



EMC TEST REPORT

Applicant:	HMD Global Oy.			
Address:	Bertel Jungin aukio 9, 02600 Espoo, Finland			
Manufacturer or Supplier:	HMD Global Oy			
Address:	Bertel Jungin aukio 9, 02600 Espo	oo, Finland		
Product:	GSM/WCDMA/LTE Mobile Phone			
Brand Name:	Nokia			
Model Name:	TA-1130	TA-1130		
FCC ID:	2AJOTTA-1130			
Date of tests:	Mar. 23, 2019~ Apr. 12, 2019			
The submitted sample of the above equipment has been tested for according to the requirements of the following standards:				
☑ FCC Part 15, Subpart B, Class B☑ ANSI C63.4:2014				
CONCLUSION: The submitted sample was found to <u>COMPLY</u> with the test requirement				
Issued by Alex Chen Approved by Luke Lu Engineer / Mobile Department Manager / Mobile Department				
	Alex luke lu			
	Date: Apr. 15, 2019 Date: Apr. 15, 2019 This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at			

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV190322W004	Original release	Apr. 15, 2019

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1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	GSM/WCDMA/LTE Mobile Phone		
BRAND NAME	Nokia		
MODEL NAME	TA-1130		
NOMINAL VOLTAGE	E OV/do (adapter or heat aguinment)		
	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM	
	BT_LE	BT-LE(GFSK) for DTS	
	Bluetooth	GFSK, π/4-DQPSK, 8DPSK, LE	
MODULATION TYPE	GPS/ GLONASS	C/A code	
	FM	FM	
	GSM	GMSK/8PSK	
	WCDMA	BPSK/QPSK	
	LTE	QPSK/16QAM	
	WLAN	2412-2462MHz for 11b/g/n(HT20)	
	Bluetooth/BT_LE	2402MHz ~ 2480MHz	
	GPS	1575.42MHz	
	GLONASS	1602MHz	
OPERATING	FM	87.5MHz ~ 108MHz	
FREQUENCY	GSM	824.2MHz ~ 848.8MHz (FOR GSM 850) 1850.2MHz ~ 1909.8MHz (FOR GSM 1900)	
	WCDMA	826.4MHz ~ 846.6MHz (FOR WCDMA Band 5)	
	LTE	824.7MHz ~ 848.3MHz (FOR LTE Band5) 2500MHz ~ 2570MHz (FOR LTE Band7) 2572.5MHz ~ 2617.5MHz (FOR LTE Band38)	
HW VERSION	HW0201		
SW VERSION	000C_0_310		
I/O PORTS	Refer to user's manual		
CABLE SUPPLIED	USB cable: non-shielded, detachable, 1.0meter Earphone cable: non-shielded, detachable, 1.5meter		
ACCESSORY DEVICES	Refer to note as below		

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NOTE:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

List of Accessories:

ACCESSORIES	BRAND	MODEL	Manufacturer	SPECIFICATION
AC Adoptor 1	A a b a i	AD EWILLIE	DONGGUAN AOHAI	I/P:100-240Vac, 150mA
AC Adapter 1	Aohai	AD-5WU(US)	TECHNOLOGY CO., LTD.	O/P: 5Vdc, 1A
AC Adapter 2	DVF	AD-5WU(US)	Dee Van Enterprise Co., LTD.	I/P:100-240Vac, 150mA
AO Adaptor 2	DVL	AD-300(00)	Dec van Enterprise Go., ETD.	O/P: 5Vdc, 1A
Battery	Lishen	HE365	-	Rating: 3.85Vdc, 2500mAh
USB Cable 1	Nokia CA-	CA-10W	Shenglan Technology Co., Ltd	1.0m shielded cable w/o
USB Cable 1	INUNIA	Sherigian Technology Co., Li		core
USB Cable 2	Nokia	MICRO USB	RongTaiFeng Technology	1.0m shielded cable w/o
USB Cable 2	5V2A Co.,Ltd		core	
USB Cable 3 Nokia CA-190CD FIH		FIH	1.0m shielded cable w/o	
OOD Cable 5	NORIA	OA-1300D	1 111	core
Earphone	Nokia WH-108	OBO	1.5m shielded cable w/o	
Larphone	alphone Nokia Wil-100 OBO		core	



1.2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart B					
Standard Section Test Item		Result	Remark		
	Conducted Test	PASS	Meets limits minimum passing margin is -16.13 dB at 0.150000 MHz		
FCC Part 15, Subpart B, Class B ANSI C63.4:2014	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -3.66 dB at 39.7 MHz		
	Radiated Emission Test (Above 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -14.39 dB at 4332 MHz		

1.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz ~ 30MHz	+/-2.66dB
Dadiated emissions	30MHz ~ 1GHz	+/-3.26dB
Radiated emissions	1GHz ~ 18GHz	+/-4.48dB

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1.4 DESCRIPTION OF TEST MODES

Test	DESCRIPTION OF TEST MODES				
Mode	Test Condition				
	Radiated emission test				
1	Adapter 1# + USB cable 1 + Earphone + BT Idle + WIFI idle(2.4G) + Battery + GPS RX				
2	Adapter 1# + USB cable 2 + Earphone + BT Idle + WIFI idle(2.4G) + Battery + GPS RX				
3	Adapter 1# + USB cable 3 + Earphone + BT Idle + WIFI idle(2.4G) + Battery + GPS RX				
4	Worst Case(1-3) + Adapter 2#				
5	Worst Case(1-4) + Camera On				
6	Worst Case(1-4) + Glonass Rx				
7	Worst Case(1-4) + MPG4				
8	Worst Case(1-4) + FM RX				
9	Worst Case(1-8) + GSM 850 Idle				
10	Worst Case(1-8) + GSM 1900 Idle				
11	Worst Case(1-8) + WCDMA B5 Idle				
12	Worst Case(1-8) + LTE B5 Idle				
13	Worst Case(1-8) + LTE B7 idle				
14	Worst Case(1-8) + LTE B38 idle				
15	USB Link + USB Cable1 + Data Trasmission(EUT to SD1) + Earphone				
16	USB Link + USB Cable1 + Data Trasmission(EUT to SD2) + Earphone				
17	USB Link + USB Cable1 + Data Trasmission(EUT to PC) + Earphone				
18	Worst Case(15-17) + USB Cable2				
19	Worst Case(15-17) + USB Cable3				
	Conducted emission test				
1	Adapter 1# + USB cable 1 + Earphone + BT Idle + WIFI idle(2.4G) + Battery + GPS RX				
2	Adapter 1# + USB cable 2 + Earphone + BT Idle + WIFI idle(2.4G) + Battery + GPS RX				
3	Adapter 1# + USB cable 3 + Earphone + BT Idle + WIFI idle(2.4G) + Battery + GPS RX				
4	Worst Case(1-3) + Adapter 2#				
5	Worst Case(1-4) + Camera On				
6	Worst Case(1-4) + Glonass Rx				
7	Worst Case(1-4) + MPG4				
8	Worst Case(1-4) + FM RX				
9	Worst Case(1-8) + GSM 850 Idle				
10	Worst Case(1-8) + GSM 1900 Idle				
11	Worst Case(1-8) + WCDMA B5 Idle				
12	Worst Case(1-8) + LTE B5 Idle				
13	Worst Case(1-8) + LTE B7 idle				

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14	Worst Case(1-8) + LTE B38 idle
15	USB Link + USB Cable1 + Data Trasmission(EUT to SD1) + Earphone
16	USB Link + USB Cable1 + Data Trasmission(EUT to SD2) + Earphone
17	USB Link + USB Cable1 + Data Trasmission(EUT to PC) + Earphone
18	Worst Case(15-17) + USB Cable2
19	Worst Case(15-17) + USB Cable3

NOTE:

- 1. For conducted emission test, test mode 9, 18 was the worst case and only this mode was presented in this report.
- 2. For radiated emission test, test mode 9, 15was the worst case and only this mode was presented in this report.



1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

FOR EMISSION TESTS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	GPS Simulator +Antenna	TOJOIN	GNSS-5000A	E1-010-010119	N/A
2	Wireless AP	ABOCOM	WR224GR	060500749P	N/A
3	FM signal generator	Rohde & Schwarz	SMB100A	109279	N/A
4	Printer	HP	Hp LaserJet 1300	CNSJF75989	N/A
5	Notebook	Lenovo	Thnikpad X520	SL10H14859JS	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS			
1	N/A			
2	N/A			
3	N/A			
4	N/A			
5	N/A			



2 EMISSION TEST

2.1 CONDUCTED EMISSION MEASUREMENT

2.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

- 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
- 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

2.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 26,19	Feb. 25, 20
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 26,19	Feb. 25, 20

NOTE: 1. The test was performed in CE shielded room.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

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2.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30MHz was searched. Emission levels under (Limit 20dB) were not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

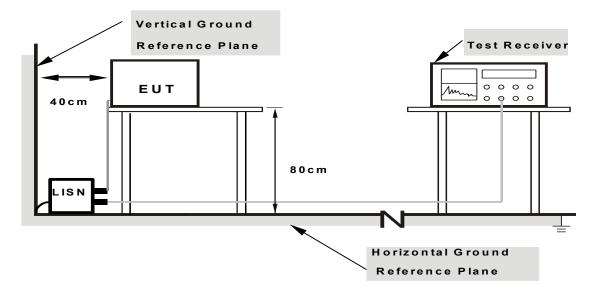
2.1.4 DEVIATION FROM TEST STANDARD

No deviation.

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2.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80

from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

2.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the use type described in the manufacturer's specifications or the user's manual.



2.1.7 TEST RESULTS

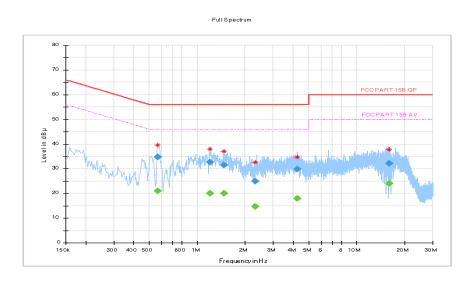
Mode 9

TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.564000		21.01	46.00	-24.99	L	ON	10.0
0.564000	34.65		56.00	-21.35	L	ON	10.0
1.200000		19.98	46.00	-26.02	L	ON	10.1
1.200000	32.65		56.00	-23.35	L	ON	10.1
1.480000		19.99	46.00	26.01	L	ON	10.1
1.480000	31.58		56.00	-24.42	L	ON	10.1
2.316000		14.75	46.00	-31.25	L	ON	10.2
2.316000	25.00		56.00	-31.00	L	ON	10.2
4.248000		17.87	46.00	-28.13	L	ON	10.2
4.248000	29.97		56.00	-26.03	L	ON	10.2
15.908000		23.97	50.00	-26.03	L	ON	10.5
15.908000	32.28		60.00	-27.72	L	ON	10.5

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.



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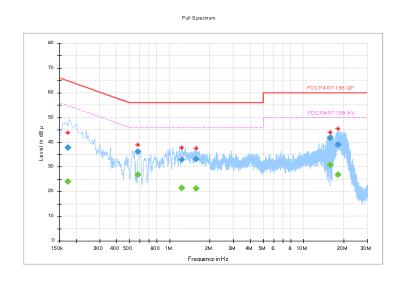


TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz		Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.174000		24.09	54.77	-30.68	N	ON	9.9
0.174000	37.84		64.77	-26.93	N	ON	9.9
0.580000		26.82	46.00	-19.18	Ν	ON	9.9
0.580000	36.26		56.00	-19.74	N	ON	9.9
1.232000		21.50	46.00	-24.50	N	ON	10.0
1.232000	32.79		56.00	-23.21	N	ON	10.0
1.568000		21.23	46.00	-24.77	N	ON	10.0
1.568000	33.09		56.00	-22.91	N	ON	10.0
15.828000		30.85	50.00	-19.15	N	ON	10.4
15.828000	41.67		60.00	-18.33	N	ON	10.4
18.148000		26.85	50.00	-23.15	N	ON	10.4
18.148000	38.94		60.00	-21.06	N	ON	10.4

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.



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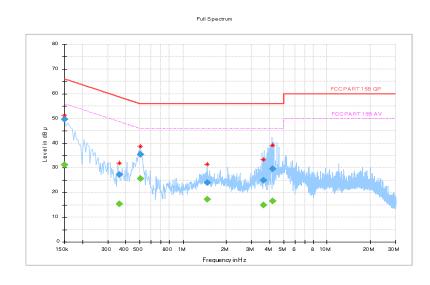
Mode 18

TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000		31.19	56.00	-24.81	L	ON	9.9
0.150000	49.67		66.00	-16.33	L	ON	9.9
0.360000		15.29	48.73	-33.44	L	ON	10.0
0.360000	27.25		58.73	-31.47	L	ON	10.0
0.504000		25.74	46.00	-20.26	L	ON	10.0
0.504000	35.53		56.00	-20.47	L	ON	10.0
1.464000		17.18	46.00	-28.82	L	ON	10.1
1.464000	24.05		56.00	-31.95	L	ON	10.1
3.612000		15.02	46.00	-30.98	L	ON	10.2
3.612000	24.97		56.00	-31.03	L	ON	10.2
4.180000		16.50	46.00	-29.50	L	ON	10.2
4.180000	29.67		56.00	-26.33	L	ON	10.2

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.



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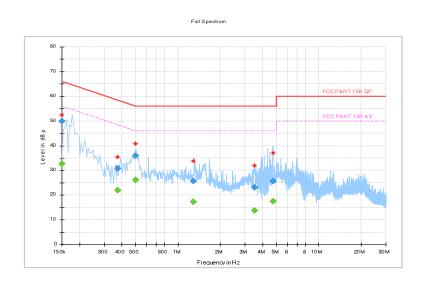


TEST VOLTAGE		Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000		32.74	56.00	-23.26	N	ON	9.9
0.150000	49.87		66.00	-16.13	N	ON	9.9
0.372000		21.98	48.46	-26.47	N	ON	9.9
0.372000	30.80		58.46	-27.65	N	ON	9.9
0.500000		26.07	46.00	-19.93	N	ON	9.9
0.500000	35.81		56.00	-20.19	N	ON	9.9
1.292000		17.19	46.00	-28.81	N	ON	10.0
1.292000	25.75		56.00	-30.25	N	ON	10.0
3.498000		13.69	46.00	-32.31	N	ON	10.1
3.498000	23.04		56.00	-32.96	N	ON	10.1
4.716000		17.55	46.00	-28.45	N	ON	10.1
4.716000	25.73		56.00	-30.27	N	ON	10.1

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.



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2.2 RADIATED EMISSION MEASUREMENT

2.2.1. LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.109)

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBμV/m)							
Frequencies (MHz)	FCC 15B/ ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B			
30-88	39	29.5					
88-216	43.5	33.1	40	30			
216-230	46.4	25.6					
230-960	40.4	35.6	47	27			
960-1000	49.5	43.5	47	37			
1000-3000	Avg: 49.5	Avg: 43.5	Not defined	Not defined			
3000+	Peak: 69.5	Peak: 63.5	Not defined	Not defined			

Radiated Emissions Limits at 3 meters (dBµV/m)						
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B		
30-88	49.5	40				
88-216	54	43.5	50.5	40.5		
216-230	56.9	46				
230-960	50.9	40	57.5	47.5		
960-1000	60	54	57.5	47.5		
1000-3000			Avg: 56	Avg: 50		
	Avg: 60	Avg: 54	Peak: 76	Peak: 70		
3000+	Peak: 80	Peak: 74	Avg: 60	Avg: 54		
			Peak: 80	Peak: 74		

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Frequency Range (For unintentional radiators)

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)	
Below 1.705	30	
1.705-108	1000	
108-500	2000	
500-1000	5000	
Above 1000	5 th harmonic of the highest frequency or 40GHz, whichever is lower	

NOTE: 1. The lower limit shall apply at the transition frequencies.

- 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
- 4. QP detector shall be applied if not specified.

2.2.2. TEST INSTRUMENTS

Frequency range below1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN		Euroshieldpn- CT0001143-1216	Feb. 26,19	Feb. 25,20
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,19	Feb. 25,20
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25,20
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jul. 09,18	Jul. 08,19

Frequency range above 1GHz

acticy range above ronz											
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.						
3m Semi-anechoic Chamber	ETS-LINDGREN		Euroshieldpn- CT0001143-1216	Feb. 26,19	Feb. 25,20						
Horn Antenna	ETS-LINDGREN	3117	00168728	Feb. 26,19	Feb. 25,20						
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25, 20						
Signal Pre-Amplifier		EMC 012645B	980257	Jul. 09,18	Jul. 08,19						

NOTE: 1. The test was performed in 3m chamber.

- 2. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
- 3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.



2.2.3. TEST PROCEDURE

<Frequency Range below 1GHz>

The basic test procedure was in accordance with ANSI C63.4:2014 (section 12).

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

NOTE:

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- 1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
- 3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
- 4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) Amplifier Gain(dB) (if the raw value contains the amplifier).
- 5. Margin value = Emission level Limit value.

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<Frequency Range above 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter fully-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. The bore sight should be used during the test above 1GHz.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz

NOTE:

- 1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth of test receiver/spectrum analyzer is 1Hz for Average detection (AV) at frequency above 1GHz.
- 3. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
- 4. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
- 5. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
- 6. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) Amplifier Gain(dB) (if the raw value contains the amplifier)
- 7. Margin value = Emission level Limit value.

DEVIATION FROM TEST STANDARD 2.2.4.

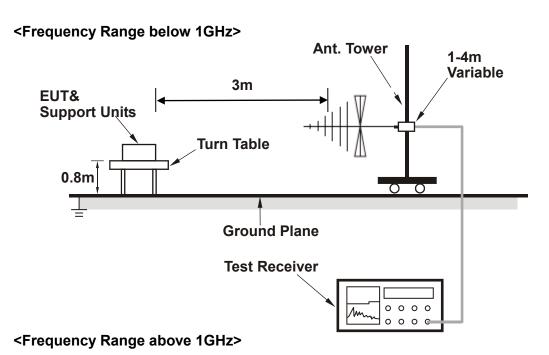
No deviation.

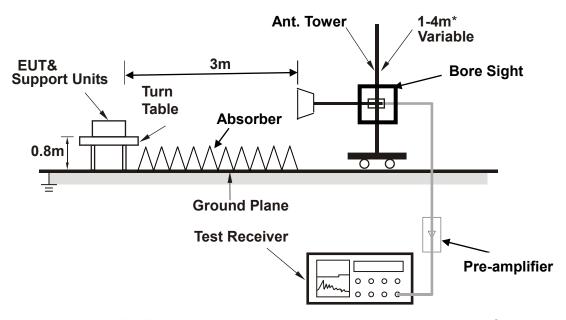
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2.2.5. TEST SETUP





*: depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

2.2.6. EUT OPERATING CONDITIONS

Same as item 2.1.6.

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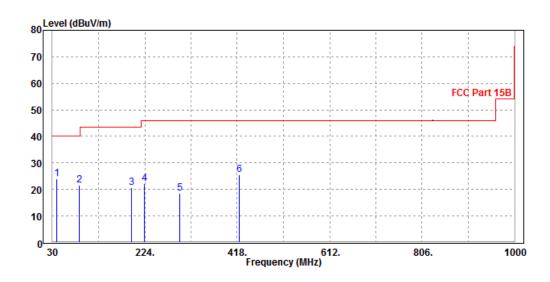
TEST RESULTS 2.2.7.

Mode 9

TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Rose Ma		

	Α	NTENN	A POLAF	RITY & TE	ST DISTA	NCE: HO	DRIZONT	AL AT 3 M		
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
39.7	24.13	47.15	40	-15.87	13.55	0.91	37.48	100	124	QP
86.26	21.61	49.09	40	-18.39	8.35	1.25	37.08	100	254	QP
196.84	20.58	44.64	43.5	-22.92	10.72	1.78	36.56	100	319	QP
223.03	22.29	45.1	46	-23.71	11.81	1.91	36.53	100	218	QP
296.75	18.53	38.8	46	-27.47	14.03	2.2	36.5	100	168	QP
422.85	25.69	42.26	46	-20.31	17.5	2.7	36.77	100	238	QP

- REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 - 2. Negative sign (-) in the margin column signify levels below the limit.
 - 3. Frequency range scanned: 30MHz to 1000MHz.
 - 4. Only emissions significantly above equipment noise floor are reported.



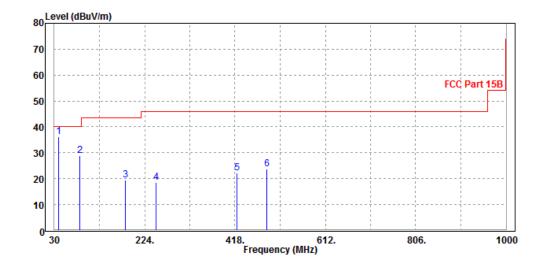
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TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Rose Ma		

		ANTEN	INA POLA	ARITY & 1	TEST DIST	ANCE: \	VERTICA	L AT 3 M		
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
39.7	36.34	59.19	40	-3.66	13.72	0.91	37.48	100	158	QP
84.32	28.88	56.32	40	-11.12	8.43	1.23	37.1	100	318	QP
183.26	19.61	44.1	43.5	-23.89	10.47	1.71	36.67	100	259	QP
249.22	18.63	39.95	46	-27.37	13.16	2.04	36.52	100	128	QP
422.85	22.34	38.79	46	-23.66	17.62	2.7	36.77	100	109	QP
486.87	23.67	39.14	46	-22.33	18.52	2.94	36.93	100	167	QP

- REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 - 2. Negative sign (-) in the margin column signify levels below the limit.
 - 3. Frequency range scanned: 30MHz to 1000MHz.
 - 4. Only emissions significantly above equipment noise floor are reported.



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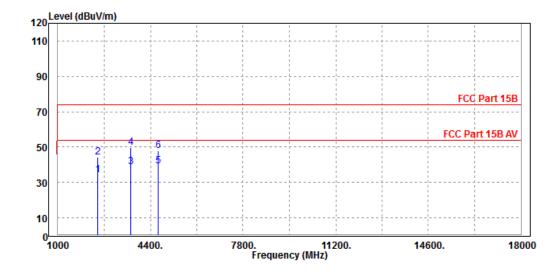


TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS		DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

	Δ	NTENN	A POLAF	RITY & TE	ST DISTA	NCE: HO	DRIZONT	AL AT 3 M		
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2456	34.16	42.36	54	-19.84	33.22	4.95	46.37	100	247	Average
2456	44.14	52.34	74	-29.86	33.22	4.95	46.37	100	247	Peak
3689	39.01	43.67	54	-14.99	35.97	5.75	46.38	100	306	Average
3689	49.61	54.27	74	-24.39	35.97	5.75	46.38	100	306	Peak
4687	39.29	43.85	54	-14.71	35.55	6.28	46.39	100	149	Average
4687	47.76	52.32	74	-26.24	35.55	6.28	46.39	100	149	Peak

REMARKS:

- 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
- 2. Negative sign (-) in the margin column signify levels below the limit.
- 3. Frequency range scanned: 1GHz to 18GHz.
- 4. Only emissions significantly above equipment noise floor are reported.



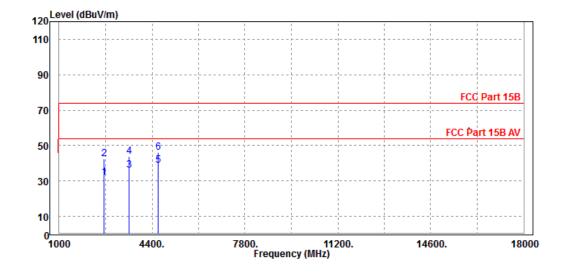
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TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

		ANTEN	INA POLA	ARITY & 1	TEST DIST	ANCE: \	VERTICA	L AT 3 M		
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2631	31.72	40.37	54	-22.28	32.58	5.14	46.37	100	138	Average
2631	42.45	51.1	74	-31.55	32.58	5.14	46.37	100	138	Peak
3552	36.13	42.96	54	-17.87	33.7	5.85	46.38	100	268	Average
3552	43.96	50.79	74	-30.04	33.7	5.85	46.38	100	268	Peak
4635	38.95	43.26	54	-15.05	35.98	6.1	46.39	100	306	Average
4635	46.18	50.49	74	-27.82	35.98	6.1	46.39	100	306	Peak

- REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 - 2. Negative sign (-) in the margin column signify levels below the limit.
 - 3. Frequency range scanned: 1GHz to 18GHz.
 - 4. Only emissions significantly above equipment noise floor are reported.



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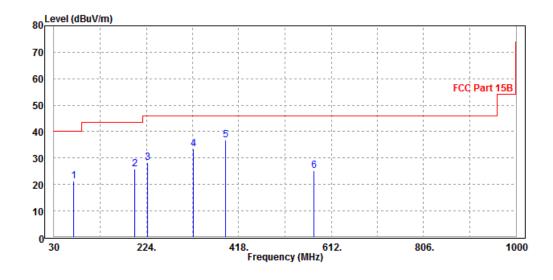


Mode 15

TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS		DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Rose Ma		

	Δ	NTENN	A POLAF	RITY & TE	ST DISTA	NCE: H	ORIZONT	AL AT 3 M		
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
71.71	21.23	49.67	40	-18.77	7.6	1.2	37.24	100	90	QP
199.75	25.85	49.81	43.5	-17.65	10.79	1.79	36.54	100	90	QP
225.94	28.2	50.87	46	-17.8	11.94	1.92	36.53	100	90	QP
321.97	33.44	52.91	46	-12.56	14.78	2.3	36.55	100	90	QP
389.87	36.89	54.12	46	-9.11	16.89	2.58	36.7	100	90	QP
576.11	25.16	39.5	46	-20.84	19.72	3.12	37.18	100	90	QP

- REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 - 2. Negative sign (-) in the margin column signify levels below the limit.
 - 3. Frequency range scanned: 30MHz to 1000MHz.
 - 4. Only emissions significantly above equipment noise floor are reported.



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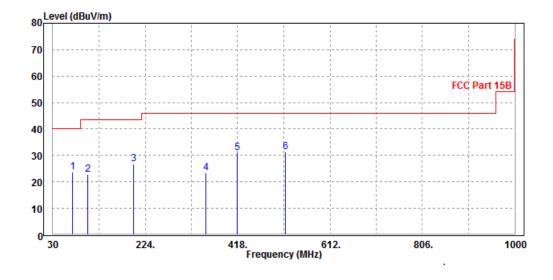


TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz	
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz	
TESTED BY	Rose Ma			

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
71.71	23.75	52.07	40	-16.25	7.72	1.2	37.24	100	216	QP
102.75	22.79	48.79	43.5	-20.71	9.65	1.33	36.98	100	216	QP
199.75	26.63	50.58	43.5	-16.87	10.8	1.79	36.54	100	216	QP
351.07	23.55	41.96	46	-22.45	15.78	2.42	36.61	100	216	QP
417.03	30.94	47.48	46	-15.06	17.54	2.68	36.76	100	216	QP
517.91	31.27	46.31	46	-14.73	18.95	3.02	37.01	100	216	QP

REMARKS:

- 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
- 2. Negative sign (-) in the margin column signify levels below the limit.
- 3. Frequency range scanned: 30MHz to 1000MHz.
- 4. Only emissions significantly above equipment noise floor are reported.



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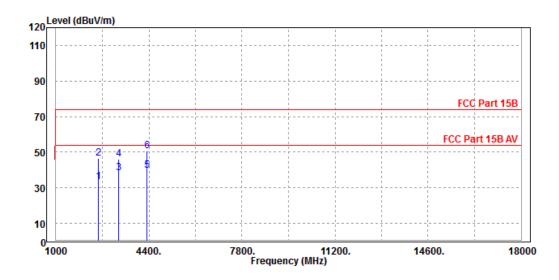


TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2547	33.22	41.23	54	-20.78	33.31	5.05	46.37	100	261	Average
2547	46.56	54.57	74	-27.44	33.31	5.05	46.37	100	261	Peak
3278	38.5	44.97	54	-15.5	34.18	5.73	46.38	100	264	Average
3278	45.99	52.46	74	-28.01	34.18	5.73	46.38	100	264	Peak
4332	39.61	44.18	54	-14.39	36.24	5.58	46.39	100	197	Average
4332	50.6	55.17	74	-23.40	36.24	5.58	46.39	100	197	Peak

REMARKS:

- 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
- 2. Negative sign (-) in the margin column signify levels below the limit.
- 3. Frequency range scanned: 1GHz to 18GHz.
- 4. Only emissions significantly above equipment noise floor are reported.



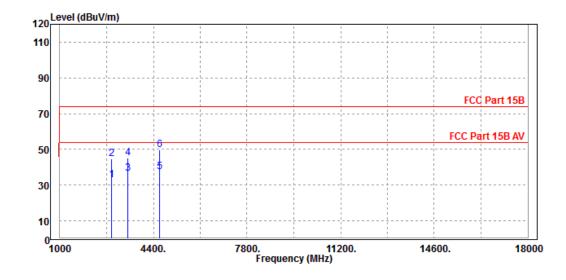
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TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2868	33	41.27	54	-21.00	32.72	5.38	46.37	100	148	Average
2868	44.67	52.94	74	-29.33	32.72	5.38	46.37	100	148	Peak
3472	36.64	43.78	54	-17.36	33.37	5.87	46.38	100	274	Average
3472	45.22	52.36	74	-28.78	33.37	5.87	46.38	100	274	Peak
4635	37.28	41.59	54	-16.72	35.98	6.1	46.39	100	298	Average
4635	49.67	53.98	74	-24.33	35.98	6.1	46.39	100	298	Peak

- **REMARKS:** 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 - 2. Negative sign (-) in the margin column signify levels below the limit.
 - 3. Frequency range scanned: 1GHz to 18GHz.
 - 4. Only emissions significantly above equipment noise floor are reported.





3 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---