ELECTROMAGNETIC EMISSION COMPLIANCE REPORT
FOR FCC CLASS B CERTIFICATION

Test report file number : E038R-001

Applicant : HANA MICRON INC.

Address : 6th Floor, Myeong-Seong B/D, Dogok-Dong, Kangnam-Gu, Seoul, 135-271, Korea

Manufacturer : HANA MICRON INC.

Address : 6th Floor, Myeong-Seong B/D, Dogok-Dong, Kangnam-Gu, Seoul, 135-271, Korea

Type of Equipment : USB Flash Drive (Peripheral Device for Class B Computing Device)

FCC ID : QH7ZIDA20

Model Name : HMDS-016C

Multiple Model Name : HMDS-032C, HMDS-064C, HMDS-128C, HMDS-256C, HMDS-512C, HMDS-01GC

Serial Number : N/A

Total page of Report : 12 pages (including this page)

Date of Incoming : July 10, 2003

Date of Issuing : August 04, 2003

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by:
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ONETECH Corp.

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ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : HANA MICRON INC.
-. ADDRESS : 6th Floor, Myeong-Seong B/D, Dogok-Dong, Kangnam-Gu, Seoul, 135-271, Korea
-. CONTACT PERSON : Mr. Jung-Woo, Lee/ Technical Manager
-. TELEPHONE NO : +82-2-2057-4787
-. FCC ID : QH7ZIDA20
-. MODEL NO/NAME : HMDS-016C
-. SERIAL NUMBER : N/A
-. DATE : August 04, 2003

DEVICE TYPE	Peripheral Device for Class B Computing Device - Unintentional Radiator
E.U.T. DESCRIPTION	USB Flash Drive
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

-. This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The HANA MICRON INC., Model HMDS-016C (referred to as the EUT in this report) is a USB Flash Drive that is USB portable storage device connected to personal computer via USB port. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. or CRY. FREQ.(FREQ.>=1MHz)	12 MHz
NUMBER OF LAYERS	4 Layers
EXTERNAL CONNECTOR	USB Plug (A type)

2.2 Model Differences:

The difference(s) compared to the EUT is as follows:

		Model Differences
Basic Model	HMDS-016C	-
Multiple Model	HMDS-032C, HMDS-064C, HMDS-128C, HMDS-256C, HMDS-512C, HMDS-01GC	Only type designation by a memory size and color of the EUT.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

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2.4 Test System Details

The model numbers for all the equipments that were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
HMDS-016C	HANA MICRON INC.	QH7ZIDA20	USB Flash Drive (EUT)	PC
GX240	DELL COMPUTER CORP.	DoC	PERSONAL COMPUTER	-
E551	DELL COMPUTER CORP.	DoC	MONITOR	PC
2225C	HP	DSI6XU2225	PRINTER	PC
020-0470	CARDINAL	GDE0196	MODEM	PC
X06-08477	MICROSOFT CORP.	DoC	MOUSE	PC
SK-8110	SILITEK	DoC	KEYBOARD	PC

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)

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3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN B'D	HANA MICRON INC.	N/A	N/A

3.2 EUT exercise Software

After connecting the EUT to a personal computer, data were continuously read and written from the HDD of the personal computer to the EUT.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
USB Flash Drive (EUT)	N/A	N/A	-
PERSONAL COMPUTER	N	Y	1.8(P), 1.2(D)
MONITOR	N	Y	1.5(P), 1.2(D)
PRINTER	N	Y	1.8(P), 1.2(D)
MODEM	N	Y	1.8(P), 1.2(D)
MOUSE	N/A	Y	1.2(D)
KEYBOARD	N/A	Y	1.2(D)

* The marked "(P)" means the Power Cable and "D" means the I/O Cable.

3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
USB Flash Drive (EUT)	N	N/A	Y	PC END
PERSONAL COMPUTER	N/A	N/A	N/A	-
MONITOR	Y	PC END	Y	PC END
PRINTER	N	N/A	Y	BOTH END
MODEM	N	N/A	Y	BOTH END
MOUSE	N	N/A	Y	PC END
KEYBOARD	N	N/A	Y	PC END

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3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

"There were no Modified items during EMI test"

3.6 Configuration of Test System

Line Conducted Test : The EUT was inserted to USB port of PC and the power line of PC was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Data were continuously read and write via USB	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Data were continuously read and write via USB	X

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5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

Humidity Level : 42 % Temperature: 27 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)

Type of Test : CLASS B

Result : PASSED BY –23.52 dB at 15.46 MHz

EUT : USB Flash Drive Date: July 15, 2003

Operating Condition : Data were continuously read and written.

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.83	N	30.84	56.00	-25.16
1.25	N	32.44	56.00	-23.56
1.46	N	32.40	56.00	-23.60
14.07	H	35.78	60.00	-24.22
15.46	N	36.48	60.00	-23.52
27.51	N	34.23	60.00	-25.77
Frequency (MHz)	**Line**	**Average (dBuV)**		**Margin (dB)**
		Emission level	**Limits**	
-				
-				

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

Average mode was not measured, because Peak values were under the Average limit.

See next page for an overview sweep performed with peak detector.

Tested by: Young-Min Choi / Project Engineer

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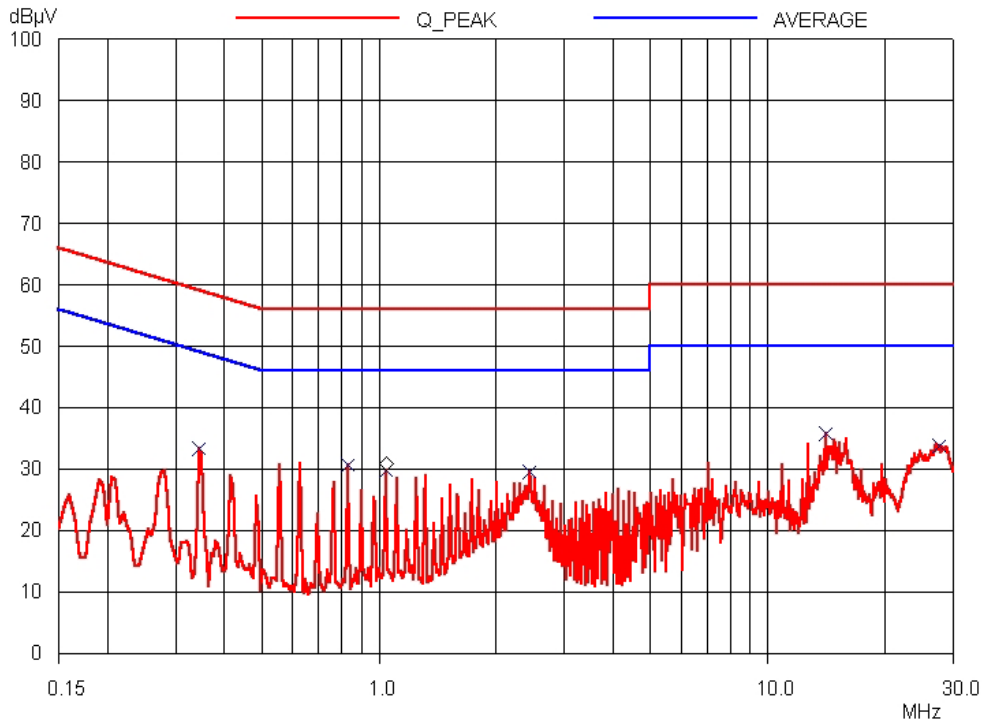
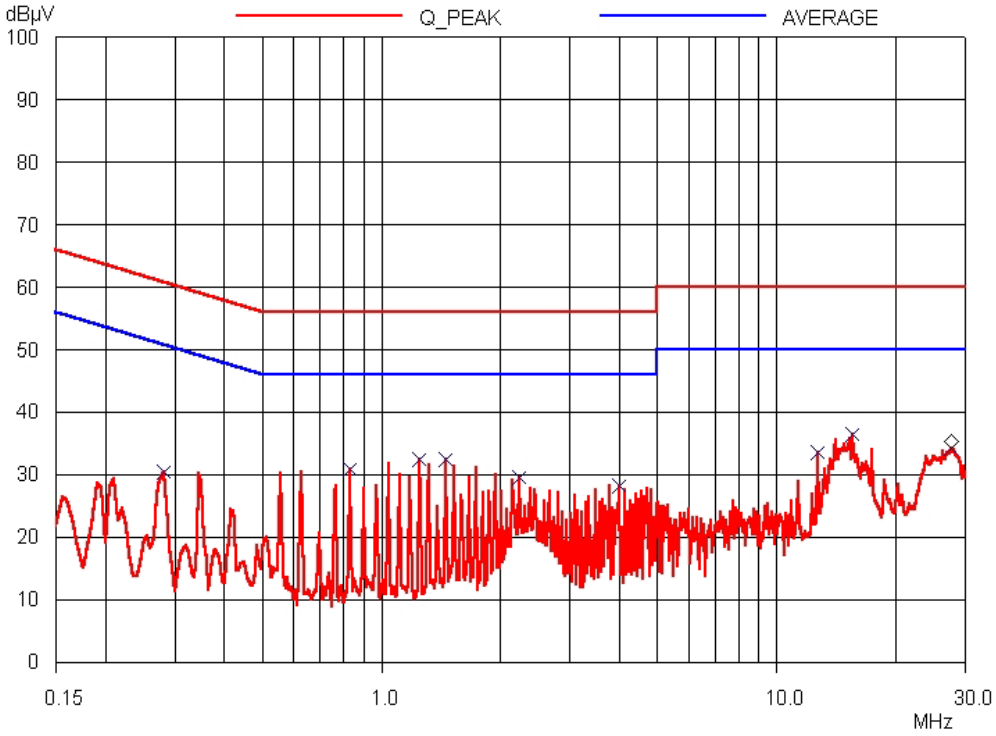


HOT LINE



NEUTRAL LINE

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5.2 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 42 % Temperature: 27 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)

Type of Test : CLASS B

Result : PASSED BY -9.63 dB at 721.88 MHz

EUT : USB Flash Drive Date: July 15, 2003

Operating Condition : Data were continuously read and written.

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
38.72	16.20	V	10.92	0.81	27.93	40.00	-12.07
85.24	17.56	V	7.56	1.10	26.22	40.00	-13.78
98.80	15.90	V	11.82	1.15	28.87	43.50	-14.63
132.78	13.32	V	12.86	1.28	27.46	43.50	-16.04
166.63	13.00	V	15.73	1.42	30.15	43.50	-13.35
199.58	12.74	V	16.87	1.57	31.18	43.50	-12.32
434.09	13.62	V	15.94	2.51	32.07	46.00	-13.93
532.93	15.82	V	17.70	2.74	36.26	46.00	-9.74
600.76	12.23	V	18.76	2.90	33.89	46.00	-12.11
666.65	12.55	V	20.50	3.15	36.20	46.00	-9.80
721.88	12.14	V	20.80	3.43	36.37	46.00	-9.63
962.20	12.65	V	23.49	4.12	40.26	54.00	-13.74

Radiated Emissions Tabulated Data

Tested by: Young-Min Choi / Project Engineer

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6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+	Meter reading	(dBuV)
+	Cable Loss	(dB)
+	Antenna Factor (Loss)	(dB/meter)
=	Corrected Reading	(dBuV/meter)
-	Specification Limit	(dBuV/meter)
=	dB Relative to Spec	(+/- dB)

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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	NOV/02	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	MAY/03	12MONTH	■
4.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/03	12MONTH	
8.	Biconical antenna	EMCO Schwarzbeck	3104C VHA9103	9109-4443 9109-4444 91031852	MAY/03 JUL/03 AUG/03	12MONTH	■
9.	Log Periodic antenna	EMCO Schwarzbeck	3146 9108-A(494)	9109-3213 9109-3214 9109-3217 62281001	AUG/02 JUL/03 MAY/03 AUG/02	12MONTH	■
10.	LISN	EMCO	3825/2	9109-1867 9109-1869	AUG/02 OCT/02	12MONTH	■
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■

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