Hong Kong

FCC/ICTEST REPORT

Report Number	:	**60/790.15.004.03**	Date of Issue:	April 1, 2015
Model	:	**Joule GPS Plus**		
Product type	:	**GPS Bike Computer**		
Applicant	:	DAYTON INDUSTRIAL CO.,LTD		
Address	:	2-12 Kwai Fat Road,11-A Kwai Chung,New Territories,Hong Kong		
Production Facility	:	KENDY ENTERPISE LTD		
Address	:	2-12 Kwai Fat Road,11-A Kwai Chung,New Territories,Hong Kong		
Test Result	:	■ **Positive** ☐ **Negative**	Total Pages:	19

Prepared by: Reviewed by:

CHAN KwongNgai Edmond FUNG

TÜV SÜD HONG KONG LTD.

TÜV SÜD Hong Kong Ltd. is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO 17025.

TÜV SÜD Hong Kong Ltd. reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented.It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Hong Kong Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Hong Kong Ltd. issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.

Tel: +852-2776 1323
Fax: +852-2776 1206

TABLE OF CONTENTS

1 General Information

1.1 Summary of Test Result

FCC Rules	IC Rules	Description of Test	Result	Remark
FCC § 15.107	ICES-003 § 6.1	AC Line Conducted Emissions	PASS	Meet Class B limit
FCC § 15.109	ICES-003 § 6.2	Radiated Emission	PASS	Meet Class B limit

Remark:

1. EUT is battery operated only.

2. The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.26 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.19 dB.

1.3 Details about the Test Laboratory

Test site 1

Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

Test site 2

Company name: Shenzhen Academy of Metrology and Quality Inspection
No.4 TongFa Road, Xili Town Nanshan District, Shenzhen, China

2 EUT Description

Product	Joule GPS Plus
Model Number	GPS Bike Computer
Applicant	DAYTON INDUSTRIAL CO.,LTD 2-12 Kwai Fat Road,11-A Kwai Chung, New Territories, Hong Kong
Manufacturer	KENDY ENTERPISE LTD 2-12 Kwai Fat Road,11-A Kwai Chung,New Territories,Hong Kong
Power Supply	Internal 3.7V battery

I/O Port Description：

I/O Port Types	Q'TY	Test Description
1). USB	1	Connected to PC for data transmitting
2). -	-	-

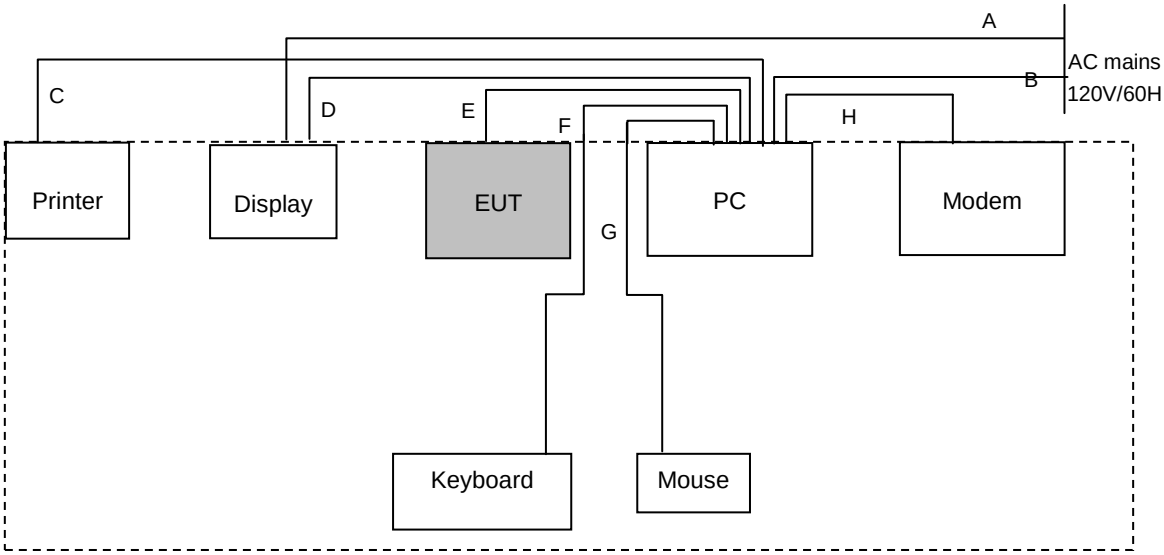
3 Test Methodology

3.1 Decision of Test Mode

Pre-Test Mode	
EMC	Mode 1:Normal working

3.2 Configuration of Test System Details

Mode 1



Signal Cable Type		Signal Cable Description
A	AC Power Cable	Non-Shielded, 2.0m
B	AC Power Cable	Non-Shielded, 2.0m
C	Printer Cable	Non-Shielded, 1.5m
D	VGA Cable	Non-Shielded, 1.5m
E	USB Cable	Non-Shielded, 0.8m
F	Keyboard Cable	Non-Shielded, 1.0m
G	Mouse Cable	Non-Shielded, 1.2m
H	Modem Cable	Non-Shielded, 1.5m

Devices Description				
Product		Manufacturer	Model Number	S/N
(1)	PC	HP	Inspiron 560MT	/
(2)	Display	AOC	3015WFT	/
(3)	Printer	Canon	P420L	/
(4)	Keyboard	HP	HK404	/
(5)	Mouse	HP	M488	/
(6)	Modem	zhiGuang	325M	/

3.3 Test Site Environment

Items	Test Item	Actual
Temperature (°C)	Conducted Emission	25
Humidity (%RH)		66
Barometric pressure (mbar)		1004
Temperature (°C)	Radiated Emission	25
Humidity (%RH)		62
Barometric pressure (mbar)		1004

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

4 Emission Test

4.1 Conducted Emission Measurement

4.1.1 Limit

A.C. Mains Conducted Interference Limit

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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 0.15 to 0.50 MHz.

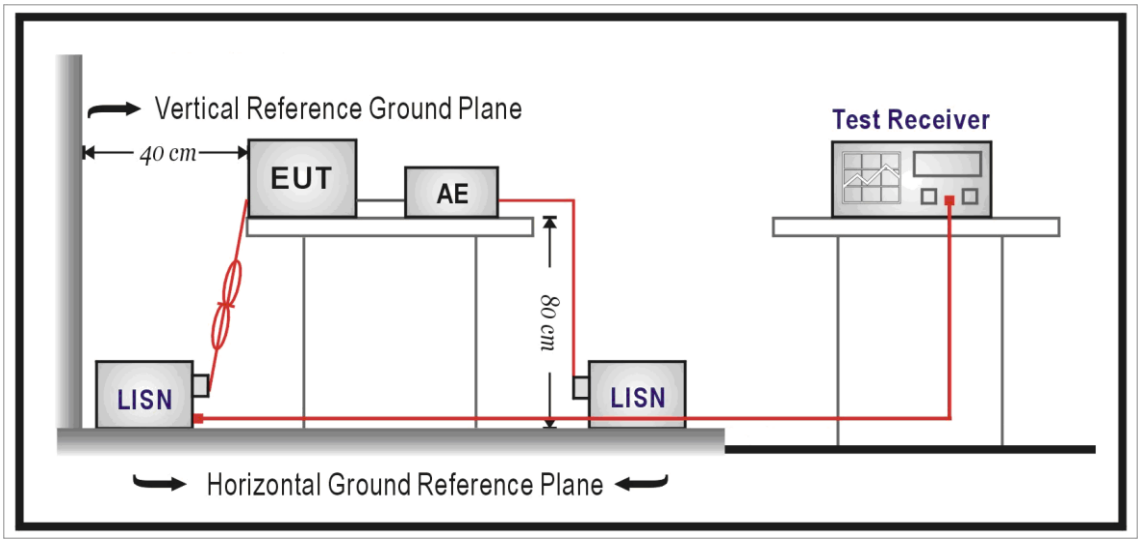
4.2.1 Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
EMI Test Receiver	R&S	ESCS30	100301	01/20/2015	(1)
LISN	R&S	ENV216	101014	01/20/2015	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.
Note: N.C.R. = No Calibration Request.

4.3.1 Test Setup

A.C. mains setup



4.4.1 Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

The mains voltage shall be supplied to the EUT via the LISN when the measurement of telecommunication port is performed. The common mode disturbances at the telecommunication port shall be connected to the ISN.

For A.C. mains conducted interference, measured both sides of A.C. lines and carried out using quasi-peak and average detector receivers of maximum conducted interference.

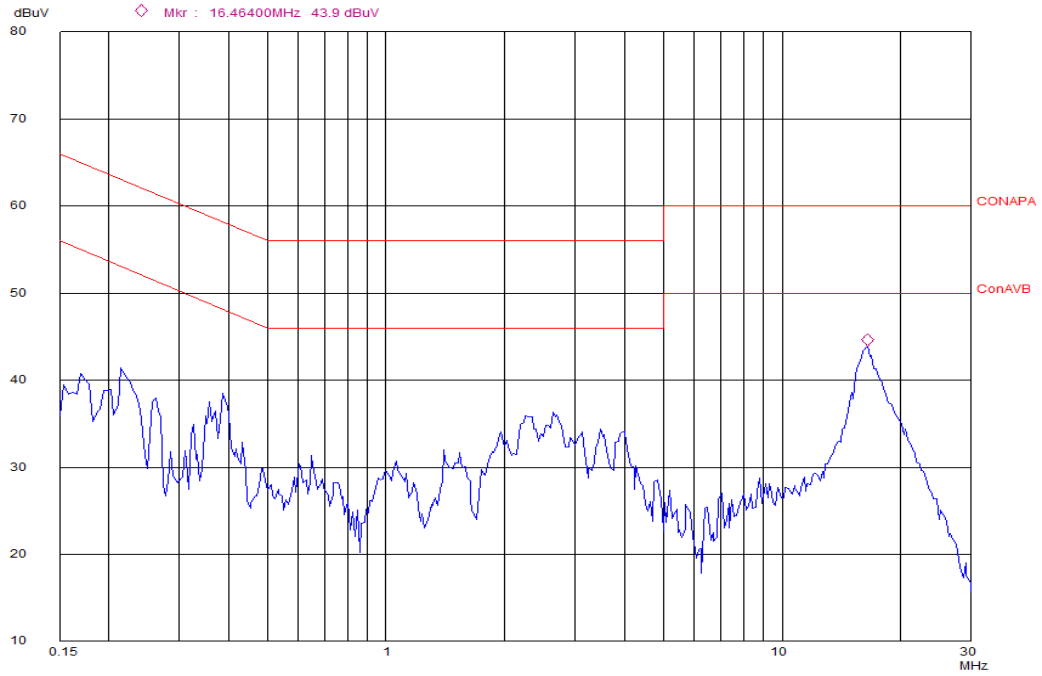
Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1.2, as applicable, including the average limit and the quasi-peak limit when using respectively (A.C. mains and telecommunication port), an average detector and quasi-peak detector measured in accordance with the methods described of related standard. Either the voltage limits or the current limits shall be met. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

4.5.1 Test Result

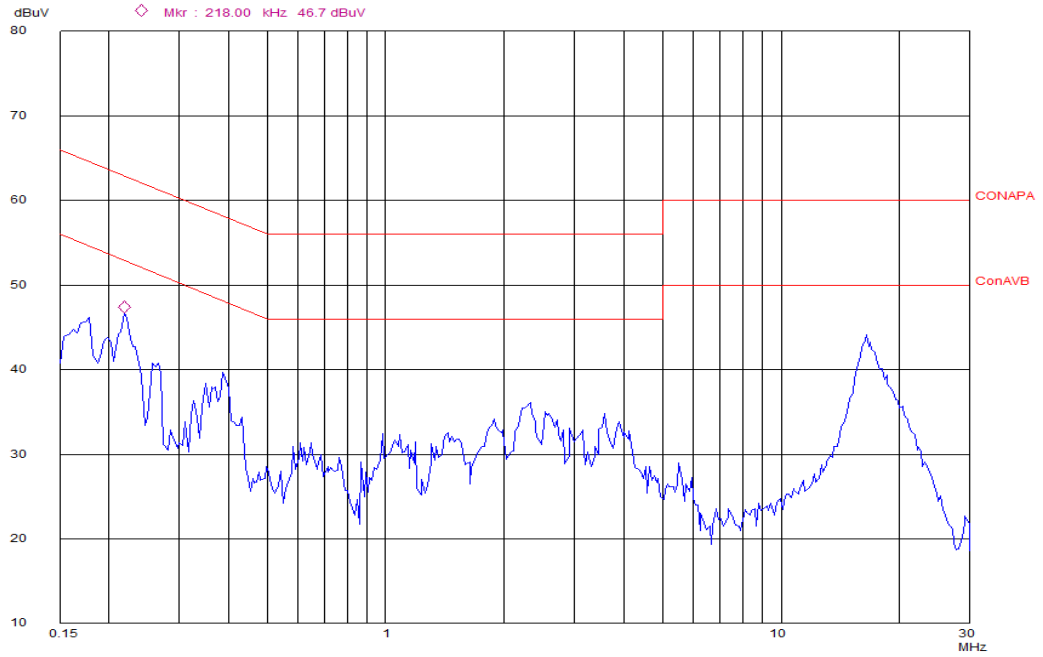
Standard:	FCC 15.107	Line:	L
Test item:	Conducted Emission	Power:	AC120V 60Hz
Model Number:	Joule GPS Plus	Date:	2015/03/25
Mode:	1	Test By:	
Description:			



	Frequency (MHz)	Quasi-Peak		Average	
		Emission Level (dBμV)	Limits (dBμV)	Emission Level (dBμV)	Limits (dBμV)
Line	0.214	37.3	63.0	30.5	53.0
	0.386	37.1	58.1	26.4	48.1
	2.238	30.7	56.0	23.2	46.0
	2.638	31.2	56.0	24.2	46.0
	3.484	30.7	56.0	23.7	46.0
	16.464	43.2	56.0	41.4	46.0

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

Standard:	FCC 15.107	Line:	N
Test item:	Conducted Emission	Power:	AC120V 60Hz
Model Number:	Joule GPS Plus	Date:	2015/03/25
Mode:	1	Test By:	
Description:			



	Frequency (MHz)	Quasi-Peak		Average	
		Emission Level (dBμV)	Limits (dBμV)	Emission Level (dBμV)	Limits (dBμV)
Neutral	0.218	43.0	62.9	35.5	52.9
	0.258	38.9	61.5	29.1	51.5
	0.386	38.4	58.1	28.0	48.1
	2.318	31.5	56.0	24.1	46.0
	2.530	28.6	56.0	20.9	46.0
	16.468	36.2	56.0	28.5	46.0

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

4.2 Radiated Interference Measurement

4.2.1 Limit

Under 1GHz test shall not exceed following value

FCC 47 CFR PART 15 SUBPART B				
Frequency range (MHz)	Class A		Class B	
	Distance(m)	dBuV/m	Distance(m)	dBuV/m
30 to 88	10	39	3	40
88 to 216	10	43.5	3	43.5
216 to 960	10	46.4	3	46
Above 960	10	49.5	3	54

Remark:1. The tighter limit shall apply at the edge between two frequency bands.
2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
4. Peak detector limit is corresponding to 20 dB above the maximum permitted average limit.

According to FCC Part 15.33 (b), for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or in which the device operated or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.75	30
1.75-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

4.2.2 Test Instruments

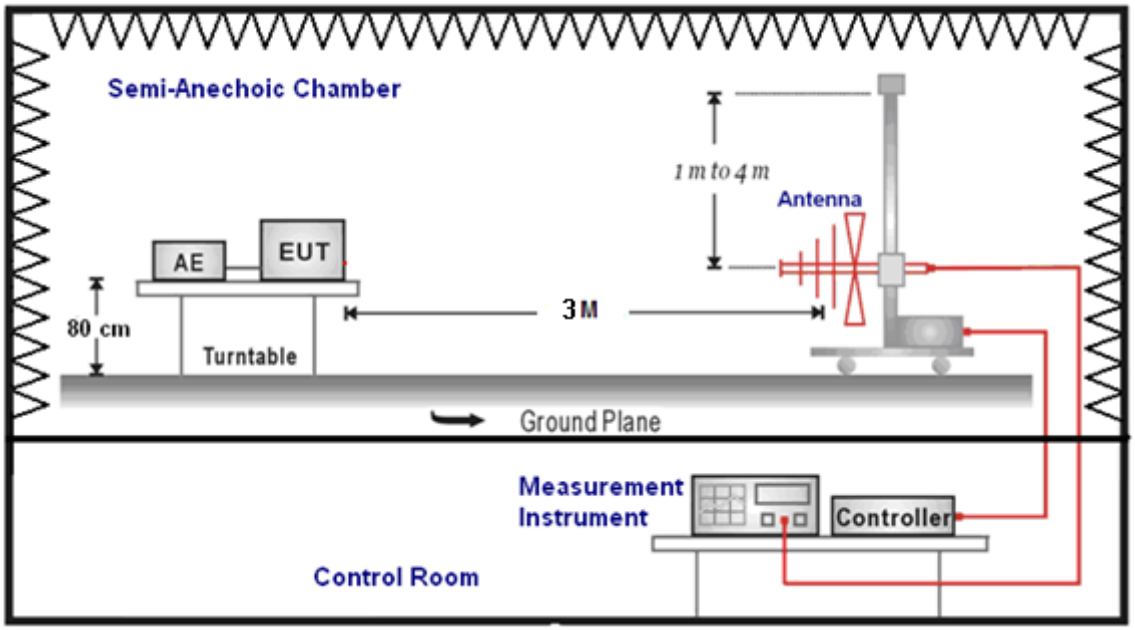
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Pre Amplifier	Agilent	8447D	2944A11120	01/10/2015	(1)
Pre Amplifier	Agilent	8447D	2944A11119	01/10/2015	(1)
Test Receiver	R&S	ESCI	100722	10/18/2014	(1)
Test Receiver	R&S	ESCI	101000	10/18/2014	(1)
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3268	06/06/2014	(1)
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3273	12/13/2014	(1)
Horn Antenna (1~18GHz)	ETS-Lindgren	3117	00128055	08/09/2014	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2014	(1)

Remark: (1)Calibration period 1 year. (2)Calibration period 2 years.
Note: N.C.R. = No Calibration Request.

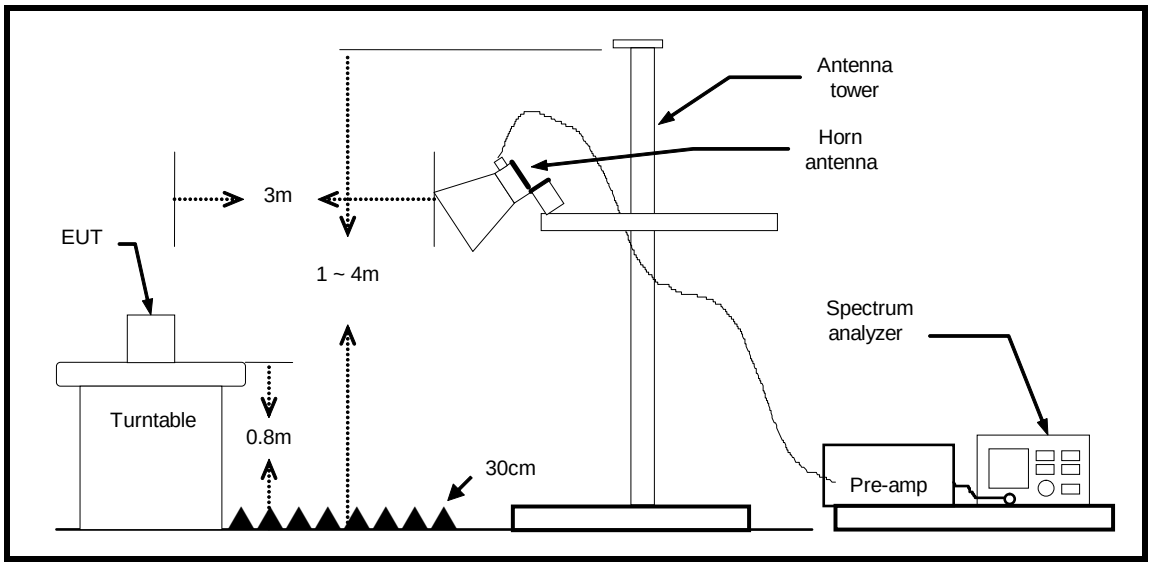
TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

4.2.3 Setup

Below 1GHz



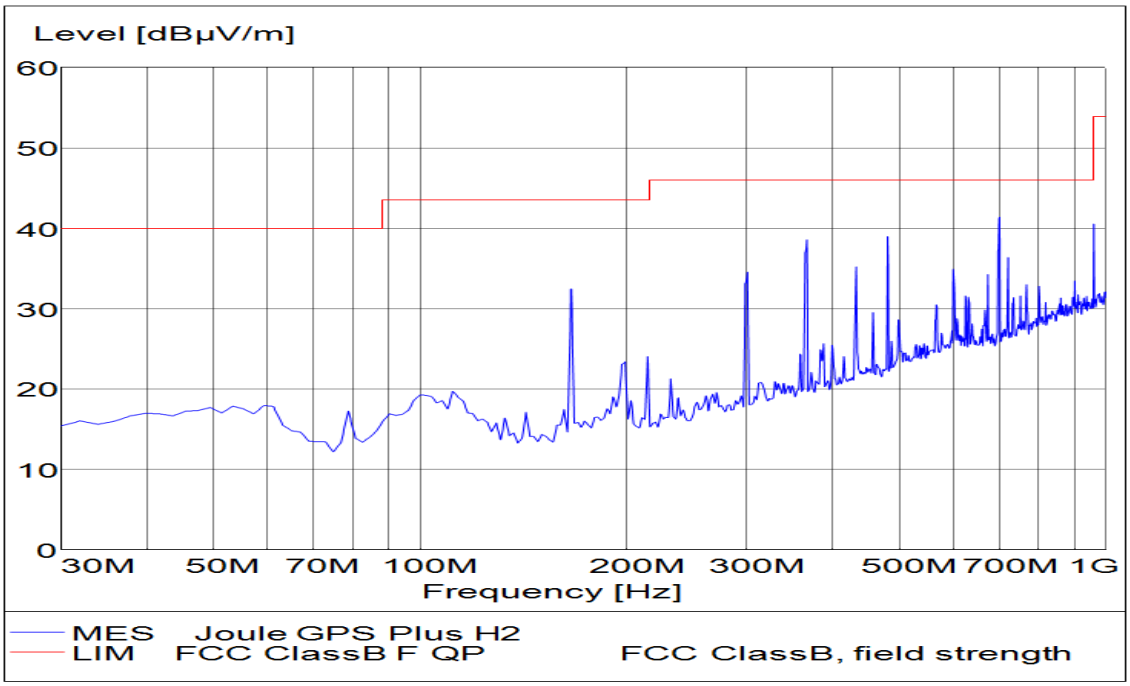
Above 1GHz



TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park,
Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

4.2.4 Test Result

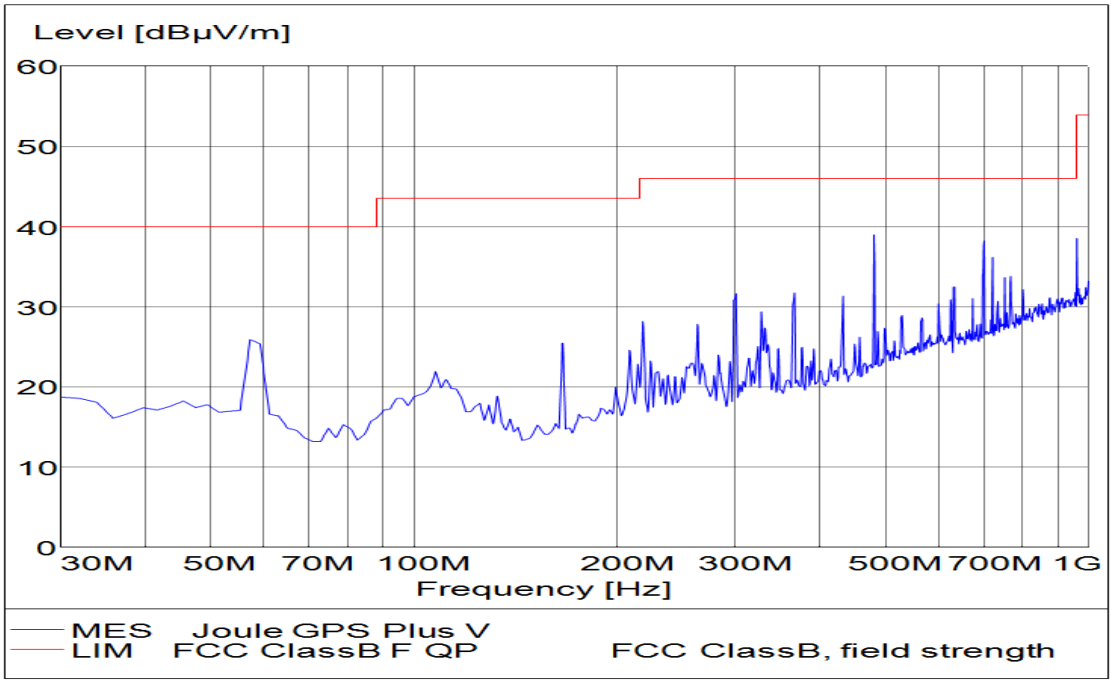
Standard:	FCC 15.109	Test Distance:	3m
Test item:	Radiated Emission	Power:	DC3V
Model Number:	Joule GPS Plus	Temp.(℃)/Hum.(%RH):	22(℃)/54%RH
Mode:	1	Date:	2015-3-25
Range:	30MHz-1GHz	Ant.polarity	H



Frequency (MHz)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
166.07	-38.9	32.6	43.5	-10.9	PK
300.20	-33.5	31.6	46.0	-14.4	PK
365.38	-31.6	35.2	46.0	-10.8	PK
480.98	-29.3	36.7	46.0	-9.3	PK
698.69	-25.4	40.2	46.0	-5.8	PK
961.12	-21.8	38.7	54.0	-15.3	PK

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

Standard:	FCC 15.109	Test Distance:	3m
Test item:	Radiated Emission	Power:	DC3V
Model Number:	Joule GPS Plus	Temp.(℃)/Hum.(%RH):	22(℃)/54%RH
Mode:	1	Date:	2015-3-25
Range:	30MHz-1GHz	Ant.polarity	V



Frequency (MHz)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
57.21	-34.7	23.8	40.0	-16.2	QP
166.07	-38.9	24.4	43.5	-19.1	QP
300.20	-33.5	30.6	46.0	-15.4	QP
480.98	-29.3	38.7	46.0	-7.3	QP
700.64	-25.4	37.9	46.0	-8.1	QP
961.12	-21.8	38.3	54.0	-15.7	QP

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
Tel: +852-2776 1323
Fax: +852-2776 1206

Standard:	FCC 15.109	Test Distance:	3m
Test item:	Radiated Emission	Power:	DC3V
Model Number:	Joule GPS Plus	Temp.(℃)/Hum.(%RH):	22(℃)/54%RH
Mode:	1	Date:	2015-3-25
Range:	1GHzMHz-6GHz	Ant.polarity	H/V

Frequency (MHz)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
1120	-5.3	41.3	74.0	-32.7	peak	H
1120	-5.3	28.9	54.0	-25.1	Average	H
1652	-2.0	43.5	74.0	-30.5	peak	H
1652	-2.0	29.7	54.0	-24.3	Average	H
1120	-5.3	42.8	74.0	-31.2	peak	V
1120	-5.3	30.2	54.0	-23.8	Average	V
1652	-2.0	40.7	74.0	-33.3	peak	V
1652	-2.0	28.6	54.0	-25.4	Average	V

-- END OF REPORT--

TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.

Tel: +852-2776 1323
Fax: +852-2776 1206