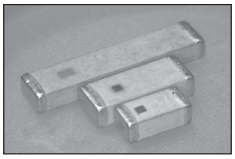
Multilayer Chip Antennas

NGAW Series

FEATURES

- LIGHT WEIGHT, COMPACT
- WIDE BANDWIDTH
- LOW COST LTCC CONSTRUCTION
- SURFACE MOUNTABLE CONSTRUCTION
- TAPED AND REELED FOR AUTOMATIC INSERTION

RoHS Compliant
includes all homogeneous materials
*See Part Number System for Details



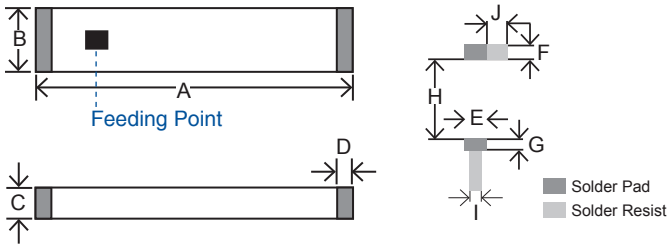
CHARACTERISTICS

Case Code	1206	5221	6020	7020	8010
Frequency Range	2.8GHz	2.35 ~ 2.78GHz	2.64GHz	2.47 ~ 2.86GHz	433MHz ~ 3.01GHz
Case Code	9020	1603	3505	5004	
Frequency Range	2.66GHz	433MHz	650Mhz	650Mhz	
Operating Temperature Range	-40°C ~ +85°C				
Impedance	50Ω				
Power Capacity	3 Watts				
Resistance to Solder Heat	+260°C for 10 seconds				

DIMENSIONS (mm)

Case Code	A	B	C ± 0.2	D ± 0.2	E ± 0.2	F ± 0.2	G ± 0.2	H ± 0.2	I	J
NGAW1206	3.2 ± 0.2	1.6 ± 0.2	1.2	0.5	1.6	0.8	0.8	2.6	1.4	1.6
NGAW5221	5.2 ± 0.2	2.1 ± 0.2	1.0	0.5	2.3	1.5	1.0	4.0	1.4	2.3
NGAW6020	6.0 ± 0.2	2.0 ± 0.2	1.0	0.5	2.2	1.5	1.0	5.0	1.4	2.2
NGAW7020	7.0 ± 0.2	2.0 ± 0.2	1.0	0.5	2.2	1.5	1.0	6.0	1.4	2.2
NGAW8010	8.0 ± 0.2	1.0 ± 0.2	1.0	0.5	1.5	1.5	1.0	7.0	1.4	1.5
NGAW9020	9.0 ± 0.2	2.0 ± 0.2	1.0	0.5	2.2	1.5	1.0	8.0	1.4	2.2
NGAW1603	16.0 ± 0.4	3.0 ± 0.2	2	0.5	3.2	1.5	1.0	15	1.4	3.2
NGAW3505	35.0 ± 0.2	5.0 ± 0.2	1.0	1.0	5.2	1.5	1.0	33	1.4	5.2
NGAW5004	50.0 ± 0.5	4.0 ± 0.5	1.0	1.0	4.2	1.5	1.0	48	1.4	4.2

DIMENSIONS

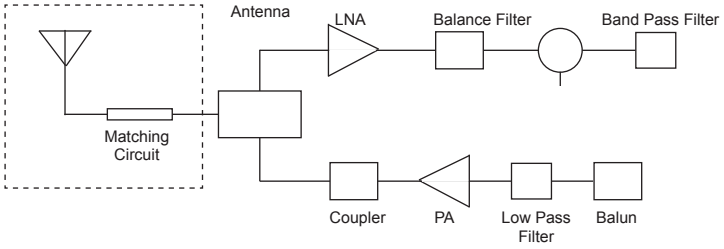


PART NUMBER SYSTEM

NGAW 1206S 2R800G S1 TR F

- F: RoHS Compliant
- TR: Packaging: TR = Tape & Reel
- S1: S1=Monopole, S2=Loop
- 2R800G: Frequency Code (Ghz): "R" indicates decimal
- 1206S: Size Code (see dimensions table for details)
- NGAW: Series

Typical Application

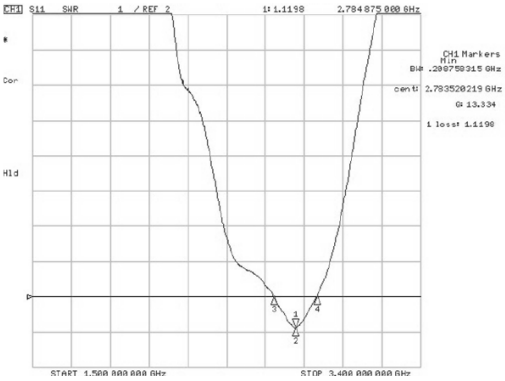


NGAW1206 Size (Please contact NIC for any specific bandwidth & center frequency requirments)

Part Number	Standard Values - Case Size 1206 (3.2 x 1.6 x 1.2mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW1206S2R800GS1TRF	2.80Ghz	≥ 100	0.5 dBi Typ.	-1dBi Typ.	<2	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves - NGAW1206S2R800GS1TRF



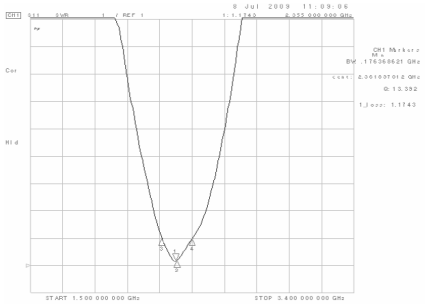
NGAW5221 Size

Part Number	Standard Values - Case Size 5221 (5.2 x 2.1 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW5221S2R350GS1TRF	2.35Ghz	≥ 150	2.5 dBi Typ.	0.5dBi Typ.	<2	50Ω	3W
NGAW5221S2R510GS1TRF	2.51Ghz	≥ 200	2.5 dBi Typ.	0.5dBi Typ.	<2	50Ω	3W
NGAW5221S2R540GS1TRF	2.54Ghz	≥ 200	2.5 dBi Typ.	0.5dBi Typ.	<2	50Ω	3W
NGAW5221S2R710GS1TRF	2.71Ghz	≥ 200	2.5 dBi Typ.	0.5dBi Typ.	<2	50Ω	3W
NGAW5221S2R780GS1TRF	2.78Ghz	≥ 200	2.5 dBi Typ.	0.5dBi Typ.	<2	50Ω	3W

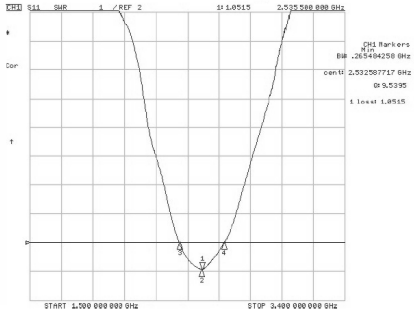
(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves -

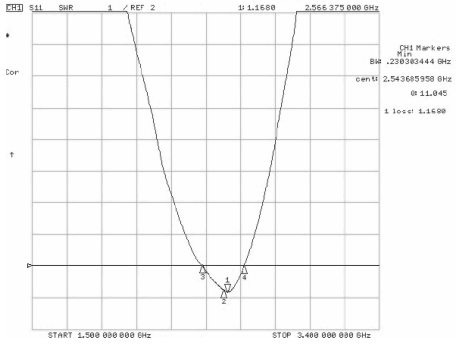
NGAW5221S2R350GS1TRF



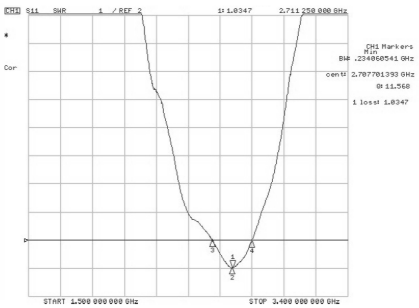
NGAW5221S2R510GS1TRF



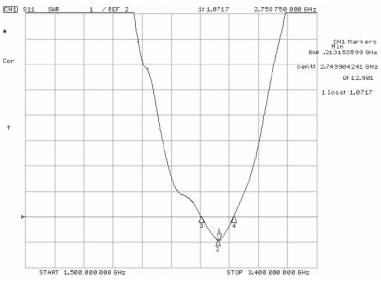
NGAW5221S2R540GS1TRF



NGAW5221S2R710GS1TRF



NGAW5221S2R780GS1TRF

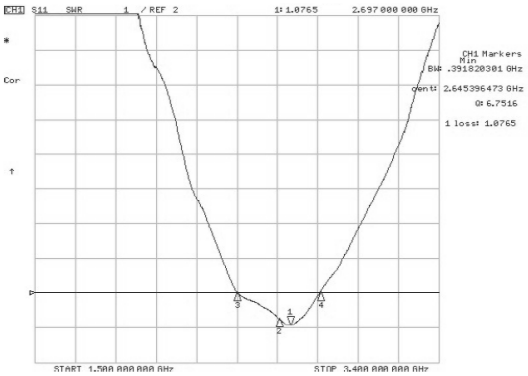


NGAW6020 Size

Part Number	Standard Values - Case Size 6020 (6.0 x 2.0 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW6020S2R640GS1TRF	2.64Ghz	≥ 200	2.6 dBi Typ.	0.7dBi Typ.	<2	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves - NGAW6020S2R640GS1TRF



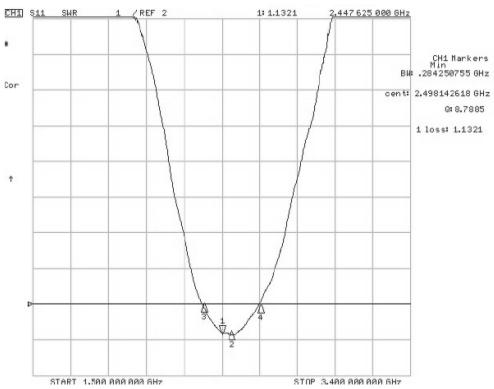
NGAW7020 Size

Part Number	Standard Values - Case Size 7020 (7.0 x 2.0 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW7020S2R470GS1TRF	2.47Ghz	≥ 200	2.7 dBi Typ.	1.0dBi Typ.	<2	50Ω	3W
NGAW7020S2R860GS2TRF	2.86Ghz	≥ 200	2.7 dBi Typ.	1.0dBi Typ.	<2	50Ω	3W

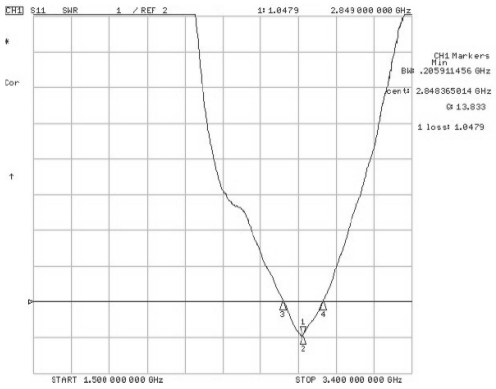
(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves -

NGAW7020S2R470GS1TRF



NGAW7020S2R860GS2TRF

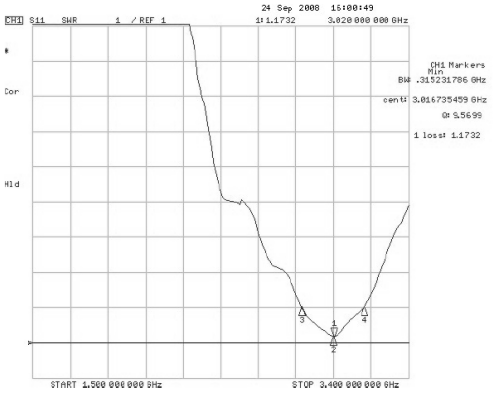


NGAW8010 Size

Part Number	Standard Values - Case Size 8010 (8.0 x 1.0 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW8010S3R010GS1TRF	3.01Ghz	≥ 200	2.0 dBi Typ.	0.5dBi Typ.	<2	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves - NGAW8010S3R010GS1TRF

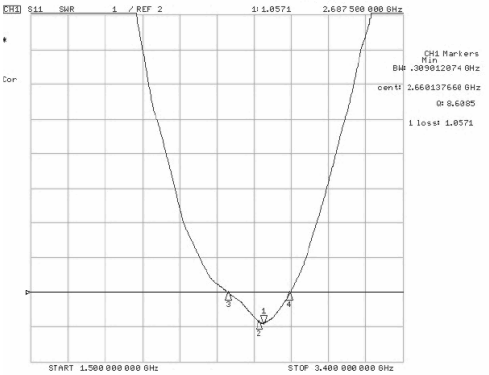


NGAW9020 Size

Part Number	Standard Values - Case Size 9020 (9.0 x 2.0 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW9020S2R660GS1TRF	2.66Ghz	≥ 200	3.0 dBi Typ.	1.0dBi Typ.	<2	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves - NGAW9020S2R660GS1TRF

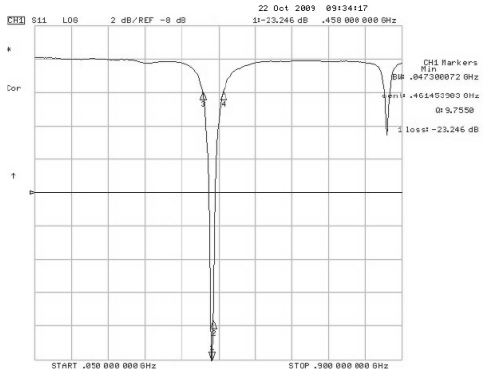


NGAW1603 Size

Part Number	Standard Values - Case Size 1603 (16.0 x 3.0 x 2.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW1603S0R433GS1TRF	433Mhz	≥ 20	3.0 dBi Typ.	1.0dBi Typ.	<2	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves - NGAW1603S0R433GS1TRF

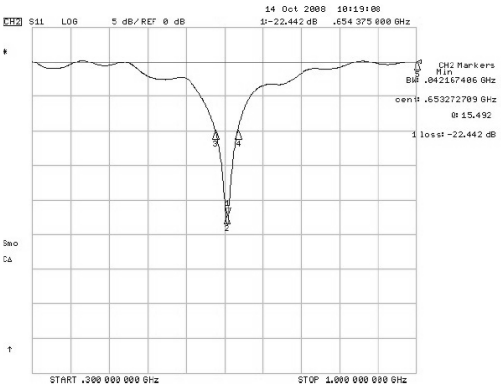


NGAW3505 Size

Part Number	Standard Values - Case Size 3505 (35.0 x 5.0 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW3505S0R650GS1TRF	650Mhz	≥ 50	-2.0 dBi Typ. (710MHz)	-7.0dBi Typ. (474MHz)	<3	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

Characteristic Curves - NGAW3505S0R650GS1TRF

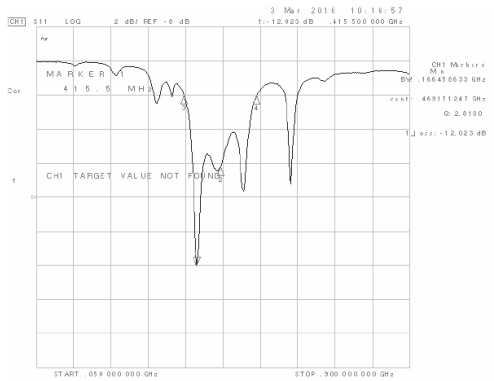


NGAW5004 Size

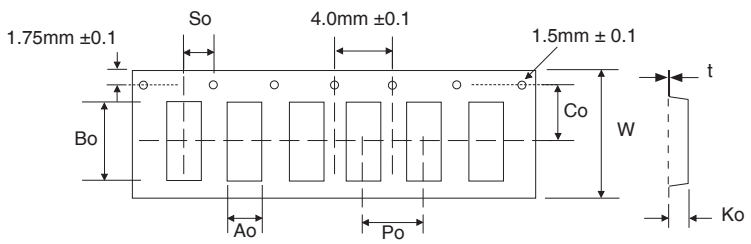
Part Number	Standard Values - Case Size 5004 (50.0 x 4.0 x 1.0mm)						
	Center Frequency	Bandwidth (MHz)	Peak Gain	Average Gain	VSWR	Impedance (Ω)	Power Capacity (W)
NGAW5004S0R650GS1TRF	650Mhz	474-862	-6.0 dBi (862 MHz).	-3.0 dBi (474 MHz)	<5	50Ω	3W

(Customization Available. Please contact NIC for any specific bandwidth & center frequency requirements)

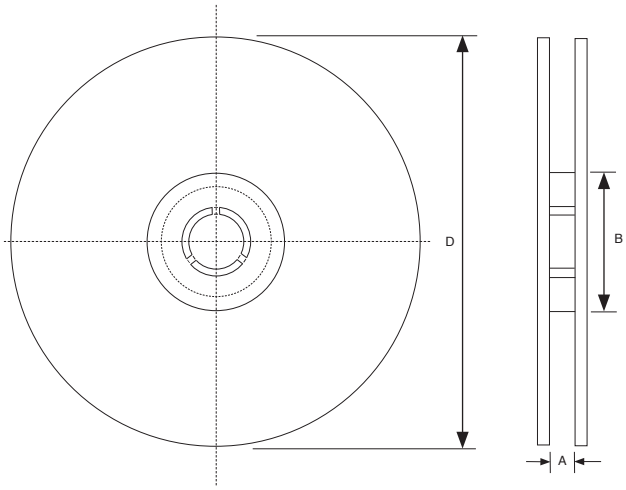
Characteristic Curves - NGAW5004S0R650GS1TRF



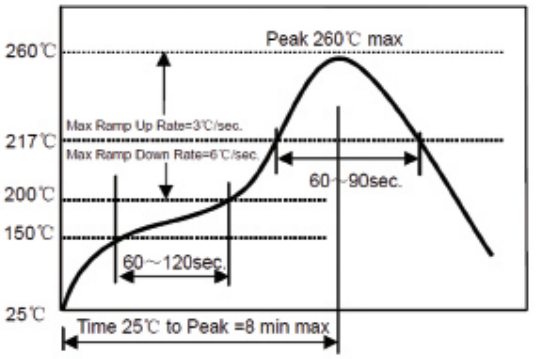
Case Size	CARRIER TAPING DIMENSIONS (mm) AND REEL QUANTITY								
	Ao	Bo	Po	So	Co	Ko	t	W	Quantity
NGAW1206	1.8 ± 0.1	3.5 ± 0.1	4.0 ± 0.1	2.0 ±0.05	3.5 ± 0.1	1.25 max.	0.27 max.	8.0 ± 0.3	3,000
NGAW5221	2.35 ± 0.1	5.50 ± 0.1	8.0 ± 0.1		5.5 ± 0.1	8.0 ± 0.3	0.35 max.	12.0 ± 0.3	4,000
NGAW6020	2.35 ± 0.1	6.30 ± 0.1	8.0 ± 0.1			12.0 ± 0.3			4,000
NGAW7020	2.30 ± 0.1	7.50 ± 0.1	8.0 ± 0.1	2.0 ±0.1	7.5 ± 0.1	1.9 ± 0.1		16.0 ± 0.3	4,000
NGAW8010	1.20 ± 0.1	8.40 ± 0.1	8.0 ± 0.1			1.6 ± 0.1			4,000
NGAW9020	2.30 ± 0.1	9.30 ± 0.1	8.0 ± 0.1			2.4 ± 0.1			4,000
NGAW1603	3.40 ± 0.1	16.40 ± 0.1	8.0 ± 0.1	2.0 ±0.2	14.25 ± 0.1	2.4 ± 0.1		32.0 ± 0.3	4,000
NGAW3505	5.70 ± 0.1	35.80 ± 0.1	12.0 ± 0.1	2.0 ±0.15	26.20 ± 0.1	3.4 ± 0.1		56.0 ± 0.3	4,000
NGAW5004	4.10 ± 0.1	51.00 ± 0.1	8.0 ± 0.1	2.0 ±0.2	34.20 ± 0.1	3.0 ± 0.15		72.0 ± 0.3	4,000



Tape Width	REEL DIMENSIONS (mm)		
	A(mm)	B(mm)	D(mm)
NGAW1206	9.0 ± 1.5	58 ± 2.0	178 ± 2.0
NGAW5221	12.5 ± 1.5	100 ± 2.0	330 ± 2.0
NGAW6020			
NGAW7020	16.5 ± 1.5		
NGAW8010			
NGAW9020			
NGAW1603	32.5 ± 1.5		
NGAW3505	56.5 ± 1.5		
NGAW5004	72.5 ± 1.5		

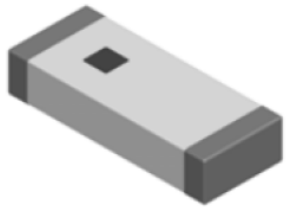


REFLOW SOLDERING PROFILE



FEATURES

- 2.450 GHz Chip Antenna
- Small Case Size:1206 (3.2 x 1.6mm)
- Pb Free Reflow Soldering Compatible
- RoHS Compliant



RoHS Compliant
includes all homogeneous materials
(see part numbering system for details)

APPLICATIONS

- Navigation
- Tracking
- Monitoring

SPECIFICATIONS

Electrical	
Center Frequency	2450MHz
Bandwidth	≤ 100MHz
Power Capacity	3 Watt
Peak Gain	2.5dBi @ XZ-total*
Average Gain	1.5dBi @ XZ-total*
V.S.W.R	<2.0
Impedance	50Ω

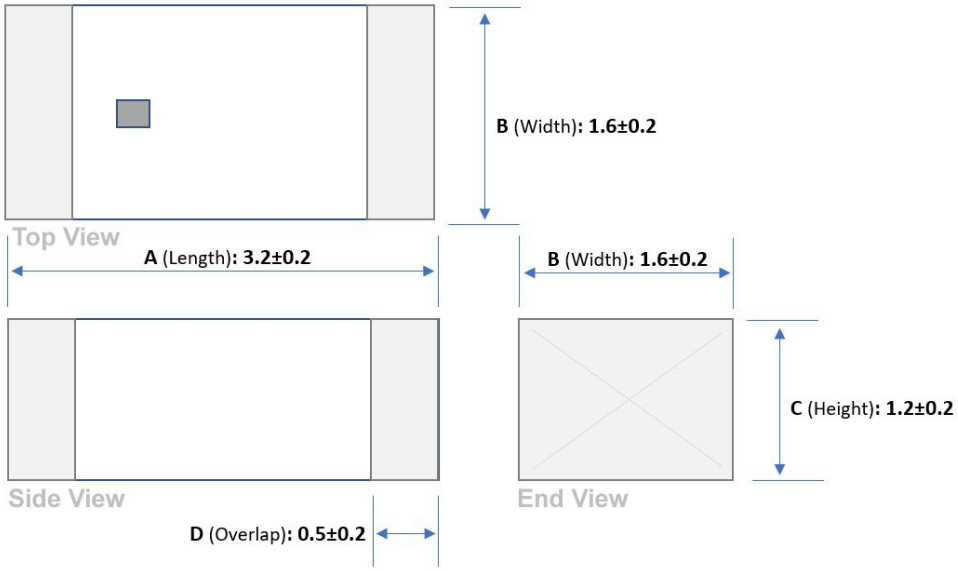
Environmental	
Operating Temperature	-40°C to +85°C
RoHS Compliant	Yes
Soldering Heat	+260°C for 10 seconds

Test Conditions:
- Ambient Temperature: +20±5℃
- Relative Humidity: 65±20%
- Air Pressure: 86 KPa to 106 KPa

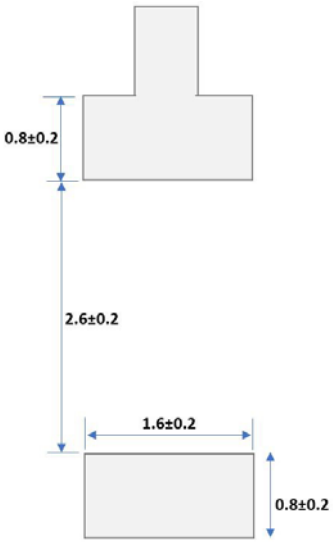
NGAW 1206S 2R45G S1 TR F

- F → RoHS compliant
- TR → Tape & Reel Packaging
- S1 → Type (S1 = Monopole, S2 = Loop)
- 2R45G → Center Frequency
- 1206S → Case Size
- NGAW → NGAW = Series

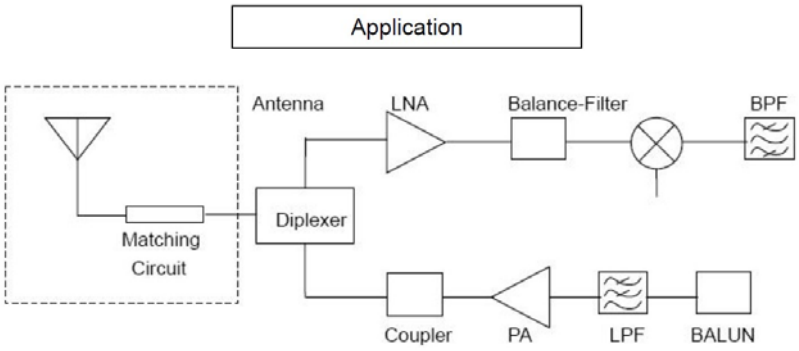
DIMENSIONS (mm)

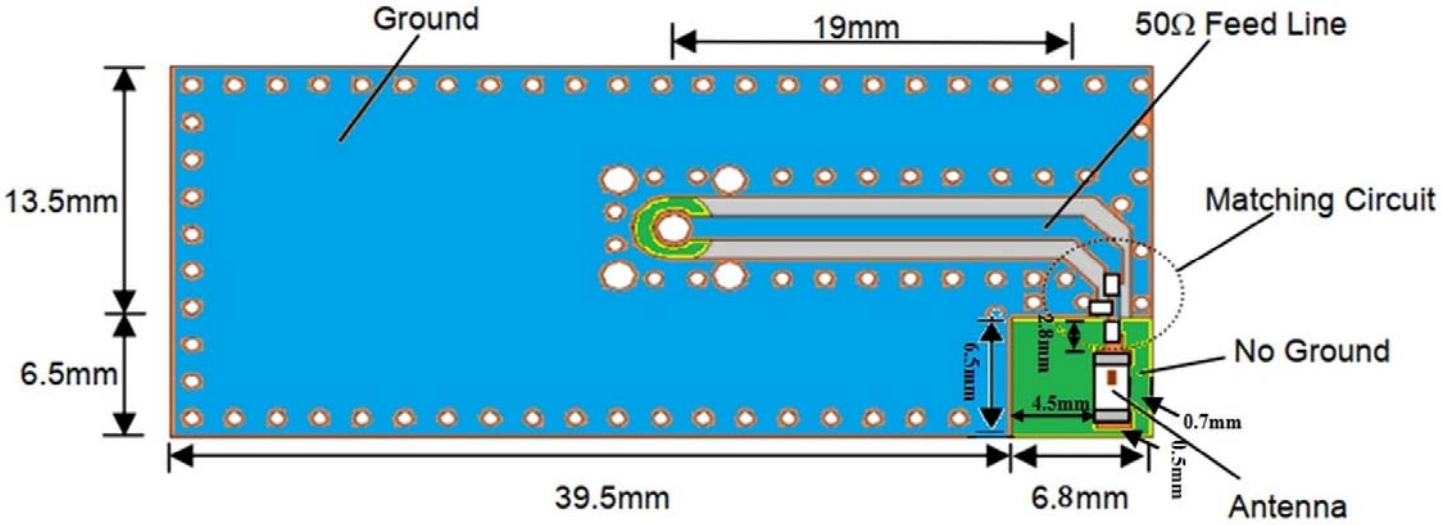


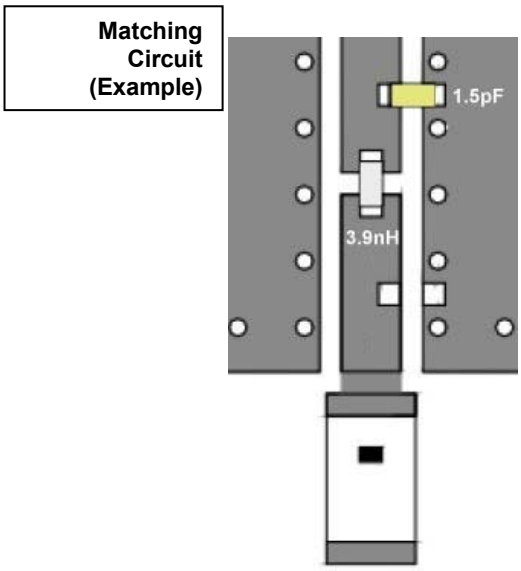
LAND PADS (mm)

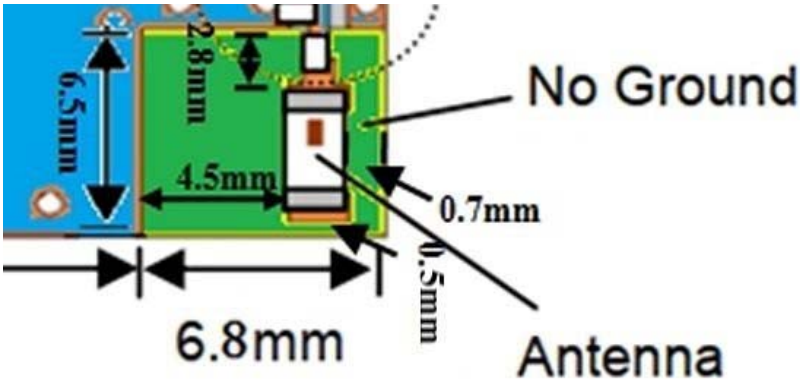


NIC Components Corp.

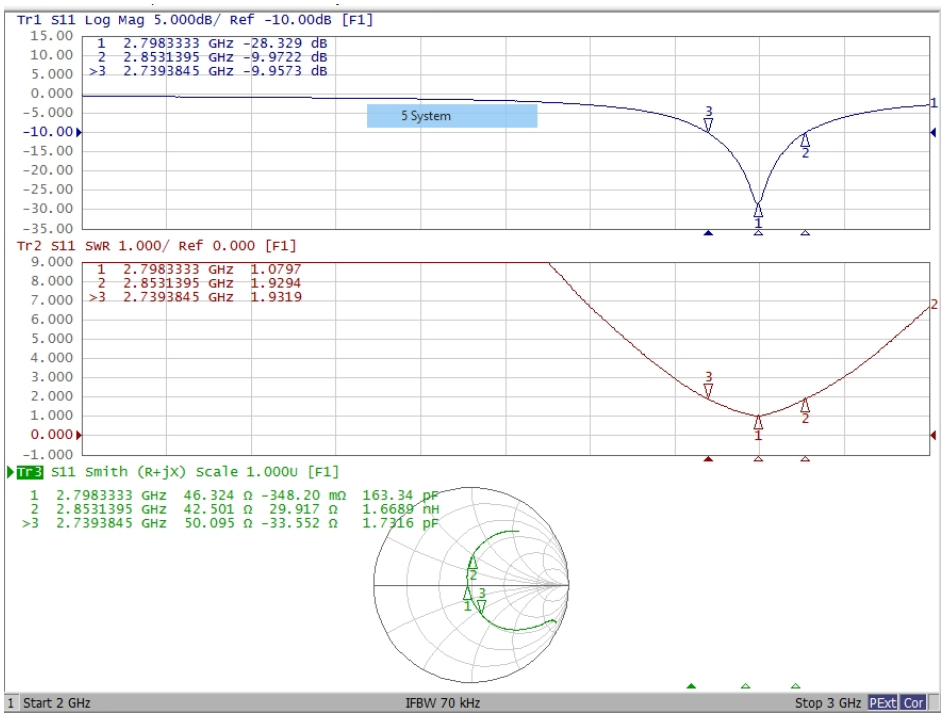

Application
Antenna
LNA
Balance-Filter
BPF
Matching
Circuit
Diplexer
Coupler
PA
LPF
BALUN


Ground
19mm
50Ω Feed Line
13.5mm
Matching Circuit
6.5mm
No Ground
2.8mm
6.5mm
4.5mm
0.7mm
0.5mm
39.5mm
6.8mm
Antenna

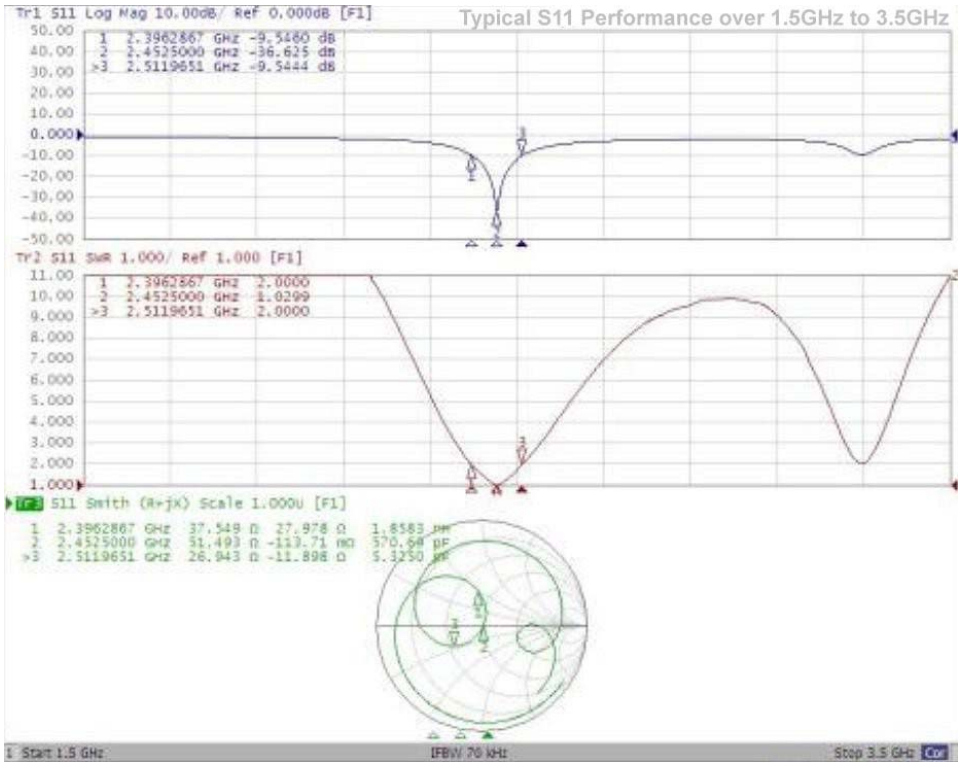

Matching
Circuit
(Example)
1.5pF
3.9nH


No Ground
2.8mm
6.5mm
4.5mm
0.7mm
0.5mm
6.8mm
Antenna

Electrical Performance Before Matching Circuit:

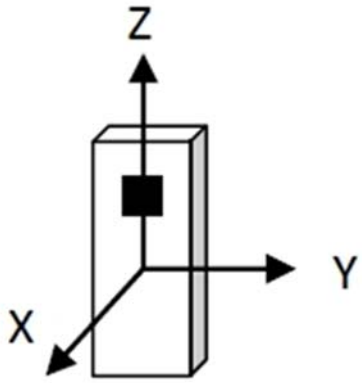


Electrical Performance After Matching Circuit:



NIC Components Corp.

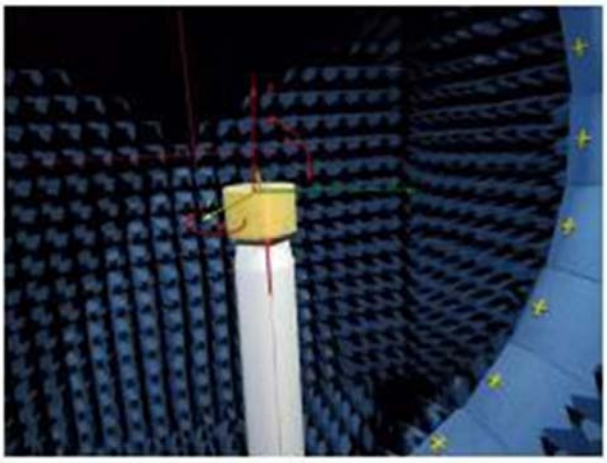
Gain & 2D Radiation pattern:



* - XZ-total is the total gain for XZ-direction (*see image below*)

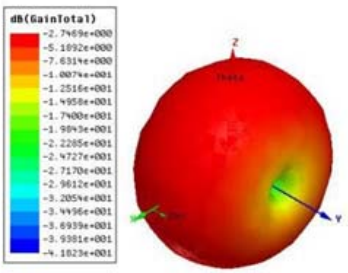
Frequency	Gain(dbi)
2400	-4.12543482
2410	-4.180958401
2420	-3.877599807
2430	-3.930632294
2440	-3.676540694
2450	-3.582882743
2460	-3.53429473
2470	-3.598055402
2480	-3.690017588
2490	-3.87625979
2500	-3.918544199

Radiation Patterns:

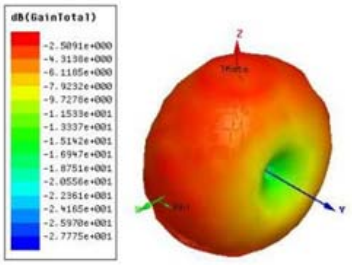


3D Radiation pattern:

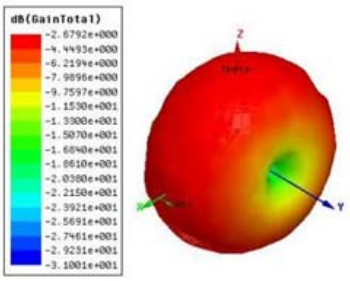
2400MHz



2450MHz

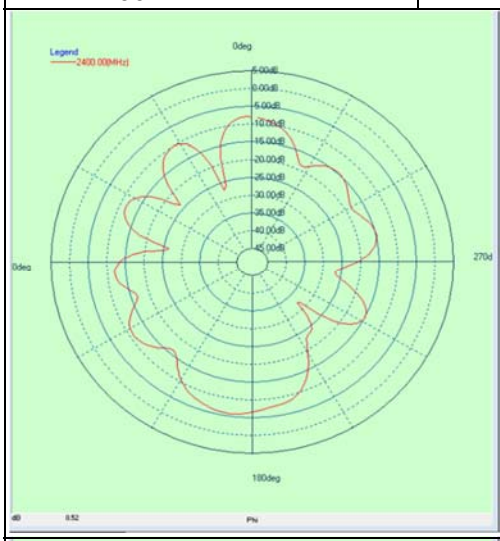
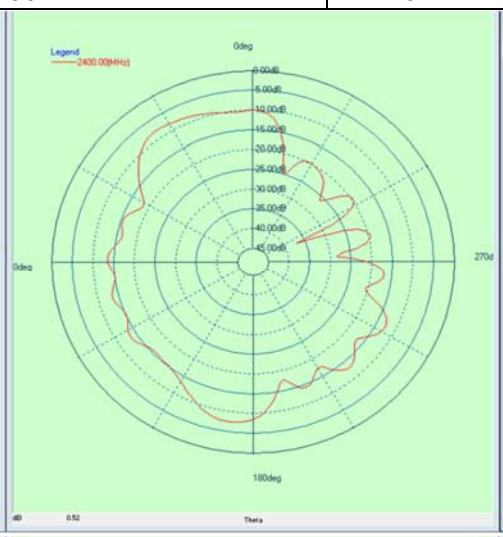
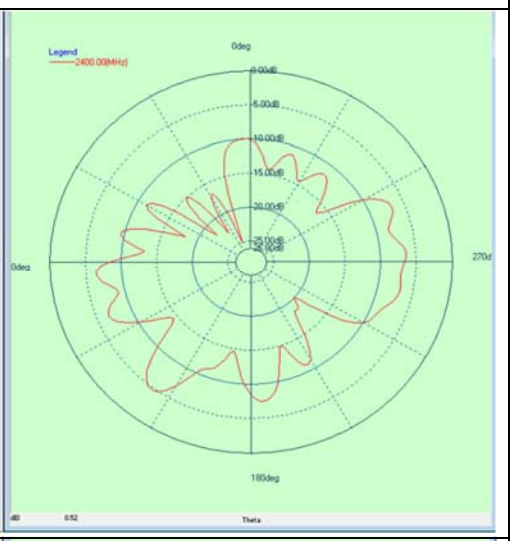
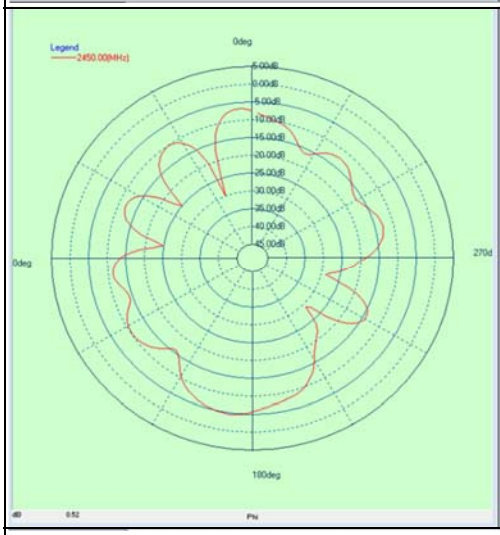
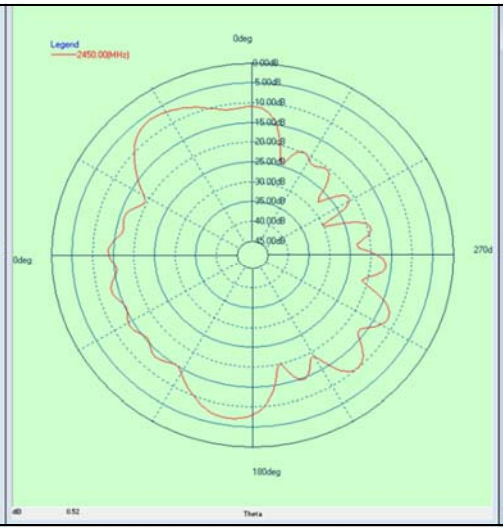
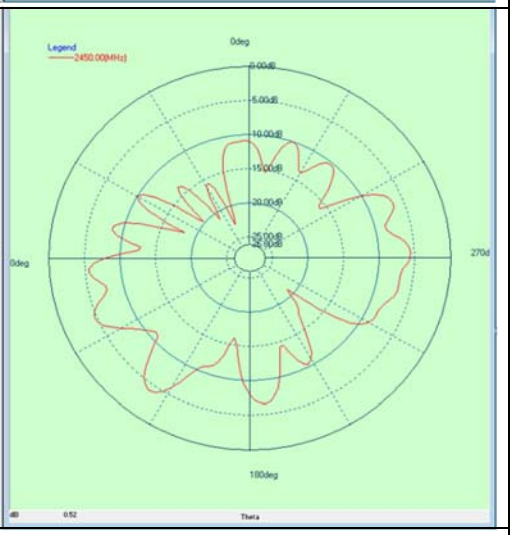
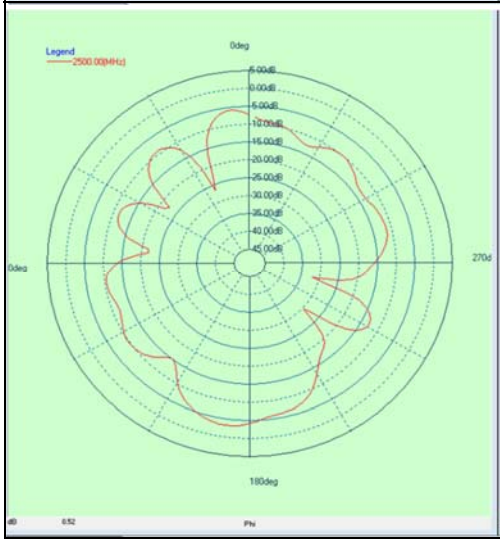
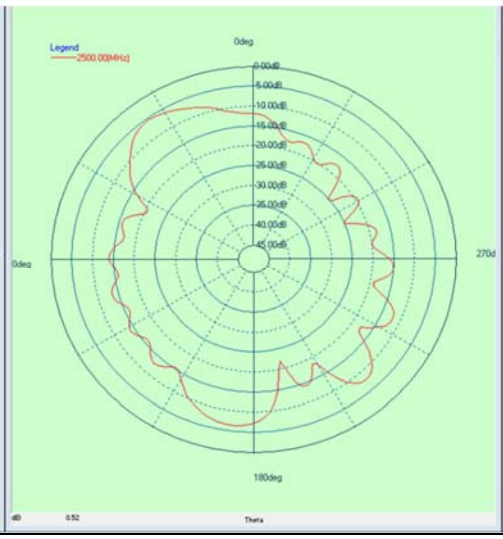
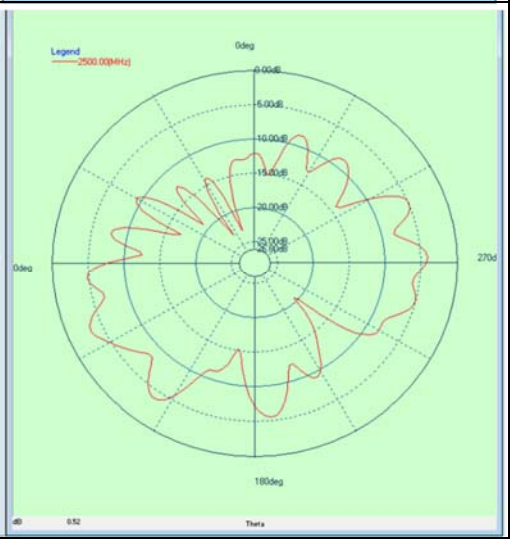


2500MHz



NIC Components Corp.

Radiation Patterns:

Theta = 90°	Phi = 90°	Phi= 0°
		
		
		

Revision History and Status

Revision	Date Issued	Details	Status
A	29 June 2020	Initial Release	Replaced
A2	02 July 2020	Dimensional Drawing Updated Corrections to Eval Board Dimensions Typos Fixed	Replaced
A3	02 July 2020	Radiation Patterns Updated	Replaced
A4	15 July 2020	Updated Radiation Patterns and Electrical Performance	Supported

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