



Annex E



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Test report annex authorized:				

Meheza Walla Lab Manager Radio Communications & EMC



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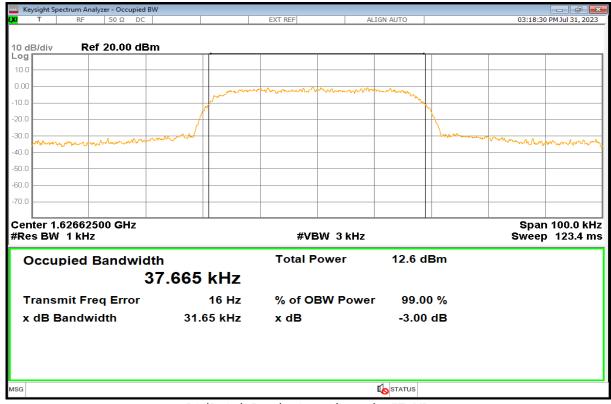


2. Measurement results for CLASS 15, FCC Part 87

This chapter consists of 102 pages including this page.

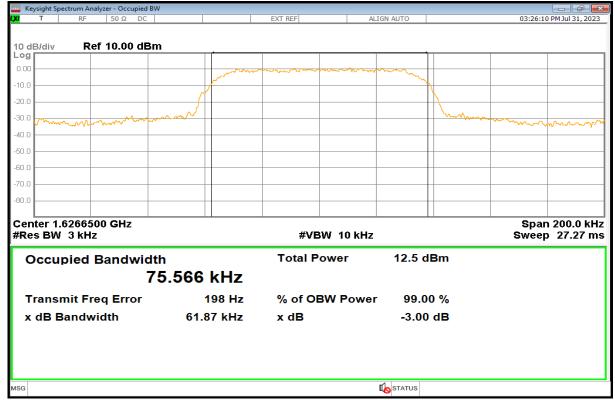


Plot No. 1



B3dB, Sub-Band 1, Low Channel, R5T1XD

Plot No. 2

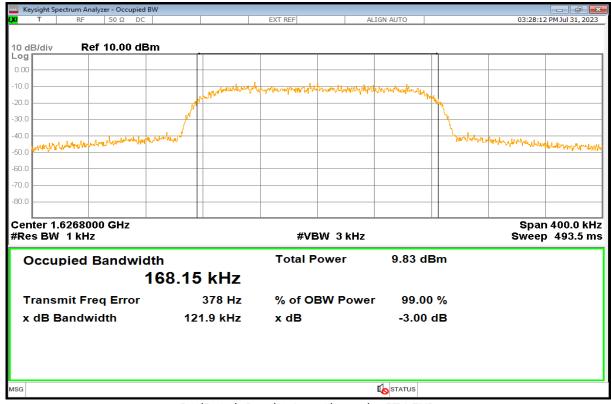


B3dB, Sub-Band 1, Low Channel, R5T2XD

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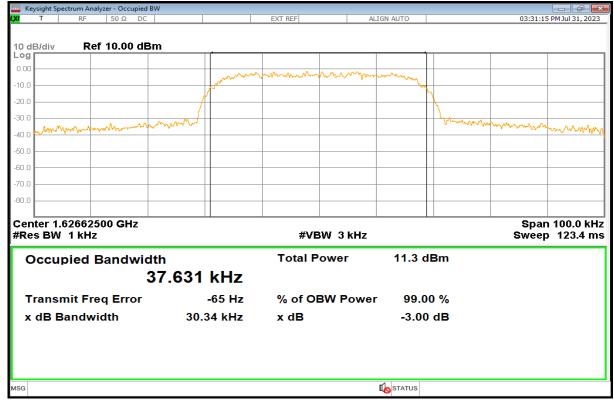


Plot No. 3



B3dB, Sub-Band 1, Low Channel, R5T4.5XD

Plot No. 4

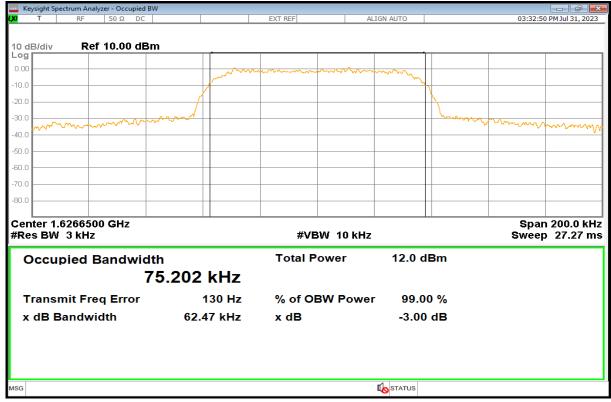


B3dB, Sub-Band 1, Low Channel, R20T1XD

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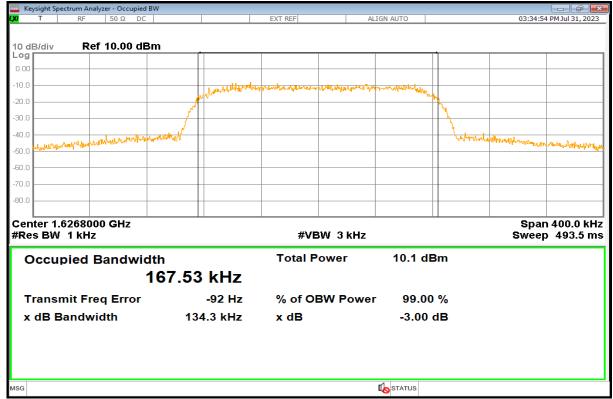


Plot No. 5



B3dB, Sub-Band 1, Low Channel, R20T2XD

Plot No. 6

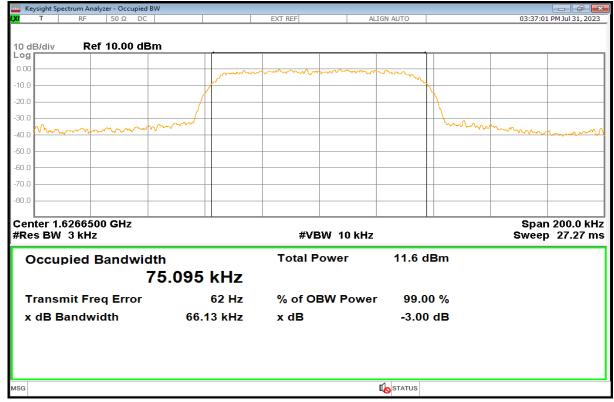


B3dB, Sub-Band 1, Low Channel, R20T4.5XD

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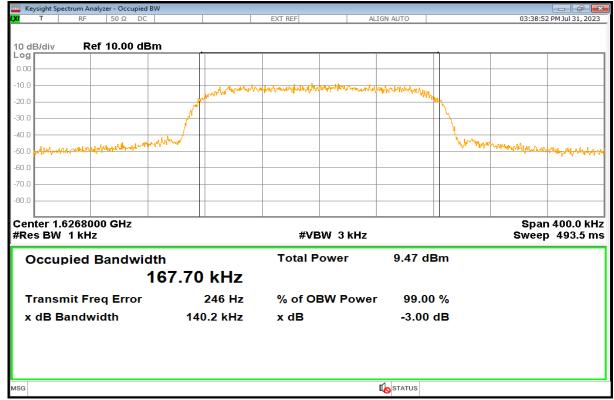


Plot No. 7



B3dB, Sub-Band 1, Low Channel, R5T2QD

Plot No. 8

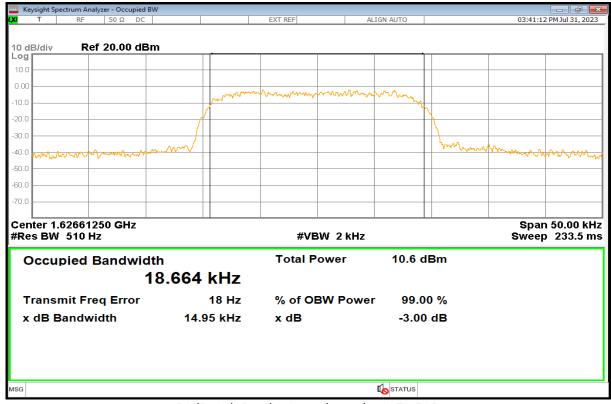


B3dB, Sub-Band 1, Low Channel, R5T4.5QD

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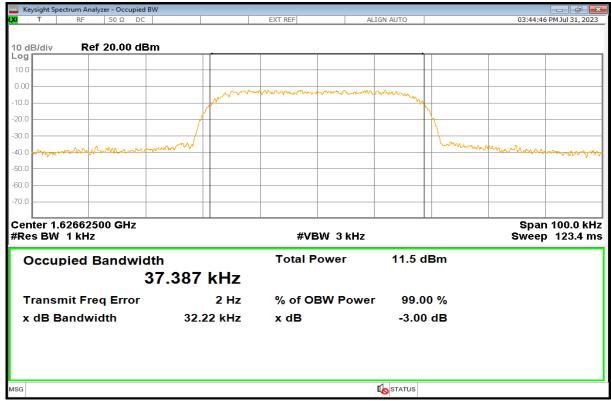


Plot No. 9



B3dB, Sub-Band 1, Low Channel, R20T0.5QD

Plot No. 10

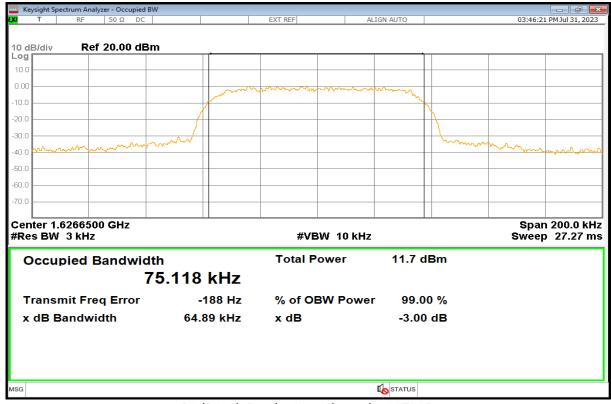


B3dB, Sub-Band 1, Low Channel, R20T1QD

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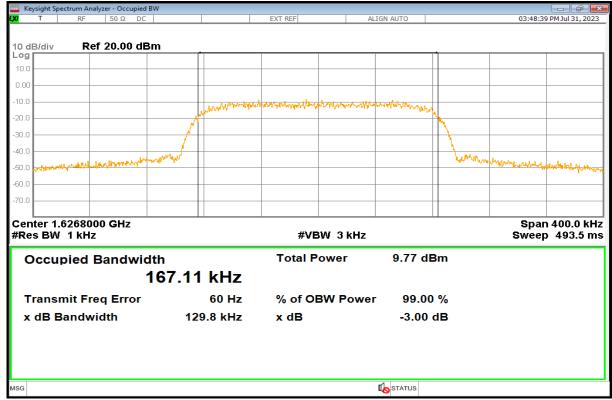


Plot No. 11



B3dB, Sub-Band 1, Low Channel, R20T2QD

Plot No. 12

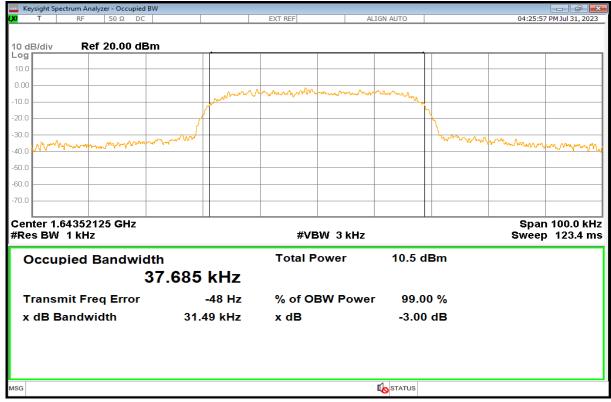


B3dB, Sub-Band 1, Low Channel, R20T4.5QD

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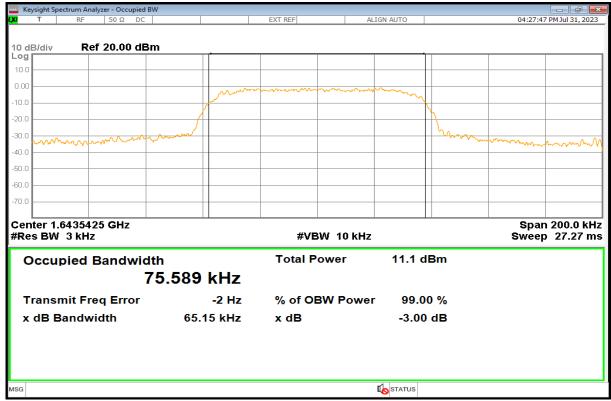


Plot No. 13



B3dB, Sub-Band 1, Middle Channel, R5T1XD

Plot No. 14

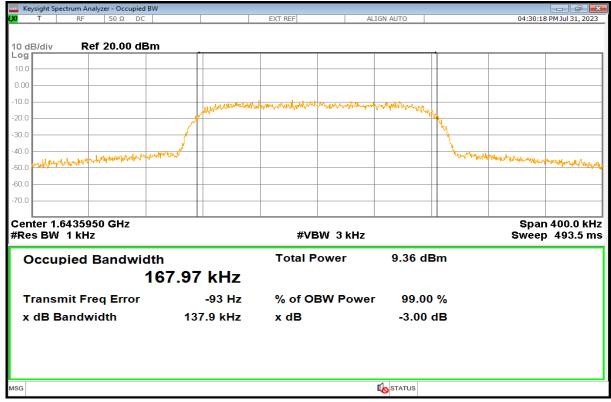


B3dB, Sub-Band 1, Middle Channel, R5T2XD

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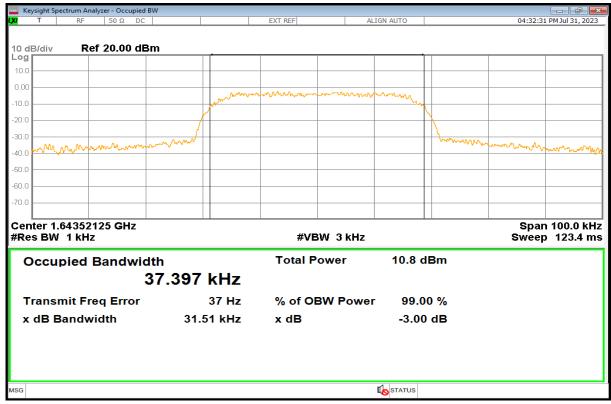


Plot No. 15



B3dB, Sub-Band 1, Middle Channel, R5T4.5XD

Plot No. 16

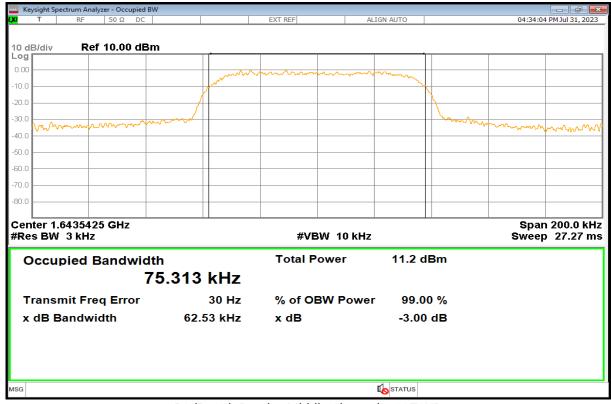


B3dB, Sub-Band 1, Middle Channel, R20T1XD

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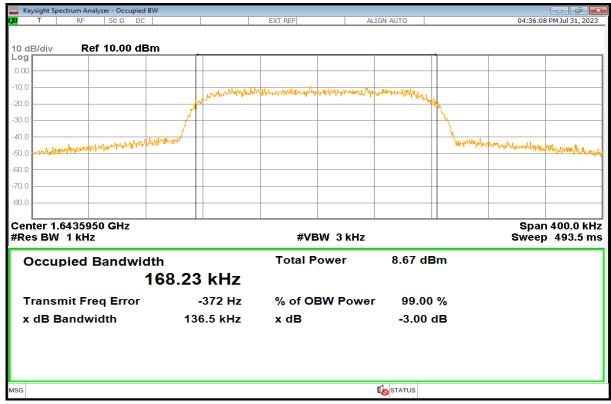


Plot No. 17



B3dB, Sub-Band 1, Middle Channel, R20T2XD

Plot No. 18

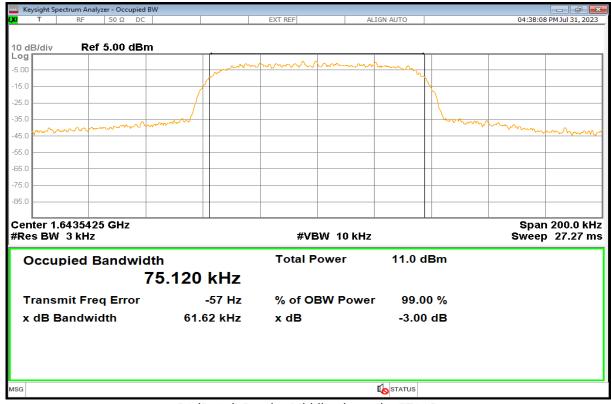


B3dB, Sub-Band 1, Middle Channel, R20T4.5XD

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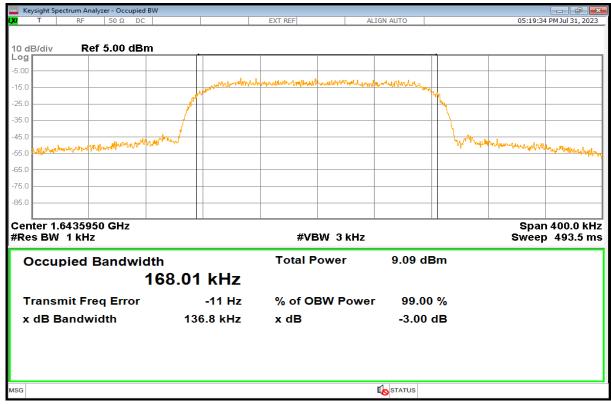


Plot No. 19



B3dB, Sub-Band 1, Middle Channel, R5T2QD

Plot No. 20

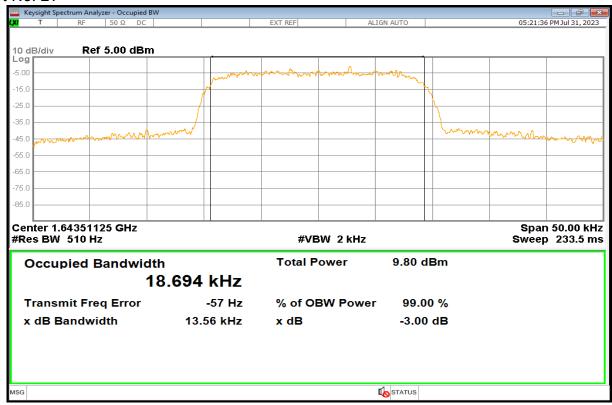


B3dB, Sub-Band 1, Middle Channel, R5T4.5QD

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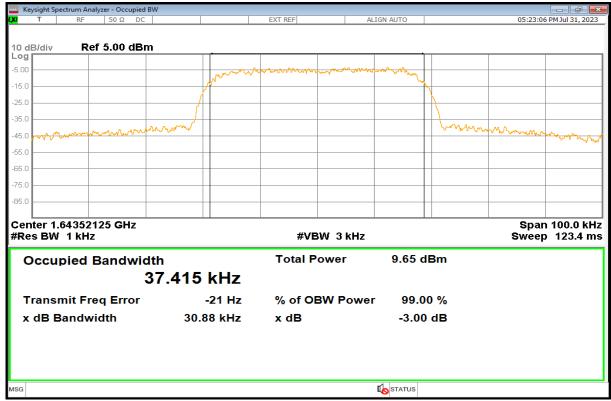


Plot No. 21



B3dB, Sub-Band 1, Middle Channel, R20T0.5QD

Plot No. 22

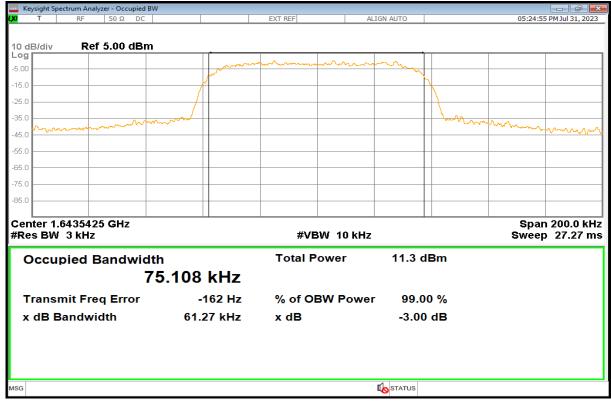


B3dB, Sub-Band 1, Middle Channel, R20T1QD

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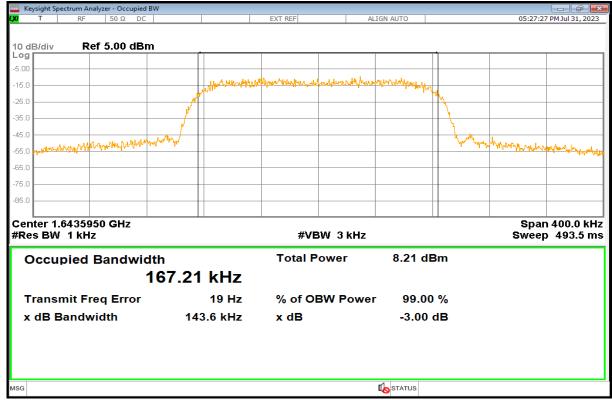


Plot No. 23



B3dB, Sub-Band 1, Middle Channel, R20T2QD

Plot No. 24

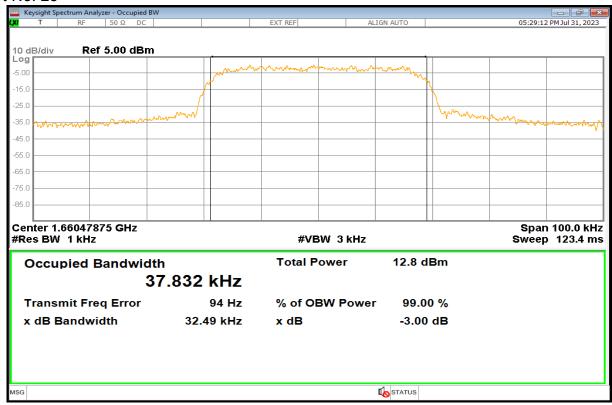


B3dB, Sub-Band 1, Middle Channel, R20T4.5QD

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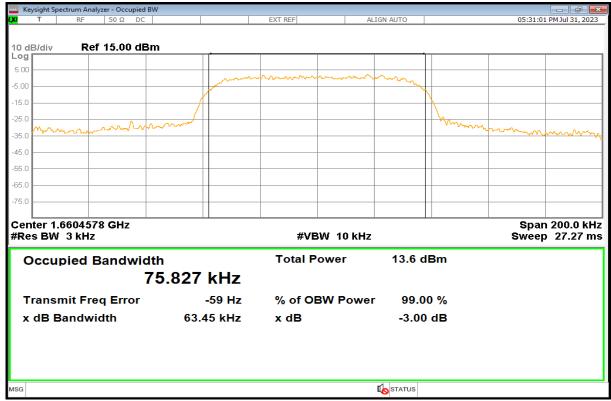


Plot No. 25



B3dB, Sub-Band 1, High Channel, R5T1XD

Plot No. 26

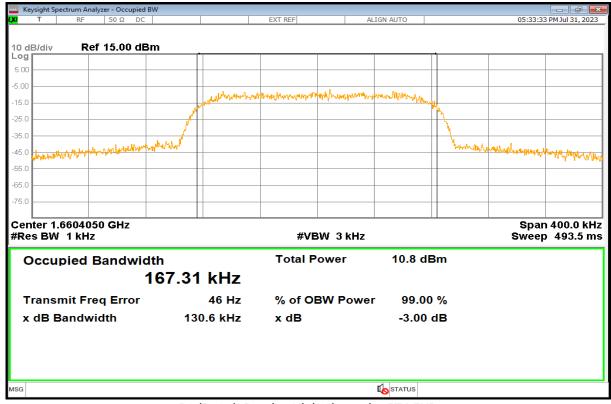


B3dB, Sub-Band 1, High Channel, R5T2XD

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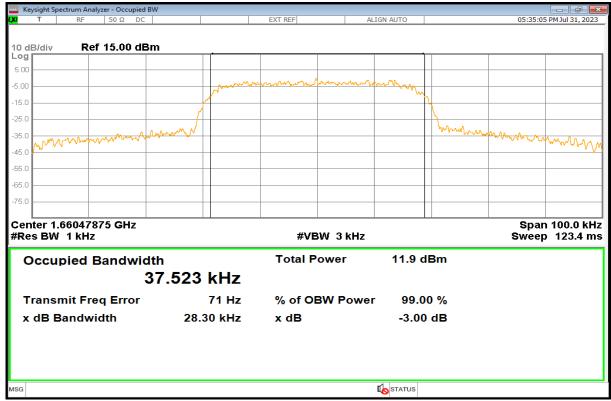


Plot No. 27



B3dB, Sub-Band 1, High Channel, R5T4.5XD

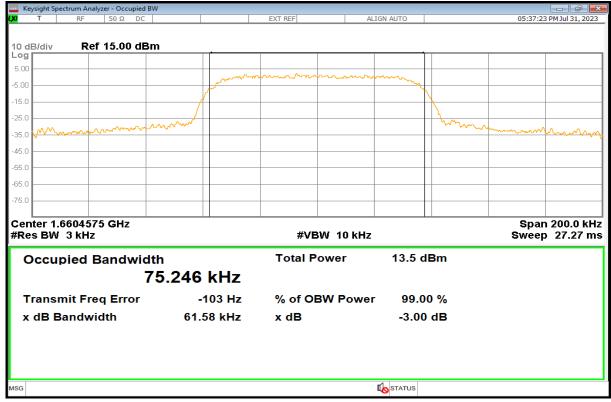
Plot No. 28



B3dB, Sub-Band 1, High Channel, R20T1XD

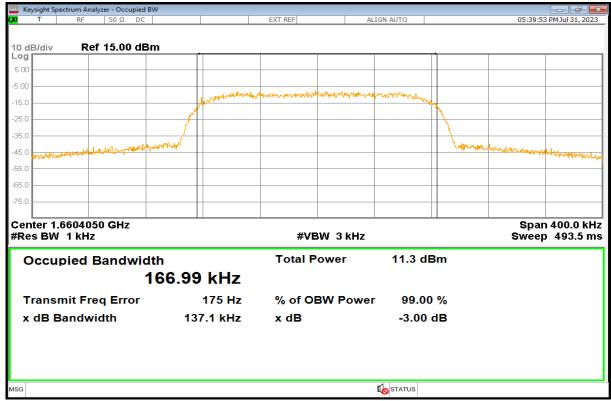


Plot No. 29



B3dB, Sub-Band 1, High Channel, R20T2XD

Plot No. 30

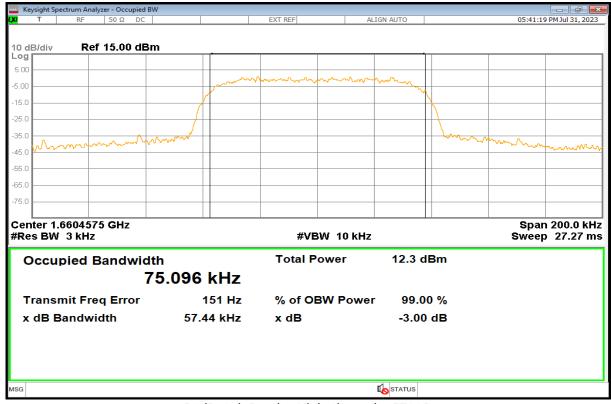


B3dB, Sub-Band 1, High Channel, R20T4.5XD

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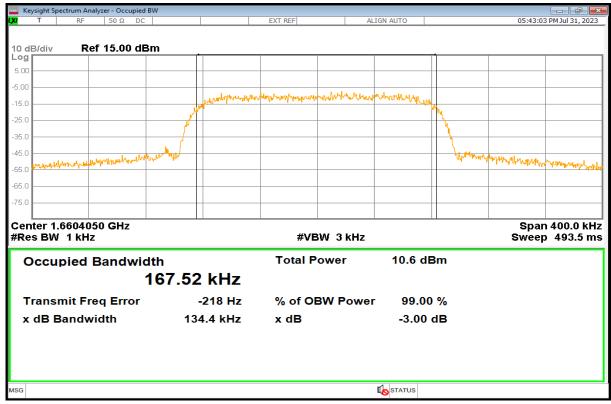


Plot No. 31



B3dB, Sub-Band 1, High Channel, R5T2QD

Plot No. 32

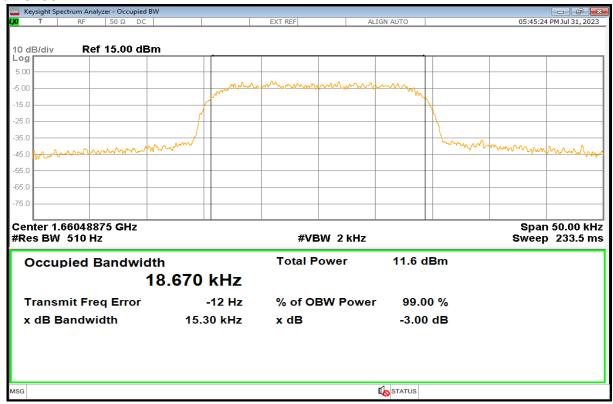


B3dB, Sub-Band 1, High Channel, R5T4.5QD

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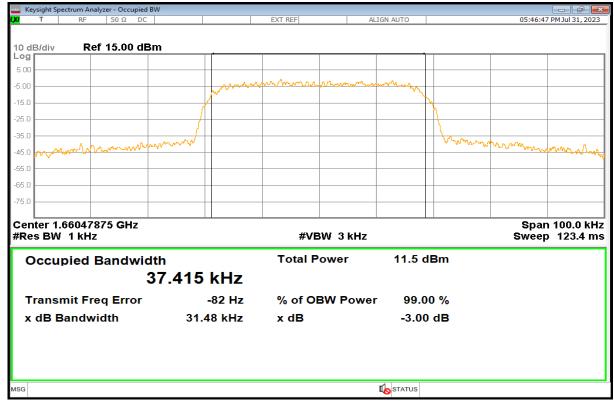


Plot No. 33



B3dB, Sub-Band 1, High Channel, R20T0.5QD

Plot No. 34

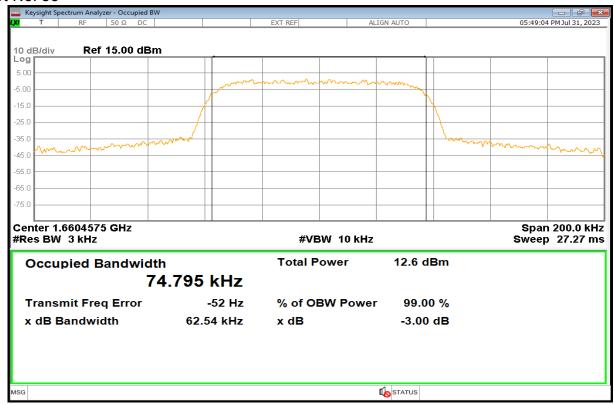


B3dB, Sub-Band 1, High Channel, R20T1QD

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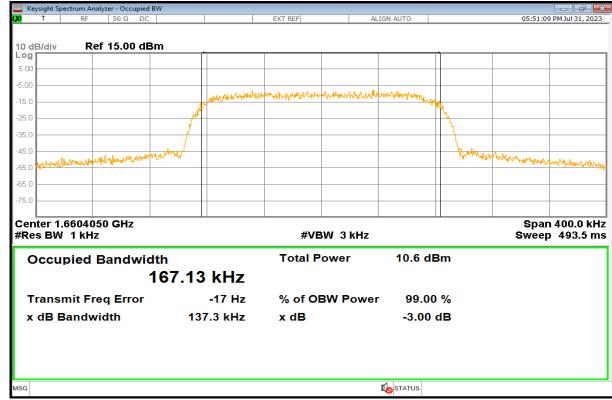


Plot No. 35



B3dB, Sub-Band 1, High Channel, R20T2QD

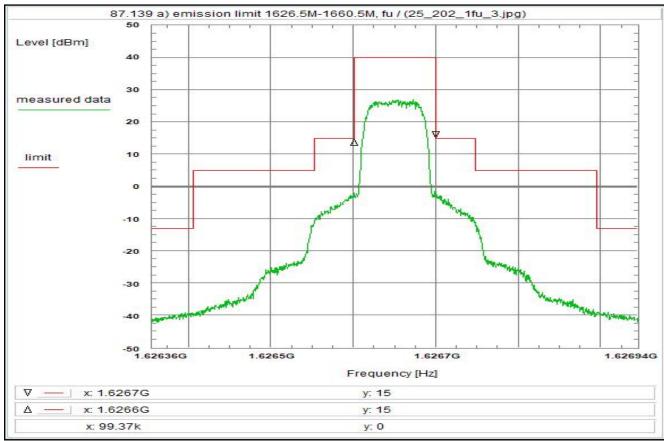
Plot No. 36



B3dB, Sub-Band 1, High Channel, R20T4.5QD



Plot No. 37



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 6.4 fl, R5T2XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

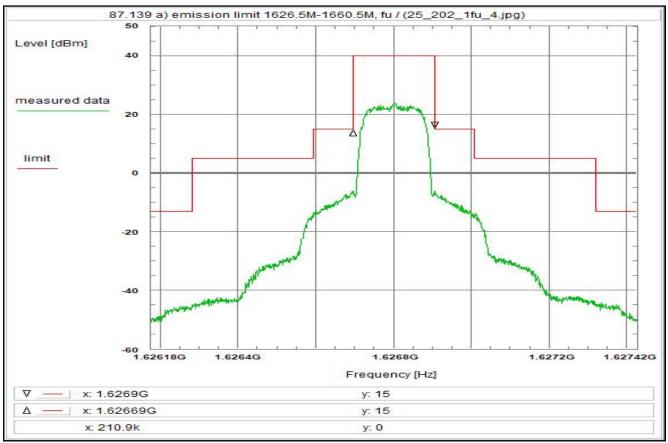
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 16:09:22 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1 626356 GHz Start frequency: 1.626944 GHz Stop frequency: Center frequency: 1.62665 GHz Frequency span: Resolution-BW: 588 kHz kHz 3 Video-BW: Input attenuation: 20 dB Clear Write Trace-Mode: Detector-Mode: Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier at the lower edge of the band (fu) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 38



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T4.5XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

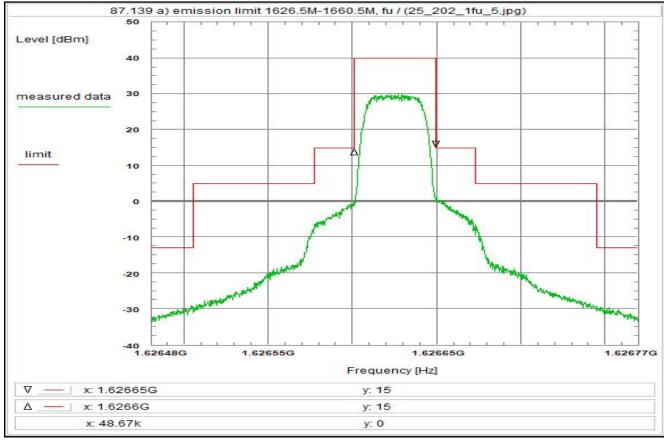
Test result: Test passed

Environment condition: Date & Time: Wed 16/Aug/202 Location: CTC advanced C Temperature: 22 Humidity: 55 Voltage: 230	GmbH, Laboratory RC-SYS °C %	
Setup of measurement equipment: Start frequency: 1.626176 Stop frequency: 1.627424 Center frequency: 1.6268 Frequency span: 1.248 Resolution-BW: 3 Video-BW: 10 Input attenuation: 20 Trace-Mode: Clear Write Detector-Mode: AVG	GHz GHz MHz kHz kHz	
Correction: Directional coupler + Coaxial cable (C220) + DUT-Antenna (on-axis) + Test antenna + BW correction factor (3k -> 4k) + Atten. between HPA and feedhom (U330) + TOTAL CORRECTION: + Remarks: Carrier-on state / Carrier at the lower edge (0.9 dB 1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB 35.4 dB	
Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth		

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Plot No. 39



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log/Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

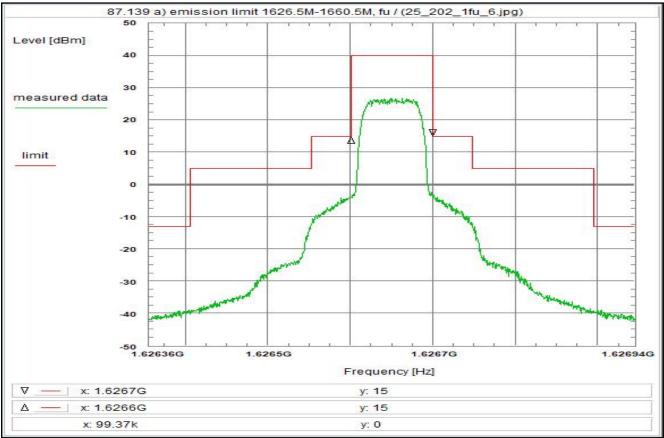
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 16:18:06 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.626481 GHz Start frequency: 1.626769 GHz Stop frequency: Center frequency: 1.626625 GHz Frequency span: Resolution-BW: 288 kHz kHz Video-BW: Input attenuation: 20 dB Clear Write Trace-Mode: Detector-Mode: Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 40



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T2XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

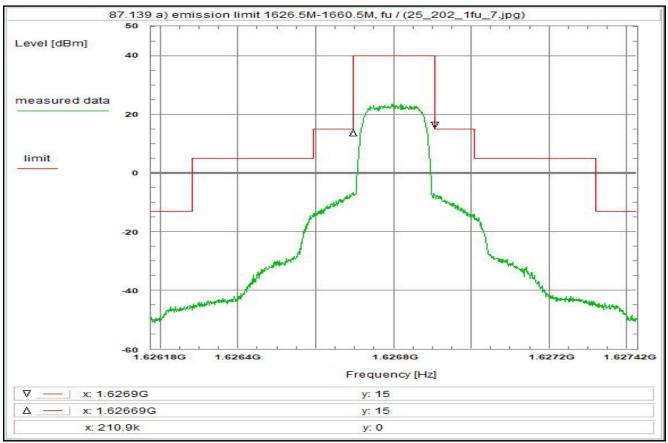
Remark:

Test result: Test passed

Environment condition: Date & Time: Wed 16/Aug/2023 16:49:20 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1 626356 GHz Start frequency: 1.626944 GHz Stop frequency: Center frequency: 1.62665 GHz Frequency span: Resolution-BW: 588 kHz kHz 3 Video-BW: Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) dBi Test antenna 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 41



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T4.5XD

Test setup:
see test report chapter 7.2:

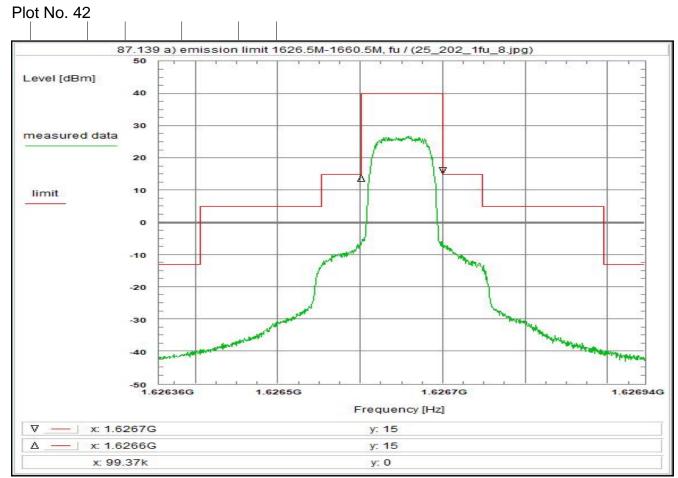
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 16:55:45 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1 626176 GHz Start frequency: 1.627424 GHz Stop frequency: Center frequency: 1.6268 GHz Frequency span: Resolution-BW: 1.248 MHz kHz Video-BW: 10 Input attenuation: 20 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth





Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -4310log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T2QD

Test setup:
see test report chapter 7.1-7.2: C220, R001, U330

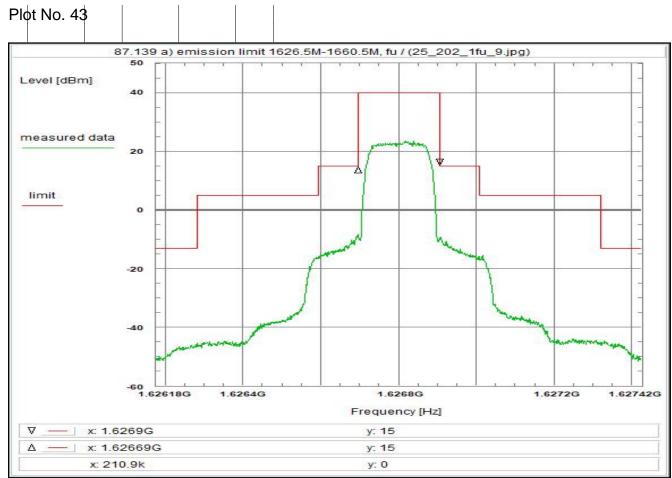
Remark:

Test result: Test passed

Environment condition:				
Date & Time:	Wed 16/Aug/202	23 17:0	7:05:28	
Location:	CTC advanced (GmbH,	H, Laboratory RC-SYS	
Temperature:	22	°C	;	
Humidity:	55	%		
Voltage:	230	Vac	ıc	
-				
Setup of measurement e				
Start frequency:	1.626356	GHz	l z	
Stop frequency:	1.626944			
Center frequency:	1.62665			
Frequency span:		kHz		
Resolution-BW:	3			
Video-BW:	10			
Input attenuation:	20	dB	!	
Trace-Mode:	Max-Hold			
Detector-Mode:	AVG			
Correction:				
Directional coupler	+			
Coaxial cable (C220)	+			
DUT-Antenna (on-axis)	+			
Test antenna	+			
BW correction factor (3k				
Atten. between HPA and	feedhom -			
(U330)	+		.9 dB	
TOTAL CORRECTION:	+	35.4	.4 dB	
Remarks:				
Carrier-on state / Carrier	at the lower edge	of the b	e band (fu)	
	_			
Reference of limit = 40 dBm				
Spectrum mask referenced to necessary bandwidth				

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Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, R5T4.5QD

Test setup: see test report chapter 7.2:

Test equipment: see test report chapter 7.1-7.2: C220, R001, U330

Remark:

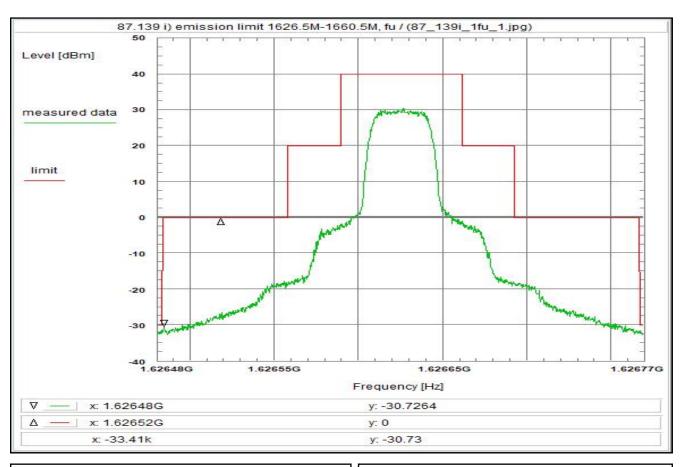
Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 18:01:04 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1 626176 GHz Start frequency: 1.627424 GHz Stop frequency: Center frequency: 1.6268 GHz Frequency span: Resolution-BW: 1.248 MHz kHz Video-BW: 10 Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier at the lower edge of the band (fu) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth

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Plot No. 44



87.139 i) Frequencies, frequency tolerance and emission limitations Subclause:

Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated

below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, R5T1XD

see test report chapter 7.2:

see test report chapter 7.1-7.2: R001

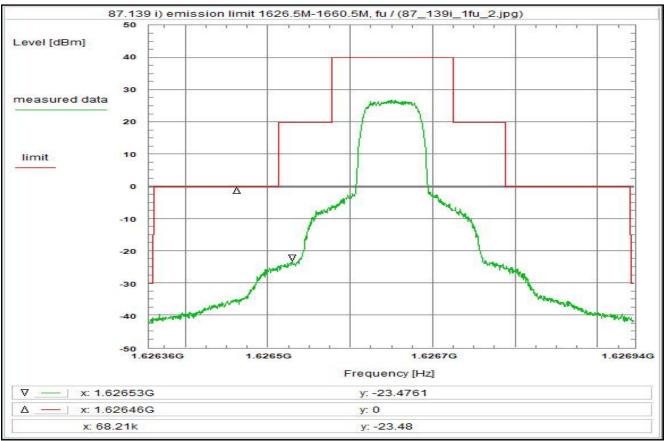
Test result: Test passed

Environment condition: Date & Time: Location: Temperature: Humidity: Voltage: Wed 16/Aug/202 CTC advanced of 22 Humidity: 55 Voltage: 230	GmbH, Laboratory RC-SYS °C %	
Setup of measurement equipment: Start frequency: 1.626481 Stop frequency: 1.626769 Center frequency: 1.626625 Frequency span: 288 Resolution-BW: 3 Video-BW: 300 Input attenuation: 20 Trace-Mode: Average Detector-Mode: AVG	GHz kHz kHz	
Correction: Directional coupler	1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB	
Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: `worst-case' = maximum antenna gain		

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Plot No. 45



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fl, R5T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

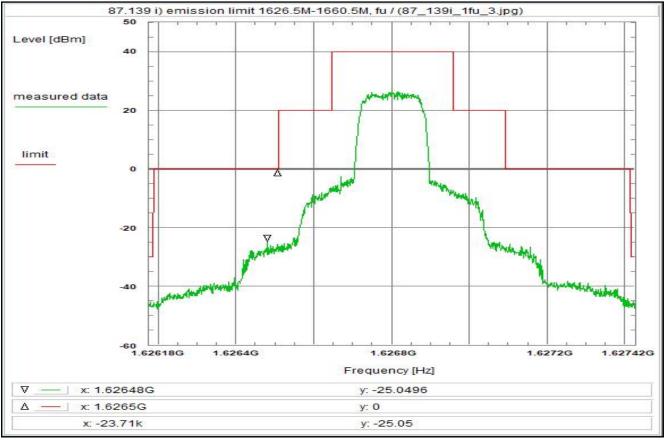
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 16:07:41 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.626356 GHz Start frequency: Stop frequency: 1.626944 GHz Center frequency: 1.62665 GHz Frequency span: Resolution-BW: 588 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Trace-Mode: Average AVG Detector-Mode: Correction: Directional coupler + 0.0 ub + 0.9 dB + 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn 1.2 dB 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: worst-case' = maximum antenna gain



Plot No. 46



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T4.5XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

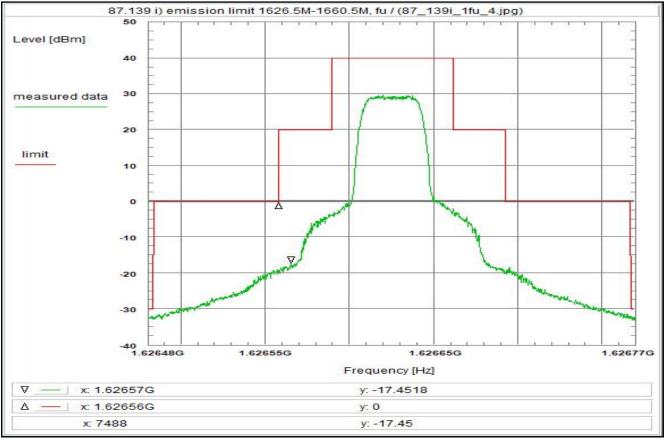
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 16:34:53 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.626176 GHz Start frequency: 1.627424 GHz Stop frequency: Center frequency: 1.6268 GHz Frequency span: Resolution-BW: 1.248 MHz kHz Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn 1.2 dB 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: worst-case' = maximum antenna gain



Plot No. 47



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T1XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

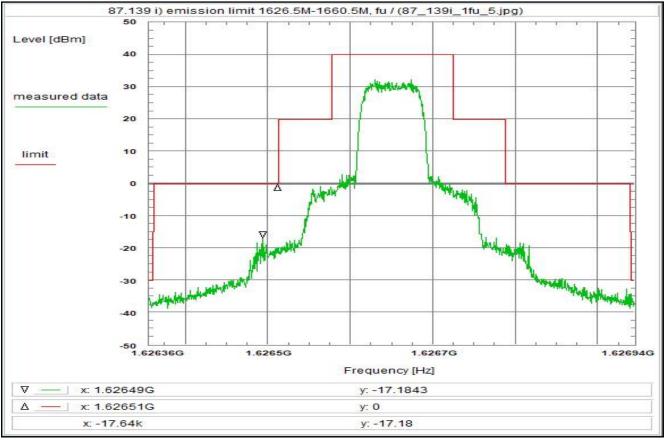
Remark:

Test result: Test passed

Temperature: 22 Humidity: 55	mbH, Laboratory RC-SYS °C %	
Setup of measurement equipment: Start frequency: 1.626481 Stop frequency: 1.626769 Center frequency: 1.626625 Frequency span: 288 Resolution-BW: 3 Video-BW: 300 Input attenuation: 20 Trace-Mode: Average Detector-Mode: AVG	GHz	
Correction: Directional coupler	0.0 dB 0.9 dB 1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB 35.4 dB	
Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: 'worst-case' = maximum antenna gain		



Plot No. 48



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T2XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

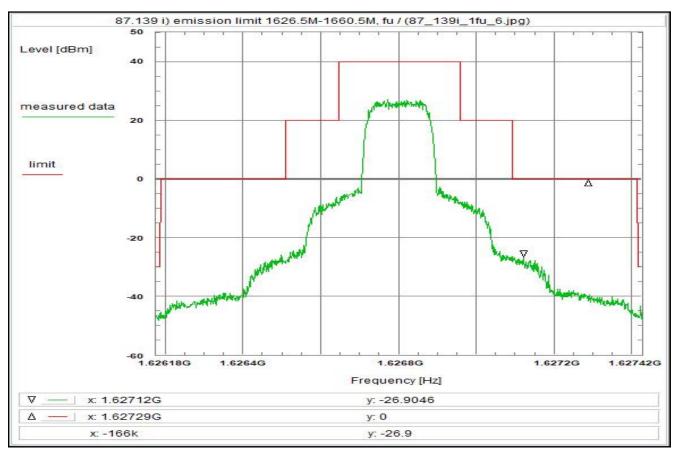
Test result: Test passed

Environment condition:				
Date & Time:				
Location:				
Temperature:	22	°C	•	
Humidity:	55	%		
Voltage:	230	Vac		
Setup of measurement e	quinment:			
Start frequency:	1.626356	GHz	,	
Stop frequency:	1.626944			
Center frequency:	1.62665			
Frequency span:		kHz		
Resolution-BW:	3			
Video-BW:	300			
Input attenuation:	20			
Trace-Mode:	Max-Hold			
Detector-Mode:	AVG			
Correction:			ID.	
Directional coupler	+			
Coaxial cable (C220)	+	0.0		
DUT-Antenna (on-axis)	+			
Test antenna	+	0.0		
BW correction factor (3k Atten, between HPA and				
(U330) TOTAL CORRECTION:	+		dB	
TOTAL CORRECTION:	+	35.4	i dB	
Remarks:				
Carrier-on state / Carrier	at the lower edge	of the b	band (fu)	
For EIRP calculation:				
'worst-case' = maximum antenna gain				
Reference of limit = 40 dBm				
Spectrum mask referenced to necessary bandwidth				
.,			•	
I				

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Plot No. 49



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see lest report chapter 7.1-7.2: C220, R001, U330

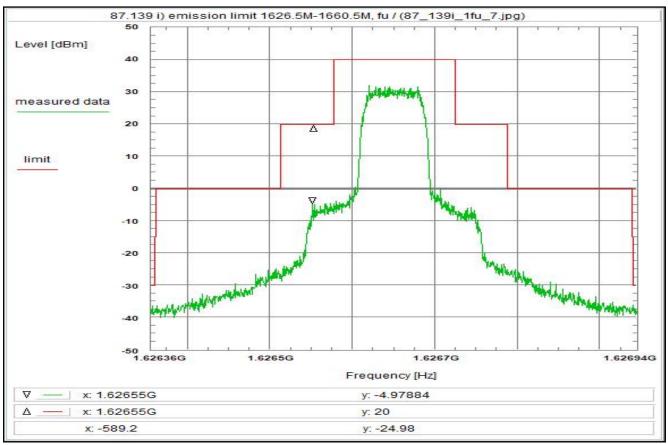
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 16:57:23 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.626176 GHz Start frequency: 1.627424 GHz Stop frequency: Center frequency: 1.6268 GHz Frequency span: Resolution-BW: 1.248 MHz kHz Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn 1.2 dB 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: worst-case' = maximum antenna gain



Plot No. 50



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

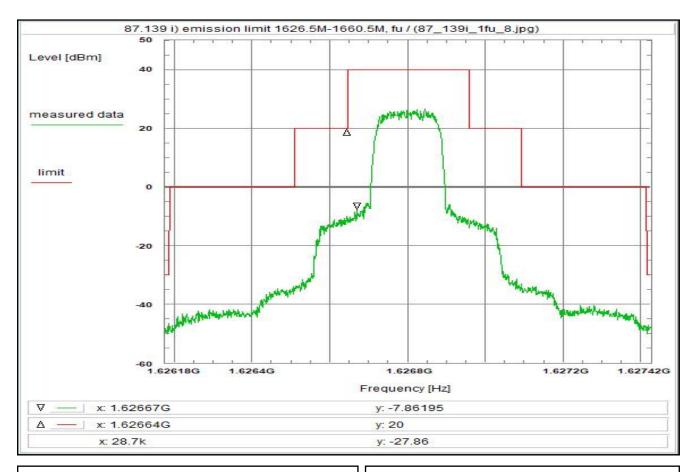
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 17:57:11 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.626356 GHz Start frequency: 1.626944 GHz Stop frequency: Center frequency: 1.62665 GHz Frequency span: Resolution-BW: 588 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: Correction: Directional coupler + 0.0 ub + 0.9 dB + 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna 0.0 dB BW correction factor (3k -> 4k) + 1.2 dB - 0.0 dB Atten. between HPA and feedhorn + 31.9 dB + 35.4 dB (U330) TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 51



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the lower edge of the band (fu) <u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, R5T4.5QD

see test report chapter 7.2:

see test report chapter 7.1-7.2: R001

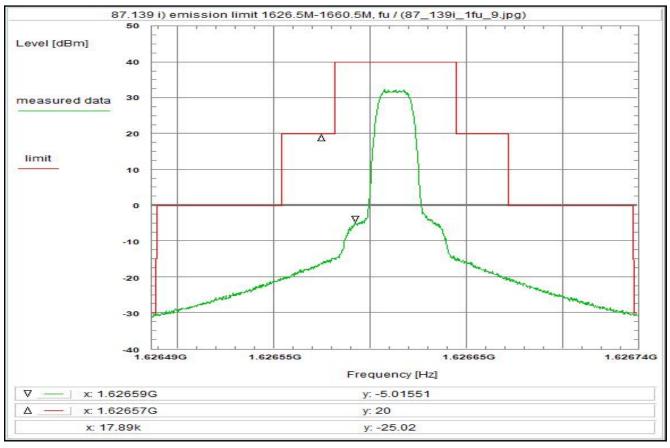
Remark:

Test result: Test passed

Temperature: 22 °	ibH, Laboratory RC-SYS C 6		
Stop frequency: 1.627424 C Center frequency: 1.6268 C Frequency span: 1.248 N Resolution-BW: 3 k Video-BW: 300 H	SHz SHz SHz MHz Hz Hz B		
Coaxial cable (C220)	0.0 dB 1.9 dB 4 dBi 1.0 dB 2 dB 1.0 dB 1.19 dB 1.54 dB		
Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: worst-case' = maximum antenna gain			
Reference of limit = 40 dBm Spectrum mask referenced to necessary band	width		



Plot No. 52



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T0.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

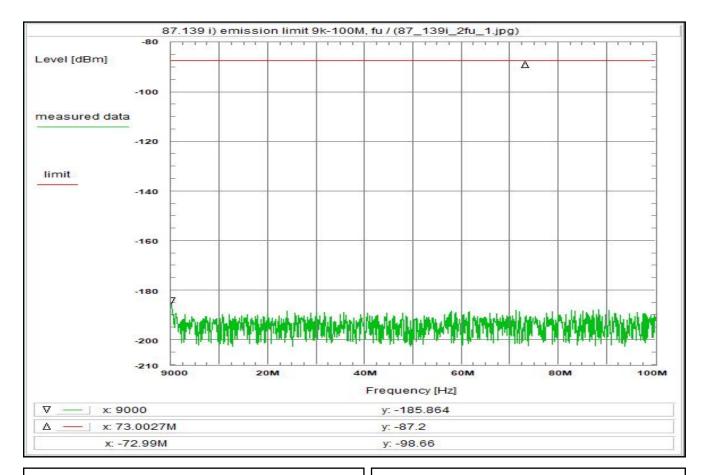
Remark:

Test result: Test passed

Environment condition:
Date & Time: Wed 16/Aug/2023 18:14:42 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.6264865 GHz Start frequency: 1.6267385 GHz Stop frequency: Center frequency: 1.6266125 GHz Frequency span: Resolution-BW: 252 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Trace-Mode: Average AVG Detector-Mode: Correction: Directional coupler + 0.0 dB + 0.9 dB + 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn + 1.2 dB - 0.0 dB + 31.9 dB + 35.4 dB (U330) TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: 'worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 53



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations

see test report chapter 7.2:

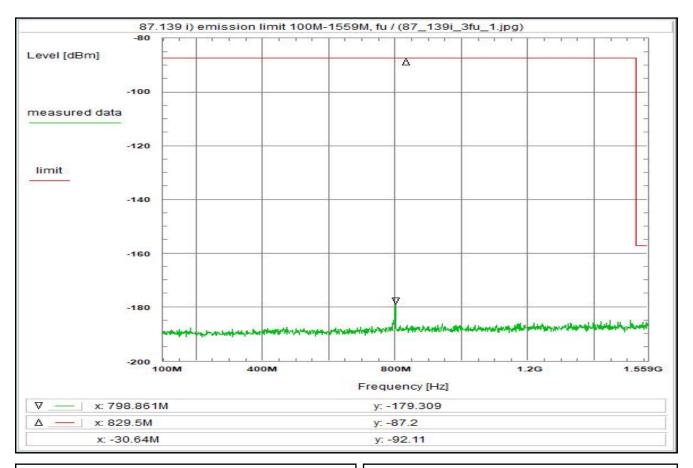
see test report chapter 7.1-7.2: C220, R001, U330, W_RE, W_REJF

Remark:

Temperature: 22 Humidity: 55	GmbH, Laboratory RC-SYS °C
Setup of measurement equipment: 9 Start frequency: 100 Stop frequency: 50.0045 Center frequency: 50.0045 Frequency span: 99.991 Resolution-BW: 3 Video-BW: 10 Input attenuation: 20 Trace-Mode: Max-Hold Detector-Mode: AVG	MHz MHz kHz kHz
Correction: (W_RE) - Coaxial cable (C220) + DUT-Antenna (on-axis) + Test antenna + BW correction factor (3k -> 4k) + Atten. between HPA and feedhom (U330) + TOTAL CORRECTION: -	1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.3 dB
Remarks: Carrier-on state / Carrier at the lower edge of For EIRP calculation: 'worst-case' = maximum antenna gain	of the band (fu)
Since the measurement was updated with corrected value of the marker is -182 dBm	the maximum antenna gain, which is 5.23 dBic, the



Plot No. 54



87.139 i) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations

Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations

see test report chapter 7.2:

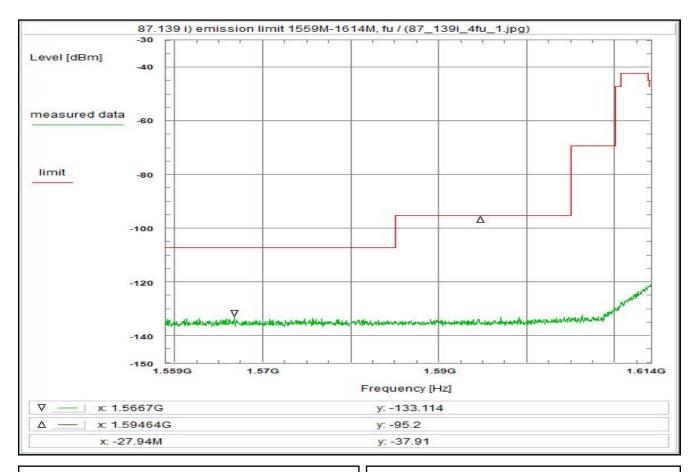
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Temperature: Humidity:	ced (22 55	GmbH, Laboratory RC-SYS
Stop frequency: 1.5 Center frequency: 82 Frequency span: 1.4 Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Max-H	100 559 9.5 459 3 10 20 lold VG	GHz MHz GHz kHz kHz
Correction: (W, RE) Coaxial cable DUT-Antenna (on-axis) Test antenna BW correction factor (3k -> 4k) Atten, between HPA and feedhom (U330) TOTAL CORRECTION: Remarks: Carrier-on state / Carrier at the lower effor EIRP calculation: 'worst-case' = maximum antenna gain	- + + + - - -	1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.7 dB -80.8 dB
Since the measurement was updated v corrected value of the marker is-175 dE		he maximum antenna gain, which is 5.23 dBic, the



Plot No. 55



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

see test report chapter 7.2:

Test equipment

see test report chapter 7.1-7.2: C220, R001, U331, W_RE

Remark:

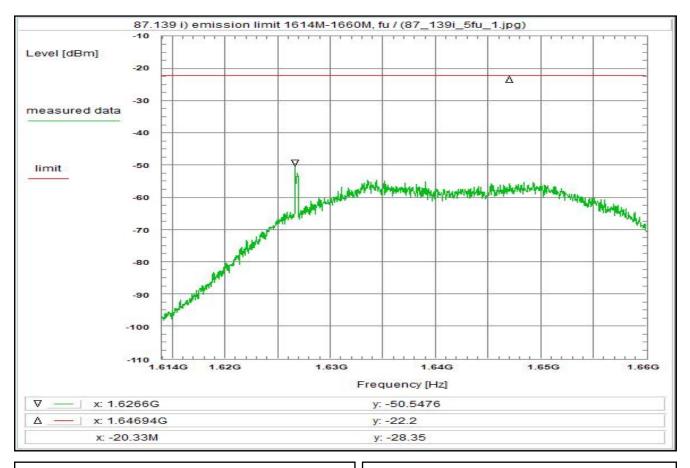
Test result: Test passed

Environment condition:			
Date & Time:	Wed 23/Aug/202		
Location:			Laboratory RC-SYS
Temperature:		°C	
Humidity:	55		
Voltage:	230	Vac	
Setup of measurement eq			
Start frequency:	1.559		
Stop frequency:	1.614		
Center frequency:	1.5865		
Frequency span:	55		
Resolution-BW:	1	MHz	
Video-BW:	3	MHz	
Input attenuation:	20	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	AVG		
Correction: (W_RE) Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor Atten. between HPA and fi (U331) TOTAL CORRECTION: Remarks: Carrier-on state / Carrier a For EIRP calculation: 'worst-case' = maximum a Since the measurement w corrected value of the mai	at the lower edge of antenna gain	1.4 0.0 0.0 0.0 32.6 -69.2	dB dBi dB dB dB dB

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Plot No. 56



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations

see test report chapter 7.2:

see test report chapter 7.1-7.2: C220, R001, U331

Remark:

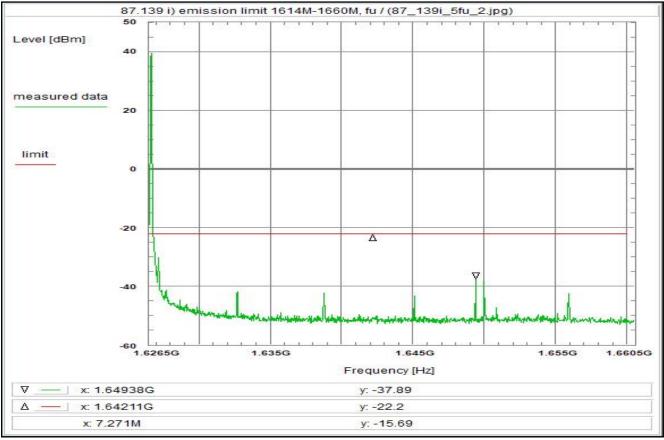
Test result: Test passed

Environment condition: Date & Time: Wed 23// Location: CTC adv Temperature: Humidity: Voltage:	anced (22 55	GmbH, °C	i0:49 Laboratory RC-SYS
Setup of measurement equipment: Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	1.637 46	GHz GHz MHz kHz	
Correction: (W_RE) Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor (3k -> 4k) Atten. between HPA and feedhorn (U331) TOTAL CORRECTION:	+ + - +	1.4 0.0 1.2	dB dBi dB dB dB
Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: 'worst-case' = maximum antenna gain			
Since the measurement was update corrected value of the marker is -46		the ma	iximum antenna gain, which is 5.23 dBic, the

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Plot No. 57

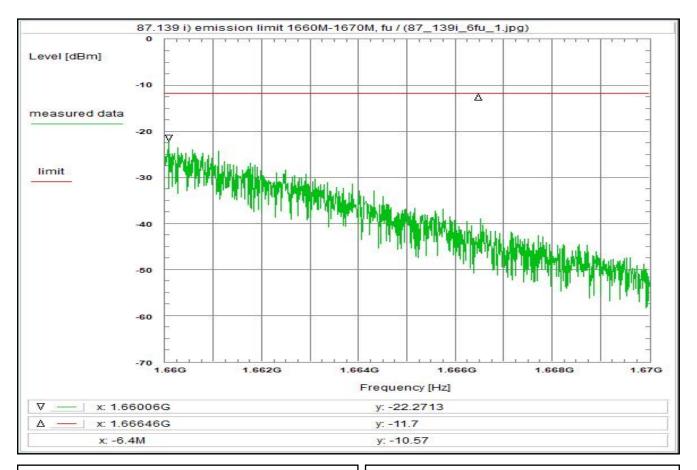


Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the lower edge of the band (fu) Limit: Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1). Test results: Frequency Level Acceptance Exceeding Limit Exceeding dBm dBm -32.2 dBm -22.2 dB dB 1.6600G -27.4 -5.2 Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations Test setup: see test report chapter 7.2: see test report chapter 7.1-7.2: C220, R001, U330 Test result: Test passed

Temperature: 22 Humidity: 55	GmbH, Laboratory RC-SYS	
Setup of measurement equipment: Start frequency: 1.6265 Stop frequency: 1.6605 Center frequency: 1.6435 Frequency span: 34 Resolution-BW: 3 Video-BW: 30 Input attenuation: 20 Trace-Mode: Max-Hold Detector-Mode: Pos Peak	GHz GHz MHz kHz kHz	
Atten. between HPA and feedhorn -	1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB	
Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: 'worst-case' = maximum antenna gain		
Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -34.1 dBm		



Plot No. 58



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations

Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations

see test report chapter 7.2:

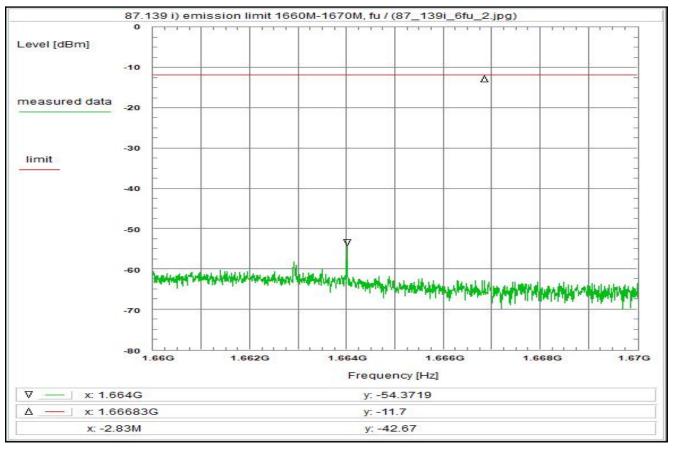
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

Environment condition: Wed 23/Aug/2020 Date & Time: CTC advanced G Location: 22 Temperature: 55 Voltage: 230	SmbH, Laboratory RC-SYS °C %
Setup of measurement equipment: 1.66 Start frequency: 1.67 Stop frequency: 1.65 Center frequency: 10 Resolution-BW: 3 Video-BW: 300 Input attenuation: 20 Trace-Mode: Max-Hold Detector-Mode: AVG	GHz GHz MHz kHz
Correction: (W_RE) - Coaxial cable (C220) + DUT-Antenna (on-axis) + Test antenna + BW correction factor (3k -> 20k) + Atten. between HPA and feedhom (U331) - TOTAL CORRECTION: +	1.4 dBi 0.0 dB 8.2 dB 0.0 dB 72.8 dB
Remarks: Carrier-on state / Carrier at the lower edge o For EIRP calculation: 'worst-case' = maximum antenna gain	of the band (fu)
Since the measurement was updated with the corrected value of the marker is -18.4 dBm	he maximum antenna gain, which is 5.23 dBic, the



Plot No. 59



Subclause:

87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

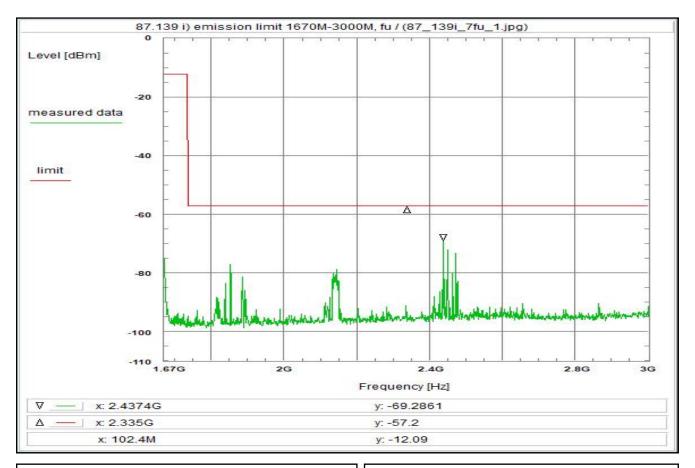
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Environment condition:
Date & Time: Wed 23/Aug/2023 18:22:34 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.66 GHz Start frequency: 1.67 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 10 MHz kHz 3 Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: Correction: (W_RE) - 4.5 dB Coaxial cable (C220) + 0.9 dB + 1.4 dBi DUT-Antenna (on-axis) 0.0 dB BW correction factor (3k -> 20k)
Atten. between HPA and feedhorn + 8.2 dB - 0.0 dB + 31.9 dB + 37.9 dB (U330) TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) For EIRP calculation: worst-case' = maximum antenna gain Since the measurement was updated with the maximum antenna gain, which is $5.23\ \mathrm{dBic}$, the corrected value of the marker is -50.5 dBm



Plot No. 60



87.139 i) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations

Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated

below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations

see test report chapter 7.2:

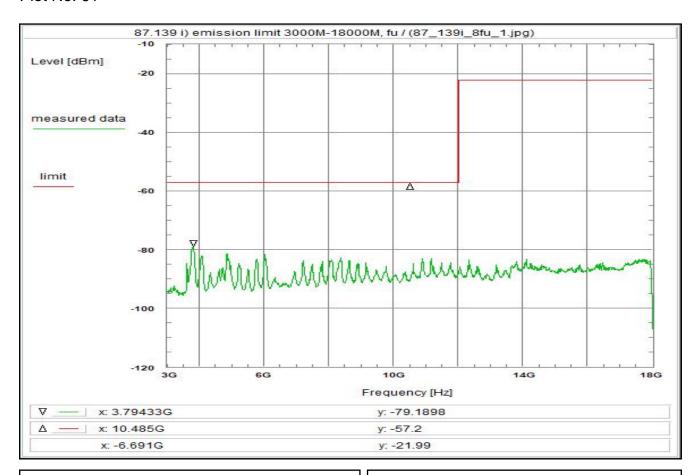
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

Temperature: 22 Humidity: 55	d GmbH, Laboratory RC-SYS 2 °C
Center frequency: 2.335 Frequency span: 1.33 Resolution-BW: 3 Video-BW: 10	3 GHz 5 GHz 8 GHz 8 kHz 0 kHz
Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor (3k -> 4k) Atten. between HPA and feedhom (U331)	- 0.0 dB - 1.1 dB - 1.4 dBi - 0.0 dB - 1.2 dB - 0.0 dB - 3.25 dB - 36.2 dB
Since the measurement was updated with corrected value of the marker is -65.5 dBr	n the maximum antenna gain, which is 5.23 dBic, the n



Plot No. 61



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations

Modulated rf-carrier at the lower edge of the band (fu)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fl, max hold, valid for all modulations

see test report chapter 7.2:

see test report chapter 7.1-7.2: C220, R001, U332

Remark:

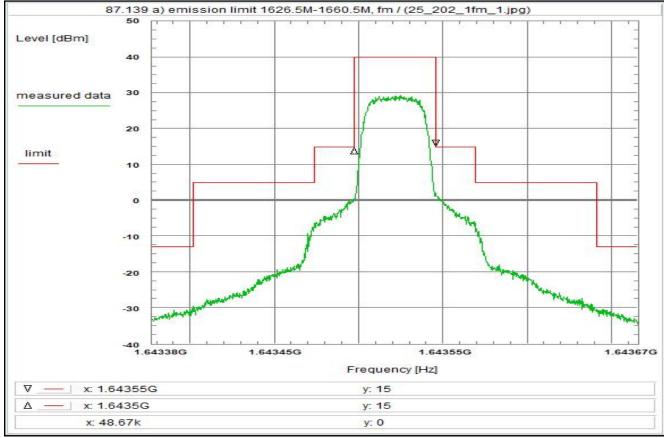
Test result: Test passed

	22 55	GmbH, °C	2:48 Laboratory RC-SYS
Setup of measurement equipme Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	3 18 10.5 15	GHz GHz GHz kHz kHz	
Correction: Directional coupler Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor (10k -> 4k) Atten. between HPA and feedho (U332) TOTAL CORRECTION: Remarks: Carrier-on state / Carrier at the le For EIRP calculation: 'worst-case' = maximum antenn Since the measurement was up corrected value of the marker is	rm - + + cower edge of a gain	2.3 1.4 0.0 4.0 0.0 34.0 33.7	dB dBi dB dB dB dB

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Plot No. 62



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-1000 of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R5T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

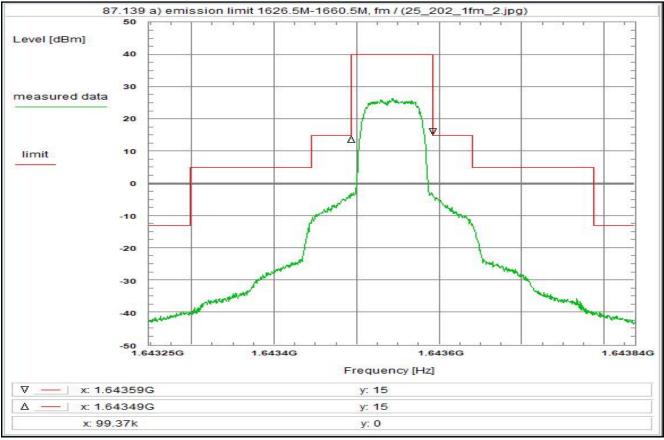
Remark:

Test result: Test passed

Environment condition: Date & Time: Fri 18/Aug/2023 14:53:30 Location: CTC advanced GmbH, Laboratory RC-SYS °C Temperature: 22 Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64337725 GHz Start frequency: 1.64366525 Stop frequency: GHz Center frequency: 1.64352125 GHz Frequency span: Resolution-BW: 288 kHz kHz 3 Video-BW: Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) dBi Test antenna 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 63



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R5T2XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: R001

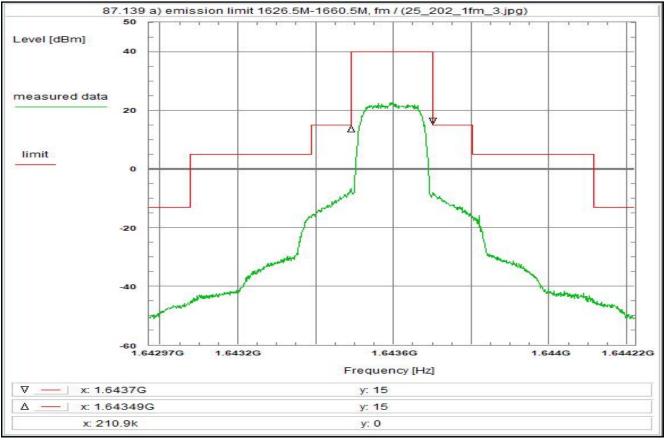
Remark:

Test result: Test passed

Environment condition:			
Date & Time:	Fri 18/Aug/2023	14:57	:39
Location:			, Laboratory RC-SYS
Temperature:	22		, ,
Humidity:	55	%	
Voltage:		Vac	
Volley I	*		
Setup of measurement e			
Start frequency:	1.64324825		
Stop frequency:	1.64383625		
Center frequency:	1.64354225		
Frequency span:	588		
Resolution-BW:	3		
Video-BW:	10		
Input attenuation:	20		
Trace-Mode:	Max-Hold		
Detector-Mode:	AVG		
Correction:			
Directional coupler	+		
Coaxial cable (C220)	+	0.0	
DUT-Antenna (on-axis)	+		 -
Test antenna	+	0.0	
BW correction factor (3k			
Atten. between HPA and			
(U330)	+	0	
TOTAL CORRECTION:	+	35.4	dB
D. Sadas			
Remarks:	1 - 10		1.75
Carrier-on state / Carrier	in the middle of th	e panu	1 (tm)
Reference of limit = 40 dl	D		
Spectrum mask reference		andwid	lth
Specifulli mask reference	30 10 Hecessary De	lluwiu	lui
ĺ			
1			



Plot No. 64



Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R5T4.5XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

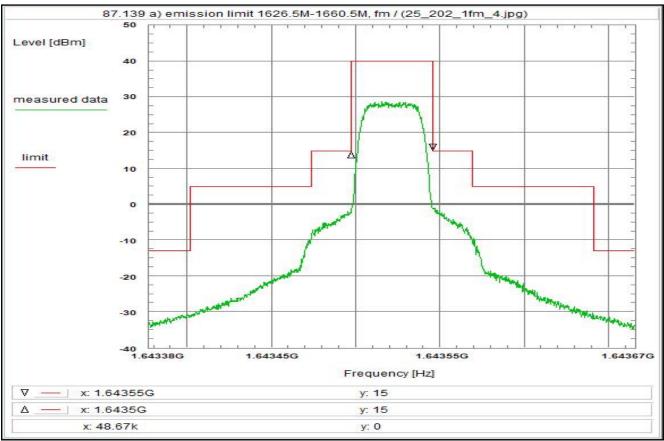
Remark:

Test result: Test passed

Environment condition:	-: 4044 10000		
Date & Time:	Fri 18/Aug/2023		
Location:			, Laboratory RC-SYS
Temperature:	22 55	°C %	
Humidity:		% Vac	
Voltage:	230	vac	
Setup of measurement e	auipment:		
Start frequency:	1.642971	GHz	
Stop frequency:	1.644219		
Center frequency:	1.643595		
Frequency span:	1.248	MHz	
Resolution-BW:	3	kHz	
Video-BW:	10	kHz	
Input attenuation:	20	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	AVG		
Correction:			
Directional coupler	+	0.0	dB
Coaxial cable (C220)	+		
DUT-Antenna (on-axis)	+		
Test antenna			
BW correction factor (3k			
Atten, between HPA and			
(U330)	+		
TOTAL CORRECTION:	+	35.4	dB
Remarks:			
Carrier-on state / Carrier	in the middle of the	e band	I (fm)
Reference of limit = 40 dl	D		
Spectrum mask reference		ndwidt	th
opodi dili ilidak referenci	ou to riccossury bu	iiiawiai	ui



Plot No. 65



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R20T1XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

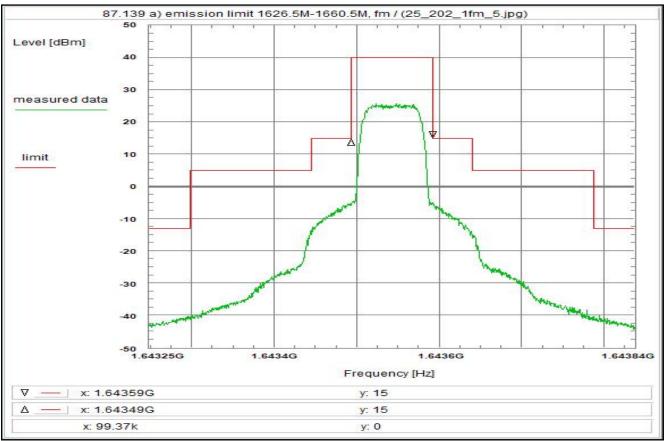
Remark:

Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:04:28 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64337725 GHz Start frequency: 1.64366525 Stop frequency: GHz Center frequency: 1.64352125 GHz Frequency span: Resolution-BW: 288 kHz kHz 3 Video-BW: Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 66



Subclause:

87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log/Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

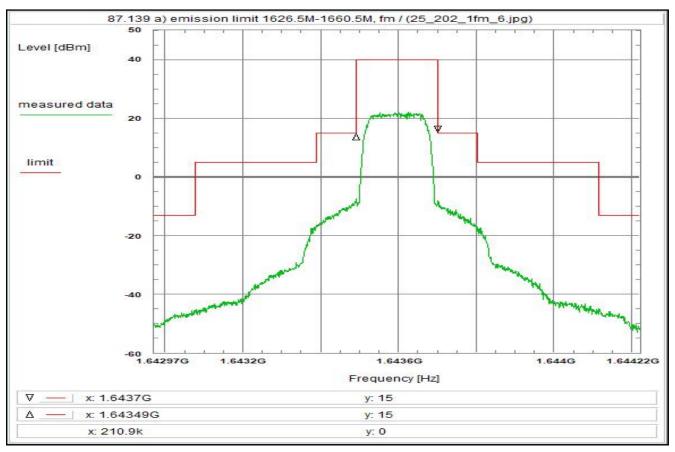
Remark:

Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:07:20 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64324825 GHz Start frequency: 1.64383625 Stop frequency: GHz Center frequency: 1.64354225 GHz Frequency span: Resolution-BW: 588 kHz kHz 3 Video-BW: Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 67

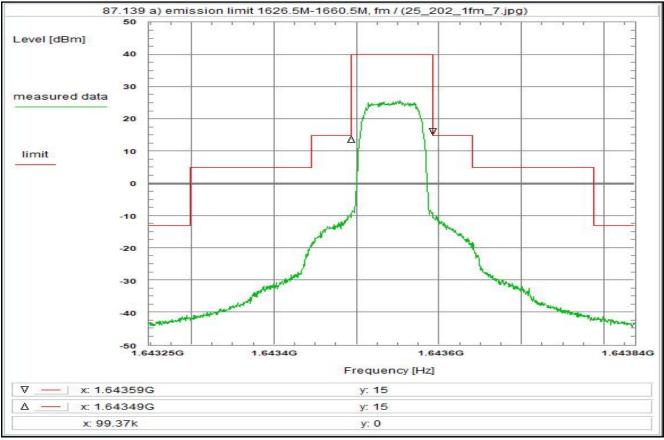


Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 87.139 a): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R20T4.5XD see test report chapter 7.2: see test report chapter 7.1-7.2: C220, R001, U330 Remark: Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:10:17 Location: CTC advanced GmbH, Laboratory RC-SYS °C Temperature: 22 Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.642971 GHz Start frequency: 1.644219 GHz Stop frequency: Center frequency: 1.643595 GHz Frequency span: Resolution-BW: 1.248 MHz kHz Video-BW: 10 Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 68



Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

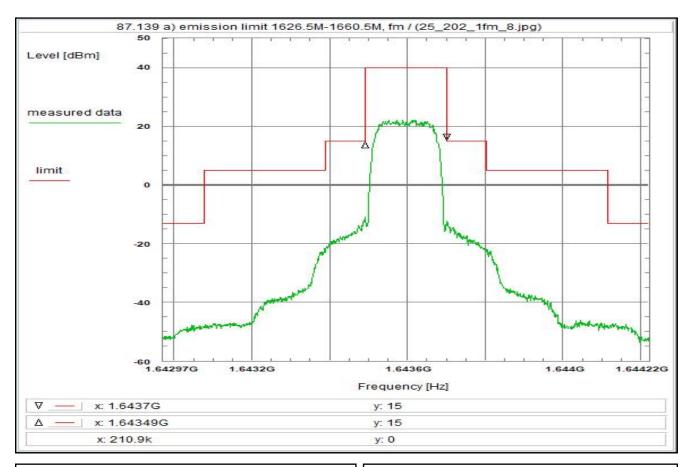
Test result: Test passed

Environment condition: Date & Time: Fri 18/Aug/2023 15:13:51 Location: CTC advanced GmbH, Laboratory RC-SYS °C Temperature: 22 Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.6432485 GHz Start frequency: 1.6438365 Stop frequency: GHz Center frequency: 1.6435425 GHz Frequency span: Resolution-BW: 588 kHz kHz 3 Video-BW: Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth

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Plot No. 69



Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit according to 87.139 a): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R5T4.5QD

see test report chapter 7.2:

see test report chapter 7.1-7.2: C220, R001, U330

Remark:

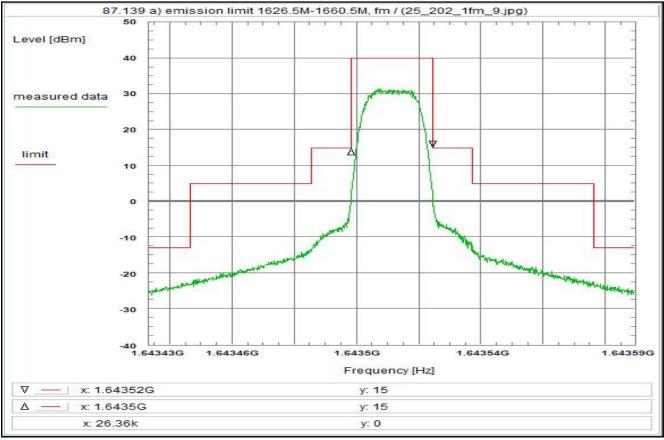
Test result: Test passed

	22 55	GmbH,	:48 Laboratory RC-SYS
Setup of measurement equ	inment		
Start frequency:	1.642971	GHz	
Stop frequency:	1.644219	GHz	
Center frequency:	1.643595	GHz	
Frequency span:	1.248	MHz	
Resolution-BW:	3	kHz	
Video-BW:	10	kHz	
Input attenuation:	20	dB	
Trace-Mode:	Max-Hold		
Detector-Mode:	AVG		
Correction: Directional coupler Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna	+ + + +	1.4	dB dBi dB
BW correction factor (3k ->			
Atten. between HPA and fe		0.0	-
(U330)	+	00	-
TOTAL CORRECTION:	+	35.4	αB
Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth			

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Plot No. 70

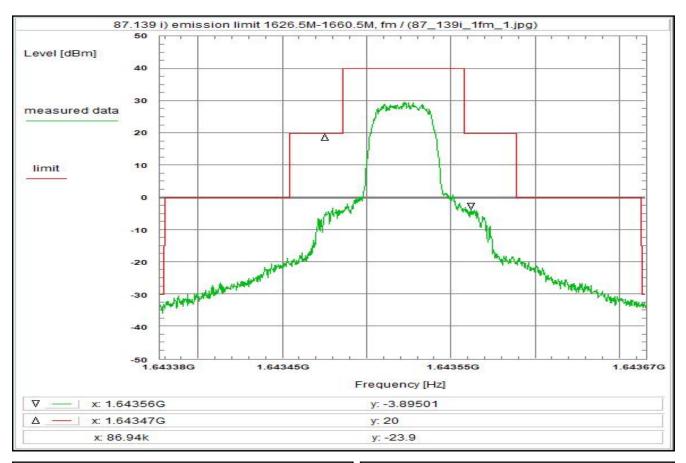


Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 87.139 a): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R20T0.5QD see test report chapter 7.2: see test report chapter 7.1-7.2: C220, R001, U330 Remark: Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:20:37 Location: CTC advanced GmbH, Laboratory RC-SYS °C Temperature: 22 Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64343325 GHz Start frequency: 1.64358925 GHz Stop frequency: Center frequency: 1.64351125 GHz Frequency span: Resolution-BW: 156 kHz kHz 3 Video-BW: 10 Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.9 dB 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhom - 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 71



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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

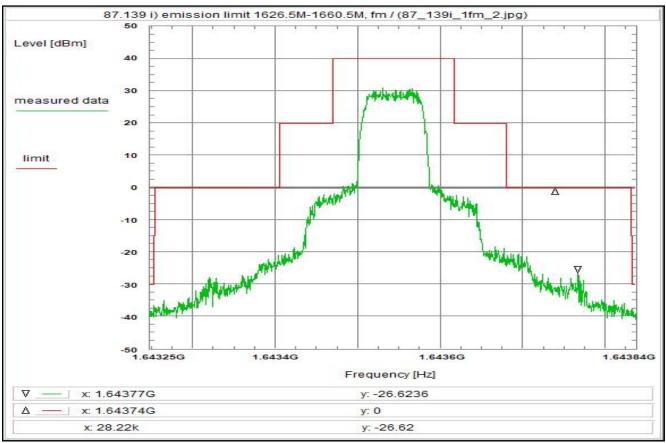
Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 14:54:36 Location: CTC advanced GmbH, Laboratory RC-SYS °C Temperature: 22 Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64337725 GHz Start frequency: 1.64366525 GHz Stop frequency: Center frequency: 1.64352125 GHz Frequency span: Resolution-BW: 288 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Trace-Mode: Average AVG Detector-Mode: Correction: Directional coupler + 0.0 dB + 0.9 dB + 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn + 1.2 dB - 0.0 dB + 31.9 dB + 35.4 dB (U330) TOTAL CORRECTION: Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth

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Plot No. 72



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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

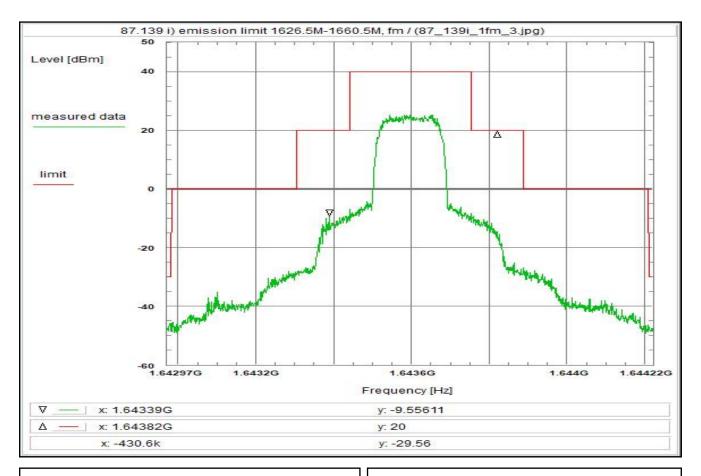
Remark:

Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 14:58:39 Location: CTC advanced GmbH, Laboratory RC-SYS °C Temperature: 22 Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64324825 GHz Start frequency: 1.64383625 GHz Stop frequency: Center frequency: 1.64354225 GHz Frequency span: Resolution-BW: 588 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) Test antenna 0.0 dB BW correction factor (3k -> 4k) 1.2 dB Atten. between HPA and feedhorn 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 73



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R5T4.5XD

see test report chapter 7.2:

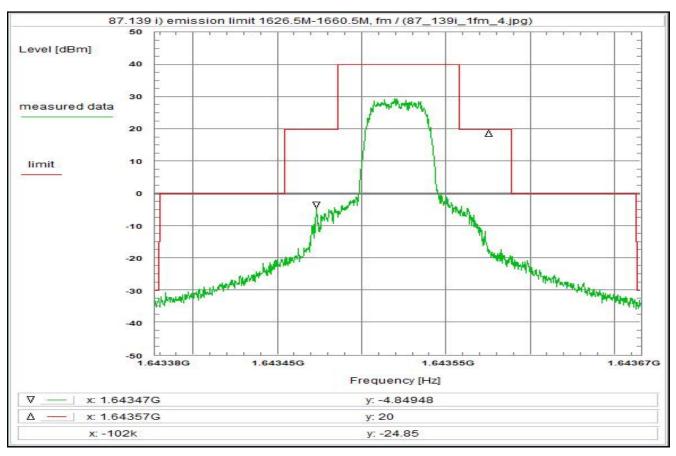
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Environment condition: Date & Time: Fri 18/Aug/2023 Location: CTC advanced CT	GmbH, Laboratory RC-SYS °C %	
Setup of measurement equipment: Start frequency: 1.642971 Stop frequency: 1.644219 Center frequency: 1.643595 Frequency span: 1.248 Resolution-BW: 3 Video-BW: 300 Input attenuation: 20 Trace-Mode: Max-Hold Detector-Mode: AVG	GHz GHz MHz kHz Hz	
Correction: Directional coupler + Coaxial cable (C220) + DUT-Antenna (on-axis) + Test antenna + BW correction factor (3k -> 4k) + Atten. between HPA and feedhom (U330) + TOTAL CORRECTION: +	0.9 dB 1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB	
Remarks: Carrier-on state / Carrier in the middle of the For EIRP calculation: 'worst-case' = maximum antenna gain	e band (fm)	
Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth		



Plot No. 74



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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R20T1XD

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

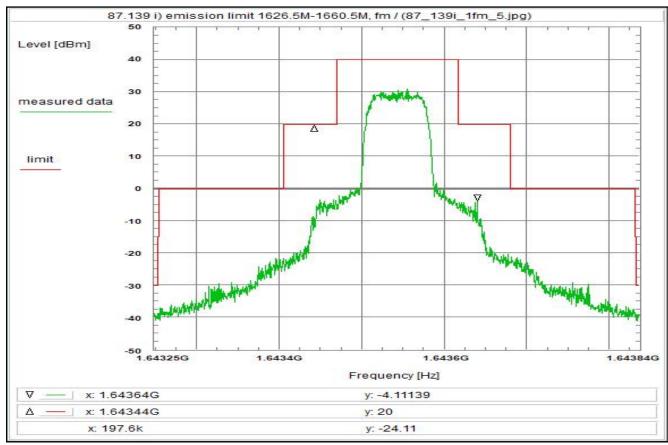
Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:05:17 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64337725 GHz Start frequency: 1.64366525 GHz Stop frequency: Center frequency: 1.64352125 GHz Frequency span: Resolution-BW: 288 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Trace-Mode: Average AVG Detector-Mode: Correction: Directional coupler + 0.0 dB + 0.9 dB + 1.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn + 1.2 dB - 0.0 dB + 31.9 dB + 35.4 dB (U330) TOTAL CORRECTION: Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth

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Plot No. 75



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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

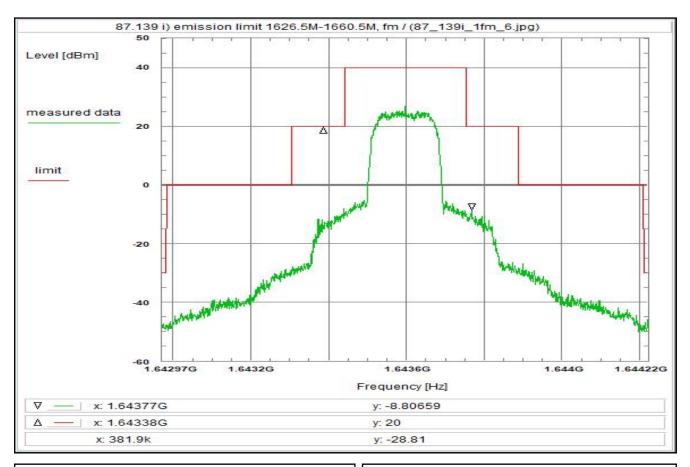
Remark:

Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:08:08 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.64324825 GHz Start frequency: 1.64383625 GHz Stop frequency: Center frequency: 1.64354225 GHz Frequency span: Resolution-BW: 588 kHz 3 kHz Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) Test antenna 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhom 1.2 dB - 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 76



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) <u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated

below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R20T4.5XD

see test report chapter 7.2:

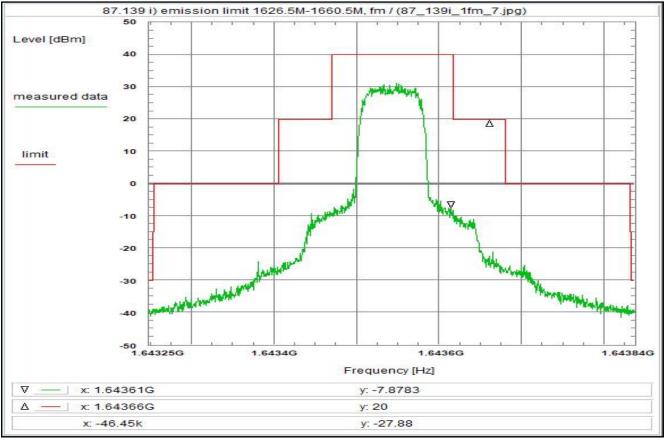
see test report chapter 7.1-7.2: R001

Remark:

Environment condition: Date & Time: Location:	Fri 18/Aug/2023 CTC advanced (:01 . Laboratory RC-SYS	
Temperature:	22		, Laboratory o o . o	
Humidity:	55			
Voltage:		Vac		
voltago.		*		
Setup of measurement ed	quipment:			
Start frequency:	1.642971	GHz		
Stop frequency:	1.644219	GHz		
Center frequency:	1.643595			
Frequency span:	1.248	MHz	1	
Resolution-BW:	3	kHz		
Video-BW:	300	Hz		
Input attenuation:	20	dB		
Trace-Mode:	Max-Hold			
Detector-Mode:	AVG			
0				
Correction:		0.0	10	
Directional coupler	+			
Coaxial cable (C220)	+			
DUT-Antenna (on-axis)	+			
Test antenna	+ -> 4k) +			
BW correction factor (3k -				
Atten. between HPA and				
(U330) TOTAL CORRECTION:	+			
TOTAL CURRECTION.	+	35.4	GR	
Remarks: Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: 'worst-case' = maximum antenna gain				
Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth				



Plot No. 77



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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

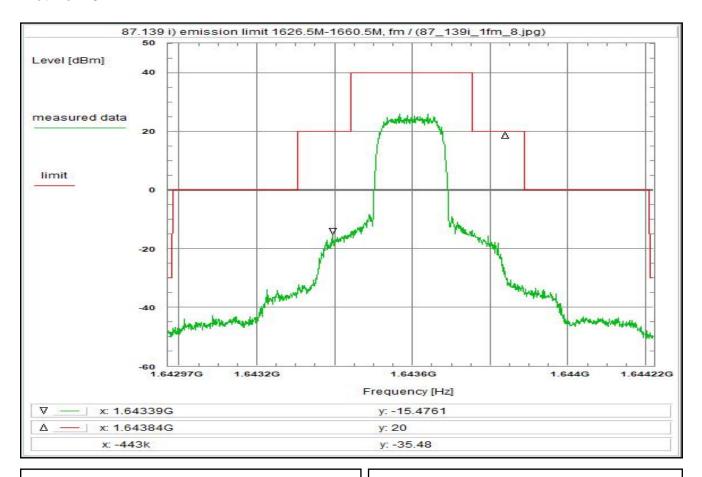
Remark:

Test result: Test passed

Environment condition:
Date & Time: Fri 18/Aug/2023 15:14:50 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.6432485 GHz Start frequency: 1.6438365 GHz Stop frequency: Center frequency: 1.6435425 GHz Frequency span: Resolution-BW: 588 kHz kHz Video-BW: 300 Input attenuation: 20 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 0.9 dB 1.4 dBi DUT-Antenna (on-axis) dBi 0.0 dB BW correction factor (3k -> 4k)
Atten. between HPA and feedhorn 1.2 dB 0.0 dB (U330) 31.9 dB TOTAL CORRECTION: 35.4 dB Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: worst-case' = maximum antenna gain Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth



Plot No. 78



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations

Modulated rf-carrier in the middle of the band (fm)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R5T4.5QD

see test report chapter 7.2:

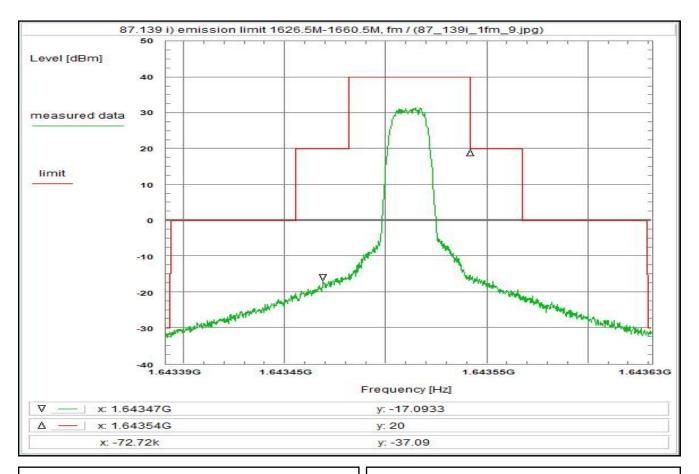
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Temperature: 22 Humidity: 55	GmbH, Laboratory RC-SYS °C		
Setup of measurement equipment: Start frequency: 1.642971 Stop frequency: 1.64219 Center frequency: 1.643595 Frequency span: 1.248 Resolution-BW: 3 Video-BW: 300 Input attenuation: 20 Trace-Mode: Max-Hold Detector-Mode: AVG	GHz GHz MHz kHz Hz		
Correction: Directional coupler	0.9 dB 1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB		
Remarks: Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: 'worst-case' = maximum antenna gain			
Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth			



Plot No. 79



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated

below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, R20T0.5QD

see test report chapter 7.2:

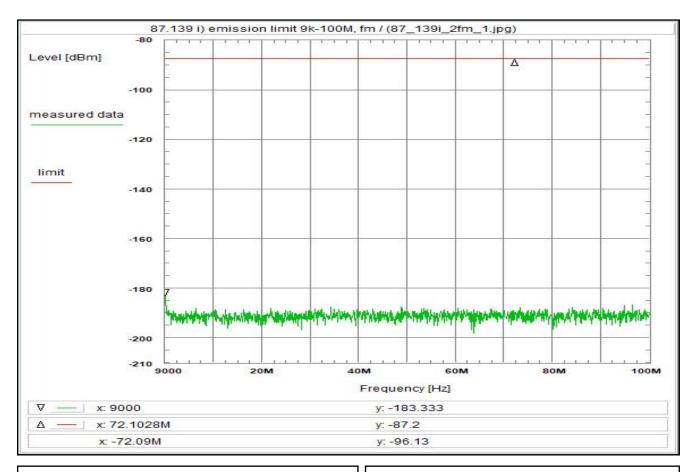
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Temperature: Humidity:		GmbH, Laboratory RC-SYS °C %	
Resolution-BW: Video-BW: 3 Input attenuation: Trace-Mode: Avera	125 125 240 3 300 20	GHz GHz KHz kHz dB	
Correction: Directional coupler Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor (3k -> 4k) Atten. between HPA and feedhom (U330) TOTAL CORRECTION:	+ + + + + + +	0.9 dB 1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.9 dB	
Remarks: Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: 'worst-case' = maximum antenna gain			
Reference of limit = 40 dBm Spectrum mask referenced to necessary bandwidth			



Plot No. 80



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, max hold, valid for all modulations

see test report chapter 7.2:

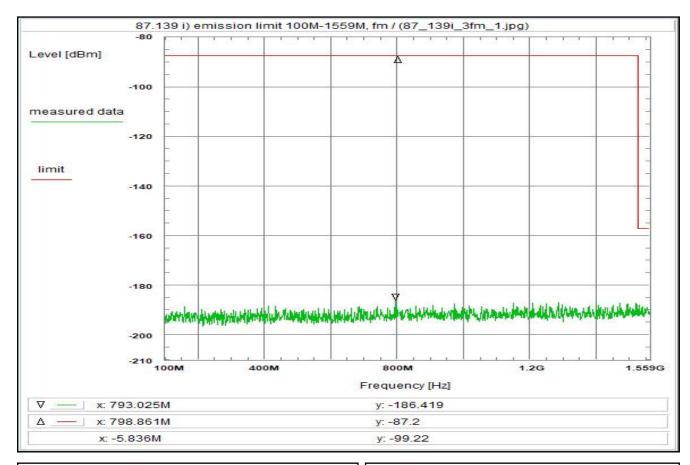
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Environment condition: Wed 23/Aug/202 Date & Time: CTC advanced Location: CTC advanced Temperature: 22 Humidity: 55 Voltage: 230	GmbH, Laboratory RC-SYS °C %		
Setup of measurement equipment: Start frequency: 9 Stop frequency: 50.0045 Frequency span: 99.991 Resolution-BW: 3 Video-BW: 10 Input attenuation: 20 Trace-Mode: Max-Hold Detector-Mode: AVG	MHz MHz MHz KHz kHz		
Correction: (W, RE) - Coaxial cable (C220) + DUT-Antenna (on-axis) + Test antenna + BW correction factor (3k -> 4k) + Atten. between HPA and feedhom - (U330) + TOTAL CORRECTION: - Remarks: Carrier-on state / Carrier in the middle of the For EIRP calculation:	1.4 dBi 0.0 dB 1.2 dB 0.0 dB 31.3 dB -85.9 dB		
'worst-case' = maximum antenna gain Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -179.5 dBm			



Plot No. 81



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm)

<u>Limit:</u>
<u>Limit according to 87.139(i)(1)</u>
The mean power of emissions shall be attenuated

below the mean output power of the transmitter in accordance with 87.139(i)(1).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, max hold, valid for all modulations

see test report chapter 7.2:

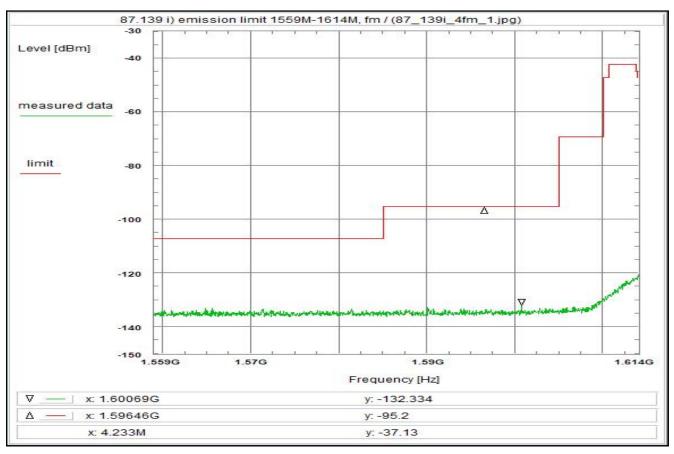
see test report chapter 7.1-7.2: R001, U330

Remark:

Environment condition:		
Date & Time: Wed 2	23/Aug/202	23 09:34:02
Location: CTC a	advanced (GmbH, Laboratory RC-SYS
Temperature:	22	
Humidity:	55	%
Voltage:	230	Vac
l stage		
Setup of measurement equipmer	nt:	
Start frequency:	100	MHz
Stop frequency:	1.559	GHz
Center frequency:	829.5	MHz
Frequency span:	1.459	GHz
Resolution-BW:	3	
Video-BW:	10	····
Input attenuation:	20	dB
	Max-Hold	GD .
Detector-Mode:	AVG	
201001212221		
Correction:		
(W RE)	_	115.7 dB
Coaxial cable	+	2.271.72
DUT-Antenna (on-axis)	+	171 TE.
Test antenna	+	
BW correction factor (3k -> 4k)	+	
Atten. between HPA and feedhor		
(U330)	+	
TOTAL CORRECTION:	-	-80.8 dB
TOTAL CONTILLOTION.		-00.0 dB
Remarks:		
Carrier-on state / Carrier in the m	iddle of the	e hand (fm)
For EIRP calculation:		s sana (m)
'worst-case' = maximum antenna	a gain	
World ddoo maamamamamamama	a guii.	
Since the measurement was upo	dated with t	the maximum antenna gain, which is 5.23 dBic, the
corrected value of the marker is -		
Controlled Value 21 212 112 112 112	.02.0	•



Plot No. 82



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).

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4 fm, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

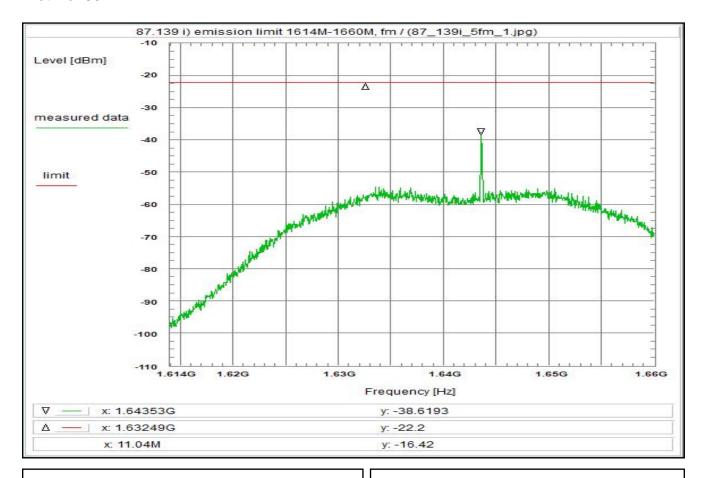
Test result: Test passed

Environment condition:
Date & Time: Wed 23/Aug/2023 11:28:33 Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: Voltage: 230 Vac Setup of measurement equipment: 1.559 GHz Start frequency: 1.614 GHz Stop frequency: Center frequency: 1.5865 GHz Frequency span: Resolution-BW: 55 MHz MHz Video-BW: MHz Input attenuation: 20 dB Trace-Mode: Max-Hold Detector-Mode: Correction: (W_RE) 104.1 dB Coaxial cable (C220) + 0.9 dB + 1.4 dBi DUT-Antenna (on-axis) Test antenna BW correction factor Atten. between HPA and feedhorn 0.0 dB 0.0 dB (U331) 32.6 dB TOTAL CORRECTION: -69.2 dB Carrier-on state / Carrier in the middle of the band (fm) For EIRP calculation: 'worst-case' = maximum antenna gain Since the measurement was updated with the maximum antenna gain, which is $5.23\ \mathrm{dBic}$, the corrected value of the marker is -128.5 dBm

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Plot No. 83



Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations Emission limitations

Modulated rf-carrier in the middle of the band (fm)

<u>Limit:</u>
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).

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

Operating condition of DUT: operating condition 1, see test report chapter 6.4 fm, max hold, valid for all modulations

see test report chapter 7.2:

see test report chapter 7.1-7.2: C220, R001, U331

Remark:

	Wed 23/Aug/202 CTC advanced 0 22 55 230	SmbH, °C %	5:53 Laboratory RC-SYS	
Setup of measurement equ Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	1.614	GHz GHz GHz MHz kHz kHz dB		
Correction: (W_RE) Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor (3k -> Atten. between HPA and fe (U331) TOTAL CORRECTION: Remarks: Carrier-on state / Carrier in	edhom - + +	1.4 0.0 1.2 0.0 74.2 29.9	dB dBi dB dB dB dB	
For EIRP calculation: 'worst-case' = maximum antenna gain Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -34.8 dBm				