

EMI REPORT (Certification)

Avantis co., Ltd.

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Test Report No.: HCT-F08-0101

Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID:

VXMSTANDALONETCD

Classification/ Standard(s):	FCC PART 15 Subpart B
Equipment (EUT) Type:	TCD
Trade Name/Model(s):	Avantis co., Ltd. / Stand Alone TCD
Application Type:	Certification
Port/ Connector(s):	DC Input Port / I/O Port

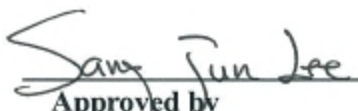
The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.(See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988, 21 U.S.C.853(a).



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1. GENERAL INFORMATION

1.1 Product Description

The Avantis co., Ltd. Stand Alone TCD TCD. Its basic purpose is used for communications. It transmits from GSM850 (824.20 MHz – 848.80 MHz), GSM1900 (1850.20 MHz – 1909.80 MHz) and receives from GSM850 (869.20 MHz – 893.80 MHz), GSM1900 (1930.20 MHz – 1989.80 MHz).

MODEL	Stand Alone TCD
FCC ID	VXM-STANDALONETDC
EUT Type	TCD
TX Frequency	824.20 MHz – 848.80 MHz (GSM850) / 1850.20 MHz – 1909.80 MHz (GSM1900)
RX Frequency	869.20 MHz – 893.80 MHz (GSM850) / 1930.20 MHz – 1989.80 MHz (GSM 1900)

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

1.3 Tested System Details

All equipment, descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER/ PART NUMBER	FCC ID / DoC	CONNECTED TO
TCD	Avantis co., Ltd.	Stand Alone TCD	VXM-STANDALONETDC	Notebook
Antenna	-	-	-	EUT
Notebook	Toshiba	PSMA2K-01D002	DoC	EUT
Notebook Adaptor	DELTA	SADP-65KB B	-	Notebook
Mouse	DELL	MO56U0	DoC	Notebook

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
TCD	DC In	N	N/A	(P)1.45
	RJ 11	N/A	N	(D)1.3
	RJ 45	N/A	N	(D)1.8
	RS 232	N/A	N	(D)0.7
	RS 485	N/A	N	(D)1.45
	Serial	N/A	Y	(D)1.8
	Antenna	N/A	Y	(D)0.55
Notebook	DC In	N	N/A	(P)1.8

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

1.5 Noise Suppression Parts on Cable. (I/O CABLE)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
TCD	RJ 45	Y	EUT End	-	-
	RS 232	Y	EUT End	-	-
	RS 485	Y	EUT End	-	-
	Antenna	N	-	Y	EUT End
	RJ 11	N	-	N	-

1.6 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.7 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyongki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

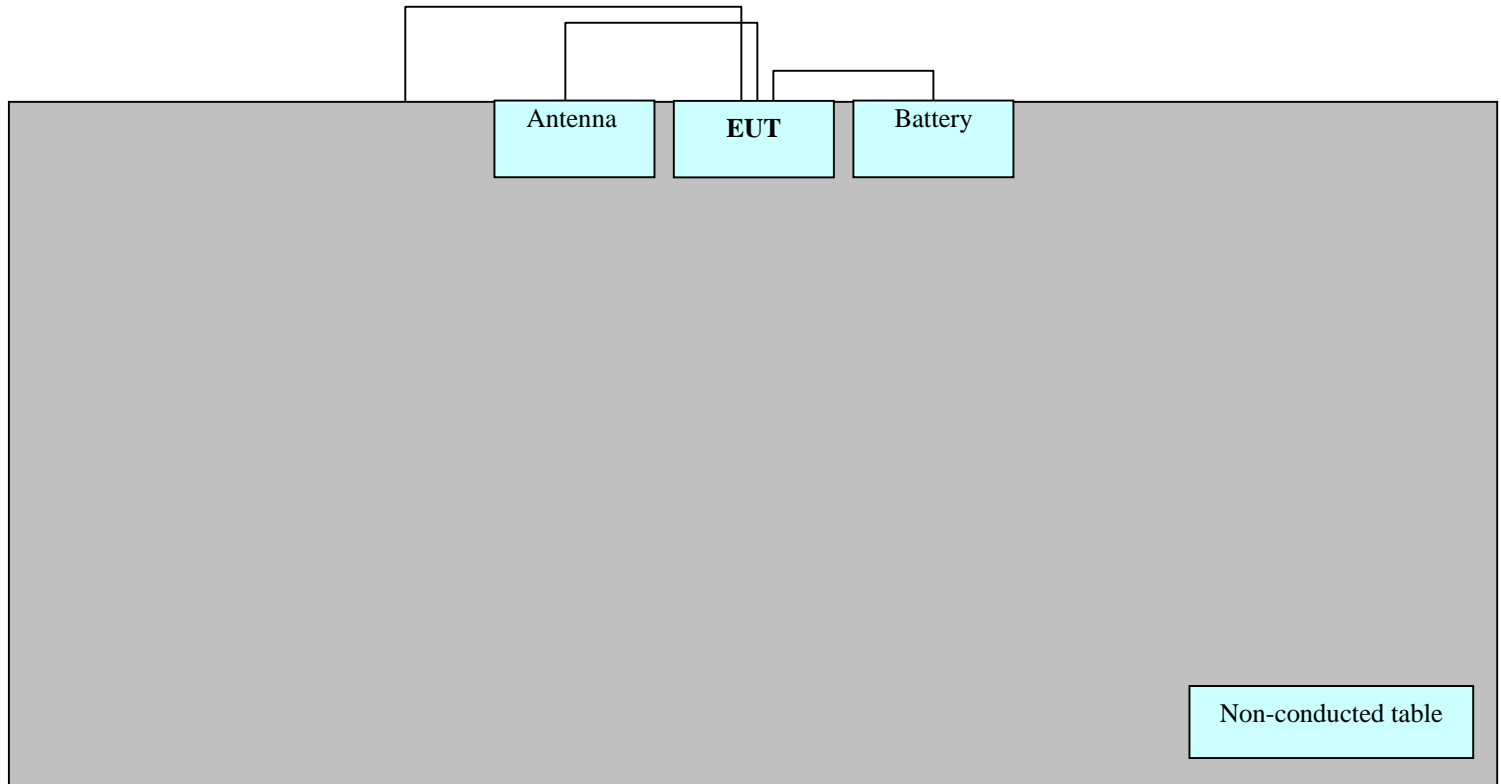
2.SYSTEM TEST CONFIGURATION

2.1 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were Connected to another LISN. Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

Radiated Emission Test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 meter open area test site.

Connected to
Notebook



[Configuration of Tested System]

3. PRELIMINARY TEST

3.1 Conducted Emission Test

This EUT doesn't have any device, which are affected by conducted emission.

This E.U.T only use battery as power and the E.U.T can not be operating when charging mode. (For Safety, DO NOT USE in Charging Mode)

3. 2 Radiated Emission Test

During Preliminary Test, the Following operation mode was investigated

Operation Mode	The worst operating condition
Idle (850,1900) Mode	

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

This EUT doesn't have any device, which are affected by conducted emission.

This E.U.T only use battery as power and the E.U.T can not be operating when charging mode. (For Safety, DO NOT USE in Charging Mode)

4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

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Limit apply to	: FCC PART 15 Subpart B
Result	: PASSED BY – 6.5 dB
Operating Condition	: Idle mode
Detector	: Quasi-Peak (6 dB Bandwidth: 120 kHz)
Temperature	: 3.0 °C
Humidity Level	: 45.0 %
Test Date	: December 27, 2007

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
250.0	18.5	11.1	3.8	H	33.4	46.0	-12.6
500.0	15.4	16.9	5.3	H	37.6	46.0	-8.4
500.0	16.2	16.9	5.3	V	38.4	46.0	-7.6
625.0	14.0	19.4	5.9	H	39.3	46.0	-6.7
625.0	14.2	19.4	5.9	V	39.5	46.0	-6.5
810.3	11.2	21.5	6.8	H	39.5	46.0	-6.5

*** For measurement over 1 GHz, noise level is more than 10 dB below the limit.

4.3 Test Setup Photos

4.3.1 Radiated Emission



5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV/m is obtained. The Antenna Factor of 7.4 dB and a Cable Factor of 1.1 dB is added. The 30 dBuV/m value is mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

Radiated emission limits

Frequency of emission	Field strength	
	$\mu\text{V} / \text{m}$	$\text{dB } \mu\text{V} / \text{m}$
30 ~ 88	100	40.0
88 ~ 216	150	43.5
216 ~ 960	200	46.0
Above 960	500	54.0

6. Test Equipment

<u>Type</u>	<u>Manufacture</u>	<u>Model Number</u>	<u>Next CAL Date</u>
EMI Test Receiver	Rohde & Schwarz	ESI40	2008.11.06
Attenuator	Rohde & Schwarz	ESH3-Z2	2008.10.30
TRILOG Antenna	Schwarzbeck	VULB9168	2008.03.19
Communication Antenna	TDK	LPDA-0802	N/A
Antenna Position Tower	HD	240/520/00	N/A
Base Station	Rohde & Schwarz	CMU 200	2008.02.27
Horn Antenna	Schwarzbeck	BBHA 9120D	2008.03.31
RF-Amplifier	MITEQ	AMF-6D-00101800-35.20P.PS	2008.01.24

7. Conclusion

The data collected shows that the Avantis co., Ltd. TCD. FCC ID: VXM-STANDALONETDC
Complies with §15.109 of the FCC Rules.