



Dates of Tests : July 01 ~ 19,, 2013

Test Report S/N: LR500111307L

Test Site : LTA CO., LTD

CLASS II PERMISSIVE CHANGE TEST REPORT

FCC ID.

PBN-ET23KH

APPLICANT

ENTER TECH CO.,LTD

Equipment Class	:	Part 15 Spread Spectrum Transmitter (DSS)
Manufacturing Description	:	HD MULTIMEDIA KARAOKE (Main Device)
Manufacturer	:	ENTER TECH CO.,LTD.
Model name	:	ET23KH
Variant Model name	:	ET23KHB, PRO900
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.247 Subpart C; ANSI C-63.4-2003
Frequency Range	:	2406 ~ 2474MHz
RF power	:	Max 9.30 dBm – Conducted
Data of issue	:	July 25, 2013

This test report is issued under the authority of:



Jae-Ho Lee, Manager

The test was supervised by:



Young-Jin Lee, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB Code.: 200723-0

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1. General information's

1-1 Test Performed

Company name : LTA Co., Ltd.
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
 Web site : <http://www.ltalab.com>
 E-mail : chahn@ltalab.com
 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2013-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	2015-03-06	EMC accredited Lab.
FCC	U.S.A	610755	2014-04-27	FCC filing
FCC	U.S.A	649054	UPDATING	FCC CAB
VCCI	JAPAN	R2133(10 m), C2307	2014-06-21	VCCI registration
VCCI	JAPAN	T-2009	2013-12-23	VCCI registration
VCCI	JAPAN	G-563	2015-05-28	VCCI registration
IC	CANADA	5799A-1	2015-06-21	IC filing

2. Information's about test item

2-1 Client

Company name : ENTER TECH CO.,LTD.
 Address : 156-7, Ojeong-dong, Ojeong-gu, Bucheon-city, Kyunggi-do, KOREA
 Telephone / Facsimile : +82-32-680-9072 / +82-32-678-0818

2-2 Manufacturer

Company name : ENTER TECH CO.,LTD.
 Address(Factory in Korea) : 156-7, Ojeong-dong, Ojeong-gu, Bucheon-city, Kyunggi-do, KOREA
 Address(Factory in China) Baolai Area, 46 Xinhe Road, Shangmugu-Cun, Pinghu-Zhen,
 Longgang-Qu, Shenzhen, China
 Telephone / Facsimile : +82-32-680-9072 / +82-32-678-0818

2-3 Equipment Under Test (EUT)

Trade name : MAGICSING
 Model name : ET23KH
 Variant Model name : ET23KHB, PRO900
 Serial number : Identical prototype
 Date of receipt : June 24, 2013
 EUT condition : Pre-production, not damaged
 Antenna type : PCB antenna, Max Gain 4.75 dBi
 Frequency Range : 2406 ~ 2474MHz
 RF output power : Max. 9.30 dBm - Conducted
 Number of channels : 18
 Channel spacing : 4MHz
 Channel Access Protocol : Frequency Hopping Spread Spectrum (FHSS)
 Power Source : 9 Vdc by Adaptor
 Firmware Version : V1.0.0

2-4 Tested frequency

Bluetooth	LOW	MID	HIGH
Frequency (MHz)	2406	2442	2474

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	Carrier Frequency Separation	> 25 kHz	Conducted	N/A
15.247(a)	Number of Hopping Frequencies	> 15 hops		N/A
15.247(a)	20 dB Bandwidth 99% Bandwidth	> 1.5 MHz		N/A
15.247(a)	Dwell Time	< 0.4 seconds		N/A
15.247(b)	Transmitter Output Power	< 250 mWatt		N/A
15.247(d)	Conducted Spurious emission	> 20 dBc		N/A
15.247(d)	Band Edge	> 20 dBc		N/A
15.249 / 15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.109	Field Strength	-		C
15.207 /15.107	AC Conducted Emissions	EN 55022	Line Conducted	C
15.203	Antenna requirement	-	-	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

Note 3: Class II permissive change

Note 1: Antenna Requirement

→ The ENTER TECH CO.,LTD. FCC ID:PBN-ET23KH unit complies with the requirement of §15.203. The antenna type is PCB antenna.

Note 2: The sample was tested according to the following specification:
FCC Parts 15.247; ANSI C-63.4-2003

Note 3: TEST METHODOLOGY

The measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.10-2009) and FCC Public Notice DA 00-705 dated March 30, 2000 entitled “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” were used in the measurement of the ENTER TECH CO.,LTD. FCC ID: PBN-ET23KH

3.2 Technical Characteristics Test

3.2.1 Field Strength of Harmonics

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz)

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

Trace = max hold

Peak:VBW $\geq$ RBW

Average:VBW=10Hz

Detector function = Peak and Average

Sweep = auto

Measurement Data: Complies

- Refer to the next page.
- No other emissions were detected at a level greater than 10dB below limit.
- The three antennas were used with this EUT during the Testing.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Radiated Emissions – Play mode

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Tel +82-31-3236008,9
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EUT/Model No.: ET23KHE

TEST MODE: Play mode

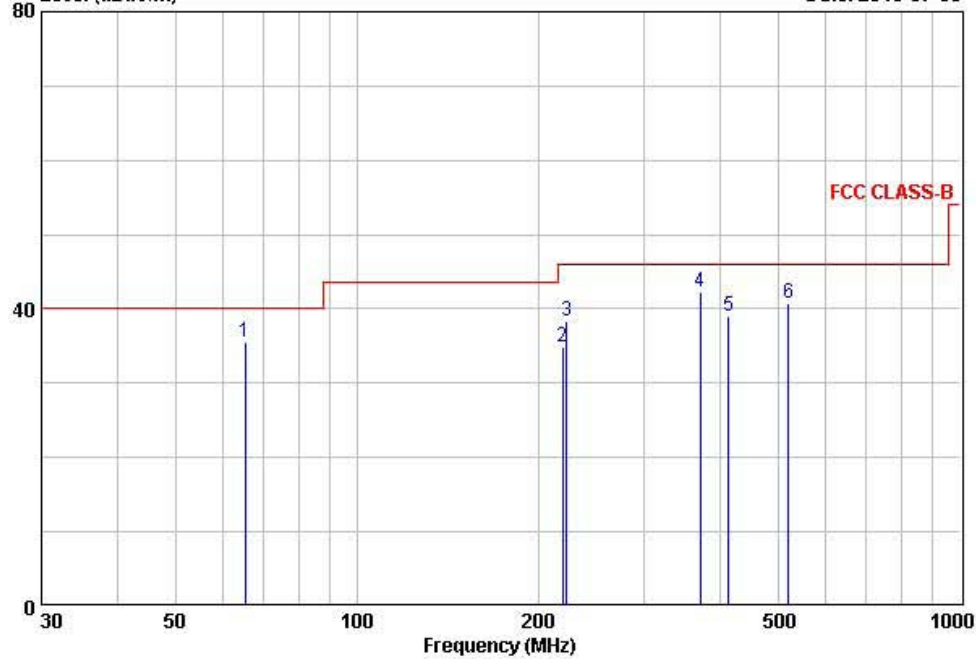
Temp Humi : 23 / 58

Tested by: PARK H W

Data: 215

Level (dBuV/m)

Date: 2013-07-08



	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1	65.22	52.00	-16.36	35.64	40.00	4.36	100	360	VERTICAL
2	219.48	48.60	-13.81	34.79	46.00	11.21	100	180	VERTICAL
3	222.74	52.00	-13.60	38.40	46.00	7.60	100	97	VERTICAL
4	371.22	48.60	-6.28	42.32	46.00	3.68	100	124	HORIZONTAL
5	413.50	43.80	-4.79	39.01	46.00	6.99	305	266	HORIZONTAL
6	519.95	42.00	-1.25	40.75	46.00	5.25	254	77	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

3.2.2 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

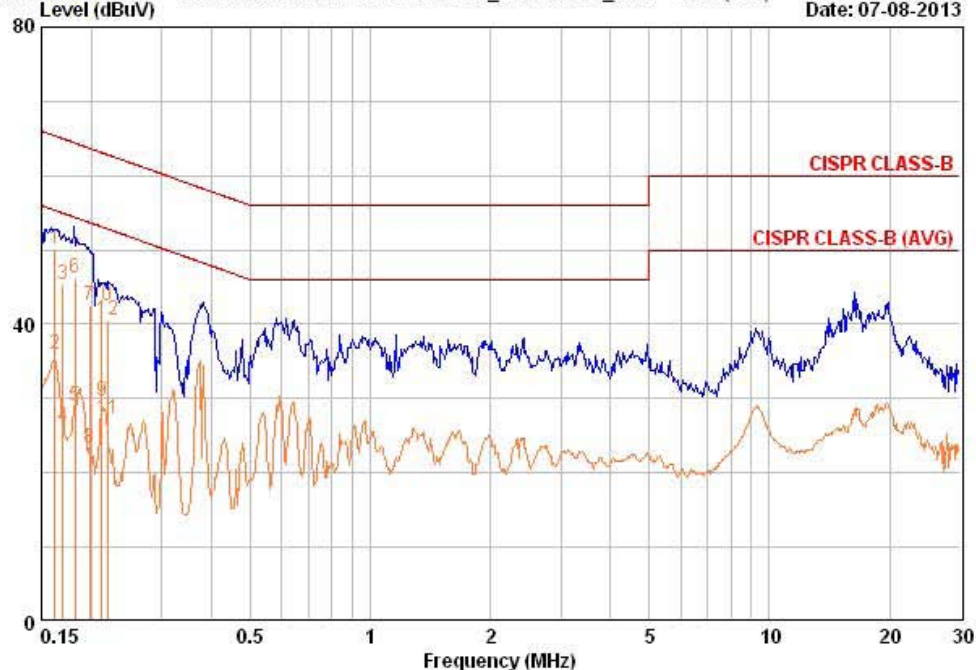
* Decreases with the logarithm of the frequency

AC Conducted Emissions – Play mode – Line

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EUT / Model No. :	ET23KHE	Phase :	LINE
Test Mode :	Play mode	Test Power :	120 / 60
Temp./Humi. :	26 / 57	Test Engineer :	PARK H W

Data: 174 File: C:\Conducted Data\2013\LTA_Conduction_1307-1.EMI (291) Date: 07-08-2013



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.162	40.54	26.44	9.58	50.12	36.02	65.36	55.36	15.24	19.34
0.170	35.84	16.64	9.58	45.42	26.22	64.96	54.96	19.54	28.74
0.182	36.65	19.45	9.58	46.23	29.03	64.39	54.39	18.17	25.37
0.198	32.85	13.85	9.58	42.43	23.43	63.69	53.69	21.26	30.26
0.212	32.95	20.05	9.58	42.53	29.63	63.13	53.13	20.60	23.50
0.220	31.05	17.75	9.58	40.63	27.33	62.82	52.82	22.19	25.49

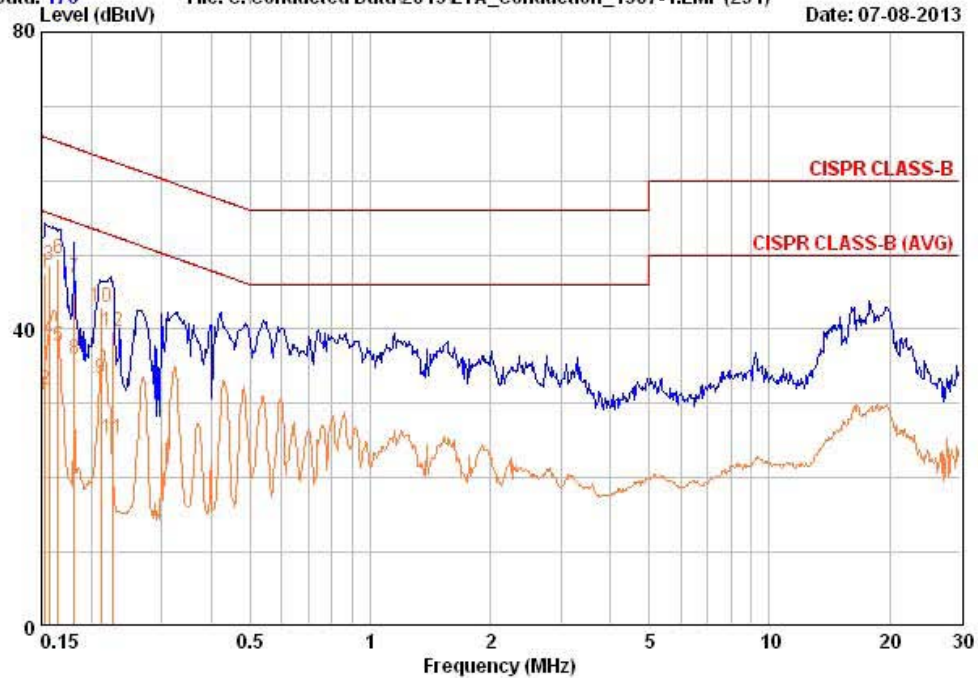
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions – Play mode – Neutral

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EUT / Model No. :	ET23KHE	Phase :	NEUTRAL
Test Mode :	Play mode	Test Power :	120 / 60
Temp./Humi. :	26 / 57	Test Engineer :	PARK H W

Data: 176 File: C:\Conducted Data\2013\LTA_Conduction_1307-1.EMI (291) Date: 07-08-2013



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.153	37.84	22.14	9.62	47.46	31.76	65.84	55.84	18.38	24.08
0.157	39.04	28.94	9.61	48.65	38.55	65.62	55.62	16.97	17.07
0.165	39.84	28.04	9.61	49.45	37.65	65.21	55.21	15.76	17.56
0.181	37.35	26.45	9.59	46.94	36.04	64.44	54.44	17.50	18.40
0.211	33.45	23.75	9.57	43.02	33.32	63.17	53.17	20.14	19.84
0.227	30.05	15.65	9.57	39.62	25.22	62.56	52.56	22.93	27.33

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	Spectrum Analyzer (~30GHz)	FSV-30	100757	R&S	1 year	2013-01-15
2	Spectrum Analyzer (~2.9GHz)	8594E	3649A03649	HP	2 year	2012-03-26
3	VECTOR SIGNAL GENERATOR (~6GHz)	8648C	3623A02597	HP	1 year	2013-03-25
4	Signal Generator (1~20GHz)	83711B	US34490456	HP	1 year	2013-03-25
5	Attenuator (3dB)	8491A	37822	HP	2 year	2012-09-22
6	Attenuator (10dB)	8491A	63196	HP	2 year	2012-09-22
7	Test Receiver (~30MHz)	ESHS10	828404/009	R&S	1 year	2013-03-25
8	EMI Test Receiver (~7GHz)	ESCI7	100722	R&S	1 year	2012-09-22
9	RF Amplifier (~1.3GHz)	8447D OPT 010	2944A07684	HP	2 year	2012-09-22
10	RF Amplifier (1~18GHz)	8449B	3008A02126	HP	1 year	2013-03-25
11	Horn Antenna (1~18GHz)	3115	114105	ETS	2 year	2012-01-26
12	DRG Horn (Small)	3116B	81109	ETS-Lindgren	2 year	2012-03-15
13	DRG Horn (Small)	3116B	133350	ETS-Lindgren	2 year	2012-03-15
14	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	2 year	2012-09-20
15	Hygro-Thermograph	THB-36	0041557-01	ISUZU	1 year	2012-10-12
16	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
17	Power Divider	11636A	06243	HP	2 year	2012-09-22
18	DC Power Supply	6674A	3637A01657	Agilent	-	-
19	Frequency Counter	5342A	2826A12411	HP	1 year	2013-03-25
20	Power Meter	EPM-441A	GB32481702	HP	1 year	2013-03-25
21	Power Sensor	8481A	US41030291	HP	1 year	2012-09-22
22	Audio Analyzer	8903B	3729A18901	HP	1 year	2012-09-22
23	Modulation Analyzer	8901B	3749A05878	HP	1 year	2012-09-22
24	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2012-09-22
25	Stop Watch	HS-3	601Q09R	CASIO	2 year	2012-03-26
26	LISN	ENV216	100408	R&S	1 year	2012-09-22
27	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	2 year	2012-06-27
28	Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	-	-
29	Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	-	-
30	Active Loop Antenna	FMZB 1519	1519-031	SCHWARZBECK	1 year	2012-12-14