

# C E R T I F I C A T E

of Conformity

EC Council Directive 89/336/EEC  
as last amended by EC Directive 93/68/EEC  
Electromagnetic Compatibility

Registration No.: AE 50017683 0001

Report No.: 14001603 001

Holder: Precision Mastech Enterprises Co.  
Room 1709, Hewlett Centre  
52 Hoi Yuen Road  
Kwun Tong, Kowloon  
Hong Kong

Product: Widerstandsmessgerät  
(Earth Resistance Tester)

Identification: MS5209  
Serial no.: n.a.  
refer to test report 14001603 001 for detailed list

Tested acc. to: EN 61326:1997+A1+A2

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex III of Council Directive 89/336/EEC., in its latest amended version, referred to as the EMC Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Article 10.1 of the Directive.

Cologne, 07.10.2002



Certification Body

  
Dipl.-Ing. F. Nispel

**TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln**

**CE** The CE marking may only be used if all relevant and effective EC Directives are complied with. **CE**

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**Auftraggeber:** Precision Mastech Enterprises Co.  
*Client:* Room 1709, Hewlett Centre, 52 Hoi Yuen Road  
 Kwun Tong, Kowloon  
 Hong Kong

**Gegenstand der Prüfung:** Earth Resistance Tester  
*Test item:*

**Bezeichnung:** MS5209 **Serien-Nr.:** Pre-production Model  
*Identification:* *Serial No.*

**Wareneingangs-Nr.:** 020801007 **Eingangsdatum:** 01.08.2002  
*Receipt No.:* *Date of receipt:*

**Prüfart:** Refer to section 2.1  
*Testing location:*

**Prüfgrundlage:** EN 61 326:1997+A1+A2  
*Test specification:*

**Prüfresultat:** Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage.  
*Test Result* The a. m. test item passed.

**geprüft / tested by:** R. Fong **kontrolliert / reviewed by:** P. Poon

18.09.2002

Datum  
Date

  
Unterschrift  
Signature

18.09.2002

Datum  
Date

  
Unterschrift  
Signature

**Sonstiges / Other Aspects:**

**Abkürzungen:** OK, Pass = entspricht Prüfgrundlage  
 Fail = entspricht nicht Prüfgrundlage  
 N/A = nicht anwendbar

**Abbreviations:** OK, Pass = passed  
 Fail = failed  
 N/A = not applicable

**Dieser Prüfbericht bezieht sich nur auf den o.g. Prüfgegenstand und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.**

This test report relates to the a. m. test item. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products.

Authorized format 16.12.1996, R.M.



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## **1 General Remarks**

### **1.1 Complementary Materials**

All attachments are integral parts of this test report.

Appendix 1: test results

Appendix 2: photos of test set-up

## **2 Test Sites**

### **2.1 Test Facilities**

TÜV Rheinland Hong Kong Ltd.  
Room 405, 4/F., Tech Centre  
72 Tat Chee Avenue  
Kowloon  
Hong Kong

Hong Kong Productivity Council  
HKPC Building  
78 Tat Chee Avenue  
Kowloon  
Hong Kong

The tests at these test sites have been conducted under the supervision of a TÜV engineer.



## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

	Kind of Equipment	Manufacturer	Type	S/N
<input checked="" type="checkbox"/>	Test Receiver	Rohde & Schwarz	ESH-3	890173/033
<input checked="" type="checkbox"/>	L/I/S/N	Rohde & Schwarz	ESH 3-Z5	849876/026
<input type="checkbox"/>	Oscilloscope	HP	54713B	US34510455
<input type="checkbox"/>	Test Receiver	Rohde & Schwarz	ESVP	882402/033
<input type="checkbox"/>	Absorbing Clamp	Rohde & Schwarz	MDS-21	979 3/4
<input type="checkbox"/>	Test Receiver	Rohde & Schwarz	ESVS30	842807/009
<input type="checkbox"/>	Biconical Antenna	Rohde & Schwarz	HK116	841489/015
<input type="checkbox"/>	Log.-Periodic Antenna	Rohde & Schwarz	HL223	841516/017
<input type="checkbox"/>	Universal Power Analyzer	Voltech	PM3000A	9915
<input type="checkbox"/>	Reference Impedance Network	Voltech	IEC 555 Standard	9946
<input type="checkbox"/>	AC Power Source	California Instr.	4500L	HK51895
<input type="checkbox"/>	Trip-Loop Antenna	Chase	LLA6142	1019
<input type="checkbox"/>	Double Ridge Horn Antenna	EMCO	3115	9002-3351
<input type="checkbox"/>	Double Ridge Horn Antenna	EMCO	3115	9002-3347
<input type="checkbox"/>	RF Comms Test Set	HP	8920B	US36492628
<input type="checkbox"/>	Spectrum Analyser + Tracking Gen.	HP	8596E	3639A00758
<input checked="" type="checkbox"/>	Signal Generator	Rohde & Schwarz	SMY 01	844146/024
<input type="checkbox"/>	Signal Generator	Rohde & Schwarz	SMY 01	844146/023
<input checked="" type="checkbox"/>	BiLog Antenna	EMCO	3143	9607-1287
<input type="checkbox"/>	Isotropic Field Probe	Holladay	HI-4422	90956
<input checked="" type="checkbox"/>	Power Amplifier	Kalmus	757-LC	7620-1
<input checked="" type="checkbox"/>	Power Amplifier	Kalmus	122-FC	7620-2
<input type="checkbox"/>	Coupling Clamp	Schaffner	CDN 126	312
<input type="checkbox"/>	Couple Device Network	Fischer	CDN-M3	9604
<input type="checkbox"/>	Spectrum Analyzer	Advantest	R3272	72420848
<input type="checkbox"/>	Temperature Chamber	Voetch	VC2020	522/79721
<input checked="" type="checkbox"/>	EFT,ESD,SURGE, DIPS tester	Schaffner	Best 96	IN3796-011



### 3 General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a battery operated earth resistance tester.

#### 3.2 Ratings and System Details

Rated Voltage	:	8 x DC 1.5V size "AA"
Protection Class	:	III

Refer to the Rating Label for further information

#### 3.3 Independent Operation Modes

The basic operation modes are:

ON

- measuring the earth resistance / earth voltage of earthed equipment under test
- checking battery voltage and lead wire connection

OFF

For further information refer to User Manual



### **3.4 Submitted Documents**

Material List  
Circuit Diagram  
User Manual



## 4 Test Results EMISSION

The Product is classified as:

Class A	<input type="checkbox"/>
Class B	<input checked="" type="checkbox"/>

Standard		PASS	FAIL	N/A
EN 61 326 Table 4	<b>ENCLOSURE PORT</b>			
	<b>RADIATED DISTURBANCE</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EN 61 326 Table 4	<b>AC MAINS PORT</b>			
	<b>MAINS TERMINAL DISTURBANCE VOLTAGE</b> Note: The EUT cannot be connected to AC Mains, therefore this test item is not applicable.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>DISCONTINUOUS DISTURBANCE</b> Note: According to CISPR14-1:2000+A1, clause 4.2.3.1 the EUT fulfils the requirements without further testing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





## 5 Test Results IMMUNITY

According to EN 61 326:1997+A1+A2 Annex C, this appliance shall fulfill the requirements of:

Electrostatic Discharge	Criterion B
Radiated Susceptibility	Criterion A

		PASS	FAIL	N/A
EN 61 326 Table 1	<b>IMMUNITY REQUIREMENTS</b>			
	<b>ENCLOSURE PORT</b>			
	<b>ELECTROSTATIC DISCHARGE</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>RADIO FREQUENCY ELECTROMAGNETIC FIELDS, AMPLITUDE MODULATED</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>AC POWER PORT</b> Note: According to EN 61 326:1997+A1+A2 Annex C, this port does not have to be considered.			
	<b>VOLTAGE DIP / SHORT INTERRUPTIONS</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>BURST</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>SURGE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>CONDUCTED RF</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>DC POWER PORT</b> Note: According to EN 61 326:1997+A1+A2 Annex C, this port does not have to be considered.			
	<b>BURST</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>SURGE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>CONDUCTED RF</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



		PASS	FAIL	N/A
EN 61 326 Table 1	<b>IMMUNITY REQUIREMENTS</b>			
	<b>I/O SIGNAL/CONTROL PORT</b> Note: According to EN 61 326:1997+A1+A2 Annex C, this port does not have to be considered.			
	<b>BURST</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>SURGE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>CONDUCTED RF</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>I/O SIGNAL/CONTROL PORT CONNECTED DIRECTLY TO MAINS SUPPLY</b> Note: According to EN 61 326:1997+A1+A2 Annex C, this port does not have to be considered.			
	<b>BURST</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>SURGE</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>CONDUCTED RF</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

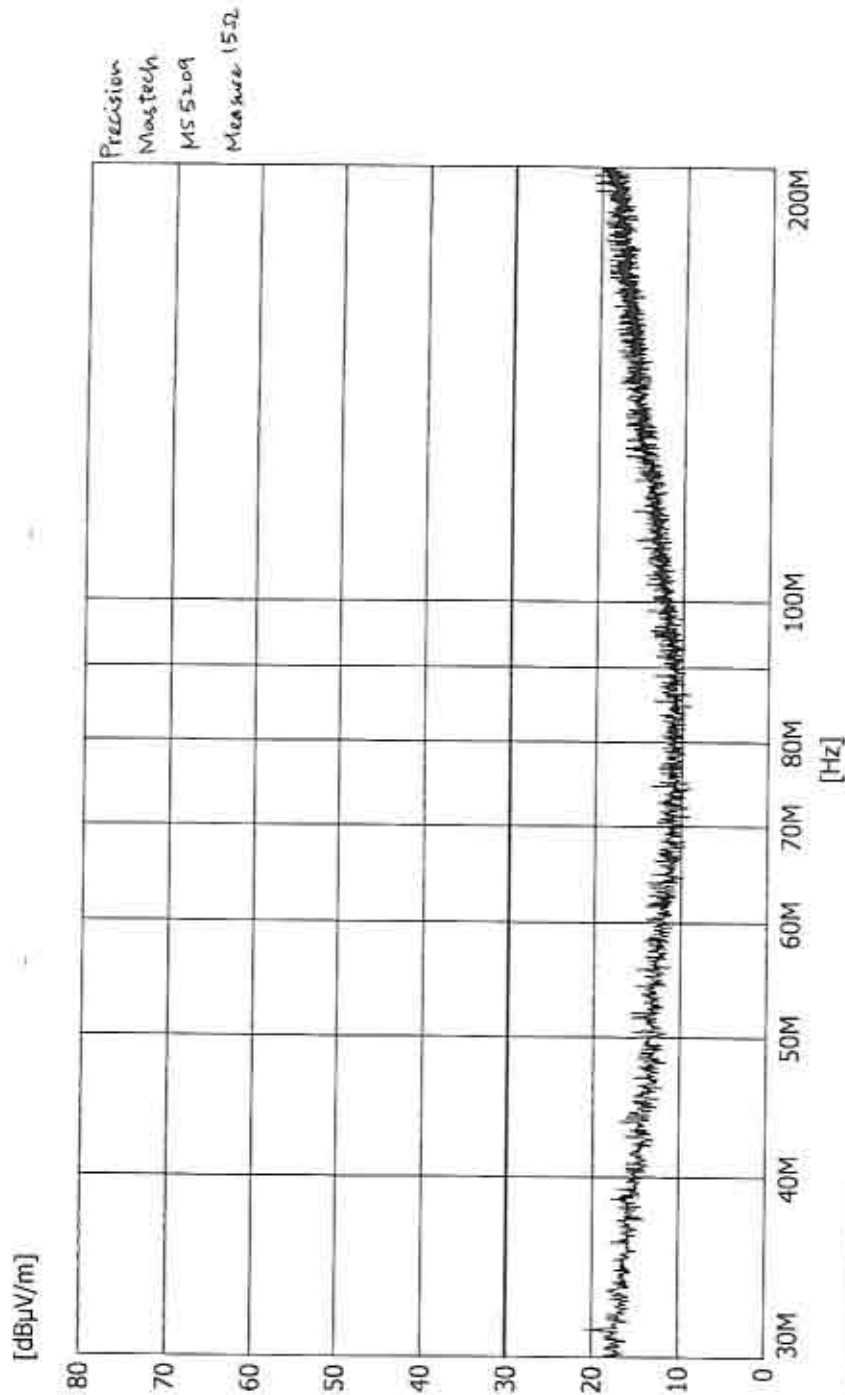




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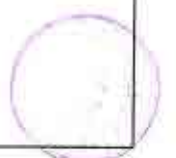
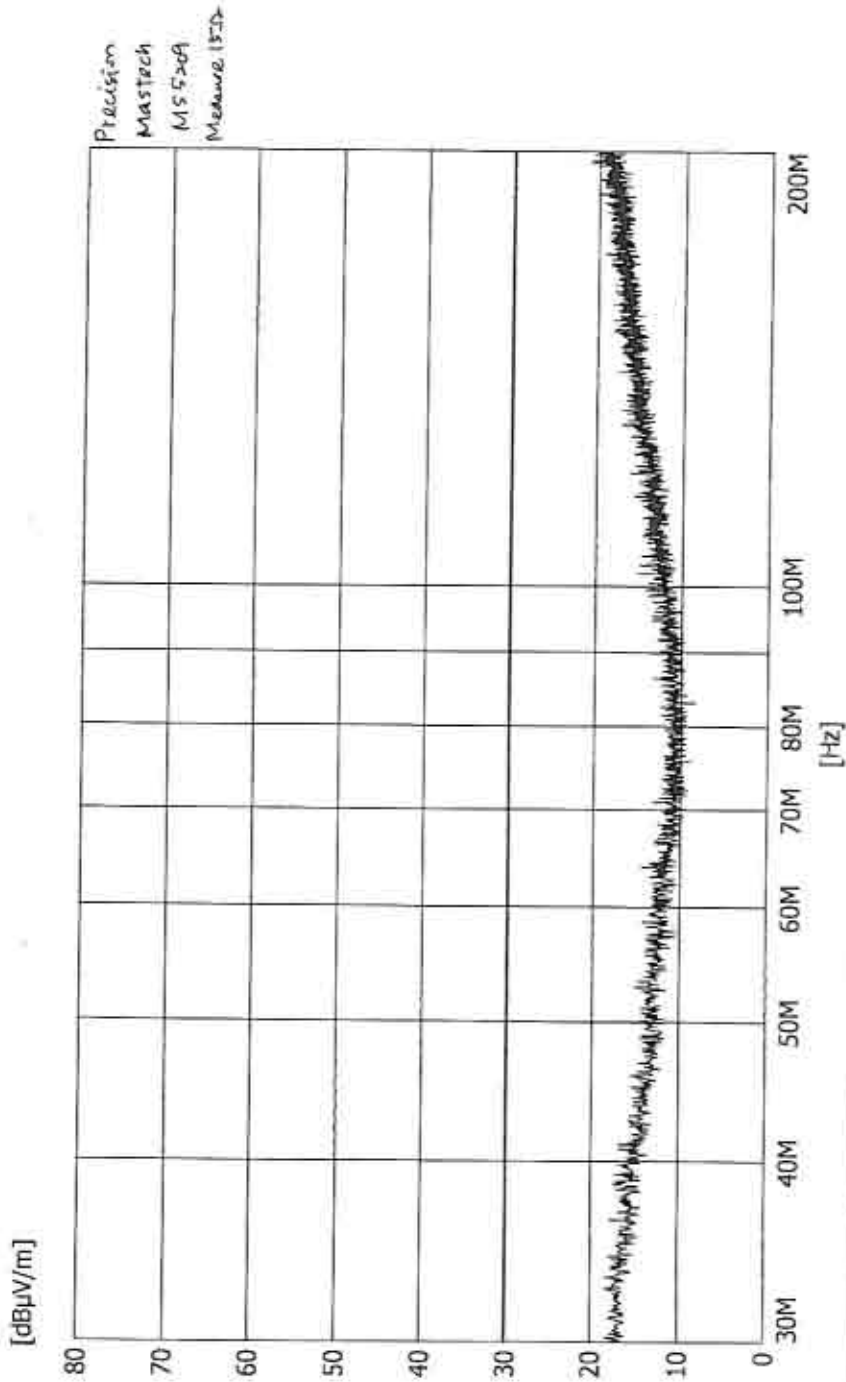
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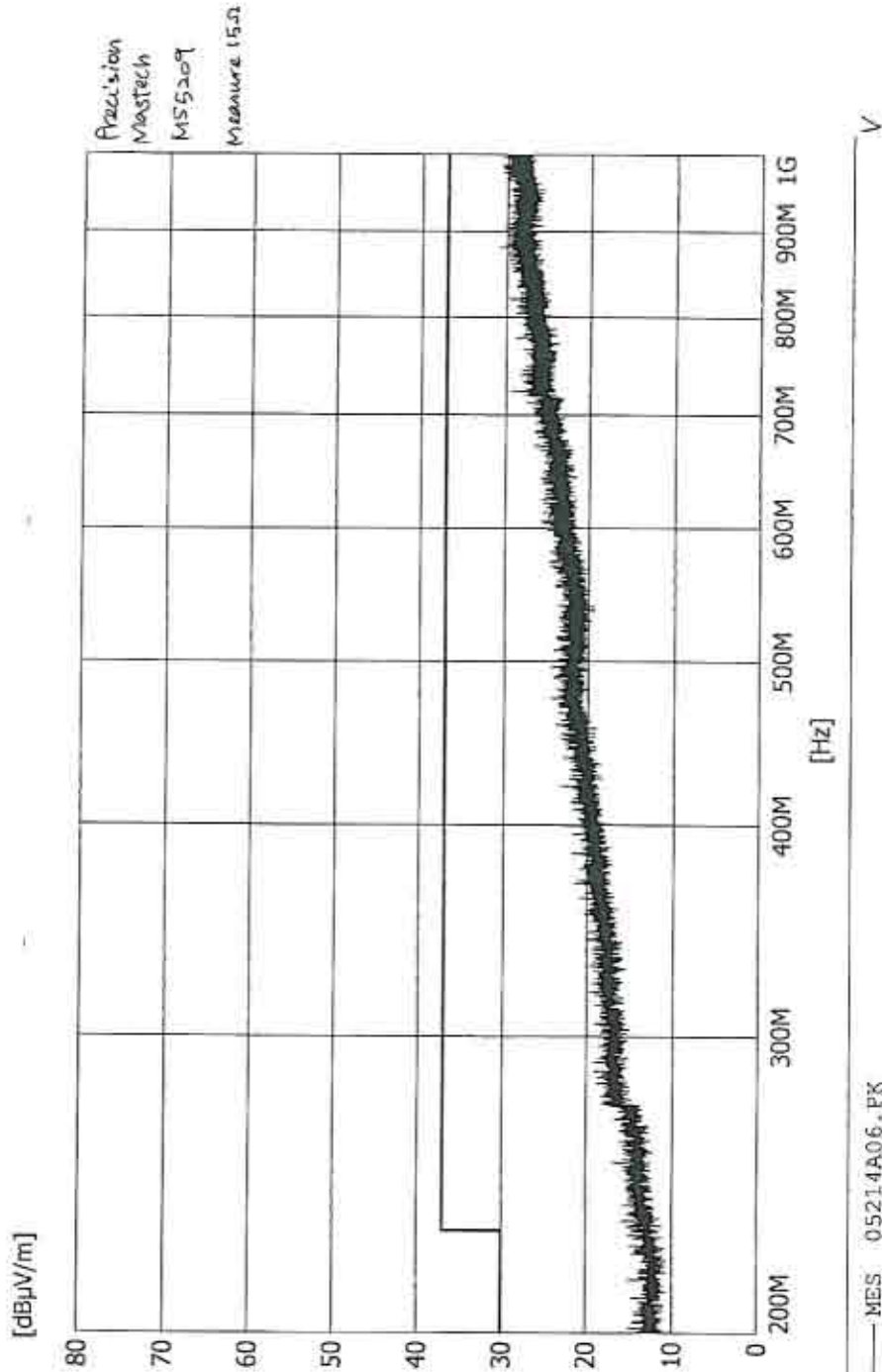




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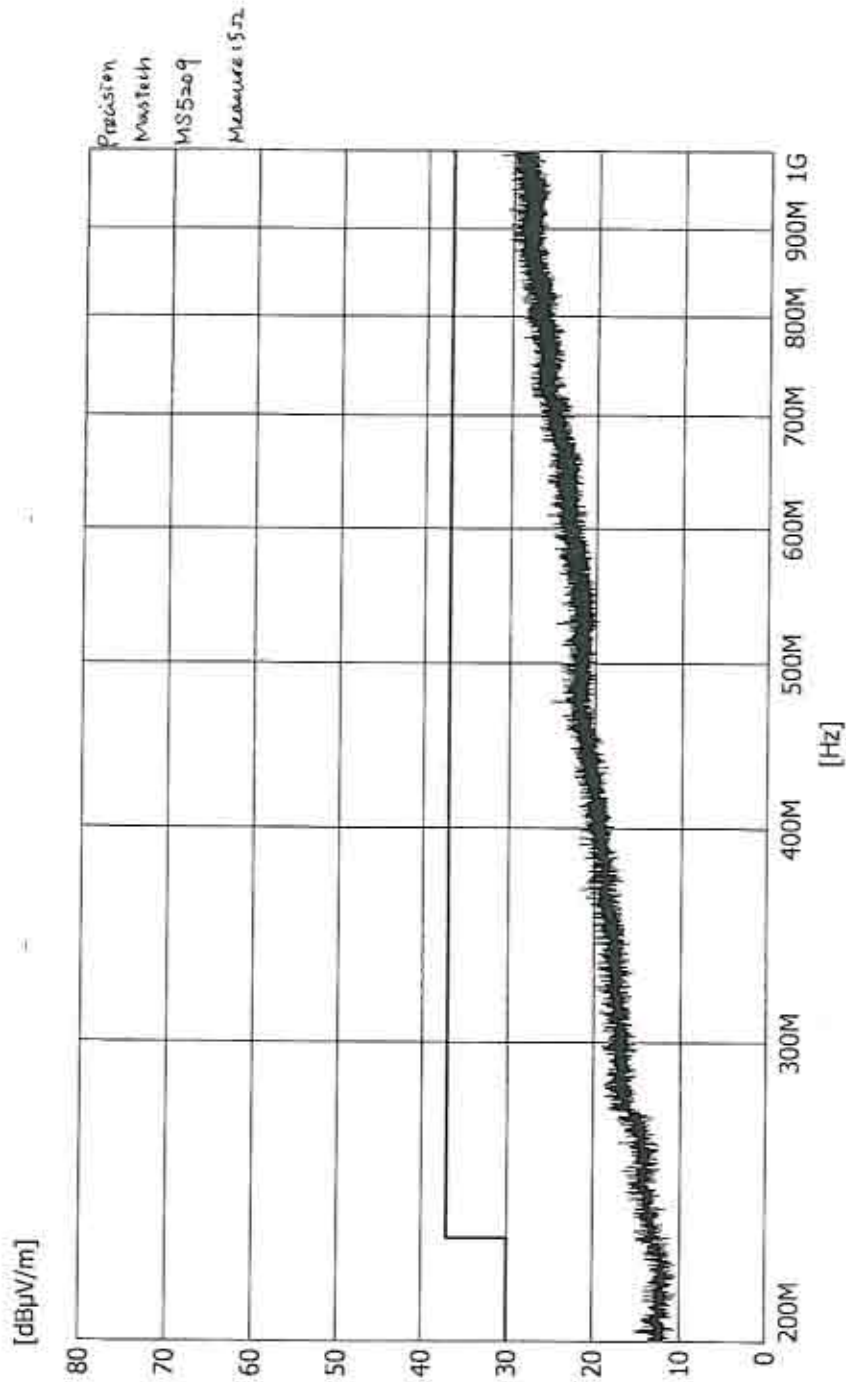
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EMC Test Protocol



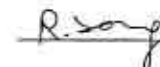
Reference:	Page: 5 of 6
Report: 14001603 001	Number of attached sheets:

Immunity Enclosure	RS Radiated Susceptibility				<input type="checkbox"/> IEC 61000-4-8 <input checked="" type="checkbox"/> IEC 61000-4-3 <input type="checkbox"/> ENV 50 204	
	Ambient: 20 °C,		Criterion: A		Total: PASS / FAIL	
Test Site:		58 % RH,		hPa		
Operation Mode: ON - measuring 15 ohms						
Electromagnetic Field		Key Carrier		Magnetic Field		
Freq. Range: 80-1000 MHz		Frequency: 900±5MHz		Frequency: 50Hz		
Field Strength: 3 V/m		Field Strength: V/m		Field Strength: A/m		
Modulation:				Modulation:		
none	AM	Pulse	%	kHz	Pulse	50%
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	80	1	Repetition time: 200Hz	
Steps	#	/	1%	#	/	%
	Horizontal		Vertical	Horizontal		Vertical
Front						
Right						
Rear						
Left						
Comments:						

Step Size 1% at standard field strength.  
 Step Size 4% at doubled field strength, if used.

Date: 19.08.2002  
 Inspector: Rachel Fong

Signature:




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### EMC Test Protocol



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Report: 14001603 001	Number of attached sheets:

Immunity Enclosure	ESD Electrostatic Discharge		<input checked="" type="checkbox"/> EN 61 326 <input checked="" type="checkbox"/> IEC 61000-4-2
Air Discharge:	±8 kV	Criterion: <b>B</b>	Total: <b>PASS</b> / <del>FAIL</del>
Contact:	±4 kV	# of discharges: <b>10</b>	per test
Ambient:	28 °C	38 % RH	hPa
Test Site:			
Operation Mode: ON – measuring 15 ohms			
Location	Kind A=Air C=Cont.	Result	
HCP (±4kV)	C	Pass	
VCP (±4kV)	C	Pass	
Enclosure (±8kV)	A	Pass	

For indirect discharge: HCP = Horizontal Coupling Plane, VCP = Vertical Coupling Plane

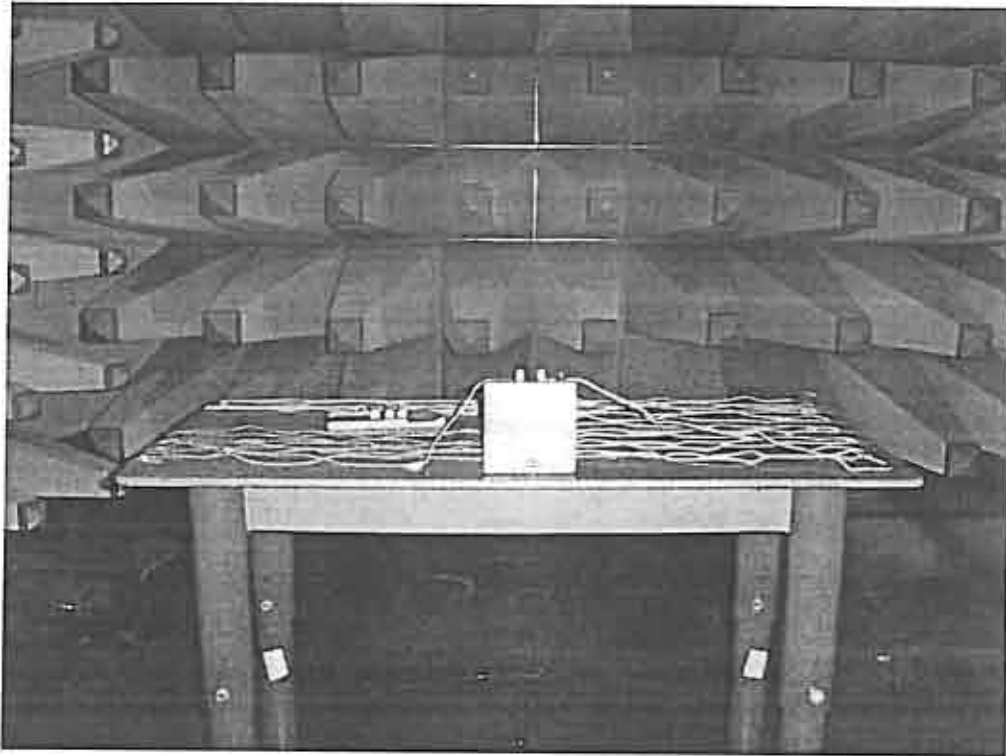
Date: 19.08.2002  
 Inspector: Rachel Fong

Signature: R. Song



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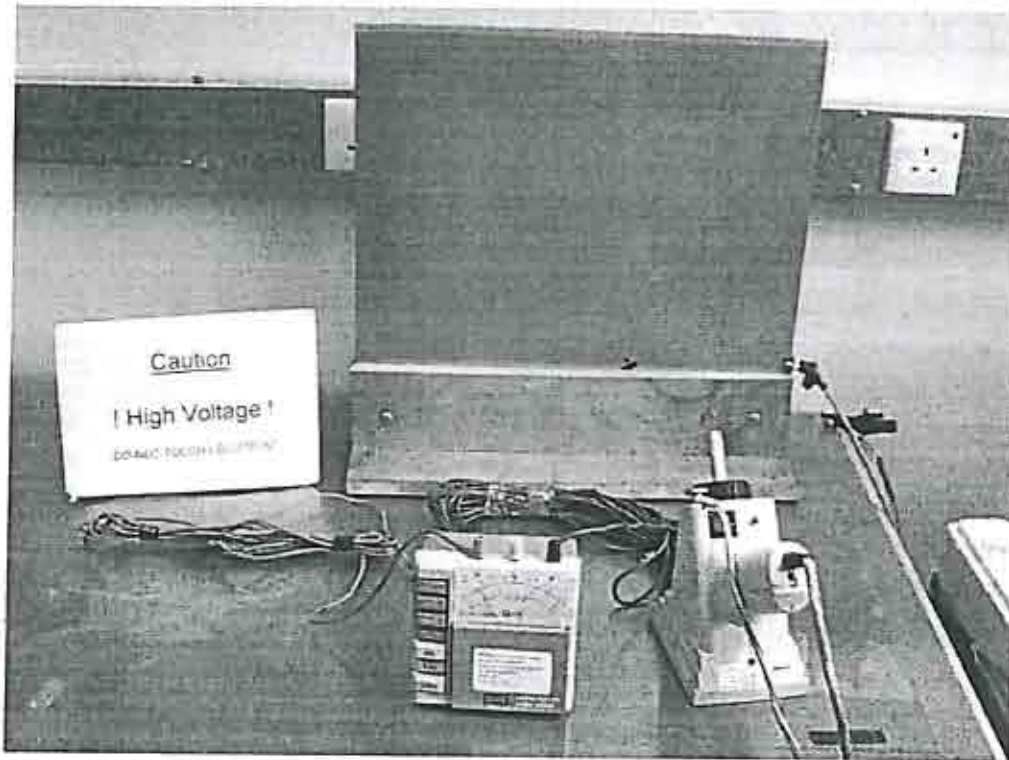
**Test Setup for Radiated Disturbance**



**Test Setup for Radiated Susceptibility**

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Test Setup for Electrostatic Discharge

