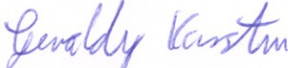


Annex E



This test report annex is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report annex authorized:

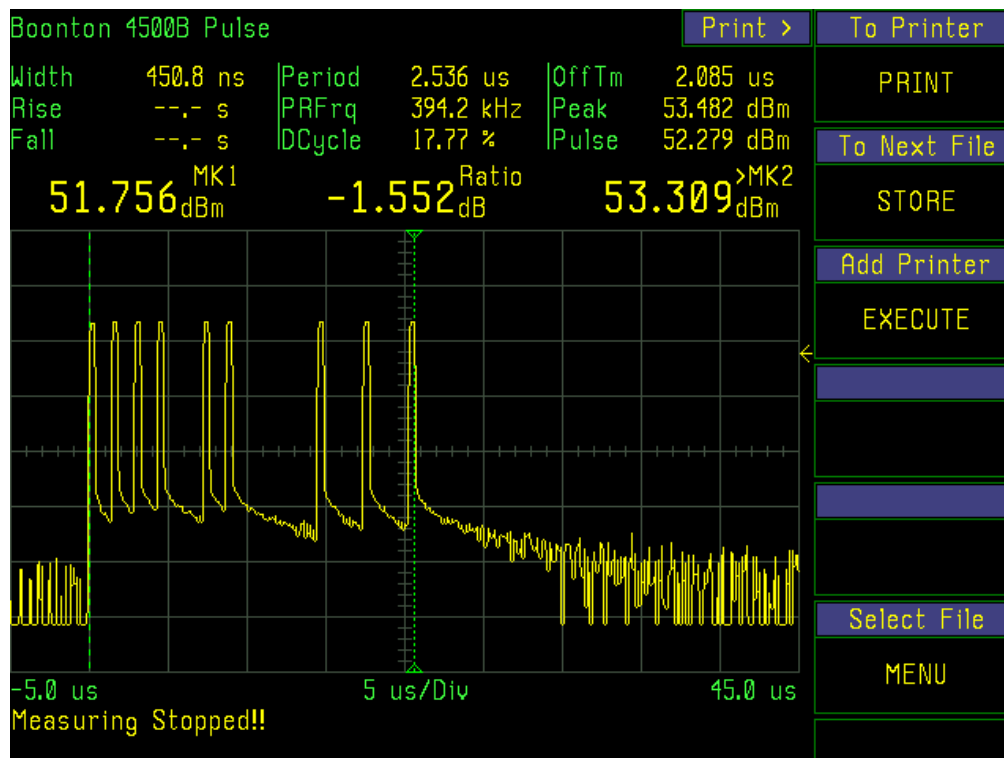


cn=Karsten Gerald, o=CTC advanced GmbH, ou=GER-2017-03-14, email=Karsten.Gerald@ctcadvanced.com, c=DE
2019.04.05 15:07:44 +02'00'

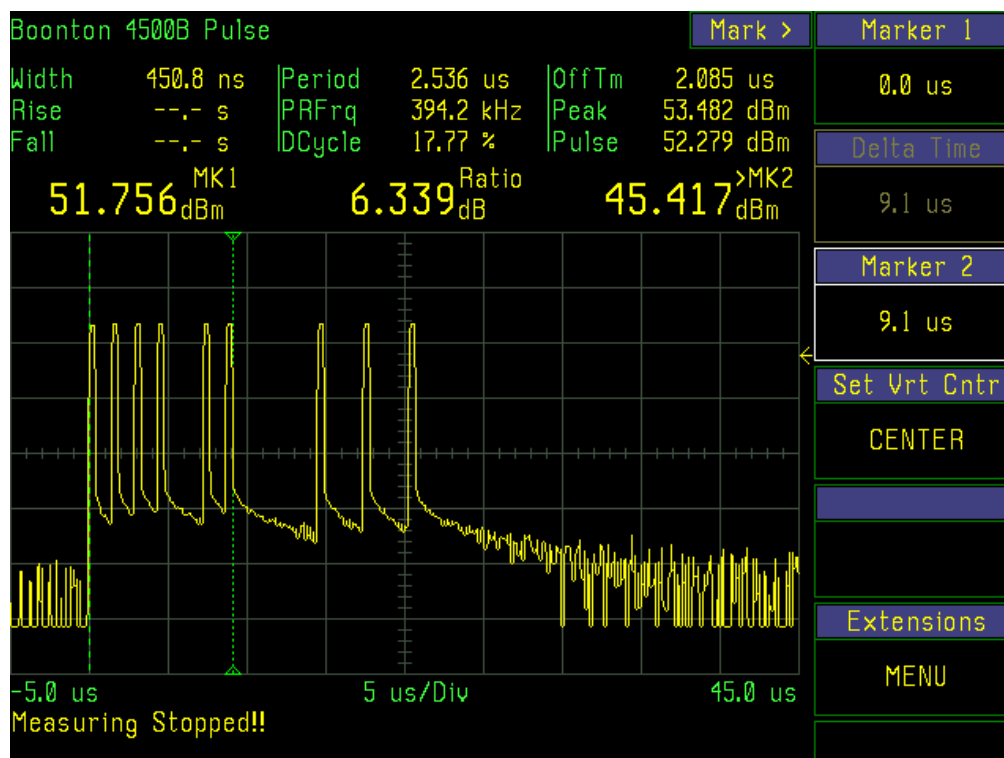
Karsten Gerald
Lab Manager
Radio Communications & EMC

Plots – PPA – Mode A

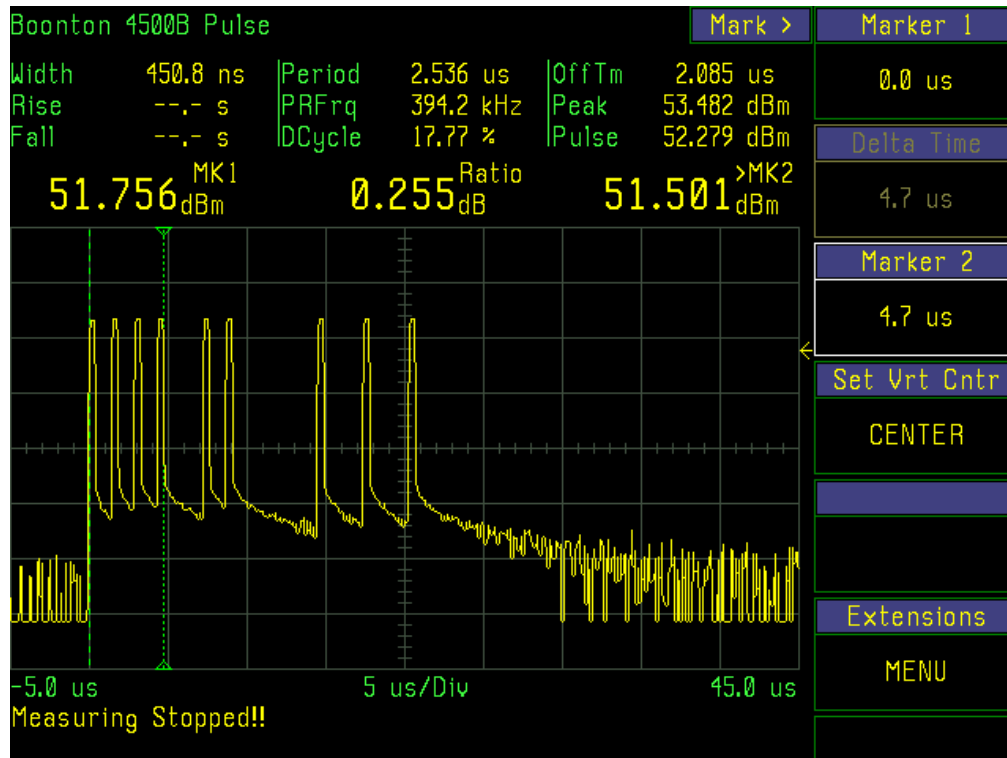
Plot no. 1:



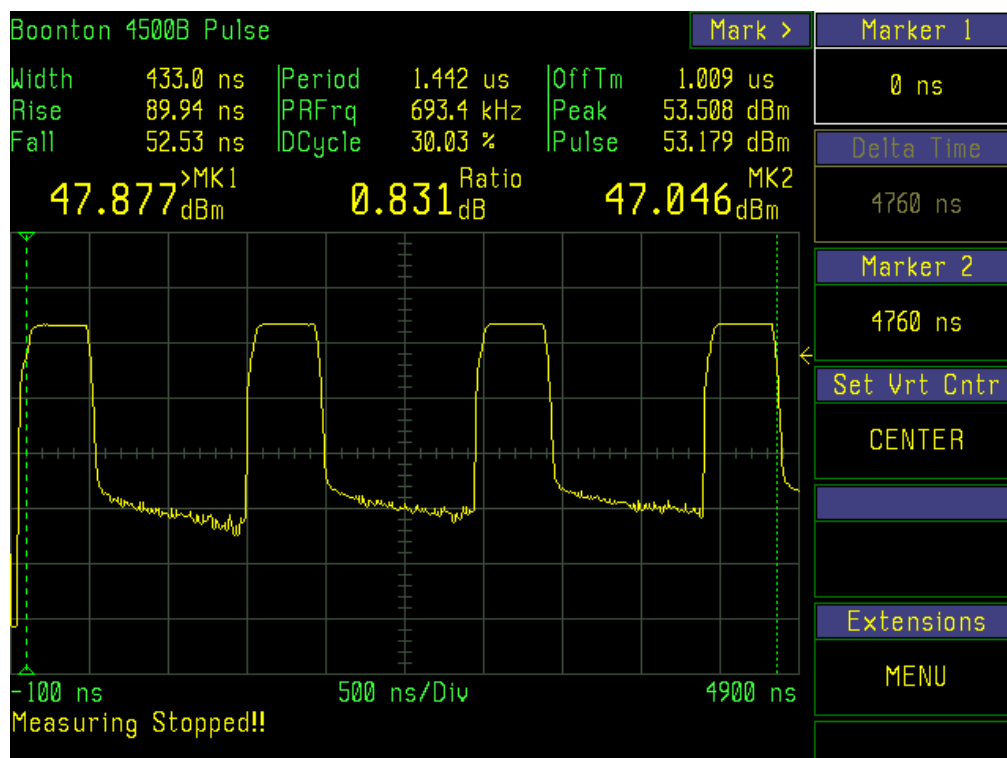
Plot no. 2:



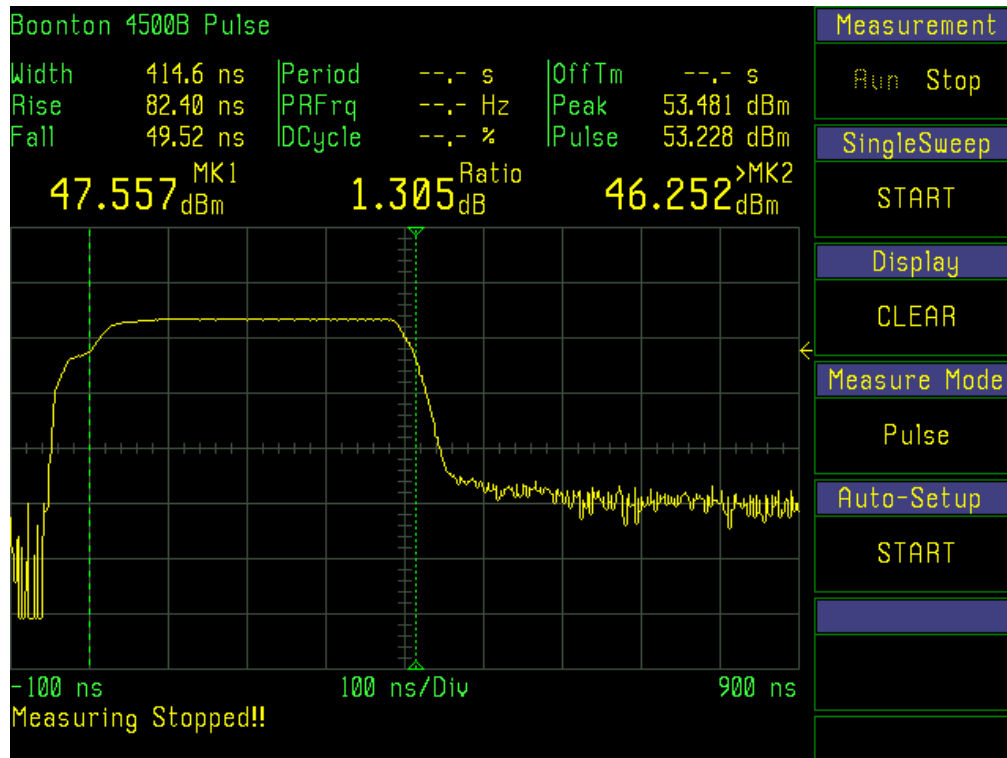
Plot no. 3:



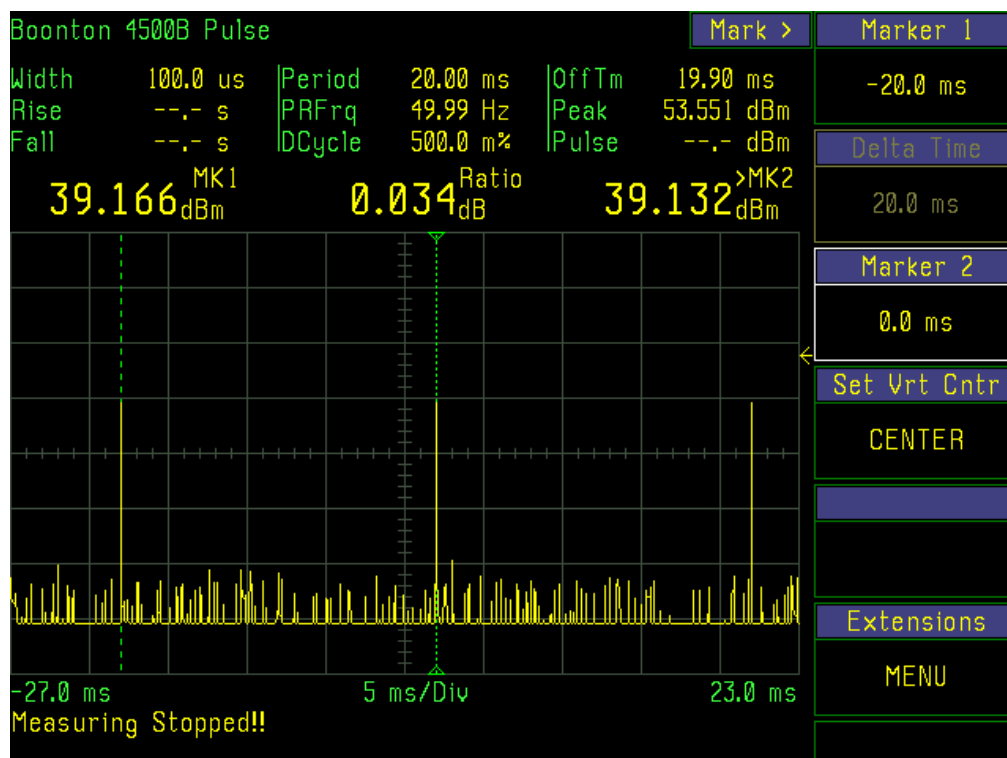
Plot no. 4:



Plot no. 5:



Plot no. 6:



Boonton 4500B Pulse

Width	413.5 ns	Period	--. s	OffTm	--. s
Rise	80.79 ns	PRFrq	--. Hz	Peak	53.793 dBm
Fall	49.07 ns	DCycle	--. %	Pulse	53.579 dBm

47.794^{MK1} dBm 0.657^{Ratio} dB 47.137^{>MK2} dBm

-132 ns 100 ns/Div 868 ns

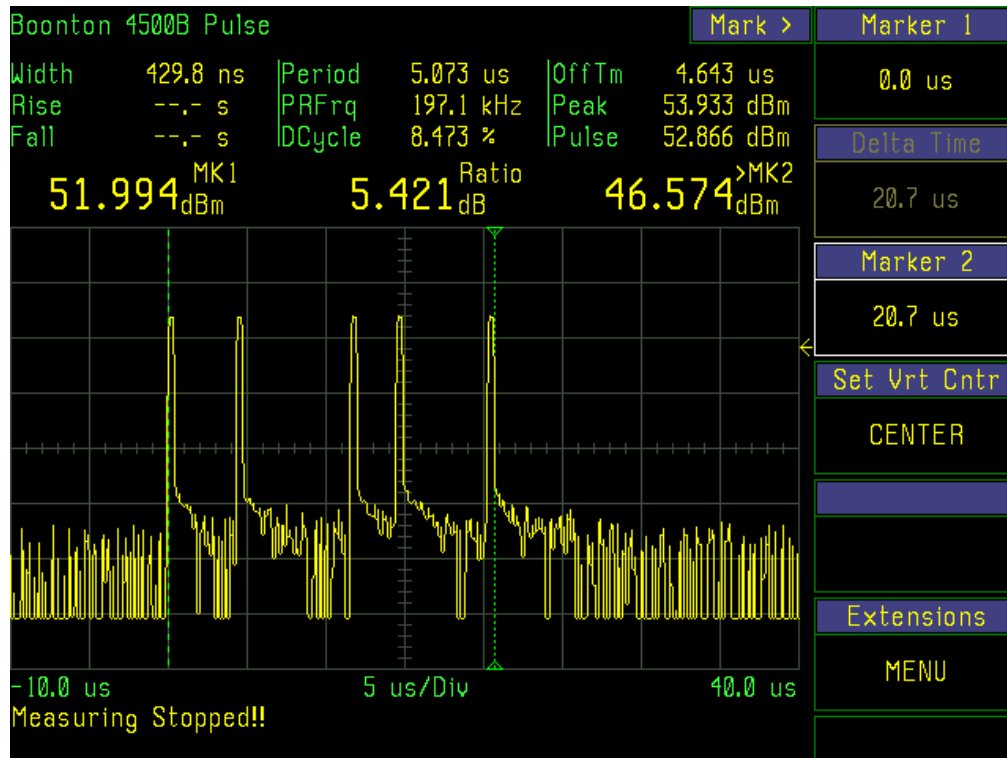
Measuring Stopped!!

- Marker 1: 0 ns
- Delta Time: 414 ns
- Marker 2: 414 ns
- Set Vrt Cntr: CENTER
- Extensions: MENU

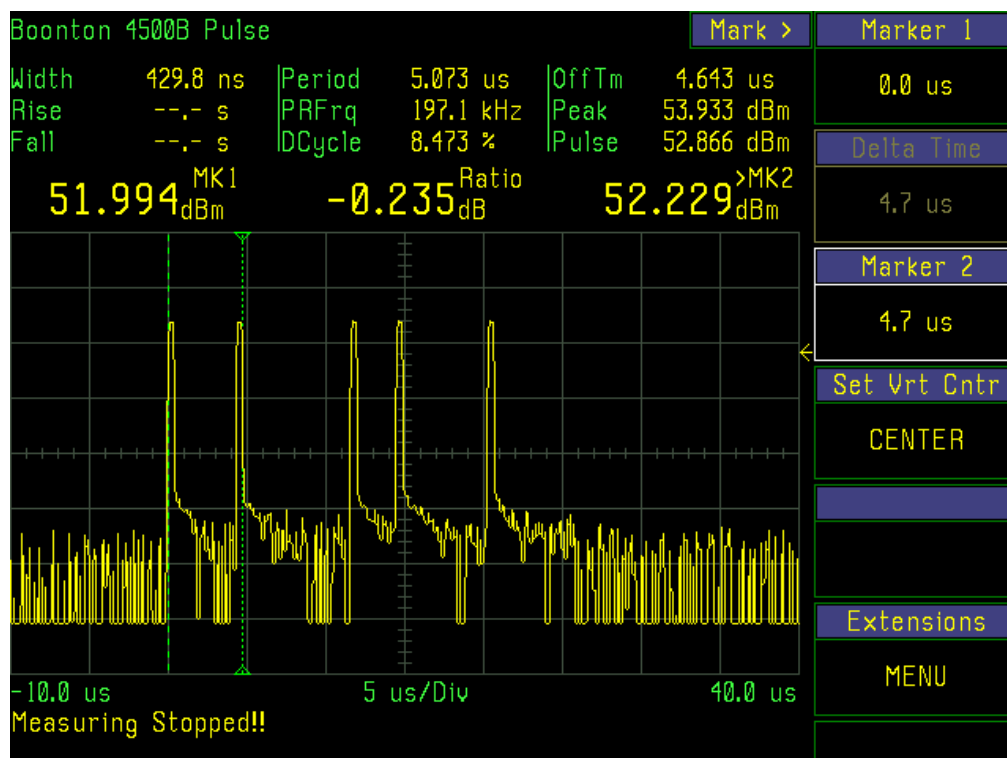
Boonton 4500B Pulse		Measurement
Measure	Chan 1	Run Stop
Width	199.9 us	SingleSweep
Rise	--.- ms	START
Fall	524.3 us	Display
Period	19.99 ms	CLEAR
PRFreq	50.00 Hz	Measure Mode
Duty C	1.000 %	Pulse
OffTime	19.79 ms	Auto-Setup
Peak	53.940 dBm	START
Pulse	--.-	
OverSh	--.- dB	
Avg	17.048 dBm	
IEEETop	36.126 dBm	
IEEEBot	-0.883 dBm	
Skew	--.-	
EdgeDly	9.849 ms	
Measuring Stopped!!		

Plots – PPA – Mode C

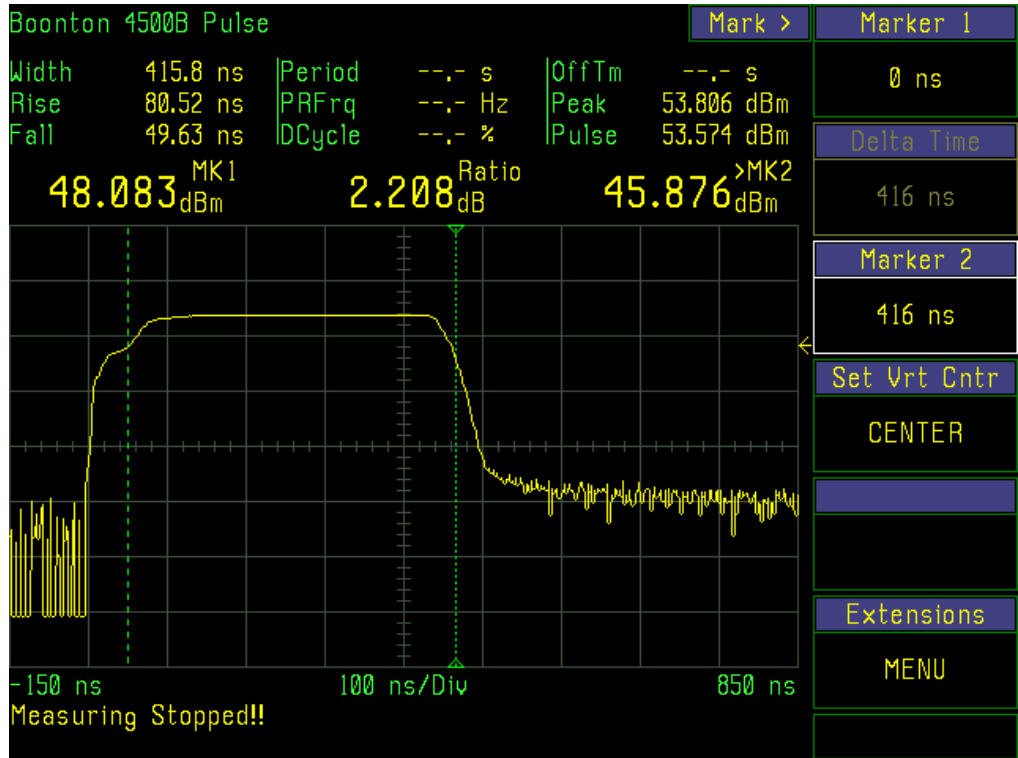
Plot no. 9:



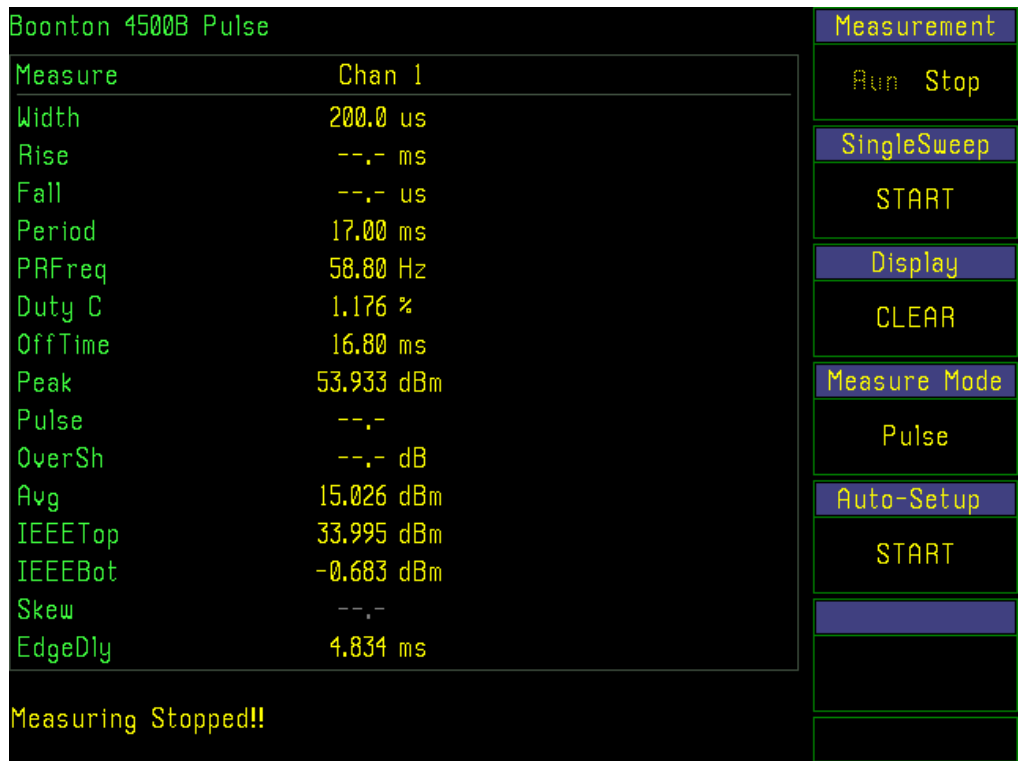
Plot no. 10:



Plot no. 11:

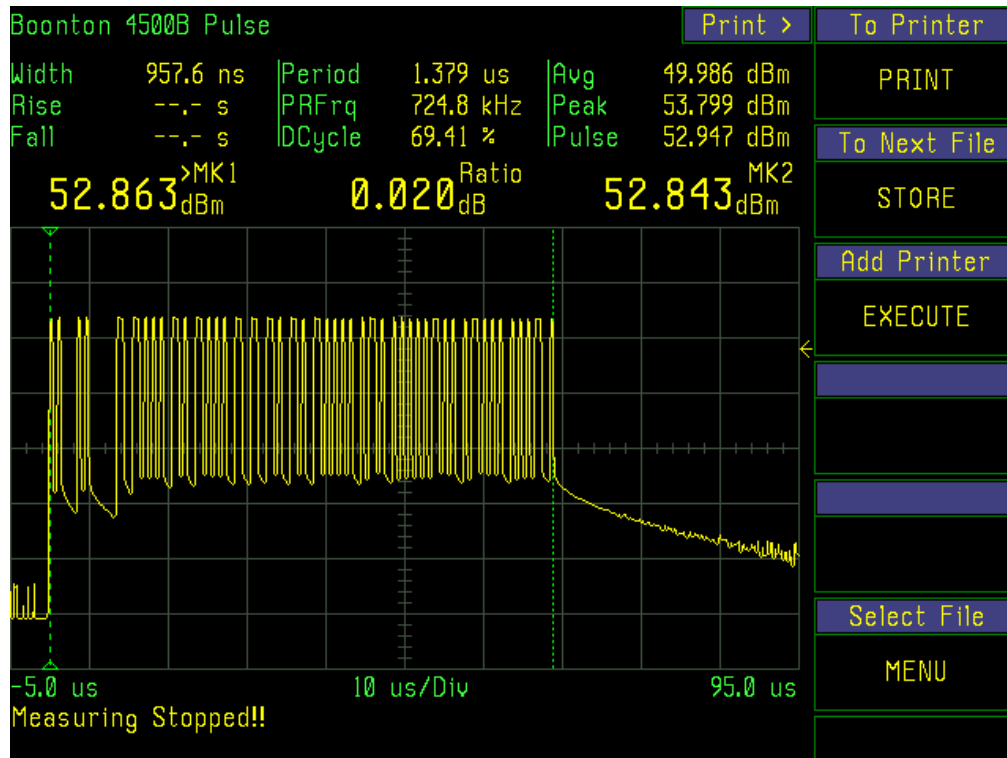


Plot no. 12:

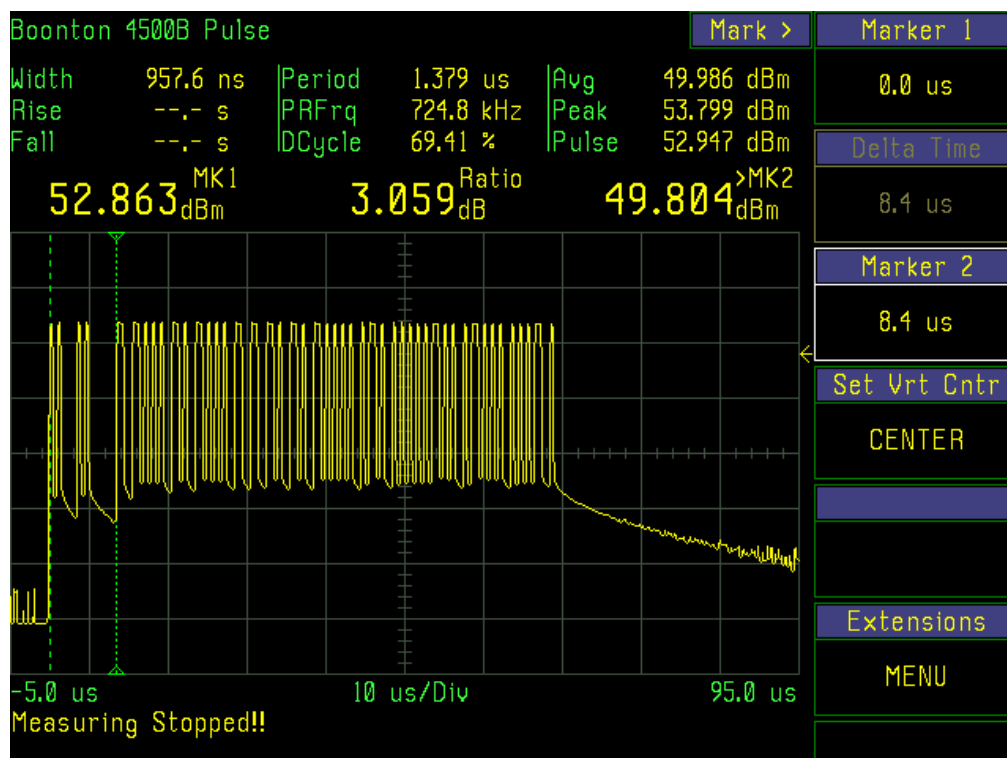


Plots – PPA – Mode S

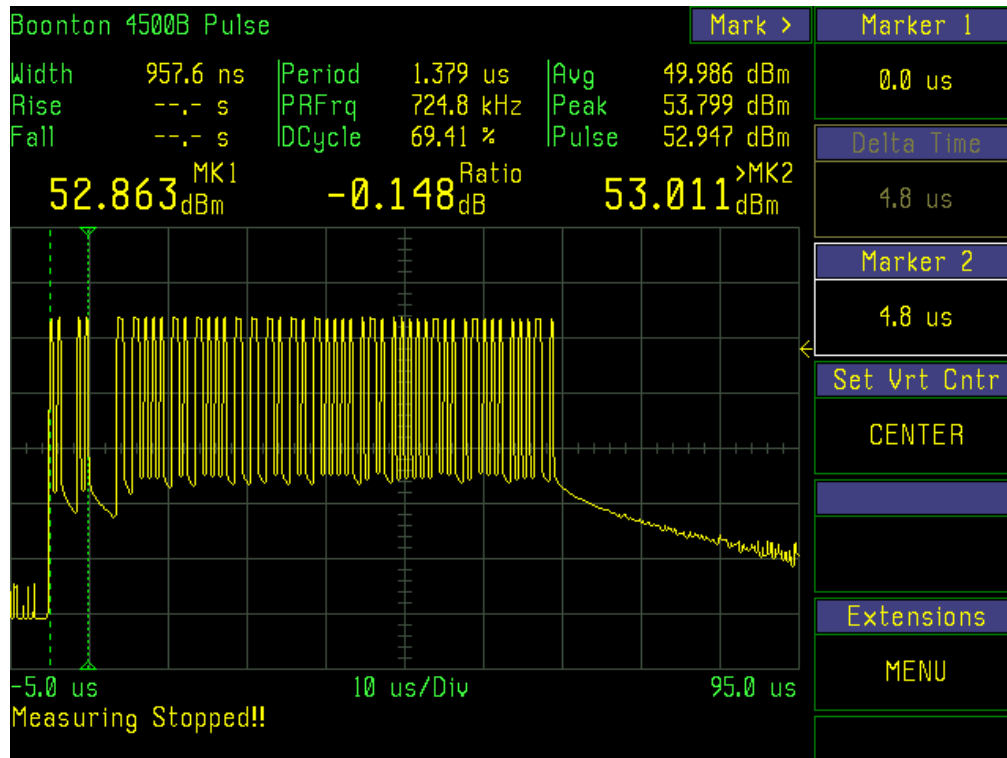
Plot no. 13:



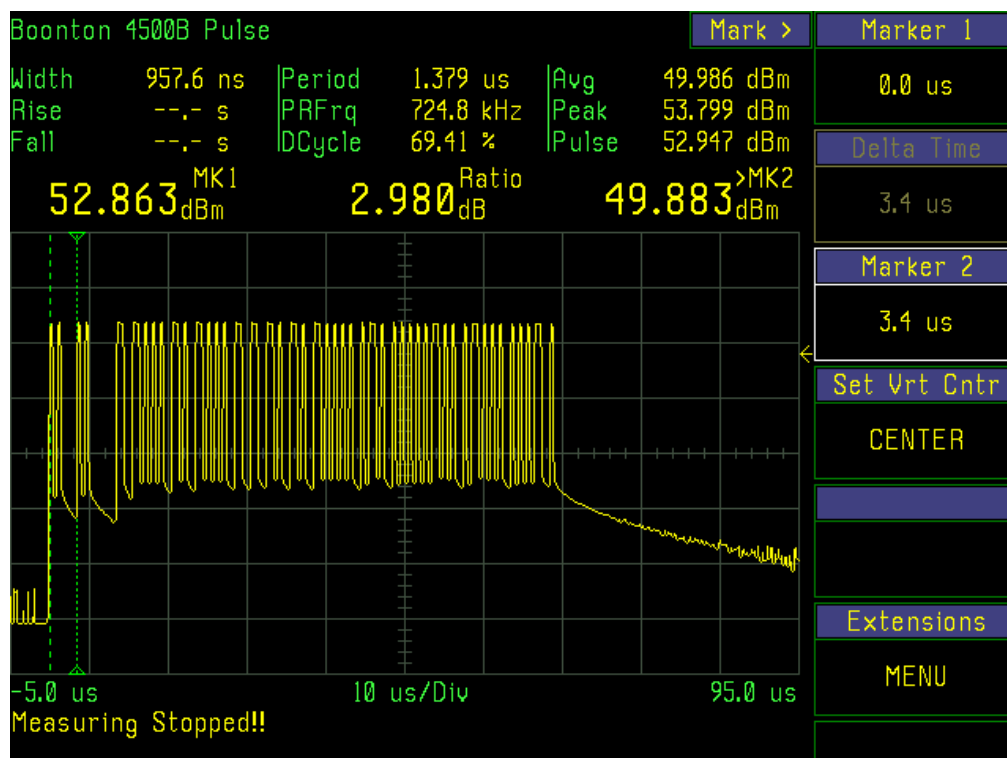
Plot no. 14:



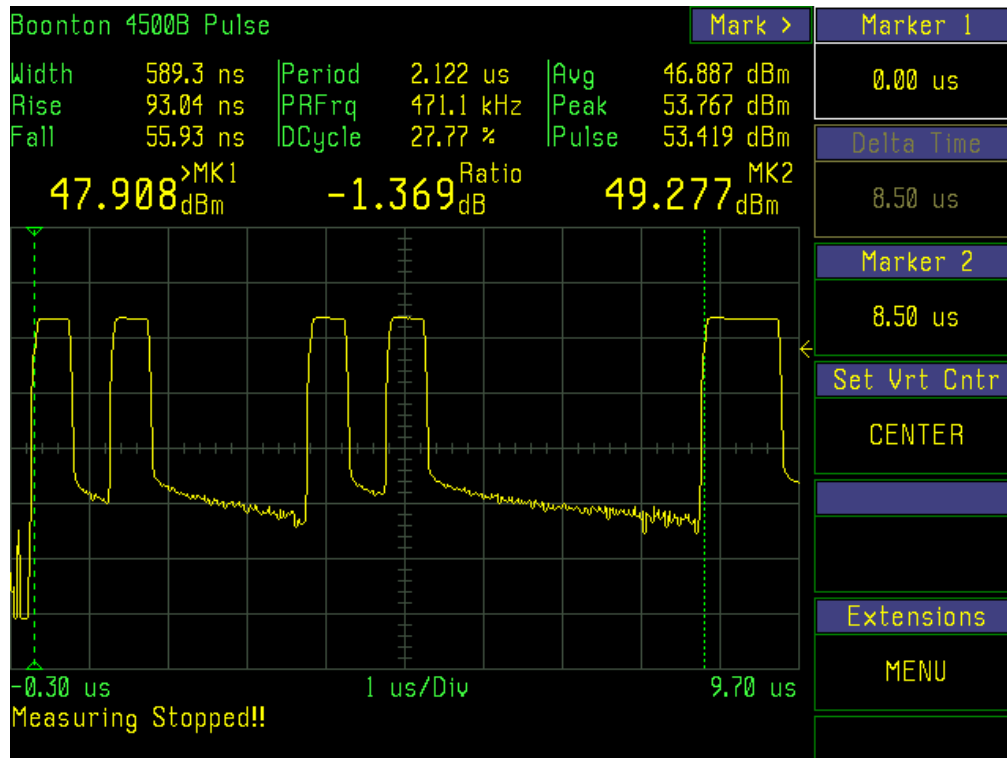
Plot no. 15:



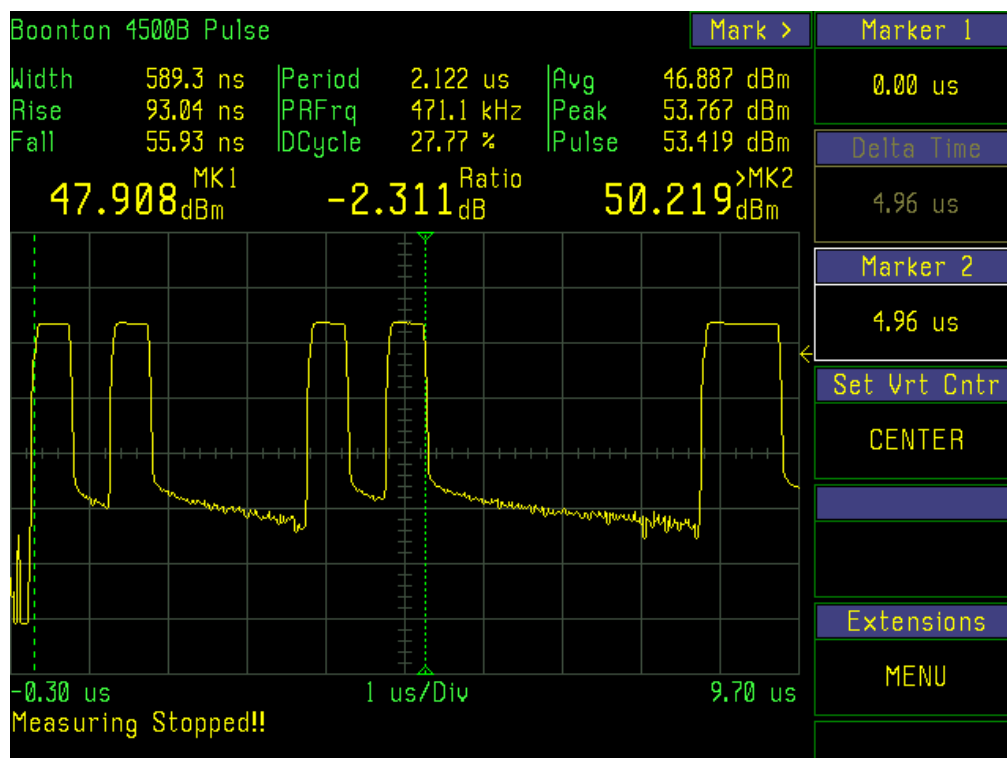
Plot no. 16:



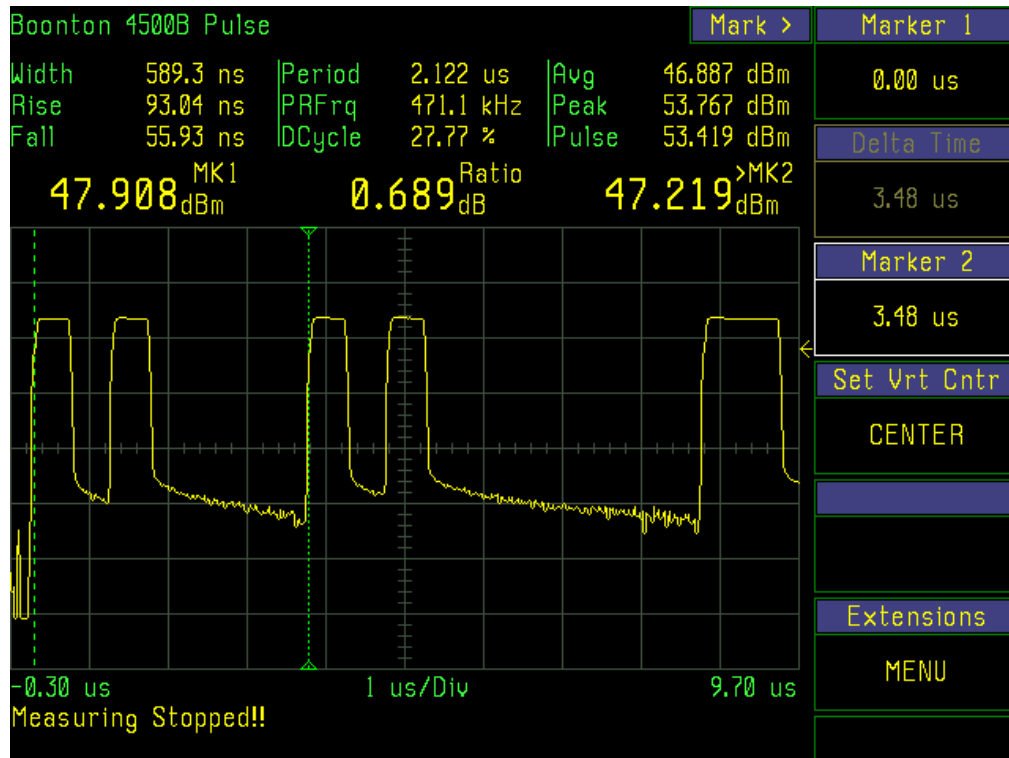
Plot no. 17:



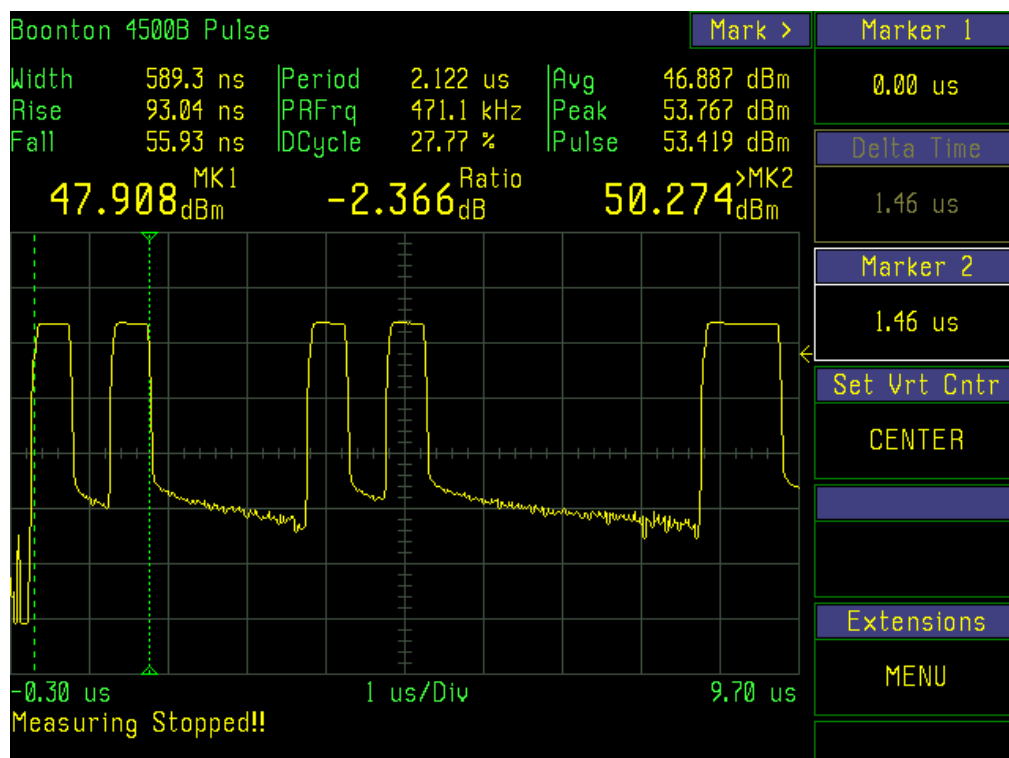
Plot no. 18:



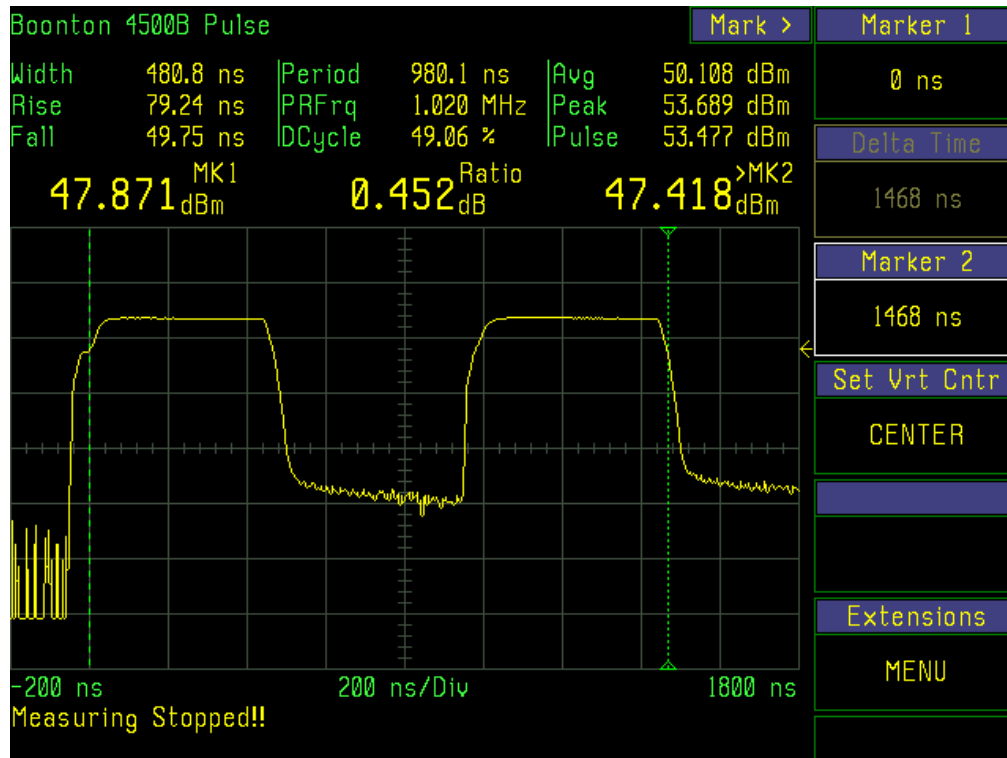
Plot no. 19:



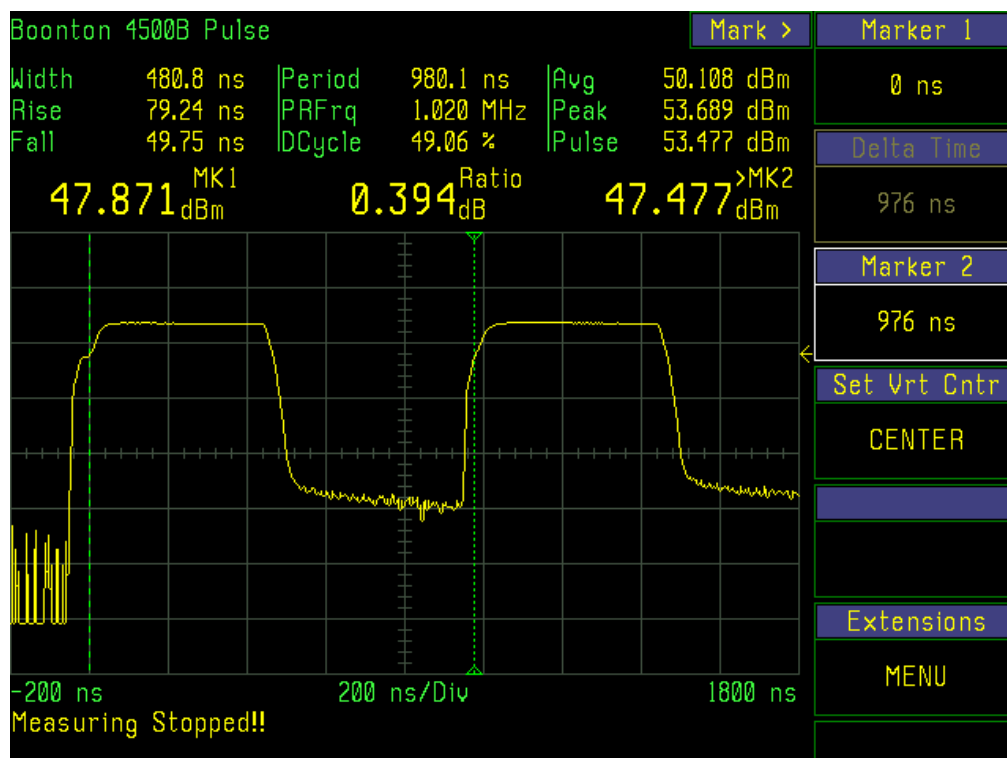
Plot no. 20:



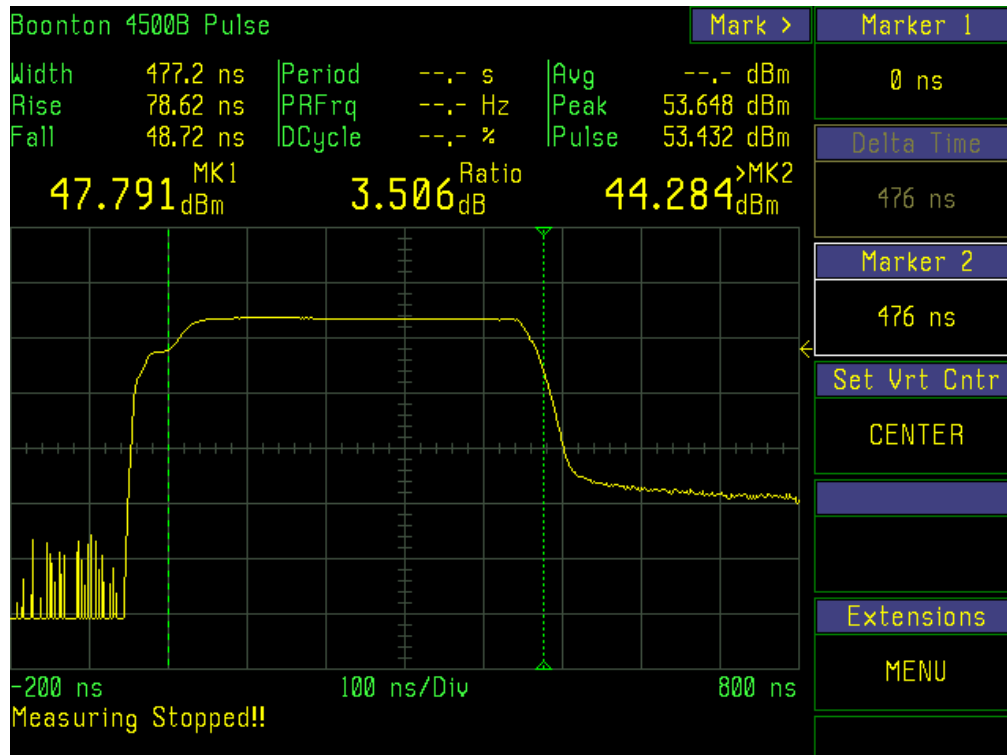
Plot no. 21:



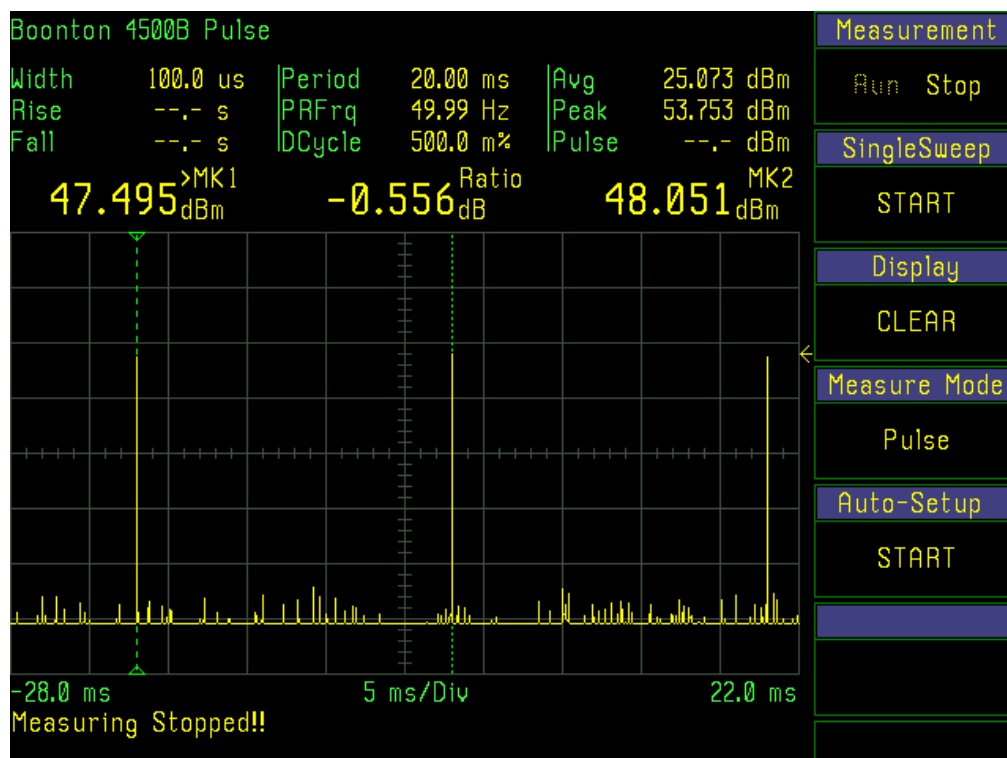
Plot no. 22:



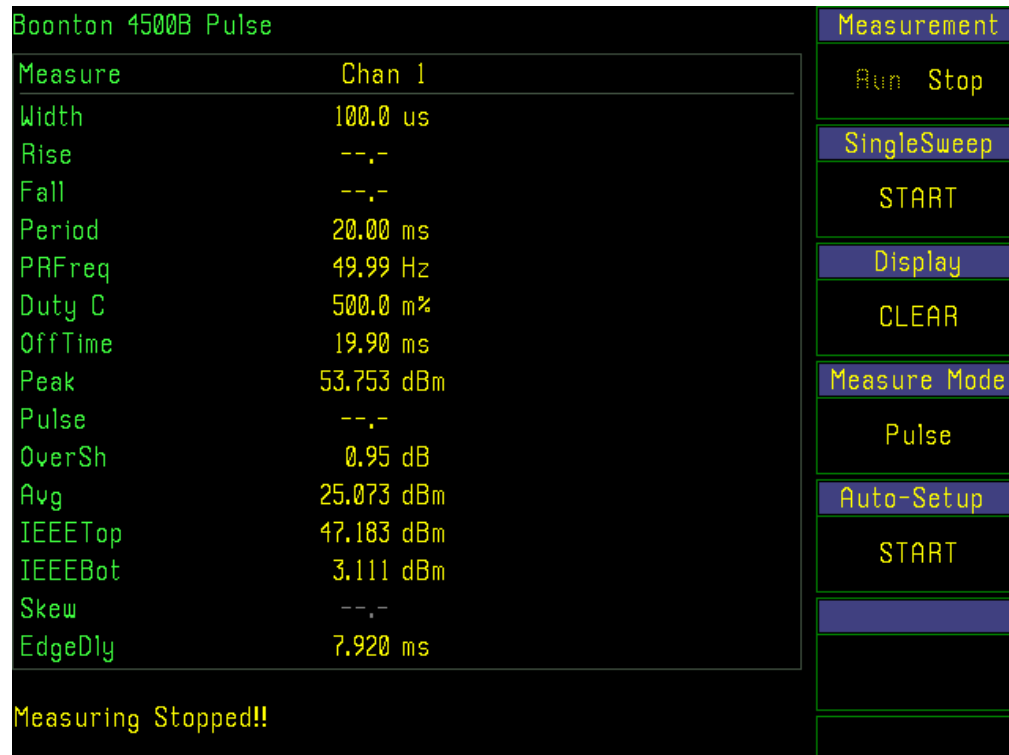
Plot no. 23:



Plot no. 24:

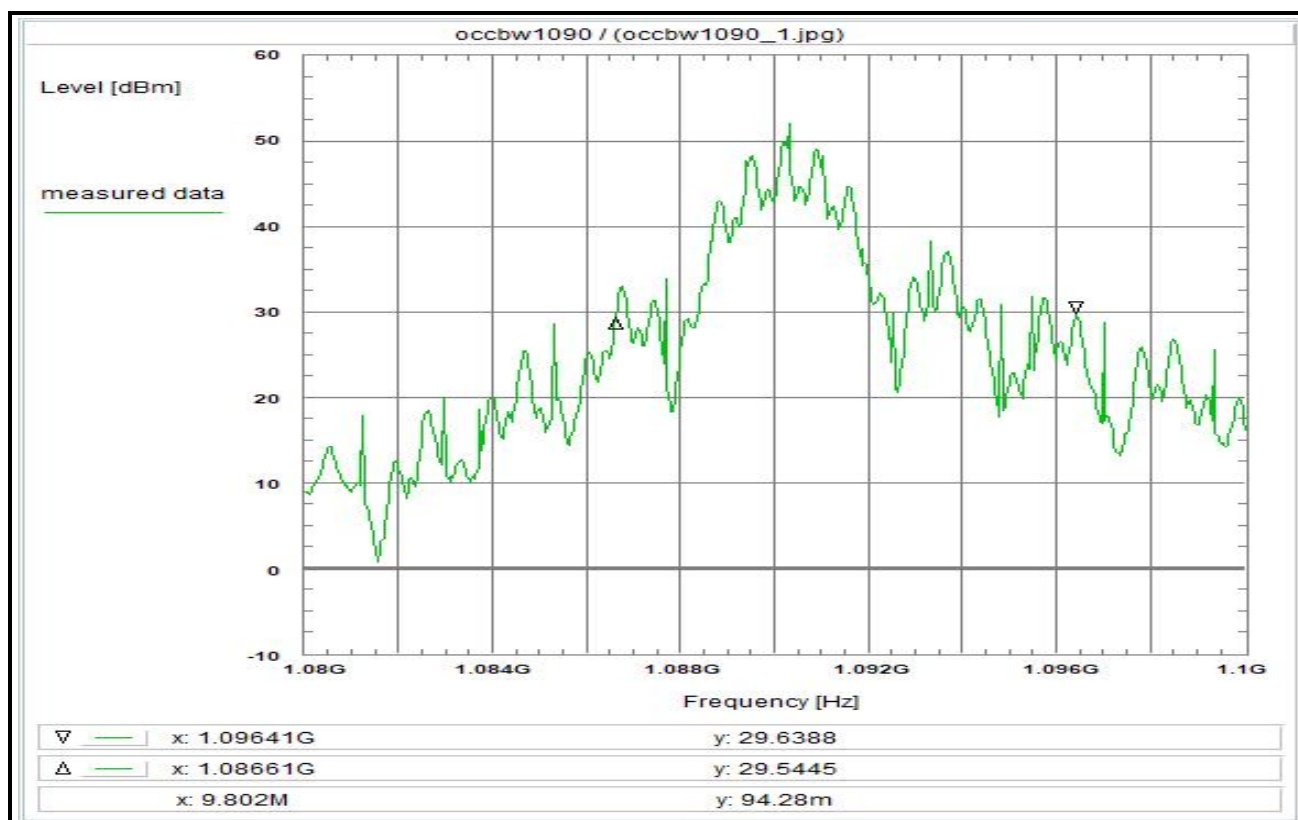


Plot no. 25:



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

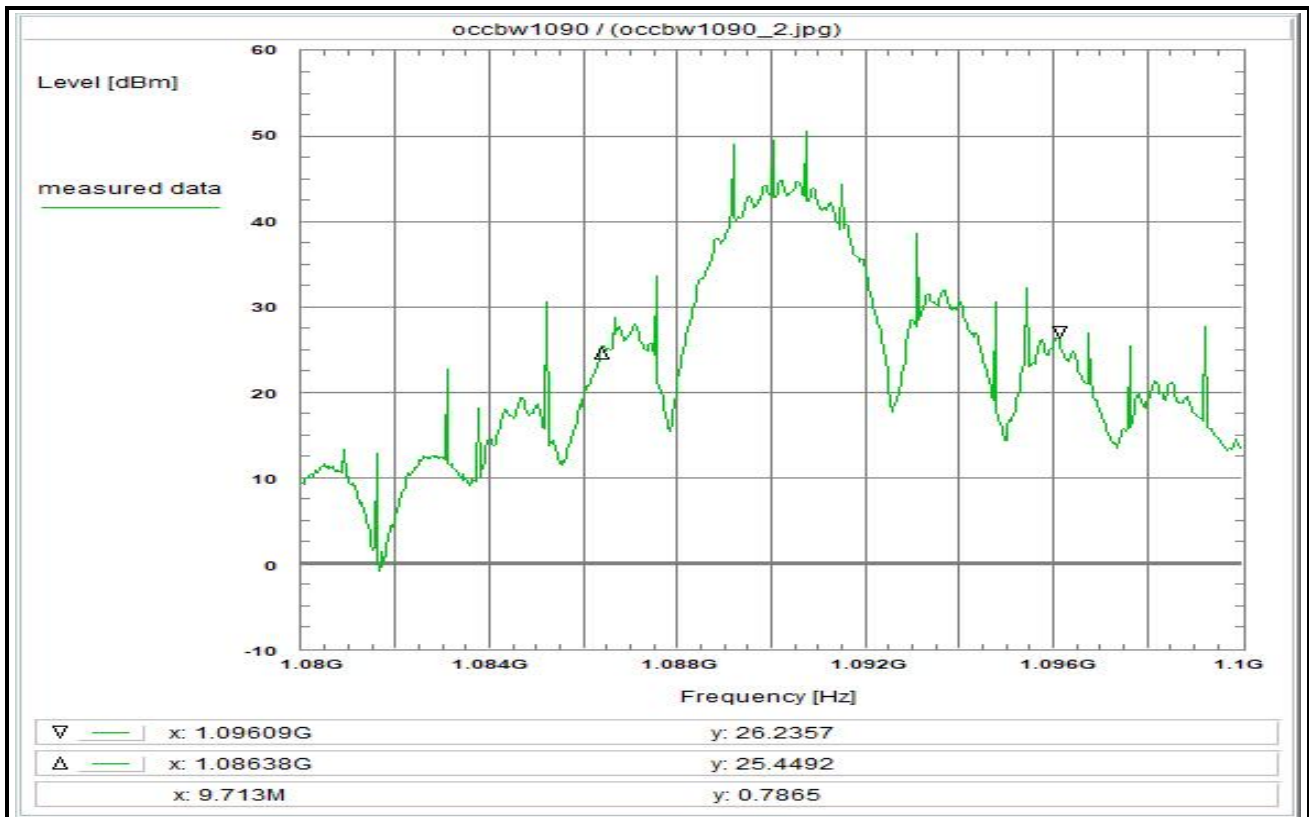
Correction:

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

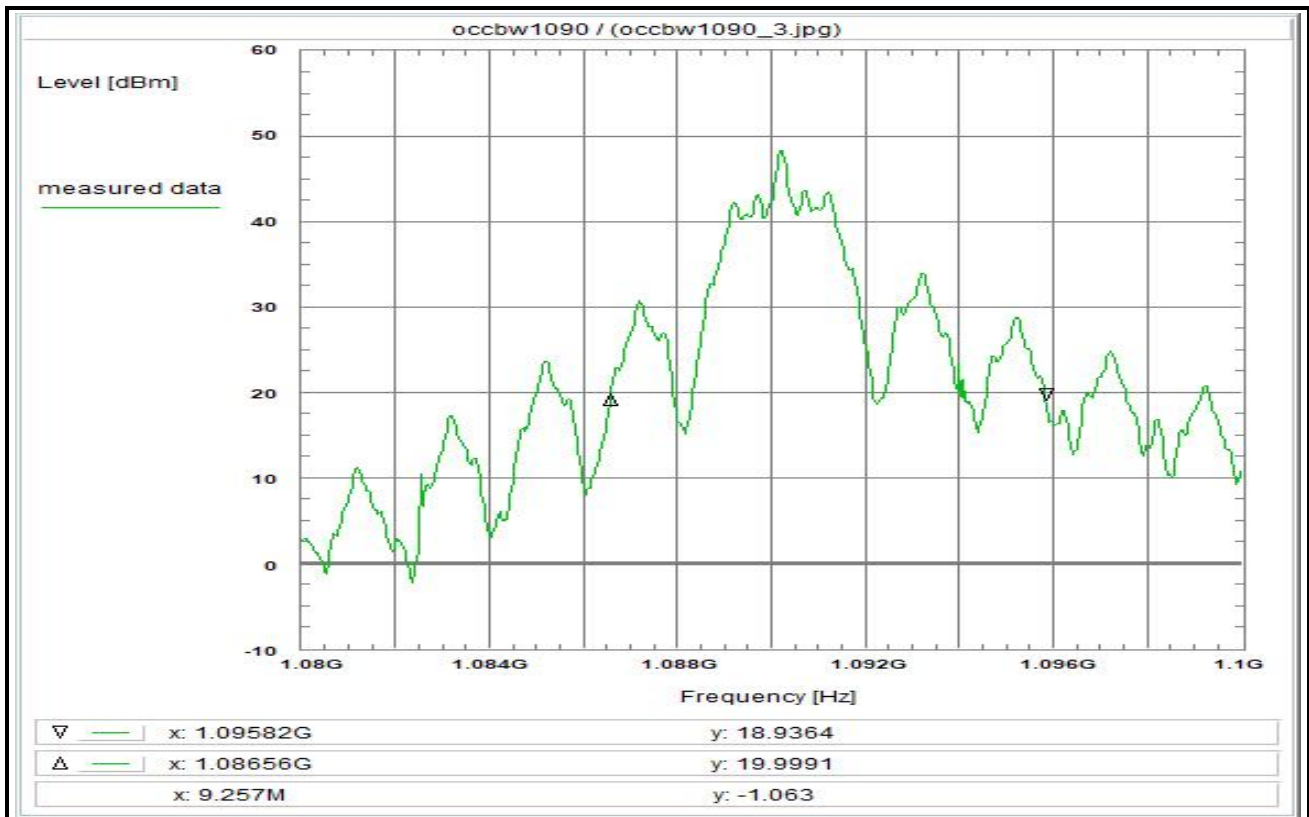
Correction:

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

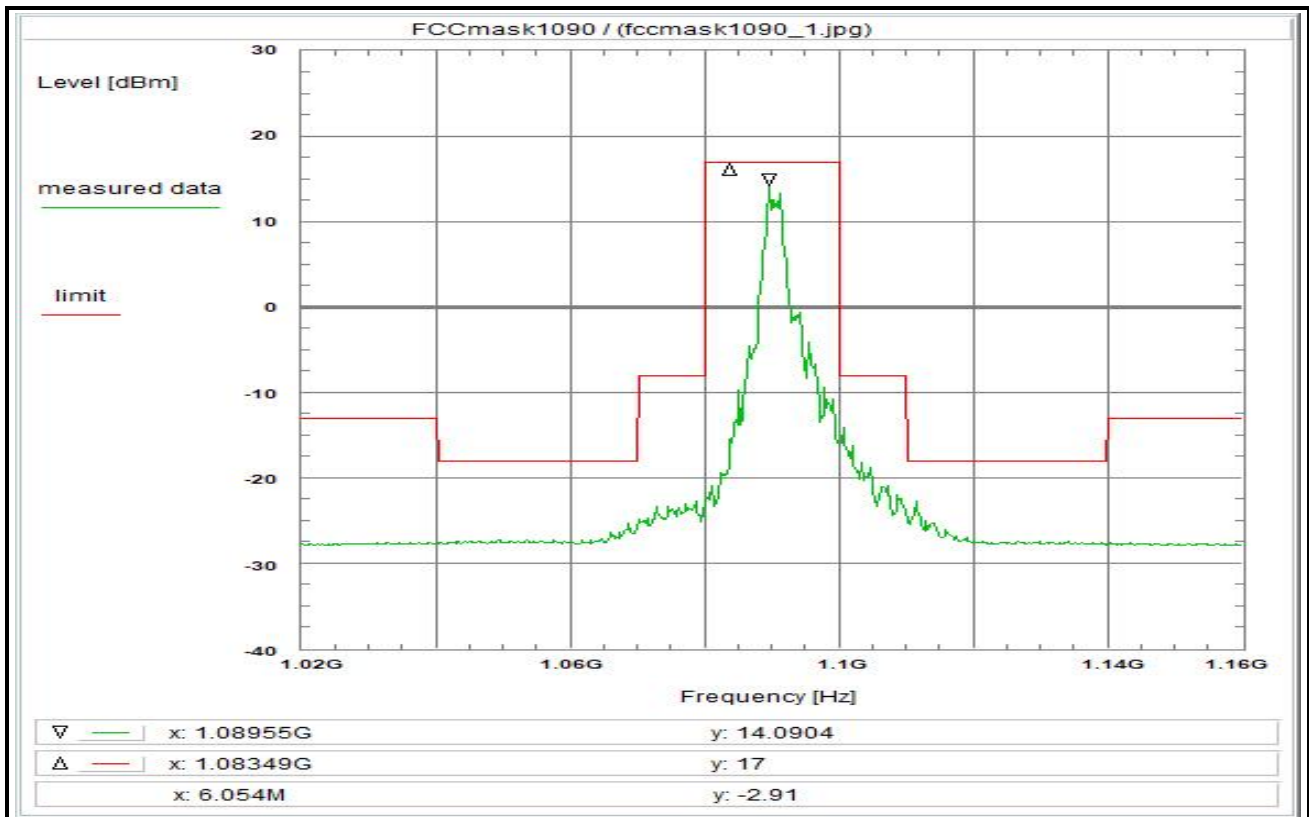
Correction:

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:

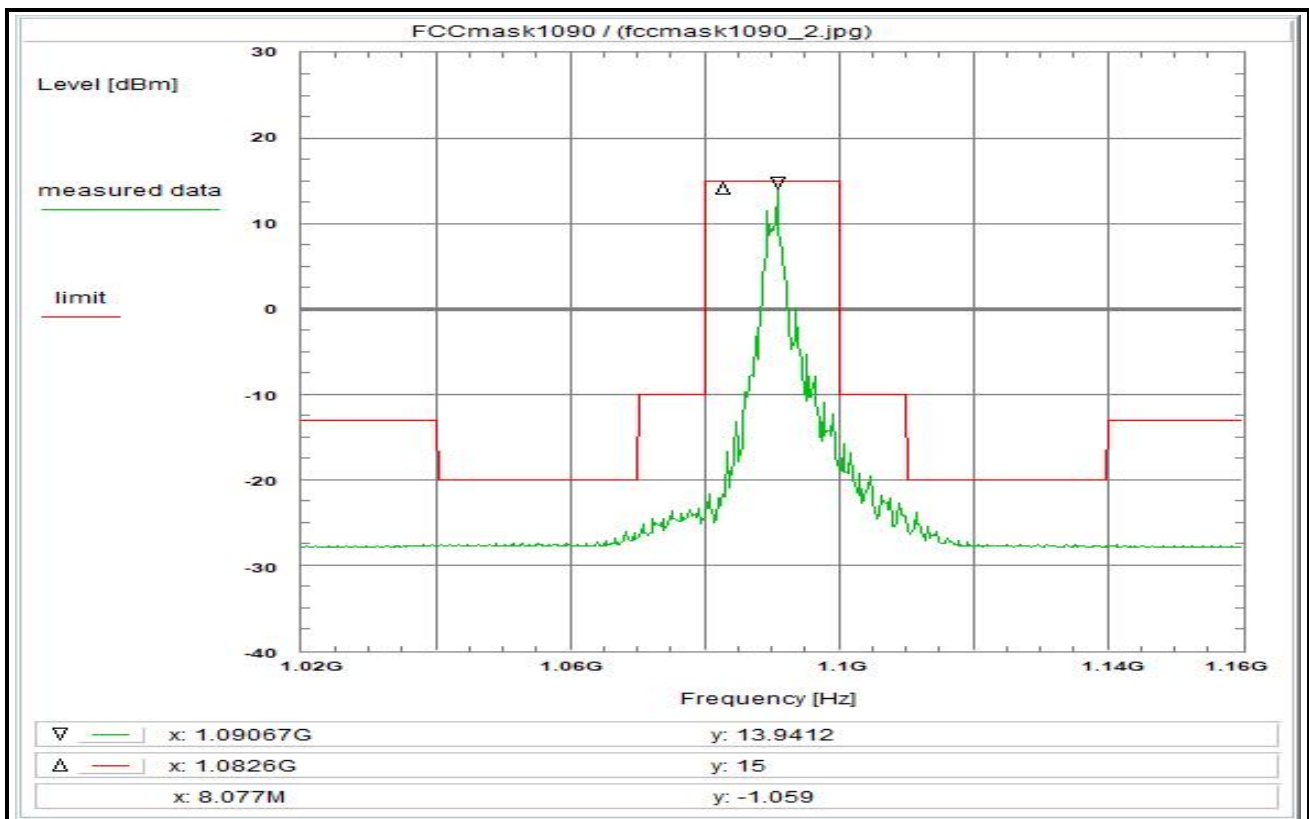
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 0.7 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.6 dB
Attenuation (U023b)	+ 10.0 dB
Power splitter	+ 6.2 dB
TOTAL CORRECTION:	+ 36.5 dB

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:

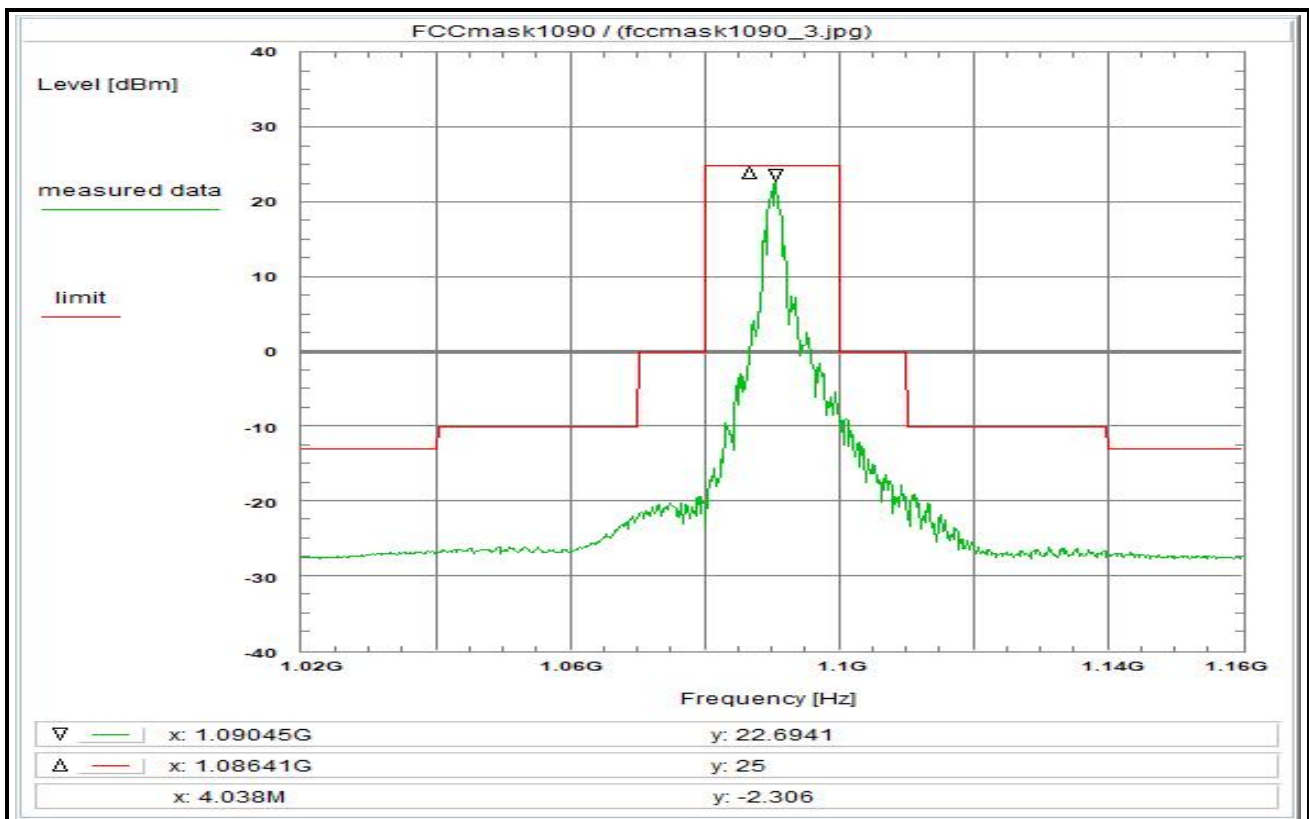
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 0.7 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.6 dB
Attenuation (U023b)	+ 10.0 dB
Power splitter	+ 6.2 dB
TOTAL CORRECTION:	+ 36.5 dB

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:

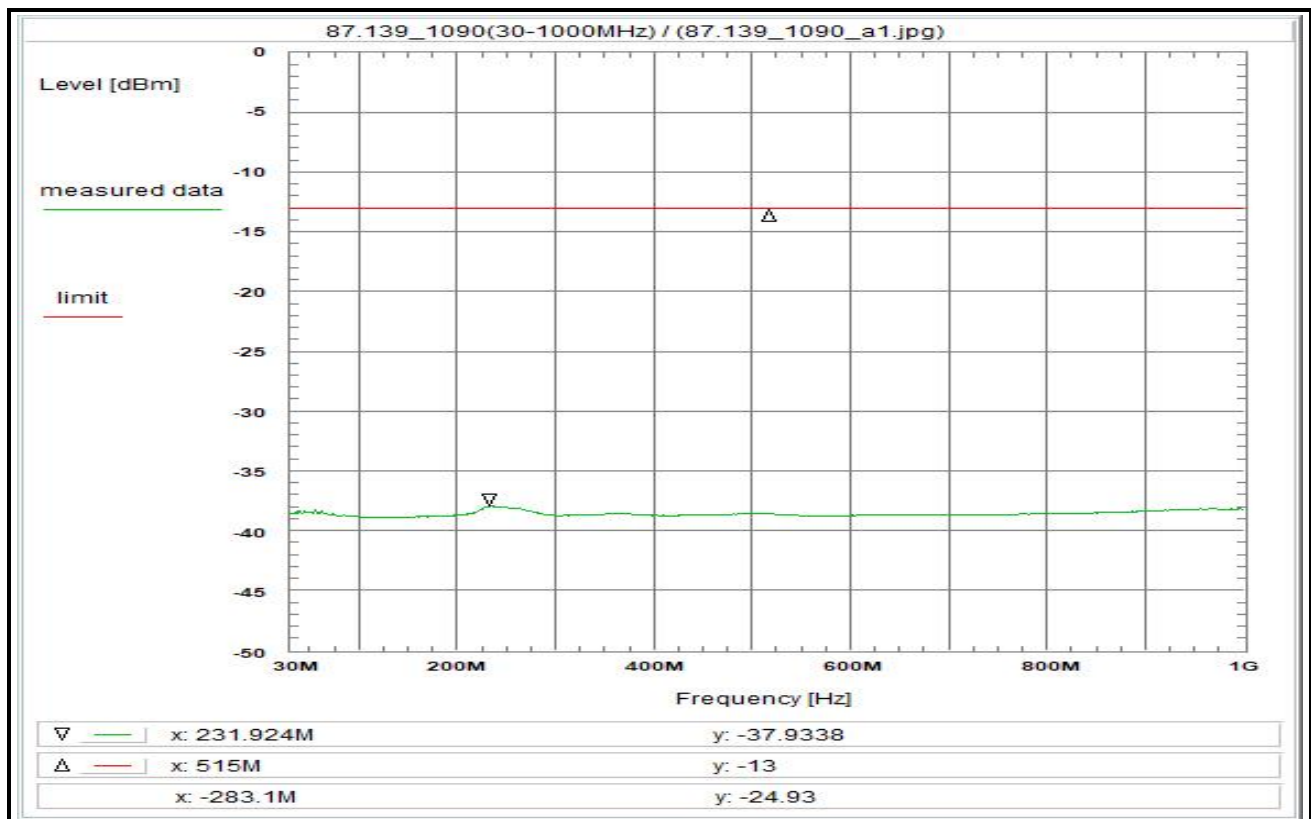
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 0.7 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.6 dB
Attenuation (U023b)	+ 10.0 dB
Power splitter	+ 6.2 dB
TOTAL CORRECTION:	+ 36.5 dB

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: hhj

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

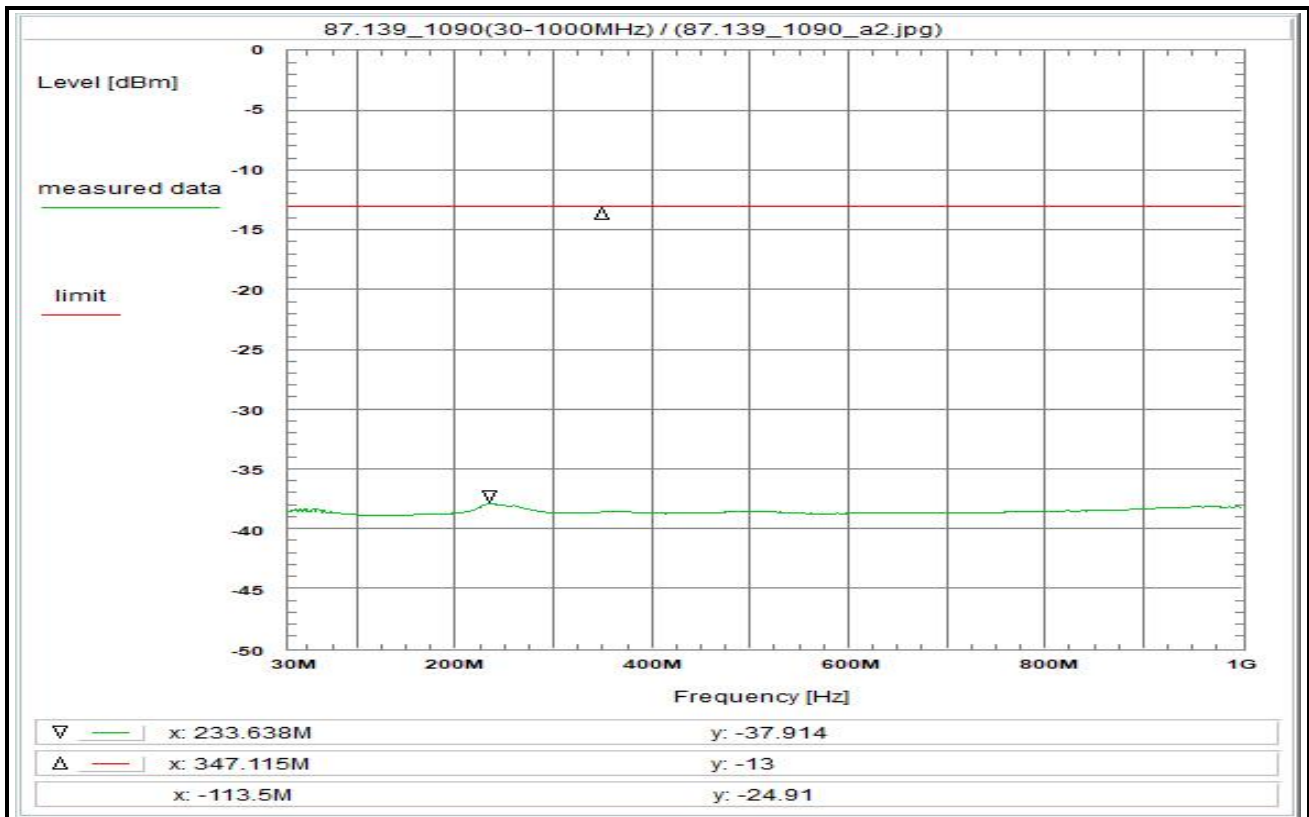
Correction:

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

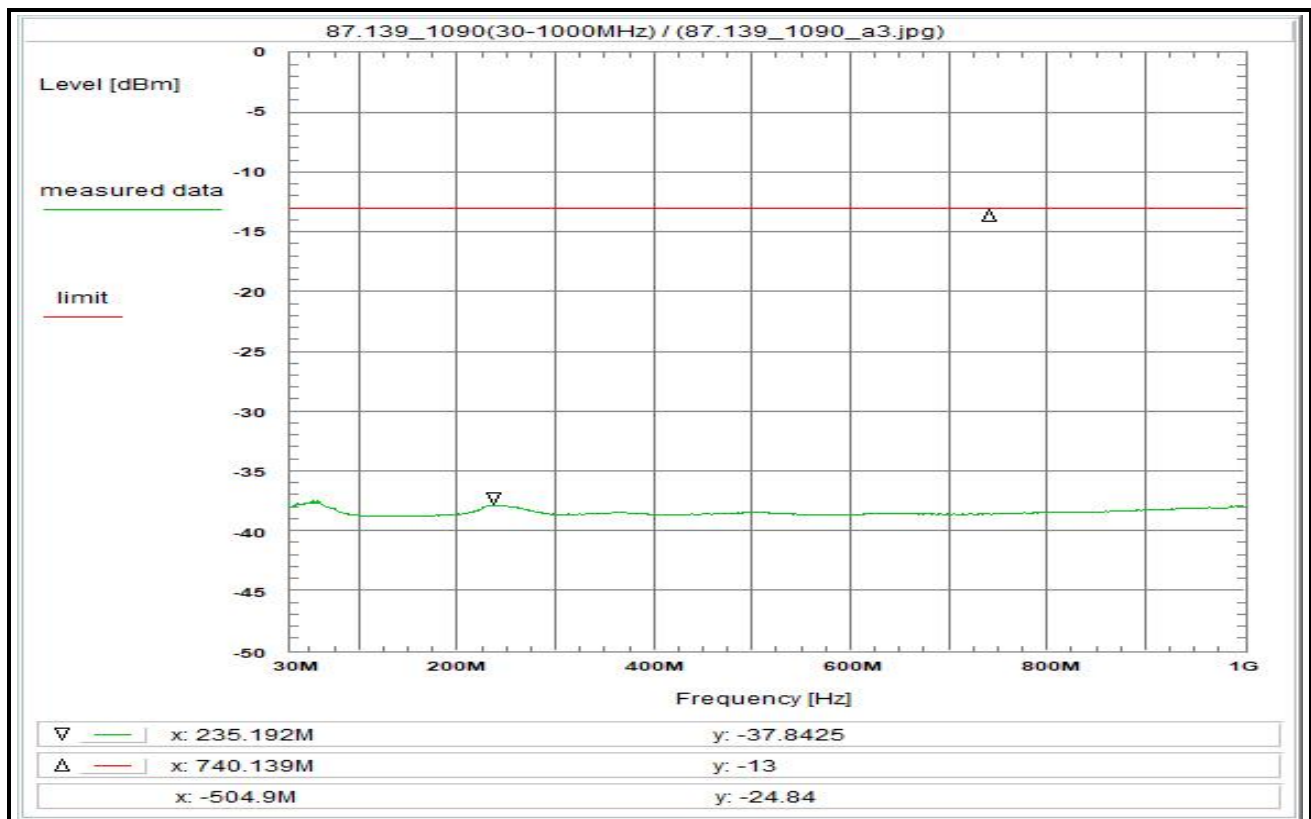
Correction:

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

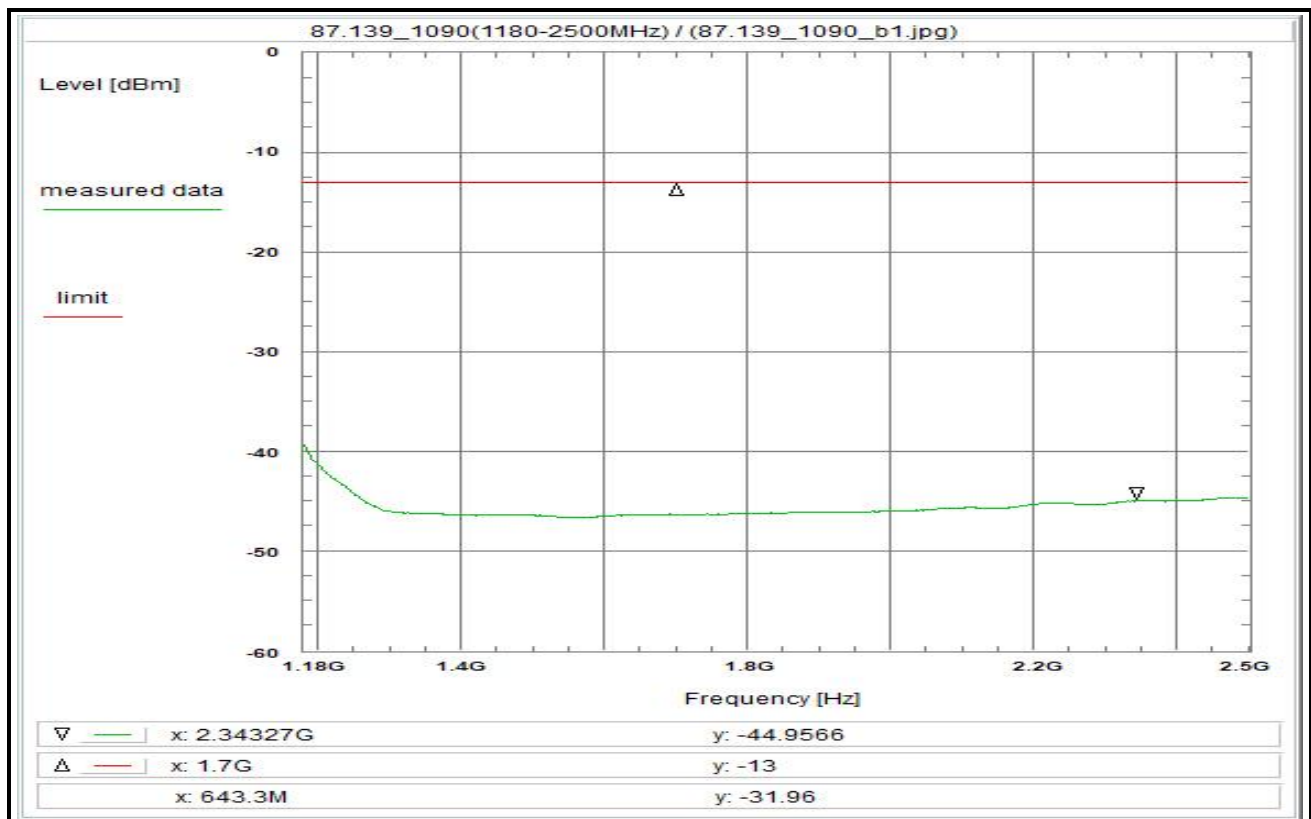
Correction:

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: hijg

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

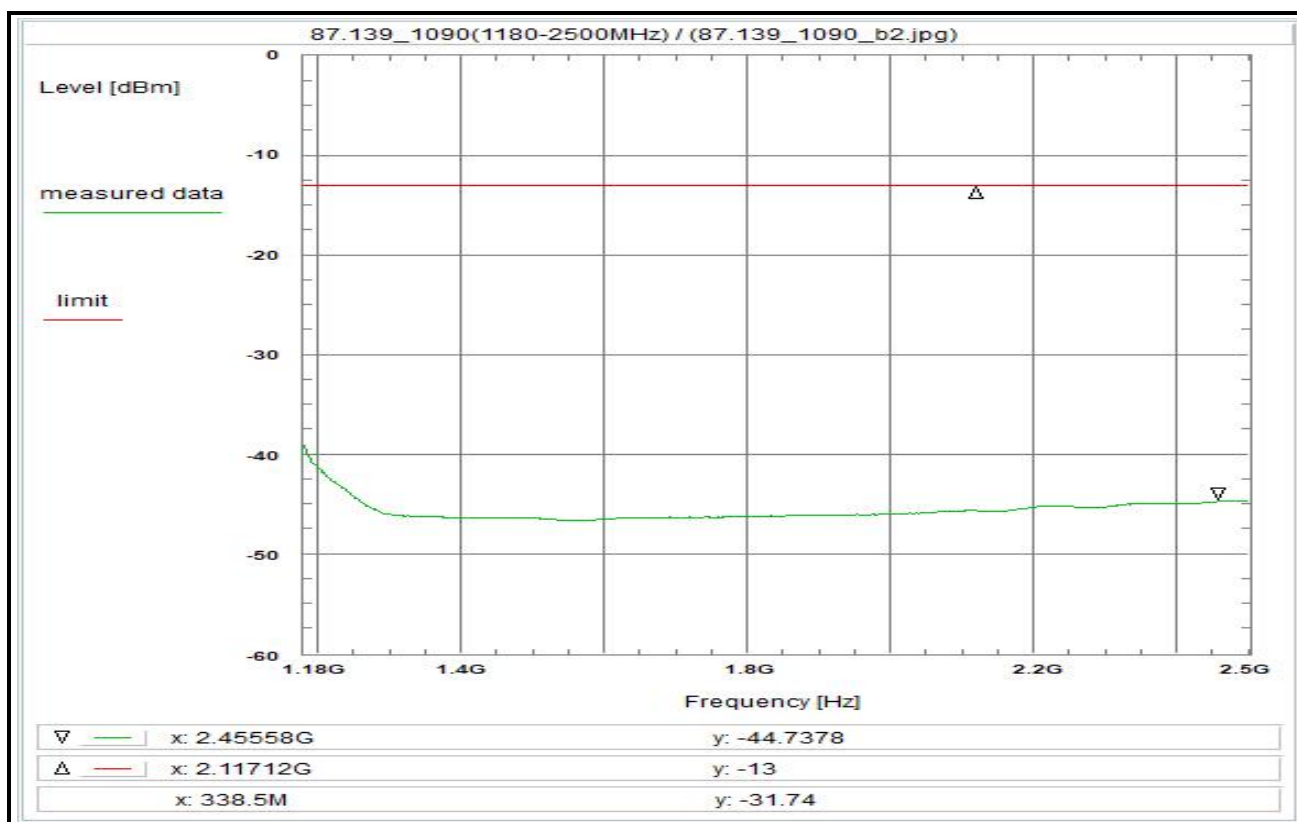
Correction:

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: hijg

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

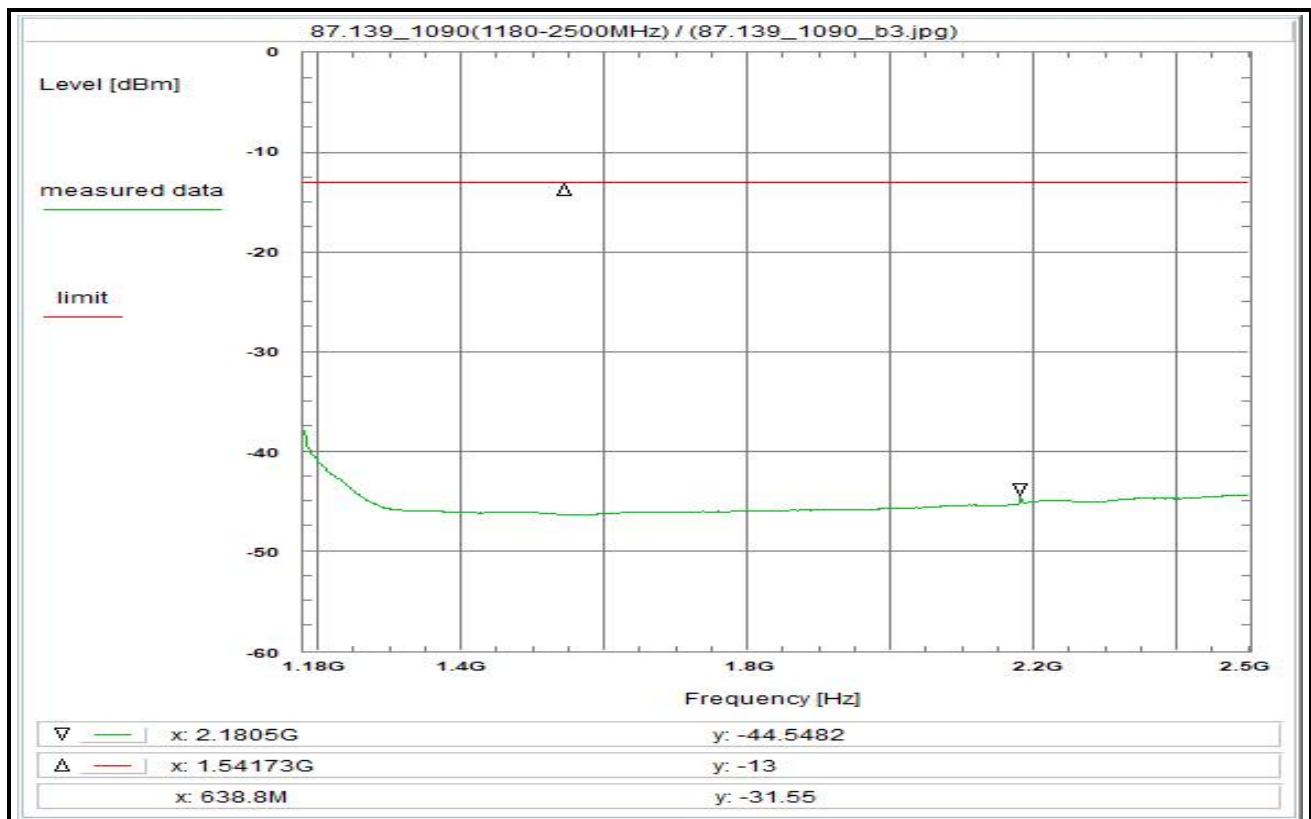
Correction:

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: hij

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:

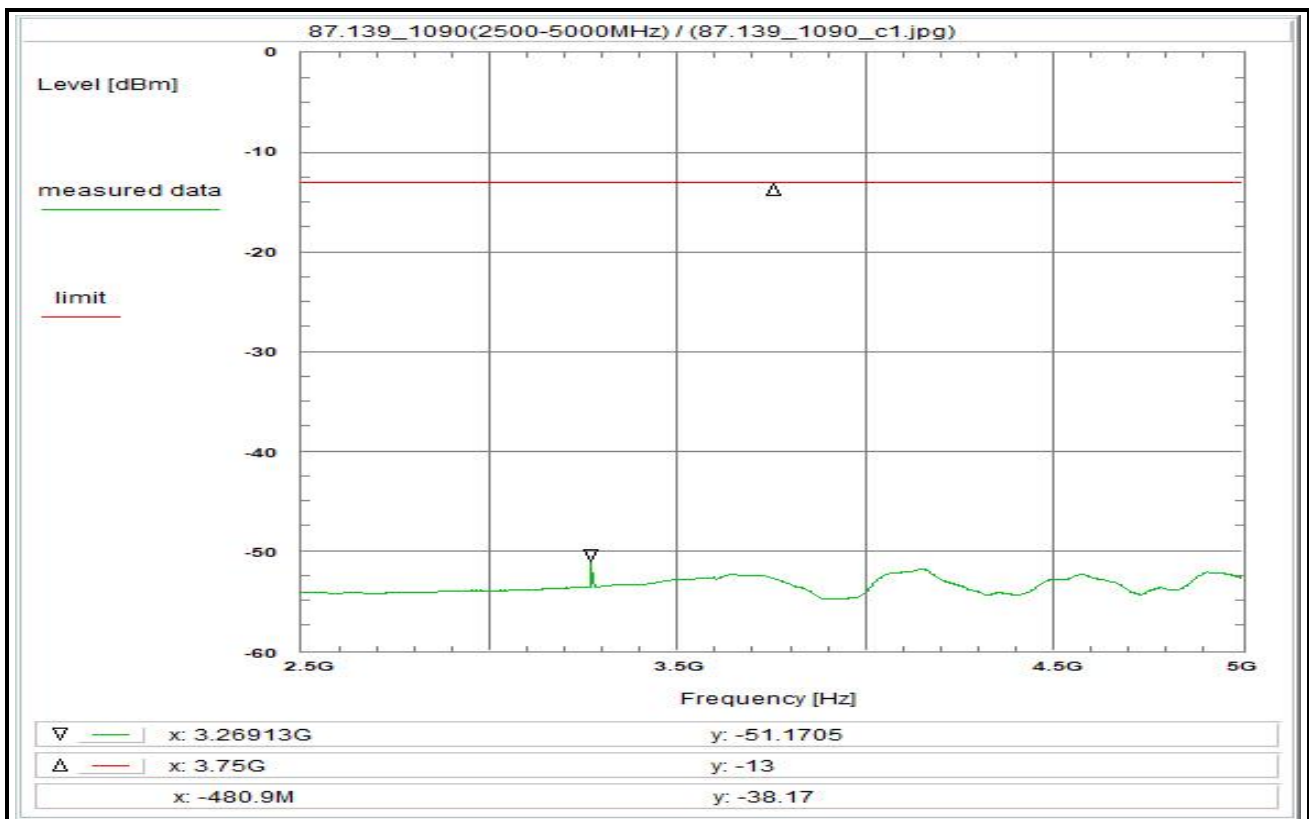
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 0.9 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.6 dB
Power splitter	+ 6.2 dB
HPF (F132)	+ 1.1 dB
TOTAL CORRECTION:	+ 27.8 dB

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: hijg

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:

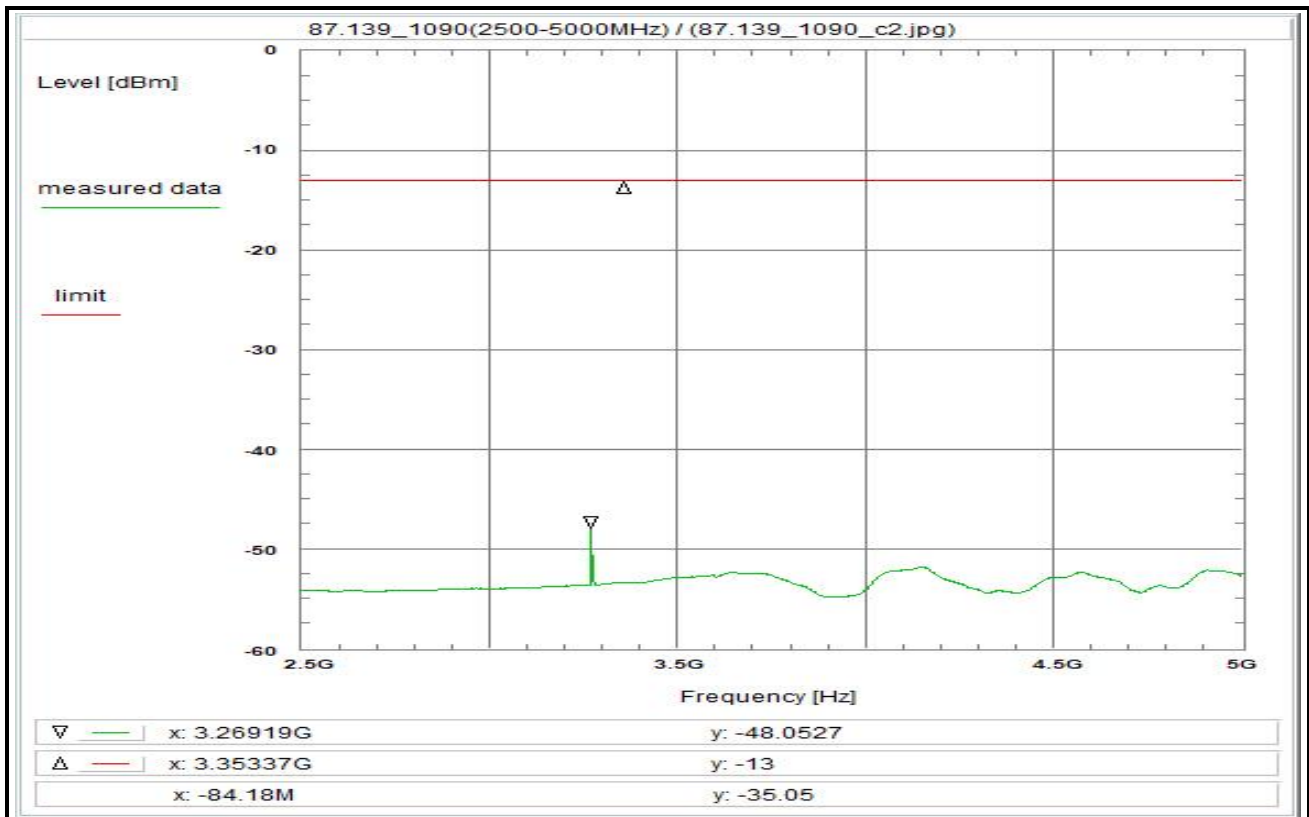
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 1.3 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.7 dB
Power splitter	+ 6.0 dB
HPF (F150)	+ 0.4 dB
TOTAL CORRECTION:	+ 27.4 dB

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: hijg

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:

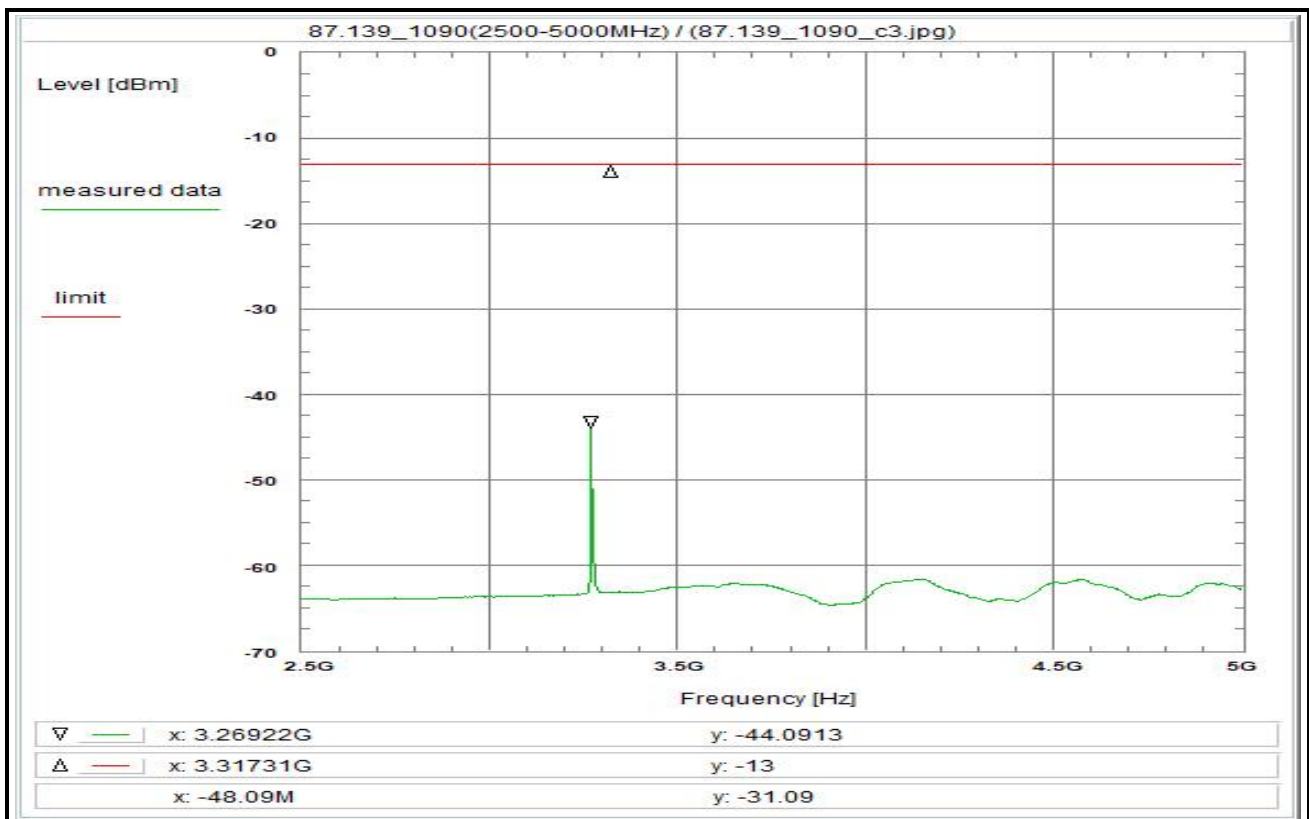
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 1.3 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.7 dB
Power splitter	+ 6.0 dB
HPF (F150)	+ 0.4 dB
TOTAL CORRECTION:	+ 27.4 dB

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: hijj

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:

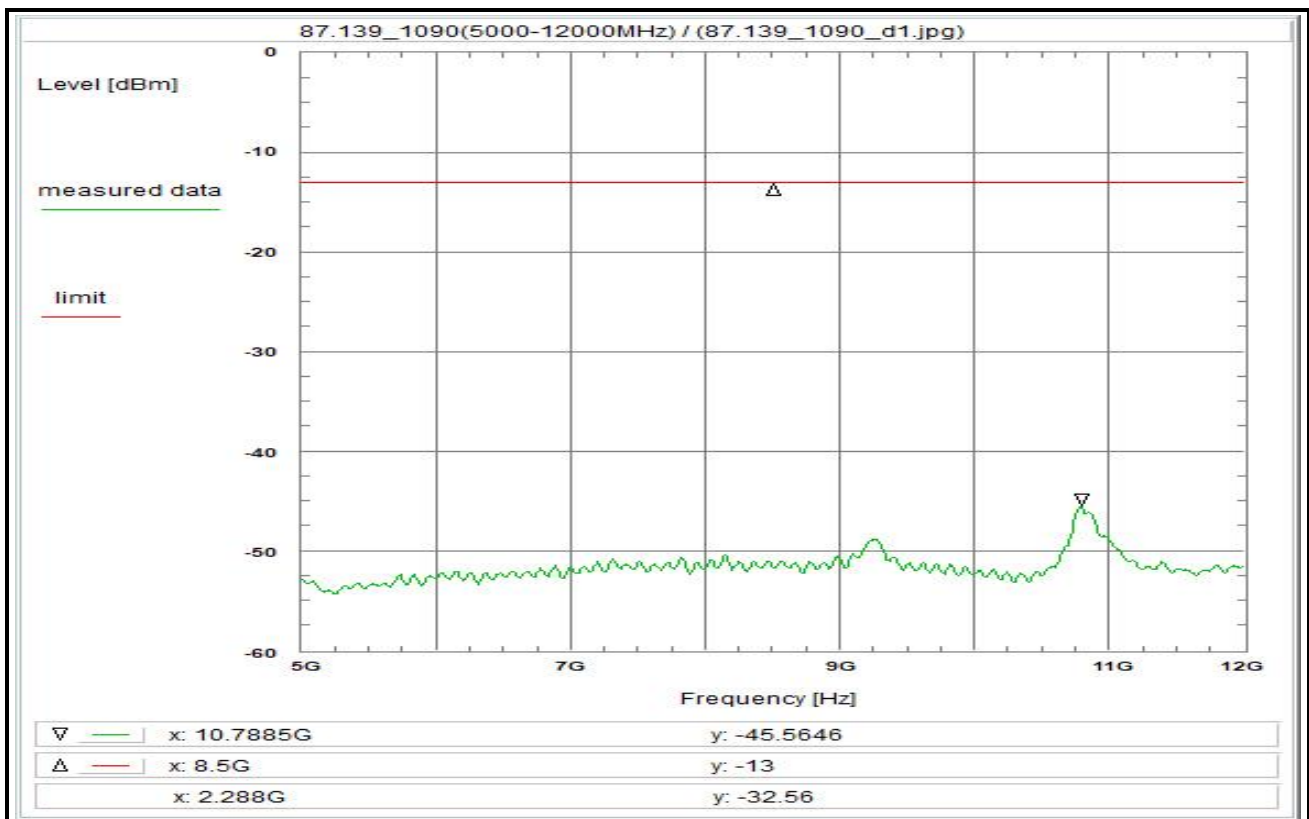
Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 1.3 dB
DUT-Antenna	+ 0.0 dBi
Test antenna	+ 0.0 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Attenuation (U312)	+ 19.7 dB
Power splitter	+ 6.2 dB
HPF (F150)	+ 0.4 dB
TOTAL CORRECTION:	+ 27.6 dB

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: hijg

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

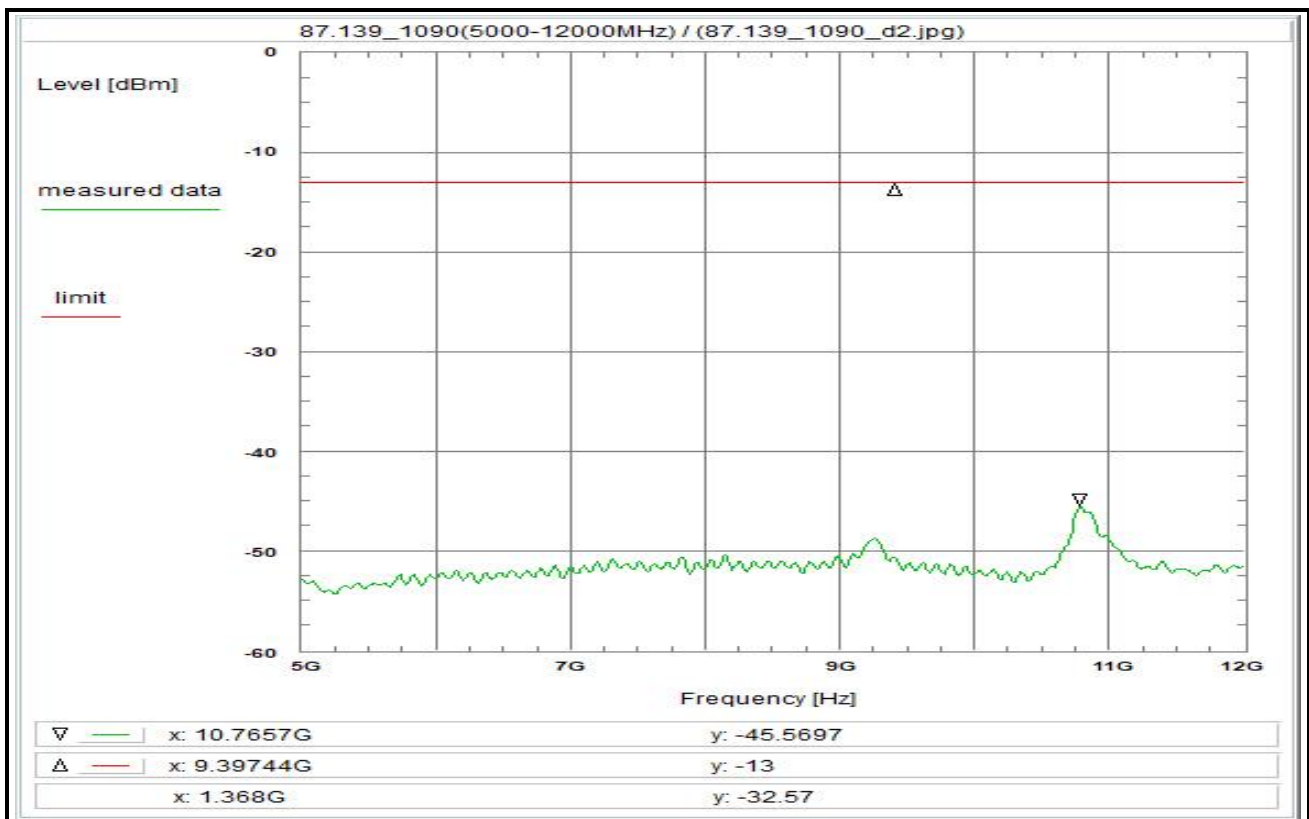
Correction:

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: hijg

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

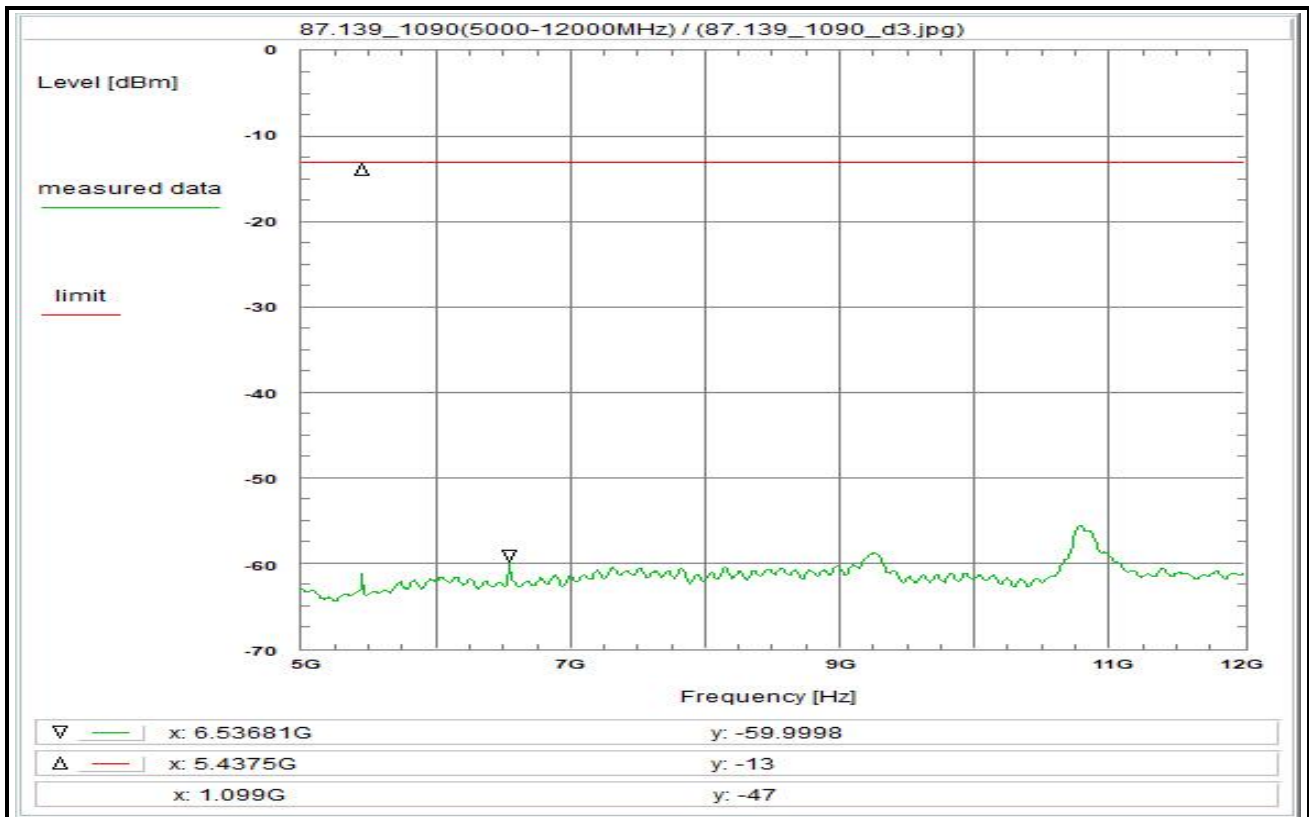
Correction:

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: hijj

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

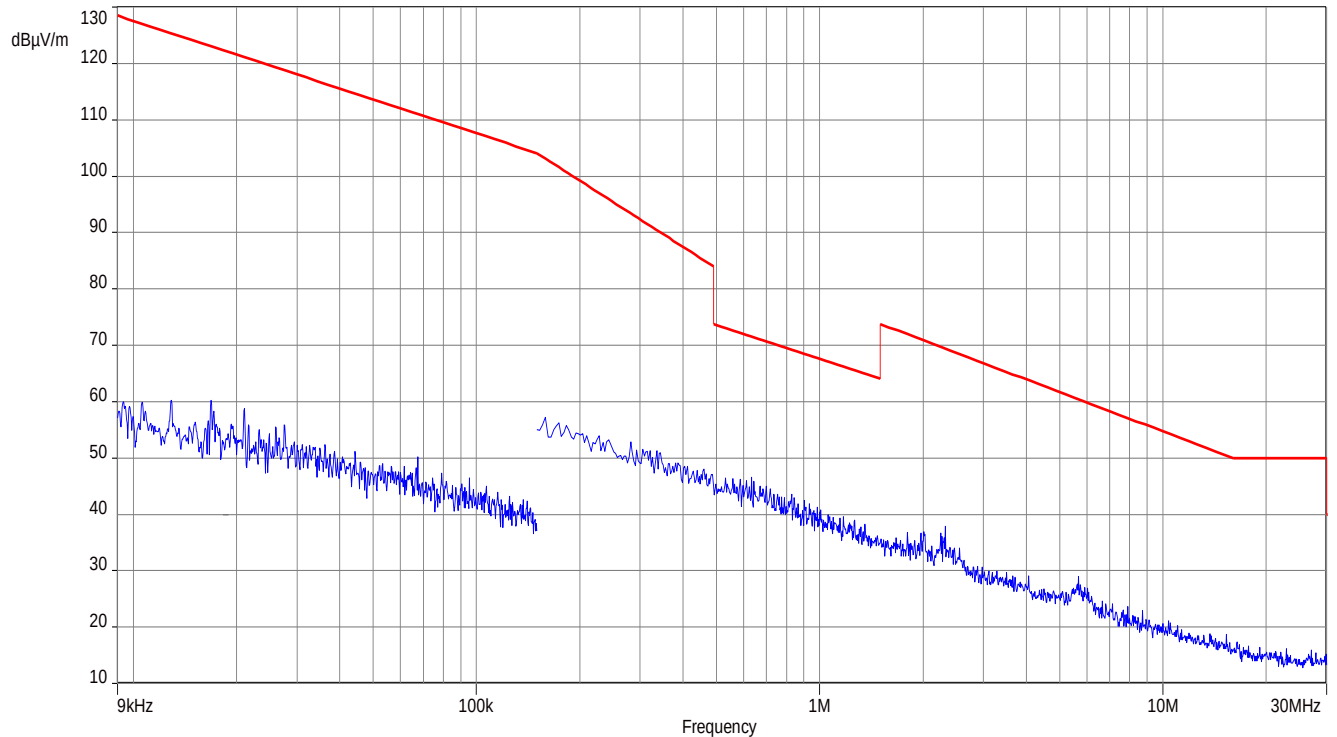
Remarks:

Spurious emissions under normal test conditions
 Max-Hold measurement.

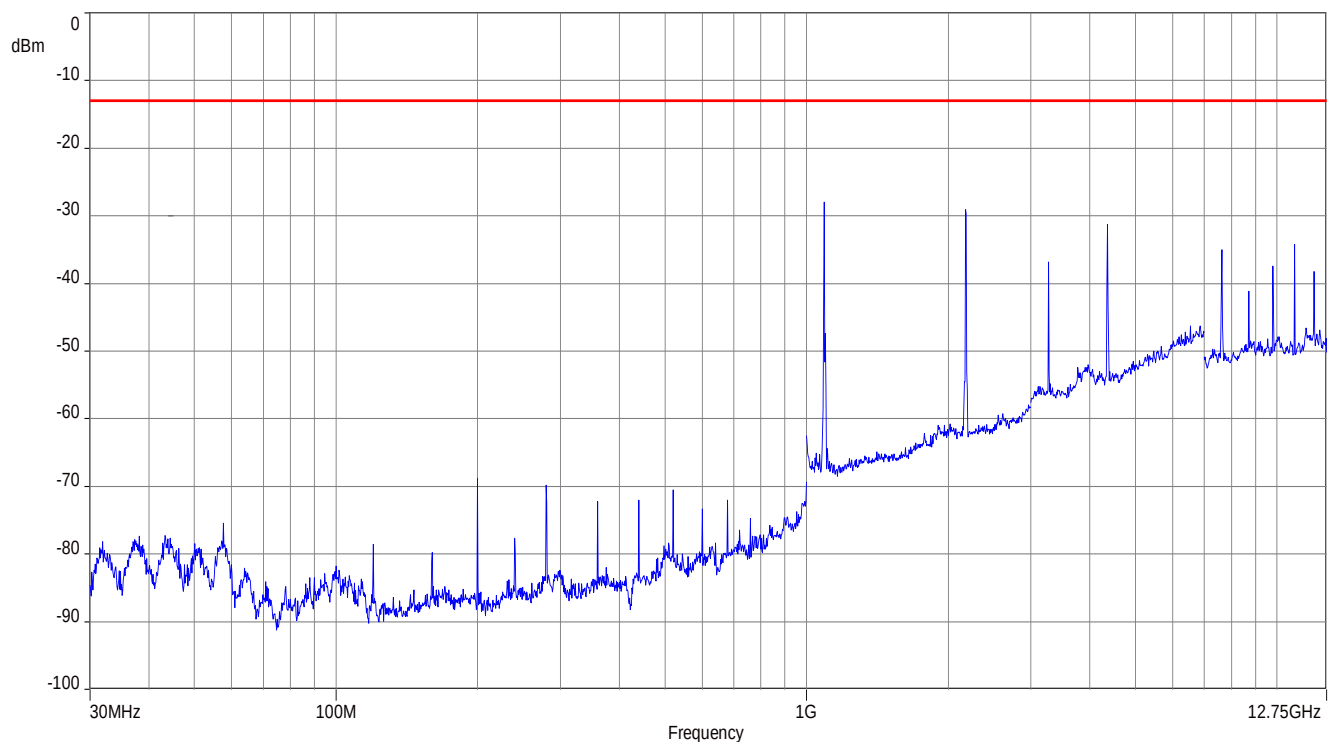
Plot shows 5th and 6th harmonic.

Plots – radiated emissions

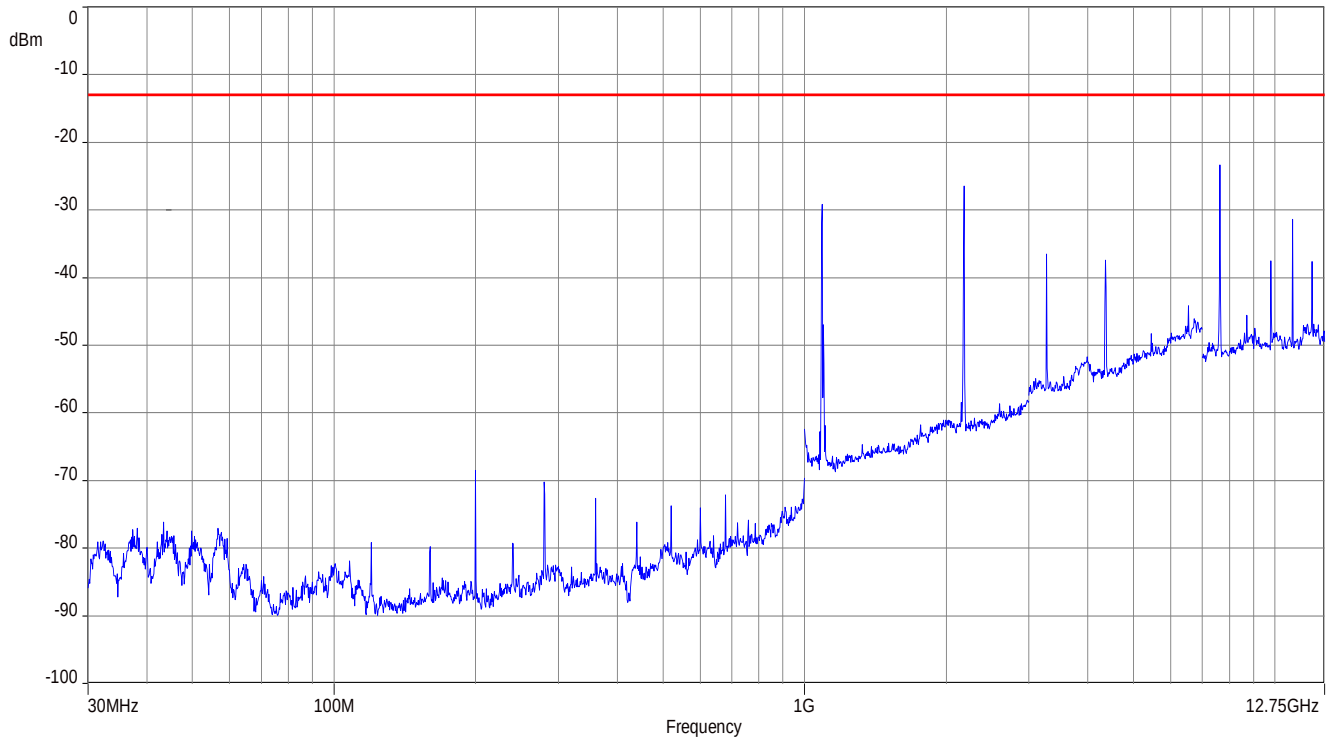
Plot No. 1: Mode S (highest mean Tx-Power, highest power consumption)



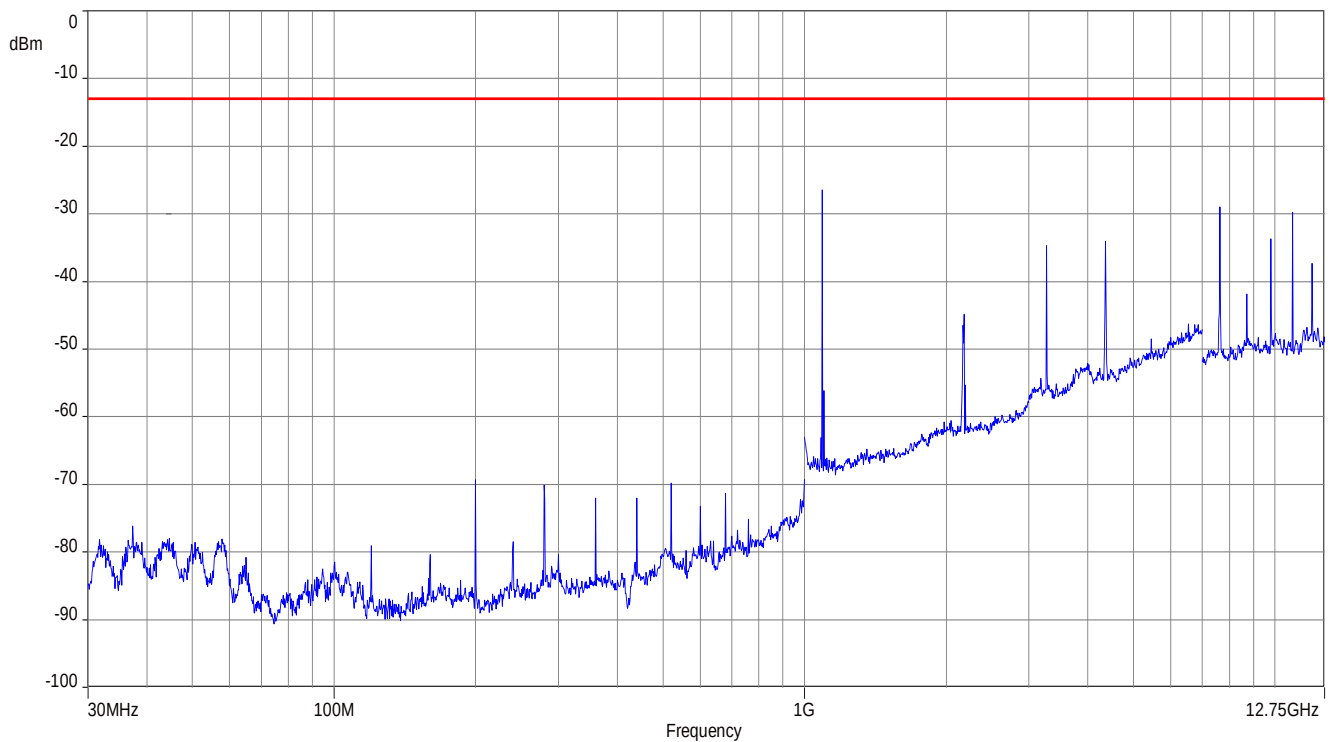
Plot No. 2: Mode A



Plot No. 3: Mode C



Plot No. 4: Mode S



Document history

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