

VGAP-CLA-AS-A1 Specification

1. Features and Application

- (1) This product is manufactured in ISO/TS16949 certified production factory.
- (2) This product is qualified according to AEC-Q200.
- (3) This product is for WiFi, Zigbee, Bluetooth, 802.11 b/g/n, 2400 MHz...

2. Explanation of Part Number


VGAP - C LA - A S - A1
 (1) (2) (3) (4) (5)

- (1) Product Type: Chip Antenna
- (2) Center Frequency/Band Code: 2400 MHz
- (3) Size Code: 5.0*3.6 mm (Length * Width)
- (4) Special Code: RoHS Compliant
- (5) Design Revision Code: Rev.1

3. Electrical Specification

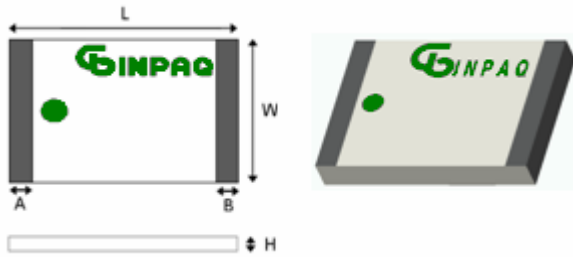
Item	Specification
Frequency Band	2400 ~ 2500 MHz
VSWR	Less than 2.5
Polarization	Linear
*Peak Gain	3.2 dBi Typ.
*Peak Efficiency	81 % Typ.
Impedance	50 ohm Typ.

* Test condition: Test board size 80*40 mm
 Matching circuit may be required

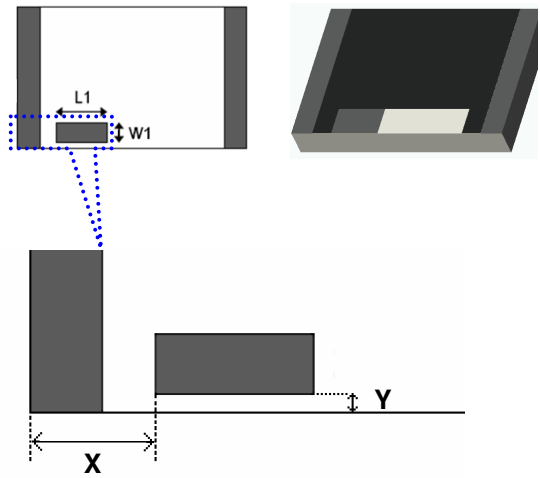
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DESIGNED BY: 林豪建 Stan	APPROVED BY: 黃月碧 Yuethee			
TITLE : VGAP-CLA-AS-A1 Specification		DOCUMENT NO.	ENS000063520	SPEC REV. A3

4. Physical Dimension

Top view



Bottom view



Chip Antenna	L	W	A	B	L1	W1	H	X	Y
VGAP-CLA-AS-A1	5.2±0.3	3.7±0.3	0.45±0.25	0.45±0.25	1.1±0.20	0.55±0.20	0.70±0.15	0.85±0.25	0.12±0.06

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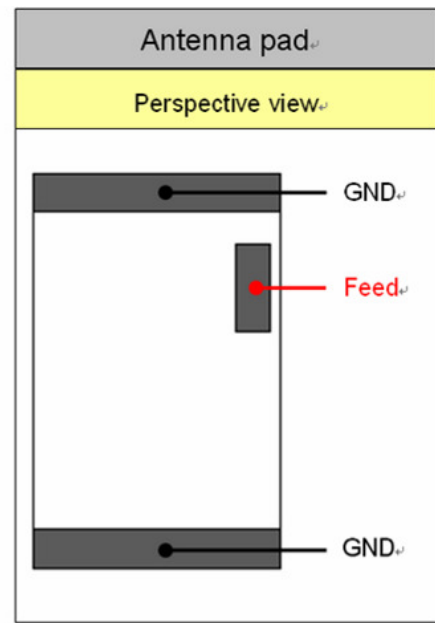
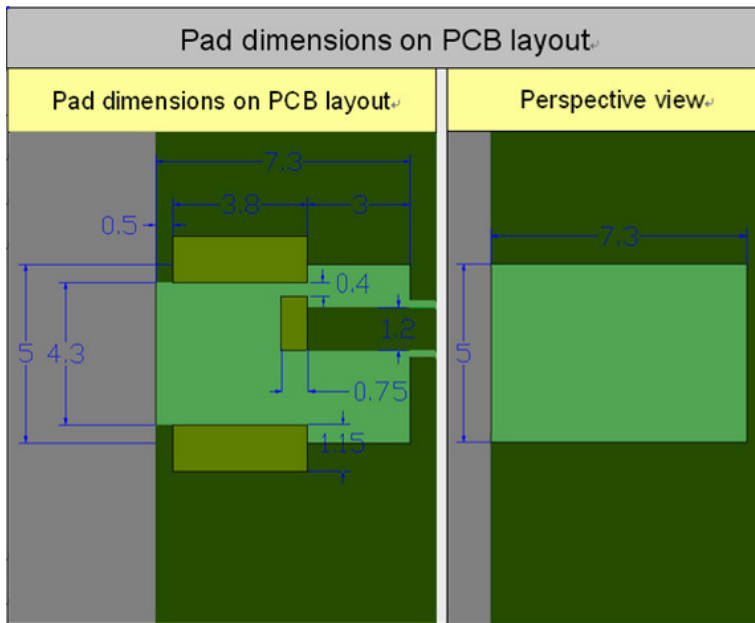
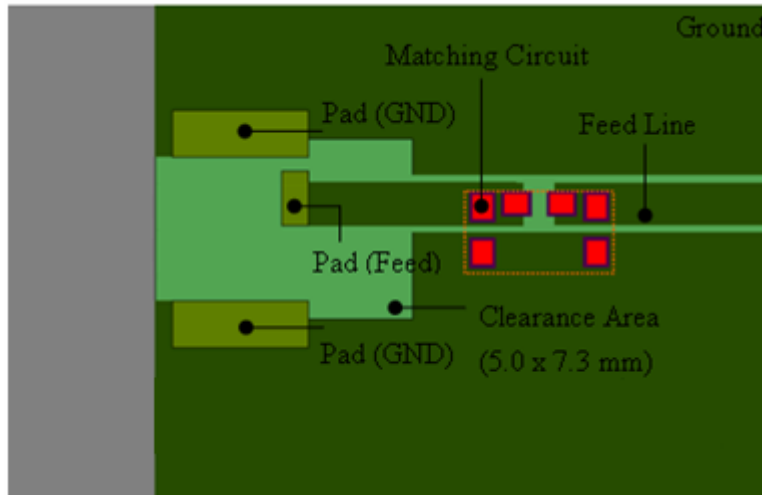
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5. Recommend PCB Layout



(Unit: mm)

PCB pad dimensions

Terminal name	Terminal Dimensions
Pad (Feed)	1.65 X 0.75
Pad (GND)	3.8 X 1.15
Pad (GND)	3.8 X 1.15

Antenna pad dimensions

Terminal name	Terminal Dimensions
Feed	1.1 X 0.55
GND	3.7 X 0.45
GND	3.7 X 0.45

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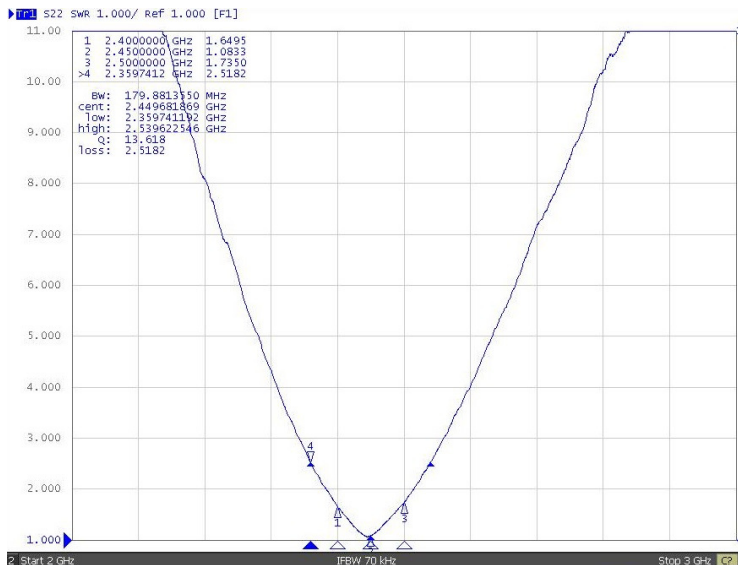
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6. Electrical Characteristics

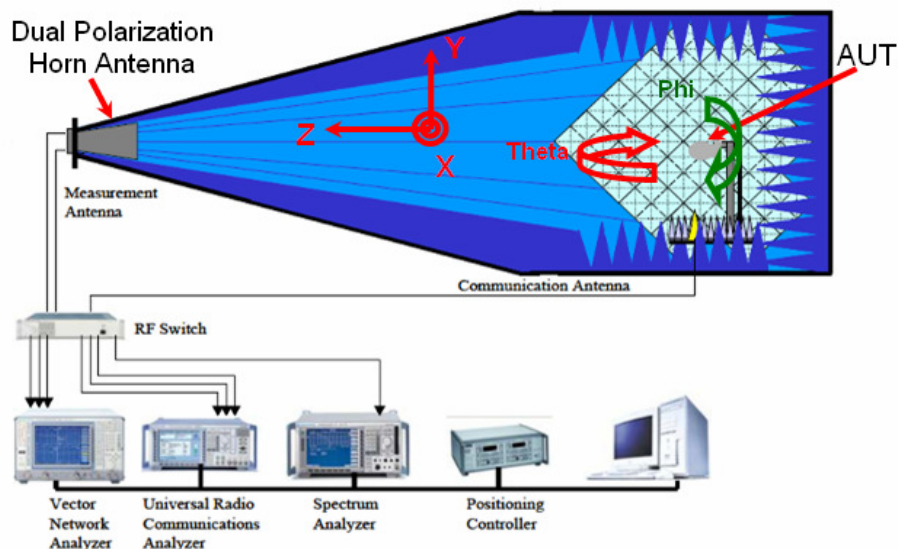
VSWR



Mark	Frequency	VSWR
1	2400 MHz	1.6
2	2450 MHz	1.1
3	2500 MHz	1.7

Radiation Pattern

The Gain pattern is measured in INPAQ's FAR-field chamber. DUT is placed on the table of rotator, a standard horn antenna and Vector Network Analyzer is used to collect data.



3D Chamber Definition

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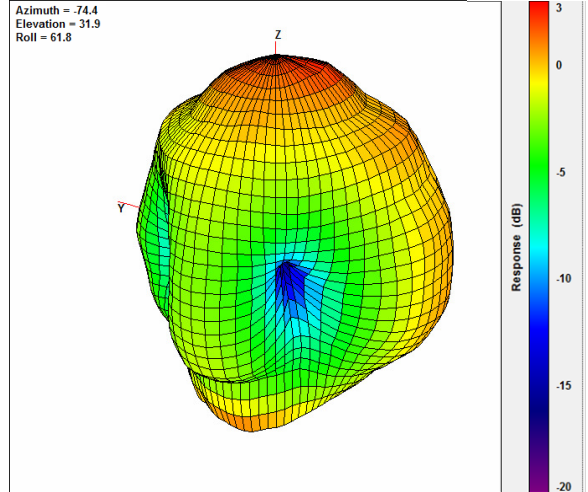
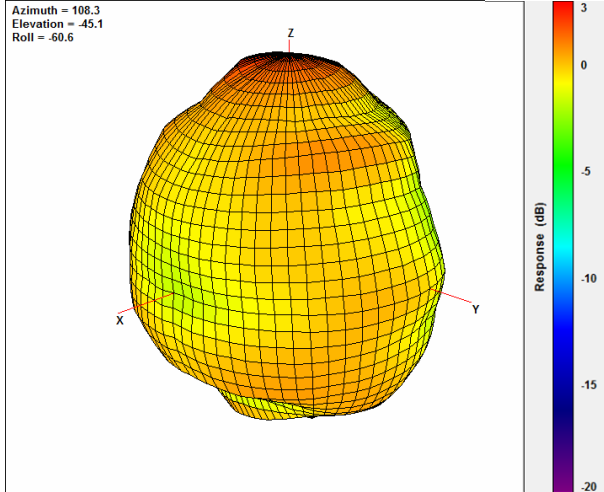
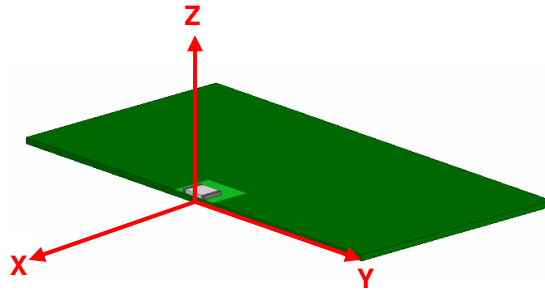
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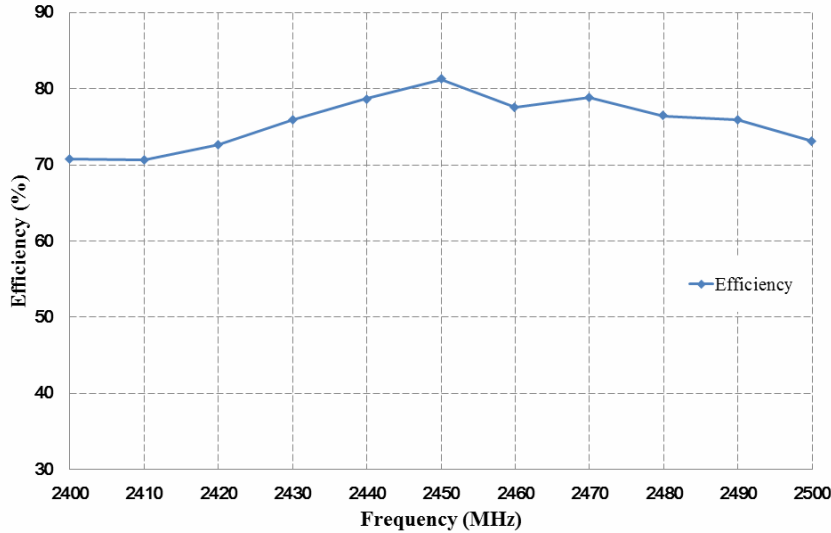
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3D Gain Pattern (2450 MHz)



Efficiency



Frequency	Efficiency (%)
2400 MHz	70.7
2450 MHz	81.2
2500 MHz	73.1

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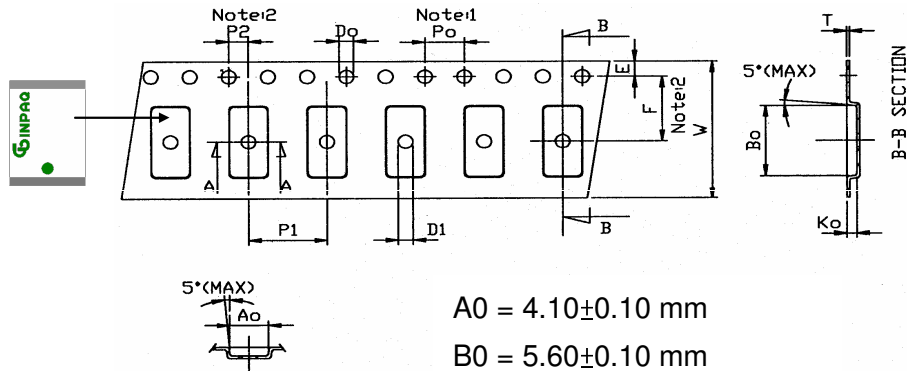
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7. Taping Package and Label Marking

- (1) Quantity/Reel : 2000pcs/Reel
- (2) Carrier tape dimensions

(Unit: mm)



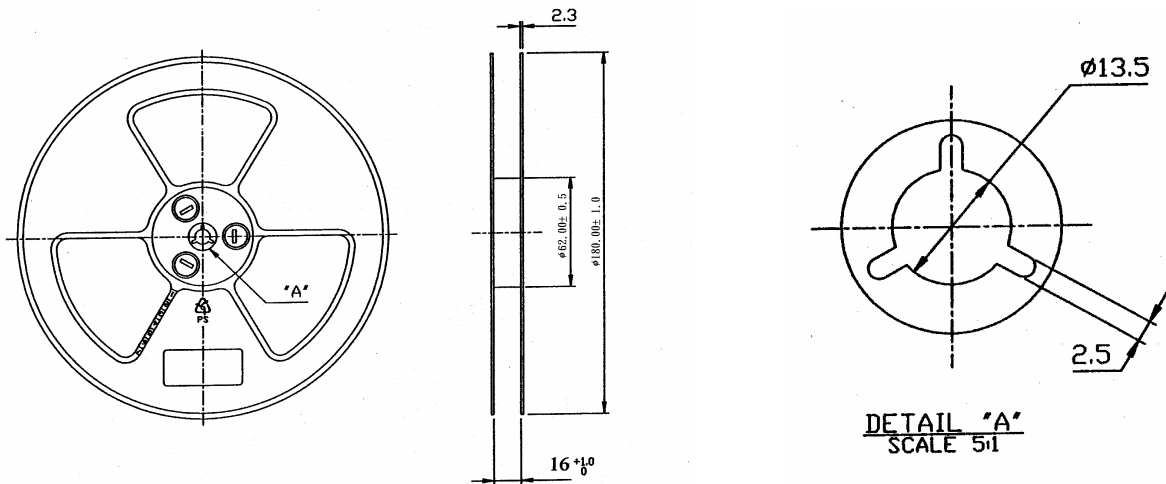
Symbol	Spec.
Po	4.00±0.1
P1	8.00±0.1
P2	2.00±0.05
Do	1.55±0.05
D1	1.50(MIN)
E	1.75±0.1
F	5.50±0.05
10Po	40.00±0.2
W	12.00±0.1
T	0.25±0.05

$A0 = 4.10 \pm 0.10$ mm
 $B0 = 5.60 \pm 0.10$ mm
 $K0 = 1.02 \pm 0.10$ mm

Notice:

1. 10 Sprocket hole pitch cumulative tolerance is ±0.1mm
2. Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3. A0 & B0 measured on a plane 0.3mm above the bottom of the pocket to top surface of the carrier.
4. K0 measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. Carrier camber shall be not than 1mm per 100mm through a length of 250mm.

(3) Taping reel dimensions



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 ANGLES = \pm HOLEDIA = \pm



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8. Environmental Characteristics

This product is qualified according to AEC-Q200.

(1) Reliability Test

Item	Condition	Specification
Thermal shock	1. 30±3 minutes at -40°C±5°C, 2. Convert to +105°C (5 minutes) 3. 30±3 minutes at +105°C±5°C, 4. Convert to -40°C (5 minutes) 5. Total 100 continuous cycles	No damage
Humidity resistance	1. Humidity: 85% R.H. 2. Temperature: 85±5°C 3. Time: 1000 hours.	No damage
High temperature resistance	1. Temperature: 150°C±5°C 2. Time: 1000 hours.	No damage
Low temperature resistance	1. Temperature: -40°C±5°C 2. Time: 1000 hours.	No damage
Soldering heat resistance	1. Solder bath temperature: 260±5°C 2. Bathing time: 10±1 seconds	No damage
Solderability	The dipped surface of the terminal shall be at least 95% covered with solder after dipped in solder bath of 245±5°C for 3±1 seconds.	No damage

(2) Storage condition

(a) At warehouse :


The temperature should be within 0 ~ 30°C and humidity should be less than 60% RH.
 The product should be used within 1 year from the time of delivery.

(b) On board :

The temperature should be within -40 ~ 85°C and humidity should be less than 85% RH.

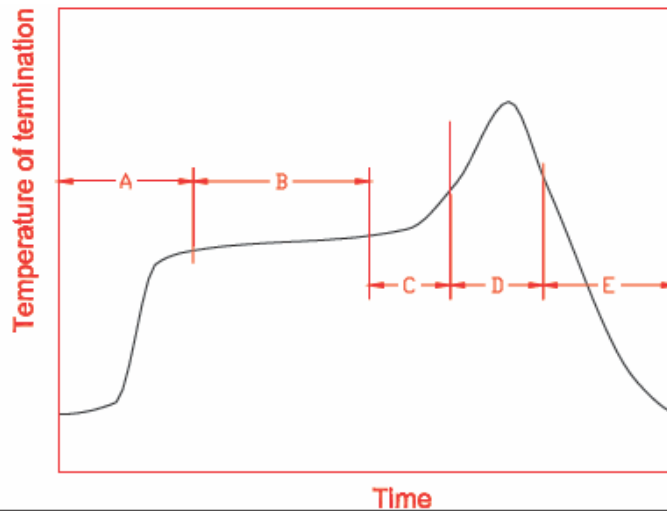
(3) Operating temperature range

Operating temperature range : -40 ~ +105°C.

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9. Recommended reflow soldering

Reference: J-STD-020C



Region	Description	Temperature Range	Time
A	1 st rising temperature	The normal to Preheating temperature	30s to 60s
B	Preheating	140°C to 160°C	60s to 120s
C	2 nd rising temperature	Preheating to 200°C	20s to 40s
D	Main heating	if 220°C	50s~60s
		if 230°C	40s~50s
		if 240°C	30s~40s
		if 250°C	20s~40s
E	Regular cooling	200°C to 100°C	1°C/s ~ 4°C/s

(1) Soldering gun procedure

Note the follows, in case of using solder gun for replacement.

- The tip temperature must be less than 350°C for the period within 3 seconds by using soldering gun under 30 W.
- The soldering gun tip shall not touch this product directly.

(2) Soldering volume

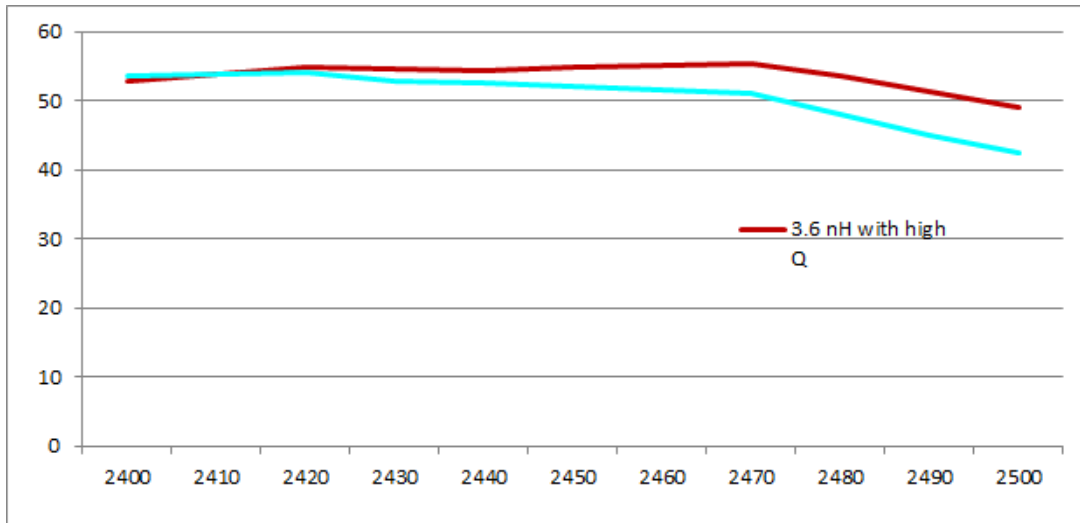
Note that excess of soldering volume will easily get crack the body of this product.

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10. IMWW Peak Gain: 1.46 dBi Typ.

condition	Frequency(MHz)	2300	2310	2320	2330	2340	2350	2360	2370	2380
3.6 nH with high Q	Directivity(dBi)	4.85	4.76	4.59	4.57	4.65	4.61	4.53	4.39	4.2
	Average Gain(dBi)	-5.69	-5.44	-5.15	-5.02	-4.66	-4.42	-4.25	-3.97	-3.73
	Efficiency(%)	26.96	28.6	30.52	31.47	34.18	36.14	37.59	40.08	42.37
	Peak Gain(dBi)	-0.84	-0.68	-0.56	-0.45	-0.01	0.19	0.28	0.42	0.47
3.6 nH with low Q	Directivity(dBi)	4.32	4.49	4.57	4.57	4.58	4.51	4.45	4.47	4.41
	Average Gain(dBi)	-4.69	-4.32	-3.9	-3.7	-3.47	-3.2	-2.98	-2.77	-2.79
	Efficiency(%)	34	36.96	40.77	42.69	45.02	47.86	50.39	52.85	52.62
	Peak Gain(dBi)	-0.37	0.17	0.68	0.87	1.11	1.31	1.47	1.7	1.62

2390	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
3.99	3.83	3.75	3.65	3.59	3.67	3.65	3.85	4.02	4.1	4.09	3.9
-3.43	-2.77	-2.69	-2.61	-2.63	-2.64	-2.6	-2.58	-2.56	-2.7	-2.9	-3.09
45.42	52.83	53.84	54.83	54.63	54.48	55	55.25	55.47	53.66	51.31	49.14
0.56	1.06	1.06	1.04	0.97	1.03	1.05	1.27	1.46	1.4	1.19	0.81
4.31	4.21	4.12	4.01	3.88	3.77	3.65	3.58	3.84	4.09	4.23	4.21
-2.82	-2.7	-2.69	-2.67	-2.76	-2.8	-2.83	-2.88	-2.93	-3.19	-3.46	-3.71
52.22	53.7	53.81	54.03	52.96	52.48	52.14	51.47	50.97	48.01	45.07	42.57
1.49	1.51	1.43	1.34	1.12	0.97	0.82	0.7	0.91	0.9	0.77	0.51



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