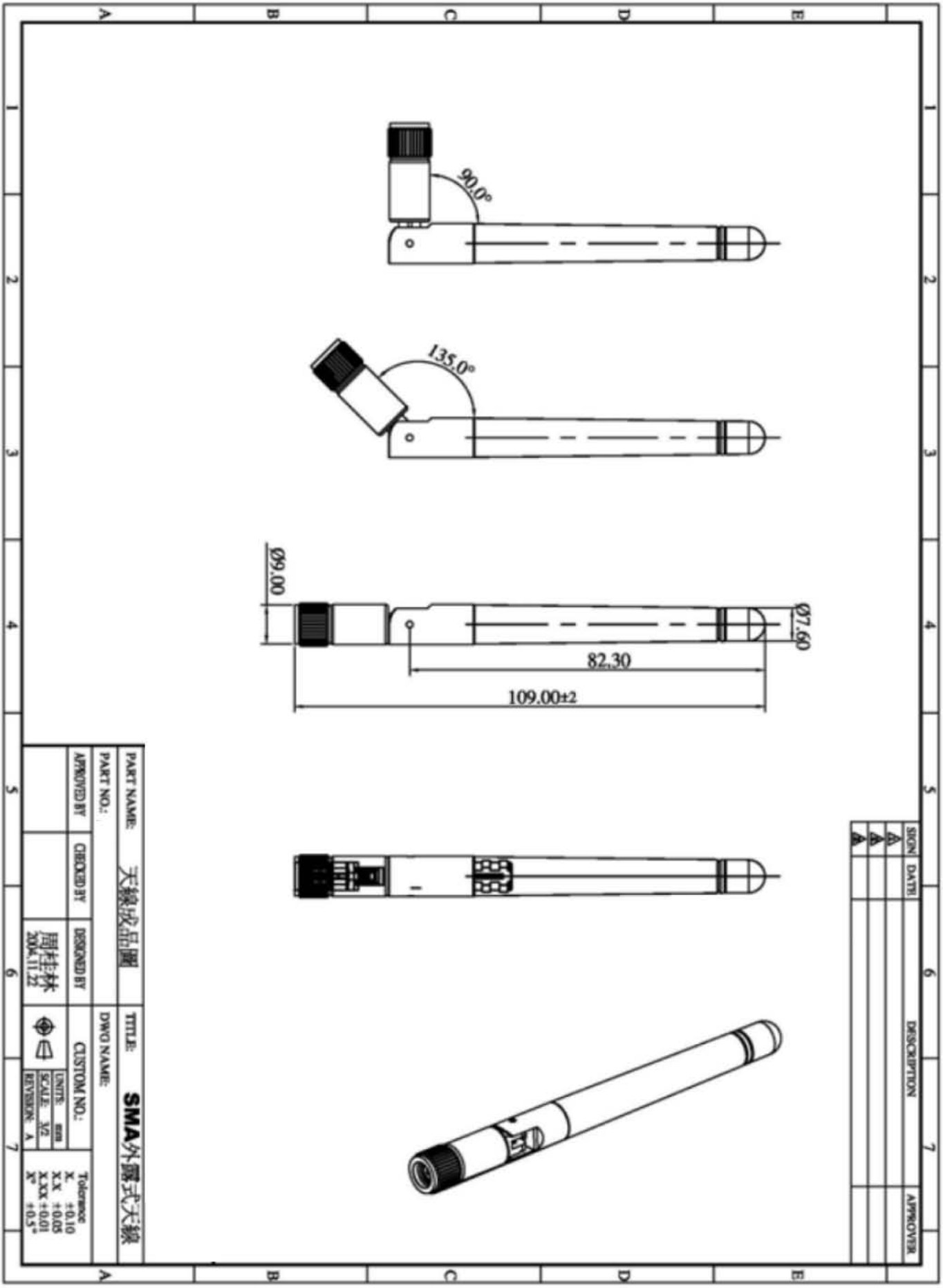
Mechanical Dimension Drawing



1. Feature and Application

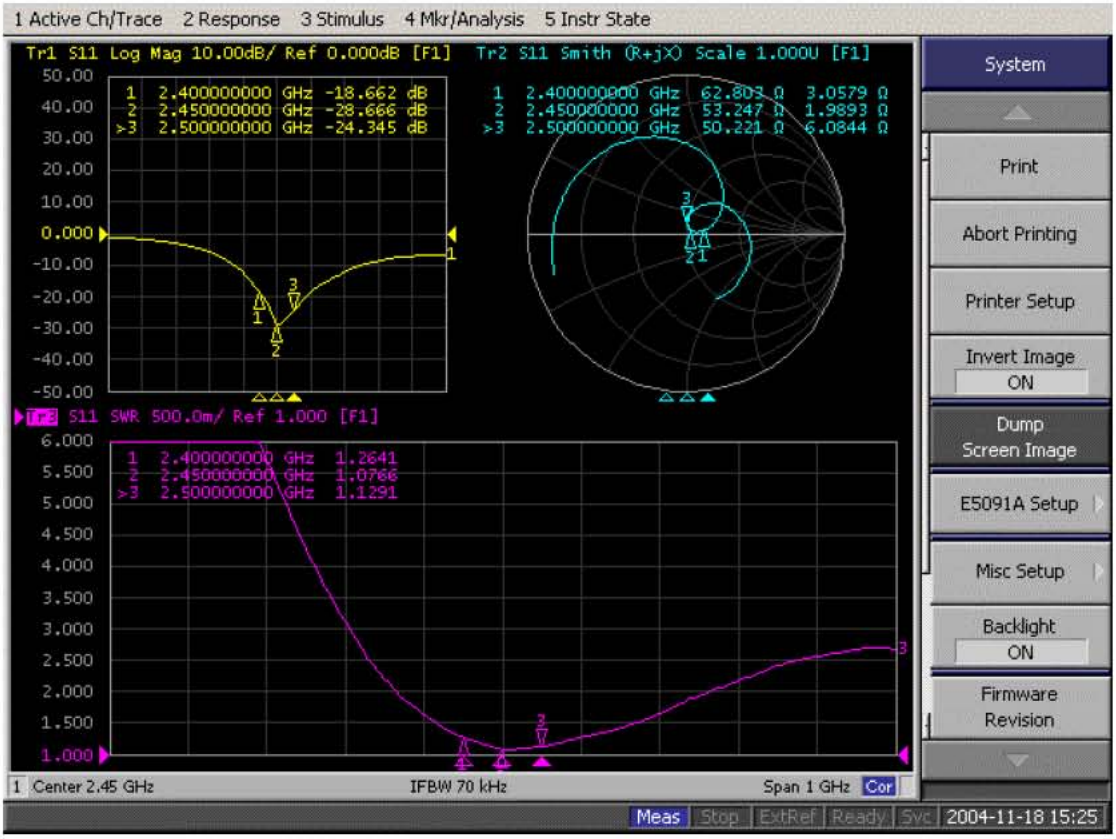
. dipole antenna design
. small size / high gain / omni-directional radiation pattern
. IEEE 802.11 b / g WLAN AP (Access Point) application
. Bluetooth / HomeRF / ISM Band and other 2.4 GHz wireless communication application

2. Specification

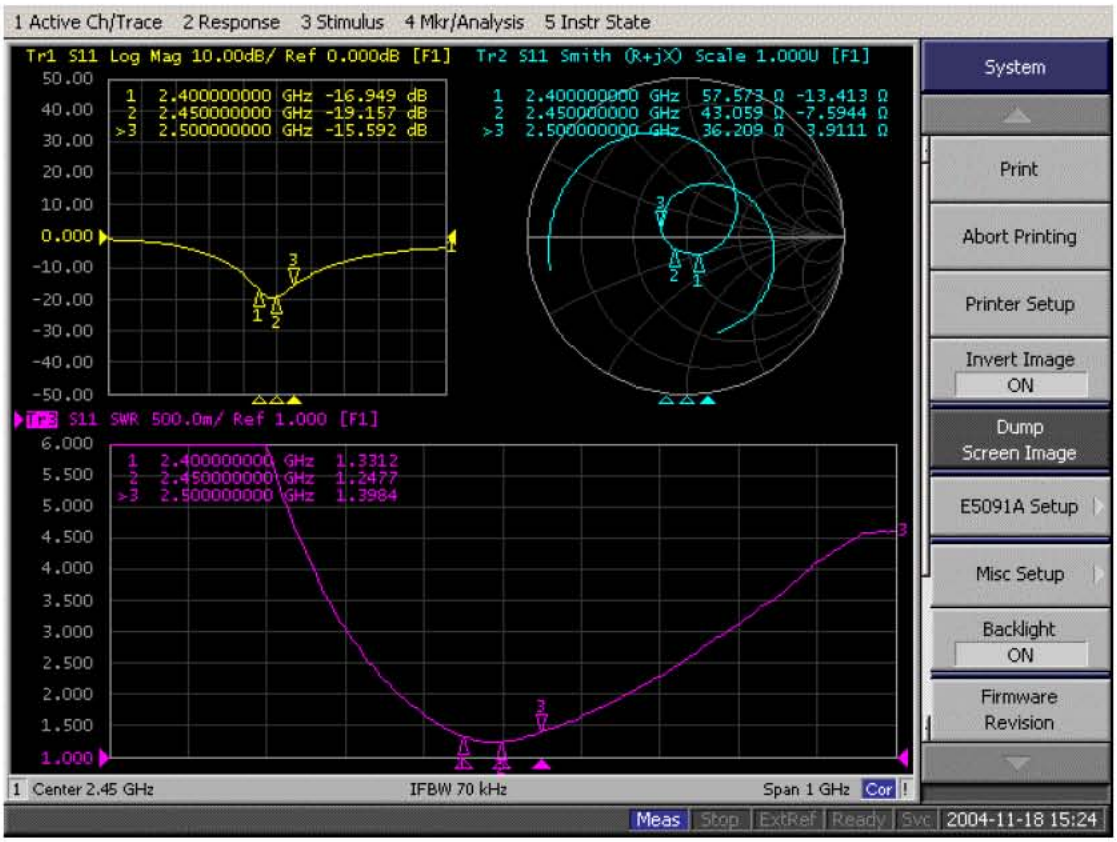
1. Frequency Range	2400 ~ 2500 MHz
2. V.S.W.R.	< 2.0
3. Antenna Gain	2.0 dBi ± 0.5dBi
4. Antenna Radiation Pattern	Omni-directional
5. Impedance	50 ohm
6. Color of Outer Cover	Black
7. Material of Outer Cover	TPE
8. Material of Hinge	PC
9. Operation Temperature	-40°C ~ + 90 °C
10. Storage Temperature	-30°C ~ + 75 °C

3. S11 Return Loss / V.S.W.R. / Impedance Testing Data

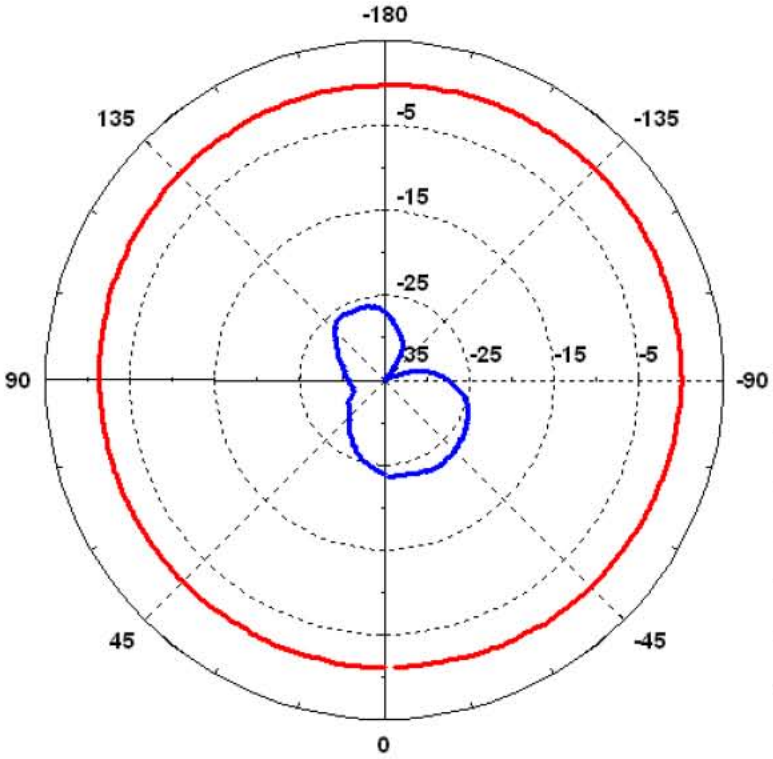
Antenna is 90 degree:



Antenna is 180 degree:



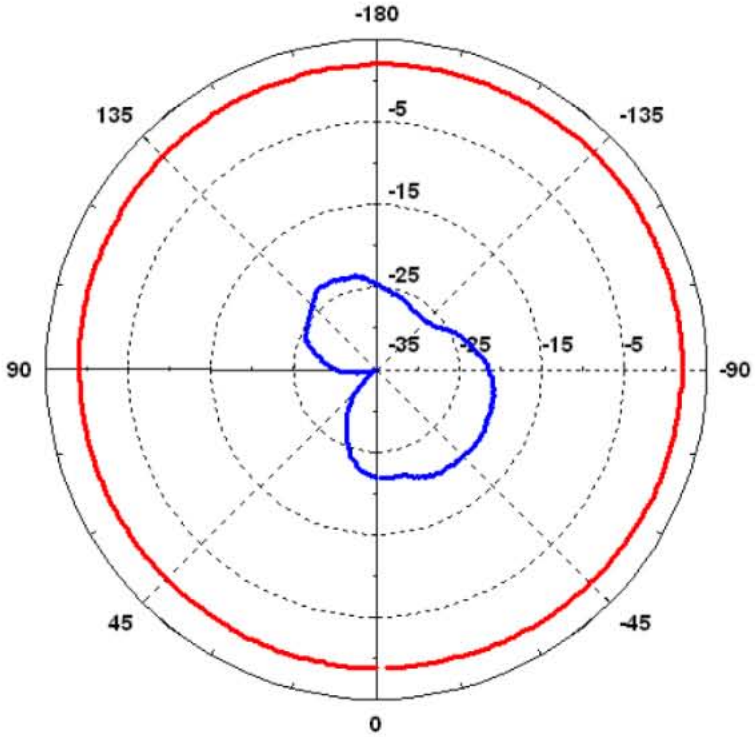
2300MHz Radiation Pattern



Ver. Pol. (max.)=	0.2
Ver. Pol. (avg.)=	-0.6
Hor. Pol. (max.)=	-22.9
Hor. Pol. (avg.)=	-26.7
Tol. Gain (max.)=	0.2
Tol. Gain (avg.)=	-0.6

Unit: dBi

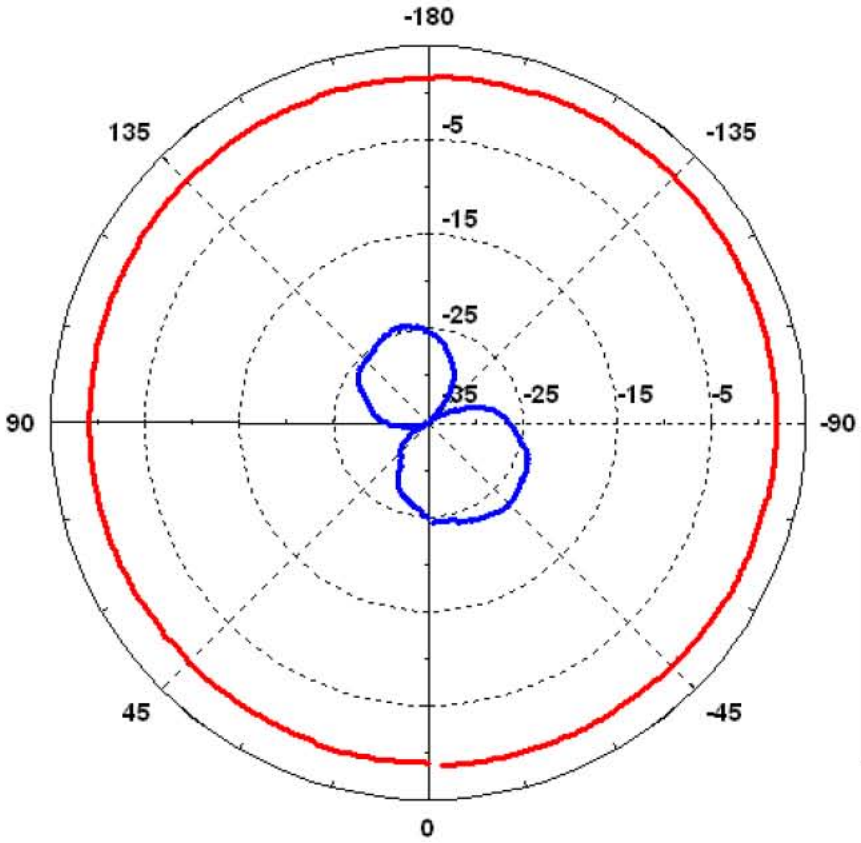
2400MHz Radiation Pattern



Ver. Pol. (max.)=	2.2
Ver. Pol. (avg.)=	1.6
Hor. Pol. (max.)=	-19.9
Hor. Pol. (avg.)=	-23.7
Tol. Gain (max.)=	2.2
Tol. Gain (avg.)=	1.6

Unit: dBi

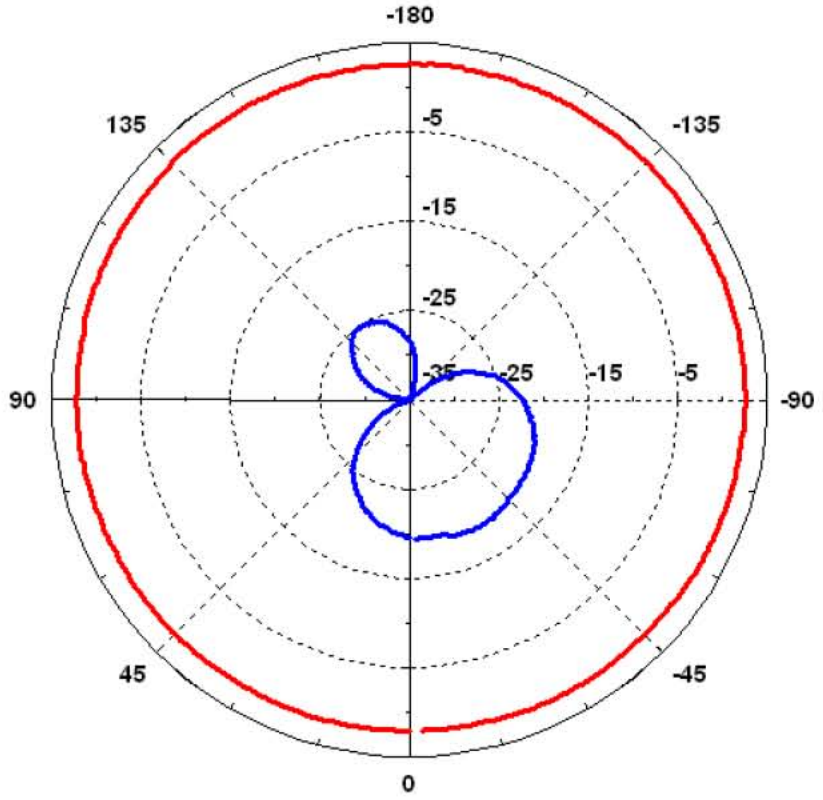
2450MHz Radiation Pattern



Ver. Pol. (max.)=	1.9
Ver. Pol. (avg.)=	1.4
Hor. Pol. (max.)=	-22.8
Hor. Pol. (avg.)=	-26.4
Tol. Gain (max.)=	1.9
Tol. Gain (avg.)=	1.4

Unit: dBi

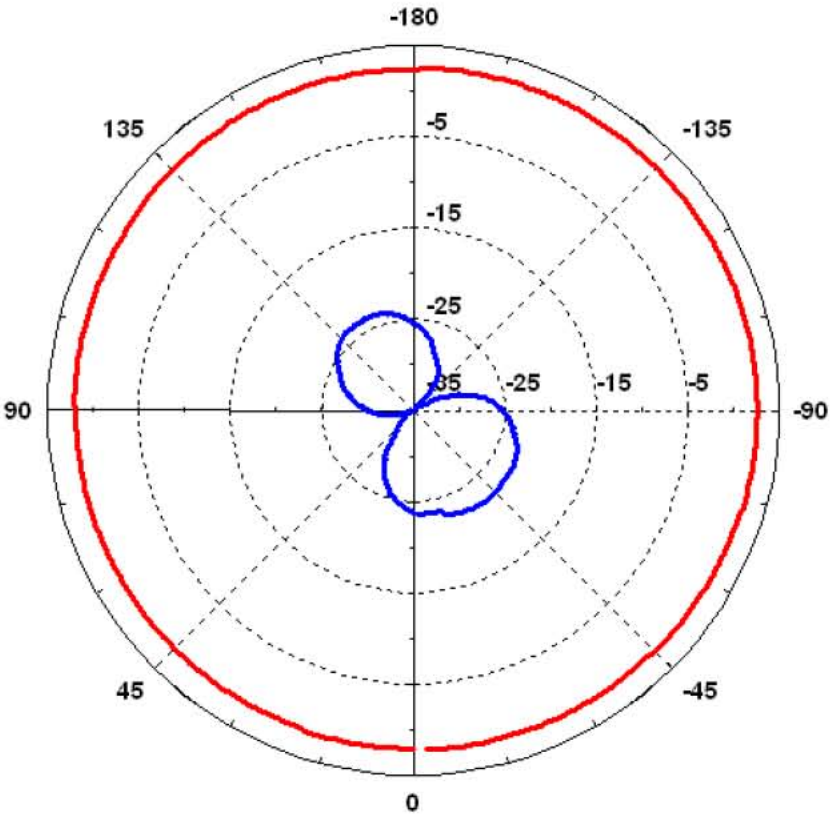
2500MHz Radiation Pattern



Ver. Pol. (max.)=	2.7
Ver. Pol. (avg.)=	2.4
Hor. Pol. (max.)=	-18.8
Hor. Pol. (avg.)=	-23.5
Tol. Gain (max.)=	2.7
Tol. Gain (avg.)=	2.4

Unit: dBi

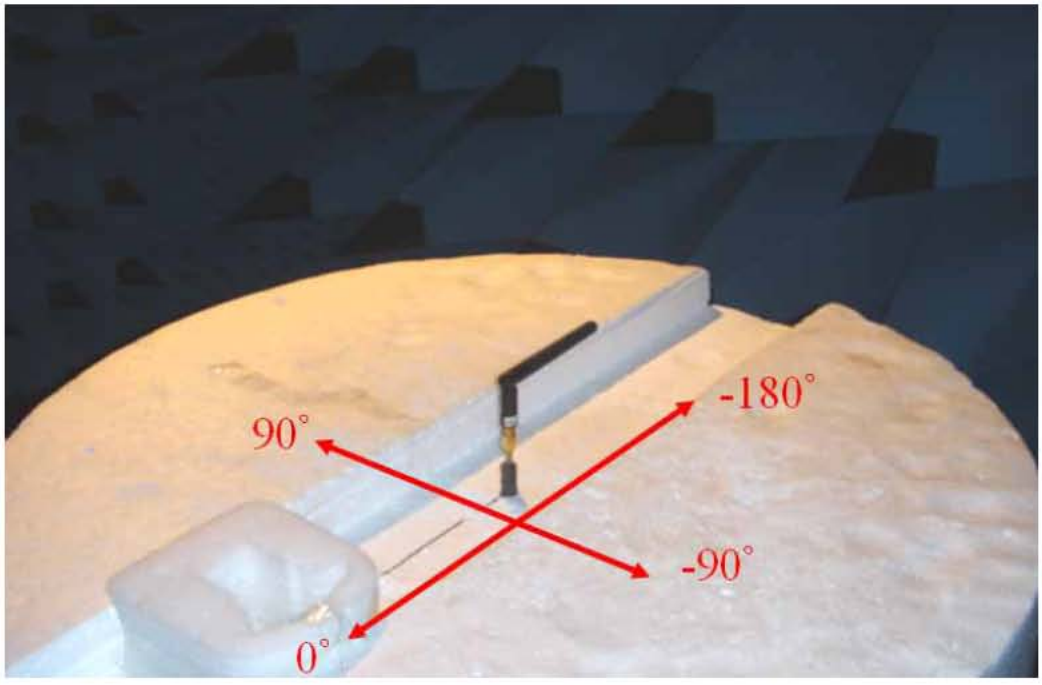
2600MHz Radiation Pattern



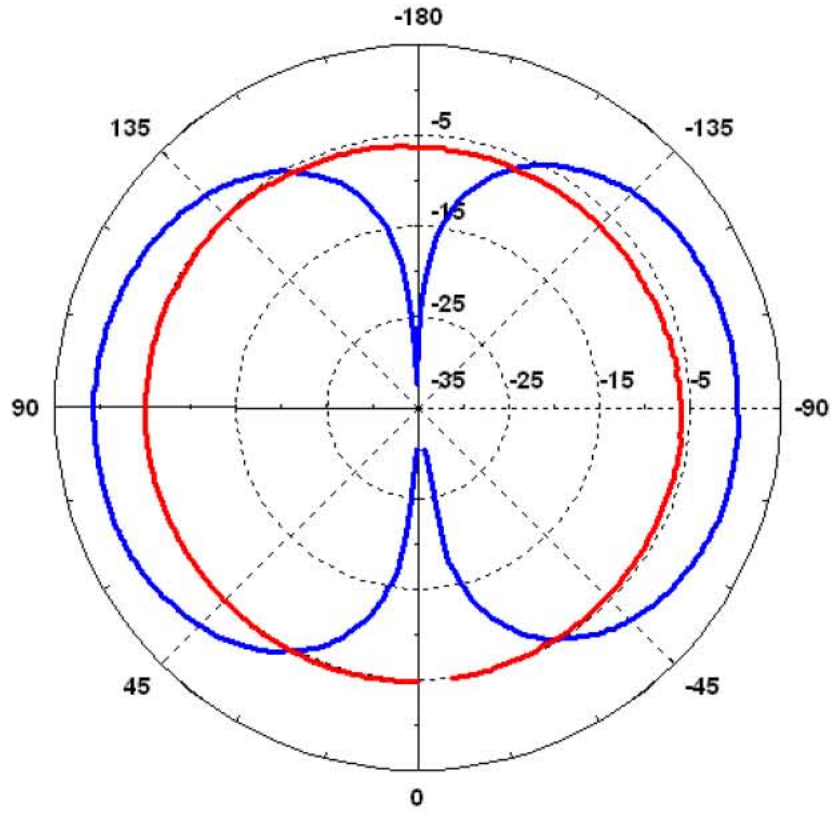
Ver. Pol. (max.)=	2.6
Ver. Pol. (avg.)=	2.3
Hor. Pol. (max.)=	-22.3
Hor. Pol. (avg.)=	-25.7
Tol. Gain (max.)=	2.6
Tol. Gain (avg.)=	2.3

Unit: dBi

Angle Definition



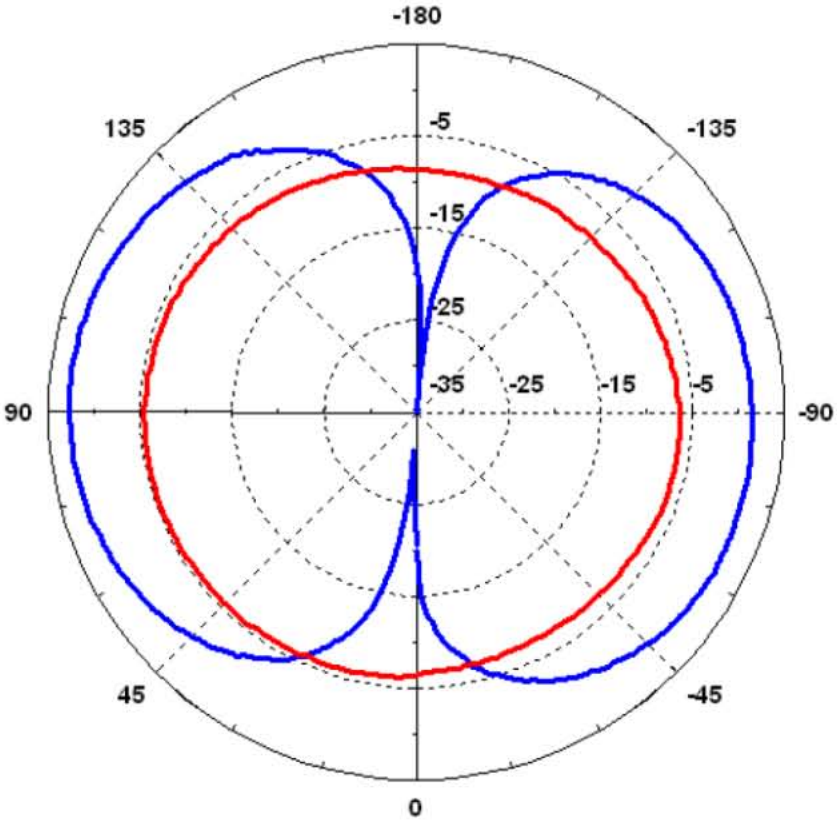
2300MHz Radiation Pattern



Ver. Pol. (max.)=	-4.8
Ver. Pol. (avg.)=	-5.5
Hor. Pol. (max.)=	0.7
Hor. Pol. (avg.)=	-2.0
Tol. Gain (max.)=	0.9
Tol. Gain (avg.)=	-1.4

Unit: dBi

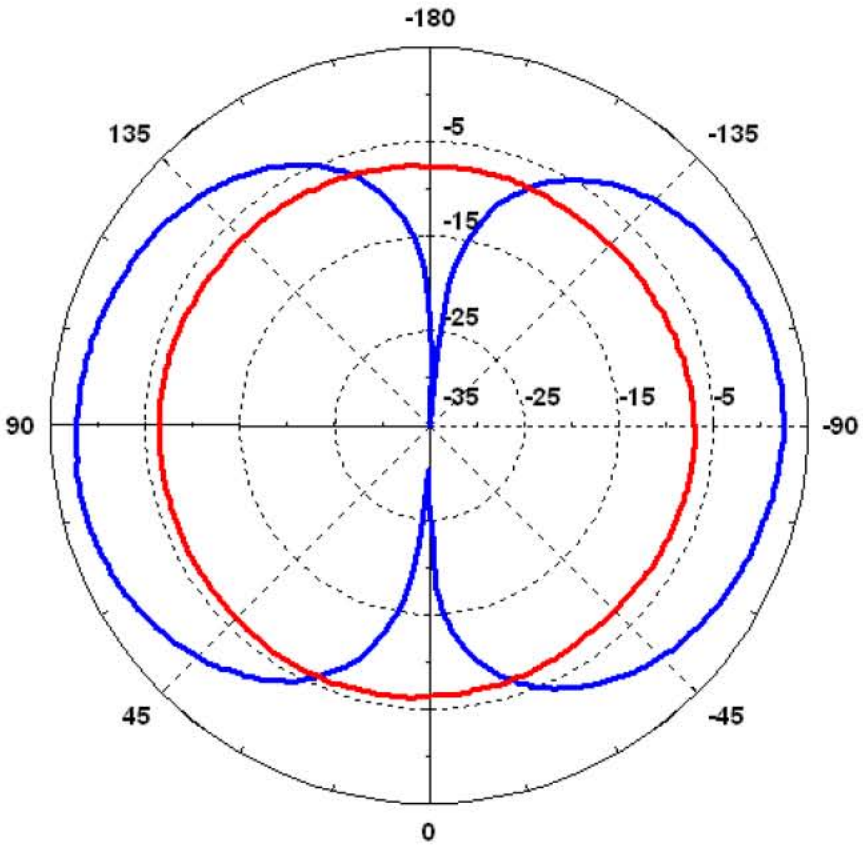
2400MHz Radiation Pattern



Ver. Pol. (max.)=	-4.9
Ver. Pol. (avg.)=	-6.6
Hor. Pol. (max.)=	2.7
Hor. Pol. (avg.)=	-0.6
Tol. Gain (max.)=	2.8
Tol. Gain (avg.)=	-0.3

Unit: dBi

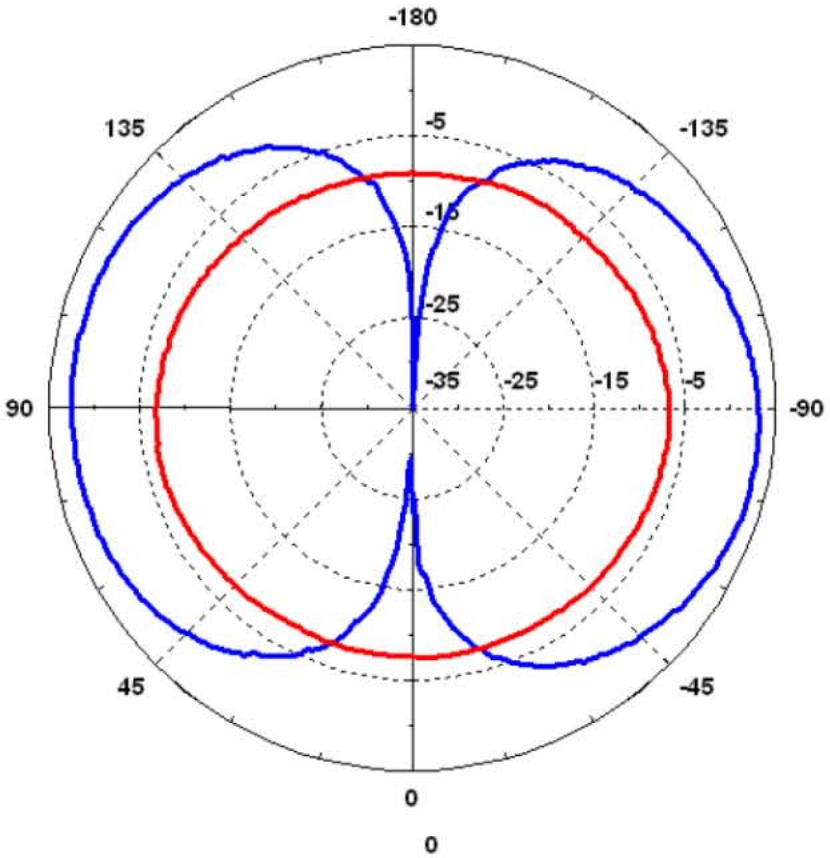
2450MHz Radiation Pattern



Ver. Pol. (max.)=	-4.9
Ver. Pol. (avg.)=	-6.8
Hor. Pol. (max.)=	2.6
Hor. Pol. (avg.)=	-0.8
Tol. Gain (max.)=	2.6
Tol. Gain (avg.)=	-0.5

Unit: dBi

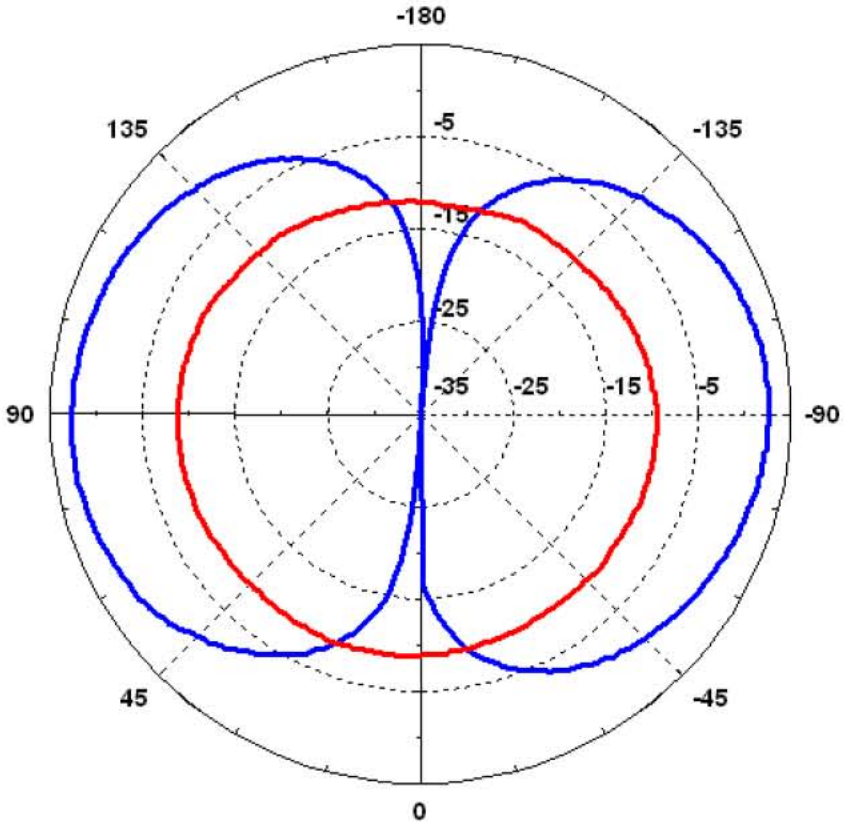
2500MHz Radiation Pattern



Ver. Pol. (max.)=	-4.9
Ver. Pol. (avg.)=	-7.5
Hor. Pol. (max.)=	3.2
Hor. Pol. (avg.)=	-0.1
Tol. Gain (max.)=	3.3
Tol. Gain (avg.)=	0.1

Unit: dBi

2600MHz Radiation Pattern



Ver. Pol. (max.)=	-4.9
Ver. Pol. (avg.)=	-9.5
Hor. Pol. (max.)=	2.7
Hor. Pol. (avg.)=	-0.7
Tol. Gain (max.)=	2.8
Tol. Gain (avg.)=	-0.6

Unit: dBi

5. TEIJIN POLYCARBONATE SINGAPORE PTE LTD

#01-01 111 SAKRA AVE. SINGAPORE 627881 SINGAPORE

Material Designation: L-1250#(f2), L-1250U#, L-1250V#, L-1250Z#
Product Description: Polycarbonate (PC)

Color	Min. thick. (mm)	Flame Class	HWI	HAI	RTI. Elec.	RTI. Imp.	RTI. Str.
ALL	0.40	V-2	4	3	80	80	80
	0.84	V-2	4	3	80	80	80
	1.5	HB	4	0	125	115	125
	3.0	HB	1	0	125	115	125
	6.0	HB	1	0	125	115	125
CXT:2, HVTR:2, D495:5							

 # Material designation may be suffixed with any one or two letters.

Subjected to one or more of the following tests; Ultraviolet Light, Water Exposure in accordance with UL 746C, where the acceptability for outdoor use is to be determined by UL Inc.

Report Date: 1999-07-29

6. Plastic Parts Material Specification

物性項目 Property	單位 Unit	ASTM 試驗法 Test Method	TPE
比重 Specific Gravity	---	D792	0.88
模具收縮率 Shrinkage	%	D955	0.8-2.5
斷裂拉伸強度 Tensile Strength	Kg/ cm³	D638	3.1
扭曲強度 Flexural Strength	Kg/ cm³	D790	---
衝擊強度缺口 23°C Impact Strength	Kg om/om	D256	---
硬度 Hardness	A Shore	---	13
熱變形溫度 0.45 MPa Heat Deflection Temp.	°C	D648	80
熔融指數 Melt Flow Index	G/ min²	D1238	10
燃燒性 Flammability	---	UL94	HB
Testing Data from			

7. Coaxial Cable RG-178 Data Sheet

RG-178 Coaxial Cable Specification		
1. Cable Type	MIL – C – 17 / RG-178	
2. Impedance	50 ± 3 ohm	
3. Inner Conductor	**Material**	silver-coated cooper
	Conductor Numbers	7
	Conductor Size	0.102 mm
	Outer Diameter	0.3 mm
4. Dielectric Layer	**Material**	FEP
	Color	Clear
	Average Thickness	0.28 mm
	Diameter	0.86 mm
5. Braid (Shielding)	**Material**	silver-coated cooper
	Construction	16-3-0.1 mm
	Coverage	95 %
6. Outer Cover	**Material**	FEP
	Color	Brown
	Average Thickness	0.25 mm
	Diameter	1.80 ± 0.05 mm
7. V.S.W.R Testing (DC ~ 6GHz)	< 1.3	
8. Attenuation (dB / 100 meter)	**100 MHz**	46
	900 MHz	155
	1800 MHz	295
	2400 MHz	340
	5200 MHz	505
	6000 MHz	550
9. Capacitance	97 ± 3 (pF / meter)	
10. Maximum Power	30 dBm	
11. Spark Test	2.0 KV	
12. Rating Temp. and Voltage	200˚C / 30V	
13. Conductor Resistance	335 ohm / KM / 20˚C max.	
14. Dielectric Resistance	3 G ohm / KM / 20˚C min.	

8. Reliability Testing on Antenna Body

Test Item	Procedure	Requirement
1. Visual inspection and dimension check	Applicable methods using x5 magnification	follow Specification
2. Rapid changing of temperature	-40˚C (30minutes) to 90˚C (30minutes); 120 cycles	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < ±5%
3. Damp Heat	500 hours at 60˚C; 90 ~ 95% RH	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < ±5%
4. Endurance	500 hours at 90˚C	After 2 hours recovery: 1. no visible damage 2. bandwidth tolerance < ±5%

Test Report

INVAX SYSTEM & TRADING CORP.
CORTEC TECHNOLOGY INC.
4F. No.815, CHUNG HSAIO EAST RD. SEC.5,
TAIPEI, TAIWAN, R.O.C.

Report No. : CE/2004/C1640A
Date : 2004/12/16

The following merchandise was (were) submitted and identified by the client as :

Type of Product	:	ANTENNA
Style/Item No.	:	EM SERIES; IM SERIES; NB SERIES; AN SERIES
Sample Received	:	2004/01/05 & 2004/04/23 & 2004/06/11 & 2004/06/24 & 2004/12/09 & 2005/01/26 & 2005/02/17
Testing Date	:	2004/01/05 TO 2004/01/06 & 2004/04/23 TO 2004/04/28 & 2004/06/11 TO 2004/06/21 & 2004/06/24 TO 2004/07/01 & 2004/12/09 TO 2004/12/16 & 2005/01/26 TO 2005/01/28 & 2005/02/17 TO 2005/03/03

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Test Result : - Please see the next page -

This report is combined with reports of SZTYR050102512/LP & CE/2004/62767 & GZSCR040100230/LP & CE/2004/61520 & GZSCR040413274/LP & GZSCR050207531/LP

Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

Test Report

INVAX SYSTEM & TRADING CORP.
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Date : 2004/12/16

Test Result

PART NAME NO.1 : BRASSY COLOR METAL BAR(SZTYR050102512/LP)
PART NAME NO.2 : BLACK PLASTIC SHEET(GZSCR040100230/LP)
PART NAME NO.3 : TAN TRANSPARENT LIQUID(GZSCR040413274/LP)
PART NAME NO.4 : BLACK PLASTIC JACKET(KHCX-32AWG-SB-TA)(CE/2004/61520)
PART NAME NO.5 : TRANSPARENT FEP JACKET(CE/2004/C1640)
PART NAME NO.6 : WHITE PALSTIC(CE/2004/62767)
PART NAME NO.7 : SILVER COLORED METAL WIRE(GZSCR050207531/LP NO. 1)
PART NAME NO.8 : TRANSPARENT LT. BROWN PLASTIC(GZSCR050207531/LP NO. 2)

Test Item (s):	Unit	Method	MDL	Result				
				No.1	No.2	No.3	No.4	No.5
PBBs(Polybrominated biphenyls)(CAS NO:059536-65-1)	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	---	---	---	N.D.	N.D.
PBBEs(PBDEs)(Polybrominated biphenyl ethers)	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	---	---	---	N.D.	N.D.

SGS

Test Report

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Date : 2004/12/16

Test Item (s):	Unit	Method	MDL	Result				
				No.1	No.2	No.3	No.4	No.5
Chromium VI (Cr+6)	ppm	As per US EPA 7196A and US EPA 3060A.	2	N.D.	---	N.D.	N.D.	N.D.
Cadmium (Cd)	ppm	ICP-AES after as per EN 1122, method B:2001 or other acid digestion.	2	22.0	N.D.	N.D.	N.D.	N.D.
Mercury (Hg)	ppm	ICP-AES after as per US EPA 3052 or other acid digestion.	2	N.D.	---	N.D.	N.D.	N.D.
Lead (Pb)	ppm	ICP-AES after as per US EPA 3050B or other acid digestion.	2	24600.0	6.0	N.D.	N.D.	N.D.

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
PBBs(Polybrominated biphenyls)(CAS NO:059536-65-1)	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.	---	N.D.
PBBEs(PBDEs)(Polybrominated biphenyl ethers)	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC)	0.0005	N.D.	---	N.D.

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Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Chromium VI (Cr+6)	ppm	As per US EPA 7196A and US EPA 3060A.	2	---	N.D.	N.D.
Cadmium (Cd)	ppm	ICP-AES after as per EN 1122, method B:2001 or other acid digestion.	2	N.D.	N.D.	---
Mercury (Hg)	ppm	ICP-AES after as per US EPA 3052 or other acid digestion.	2	---	N.D.	---
Lead (Pb)	ppm	ICP-AES after as per US EPA 3050B or other acid digestion.	2	N.D.	N.D.	---
Cadmium (Cd)	ppm	ICP-AES after as per EN 1122, method B:2001 or other acid digestion.	15	---	---	N.D.
Mercury (Hg)	ppm	ICP-AES after as per US EPA 3052 or other acid digestion.	50	---	---	N.D.
Lead (Pb)	ppm	ICP-AES after as per US EPA 3050B or other acid digestion.	15	---	---	N.D.

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
AZO		As per LMBG 8202-2				
4-AMINODIPHENYL (CAS NO.92-67-1)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
BENZIDINE (CAS NO.92-87-5)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
4-CHLORO-O-TOLUIDINE (CAS NO.95-69-2)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
2-NAPHTHYLAMINE (CAS NO.91-59-8)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
O-AMINOAZOTOLUENE (CAS NO.97-56-3)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.

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Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
2-AMINO-4-NITROTOLUENE (CAS	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
P-CHLOROANILINE (CAS NO.106-47-8)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
2,4-DIAMINOANISOLE (CAS NO.615-05-4)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
4,4-DIAMINODIPHENYLMETHANE (CAS NO.101-77-9)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
3,3-DICHLOROBENZIDINE (CAS NO.91-94-1)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
3,3-DIMETHOXYBENZIDINE (CAS NO.119-90-4)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
3,3-DIMETHYLBENZIDINE (CAS NO.119-93-7)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
3,3-DIMETHYL-4,4-DIAMINODIPHENYLMETHANE (CAS NO.838-88-0)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
P-CRESIDINE(2-METHOXY-5-METHYLANILINE) (CAS NO.120-71-8)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
4,4-METHYLENE-BIS-(2-CHLORANILINE) (CAS NO.101-14-4)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
4,4-OXYDIANILINE (CAS NO.101-80-4)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
4,4-THIODIANILINE (CAS NO.139-65-1)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
O-TOLUIDINE (CAS NO.95-53-4)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.

Test Report

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Date : 2004/12/16

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
2,4-TOLUYLENDIAMINE (CAS NO.95-80-7)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
2,4,5-TRIMETHYLANILINE (CAS NO.137-17-7)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
O-ANISIDINE (CAS NO.90-04-0)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.
P-AMINOAZOBENZENE (CAS NO.60-09-3)	ppm	Analysis was performed by GC/MS.	3	N.D.	---	N.D.

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Mirex(CAS NO:002385-85-5)	ppm	Analysis was performed by GC/MS.	4	N.D.	---	---

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
PCBs(Polychlorinated Biphenyls)(CAS NO:001336-36-3)	ppm	With reference to USEPA 8082A. Analysis was performed by GC/ECD/MS.	0.5	N.D.	---	---

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Organic-tin coumpounds						
Triphenyl Tin(TPT)(CAS NO:000668-34-8)	ppm	With reference to 83/677/EEC & DIN 38407. Analysis was performed by GC/FPD.	0.03	---	---	N.D.
Tributyl Tin(TBT)	ppm	With reference to 83/677/EEC & DIN 38407. Analysis was performed by GC/FPD.	0.03	---	---	N.D.

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Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Asbestos						
Anthrophyllite(CAS NO.017068-78-9)	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	---	---	Negative
Crocodolite(CAS NO.012001-28-4)	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	---	---	Negative
Amosite(CAS NO.012172-73-5)	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	---	---	Negative
Tremolite(CAS NO.014567-73-8)	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	---	---	Negative
Chrysotile(CAS NO.012001-29-5)	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	---	---	Negative
Actinolite(CAS NO.013768-00-8)	**	As per NIOSH 9000 method. Analysis was performed by XRD.	-	---	---	Negative

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
PCBs(Polychlorinated Biphenyls)(CAS NO:001336-36-3)	ppm	With reference to USEPA 8082A. Analysis was performed by GC/ECD/MS.	0.5	---	---	N.D.

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Polychlorinated Naphthalene	ppm	With reference to USEPA 8081B. Analysis was performed by GC/MS.	5	---	---	N.D.

Test Report

INVAX SYSTEM & TRADING CORP.
CORTEC TECHNOLOGY INC.
4F. No.815, CHUNG HSAIO EAST RD. SEC.5,
TAIPEI, TAIWAN, R.O.C.

Report No. : CE/2004/C1640A
Date : 2004/12/16

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
PVC (CAS No:9002-86-2)	**	Analysis was performed by FTIR/ATR and Pyro-GC/MS.	-	---	---	N.D.

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Chlorinated Paraffin (C10~C13) (CAS NO:010871-26-2)	%	With reference to USEPA3540C or USEPA3550C. Analysis was performed by GC/MS or GC/ECD.	0.01	---	---	N.D.

Test Item (s):	Unit	Method	MDL	Result		
				No.6	No.7	No.8
Formaldehyde(CAS No:000050-00-0)	ppm	With reference to DIN 53315 & USEPA 8315A method. Analysis was performed by HPLC/DAD/MS	0.2	---	---	N.D.

NOTE: (1) N.D. = Not detected (<MDL)
(2) ppm = mg/kg
(3) MDL = Method Detection Limit
(4) " --- " = Not Applicable
(5) " - " = No Regulation
(6) * = Results shown are of the adjusted analytical results
(7) ** = Qualitative analysis (No Unit)
(8) Negative = Undetectable / Positive = Detectable
(9) The MDL is 5ppm for the single compound of CP