







Annex D



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

T	Test report annex authorized:					

Meheza Walla Lab Manager Radio Communications & EMC

© CTC advanced GmbH Page 1 of 42



Table of contents

1	Table of contents	2
2	Measurement results, FCC Part 87 and FCC Part 25	3
3	Measurement results, Spurious emissions 30MHz - 18 GHz	. 39
4	Measurement results, FCC Part 15B	. 41
5	Document history	. 42



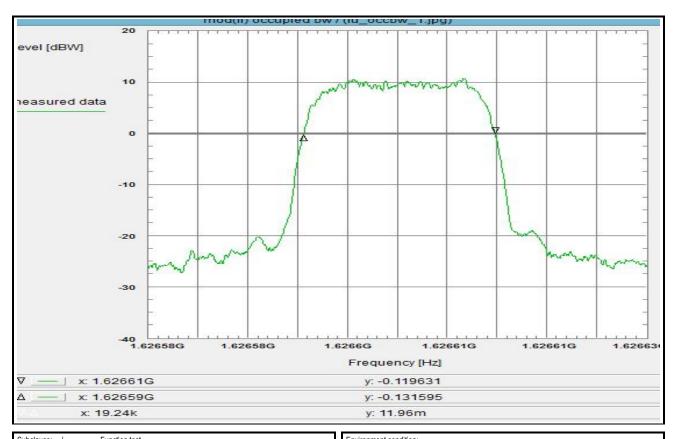
2 Measurement results, FCC Part 87 and FCC Part 25

This part 2 consists of 36 pages including this page.

© CTC advanced GmbH Page 3 of 42



Plot No. 1 (35)

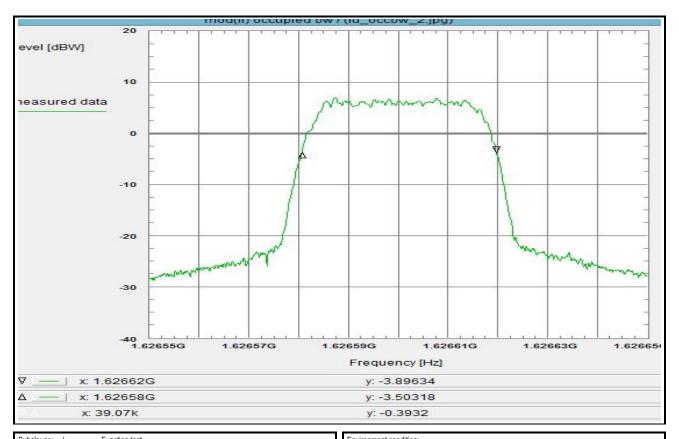


Subclause: -/-Environment condition: Wed 08/Nov/2017 09:47:26 Modulated rf-carrier at the lower edge of the band (fl) Date & Time: CTC advanced GmbH, Laboratory RSC-Sat Determination of the 'occupied bandwidth' Location: 22 °C 55 % Temperature: Humidity: 230 Vac Voltage: The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to $0.5\,\%$ of the total mean power radiated by a given emission. Setup of measurement equipment:
Start frequency: 1.626575 1.626625 1.6266 Stop frequency: GHz This occupied bandwidth corresponds to the -20 dB-bandwidth. GHz Center frequency: 50 kHz Frequency span: Resolution-BW: kHz Video-BW: kHz 3 15 dB Input attenuation: Max-Hold Test results: Trace-Mode: see plot (an explicit table was not generated) Detector-Mode: Pos Peak Correction: Directional coupler Operating condition of DUT: operating condition 1, see subclause 1.5.2 SBU 405040A, fl, QPSK, 21 kHz 0.0 dB Coaxial cable (C218) DUT-Antenna (on-axis) 0.0 dBi 0.0 Test setup: see section 8.1: 1.2hgj Test antenna dB BW correction factor (1k -> 3k) Atten. between HPA and feedhorn Freefield attenuation (U005) 0.0 dB 29.8 dB Test equipment: see annex 2: C218, R001, U005 TOTAL CORRECTION: Remark: Remarks: <u>Determination of the 'occupied bandwidth' at fl:</u>
The measured value is about 19 kHz (delta marker) Measurement with 3 kHz resolution filter and noise averaging. Test result: Determination of the occupied bandwidth'

© CTC advanced GmbH Page 4 of 42



Plot No. 2 (35)

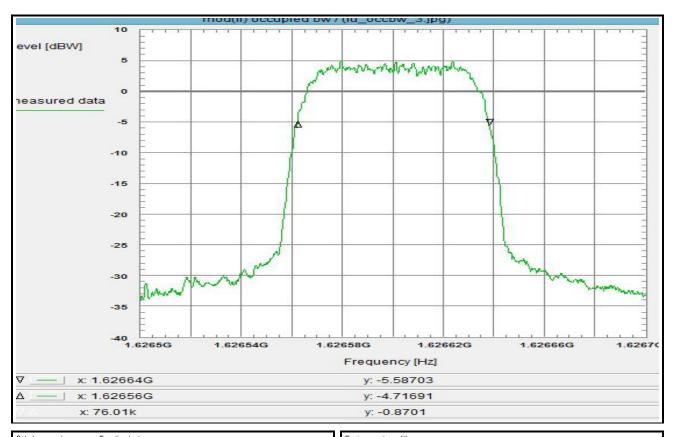


Subclause: -/- Function test		Environment condition:				
Modulated rf-carrier at the lower edge of	the band (fl)	Date & Time:	Wed 08/Nov/201	7 10:33:25		
Determination of the 'occupied bandwidth	n'	Location:	CTC advanced 0	GmbH, Laborato	ry RSC-Sat	
'		Temperature:	22	°C	•	
		Humidity:	55	%		
Limit:		Voltage:	230	Vac		
The occupied bandwidth, that is the frequency bandwidth such that,	below					
its lower and above its upper frequency limits, the mean powers rad		Setup of measurement eq	uipment:			
each equal to 0.5 % of the total mean power radiated by a given em		Start frequency:		GHz		
(see §2.1049).		Stop frequency:	1.62665	GHz		
This occupied bandwidth corresponds to the -20 dB-bandwidth.		Center frequency: Frequency span: Resolution-BW:	1.6266			
		Frequency span:	100			
		Resolution-BW:	3	kHz		
		Video-BW:	10	kHz		
		Input attenuation:	10			
Test results:		Trace-Mode:	Max-Hold			
see plot (an explicit table was not generated)		Detector-Mode:	Pos Peak			
3 ,						
Operating condition of DUT:		Correction:				
operating condition 1, see subclause 1.5.2		Directional coupler Coaxial cable (C218) DUT-Antenna (on-axis)	+	0.0 dB		
SBU 405040A, fl, QPSK, 42 kHz		Coaxial cable (C218)	+	0.8 dB		
		DUT-Antenna (on-axis)	+	0.0 dBi		
Test setup:		Test antenna `	+	0.0 dB		
see section 8.1: 1.2hgj		BW correction factor	+	0.0 dB		
Si .		Atten, between HPA and t		0.0 dB		
Test equipment:		Attenuation (U005)	+	29.8 dB		
see annex 2: C218, R001, U005		TOTAL CORRECTION:	+	30.6 dB		
Remark:		Remarks:				
		Determination of the 'occu	upied bandwidth' a	at fu:		
		The measured value is ab	out 39 kHz (delta	marker)		
		Measurement with 3 kHz i	resolution filter and	d noise averagir	ng.	
Test result: Determination of the occupied band	dwidth'			- 3	-	

© CTC advanced GmbH Page 5 of 42



Plot No. 3 (35)

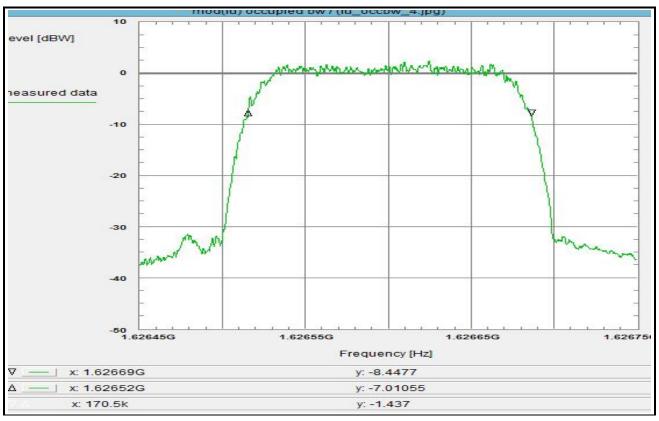


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier at the lower edge of the band (fl)	Date & Time: Wed 08/Nov/2017 11:14:58
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
'	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1 6265 GHz
(see §2.1049).	Stop frequency: 1.6267 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Center frequency: 1.6266 GHz
	Frequency span: 200 kHz
	Resolution-BW: 3 kHz
	Video-BW: 10 kHz
	Stop frequency:
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
see plot (all explicit table was not generated)	Detector-wode. 1 05 Feak
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SBU 405040A, fl, QPSK, 84 kHz	Coaxial cable (C218) + 0.8 dB
350 403040A, II, QF3N, 04 KHZ	DUT-Antenna (on-axis) + 0.0 dBi
Tool actum	Coaxial cable (C218) + 0.8 dB DUT-Antenna (on-axis) + 0.0 dBi Test antenna + 0.0 dB
Test setup: see section 8.1: 1.2hqi	BW correction factor + 0.0 dB
see section o.t. t.zngj	Atten, between HPA and feedhom + 0.0 dB
Total and formation	Attenuation (U005) + 29.8 dB
Test equipment:	
see annex 2: C218, R001, U005	TOTAL CORRECTION: + 30.6 dB
D	II possible
Remark:	Remarks:
	Determination of the 'occupied bandwidth' at fu:
	The measured value is about 76 kHz (delta marker)
	Measurement with 3 kHz resolution filter and noise averaging.
Test result: Determination of the occupied bandwidth	
	[]
	[]
	

© CTC advanced GmbH Page 6 of 42



Plot No. 4 (35)

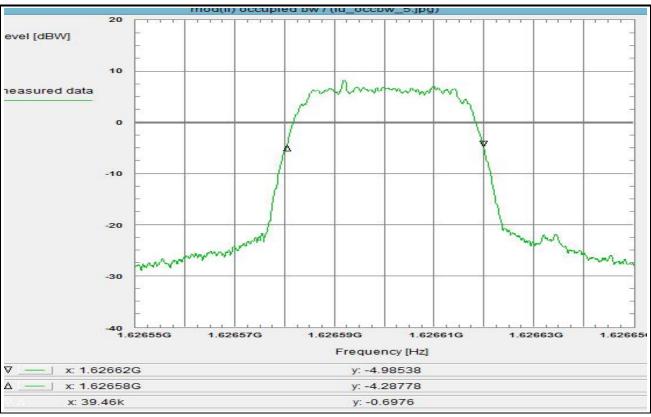


Subclause: -/- Function test Modulated rf-carrier at the lower edge of the band (fl) Determination of the 'occupied bandwidth' Limit:	Environment condition: Date & Time: Wed 08/Nov/2017 11:35:38 Location: CTC advanced GmbH, Laboratory RSC-Sat Temperature: 22 °C Humidity: 55 % Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission. (see §2.1049). This occupied bandwidth corresponds to the -20 dB-bandwidth.	Setup of measurement equipment: Start frequency: 1.62645 GHz Stop frequency: 1.62675 GHz Center frequency: 1.6266 GHz Frequency span: 300 kHz Resolution-BW: 3 kHz
Test results: see plot (an explicit table was not generated)	Input attenuation: 10 dB Trace-Mode: Max-Hold Detector-Mode: Pos Peak
Operating condition of DUT: operating condition 1, see subclause 1.5.2 SBU 405040A, fl, QPSK, 189 kHz Test setup:	Correction: Directional coupler + 0.0 dB Coaxial cable (C218) + 0.8 dB DUT-Antenna (on-axis) + 0.0 dBi Test antenna + 0.0 dB
see section 8.1: 1.2hgj <u>Test equipment:</u> see annex 2: C218, R001, U005	BW correction factor
Remark: Test result: Determination of the occupied bandwidth'	Remarks: Determination of the 'occupied bandwidth' at fu: The measured value is about .170 kHz (delta marker) Measurement with 3 kHz resolution filter and noise averaging.

© CTC advanced GmbH Page 7 of 42



Plot No. 5 (35)



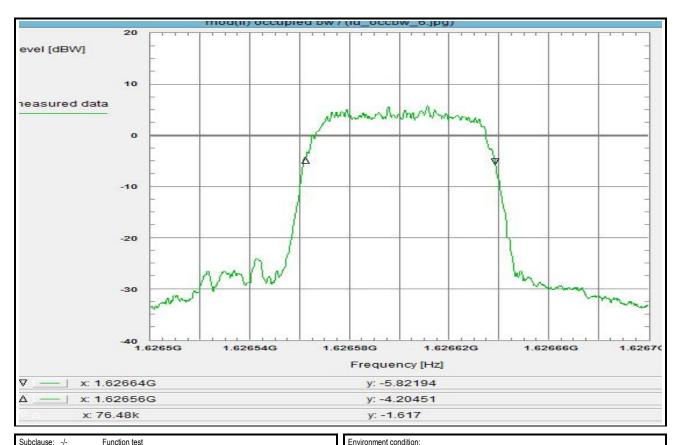
	Function test Modulated rf-carrier at the lower edge of the band (fl) Determination of the 'occupied bandwidth'		
its lower and above its upp each equal to 0.5 % of the (see §2.1049).	hat is the frequency bandwidth such that, below er frequency limits, the mean powers radiated are total mean power radiated by a given emission. orresponds to the -20 dB-bandwidth.		
Test results: see plot (an explicit table w	vas not generated)		
Operating condition of DUT: operating condition 1, see subclause 1.5.2 SBU 405040A, fm, 16QAM, 42 kHz			
Test setup: see section 8.1: 1.2hgj			
Test equipment: see annex 2: C218, R001,	U005		
Remark:			
Test result: Dete	ermination of the occupied bandwidth′		

Environment condition:			
Date & Time:	Wed 08/Nov/201	7 13:2	6:45
Location:	CTC advanced (GmbH,	Laboratory RSC-Sat
Temperature:	22	°C	•
Humidity:	55	%	
Voltage:	230	Vac	
· ·			
Setup of measurement ed	uipment:		
Start frequency:	1.62655	GHz	
Stop frequency:	1.62665	GHz	
Center frequency:	1.6266	GHz	
Frequency span:	100	kHz	
Resolution-BW:	3	kHz	
Video-BW:	10	kHz	
Input attenuation:	5	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	Pos Peak		
Correction:			
Directional coupler	+		dB
Coaxial cable (C218)	+		dB
DUT-Antenna (on-axis)	+	0.0	
Test antenna	+		dB
BW correction factor	+	0.0	dB
Atten. between HPA and	feedhorn +	0.0	
Attenuation (U005)	+		
TOTAL CORRECTION:	+	30.6	dB
Remarks:			
Determination of the 'occ			
The measured value is at			
Measurement with 3 kHz	resolution filter and	a noise	e averaging.
ĺ			

© CTC advanced GmbH Page 8 of 42



Plot No. 6 (35)

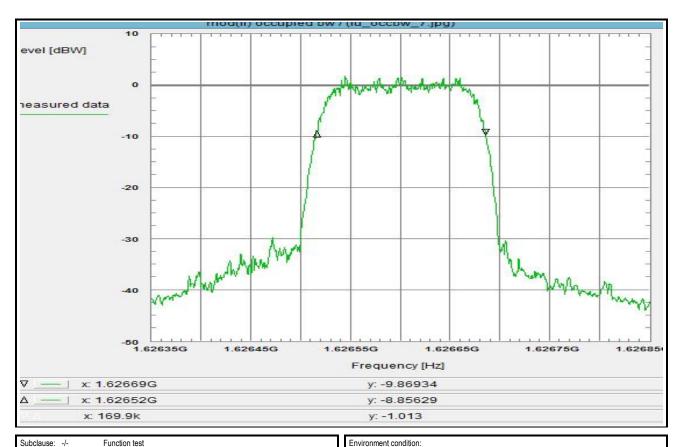


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier at the lower edge of the band (fl)	Date & Time: Wed 08/Nov/2017 14:05:42
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
'	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	200 100
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.6265 GHz
	Stop frequency: 1.6267 GHz
(see §2.1049).	Stop frequency: 1.6267 GHZ
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Stop frequency: 1.6267 GHz Center frequency: 1.6266 GHz Frequency span: 200 kHz Resolution-BW: 3 kHz Video-BW: 10 kHz Input attenuation: 5 dB
	Frequency span: 200 kHz
	Resolution-BW: 3 kHz
	Video-BW: 10 kHz
	Input attenuation: 5 dB
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
,,	
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SBU 405040A, fl. 16QAM, 84 kHz	Directional coupler
300 400040A, II, 10QAIVI, 04 K112	DUT-Antenna (on-axis) + 0.0 dBi
Total color	DUT-Antenna (on-axis) + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hgj	BW correction factor + 0.0 dB
	Atten. between HPA and feedhom + 0.0 dB
Test equipment:	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 30.6 dB
see annex 2: C218, R001, U005	TOTAL CORRECTION: + 30.6 dB
Remark:	Remarks:
	Determination of the 'occupied bandwidth' at fu:
	The measured value is about 76 kHz (delta marker)
	Measurement with 3 kHz resolution filter and noise averaging.
Test results Determination of the accurried handwidth'	model of the total and the tot
Test result: Determination of the occupied bandwidth	

© CTC advanced GmbH Page 9 of 42



Plot No. 7 (35)

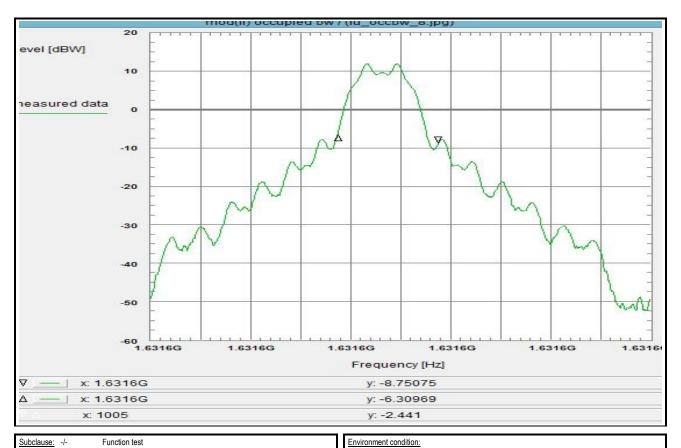


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier at the lower edge of the band (fl)	Date & Time: Wed 08/Nov/2017 14:54:20
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
	Temperature: 22 °C Humidity: 55 %
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.62635 GHz
(see §2.1049).	Stop frequency: 1.62685 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Center frequency: 1.6266 GHz
The coolpies ballaman con coponia to allo 20 ab ballaman.	Frequency span: 500 kHz
	Frequency span: 500 kHz Resolution-BW: 3 kHz Video-BW: 10 kHz Resolution-BW: 10 kHz Resoluti
	Video-BW: 10 kHz
	Input attenuation: 5 dB
Test results:	Input attenuation: 5 dB Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
see plot (all explicit table was not generated)	Detector-wode. Fos Feak
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SBU 405040A, fl, 16QAM, 189 kHz	Coaxial cable (C218) + 0.8 dB
350 403040A, II, 10QAIVI, 103 KTZ	Coaxial cable (C218)
Took ook us	Test antenna + 0.0 dB
Test setup: see section 8.1: 1.2hqj	BW correction factor + 0.0 dB
see section 6.1. 1.2ngj	Atten. between HPA and feedhom + 0.0 dB
Test environment	
Test equipment:	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 30.6 dB
see annex 2: C218, R001, U005	TOTAL CORRECTION: + 30.0 dB
Darrad:	Remarks:
Remark:	
	Determination of the 'occupied bandwidth' at fu: The measured value is about 170 kHz (delta marker)
T	Measurement with 3 kHz resolution filter and noise averaging.
Test result: Determination of the occupied bandwidth'	
	[]
]
	I I

© CTC advanced GmbH Page 10 of 42



Plot No. 8 (35)

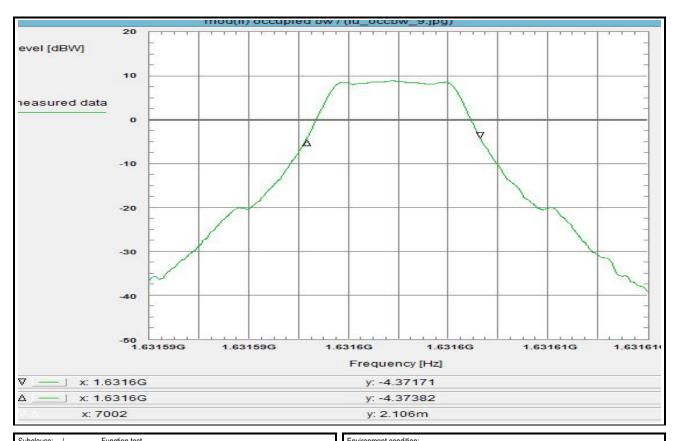


Wed 08/Nov/2017 16:42:04 Modulated rf-carrier at the lower edge of the band (fl) Date & Time: CTC advanced GmbH, Laboratory RSC-Sat Determination of the 'occupied bandwidth' Location: 22 °C 55 % Temperature: Humidity: 230 Vac Voltage: The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to $0.5\,\%$ of the total mean power radiated by a given emission. Setup of measurement equipment:
Start frequency: 1.6315975 Stop frequency: 1.6316025 GHz This occupied bandwidth corresponds to the -20 dB-bandwidth. 1.6316 GHz Center frequency: kHz Frequency span: 100 Resolution-BW: Hz Video-BW: 300 Hz Input attenuation: Max-Hold Test results: Trace-Mode: see plot (an explicit table was not generated) Detector-Mode: Pos Peak Operating condition of DUT: operating condition 1, see subclause 1.5.2 SDU 405035A, C2, fl Correction: Directional coupler 0.0 dB Coaxial cable (C218) DUT-Antenna (on-axis) 0.0 dBi 0.0 dB Test setup: see section 8.1: 1.2hgj Test antenna BW correction factor (100 -> 3k) 0.0 dB 29.8 dB Atten. between HPA and feedhorn Test equipment: see annex 2: C218, R001, U005 Attenuation (U005) TOTAL CORRECTION: Remark: Remarks: Determination of the 'occupied bandwidth' at fu:
The measured value is about 1 kHz (delta marker) Measurement with 100 Hz resolution filter and noise averaging. Test result: Determination of the occupied bandwidth'

© CTC advanced GmbH Page 11 of 42



Plot No. 9 (35)

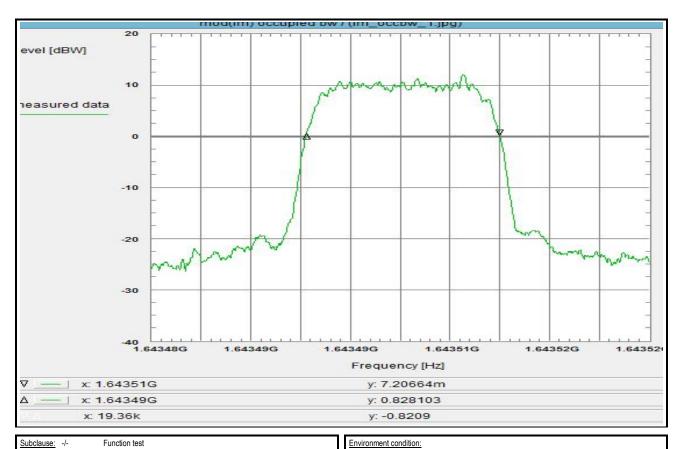


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier at the lower edge of the band (fl)	Date & Time: Wed 08/Nov/2017 16:22:01
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
'	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.63159 GHz
(see §2.1049).	Stop frequency: 1.63161 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Center frequency: 1.6316 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Frequency span: 20 kHz
	Resolution-BW: 1 kHz
	Video-BW: 3 kHz
	Input attenuation: 5 dB
Took assocition	
Test results:	
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
0 6 60	
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SDU 405035A, C1, fl	Coaxial cable (C218) + 0.8 dB DUT-Antenna (on-axis) + 0.0 dBi
	DUT-Antenna (on-axis) + 0.0 dBi
Test setup:	l lest antenna + 0.0 dB
see section 8.1: 1.2hgj	BW correction factor (1k -> 3k) + 4.8 dB
	Atten. between HPA and feedhorn + 0.0 dB
Test equipment:	Attenuation (U005) + 29.8 dB
see annex 2: C218, R001, U005	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 35.4 dB
Remark:	Remarks:
	Determination of the 'occupied bandwidth' at fu:
	The measured value is about 7 kHz (delta marker)
	Measurement with 1 kHz resolution filter and noise averaging.
Test result: Determination of the occupied bandwidth'	

© CTC advanced GmbH Page 12 of 42



Plot No. 10 (35)

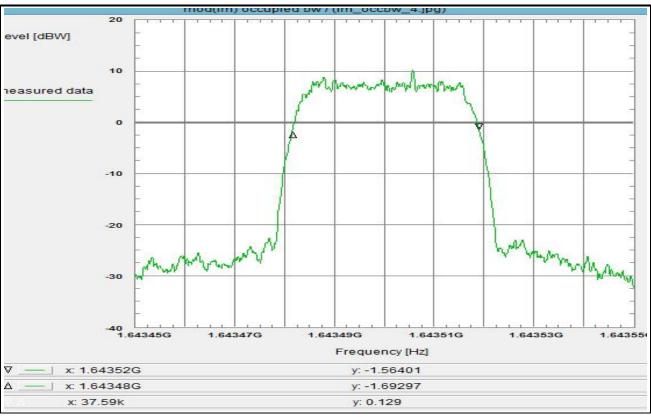


Modulated rf-carrier in the middle of the band (fm) Wed 08/Nov/2017 09:42:17 Date & Time: CTC advanced GmbH, Laboratory RSC-Sat Determination of the 'occupied bandwidth' Location: 22 °C 55 % Temperature: Humidity: 230 Vac Voltage: The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to $0.5\,\%$ of the total mean power radiated by a given emission. Setup of measurement equipment:
Start frequency: 1.643475 Stop frequency: 1.643525 GHz This occupied bandwidth corresponds to the -20 dB-bandwidth. 1.6435 GHz Center frequency: 50 kHz Frequency span: Resolution-BW: kHz Video-BW: kHz 3 15 dB Input attenuation: Max-Hold Test results: Trace-Mode: see plot (an explicit table was not generated) Detector-Mode: Pos Peak Correction: Directional coupler Operating condition of DUT: 0.0 dB operating condition 1, see subclause 1.5.2 SBU 405040A, fm, QPSK, 21 kHz Coaxial cable (C218) DUT-Antenna (on-axis) 0.0 dBi 0.0 Test setup: see section 8.1: 1.2hgj Test antenna dB BW correction factor (1k -> 3k) Atten. between HPA and feedhorn Freefield attenuation (U005) 0.0 dB 29.8 dB Test equipment: see annex 2: C218, R001, U005 TOTAL CORRECTION: Remark: Remarks: Determination of the 'occupied bandwidth' at fm:
The measured value is about 19 kHz (delta marker) Measurement with 3 kHz resolution filter and noise averaging. Test result: Determination of the occupied bandwidth'

© CTC advanced GmbH Page 13 of 42



Plot No. 11 (35)



Environment condition:

Subclause: -/-	Function test Modulated rf-carrier in the middle of the band (fm) Determination of the 'occupied bandwidth'
its lower and above it each equal to 0.5 % ((see §2.1049).	idth, that is the frequency bandwidth such that, below s upper frequency limits, the mean powers radiated are of the total mean power radiated by a given emission. idth corresponds to the -20 dB-bandwidth.
Test results: see plot (an explicit ta	able was not generated)
Operating condition operating condition 1 SBU 405040A, fm, Q	, see subclause 1.5.2
Test setup: see section 8.1: 1.2h	gj
Test equipment: see annex 2: C218, F	R001, U005
Remark:	

Determination of the occupied bandwidth'

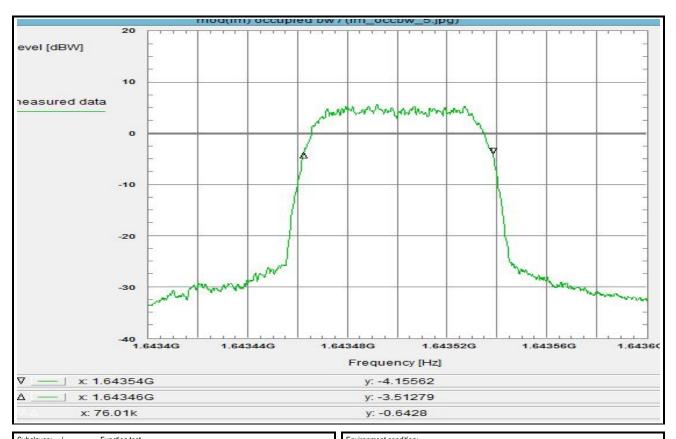
Test result:

Date & Time:	Wed 08/Nov/201	7 10:0	5:36
Location:	CTC advanced (GmbH,	Laboratory RSC-Sat
Temperature:	22	°C	
Humidity:	55	%	
Voltage:	230	Vac	
Setup of measurement eq			
Start frequency:	1.64345	GHz	
Stop frequency:	1.64355		
Center frequency:	1.6435		
Frequency span:	100		
Resolution-BW:	1		
Video-BW:	3	kHz	
Input attenuation:	15	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	Pos Peak		
Correction:			
Directional coupler	+	0.0	dB
Coaxial cable (C218)	+		dB
DUT-Antenna (on-axis)	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor (1k -			dB
Atten. between HPA and f		0.0	
Freefield attenuation (U00	,		
TOTAL CORRECTION:	+	35.4	dB
Remarks:			
Determination of the 'occu			
The measured value is ab			
Measurement with 1 kHz r	esolution filter and	d noise	e averaging.

© CTC advanced GmbH Page 14 of 42



Plot No. 12 (35)

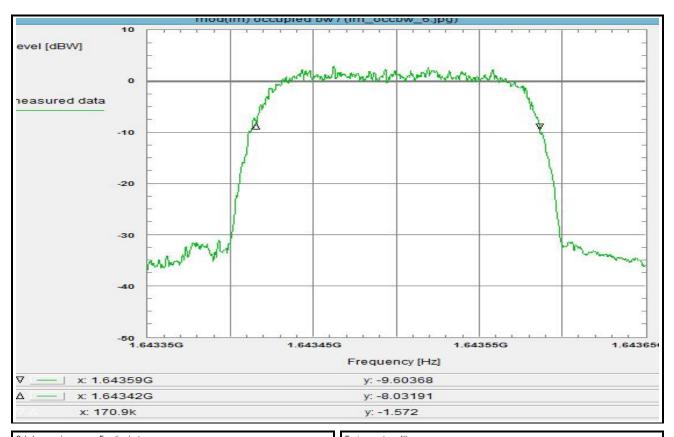


Subclause: -/-	Function test	Environment condition:			
	Modulated rf-carrier in the middle of the band (fm)	Date & Time:	Wed 08/Nov/201	17 10:49:20	
	Determination of the 'occupied bandwidth'	Location:	CTC advanced 0	GmbH, Laboratory RSC-Sa	ıt .
		Temperature:	22		
		Humidity:	55		
Limit:		Voltage:	230		
	h, that is the frequency bandwidth such that, below	Voltage.	230	vac	
	upper frequency limits, the mean powers radiated are	Setup of measurement e	a uia manti		
	the total mean power radiated by a given emission.	Start frequency:	1.6434	CH-	
	ne total mean power radiated by a given emission.				
(see §2.1049).	h	Stop frequency:	1.6436		
This occupied bandwidt	h corresponds to the -20 dB-bandwidth.	Center frequency:	1.6435		
		Frequency span:	200		
		Center frequency: Frequency span: Resolution-BW:	3	kHz	1
		Video-BW:	10	kHz	1
		Input attenuation:		dB	1
Test results:		Trace-Mode:	Max-Hold		
see plot (an explicit tabl	e was not generated)	Detector-Mode:	Pos Peak		
, , ,	• ,				
Operating condition of D	DUT:	Correction:			
operating condition 1, s		Directional coupler	+	0.0 dB	
SBU 405040A, fm, QPS		Directional coupler Coaxial cable (C218) DUT-Antenna (on-axis)	+	0.8 dB	
	, • =	DUT-Antenna (on-axis)	+	0.0 dBi	
Test setup:		Test antenna	+	0.0 dB	
see section 8.1: 1.2hgj		BW correction factor			
000 000tion 0.1. 1.2ngj		Atten, between HPA and		0.0 dB	
Test equipment:		Attenuation (U005)		29.8 dB	
see annex 2: C218, R00	04 11005	TOTAL CORRECTION:	Ţ.	30.6 dB	
See annex 2. 6210, Rui	J1, 0005	TOTAL CORRECTION.	+	30.0 UD	
Damadu.		Damada			
Remark:		Remarks:		.16	
		Determination of the 'oc			
		The measured value is a			
		Measurement with 3 kHz	z resolution filter and	d noise averaging.	
Test result: Do	etermination of the occupied bandwidth'				
	•				
					1
					I
1					

© CTC advanced GmbH Page 15 of 42



Plot No. 13 (35)

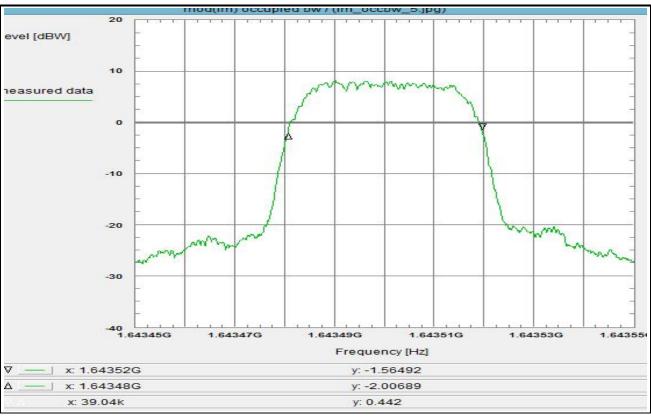


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier in the middle of the band (fm)	Date & Time: Wed 08/Nov/2017 11:26:09
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
· '	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.64335 GHz
(see §2.1049).	Stop frequency: 1.64365 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Center frequency: 1.6435 GHz
The occupied sandman concepting to the 25 as sandman.	Frequency span: 300 kHz
	Frequency span: 300 kHz Resolution-BW: 3 kHz Video-BW: 10 kHz
	Video-BW: 10 kHz
	Input attenuation: 10 dB
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
see plot (all explicit table was not generated)	Detector-widde. 1 031 eak
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SBU 405040A, fm, QPSK, 189 kHz	Coaxial cable (C218) + 0.8 dB
360 403040A, IIII, QF3N, 109 KHZ	Directional coupler
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hqj	BW correction factor + 0.0 dB
see section o. r. r.zrigj	Atten, between HPA and feedhorn + 0.0 dB
Test equipments	
Test equipment: see annex 2: C218, R001, U005	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 30.6 dB
see annex 2: G218, R001, 0005	TOTAL CORRECTION: + 30.0 dB
Domarks	Domarko
Remark:	Remarks:
	Determination of the 'occupied bandwidth' at fm: The measured value is about 170 kHz (delta marker)
T	Measurement with 3 kHz resolution filter and noise averaging.
Test result: Determination of the occupied bandwidth'	

© CTC advanced GmbH Page 16 of 42



Plot No. 14 (35)



Subclause: -/-	Function test Modulated rf-carrier in the middle of the band (fm) Determination of the 'occupied bandwidth'
its lower and above its up each equal to 0.5 % of the (see §2.1049).	that is the frequency bandwidth such that, below per frequency limits, the mean powers radiated are total mean power radiated by a given emission. corresponds to the -20 dB-bandwidth.
Test results: see plot (an explicit table Operating condition of DU operating condition 1, see	<u>л:</u>
SBU 405040A, fm, 16QAl <u>Test setup:</u> see section 8.1: 1.2hgj	M, 42 kHz
Test equipment: see annex 2: C218, R001 Remark:	, U005

Determination of the occupied bandwidth'

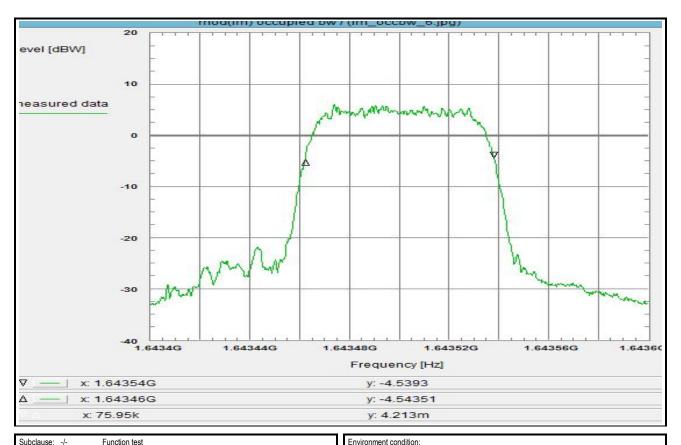
Test result:

Environment condition:			
Date & Time:	Wed 08/Nov/201	7 13:1	7:43
Location:	CTC advanced (GmbH,	Laboratory RSC-Sat
Temperature:	22	°C	•
Humidity:	55	%	
Voltage:	230	Vac	
Setup of measurement ed	uipment:		
Start frequency:	1.64345	GHz	
Stop frequency:	1.64355	GHz	
Center frequency:	1.6435	GHz	
Frequency span:	100	kHz	
Resolution-BW:	3	kHz	
Video-BW:	10		
Input attenuation:	5	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	Pos Peak		
Dotootoi Modo.	1 001 001		
Correction:			
Directional coupler	+	0.0	dB
Coaxial cable (C218)	+		dB
DUT-Antenna (on-axis)	+		
Test antenna	+		dB
BW correction factor	+		dB
Atten, between HPA and			
Attenuation (U005)	+		
TOTAL CORRECTION:	+	30.6	
TOTAL CONNECTION.	-	30.0	ub
Remarks:			
Determination of the 'occ	unied handwidth'	at fm:	
The measured value is at			r)
Measurement with 3 kHz			
Wicasarchiont with 5 Kinz	resolution inter am	u Holoc	averaging.
ĺ			
ĺ			
ĺ			
ĺ			

© CTC advanced GmbH Page 17 of 42



Plot No. 15 (35)

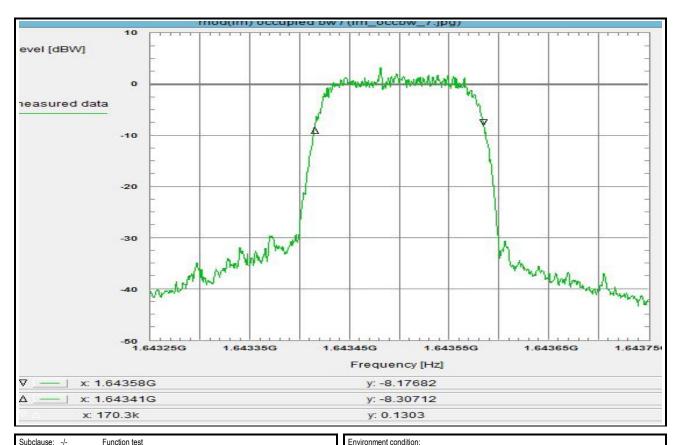


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier in the middle of the band (fm)	Date & Time: Wed 08/Nov/2017 13:52:28
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
·	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.6434 GHz
(see §2.1049).	Stop frequency: 1.6436 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Stop frequency: 1.6436 GHz Center frequency: 1.6435 GHz Frequency span: 200 kHz Resolution-BW: 3 kHz Video-BW: 10 kHz Input attenuation: 5 dB
·	Frequency span: 200 kHz
	Resolution-BW: 3 kHz
	Video-BW: 10 kHz
	Input attenuation: 5 dB
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
,,,	
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler
SBU 405040A, fm, 16QAM, 84 kHz	Coaxial cable (C218) + 0.8 dB
	DUT-Antenna (on-axis) + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hgj	BW correction factor + 0.0 dB
3,	Atten, between HPA and feedhom + 0.0 dB
Test equipment:	
see annex 2: C218, R001, U005	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 30.6 dB
	10 1/2 00 1 1 2 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1
Remark:	Remarks:
	Determination of the 'occupied bandwidth' at fm:
	The measured value is about 76 kHz (delta marker)
	Measurement with 3 kHz resolution filter and noise averaging.
Test result: Determination of the occupied bandwidth	
Determination of the occupied bandwidth	

© CTC advanced GmbH Page 18 of 42



Plot No. 16 (35)

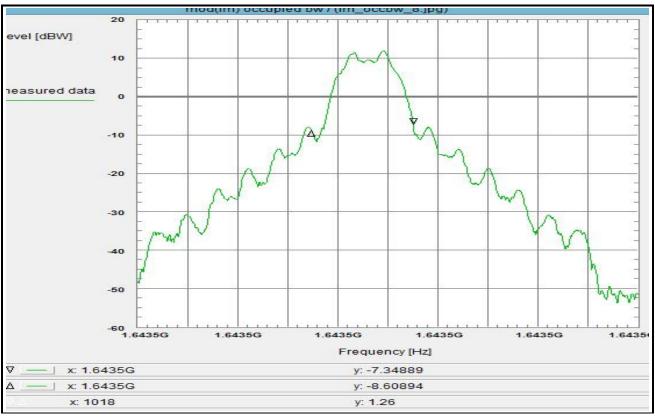


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier in the middle of the band (fm)	Date & Time: Wed 08/Nov/2017 14:49:51
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
·	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	·
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.64325 GHz
(see §2.1049).	Stop frequency: 1.64375 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Center frequency: 1.6435 GHz
' '	Frequency span: 500 kHz
	Resolution-BW: 3 kHz
	Video-BW: 10 kHz
	Stop frequency:
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
··· · · · · · · · · · · · · · · · · ·	
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SBU 405040A, fm, 16QAM, 189 kHz	Directional coupler
, , ,	DUT-Antenna (on-axis) + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hqi	BW correction factor + 0.0 dB
3,	Atten, between HPA and feedhorn + 0.0 dB
Test equipment:	Attenuation (U005) + 29.8 dB
see annex 2: C218, R001, U005	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 30.6 dB
555 dillion 21 52 10; 1165 1; 5555	70 1/2 00 1/1 20 1/0 1/1 00 1/2 00 1/
Remark:	Remarks:
	Determination of the 'occupied bandwidth' at fm:
	The measured value is about 170 kHz (delta marker)
	Measurement with 3 kHz resolution filter and noise averaging.
Test result: Determination of the occupied bandwidth'	
Determination of the occupied bandwidth	

© CTC advanced GmbH Page 19 of 42



Plot No. 17 (35)



Subclause: -/
Function test
Modulated rf-carrier in the middle of the band (fm)
Determination of the 'occupied bandwidth'

Limit:
The occupied bandwidth, that is the frequency bandwidth such that, below
its lower and above its upper frequency limits, the mean powers radiated are
each equal to 0.5 % of the total mean power radiated by a given emission.
(see §2.1049).
This occupied bandwidth corresponds to the -20 dB-bandwidth.

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

Operating condition of DUT:
operating condition 1, see subclause 1.5.2
SDU 405035A, RT, fm

Test setup:
see section 8.1: 1.2hgj

Test equipment:
see annex 2: C218, R001, U005

Remark:

Determination of the occupied bandwidth'

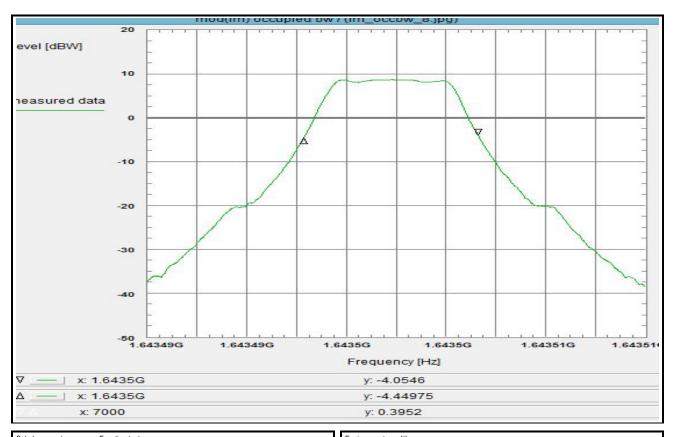
Test result:

Environment condition: Wed 08/Nov/2017 15:42:43 Date & Time: CTC advanced GmbH, Laboratory RSC-Sat Location: 22 °C 55 % Temperature: Humidity: 230 Vac Voltage: Setup of measurement equipment:
Start frequency: 1.6434975 Stop frequency: 1.6435025 GHz 1.6435 GHz Center frequency: kHz Frequency span: 100 Resolution-BW: Hz Video-BW: 300 Hz dB Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB Coaxial cable (C218) DUT-Antenna (on-axis) 0.0 dBi 0.0 dB Test antenna BW correction factor (100 -> 3k) 0.0 dB 29.8 dB Atten. between HPA and feedhorn Attenuation (U005) TOTAL CORRECTION: Remarks: Determination of the 'occupied bandwidth' at fm:
The measured value is about 1 kHz (delta marker) Measurement with 100 Hz resolution filter and noise averaging.

© CTC advanced GmbH Page 20 of 42



Plot No. 18 (35)

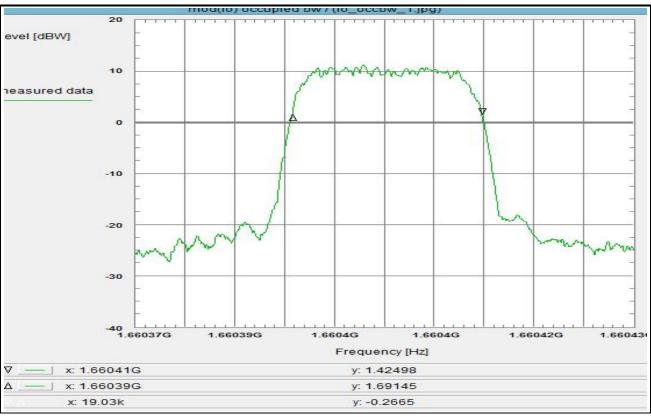


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier in the middle of the band (fm)	Date & Time: Wed 08/Nov/2017 15:15:47
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1 6/3/10 CHz
(see §2.1049).	Stop frequency: 1.64351 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Stop frequency:
	Frequency span: 20 kHz
	Resolution-BW: 1 kHz
	Video-BW: 3 kHz
	Input attenuation: 5 dB
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
see plot (all explicit table was not generated)	Detector-mode.
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SDU 405035A, C1, fm	Directional coupler
000 4000000, 01, 1111	DUT-Antenna (on-axis) + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hqj	BW correction factor (1k -> 3k) + 4.8 dB
see section o.r. r.zngj	Atten, between HPA and feedhom + 0.0 dB
Test equipment:	
see annex 2: C218, R001, U005	Attenuation (U005)
See annex 2. G216, R001, 0005	TOTAL CORRECTION. + 35.4 db
Remark:	Remarks:
Nellaik.	Determination of the 'occupied bandwidth' at fm:
	The measured value is about 7 kHz (delta marker)
	Measurement with 3 kHz resolution filter and noise averaging.
Test week to Determine the extreme to the extreme t	Weasurement with 3 km2 resolution litter and hoise averaging.
Test result: Determination of the occupied bandwidth'	

© CTC advanced GmbH Page 21 of 42



Plot No. 19 (35)



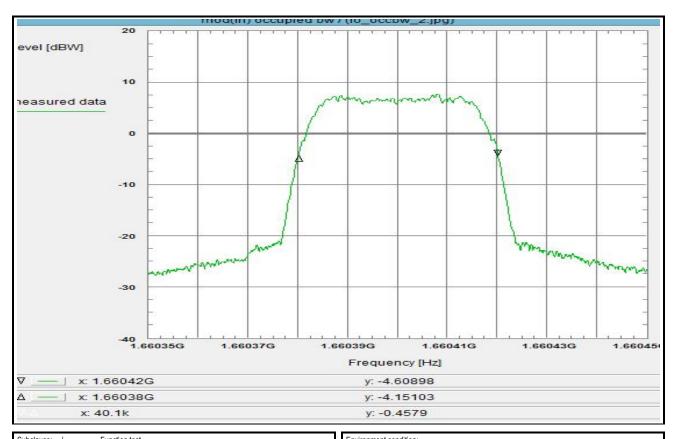
Subclause: -/-Modulated rf-carrier at the upper edge of the band (fo) Determination of the 'occupied bandwidth' Limit: The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to $0.5\,\%$ of the total mean power radiated by a given emission. This occupied bandwidth corresponds to the -20 dB-bandwidth. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see subclause 1.5.2 SBU 405040A, fh, QPSK, 21 kHz Test setup: see section 8.1: 1.2hgj Test equipment: see annex 2: C218, R001, U005 Remark: Test result: Determination of the occupied bandwidth'

Environment condition: Wed 08/Nov/2017 09:58:43 Date & Time: CTC advanced GmbH, Laboratory RSC-Sat Location: 22 °C 55 % Temperature: Humidity: 230 Vac Voltage: Setup of measurement equipment:
Start frequency: 1.660375 1.660425 1.6604 Stop frequency: GHz GHz Center frequency: 50 kHz Frequency span: Resolution-BW: kHz Video-BW: kHz 3 15 dB Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB Coaxial cable (C218) DUT-Antenna (on-axis) 0.0 dBi 0.0 Test antenna dB BW correction factor (1k -> 3k) Atten. between HPA and feedhorn Freefield attenuation (U005) 0.0 dB 29.8 dB TOTAL CORRECTION: Remarks: Determination of the 'occupied bandwidth' at fo:
The measured value is about 19 kHz (delta marker) Measurement with 3 kHz resolution filter and noise averaging.

© CTC advanced GmbH Page 22 of 42



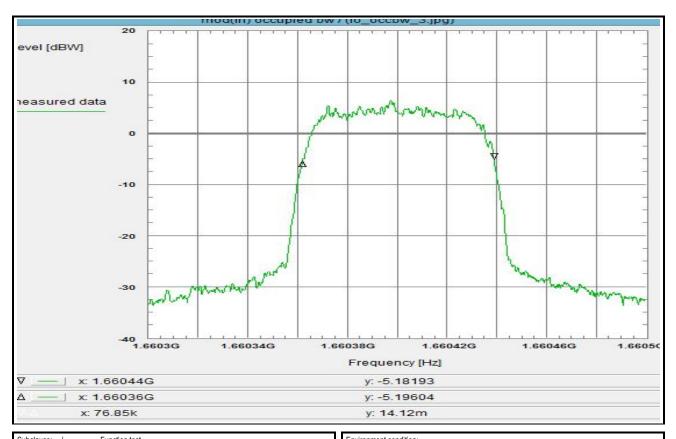
Plot No. 20 (35)



© CTC advanced GmbH Page 23 of 42



Plot No. 21 (35)

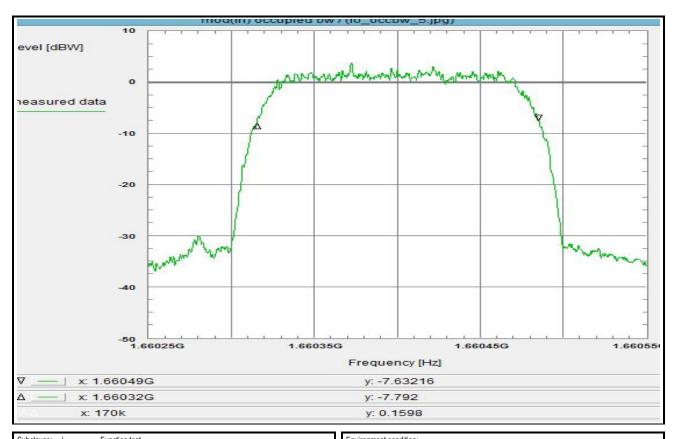


Subclause: -/-	Function test	Environment condition:			
	Modulated rf-carrier at the upper edge of the band (fh)	Date & Time:	Wed 08/Nov/201	7 11:17:53	
	Determination of the 'occupied bandwidth'	Location:	CTC advanced (GmbH, Laboratory RSC-Sat	
		Temperature:	22		
		Humidity:	55	%	
Limit:		Voltage:	230		
	dth, that is the frequency bandwidth such that, below				
	s upper frequency limits, the mean powers radiated are	Setup of measurement e	equipment:		
	f the total mean power radiated by a given emission.	Start frequency:	1.6603	GHz	
(see §2.1049).	, , ,	Stop frequency:	1.6605	GHz	
	dth corresponds to the -20 dB-bandwidth.	Center frequency: Frequency span: Resolution-BW: Video-BW:	1.6604		
		Frequency span:	200		
		Resolution-BW:	3	kHz	
		Video-BW:	10	kHz	
1		Input attenuation:	10		
Test results:		Trace-Mode:	Max-Hold		
	ble was not generated)	Detector-Mode:	Pos Peak		
p (p					
Operating condition of	fDUT:	Correction:			
operating condition 1,		Directional coupler	+	0.0 dB	
SBU 405040A, fh, QP		Directional coupler Coaxial cable (C218) DUT-Antenna (on-axis) Test antenna	+	0.8 dB	
		DUT-Antenna (on-axis)	+	0.0 dBi	
Test setup:		Test antenna	+	0.0 dB	
see section 8.1: 1.2hg	i	BW correction factor	+	0.0 dB	
3	u	Atten, between HPA and	d feedhorn +	0.0 dB	
Test equipment:		Attenuation (U005)	+	29.8 dB	
see annex 2: C218, R	001. U005	TOTAL CORRECTION:	+	30.6 dB	
	,				
Remark:		Remarks:			
		Determination of the 'occ	cupied bandwidth'	at fo:	
		The measured value is a	about 76 kHz (delta	marker)	
		Measurement with 3 kHz	z resolution filter an	d noise averaging.	
Test result: [Determination of the occupied bandwidth'			0 0	
	solonimation of the occupied buildmidth				
1					
1					
1					
ĺ					
		I			

© CTC advanced GmbH Page 24 of 42



Plot No. 22 (35)

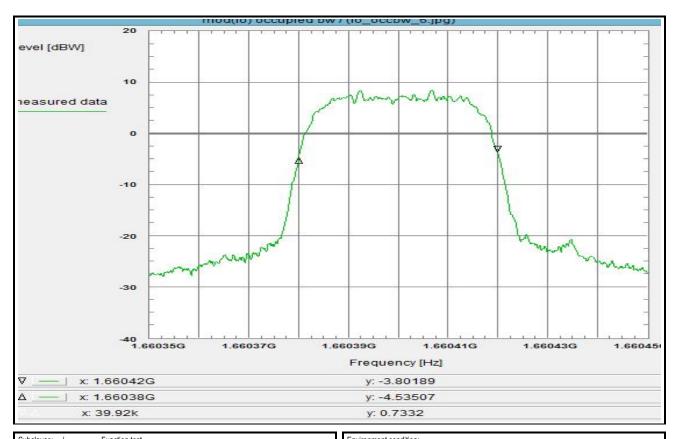


Subclause: -/-	Function test	Environment condition:			
	Modulated rf-carrier at the upper edge of the band (fh)	Date & Time:	Wed 08/Nov/201	7 12:03:09	
	Determination of the 'occupied bandwidth'	Location:	CTC advanced 0	GmbH, Laboratory RSC-Sat	
		Temperature:	22		
		Humidity:	55		
Limit:		Voltage:	230		
	Ith, that is the frequency bandwidth such that, below	Tollago.	200	140	
	upper frequency limits, the mean powers radiated are	Setup of measurement e	auinment:		
	f the total mean power radiated by a given emission.	Start frequency:	1.66025	GH ₇	
(see §2.1049).	The total mount power radiated by a given emission.	Stop frequency:	1.66055		
	dth corresponds to the -20 dB-bandwidth.	Center frequency:	1.6604		
This occupied bandwid	dui corresponds to tile -20 db-bandwidth.	Eroguenov coon:	300		
		Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode:	300	kHz	
		Video DW:	J 10	kHz	
		Video-BVV:	10		
		input attenuation:	. 10	ав	
Test results:		Trace-Mode:	Max-Hold		
see plot (an explicit tal	ole was not generated)	Detector-Mode:	Pos Peak		
Operating condition of	DUT	Correction:			
operating condition 1,		Directional coupler	+	0.0 dB	
SBU 405040A, fh, QP		Cooxiol coble (C219)		0.8 dB	
300 403040A, III, QF	3N, 109 N12	Coaxial cable (C218) DUT-Antenna (on-axis)		0.0 dBi	
Tastastin.		Tool antenna (on-axis)	+		
Test setup:		Test antenna BW correction factor		0.0 dB	
see section 8.1: 1.2hg				0.0 dB	
		Atten. between HPA and		0.0 dB	
Test equipment:		Attenuation (U005) TOTAL CORRECTION:	+	29.8 dB	
see annex 2: C218, R	J01, U005	TOTAL CORRECTION:	+	30.6 dB	
Remark:		Remarks:			
rtomant.		Determination of the 'occ	runied handwidth' a	at fo:	
		The measured value is al			
		Measurement with 3 kHz			
Took vooult: F	Determination of the occupied bandwidth	Weasurement with 5 kinz	. resolution liiter and	u noise averaging.	
Test result:	retermination of the occupied bandwidth				
Ĩ					

© CTC advanced GmbH Page 25 of 42



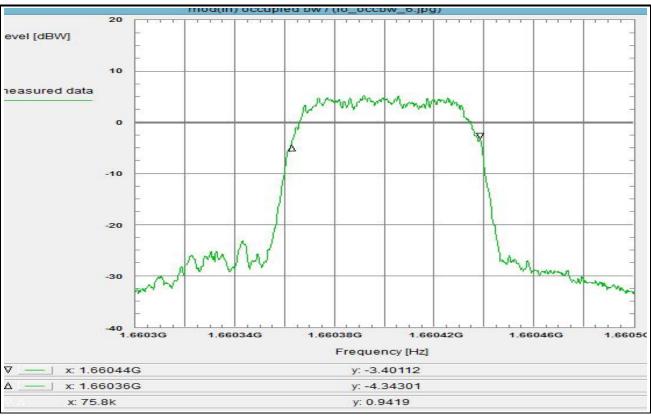
Plot No. 23 (35)



© CTC advanced GmbH Page 26 of 42



Plot No. 24 (35)



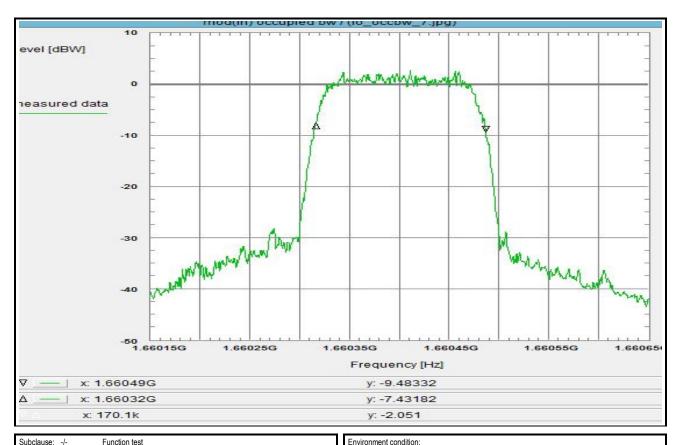
Subclause: -/-	Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth'
its lower and above its up each equal to 0.5 % of th (see §2.1049).	that is the frequency bandwidth such that, below oper frequency limits, the mean powers radiated are e total mean power radiated by a given emission. corresponds to the -20 dB-bandwidth.
Test results: see plot (an explicit table	was not generated)
Operating condition of DU operating condition 1, see SBU 405040A, fh, 16QAI	e subclause 1.5.2
Test setup: see section 8.1: 1.2hgj	
Test equipment: see annex 2: C218, R001	1, U005
Remark:	
Test result: Det	termination of the occupied bandwidth´

Environment condition:			
Date & Time:	Wed 08/Nov/201	7 14:0	08:11
Location:	CTC advanced (GmbH,	Laboratory RSC-Sat
Temperature:	22	°C	,
Humidity:	55	%	
Voltage:	230	Vac	
3 .			
Setup of measurement ed	quipment:		
Start frequency:	1.6603	GHz	
Stop frequency:	1.6605	GHz	
Center frequency:	1.6604	GHz	
Frequency span:	200	kHz	
Resolution-BW:	3	kHz	
Video-BW:	10	kHz	
Input attenuation:	5	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	Pos Peak		
Correction:			
Directional coupler	+	0.0	dB
Coaxial cable (C218)	+	8.0	dB
DUT-Antenna (on-axis)	+	0.0	dBi
Test antenna	+	0.0	dB
BW correction factor	+	0.0	dB
Atten. between HPA and	feedhorn +	0.0	dB
Attenuation (U005)	+	29.8	dB
TOTAL CORRECTION:	+	30.6	dB
Remarks:			
Determination of the 'occ			
The measured value is at			
Measurement with 3 kHz	resolution filter and	d noise	e averaging.

© CTC advanced GmbH Page 27 of 42



Plot No. 25 (35)

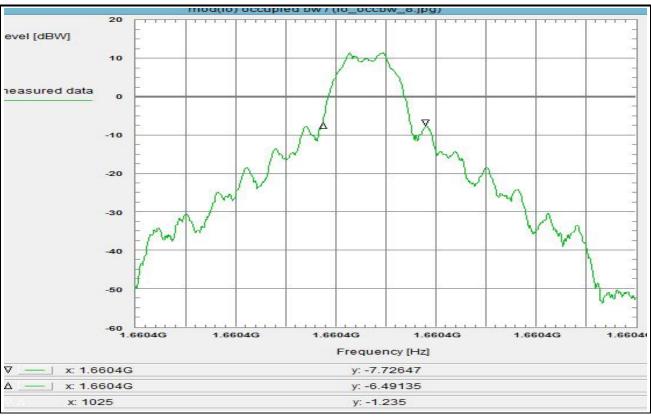


Subclause: -/- Function test	Environment condition:
Modulated rf-carrier at the upper edge of the band (fh)	Date & Time: Wed 08/Nov/2017 15:02:58
Determination of the 'occupied bandwidth'	Location: CTC advanced GmbH, Laboratory RSC-Sat
· '	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
The occupied bandwidth, that is the frequency bandwidth such that, below	
its lower and above its upper frequency limits, the mean powers radiated are	Setup of measurement equipment:
each equal to 0.5 % of the total mean power radiated by a given emission.	Start frequency: 1.66015 GHz
(see §2.1049).	Stop frequency: 1.66065 GHz
This occupied bandwidth corresponds to the -20 dB-bandwidth.	Center frequency: 1.6604 GHz
This occupied bandwidth corresponds to the -20 db-bandwidth.	Frequency span: 500 kHz
	Frequency span: 500 kHz Resolution-BW: 3 kHz Video-BW: 10 kHz
	Resolution-Bw: 3 kHz
	Video-BW: 10 kHz
	Input attenuation: 5 dB
Test results:	Trace-Mode: Max-Hold
see plot (an explicit table was not generated)	Detector-Mode: Pos Peak
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler + 0.0 dB
SBU 405040A, fh, 16QAM, 189 kHz	Coaxial cable (C218) + 0.8 dB DUT-Antenna (on-axis) + 0.0 dBi
	DUT-Antenna (on-axis) + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hqj	BW correction factor + 0.0 dB
3,	Atten, between HPA and feedhom + 0.0 dB
Test equipment:	
see annex 2: C218, R001, U005	Attenuation (U005) + 29.8 dB TOTAL CORRECTION: + 30.6 dB
000 unitox 2. 0210, 1001, 0000	TOTAL CONNECTION.
Remark:	Remarks:
Neman.	Determination of the 'occupied bandwidth' at fo:
	The measured value is about 170 kHz (delta marker)
	Measurement with 3 kHz resolution filter and noise averaging.
Test would be between the control of	weasurement with 5 kHz resolution liner and holse averaging.
Test result: Determination of the occupied bandwidth'	

© CTC advanced GmbH Page 28 of 42



Plot No. 26 (35)



Environment condition:

Subclause: -/-Modulated rf-carrier at the upper edge of the band (fo) Determination of the 'occupied bandwidth' The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to $0.5\,\%$ of the total mean power radiated by a given emission. This occupied bandwidth corresponds to the -20 dB-bandwidth. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see subclause 1.5.2 SDU 405035A, RT, fh Test setup: see section 8.1: 1.2hgj Test equipment: see annex 2: C218, R001, U005 Remark:

Determination of the occupied bandwidth'

Test result:

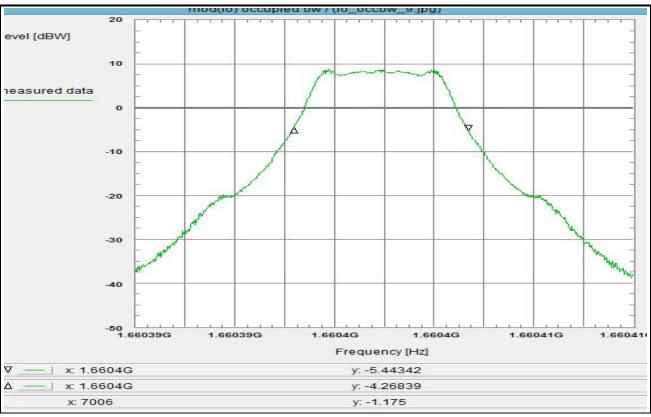
Date & Time: CTC advanced GmbH, Laboratory RSC-Sat Location: 22 °C 55 % Temperature: Humidity: 230 Vac Voltage: Setup of measurement equipment:
Start frequency: 1.6603975 1.6604025 1.6604 Stop frequency: GHz GHz Center frequency: kHz Frequency span: 100 Resolution-BW: Hz Video-BW: 300 Hz dB Input attenuation: Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C218) 0.0 dBi 0.0 dB DUT-Antenna (on-axis) Test antenna BW correction factor (100 -> 3k) 0.0 dB 29.8 dB Atten. between HPA and feedhorn Attenuation (U005) TOTAL CORRECTION: Remarks: <u>Determination of the 'occupied bandwidth' at fo:</u>
The measured value is about 1 kHz (delta marker) Measurement with 100 Hz resolution filter and noise averaging.

Wed 08/Nov/2017 16:12:29

© CTC advanced GmbH Page 29 of 42



Plot No. 27 (35)



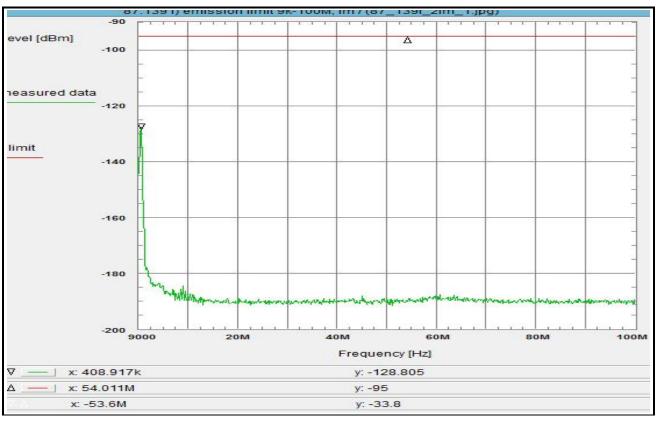
Subclause: -/-	Function test Modulated rf-carrier at the upper edge of the band (fo) Determination of the 'occupied bandwidth'
its lower and above its up each equal to 0.5 % of the (see §2.1049).	that is the frequency bandwidth such that, below per frequency limits, the mean powers radiated are e total mean power radiated by a given emission. corresponds to the -20 dB-bandwidth.
Test results: see plot (an explicit table	was not generated)
Operating condition of DU operating condition 1, see SDU 405035A, C1, fh	
Test setup: see section 8.1: 1.2hgl	
Test equipment: see annex 2: C218, R001	, U005
Remark:	
Test result: Det	ermination of the occupied bandwidth

Environment condition:			
Date & Time:	Thu 09/Nov/2017	7 15:00	0:52
Location:	CTC advanced GmbH, Laboratory RSC-Sat		
Temperature:	22	°C	
Humidity:	55	%	
Voltage:	230	Vac	
Setup of measurement ed			
Start frequency:	1.66039		
Stop frequency:	1.66041		
Center frequency:	1.6604		
Frequency span:	20		
Resolution-BW:	1		
Video-BW:	3		
Input attenuation:	5	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	Pos Peak		
0			
Correction: Directional coupler	+	0.0	dB
Coaxial cable (C218)	+		
DUT-Antenna (on-axis)			
Test antenna	+		
BW correction factor (1k -			
Atten. between HPA and		- :	
(U005)	+		
TOTAL CORRECTION:	+		
101112 00111120110111		00	45
Remarks:			
Determination of the 'occ	upied bandwidth'	at fo:	
The measured value is at			
Measurement with 1 kHz	resolution filter and	d noise	e averaging.

© CTC advanced GmbH Page 30 of 42



Plot No. 28 (35)

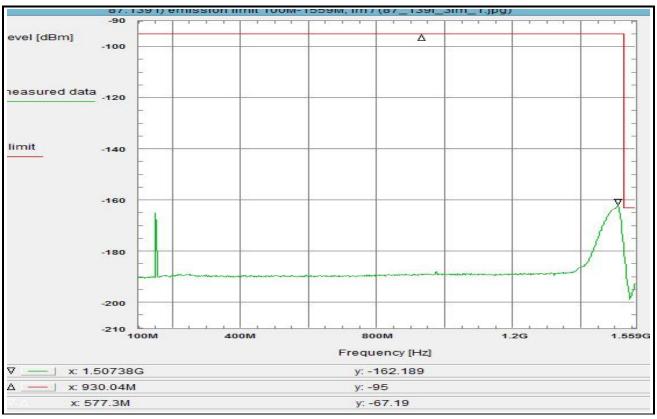


Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 87.139(i)(1) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).	Environment condition: Date & Time: Thu 09/Nov/2017 11:58:26 Location: CTC advanced GmbH, Laboratory RSC-Sat Temperature: 22 °C Humidity: 55 % Voltage: 230 Vac Setup of measurement equipment: Start frequency: Stop frequency: 100 MHz Center frequency: 50.0045 MHz
Test results: see plot (an explicit table was not generated)	Section Review Section Secti
Operating condition of DUT: operating condition 1, see subclause 1.5.2 A700, All modems active Test setup: see section 8.1: 1.2hgl Test equipment: see annex 2: C218, FCOB, R001, WDLN	Correction: Directional coupler (WDLN) - 80.0 dB Coaxial cable (C218) + 0.2 dB DUT-Antenna + 0.0 dBi Test antenna + 0.0 dB BW correction factor (3k -> 4k) + 1.2 dB Atten. between HPA and feedhorn - 0.0 dB Notch Filter & 10 dB Att (FCOB) + 8.6 dB TOTAL CORRECTION: - -70.0 dB
Remark: Test result: Test passed	Remarks: Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: 'worst-case' = maximum antenna gain Marker shows the zero line of the Spectrum Analyzer

© CTC advanced GmbH Page 31 of 42



Plot No. 29 (35)

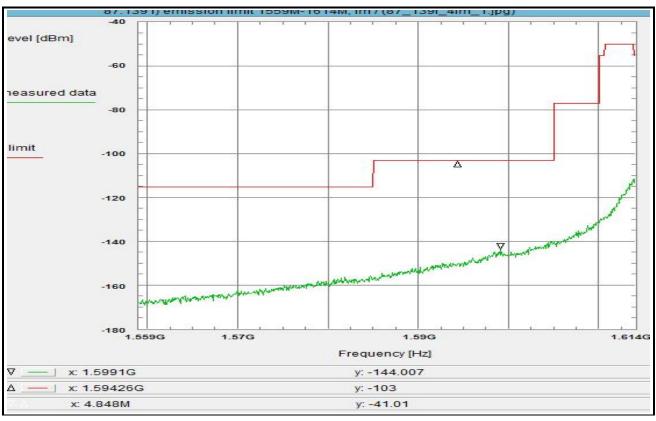


Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations	Environment condition:
Emission limitations	Date & Time: Thu 09/Nov/2017 12:02:45
Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
` '	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
Limit according to 87.139(i)(1)	,
The mean power of emissions shall be attenuated	Setup of measurement equipment:
below the mean output power of the transmitter	Start frequency: 100 MHz
in accordance with 87.139(i)(1).	Stop frequency: 1.559 GHz
11 45551341155 Hitti 51 1155(1)(1).	Center frequency: 829.5 MHz
	Frequency span: 1.459 GHz
	Resolution-BW: 3 kHz
	Video-BW: 30 kHz
	Input attenuation: 0 dB
Test results:	Stop frequency:
see plot (an explicit table was not generated)	Detector-Mode: RMS
see plot (an explicit table was not generated)	Detector-wode: RMS
O	0
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler (WDLN)
A700, All modems active	Coaxial cable (C218) + 0.6 dB
	DUT-Antenna + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hgl	BW correction factor (3k -> 4k) + 1.2 dB
	Atten. between HPA and feedhom - 0.0 dB
Test equipment:	(FCOB) + 8.8 dB
see annex 2: C218, FCOB, R001, WDLN	TOTAL CORRECTION:91.6 dB
Remark:	Remarks:
	Carrier-on state / Carrier in the middle of the band (fm)
	For EIRP calculation:
	'worst-case' = maximum antenna gain
Test result: Test passed	
·	

© CTC advanced GmbH Page 32 of 42



Plot No. 30 (35)

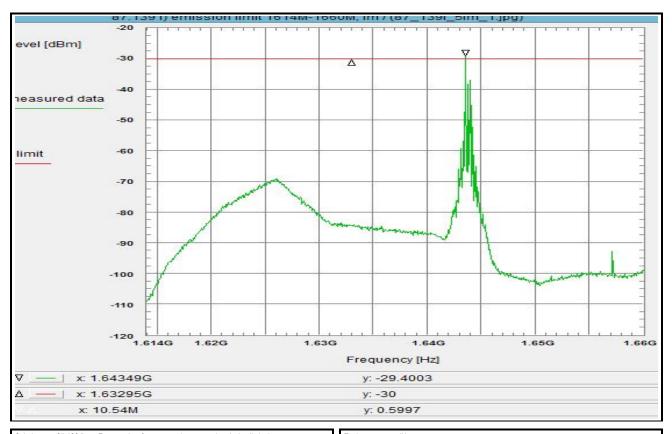


Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations	Environment condition:
Emission limitations	Date & Time: Thu 09/Nov/2017 12:04:03
Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
modulated if edition in all middle of the balls (iii)	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
Limit according to 87.139(i)(1)	voltago.
The mean power of emissions shall be attenuated	Setup of measurement equipment:
below the mean output power of the transmitter	Start frequency: 1 559 GHz
in accordance with 87.139(i)(1).	Stop frequency: 1.614 GHz
	Center frequency: 1.5865 GHz
	Frequency span: 55 MHz
	Resolution-BW: 3 kHz
	Video-BW: 30 kHz
	Stop frequency: 1.614 GHz Center frequency: 1.5865 GHz Frequency span: 55 MHz Resolution-BW: 3 kHz Video-BW: 30 kHz Input attenuation: 0 dB Trace-Mode: Clear Write
Test results:	Trace-Mode: Clear Write
see plot (an explicit table was not generated)	Detector-Mode: RMS
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler (WDLN)
A700. All modems active	Coaxial cable (C218) + 0.8 dB
· ·	DUT-Antenna + 0.0 dBi
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hql	BW correction factor (3k -> 1M) + 25.2 dB
·	Atten. between HPA and feedhom - 0.0 dB
Test equipment:	(FCOB) + 14.6 dB
see annex 2: C218, FCOB, R001, WDLN	TOTAL CORRECTION:36.4 dB
Remark:	Remarks:
	Carrier-on state / Carrier in the middle of the band (fm)
	For EIRP calculation:
	'worst-case' = maximum antenna gain
Test result: Test passed	

© CTC advanced GmbH Page 33 of 42



Plot No. 31 (35)

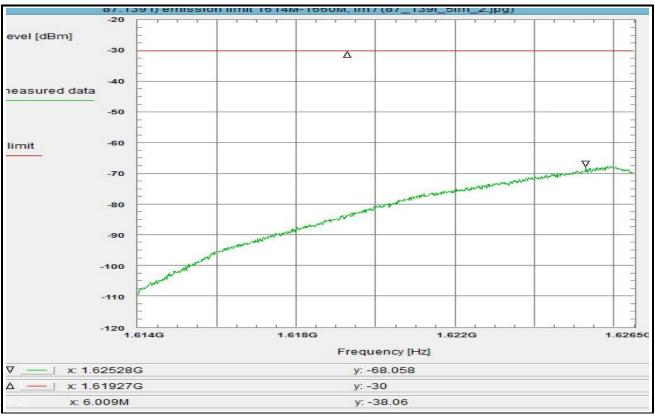


Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations	Environment condition:
Emission limitations	Date & Time: Thu 09/Nov/2017 13:09:33
Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
Limit according to 87.139(i)(1)	
The mean power of emissions shall be attenuated	Setup of measurement equipment:
below the mean output power of the transmitter	Start frequency: 1.614 GHz
in accordance with 87.139(i)(1).	Stop frequency: 1.66 GHz
	Center frequency: 1.637 GHz
	Frequency span: 46 MHz
	Resolution-BW: 3 kHz
	Video-BW: 10 kHz
	Input attenuation: 25 dB
Test results:	Trace-Mode: Clear Write
see plot (an explicit table was not generated)	Detector-Mode: AVG
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler (WDLN) - 16.3 dB
A700, All modems active	Coaxial cable (C218) + 0.8 dB DUT-Antenna + 0.0 dBi Test antenna + 0.0 dB
	DUT-Antenna + 0.0 dBi
Test setup:	
see section 8.1: 1.2hgl	BW correction factor (3k -> 4k) + 1.2 dB
	Atten. between HPA and feedhorn - 0.0 dB
Test equipment:	(FCOB) + 58.3 dB
see annex 2: C218, FCOB, R001, WDLN	TOTAL CORRECTION: + 44.0 dB
Remark:	Remarks:
	Carrier-on state / Carrier in the middle of the band (fm)
	For EIRP calculation:
	'worst-case' = maximum antenna gain
Test result: Test passed (Wanted signal)	

© CTC advanced GmbH Page 34 of 42



Plot No. 32 (35)

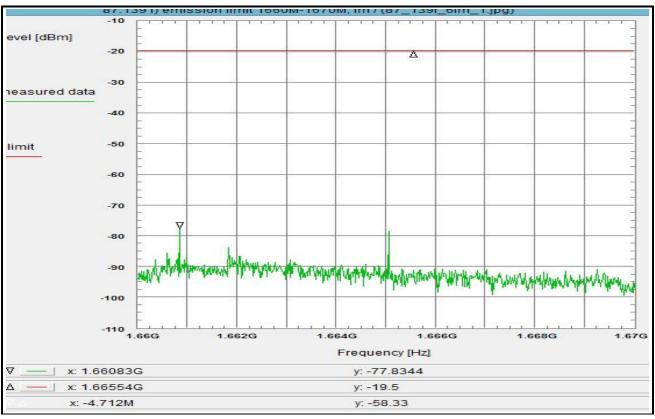


Subclause: 87.139 i)	Frequencies, frequency tolerance and emission limitations	Environment condition:
	Emission limitations	Date & Time: Thu 09/Nov/2017 13:11:36
	Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
		Temperature: 22 °C
		Humidity: 55 %
Limit:		Voltage: 230 Vac
Limit according to 87.139	9(i)(1)	· · · · · · · · · · · · · · · · · ·
	ssions shall be attenuated	Setup of measurement equipment:
below the mean output p		Start frequency: 1 614 GHz
in accordance with 87.13		Cton francisco 4 6005 OH-
40001441100 11141 01 110		Center frequency: 1.62025 GHz
		Frequency span: 12.5 MHz
		Resolution-BW: 3 kHz
		Video-BW: 10 kHz
		Input attenuation: 25 dB
Test results:		Stop frequency:
		Detector-Mode: RMS
see plot (an explicit table	e was not generated)	Detector-wode: RWS
O	LIT.	Commentions
Operating condition of D operating condition 1, se		Correction: Directional coupler (WDLN) - 20.2 dB
		Directional coupler (WDLN) - 20.2 dB
A700, All modems active)	Directional coupler (WDLN)
		DUT-Antenna + 0.0 dBi
Test setup:		Test antenna + 0.0 dB
see section 8.1: 1.2hgl		BW correction factor (3k -> 4k) + 1.2 dB
		Atten. between HPA and feedhom - 0.0 dB
Test equipment:		(FCOB) + 75.4 dB
see annex 2: C218, FCC	DB, R001, WDLN	TOTAL CORRECTION: + 57.2 dB
Remark:		Remarks:
		Carrier-on state / Carrier in the middle of the band (fm)
		For EIRP calculation:
		'worst-case' = maximum antenna gain
Test result: Te	st passed	

© CTC advanced GmbH Page 35 of 42



Plot No. 33 (35)

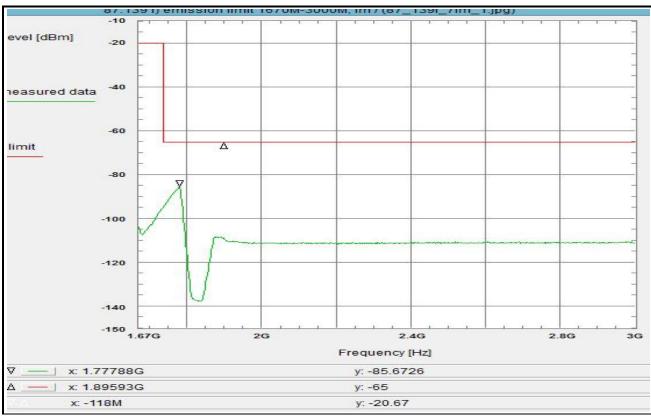


ubclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations	Environment condition: Date & Time: Thu 09/Nov/2017 12:08:43
Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
	Temperature: 22 °C
	Humidity: 55 %
<u>imit:</u>	Voltage: 230 Vac
imit according to 87.139(i)(1)	
he mean power of emissions shall be attenuated	Setup of measurement equipment:
elow the mean output power of the transmitter	Start frequency: 1.66 GHz
accordance with 87.139(i)(1).	Stop frequency: 1.67 GHz
	Center frequency: 1.665 GHz
	Frequency span: 10 MHz
	Resolution-BW: 3 kHz
	Video-BW: 30 kHz
	Stop frequency: 1.67 GHz Center frequency: 1.665 GHz Frequency span: 10 MHz Resolution-BW: 3 kHz Video-BW: 30 kHz Input attenuation: 0 dB Trace-Mode: Clear Write
est results:	Trace-Mode: Clear Write
ee plot (an explicit table was not generated)	Detector-Mode: RMS
, , ,	
perating condition of DUT:	Correction:
perating condition 1, see subclause 1.5.2	Directional coupler (WDLN) - 0.8 dB
700, All modems active	Directional coupler (WDLN)
	DUT-Antenna + 0.0 dBi
est setup:	Test antenna + 0.0 dB
ee section 8.1: 1.2hgl	BW correction factor (3k -> 20k) + 8.2 dB
55 55556H 5TH 11211gi	Atten. between HPA and feedhorn - 0.0 dB
est equipment:	(FCOR) ± 24.1 dB
ee annex 2: C218, FCOB, R001, WDLN	TOTAL CORRECTION: + 32.3 dB
CC WITHCA Z. OZ 10, 1 OOD, 1001, WDEW	TOTAL CONNECTION: 5 02.0 db
emark:	Remarks:
OTHER CONTROL	Carrier-on state / Carrier in the middle of the band (fm)
	For EIRP calculation:
	worst-case' = maximum antenna gain
and manufer. That manned	worst-case - maximum antenna gain
est result: Test passed	
	11

© CTC advanced GmbH Page 36 of 42



Plot No. 34 (35)

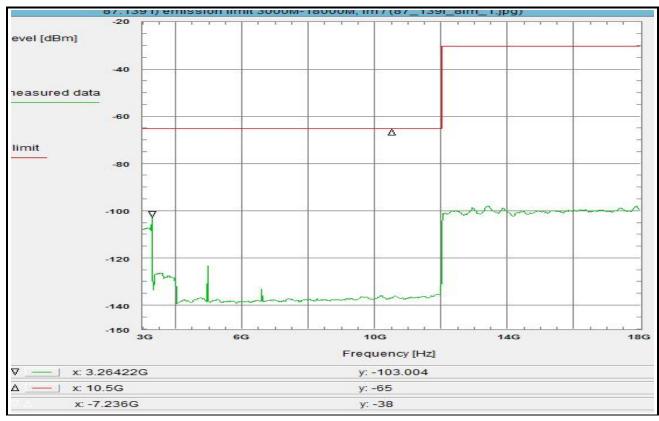


Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations	Environment condition:
Emission limitations	Date & Time: Thu 09/Nov/2017 12:11:51
Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
	Temperature: 22 °C
	Humidity: 55 %
Limit:	Voltage: 230 Vac
Limit according to 87.139(i)(1)	[] · · · · · · · · · · · · · · · · · ·
The mean power of emissions shall be attenuated	Setup of measurement equipment:
below the mean output power of the transmitter	Ctt
in accordance with 87.139(i)(1).	Stop frequency: 3 GHz
	Center frequency: 2 335 GHz
	Frequency span: 1.33 GHz
	Resolution-RW: 3 kHz
	Video-BW: 30 kHz
	Input attenuation: 0 dB
Test results:	Start requency:
see plot (an explicit table was not generated)	Detector-Mode: RMS
see plot (all explicit table was not generated)	Detector-woode. Itimo
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler (WDLN)
A700, All modems active	Coavial cable (C218) + 1.0 dB
A700, All moderns active	DIT Antonno
Test setup:	Toot entenne
see section 8.1: 1.2hql	PW correction factor (2k > 4k) + 1.2 dP
See Section 6.1. 1.2ngi	Atten. between HPA and feedhom - 0.0 dB
Test equipment:	(FCOB) + 9.1 dB
	TOTAL CORRECTION:18.9 dB
see annex 2: C218, FCOB, R001, WDLN	TOTAL CORRECTION:18.9 dB
Remark:	Remarks:
	Carrier-on state / Carrier in the middle of the band (fm)
	For EIRP calculation:
	worst-case' = maximum antenna gain
Test result: Test passed	
Tool passed	

© CTC advanced GmbH Page 37 of 42



Plot No. 35 (35)



0.1.1	E :
Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations	Environment condition:
Emission limitations	Date & Time: Thu 09/Nov/2017 14:26:20
Modulated rf-carrier in the middle of the band (fm)	Location: CTC advanced GmbH, Laboratory RSC-Sat
	Temperature: 22 °C
	Humidity: 55 %
<u>Limit:</u>	Voltage: 230 Vac
Limit according to 87.139(i)(1)	
The mean power of emissions shall be attenuated	Setup of measurement equipment:
below the mean output power of the transmitter	Start frequency: 3 GHz
in accordance with 87.139(i)(1).	Stop frequency:
	Center frequency: 10.5 GHz
	Frequency span: 15 GHz
	Resolution-BW: 10 kHz
	Video-BW: 100 kHz
I	Input attenuation: 25 dB Trace-Mode: Clear Write
Test results:	Trace-Mode: Clear Write
see plot (an explicit table was not generated)	Detector-Mode: RMS
Operating condition of DUT:	Correction:
operating condition 1, see subclause 1.5.2	Directional coupler (WDLN) - 35.0 dB
A700, All modems active	Coaxial cable (C218) + 2.0 dB
	Directional coupler (WDLN)
Test setup:	Test antenna + 0.0 dB
see section 8.1: 1.2hgl	BW correction factor (10k -> 4k) - 4.0 dB
	Atten. between HPA and feedhom - 0.0 dB
Test equipment:	(FHPF) + 0.7 dB
see annex 2: C218, FCOB, FHPF, R001, U214, WDLN	TOTAL CORRECTION:36.3 dB
D I	B I
Remark:	Remarks:
	Carrier-on state / Carrier in the middle of the band (fm)
	For EIRP calculation:
_ , , , _ ,	'worst-case' = maximum antenna gain
Test result: Test passed	

© CTC advanced GmbH Page 38 of 42



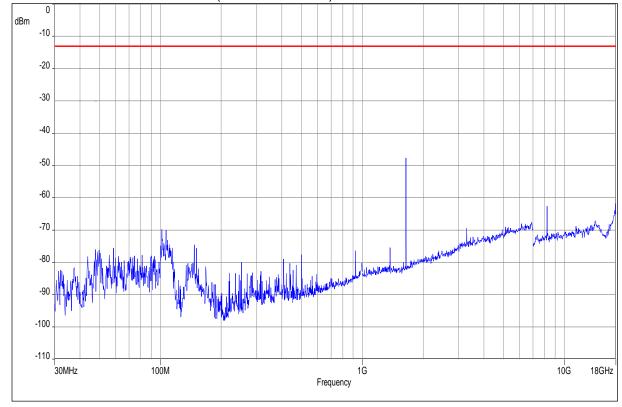
3 Measurement results, Spurious emissions 30MHz - 18 GHz

This part 3 consists of 2 pages including this page.

© CTC advanced GmbH Page 39 of 42



Plot No. 1: antenna vertical / horizontal (All modems active)



© CTC advanced GmbH Page 40 of 42



4 Measurement results, FCC Part 15B

This part 4 consists of 1 pages including this page.

Refer to test report 1-0716_15-01-05.pdf

© CTC advanced GmbH Page 41 of 42



5 Document history

Version	Applied changes	Date of release
	Initial release - DRAFT	2018-03-20
	minor editorial changes	2018-06-21

© CTC advanced GmbH Page 42 of 42