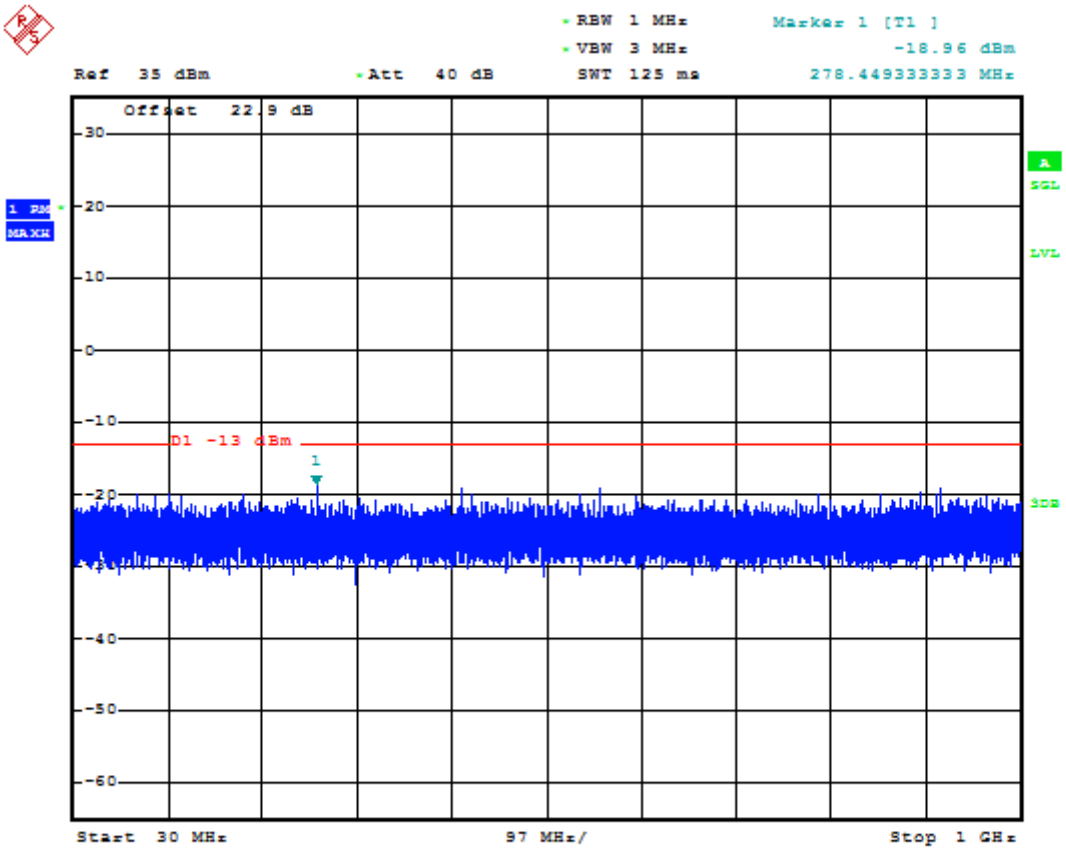
Test Channel=HCH



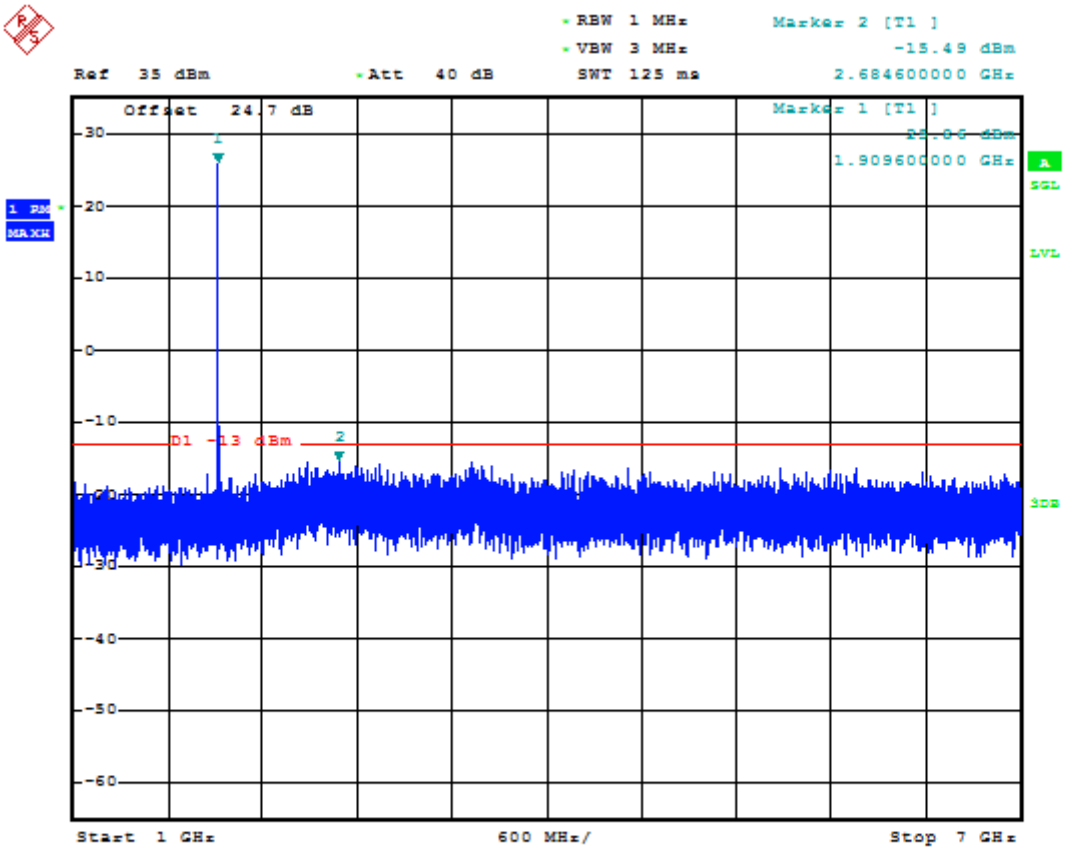
Date: 11.APR.2017 12:16:48



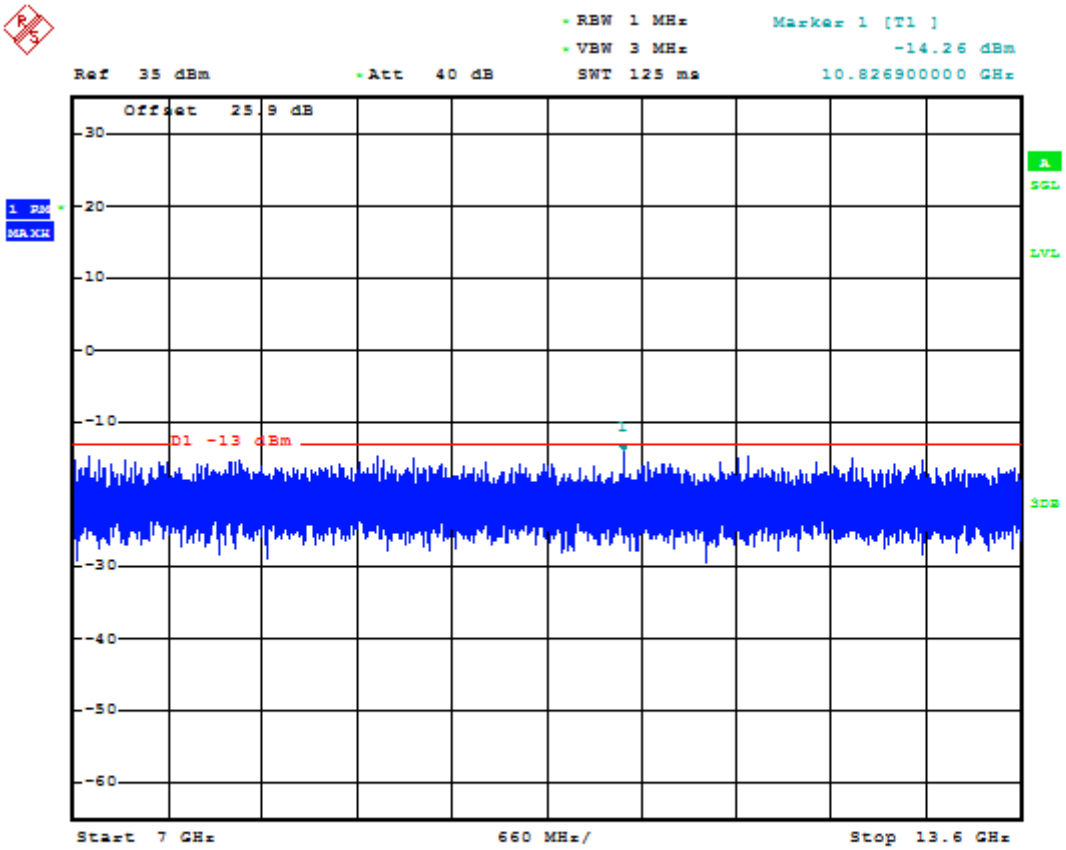
Date: 11.APR.2017 12:16:57



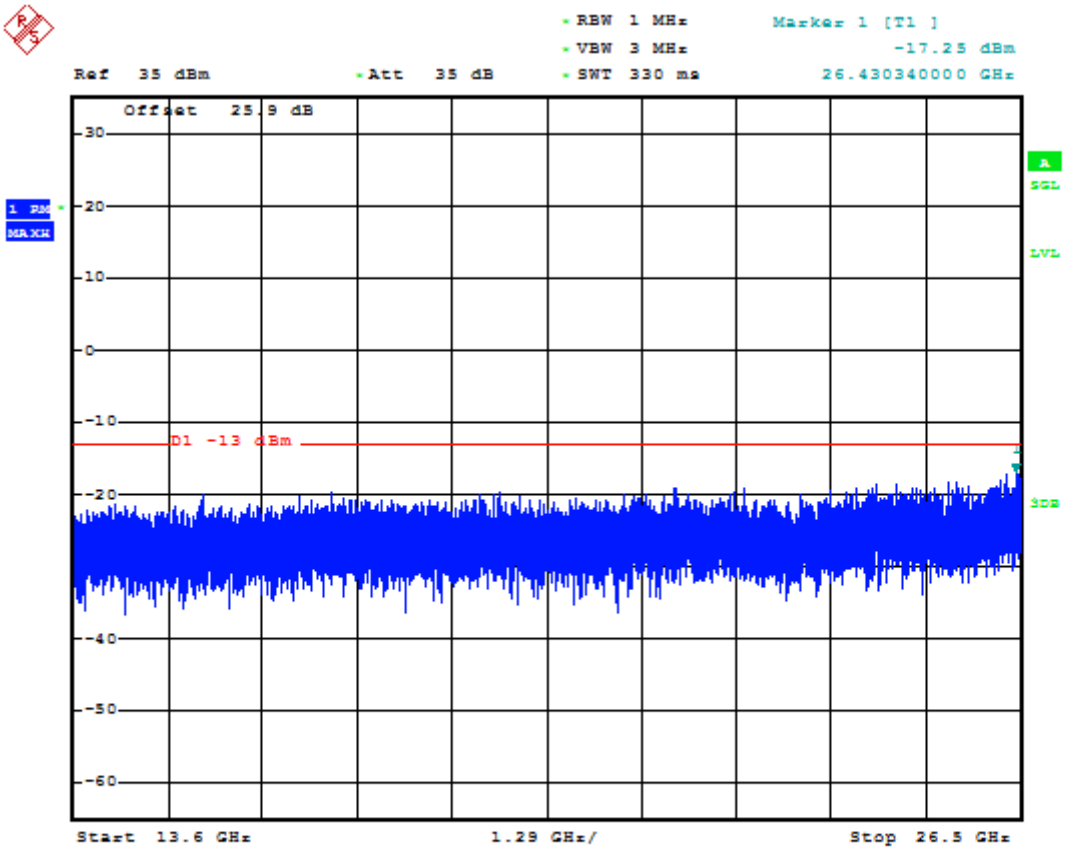
Date: 11.APR.2017 12:17:06



Date: 11.APR.2017 12:17:17



Date: 11.APR.2017 12:17:26



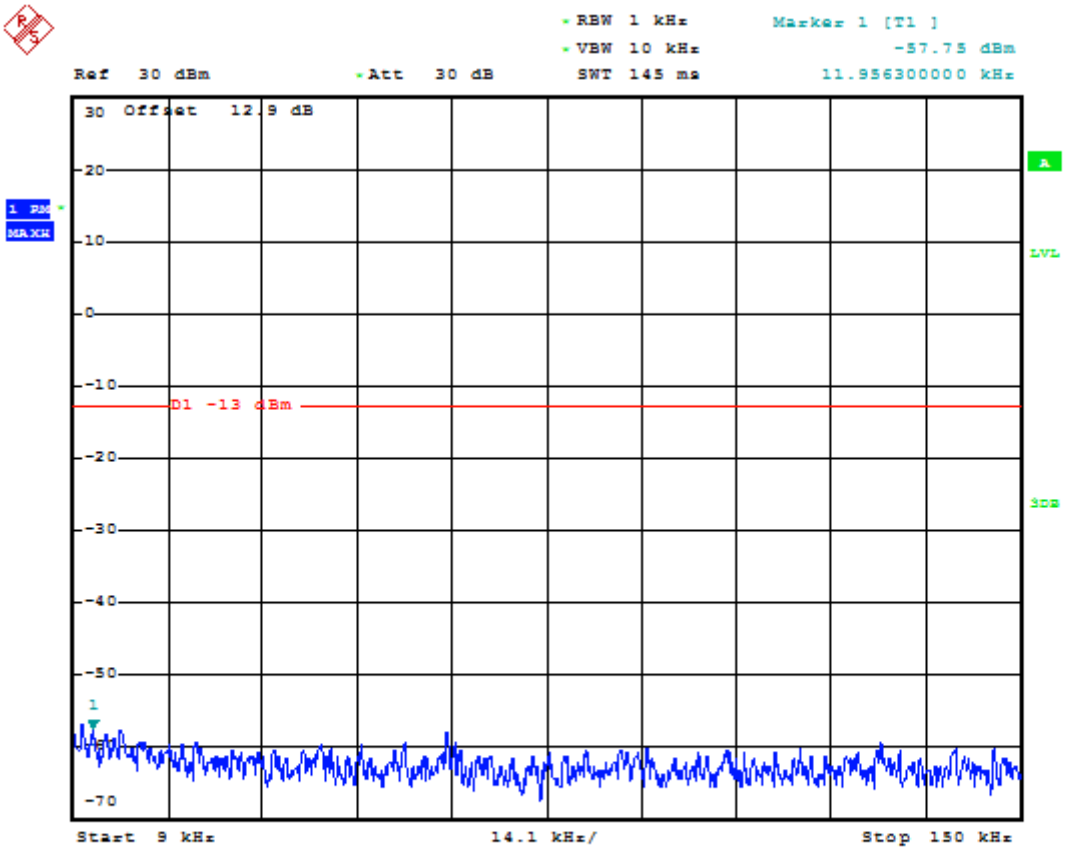
Date: 11.APR.2017 12:17:44

For WCDMA

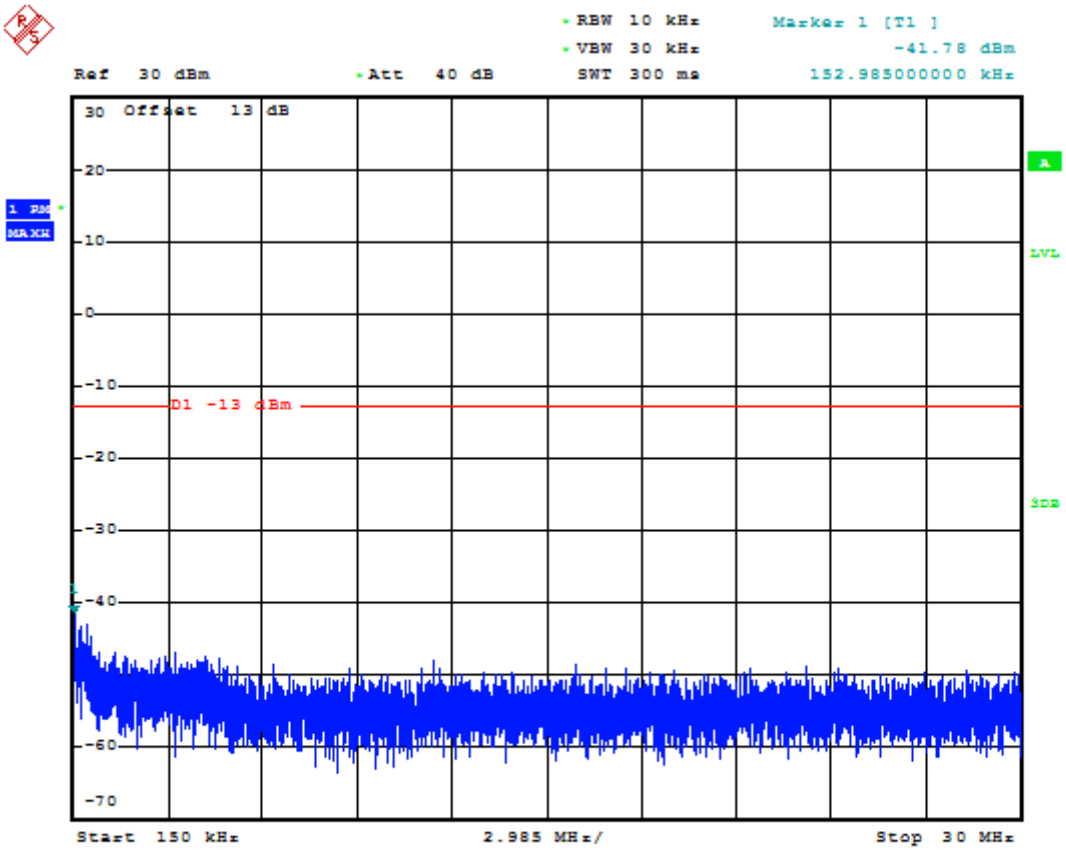
Test Band=WCDMA850

Test Mode=UMTS/TM1

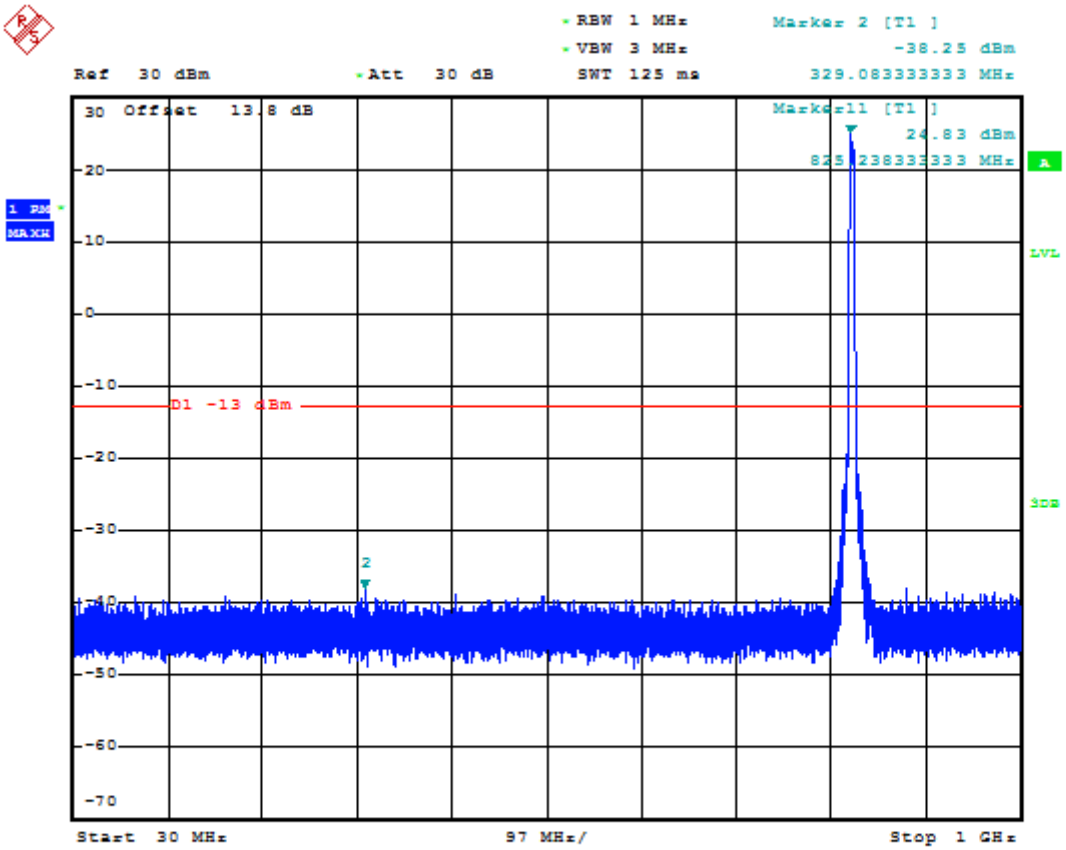
Test Channel=LCH



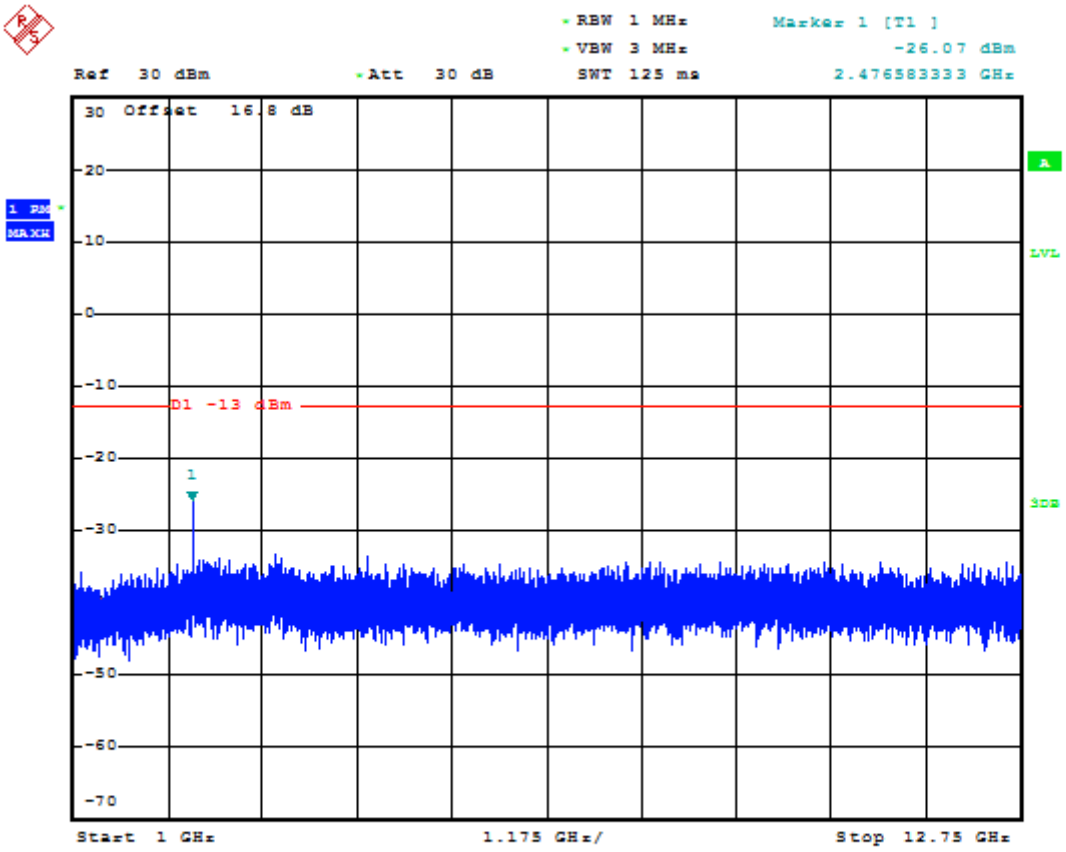
Date: 11.APR.2017 07:14:51



Date: 11.APR.2017 07:15:14

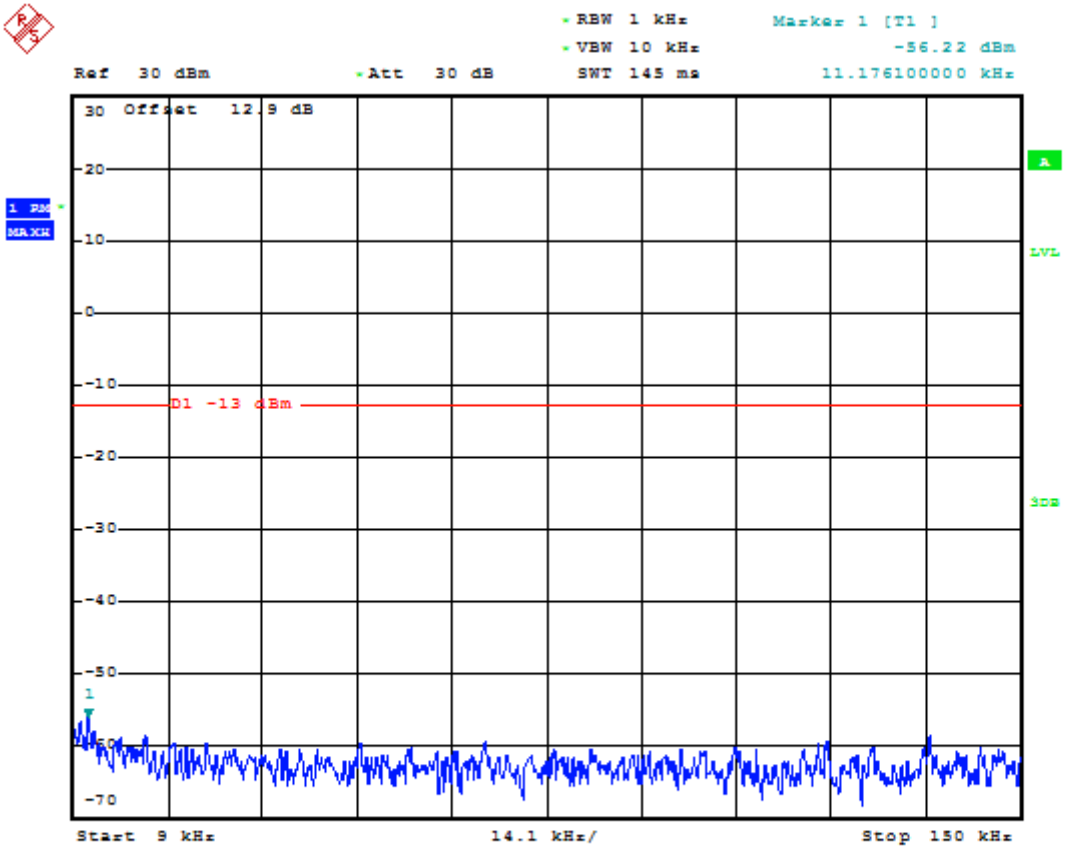


Date: 11.APR.2017 07:15:24

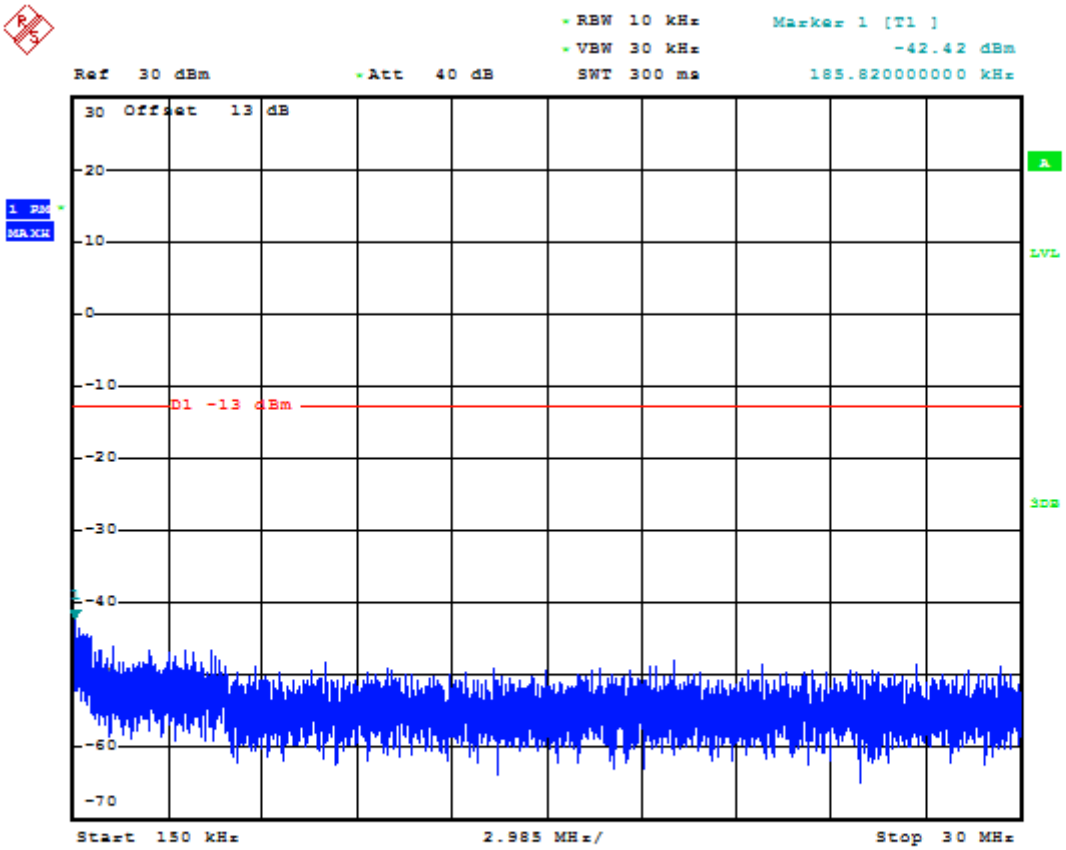


Date: 11.APR.2017 07:15:33

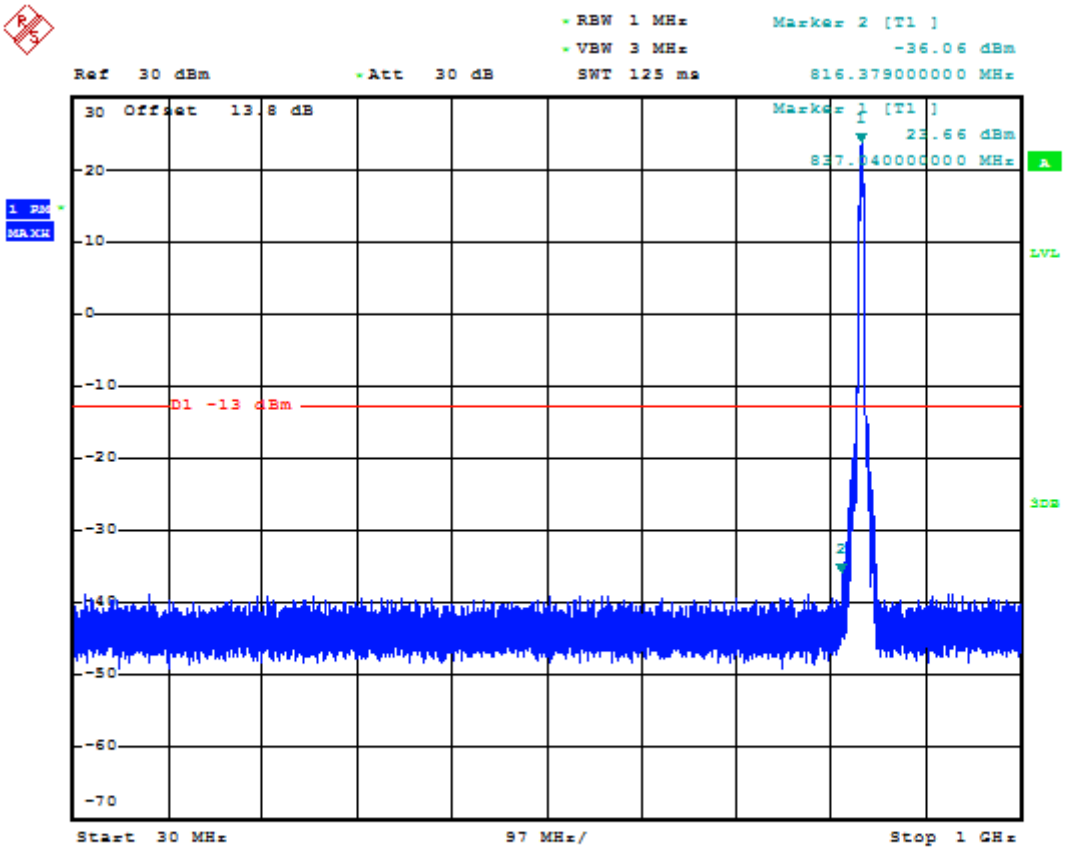
Test Channel=MCH



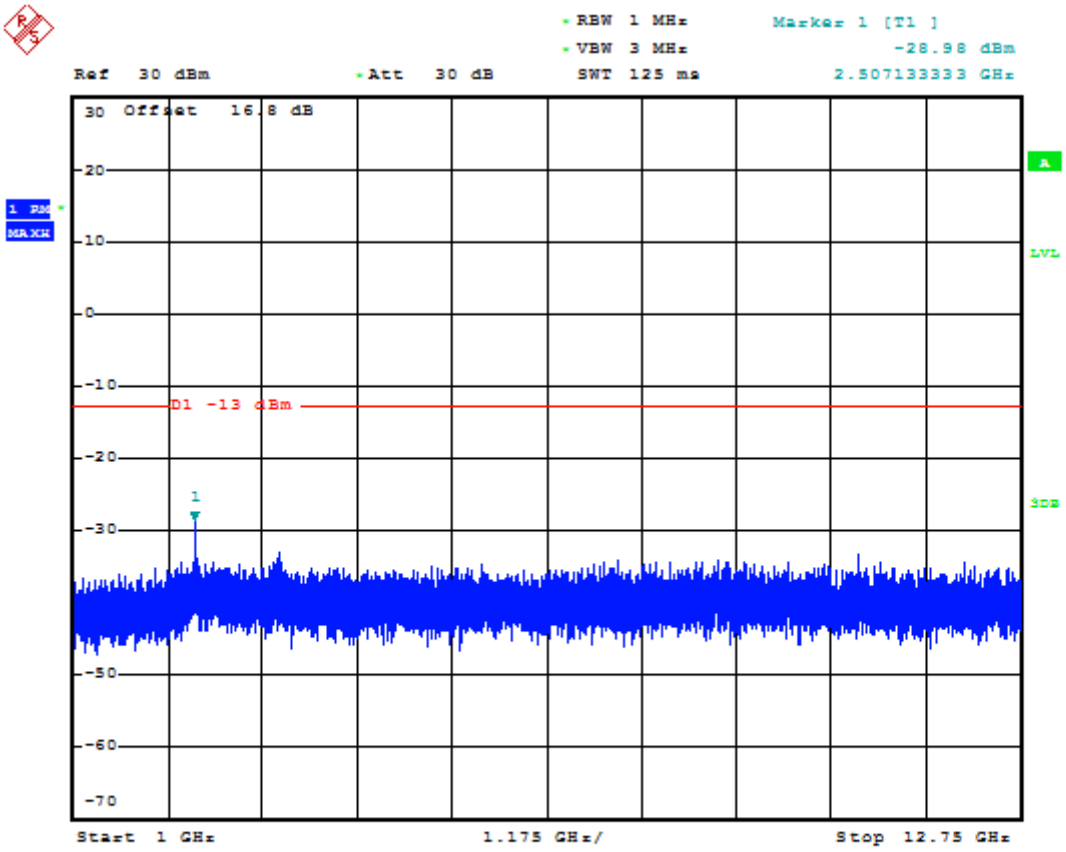
Date: 11.APR.2017 07:15:45



Date: 11.APR.2017 07:16:08

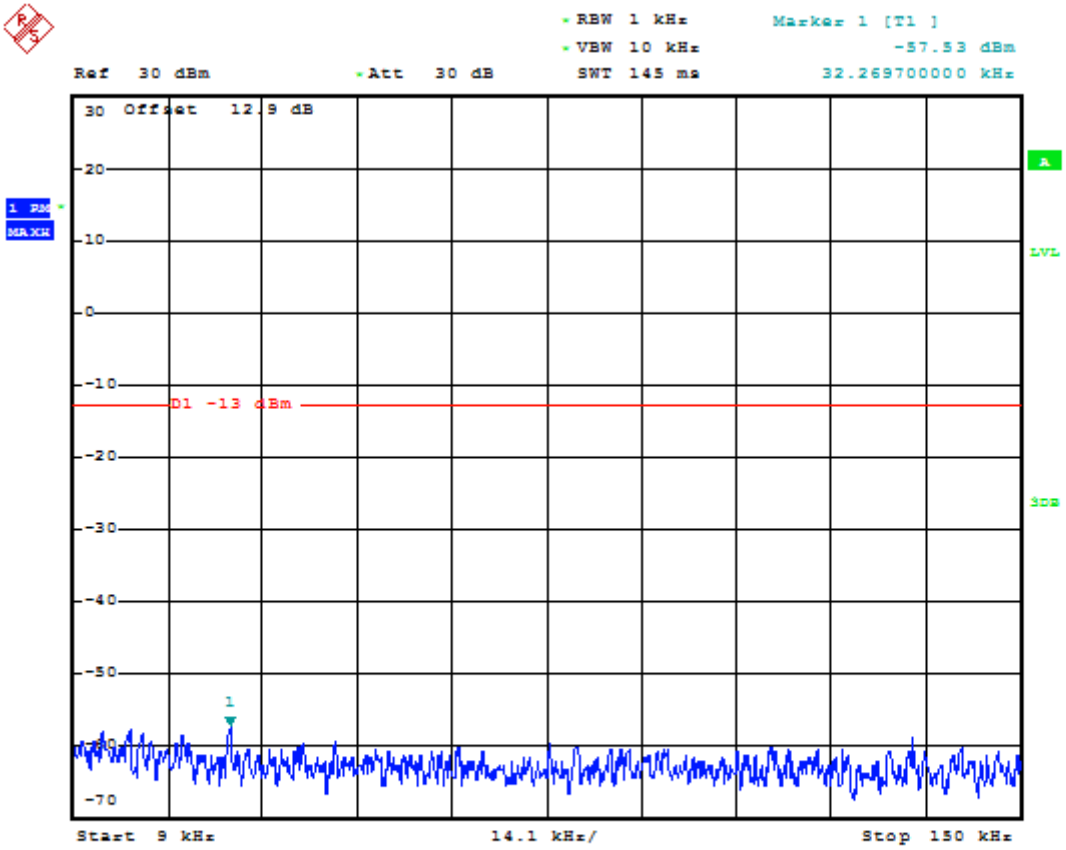


Date: 11.APR.2017 07:16:18

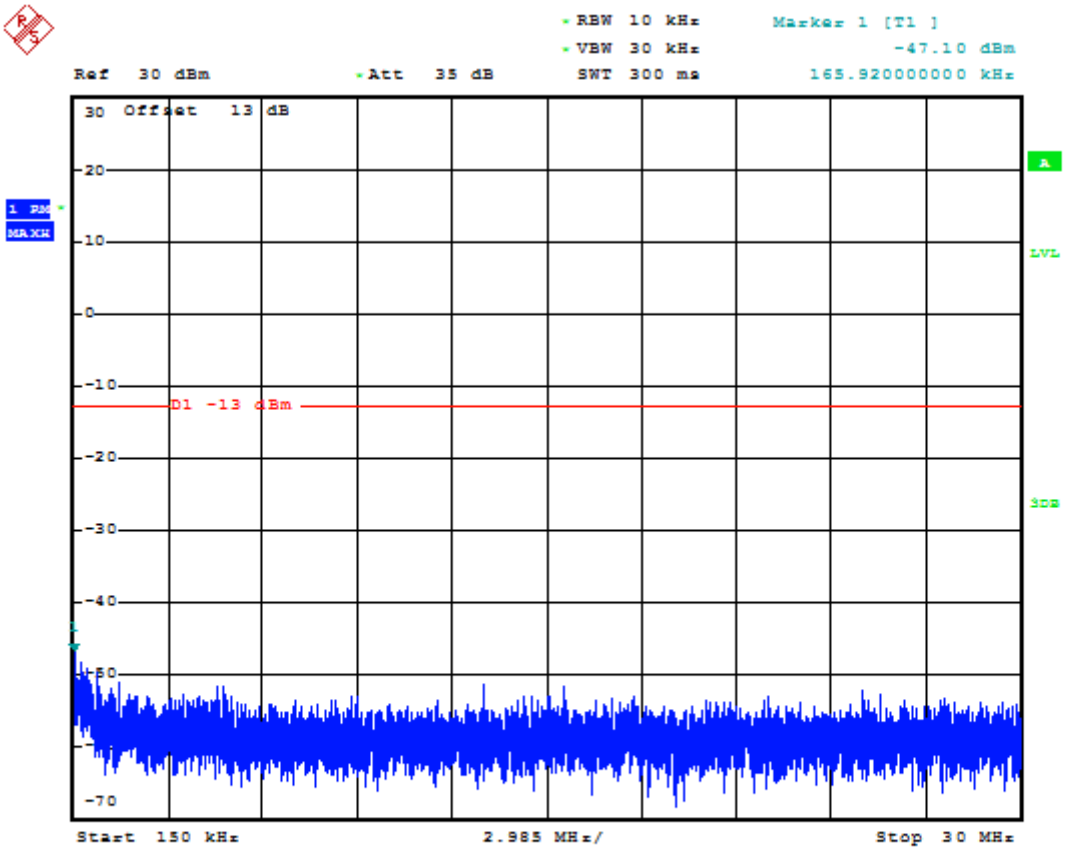


Date: 11.APR.2017 07:16:27

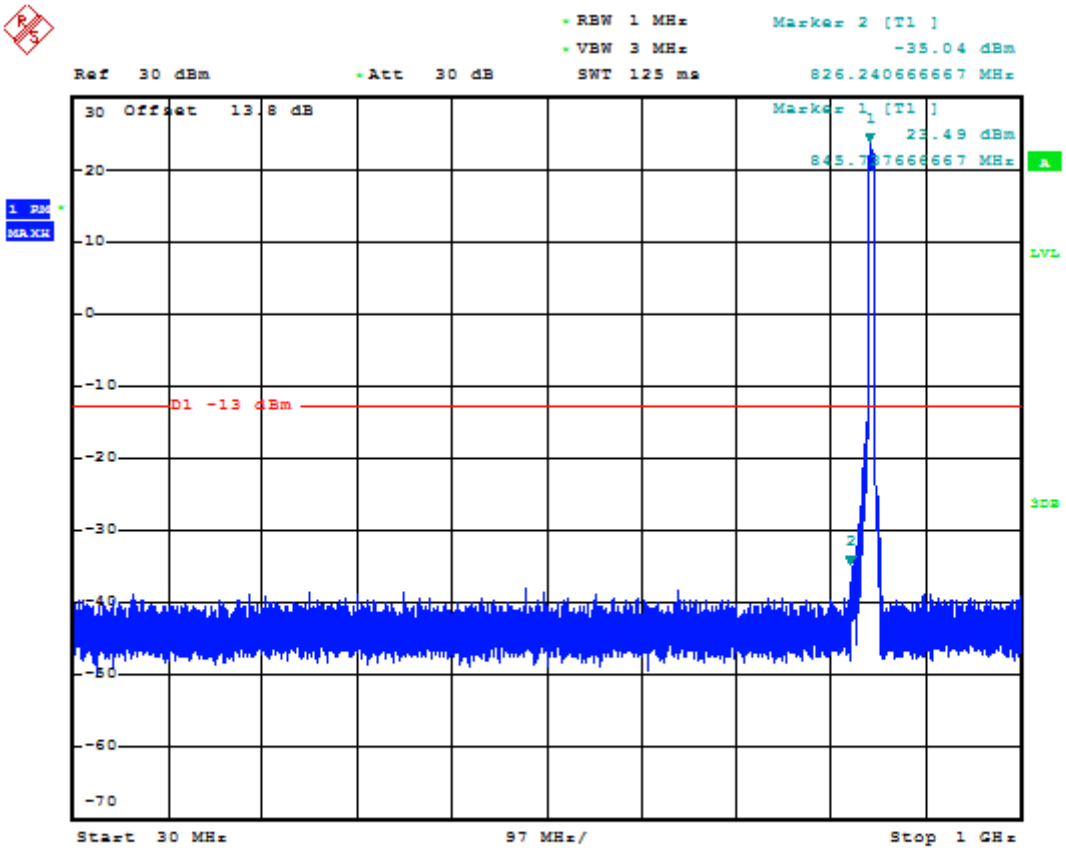
Test Channel=HCH



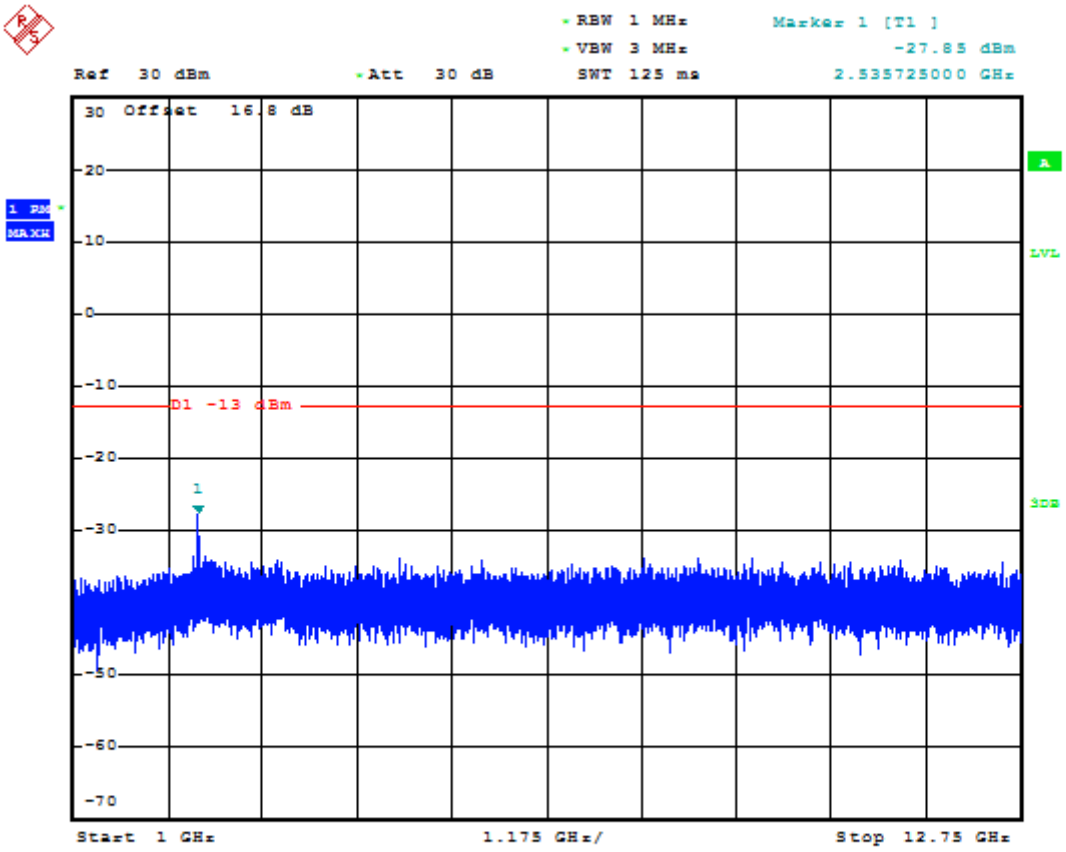
Date: 11.APR.2017 07:16:39



Date: 11.APR.2017 07:16:55



Date: 11.APR.2017 07:17:05

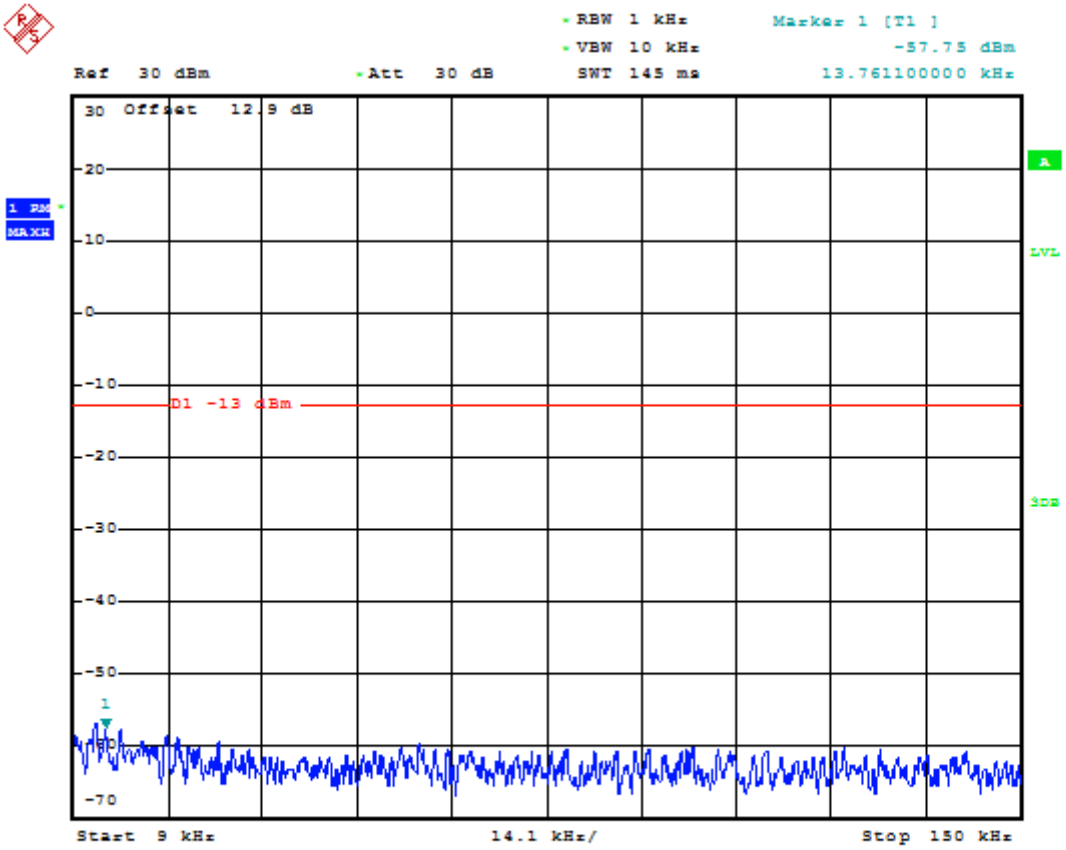


Date: 11.APR.2017 07:17:13

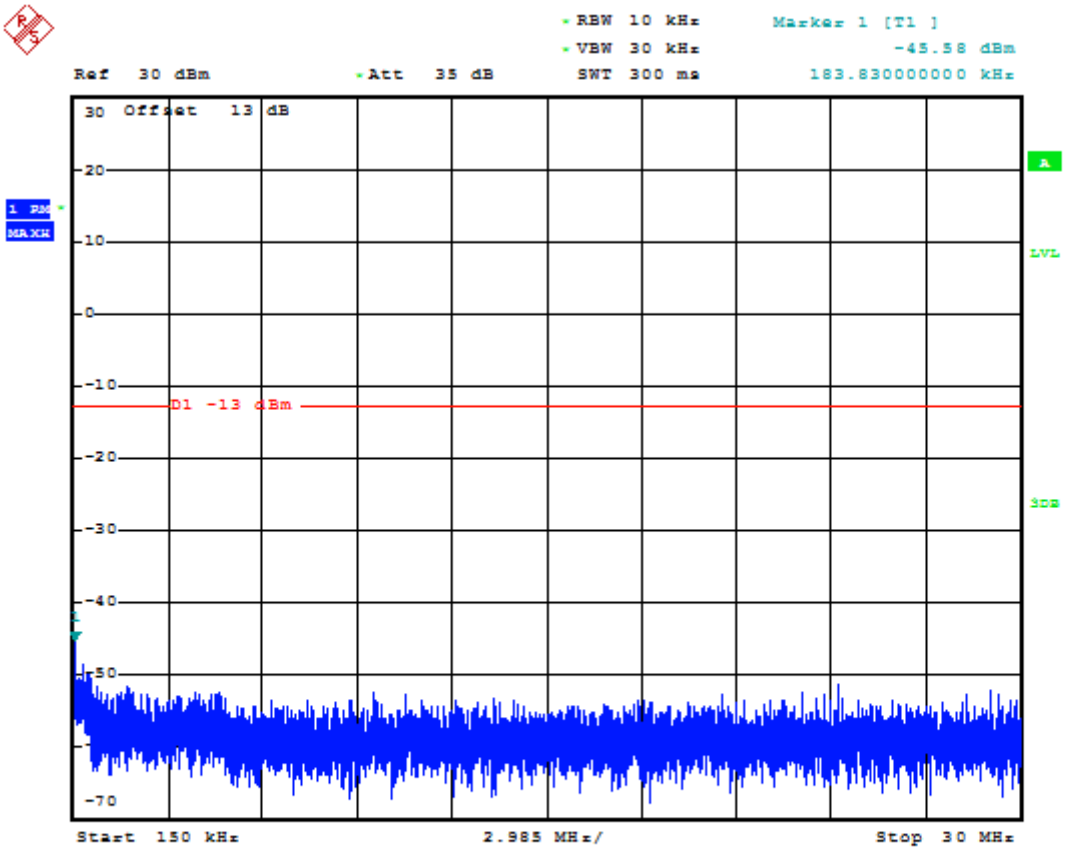
Test Band=WCDMA1900

Test Mode=UMTS/TM1

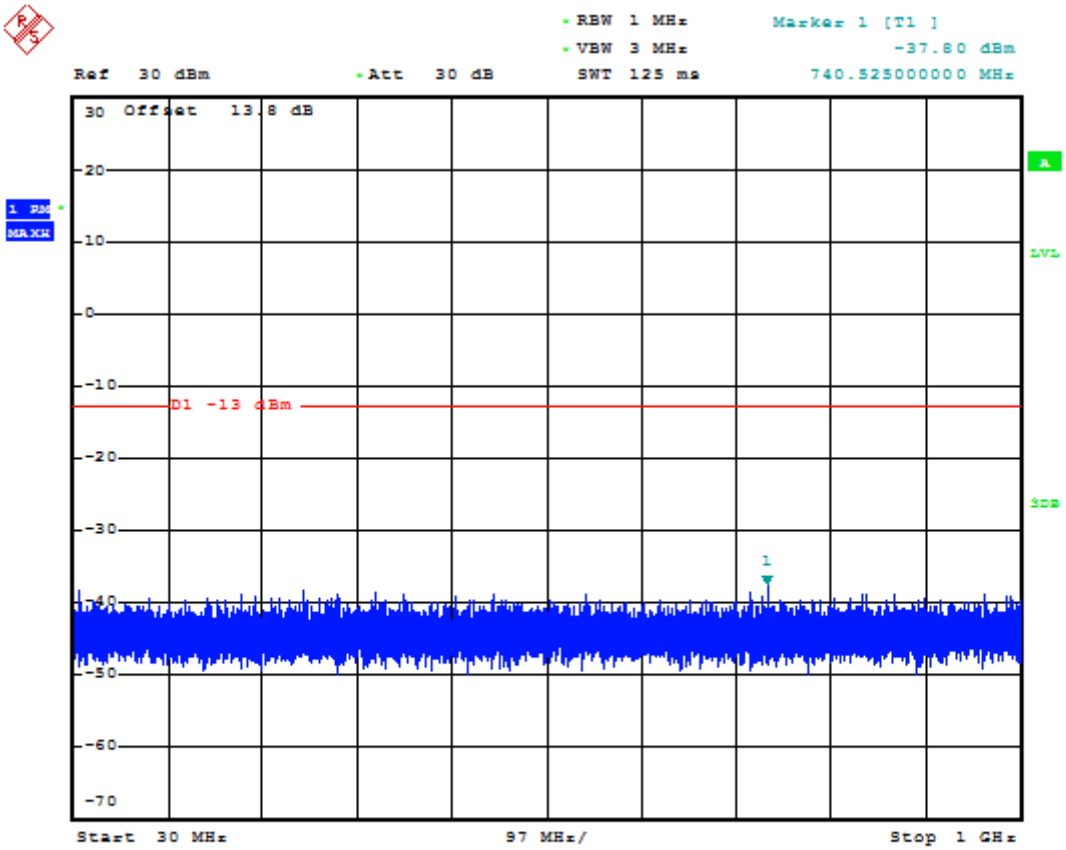
Test Channel=LCH



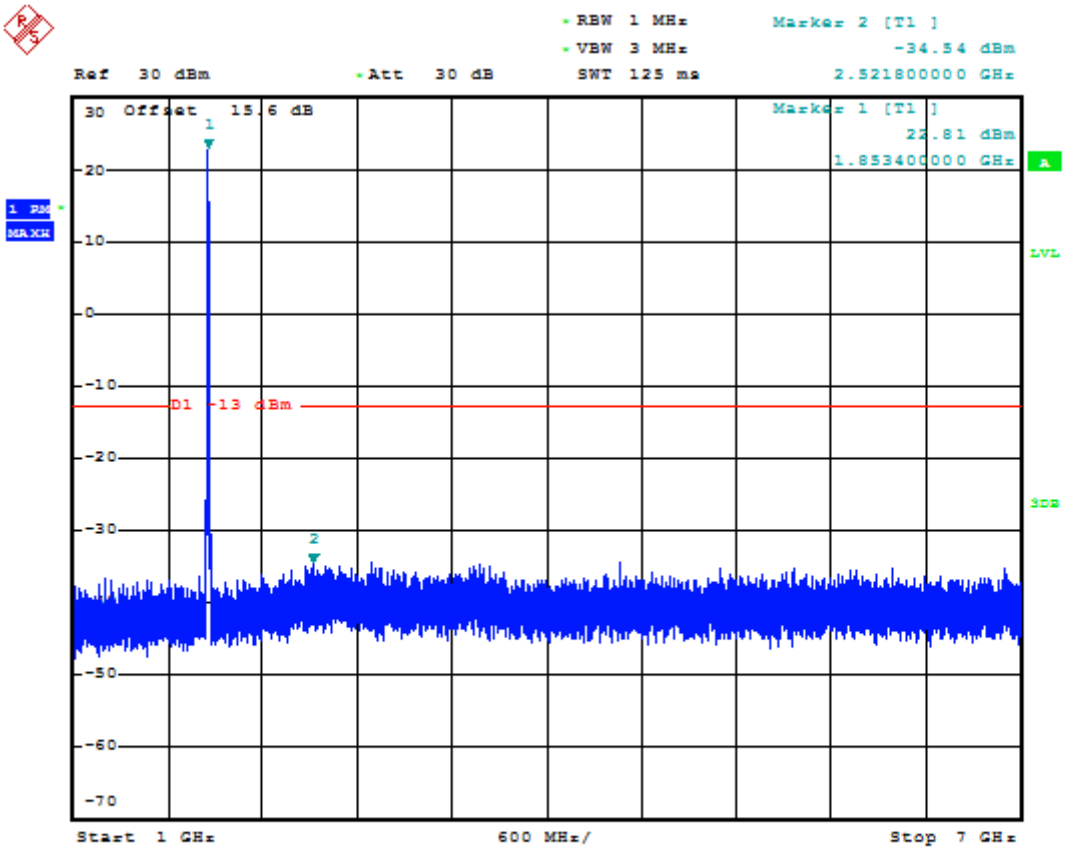
Date: 11.APR.2017 07:00:49



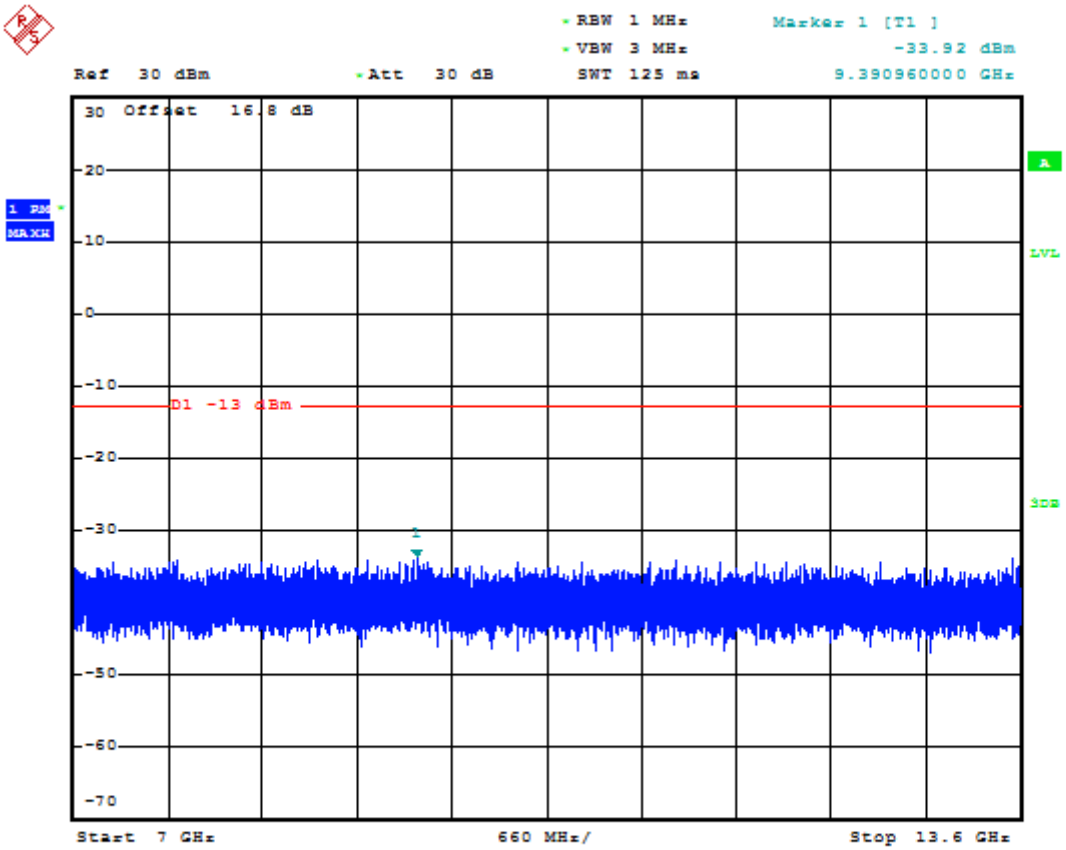
Date: 11.APR.2017 07:01:06



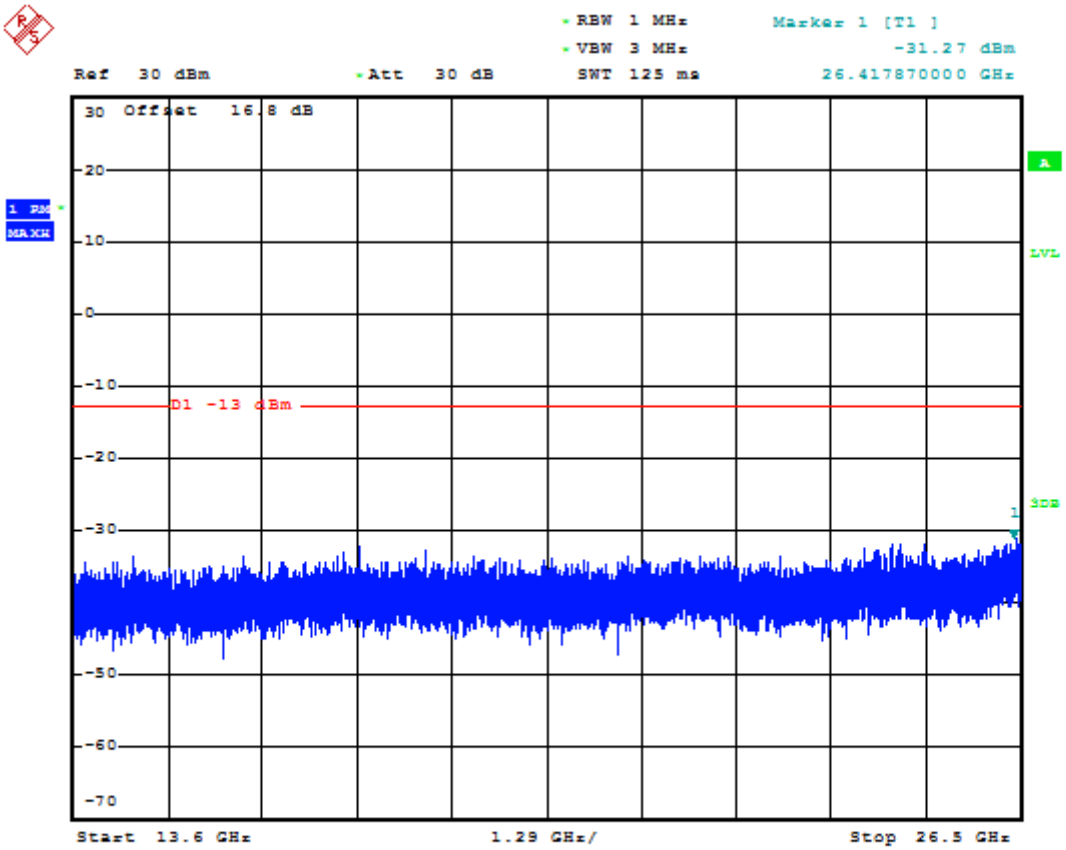
Date: 11.APR.2017 07:01:14



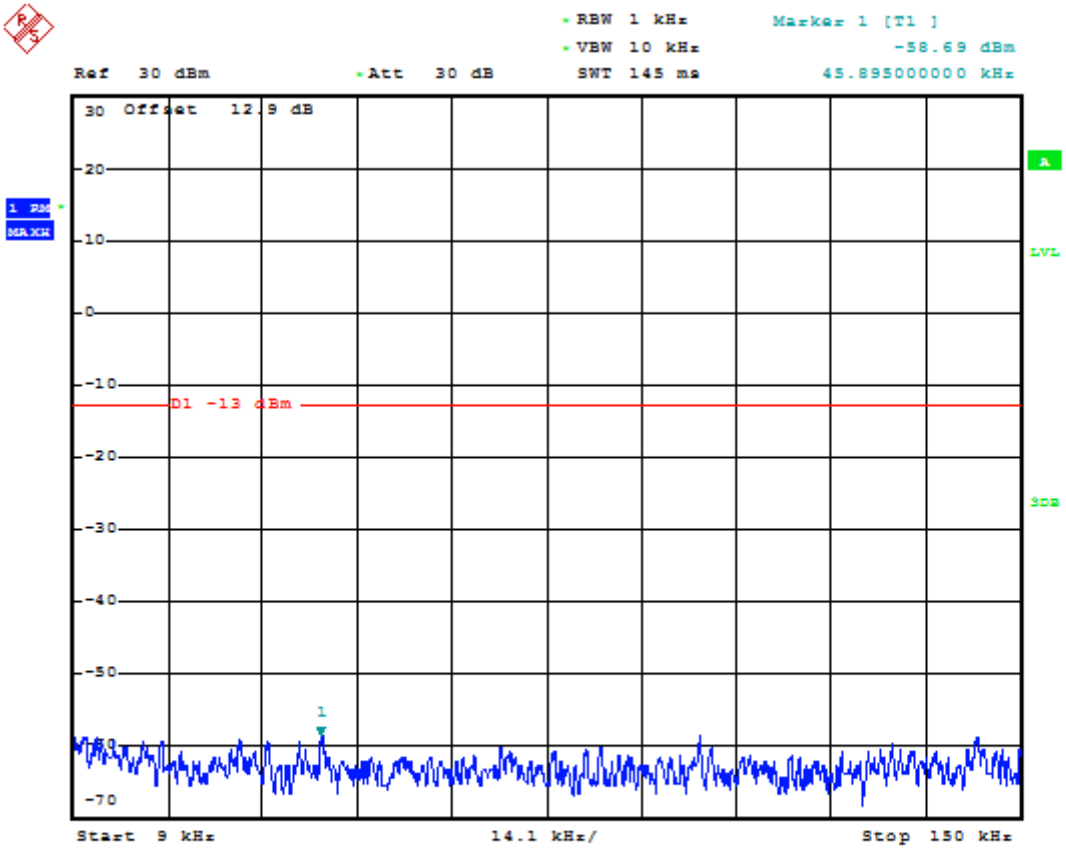
Date: 11.APR.2017 07:01:24



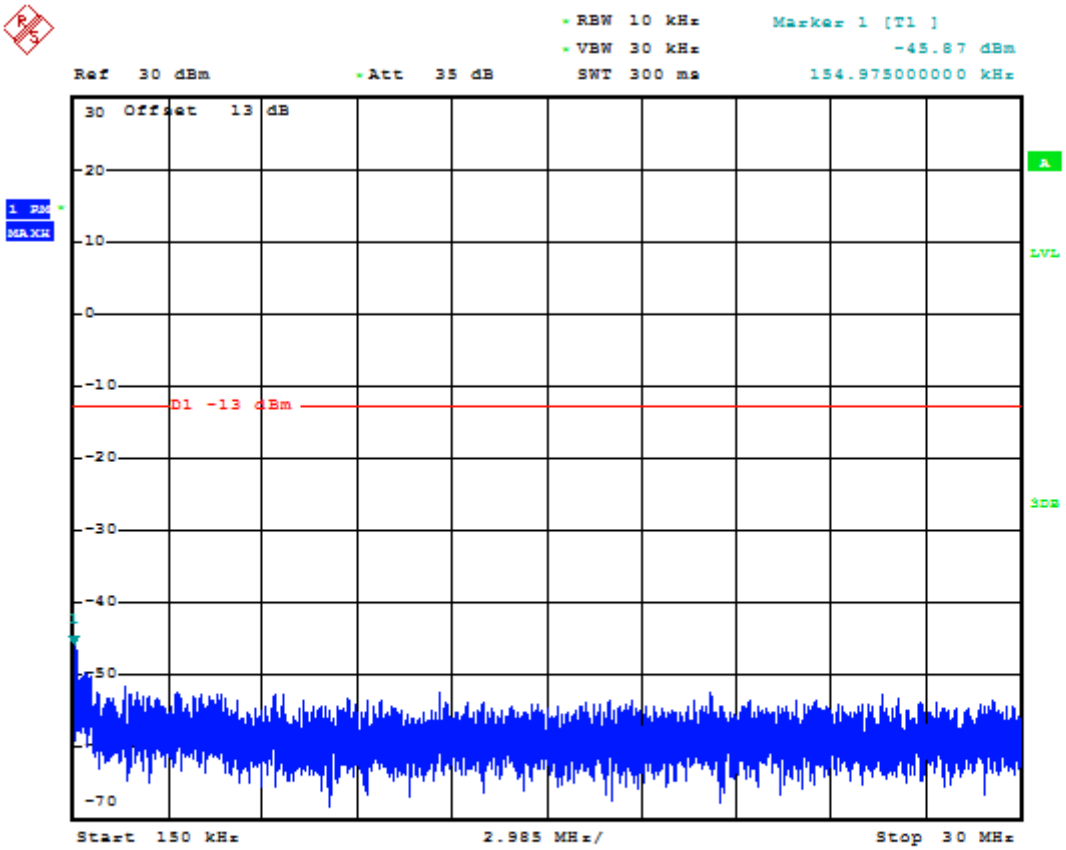
Date: 11.APR.2017 07:01:33


RBW 1 MHz
VBW 3 MHz
SWT 125 ms
Marker 1 [T1]
-31.27 dBm
26.417870000 GHz
Ref 30 dBm
Att 30 dB
Offset 16.8 dB
D1 -13 dBm
Start 13.6 GHz
1.29 GHz/
Stop 26.5 GHz
Date: 11.APR.2017 07:01:41

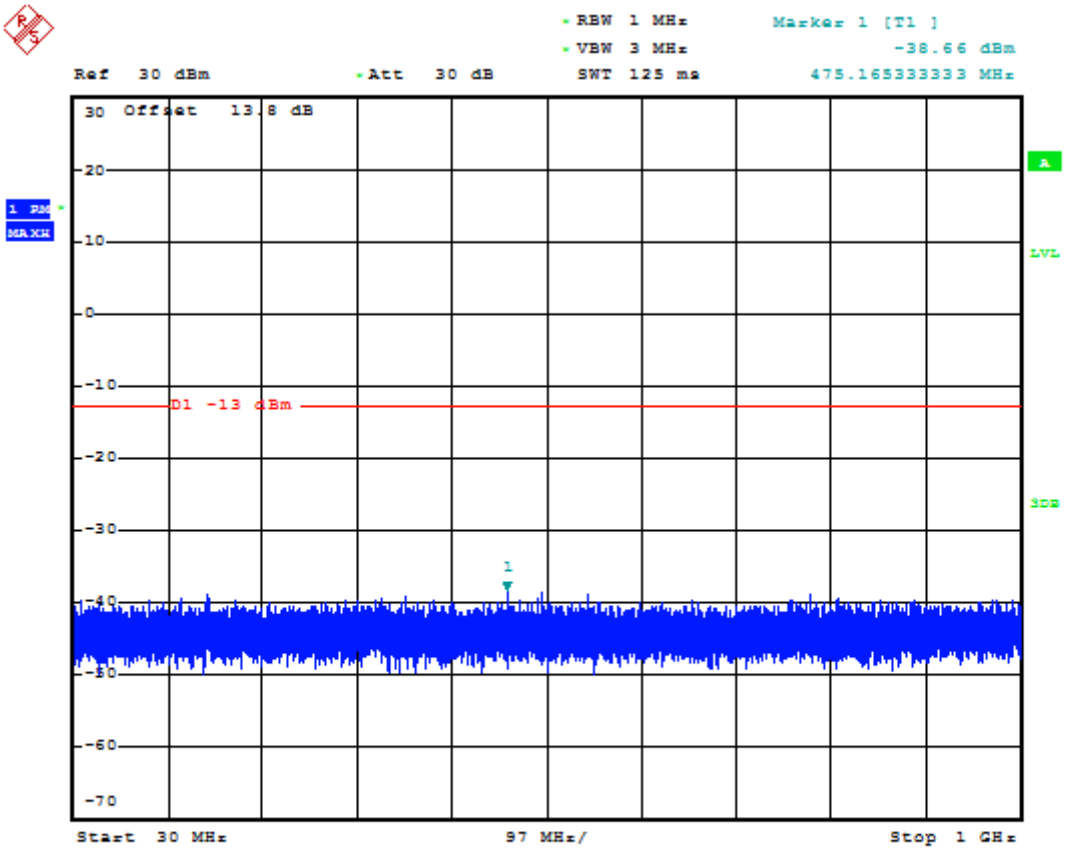
Test Channel=MCH



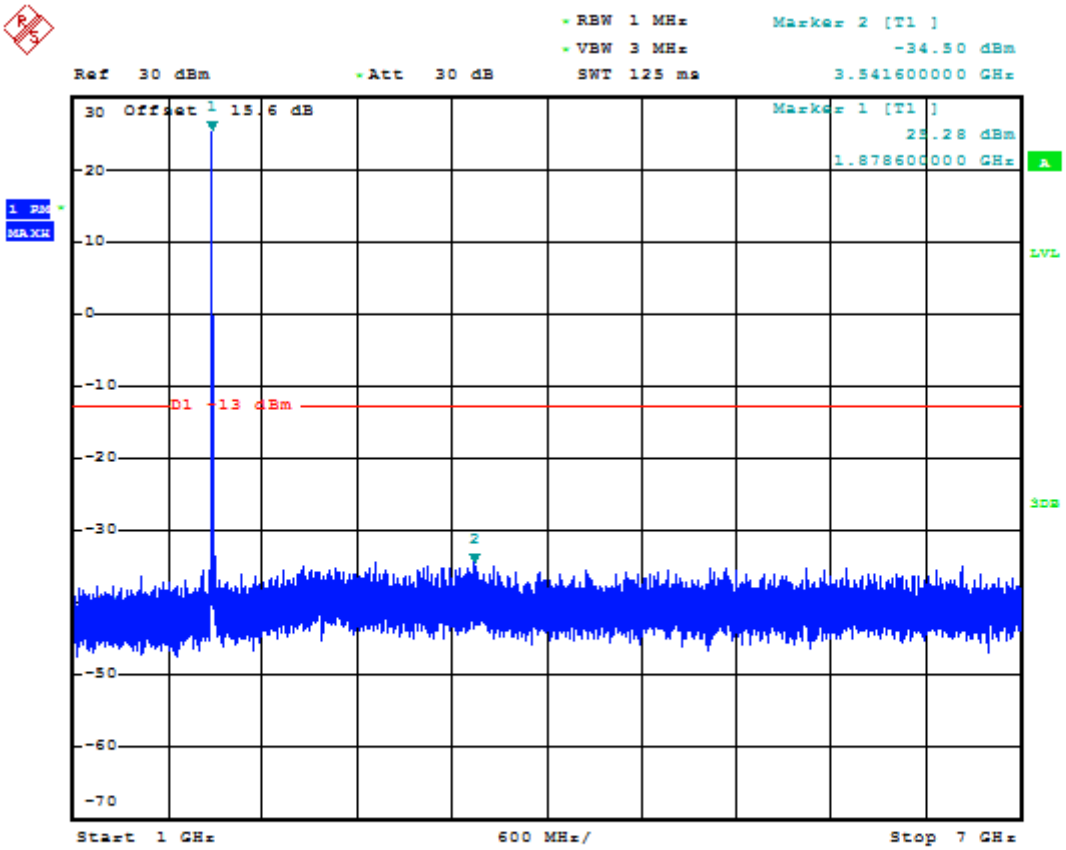
Date: 11.APR.2017 07:01:53



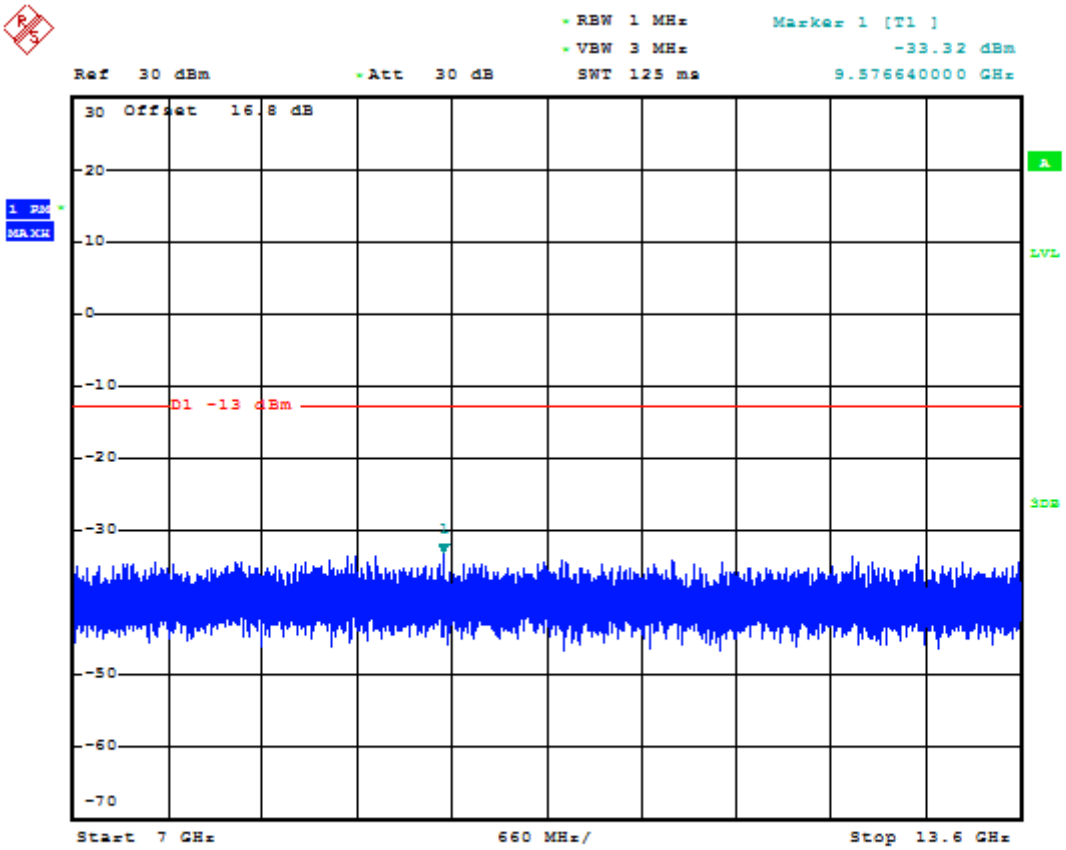
Date: 11.APR.2017 07:02:09



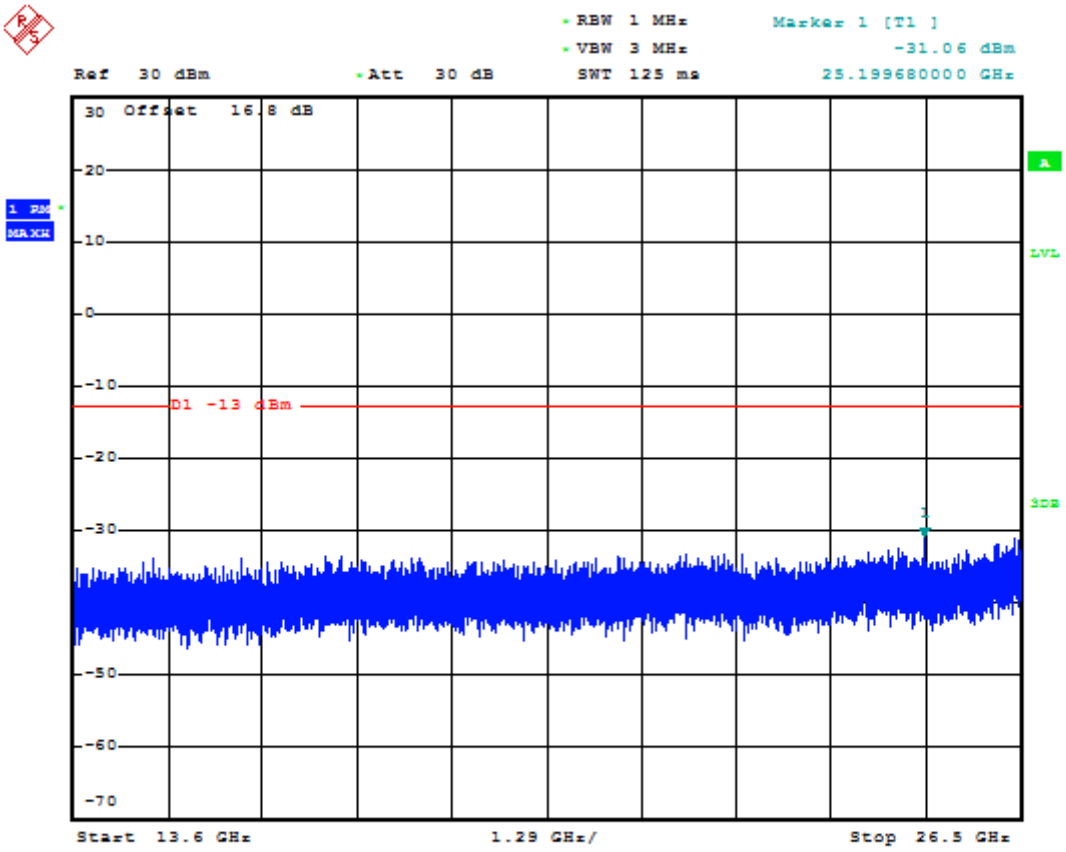
Date: 11.APR.2017 07:02:18



Date: 11.APR.2017 07:02:28

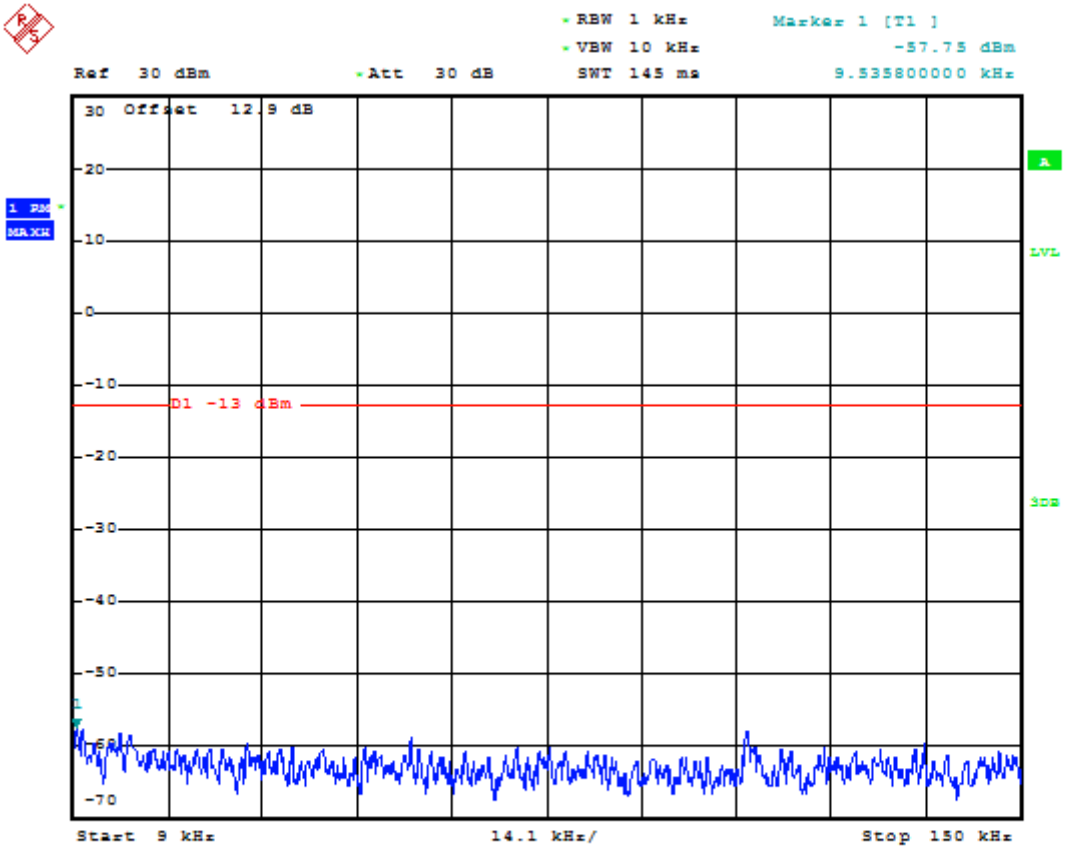


Date: 11.APR.2017 07:02:36

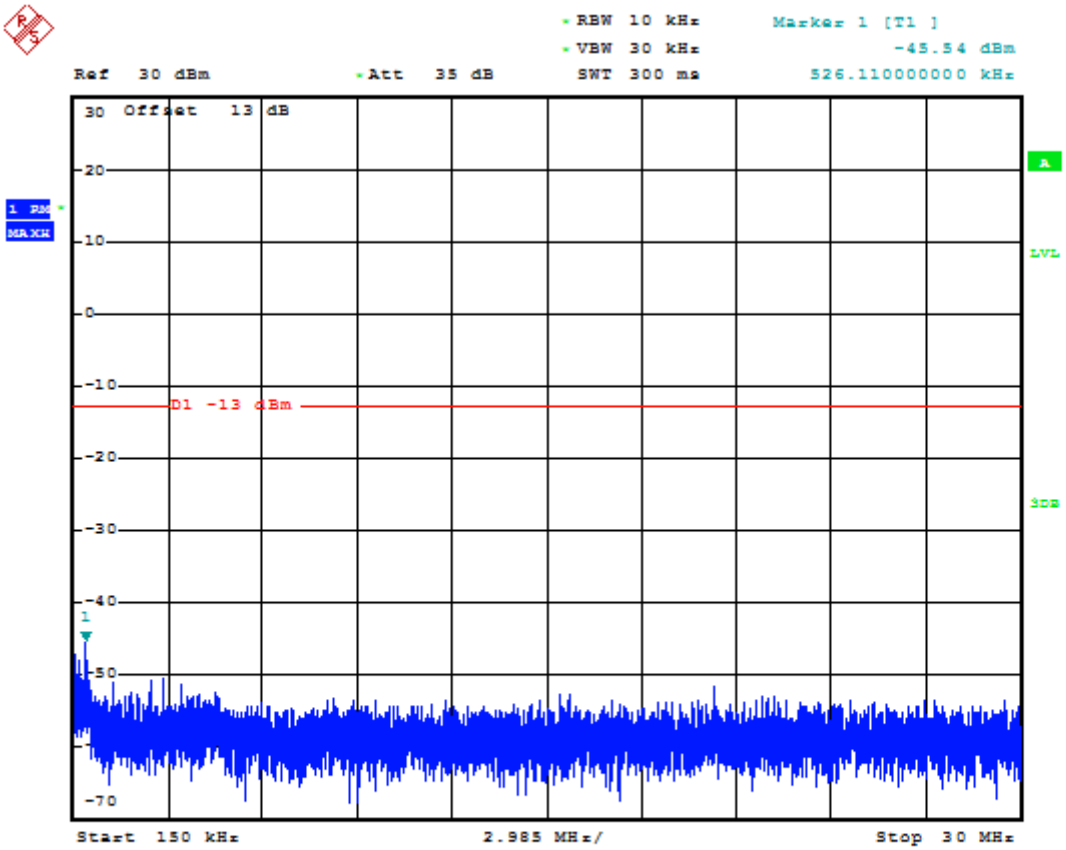


Date: 11.APR.2017 07:02:45

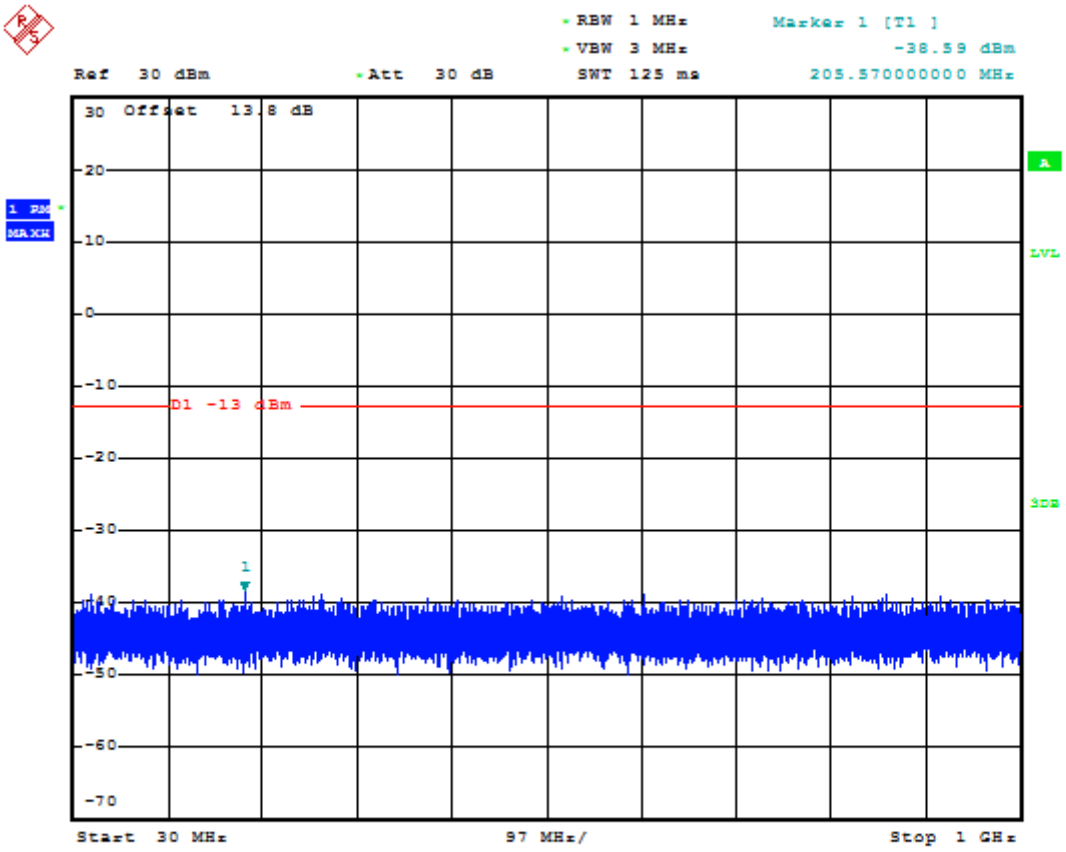
Test Channel=HCH



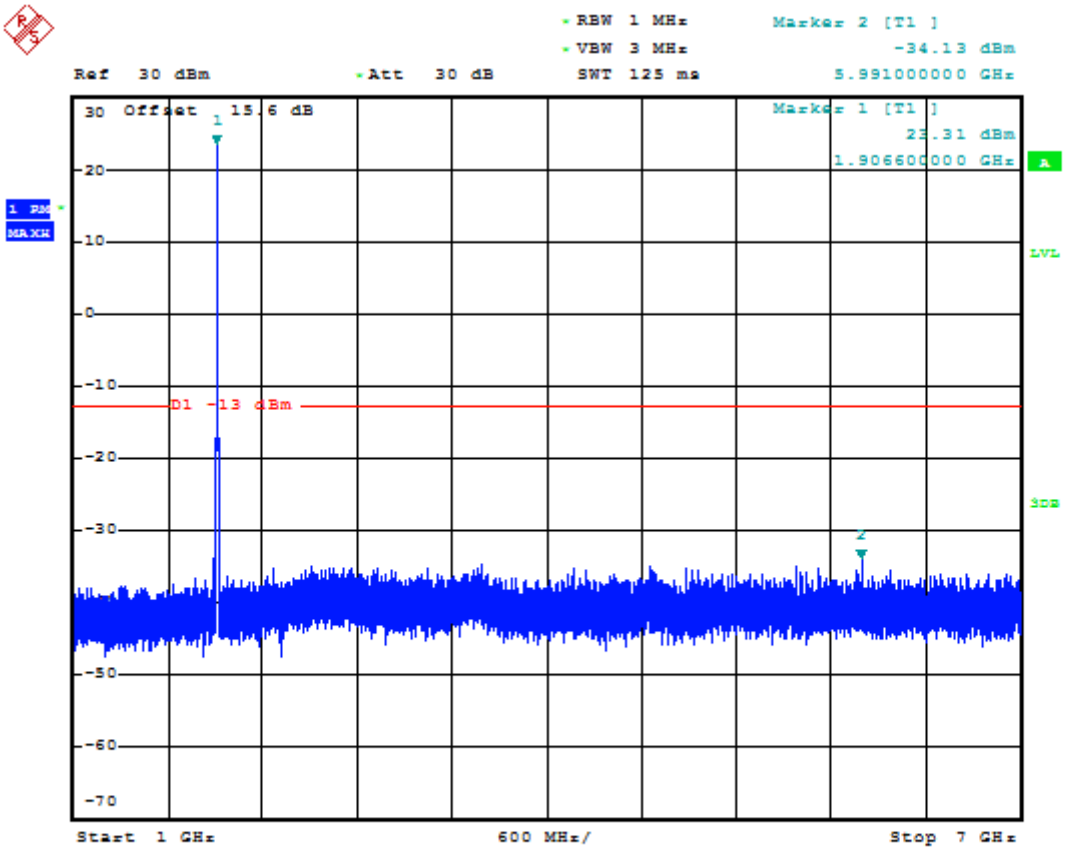
Date: 11.APR.2017 07:02:57



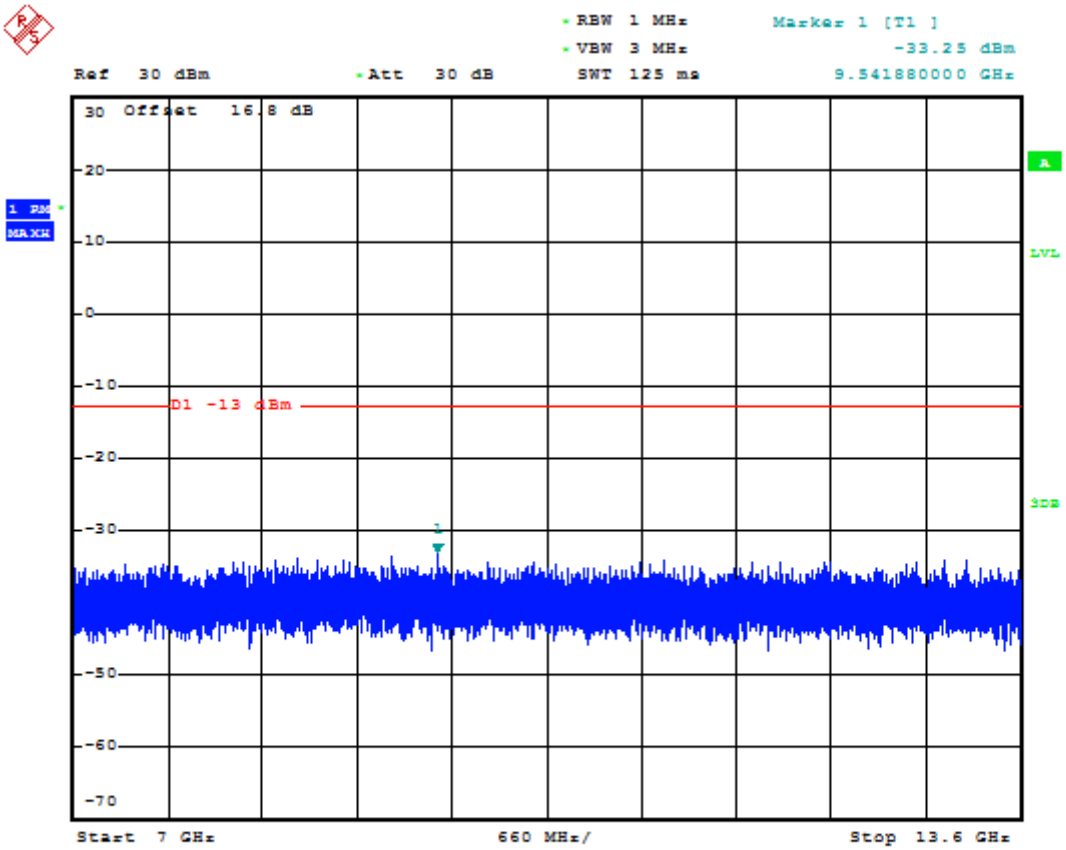
Date: 11.APR.2017 07:03:13



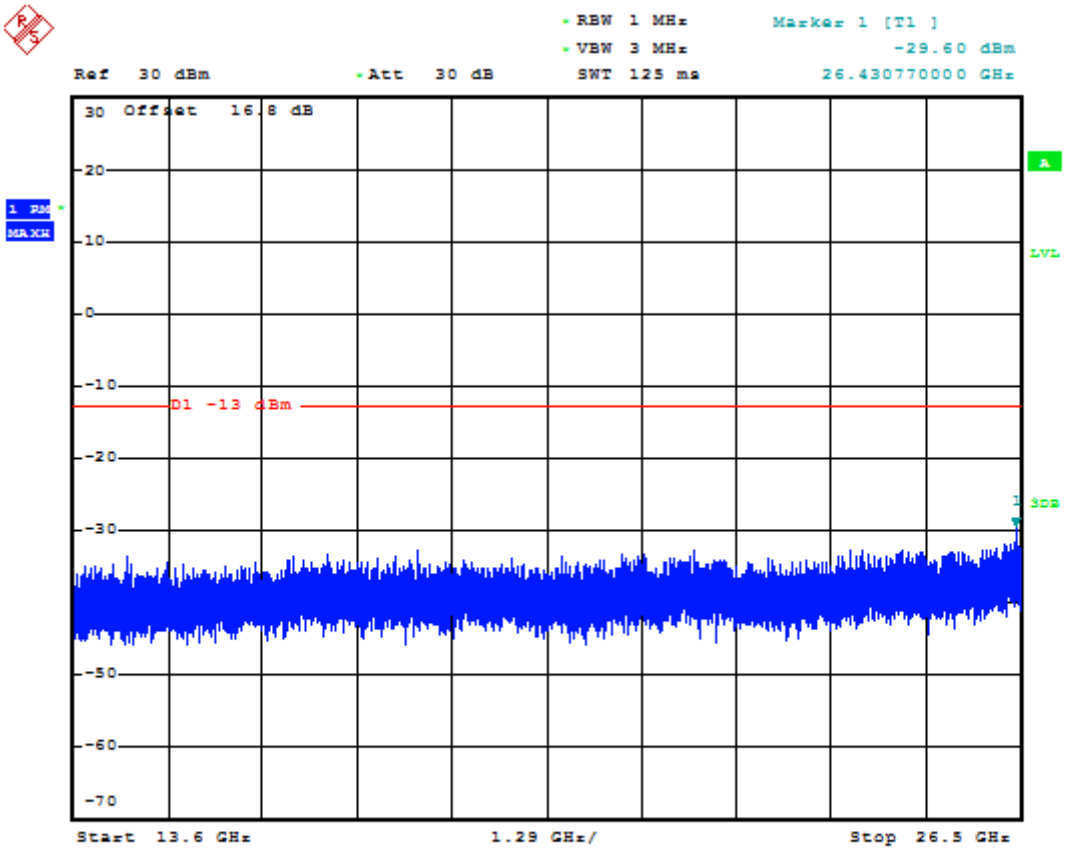
Date: 11.APR.2017 07:03:21



Date: 11.APR.2017 07:03:31



Date: 11.APR.2017 07:03:40



Date: 11.APR.2017 07:03:48

2.7. Field Strength of Spurious Radiation Test

Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

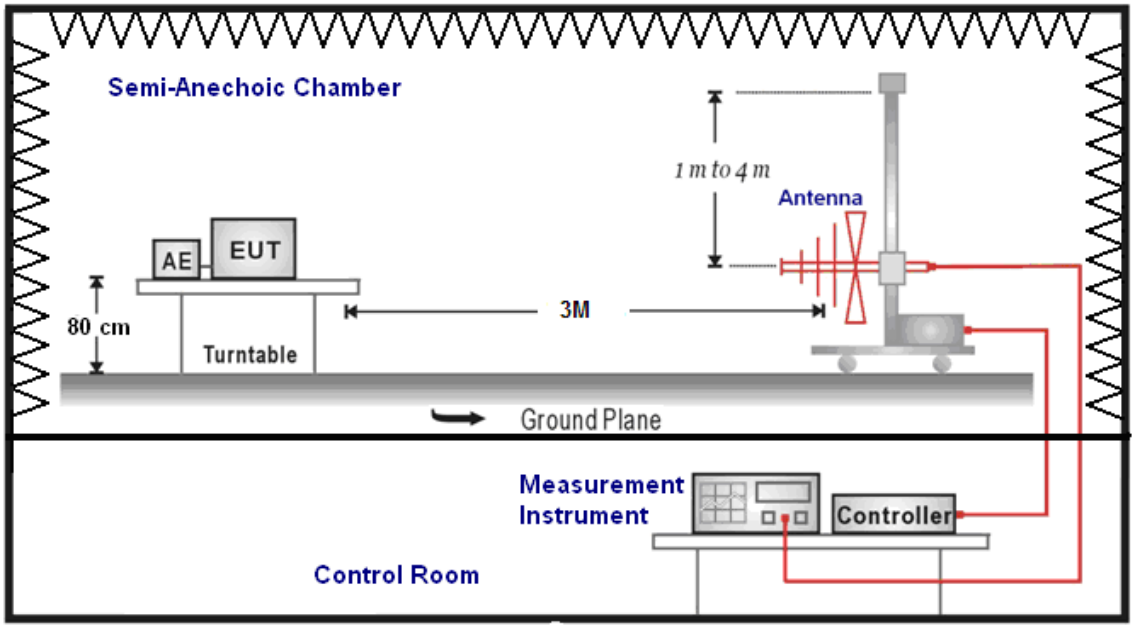
Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	03/30/2016	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	03/30/2016	1 year
Pre Amplifier	Agilent	8449B	3008A02237	10/11/2016	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/12/2017	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	416	10/13/2016	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	419	11/03/2016	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Horn Antenna (18~40GHz)	ETS	3116	00086467	09/05/2016	1 year
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/18/2016	1 year
Microwave Cable	EMCI	EMC102-KM-KM-1 4000	151001	02/20/2017	1 year
Microwave Cable	EMCI	EMC-104-SM-SM-1 4000	140202	02/20/2017	1 year
Microwave Cable	EMCI	EMC104-SM-SM-6 00	140301	02/20/2017	1 year
Signal Generator	Agilent	E8257D	MY44320425	03/02/2017	1 year
Test Site	ATL	TE01	888001	08/29/2016	1 year

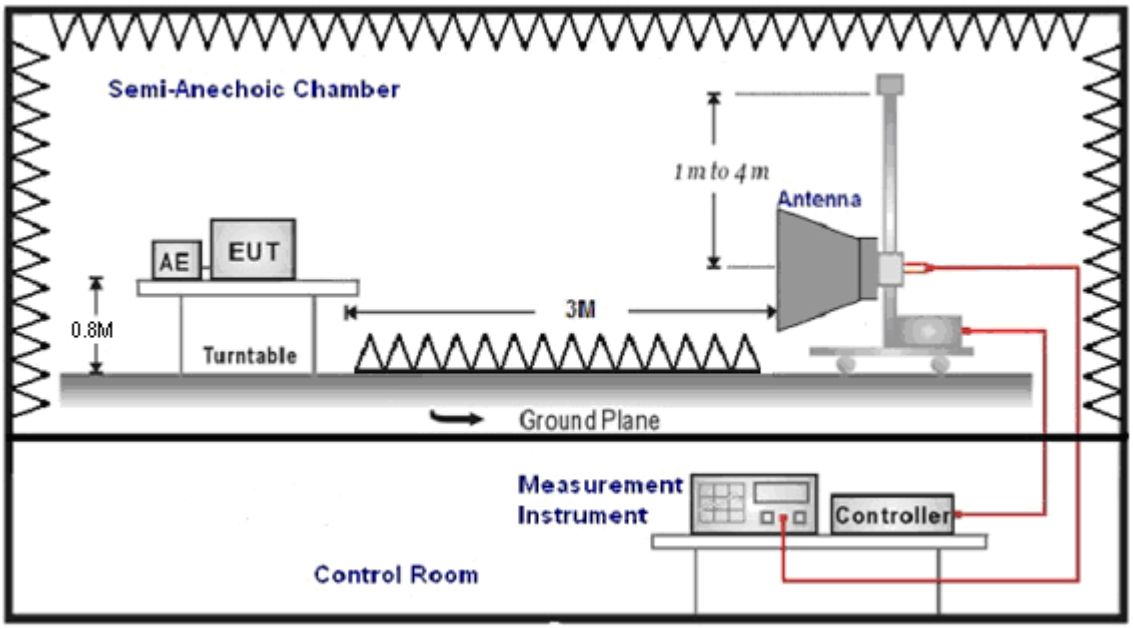
Note: N.C.R. = No Calibration Request.

■ **Setup**

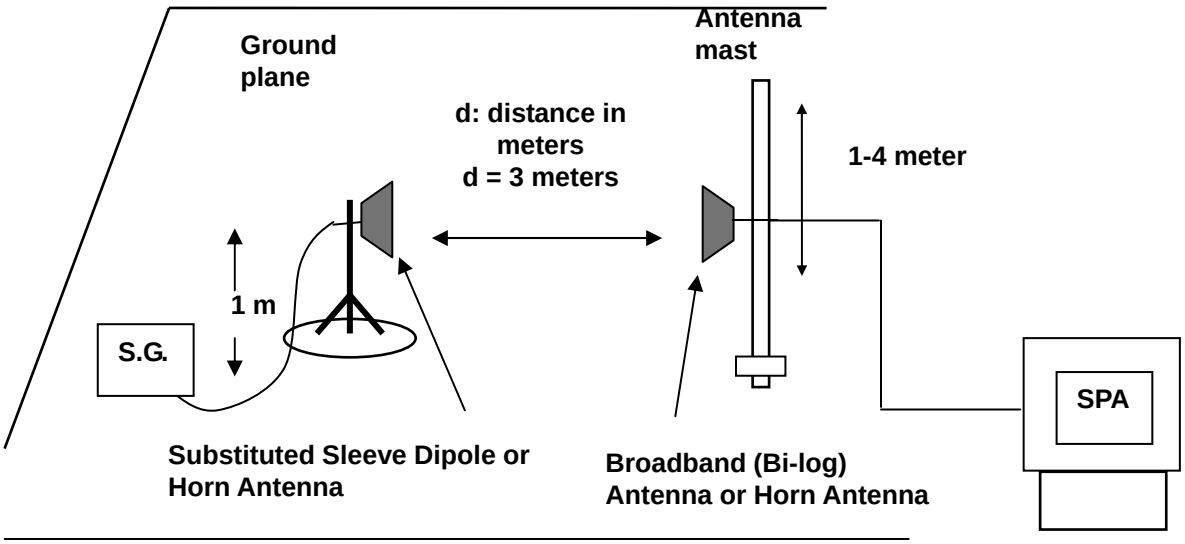
Below 1GHz



Above 1GHz



For Substituted Method Test Set-UP



■ Test Procedure

a. The EUT was set up for the maximum power with WWAN link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 5MHz for WWAN mode.

b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.

d. E.I.R.P. = Output power level of S.G - TX cable loss + Antenna gain of substitution horn

e. E.R.P. = E.I.R.P.- 2.15 dB

Note: 1. Below 1 GHz Substituted Method Test：Sleeve dipole antenna to Bi-Log Antenna

2. Above 1 GHz Substituted Method Test：Horn antenna to Horn Antenna

■ Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.

■ **Test Result**

Module 1:QUALCOMM , MSM6290

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1852.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9262	Date:	03/27/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3704.800	-44.50	2.12	-42.38	-13.00	-29.38	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1852.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9262	Date:	03/27/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3704.800	-42.34	2.12	-40.22	-13.00	-27.22	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9400	Date:	03/27/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-45.12	2.23	-42.89	-13.00	-29.89	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9400	Date:	03/27/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-43.28	2.23	-41.05	-13.00	-28.05	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1907.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9538	Date:	03/27/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3815.200	-44.31	2.33	-41.98	-13.00	-28.98	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1907.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9538	Date:	03/27/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3815.200	-41.68	2.33	-39.35	-13.00	-26.35	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	826.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4132	Date:	03/27/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1652.800	-38.61	-4.63	-43.24	-13.00	-30.24	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	826.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4132	Date:	03/27/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1652.800	-35.85	-4.63	-40.48	-13.00	-27.48	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4183	Date:	03/27/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-38.24	-4.55	-42.79	-13.00	-29.79	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4183	Date:	03/27/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-37.62	-4.55	-42.17	-13.00	-29.17	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	846.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4233	Date:	03/27/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1692.800	-38.56	-4.50	-43.06	-13.00	-30.06	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	846.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4233	Date:	03/27/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1692.800	-36.79	-4.50	-41.29	-13.00	-28.29	peak

Module 2:QUALCOMM , MSM8916

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	824.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_850_CH128	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1648.400	-39.72	-4.63	-44.35	-13.00	-31.35	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	824.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_850_CH128	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1648.400	-38.03	-4.63	-42.66	-13.00	-29.66	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_850_CH190	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-41.06	-4.55	-45.61	-13.00	-32.61	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_850_CH190	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-37.95	-4.55	-42.50	-13.00	-29.50	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	848.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_850_CH251	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1697.600	-40.34	-4.48	-44.82	-13.00	-31.82	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	848.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_850_CH251	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1697.600	-37.99	-4.48	-42.47	-13.00	-29.47	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1850.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_1900_CH512	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3700.400	-44.37	2.11	-42.26	-13.00	-29.26	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1850.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_1900_CH512	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3700.400	-43.94	2.11	-41.83	-13.00	-28.83	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_1900_CH661	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-45.75	2.23	-43.52	-13.00	-30.52	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_1900_CH661	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-42.42	2.23	-40.19	-13.00	-27.19	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1909.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_1900_CH810	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3819.600	-46.98	2.34	-44.64	-13.00	-31.64	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1909.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_GPRS_1900_CH810	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3819.600	-43.48	2.34	-41.14	-13.00	-28.14	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	824.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_850_CH128	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1648.400	-54.38	-4.63	-59.01	-13.00	-46.01	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	824.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_850_CH128	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1648.400	-54.72	-4.63	-59.35	-13.00	-46.35	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_850_CH190	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-53.96	-4.55	-58.51	-13.00	-45.51	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_850_CH190	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-53.69	-4.55	-58.24	-13.00	-45.24	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	848.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_850_CH251	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1697.600	-54.17	-4.48	-58.65	-13.00	-45.65	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	848.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_850_CH251	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1697.600	-53.21	-4.48	-57.69	-13.00	-44.69	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1850.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_1900_CH512	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3700.400	-57.52	2.11	-55.41	-13.00	-42.41	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1850.2MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_1900_CH512	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3700.400	-57.64	2.11	-55.53	-13.00	-42.53	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_1900_CH661	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-57.61	2.23	-55.38	-13.00	-42.38	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_1900_CH661	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-57.88	2.23	-55.65	-13.00	-42.65	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1909.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_1900_CH810	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3719.600	-57.11	2.15	-54.96	-13.00	-41.96	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1909.8MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	2G_EGPRS_1900_CH810	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3819.600	-58.99	2.34	-56.65	-13.00	-43.65	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1852.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9262	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3704.800	-46.05	2.12	-43.93	-13.00	-30.93	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1852.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9262	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3704.800	-42.48	2.12	-40.36	-13.00	-27.36	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9400	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-45.35	2.23	-43.12	-13.00	-30.12	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1880MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9400	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3760.000	-43.52	2.23	-41.29	-13.00	-28.29	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1907.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9538	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3815.200	-45.66	2.33	-43.33	-13.00	-30.33	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	1907.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 2_CH9538	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3815.200	-44.18	2.33	-41.85	-13.00	-28.85	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	826.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4132	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1652.800	-39.65	-4.63	-44.28	-13.00	-31.28	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	826.4MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4132	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1652.800	-37.84	-4.63	-42.47	-13.00	-29.47	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4183	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-40.34	-4.55	-44.89	-13.00	-31.89	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	836.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4183	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1673.200	-36.84	-4.55	-41.39	-13.00	-28.39	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	846.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4233	Date:	03/24/2017
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1692.800	-38.89	-4.50	-43.39	-13.00	-30.39	peak

Standard:	P22H/24E	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	846.6MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Mode:	3G_BAND 5_CH4233	Date:	03/24/2017
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1692.800	-37.06	-4.50	-41.56	-13.00	-28.56	peak

2.8. Frequency Stability (Temperature & Voltage Variation) Test

Limit

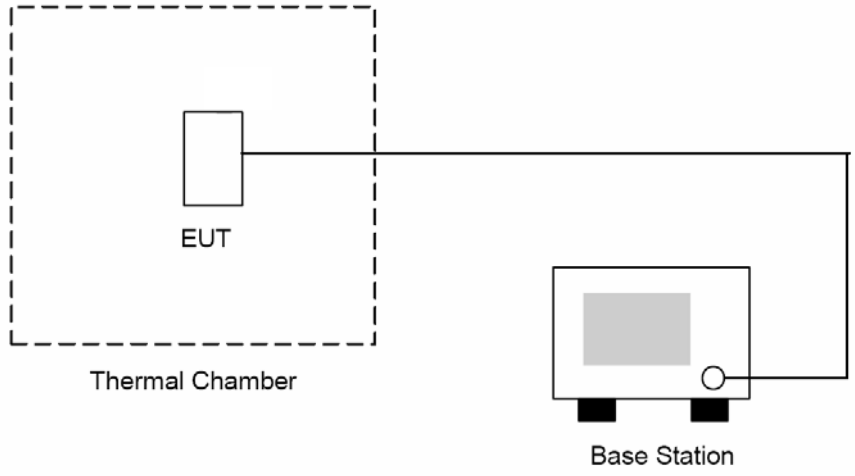
The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	03/02/2017	1 year
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	04/18/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

Setup



Test Procedure

The measurement is made according to FCC rules:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30℃ and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in 10℃ steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The EUT was placed in a temperature chamber at 25±5 ℃ and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

Uncertainty

The measurement uncertainty is defined as for Frequency Stability (Temperature Variation) measurement is ± 10Hz.

■ Test Result

Module 1:QUALCOMM , MSM6290

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA Band V	TM1	LCH	TN	VL	0.27	0.00	±2.5	PASS
			TN	VN	-0.90	0.00	±2.5	PASS
			TN	VH	-0.87	0.00	±2.5	PASS
		MCH	TN	VL	-0.44	0.00	±2.5	PASS
			TN	VN	-0.90	0.00	±2.5	PASS
			TN	VH	-1.37	0.00	±2.5	PASS
		HCH	TN	VL	2.67	0.00	±2.5	PASS
			TN	VN	-0.90	0.00	±2.5	PASS
			TN	VH	1.39	0.00	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA Band II	TM1	LCH	TN	VL	-10.76	-0.01	±2.5	PASS
			TN	VN	-14.02	-0.01	±2.5	PASS
			TN	VH	-13.24	-0.01	±2.5	PASS
		MCH	TN	VL	-8.53	0.00	±2.5	PASS
			TN	VN	-14.02	0.00	±2.5	PASS
			TN	VH	-9.23	0.00	±2.5	PASS
		HCH	TN	VL	-8.42	0.00	±2.5	PASS
			TN	VN	-14.02	0.00	±2.5	PASS
			TN	VH	-8.80	0.00	±2.5	PASS

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA Band V	TM1	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-2.15	0.00	±2.5	PASS
			VN	10	-0.23	0.00	±2.5	PASS
			VN	20	1.36	0.00	±2.5	PASS
			VN	30	-1.72	0.00	±2.5	PASS
			VN	40	0.32	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
WCDMA Band V	TM1	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	1.85	0.00	±2.5	PASS
			VN	10	2.62	0.00	±2.5	PASS
			VN	20	1.11	0.00	±2.5	PASS
			VN	30	2.66	0.00	±2.5	PASS
			VN	40	1.24	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
WCDMA Band V	TM1	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-1.80	0.00	±2.5	PASS
			VN	10	-0.37	0.00	±2.5	PASS
			VN	20	1.48	0.00	±2.5	PASS
			VN	30	0.50	0.00	±2.5	PASS
			VN	40	4.91	0.01	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA Band II	TM1	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-12.45	-0.01	±2.5	PASS
			VN	10	-9.84	-0.01	±2.5	PASS
			VN	20	-9.66	-0.01	±2.5	PASS
			VN	30	-10.85	-0.01	±2.5	PASS
			VN	40	-10.38	-0.01	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
WCDMA Band II	TM1	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-4.44	0.00	±2.5	PASS
			VN	10	-7.68	0.00	±2.5	PASS
			VN	20	-9.29	0.00	±2.5	PASS
			VN	30	-5.57	0.00	±2.5	PASS
			VN	40	-6.01	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
WCDMA Band II	TM1	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-9.32	0.00	±2.5	PASS
			VN	10	-10.94	-0.01	±2.5	PASS
			VN	20	-9.98	-0.01	±2.5	PASS
			VN	30	-10.79	-0.01	±2.5	PASS
			VN	40	-6.35	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Module 2:QUALCOMM , MSM8916

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GPRS850	TM2	LCH	TN	VL	11.62	0.01	±2.5	PASS
			TN	VN	9.88	0.01	±2.5	PASS
			TN	VH	9.94	0.01	±2.5	PASS
		MCH	TN	VL	21.31	0.03	±2.5	PASS
			TN	VN	23.31	0.03	±2.5	PASS
			TN	VH	22.73	0.03	±2.5	PASS
		HCH	TN	VL	11.62	0.01	±2.5	PASS
			TN	VN	8.46	0.01	±2.5	PASS
			TN	VH	7.04	0.01	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
EGPRS850	TM3	LCH	TN	VL	16.53	0.02	±2.5	PASS
			TN	VN	16.11	0.02	±2.5	PASS
			TN	VH	14.30	0.02	±2.5	PASS
		MCH	TN	VL	27.51	0.03	±2.5	PASS
			TN	VN	21.76	0.03	±2.5	PASS
			TN	VH	24.63	0.03	±2.5	PASS
		HCH	TN	VL	15.59	0.02	±2.5	PASS
			TN	VN	14.79	0.02	±2.5	PASS
			TN	VH	15.14	0.02	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GPRS1900	TM2	LCH	TN	VL	2.52	0.00	±2.5	PASS
			TN	VN	4.39	0.00	±2.5	PASS
			TN	VH	-0.65	0.00	±2.5	PASS
		MCH	TN	VL	-5.68	0.00	±2.5	PASS
			TN	VN	-5.68	0.00	±2.5	PASS
			TN	VH	-7.49	0.00	±2.5	PASS
		HCH	TN	VL	-4.07	0.00	±2.5	PASS
			TN	VN	-0.06	0.00	±2.5	PASS
			TN	VH	-3.87	0.00	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
EGPRS1900	TM3	LCH	TN	VL	11.95	0.01	±2.5	PASS
			TN	VN	14.01	0.01	±2.5	PASS
			TN	VH	11.95	0.01	±2.5	PASS
		MCH	TN	VL	4.97	0.00	±2.5	PASS
			TN	VN	4.94	0.00	±2.5	PASS
			TN	VH	3.87	0.00	±2.5	PASS
		HCH	TN	VL	6.17	0.00	±2.5	PASS
			TN	VN	8.88	0.00	±2.5	PASS
			TN	VH	6.42	0.00	±2.5	PASS

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GPRS850	TM2	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	8.85	0.01	±2.5	PASS
			VN	10	8.01	0.01	±2.5	PASS
			VN	20	10.33	0.01	±2.5	PASS
			VN	30	10.78	0.01	±2.5	PASS
			VN	40	11.69	0.01	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
GPRS850	TM2	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	21.24	0.03	±2.5	PASS
			VN	10	18.66	0.02	±2.5	PASS
			VN	20	21.24	0.03	±2.5	PASS
			VN	30	21.76	0.03	±2.5	PASS
			VN	40	21.57	0.03	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
GPRS850	TM2	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	7.10	0.01	±2.5	PASS
			VN	10	7.36	0.01	±2.5	PASS
			VN	20	8.91	0.01	±2.5	PASS
			VN	30	7.68	0.01	±2.5	PASS
			VN	40	7.55	0.01	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
EGPRS850	TM3	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	17.34	0.02	±2.5	PASS
			VN	10	17.47	0.02	±2.5	PASS
			VN	20	15.56	0.02	±2.5	PASS
			VN	30	15.76	0.02	±2.5	PASS
			VN	40	16.14	0.02	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
EGPRS850	TM3	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	21.50	0.03	±2.5	PASS
			VN	10	30.15	0.04	±2.5	PASS
			VN	20	26.44	0.03	±2.5	PASS
			VN	30	26.47	0.03	±2.5	PASS
			VN	40	25.28	0.03	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
EGPRS850	TM3	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	14.24	0.02	±2.5	PASS
			VN	10	13.50	0.02	±2.5	PASS
			VN	20	13.88	0.02	±2.5	PASS
			VN	30	15.24	0.02	±2.5	PASS
			VN	40	14.17	0.02	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
GPRS1900	TM2	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	N/A	N/A	±2.5	PASS
			VN	10	-3.16	0.00	±2.5	PASS
			VN	20	-4.07	0.00	±2.5	PASS
			VN	30	-1.16	0.00	±2.5	PASS
			VN	40	-4.46	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
GPRS1900	TM2	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-6.13	0.00	±2.5	PASS
			VN	10	-2.52	0.00	±2.5	PASS
			VN	20	-8.46	0.00	±2.5	PASS
			VN	30	-8.39	0.00	±2.5	PASS
			VN	40	-6.26	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
GPRS1900	TM2	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	1.81	0.00	±2.5	PASS
			VN	10	-2.71	0.00	±2.5	PASS
			VN	20	-4.46	0.00	±2.5	PASS
			VN	30	-1.55	0.00	±2.5	PASS
			VN	40	-3.23	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
EGPRS1900	TM3	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	N/A	N/A	±2.5	PASS
			VN	10	11.24	0.01	±2.5	PASS
			VN	20	9.07	0.00	±2.5	PASS
			VN	30	13.33	0.01	±2.5	PASS
			VN	40	6.01	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
EGPRS1900	TM3	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	6.42	0.00	±2.5	PASS
			VN	10	7.26	0.00	±2.5	PASS
			VN	20	6.49	0.00	±2.5	PASS
			VN	30	4.88	0.00	±2.5	PASS
			VN	40	3.26	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
EGPRS1900	TM3	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	6.65	0.00	±2.5	PASS
			VN	10	8.07	0.00	±2.5	PASS
			VN	20	6.36	0.00	±2.5	PASS
			VN	30	6.72	0.00	±2.5	PASS
			VN	40	9.69	0.01	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA850	TM1	LCH	TN	VL	-0.40	0.00	±2.5	PASS
			TN	VN	-1.11	0.00	±2.5	PASS
			TN	VH	2.01	0.00	±2.5	PASS
		MCH	TN	VL	1.11	0.00	±2.5	PASS
			TN	VN	-1.11	0.00	±2.5	PASS
			TN	VH	-0.31	0.00	±2.5	PASS
		HCH	TN	VL	-2.04	0.00	±2.5	PASS
			TN	VN	-1.11	0.00	±2.5	PASS
			TN	VH	0.87	0.00	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA1900	TM1	LCH	TN	VL	-11.72	-0.01	±2.5	PASS
			TN	VN	-9.83	-0.01	±2.5	PASS
			TN	VH	-9.69	-0.01	±2.5	PASS
		MCH	TN	VL	-8.27	0.00	±2.5	PASS
			TN	VN	-9.83	0.00	±2.5	PASS
			TN	VH	-6.45	0.00	±2.5	PASS
		HCH	TN	VL	-9.64	-0.01	±2.5	PASS
			TN	VN	-9.83	0.00	±2.5	PASS
			TN	VH	-10.28	-0.01	±2.5	PASS

Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA Band V	TM1	LCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	-0.09	0.00	±2.5	PASS
			VN	10	-1.66	0.00	±2.5	PASS
			VN	20	1.34	0.00	±2.5	PASS
			VN	30	-1.14	0.00	±2.5	PASS
			VN	40	0.93	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
WCDMA Band V	TM1	MCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	0.43	0.00	±2.5	PASS
			VN	10	2.50	0.00	±2.5	PASS
			VN	20	3.39	0.00	±2.5	PASS
			VN	30	0.32	0.00	±2.5	PASS
			VN	40	1.59	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS
WCDMA Band V	TM1	HCH	VN	-30	N/A	N/A	±2.5	PASS
			VN	-20	N/A	N/A	±2.5	PASS
			VN	-10	N/A	N/A	±2.5	PASS
			VN	0	0.98	0.00	±2.5	PASS
			VN	10	-0.35	0.00	±2.5	PASS
			VN	20	1.57	0.00	±2.5	PASS
			VN	30	-1.27	0.00	±2.5	PASS
			VN	40	2.35	0.00	±2.5	PASS
			VN	50	N/A	N/A	±2.5	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq.Error (Hz)	Freq.vs.rated (ppm)	Limit (ppm)	Verdict
WCDMA Band II	TM1	LCH	VN	-30	-11.78	-0.01	±2.5	PASS
			VN	-20	-9.92	-0.01	±2.5	PASS
			VN	-10	-10.30	-0.01	±2.5	PASS
			VN	0	-10.94	-0.01	±2.5	PASS
			VN	10	-11.37	-0.01	±2.5	PASS
			VN	20	-6.91	0.00	±2.5	PASS
			VN	30	-13.78	-0.01	±2.5	PASS
			VN	40	-12.59	-0.01	±2.5	PASS
			VN	50	-11.95	-0.01	±2.5	PASS
WCDMA Band II	TM1	MCH	VN	-30	-5.31	0.00	±2.5	PASS
			VN	-20	-8.56	0.00	±2.5	PASS
			VN	-10	-5.65	0.00	±2.5	PASS
			VN	0	-10.68	-0.01	±2.5	PASS
			VN	10	-10.82	-0.01	±2.5	PASS
			VN	20	-8.07	0.00	±2.5	PASS
			VN	30	-9.06	0.00	±2.5	PASS
			VN	40	-6.97	0.00	±2.5	PASS
			VN	50	-7.29	0.00	±2.5	PASS
WCDMA Band II	TM1	HCH	VN	-30	-8.39	0.00	±2.5	PASS
			VN	-20	-9.80	-0.01	±2.5	PASS
			VN	-10	-6.36	0.00	±2.5	PASS
			VN	0	-8.91	0.00	±2.5	PASS
			VN	10	-10.44	-0.01	±2.5	PASS
			VN	20	-7.46	0.00	±2.5	PASS
			VN	30	-9.43	0.00	±2.5	PASS
			VN	40	-9.34	0.00	±2.5	PASS
			VN	50	-11.67	-0.01	±2.5	PASS