Annex E

CTC advanced member of RWTÜV group

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Test report annex authorized:

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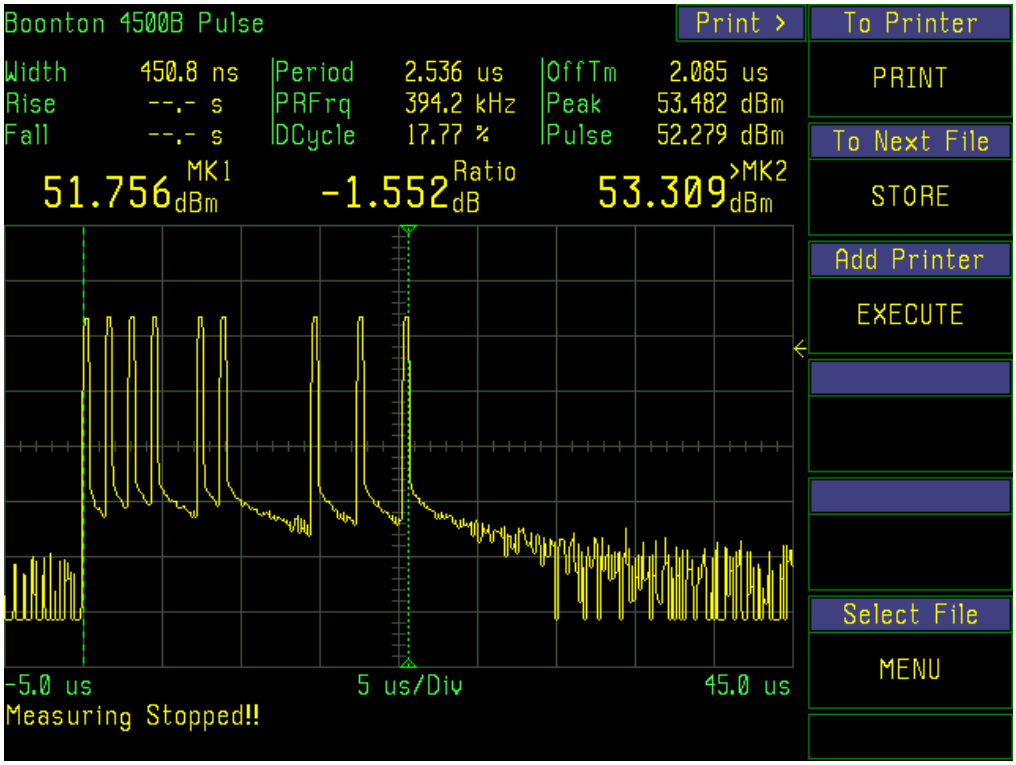
2019.04.05 15:07:44 +02'00'

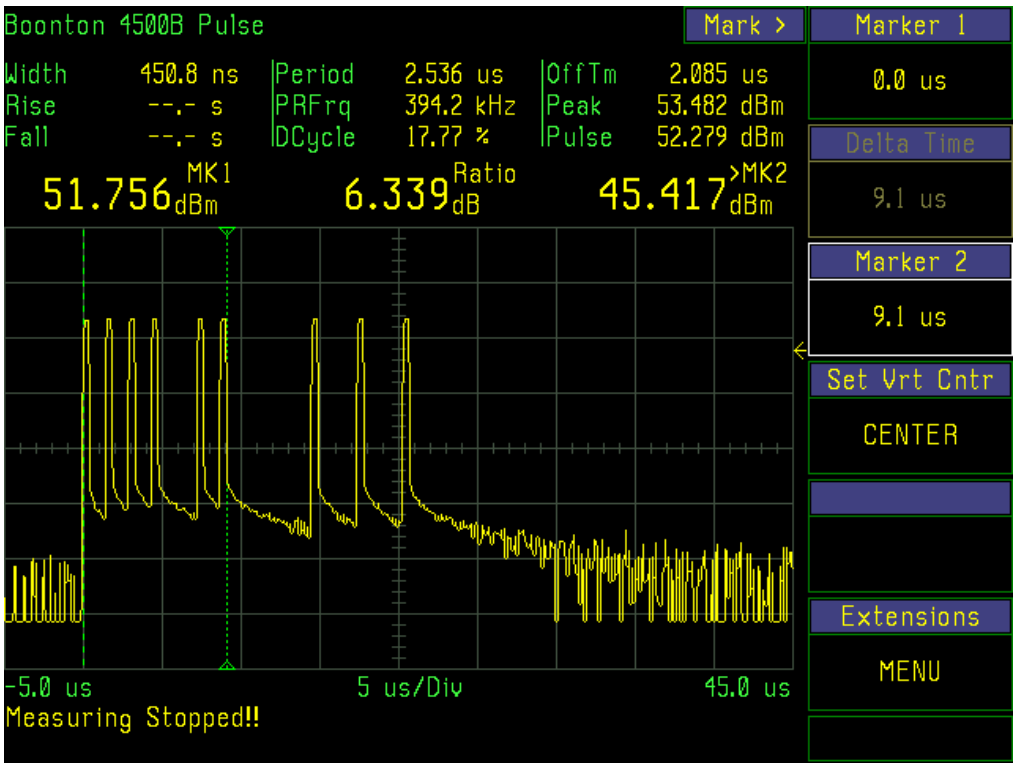
Karsten Geraldy
Lab Manager
Radio Communications & EMC

Plots – PPA – Mode A

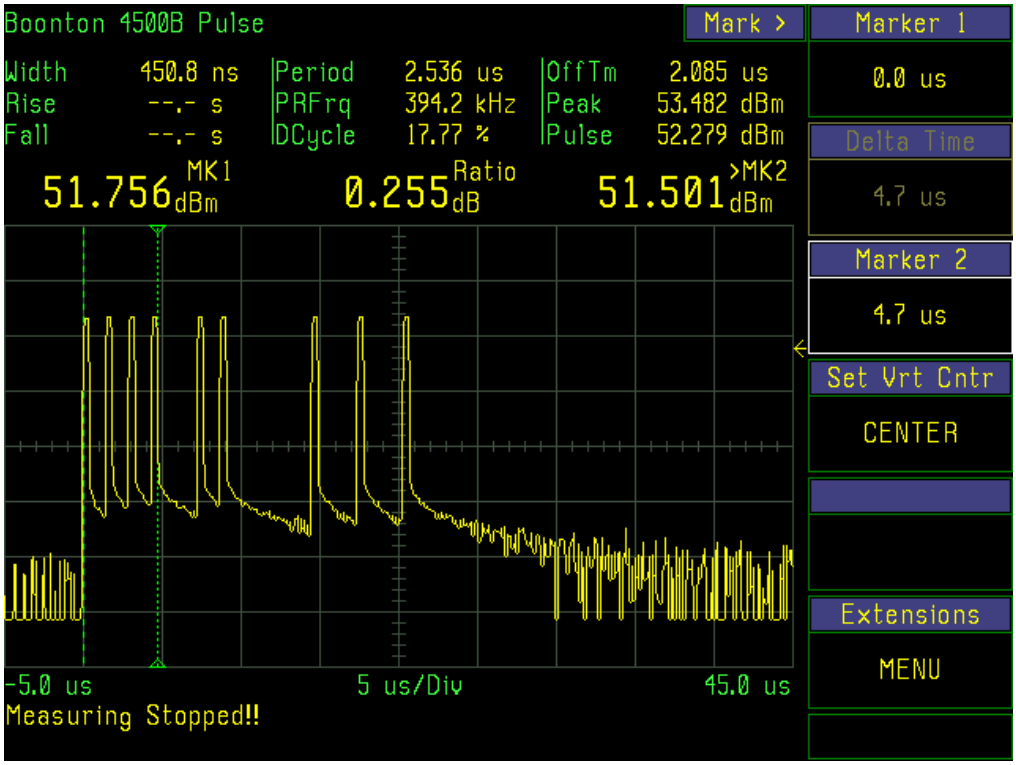
Plot no. 1:



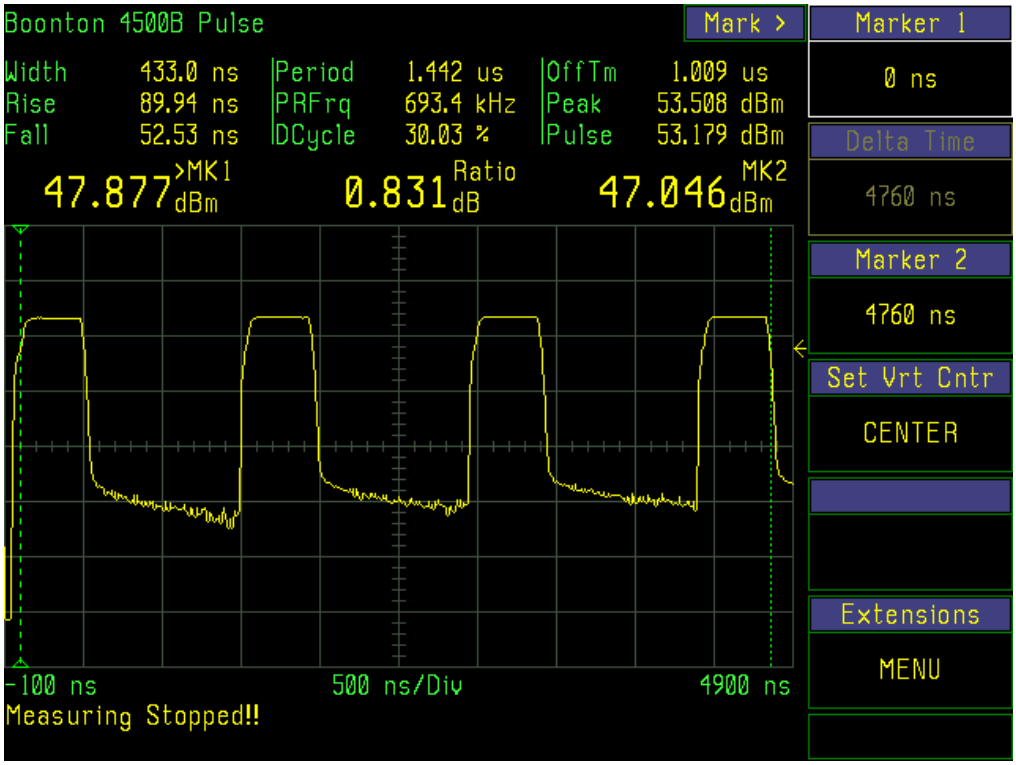
Plot no. 2:



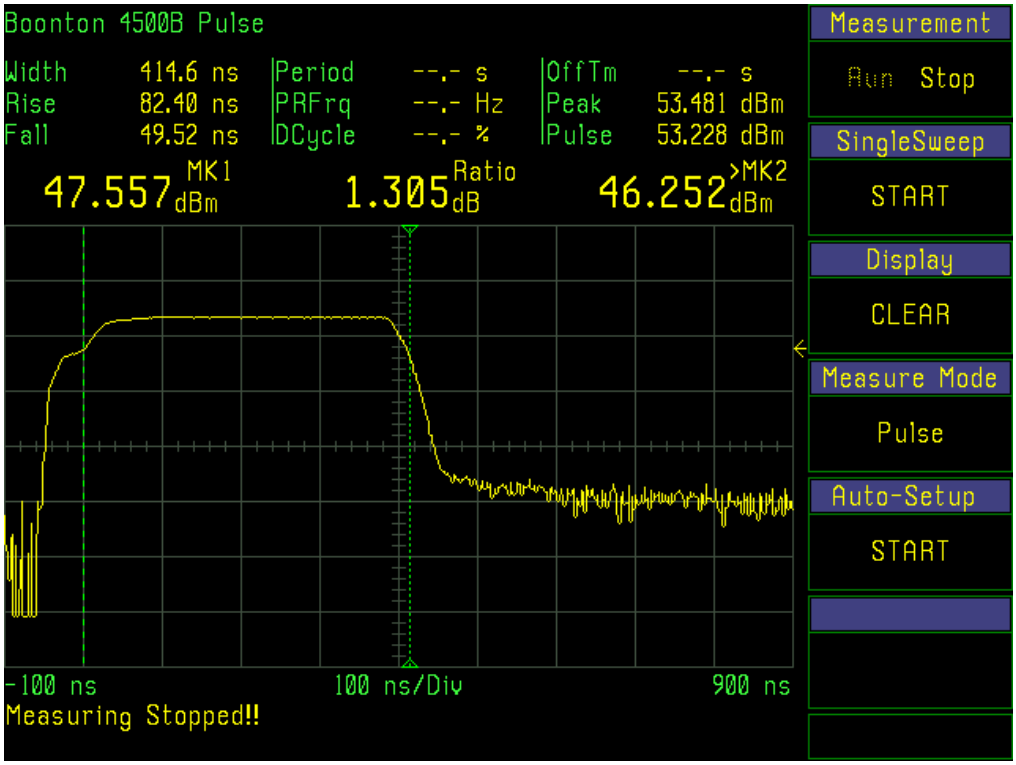
Plot no. 3:



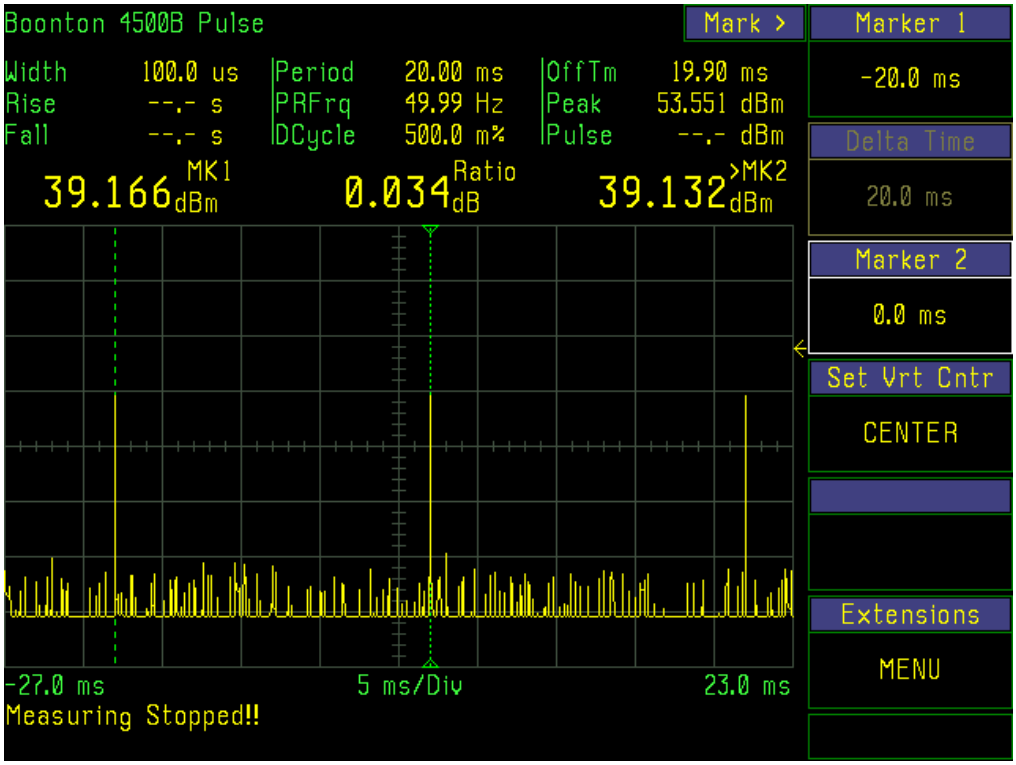
Plot no. 4:



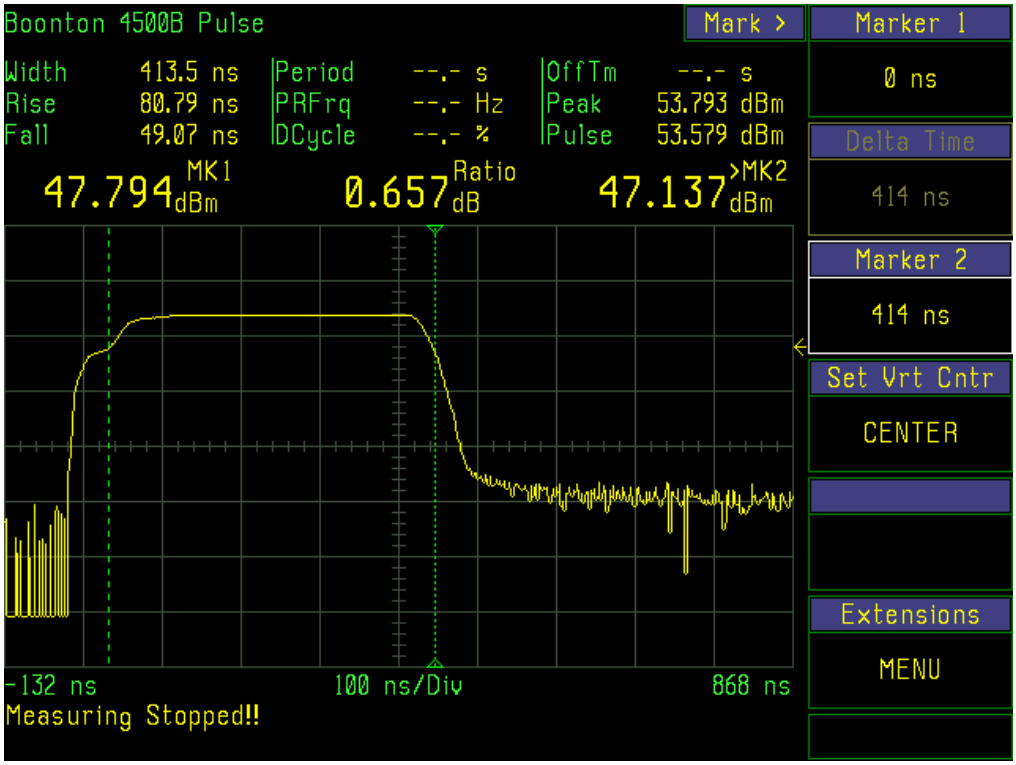
Plot no. 5:



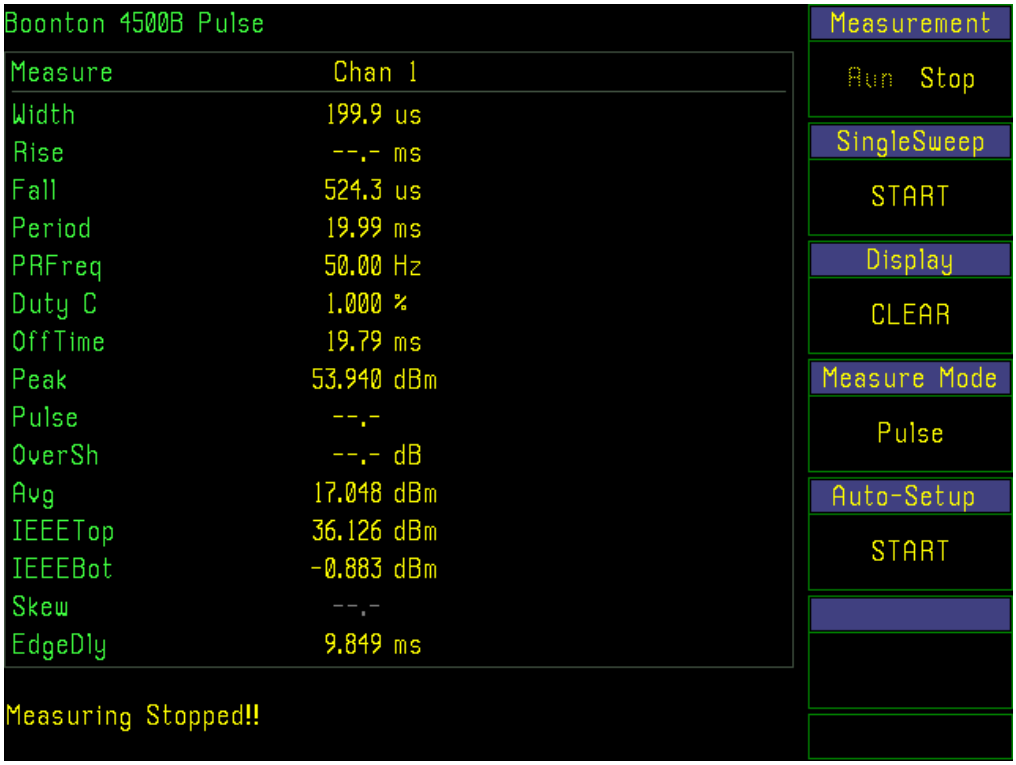
Plot no. 6:



Plot no. 7:

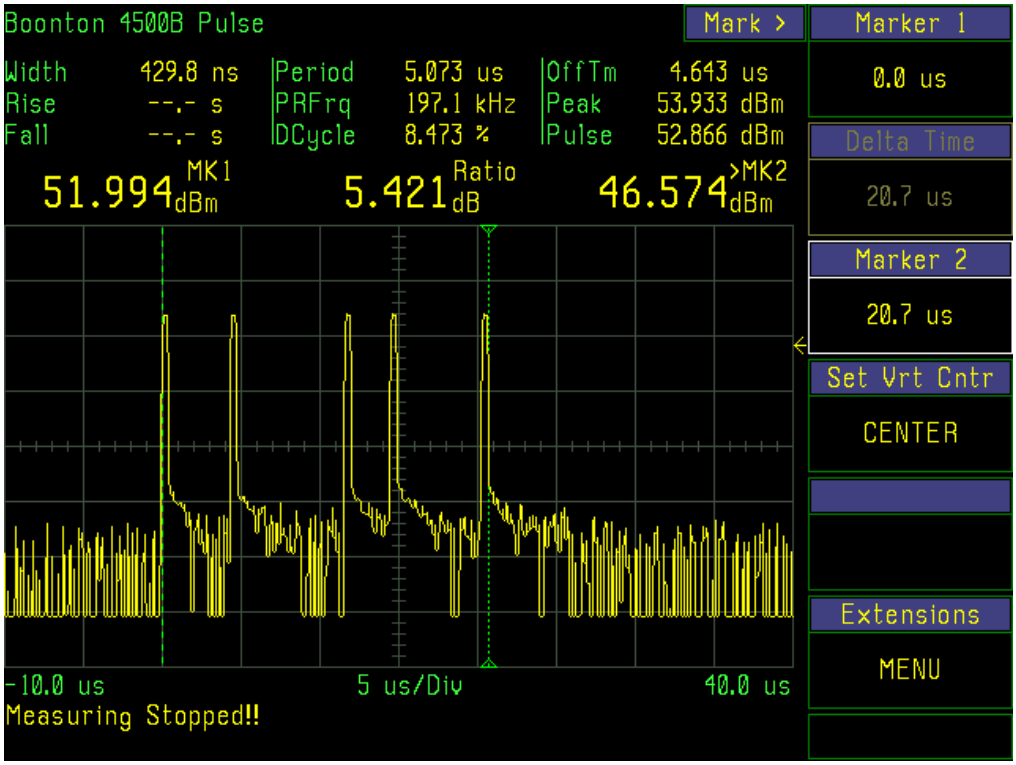


Plot no. 8:

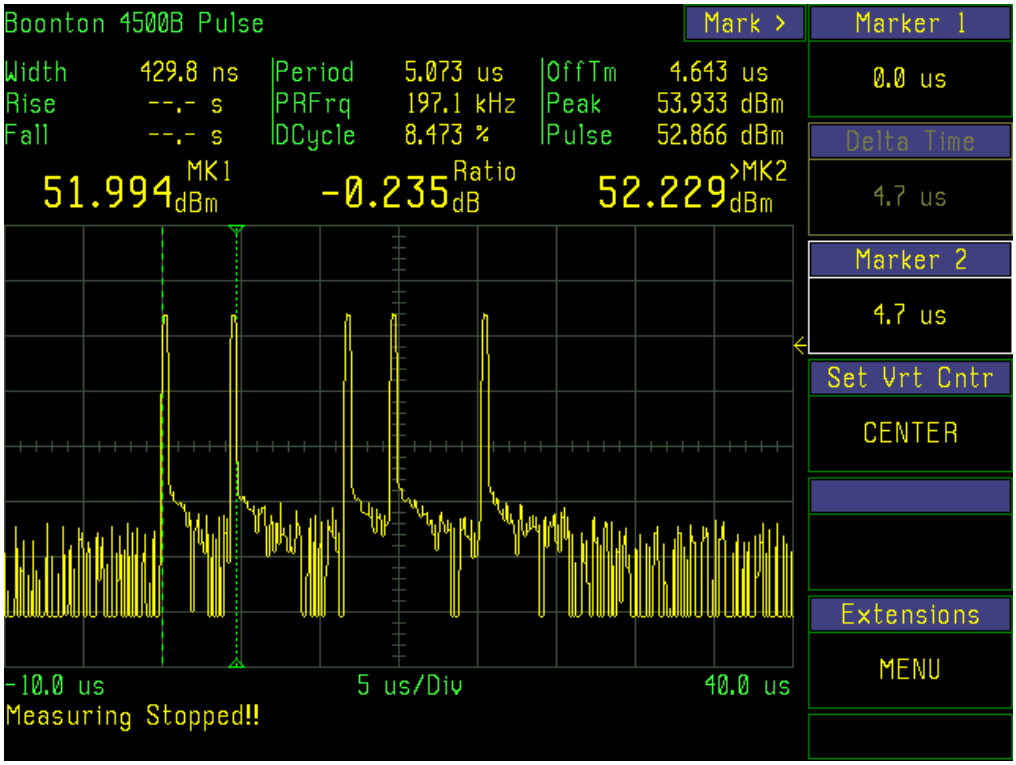


Plots – PPA – Mode C

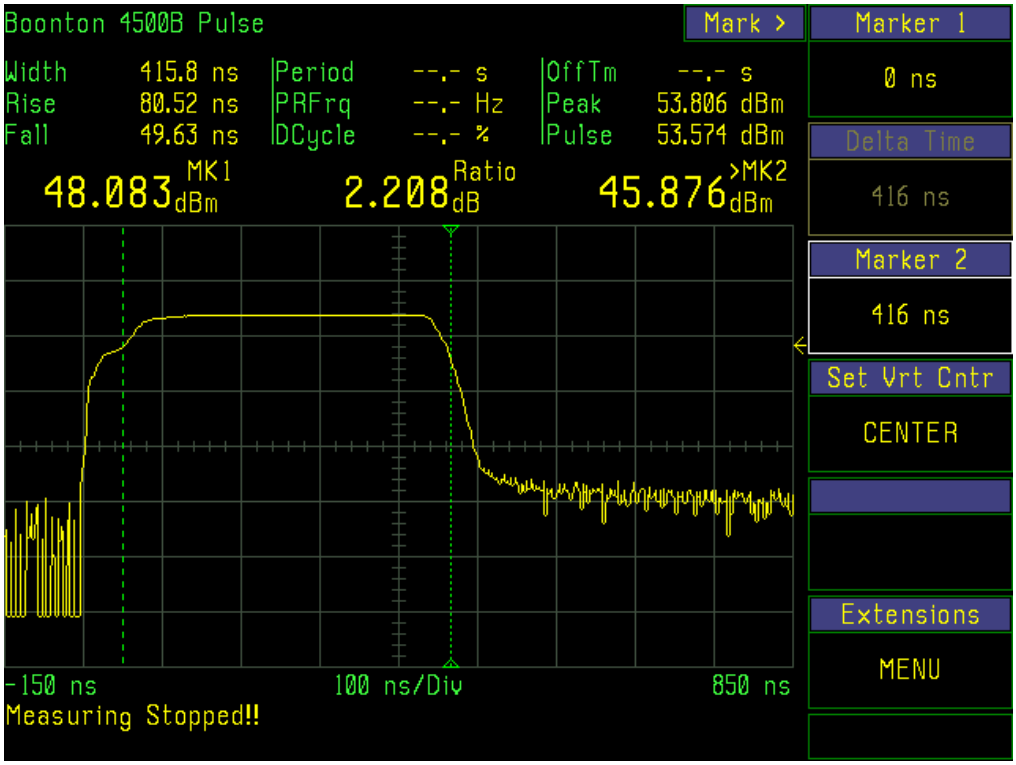
Plot no. 9:



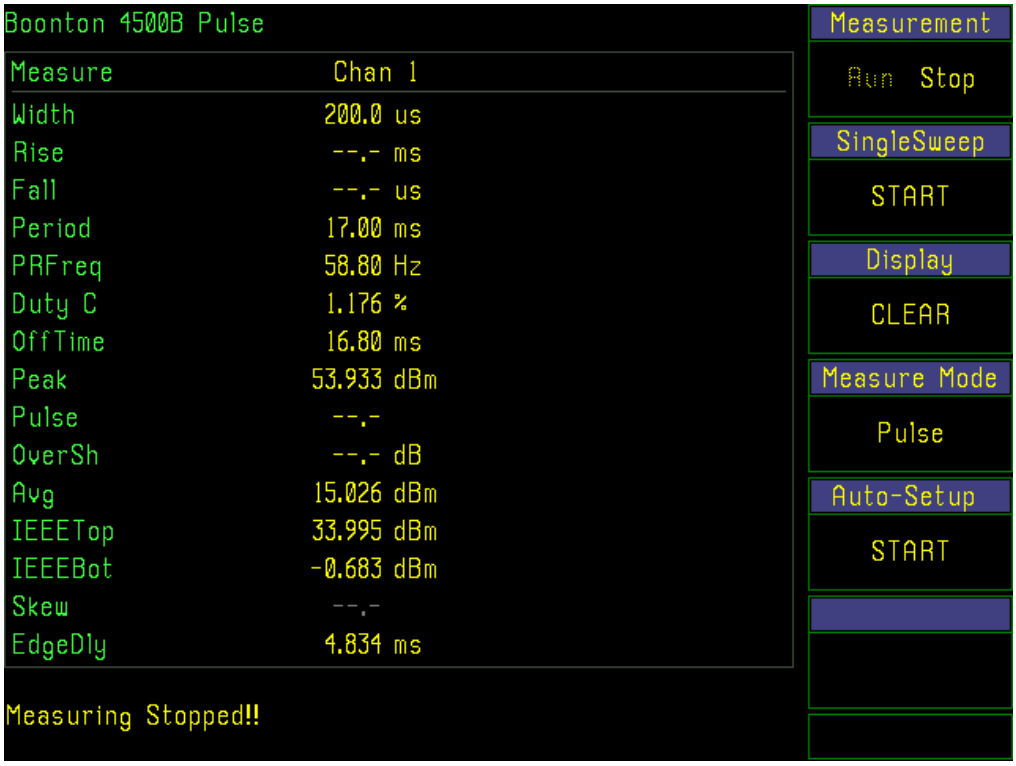
Plot no. 10:



Plot no. 11:

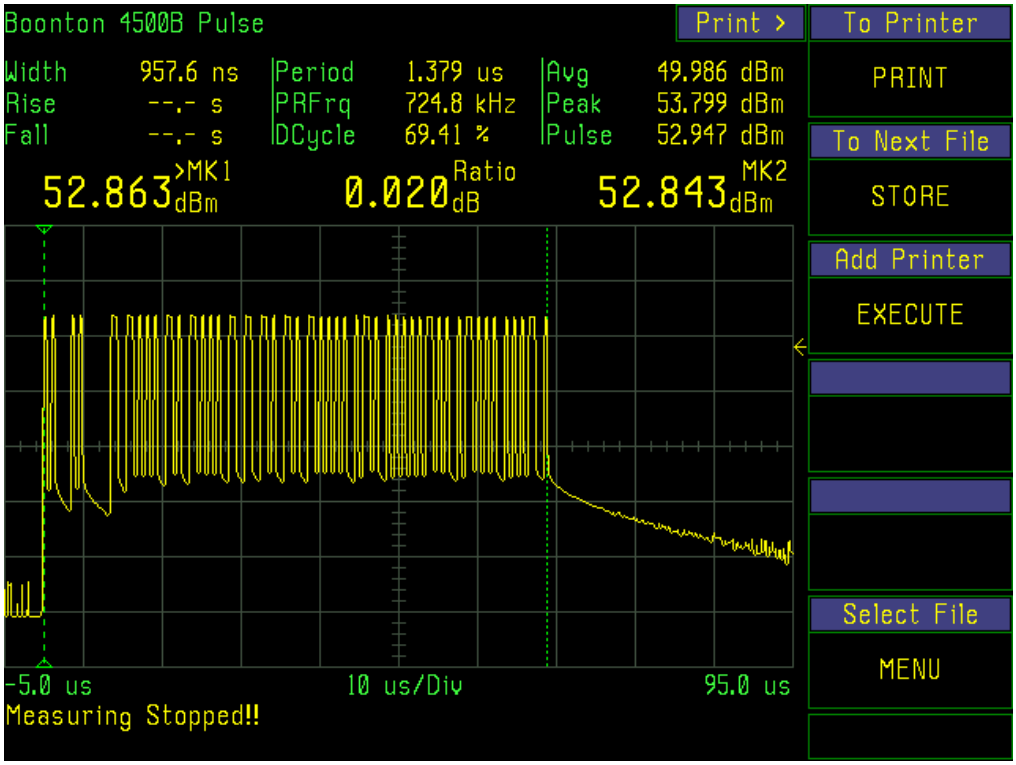


Plot no. 12:

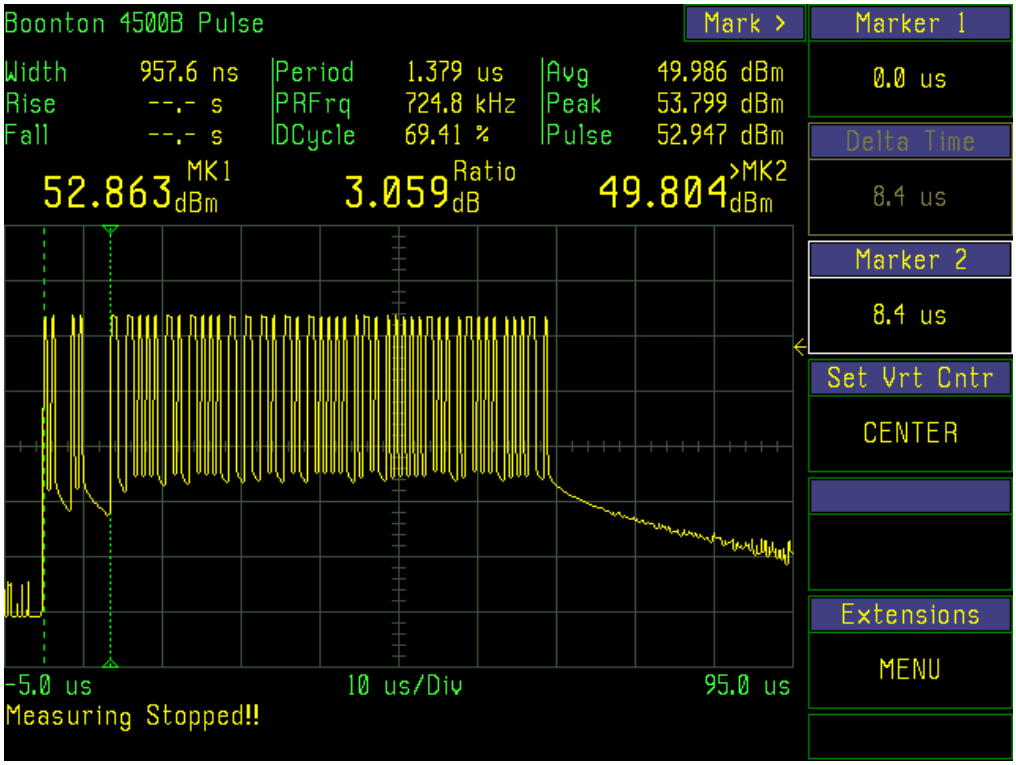


Plots – PPA – Mode S

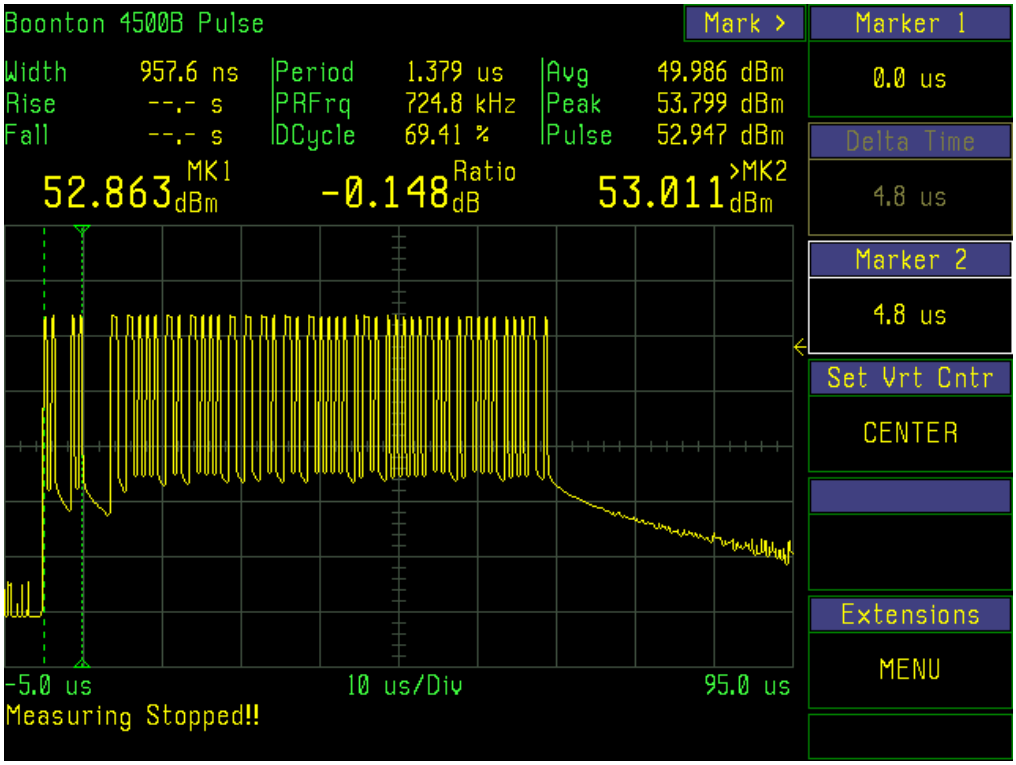
Plot no. 13:



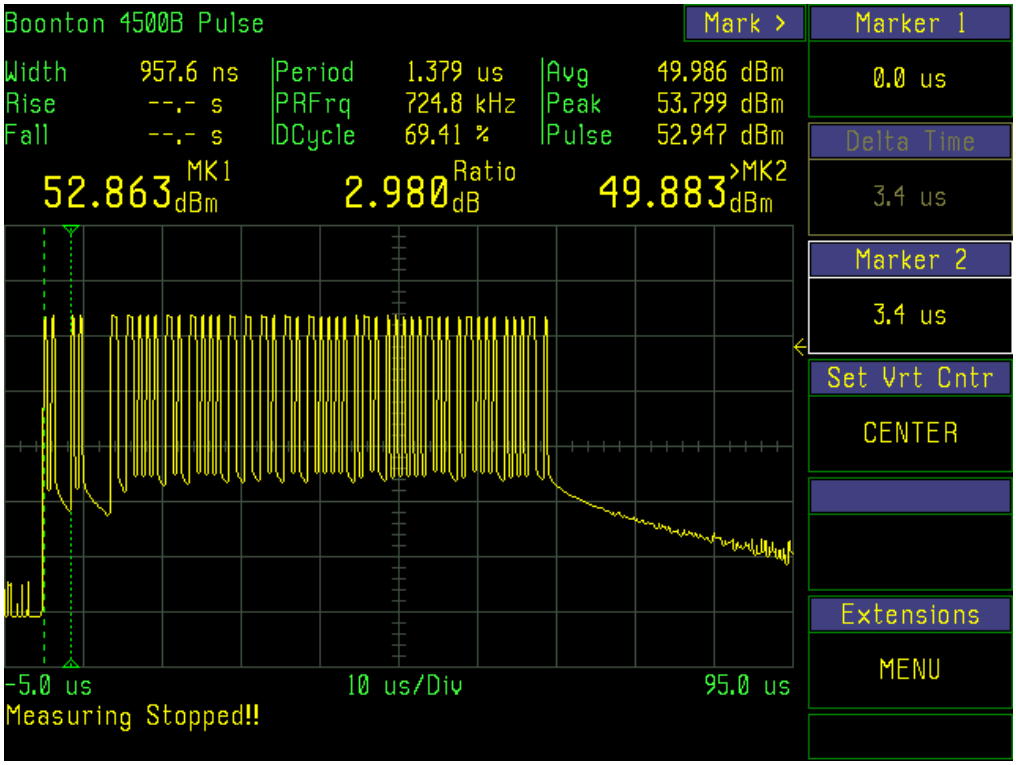
Plot no. 14:



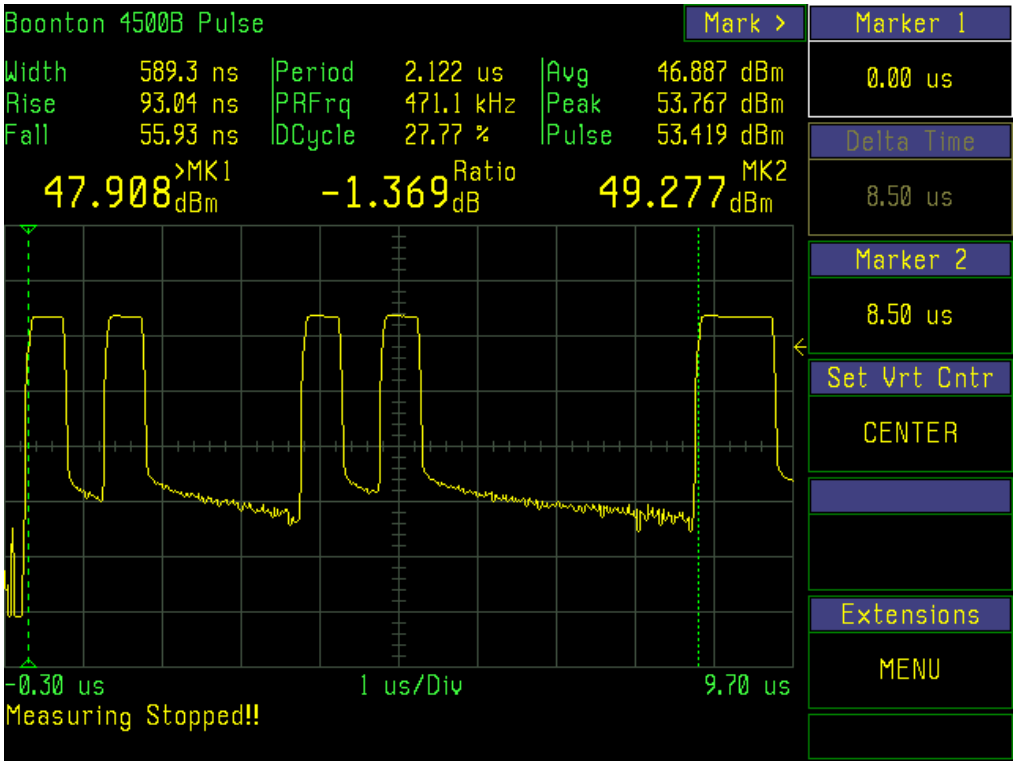
Plot no. 15:



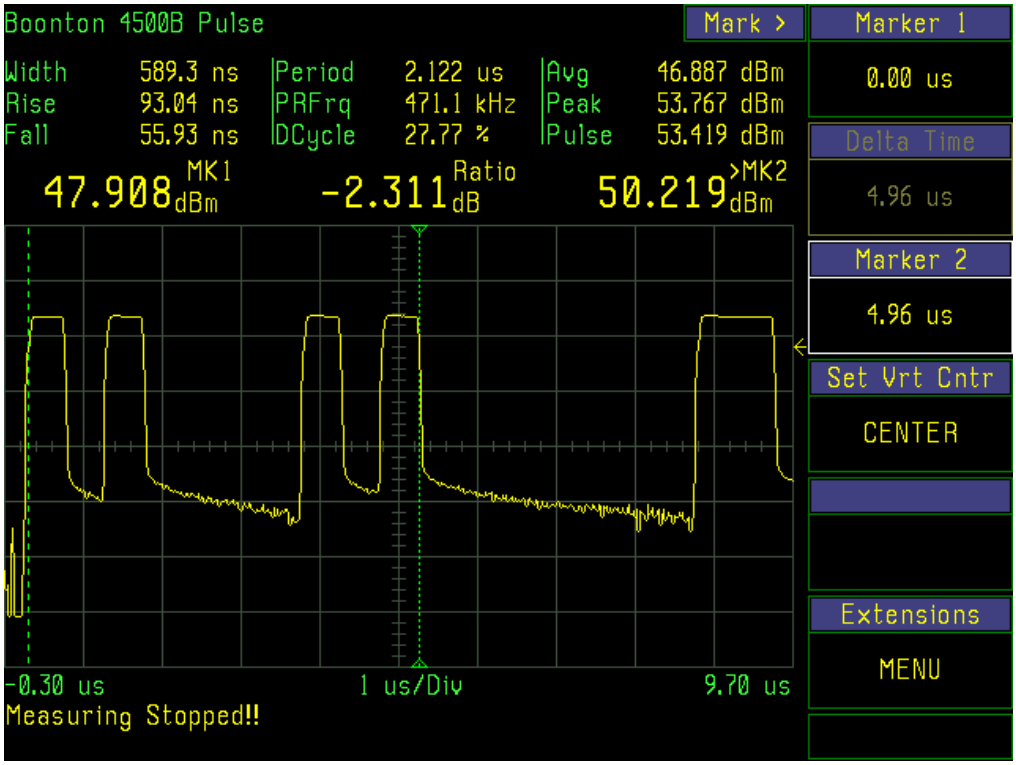
Plot no. 16:



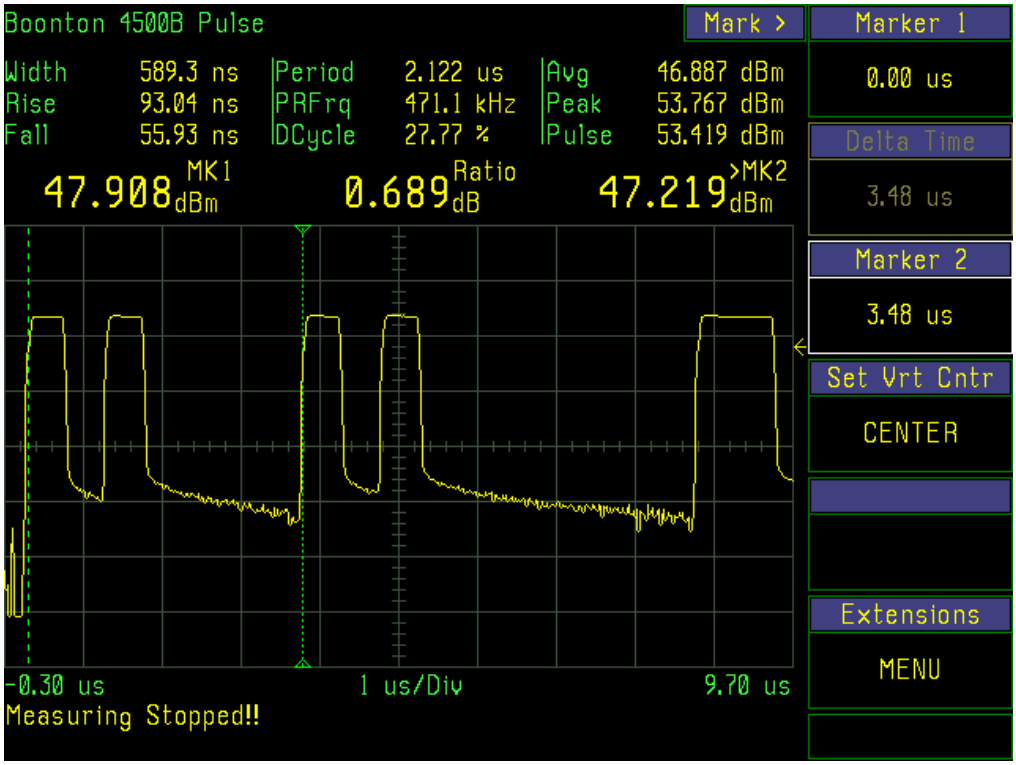
Plot no. 17:



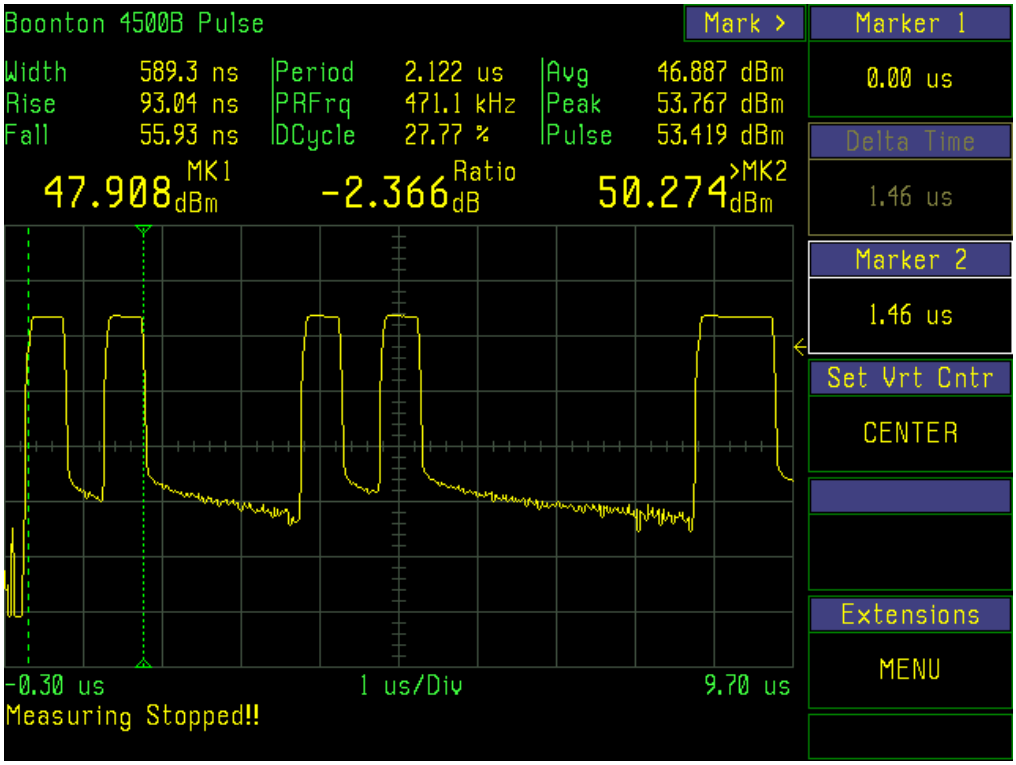
Plot no. 18:



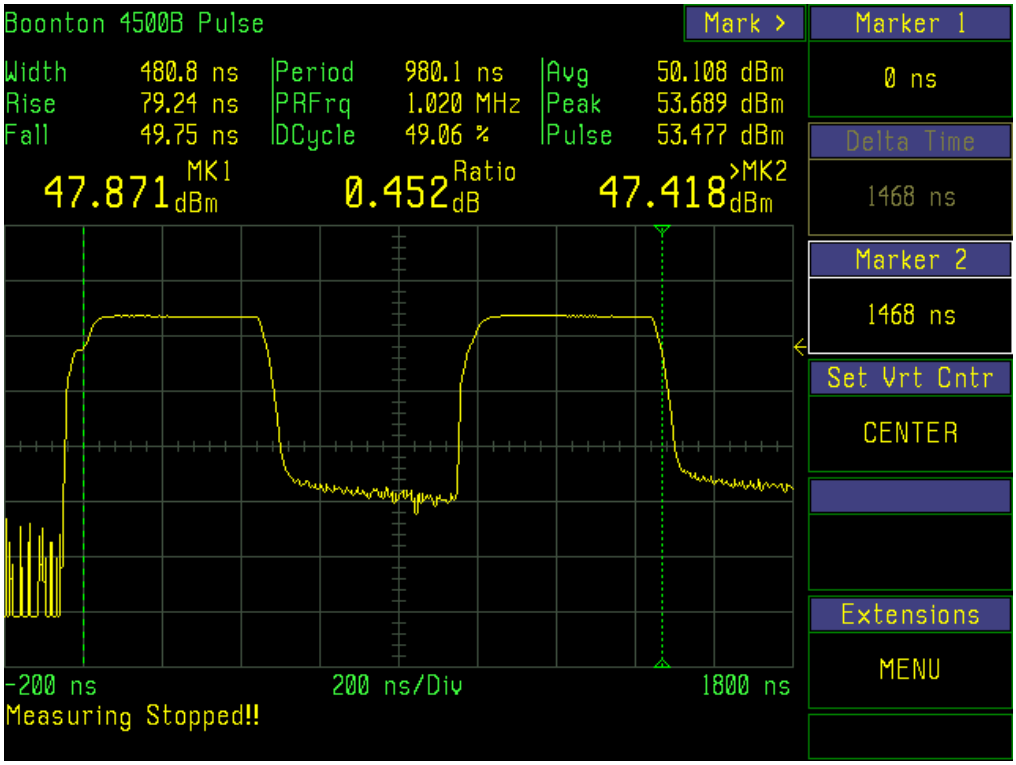
Plot no. 19:



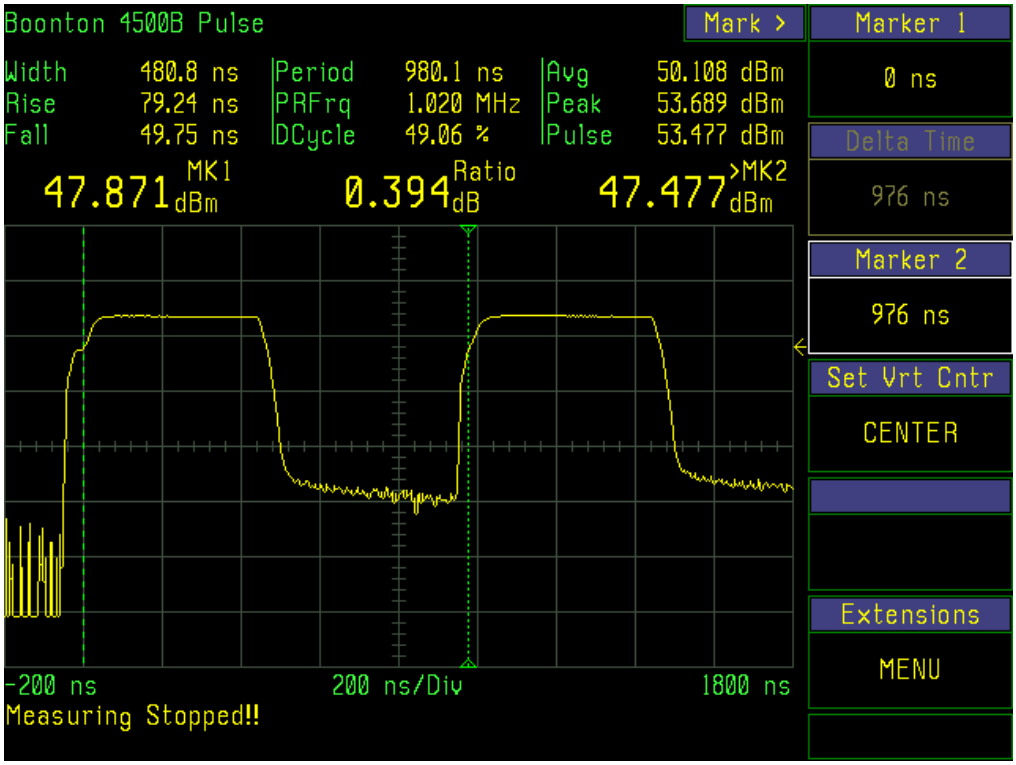
Plot no. 20:



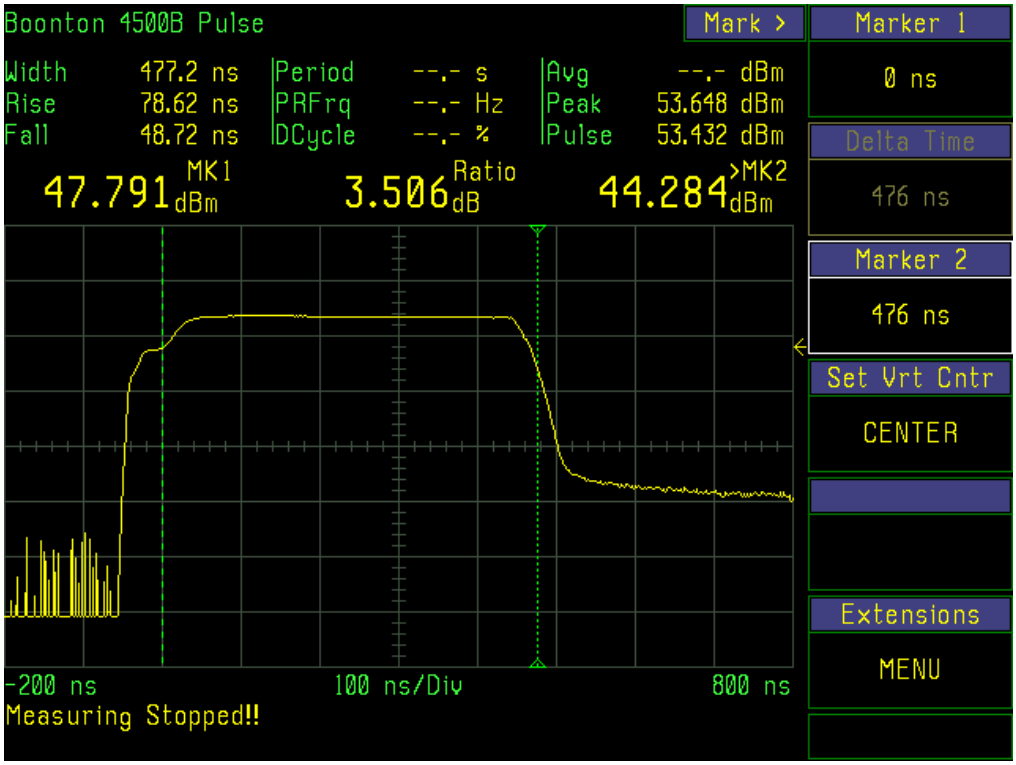
Plot no. 21:



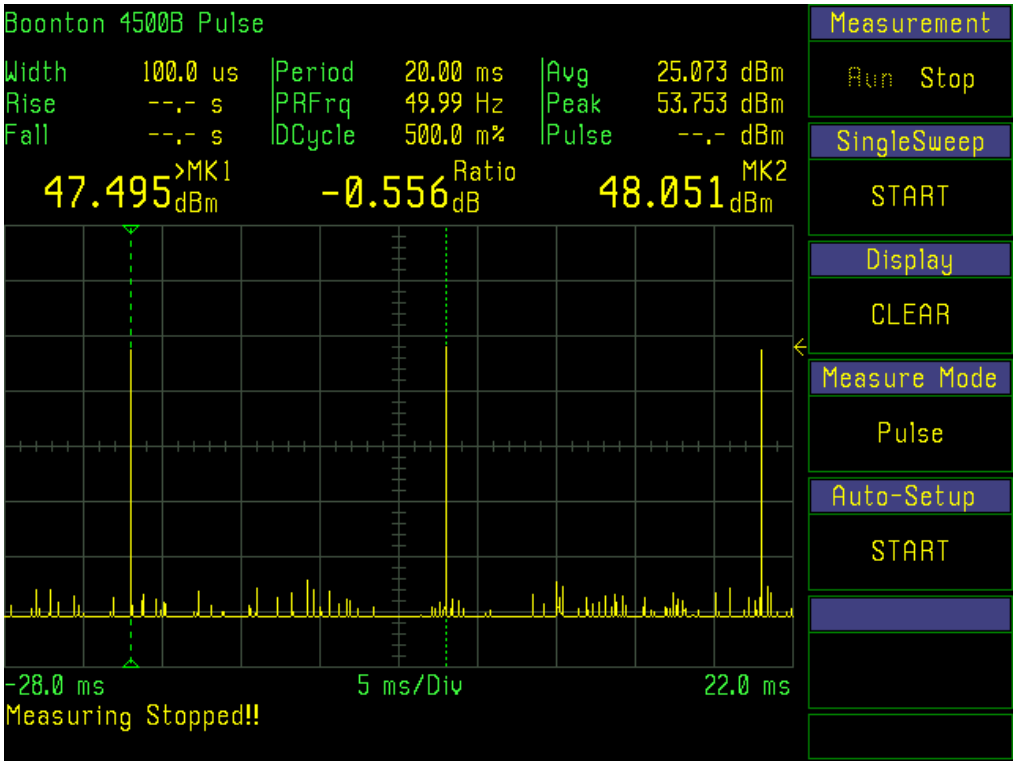
Plot no. 22:



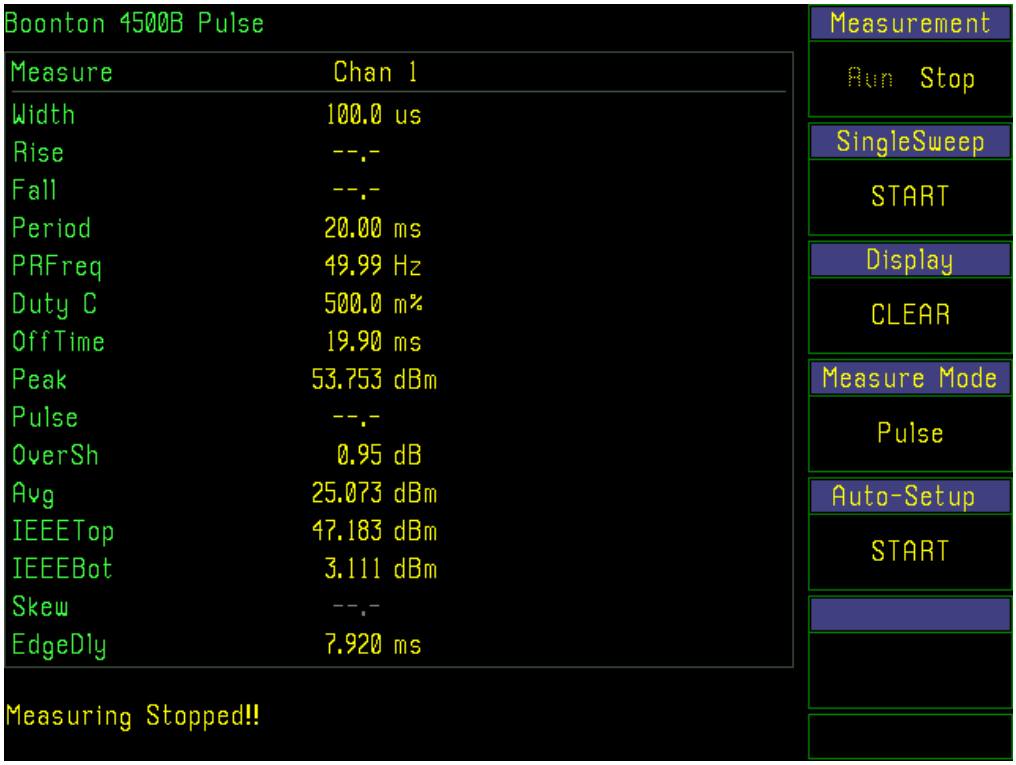
Plot no. 23:



Plot no. 24:

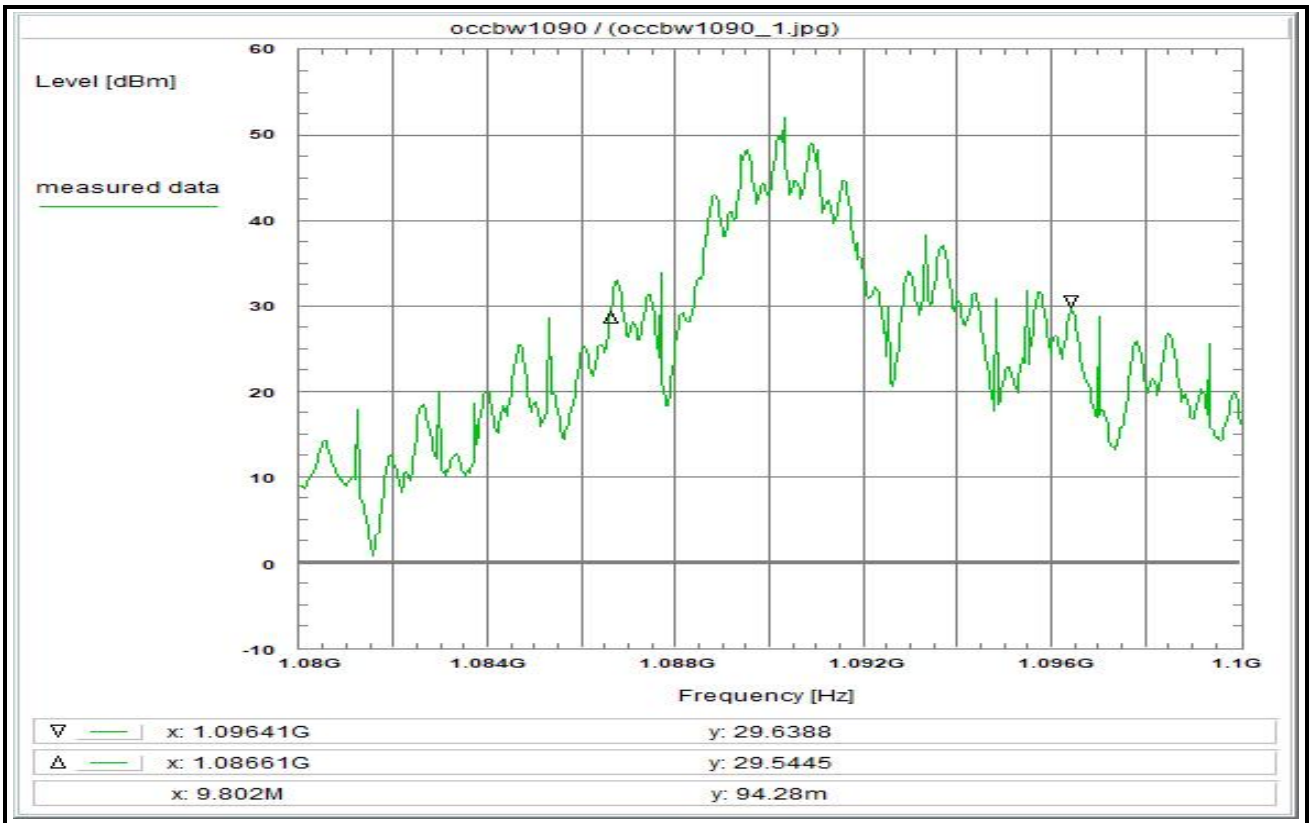


Plot no. 25:


Boonton 4500B Pulse
Measure
Chan 1
Width 100.0 us
Rise --.-
Fall --.-
Period 20.00 ms
PRFreq 49.99 Hz
Duty C 500.0 m%
OffTime 19.90 ms
Peak 53.753 dBm
Pulse --.-
OverSh 0.95 dB
Avg 25.073 dBm
IEEETop 47.183 dBm
IEEEBot 3.111 dBm
Skew --.-
EdgeDly 7.920 ms
Measuring Stopped!!
Measurement
Run Stop
SingleSweep
START
Display
CLEAR
Measure Mode
Pulse
Auto-Setup
START

Plots – conducted emissions

Plot No. 1 (18)



Subclause: -/- Function test
RF-carrier at 1090 MHz
Determination of the occupied bandwidth

Limit:
no limits defined

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode A

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Determination of the occupied bandwidth**

Environment condition:

Date & Time:	Thu 07/Mar/2019 11:21:52	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

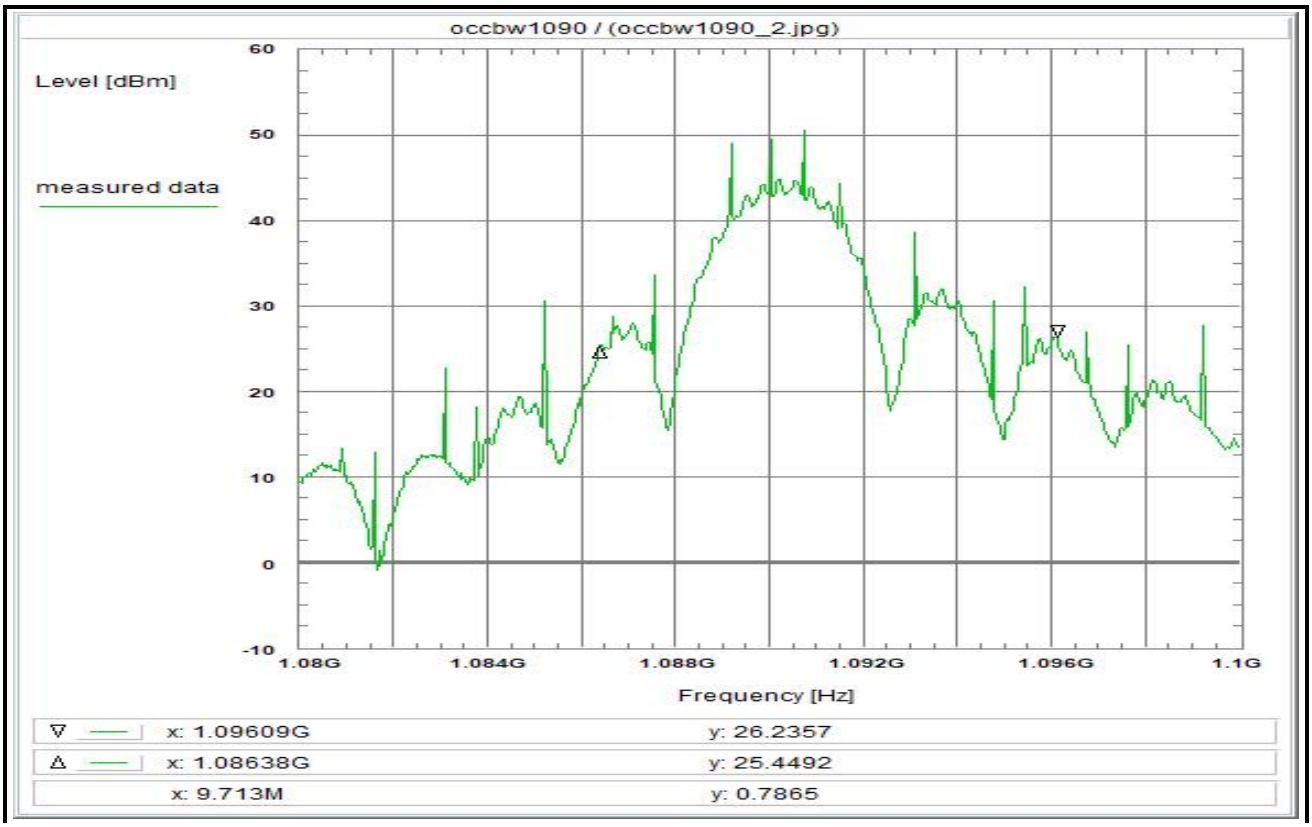
Start frequency:	1.08	GHz
Stop frequency:	1.1	GHz
Center frequency:	1.09	GHz
Frequency span:	20	MHz
Resolution-BW:	200	kHz
Video-BW:	1	MHz
Input attenuation:	30	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	Pos Peak	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.7	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor (200k -> 1M)	+	7.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	43.5	dB

Remarks:
Determination of the occupied bandwidth
The measured value is about 9.8 MHz (delta marker)
(acc. to the definitions: 99% of the total mean power)
Max-Hold measurement.

Plot No. 2 (18)



Subclause: -/- Function test
RF-carrier at 1090 MHz
Determination of the occupied bandwidth

Limit:
no limits defined

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode C

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Determination of the occupied bandwidth**

Environment condition:

Date & Time:	Thu 07/Mar/2019 11:16:47	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

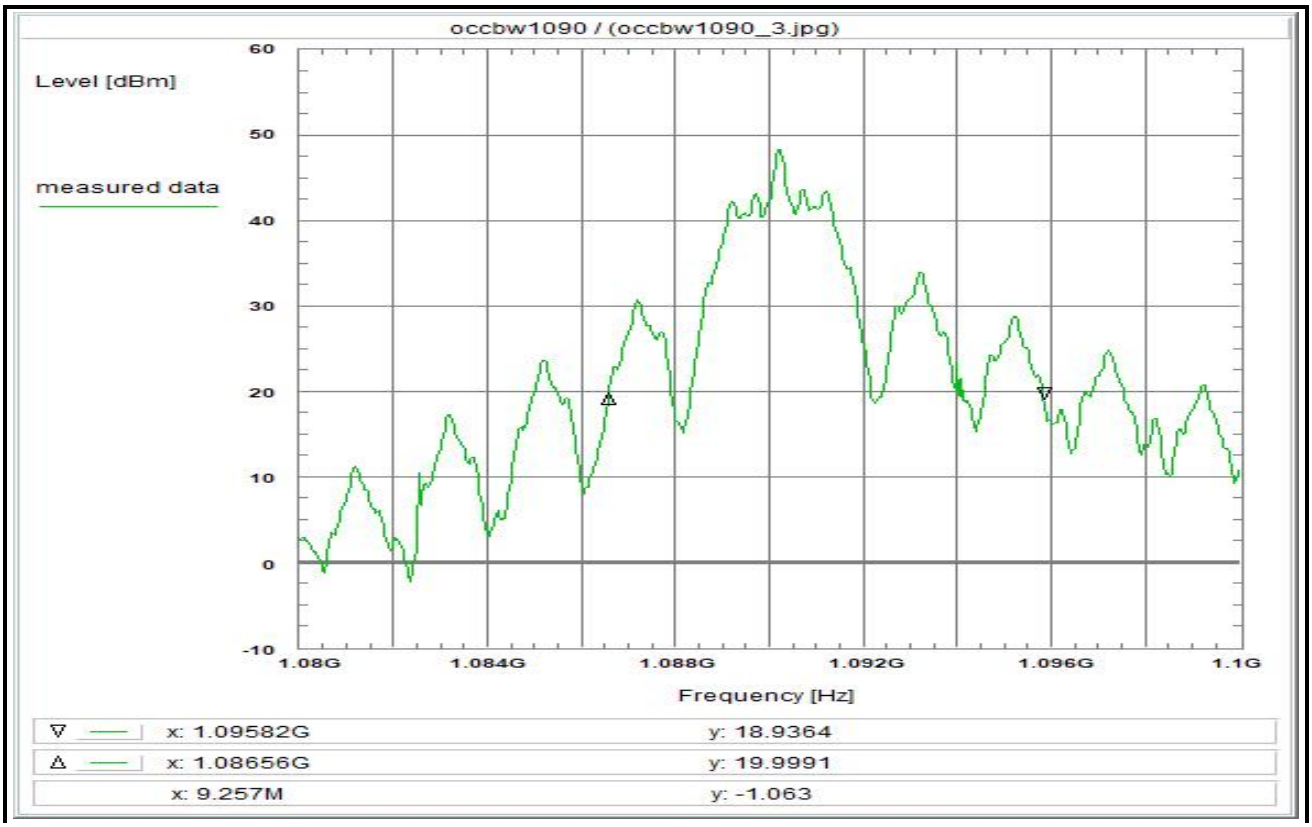
Start frequency:	1.08	GHz
Stop frequency:	1.1	GHz
Center frequency:	1.09	GHz
Frequency span:	20	MHz
Resolution-BW:	200	kHz
Video-BW:	1	MHz
Input attenuation:	30	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	Pos Peak	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.7	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor (200k -> 1M)	+	7.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	43.5	dB

Remarks:
Determination of the occupied bandwidth
The measured value is about 9.7 MHz (delta marker)
(acc. to the definitions: 99% of the total mean power)
Max-Hold measurement.

Plot No. 3 (18)



Subclause: -/- Function test
RF-carrier at 1090 MHz
Determination of the occupied bandwidth

Limit:
no limits defined

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode S

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Determination of the occupied bandwidth**

Environment condition:

Date & Time:	Thu 07/Mar/2019 11:12:09	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

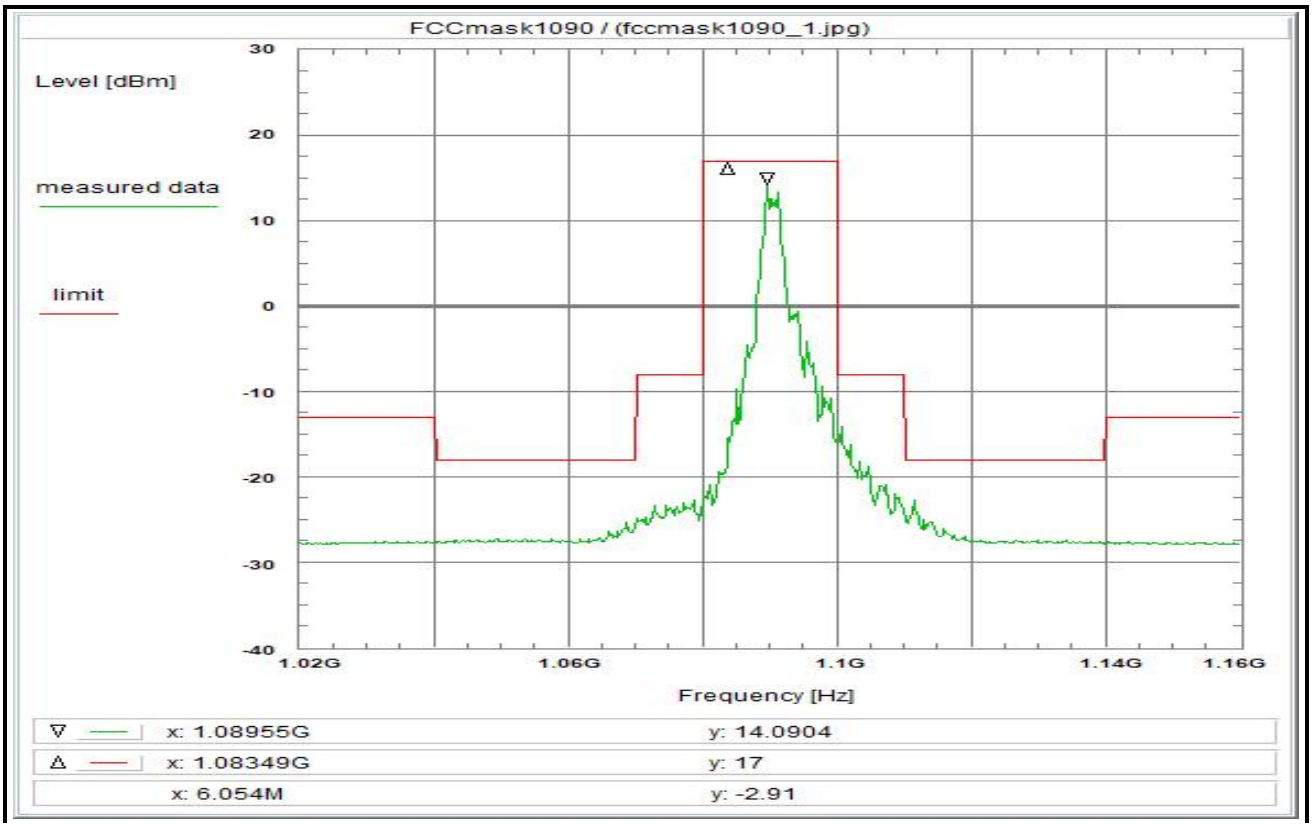
Start frequency:	1.08	GHz
Stop frequency:	1.1	GHz
Center frequency:	1.09	GHz
Frequency span:	20	MHz
Resolution-BW:	200	kHz
Video-BW:	1	MHz
Input attenuation:	30	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	Pos Peak	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.7	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.5	dB

Remarks:
Determination of the occupied bandwidth
The measured value is about 9.25 MHz (delta marker)
(acc. to the definitions: 99% of the total mean power)
Max-Hold measurement.

Plot No. 4 (18)



Subclause: -/- Spectrum mask
RF-carrier at 1090 MHz
Spectrum mask

Limit:
Limit acc. to FCC Part 87.139

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode A

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Wed 06/Mar/2019 16:48:30	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	1.02	GHz
Stop frequency:	1.16	GHz
Center frequency:	1.09	GHz
Frequency span:	140	MHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	30	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

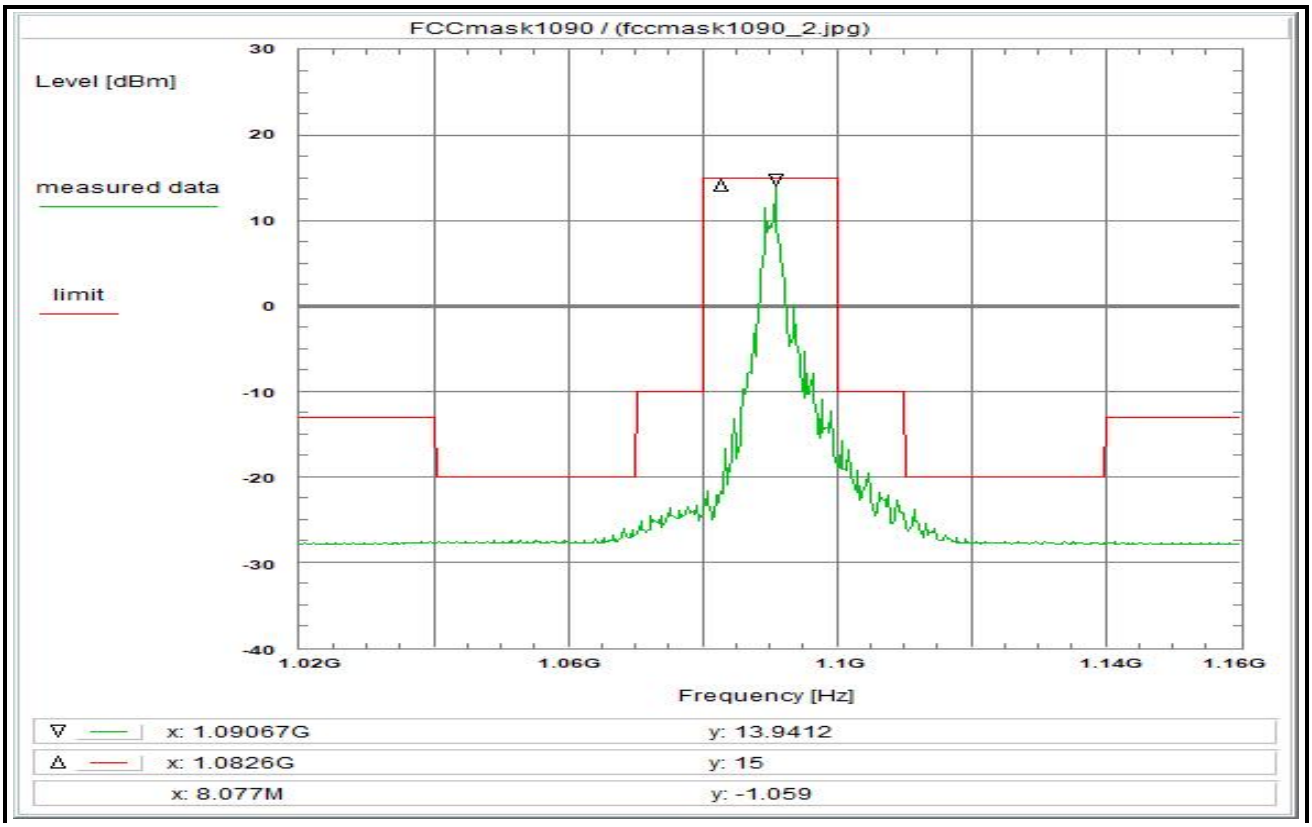
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.7	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.5	dB

Remarks:
Spectrum mask according to picture 1
Max-Hold measurement.

Spectrum mask based on 20 MHz bandwidth and 15 dBm mean power.

Plot No. 5 (18)



Subclause: -/- Spectrum mask
RF-carrier at 1090 MHz
Spectrum mask

Limit:
Limit acc. to FCC Part 87.139

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode C

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Wed 06/Mar/2019 16:46:07	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	1.02	GHz
Stop frequency:	1.16	GHz
Center frequency:	1.09	GHz
Frequency span:	140	MHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	30	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

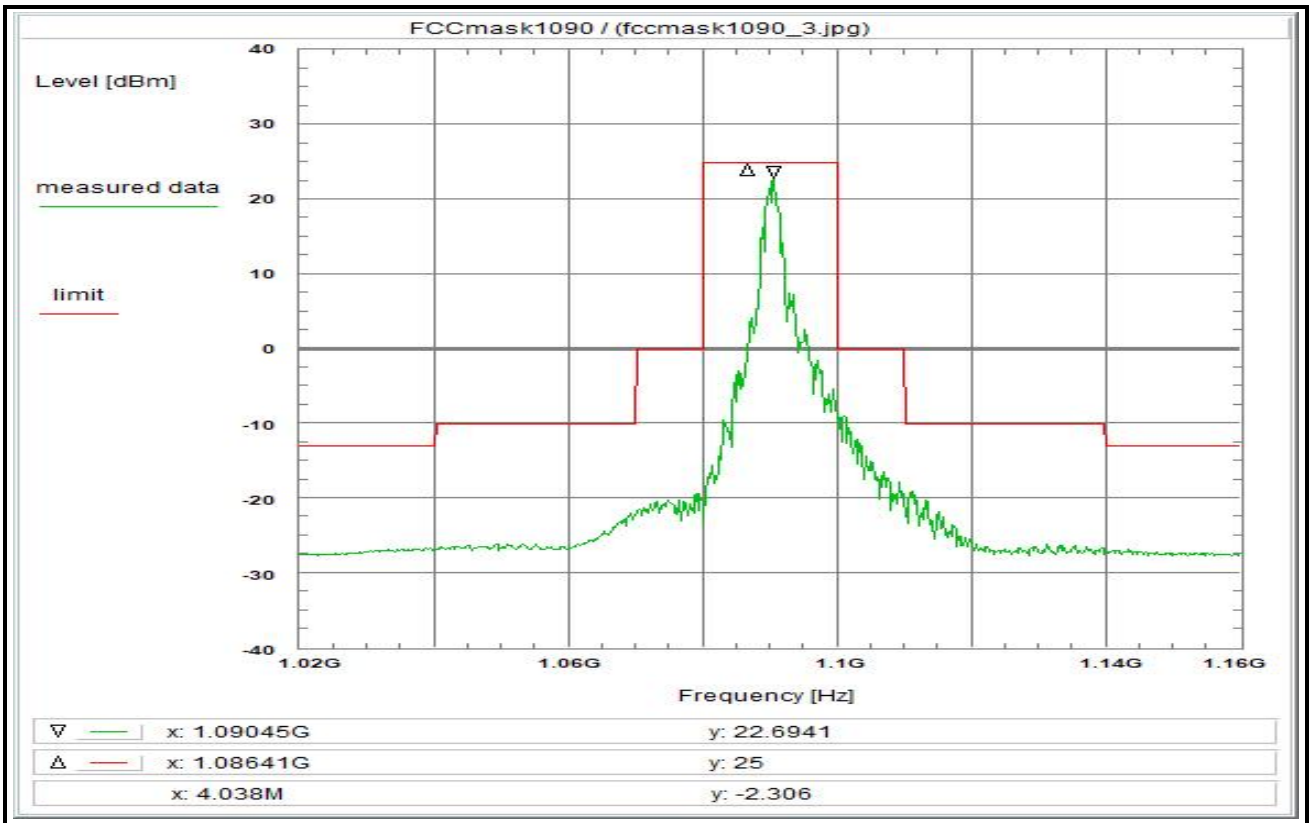
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.7	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.5	dB

Remarks:
Spectrum mask according to picture 1
Max-Hold measurement.

Spectrum mask based on 20 MHz bandwidth and 15 dBm mean power.

Plot No. 6 (18)



Subclause: -/- Spectrum mask
RF-carrier at 1090 MHz
Spectrum mask

Limit:
Limit acc. to FCC Part 87.139

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode S

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 13:51:07	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	1.02	GHz
Stop frequency:	1.16	GHz
Center frequency:	1.09	GHz
Frequency span:	140	MHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	30	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

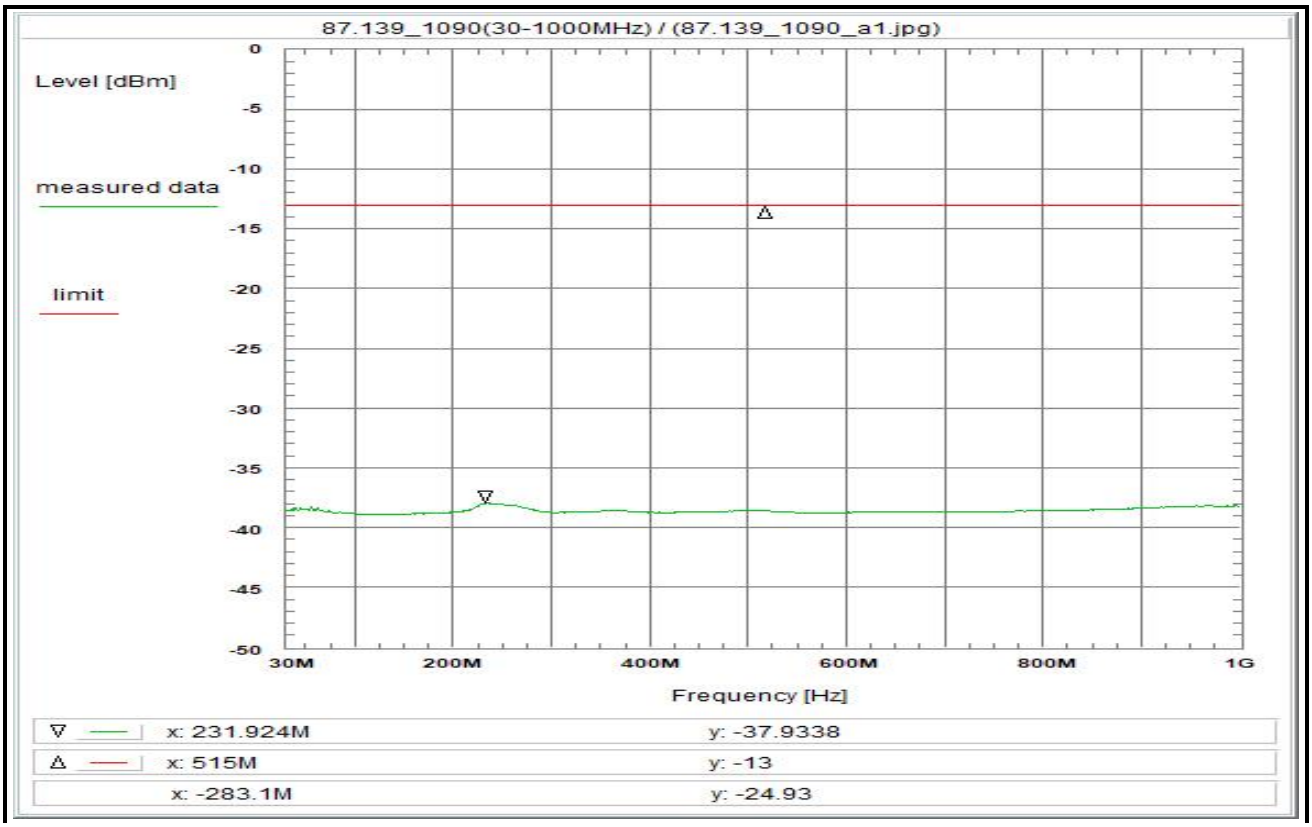
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.7	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.5	dB

Remarks:
Spectrum mask according to picture 1
Max-Hold measurement.

Spectrum mask based on 20 MHz bandwidth and 25 dBm mean power.

Plot No. 7 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 30 MHz - 1000 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode A

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:14:36	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

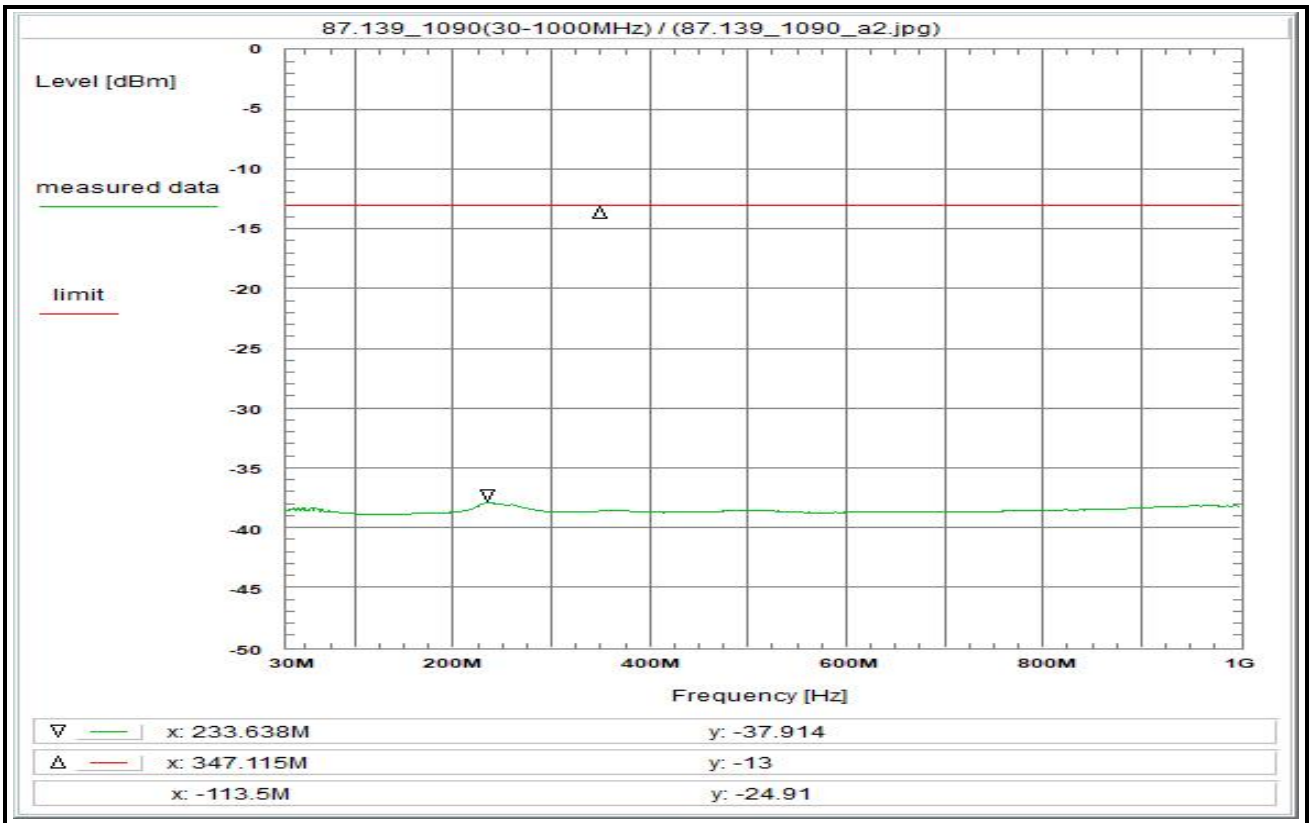
Start frequency:	30	MHz
Stop frequency:	1	GHz
Center frequency:	515	MHz
Frequency span:	970	MHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	20	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.5	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.5	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.2	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 8 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 30 MHz - 1000 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode C

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:26:39	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

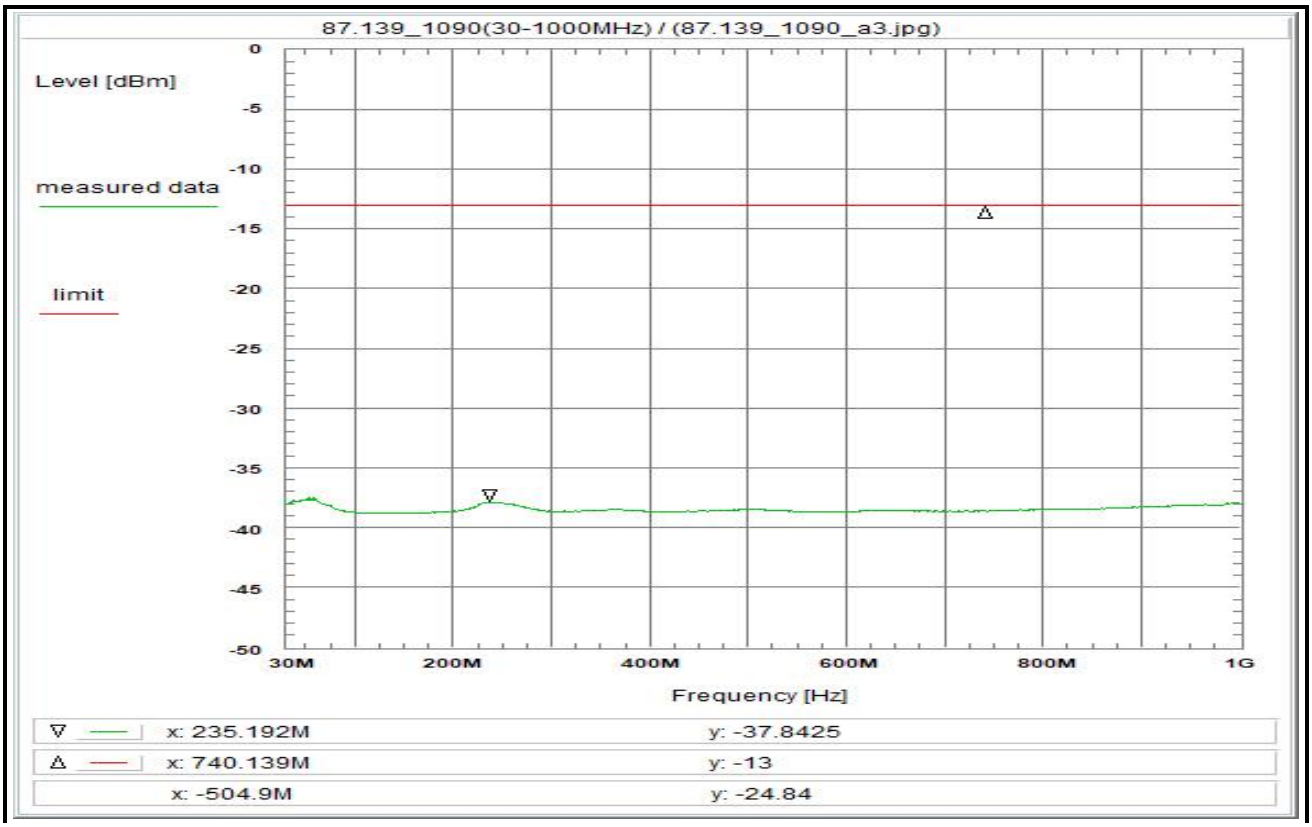
Start frequency:	30	MHz
Stop frequency:	1	GHz
Center frequency:	515	MHz
Frequency span:	970	MHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	20	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.5	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.5	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.2	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 9 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 30 MHz - 1000 MHz

Limit:
Limit acc. to 87.139_1090.3: -36.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode S

Test setup:
see test report, chapter 6.2: hhgj

Test equipment:
see test report, chapter 6.2/6.3: C220, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 13:55:09	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

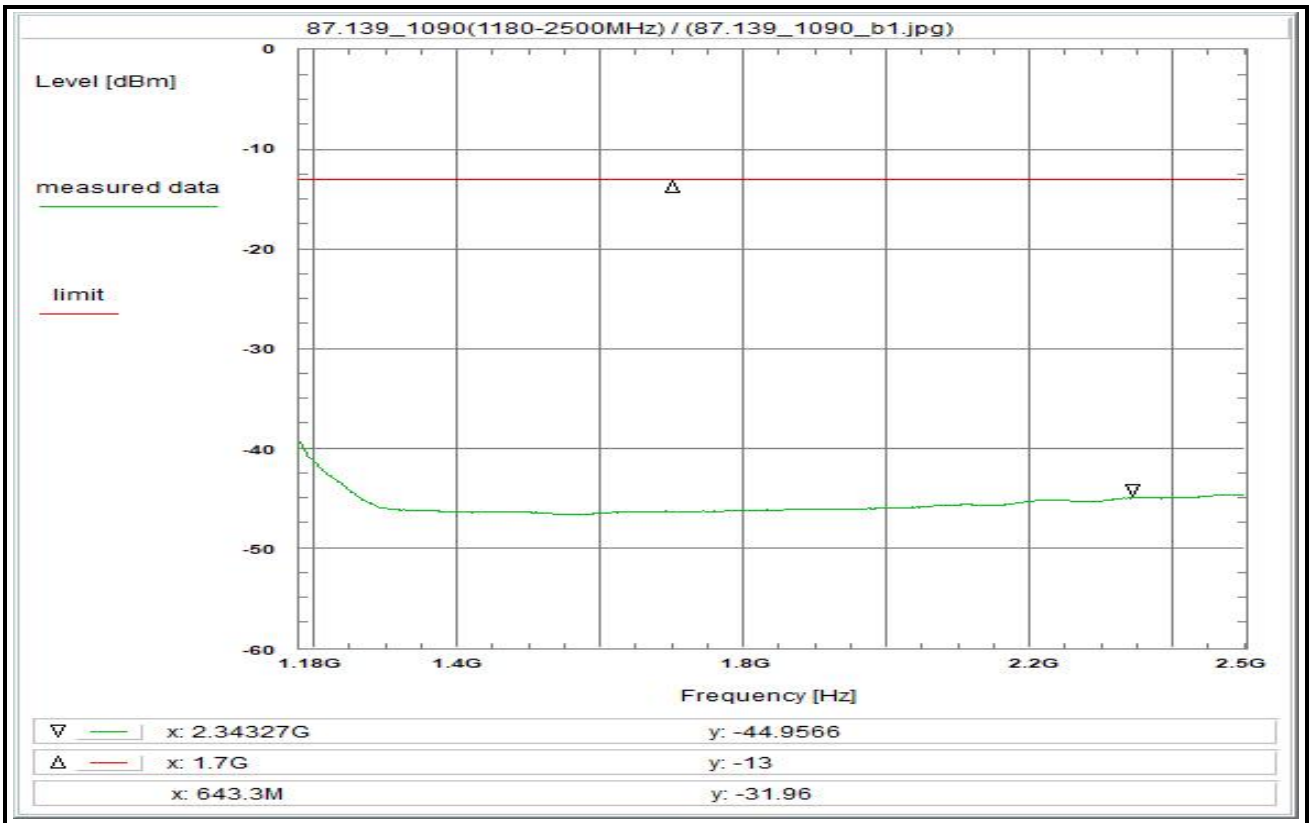
Start frequency:	30	MHz
Stop frequency:	1	GHz
Center frequency:	515	MHz
Frequency span:	970	MHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	20	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.5	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.5	dB
Attenuation (U023b)	+	10.0	dB
Power splitter	+	6.2	dB
TOTAL CORRECTION:	+	36.2	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 10 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 1180 MHz - 2500 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode A

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F132, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:41:03	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

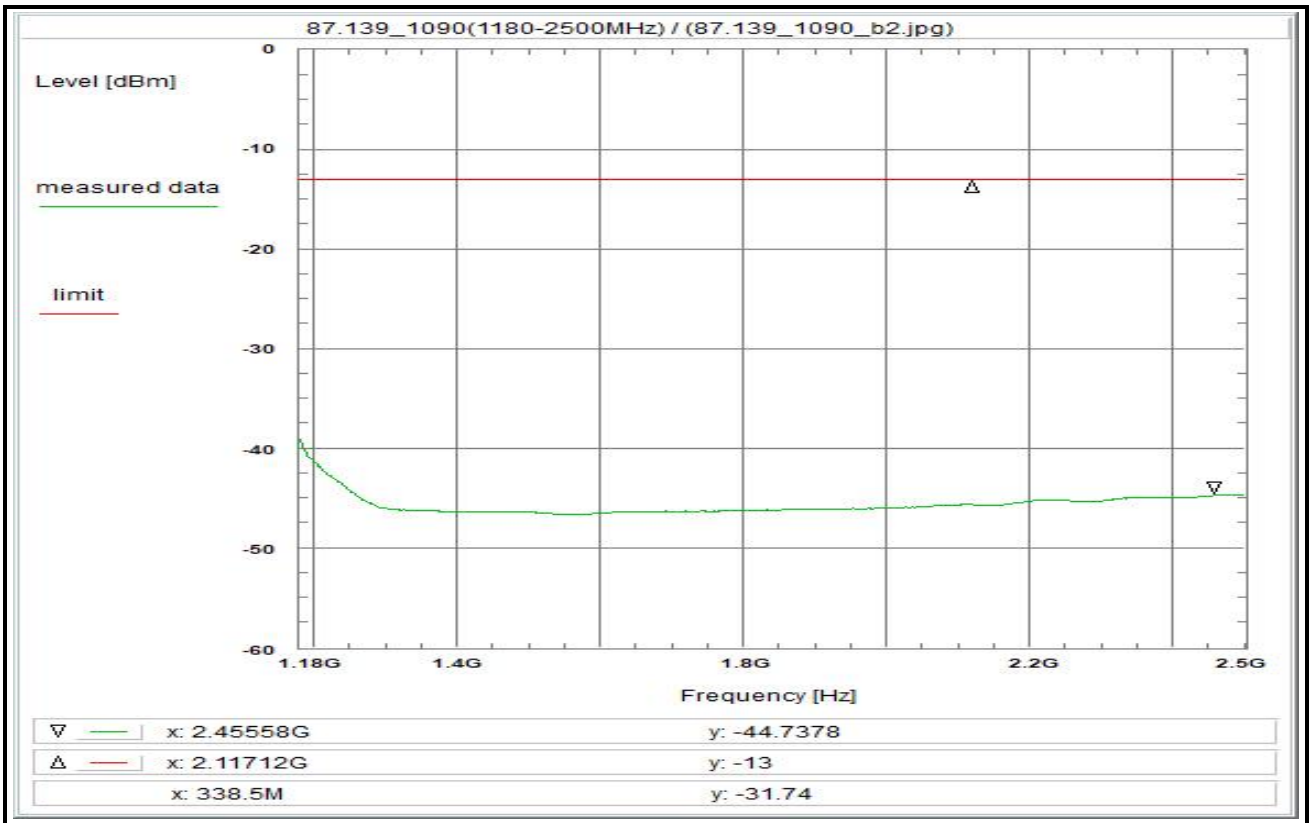
Start frequency:	1.18	GHz
Stop frequency:	2.5	GHz
Center frequency:	1.84	GHz
Frequency span:	1.32	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	20	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.9	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Power splitter	+	6.0	dB
HPF (F132)	+	1.1	dB
TOTAL CORRECTION:	+	27.6	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 11 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 1180 MHz - 2500 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode C

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F132, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:42:47	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

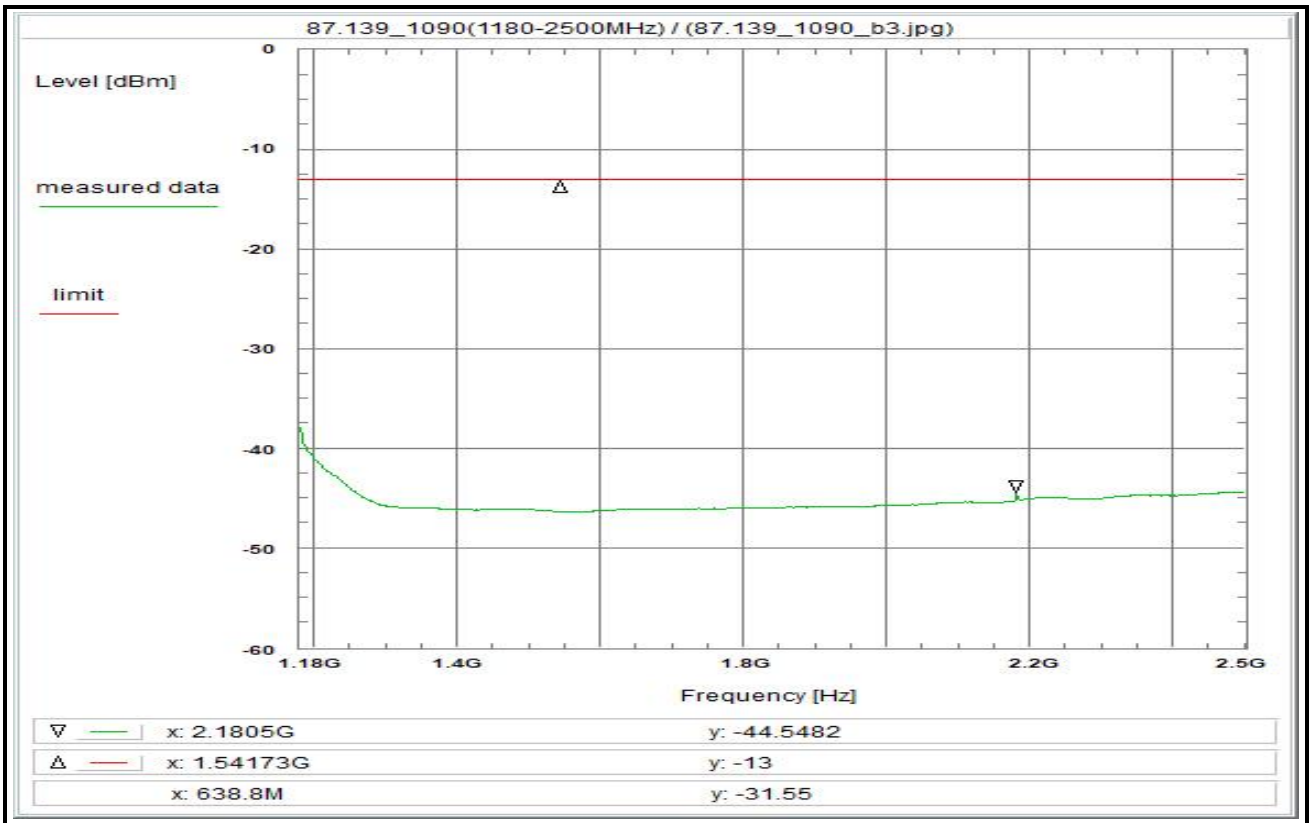
Start frequency:	1.18	GHz
Stop frequency:	2.5	GHz
Center frequency:	1.84	GHz
Frequency span:	1.32	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	20	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.9	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Power splitter	+	6.0	dB
HPF (F132)	+	1.1	dB
TOTAL CORRECTION:	+	27.6	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 12 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 1180 MHz - 2500 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode S

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F132, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 14:05:12	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	1.18	GHz
Stop frequency:	2.5	GHz
Center frequency:	1.84	GHz
Frequency span:	1.32	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	20	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

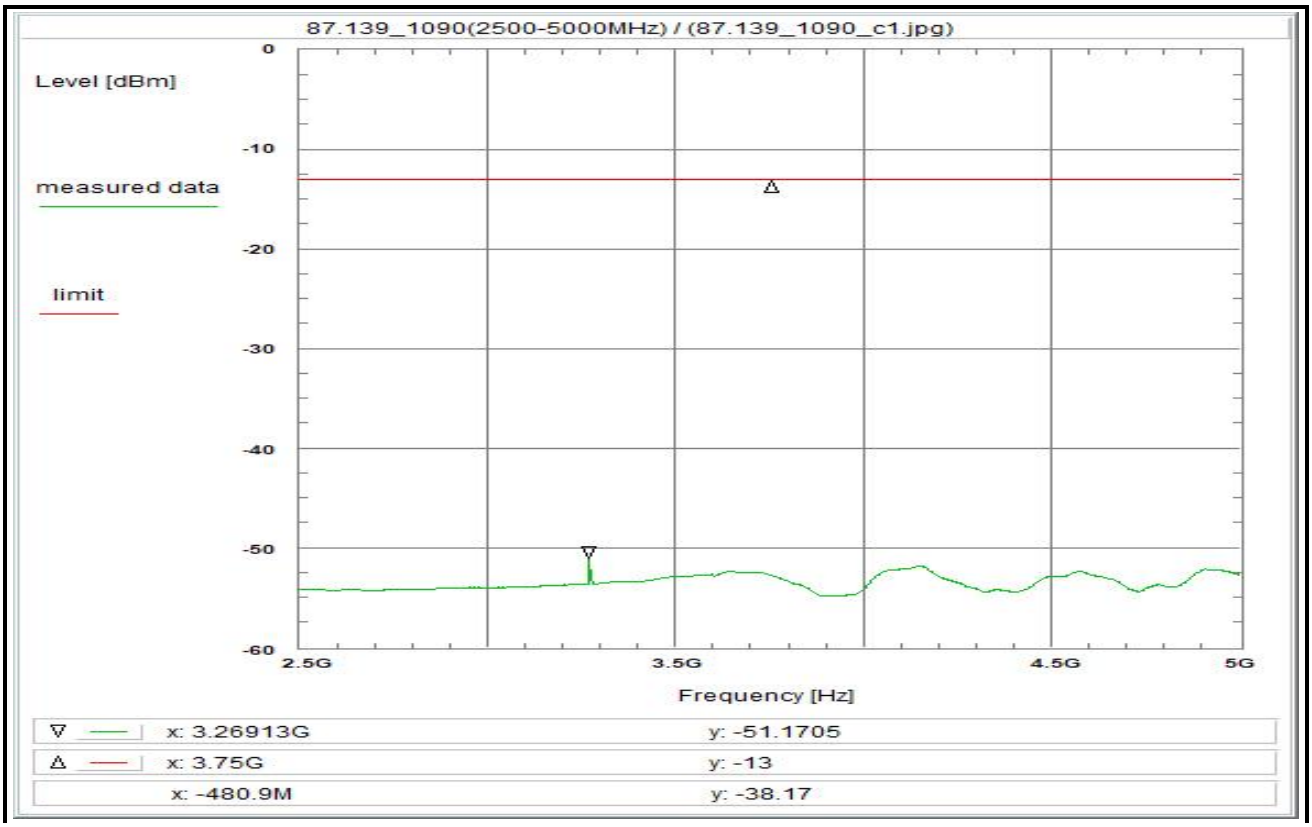
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	0.9	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.6	dB
Power splitter	+	6.2	dB
HPF (F132)	+	1.1	dB
TOTAL CORRECTION:	+	27.8	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Marker shows 2nd harmonic.

Plot No. 13 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 2500 MHz - 5000 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode A

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F150, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:49:54	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	2.5	GHz
Stop frequency:	5	GHz
Center frequency:	3.75	GHz
Frequency span:	2.5	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	10	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

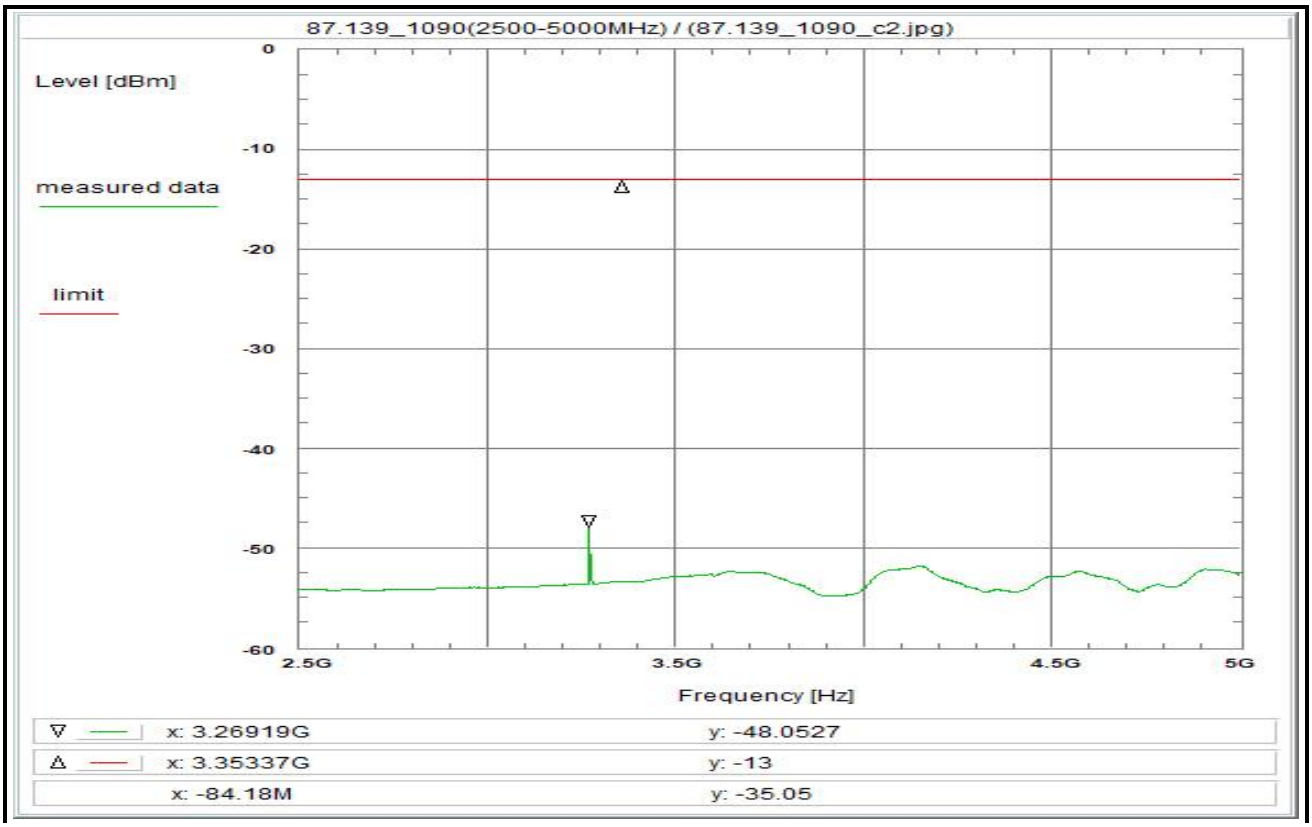
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	1.3	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.7	dB
Power splitter	+	6.0	dB
HPF (F150)	+	0.4	dB
TOTAL CORRECTION:	+	27.4	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Marker shows 3rd harmonic.

Plot No. 14 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 2500 MHz - 5000 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode C

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F150, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:51:28	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	2.5	GHz
Stop frequency:	5	GHz
Center frequency:	3.75	GHz
Frequency span:	2.5	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	10	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

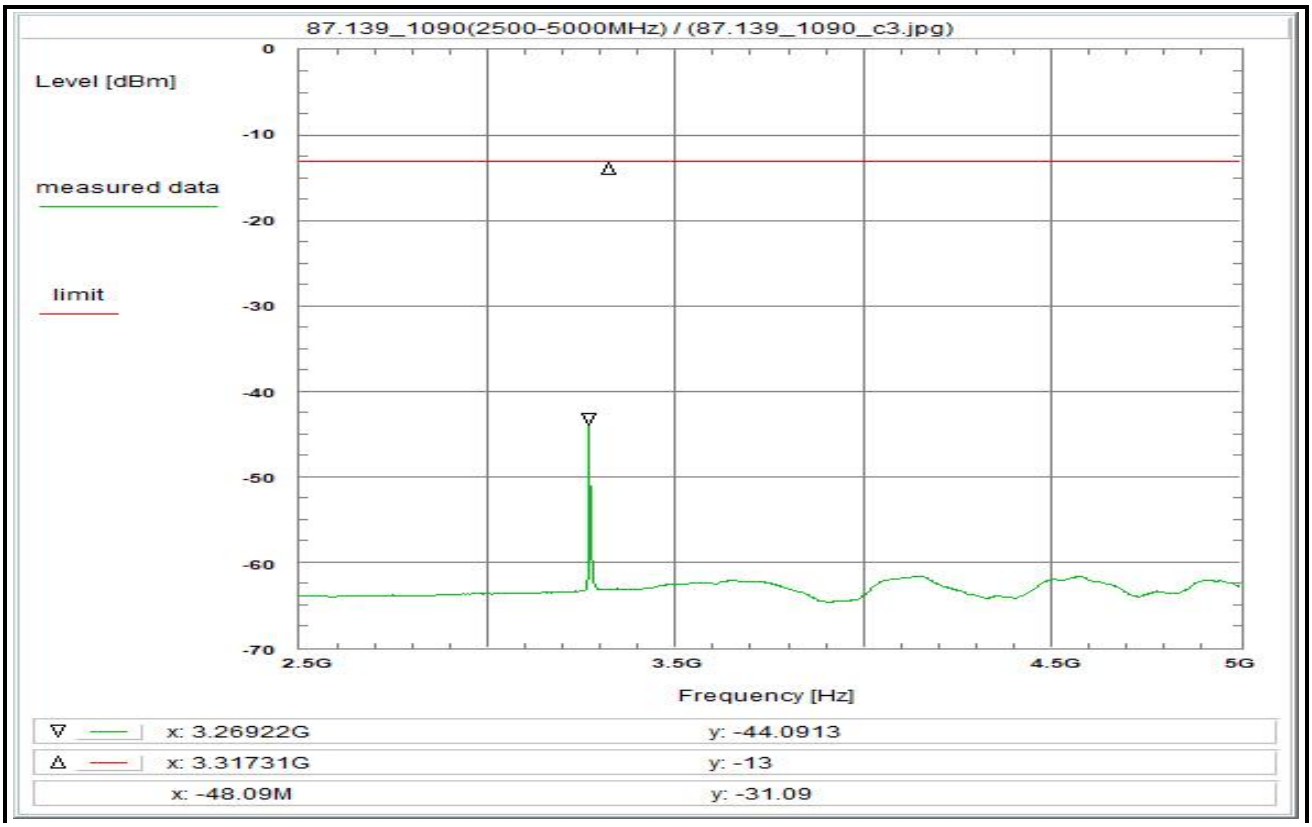
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	1.3	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.7	dB
Power splitter	+	6.0	dB
HPF (F150)	+	0.4	dB
TOTAL CORRECTION:	+	27.4	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Marker shows 3rd harmonic.

Plot No. 15 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 2500 MHz - 5000 MHz

Limit:
Limit acc. to 87.139_1090.3: -30.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode S

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F150, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 14:08:54	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	2.5	GHz
Stop frequency:	5	GHz
Center frequency:	3.75	GHz
Frequency span:	2.5	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	0	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

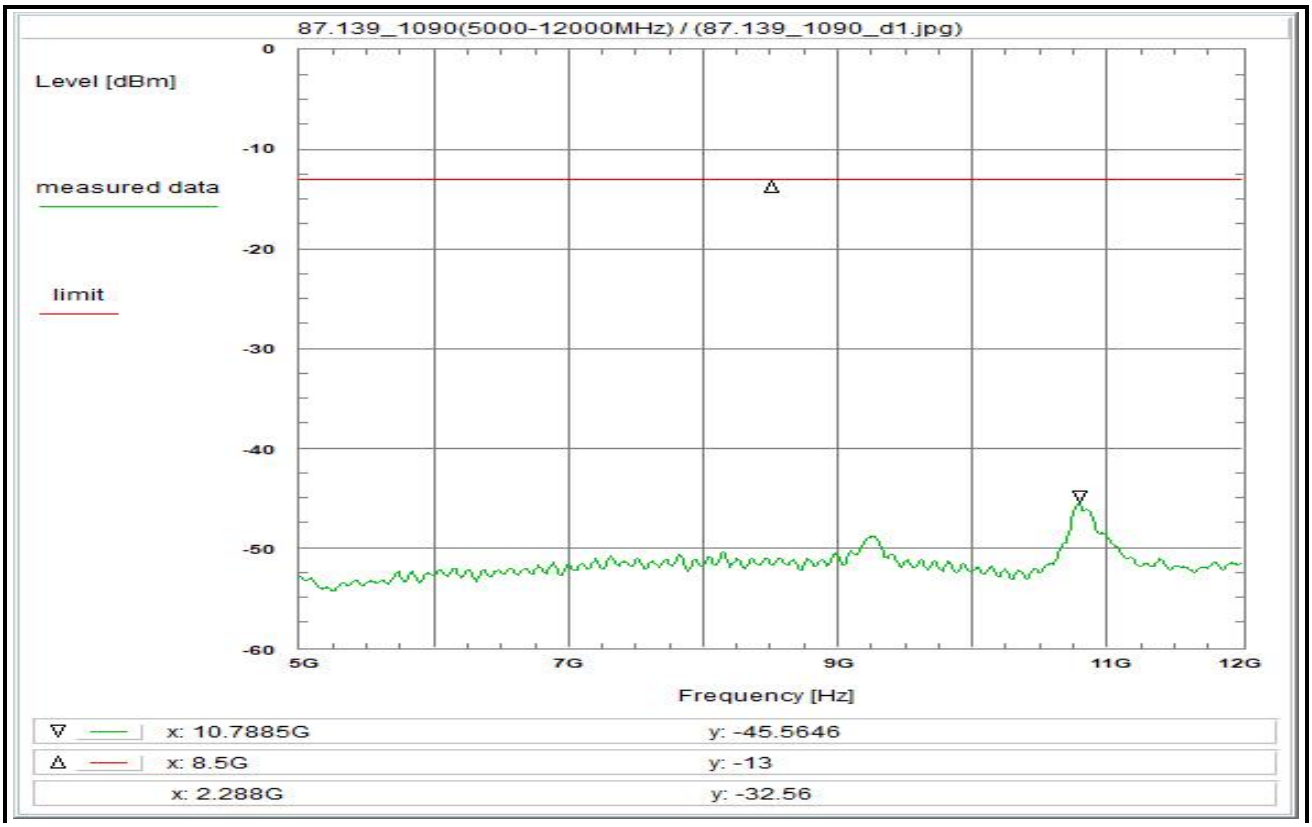
Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	1.3	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.7	dB
Power splitter	+	6.2	dB
HPF (F150)	+	0.4	dB
TOTAL CORRECTION:	+	27.6	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Marker shows 3rd harmonic.

Plot No. 16 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 5000 MHz - 12000 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode A

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F150, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 09:56:08	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

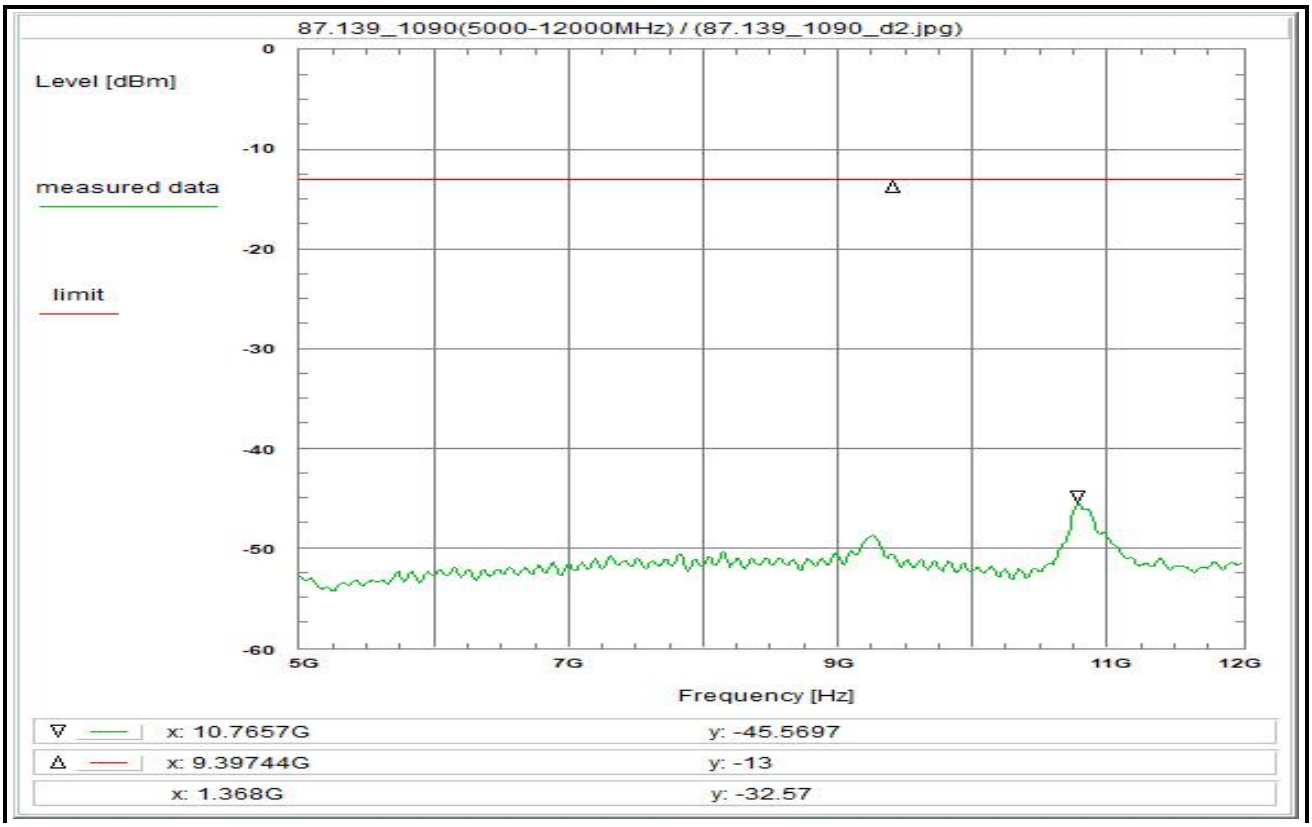
Start frequency:	5	GHz
Stop frequency:	12	GHz
Center frequency:	8.5	GHz
Frequency span:	7	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	10	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	2.1	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.8	dB
Power splitter	+	6.0	dB
HPF (F150)	+	3.1	dB
TOTAL CORRECTION:	+	31.0	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 17 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 5000 MHz - 12000 MHz

Limit:
Limit acc. to 87.139_1090: -13.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode C

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F150, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 10:18:12	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

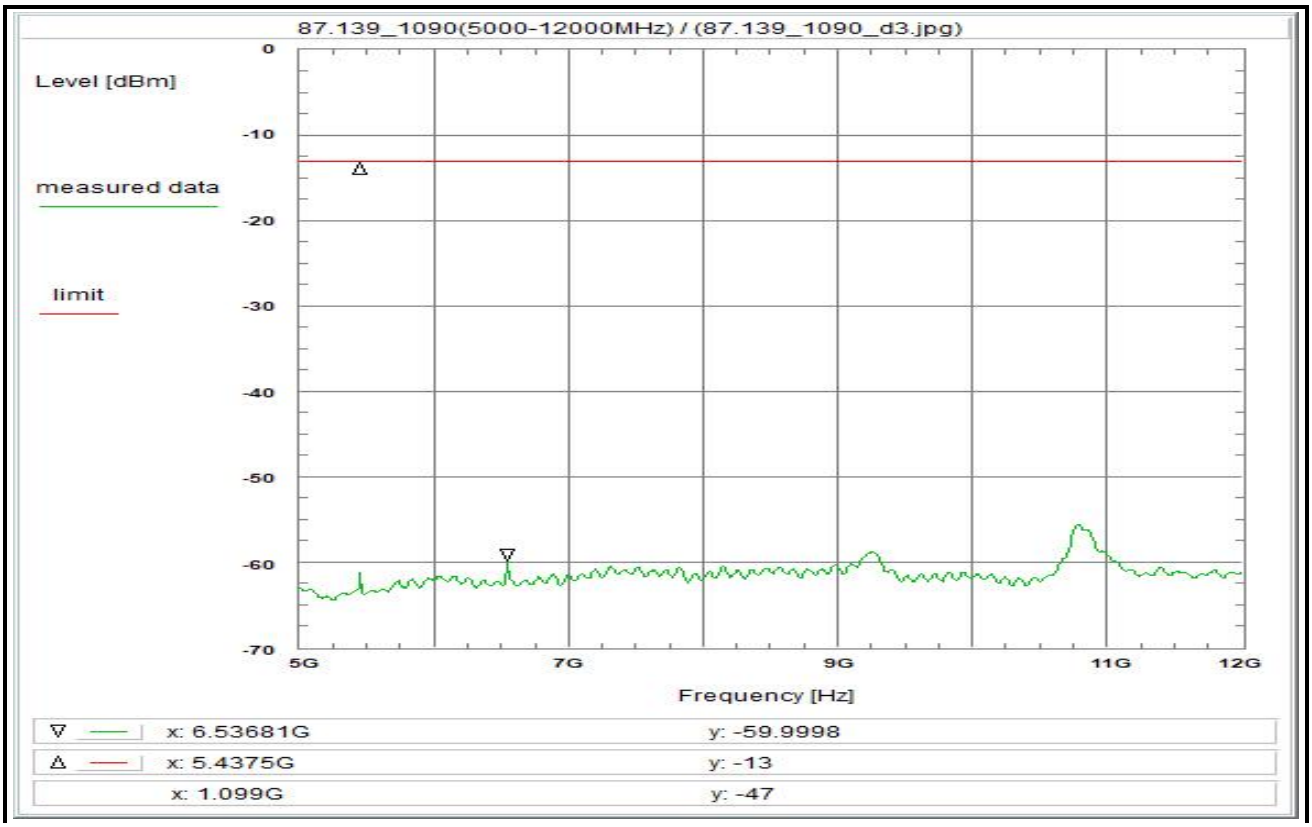
Start frequency:	5	GHz
Stop frequency:	12	GHz
Center frequency:	8.5	GHz
Frequency span:	7	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	10	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	2.1	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.8	dB
Power splitter	+	6.0	dB
HPF (F150)	+	3.1	dB
TOTAL CORRECTION:	+	31.0	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

Plot No. 18 (18)



Subclause: -/- Spurious emissions
RF-carrier at 1090 MHz
Examination of the frequency range 5000 MHz - 12000 MHz

Limit:
Limit acc. to 87.139_1090.3: -30.0 dBm/1MHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
TX: Mode S

Test setup:
see test report, chapter 6.2: higj

Test equipment:
see test report, chapter 6.2/6.3: C220, F150, R001, U312

Remark:

Test result: **Test passed**

Environment condition:

Date & Time:	Thu 07/Mar/2019 14:10:56	
Location:	CTC advanced GmbH, Laboratory RCE-Sat	
Temperature:	22	°C
Humidity:	35	%
Voltage:	28	Vdc

Setup of measurement equipment:

Start frequency:	5	GHz
Stop frequency:	12	GHz
Center frequency:	8.5	GHz
Frequency span:	7	GHz
Resolution-BW:	1	MHz
Video-BW:	1	MHz
Input attenuation:	0	dB
Trace-Mode:	Max-Hold	
Detector-Mode:	RMS	

Correction:

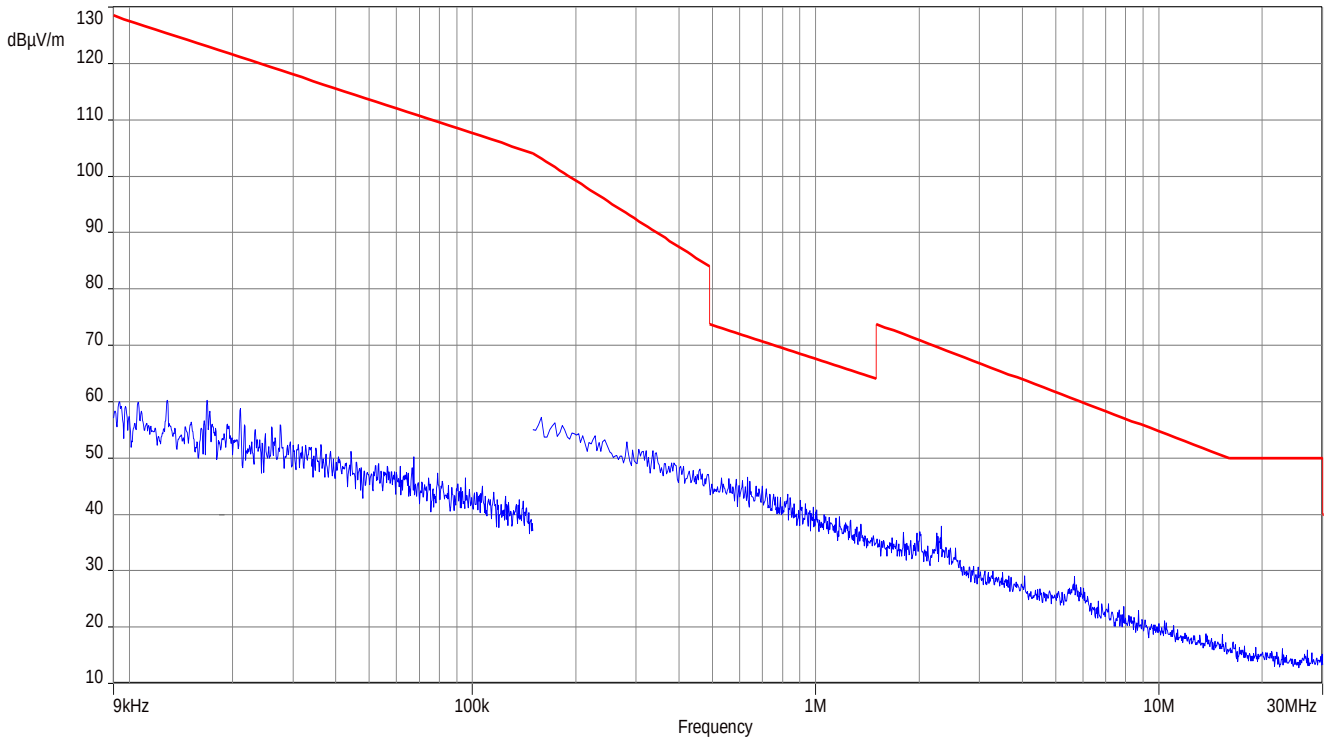
Directional coupler	+	0.0	dB
Coaxial cable (C220)	+	2.1	dB
DUT-Antenna	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and feedhorn	-	0.0	dB
Attenuation (U312)	+	19.8	dB
Power splitter	+	6.2	dB
(F150)	+	3.1	dB
TOTAL CORRECTION:	+	31.2	dB

Remarks:
Spurious emissions under normal test conditions
Max-Hold measurement.

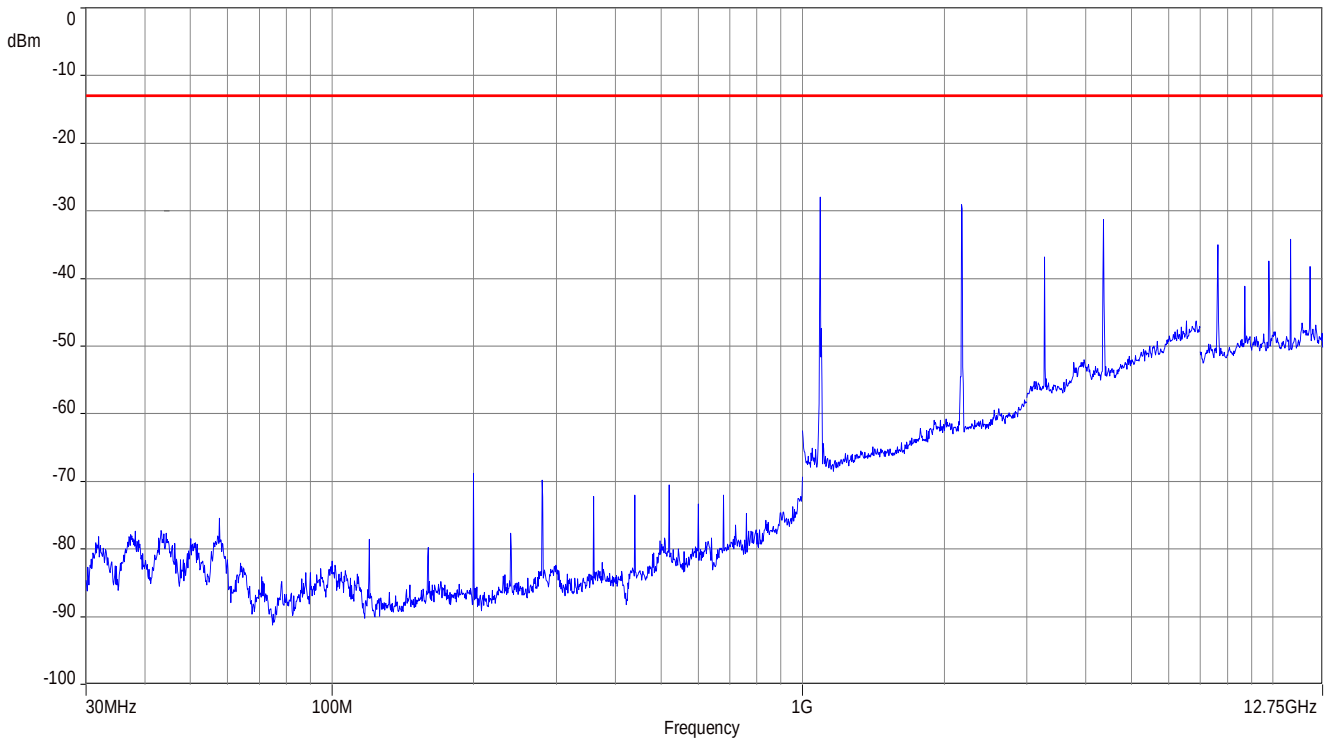
Plot shows 5th and 6th harmonic.

Plots – radiated emissions

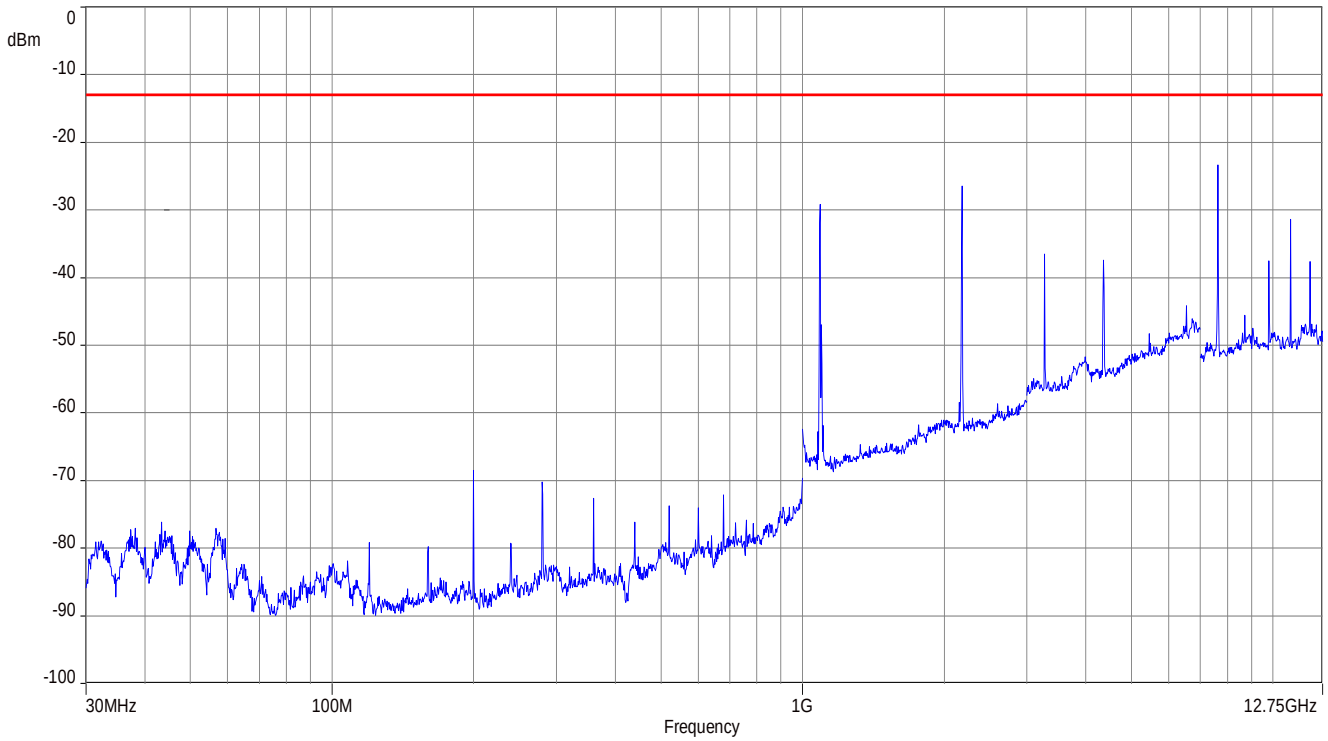
Plot No. 1: Mode S (highest mean Tx-Power, highest power consumption)



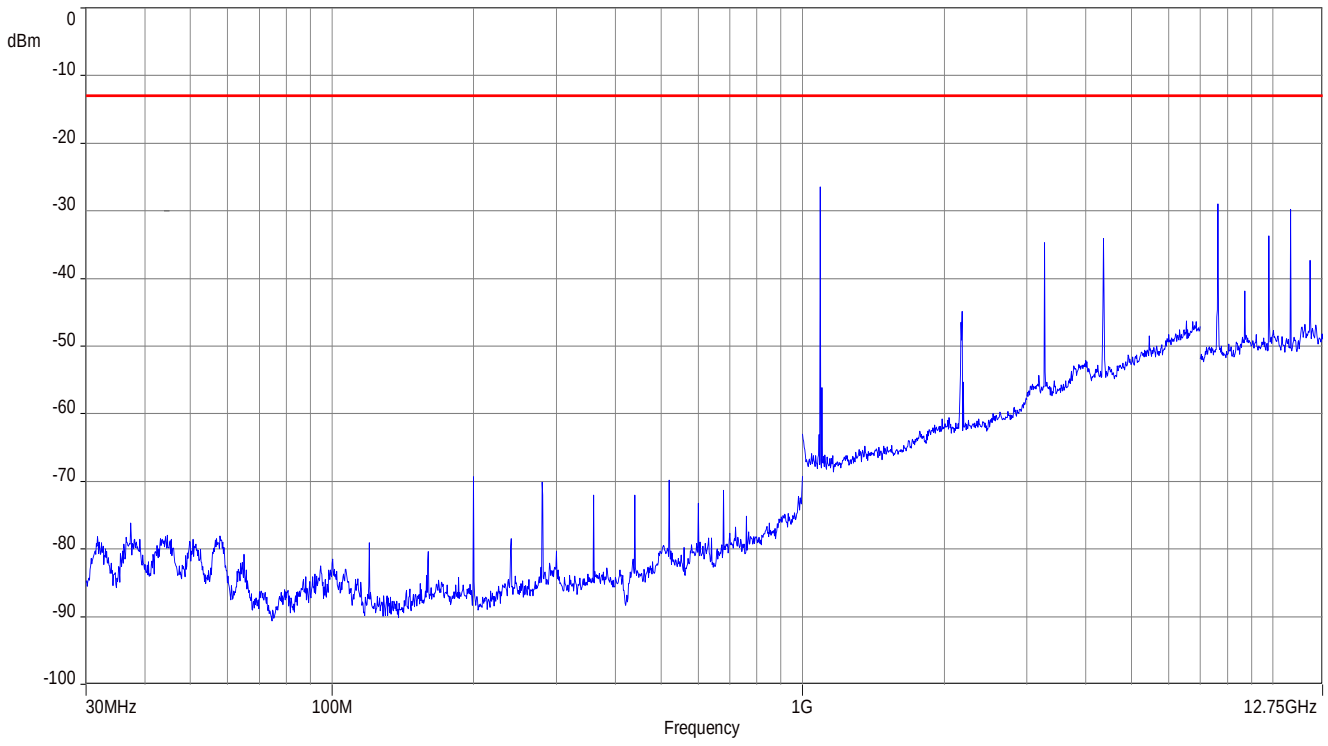
Plot No. 2: Mode A



Plot No. 3: Mode C



Plot No. 4: Mode S



Document history

Version	Applied changes	Date of release
	Initial release	2019-04-05