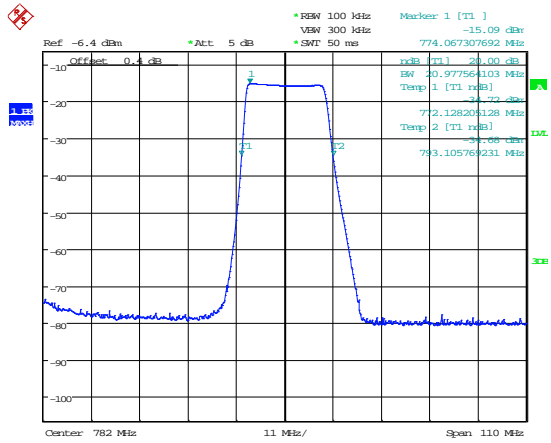


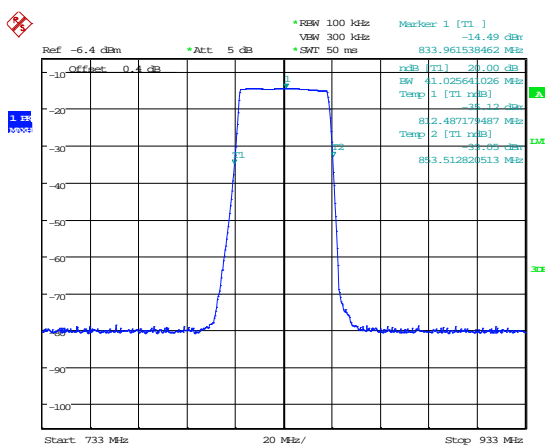
Date: 1.AUG.2014 15:03:24

700 MHz Lower Band



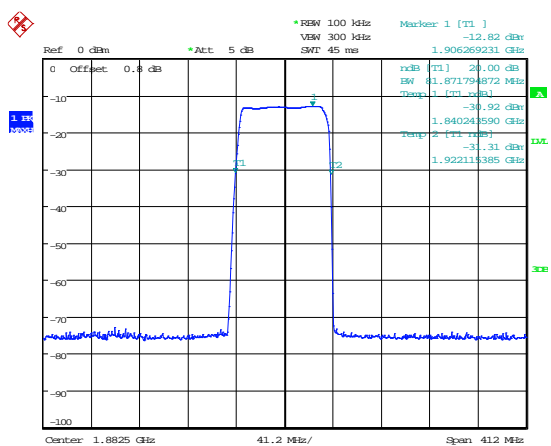
Date: 1.AUG.2014 15:15:36

700 MHz Upper Band



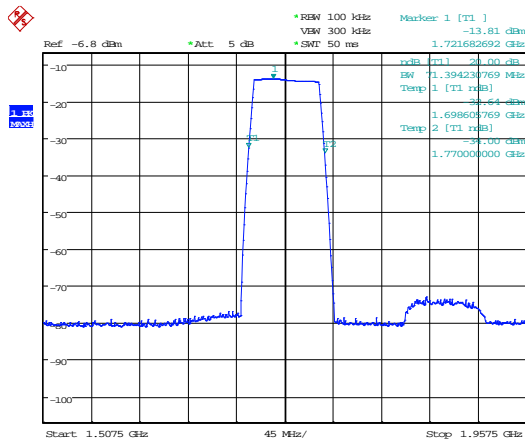
Date: 1.AUG.2014 14:43:18

850 MHz & SMR 800 (Sprint)



Date: 4.AUG.2014 13:53:32

1900 MHz (PCS)



Date: 1.AUG.2014 15:36:26

1700 MHz (AWS)

Appendix B:**Downlink Formal Emission Test Results**

Abbreviations used in the tables in this appendix:

Spec	: Specification	ALSR	: Absorber Lined Screened Room
Mod	: Modification	OATS	: Open Area Test Site
EUT	: Equipment Under Test	ATS	: Alternative Test Site
SE	: Support Equipment	Ref	: Reference
L	: Live Power Line	Freq	: Frequency
N	: Neutral Power Line	MD	: Measurement Distance
E	: Earth Power Line	SD	: Spec Distance
Pk	: Peak Detector	Pol	: Polarisation
QP	: Quasi-Peak Detector	H	: Horizontal Polarisation
Av	: Average Detector	V	: Vertical Polarisation
CDN	: Coupling & decoupling network		

B1 RF Gain and Output Power

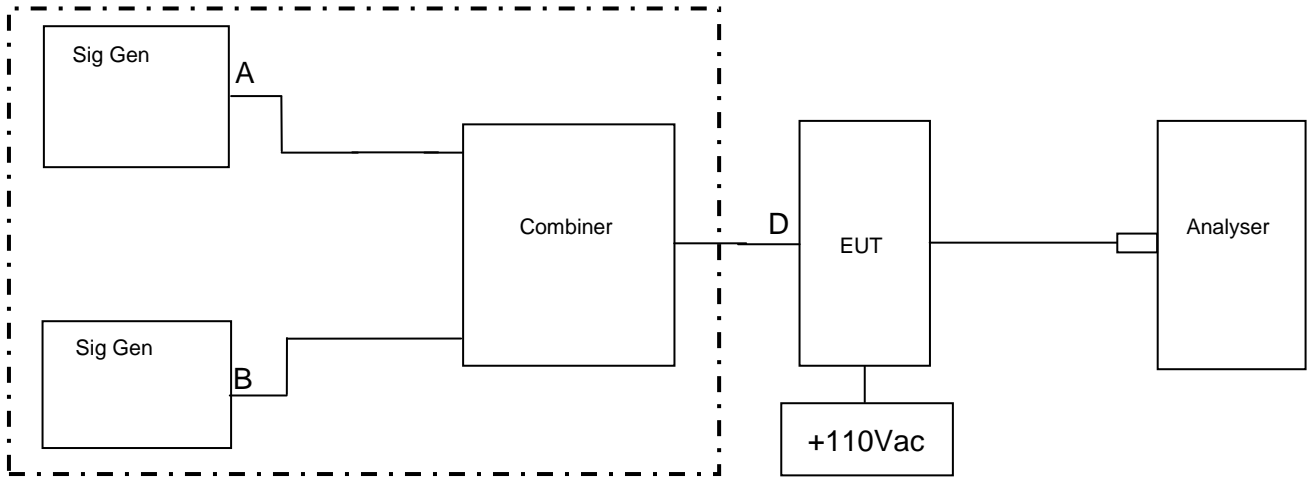
Test Details:	
Measurement standard	Part 2.1046,22.913(a), 24.232(a), 27.50(a), 90.205(k)
EUT sample number	S01 & S02
Modification state	0
SE in test environment	None
SE isolated from EUT	None
Temperature	22°C
Humidity	47%
EUT set up	Refer to Appendix C

Frequency (MHz)	Signal Generator input level (dBm)	Input Cable Loss (dB)	Input Level (dBm)	Level at Spectrum Analyser (dBm)	Output Cable & Attenuator loss (dB)	Gain (dB)	Conducted Output Power (dBm)	Gain after 10dB input level increase (dB)
700MHz								
728.000	-10.26	0.50	-10.76	-14.87	50.8	46.69	35.93	36.75
742.000	-9.38	0.50	-9.88	-14.61	50.8	46.07	36.19	36.12
757.000	-9.34	0.50	-9.84	-15.37	50.8	45.27	35.43	35.31
850 MHz								
862.000	-8.86	0.50	-9.36	-15.09	50.9	45.17	35.81	35.22
878.000	-10.81	0.50	-11.31	-14.53	50.9	47.68	36.37	37.74
894.000	-8.82	0.60	-9.42	-14.63	50.9	45.69	36.27	35.72
1900 MHz								
1930.000	-12.42	1.00	-13.42	-14.77	51.1	49.75	36.33	39.80
1962.500	-11.44	1.00	-12.44	-14.00	51.1	49.54	37.10	39.59
1995.000	-11.66	1.00	-12.66	-14.57	51.1	49.19	36.53	39.24
2100 MHz								
2110.000	-10.20	0.90	-11.10	-13.04	51.1	49.16	38.06	39.23
2132.500	-10.42	0.90	-11.32	-12.73	51.3	49.89	38.57	39.94
2155.000	-9.12	0.90	-10.02	-13.01	51.4	48.41	38.39	38.45

Notes: 1.The signal generator input was increased by 10dBs and the level of the output signal remeasured.

B2 Amplifier Intermodulation Spurious Emissions

Test Details:	
Measurement standard	Part 2.1053, 22.917(a), 24.238(a), 27.53(c) & (g), 90.691(a)(1) & (2)
EUT sample number	S01 & S02
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C



2 Signals at	Frequency (MHz)	Level (dBm)	Limit (dBm)
700MHz			
Top end of band	755.498	-24.75	-13
850MHz			
Top end of band	892.498	-20.38	-13
1900 MHz			
Top end of band	1993.496	-15.72	-13
2100 MHz			
Top end of band	2155.3	-18.47	-13

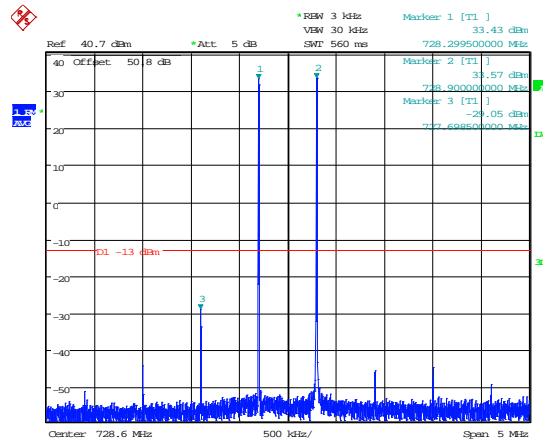
Sweep data is shown on the next page:

Results

The EUT was found to comply with the limits

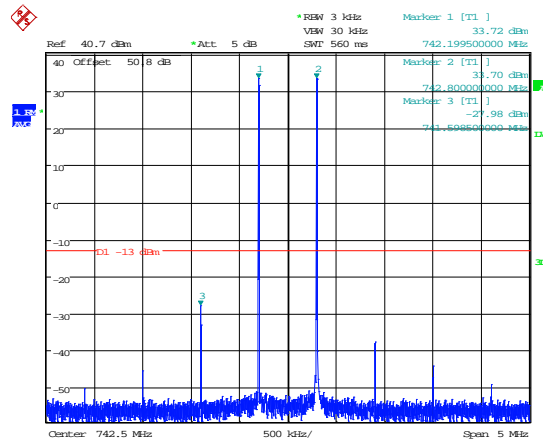
See plots below

700 MHz (Lower) Intermodulation close View



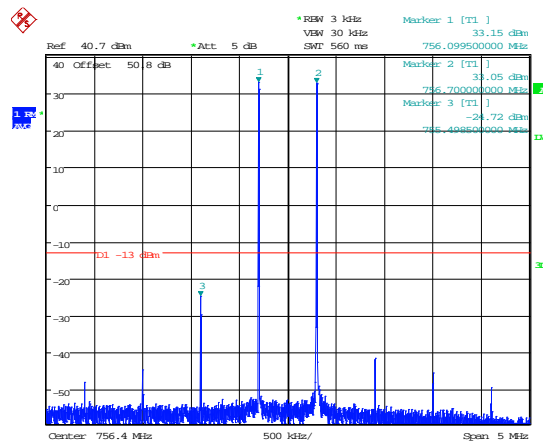
Date: 13.AUG.2014 13:29:33

2 Signals at bottom end of band



Date: 13.AUG.2014 13:36:03

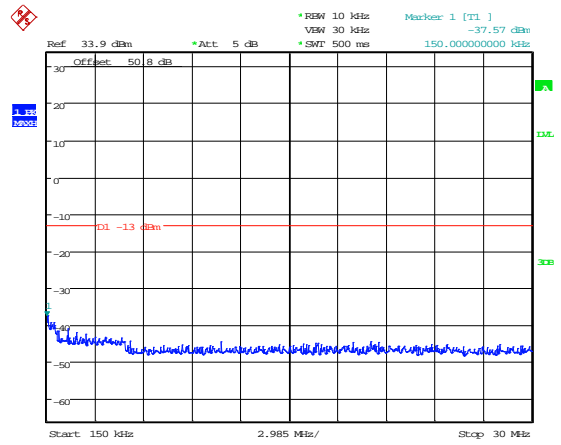
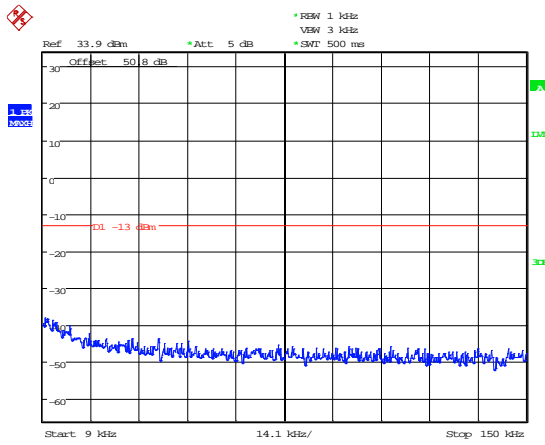
2 Signals at bottom end of band



Date: 13.AUG.2014 13:42:10

2 Signals at bottom end of band

700 MHz intermodulation

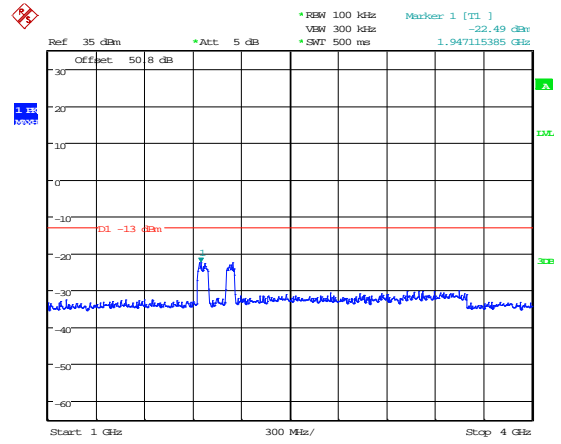
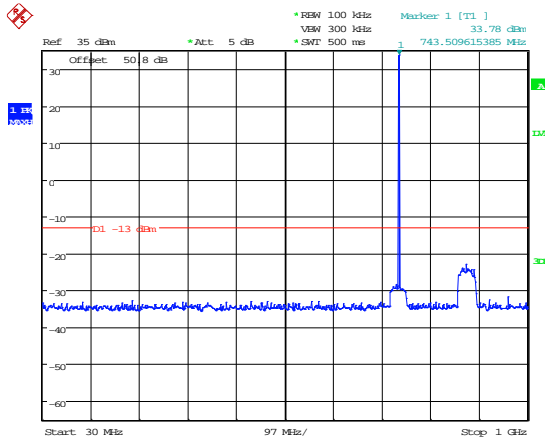


Date: 12.AUG.2014 13:51:42

Date: 12.AUG.2014 13:52:17

9 – 150kHz

150kHz – 30MHz

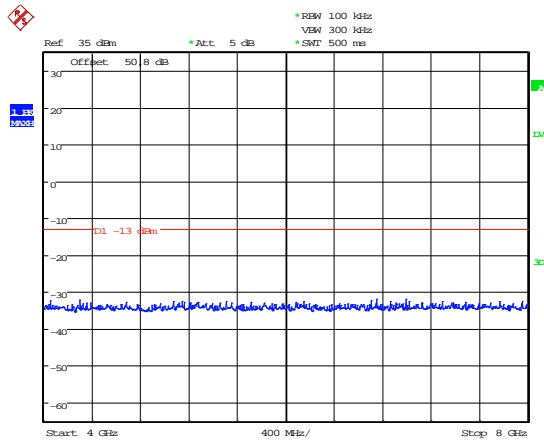


Date: 12.AUG.2014 13:52:58

Date: 12.AUG.2014 13:53:31

30MHz – 1GHz

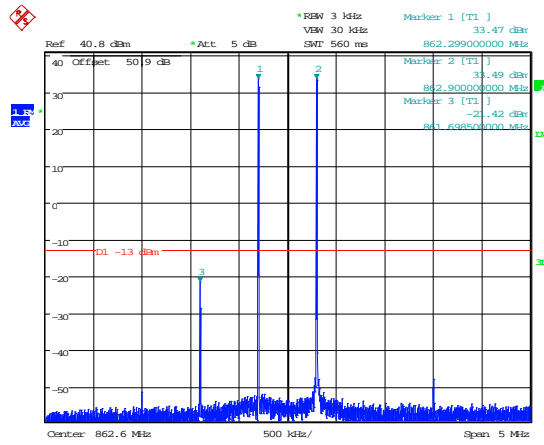
1GHz – 4GHz



Date: 12.AUG.2014 13:54:05

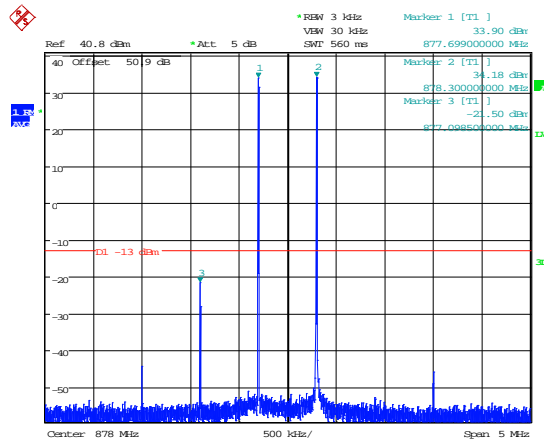
4GHz – 8GHz

850 MHz Intermodulation close View



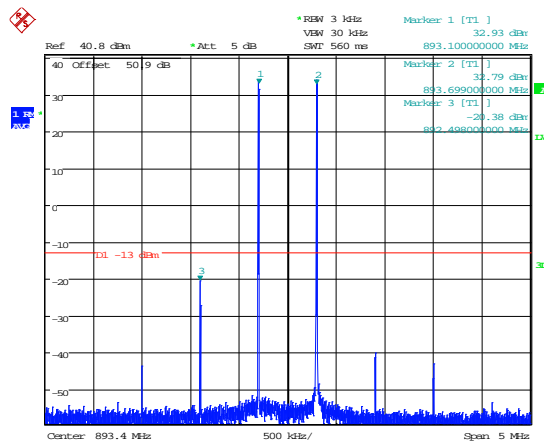
Date: 13.AUG.2014 12:22:23

2 Signals at bottom end of band



Date: 13.AUG.2014 12:14:34

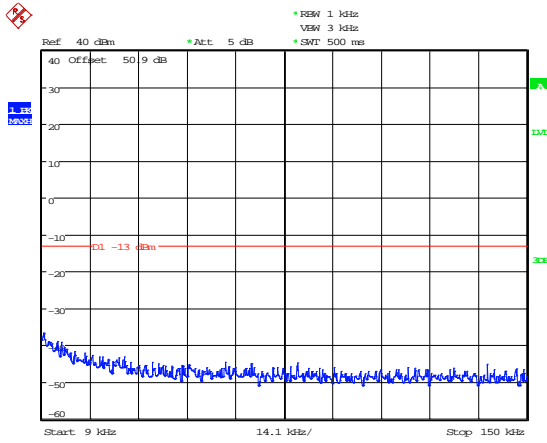
2 Signals at bottom end of band



Date: 13.AUG.2014 12:30:47

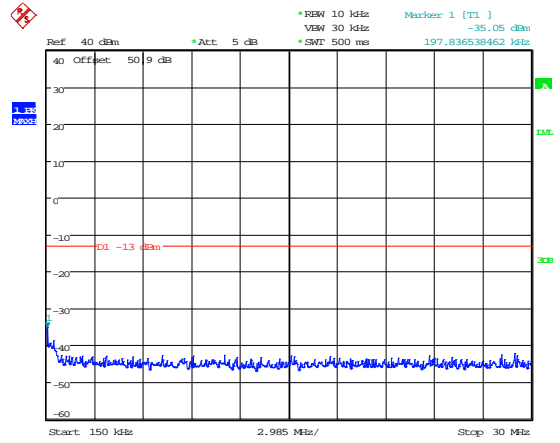
2 Signals at bottom end of band

850 MHz Intermodulation



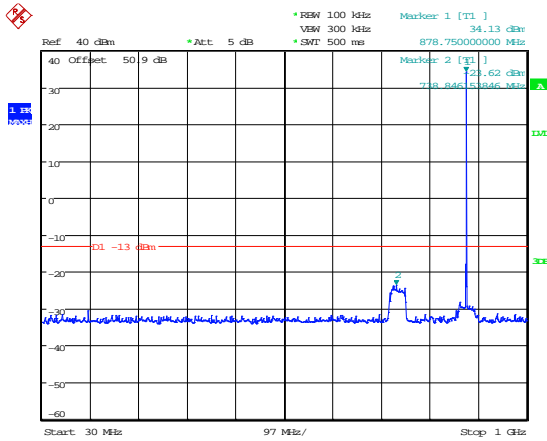
Date: 12.AUG.2014 14:52:34

9 – 150kHz



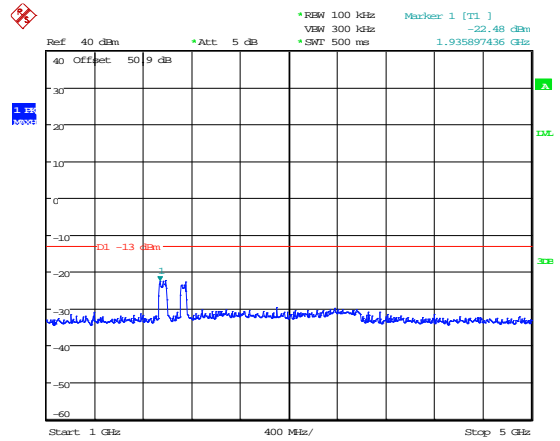
Date: 12.AUG.2014 14:53:00

150kHz – 30MHz



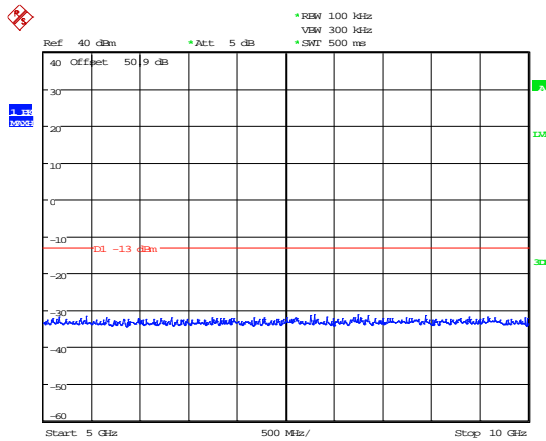
Date: 12.AUG.2014 14:53:46

30MHz – 1GHz



Date: 12.AUG.2014 14:54:16

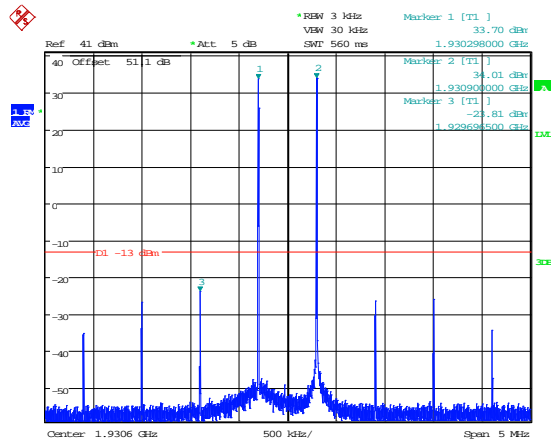
1GHz – 5GHz



Date: 12.AUG.2014 14:54:40

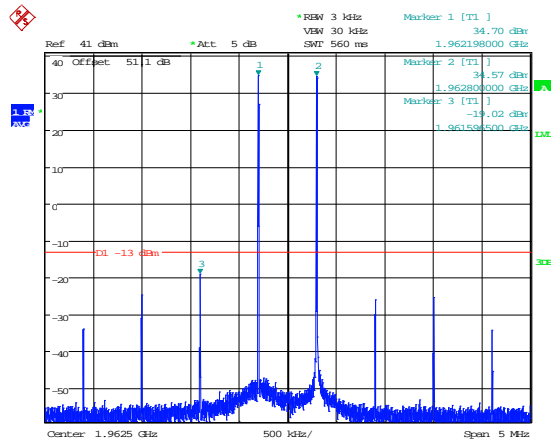
5GHz – 10GHz

1900 MHz Intermodulation close View



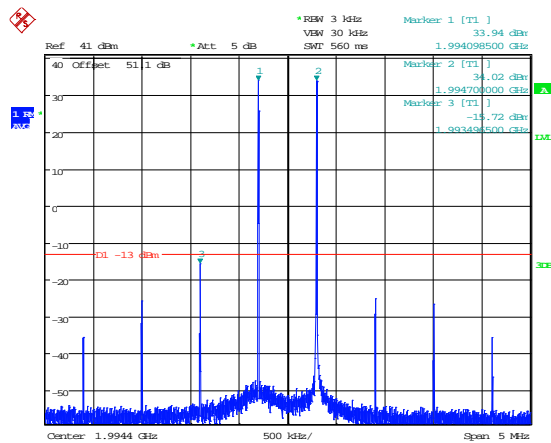
Date: 13.AUG.2014 13:52:09

2 Signals at bottom end of band



Date: 13.AUG.2014 13:57:57

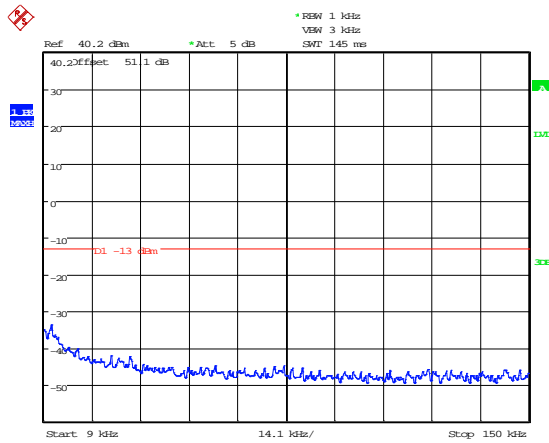
2 Signals at bottom end of band



Date: 13.AUG.2014 14:05:31

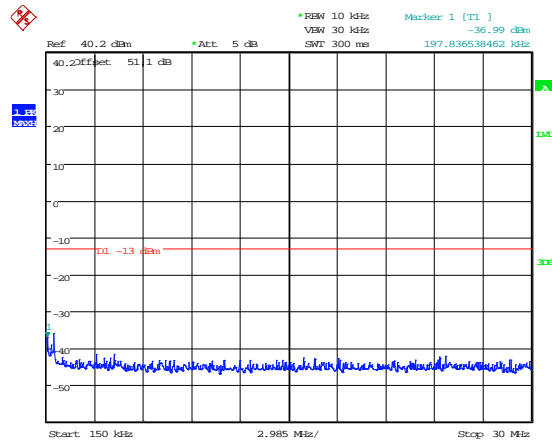
2 Signals at bottom end of band

1900 MHz Intermodulation



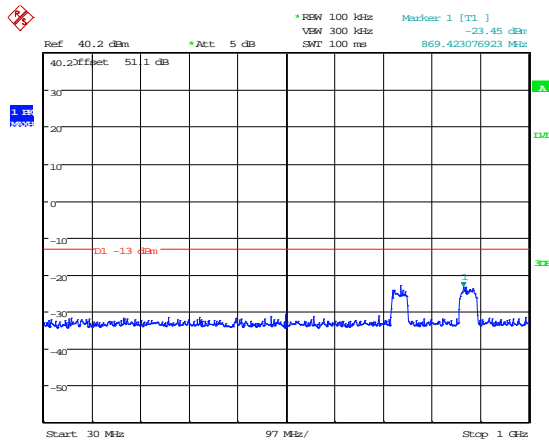
Date: 12.AUG.2014 15:22:21

9 – 150kHz



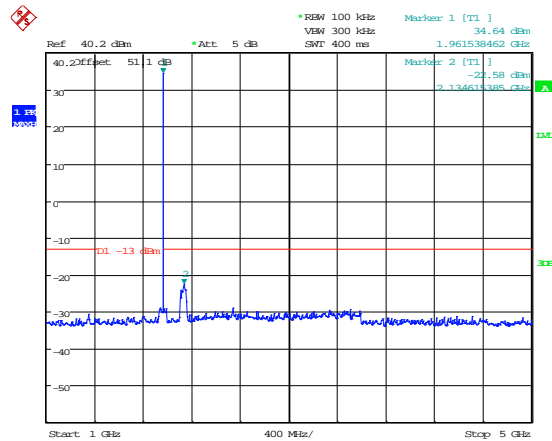
Date: 12.AUG.2014 15:22:51

150kHz – 30MHz



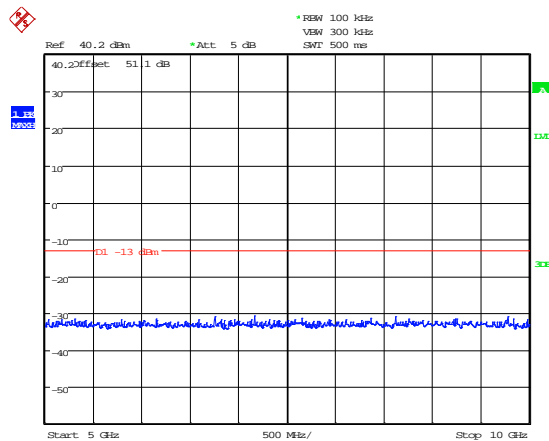
Date: 12.AUG.2014 15:23:17

30MHz – 1GHz



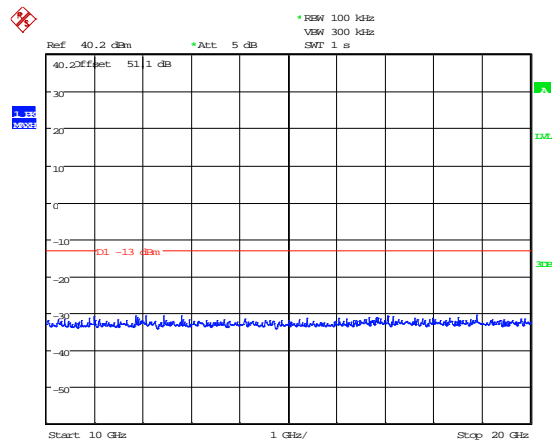
Date: 12.AUG.2014 15:23:51

1GHz – 5GHz



Date: 12.AUG.2014 15:24:12

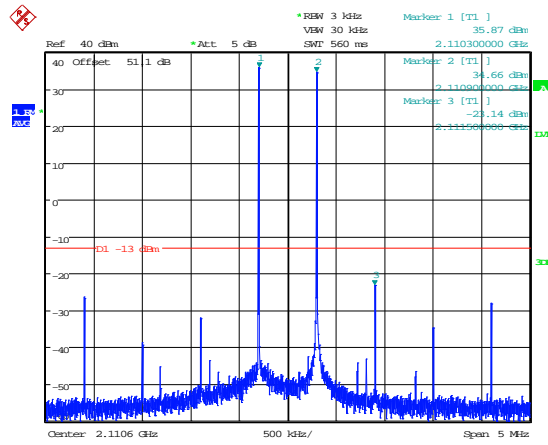
5GHz – 10GHz



Date: 12.AUG.2014 15:24:39

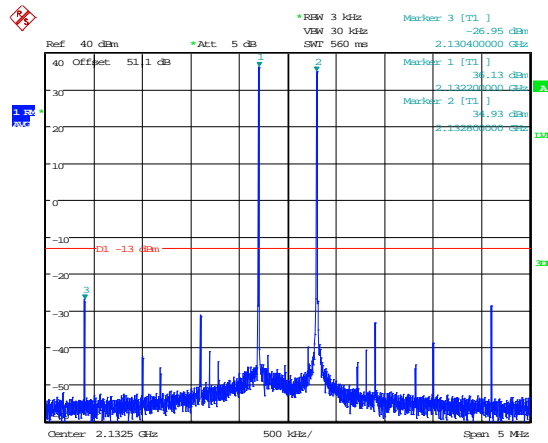
10GHz – 20GHz

2100 MHz Intermodulation close View



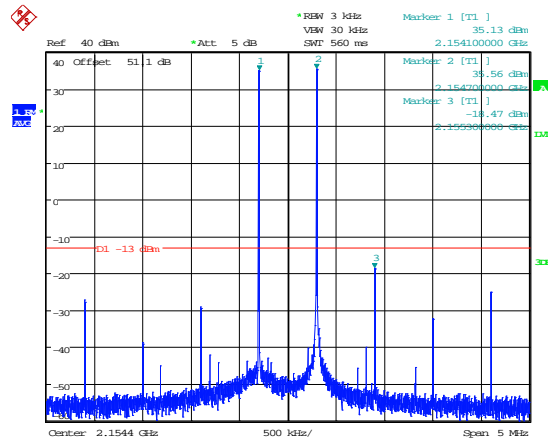
Date: 1.SEP.2014 10:00:31

2 Signals at bottom end of band



Date: 1.SEP.2014 09:56:13

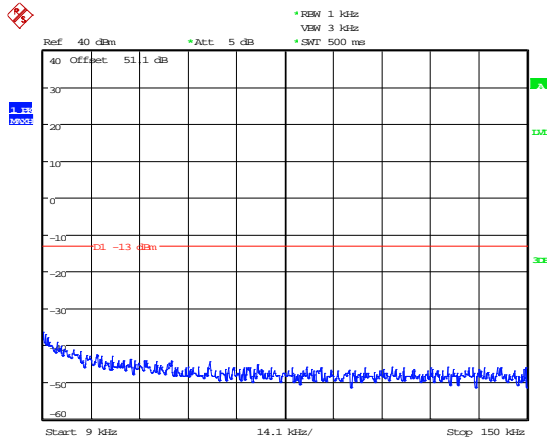
2 Signals at bottom end of band



Date: 1.SEP.2014 10:06:21

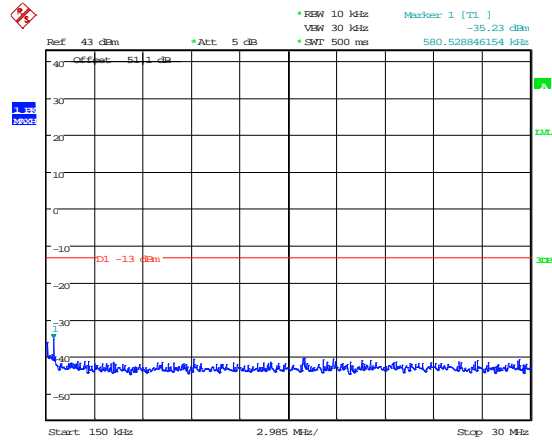
2 Signals at bottom end of band

2100 MHz Intermodulation



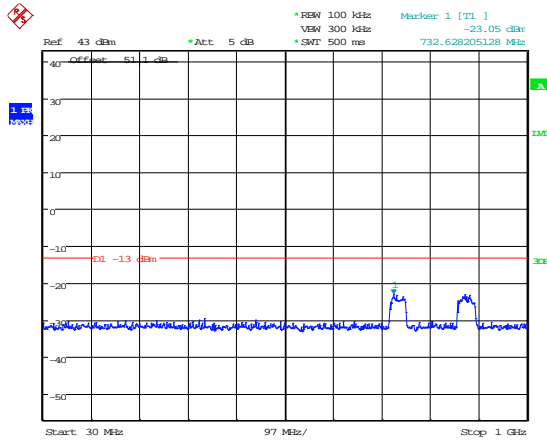
Date: 1.SEP.2014 10:19:49

9 – 150kHz



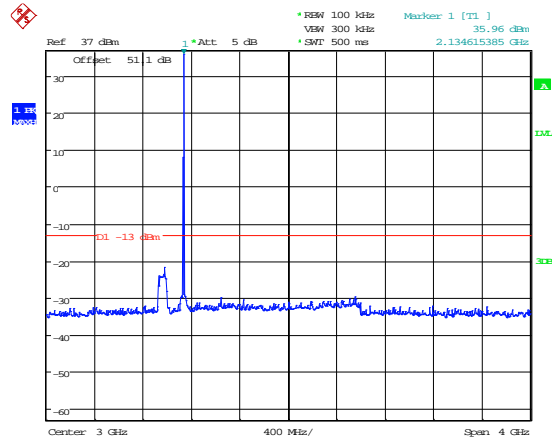
Date: 1.SEP.2014 10:23:38

150kHz – 30MHz



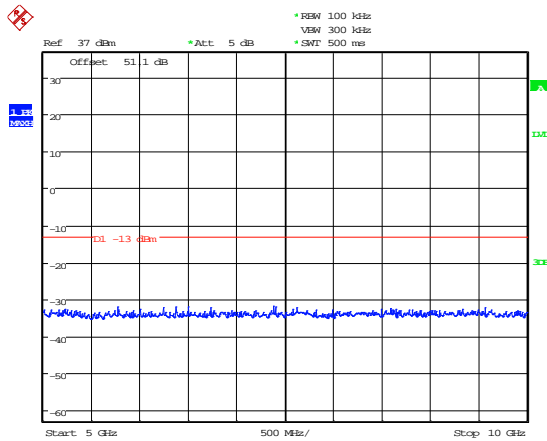
Date: 1.SEP.2014 10:22:26

30MHz – 1GHz



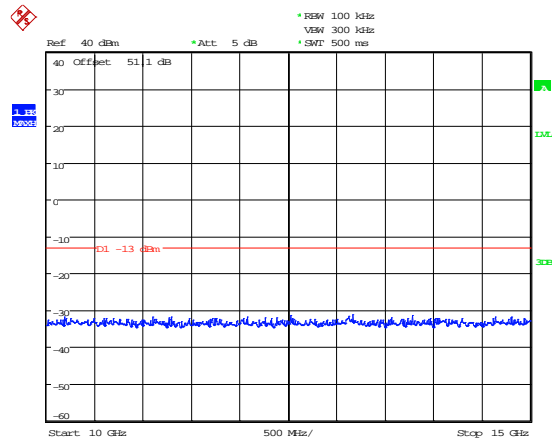
Date: 1.SEP.2014 10:13:09

1GHz – 5GHz



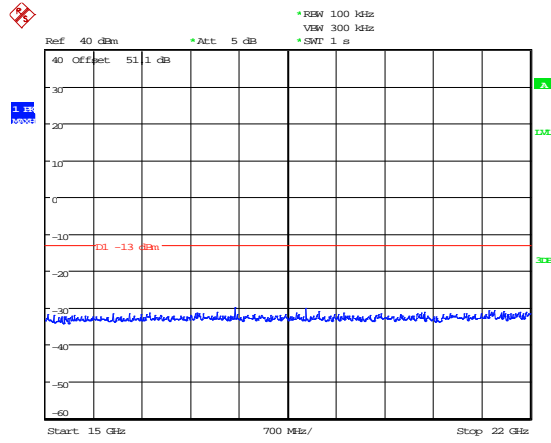
Date: 1.SEP.2014 10:13:39

5GHz – 10GHz



Date: 1.SEP.2014 10:18:33

10GHz – 15GHz



Date: 1.SEP.2014 10:19:14

15GHz – 22GHz

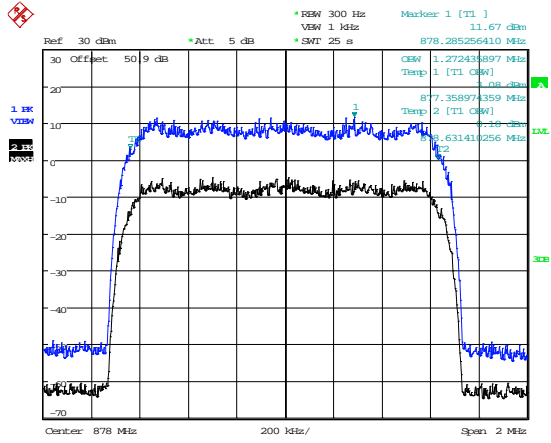
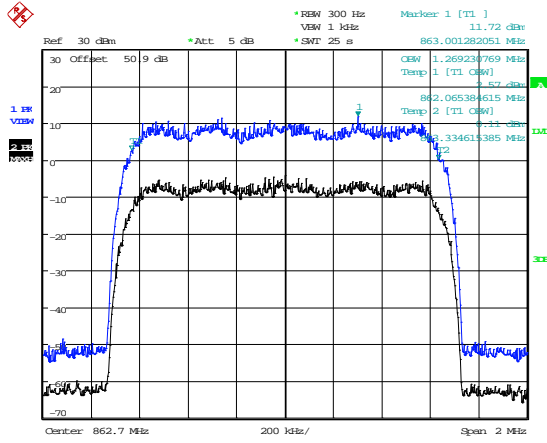
B3 Amplifier Modulated Channel Test

Test Details:	
Measurement standard	D.3 Policies + Procedures (j) of KDB 935210 D02 Signal Boosters Certification v02
EUT sample number	S01 & S02
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C

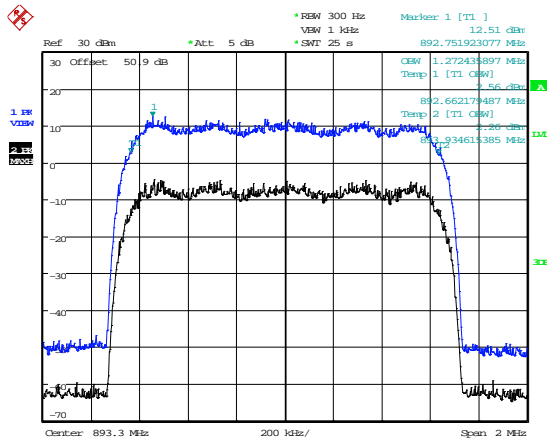
Frequency Of Operation Channel	Modulation Type				
	CDMA	GSM	WCDMA	LTE 1.4 MHz	LTE 20.0 MHz
728.000	N/A	N/A	N/A	1.089MHz	17.825MHz
742.000	N/A	N/A	N/A	1.089MHz	17.868MHz
756.000	N/A	N/A	N/A	1.089MHz	17.828MHz
862.000	1.269MHz	245.192kHz	4.173MHz	1.092MHz	17.828MHz
878.000	1.272MHz	245.192kHz	4.173MHz	1.092MHz	17.828MHz
894.000	1.272MHz	248.397kHz	4.173MHz	1.089MHz	17.748MHz
1930.000	1.272MHz	248.397kHz	4.173MHz	1.089MHz	17.828MHz
1962.500	1.269MHz	248.397kHz	4.173MHz	1.089MHz	17.828MHz
1995.000	1.266MHz	248.397kHz	4.153MHz	1.089MHz	17.828MHz
2110.000	1.269MHz	N/A	4.173MHz	1.092MHz	17.828MHz
2132.500	1.269MHz	N/A	4.182MHz	1.089MHz	17.828MHz
2155.000	1.272MHz	N/A	4.182MHz	1.089MHz	17.788MHz

Waveforms applied to selected bands as requested.

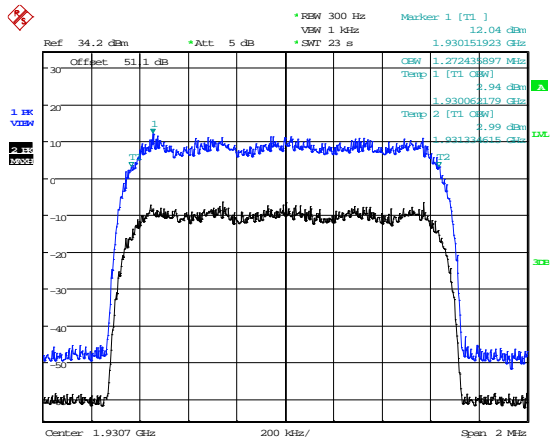
CDMA Modulation



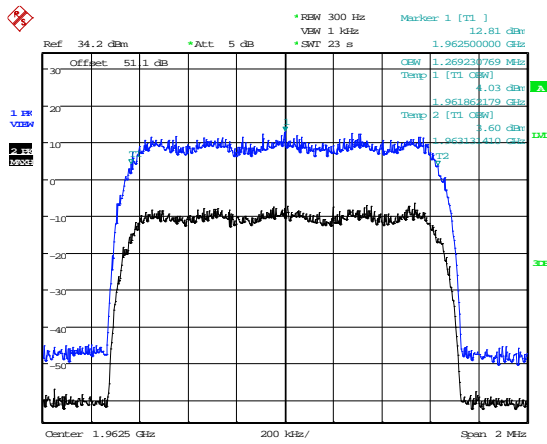
862.0 MHz



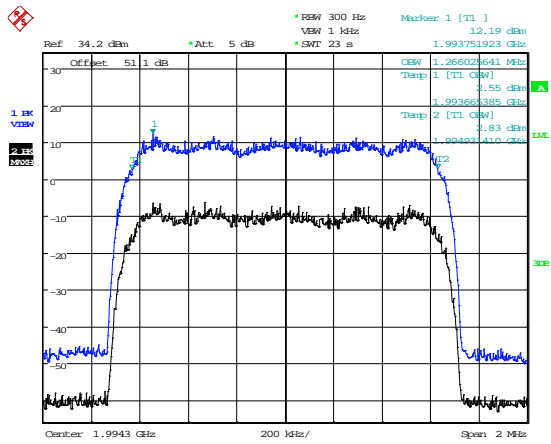
878.0 MHz



894.0 MHz



1930.0 MHz

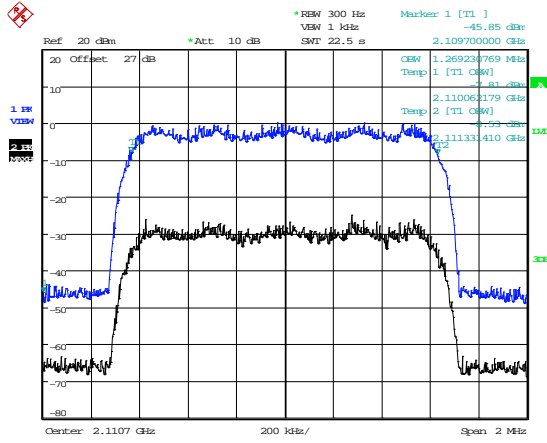


1962.5 MHz

1995.0 MHz

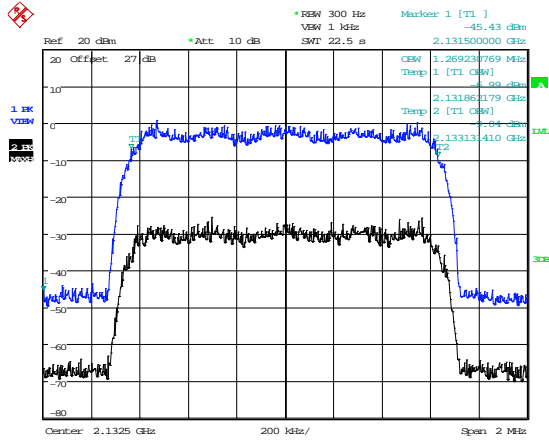
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

CDMA Modulation



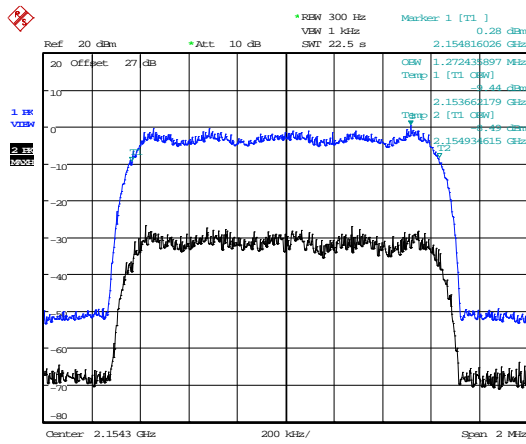
Date: 23.OCT.2013 15:54:00

2110.0 MHz



Date: 23.OCT.2013 15:58:05

2132.5 MHz

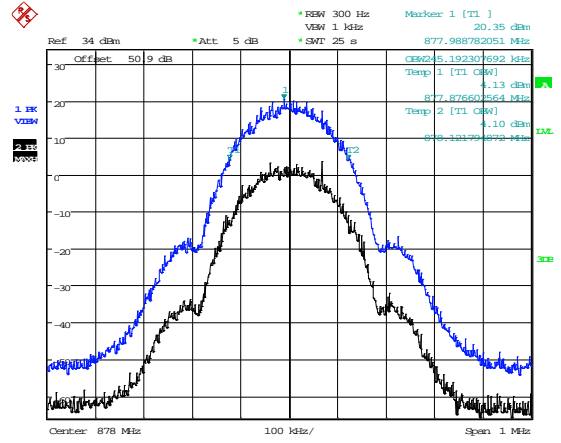
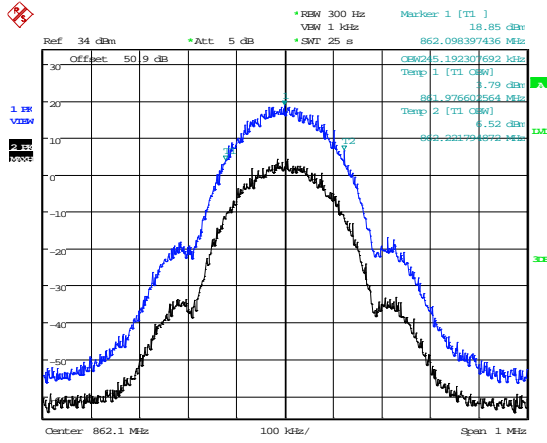


Date: 23.OCT.2013 16:13:43

2155.0 MHz

The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

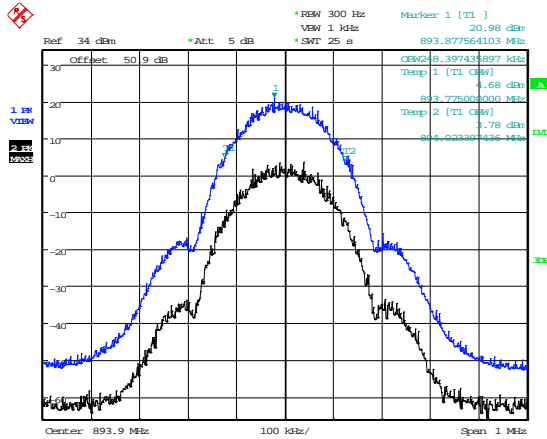
GSM Modulation



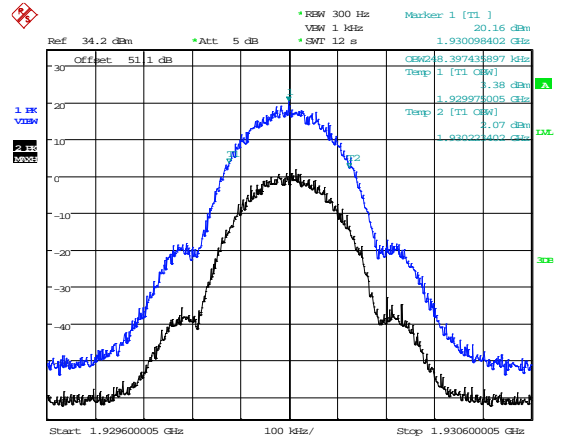
Date: 30.JUL.2014 14:51:43

Date: 30.JUL.2014 14:58:03

862.0 MHz



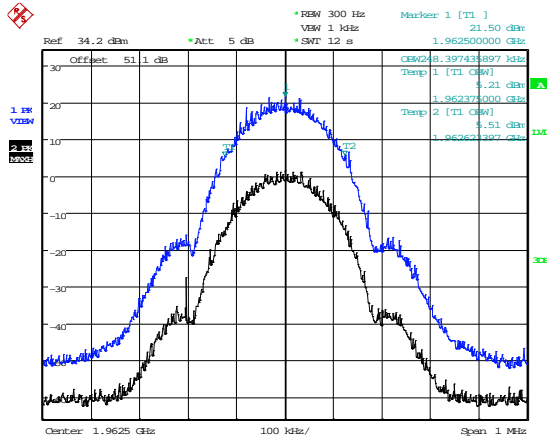
878.0 MHz



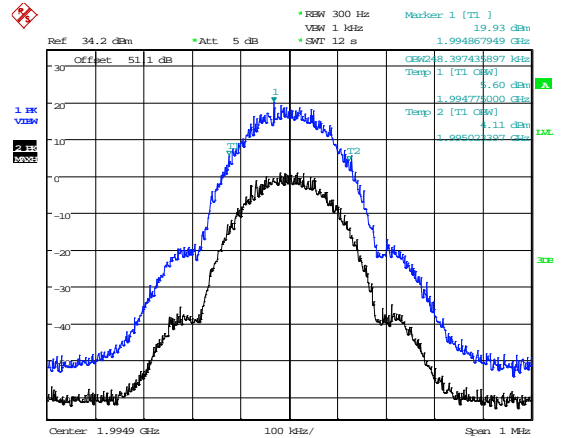
Date: 30.JUL.2014 15:21:00

Date: 31.JUL.2014 08:47:46

894.0 MHz



1930.0 MHz



Date: 31.JUL.2014 08:54:21

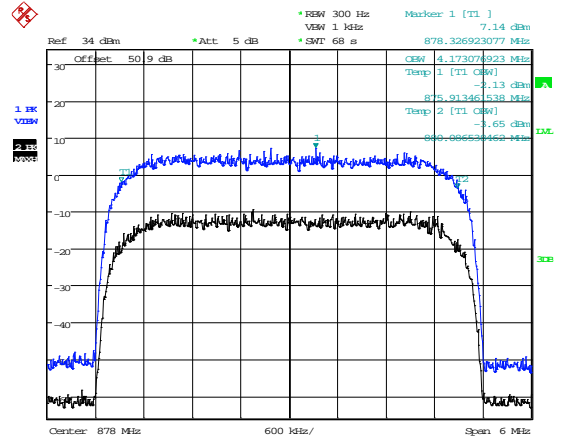
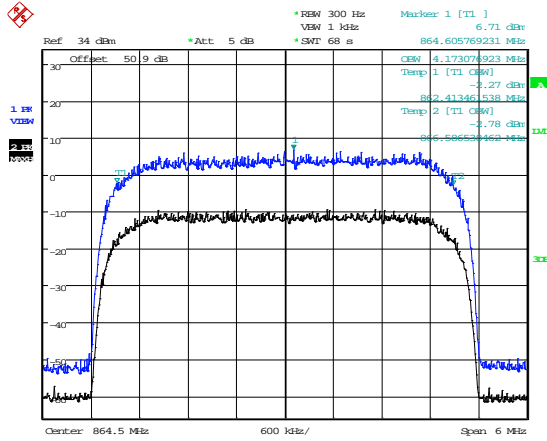
Date: 31.JUL.2014 09:01:55

1962.5 MHz

1995.0 MHz

The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

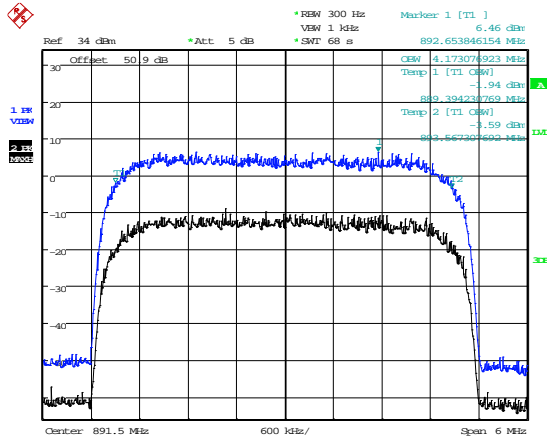
WCDMA Modulation



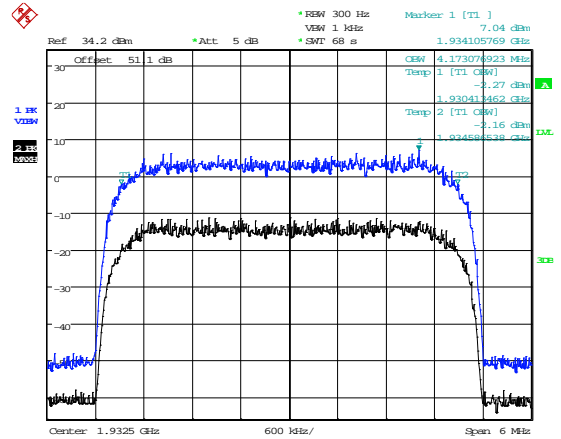
Date: 30.JUL.2014 15:42:15

Date: 30.JUL.2014 15:49:31

862.0 MHz



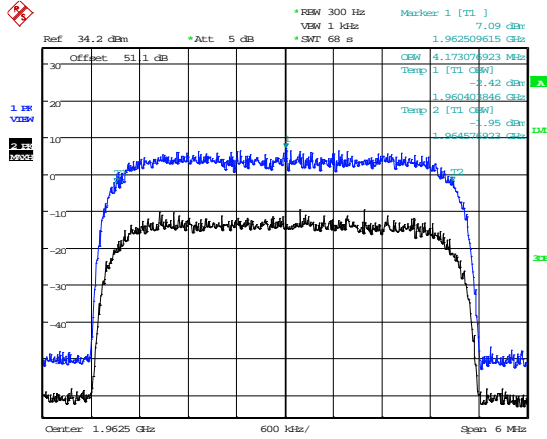
878.0 MHz



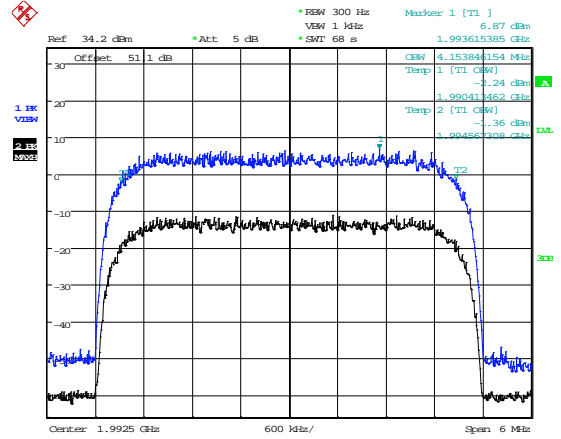
Date: 30.JUL.2014 15:56:36

Date: 30.JUL.2014 16:18:30

894.0 MHz



1930.0 MHz



Date: 30.JUL.2014 16:30:01

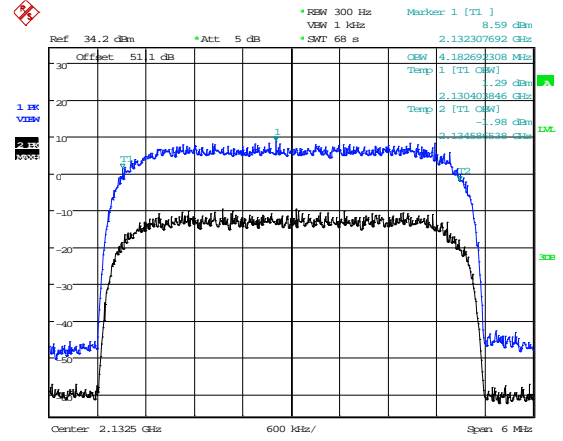
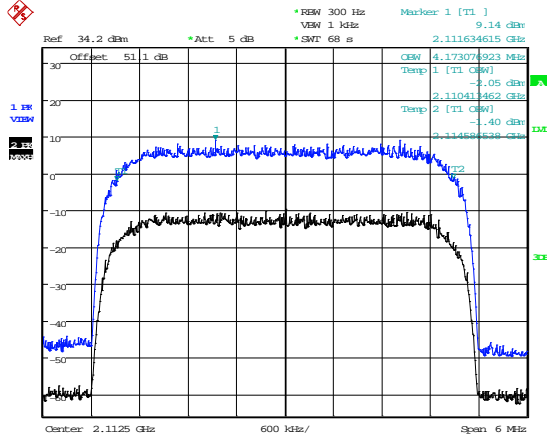
Date: 30.JUL.2014 16:40:20

1962.5 MHz

1995.0 MHz

The above plots depicting the output wavelshape show no measurable distortion visible when compared to the input signal.

WCDMA Modulation

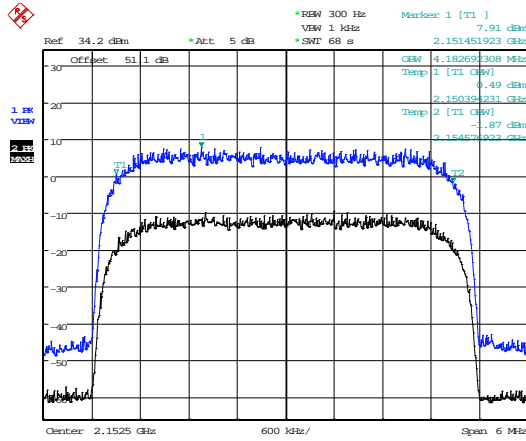


Date: 31.JUL.2014 10:26:48

Date: 31.JUL.2014 10:35:27

2110.0 MHz

2132.5 MHz

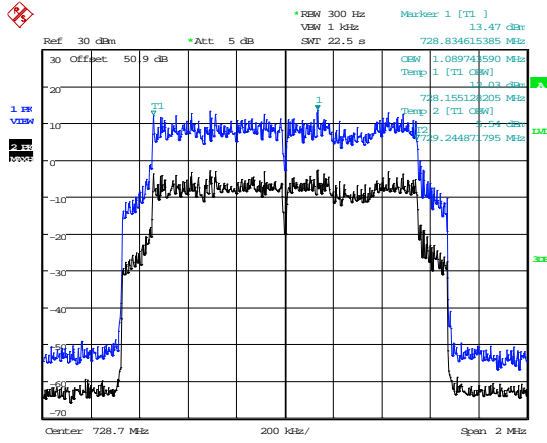


Date: 31.JUL.2014 10:43:47

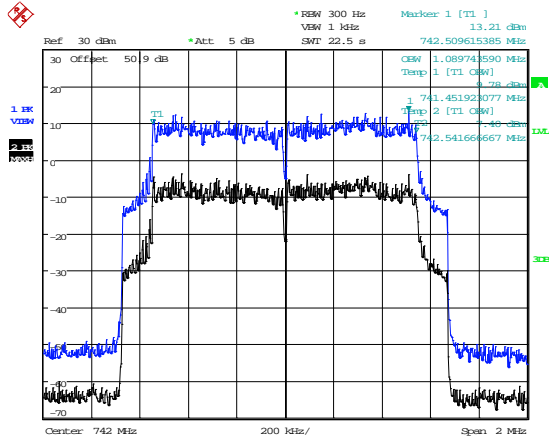
2155.0 MHz

The above plots depicting the output wavelshape show no measurable distortion visible when compared to the input signal.

1.4 MHz LTE Modulation

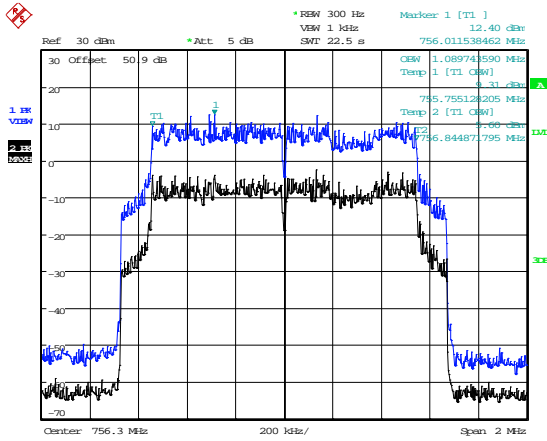


Date: 18.JUL.2014 10:12:20



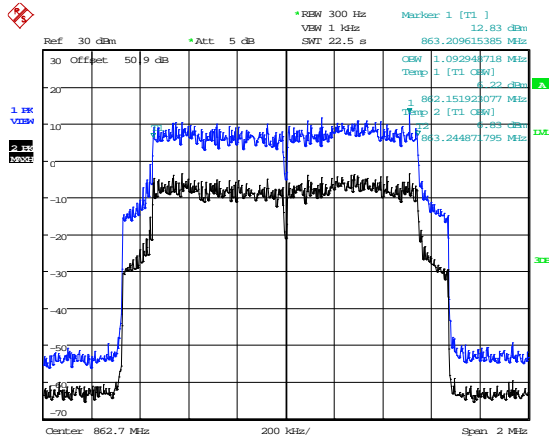
Date: 18.JUL.2014 11:57:23

728.0 MHz



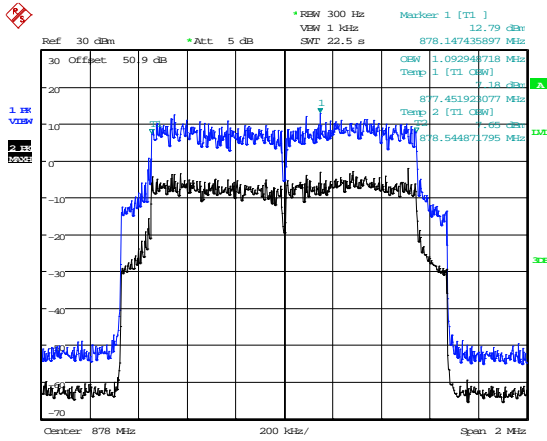
Date: 18.JUL.2014 10:32:32

742.0 MHz



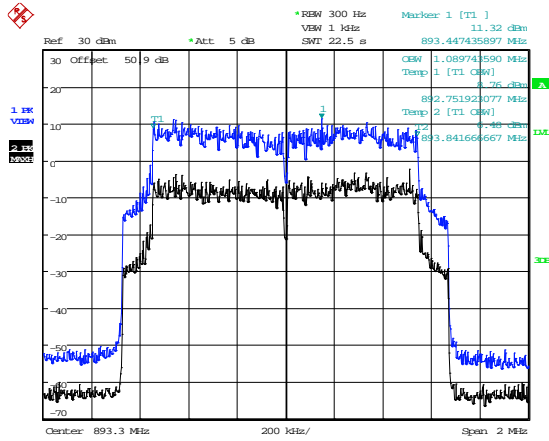
Date: 18.JUL.2014 12:14:14

756.0 MHz



Date: 18.JUL.2014 12:20:58

862.0 MHz



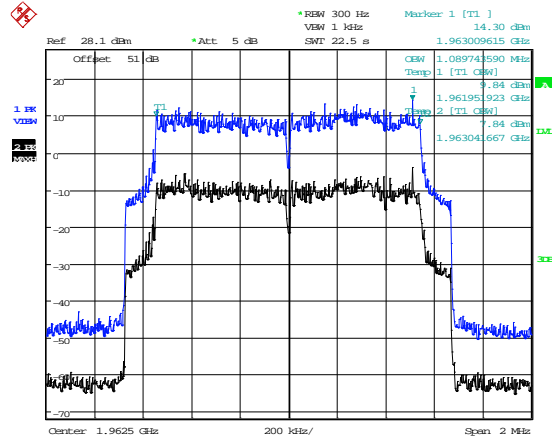
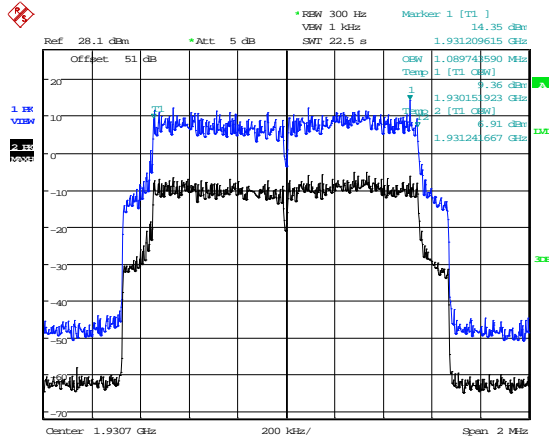
Date: 18.JUL.2014 12:25:00

878.0 MHz

894.0 MHz

The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

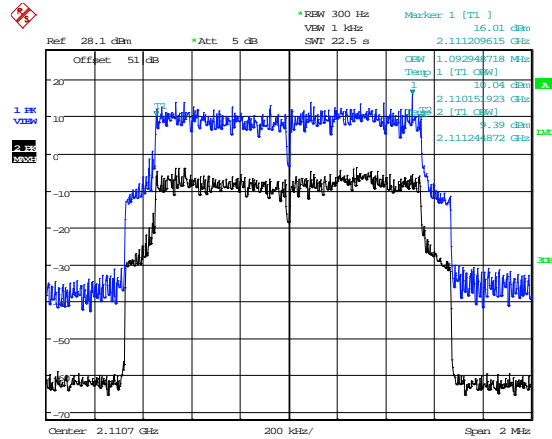
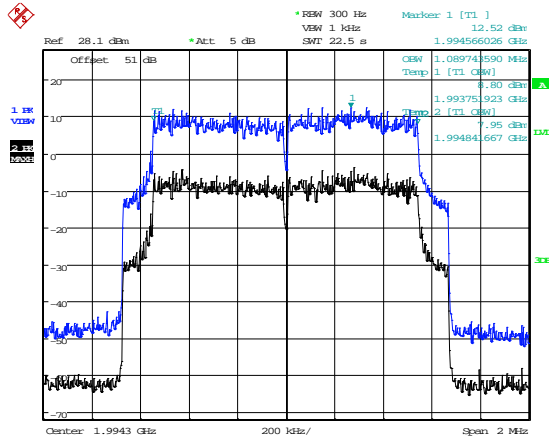
1.4 MHz LTE Modulation



Date: 18.JUL.2014 14:12:35

Date: 18.JUL.2014 14:15:56

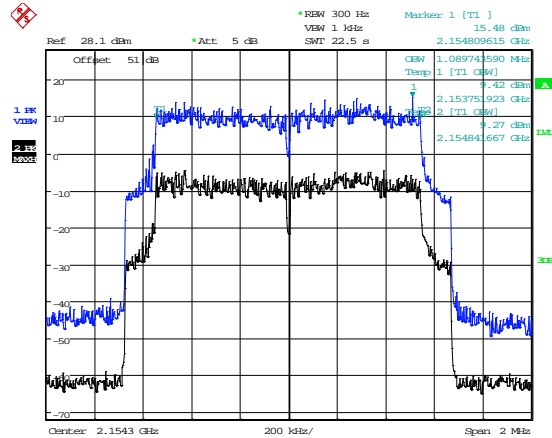
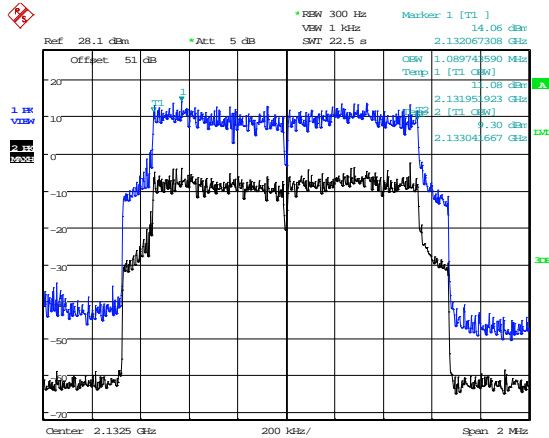
1930.0 MHz



Date: 18.JUL.2014 14:19:29

Date: 18.JUL.2014 15:10:53

1995.0 MHz



Date: 21.JUL.2014 09:05:50

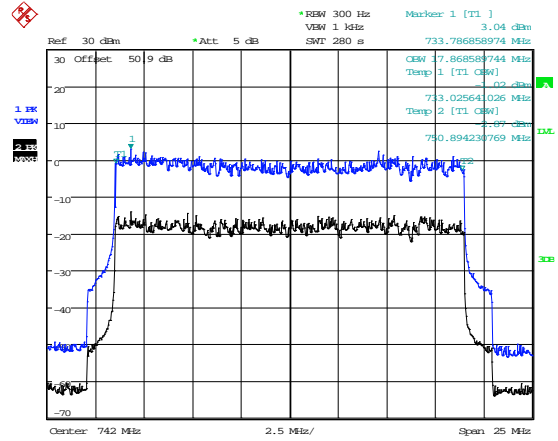
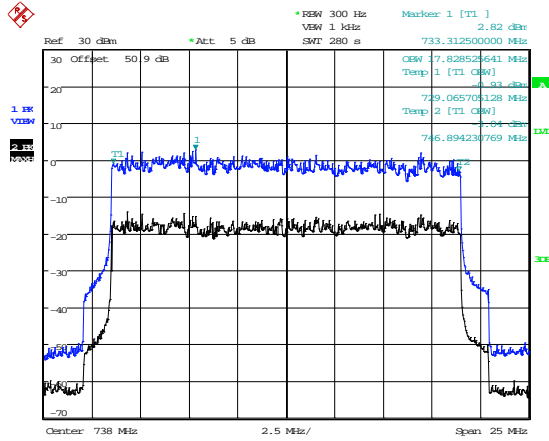
Date: 18.JUL.2014 15:18:50

2132.5 MHz

2155.0 MHz

The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

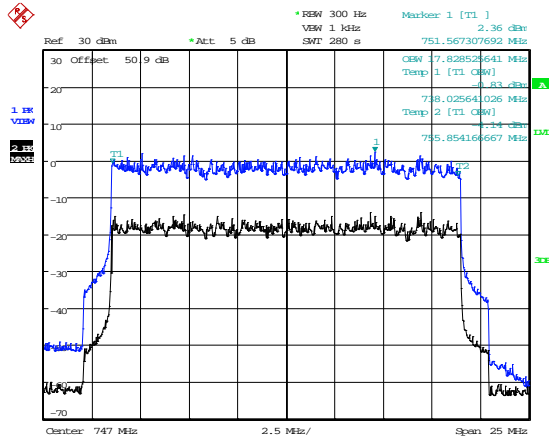
20.0 MHz LTE Modulation



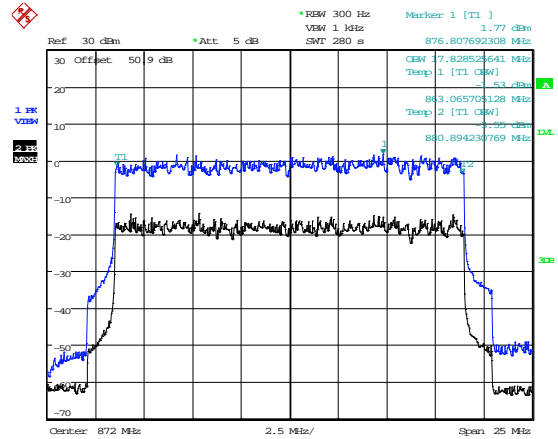
Date: 18.JUL.2014 11:11:52

Date: 18.JUL.2014 11:42:10

728.0 MHz



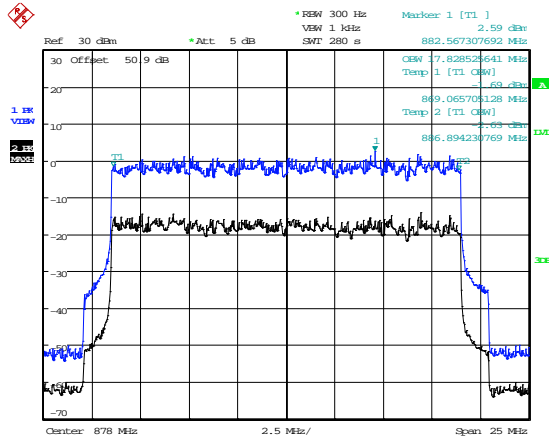
742.0 MHz



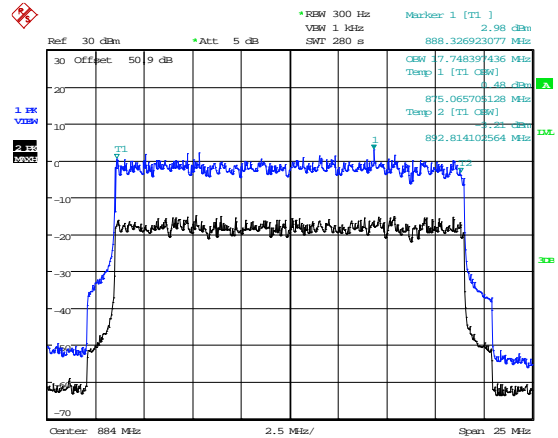
Date: 18.JUL.2014 11:53:43

Date: 18.JUL.2014 14:01:45

756.0 MHz



862.0 MHz



Date: 18.JUL.2014 13:45:09

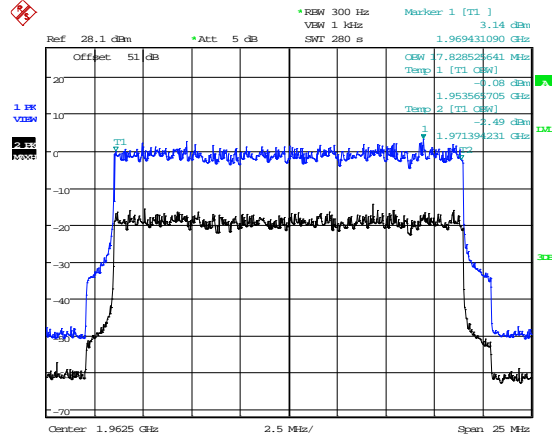
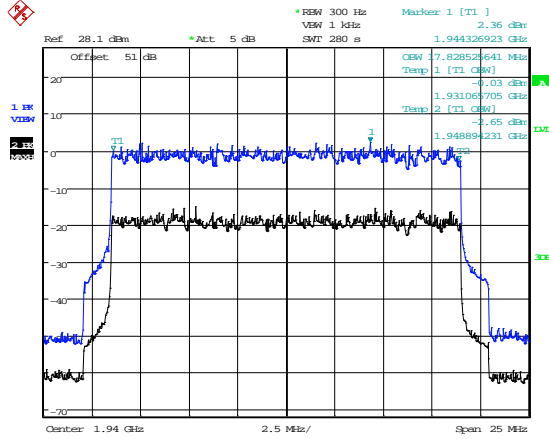
Date: 18.JUL.2014 13:32:16

878.0 MHz

894.0 MHz

The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

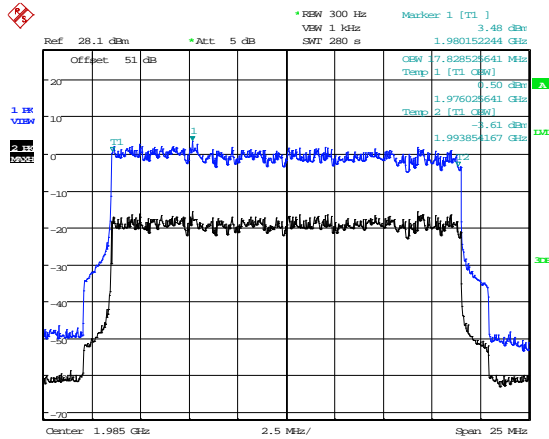
20.0 MHz LTE Modulation



Date: 18.JUL.2014 15:00:12

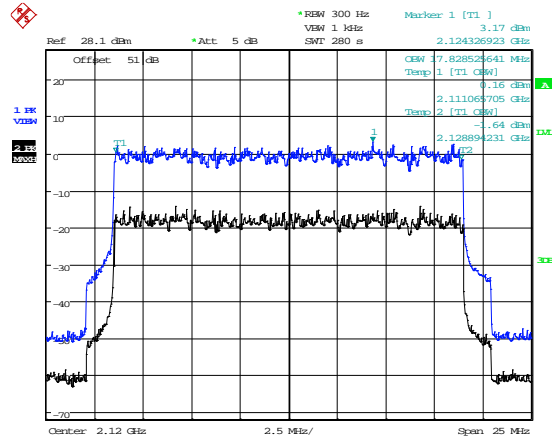
Date: 18.JUL.2014 14:49:28

1930.0 MHz



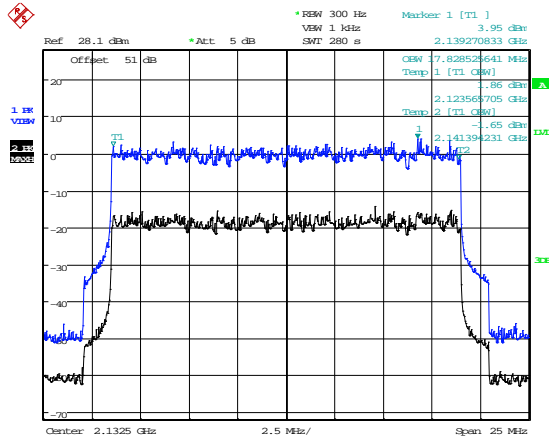
Date: 18.JUL.2014 14:37:06

1962.5 MHz



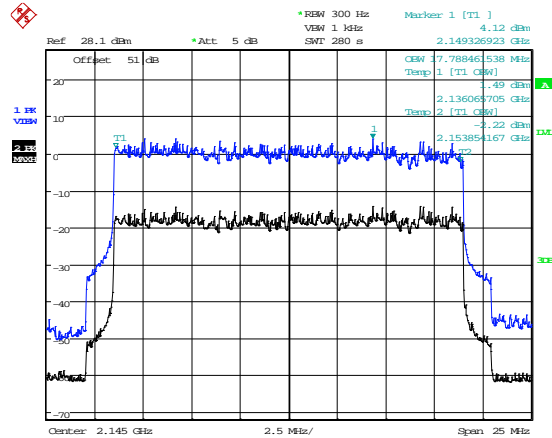
Date: 18.JUL.2014 15:46:18

1995.0 MHz



Date: 21.JUL.2014 09:27:53

2110.0 MHz



Date: 18.JUL.2014 15:30:28

2132.5 MHz

2155.0 MHz

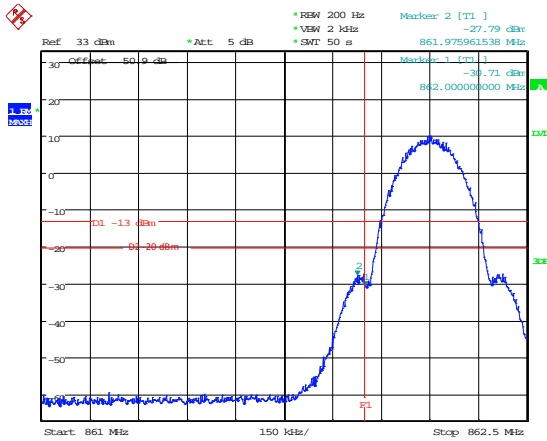
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

B4 Spurious Emissions at Antenna Terminals Less than 1MHz

Test Details:	
Measurement standard	Part 2.1053, 22.917(a), 24.238(a), 27.53(c) & (g), 90.691(a)(1) & (2)
EUT sample number	S01 & S02
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C

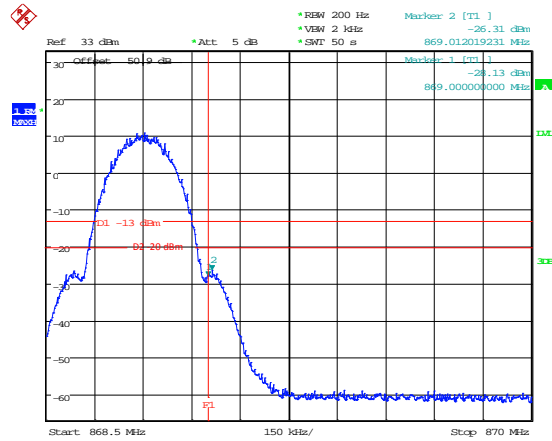
Modulation Type	Bandedge	Carrier Centre Frequency (MHz)	Max Level @ upto 1MHz from Bandedge (dBm)
GSM	SMR 800 (Sprint) Lower	862.2	-27.79
	SMR 800 (Sprint) Upper	868.8	-26.31
	850 MHz Lower	869.2	-25.62
	850 MHz Upper	893.8	-27.61
	1900 MHz Lower	1930.2	-27.64
	1900 MHz Upper	1994.8	-26.44

GSM Modulation



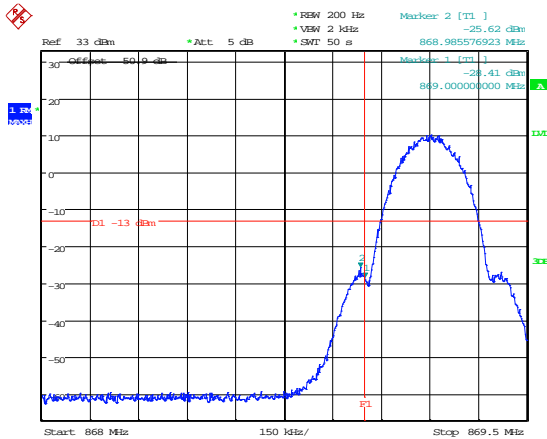
Date: 29.JUL.2014 15:03:43

862.2MHz



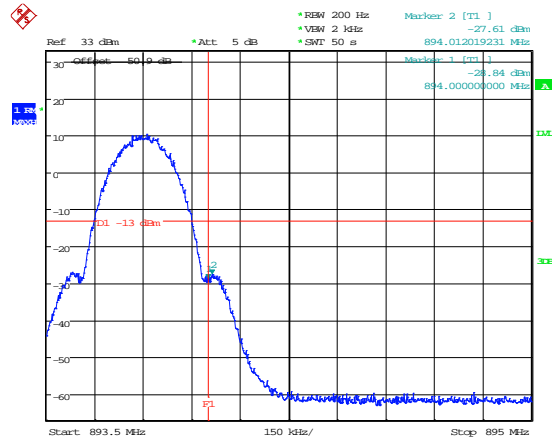
Date: 29.JUL.2014 15:00:10

868.8 MHz



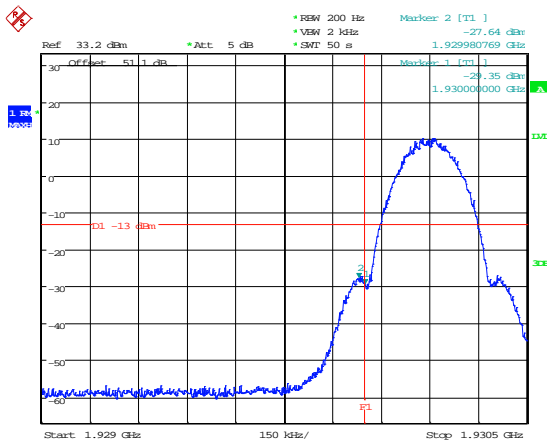
Date: 29.JUL.2014 15:08:55

896.2MHz



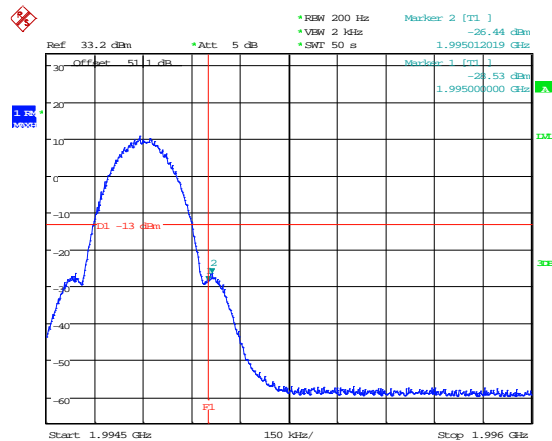
Date: 29.JUL.2014 15:13:24

893.8 MHz



Date: 29.JUL.2014 15:20:58

1930.2 MHz

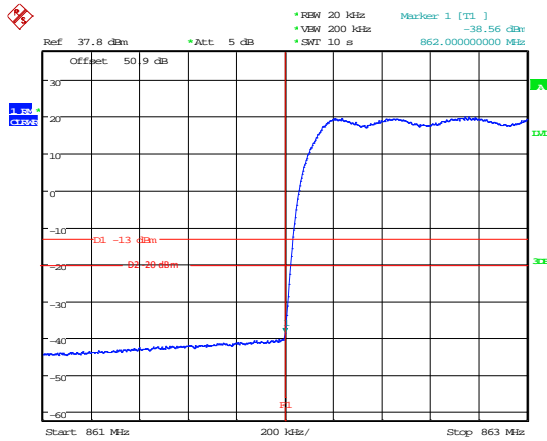


Date: 29.JUL.2014 15:29:03

1994.8 MHz

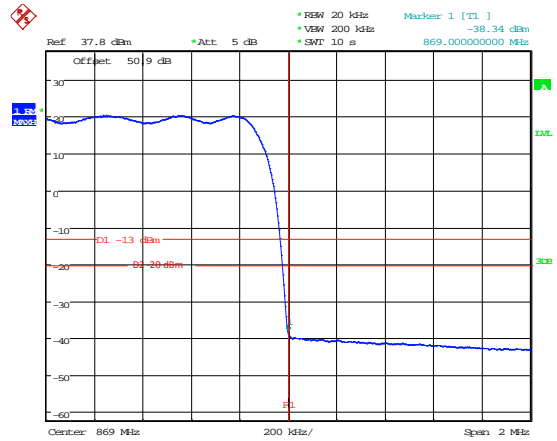
Modulation Type	Bandedge	Carrier Centre Frequency (MHz)	Max Level @ upto 1MHz from Bandedge (dBm)
CDMA	SMR 800 (Sprint) Lower	863.25	-38.56
	SMR 800 (Sprint) Upper	868.75	-38.34
	850 MHz Lower	869.25	-37.34
	850 MHz Upper	892.75	-38.85
	1900 MHz Lower	1931.25	-35.18
	1900 MHz Upper	1993.75	-36.24

CDMA Modulation



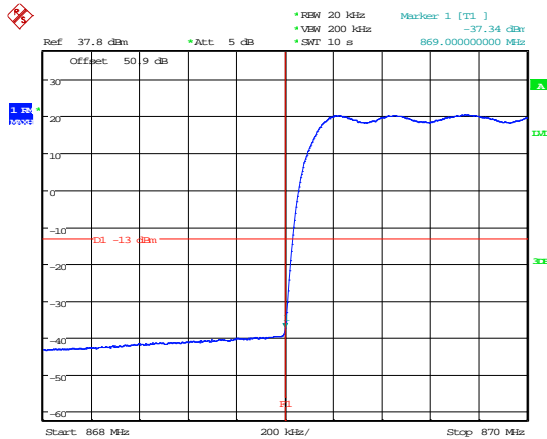
Date: 30.JUL.2014 08:55:13

863.25MHz



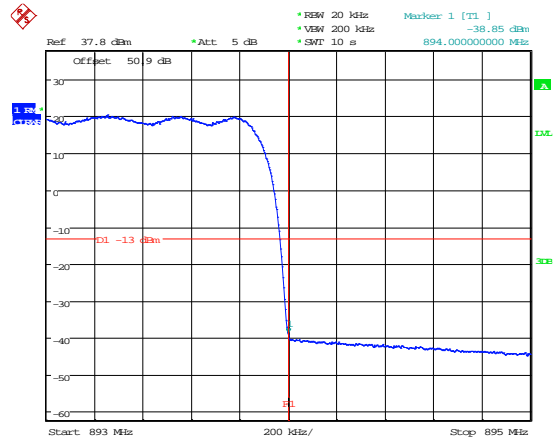
Date: 30.JUL.2014 08:49:36

868.75 MHz



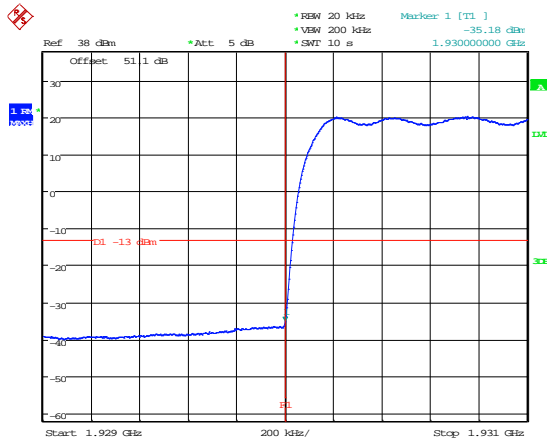
Date: 30.JUL.2014 09:04:01

869.25MHz



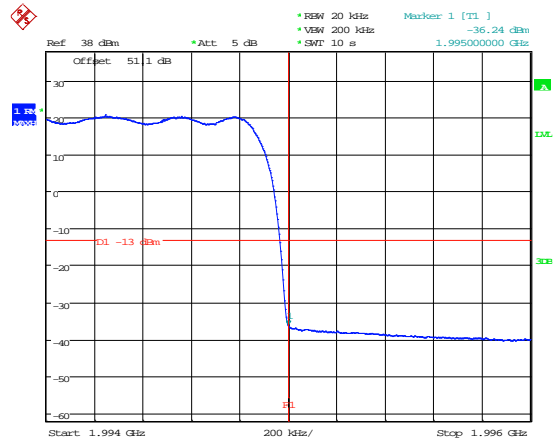
Date: 30.JUL.2014 09:07:52

892.75 MHz



Date: 30.JUL.2014 09:15:25

1931.25 MHz

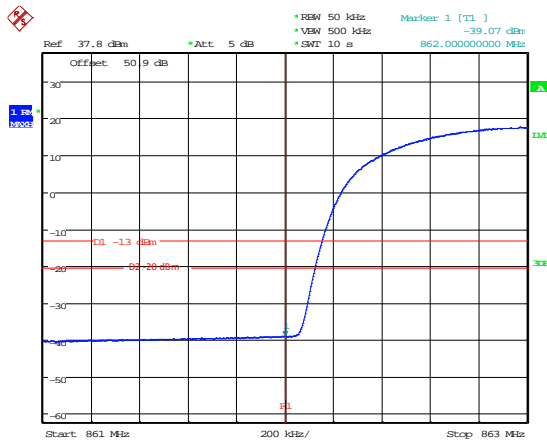


Date: 30.JUL.2014 09:19:46

1993.75 MHz

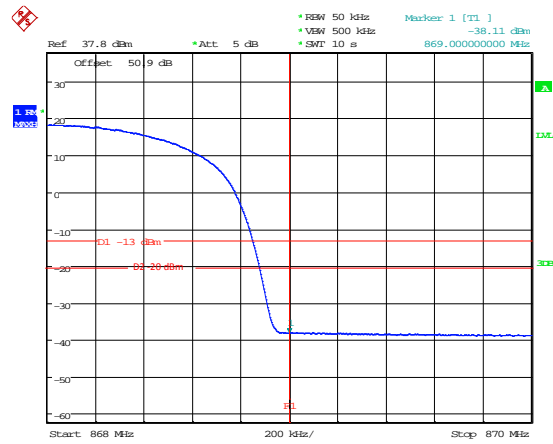
Modulation Type	Bandedge	Carrier Centre Frequency (MHz)	Max Level @ upto 1MHz from Bandedge (dBm)
WCDMA	SMR 800 (Sprint) Lower	864.5	-39.07
	SMR 800 (Sprint) Upper	866.5	-38.11
	850 MHz Lower	871.5	-38.17
	850 MHz Upper	891.5	-39.22
	1900 MHz Lower	1932.5	-36.21
	1900 MHz Upper	1992.5	-35.83
	1700 MHz (AWS) Lower	2112.5	-31.16
	1700 MHz (AWS) Upper	2152.5	-30.19

WCDMA Modulation



Date: 30.JUL.2014 10:04:52

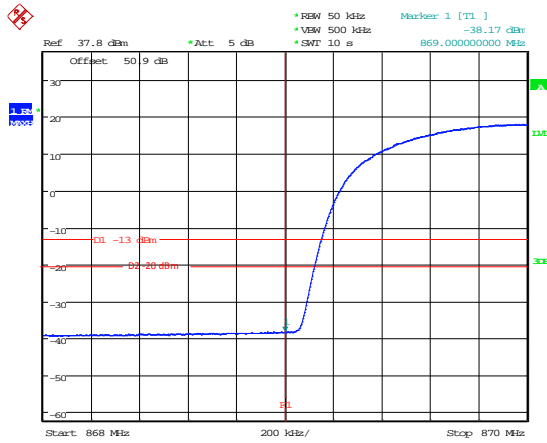
864.5 MHz



Date: 30.JUL.2014 10:06:29

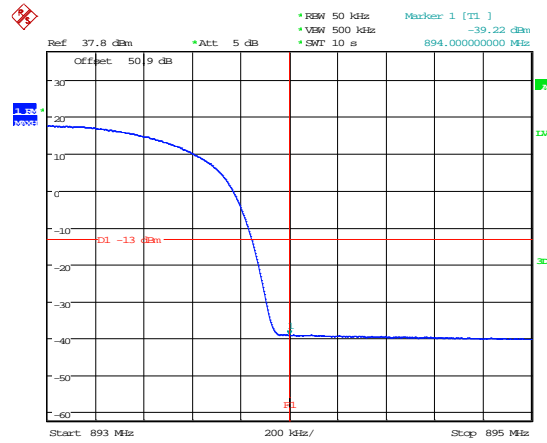
866.5 MHz

WCDMA Modulation



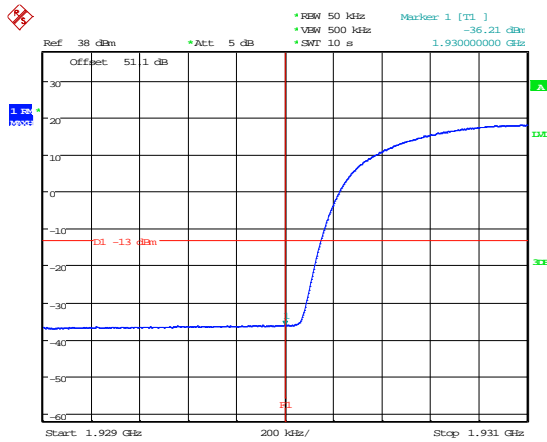
Date: 30.JUL.2014 10:07:40

871.5 MHz



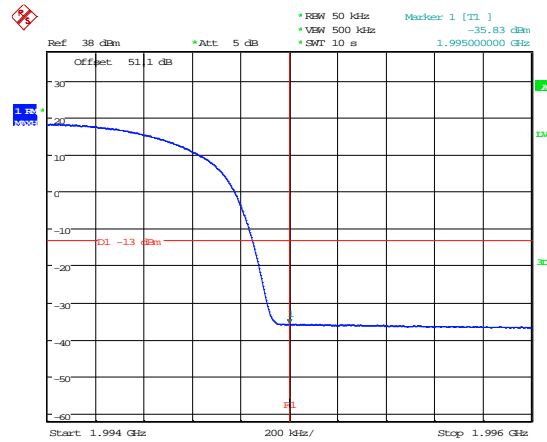
Date: 30.JUL.2014 10:09:11

891.5 MHz



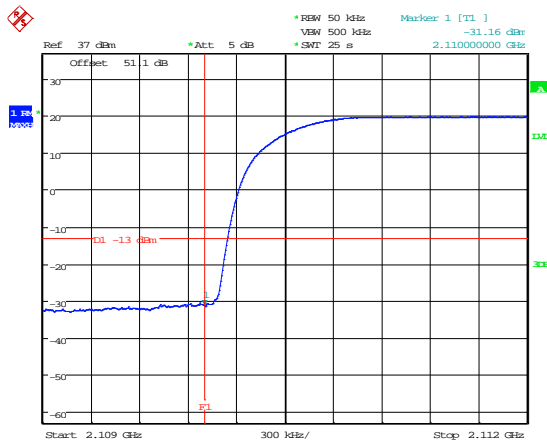
Date: 30.JUL.2014 10:11:21

1932.5 MHz



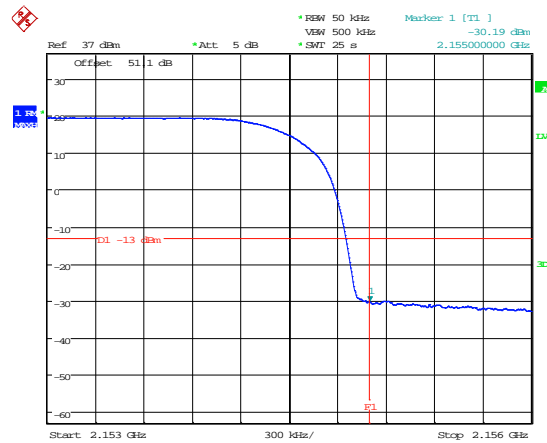
Date: 30.JUL.2014 10:12:40

1992.5 MHz



Date: 30.JUL.2014 11:43:06

2112.5 MHz

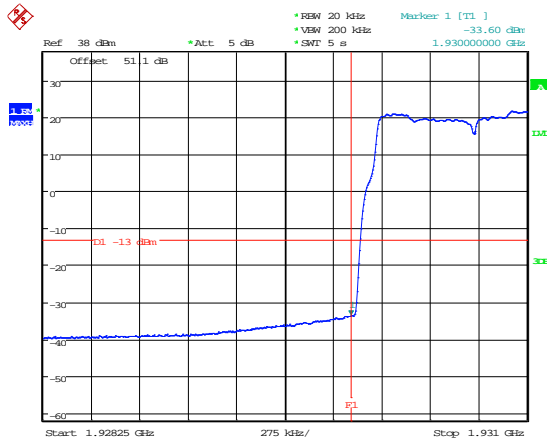


Date: 30.JUL.2014 11:48:57

2152.5 MHz

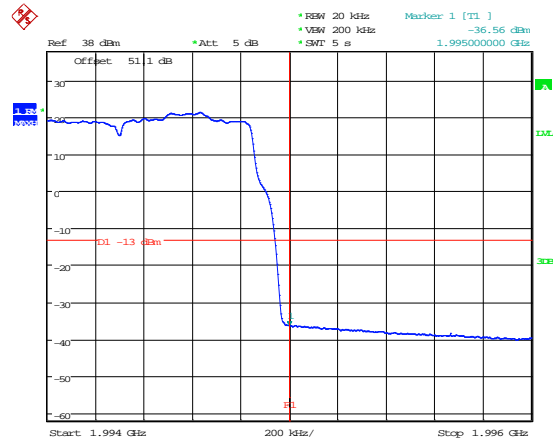
Modulation Type	Bandedge	Carrier Centre Frequency (MHz)	Max Level @ upto 1MHz from Bandedge (dBm)
LTE 1.4 MHz	700 MHz Lower	728.7	-40.18
	700 MHz Upper	755.3	-41.32
	SMR 800 (Sprint) Lower	862.7	-39.15
	SMR 800 (Sprint) Upper	868.3	-37.71
	850 MHz Lower	869.7	-38.83
	850 MHz Upper	893.3	-40.07
	1900 MHz Lower	1930.7	-33.60
	1900 MHz Upper	1994.3	-35.56
	1700 MHz (AWS) Lower	2110.7	-16.87
	1700 MHz (AWS) Upper	2154.3	-21.13

LTE 1.4 MHz Modulation



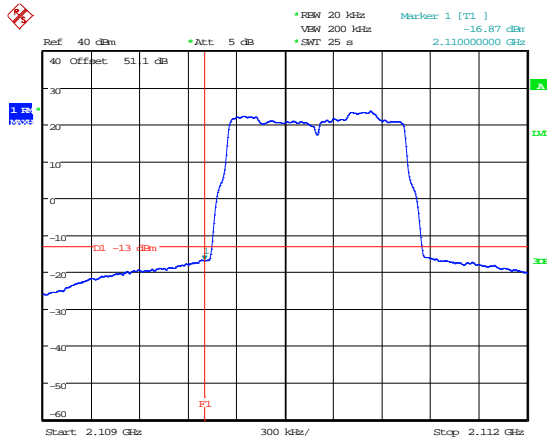
Date: 29.JUL.2014 15:42:24

1930.7 MHz



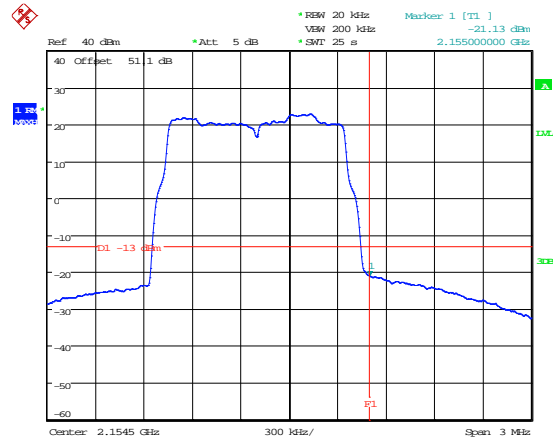
Date: 29.JUL.2014 15:44:59

1994.3 MHz



Date: 30.JUL.2014 12:12:02

2110.7 MHz



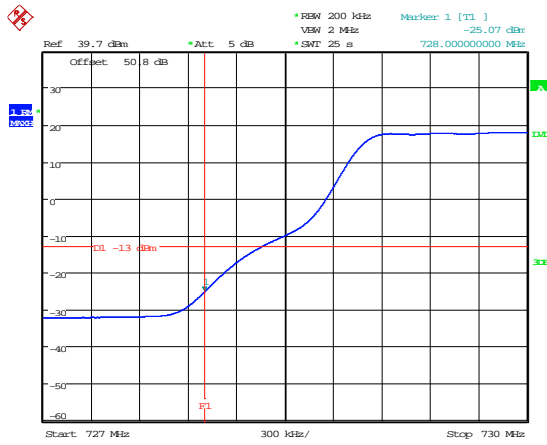
Date: 30.JUL.2014 12:14:24

2154.3 MHz

Modulation Type	Bandedge	Carrier Centre Frequency (MHz)	Max Level @ upto 1MHz from Bandedge (dBm)
LTE 20.0 MHz	700 MHz Lower	738.0	-25.07
	700 MHz Upper	746.0	-28.07
	SMR 800 (Sprint) Lower	872.0	-25.51
	SMR 800 (Sprint) Upper	866.5	-21.35
	850 MHz Lower	879.0	-24.07
	850 MHz Upper	884.0	-27.03
	1900 MHz Lower	1940.0	-23.81
	1900 MHz Upper	1985.0	-25.33
	1700 MHz (AWS) Lower	2120.0	-21.23
	1700 MHz (AWS) Upper	2145.0	-22.70

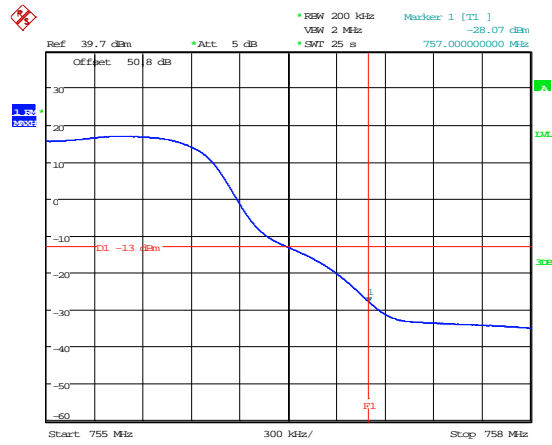
* Reduced to 5 MHz LTE to fit into 862 -869 MHz band

LTE 20 MHz Modulation



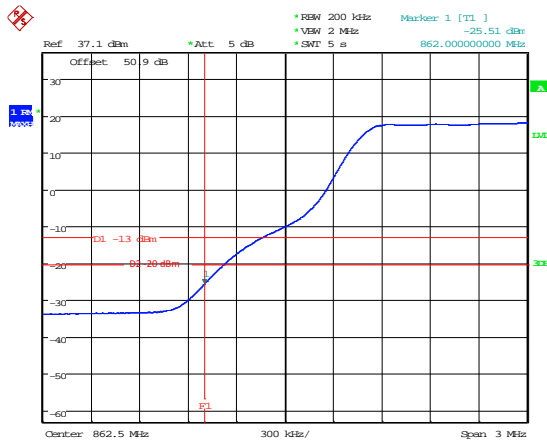
Date: 30.JUL.2014 12:21:07

738.0 MHz



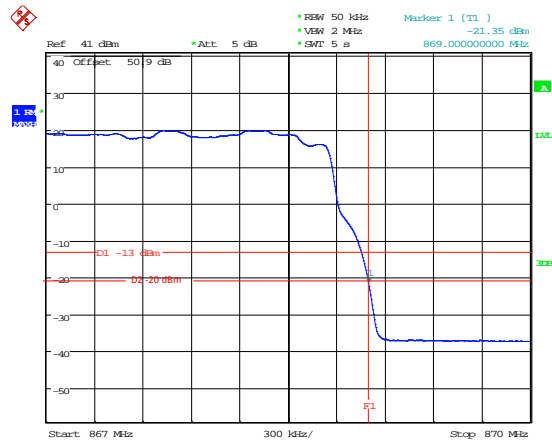
Date: 30.JUL.2014 12:23:08

746.0 MHz



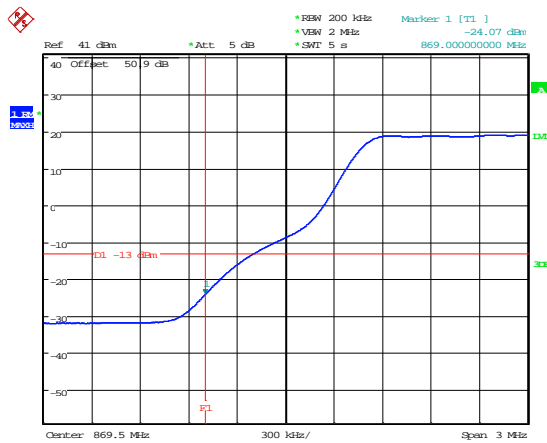
Date: 29.JUL.2014 11:55:24

866.5 MHz



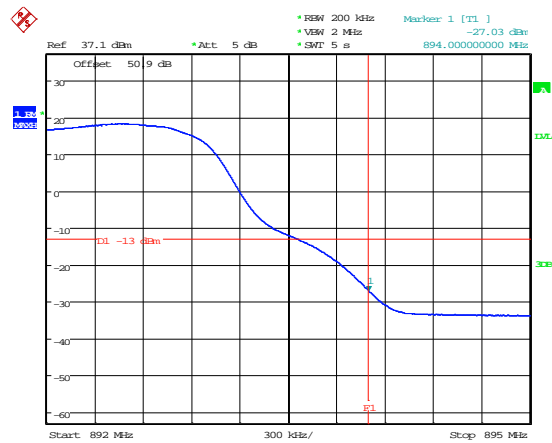
Date: 29.JUL.2014 13:26:59

872.0 MHz



Date: 29.JUL.2014 13:33:12

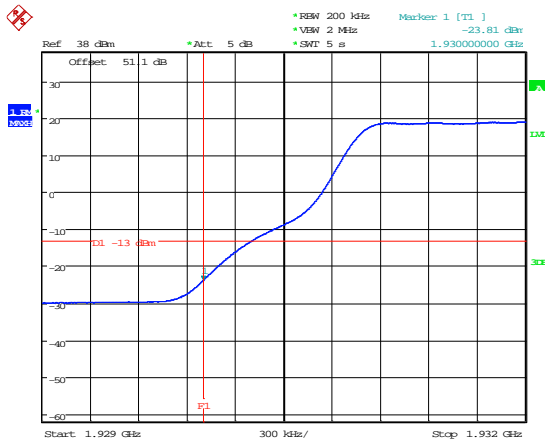
879.0 MHz



Date: 29.JUL.2014 11:58:21

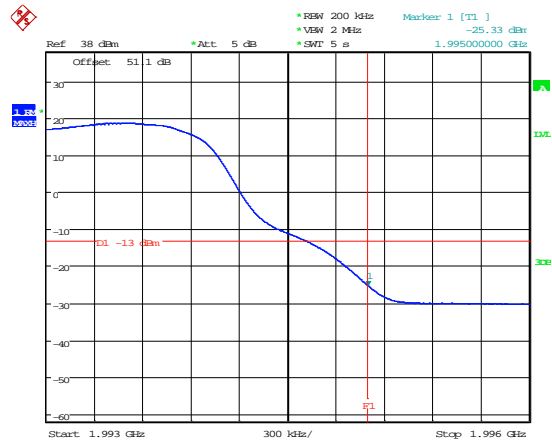
884.0 MHz

LTE 20 MHz Modulation



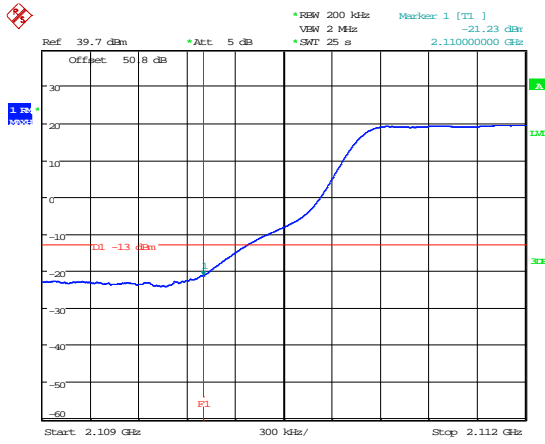
Date: 29.JUL.2014 15:51:42

1940.0 MHz



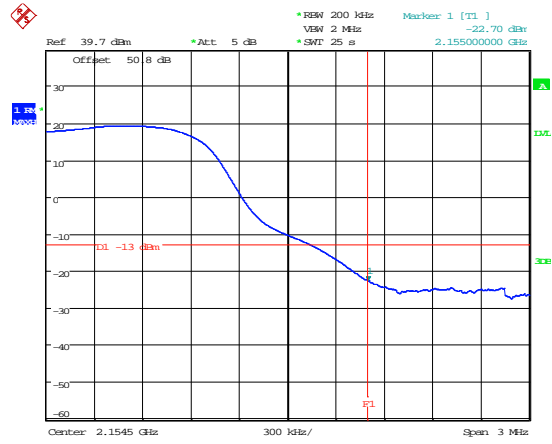
Date: 29.JUL.2014 15:54:41

1985.0 MHz



Date: 30.JUL.2014 12:25:21

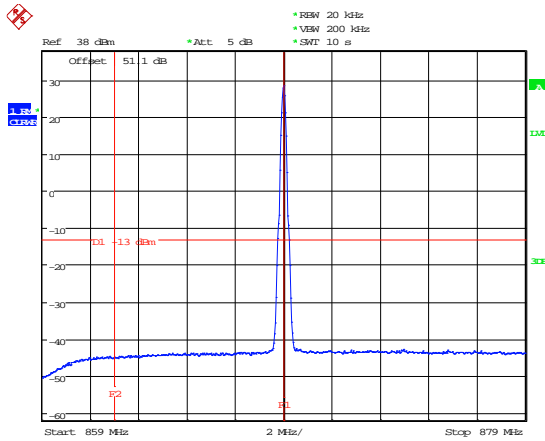
2120.0 MHz



Date: 30.JUL.2014 12:27:52

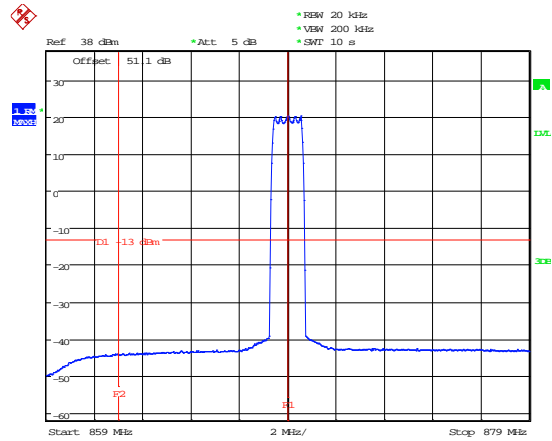
2145.0 MHz

SMR 800 (Sprint) & 850 MHz - Cross Boundary - 869.0 MHz



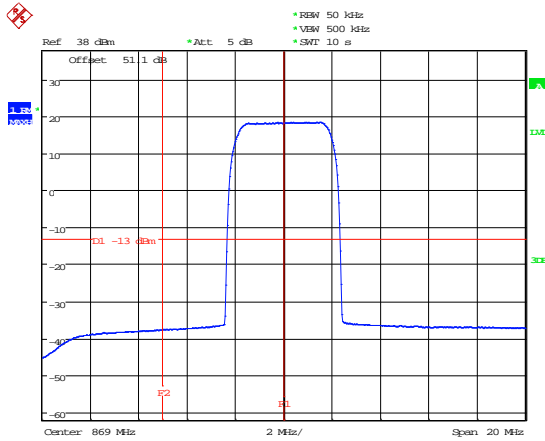
Date: 30.JUL.2014 09:37:47

GSM



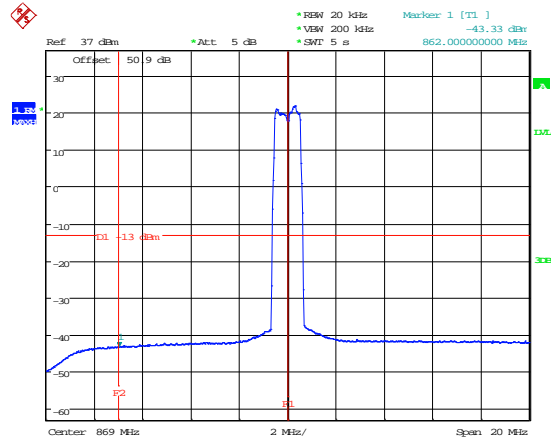
Date: 30.JUL.2014 09:28:55

CDMA



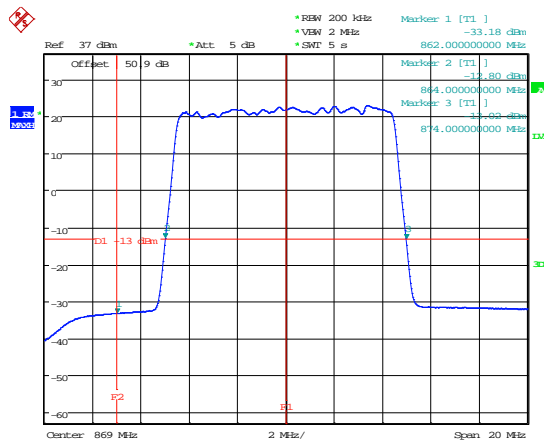
Date: 30.JUL.2014 10:18:33

WCDMA



Date: 29.JUL.2014 13:52:02

1.4 MHz LTE



Date: 29.JUL.2014 13:55:29

10 MHz LTE

B5 Spurious Emissions at Antenna Terminals Greater than 1MHz

Test Details:	
Measurement standard	Part 2.1053, 22.917(a), 24.238(a), 27.53(c) & (g), 90.691(a)(1) & (2)
EUT sample number	S01 & S02
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C

Frequency (MHz)	Frequency Range (MHz)	Freq. of Emission (MHz)	Measured Level (dBm)	Attenuator & Cable Losses (dB)	Spurious Emission Level (dBm)	Limit (dBm)
700MHz						
728.000	No Significant Emissions Within 20 dB of limit					-13
742.000						-13
756.000						-13
850 MHz						
862.000	No Significant Emissions Within 20 dB of limit					-13
878.000						-13
894.000						-13
1900 MHz						
1930.000	No Significant Emissions Within 20 dB of limit					-13
1962.500						-13
1995.000						-13
2100 MHz						
2110.000	No Significant Emissions Within 20 dB of limit					-13
2132.500						-13
2155.000						-13

Limit is determined by the outermost step of the emissions mask and is calculated as follows:

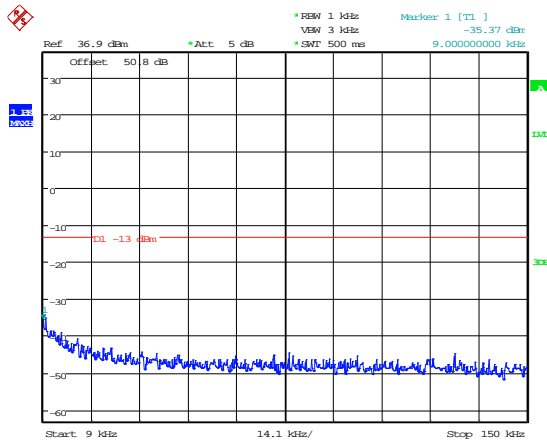
At least $43 + 10 \log P$ dB

$$(10 \log P_{\text{watts}}) - (43 + 10 \log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

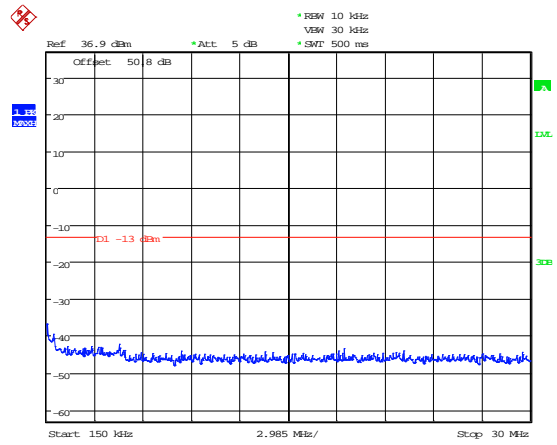
Result

The EUT was found to comply with the limits

700 MHz – 728.0 MHz



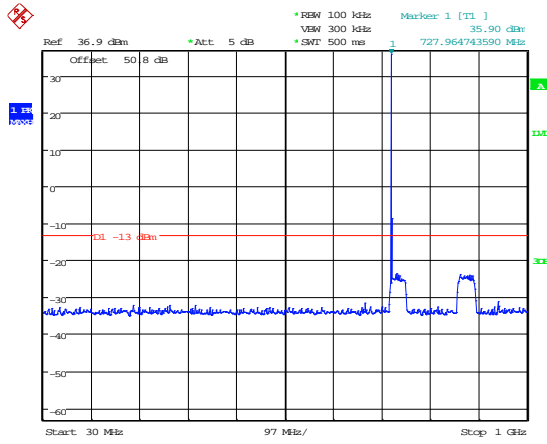
Date: 17.JUL.2014 11:49:48



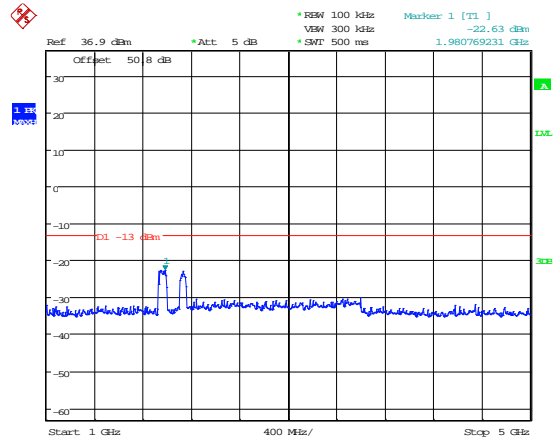
Date: 17.JUL.2014 11:50:20

9kHz - 150kHz

150kHz – 30MHz



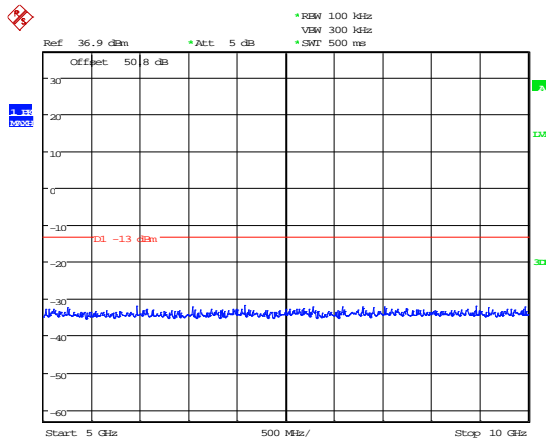
Date: 17.JUL.2014 11:48:23



Date: 17.JUL.2014 11:48:47

30MHz – 1GHz

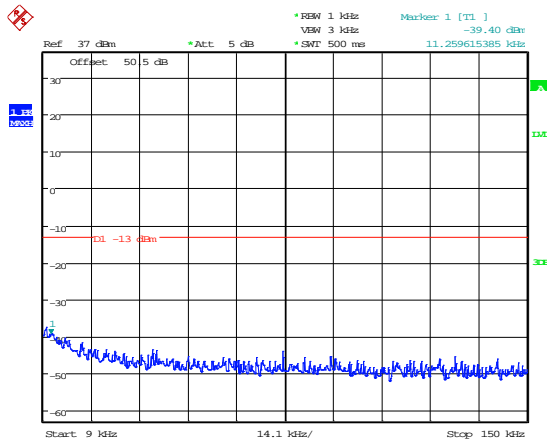
1GHz – 5GHz



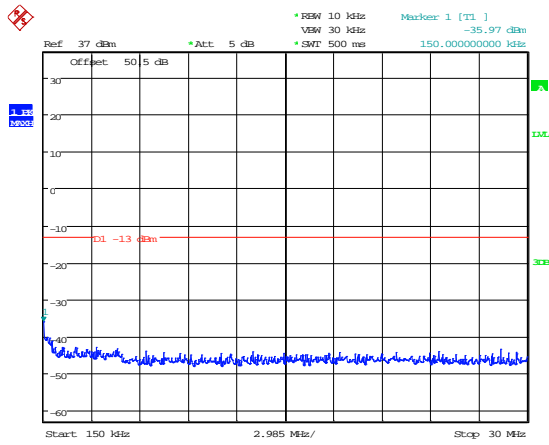
Date: 17.JUL.2014 11:49:15

5GHz – 10GHz

700 MHz – 742.0 MHz



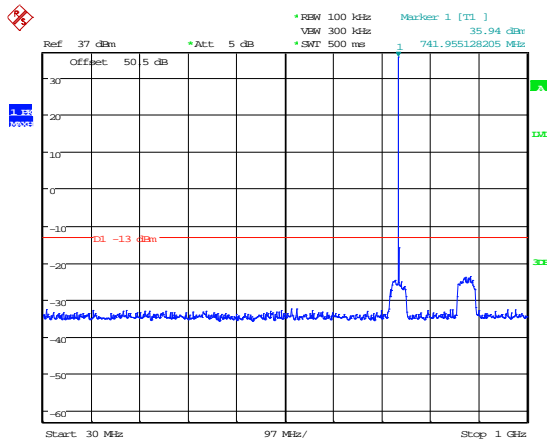
Date: 22.JUL.2014 15:20:20



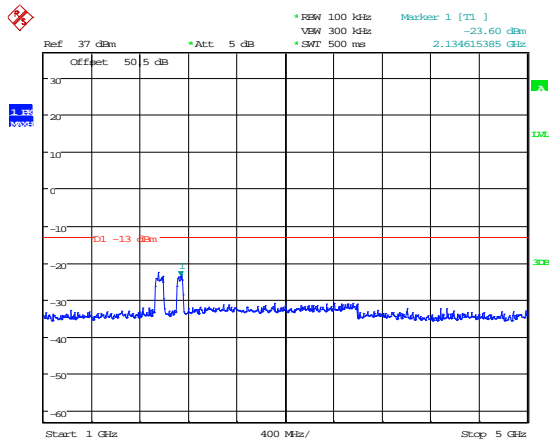
Date: 22.JUL.2014 15:20:46

9kHz - 150kHz

150kHz – 30MHz



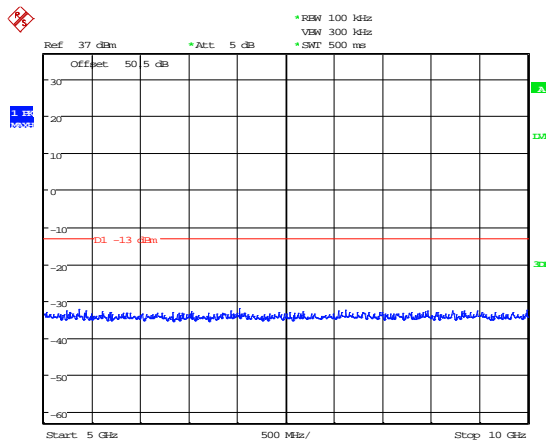
Date: 22.JUL.2014 15:19:19



Date: 22.JUL.2014 15:19:35

30MHz – 1GHz

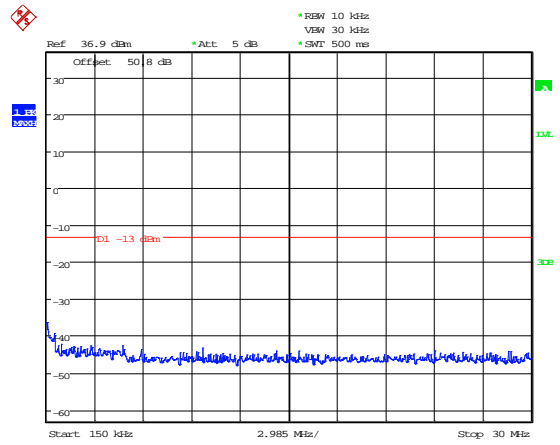
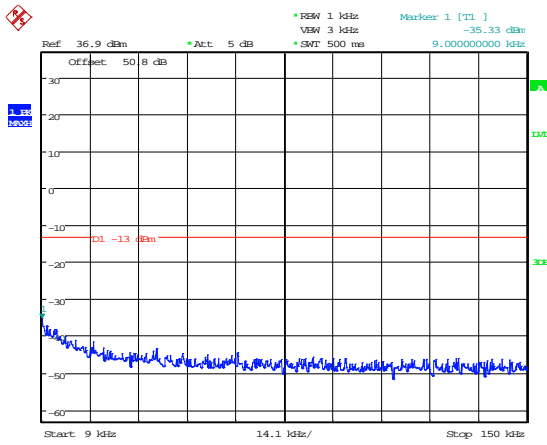
1GHz – 5GHz



Date: 22.JUL.2014 15:19:54

5GHz – 10GHz

700 MHz – 756.0 MHz

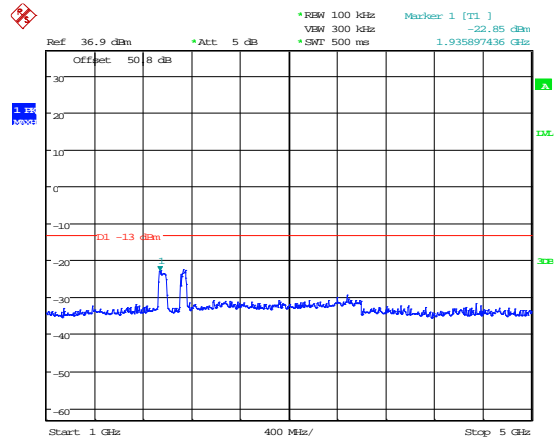
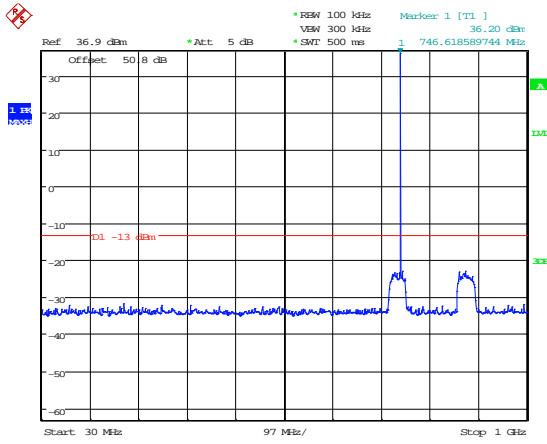


Date: 17.JUL.2014 11:56:05

Date: 17.JUL.2014 11:56:37

9kHz - 150kHz

150kHz – 30MHz

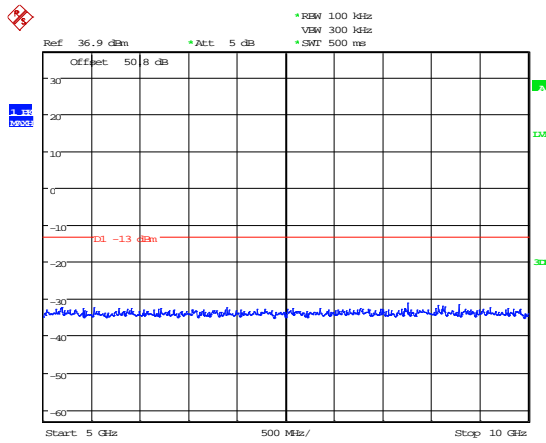


Date: 17.JUL.2014 11:54:38

Date: 17.JUL.2014 11:55:02

30MHz – 1GHz

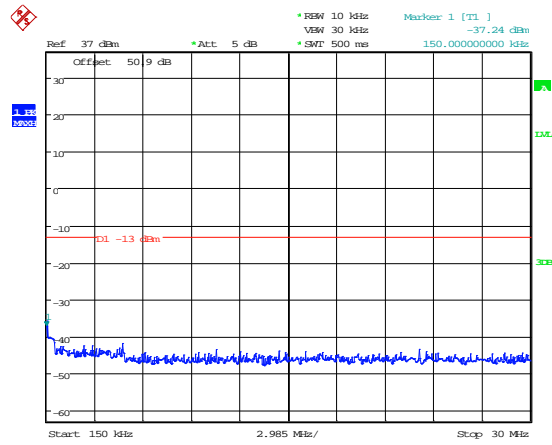
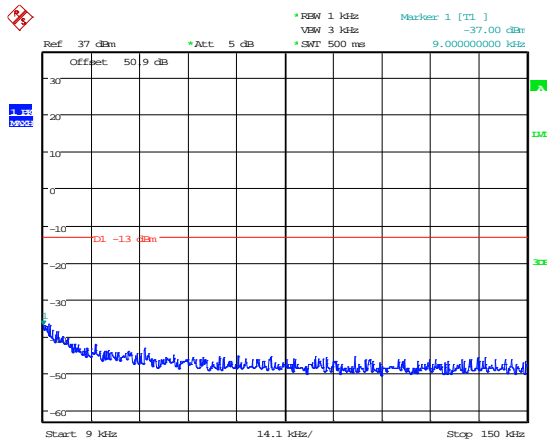
1GHz – 5GHz



Date: 17.JUL.2014 11:55:28

5GHz – 10GHz

850 MHz – 862.0 MHz

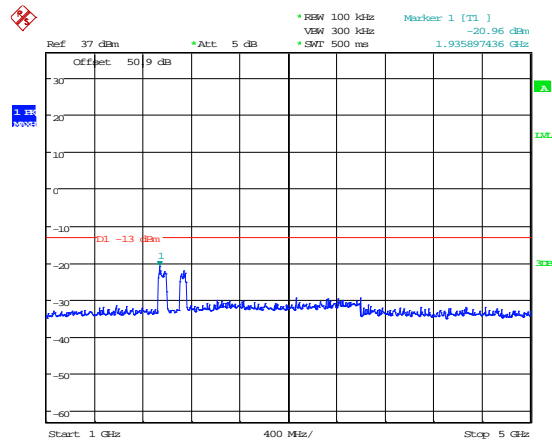
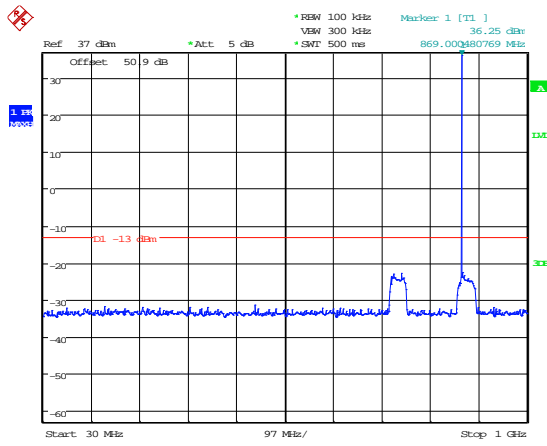


Date: 17.JUL.2014 11:00:28

Date: 17.JUL.2014 11:00:59

9kHz - 150kHz

150kHz – 30MHz

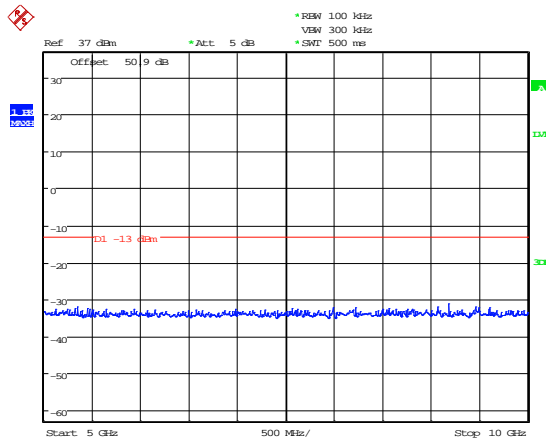


Date: 17.JUL.2014 10:58:46

Date: 17.JUL.2014 10:59:27

30MHz – 1GHz

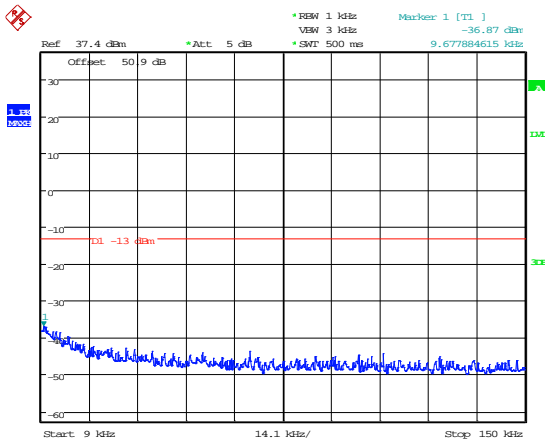
1GHz – 5GHz



Date: 17.JUL.2014 10:59:51

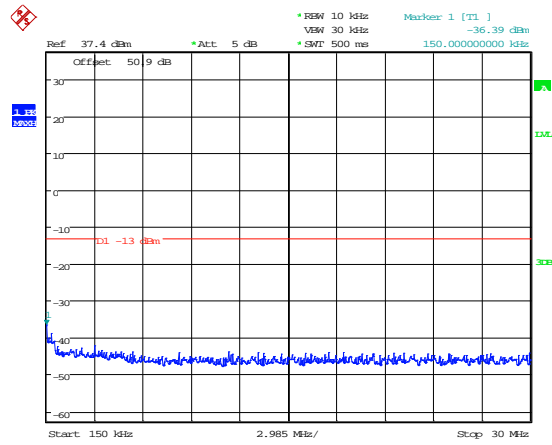
5GHz – 10GHz

850 MHz – 878.0 MHz



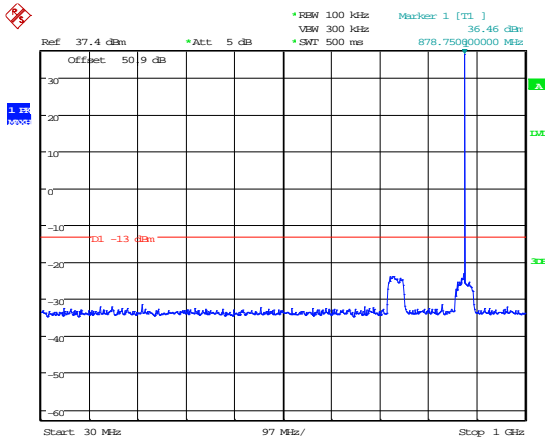
Date: 22.JUL.2014 15:25:26

9kHz - 150kHz



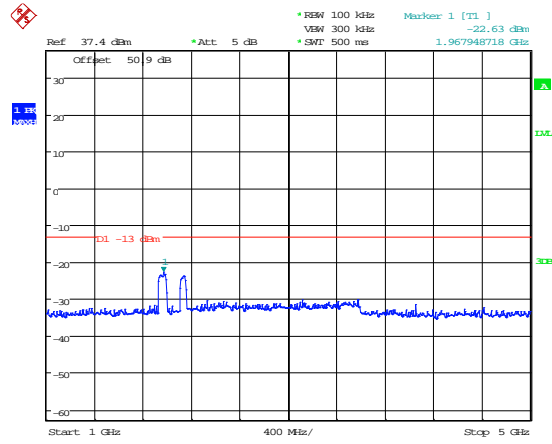
Date: 22.JUL.2014 15:25:52

150kHz – 30MHz



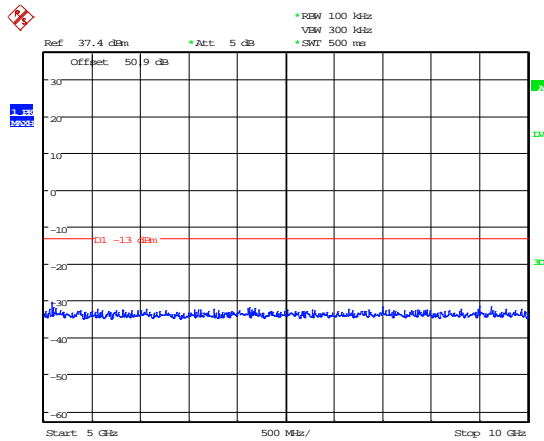
Date: 22.JUL.2014 15:23:56

30MHz – 1GHz



Date: 22.JUL.2014 15:24:17

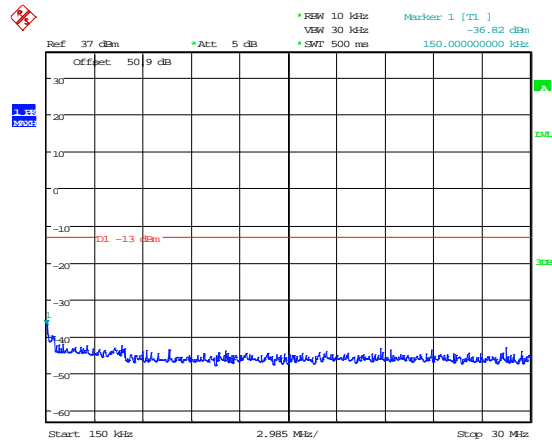
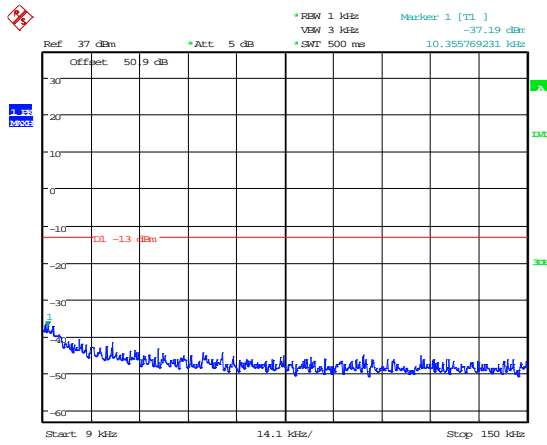
1GHz – 5GHz



Date: 22.JUL.2014 15:24:41

5GHz – 10GHz

850 MHz – 894.0 MHz

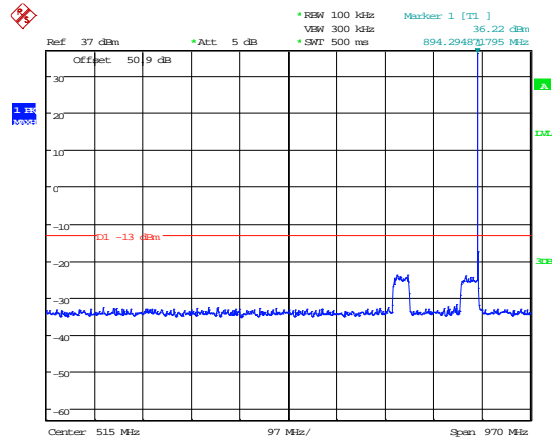
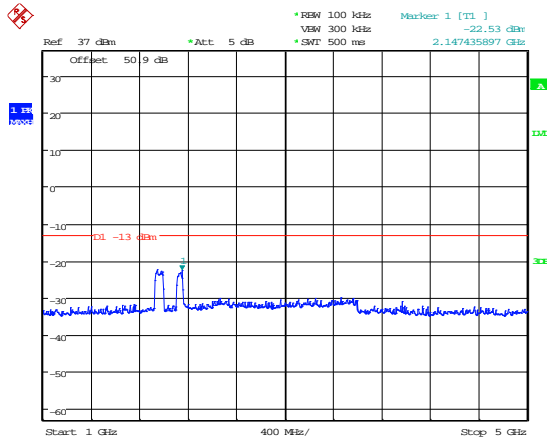


Date: 17.JUL.2014 11:10:47

Date: 17.JUL.2014 11:11:18

9kHz - 150kHz

150kHz – 30MHz

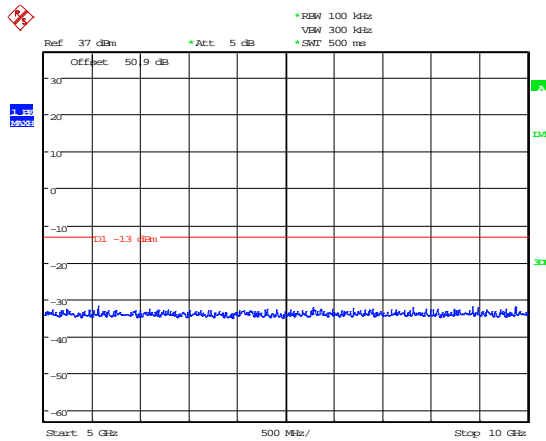


Date: 17.JUL.2014 11:09:51

Date: 17.JUL.2014 11:07:35

30MHz – 1GHz

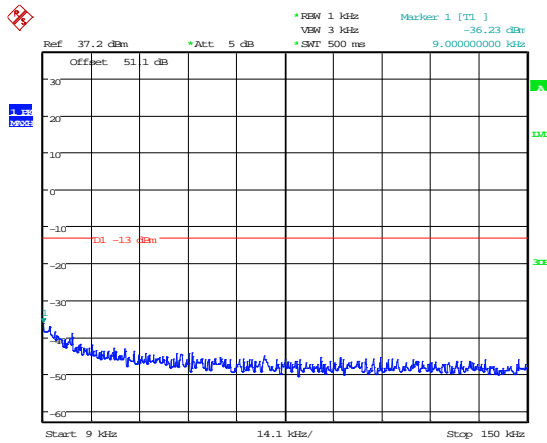
1GHz – 5GHz



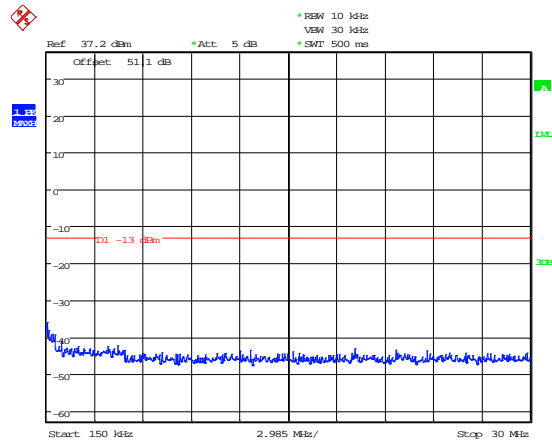
Date: 17.JUL.2014 11:10:15

5GHz – 10GHz

1900 MHz – 1930.0 MHz



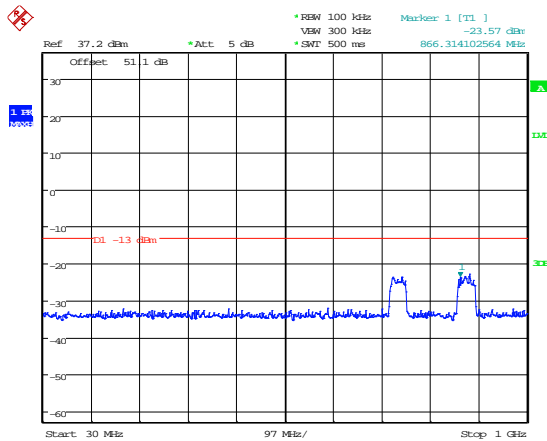
Date: 17.JUL.2014 11:21:09



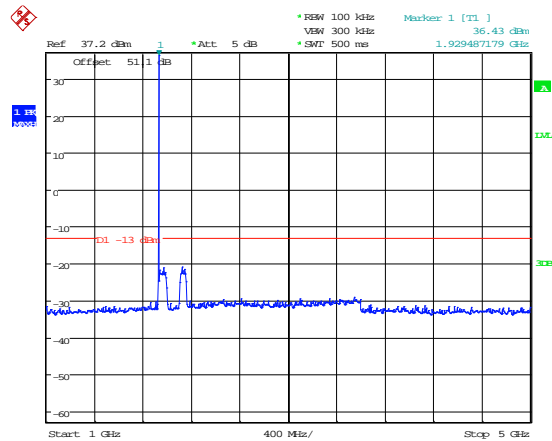
Date: 17.JUL.2014 11:21:42

9kHz - 150kHz

150kHz – 30MHz



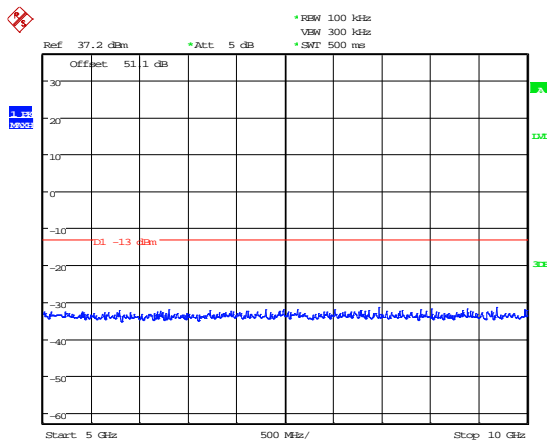
Date: 17.JUL.2014 11:22:09



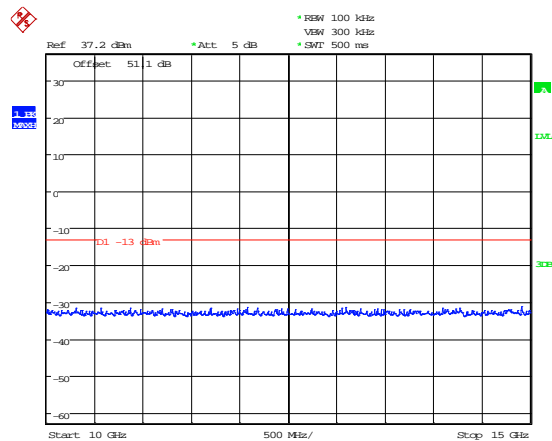
Date: 17.JUL.2014 11:17:07

30MHz – 1GHz

1GHz – 5GHz



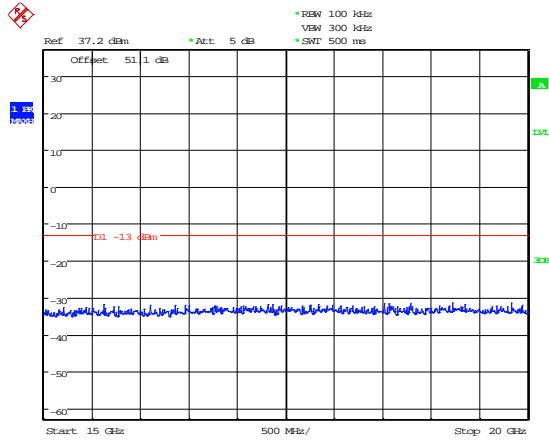
Date: 17.JUL.2014 11:18:14



Date: 17.JUL.2014 11:20:14

5GHz – 10GHz

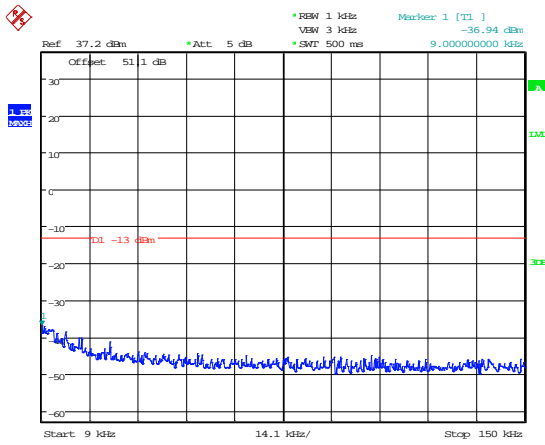
10GHz – 15GHz



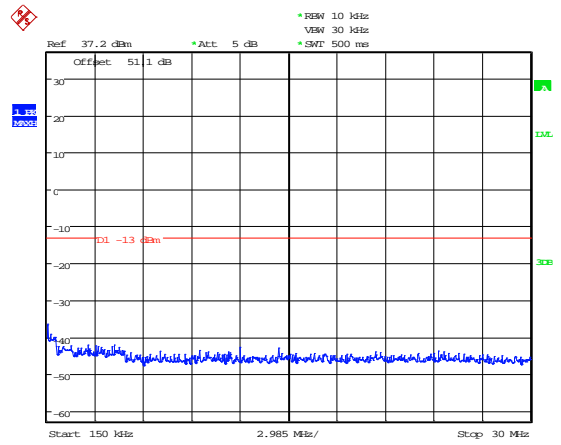
Date: 17 JUL 2014 11:20:37

15GHz – 20GHz

1900 MHz – 1962.5 MHz



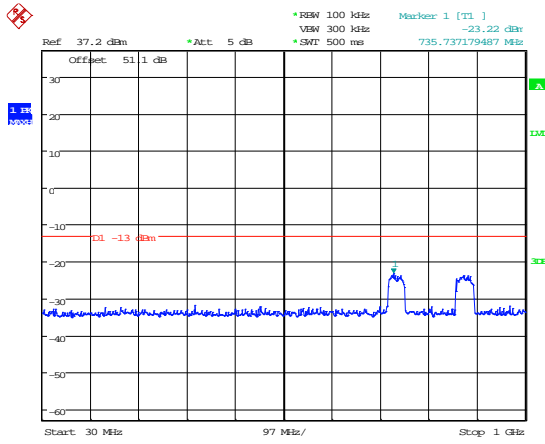
Date: 17.JUL.2014 11:25:06



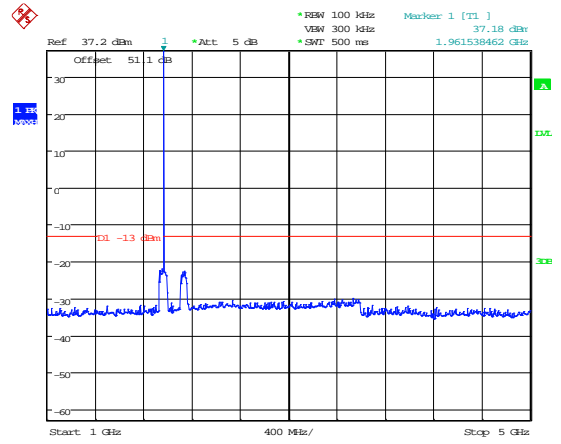
Date: 17.JUL.2014 11:25:40

9kHz - 150kHz

150kHz – 30MHz



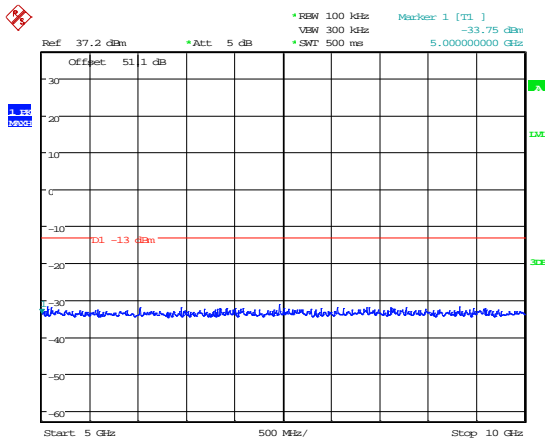
Date: 17.JUL.2014 11:26:15



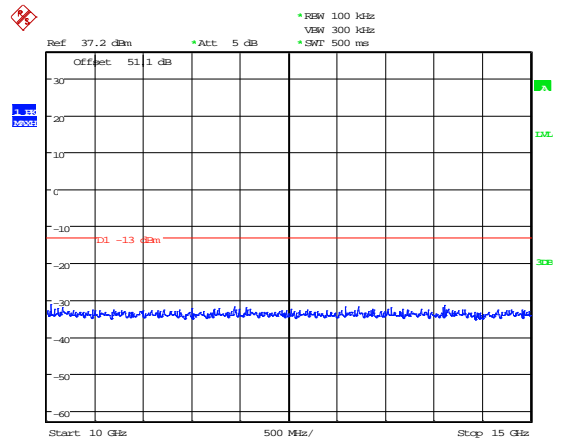
Date: 17.JUL.2014 11:23:16

30MHz – 1GHz

1GHz – 5GHz



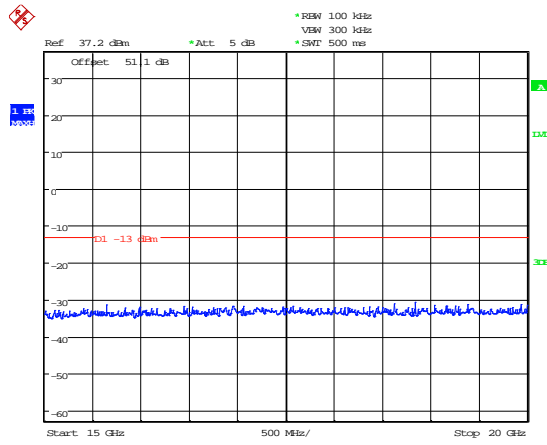
Date: 17.JUL.2014 11:23:42



Date: 17.JUL.2014 11:24:05

5GHz – 10GHz

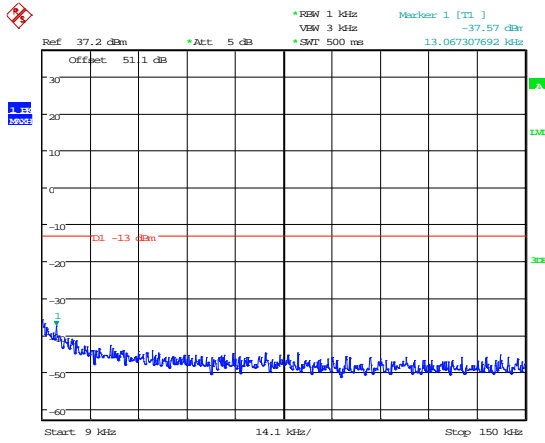
10GHz – 15GHz



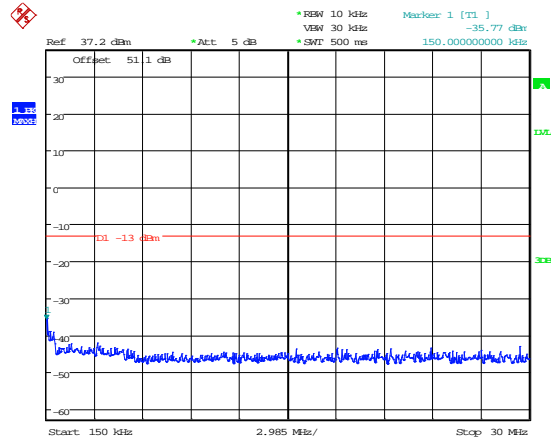
Date: 17.JUL.2014 11:24:27

15GHz – 20GHz

1900 MHz – 1995.0 MHz



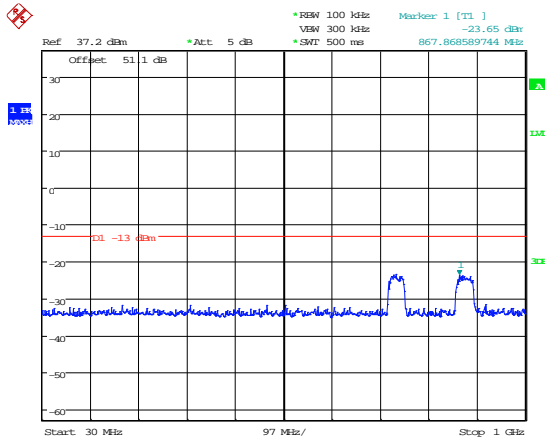
Date: 17.JUL.2014 11:30:41



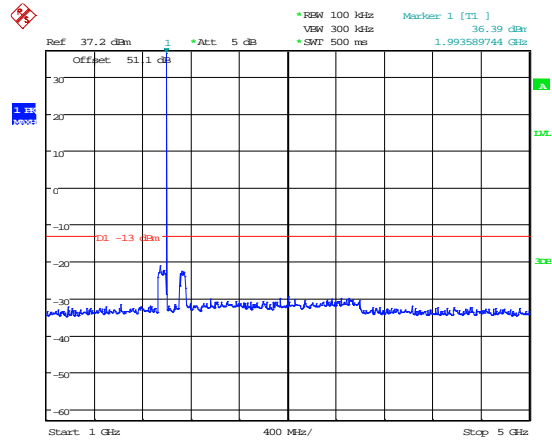
Date: 17.JUL.2014 11:31:26

9kHz - 150kHz

150kHz – 30MHz



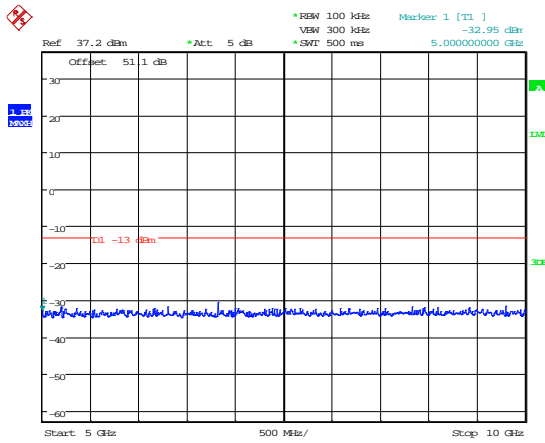
Date: 17.JUL.2014 11:31:55



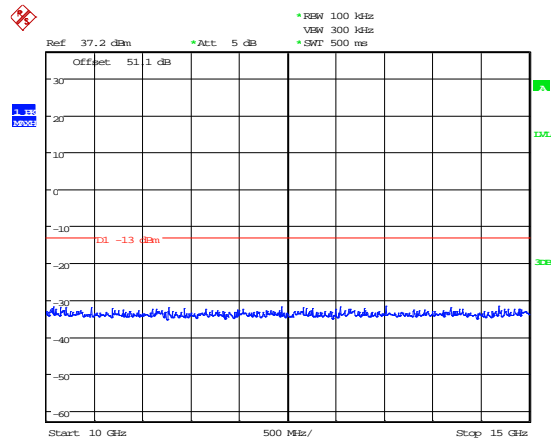
Date: 17.JUL.2014 11:27:04

30MHz – 1GHz

1GHz – 5GHz



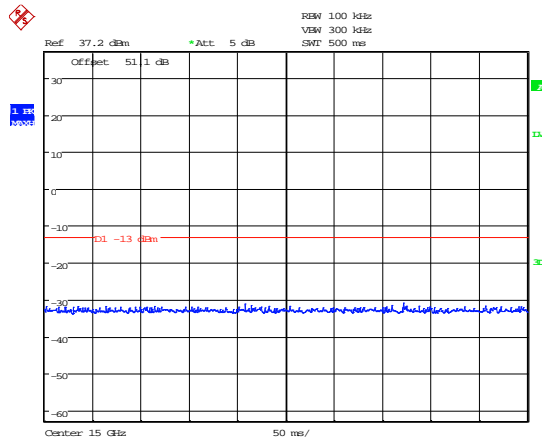
Date: 17.JUL.2014 11:27:31



Date: 17.JUL.2014 11:27:54

5GHz – 10GHz

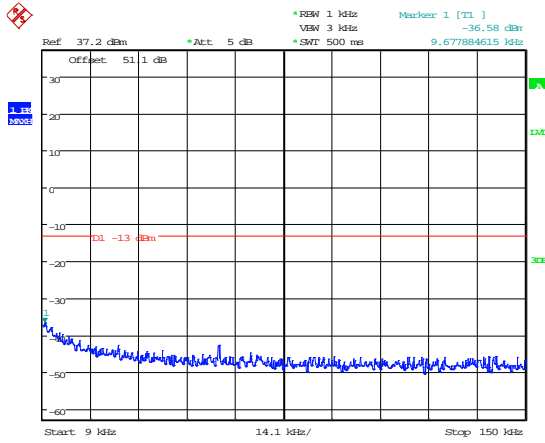
10GHz – 15GHz



Date: 17.JUL.2014 11:30:14

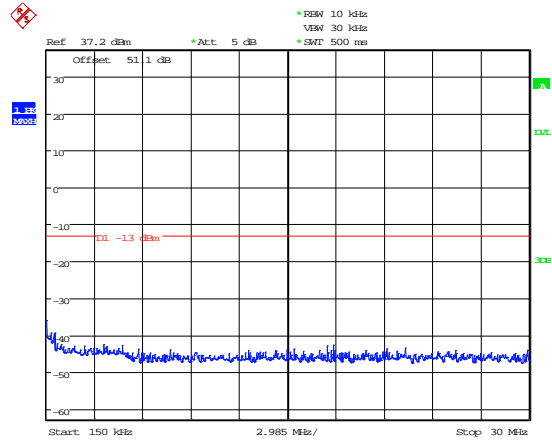
15GHz – 20GHz

2100 MHz – 2110.0 MHz



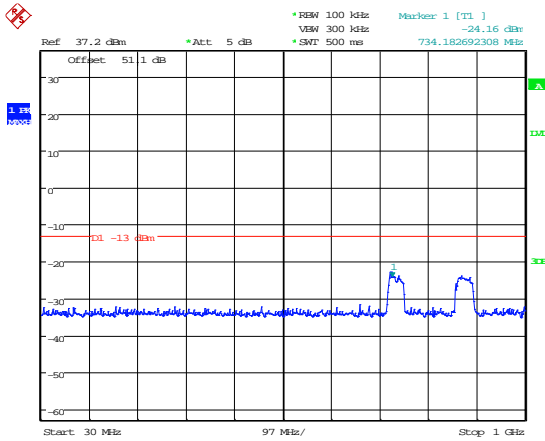
Date: 17.JUL.2014 12:24:13

9kHz - 150kHz



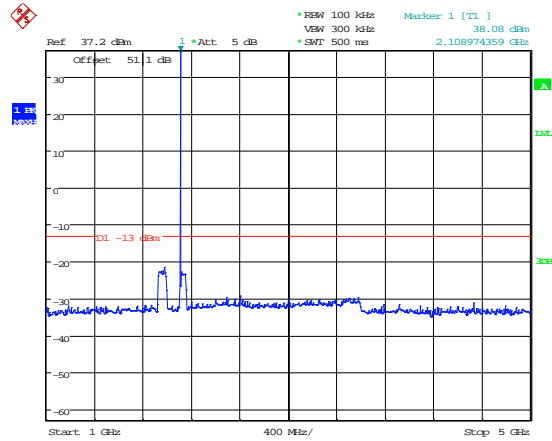
Date: 17.JUL.2014 12:24:58

150kHz – 30MHz



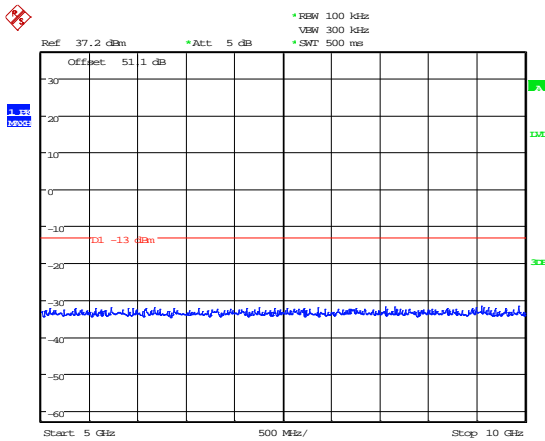
Date: 17.JUL.2014 12:25:27

30MHz – 1GHz



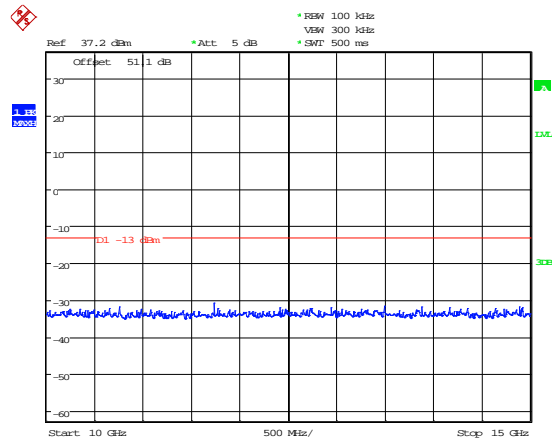
Date: 17.JUL.2014 12:22:08

1GHz – 5GHz



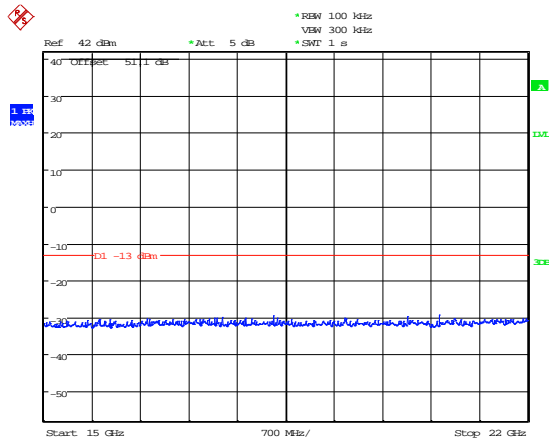
Date: 17.JUL.2014 12:22:40

5GHz – 10GHz



Date: 17.JUL.2014 12:23:02

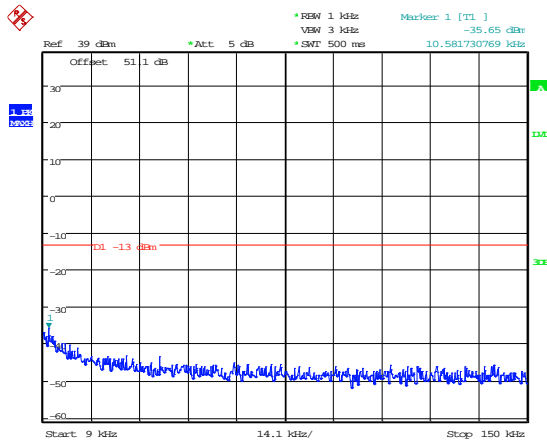
10GHz – 15GHz



Date: 17 JUL 2014 13:35:52

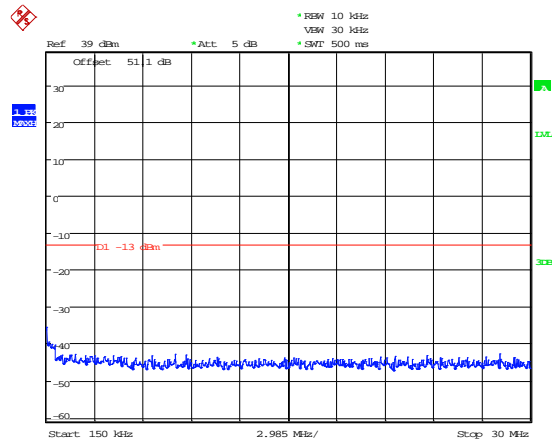
15GHz – 22GHz

2100 MHz – 2132.5 MHz



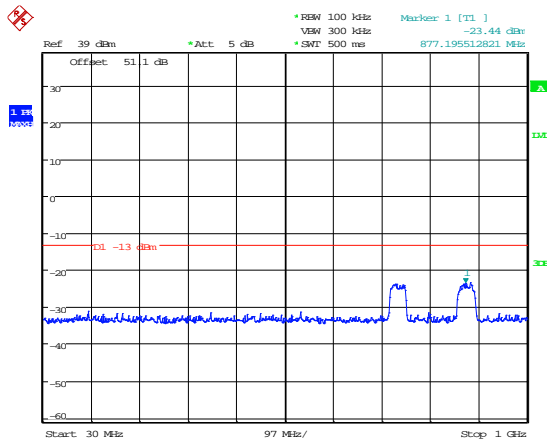
Date: 17.JUL.2014 12:28:43

9kHz - 150kHz



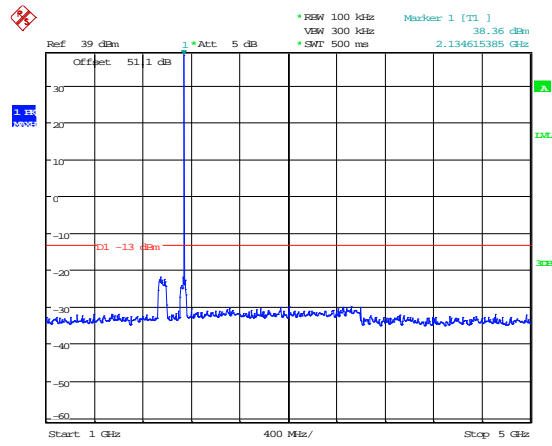
Date: 17.JUL.2014 12:29:16

150kHz – 30MHz



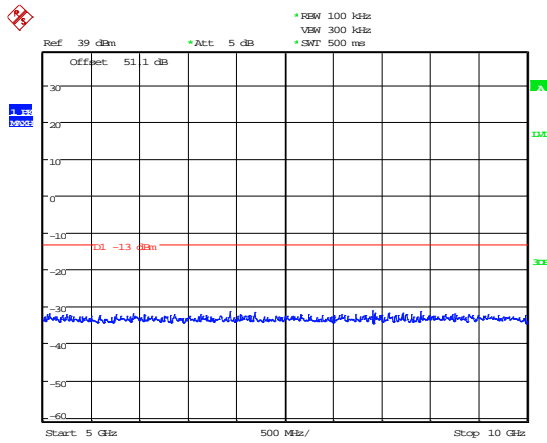
Date: 17.JUL.2014 12:29:53

30MHz – 1GHz



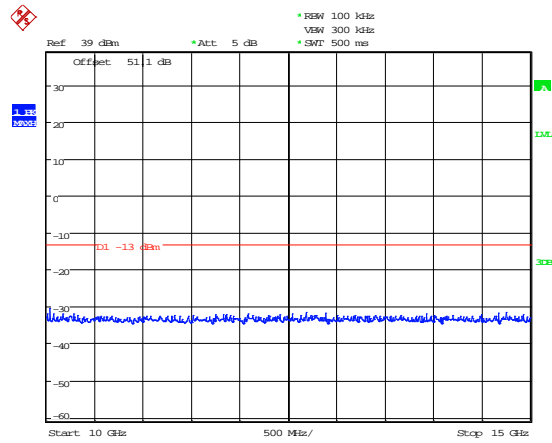
Date: 17.JUL.2014 12:27:04

1GHz – 5GHz



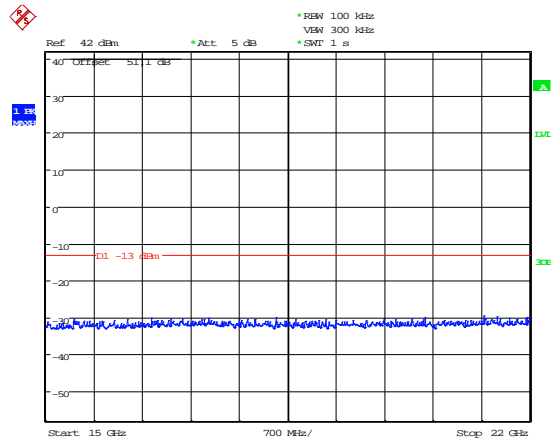
Date: 17.JUL.2014 12:27:28

5GHz – 10GHz



Date: 17.JUL.2014 12:27:53

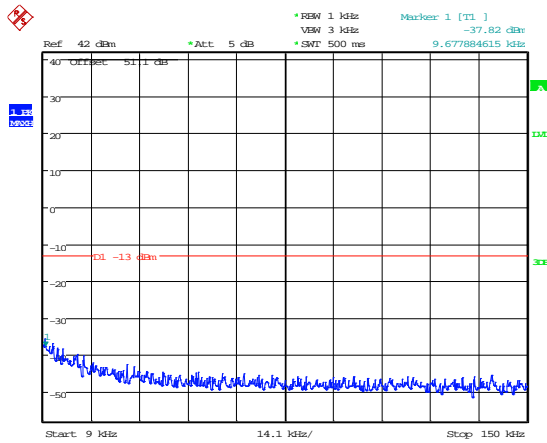
10GHz – 15GHz



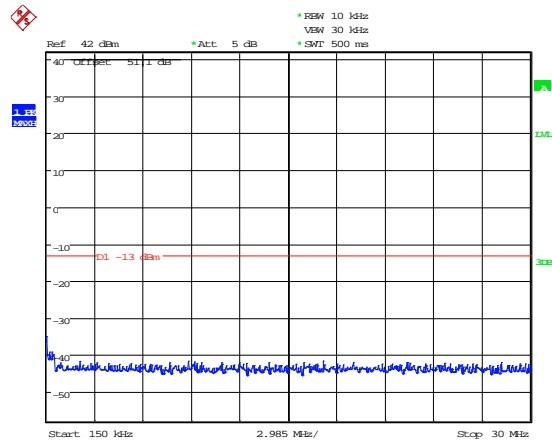
Date: 17 JUL 2014 13:36:44

15GHz – 22GHz

2100 MHz – 2155.0 MHz



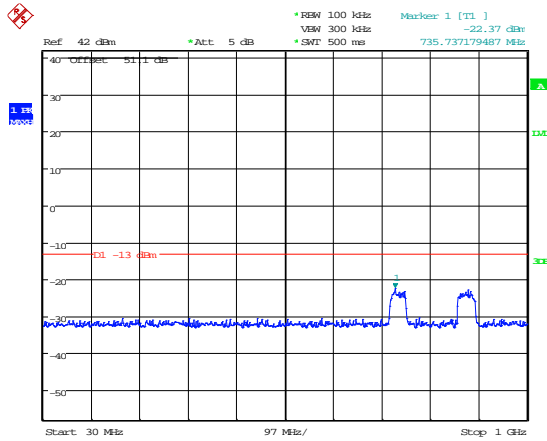
Date: 17.JUL.2014 13:27:49



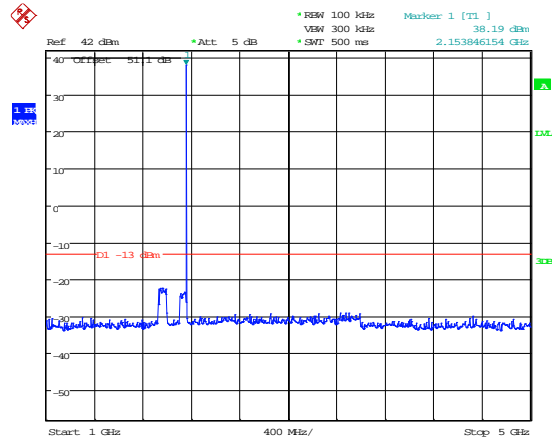
Date: 17.JUL.2014 13:28:18

9kHz - 150kHz

150kHz – 30MHz



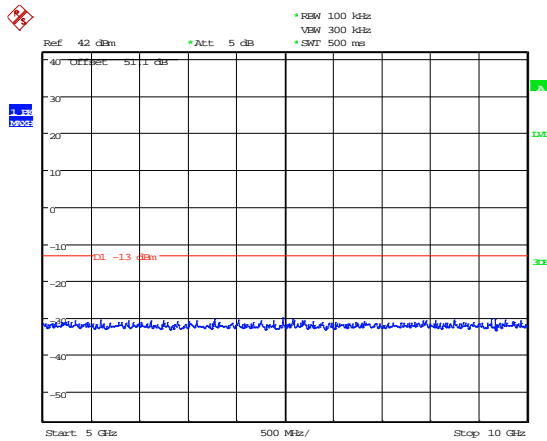
Date: 17.JUL.2014 13:29:09



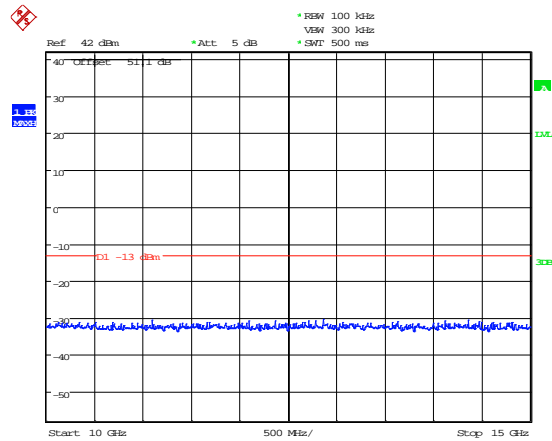
Date: 17.JUL.2014 13:26:04

30MHz – 1GHz

1GHz – 5GHz



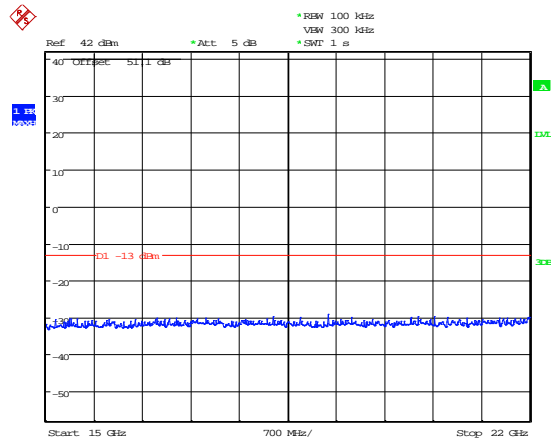
Date: 17.JUL.2014 13:26:34



Date: 17.JUL.2014 13:26:56

5GHz – 10GHz

10GHz – 15GHz



15GHz – 22GHz

B6 Radiated Electric Field Emissions

Preliminary scans were performed using a peak detector with the RBW = 100kHz. The radiated electric field emission test applies to all spurious and harmonic emissions. The EUT was set to transmit as required.

The following test site was used for final measurements as specified by the standard tested to:

3m open area test site : 3m alternative test site :

The effect of the EUT set-up on the measurements is summarised in note (c) below.

Test Details:	
Measurement standard	Part 2.1053, 22.917(a), 24.238(a), 27.53(c) & (g), 90.691(a)(1) & (2)
Frequency range	30 MHz – 22 GHz
EUT sample number	S01 & S02
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C

Frequency (MHz)	Freq. of Emission (MHz)	ERP/EIRP (dBm)	Limit (dBm)
700MHz			
728.000	No Significant Emissions Within		-13
742.000			-13
756.000			-13
850 MHz			
862.000	No Significant Emissions Within		-13
878.000			-13
894.000			-13
1900 MHz			
1930.000	No Significant Emissions Within		-13
1962.500			-13
1995.000			-13
2100 MHz			
2110.000	No Significant Emissions Within		-13
2132.500			-13
2155.000			-13

Result

The EUT was found to comply with the limits

Notes:

1. Emissions Checked up to 10 times Fc.
2. The unit was mounted on a turntable and rotated through 360° and in 3 orthogonal planes to find the worst case emission.
3. For Frequencies below 1 GHz, RBW = 120 kHz, testing was performed with CISPR16 compliant test receiver with QP detector. Above 1 GHz tests were performed using a spectrum analyser using the following settings:

Peak Detector RBW = 1MHz; VBW = ≥RBW

4. Limit is determined as the outermost step of the emissions mask and is calculated as follows.

At least 43 + 10 log P dB

$$(10\log P_{\text{watts}}) - (43 + 10\log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

The upper and lower frequency of the measurement range was decided according to 47 CFR Part 2.1057.

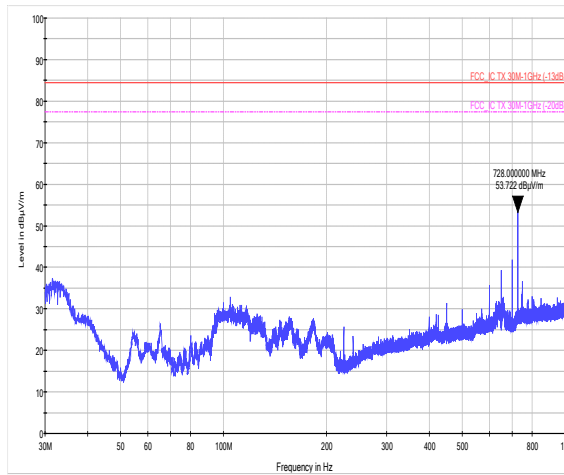
- (a) Where results have been measured at one distance, and a signal level displayed at another, the results have been extrapolated using the following formula:

$$\text{Extrapolation (dB)} = 20 \log_{10} \left(\frac{\text{measurement distance}}{\text{specification distance}} \right)$$

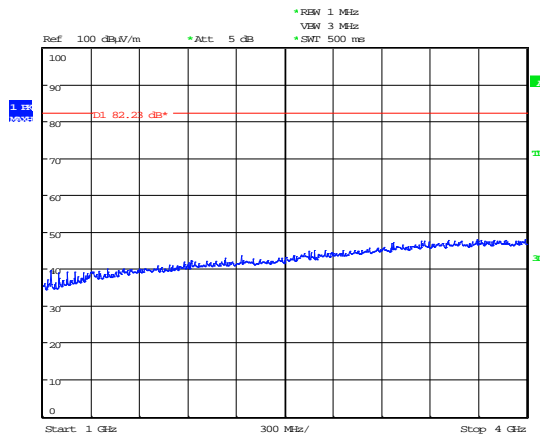
- (b) The levels may have been rounded for display purposes.
- (c) The following table summarises the effect of the EUT operating mode, internal configuration and arrangement of cables / samples on the measured emission levels :

	See (i)	See (ii)	See (iii)	See (iv)
Effect of EUT operating mode on emission levels	✓			
Effect of EUT internal configuration on emission levels	✓			
Effect of Position of EUT cables & samples on emission levels			✓	
(v) Parameter defined by standard and / or single possible, refer to Appendix D (vi) Parameter defined by client and / or single possible, refer to Appendix D (vii) Parameter had a negligible effect on emission levels, refer to Appendix D (viii) Worst case determined by initial measurement, refer to Appendix D				

700 MHz – 728.0 MHz

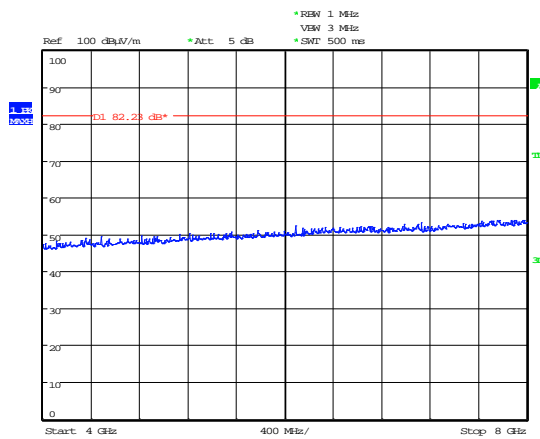


30MHz – 1GHz



Date: 11.AUG.2014 12:33:31

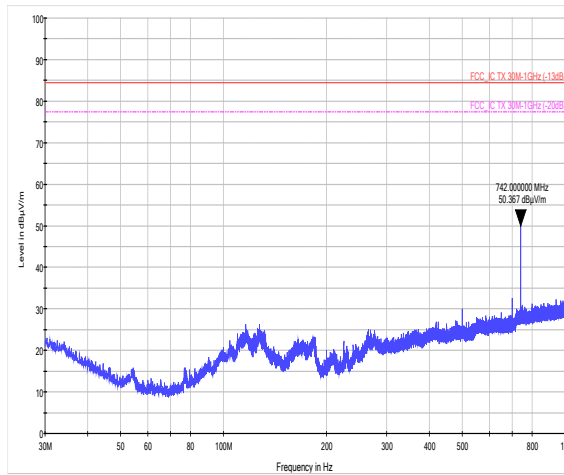
1GHz – 4GHz



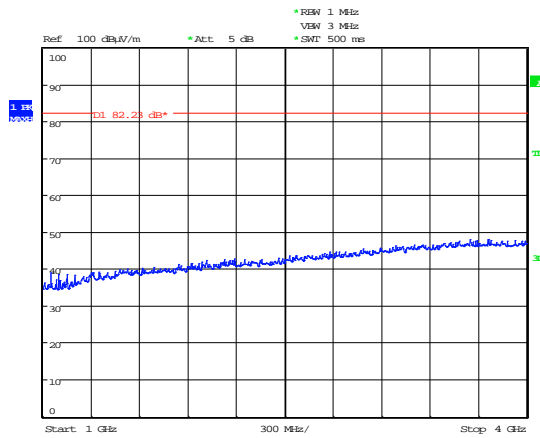
Date: 11.AUG.2014 12:35:35

4GHz – 8GHz

700 MHz – 742.0 MHz

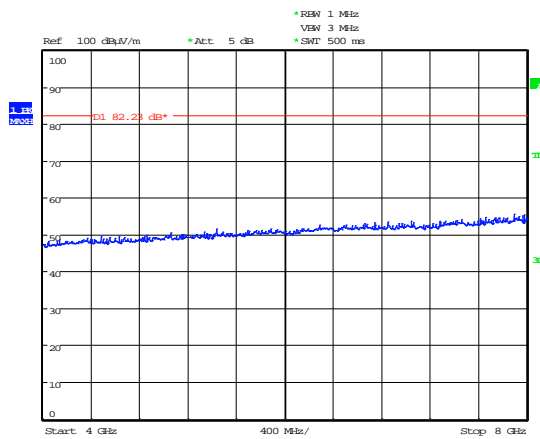


30MHz – 1GHz



Date: 11.AUG.2014 12:38:29

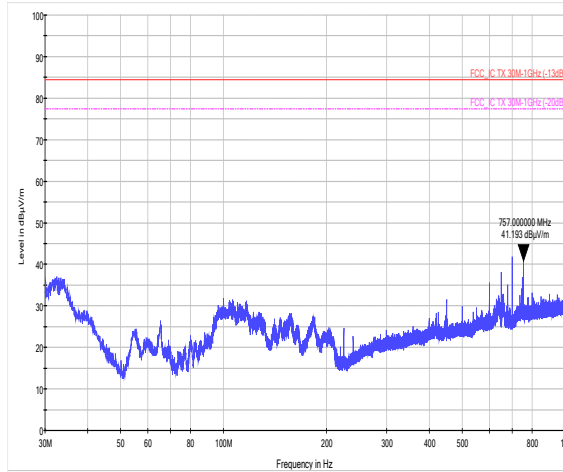
1GHz – 4GHz



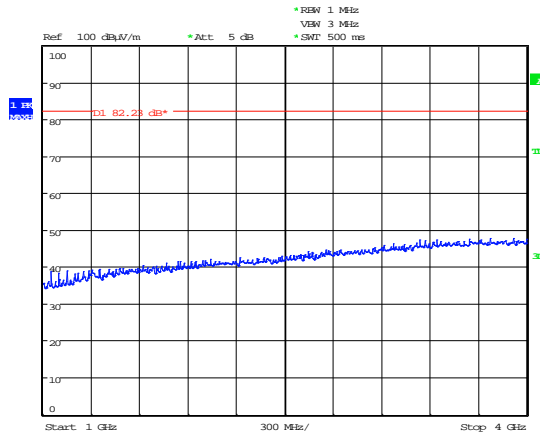
Date: 11.AUG.2014 12:39:59

4GHz – 8GHz

700 MHz – 756.0 MHz

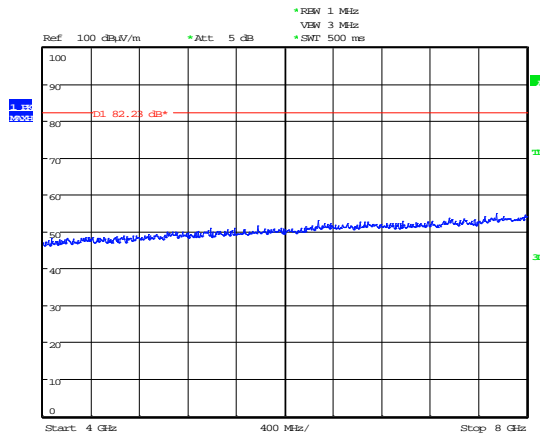


30MHz – 1GHz



Date: 11.AUG.2014 12:43:51

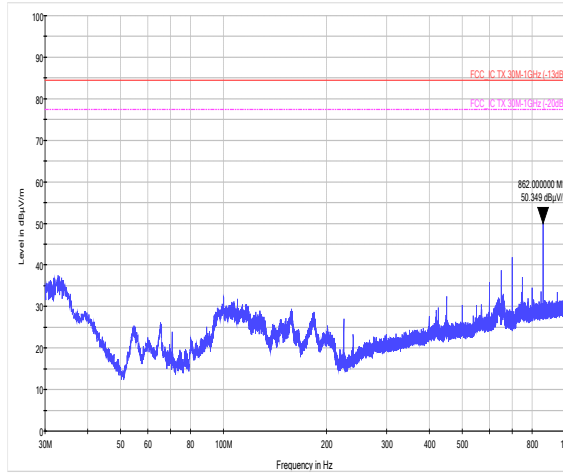
1GHz – 4GHz



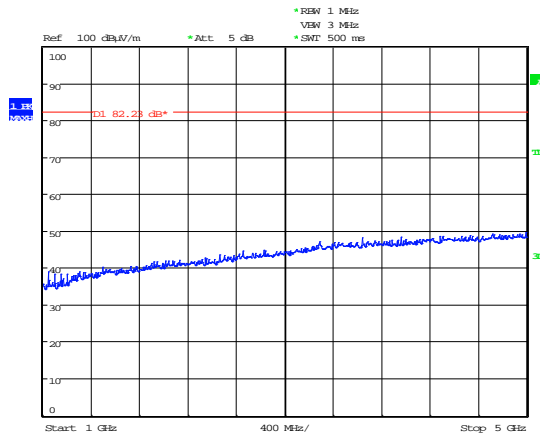
Date: 11.AUG.2014 12:44:15

4GHz – 8GHz

850 MHz – 862.0 MHz

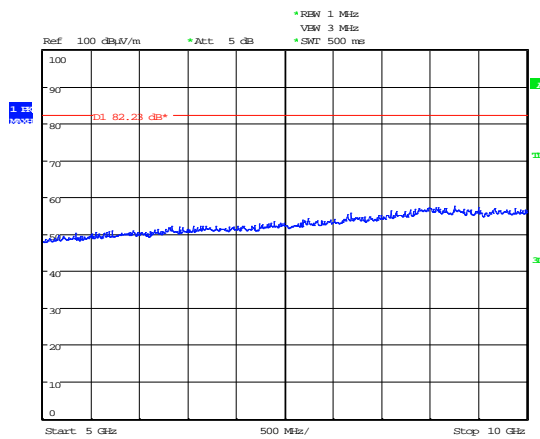


30MHz – 1GHz



Date: 11.AUG.2014 14:30:48

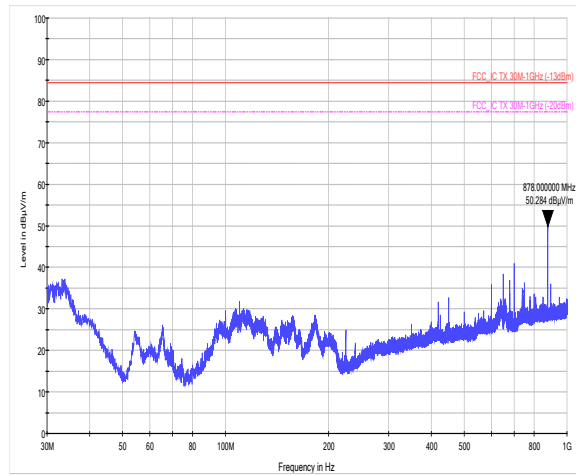
1GHz – 5GHz



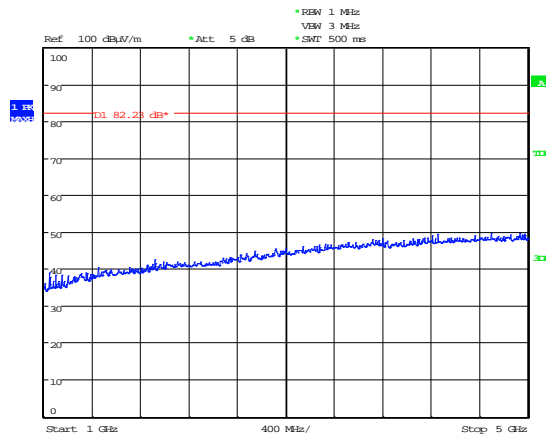
Date: 11.AUG.2014 14:31:09

5GHz – 10GHz

850 MHz – 878.0 MHz

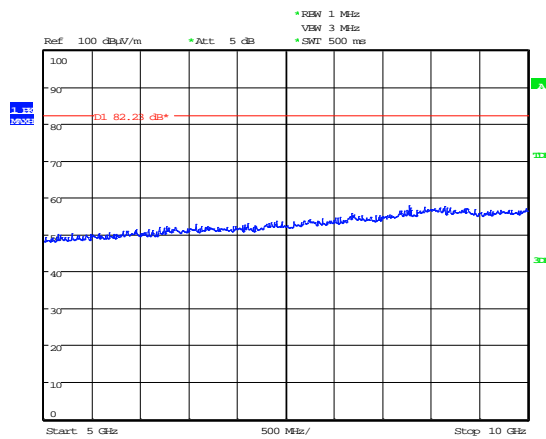


30MHz – 1GHz



Date: 11.AUG.2014 14:32:47

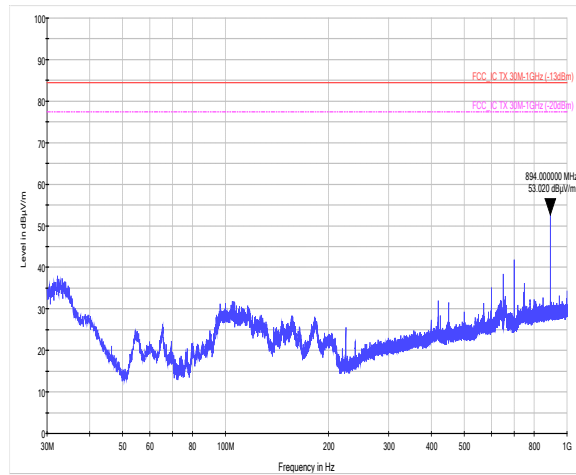
1GHz – 5GHz



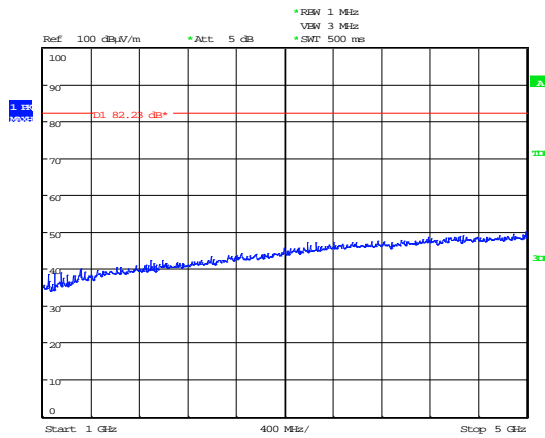
Date: 11.AUG.2014 14:33:16

5GHz – 10GHz

850 MHz – 894.0 MHz

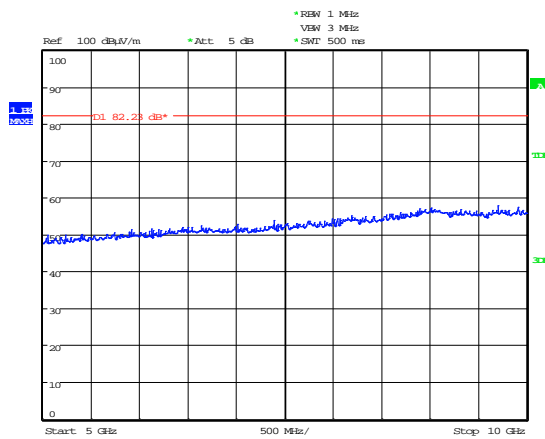


30MHz – 1GHz



Date: 11.AUG.2014 14:34:43

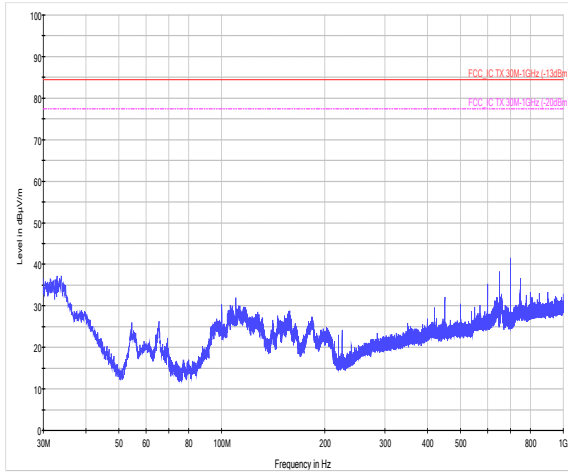
1GHz – 5GHz



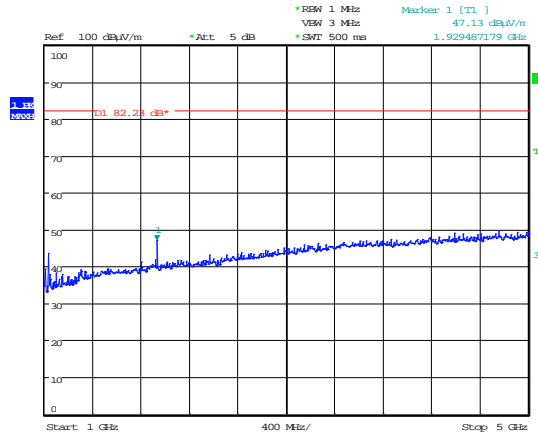
Date: 11.AUG.2014 14:35:20

5GHz – 10GHz

1900 MHz – 1930.0 MHz

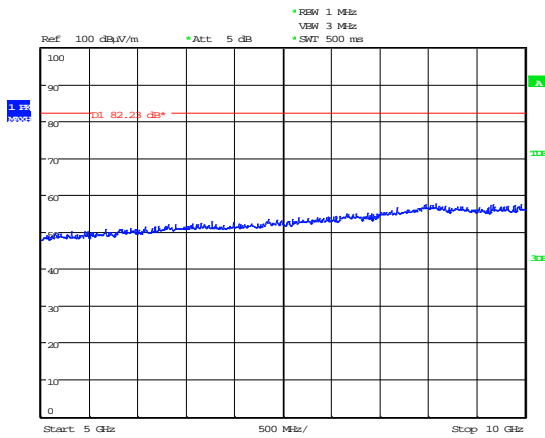


30MHz – 1GHz

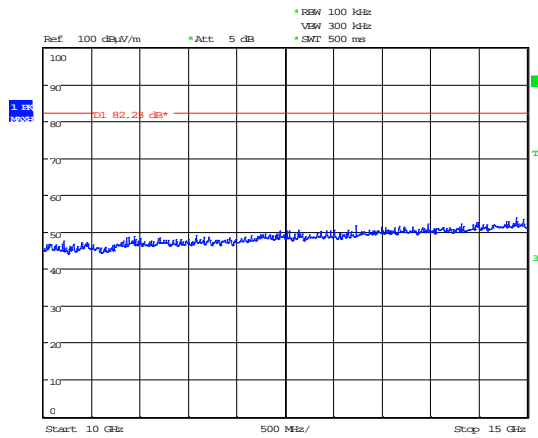


1GHz – 5GHz

Date: 11.AUG.2014 14:38:14

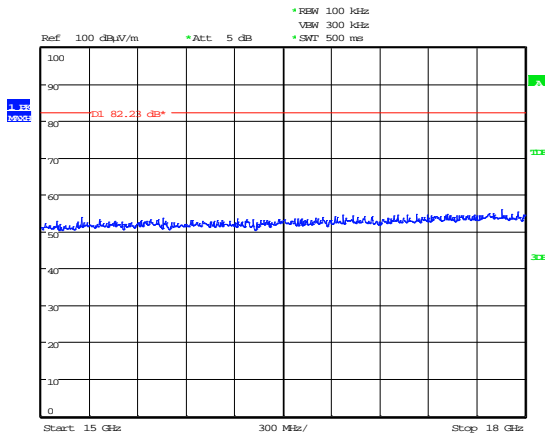


5GHz – 10GHz

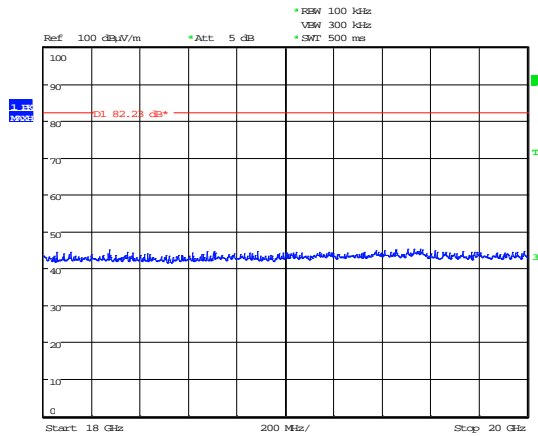


10GHz – 15GHz

Date: 11.AUG.2014 14:39:18



15GHz – 18GHz

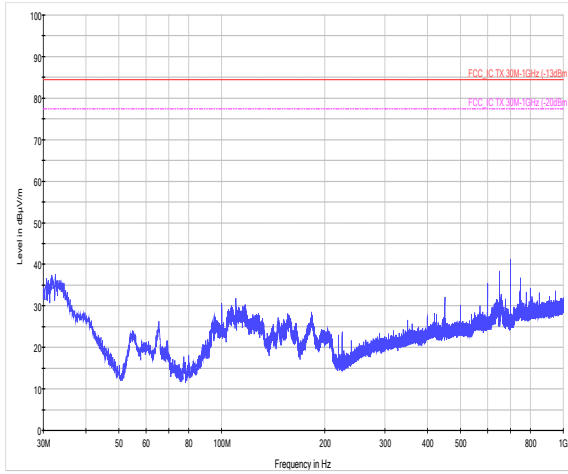


18GHz – 20GHz

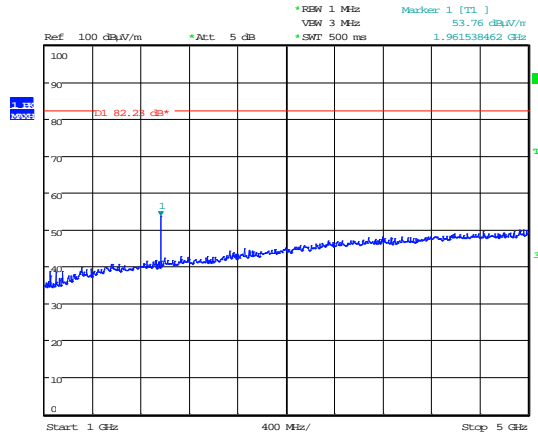
Date: 11.AUG.2014 14:56:32

Date: 11.AUG.2014 14:39:45

1900 MHz – 1962.5 MHz

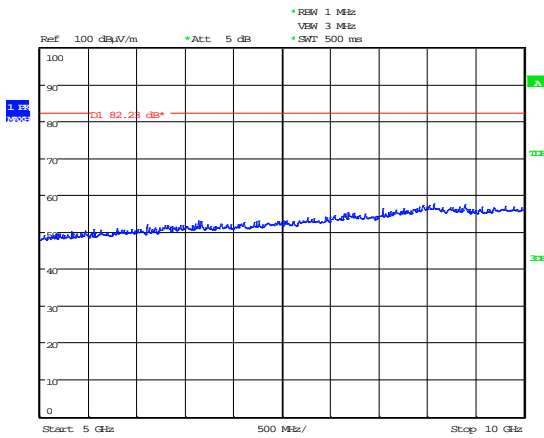


30MHz – 1GHz

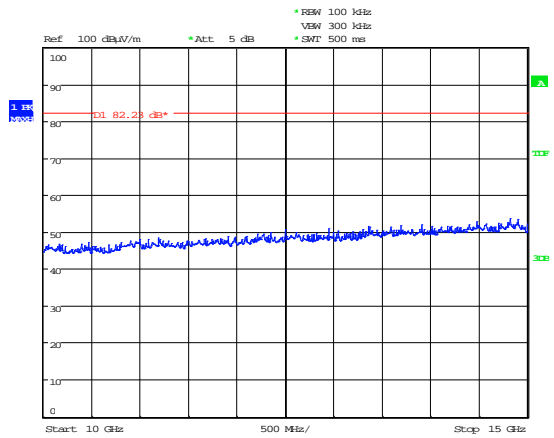


1GHz – 5GHz

Date: 11.AUG.2014 14:43:48

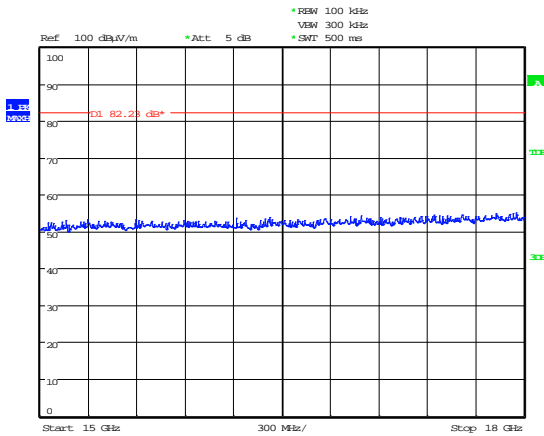


5GHz – 10GHz

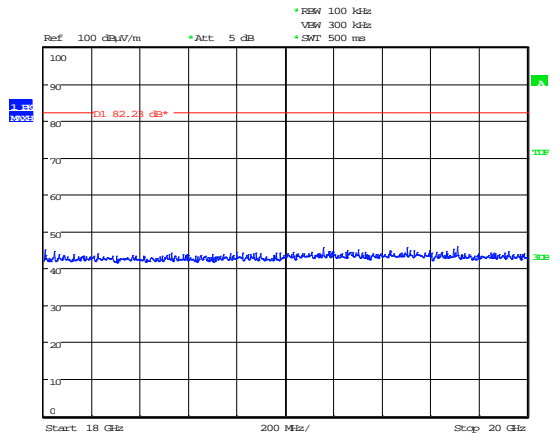


10GHz – 15GHz

Date: 11.AUG.2014 14:44:21



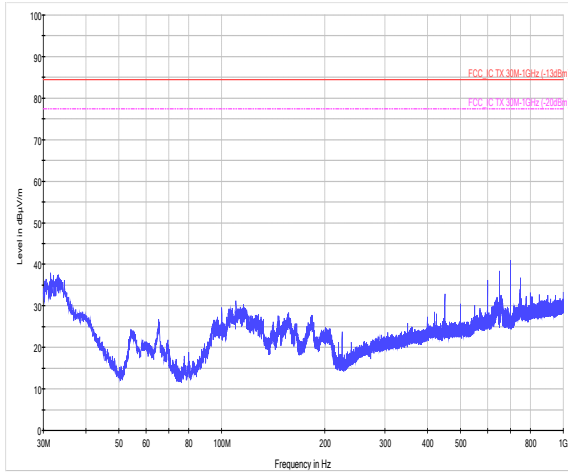
15GHz – 18GHz



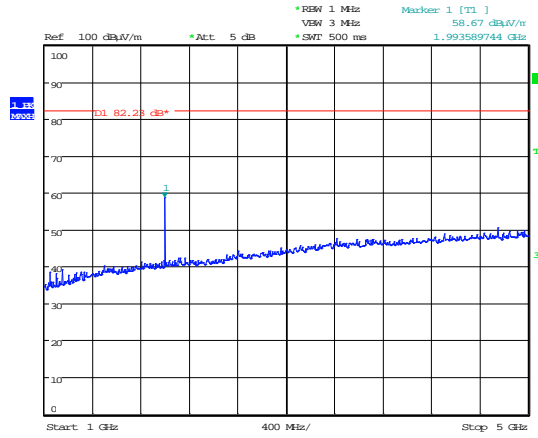
18GHz – 20GHz

Date: 11.AUG.2014 14:45:09

1900 MHz – 1995.0 MHz

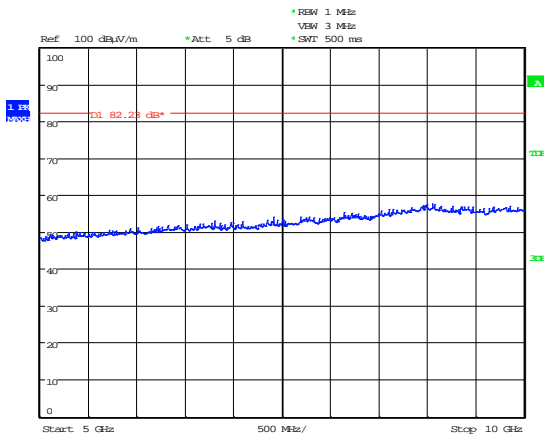


30MHz – 1GHz



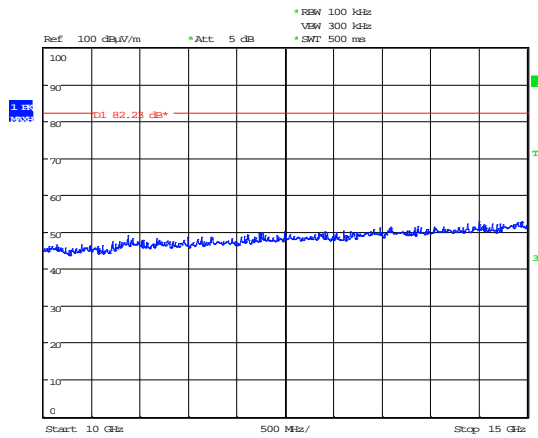
1GHz – 5GHz

Date: 11.AUG.2014 14:51:14



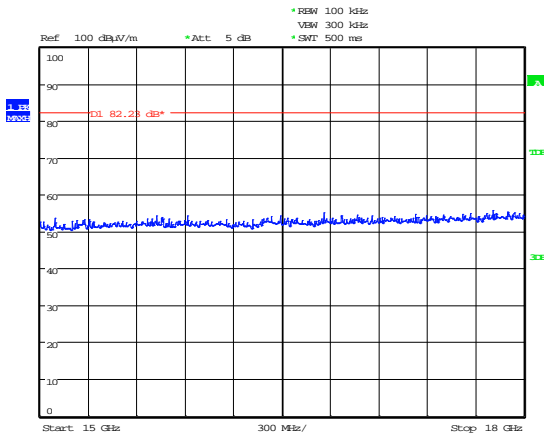
5GHz – 10GHz

Date: 11.AUG.2014 14:51:37



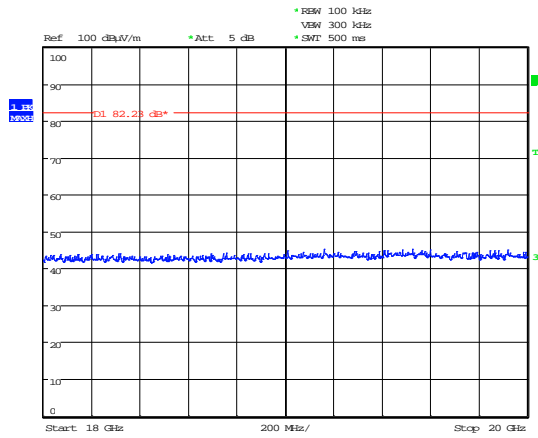
10GHz – 15GHz

Date: 11.AUG.2014 14:52:10



15GHz – 18GHz

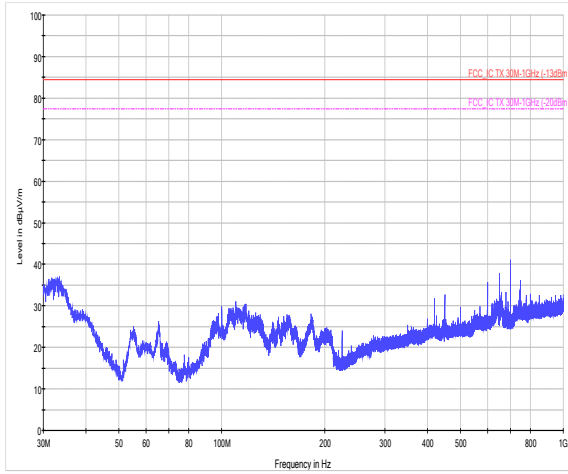
Date: 11.AUG.2014 14:52:48



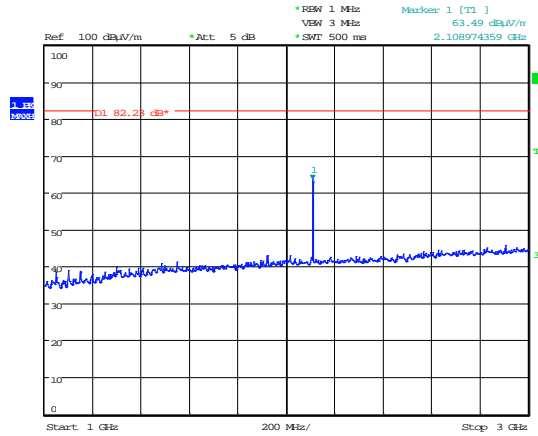
18GHz – 20GHz

Date: 11.AUG.2014 14:59:51

2100 MHz – 2110.0 MHz

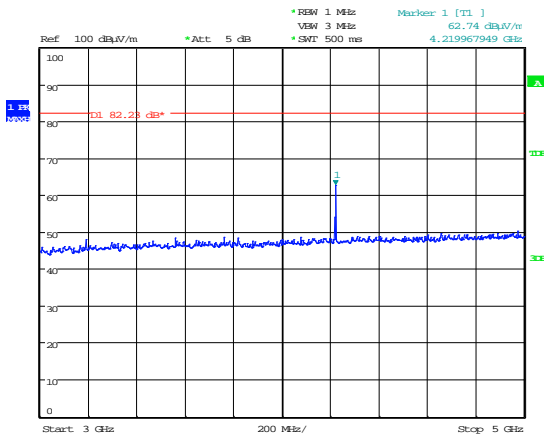


30MHz – 1GHz



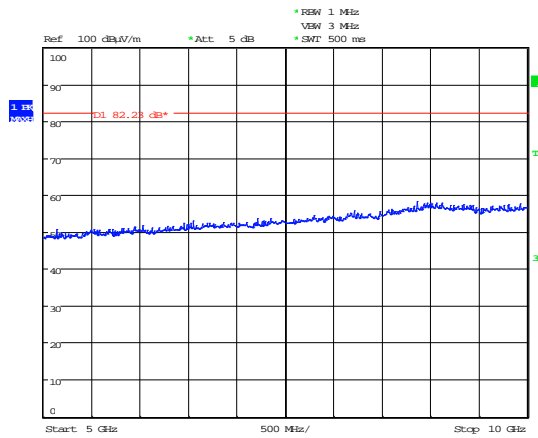
1GHz – 3GHz

Date: 11.AUG.2014 15:06:41



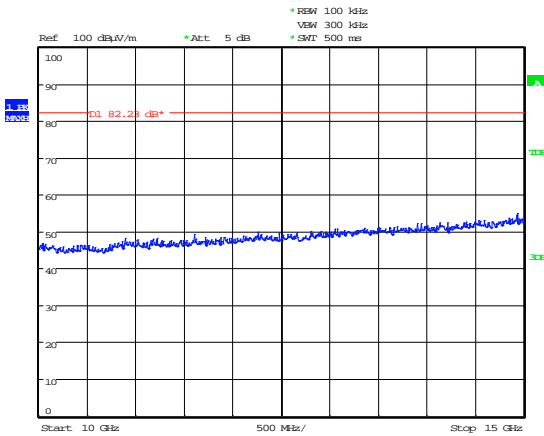
3GHz – 5GHz

Date: 11.AUG.2014 15:19:19



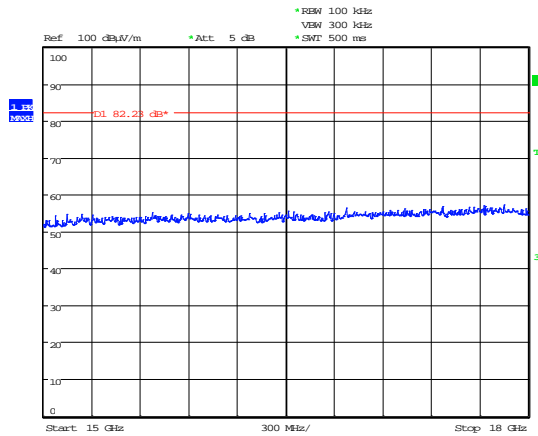
5GHz – 10GHz

Date: 11.AUG.2014 15:19:50



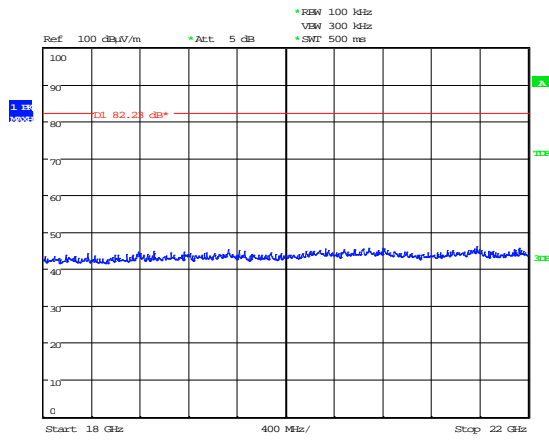
10GHz – 15GHz

Date: 11.AUG.2014 15:20:18



15GHz – 18GHz

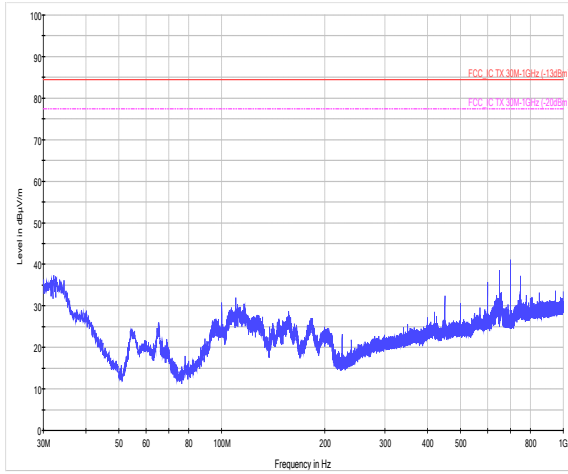
Date: 11.AUG.2014 15:20:46



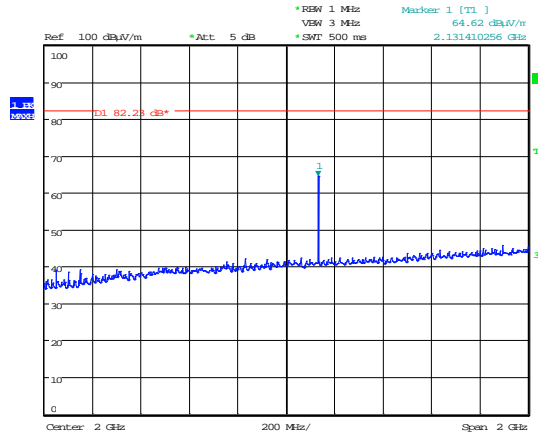
Date: 11.AUG.2014 15:43:49

18GHz – 22GHz

2100 MHz – 2132.5 MHz

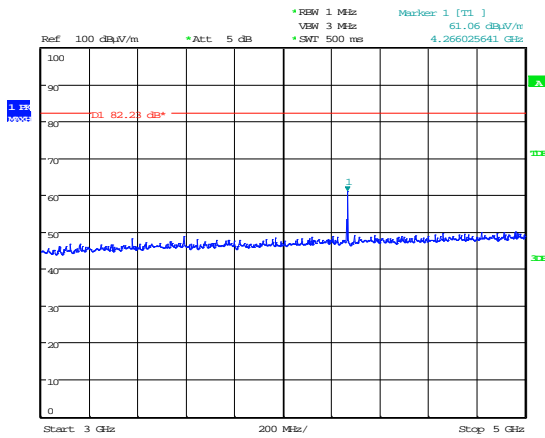


30MHz – 1GHz



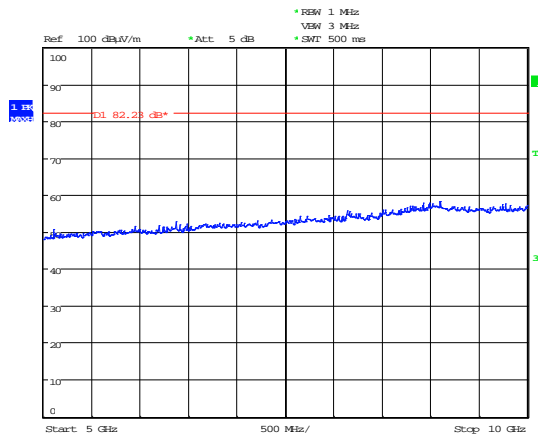
1GHz – 3GHz

Date: 11.AUG.2014 15:08:31



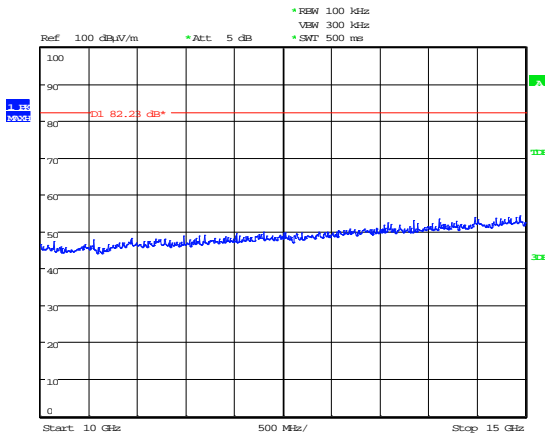
3GHz – 5GHz

Date: 11.AUG.2014 15:29:52



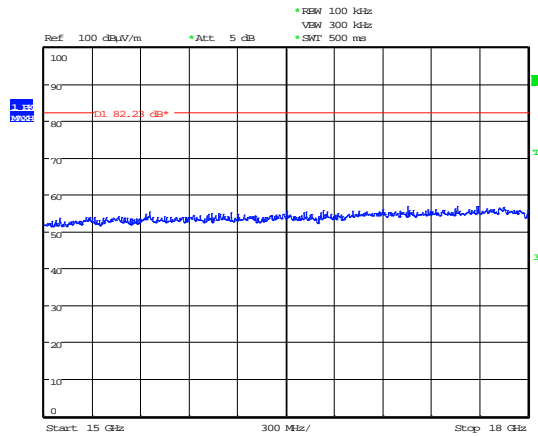
5GHz – 10GHz

Date: 11.AUG.2014 15:30:17



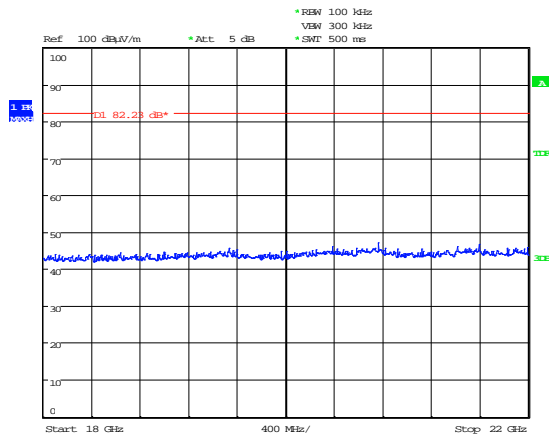
10GHz – 15GHz

Date: 11.AUG.2014 15:30:51



15GHz – 18GHz

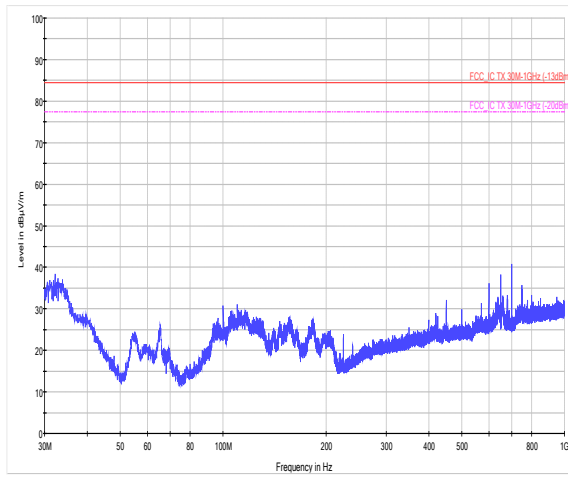
Date: 11.AUG.2014 15:31:15



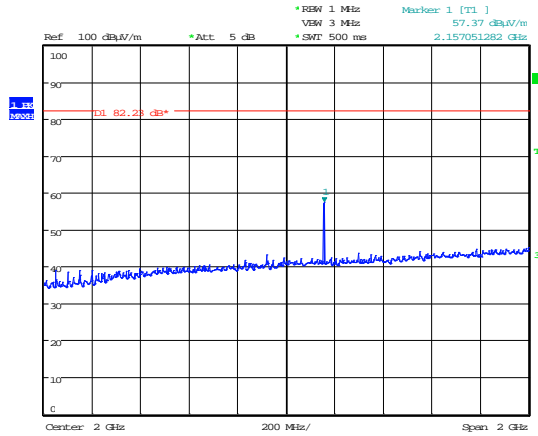
Date: 11.AUG.2014 15:46:05

18GHz – 22GHz

2100 MHz – 2155.0 MHz

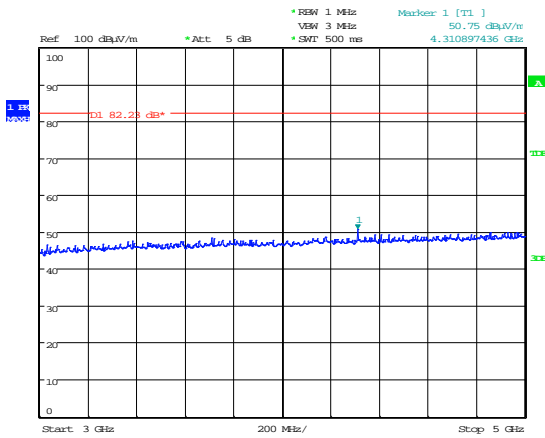


30MHz – 1GHz



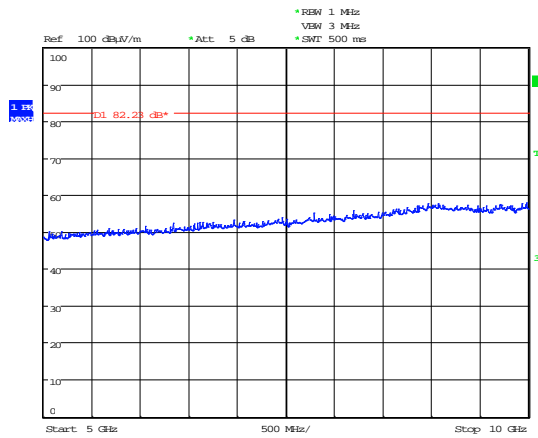
1GHz – 3GHz

Date: 11.AUG.2014 15:09:12



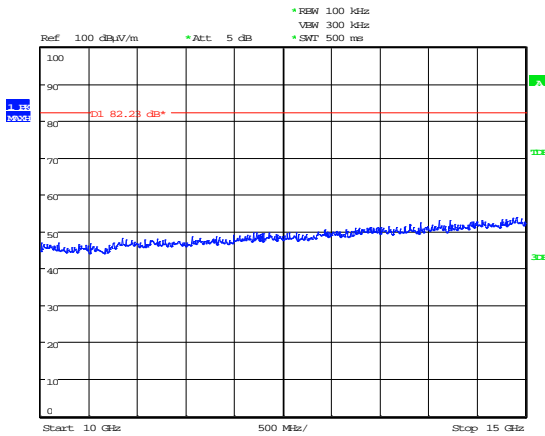
3GHz – 5GHz

Date: 11.AUG.2014 15:36:31



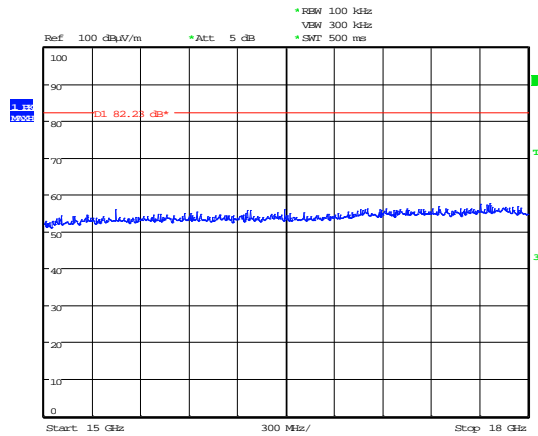
5GHz – 10GHz

Date: 11.AUG.2014 15:36:55



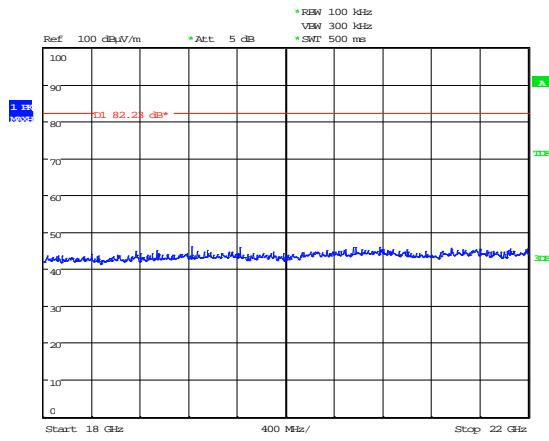
10GHz – 15GHz

Date: 11.AUG.2014 15:37:21



15GHz – 18GHz

Date: 11.AUG.2014 15:37:55



Date: 11.AUG.2014 15:46:46

18GHz – 22GHz

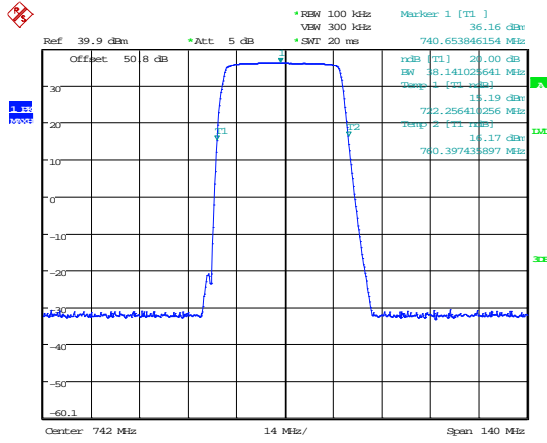
B7 Passband Gain & Bandwidth

Test Details:	
Measurement standard	D.3 Policies + Procedures (k) of KDB 935210 D02 Signal Boosters Certification v02
EUT sample number	S03
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C

BAND	Frequency MHz	fl	fh	20 dB Bandwidth
700 MHz	728 – 756 MHz	722.256410	760.397435	38.141
850 MHz	869 - 894 MHz	857.807692	899.794871	41.987
SMR 800 (Sprint)	862-869 MHz			
1900 MHz Upper	1930 - 1990 MHz	2097.628205	2166.282051	68.654
1700 MHz (AWS)	2110 - 2155 MHz	1923.397436	2002.243590	78.846

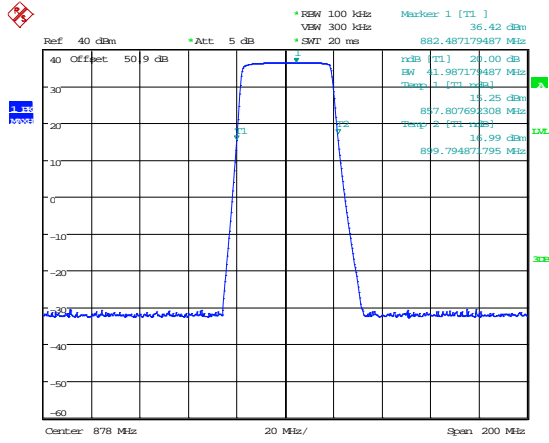
See below for plots showing passband gain & bandwidth

With the aid of a CW Swept signal generator and spectrum analyser, the bandwidth and frequency response of the open channel (i.e. at the point where the gain has fallen by 20 dB) is measured. This measurement shows the gain-versus-frequency response of the open channel from the midband frequency f_0 of the channel up to at least $f_0 + 250\%$ of the 20 dB bandwidth.



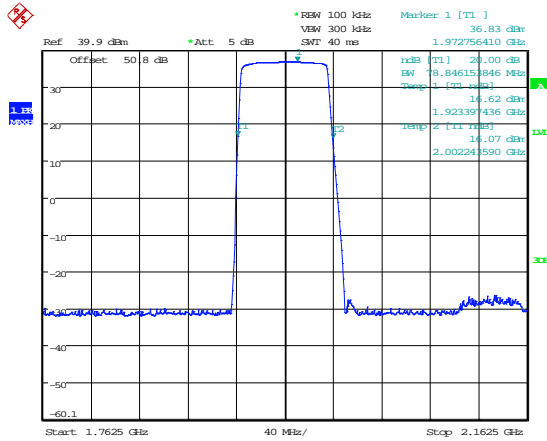
Date: 4.AUG.2014 11:05:01

700 MHz Band



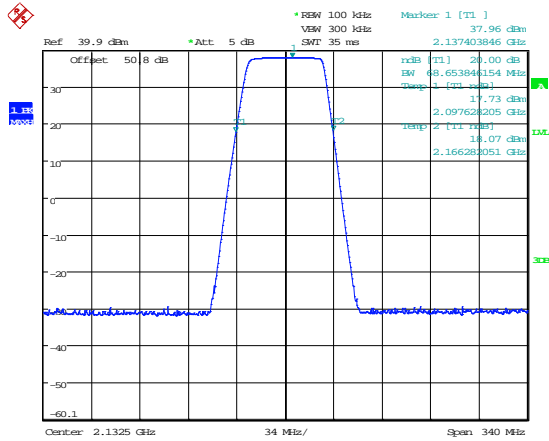
Date: 4.AUG.2014 10:34:23

850 MHz & SMR 800 (Sprint)



Date: 4.AUG.2014 12:12:36

1900 MHz (PCS)



Date: 4.AUG.2014 11:38:56

1700 MHz (AWS)

Appendix C:**Additional Test and Sample Details**

This appendix contains details of:

1. The samples submitted for testing.
2. Details of EUT operating mode(s)
3. Details of EUT configuration(s) (see below).
4. EUT arrangement (see below).

Throughout testing, the following numbering system is used to identify the sample and it's modification state:

Sample No: Sxx Mod w

where:

xx	= sample number	eg. S01
w	= modification number	eg. Mod 2

The following terminology is used throughout the test report:

Support Equipment (SE) is any additional equipment required to exercise the EUT in the applicable operating mode. Where relevant SE is divided into two categories:

SE in test environment: The SE is positioned in the test environment and is not isolated from the EUT (e.g. on the table top during REFE testing).

SE isolated from the EUT: The SE is isolated via filtering from the EUT. (e.g. equipment placed externally to the ALSR during REFE testing).

EUT configuration refers to the internal set-up of the EUT. It may include for example:

- Positioning of cards in a chassis.
- Setting of any internal switches.
- Circuit board jumper settings.
- Alternative internal power supplies.

Where no change in EUT configuration is **possible**, the configuration is described as "single possible configuration".

EUT arrangement refers to the termination of EUT ports / connection of support equipment, and where relevant, the relative positioning of samples (EUT and SE) in the test environment.

For further details of the test procedures and general test set ups used during testing please refer to the related document "EMC Test Methods - An Overview", which can be supplied by TRaC Global upon request.

C1) Test samples

The following samples of the apparatus were submitted by the client for testing :

Sample No.	Description
S01	MBF40
S02	OMU

C2) EUT Operating Mode During Testing.

During testing, the EUT was exercised as described in the following tables :

Test	Description of Operating Mode:
All tests detailed in this report	EUT active, operating at maximum gain and output power

C3) EUT Configuration Information.

The EUT was submitted for testing in one single possible configuration.

C4) List of EUT Ports

The tables below describe the termination of EUT ports:

Sample : S01 & S02
Tests : Conducted

Port	Description of Cable Attached	Cable length	Equipment Connected
Server / Donor	Coaxial	2m	Measurement System
Power	Multi core	1.5m	AC Mains

Sample : S01 & S02
Tests : Radiated Emissions

Port	Description of Cable Attached	Cable length	Equipment Connected
Server / Donor	Coaxial	2m	Measurement System
Power	Multi core	1.5m	AC Mains

* Only connected during setup.

C5 Details of Equipment Used

TRaC No	Equipment Type	Equipment Description	Manufacturer	Last Cal	Cal Period	Due For Cal
L352	ESVS10	Receiver	R&S	21/03/2014	12	21/03/2015
UH093	CBL6112B	Bilog	Chase	08/07/2013	24	08/07/2015
UH281	FSU46	Spectrum Analyser	R&S	26/03/2014	12	26/03/2015
UH405	FSU26	Spectrum Analyser	R&S	16/04/2014	12	16/04/2015
L138	3115	1-18GHz Horn	EMCO	17/10/2013	24	17/10/2015
L139	3115	1-18GHz Horn	EMCO	20/09/2013	24	20/09/2015
L254	2042	Signal Generator	Marconi	08/01/2014	12	08/01/2015
L176	2042	Signal Generator	Marconi	20/11/2012	12	20/11/2013
L263/A	20240-20	Horn 18-26GHz	Flann	17/11/2011	24	17/11/2013
L290	CBL611/A	Bilog	Chase	13/12/2012	24	13/12/2014
L572	8449B	Pre Amp	Agilent	12/12/2012	24	12/12/2014
REF916	SMBV100A	Signal Generator	R&S	23/07/2012	12	23/07/2013
REF940	ATS	Radio Chamber - PP	Rainford EMC	09/07/2013	12	09/07/2014
REF976	34405a	Multimeter	Agilent	26/04/2013	12	26/04/2014
REF977	SH4141	High Pass Filter	BSC	25/02/2013	24	25/02/2015

Appendix D:

Additional Information

No additional information is included within this test report.

Appendix E:

Photographs and Figures

The following photographs were taken of the test samples:

1. Radiated electric field emissions arrangement



Photograph 1

