EMC TEST REPORT

Test Report No. :	DST-11-F012
Applicant :	Diasonic Technology Co., Ltd. #321-43, Suksu-dong, Manan-ku, Anyang-city, Kyungki-do, Korea.
Manufacturer :	Diasonic Technology Co., Ltd. #321-43, Suksu-dong, Manan-ku, Anyang-city, Kyungki-do, Korea.
Product name :	TOUCH PEN & CARD READER
Model name. :	TSR-001
Serial number:	-
Standard applied:	ANSI C 63.4:2009 FCC Part 15 subpart B
FCC Classification :	Class B personal computers and peripherals
FCC Procedure :	Certification
FCC ID :	P7KTSR-001
Test Lab :	DSTech Co.(FCC Registration No. : 762812)
Date of receipt :	May 6, 2011
Test Period :	May 17, 2011
Date of issue :	May 18, 2011

Tested by : **Chang-youl Kim / EMC Engineer**

Reviewed by: **Sang-uk Han / Chief Engineer**

DSTech Co.

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1. General Description of EUT

1.1 Applicant

Company Name	:	Diasonic Technology Co., Ltd.
Address	:	#321-43, Suksu-dong, Manan-ku, Anyang-city, Kyungki-do, Korea.
Contact Person	:	Han-hyung, Lee
E-mail	:	rnd2@diasonic.com
Phone	:	+82-31-474-0852

1.2 Manufacture

Company Name	:	Diasonic Technology Co., Ltd.
Address	:	#321-43, Suksu-dong, Manan-ku, Anyang-city, Kyungki-do, Korea.

1.3 Basic Description of EUT

Product Name	:	TOUCH PEN & CARD READER
Model Name	:	TSR-001
Serial Number	:	-
Input Rating	:	DC 5 V
Internal Clock Freq	:	48 MHz

2. General Information of Test

2.1 Test Facility

This test was carried out by DSTech Co.
Test Site Location : 80, Jeil-ri, Yangji-myun, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
TEL : 82-31-336-1798, FAX : 82-31-336-3451

2.2 Standard for Methods of Measurement

Basic Standard	Description	Test Result
FCC Part 15 Subpart B	15.107(a) Conducted Emission	☒ Pass ☐ Fail
	15.109(a) Radiated Emission	☒ Pass ☐ Fail

* The sample was tested according to the following specification: ANSI C 63.4:2009

2.3 Description of EUT modification

N/A

2.4 Variations covered by this report

N/A

2.5 Additional information related to Testing

Test results apply only to the particular sample tested and functionality described in this test report. This report may be reproduced in full. Partial reproduction may only be made with the written permission of the DSTech.

2.6 Test Conditions

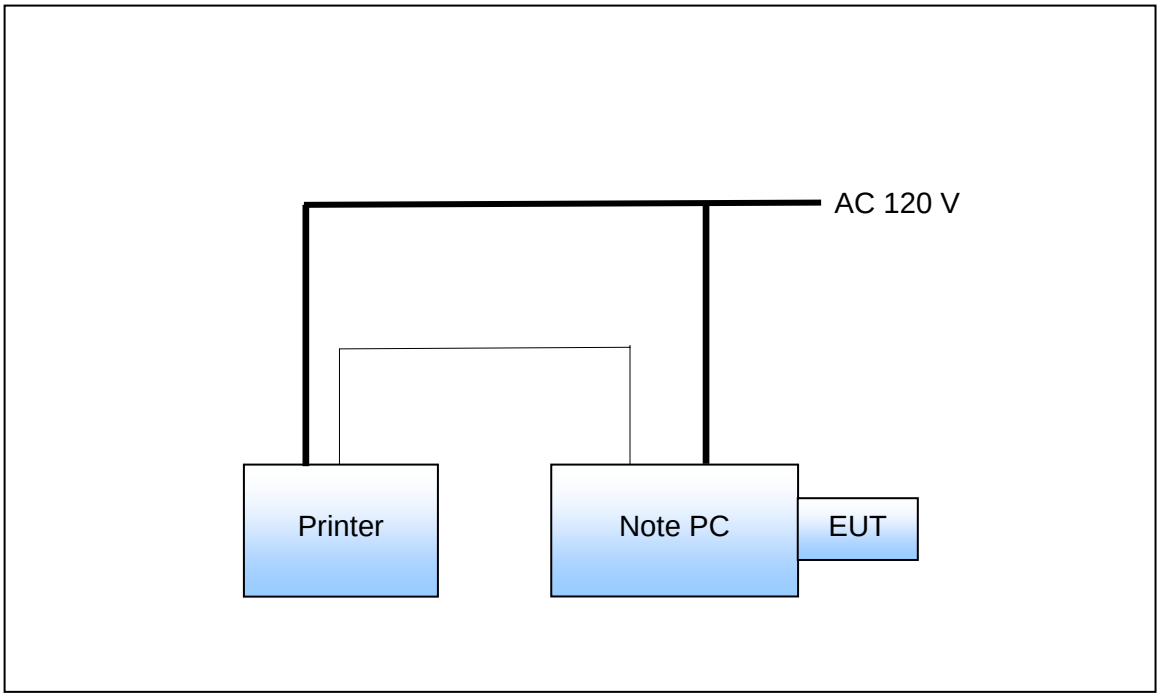
EUT Operating Mode

EUT was tested according to the following operation modes provided by the specifications given by the manufacturer and reported the worst emissions.

Operation Modes	Worst Case Mode
Continuous data read/write/delete	☒

Test System layout on EUT and peripherals

Power cable ——— Signal cable



2.7 Description of Test System

Type of Peripheral Equipment Used:

Description	Model Name	Serial No.	Manufacturer	FCC Approval
Note pc	NT-R780	ZNWE93GZ200193M	SAMSUNG	DoC
Printer	VCVRA-0702	TH7CI541WW	HP	DoC

Type of Cables Used:

Device from	Device to	Type of Cable	Length (m)	Type of shield
Note PC	AC power	Power	1.8	Unshield
Printer	AC power	Power	1.8	Unshield
Note PC	Printer	USB	1.5	Shield
Note PC	EUT	USB	-	-

3.1 Conducted Emission Test

Conducted emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz on the 120 V AC power input terminal. The EUT was placed on a un-metallic stand in a shielded room 0.8 meters above the ground plane as shown in photograph of test setup. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

3.1.1 Test Condition

Frequency Range of Test	:	150 kHz to 30 MHz
Test Method		FCC Part 15 Subpart B (Section : 15.107a)
Test Date	:	May 17, 2011
Temperature/Humidity	:	(20 ± 1) °C / (55 ± 1) % R.H.
Input Voltage	:	AC 120 V / 60 Hz

3.1.2 Test Standard.

Frequency Range (MHz)	Limit at Mains Terminal	
	Quasi-Peak [dB(μV)]	Average [dB(μV)]
0.15 ~ 0.5	66	56
0.5 ~ 5	56	46
5 ~ 30	60	50

3.1.3 Test Equipment List.

Equipment Type	Model	Manufacture	Serial No	Cal Due Date	Use
2-LINE V-NETWORK	ESH3-Z5	R&S	100193	2011.06.18	☒
ARTIFICIAL MAIN NETWORK	MN425B	ANRITSU	M05519	2011.06.28	☒
EMI TEST RECEIVER	ESCI	R&S	100049	2011.06.21	☒

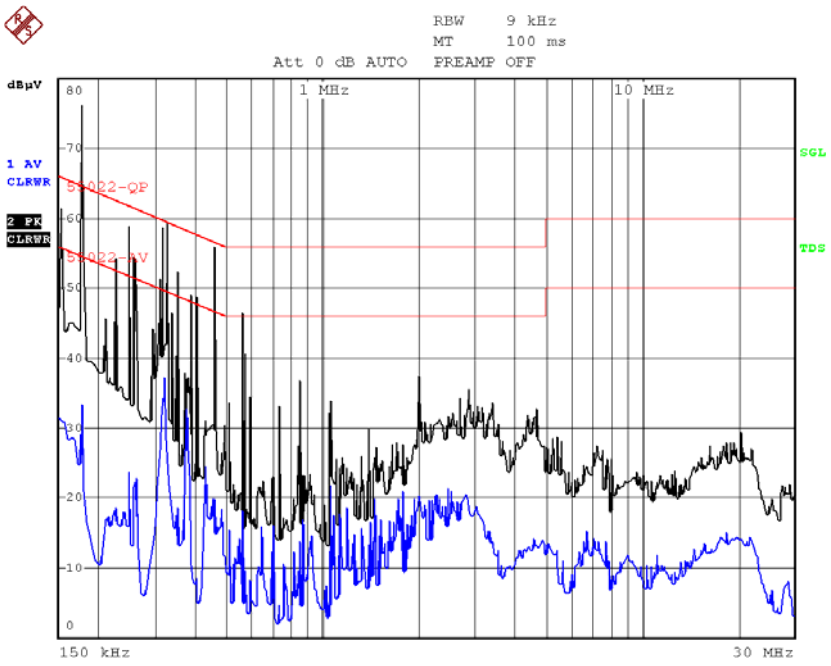
3.1.4 Test Result of Main Conducted Emission

Test Results: PASS
Test data sheets follow.

Frequency	C.F.	Phase	Quasi-Peak Mode			Average Mode		
			Limit	Result	Margin	Limit	Result	Margin
[MHz]	[dB]	[N/L1]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]
0.182	0.1	N	64.4	48.3	11.2	54.4	32.5	20.1
0.194	0.1	N	63.9	53.7	10.2	53.9	34.1	19.8
0.258	0.1	N	61.5	49.3	12.2	51.5	30.7	20.8
0.378	0.1	N	58.3	40.7	17.6	48.3	37.3	11.0
0.486	0.1	N	56.2	36.9	19.3	46.2	26.3	19.9
0.154	0.1	L1	65.8	55.1	10.7	55.8	37.3	18.5
0.178	**0.1**	**L1**	**64.6**	**55.0**	**9.6**	**54.6**	**34.0**	**20.6**
0.330	0.1	L1	59.4	47.1	12.3	49.4	36.1	13.3
0.378	0.1	L1	58.3	39.2	19.1	48.3	32.9	15.4
0.462	0.1	L1	56.6	33.9	22.7	46.6	20.9	25.7
0.560	0.1	L1	56.0	30.6	25.4	46.0	20.8	25.2

Notes:
1. C.F = LISN Factor + Cable Loss + Pulse Limiter Loss / Result = Reading Level + C.F
2. All modes of operation were investigated and the worst-case emissions are reported.
3. Measurement uncertainty estimated at ± 3.9 dB.
   The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k=2.
4. See next page for measurement graph.

Tested by Chang-youl Kim



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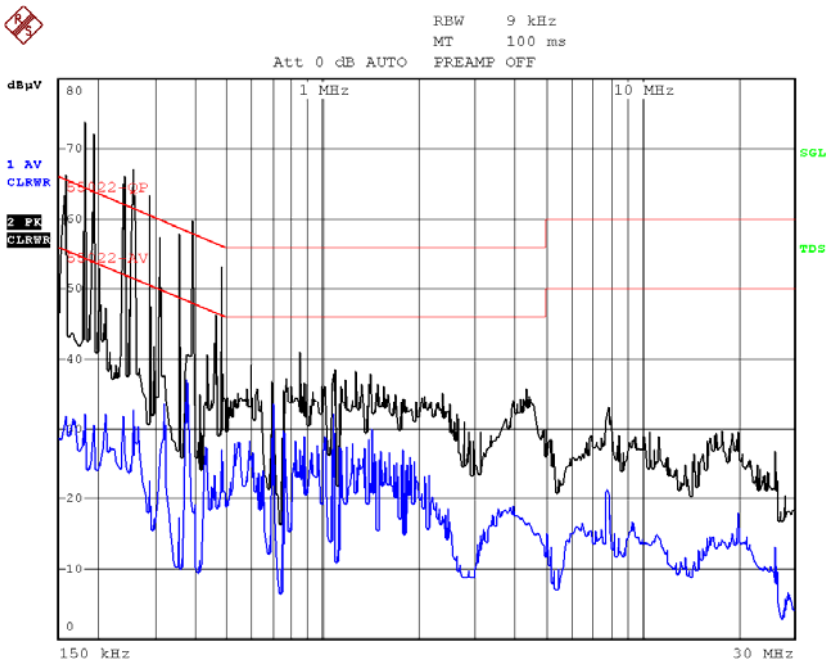

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3.2 Radiated Emission Test

Radiated disturbance from 30 MHz to 1 000 MHz were measured with a bandwidth of 120 kHz(and 1 MHz above 1 GHz) for both vertical and horizontal polarization of the measuring antenna according to the methods defines in ANSI C 63.4:2009. The EUT was placed on a non-metallic table in the 3 meter open area test site, 0.8 meter above the ground plane, and the measurement distance from the measuring antenna to the center of the EUT was set 10 m distance as shown in Test setup photograph. The measuring antenna was adjusted in height of 1m to 4m range for the maximum emission. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

3.2.1 Test Condition

Frequency Range of Test	:	30 MHz to 1 000 MHz
Test Method		FCC Part 15 Subpart B (Section : 15.109a)
Test Date	:	May 17, 2011
Temperature/Humidity	:	(25 ± 1) °C / (48 ± 2) % R.H.

3.2.2 Test Standard

Frequency Range (MHz)	Limit
	Quasi-Peak dB(μV/m)
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
Above 960	53.9

3.2.3 Test Equipment List

Equipment Type	Model	Manufacture	Serial No	Cal Due Date	Use
EMI TEST RECEIVER	ESCI	R&S	100049	2011.06.21	☒
Antenna Mast	EAM 4.0	DAEIL EMC	N/A	N/A	☒
Antenna Turntable Controller	EMRT2015	HD	N/A	N/A	☒
Biconical ANT	HK116	R&S	825177/014	2011.07.09	☒
Log-Periodic ANT	HL223	R&S	832369/010	2011.07.09	☒

3.2.4 Test Result of Radiated Emission

Test Results: PASS
Test data sheets follow.

Frequency (MHz)	Quasi-Peak [dB(μV)/m]	Antenna height (cm)	Pol	Corr. (dB)	Margin (dB)	Limit [dB(μV)/m]
241.3	42.2	160	V	-5.2	3.8	46.0
481.5	38.6	230	V	-1.5	7.4	46.0
481.5	40.5	180	H	-1.5	5.5	46.0
721.2	**42.6**	**150**	**H**	**3.8**	**3.4**	**46.0**
750.0	41.3	180	V	4.2	4.7	46.0

Notes
1. H: Horizontal polarization, V: Vertical polarization
2. Quasi-Peak Level = Reading + Corr. (Antenna factor + Cable loss)
3. Margin value = Limit – Quasi-Peak Level
4. Measurement uncertainty estimated at ± 5.08 dB.
   The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k = 2.

Tested by Chang-youl Kim