



Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140461
Test Spec
Horiz

Final Measurement

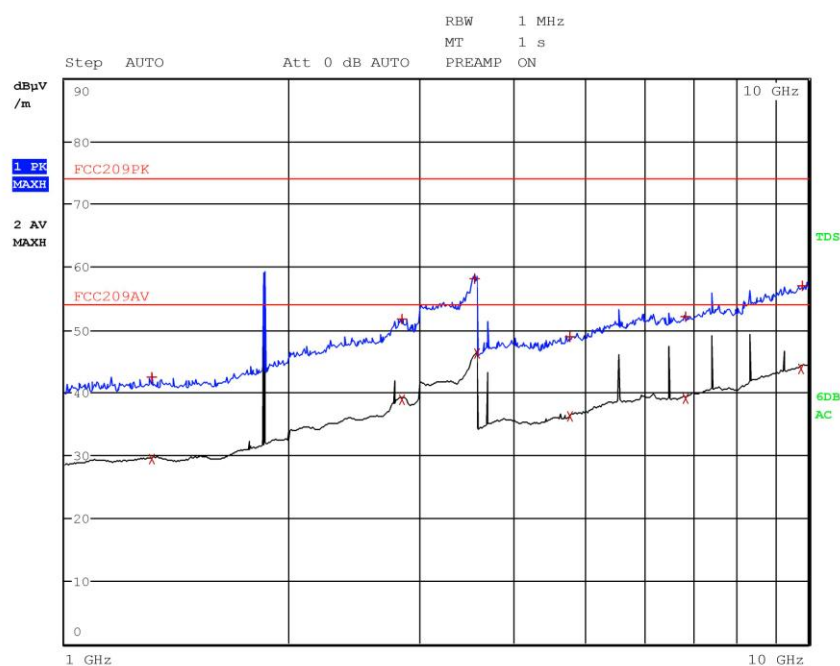
Meas Time: 1 s
Margin: 6 dB
Subranges: 12

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
2	1.316000000 GHz	29.31	Average	-24.69
1	1.316000000 GHz	42.18	Max Peak	-31.82
1	2.837200000 GHz	52.32	Max Peak	-21.68
2	2.843600000 GHz	38.85	Average	-15.15
1	3.580400000 GHz	58.34	Max Peak	-15.66
2	3.592800000 GHz	46.09	Average	-7.91
1	4.540000000 GHz	48.75	Max Peak	-25.25
2	4.540000000 GHz	35.93	Average	-18.07
2	6.978000000 GHz	39.52	Average	-14.48
1	7.000800000 GHz	52.10	Max Peak	-21.90
1	9.329200000 GHz	55.90	Max Peak	-18.10
2	9.392400000 GHz	43.25	Average	-10.75



G15140462

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzo 15140462
Test Spec
Vert





Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140462
Test Spec
Vert

Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 12

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
2	1.309600000 GHz	29.34	Average	-24.66
1	1.310400000 GHz	42.54	Max Peak	-31.46
1	2.839600000 GHz	51.78	Max Peak	-22.22
2	2.846000000 GHz	38.84	Average	-15.16
1	3.560800000 GHz	58.22	Max Peak	-15.78
2	3.600000000 GHz	46.26	Average	-7.74
2	4.776000000 GHz	36.15	Average	-17.85
1	4.783600000 GHz	48.89	Max Peak	-25.11
1	6.847200000 GHz	52.03	Max Peak	-21.97
2	6.848000000 GHz	39.01	Average	-14.99
2	9.790000000 GHz	43.78	Average	-10.22
1	9.833200000 GHz	57.04	Max Peak	-16.96

Result: The requirements are met



11.4 DTS bandwidth

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 8.1
- Internal procedure PM001
- See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test specification

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	45

Test configuration

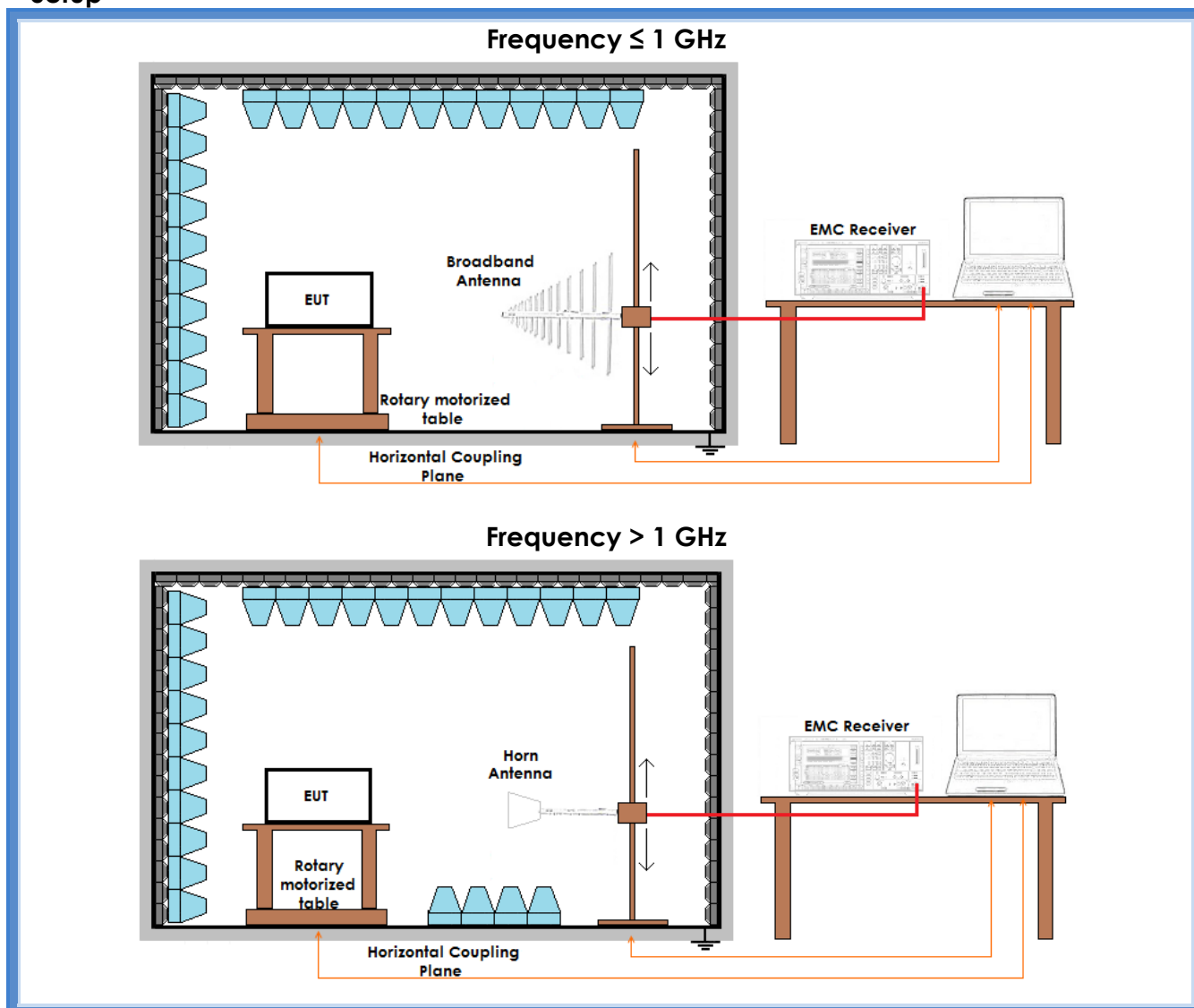
Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Setup



Result

Integrated antenna				
Channel	Graphs	6 dB bandwidth (kHz)	Limits (kHz)	Results
Lowest	G15140401	564,102	At least 500	Complies
Medium	G15140407	567,307	At least 500	Complies
Highest	G15140420	556,089	At least 500	Complies



External antenna				
Channel	Graphs	6 dB bandwidth (kHz)	Limits (kHz)	Results
Lowest	G15140437	565,704	At least 500	Complies
Medium	G15140446	565,704	At least 500	Complies
Highest	G15140429	554,487	At least 500	Complies

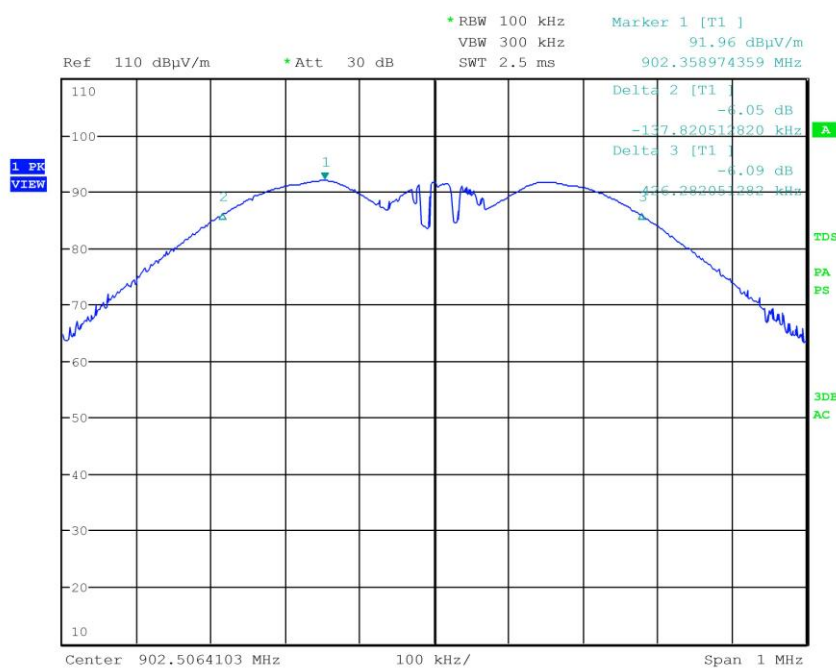




Graphs

G15140401

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzo 15140401
Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140407

Meas Type

Equipment under Test

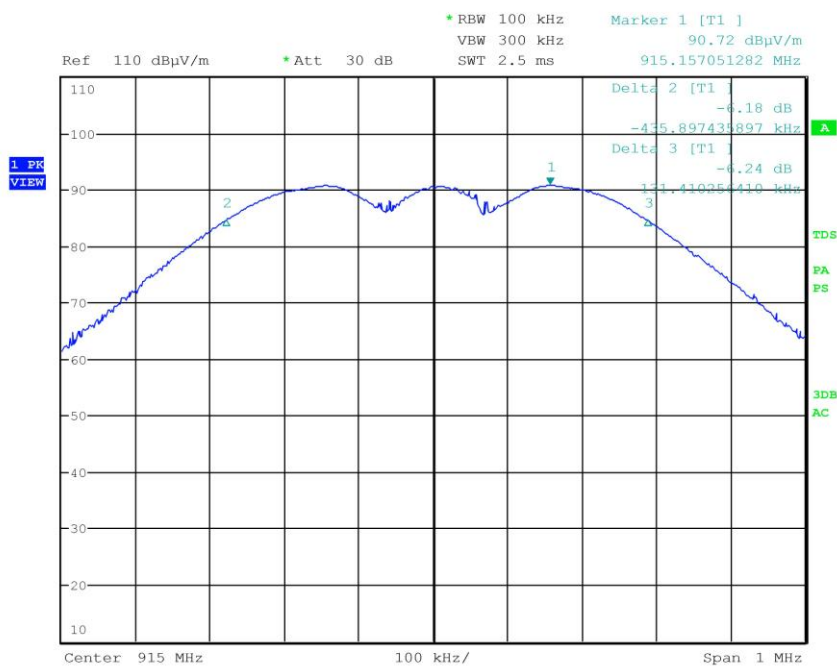
Manufacturer

OP Condition

Operator

Bertezzo 15140407

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140420

Meas Type

Equipment under Test

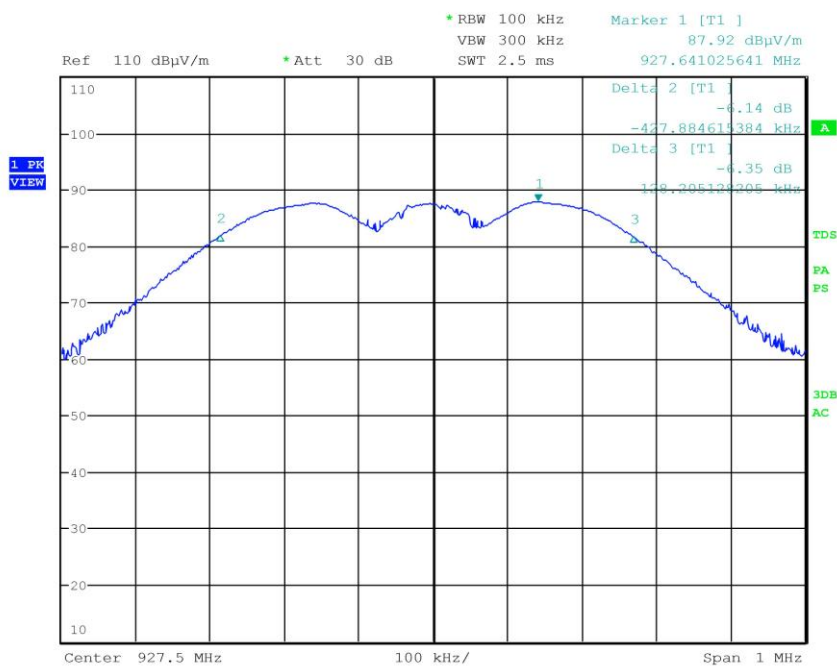
Manufacturer

OP Condition

Operator

Bertezzo 15140420

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140429

Meas Type

Equipment under Test

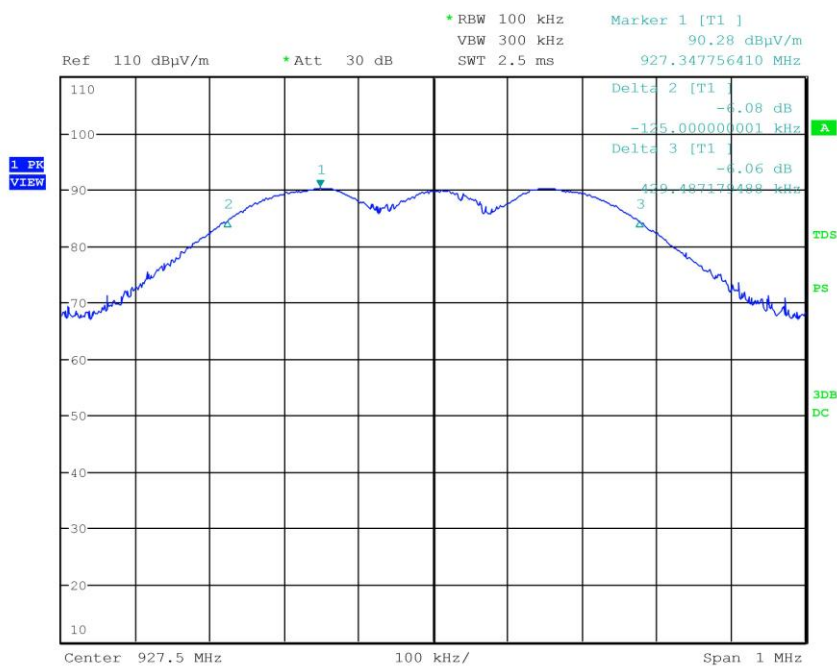
Manufacturer

OP Condition

Operator

Bertezzo 15140429

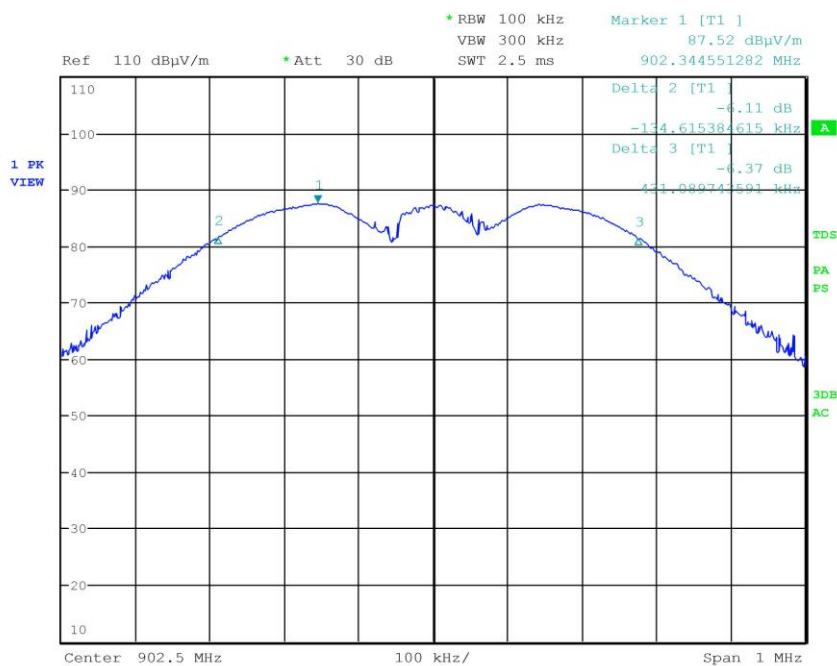
Test Spec





G15140437

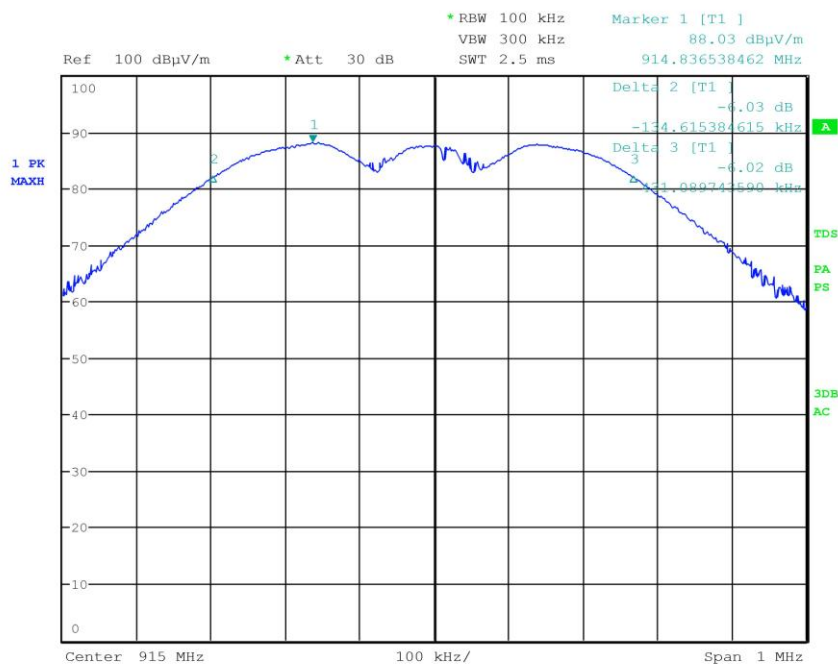
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140437
Test Spec





G15140446

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140446
Test Spec



Result: The requirements are met



11.5 Band edge

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247 (d)
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 11.1(a) and 12.1
- Internal procedure PM001
- See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
21	100	45

Acceptance limits: operation within the band 902 – 928 MHz

Test configuration

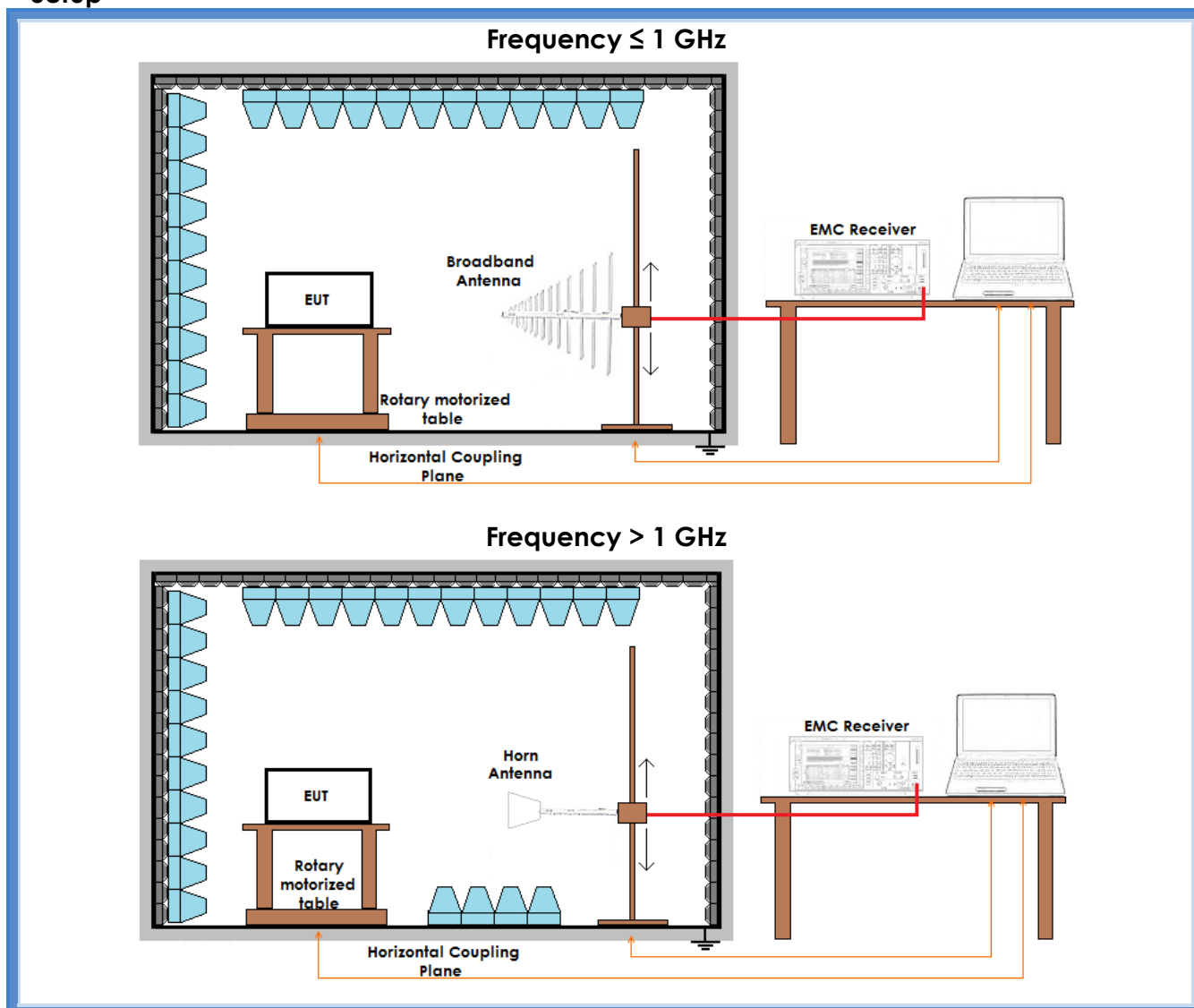
Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Setup



Result

Integrated antenna				
Channel	Bandwidth	Graph(s)	Results	
Lowest	100 kHz	G15140419	902,075721 MHz	Complies
Highest	100 kHz	G15140426	927,913060 MHz	Complies

External antenna				
Channel	Bandwidth	Graph(s)	Results	
Lowest	100 kHz	G15140442	902,075721 MHz	Complies
Highest	100 kHz	G15140435	927,907451 MHz	Complies



Graphs

G15140419

Meas Type

Equipment under Test

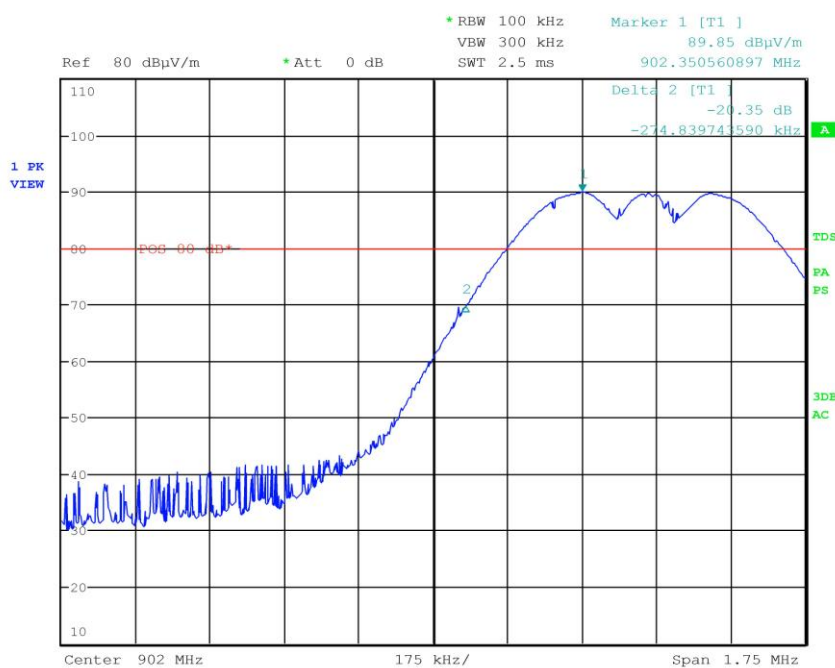
Manufacturer

OP Condition

Operator

Bertezzo 15140419

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140426

Meas Type

Equipment under Test

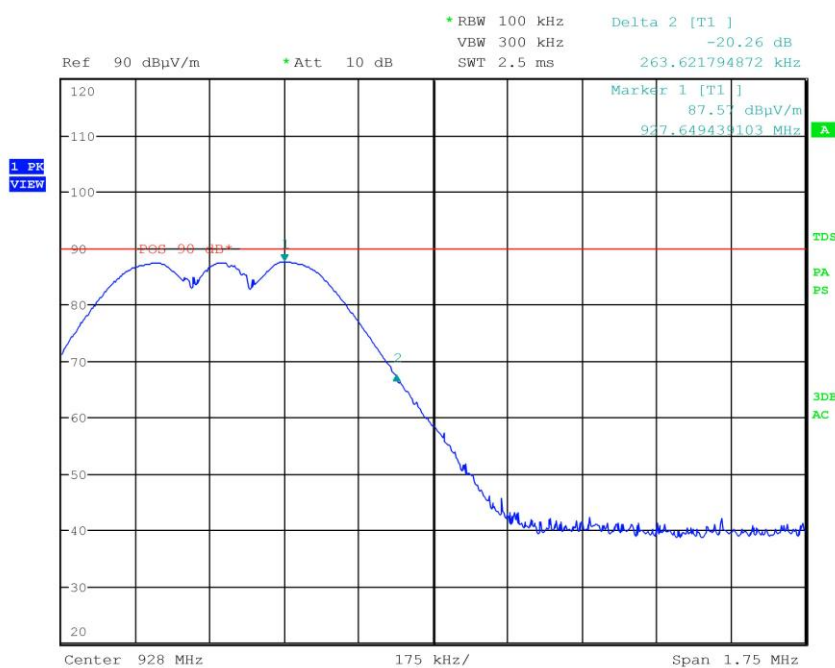
Manufacturer

OP Condition

Operator

Bertezzo 15140426

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140435

Meas Type

Equipment under Test

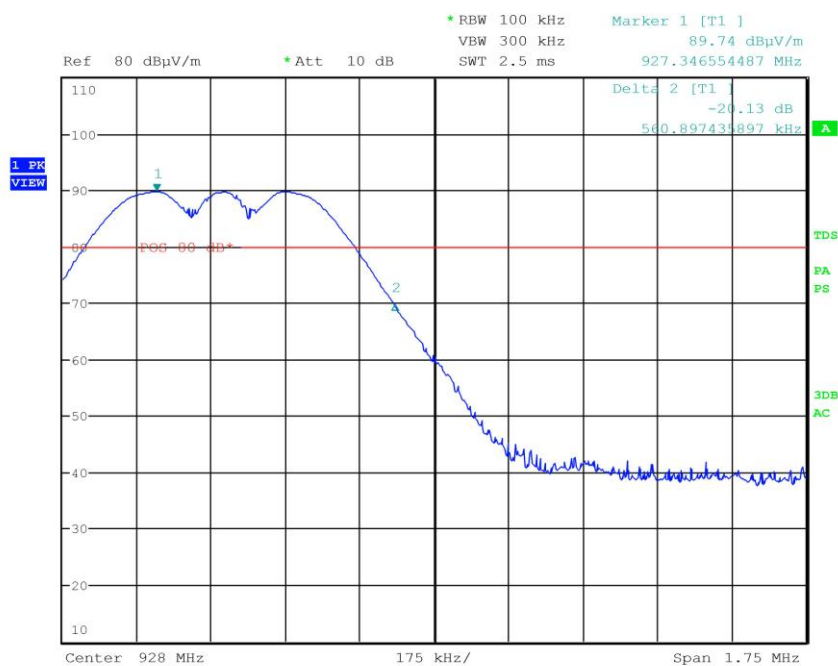
Manufacturer

OP Condition

Operator

Bertezzo 15140435

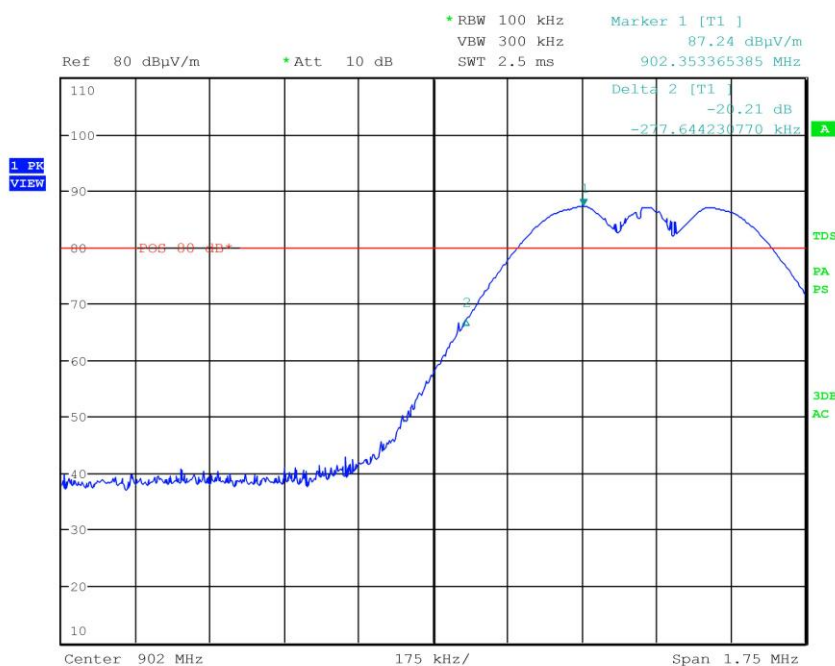
Test Spec





G15140442

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140442
Test Spec



Result: The requirements are met



11.6 Fundamental emission output power

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 3.0 and 9
- Internal procedure PM001
- See clause 4 of this test report

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure (conducted measurements are not applicable because the antenna connector is not available, see also cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r02)
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 10 m
EUT height about the floor: 80 cm

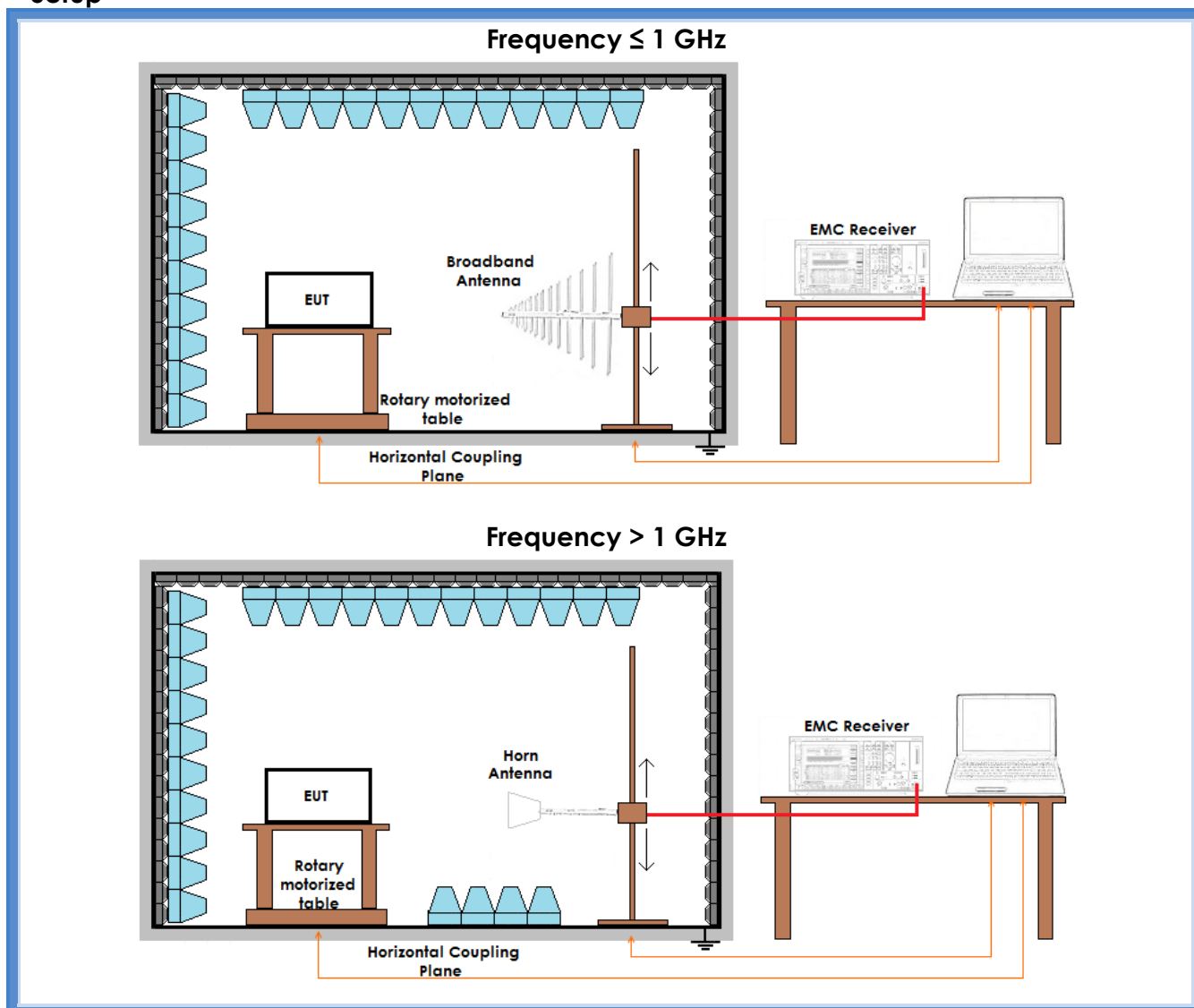
Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	42

Acceptance limits:

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt

Setup





Result

Integrated antenna					
Channel	Polarization	Graphs	Measured PK level (dBμV/m)	Peak Output Conducted Power (mW)	Remarks
Lowest	Worst case	G15140402	92,36	2,75	--
Medium	Worst case	G15140408	91,19	2,10	--
Highest	Worst case	G15140422	88,47	1,12	--

External antenna					
Channel	Polarization	Graphs	Measured PK level (dBμV/m)	Peak Output Conducted Power (mW)	Remarks
Lowest	Worst case	G15140438	88,25	1,07	--
Medium	Worst case	G15140447	88,71	1,19	--
Highest	Worst case	G15140431	90,46	1,77	--

Remarks: the above table shows the results of radiated measurements, in agreement with cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r03.
Conducted measurements are not applicable because the antenna connector is not available.
The following formula, provided in document DA 00-705, has been used for the conversion between radiated to conducted values:

$$\text{Conducted value} = (E \times d)^2 / (30 \times G)$$

Where:

E = $(10^{(\text{dB}\mu\text{V}/\text{m})/20})/1000000$, the maximum measured fundamental field strength in V/m

G = $10^{\text{dBi}/10}$, the numeric gain of the transmitting antenna: 2,09 (3,2 dBi)

d = the distance in meters from which the field strength was measured (10 m)

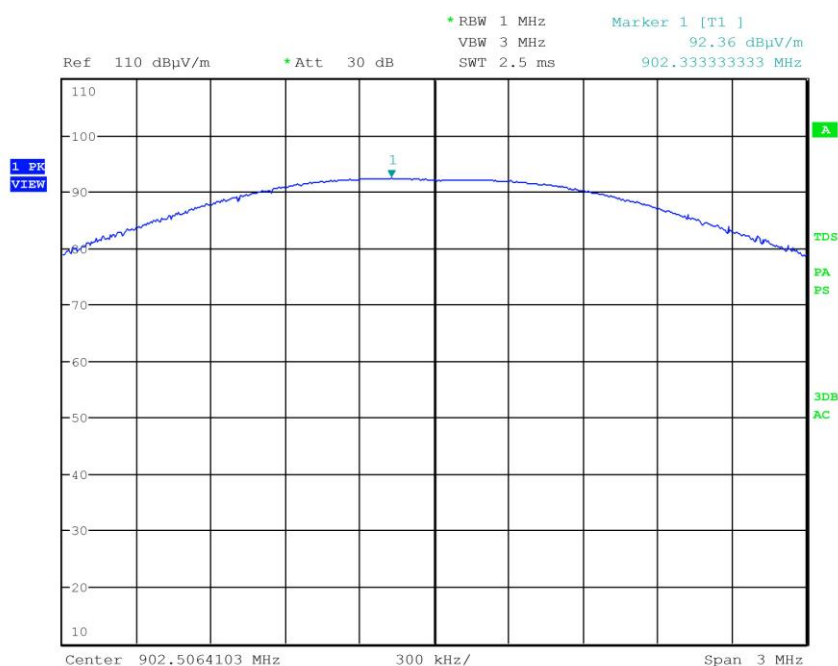
P = the power in watts



Graphs

G15140402

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzo 15140402
Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140408

Meas Type

Equipment under Test

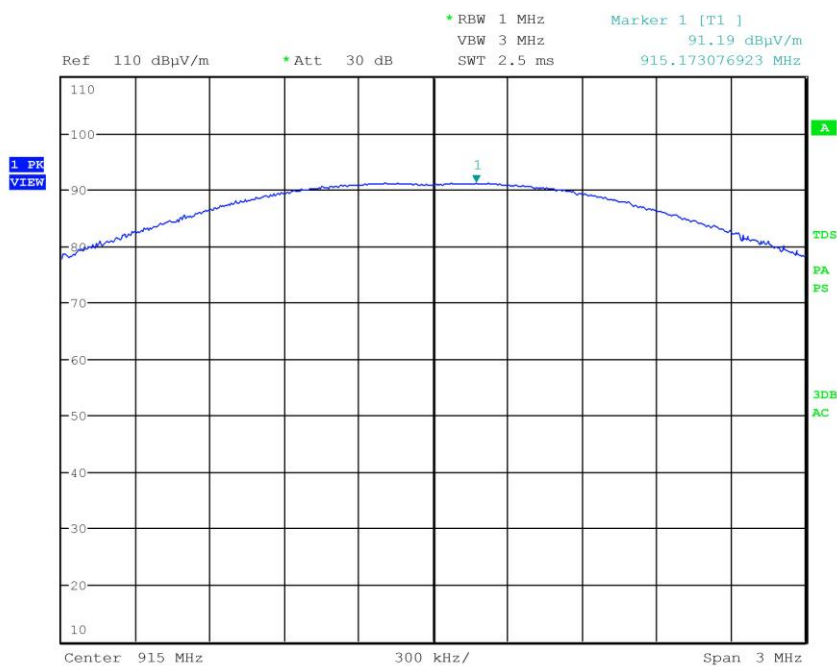
Manufacturer

OP Condition

Operator

Bertezzo 15140408

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140422

Meas Type

Equipment under Test

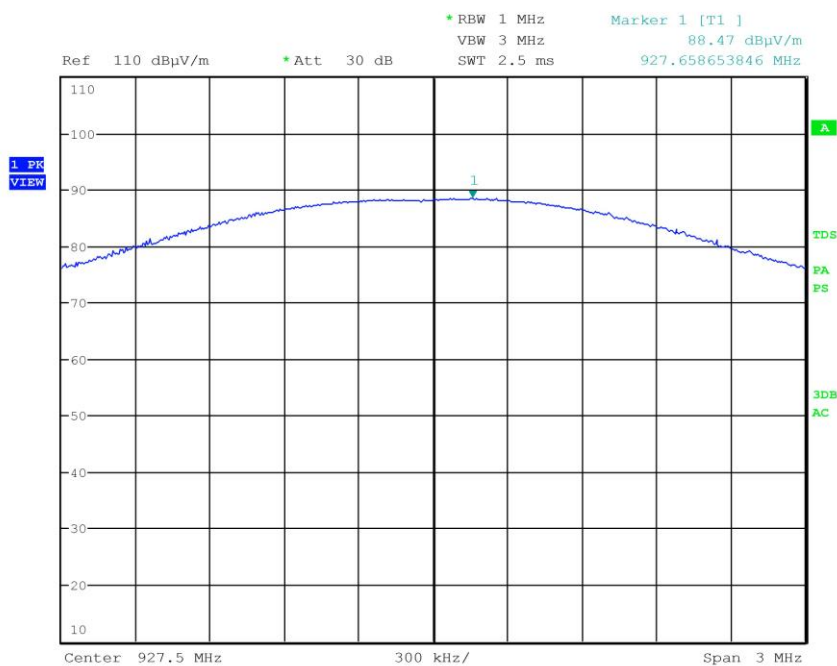
Manufacturer

OP Condition

Operator

Bertezzo 15140422

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140431

Meas Type

Equipment under Test

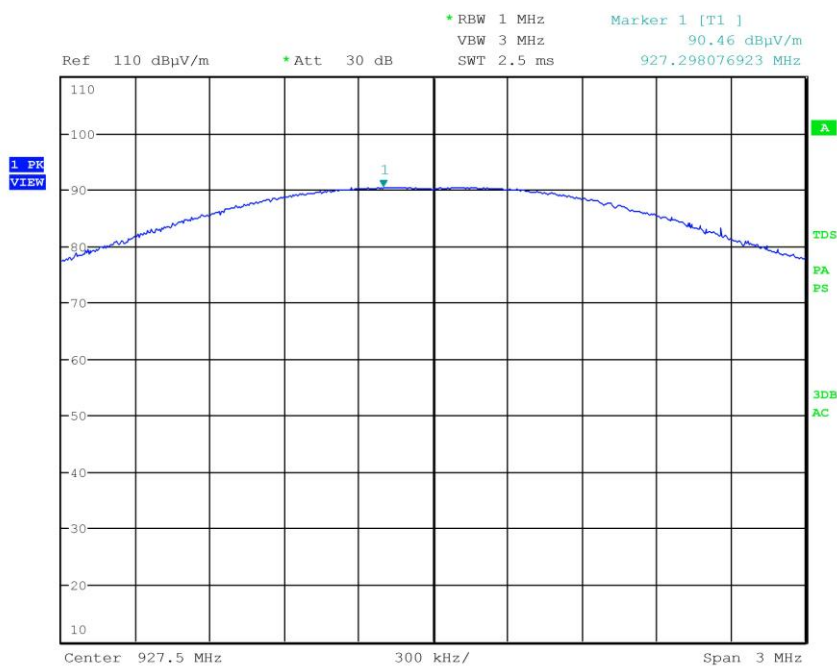
Manufacturer

OP Condition

Operator

Bertezzo 15140431

Test Spec





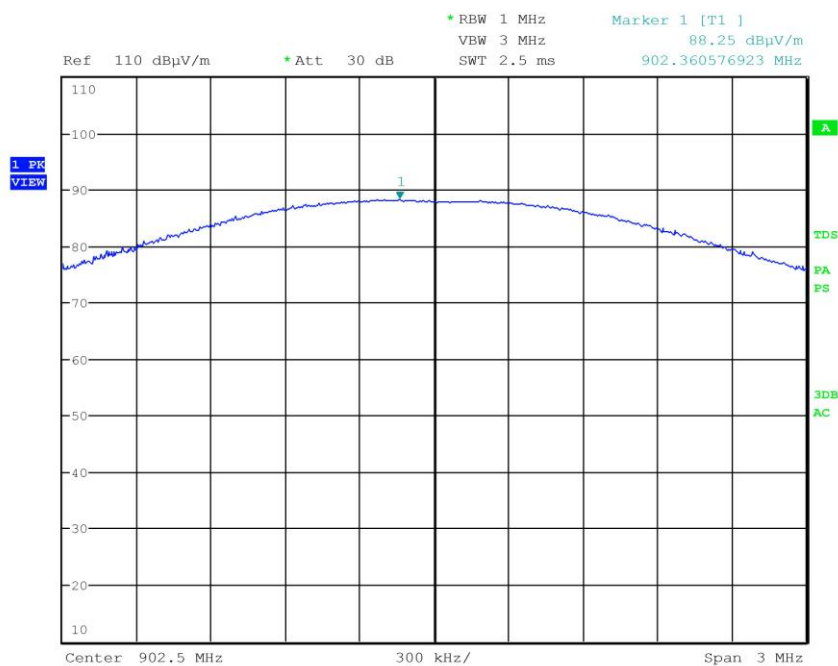
CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140438

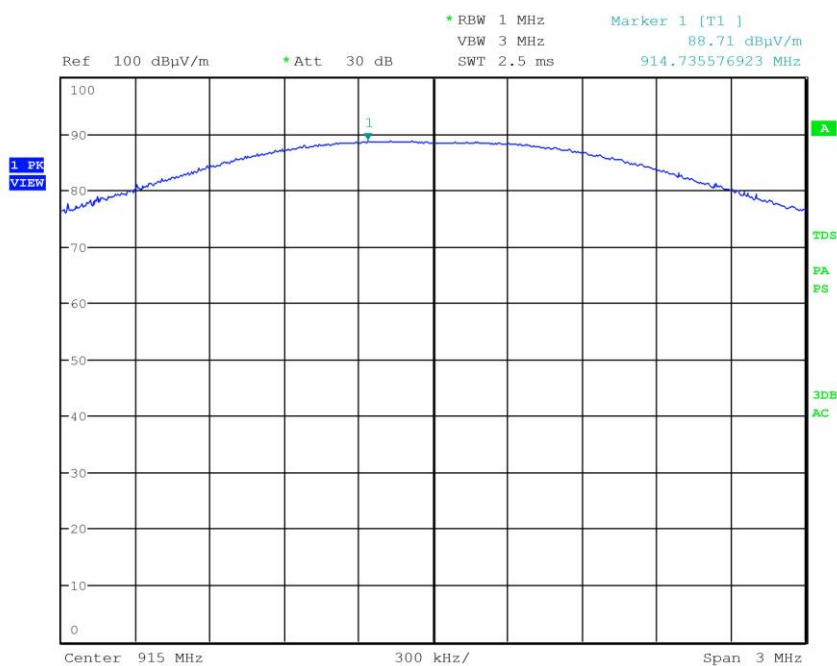
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzo 15140438
Test Spec





G15140447

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140447
Test Spec



Result: The requirements are met



11.7 Maximum power spectral density level in the fundamental emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 10.2
- Internal procedure PM001
- See clause 4 of this test report

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 10 m

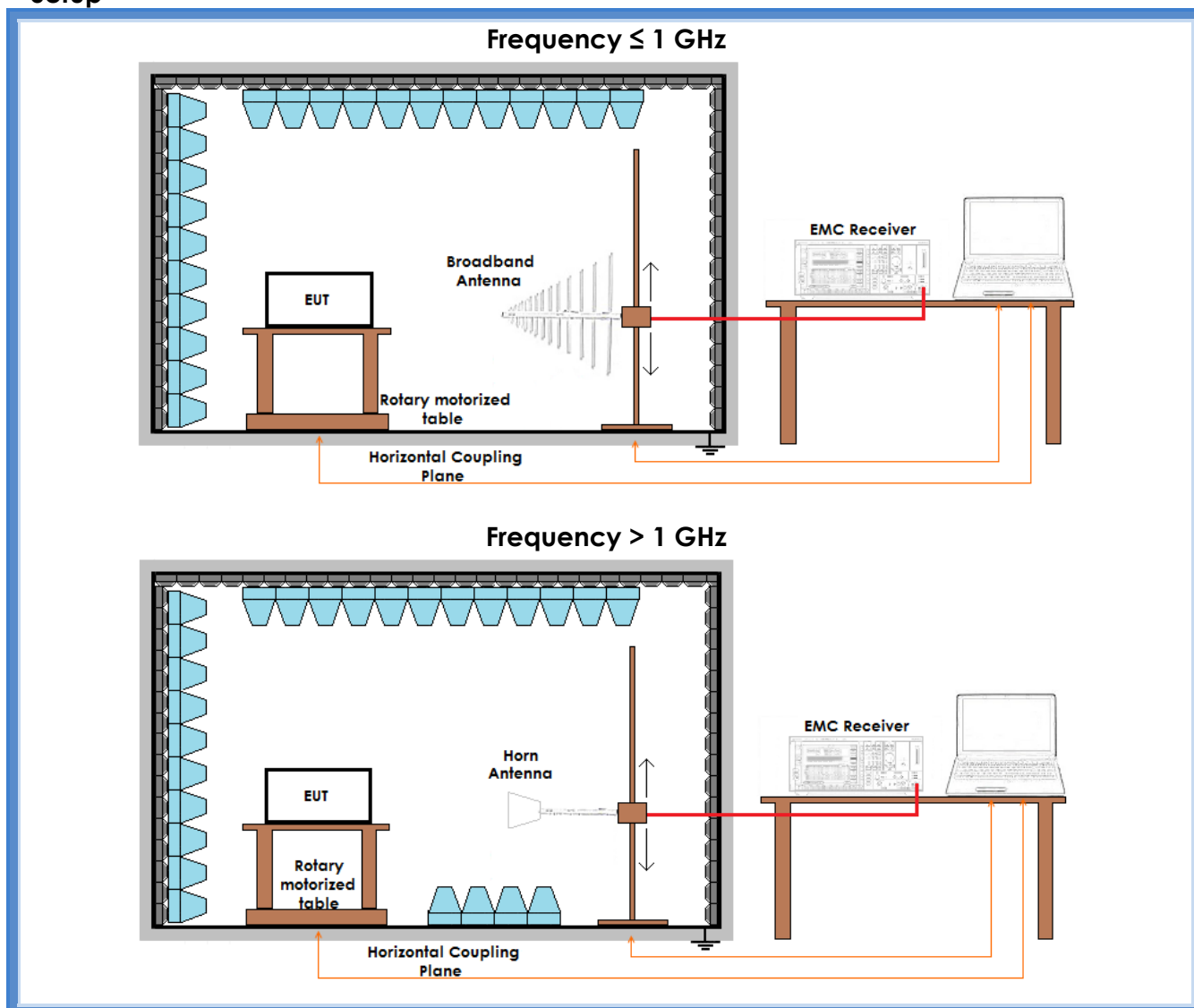
Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	42

Acceptance limits:

Frequency Range	Power Spectral Density
902 – 928 MHz	8 dBm / 6,31 mW

Setup





Result

Integrated antenna					
Channel	Polarization	Graphs	Measured PK level (dB μ V/m)	Power Spectral Density (mW)	Remarks
Lowest	Worst case	G15140406	91,97	2,51	RBW: 100 kHz
Medium	Worst case	G15140409	90,70	1,87	RBW: 100 kHz
Highest	Worst case	G15140421	87,92	0,99	RBW: 100 kHz

External antenna					
Channel	Polarization	Graphs	Measured PK level (dB μ V/m)	Power Spectral Density (mW)	Remarks
Lowest	Worst case	G15140436	87,52	0,90	RBW: 100 kHz
Medium	Worst case	G15140445	88,03	1,01	RBW: 100 kHz
Highest	Worst case	G15140430	90,28	1,70	RBW: 100 kHz

Remarks: the above table shows the results of radiated measurements, in agreement with cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r03.
Conducted measurements are not applicable because the antenna connector is not available.
The following formula, provided in document DA 00-705, has been used for the conversion between radiated to conducted values:

$$\text{Conducted value} = (E \times d)^2 / (30 \times G)$$

Where:

E = $(10^{(\text{dB}\mu\text{V/m})/20})/1000000$, the maximum measured fundamental field strength in V/m

G = $10^{\text{dBi}/10}$, the numeric gain of the transmitting antenna: 2,09 (3,2 dBi)

d = the distance in meters from which the field strength was measured (10 m)

P = the power in watts



CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)

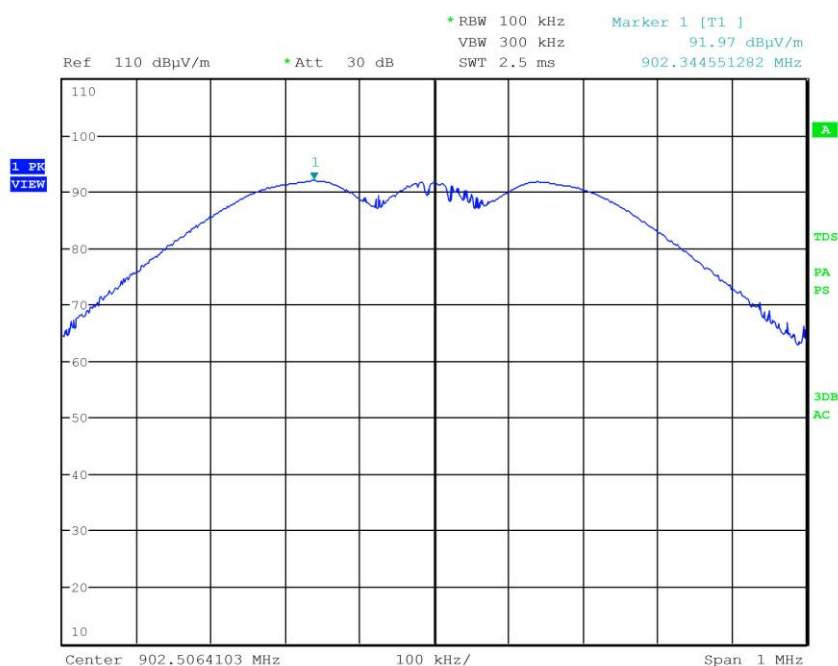


LAB N° 0168

Graphs

G15140406

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzo 15140406
Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140409

Meas Type

Equipment under Test

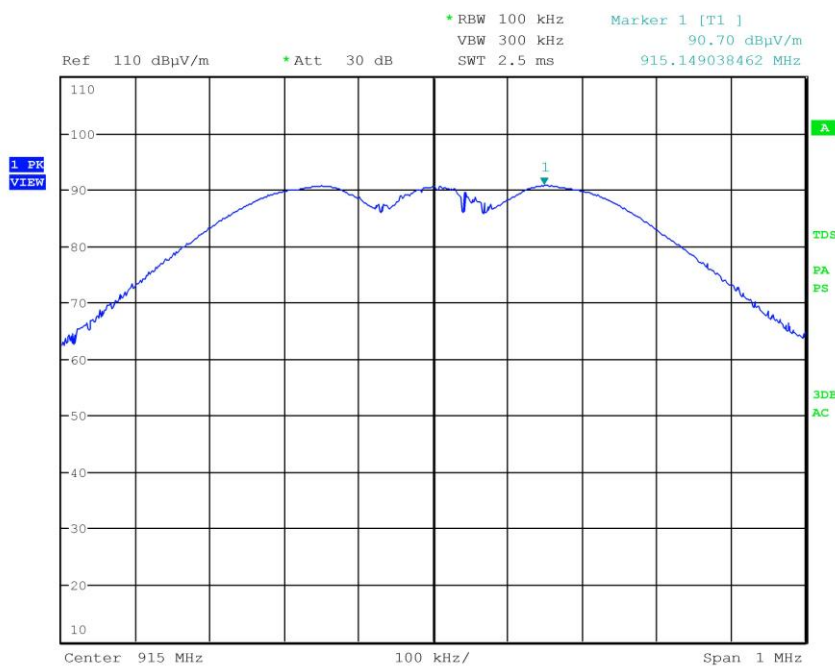
Manufacturer

OP Condition

Operator

Bertezzo 15140409

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140421

Meas Type

Equipment under Test

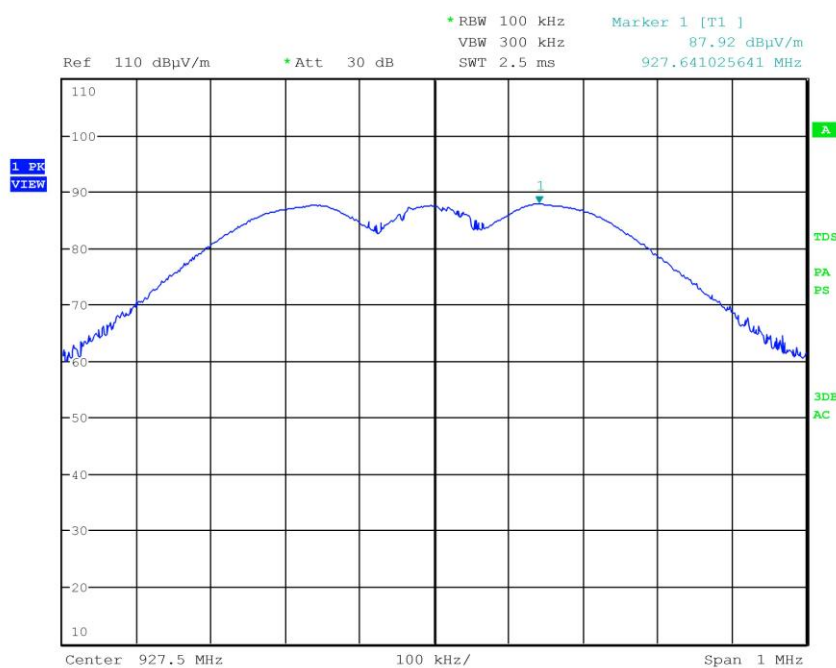
Manufacturer

OP Condition

Operator

Bertezzo 15140421

Test Spec





CMC
Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI)



LAB N° 0168

G15140430

Meas Type

Equipment under Test

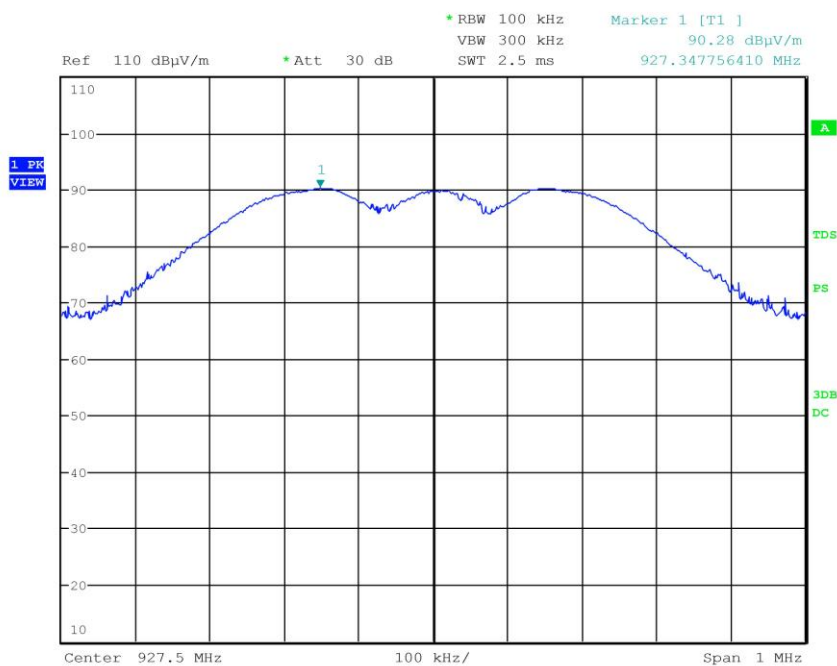
Manufacturer

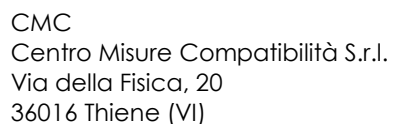
OP Condition

Operator

Bertezzo 15140430

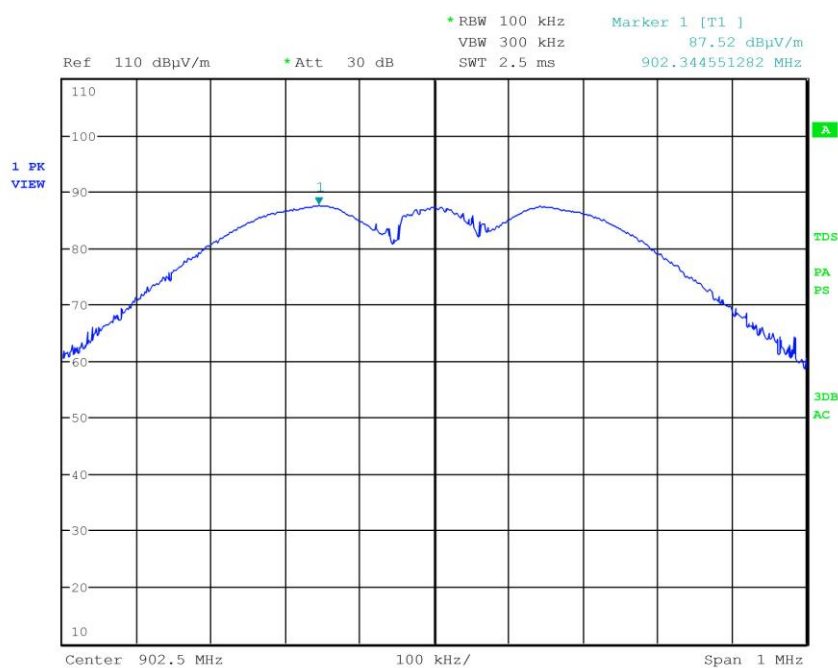
Test Spec





LAB N° 0168

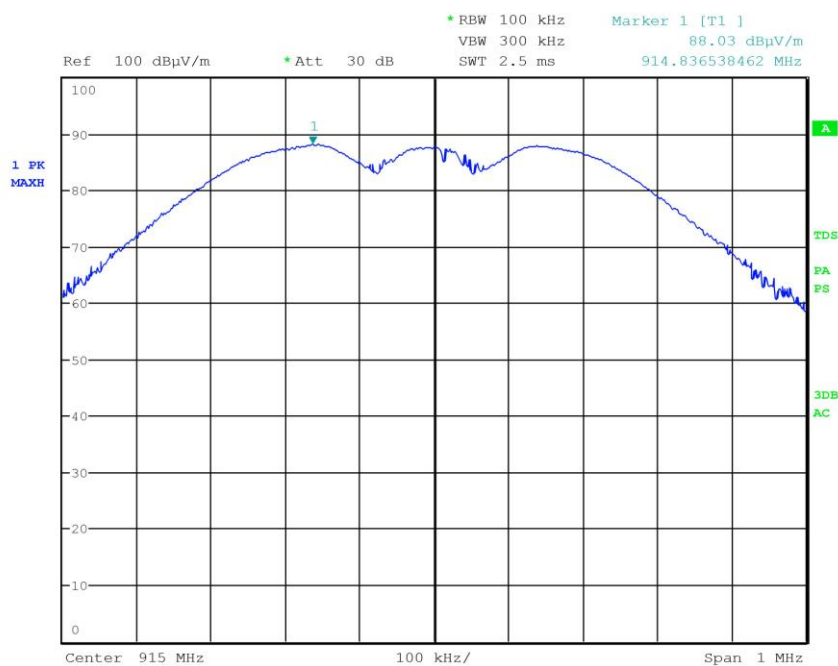
Meas Type	Emission
Equipment under Test	
Manufacturer	
OP Condition	
Operator	Bertezzo 15140436
Test Spec	





G15140445

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 15140445
Test Spec



Result: The requirements are met



11.8 Spurious Emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- Internal procedure PM001
- See clause 4 of this test report

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 10 m
EUT height about the floor: 80 cm
Detector AV + Peak

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	45

Acceptance limits

Acceptance limits for emissions in restricted frequency bands		
Frequency (MHz)	AV limits [dB(μV/m)]	Peak limits [dB(μV/m)]
> 1000	54	74



The restricted frequency bands are listed in the following table

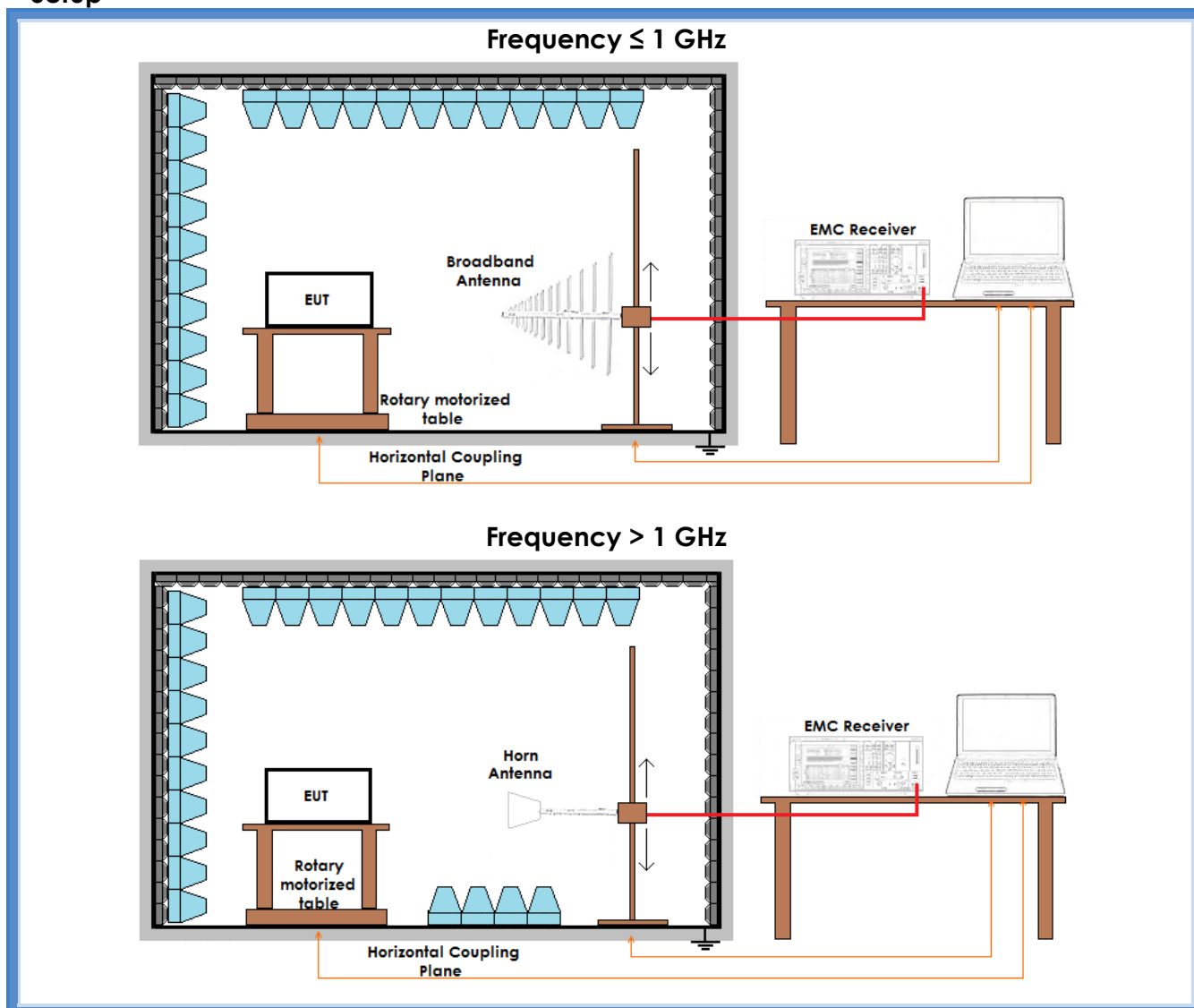
MHz	MHz	MHz	GHz
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	73 – 74,6	1645,5 – 1646,5	9,3 – 9,5
6,215 – 6,218	74,8 – 75,2	1660 – 1710	10,6 – 12,7
6,26775 – 6,26825	108 – 121,94	1718,8 – 1722,2	13,25 – 13,4
6,31175 – 6,31225	123 – 138	2200 – 2300	14,47 – 14,5
8,291 – 8,294	149,9 – 150,05	2310 – 2390	15,35 – 16,2
8,362 – 8,366	156,52475 – 156,52525	2483,5 – 2500	17,7 – 21,4
8,37625 – 8,38675	156,7 – 156,9	2690 – 2900	22,01 – 23,12
8,41425 – 8,41475	162,0125 – 167,17	3260 – 3267	23,6 – 24,0
12,29 – 12,293	167,72 – 173,2	3332 – 3339	31,2 – 31,8
12,51975 – 12,52025	240 – 285	3345,8 – 3358	36,43 – 36,5
12,57675 – 12,57725	322 – 335,4	3600 – 4400	Above 38,6
13,36 – 13,41			

Acceptance limits for emissions in non-restricted frequency bands

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

- If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz
- If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.
- In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required

Setup





Result – AV detector

Integrated antenna							
Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	
II	56,20*	72,00	57,20*	70,70	56,70*	67,90	Complies
III	47,50*	72,00	47,30*	70,70	48,00*	67,90	Complies
IV	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
V	48,10	54,00	49,60	54,00	49,50	54,00	Complies
VI	49,90	54,00	50,00*	70,70	50,30*	67,90	Complies
VII	56,10*	72,00	55,90*	70,70	54,80*	67,90	Complies
VIII	51,40*	72,00	52,10	54,00	52,00	54,00	Complies
IX	50,20	54,00	51,00	54,00	50,90	54,00	Complies
X	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit *	67,90	Complies
Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values. The emission values marked with * have been detected in non-restricted frequency bands							

External antenna							
Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	
II	55,00*	67,50	55,20*	68,00	55,10*	70,30	Complies
III	45,30*	67,50	46,20*	68,00	45,90*	70,30	Complies
IV	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
V	44,70	54,00	45,10	54,00	45,30	54,00	Complies
VI	49,40	54,00	50,00*	68,00	49,90*	70,30	Complies
VII	51,90*	67,50	51,80*	68,00	52,00*	70,30	Complies
VIII	50,90*	67,50	50,50	54,00	50,10	54,00	Complies
IX	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
X	51,50	54,00	51,20	54,00	52,00 *	70,30	Complies
Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values. The emission values marked with * have been detected in non-restricted frequency bands							



Result – Peak detector

Integrated antenna							
Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	
II	58,30*	91,97	59,10*	90,70	58,50*	87,92	Complies
III	49,50*	91,97	50,00*	90,70	50,20*	87,92	Complies
IV	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
V	50,20	74,00	51,00	74,00	51,50	74,00	Complies
VI	51,60	74,00	52,10*	90,70	52,30*	87,92	Complies
VII	58,60*	91,97	59,00*	90,70	60,10*	87,92	Complies
VIII	55,20*	91,97	54,90	74,00	55,00	74,00	Complies
IX	53,40	74,00	54,20	74,00	55,10	74,00	Complies
X	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit*	87,92	Complies

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values. The emission values marked with * have been detected in non-restricted frequency bands

External antenna							
Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	Level (dB μ V/m)	Limits (dB μ V/m)	
II	57,20*	87,52	58,20*	88,03	58,30*	90,28	Complies
III	46,90*	87,52	47,30*	88,03	46,80*	90,28	Complies
IV	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
V	46,20	74,00	46,30	74,00	48,00	74,00	Complies
VI	51,60	74,00	51,90*	88,03	52,00*	90,28	Complies
VII	53,90*	87,52	53,60*	88,03	53,90*	90,28	Complies
VIII	52,50*	87,52	52,40	74,00	53,00	74,00	Complies
IX	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
X	53,40	74,00	53,00	74,00	53,60 *	90,28	Complies

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values. The emission values marked with * have been detected in non-restricted frequency bands

Result: The requirements are met



11.9 Maximum permissible exposure

Test set-up and execution

- FCC Rules and Regulation;
Titles 47 Part 1.1310
- Internal procedure PM001
- See clause 4 of this test report

Test configuration

Test site:
Laboratory

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Antenna

Acceptance limits	1 mW/cm ² max at 20 cm of distance
--------------------------	---

Result

Power Density Limit (mW/cm ²)	Output Power (mW)	Antenna Gain (G)	Power Density at 20 cm (mW/cm ²)	Remarks
1,00	2,75	2,09	0,00114	Measured
Remarks: Power Density = (P x G) / (4πR ²)				

Result: The requirements are met