





# **TEST REPORT**

No. I21N03152-BLE

for

**IDEMIA Identity and Security France** 

ID Screen 60

Model Name: MPH-MB004A

with

**Hardware Version: V02** 

Software Version: IDEMIA\_WM38\_V01\_211023

FCC ID: ZBW-MPHMB004

Issued Date: 2021-12-24

**Designation Number: CN1210** 

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

#### **Test Laboratory:**

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# 1. Summary of Test Report

# 1.1. Test Items

Description ID Screen 60 Model Name MPH-MB004A

Applicant's name IDEMIA Identity and Security France
Manufacturer's Name IDEMIA Identity and Security France

# 1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013

# 1.3. Test Result

#### **Pass**

Please refer to "5.2. Test Results"

# 1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China

## 1.5. Project data

Testing Start Date: 2021-11-08
Testing End Date: 2021-12-24

# 1.6. Signature

Lin Zechuang

(Prepared this test report)

An Ran

(Reviewed this test report)

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(Approved this test report)



# 2. Client Information

# 2.1. Applicant Information

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# 2.2. Manufacturer Information

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# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

# 3.1. About EUT

Description ID Screen 60 Model Name MPH-MB004A

Frequency Range 2400MHz~2483.5MHz

Type of Modulation GFSK Number of Channels 40

Antenna Type Dedicated antenna

Supply Voltage DC 3.85V Power source Battery

FCC ID ZBW-MPHMB004

Condition of EUT as received No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

# 3.2.Internal Identification of EUT used during the test

EUT ID*	IMEI	<b>HW Version</b>	SW Version	Receive Date
UT03aa	351935780004224	V02	IDEMIA_WM38_V01_211023	2021-11-12
UT04aa	351935780003408	V02	IDEMIA_WM38_V01_211023	2021-11-12

<sup>\*</sup>EUT ID: is used to identify the test sample in the lab internally.

UT03aa is used for conduction test, UT04aa used for radiation test and AC Power line Conducted Emission test.

# 3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	Manufacturer
AE1	Battery	293780548	SCUD (Fujian) Electronics Co., Ltd.
AE2	Charger	A839-200150C-US1	Shenzhen Aoda Power Technology Co., Ltd.

<sup>\*</sup>AE ID: is used to identify the test sample in the lab internally.

## 3.4. General Description

The Equipment under Test (EUT) is a model of ID Screen 60 with dedicated antenna.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.



# 4. Reference Documents

# 4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

# 4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15	FCC CFR 47, Part 15, Subpart C:	2019
	15.205 Restricted bands of operation;	
	15.209 Radiated emission limits, general requirements;	
	15.247 Operation within the bands 902–928MHz,	
	2400–2483.5 MHz, and 5725–5850 MHz	
ANSI C63.10	American National Standard of Procedures for Compliance	2013
	Testing of Unlicensed Wireless Devices	



# 5. Test Results

# **5.1.** Testing Environment

Normal Temperature:  $15\sim35^{\circ}$ C Relative Humidity:  $20\sim75\%$ 

# 5.2. Test Results

No	Test cases	Sub-clause of Part 15C	Verdict
0	Antenna Requirement	15.203	Р
1	Maximum Peak Output Power	15.247 (b)	Р
2	Peak Power Spectral Density	15.247 (e)	Р
3	6dB Bandwidth	15.247 (a)	Р
4	Band Edges Compliance	15.247 (d)	Р
5	Transmitter Spurious Emission - Conducted	15.247 (d)	Р
6	Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	Р
7	AC Power line Conducted Emission	15.107, 15.207	Р

See ANNEX A for details.

## 5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

#### Disclaimer:

- A. After confirmation with the customer, the sample information provided by the customer may affect the validity of the measurement results in this report, and the impact and consequences arising therefrom shall be borne by the customer.
- B. The samples in this report are provided by the customer, and the test results are only applicable to the samples received.



# 6. Test Equipments Utilized

# **Conducted test system**

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2021-12-30	1 year
2	Power Sensor	U2021XA	MY55430013	Keysight	2022-01-13	1 year
3	Data Acquisiton	U2531A	TW55443507	Keysight	/	/
4	Test Receiver	ESCI	100701	Rohde & Schwarz	2022-08-08	1 year
5	LISN	ENV216	102067	Rohde & Schwarz	2022-07-15	1 year

Radiated test system

	Radiated test system					
No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Loop Antenna	HLA6120	35779	TESEQ	2022-04-25	3 years
2	BiLog Antenna	3142E	00224831	ETS-Lindgren	2024-05-27	3 years
3	Horn Antenna	3117	00066577	ETS-Lindgren	2022-04-02	3 years
4	Horn Antenna	QSH-SL-18 -26-S-20	17013	Q-par	2023-01-06	3 years
5	Horn Antenna	QSH-SL-8- 26-40-K-20	17014	Q-par	2023-01-06	3 years
6	Test Receiver	ESR7	101676	Rohde & Schwarz	2022-11-24	1 year
7	Spectrum Analyser	FSV40	101192	Rohde & Schwarz	2022-01-13	1 year
8	Chamber	FACT3-2.0	1285	ETS-Lindgren	2023-05-29	2 years

# **Test software**

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	10.50.40

EUT is engineering software provided by the customer to control the transmitting signal.

The EUT was programmed to be in continuously transmitting mode.

# **Anechoic chamber**

Fully anechoic chamber by ETS-Lindgren



# 7. Laboratory Environment

# Semi-anechoic chamber

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz

# Shielded room

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-1000MHz>90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω

# Fully-anechoic chamber

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Q
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz



# 8. Measurement Uncertainty

Test Name	Uncertair	ity ( <i>k</i> =2)
1. RF Output Power - Conducted	1.32dB	
2.Power Spectral Density - Conducted	2.32	dB
3.Occupied channel bandwidth - Conducted	66H	łz
	30MHz≤f<1GHz	1.41dB
4 Transmitter Churique Emission Conducted	1GHz≤f<7GHz	1.92dB
4 Transmitter Spurious Emission - Conducted	7GHz≤f<13GHz	2.31dB
	13GHz≤f≤26GHz	2.61dB
	9kHz≤f<30MHz	1.74dB
F. Transmitter Courieus Emissian Dedicted	30MHz≤f<1GHz	4.84dB
5. Transmitter Spurious Emission - Radiated	1GHz≤f<18GHz	4.68dB
	18GHz≤f≤40GHz	3.76dB
6. AC Power line Conducted Emission	150kHz≤f≤30MHz	3.00dB



# **ANNEX A: Detailed Test Results**

# **Test Configuration**

The measurement is made according to ANSI C63.10.

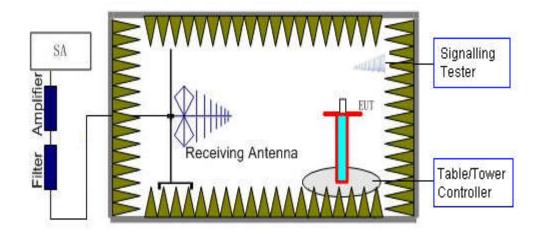
# 1) Conducted Measurements

- 1. Connect the EUT to the test system correctly.
- 2. Set the EUT to the required work mode.
- 3. Set the EUT to the required channel.
- 4. Set the spectrum analyzer to start measurement.
- 5. Record the values.



## 2) Radiated Measurements

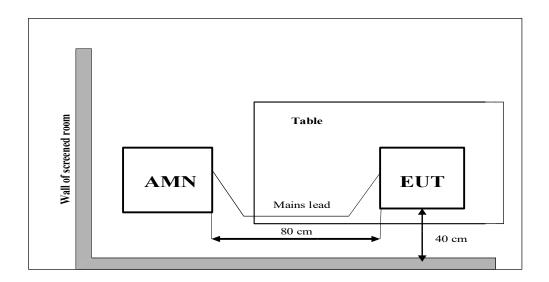
**Test setup:** EUT was placed on a 1.5 meter high non-conductive table at a 3 meter test distance from the receive antenna. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiving antenna polarization.





# 3) AC Power line Conducted Emission Measurement

For Bluetooth LE, the EUT is working under test mode. The EUT is commanded to operate at maximum transmitting power.





# A.0 Antenna requirement

## **Measurement Limit:**

Standard	Requirement
	An intentional radiator shall be designed to ensure that no antenna other than that
	furnished by the responsible party shall be used with the device. The use of a
	permanently attached antenna or of an antenna that uses a unique coupling to the
	intentional radiator shall be considered sufficient to comply with the provisions of
	this section. The manufacturer may design the unit so that a broken antenna can
	be replaced by the user, but the use of a standard antenna jack or electrical
FCC CRF Part	connector is prohibited. This requirement does not apply to carrier current devices
15.203	or to devices operated under the provisions of §15.211, §15.213, §15.217,
	§15.219, or §15.221. Further, this requirement does not apply to intentional
	radiators that must be professionally installed, such as perimeter protection
	systems and some field disturbance sensors, or to other intentional radiators
	which, in accordance with §15.31(d), must be measured at the installation site.
	However, the installer shall be responsible for ensuring that the proper antenna is
	employed so that the limits in this part are not exceeded.

Conclusion: The Directional gains of antenna used for transmitting is -1.0 dBi.

The RF transmitter uses an integrate antenna without connector.



# A.1 Maximum Peak Output Power

# Method of Measurement: See ANSI C63.10-clause 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter.

#### **Measurement Limit:**

Standard	Limit (dBm)
FCC 47 CRF Part 15.247(b)	< 30

#### **Measurement Results:**

Mode	Frequency (MHz)	RF output power (dBm)	Conclusion
	2402(CH0)	0.07	Р
LE 1M	2440(CH19)	3.34	Р
	2480(CH39)	1.69	Р

**Conclusion: Pass** 



# A.2 Peak Power Spectral Density

Method of Measurement: See ANSI C63.10-clause 11.10.2

#### **Measurement Limit:**

Standard	Limit
FCC 47 CRF Part 15.247(e)	< 8 dBm/3 kHz

#### **Measurement Results:**

Mode	Frequency (MHz)	Peak Power Sp (dB	_	Conclusion
	2402(CH0)	Fig.1	-7.68	Р
LE 1M	2440(CH19)	Fig.2	-6.29	Р
	2480(CH39)	Fig.3	-8.07	Р

See below for test graphs.

**Conclusion: PASS** 

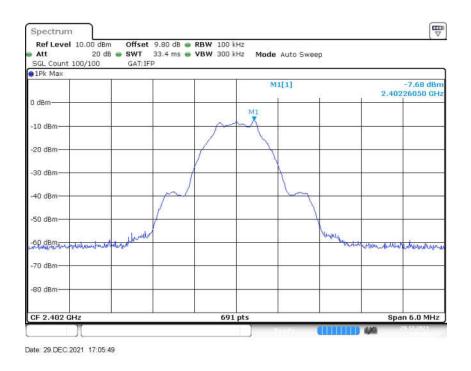


Fig.1 Power Spectral Density (Ch 0), LE 1M



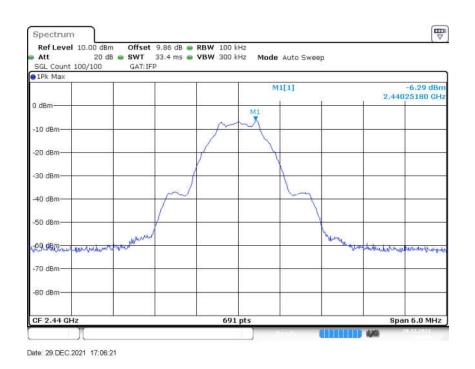


Fig.2 Power Spectral Density (Ch 19), LE 1M

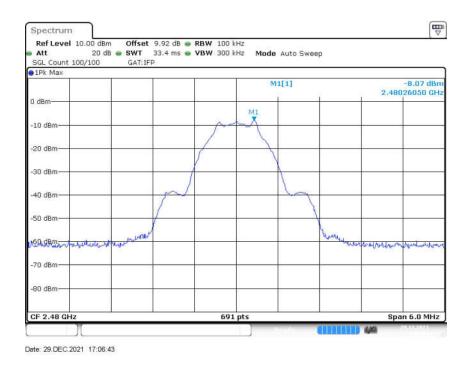


Fig.3 Power Spectral Density (Ch 39), LE 1M



## A.3 6dB Bandwidth

#### **Measurement Limit:**

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

## **Measurement Result:**

Mode	Frequency (MHz)	Test Results ( KHz)		Conclusion
	2402(CH0)	Fig.4	738.00	Р
LE 1M	2440(CH19)	Fig.5	729.00	Р
	2480(CH39)	Fig.6	729.00	Р

See below for test graphs.

**Conclusion: PASS** 

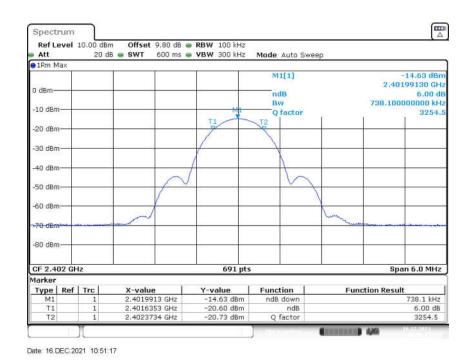


Fig.4 6dB Bandwidth (Ch 0), LE 1M



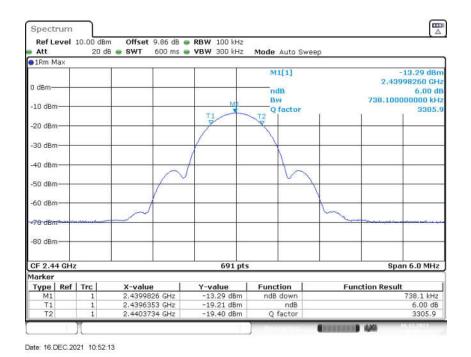


Fig.5 6dB Bandwidth (Ch 19), LE 1M

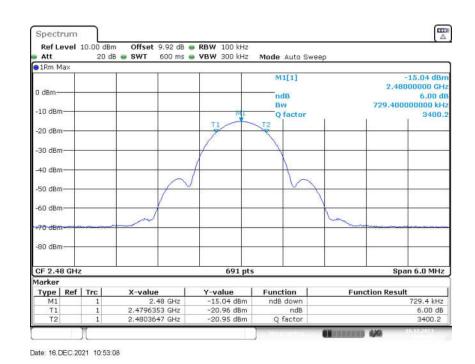


Fig.6 6dB Bandwidth (Ch 39), LE 1M



# A.4 Band Edges Compliance

# **Measurement Limit:**

Standard	Limit (dB)
FCC 47 CFR Part 15.247 (d)	> 20

# **Measurement Result:**

Mode	Frequency (MHz)	Test Results (dBc)		Conclusion
LE 1M	2402(CH0)	Fig.7	/	Р
LE IIVI	2480(CH39)	Fig.8	/	Р

See below for test graphs.

**Conclusion: PASS** 



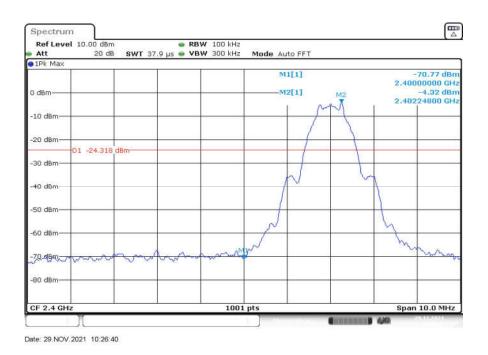


Fig.7 Band Edges (Ch 0), LE 1M

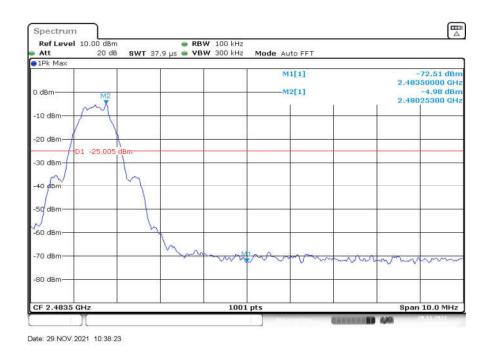


Fig.8 Band Edges (Ch 39), LE 1M



# A.5 Transmitter Spurious Emission - Conducted

## **Measurement Limit:**

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz
, ,	bandwidth

#### **Measurement Results:**

MODE	Channel	Frequency Range	Test Results	Conclusion
	0	30MHz -26.5GHz	Fig.9	Р
LE 1M	19	30MHz -26.5GHz	Fig.10	Р
	39	30MHz -26.5GHz	Fig.11	Р

See below for test graphs.

**Conclusion: Pass** 

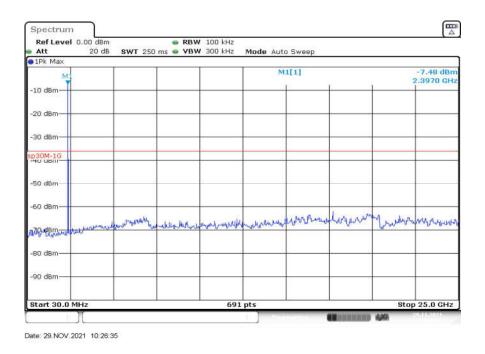


Fig.9 Conducted Spurious Emission (Ch0, 30 MHz-26.5 GHz), LE 1M



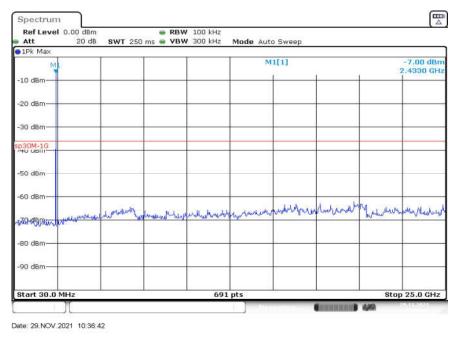


Fig.10 Conducted Spurious Emission (Ch19, 30 MHz-26.5 GHz), LE 1M

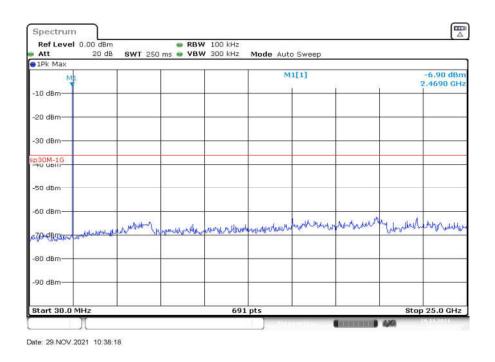


Fig.11 Conducted Spurious Emission (Ch39, 30 MHz-26.5 GHz), LE 1M



# A.6 Transmitter Spurious Emission - Radiated

#### **Measurement Limit:**

Standard	Limit	
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power	

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

#### Limit in restricted band:

Frequency of emission (MHz)	Field strength(μV/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

#### **Test Condition:**

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

**Note**: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic. The measurement results include the horizontal polarization and vertical polarization measurements.



# **Measurement Results:**

Mode	Channel	Frequency Range	Test Results	Conclusion
	0	3 GHz ~18 GHz	Fig.12	Р
	19	3 GHz ~18 GHz	Fig.13	Р
	39	3 GHz ~18 GHz	Fig.14	Р
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.15	Р
LE 1M	Restricted Band(CH39)	2.45 GHz ~ 2.5 GHz	Fig.16	Р
		9 kHz ~30 MHz	Fig.17	Р
	All channels	30 MHz ~1 GHz	Fig.18	Р
	All Glaffileis	1 GHz ~3 GHz	Fig.19	Р
		18 GHz ~ 26.5 GHz	Fig.20	Р

# Worst Case Result For LE 1M:

# CH19 (3-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
9757.500000	45.39	74.00	28.61	V	4.9
11386.500000	46.72	74.00	27.28	Н	6.6
13091.500000	48.16	74.00	25.84	Н	9.5
14223.000000	49.49	74.00	24.51	Н	11.6
16361.500000	50.27	74.00	23.73	V	15.0
17655.000000	51.97	74.00	22.03	Н	16.0

Frequency	Average	Limit	Margin	Pol	Corr.
(MHz)	(dBµV/m)	(dBµV/m)	(dB)	POI	(dB/m)
9870.500000	33.60	54.00	20.40	Н	5.2
11425.000000	34.52	54.00	19.48	V	6.7
13098.000000	36.23	54.00	17.77	V	9.8
14492.000000	37.02	54.00	16.98	V	11.7
16543.500000	39.40	54.00	14.60	Н	15.3
17947.000000	40.32	54.00	13.68	V	17.3



#### Note:

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and Antenna Factor, the gain of the preamplifier, the cable loss.  $P_{Mea}$  is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result=  $P_{Mea}$  +Cable Loss +Antenna Factor-Gain of the preamplifier.

See below for test graphs.

**Conclusion: Pass** 

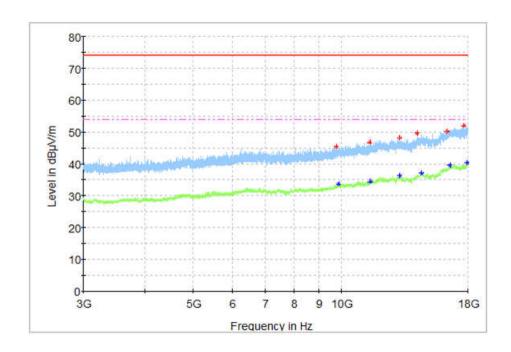


Fig.12 Radiated Spurious Emission (Ch0, 3 GHz ~18 GHz), LE 1M



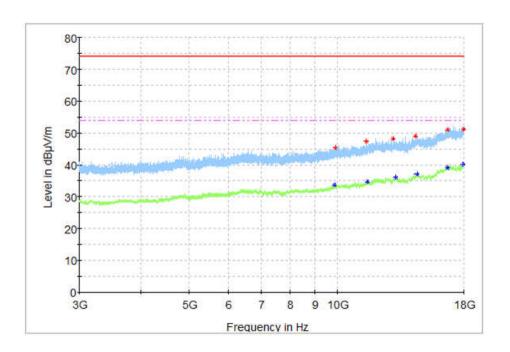


Fig.13 Radiated Spurious Emission (Ch19, 3 GHz ~18 GHz), LE 1M

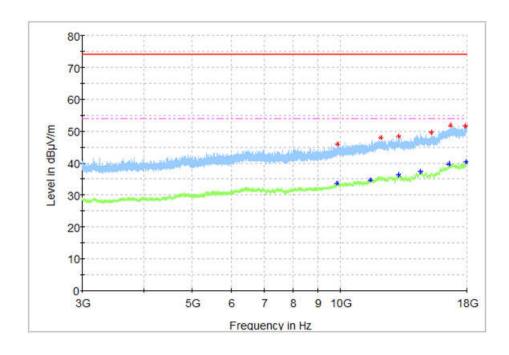


Fig.14 Radiated Spurious Emission (Ch39, 1 GHz ~18 GHz), LE 1M



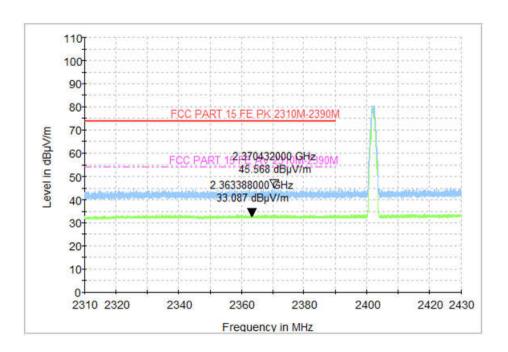


Fig.15 Radiated Band Edges (Ch0, 2380GHz~2450GHz), LE 1M

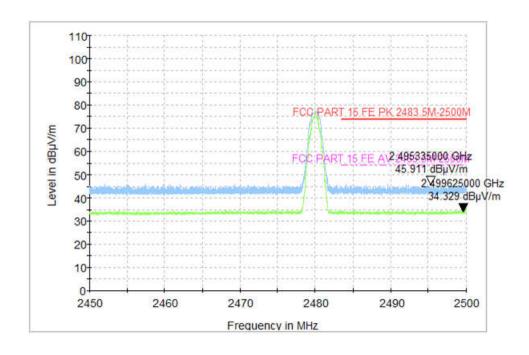


Fig.16 Radiated Band Edges (Ch39, 2450GHz~2500GHz), LE 1M



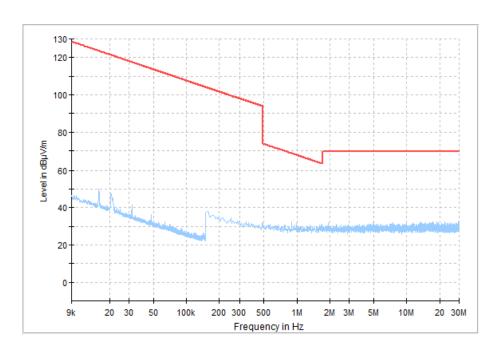


Fig.17 Radiated Spurious Emission (All Channels, 9 kHz-30 MHz), LE

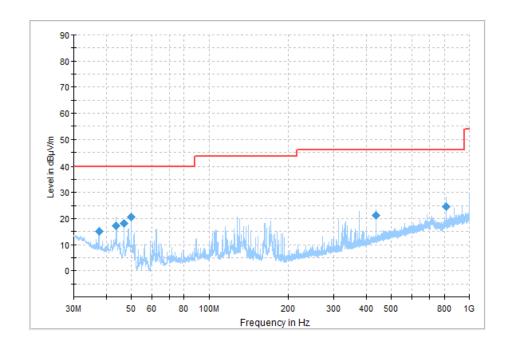


Fig.18 Radiated Spurious Emission (All Channels, 30 MHz-1 GHz), LE



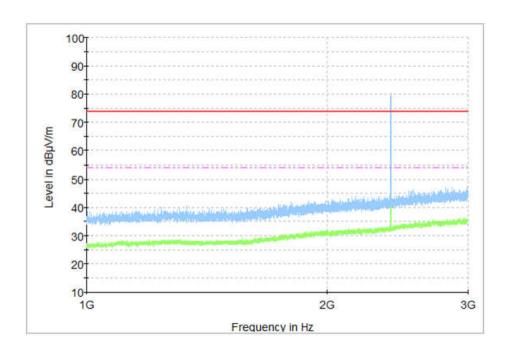


Fig.19 Radiated Spurious Emission (All Channels, 1 GHz-3 GHz), LE

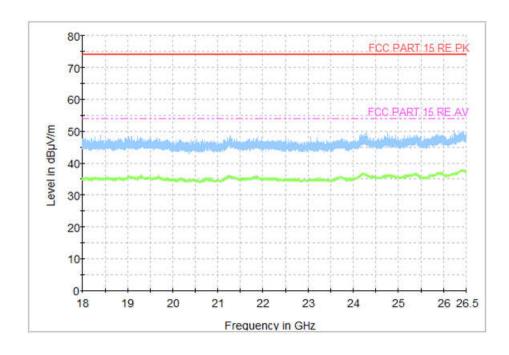


Fig.20 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz), LE



# A.7 AC Power line Conducted Emission

## **Test Condition:**

Voltage (V)	Frequency (Hz)
120	60

## **Measurement Result and limit:**

# LE -AE1,AE2,AE3

Frequency range	Quasi-peak	Average-peak	Result (dBμV)		Conclusion
(MHz)	Limit (dBμV)	Limit (dBμV)	Traffic	Idle	Conclusion
0.15 to 0.5	66 to 56	56 to 46			
0.5 to 5	56	46	Fig.21	Fig.22	Р
5 to 30	60	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

LE Note: The measurement results include the L1 and N measurements.

See below for test graphs.

**Conclusion: Pass** 



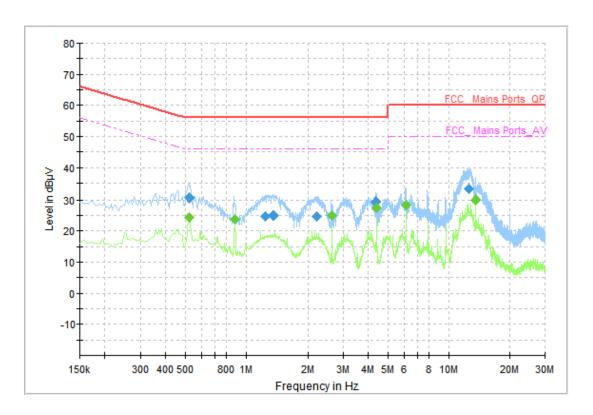


Fig.21 AC Power line Conducted Emission (Traffic), LE

Measurement Results: Quasi Peak

Frequency	Quasi Peak	Limit	Margin	Line	Ciltor.	Corr.
(MHz)	(dBµV)	(dBµV)	(dB)		Filter	(dB)
0.522000	30.55	56.00	25.45	L1	ON	10
1.242000	24.53	56.00	31.47	L1	ON	10
1.366000	25.09	56.00	30.91	L1	ON	10
2.206000	24.59	56.00	31.41	N	ON	10
4.354000	29.32	56.00	26.68	L1	ON	10
12.562000	33.10	60.00	26.90	N	ON	10

Measurement Results: Average

Frequency	Average	Limit	Margin	Lino	Filter	Corr.
(MHz)	(dBµV)	(dBµV)	(dB)	Line	riiter	(dB)
0.522000	24.41	46.00	21.59	N	ON	10
0.878000	23.74	46.00	22.26	N	ON	10
2.638000	25.04	46.00	20.96	N	ON	10
4.398000	27.32	46.00	18.68	L1	ON	10
6.158000	28.22	50.00	21.78	L1	ON	10
13.562000	29.84	50.00	20.16	N	ON	11



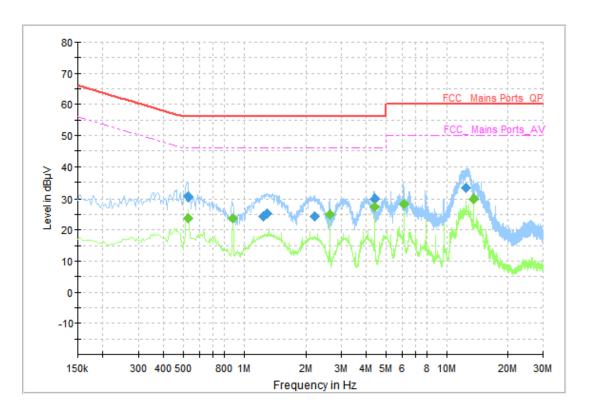


Fig.22 AC Power line Conducted Emission (Idle), LE

# Measurement Results: Quasi Peak

Frequency	Quasi Peak	Limit	Margin	Line	Filter	Corr.
(MHz)	(dBµV)	(dBµV)	(dB)		riiter	(dB)
0.526000	30.55	56.00	25.45	N	ON	10
1.242000	24.45	56.00	31.55	L1	ON	10
1.302000	25.11	56.00	30.89	N	ON	10
2.206000	24.49	56.00	31.51	N	ON	10
4.398000	29.84	56.00	26.17	L1	ON	10
12.486000	33.08	60.00	26.92	N	ON	10

# Measurement Results: Average

Frequency	Average	Limit	Margin	Lina	Filton	Corr.
(MHz)	(dBµV)	(dBµV)	(dB)	Line	Filter	(dB)
0.526000	23.76	46.00	22.24	N	ON	10
0.878000	23.84	46.00	22.16	L1	ON	10
2.638000	25.09	46.00	20.91	N	ON	10
4.398000	27.32	46.00	18.68	L1	ON	10
6.158000	28.33	50.00	21.67	L1	ON	10
13.562000	29.89	50.00	20.11	N	ON	11

## \*\*\*END OF REPORT\*\*\*