CMC Centro Misure Compatibilità S.r.l.
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LAB N° 0168

Independent Testing Laboratory
Accredited by ACCREDIA according to UNI CEI EN ISO/IEC 17025 cert. nr. 0168

TEST REPORT nr. R16149301

Federal Communication Commission (FCC)

Test item

Description ..... :	THERMAL TRANSFER PRINTER
Trademark ..... :	CEMBRE
Model/Type ..... :	MG3
FCC ID ..... :	2ABSQ4190016

Test Specification

Standard ..... :	FCC Rules & Regulations, Title 47:2015 Part 15 paragraph(s): 107 and 109

Client's name ..... :	CEMBRE S.p.A.
Address ..... :	Via Serenissima, 9 – 25135 Brescia (BS) – ITALY
Manufacturer's name :	Same as client
Address ..... :	--

Report

Tested by ..... :	D. Velo – *Technician*	.....
Approved by ..... :	R. Beghetto – *Laboratory Manager*	.....
Date of issue ..... :	26.10.16	
Contents ..... :	26 pages	

Index

1. Summary

Emission Test:

FCC Rules & Regulations, Title 47:2015
Part 15 paragraph(s): 107 and 109

Test specifications	*Environmental Phenomena*	*Port*	*Tests sequence*	*Result*
Part 15.107 Class B	Continuous disturbance voltage	Mains terminal	2	Complies
Part 15.109 Class B	Radiated disturbance	Enclosure	1	Complies

The Test Report was given to the Client representatives for necessary documentation of ratification of the tested equipment and it is valid for the FCC certification.

2. Description of Equipment under test (EUT)

Power supply ..... : 120 V ~ 60 Hz single-phase + earth
Power cable ..... : Unshielded
Serial Number ..... : --

2.1 *Test Site*

Company ..... : CMC Centro Misure Compatibilità S.r.l.
Address ..... : Via della Fisica, 20
36016 Thiene (VI) – ITALY
Test site facility's FCC registration number ..... : 271947

3. Testing and sampling

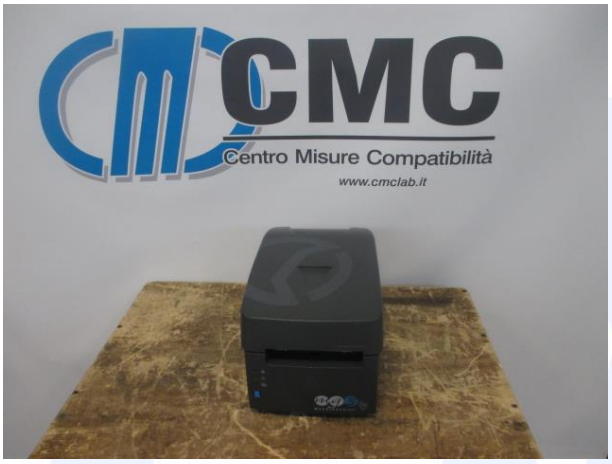
Date of receipt of test item ..... : 02.05.16
Testing start date ..... : 09.09.16
Testing end date ..... : 15.09.16
Samples tested nr. ..... : 1
Sampling procedure. ..... : Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion
Internal identification ..... : adhesive label with the product number P160531

4. Operative conditions

EUT exercising ..... : Steady condition, printing cycles
Auxiliary equipment ..... : PC

5. Photograph(s) of EUT

5.1 Photograph(s) of EUT



6. Equipment list

Id. number	*Manufacturer*	*Model*	*Description*	*Serial number*	*Last calibration*	*Due date calibration*
CMC S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	- - -	January '16	January '17
CMC S108	EMCO	3115	Horn Antenna	9811-5622	June '16	June '19
CMC S127	Schaffner	HLA6120	Loop Antenna	1191	November '13	November '18
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	January '16	January '17
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273	January '16	January '17
CMC S227	Rohde & Schwarz	ESR7	EMI Test Receiver 7GHz	101121	January '16	January '17
CMC S260	CMC	Wfr_N	Shielded Cable	Wfr_ant10-1	November '15	November '16
CMC S261	CMC	Wfr_N	Shielded Cable	Wfr_ant20-1	November '15	November '16
CMC S262	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix32-1	November '15	November '16
CMC S263	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix31-1	November '15	November '16
CMC S264	CMC	Wfr_N	Shielded Cable	Wfr_ext03-1	November '15	November '16
CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Biconical Antenna (30-300MHz)	831	June '16	June '19
CMC S287	Schwarzbeck	VUSLP 9111B	Log-periodic Antenna (200 MHz-3Ghz)	9111B-203	June '16	June '19
CMC S288	CMC	W_sma_white	Joint Shielded Cable	W_001	November '15	November '16

7. Measurement uncertainty

Test	Expanded Uncertainty	note
Conducted Emission		
(50Ω/50µH AMN) - (9 kHz – 150 kHz)	±3.6 dB	1
(50Ω/50µH AMN) - (150 kHz – 30 MHz)	±3.0 dB	1
(Voltage probe) - (150 kHz – 30 MHz)	±2.9 dB	1
(50Ω/5µH AMN) - (150 kHz – 108 MHz)	±2.6 dB	1
Discontinuous Conducted Emission		
Conducted Emission (50Ω/50µH AMN) - (150 kHz – 30 MHz)	±3.0 dB	1
Disturbance Power (30 MHz – 300 MHz)	±3.4 dB	1
Radiated Emission		
(0,150 MHz – 30 MHz)	±3.8 dB	1
(30 MHz – 1000 MHz)	±3.8 dB	1
(1 GHz – 6 GHz)	±4.3 dB	1
Electromagnetic field EMF	±10.5 %	1
Harmonic current emissions test	±1.2 %	1
Voltage fluctuation and flicker test	±3.8 %	1
Insertion loss test	±2.0 dB	1
Radiated electromagnetic disturbance test (loop antenna)	±1.5 dB	1
Radiated electromagnetic field immunity test	0.81 V/m at 3V/m	1
Pulse modulated radiated electromagnetic field immunity test	0.81 V/m at 3V/m	1
Injected currents immunity test	0.45 V at 3V	1
Bulk current	3.7 mA at 60 mA	1
Power frequency magnetic field immunity test	0.23 A/m at 10 A/m	1
Effective radiated power (F < 1GHz)	±3.8 dB	1
Effective radiated power (F > 1GHz)	±5.5 dB	1
Frequency error	< 1x10-7	1
Modulation bandwidth	< 1x10-7	1
Conducted RF power and spurious emission	±0.7 dB	1
Adjacent channel power	±1.2 dB	1
Blocking	±1.2 dB	1
Electrostatic discharge immunity test		2
Electrical fast transients / burst immunity test		2
Surge immunity test		2
Pulse magnetic field immunity test		2
Damped oscillatory magnetic field immunity test		2
Short interruption immunity test		2
Voltage transient emission test	±2.2 %	1
Transient immunity test		2
Rev_16_01 date 09/02/2016		

Note 1:
The expanded uncertainty reported according to EN55016-4-2:2011 is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of p = 95%

Note 2:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor k = 2.

8. Reference documents

Reference no.	*Description*
FCC Rules and Regulation Title 47 part 15:2015	--
ANSI C63.4:2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
Internal Procedure PM001 rev. 2.0 (Quality Manual)	Measure procedure
Internal procedure INC_M rev. 8.2 (Quality Manual)	Measurement uncertainty calculation

9. Deviation from test specification

In agreement with the client, emission tests were performed with peak detector.

At the frequencies where the measures exceed the limit or within 6 dB from it, the test was repeated with quasi-peak detector and/or average detector.

10. Test case verdicts

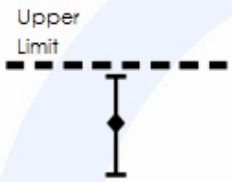
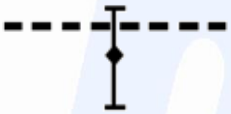
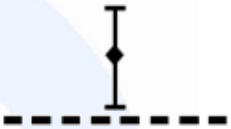
Test case does not apply to the test object	:	N.A.
Test item does meet the requirement	:	Complies
Test item does not meet the requirement	:	Does not comply
Test not performed	:	N.E.

11. Results

In this clause tests results are reported.

Measurement uncertainty is in accordance with document CMC INC_M rev. 8.2.

Judgement of compliance:

Case 1	Case 2	Case 3	Case 4
			
The sample complies with the requirement.	The sample complies with the requirement.	The sample does not comply with the requirement.	The sample does not comply with the requirement.
The measurement results is within the specification limit when the measurement uncertainty is taken into account.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit.	The measurement results is outside the specification limit when the measurement uncertainty is taken into account.

In agreement with ILAC-G8: 03/2009 Guidelines on the Reporting of Compliance with Specification.

11.1 Continuous disturbance voltage test (150 kHz – 30 MHz)

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.107
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Shielded chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S010, CMC S200, CMC S206
Measurement uncertainty: See clause 7 of this test report

Test specification

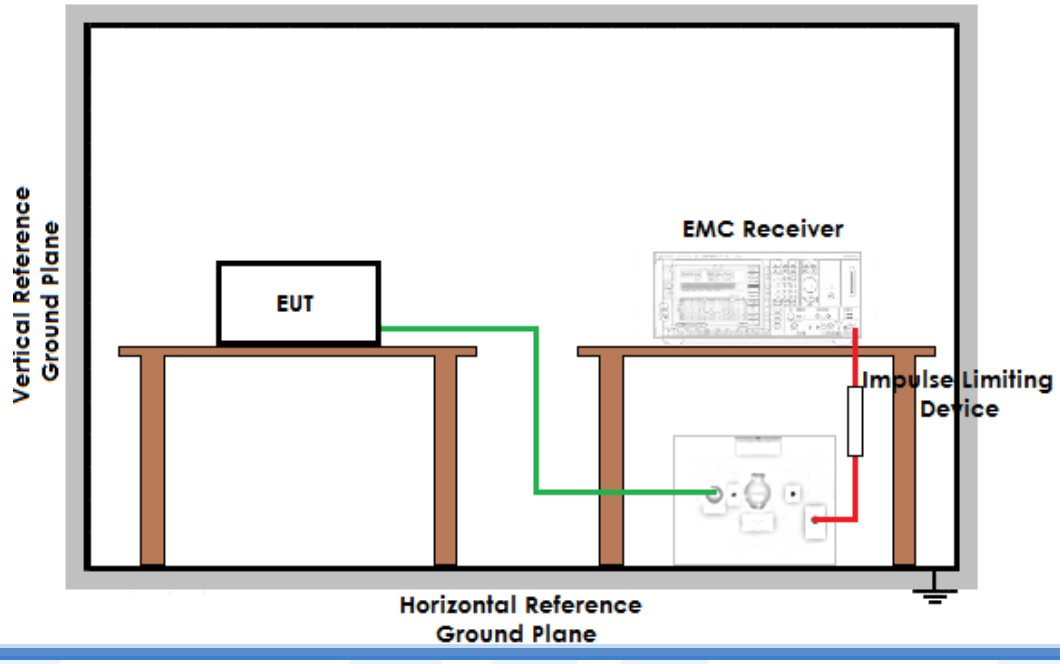
Port: Mains terminal
Frequency range: 150 kHz – 30 MHz

Acceptance limits

Limits for class A equipment		
Frequency range (MHz)	*dB(µV) Quasi-peak*	*dB(µV) Average*
0,15 to 0,50	79	66
0,5 to 5	73	60
5 to 30	73	60

Limits for class B equipment		
Frequency range (MHz)	*dB(µV) Quasi-peak*	*dB(µV) Average*
0,15 to 0,50	66 to 56	56 to 46
0,5 to 5	56	46
5 to 30	60	50

Setup



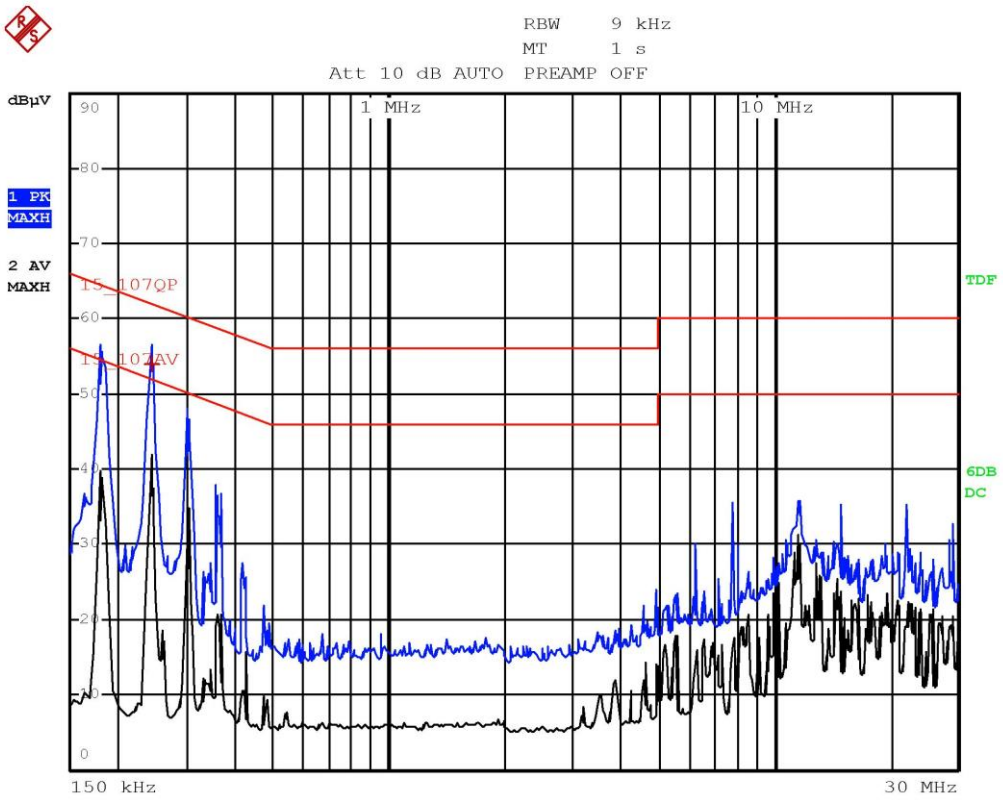
Result

Line	*Graphs*	*Remarks*	*Result*
N	G16149307	EUT side	Complies
L1	G16149308	EUT side	Complies
L1	G16149309	Auxiliary PC side	Complies
N	G16149310	Auxiliary PC side	Complies
Remarks: --			

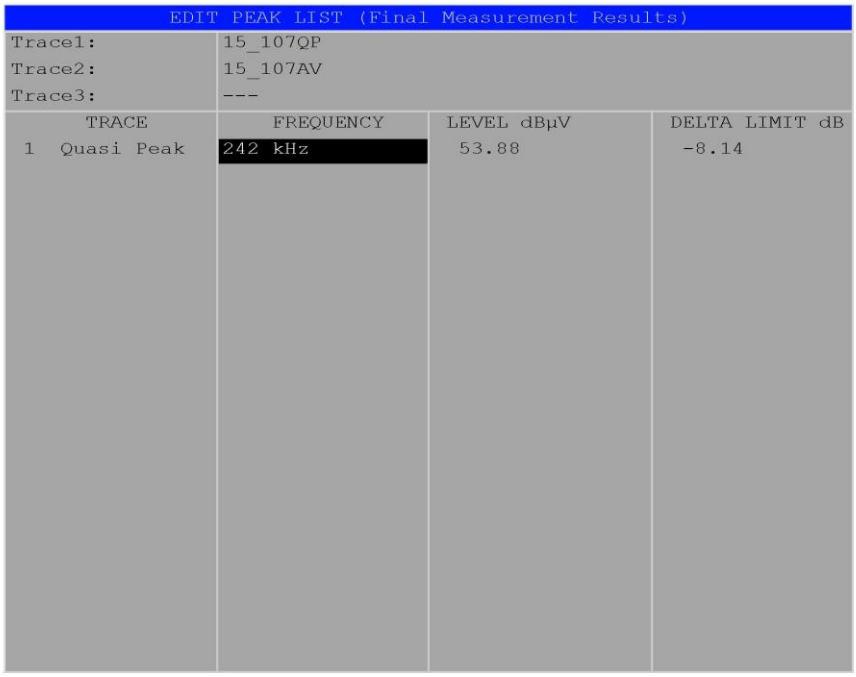
Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a X

Graphs

G16149307



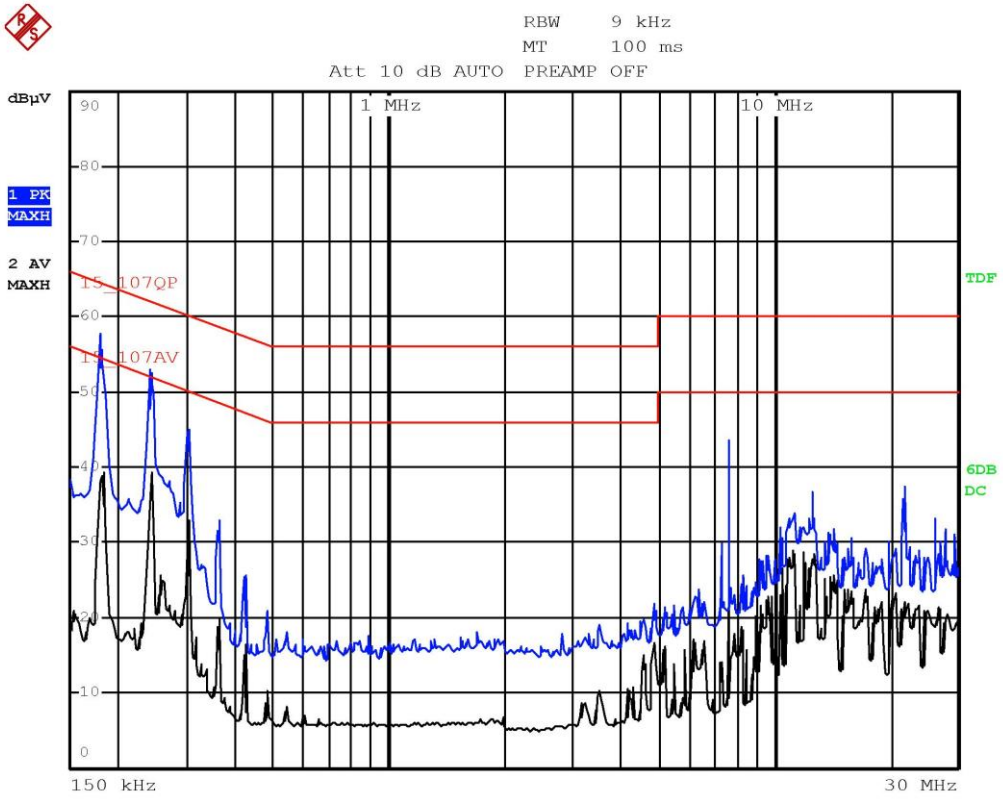
Velo 16149307-Line N(EUT)-Cicli di stampa continui



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_107QP		
Trace2:	15_107AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	242 kHz	53.88	-8.14

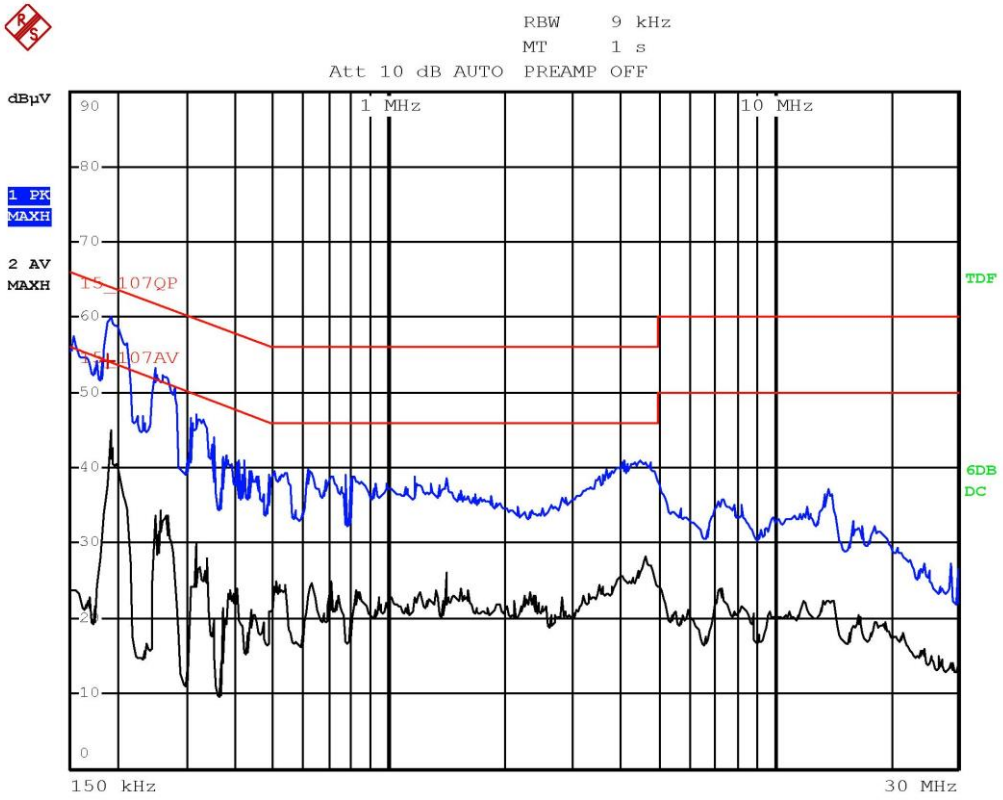
Velo 16149307-Line N(EUT)-Cicli di stampa continui

G16149308

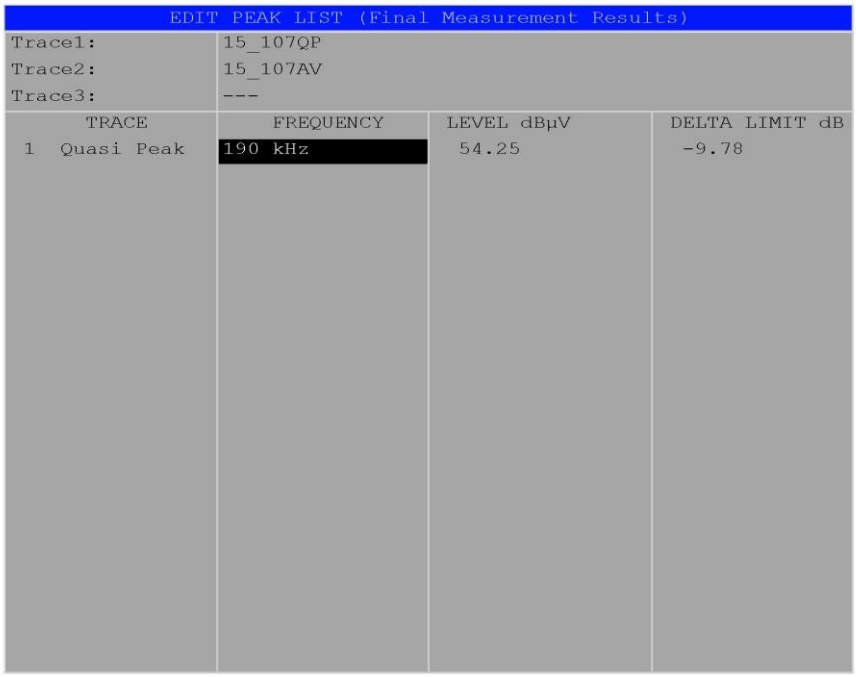


Velo 16149308-Line L(EUT)-Cicli di stampa continui

G16149309



Velo 16149309-Line L(PC)-Cicli di stampa continui



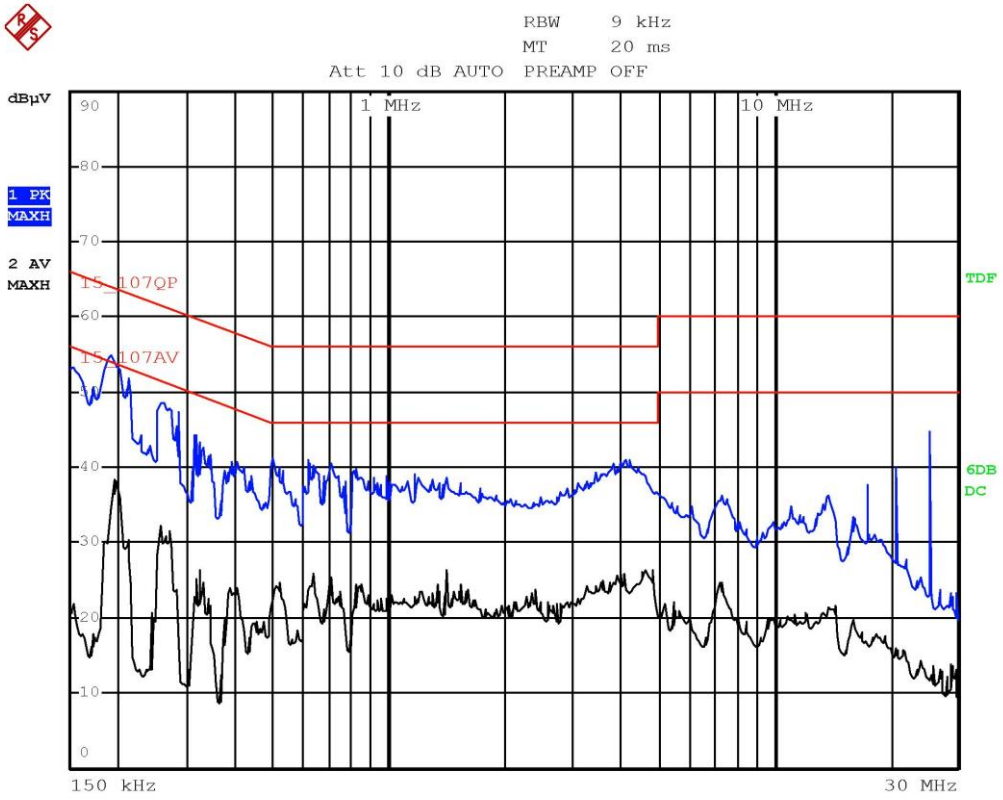
EDIT PEAK LIST (Final Measurement Results)

Trace1:	15_107QP
Trace2:	15_107AV
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	190 kHz	54.25	-9.78

Velo 16149309-Line L(PC)-Cicli di stampa continui

G16149310



Velo 16149310-Line N(PC)-Cicli di stampa continui

Result: The requirements are met

11.2 Radiated disturbance test

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.109
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

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 S127, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

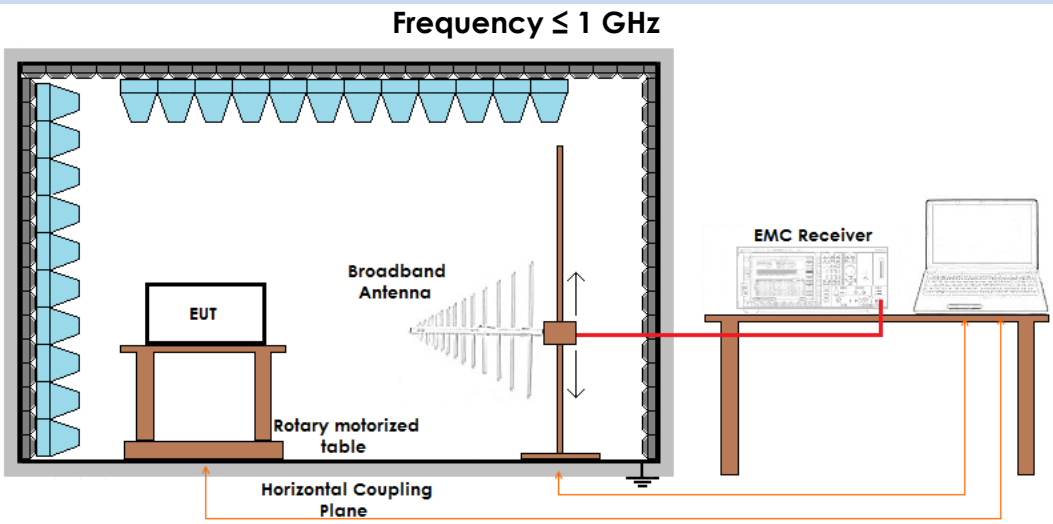
Port: Enclosure
Frequency range: 30 MHz – 6000 MHz
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance:
10 m for frequencies ≤ 1000 MHz
3 m for frequencies > 1000 MHz

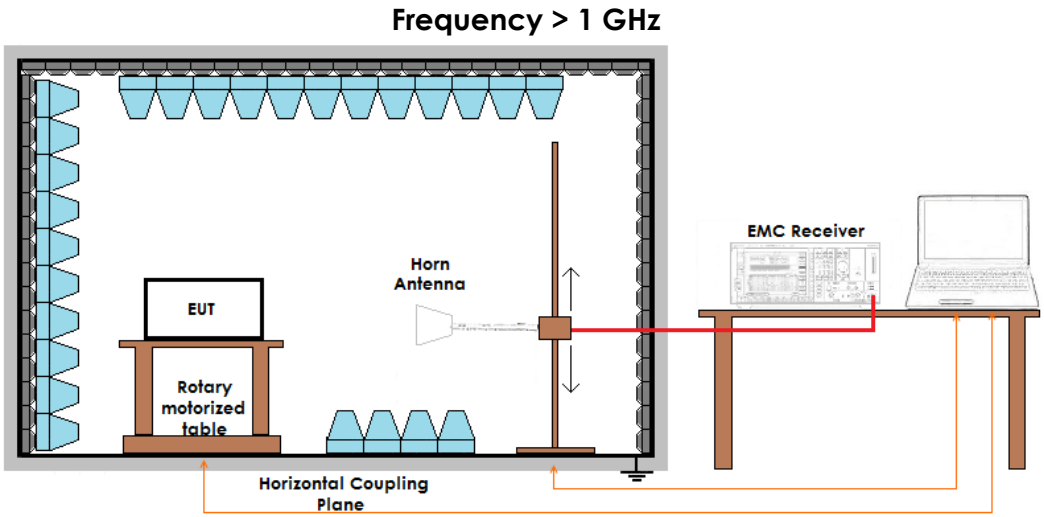
Acceptance limits

Class A radiated limits		
Frequency range (MHz)	*Limits [dB(µV/m)]*	
30 to 88	39,08	
88 to 216	43,52	
216 to 960	46,44	
960 to 1000	49,54	
	Linear average detector [dB(µV/m)]	*Peak detector [dB(µV/m)]*
Above 1000	59,54	79,54

Class B radiated limits		
Frequency range (MHz)	*Limits [dB(µV/m)]*	
30 to 88	30	
88 to 216	33,52	
216 to 960	36,02	
960 to 1000	43,98	
	Linear average detector [dB(µV/m)]	*Peak detector [dB(µV/m)]*
Above 1000	53,98	73,98

Setup





Result

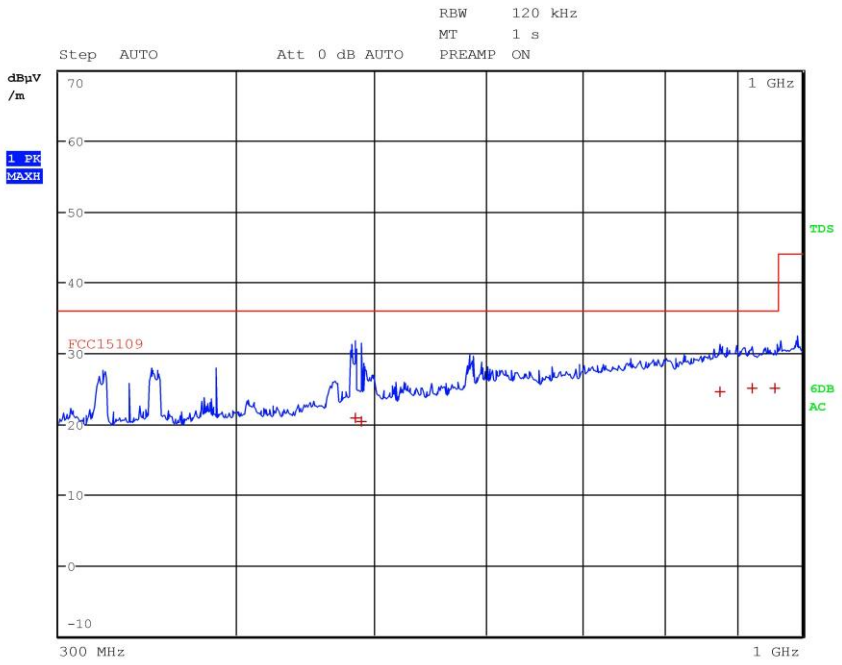
Polarization	*Frequency Range (MHz)*	*Graphs*	*Remarks*	*Result*
V	300 – 1000	G16149301	--	Complies
H	30 – 300	G16149303	--	Complies
V	1000 – 6000	G16149305	--	Complies
H	1000 – 6000	G16149306	--	Complies
H	300 – 1000	G16149311	--	Complies
V	30 – 300	G16149312	--	Complies
Remarks: --				

Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a x

Graphs

G16149301

Meas Type Emission 300-1000MHz - 10m
Equipment under Test
Manufacturer
OP Condition Ciclo continuo di stampa
Operator Segalla 16149301
Test Spec
Vert



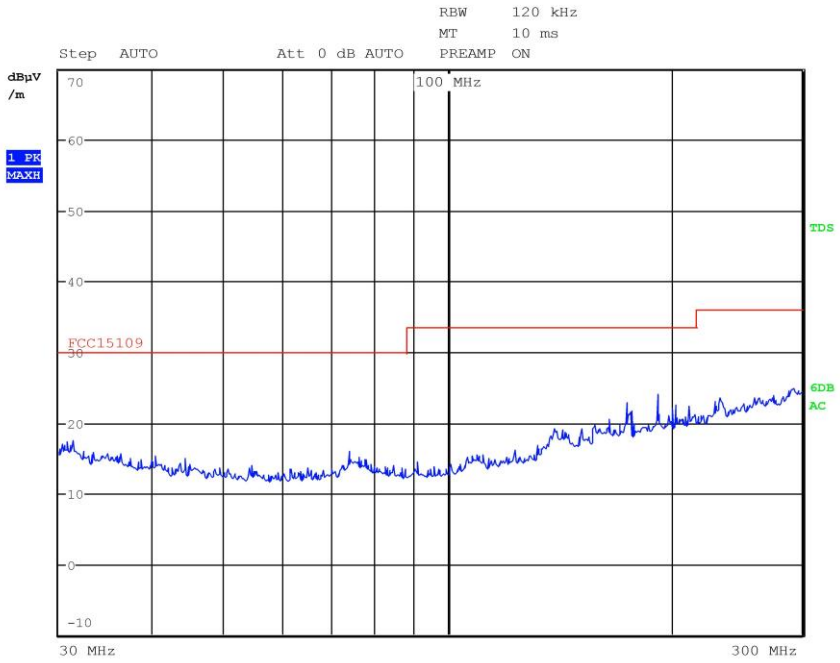
Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 5

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	485.440000000 MHz	20.91	Quasi Peak	-15.11
1	489.520000000 MHz	20.29	Quasi Peak	-15.73
1	874.600000000 MHz	24.53	Quasi Peak	-11.49
1	921.640000000 MHz	24.96	Quasi Peak	-11.06
1	956.360000000 MHz	24.99	Quasi Peak	-11.03

G16149303

Meas Type Emission 30-300MHz - 10m
Equipment under Test
Manufacturer
OP Condition Ciclo continuo di stampa
Operator Segalla 16149303
Test Spec
Horiz

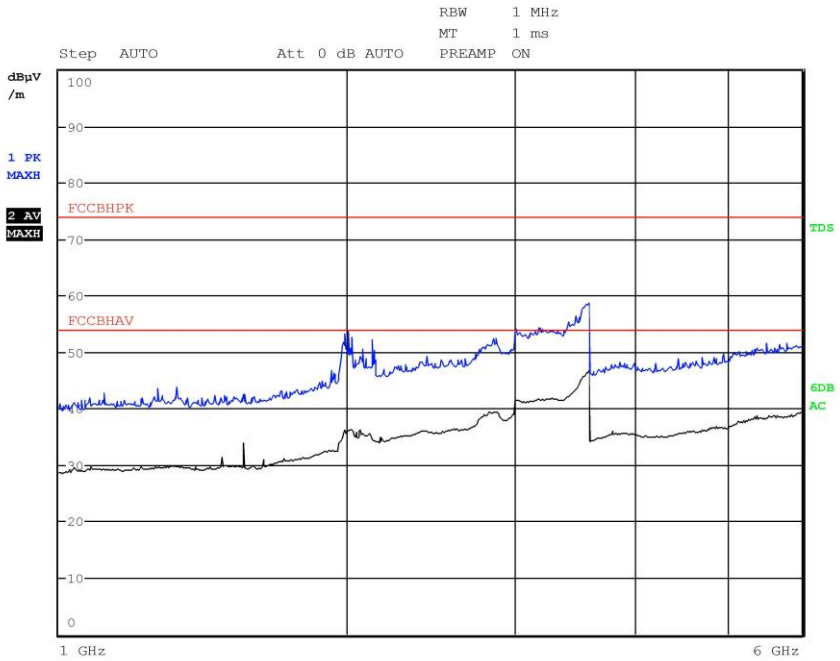


Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 0

G16149305

Meas Type Emission 1000-600MHz
Equipment under Test
Manufacturer
OP Condition Ciclo continuo di stampa
Operator Segalla 16149305
Test Spec
Vert



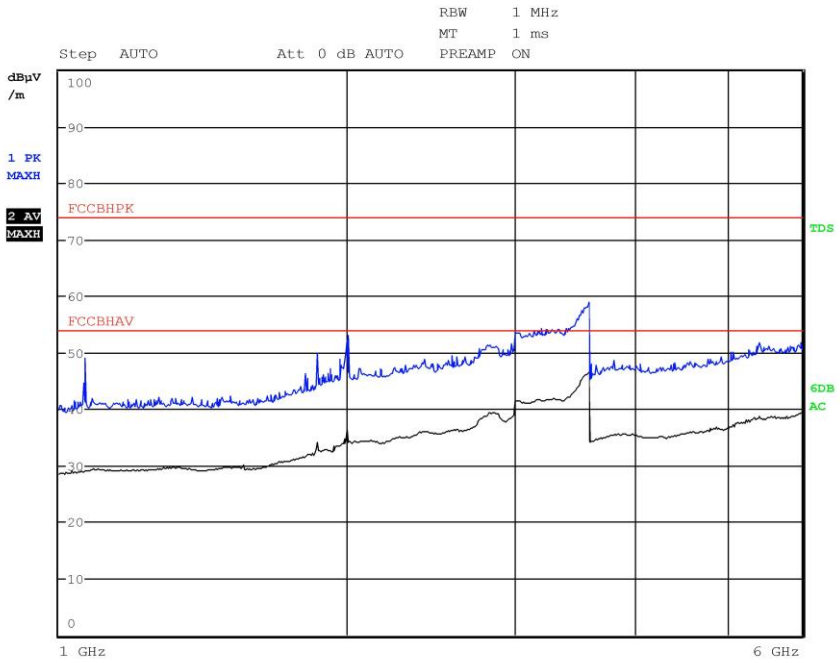
Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 0

G16149306

Meas Type	Emission 1000-600MHz
Equipment under Test	
Manufacturer	
OP Condition	Ciclo continuo di stampa
Operator	Segalla 16149306
Test Spec	

Horiz



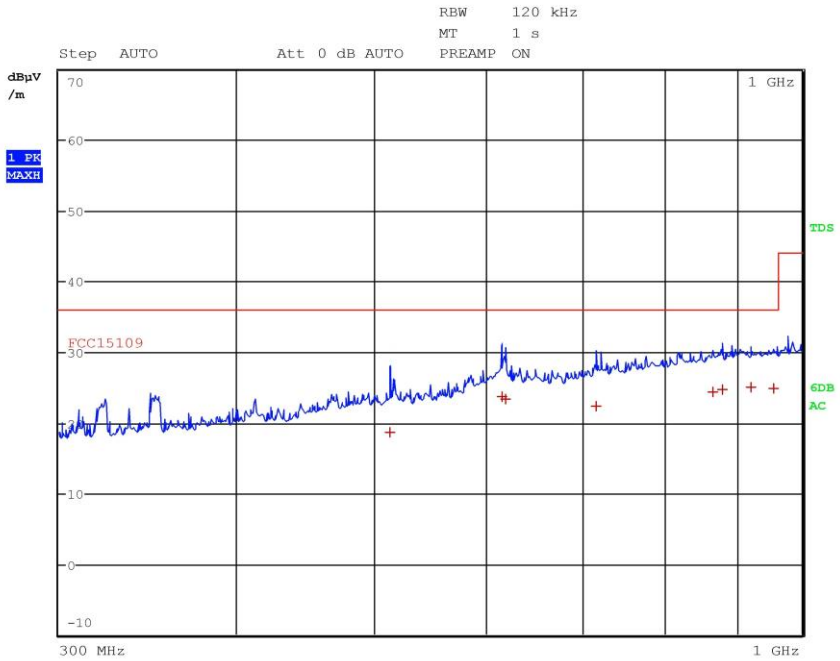
Final Measurement

Meas Time:	1 s
Margin:	6 dB
Subranges:	0

G16149311

Meas Type	Emission 300-1000MHz - 10m
Equipment under Test	
Manufacturer	
OP Condition	Ciclo continuo di stampa
Operator	Segalla 16149311
Test Spec	

horiz



Final Measurement

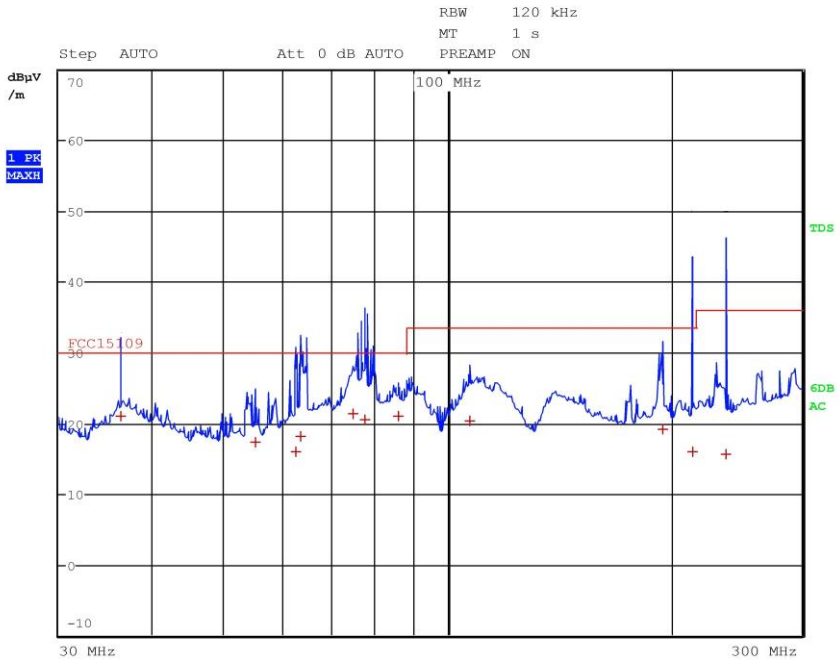
Meas Time: 1 s
Margin: 6 dB
Subranges: 8

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	512.680000000 MHz	18.70	Quasi Peak	-17.32
1	615.160000000 MHz	23.71	Quasi Peak	-12.31
1	618.400000000 MHz	23.42	Quasi Peak	-12.60
1	715.680000000 MHz	22.42	Quasi Peak	-13.60
1	864.840000000 MHz	24.45	Quasi Peak	-11.57
1	879.400000000 MHz	24.70	Quasi Peak	-11.32
1	920.680000000 MHz	24.99	Quasi Peak	-11.03
1	954.600000000 MHz	24.94	Quasi Peak	-11.08

G16149312

Meas Type	Emission 30-300MHz - 10m
Equipment under Test	
Manufacturer	
OP Condition	Ciclo continuo di stampa
Operator	Segalla 16149312
Test Spec	

Vert



Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 11

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	36.320000000 MHz	20.94	Quasi Peak	-9.06
1	55.080000000 MHz	17.32	Quasi Peak	-12.68
1	62.440000000 MHz	16.00	Quasi Peak	-14.00
1	63.440000000 MHz	18.22	Quasi Peak	-11.78
1	74.720000000 MHz	21.30	Quasi Peak	-8.70
1	77.440000000 MHz	20.51	Quasi Peak	-9.49
1	85.960000000 MHz	20.97	Quasi Peak	-9.03
1	107.160000000 MHz	20.28	Quasi Peak	-13.24
1	194.880000000 MHz	19.21	Quasi Peak	-14.31
1	213.880000000 MHz	15.92	Quasi Peak	-17.60
1	237.200000000 MHz	15.55	Quasi Peak	-20.47

Result: The requirements are met