



PARTS NUMBER REQUEST & APPROVAL SHEET

Powering Communications

1. Part Number:

AAZANDXSXAN0727101

申請單：新增料件
新增經銷商
變更單

2. 製造商:

(Manufacturer)

英碩科技股份有限公司

製造商料號:

(Manufacturer P/N)

AN0727-13B03SM

3. 經銷商:

(Supplier)

英碩科技股份有限公司

經銷商料號:

(Supplier P/N)

4. 種類名稱:

(分群碼)

Antenna

5A. 品名描述(Part Description):

英碩LTE ANT-D(700MHz 黑-2pcs)

5B. 規格描述(Spec.Description):

BEC 用 ^{1dB}swivel SMA AN0727-13B03SM
鄒坤龍

6. 變更原因說明(Change Reason):

(申請或變更料號請附上規格說明書) 如有任何變更, 須事前聯絡, 取得承認後, 始能變更

7. Series Approval 請勾選 (規格請參照 _____ 系列承認書)

8. 樣品發行: BILLION EG-B None

9. 備註(Remark):

DCC 文管中心發行章	主管核准 Manager Signature		審查 Engineer Signature		承辦
	M.E.	E.E.	M.E.	E.E.	
	 林桂美 02/7/15	 Katie 9/17	 Katie 2013/7/15 Coyol	 趙宗茂 2013-7-16	Mini 2013 7/15 鄒坤龍
	*無須審核者以"N/A"表示 *簽名時應註明日期				

申請日: 2013/7/15 ☐ (Request Date)	Katie	Comm. PM	高堤吟
	☑ 申請者 (Request) ☐	☑ 申請單位 (Department) ☐	鍵入者 (Key-in) 品

☐由零件工程師填寫

料號申請/零件承認單: 第 1 頁

Specification For Approval

Date: 2013 / 07 / 01

File No.: 130701001

Version: 1.0

Customer : 盛達電業股份有限公司

Customer P/N : AAZANDXSXAN0727101

INVAX P/N : AN0727-13B03SM

Description : Antenna

Cortec Checked By:



Customer Approved By:



INVAX System Technology Corp.
4F. No. 815.Chung Hsiao East Rd.,Sec.5
Taipei, TAIWAN

TEL:886-2-2788-5218 FAX:886-2-2783-1658
<http://www.invaxsystem.com>



Cortec Technology Inc.
Xian-Xi Industrial, Sha-Tou Administration Zone,
Chang-A n Town, Dong-Guan City, Guangdong
Province, China

TEL:86-76 9-85388261 F AX:86-769-85317869
<http://www.cortec.com.cn>

Index:

- 1. Revision History / Page 3**
- 2. Specification / Page 4**
- 3. Characteristics and Reliability Test / Page 5**
- 4. Antenna - S Parameter Test Data / Page 6**
- 5. Antenna - Radiation Pattern Test Data / Page 7 ~ 10**
- 6. Mechanical and Packing Drawing / Page 11 ~ 12**
- 7. Material Description and RoHS Test Report / Page 13 ~ end**

Product Number: AN0727-13B03SM

Product Name: Antenna



1. Revision History

Revision	Date	Change Notification	Description
1.0	2013.07.01		

Product Number: AN0727-13B03SM

Product Name: Antenna



2. Specification

Sample Photo	
	
A. Electrical Characteristics	
Frequency	700 ~ 960 MHz 1710 ~ 2700 MHz
S.W.R.	≤ 3.5 @ 700 ~ 960 MHz ≤ 4.0 @ 1710 ~ 2700 MHz
Antenna Gain	1.0 ± 0.7 dBi @ low Band 1.0 ± 0.7 dBi @ High Band
Polarization	Linear
Impedance	50 Ohm
B. Material & Mechanical Characteristics	
Material of Radiator	Cu
Material of Plastic	TPE & ABS
Cable Type	RG-178
Connector Type	SMA Male
Pull Test	≥ 5 Kg
C. Environmental	
Operation Temperature	- 40 °C ~ + 65 °C
Storage Temperature	- 40 °C ~ + 80 °C

3. Characteristics and Reliability Test

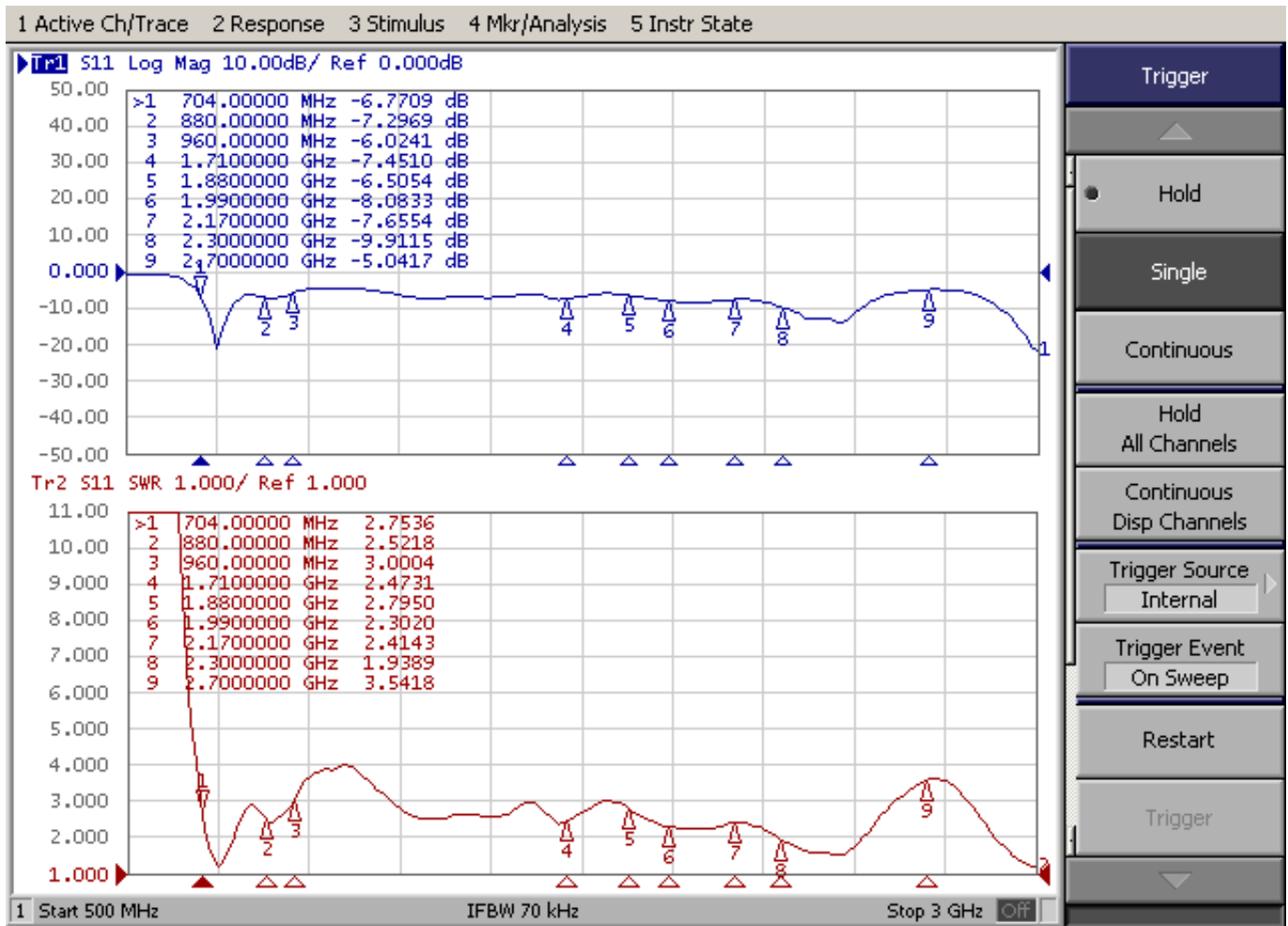
Test Items		Test Condition and Procedure	Requirements
C1	S.W.R.	Set DUT on Network Analyzer; make individual calibration to test	Directive DUT specification
C2	Antenna Gain	Set DUT on Antenna Chamber; make individual calibration to test	Directive DUT specification
M1	Vibration	GB / T2423 . 48-1997 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction	1. No Visual Damage 2. Frequency Tol.<= 5%
M2	Random Drop	GB / T2423.8-1995 Height: 1.0 Meter; 3 directions; 1 time for each direction	1. No parts separated 2. Frequency Tol.<= 5%
M3	Solderability	GB 2423 . 28- 82 Solder iron: 260±5°C; Duration: 5 seconds	1. Mounted on PCB 2. No Visual Damage
M4	Terminal-Pull Test	Holding with individual specification; force applied to axis of terminal	1. Directive DUT specification 2. Frequency Tol.<= 5%
M5	Terminal-Torque Test	Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal	1. Directive DUT specification 2. Frequency Tol.<= 5%
M6	Dimension	Inspection of dimension, color, material, package, surface process	Directive DUT specification
E1	Salt Spray	GB / T 2423 . 17- 93 Temp: 35°C; RH: >= 95%; NaCl solution: >= 5%; Time: 24 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
E2	Humidity	GB / T 2423 . 4 - 93 Temp: 80°C / 12 H; -40°C / 12H RH: >= 90%; Time: 24 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
E3	Thermal Shock	GB / T 2423 . 22 - 87 1 Cycle: - 40°C (30 minutes) to + 80°C (30 minutes) Cycles: 24	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
E4	Life (High Temp.)	GB /T 2423 . 2 - 89 Temp: 80°C; Time: 24 hours	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.<= 5%
R1	RoHS	With Reference to IEC 62321:2008 with flow chart	Directive RoHS 2011/65/EU
R2	PFOS	With Reference to USA EPA 3540C:1996 by LC/MS	Directive RoHS 2006/122/EC
R3	PFOA	With Reference to USA EPA 3540C:1996 by LC/MS	Directive RoHS 2006/122/EC

Product Number: AN0727-13B03SM

Product Name: Antenna



4. Antenna - S Parameter Test Data



Product Number: AN0727-13B03SM

Product Name: Antenna



5. Antenna - Radiation Pattern Test Data

Testing Equipment Specification:

Antenna Anechoic Chamber Dimension: 8 x 4 x 4 m

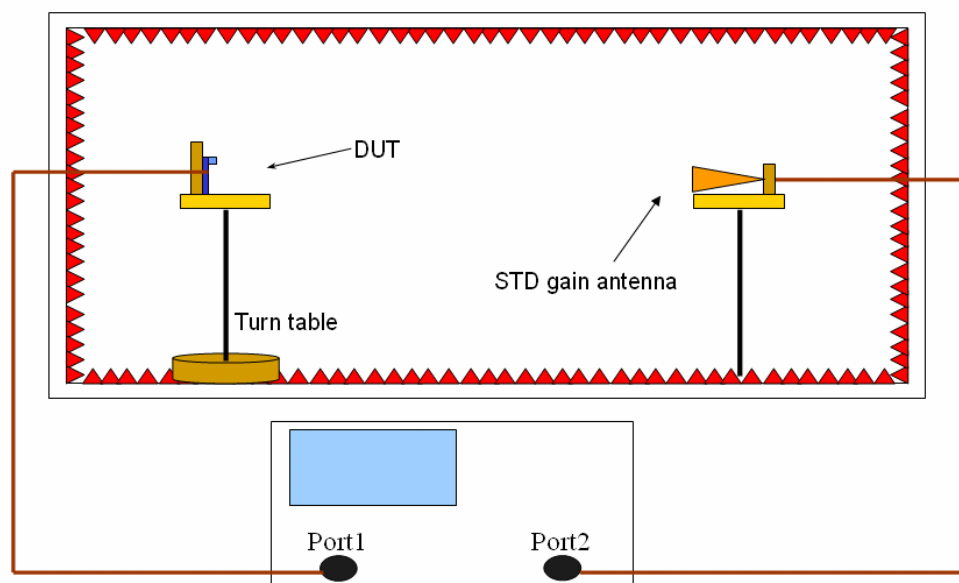
Quiet Zone: 600mm @1 GHz

Isolation: >100dB @ 1 MHz ~ 10 GHz

Testing Equipment: Agilent 5071B

Received Antenna: 0.7 ~ 6.0 GHz for Gain Calibration

Double Ridged Horn Antenna



6. Mechanical Drawing

See attached files

7. Material Description and RoHS Test Report

See attached files



Antenna LTE Antenna/bm
Remark: H-Plane/V-Pol
Tested by : Antenna 3D Lab

Location: **Chamber**

Date: **2012/8/23**

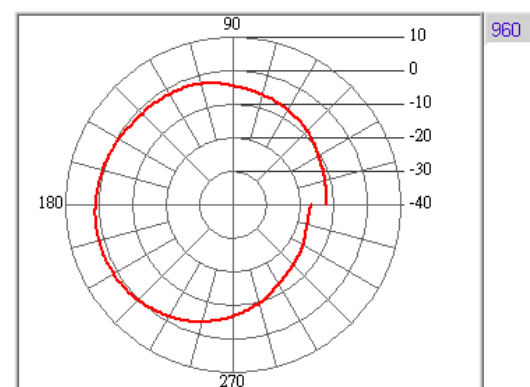
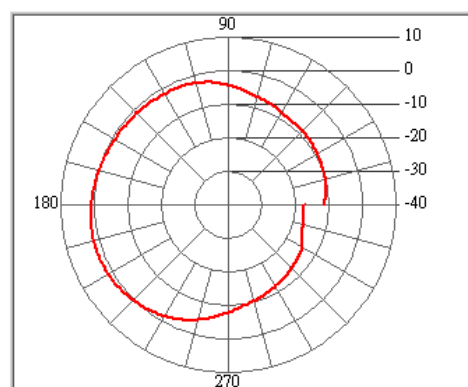
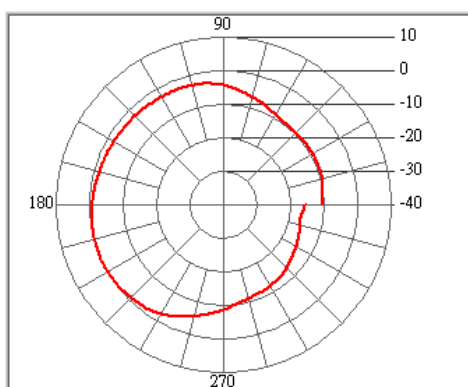
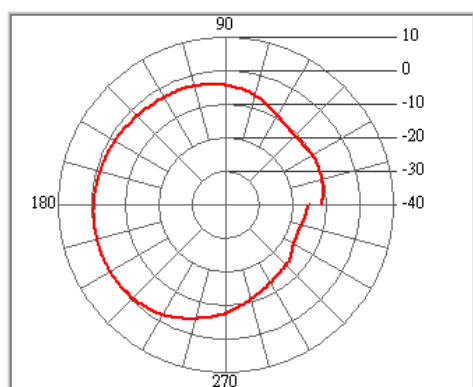
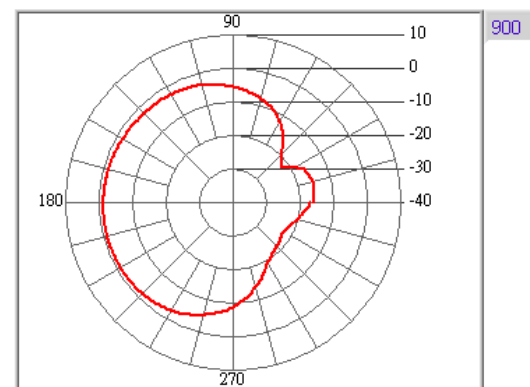
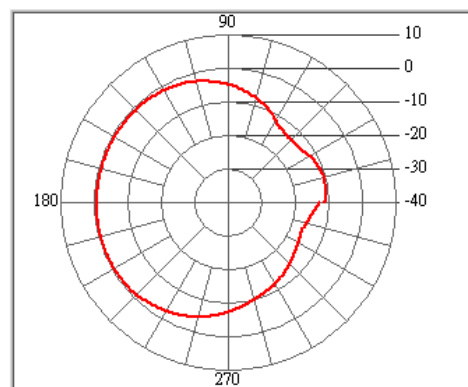
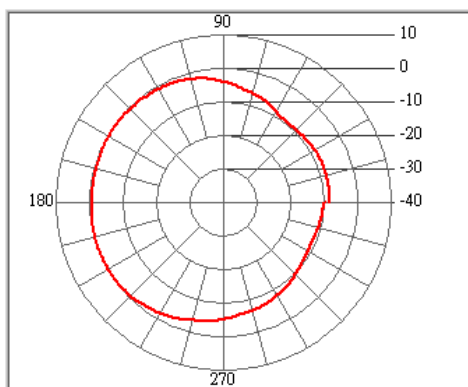
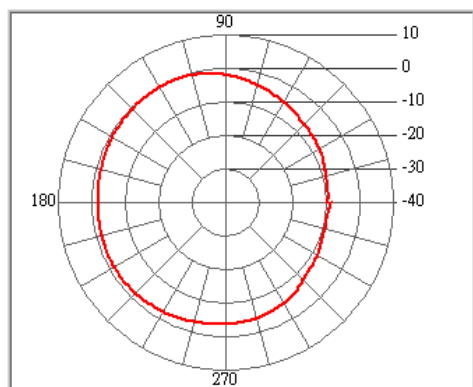
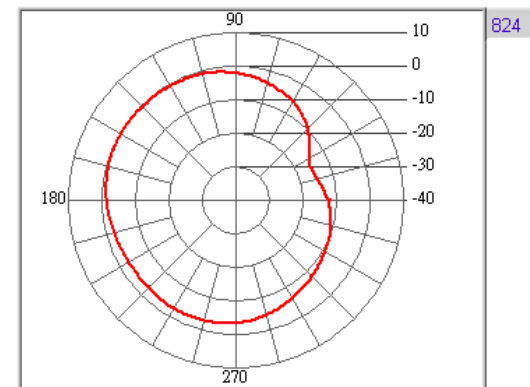
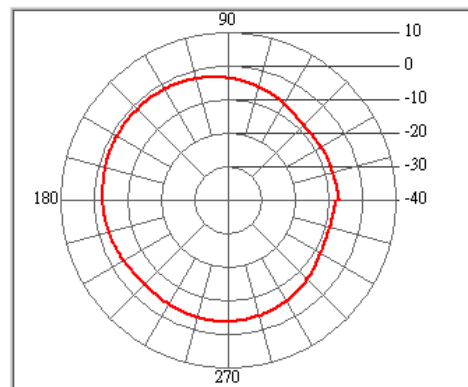
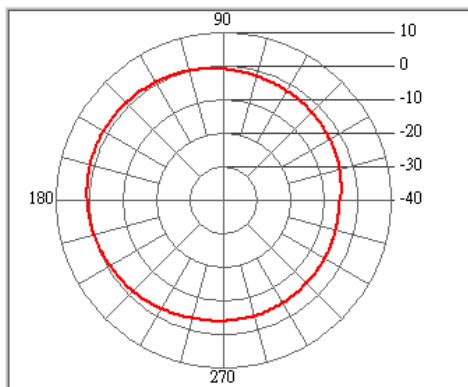
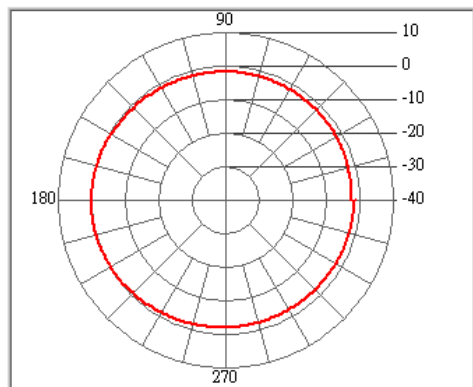
Time: **下午 04:59:48**

Temperatuer (°C): **25.00**

Humidity (%): **65.00**

Approved by:

Freq. (MHz)	704	750	800	824	850	870	880	900	920	930	950	960
Peak Gain (dBi)	0.06	1.37	-1.49	-0.33	-0.28	-0.25	-0.59	-1.14	-0.21	-0.02	1.49	1.38
Peak Degree	193	151	131	151	120	204	204	193	204	204	204	203
AV Gain (dBi)	-1.38	-1.62	-4.26	-3.58	-3.22	-3.38	-4.15	-5.11	-4.32	-4.37	-3.26	-3.22





Antenna LTE Antenna/bm
Remark: H-Plane/V-Pol
Tested by : Antenna 3D Lab

Location: **Chamber**

Date: **2012/8/23**

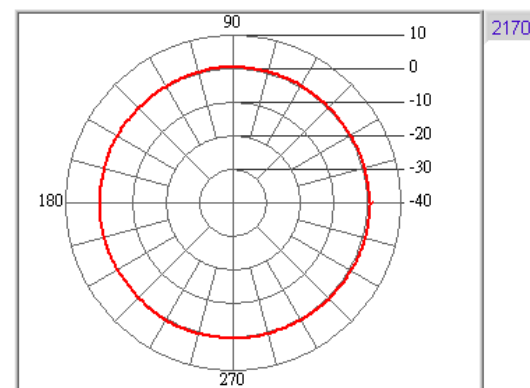
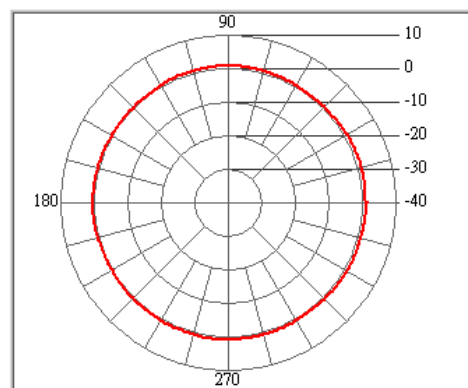
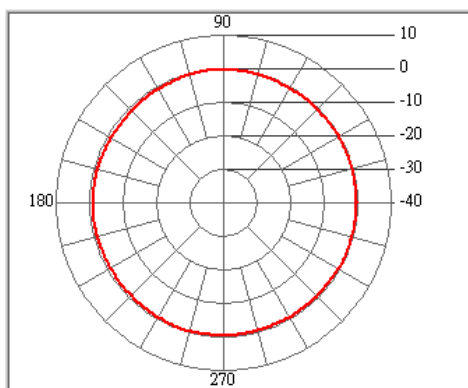
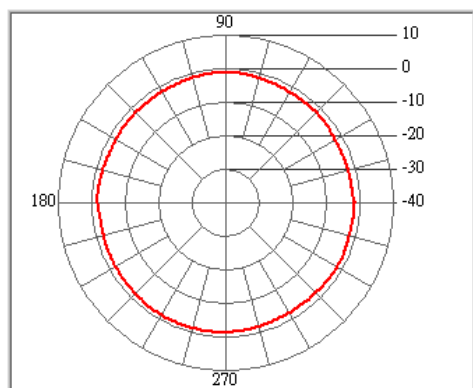
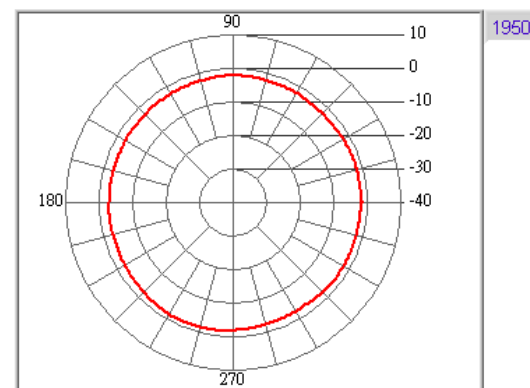
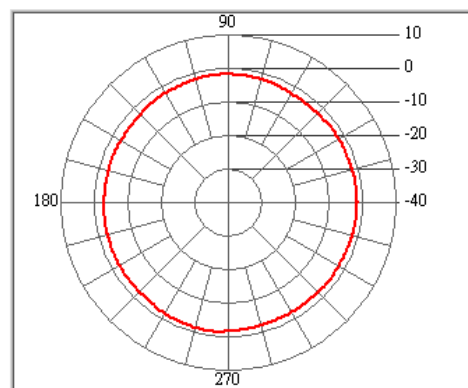
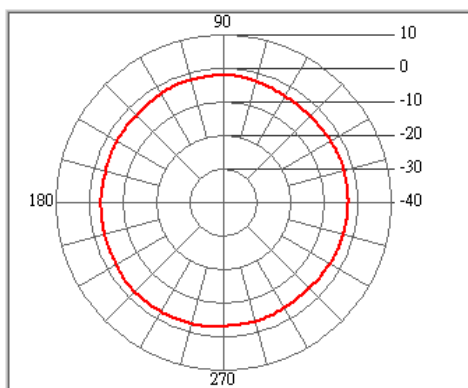
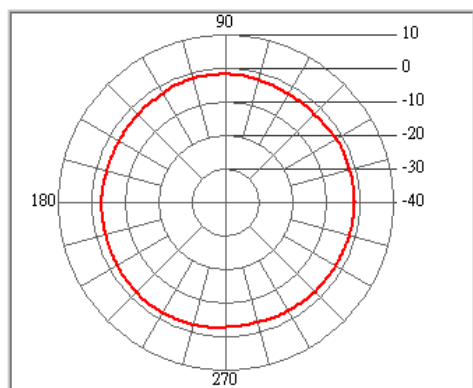
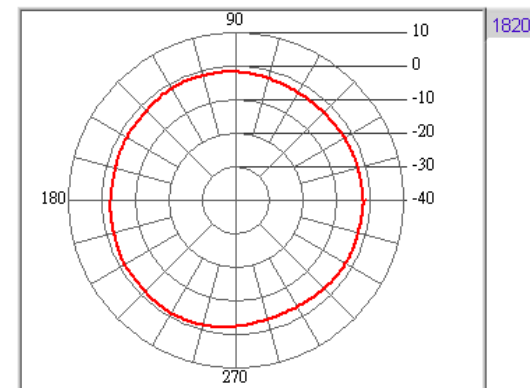
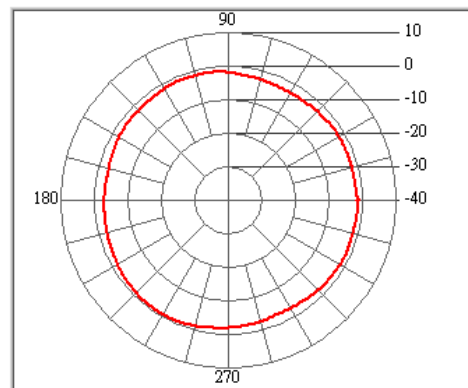
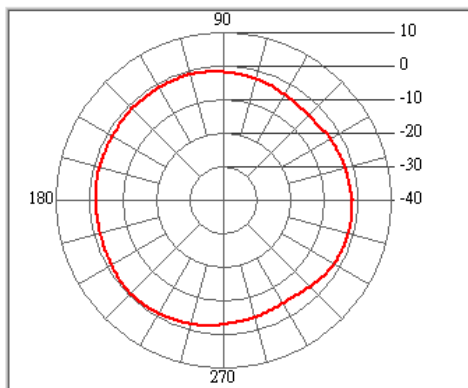
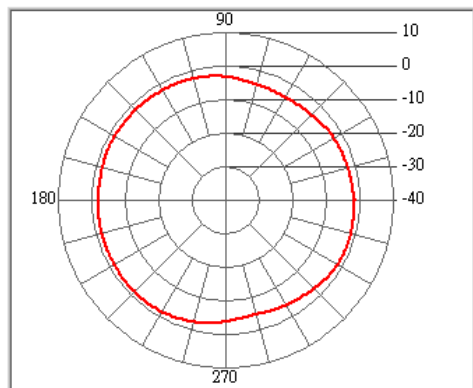
Time: **下午 04:32:58**

Temperature (°C): **25.00**

Humidity (%): **65.00**

Approved by:

Freq. (MHz)	1710	1750	1790	1820	1860	1880	1920	1950	1990	2050	2100	2170
Peak Gain (dBi)	-1.29	-0.66	-0.75	-1.08	-1.51	-2.09	-1.14	-1.51	-1.16	-0.21	1.32	1.05
Peak Degree	345	230	241	241	0	93	262	251	93	93	360	360
AV Gain (dBi)	-2.44	-2.13	-1.99	-2.24	-2.38	-3	-2.16	-2.29	-1.8	-0.65	0.57	0.28





Antenna LTE Antenna/bm
Remark: H-Plane/V-Pol
Tested by : Antenna 3D Lab

Location: **Chamber**

Date: **2012/8/23**

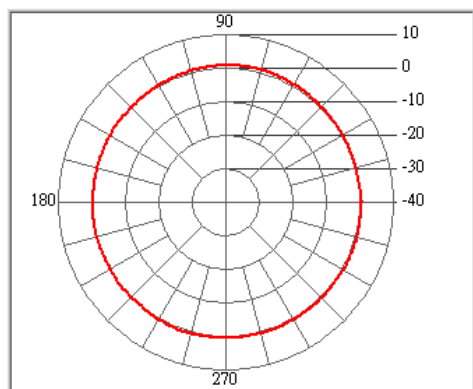
Time: **下午 04:53:43**

Temperature (°C): **25.00**

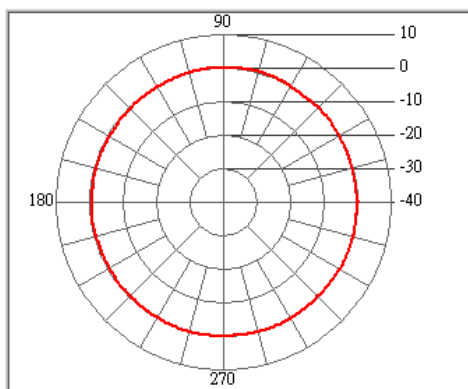
Humidity (%): **65.00**

Approved by:

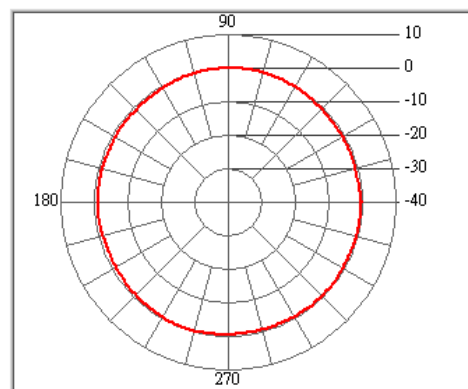
Freq. (MHz)	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2680	2700
Peak Gain (dBi)	0.91	0.4	0.09	0.03	-0.3	0.85	0.68	0.26	0.41	1.74	2.33	2.46
Peak Degree	74	74	84	105	74	64	189	22	168	1	2	0
AV Gain (dBi)	0.28	-0.22	-0.63	-0.67	-1.55	-0.96	-0.3	-0.91	-1.19	-0.78	-0.38	-0.48



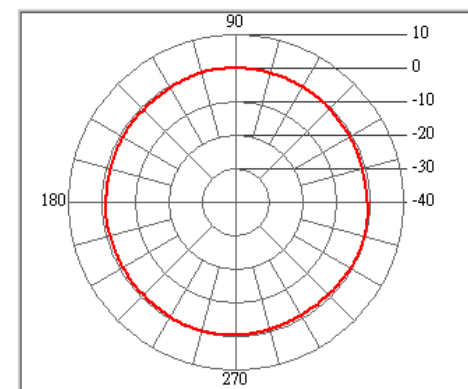
2200



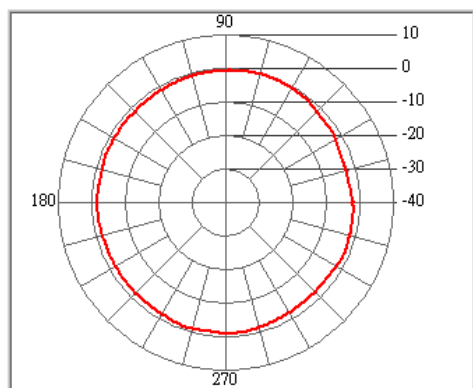
2250



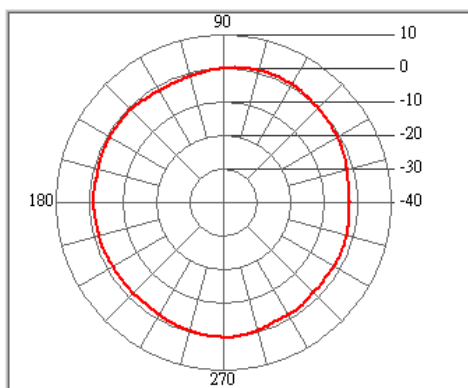
2300



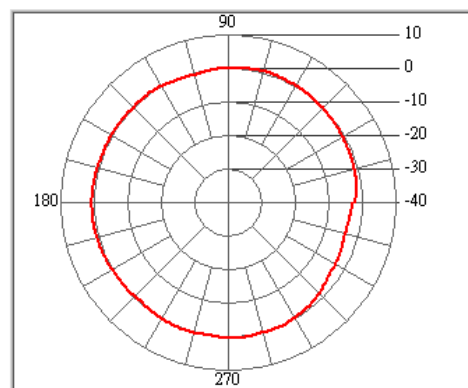
2350



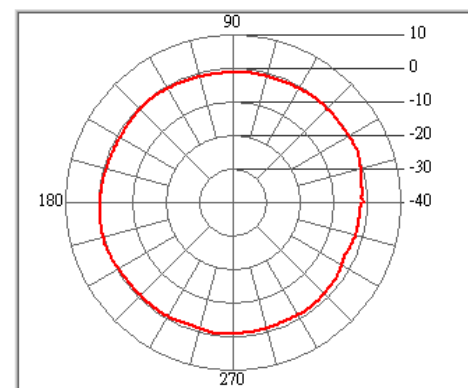
2400



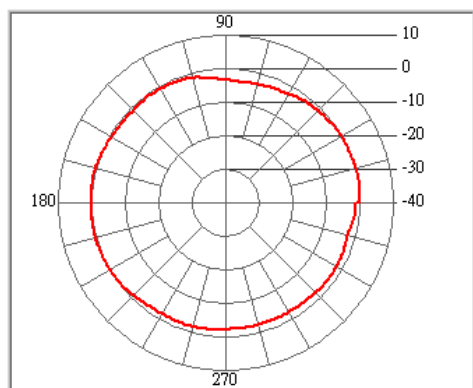
2450



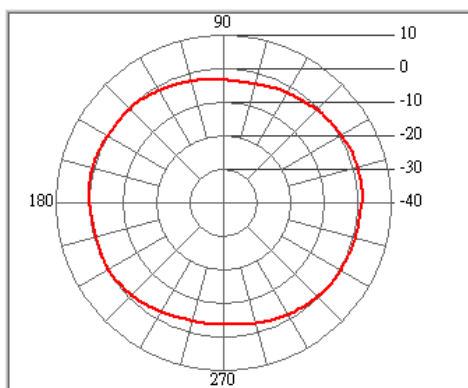
2500



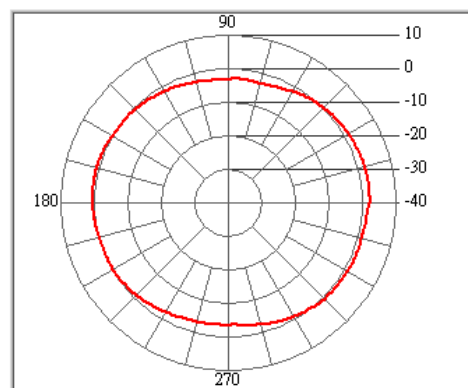
2550



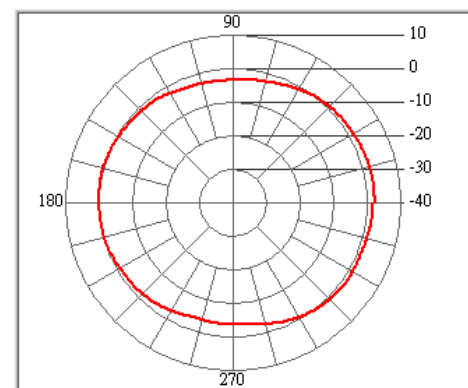
2600



2650



2680



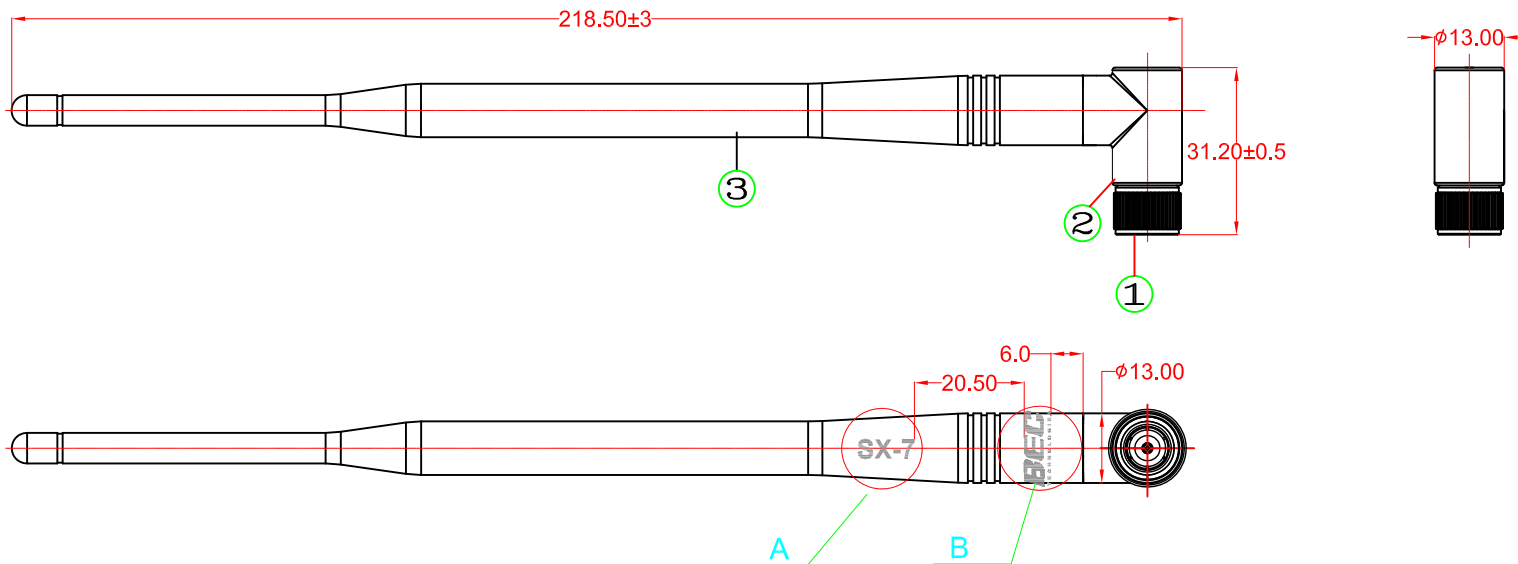
2700

RoHS

Compatible



SIGN	DATE	DESCRIPTION	APPROVER
△			
△			
△			



Section A 2:1

注: SX-7为Arial Block 14 级



Section B 2:1

注: BEC LOGO文字颜色为
pantone Gray 6c

Note:

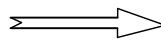
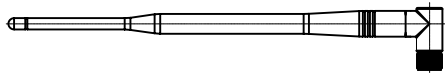
1. Take " * " is the important dimension.
2. Tolerance: Unmarked tolerance refer to the standard tolerance please.

3	AN13B-01B	Body1	TPE	Black	1
2	AN9101-02B	Base	ABS	Black	1
1	SMA207-CCT5AN19-A	SMA Male	Zn-Alloy	Black	1
NO.	Part Number	Description	Material	Finished	Q'ty

Invax System Group.				Cortec Technology Inc.	
Cortec				<small>Http://www.invaxsystem.com Tel:886-2-27885218 E-mail:info@invax.com.tw Fax:886-2-27831658</small>	
TITLE: 13B Type Antenna					
PART NO.: AN0727-13B03SM			CUSTOMER P/N: /		
APP BY	CHK BY	RF BY	DES BY		Tolerance
Grant	Jack	SiFei	LJHUA		X.X ±0.5 X.XX ±0.2 X° ±1
2013/06/20	2013/06/20	2013/06/20	2013/06/20	UNITS: mm SCALE: / REVISION: A	

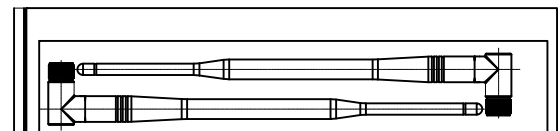
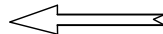
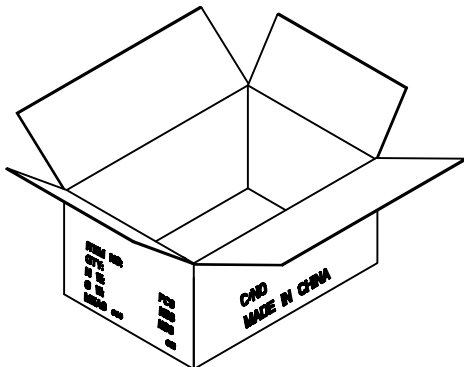
Part Number : AN0727-13B03SM	Revision : A
Name: 700~2700MHz Antenna	Customer : ALL

1. Enter PE bag.



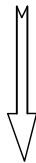
2PCS/SET
R-PE-BAG-50240

2.PACKING ◦

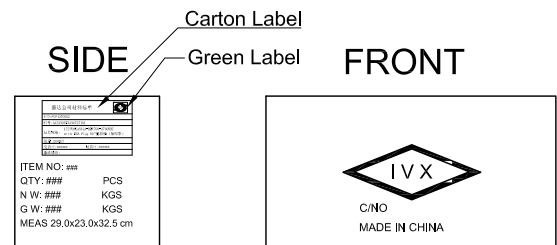
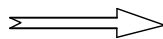
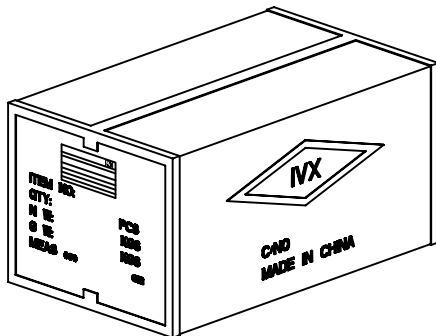


10SET/BAG
R-PE-BAG-220260

SIZE:29.0x23.0x32.5cm
200SET/BOX



3. SEALING.



SGS 台灣網站 → http://twap.sgs.com/sgsrsts/chn/cheres_tw.asp
 SGS 大陸網站 → http://rsts.cn.sgs.com/chn/cheres_cn.asp
 SGS 韓國網站 → http://rohs.kr.sgs.com/sgsrsts/en/cheres_en.asp

COR/F-G-47a

請輸入以下報告正確資料及檢查碼以便查核

1. 報告編號
2. 報告日期 (YYYY/MM/DD)
3. 產品名稱 (輸入前 10 個字不含空白)
4. 圖示檢查碼 (依指示畫面)



物料中HSF對象物質含量調查表

康捷電子有限公司	
填表：	時麗
部門：	研發部
職務：	文員

物料名稱：AN0727-13B03SM

序號	物料型號	物料各構成名稱	各構成物料的材質	測試報告裡RoHS對應物質測試結果						檢測報告編號	測試日期	測試名稱	測試機構名稱
				Cd	Pb	Hg	Cr(VI)	PBBs	PBDEs				
1	AN13B-01B	Body	TPEE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	RLSZD00108120002C	2012.10.10	TPEE	CTI
2	AN9101-02B	Body2	ABS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	KA/2012/C1575	2013.01.02	ACRYLONITRILE	SGS
3	SMA207-CCT5AN19-A	SMA Male	銅	66	31000	N.D.	Negative			CE201314616	2013.01.28	REECUTTINGBRASSBA	SGS
4	AN13B7070	HAT	EVA	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	CANEC1303661001	2013.03.28	HEAT SHRINKABLE	SGS
5	R-HSTUBE-004N	HSTUBE	鋅合金	N.D.	15	N.D.	Negative	N.D.	N.D.	A001R121106068001-1	2012.11.09	鋅合金錠	AOV
6	R-RG-178U	Cable (RG178)	FEP	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	RLSHE001125120002C	2012.08.21	电线电缆料	CTI
7			PTFE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	RLSHE001125120001C	2012.08.21	电线电缆料	CTI
8			鍍銀銅	N.D.	N.D.	N.D.	Negative	N.D.	N.D.	RLSHE001125120003C	2012.08.21	电线电缆料	CTI

根據測試報告如實填寫鉛、鎘、汞、六價鉻、PBBs和PBDEs六項禁用物質的含量

包裝材料中鉛、鎘、汞、六價鉻總含量不超過100ppm，鎘的允許濃度為5ppm

歐盟ROHS指令豁免條款2009/95/BC、鋼中合金元素中的鉛含量達0.35%、鋁含量達0.4%、銅合金中的鉛含量達4%

CHANG CHUN PLASTICS CO LTD

7TH FL, 301 SOHNGKIAHG RD, TAIPEI 104 TW

1163

Thermoplastic Polyester Elastomer (TPEE), furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	0.8	HB	4	0	50	50	50
	3.0	HB	3	0	50	50	50

Comparative Tracking Index (CTI): 0

Dimensional Stability (%): -

High-Voltage Arc Tracking Rate (HVTR): 0

High Volt, Low Current Arc Resis (D495): 4

Dielectric Strength (kV/mm): -

Volume Resistivity (10^x ohm-cm): -

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2009-06-24

Last Revised: 2009-07-01

Underwriters Laboratories Inc®



IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.8	HB75 (IIC, BK)
			3.0	HB40 (IIC, BK)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m ²	-	-
ISO Izod Impact	ISO 180	kJ/m ²	-	-
ISO Charpy Impact	ISO 179-2	kJ/m ²	-	-

Underwriters Laboratories Inc®

ABS

Component - Plastics

E56070

CHI MEI CORPORATION

59-1 SAN CHIA, JEN TE, TAINAN HSIEN 717 TW

PA-757(+)

Acrylonitrile Butadiene Styrene (ABS), "Polylac", furnished as pellets

	Min Thk	Flame			RTI	RTI	RTI
Color	(mm)	Class	HWI	HAI	Elec	Imp	Str
ALL	1.5	HB	4	0	85	80	85
	3.0	HB	3	0	85	80	85

Comparative Tracking Index (CTI): **0**

Dimensional Stability (%): -

High-Voltage Arc Tracking Rate (HVTR): **1**

High Volt, Low Current Arc Resis (D495): **7**

Dielectric Strength (kV/mm): -

Volume Resistivity (10^x ohm-cm) : -

(+) - Optional prefix or suffix; may be used to denote usage of 0-0.5 percent acid scavengers.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1983-06-23

Last Revised: 2011-01-27

Underwriters Laboratories Inc®

UL Online Certifications Directory

QMFZ2.E52460 Plastics - Component

Page Bottom

Plastics - Component

See General Information for Plastics - Component

DAIKIN INDUSTRIES LTD

E52460

YODOGAWA PLANT

CHEMICAL DIV, POLYMER PRODUCTION DEPT

1-1 NISHI-HITOTSUYA

SETTSU-SHI, OSAKA 566-8585 JAPAN

Material Dsg	Color	Min. Thk mm	Flame Class	H		R T I		H	D	
				W	A	Elec	Mech	V	4	C
				I	I	Imp	Str	T	9	T
								R	5	I
Ethylene/Tetraflouroethylene (E/TFE), "Neoflon", furnished as pellets.										
EP-520	NC	1.5 ONLY	V-0	-	-	50	50	50		
EP-540	NC	1.5	V-0	-	-	50	50	50		
Ethylene/Tetraflouroethylene (E/TFE), furnished as pellets.										
EP-521	NC	1.5	V-0	-	-	50	50	50		
EP-522	NC	1.5	V-0	-	-	50	50	50		
EP-522BU	BL	1.5	V-0	-	-	50	50	50		
EP-541	NC	1.5	V-0	-	-	50	50	50		
Florinated Ethylene Propylene (FEP), furnished as pellets, powder.										
NP-100	NC	1.7	V-0	-	-	150	150	150		
		3.2	V-0	-	-	150	150	150		
NP-100H	NC	1.5 ONLY	V-0	-	-	150	150	150		
NP-101	NC	1.1	V-0	-	-	150	150	150		
		3.3	V-0	-	-	150	150	150		
NP-120	NC	1.7	V-0	-	-	150	150	150		
		3.3	V-0	-	-	150	150	150		
NP-12X	NC	1.5	V-0	-	-	150	150	150		
		3.0	V-0	-	-	150	150	150		
NP-20	NC	1.5 ONLY	V-0	-	-	150	150	150		
NP-20PW	NC	1.5 ONLY	V-0	-	-	150	150	150		
NP-21	NC	1.5 ONLY	V-0	-	-	150	150	150		
NP-22	NC	1.5 ONLY	V-0	-	-	150	150	150		
NP-23	NC	0.75 ONLY	V-0	-	-	150	150	150		

NP-30	NC	1.5 ONLY	V-0	-	-	150	150	150			
NP-40	NC	1.5 ONLY	V-0	-	-	150	150	150			
SP-100	NC	1.5 ONLY	V-0	-	-	150	150	150			
SP-120	NC	1.5 ONLY	V-0	-	-	150	150	150			
Florinated Rubber (FR), "Daiel", furnished as sheets.											
DC-7026023H	GY	0.75	V-0	-	-	50	50	50			
		2.0	V-0	-	-	50	50	50			
Perfluoro Alkoxy Alkene (PFA), "Neoflon", furnished as pellets.											
AP-210, AP-230											
	NC	0.81 ONLY	V-0	3	3	50	50	50	0	4	0
AP-210BK	BK	0.38	V-0	-	-	50	50	50			
		1.5	V-0	-	-	50	50	50			
AR-6020	BK	0.89 ONLY	V-0	-	-	50	50	50			
AR-6040	BK	0.75	V-0	-	-	50	50	50			
		1.5	V-0	-	-	50	50	50			
PFA AP-201	NC	0.38	V-0	-	-	50	50	50			
		0.75	V-0	-	-	50	50	50			
		1.5	V-0	-	-	50	50	50			
Polychlorotrifluoroethylene (PCTFE), "Neoflon", furnished as pellets, powder.											
M-300H+	NC	0.75	V-0	3	0	150	150	150	0	4	
		1.5	V-0	2	0	150	150	150			
		3.0	V-0	1	0	150	150	150			
M-300P+	NC	0.75	V-0	3	0	150	150	150	0	4	
		1.5	V-0	2	0	150	150	150			
		3.0	V-0	1	0	150	150	150			
M-400H+	NC	0.75	V-0	3	0	150	150	150	0	4	
		1.5	V-0	2	0	150	150	150			
		3.0	V-0	1	0	150	150	150			
Polyphenylene Sulfide/Polytetrafluoroethylene (PPS/PTFE), "Neoflon", furnished as pellets.											
SA-7600	GY	0.75	V-0	-	-	50	50	50			
		1.5	V-0	-	-	50	50	50			
Polytetrafluoroethylene (PTFE), "Polyflon", furnished as powder.											
M-532	NC	0.9-1.4	V-0	-	-	180	180	180			
Polytetrafluoroethylene (PTFE), furnished as pellets.											
F-205	NC	0.84	V-0	-	-	180	180	180			
		1.5	V-0	-	-	180	180	180			
Polytetrafluoroethylene (PTFE), furnished as powder.											
F-201, F-202, F-203											
	NC	0.81	V-0	-	4	180	180	180		4	0
		1.5	V-0	-	4	180	180	180			

M-111	NC	0.050	VTM-0	-	-	180	180	180			
		0.060	VTM-0	-	-	180	180	180			
		0.75	V-0	-	-	180	180	180			
M-112	NC	0.067	V-0	-	-	180	180	180			
		0.75	V-0	-	-	180	180	180			
M-12, M-15, M-24, M-25, M-31, M-32, M-33											
	NC	0.81	V-0	1	2	180	180	180	0	4	0
		1.5	V-0	1	2	180	180	180			
M-137	NC	0.072	V-0	-	-	180	180	180			
		0.75	V-0	-	-	180	180	180			
MG-1040F	NC	0.90	V-0	-	-	180	180	180			
		3.0	V-0	-	-	180	180	180			

+ - For the HWI property PLC equals time to melt, no ignition.

Marking: Company name and material designation on container, wrapper or finished part.

Last Updated on 2005-04-13

[Questions?](#)

[Notice of Disclaimer](#)

[Page Top](#)

Copyright © 2006 Underwriters Laboratories Inc.®

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Designs and/or Listings (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from Underwriters Laboratories Inc." must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "Copyright © 2006 Underwriters Laboratories Inc.®"

An independent organization working for a safer world with integrity, precision and knowledge

