RADIO TEST REPORT

Test Report No. : 30CE0008-YK-01-D-R1

Applicant	:	**YAMAHA MOTOR POWERED PRODUCTS CO., LTD.**
Type of Equipment	:	**TERMINAL UNIT**
Model No.	:	**JW9-85579-00**
Test regulation	:	**FCC Part 15 Subpart C 2010**
FCC ID	:	**YK4-JW9-85579-00**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 30CE0008-YK-01-D. 30CE0008-YK-01-D is replaced with this report.

Date of test: June 15 and 16, 2010

Tested by: K. Okai
Katsunori Okai
Engineer of EMC Service

Approved by: M. Fujimura
Mitsuru Fujimura
Manager of EMC Service

NVLAP®
NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

CONTENTS PAGE

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

SECTION 1: Customer information

Company Name	:	YAMAHA MOTOR POWERED PRODUCTS CO., LTD. *
Address	:	322-1 Narutaki, Kakegawa, Shizuoka, 436-0085 Japan
Telephone Number	:	+81-537-21-0950
Facsimile Number	:	+81-537-21-0951
Contact Person	:	Atsushi Uchiyama

*Remarks:
YAMAHA MOTOR POWERED PRODUCTS CO., LTD. designates Tateyama Kagaku Industry Co., Ltd. as manufacturer of the product (TERMINAL UNIT).

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	TERMINAL UNIT
Model No.	:	JW9-85579-00
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5.0V
Receipt Date of Sample	:	June 11, 2010
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model No: JW9-85579-00 (referred to as the EUT in this report) is the TERMINAL UNIT.

Feature of EUT: EUT is the data transfer unit. It conducts radio communication (transmitting and receiving) with BASE ASSY and TRANSMITTING UNIT.

Clock frequency(ies) in the system	:	CPU Main: 9.83MHz, RF reference clock: 14.7456MHz
Equipment Type	:	Transceiver
Frequency of Operation	:	916.2204MHz, 918.0636MHz, 921.7500MHz, 923.5932MHz
Frequency Shift	:	64kHz
Type of Modulation	:	FSK
Antenna Type	:	Dielectric Chip Antenna
Antenna Gain	:	1.64dBi (max)
Antenna Connector Type	:	Soldering
Power Supply (Inner)	:	DC 3.3V

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C: 2010, final revised on January 22, 2010 and effective March 1, 2010

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.249 Operation within the bands 902-928MHz, 2400-2483.5MHz, 5725-5875MHz and 24.0-24.25GHz

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Deviation	Worst margin	Results
1	Conducted Emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207(a)	N/A	N/A	N/A *1)
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.249(a)(e)	N/A	0.1dB (916.220MHz, Horizontal, QP)	Complied
3	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.205(a)(b) Section 15.209(a) Section 15.249(a)(d)(e)	N/A	2.9dB (1836.127MHz, Vertical, PK with Duty factor)	Complied
4	20dB Bandwidth	ANSI C63.4:2003	Reference	N/A	N/A	N/A
5	Frequency Tolerance	ANSI C63.4:2003	Section 15.249(b)	N/A	N/A	N/A *2)

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line. The EUT is a vehicle equipment.
*2) The test is not required since this EUT does not operate with 24.05GHz to 24.25GHz.

*In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)
This EUT provides stable voltage (DC 3.3V) constantly to RF part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI
The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	**Radiated emission (10m*)(±dB)**		
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz
No.1	2.7dB	4.8dB	5.0dB
No.2	-	-	-
No.3	-	-	-
No.4	-	-	-

*10m = Measurement distance

Test room (semi-anechoic chamber)	**Radiated emission**						
	(3m*)(±dB)				**(1m*)(±dB)**		**(0.5m*)(±dB)**
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	2.9dB	4.8dB	5.0dB	3.9dB	4.3dB	4.5dB	4.3dB
No.2	3.5dB	4.8dB	5.1dB	4.0dB	4.2dB	4.4dB	4.2dB
No.3	3.8dB	4.6dB	4.7dB	4.0dB	4.2dB	4.5dB	4.2dB
No.4	3.5dB	4.4dB	4.9dB	4.0dB	4.2dB	4.6dB	4.2dB

*3m/1m/0.5m = Measurement distance

Radiated emission test(3m)
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Data of EMI, Test instruments.

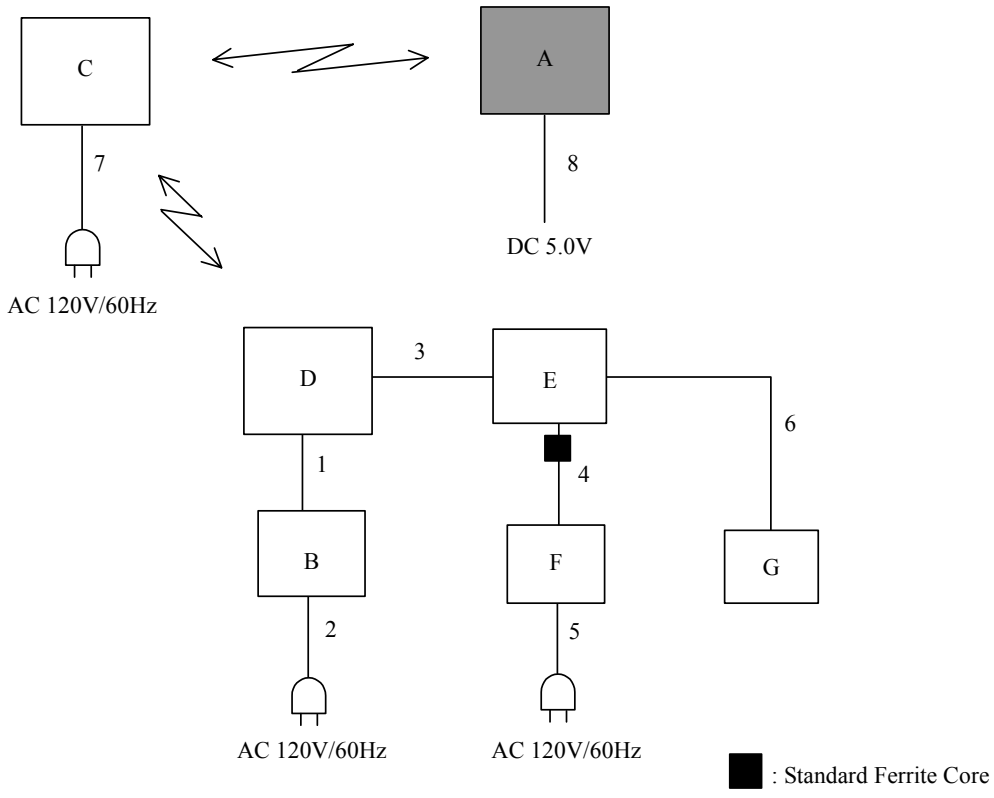
Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

Test Item	Mode	Tested frequency
Electric Field Strength of Fundamental Emission Electric Field Strength of Spurious Emission 20dB Bandwidth	Transmitting mode (Tx), PN9	916.2204MHz 918.0636MHz 923.5932MHz
The system was configured in typical fashion (as a customer would normally use it) for testing. *EUT has the power settings by the software as follows; Power settings: Level 7 Software: G172TestCom_ver3 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting.		

4.2 Configuration and peripherals



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	TERMINAL UNIT	JW9-85579-00	2	Tateyama Kagaku Industry Co., Ltd.	EUT
B	AC Adapter	IPU16B-105	06029025	SINPRO	-
C	TRANSMITTING UNIT	JW9-8A2F0-00	1	Tateyama Kagaku Industry Co., Ltd.	-
D	BASE ASSY	JW9-85560-00	1	Tateyama Kagaku Industry Co., Ltd.	-
E	Personal Computer	MS-N011	-	MSI	-
F	AC Adapter	0225A2040	A30829148199	LI SHIN INTERNATIONAL ENTERPRISE CORP.	-
G	Mouse	1049	X803801	Microsoft	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.3	Unshielded	Unshielded	-
2	AC Cable	1.8	Unshielded	Unshielded	-
3	LAN Cable	3.1	Unshielded	Unshielded	-
4	DC Cable	1.8	Unshielded	Unshielded	-
5	AC Cable	1.8	Unshielded	Unshielded	-
6	USB Cable	0.8	Shielded	Shielded	-
7	AC Cable	4.1	Unshielded	Unshielded	-
8	DC Cable	2.3	Unshielded	Unshielded	-

SECTION 5: Radiated emission (Electric Field Strength of Fundamental and Spurious Emission)

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.
The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
Photographs of the set up are shown in Appendix 1.

The Radiated Electric Field Strength has been measured on Semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization.
The radiated emission measurements were made with the following detector function of the test receiver/spectrum analyzer.

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

	Below or equal to 1GHz *1)	Above 1GHz
Detector Type	QP	Peak and Peak with Duty factor
IF Bandwidth	120kHz	PK: S/A:RBW 1MHz, VBW:3MHz

*1) The test below1GHz was performed with QP detect.
Because it was generated at the repetition cycle of 20Hz or more the pulse emission.

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

*The result is rounded off to the second decimal place, so some differences might be observed.

Measurement range : 30MHz-9.2GHz
Test data : APPENDIX
Test result : Pass

SECTION 6: 20dB Bandwidth and Duty Cycle

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth	1MHz	10kHz	30kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Duty Cycle	zero span	62kHz	180kHz	10msec / 100msec	Peak	Single	Spectrum Analyzer

Test data : APPENDIX
Test result : Pass