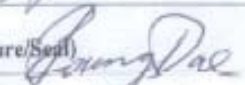


	ESTECH Co., Ltd. 3rd Fl., Chungdam Bldg., 119-1 Chungdam-dong, Kangnamgu, Seoul	    	Electromagnetic Interference Test Report

Compliance Test Report for FCC

Report Number	ESTF150201-001			
Applicant	Company Name	ORACOM Co., Ltd		
	Address	3 rd Fl. Myung-Jin Bldg. 776, Yeoksam-2Dong, Kangnam-gu, Seoul, Korea		
	Telephone	82-2-563-5633		
Product	Product Name	USB Storage Device		
	Model No.	USD-01	Manufacturer	ORACOM Co., Ltd
	Serial No.		Country of origin	Korea
Test data	Date of Receipt	2002. 1. 25	Date of Issue	2002. 1. 30
Testing Location	ESTECH. Co., Ltd 3 rd Fl., Chungdam Bldg., 119-1, Chungdam-dong Kangnam-gu , Seoul , Korea			
Standard	FCC PART 15 2001 , ANSI C 63.4 1992			
Emission Test	☒ Conducted Emission	☐ Class A	☒ Class B	Test Result : OK
	☒ Radiated Emission	☐ Class A	☒ Class B	Test Result : OK
Measurement Facility Registration Number : 94696				
Tested by : Senior Engineer J. M. Yang		(Signature/Seal) 		
Reviewed by : Director S. D. Park		(Signature/Seal) 		
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable			
* Note - This test report is not permitted to copy partly without our permission - This test result is dependent on only equipment to be used - This test result based on a single evaluation of one sample of the above mentioned				



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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and tested in accordance with the measurement procedures as indicated in this report

ESTECH Lab. attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab. assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd.

Head Office : 3 rd Fl., Chungdam Bldg., 119-1, Chungdam-dong Kangnam-gu , Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab. : 58-1, O-San Ri, Ga-Nam Myon, Yeo-Joo Gun, Kyung-Ki Do, Korea
 97-1, Hoi-uk Ri Ma-jang Myon, Icheon city, Kyung-Ki Do, Korea

Branch Office : USA-ESTECH INC.
 21801 Stevens Creek Blvd. Suite 2A Cupertino, CA95014

1.3 Official Qualification(s)

Our Test lab has worked test lab system by IEC 17025 and was registered the follows certification body

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecom.

KOLAS : Accredited Lab. By Korea Laboratory Accreditation Schema base on CENELEC requirements

FCC : Granted Accreditation from Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

- ◆ EUT Name : **USB Storage Device**
- ◆ Model Number : **USD-01**
- ◆ Serial Number : **-**
- ◆ Manufacturer : **ORACOM Co., Ltd**
- ◆ Country of origin : **KOREA**
- ◆ Power Rating
 PC power Using
- ◆ Test Date
 Test Date : **2002. 1. 25**

2.2 General descriptions of EUT

- You can use the USB Storage Device the same way as a Floppy disk or a Hard disk drive.
- This product have the following Capacity : 16M/32M/64M/128M/256M/512M.
- Dimension : 12.5×85×11mm
- Support OS : Windows98/SE, ME, 2000, XP, Linux kernel 2.4.0

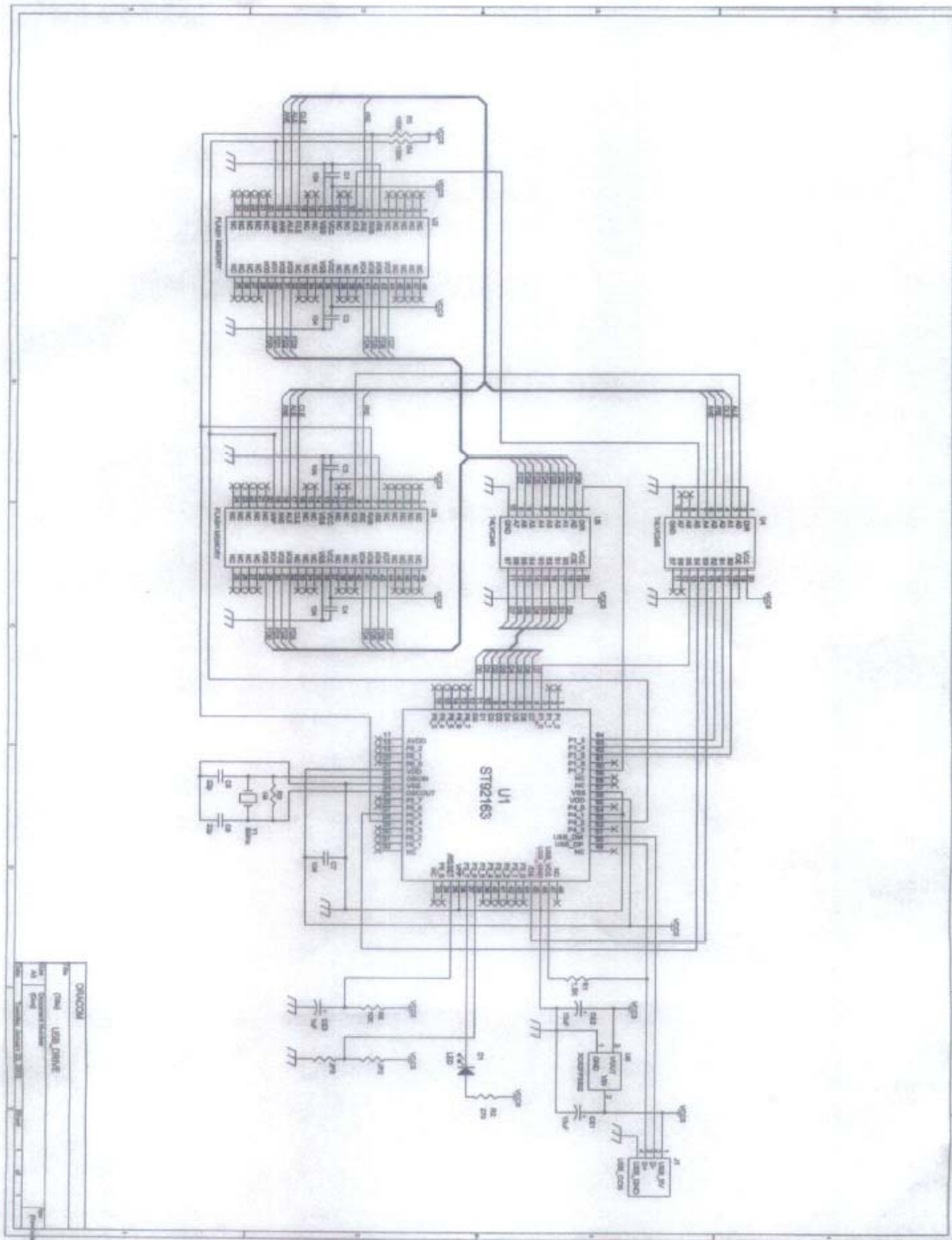


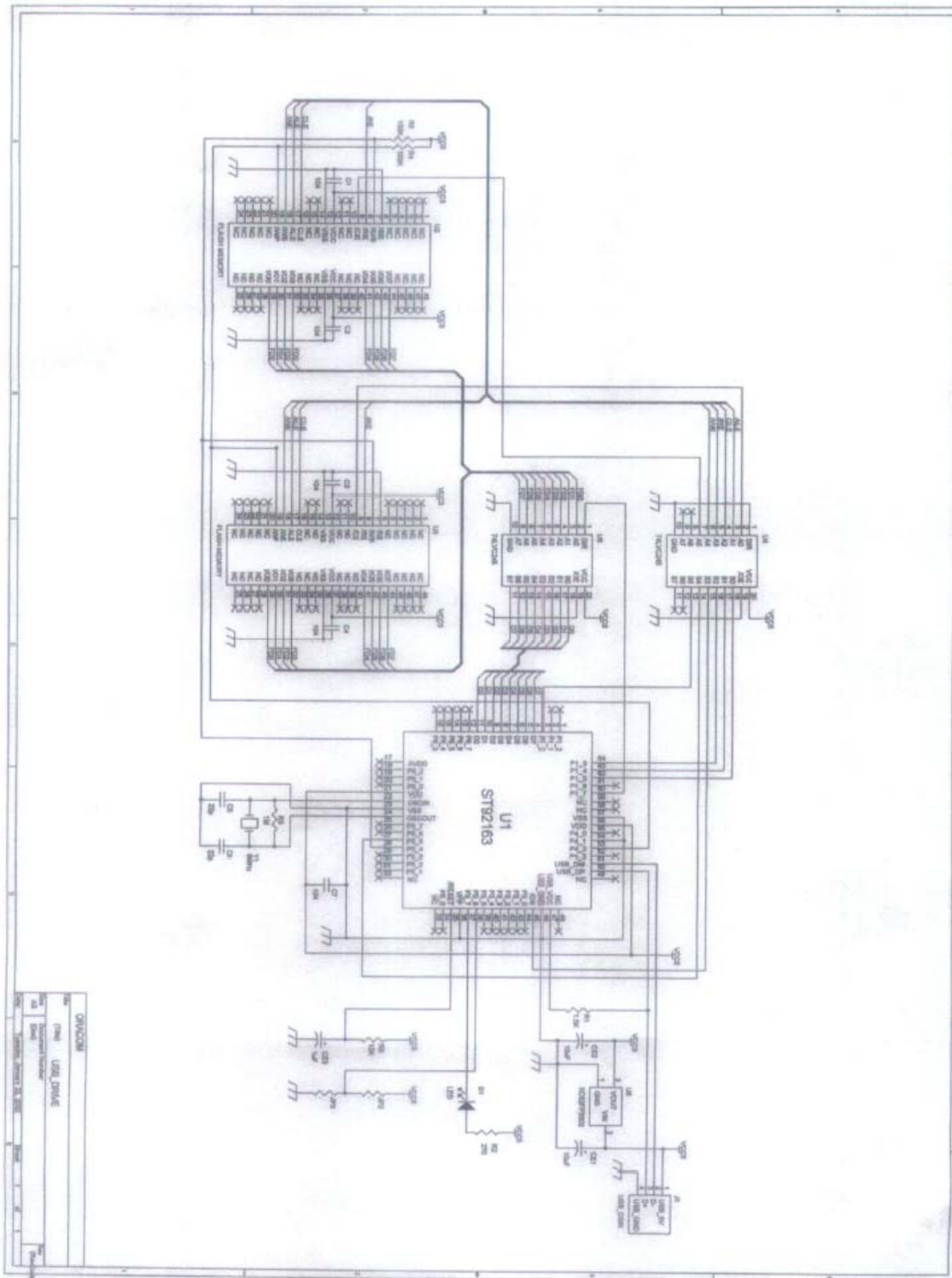
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Kangnamgu, Seoul



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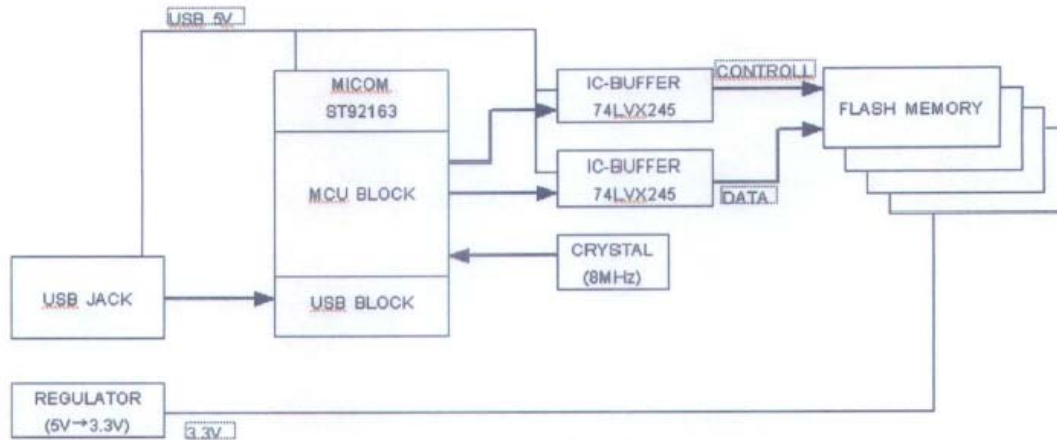
2.3 Circuit Diagram



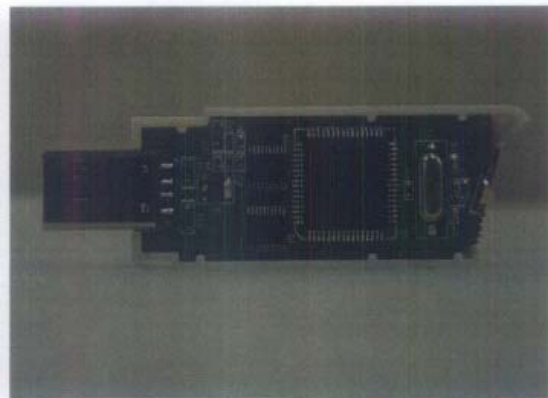
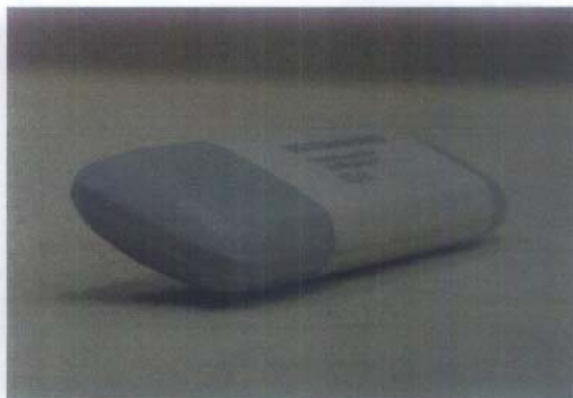




2.4 EUT Block Diagram



2.5 EUT Figure



3. Test Standards

Test Standard : FCC PART 15 (2001)

This Parts sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (1992)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements.

These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment

These method apply to the measurement of individual units or systems comprised of multiple units

4. Measurement Condition

4.1 EUT Operation.

- The EUT was in the following operation mode during all testing
 1. The EUT is connected with PC, Monitor, Keyboard, Printer, Mouse. And check to normal mode operation
 2. The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission.
“H” Character Read/Write.

4.2 Cable Connecting

Start Equipment		End Equipment		Cable		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
USB Storage Device	USB	PC	USB	1.0	shielded	-
PC	Video	Monitor	Video	2.0	shielded	-
PC	Parallel	Printer	Parallel	2.0	shielded	-
PC	PS/2 Keyboard	Keyboard	PS/2 Keyboard	2.0	Un-shielded	-
PC	PS/2 Mouse	Mouse	PS/2 Mouse	2.0	Un-shielded	-
Printer	Power	Adaptor	-	2.0	Un-shielded	-

4.3 EUT Configurations

Equipment Name	Model Name	Manufacturer	Country of origin	Remark
USB Storage	USD-01	Oracom	Korea	EUT
PC	M6030	ERA00236	Samsung	-
Monitor	D8897	CN11104168	HP/China	-
Printer	C6414J	TH18M149P2	Calcomp/Thailand	-
Keyboard	T800	K19120116	BC Telcom./Korea	-
Mouse	M-S48a	HCA11804896	Logitech/China	-
Adaptor	C6409-60152	-	YokoGawa	-

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with **FCC Part 15 (2001) & ANSI C 63.4 (1992)**. The test setup was made according to **FCC Part 15 (2001) & ANSI C 63.4 (1992)** on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LogBicon Antenna	VULB 9160	Schwarzbeck	3107	2002.5.9
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-1	EMCO	9702-203	-
Amplifier	310N	Sonoma Instrument	185817	2002.9.27
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-
Receiver	ESPC	Rohde & Schwarz	838248/001	2002.1.29

5.2 Environmental Conditions

Section	Temperature (°C)	Humidity (%)
Radiated	17	45
Test Place	Open site : 3m	

5.3 Test data sheet

Frequency (MHz)	Position (V/H)	Height (m)	Correction Factor (dB)		Result Value (dBuV/m)		Margin
			Air Line	Cable etc.	Limit	Result	
40.84	V	1.0	11.99	1.22	40.00	28.20	-11.8
75.48	H	2.5	9.03	1.70	40.00	33.73	-6.27
79.07	H	2.5	8.24	1.70	40.00	32.94	-7.06
85.32	H	2.5	7.99	1.81	40.00	30.30	-9.7
197.77	H	2.3	9.94	2.92	43.50	29.87	-13.63
240.03	V	1.0	11.35	3.40	46.00	30.25	-15.75
250.03	H	1.1	11.61	3.50	46.00	33.61	-12.39
336.04	H	1.0	13.98	4.24	46.00	33.22	-12.78
432.06	H	1.9	16.20	4.92	46.00	34.32	-11.66
528.06	H	1.3	17.80	5.50	46.00	40.80	-5.2
600.00	H	1.5	19.55	5.70	46.00	37.25	-8.75
624.08	H	1.3	19.66	5.94	46.00	41.80	-4.2
912.11	H	1.1	23.28	7.44	46.00	40.22	5.78
Remark	H : Horizontal, V : Vertical						

6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.45 to 30 MHz was measured in accordance to **FCC Part 15 (2001) & ANSI C 63.4 (1992)**. The test setup was made according to **FCC Part 15 (2001) & ANSI C 63.4 (1992)** in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESHS-Z5	Rohde & Schwarz	8120161	2002.1.29
LISN	NNLA81020A	Schwarzbeck	838979/010	2002.1.30
TEST Receive	ESPC	Rohde & Schwarz	838248/001	2002.1.30

6.2 Environmental Conditions

Section	Temperature (°C)	Humidity (%)
Conducted	19	50
Test Place	Shield Room	

6.3 Test data sheet

Frequency (MHz)	Correction Factor (dB)		Quasi-peak Value (dBuV/m)			Margin
	Lisn	Cable etc.	Limit	Result	Line	
0.487	0.08	0.2	48	5.78	H	-42.22
0.886	0.09	0.2	48	14.78	N	-33.22
1.362	0.11	0.1	48	18.27	N	-29.73
2.250	0.23	0.3	48	13.95	H	-34.05
3.717	0.20	0.3	48	14.71	N	-33.29
5.278	0.34	0.4	48	15.09	H	-32.91
9.294	0.44	0.6	48	20.60	H	-27.40
10.308	0.61	0.8	48	21.67	N	-26.33
16.627	0.92	0.8	48	22.00	H	-26.00
25.772	0.70	0.9	48	26.62	N	-21.38
Rema2.16rk	H : Hot Line, N : Neutral Line					



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6.4 Spectral Diagram

- Hot Line

25 Jan 2002 13:49

ESTECH
HOT

EUT: USD-01
Manuf: (주)오라콤
Op Cond: 220V
Operator: JMYang
Test Spec: CLASS B
Comment:

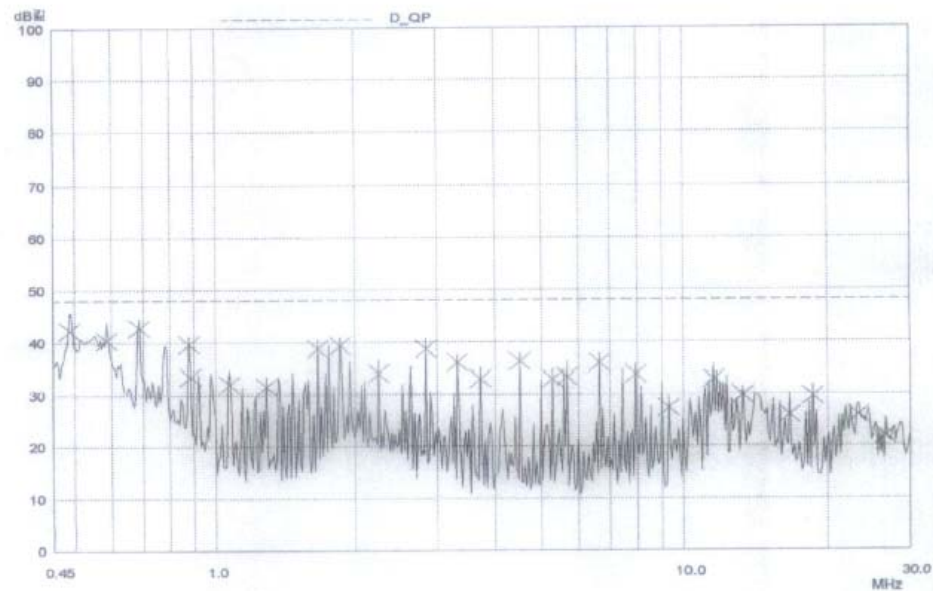
File: usd01_h.dat : New Measurement

Scan Settings (1 Range)

Start	Frequencies	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge
450kHz	30MHz	30MHz	0.6%	10kHz	PK	20msec	Auto	60dB

Final Measurement:

X QP
Meas Time: 1sec
Subranges: 25
Acc Margin: 60 dB





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Electromagnetic Interference Test Report

- Neutral Line

25 Jan 2002 13:43

ESTECH NEUTRAL

EUT: USD-01
Manuf: (주)오리원
Op Cond: Z20V
Operator: JMYang
Test Spec: CLASS B
Comment:

File: usd01_n.dat : New Measurement

Scan Settings			Receiver Settings			
(1 Range)						
Start	Frequencies	Step	IF BW	Detector	M-Time	Atten
450kHz	Stop 30MHz	0.8%	10kHz	PK	20msec	Auto
Final Measurement:						OpRge 60dB
			X QP			
			Meas Time:	1sec		
			Subranges:	25		
			Acc Margin:	60 dB		

