

AD-315N

Antenna Approval Sheet

Part Number	R3410110233
Product Number	AD-315N
Description	Dipole Antenna, 3dBi/5dBi 2.4G/5GHz, I-PEX / MHF1 coonector
DOC NO.	AS-2111002

Ver. 1.0

Revised History

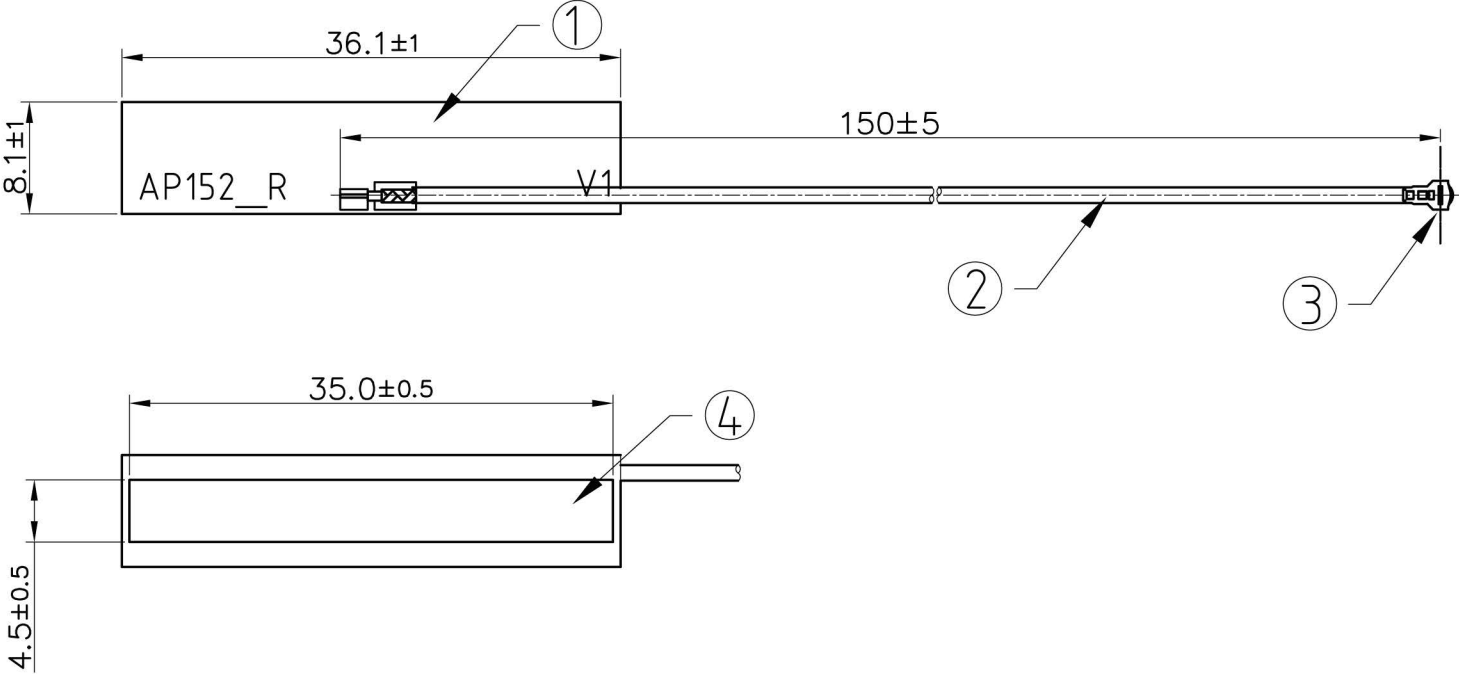
Version	Purpose	Date	Editor
V1.0	Initial Doc	2021/11/16	Kamoro

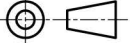
SparkLAN		Customer
Sales	PM	Approved by

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NO.	NAME	FINSH	MAT'L	Q'TY	MEMO
1.	PCB	BLACK	FR4	1	
2.	CABLE	BLACK	--	1	ø1.13
3.	IPEX	PLATED GOLD	BRASS	1	MHF I
4.	TAPE	--	--	1	



PROJECTION		TOLERANCE UNLESS OTHERWISE SPECIFIED			AD-315N
		LINER		ANGLE	
UNITS		.X ±0.10		X° ±0.5°	
MM		.XX ±0.05			
		.XXX ±0.01			TITLE
					R3410110233
REV.	A	APPD.			DWG NO.
SHEET	1/1	CHKD.			R3410110233
SIZE	SCALE	DESIGN			
A4	1:1	DRAW	Gino	2018/12/07	

3.				REV.	A	APPD.		
2.				SHEET	1/1	CHKD.		
1.				SIZE	SCALE	DESIGN		
REV.	ECN.	NAME	DATE	A4	1:1	DRAW	Gino	2018/12/07

SPECIFICATION FOR APPROVAL

DOCUMENT: A3132TS001

STYLE : COAXIAL CABLE
105°C 30V

SIZE: 32AWG×1C
BRAID : TD

RECOGNIZED: UL 1979
MEET VW-1



WONDERFUL HI-TECH CO.,LTD.

OFFICE : 72WU KONG 6TH ROAD,
WU KU IND. DISTRICT
TAIPEI HSIEN,TAIWAN

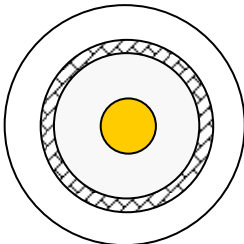
FACTORY : 17 PEI YUAN ROAD,
CHUNG-LI IND. PARK
TAIWAN, R.O.C.

TEL : (02)22988033
FAX : (02)22988031-2

TEL : (03)4527777
FAX : (03)4517214



WONDERFUL HI-TECH CO., LTD. SPECIFICATION

STYLE	105°C 30V UL 1979	DOCUMENT NO : A3132TS001
SIZE	32AWG	ESTABLISHED DATE: Mar/16/2005
STANDARD :		
Conductor	Size	AWG 32
	Material	---- Silver Cover Copper
	Conductors No.	---- 7
	Conductors Size	mm 0.085
	O.D.	mm 0.26
Insulation	Average Thickness	mm 0.22
	Diameter	mm 0.70 ± 0.03
	Material	---- FEP
	Color	---- Clear
Braid	Material	---- Tinned Copper
	Construction	mm 16 / 4 / 0.050
	Coverage	% 89.4
Jacket	Average Thickness	mm 0.12
	Diameter	mm 1.13 ± 0.05
	Material	---- FEP
	Color	---- According to customer
Marking	Non	
Drawing		



WONDERFUL HI-TECH CO., LTD.

SPECIFICATION

Electrical & Physical Properties						
Item			32AWG			
Rating Temp Voltage			105°C 30V			
Conductor Resistance			497 OHM/KM/20°C MAX.			
Insulation Resistance			3000 MEGA OHM-KM MIN.			
Dielectric Strength			AC 1000 V/Minute			
Spark Test			2 KV			
Insulation	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / m m ²)			
		Elongation	200% MIN.			
	Aged	Tensile Strength	UNAGED MIN. 75%(168HRS×232°C)			
		Elongation	UNAGED MIN. 75%(168HRS×232°C)			
Jacket	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / m m ²)			
		Elongation	200% MIN.			
	Aged	Tensile Strength	UNAGED MIN.75%(168HRS×232°C)			
		Elongation	UNAGED MIN.75%(168HRS×232°C)			
Nom. Impedance			50 ± 3 Ohms			
Nom. Capacitance			96 ± 3 pF/m			
Nom. Vel. of Prop.			69%			
Storage Temperature			-40°C ~+80°C			
VSWR Test (0 – 6 GHZ)			Max 1.3			
Flame Test			VW-1 OK			
Attenuation (dB/1m)		2.0GHZ	2.4GHZ	2.5GHZ	5.0GHZ	6.0 GHZ
		2.90	3.20	3.28	5.05	5.40



NAN YA PLASTICS CORPORATION
ELECTRONIC MATERIALS DIVISION.
COPPER CLAD LAMINATE DEPARTMENT

**Glass cloth base epoxy resin
flame retardant copper clad laminate**

NO. 201. TUNG HWA N. ROAD,
TAIPEI, TAIWAN.

NP-140TL

■ FEATURES

- Multi-functional epoxy renders the material outstanding heat resistance, better dimensional stability, and through-hole reliability that benefit the performance of high layer count multilayer boards.
- HTE copper foil applied to prevent corner cracking.
- High luminance of epoxy contrast with copper for laser type A.O.I.
- UV solder mask may be applied simultaneously in order to increase yields.
- IPC-4101B specification is applicable.

■ PERFORMANCE LIST

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method
Volume resistivity	MΩ-cm	C-96/35/90	5.0×10^9	$10^6 \uparrow$	2.5.17
Surface resistivity	MΩ	C-96/35/90	5.0×10^7	$10^4 \uparrow$	2.5.17
Permittivity 1 MHZ	-	C-24/23/50	4.2-4.4	5.4 ↓	2.5.5.9
Permittivity 1 GHZ	-	C-24/23/50	3.8-4.0	-	2.5.5.9
Loss Tangent 1 MHZ	-	C-24/23/50	0.015-0.020	0.035 ↓	2.5.5.9
Loss Tangent 1 GHZ	-	C-24/23/50	0.012-0.014	-	2.5.5.9
Arc resistance	SEC	D-48/50+D-0.5/23	120 ↑	60 ↑	2.5.1
Dielectric breakdown	KV	D-48/50	60 ↑	40 ↑	2.5.6
Moisture absorption	%	D-24/23	0.20-0.30	0.35 ↓	2.6.2.1
Flammability	-	C-24/23/50+E-24/125	94V0	94V0	UL94
Peel strength 1 oz	lb/in	288°Cx10" solder floating	10-14	6 ↑	2.4.8
Thermal stress	SEC	288°C solder dipping	90 ↑	10 ↑	2.4.13.1
Glass transition temp	°C	DSC	140 ± 5	N/A	2.4.25
Dimensional stability X-Y axis	%	E 4/105	0.01-0.03	0.05 ↓	2.4.39
Coefficient of thermal expansion	ppm/°C	TMA	50-70	N/A	2.4.24
Z-axis before Tg	ppm/°C	TMA	250-350		
Z-axis after Tg					

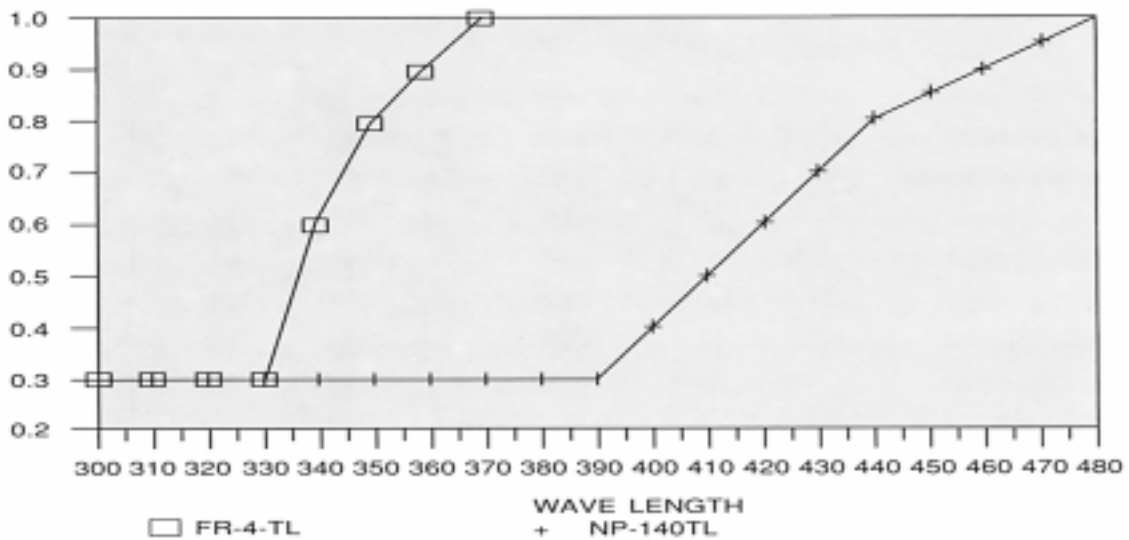
NOTE:

The average value in the table refers to samples of .020" 1/1.

Test method per IPC-TM-650

Data shown are nominal values for reference only.

■ UV TRANSMISSION CURVE OF 0.2mm CCL



■ PRODUCT SIZE & THICKNESS

THICKNESS INCH(mm)	COPPER CLADDING OZ (μm)	SIZE		THICKNESS TOLERANCE
		INCH	mm	
0.004 (0.1)	0.5 (17)	48.8 x 36.6	1240 x 0930	CLASS C/M
to	1.0 (35)	48.8 x 40.5	1240 x 1030	
0.047(1.2)	2.0 (70)	48.8 x 42.5	1240 x 1080	

■ Keeping the core and prepreg in the same grain direction is crucial to ensure the flatness of multilayer boards.

Grain direction is shown on the Certificate of Conformance

■ CERTIFICATION UL

• UL File No. : E98983

■ **CONSTRUCTION:**

THICKNESS		CONSTRUCTION
mm	mil	
0.08	3	2112 1 ply
0.10	4	1080 2 plies
0.11	4	2116 1 ply
0.13	5	1080 2 plies
0.13sp	5	2116 1 ply
0.15	6	1506 1 ply
0.16	6	2112 2 plies
0.21	8	7628 1 ply
0.26	10	2116 2 plies
0.30	12	2116 3 plies
0.30sp	12	1506 2 plies
0.35	14	7628 2 plies
0.38	15	7628 2 plies

THICKNESS		CONSTRUCTION
mm	mil	
0.45	18	7628 x 2 + 1080 x 1
0.46	18	7667 2 plies
0.50	20	7628 3 plies
0.53	21	7628 3 plies
0.60	24	7628 3 plies
0.77	31	7628 4 plies
0.8	32	7628 4 plies
0.9	36	7628 5 plies
1.0	39	7628 5 plies
1.1	43	7628 6 plies
1.2	47	7628 6 plies

*1.2,1.1,1.0,0.9,0.77 mm, THICKNESS INCLUDES CLADDING. ALL OTHERS EXCLUDE CLADDING.

Dual Band Dipole Antenna

AD-315N

Electrical Specifications

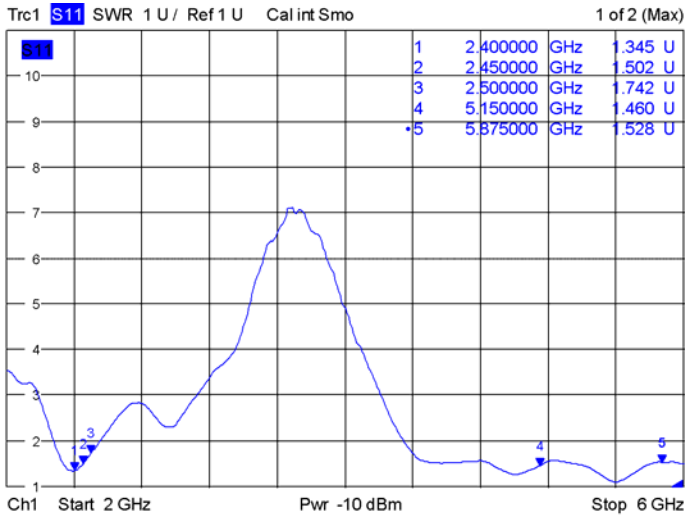
Frequency range	2400 -2500 MHz	5150-5875 MHz
Peak Gain	3 dBi	5 dBi
Efficiency	80%	80%
VSWR	2.0 : 1 Max.	2.0 : 1 Max.
Power handling	1W (cw)	
Impedance	50 Ω	
Dimensions	36.1x8.1mm	
Antenna Material	FR4	
Connector	I-PEX MHF1	
Cable	Ø1.13 L:150mm	

*Antenna measured on a 2mm thick ABS plastic base

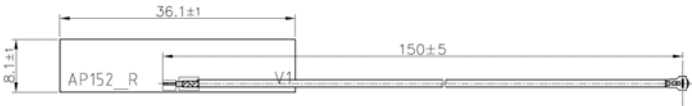
Environmental & Mechanical Characteristics

Temperature	- 10°C to +55°C
Humidity	95% @ 25°C

Weight (g) : 1.5g

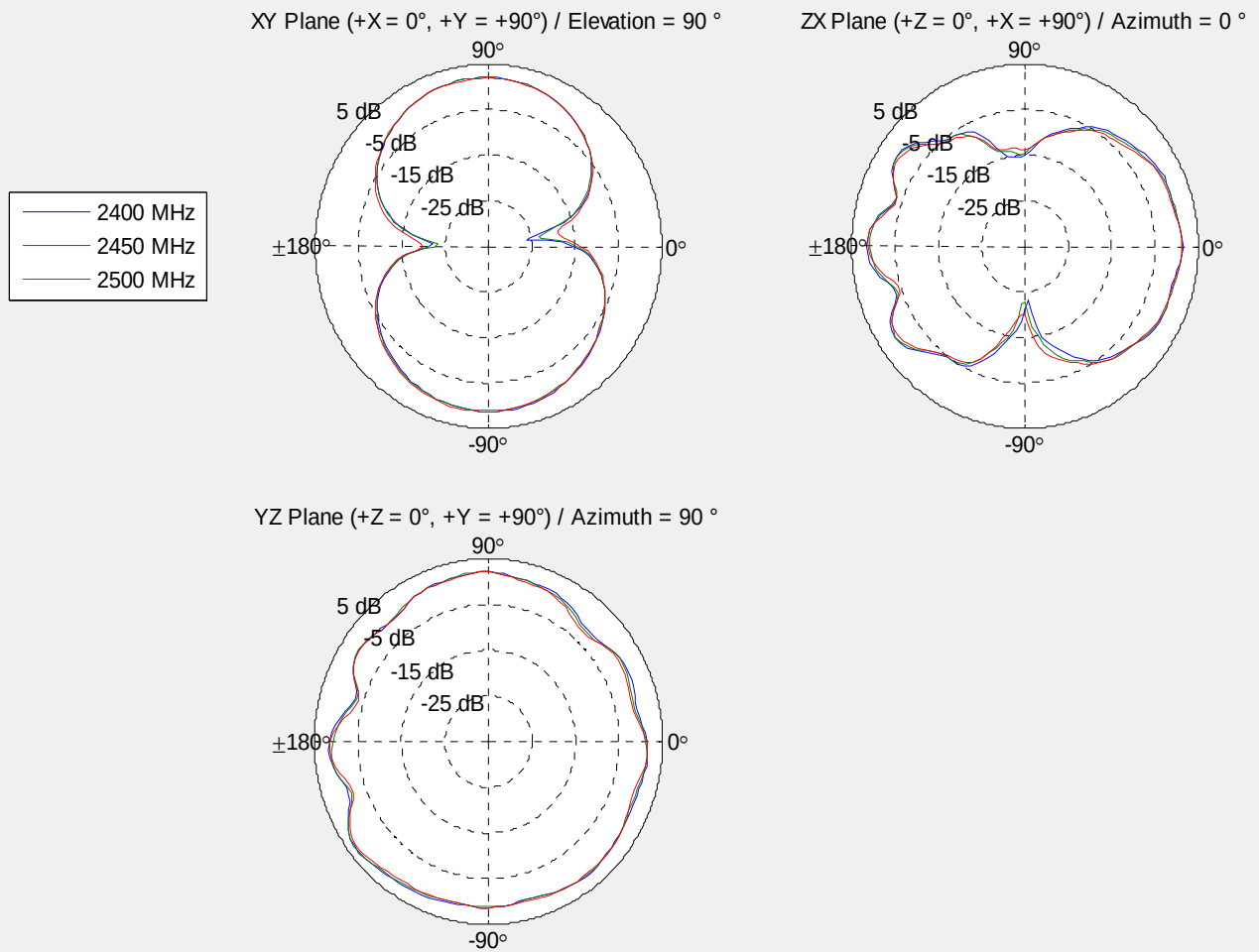


Date: 16.NOV.2016 12:25:07



Antenna Pattern

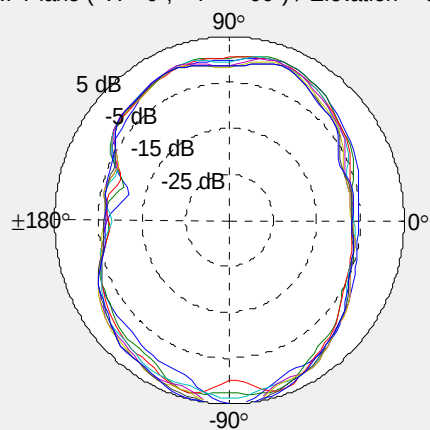
2G Band = 2400 - 2500 MHz % 2G Band



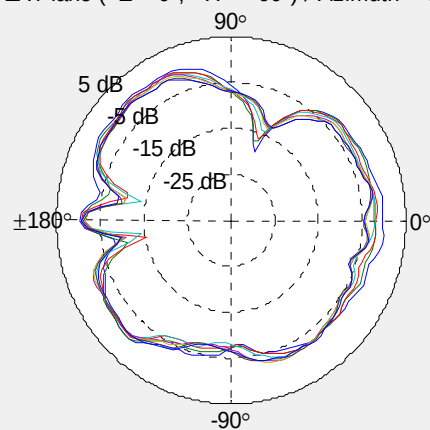
Antenna Pattern

5G Band = 5150 - 5875 MHz % 5G Band

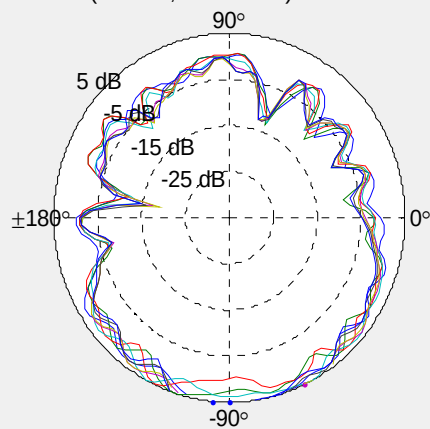
XY Plane (+X = 0°, +Y = +90°) / Elevation = 90 °



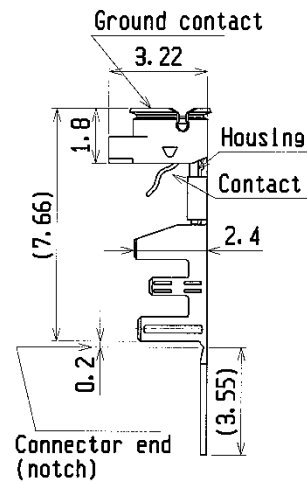
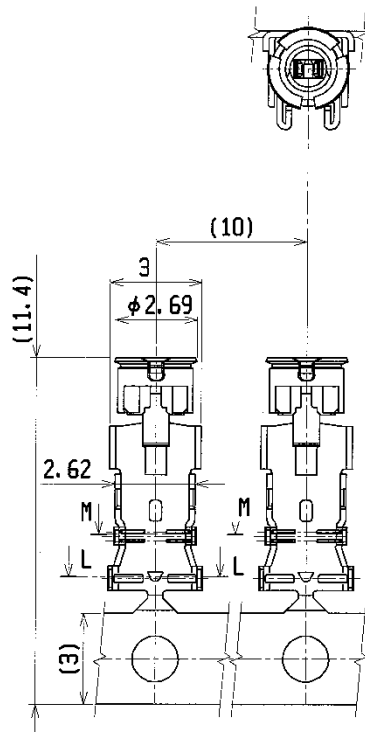
ZX Plane (+Z = 0°, +X = +90°) / Azimuth = 0 °



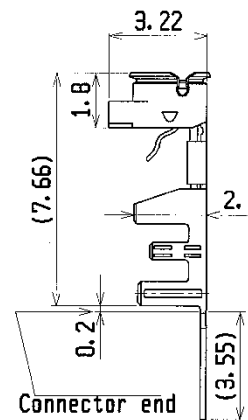
YZ Plane (+Z = 0°, +Y = +90°) / Azimuth = 90 °



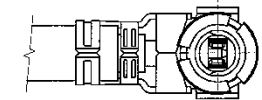
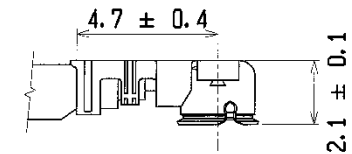
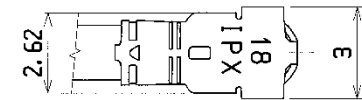
PART NO.
20278-...R-...



Part No. 20278-101R-18
20278-102R-18
For hand tool
(with notch)

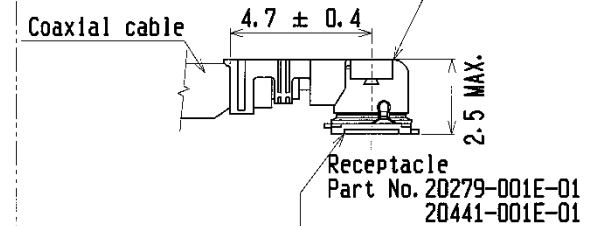


Part No. 20278-111R-18
20278-112R-18
For semi auto
termination machine
(without notch)



Cable Ass'y

Plug
P/N 20278-1...R-18



MATING

GENERAL TOLERANCE		
6 MAX.	±0.2	
6 OVER MAX. 30	±0.3	
30 OVER MAX. 120	±0.5	
ANGLE	±2°	

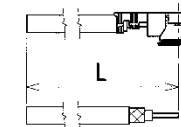
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DESIGN' D BY	DATE
CHK' D BY	DATE
APP' D BY	DATE
P	
CUSTOMER COPY	PROJECT I

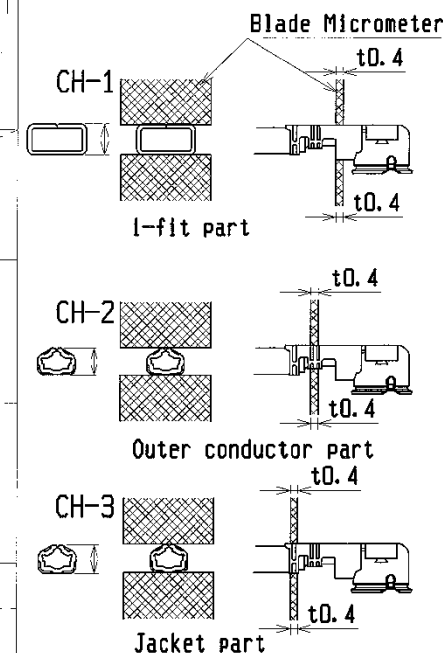
I-PEX Interconnect and Packaging Electronics TOKYO, JAPAN	
TITLE	General
MHF series micro coaxial connector plug vertical (ground contact : gold plating)	

Part No. of non halogen free type	20278-101R-08 20278-111R-08	20278-101R-13 20278-111R-13	20278-101R-32 20278-111R-32	20278-101R-18 20278-111R-18
Part No. of halogen free type	20278-102R-08 20278-112R-08	20278-102R-13 20278-112R-13	20278-102R-32 20278-112R-32	20278-102R-18 20278-112R-18
Housing color	White	Black	Black	White
Applicable cable nominal dimension	2.09±0.1 1.25±0.1 1.16±0.1 Jacket Outer conductor silver or tin plating Dielectric core Inner conductor silver plating φ0.81 Nominal (φ0.65) φ0.4 Nominal ANG36(7/0.05) ※ NOTE-1	2.09±0.1 1.25±0.1 1.16±0.1 φ1.13 Nominal (φ0.93) φ0.68 Nominal ANG32(7/0.08) ※ NOTE-1	2.09±0.1 1.25±0.1 1.16±0.1 Nominal φ1.32 (φ1.12) φ0.66 Nominal ANG32(7/0.08) ※ NOTE-1	2.09±0.1 1.25±0.1 1.16±0.1 RG178 B/U φ1.8 Nominal (φ1.35) φ0.84 Nominal ANG30(7/0.102) ※ NOTE-1
Braided shield of Outer conductor 外部導体の編組	Single / 1重編組	Single / 1重編組	Double / 2重編組	Single / 1重編組
P/N of hand Tool	90187-008C	90187-013C	90187-032C	90233-018
P/N of semi auto termination machine	90213-008C	90213-013C	90213-032C	90232-018
Sect. M-M	1.68 1.12	2.24 1.48	2.29 1.56	2.71 1.9
Sect. L-L	1.72 1.19	2.28 1.55	2.37 1.71	3.1 2.26
Crimp Height	CH-1	1.34~1.40	1.34~1.40	1.34~1.40
	CH-2	0.76~0.84	1.06~1.14	1.41~1.49
	CH-3	0.85~0.97	1.15~1.35	1.70~1.80

Cable cut length



Crimp Height



NOTE-1
中心導体、外部導体への半田コーティングは不可
Must not use solder coated
inner conductor and outer conductor.

DESIGN'D BY		DATE	
CHK'D BY		DATE	
APP'D BY		DATE	
REV	ECN	BY	DATE
REV. RECORD			
SERIES No.		2814	
CUSTOMER COPY		PROJECTION	SCALE UNIT
			mm
DWO. No.		20278	
SHEET		REV.	
3/4		19C	

Notes

1. Material

(1) Housing : PBT , UL94V-0

(2) Contact

phosphor bronze
gold plating 0.1 μ m MIN.
over nickel 1.27 μ m MIN.

(3) Ground contact

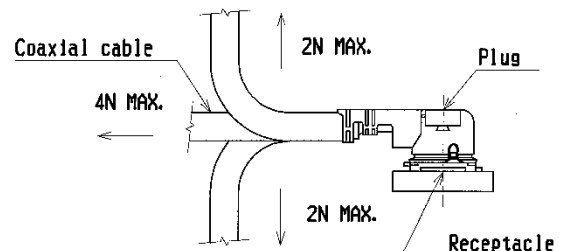
phosphor bronze
gold plating 0.05 μ m MIN.
over nickel 1.27 μ m MIN.

2. Packing : reel

3. Mating partner part No.

: 20279-001E-01, 20441-001E-01

4. Permissible load of cable at mating



5. Suggestions for mating & unmating operation.

5-1 Mating.

Please mate the connector straightly to vertical direction as much as possible, adjusting the mating axis of plug and receptacle.

As excessive slant angle mating may break the connector, please don't do it.

1. 材料

(1) ハウジング : PBT, UL94V-0

(2) コンタクト

りん青銅
金メッキ0.1 μ m MIN.
下地 ニッケル1.27 μ m MIN.

(3) グランドコンタクト

りん青銅
金メッキ0.05 μ m MIN.
下地 ニッケル1.27 μ m MIN.

2. 梱包 : リール

3. カン合相手 part No.

: 20279-001E-01, 20441-001E-01

4. コネクタカン合後のケーブルに対する荷重

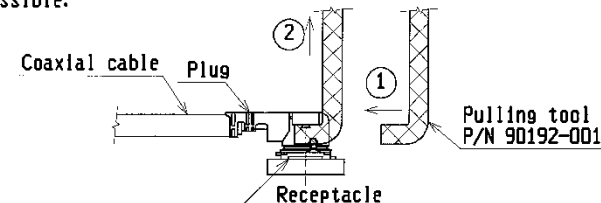
5. コネクタカン合時および抜去時の注意

5-1 コネクタ挿入時

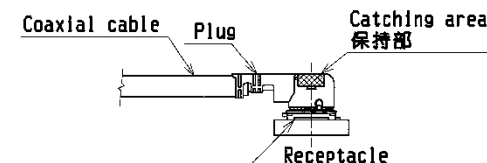
PlugとReceptacleのカン合軸を合わせ、できるだけ垂直に挿入して下さい。
極端な斜め挿入は行わないで下さい。
コネクタ破損の原因となりますので、過度なこじり挿入は行わないで下さい。

5-2 Unmating.

(1) In case of unmating by pulling tool.
Please use the pulling tool as the following drawing, and please pull plug to vertical direction as directly as possible.



(2) In case of unmating directly by hand
Please catch the catching area of plug, and please pull plug to vertical direction as directly as possible.



5-3 Crimp over standards of outer conductor

Standards: Less than 10% from total numbers of outer conductor
(Numbers of outer conductor's crimp over from outer conductor's barrel)

5-4 Caution about Heat shrinkage tubes

Please be careful not to melt housing when using heat shrinkage tubes.
It will become cause of open circuit.

6. This is 'Pb-free' connector.

5-2 コネクタ抜去時

(1) 抜去ジグを用いる場合
下図のようにできるだけ垂直に引き抜いて下さい。

(2) 手で直接引き抜く場合
下図の保持部をつかみ、できるだけ垂直に引き抜いて下さい。

5-3 外部導体はみ出し量

外部導体はみ出し量規定
: 外部導体トータル本数の10%以下
(外部導体/バレルの外はみ出し量)

5-4 熱収縮チューブについて

熱収縮チューブで外部導体を覆う場合は、導通不良の原因となりますので、熱によりハウジングを溶融させないように注意してください。

6. 本コネクタは'Pb-free'である

GENERAL TOLERANCE		
6 MAX.	± 0.2	
6 OVER MAX. 30	± 0.3	
30 OVER MAX. 120	± 0.5	
ANGLE	$\pm 2^\circ$	

					DESIGN' D BY		DATE		I-PEX Interconnect and Packaging Electronics TOKYO, JAPAN									
					CHK' D BY		DATE											
					APP' D BY		DATE											
REV	ECN	BY	DATE	APP						TITLE								
										MHF series micro coaxial connector plug vertical (ground contact : gold plating)		General						
REV. RECORD					CUSTOMER COPY		PROJECTION 		SCALE		UNIT		DWC. No.		SHEET		REV.	
SERIES No. 2814									-/-		mm		20278		4/4		19C	

I-PEX		Interconnect and Packaging Electronics		TOKYO, JAPAN	
TITLE		MF series micro coaxial connector plug		General	
		vertical (ground contact : gold plating)			