

EMC TEST REPORT For FCC



Test Report No. : CTK02-F054

Date of Issue : April 23, 2002

Model/Type No: : ANY DRIVE

Kind of Product : USB MEMORY

Applicant : AL Tech, Inc.

Applicant Address : Haesung Bldg. 1F, 747-2, Yoksam-Dong, Kangnam-Gu, Seoul,
Korea, 153-080

Manufacturer : AL Tech, Inc.

Manufacturer Address : Haesung Bldg. 1F, 747-2, Yoksam-Dong, Kangnam-Gu, Seoul,
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Received Date : April 17, 2002

Test period : Start: Apr. 17, 2002 End: Apr. 23, 2002

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

CERTiTEK Standards Laboratory Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by



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EMC Test Engineer
Date: April 23, 2002

Reviewed by



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Date: April 23, 2002



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REPORT REVISION HISTORY

Date	Revision	Page No
Apr. 23, 2002	(CTK02-F054) Issued	All

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1.0 General Product Description

The product is an USB MEMORY.

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model ANY DRIVE.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 85 by 20 by 10 ☒ mm ☐ in
Mobility: ☐ Hand-Held ☐ Table-top ☐ Floor-standing
☒ Stationary
Serial No.: -

1.0.3 Electrical Ratings

Input: Supplied by PC's USB port
Output: Not applicable

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: Supplied by PC's USB port
Frequency: Not applicable

* During the EMI and EMS tests, PC Voltage/Frequency put 230VAC/50Hz to use.

1.0.5 Clock & Other Frequencies Utilized

Switching frequency : 14.31818MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
PC	Hewlett Packard	DTPC-17	SG01501776	DOC
Monitor	Hewlett Packard	D2813	TW61100109	DOC
MOUSE (PS/2 type)	PANWEST	Cyber Beetle	PM1F144009945	DOC
MOUSE (USB type)	PANWEST	Cyber Beetle	PM1F154000055	DOC
MOUSE (Serial type)				
KEYBOARD	World Com Mart	KB120	-	D840902 MIC
Game Pad	Microsoft	Sidewinder game pad	03426853	C3KMGP1
HEADSET	CAMAC	CMK-C3	-	-
PRINTER	Seiko Epson	Stylus Color 460	BWCE136524	DOC

☒ Cable Description

#	Description	Ferrited	Length (m)	Other Details
1	AC Power, Unshielded	No	1.8	Connect to AC Power from PC
2	AC Power, Unshielded	No	1.8	Connect to AC Power from Monitor
3	AC Power, Unshielded	No	1.8	Connect to AC Power from printer
4	Monitor cable, Shielded	Yes	1.8	Connect to PC
5	Printer cable, Shielded	Yes	1.8	Connect to PC
6	Game Pad cable, Unshielded	No	2.0	-
7	Headset cable, Unshielded	No	2.0	-
8	Keyboard cable, Shielded	No	2.0	PS/2 Type
9	Mouse cable, Shielded	No	2.0	USB Type
10	Mouse cable, Shielded	No	2.0	Serial Type
11	Mouse cable, Shielded	No	2.0	PS/2 Type
12	Line in cable, Unshielded	No	2.0	-

n/a = not available

1.4 Test Software

☐ Pinging

☒ Name / Version / Manufacturer

: USB Mass Storage Driver / 5.0.1868.1 / Microsoft Corp.

1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☐ Test program (H-Pattern)

☐ Test program (color bar)

☐ Standby

☐ Test program (customer specific)

☒ Practice operation – 1. Data of PC saving to EUT

2. Reading the EUT's data

1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-1992 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (CE, RE) EMS (ESD, Burst, RS, Surge, CS, Power-Frequency Susceptibility, Voltage Dips and Short Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	 KOLAS LABORATORY ACCREDITATION SCHEME NO. 119

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

- | | | |
|---|---|---|
| ☐ EN 50081-1 /1992 | | |
| ☐ EN 55011 /1998 | ☐ Group 1 | ☐ Group 2 |
| | ☐ Class A | ☐ Class B |
| ☐ EN 55013 /A12:1994 | | |
| ☐ EN 55014 /1987 | ☐ Household appliances and similar | |
| | ☐ Portable tools | |
| | ☐ Semiconductor devices | |
| ☐ EN 55014 /A2:1990 | | |
| ☐ EN 55014 /1993 | ☐ Household appliances and similar | |
| | ☐ Portable tools | |
| | ☐ Semiconductor devices | |
| ☐ EN 55015 /1987 | | |
| ☐ EN 55015 /A1:1990 | | |
| ☐ EN 55015 /1993 | | |
| ☐ EN 55022 /A1:1995 | ☐ Class A | ☐ Class B |
| ☐ EN 55022 /1998 | ☐ Class A | ☐ Class B |
| ☐ EN 61000-3-2 /1995 (EN 60555 Part 2 /4.87) | | |
| ☐ EN 61000-3-3 /1995 (EN 60555 Part 3 /4.87) | | |
| ☐ BS | | |
| ☐ VCCI V-3/99.05 : 1999 | ☐ Class A | ☐ Class B |
| ☒ FCC Part 15 SUBPART B | ☐ Class A | ☒ Class B |
| ☐ AS 3548 (1992) | ☐ Class A | ☐ Class B |
| ☐ CISPR 11 (1990) | ☐ Group 1 | ☐ Group 2 |
| | ☐ Class A | ☐ Class B |
| ☒ CISPR 22 (1997) | ☐ Class A | ☒ Class B |

2.1 Conducted Voltage Emissions

Test Date

April 23, 2002

Test Location

EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde Schwarz	ESHS30	828144/002
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Test Accessories

☐ LISN	EMCO	3825/2	9206-1971
☒ LISN	EMCO	3825/2	9409-2246
☒ LISN	EMCO	3825/2	9607-2574
☒ Control PC	HP	Vectra 500	SG72000192

Frequency Range of Measurement

☒ 150 kHz to 30 MHz
☐ 450 kHz to 30 MHz
☐ _____

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

☒ MET	minimum margin is 5.8 dB μ V at 0.81 MHz
☐ NOT MET	limit exceeded by maximum of ____ dB μ V at ____ MHz
☐ NOT APPLICABLE	

Remarks

See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date

April 23, 2002

Test Location

- ☒ EMI-OATS: Testing was performed at a test distance of 10 m
☐ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter	Rohde Schwarz	ESVS30	826638/008
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Test Accessories

☒ ULTRA Broadband Antenna	R & S	HL562	361324/014
☐ Biconical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Biconical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

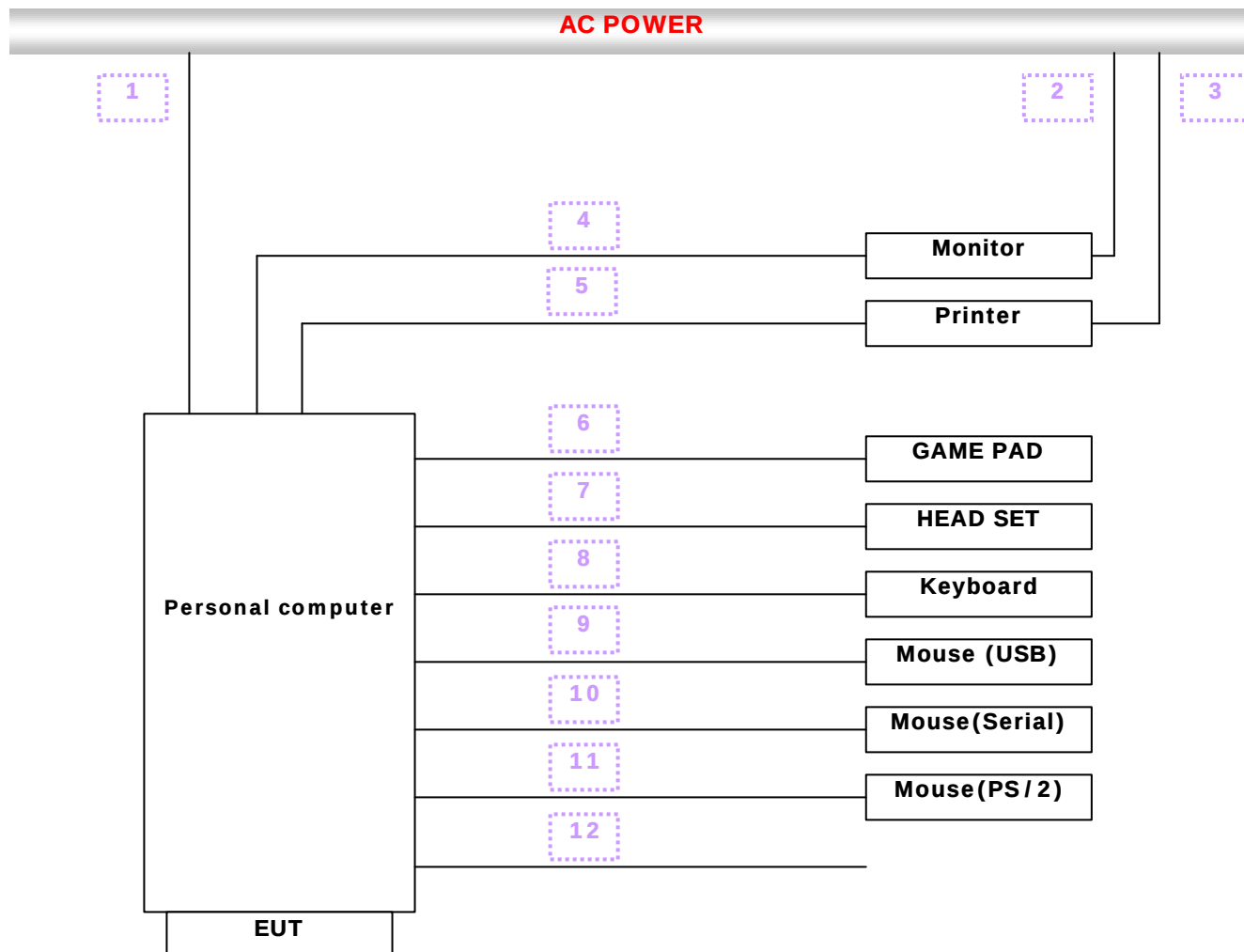
The requirements are:

- ☒ MET minimum margin is 4.20 dB ($\mu\text{V}/\text{m}$) at 648.00 MHz
☐ NOT MET limit exceeded by maximum of ____ dB($\mu\text{V}/\text{m}$) at ____ MHz
☐ NOT APPLICABLE

Remarks

See Appendix A for test data

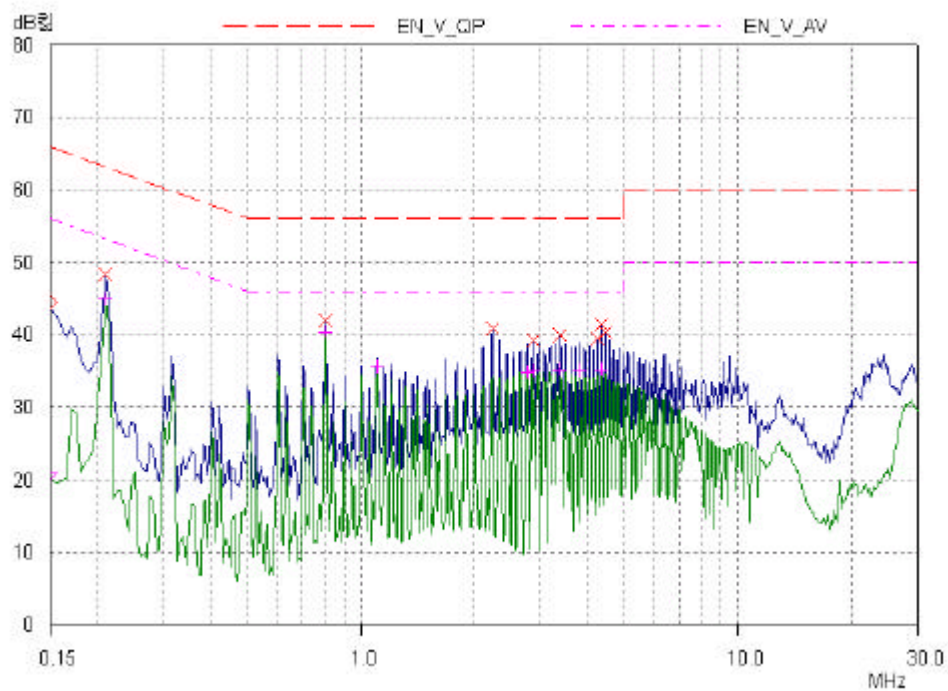
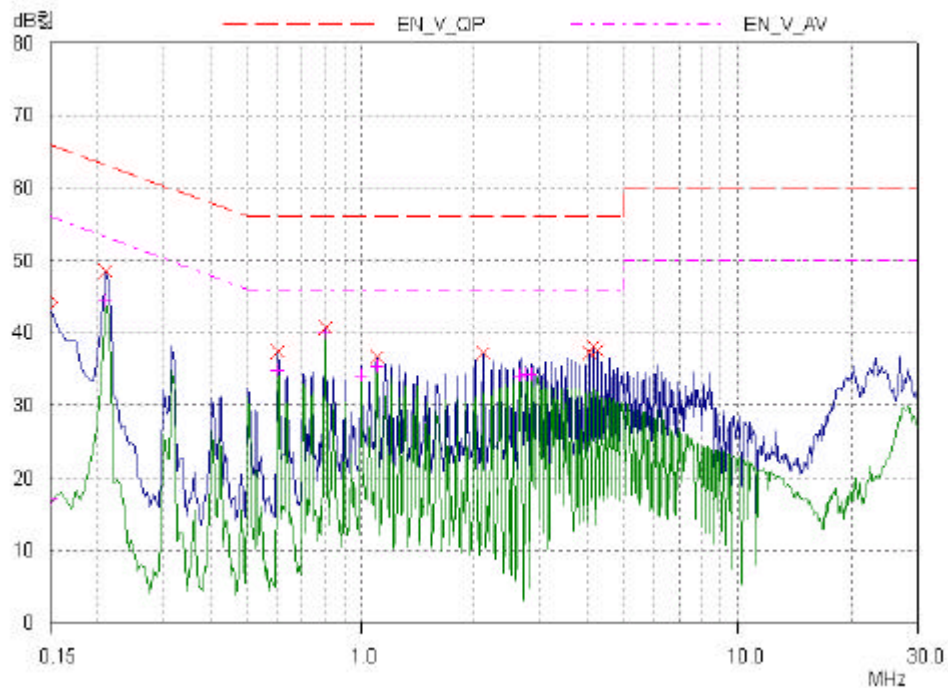
Configuration



APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.21	2.3	0.1	N	63.2	45.9	48.3	14.9	53.2	42.4	44.8	8.4
0.60	0.6	0.1	L	56.0	36.7	37.4	18.6	46.0	34.2	34.9	11.1
0.81	0.4	0.1	N	56.0	41.4	41.9	14.1	46.0	39.8	40.3	5.8
1.11	0.3	0.1	N					46.0	34.6	35.0	11.0
2.84	0.3	0.1	N	56.0	38.9	39.3	16.7	46.0	34.6	35.0	11.0
3.37	0.3	0.1	N	56.0	39.6	40.0	16.0	46.0	34.8	35.2	10.9
4.32	0.3	0.1	N	56.0	40.9	41.3	14.7	46.0	34.9	35.3	10.7



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<http://www.certitek.com/>**Radiated Electric Field Emissions (Quasi-Peak reading)**

Frequency [MHz]	Reading [dBuV / m]	Pol.	Height [m]	Correction Factor		Limits [dBuV / m]	Result [dBuV / m]	Margin [dB]
				Antenna	Cable			
552.00	4.9	V	1.0	16.30	4.80	37.0	25.98	11.02
564.00	8.3	H	3.8	16.40	4.90	37.0	29.63	7.37
589.00	8.2	H	3.5	17.00	5.20	37.0	30.35	6.65
601.00	7.8	H	3.8	17.00	5.20	37.0	29.99	7.01
613.00	9.8	H	3.8	17.10	5.20	37.0	32.14	4.86
626.00	5.8	V	1.0	17.40	5.30	37.0	28.48	8.52
636.00	8.1	H	4.0	17.60	5.50	37.0	31.22	5.78
648.00	9.5	H	4.0	17.80	5.50	37.0	32.80	4.20
673.00	7.5	H	4.0	18.10	5.50	37.0	31.14	5.86
685.00	5.1	H	3.5	18.20	5.70	37.0	28.99	8.01