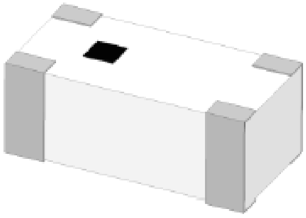
NGAW1206S2R450GS3TRF

2.45 GHz Multilayer Chip Antenna



Features

- Bluetooth/WIFI Protocols
- Support: 2.45 GHz Frequency
- Small Case Size:1206 (3.2 x 1.6mm)
- RoHs Complaint

Applications

- Navigation
- Tracking
- Monitoring

Specifications

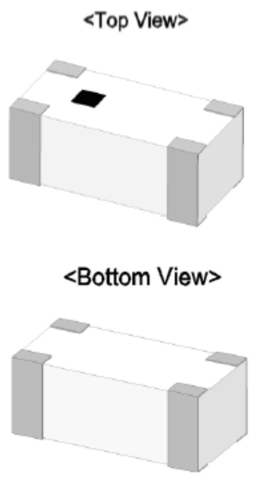
Electrical	
Center Frequency	2450 MHz
Frequency Range	2400 - 2500 MHz
Peak Gain	1.65 dBi
Return Loss	10 dB min.
Impedance	50Ω
Power Capacity	3 W max.
Environmental	
Operating Temperature -	-40℃~+85℃
Storage Temperature	-10℃~ +40℃
Relative Humidity	70% (Max)
ROHS Compliant	Yes

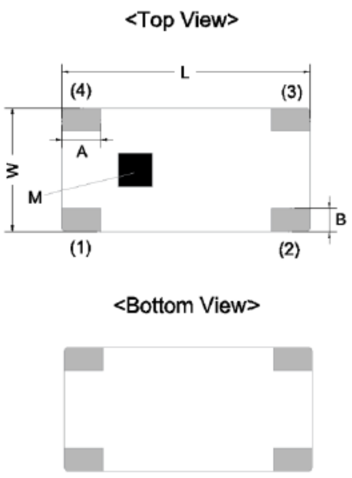
Part Number Breakdown

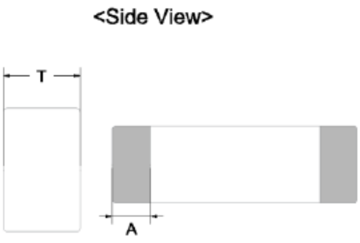
NGAW 1206S 2R450G S3 TR F

F: RoHS Compliant
TR = Tape & Reel Packaging
S3: Internal Performance Code
2R45G = Center Frequency
1206S = Case Size
NGAW: Series

Dimension Drawing & Dimensions (mm)







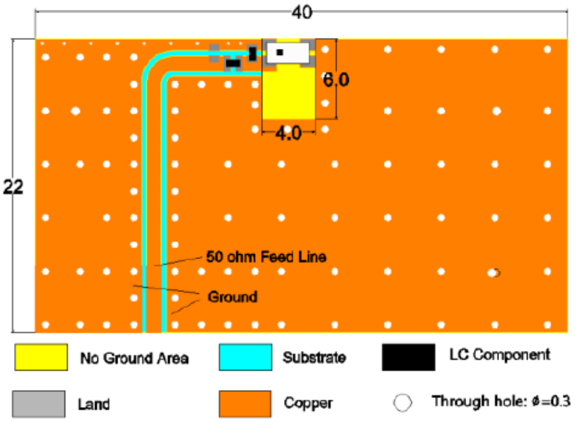
Scenario 1:
(1) : Feed
(2)(3)(4) : GND
M : MARK
Unit : mm

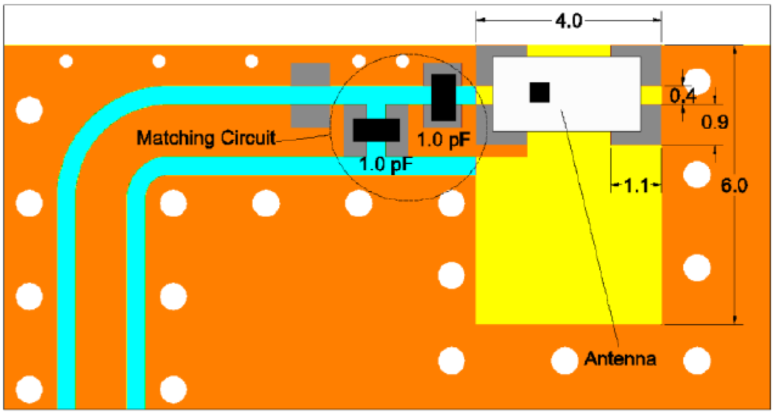
Scenario 2:
(4) : Feed
(1)(2)(3) : GND
M : MARK
Unit : mm

▨ : Pin Land

Mark	L	W	T	A	B
Dimensions (mm)	3.2 ± 0.2	1.6 ± 0.2	1.2 ± 0.2	0.5 ± 0.2	0.3 +0.1/-0.2

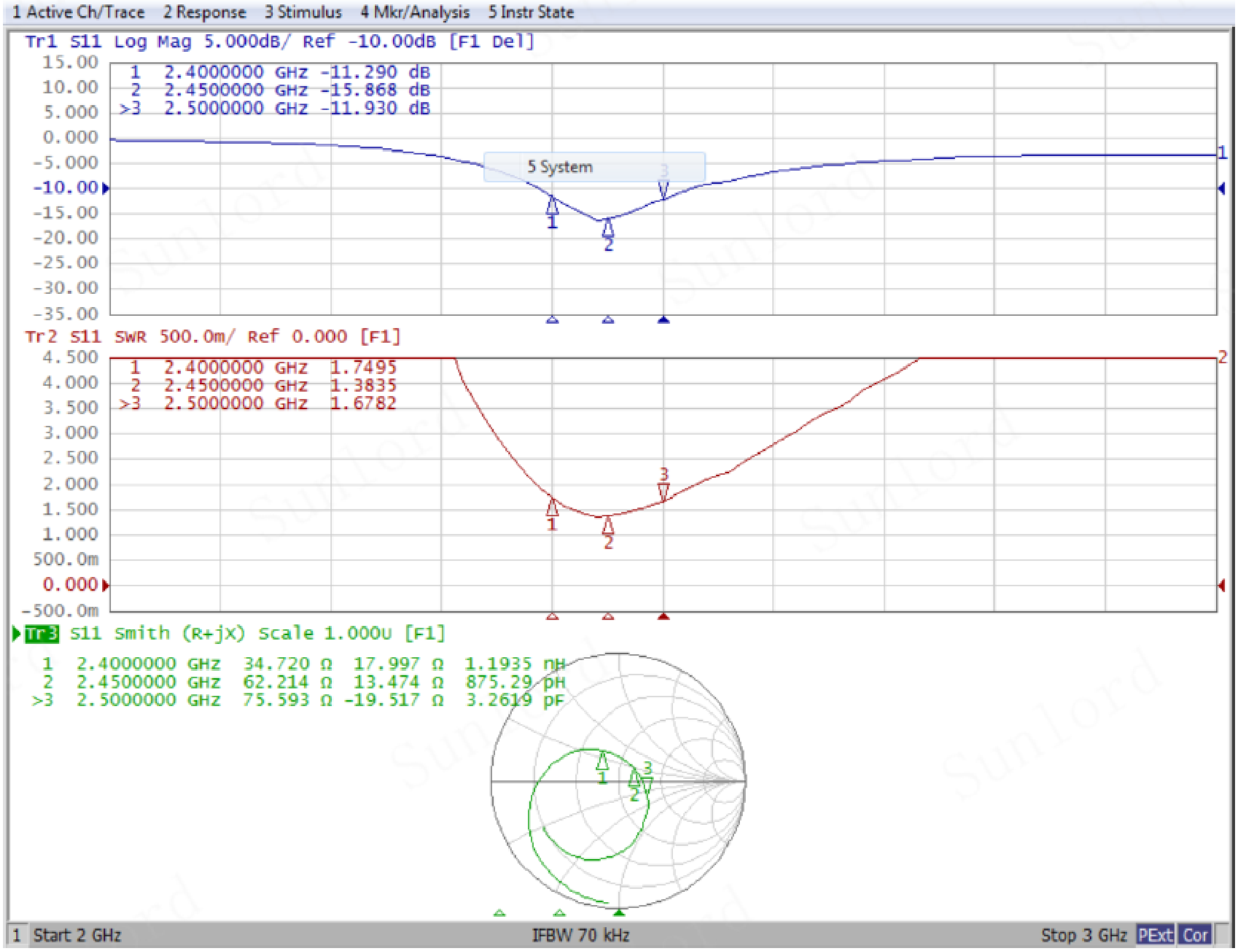
Recommended Land Pattern





*The matching circuits and LC component values are based on our evaluation board. The actual matching circuits need to be adjusted when the antenna is applied in the customer's design, because the antenna impedance is easily affected by PCB layout

Electrical Performance



```
Tr1 S11 Log Mag 5.000dB/ Ref -10.00dB [F1 Del]
  1  2.4000000 GHz -11.290 dB
  2  2.4500000 GHz -15.868 dB
 >3  2.5000000 GHz -11.930 dB
```

```
Tr2 S11 SWR 500.0m/ Ref 0.000 [F1]
  1  2.4000000 GHz  1.7495
  2  2.4500000 GHz  1.3835
 >3  2.5000000 GHz  1.6782
```

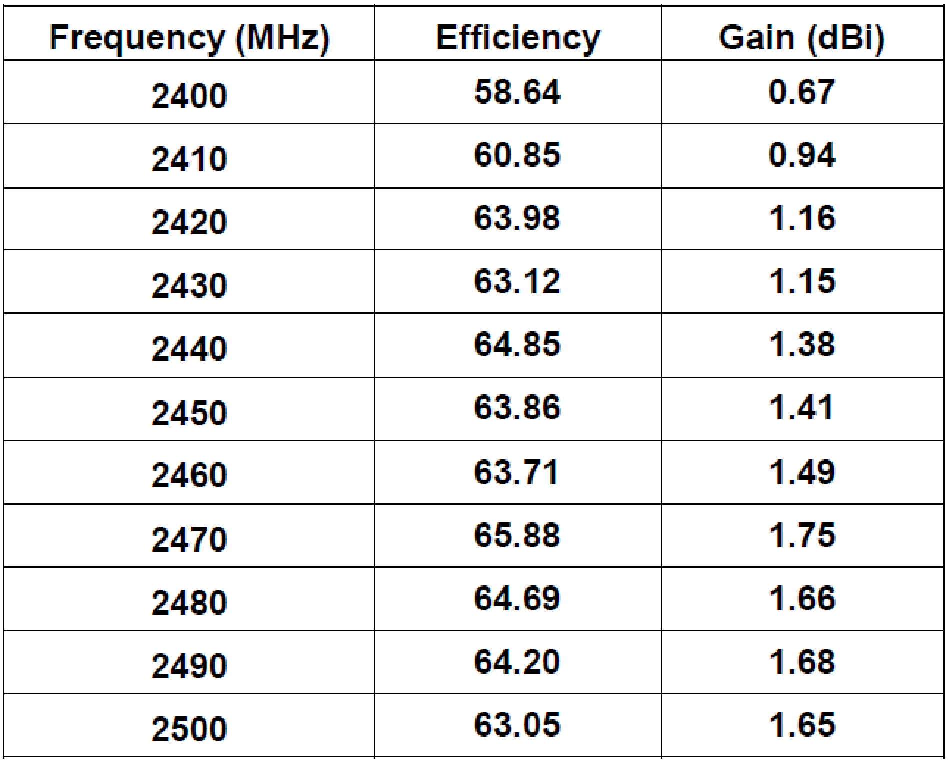
```
Tr3 S11 Smith (R+jX) Scale 1.000U [F1]
  1  2.4000000 GHz  34.720 Ω  17.997 Ω  1.1935 nH
  2  2.4500000 GHz  62.214 Ω  13.474 Ω  875.29 pH
 >3  2.5000000 GHz  75.593 Ω -19.517 Ω  3.2619 pF
```

Test Conditions

Unless otherwise specified, the standard atmospheric conditions for measurement/test as:
a. Ambient Temperature: 20±15℃
b. Relative Humidity: 65±20%
c. Air Pressure: 86 KPa to 106 KPa

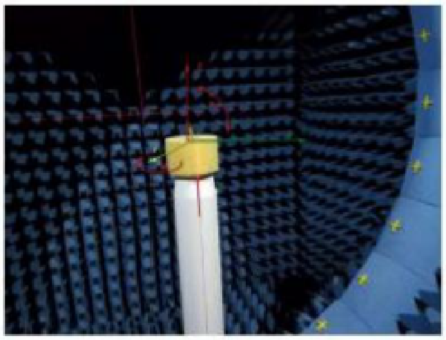
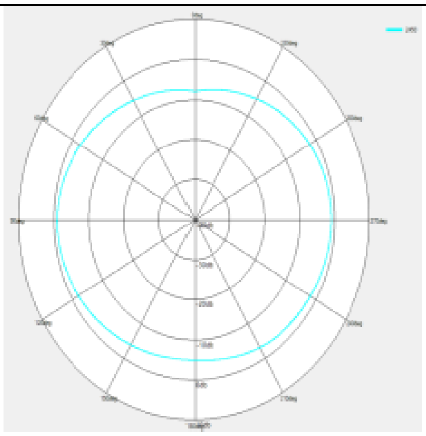
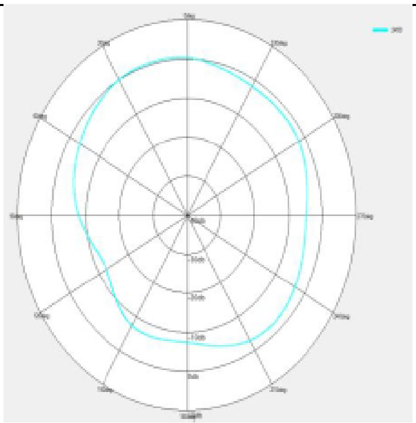
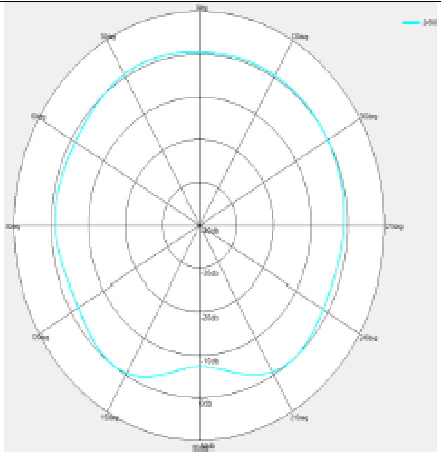
If any doubt on the results, measurements/tests should be made within the following limits:
a. Ambient Temperature: 20±2℃
b. Relative Humidity: 65±5%
c. Air Pressure: 86 KPa to 106 KPa

Gain and Efficiency at 2400 – 2500 MHz



Frequency (MHz)	Efficiency	Gain (dBi)
2400	58.64	0.67
2410	60.85	0.94
2420	63.98	1.16
2430	63.12	1.15
2440	64.85	1.38
2450	63.86	1.41
2460	63.71	1.49
2470	65.88	1.75
2480	64.69	1.66
2490	64.20	1.68
2500	63.05	1.65

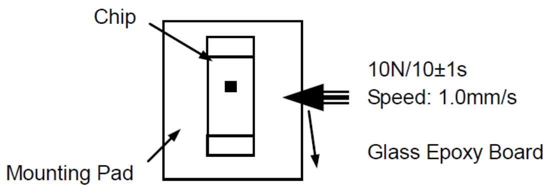
2D Radiation Patterns @ 2450 MHz

	Direction	
	XOY Plane	
	XOZ Plane	
	YOZ Plane	

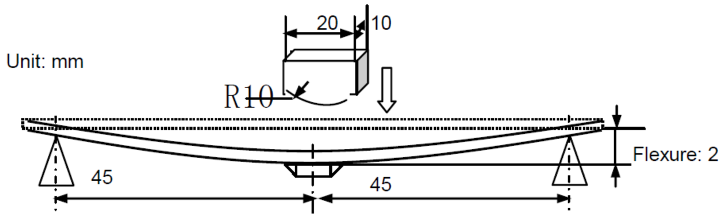
Reliability Test

<table>
<tr><td>Items</td><td>Requirements</td><td>Test Methods and Remarks</td></tr>
<tr><td>Terminal Strength</td><td>No visible mechanical damage</td><td>

1. Solder the inductor to the testing jig (glass epoxy board shown as the following figure) using leadfree solder. Then apply a force in the direction of the arrow
2. 10N force for 1206 series
3. Keep time: 10± 1 sec

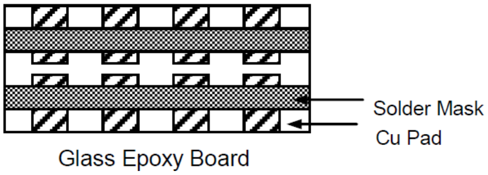


</td></tr>
<tr><td rowspan="2">Resistance to Fixture</td><td>No visible mechanical damage</td><td>

1. Solder the chip to the test jig (glass epoxy board) using a leadfree solder. Then apply a force in the direction shown as the following figure.
2. Flexure: 2 mm
3. Pressurizing Speed: 0.5mm/sec
4. Keep time: ≥ 30 sec
</td></tr>
<tr><td colspan="2">


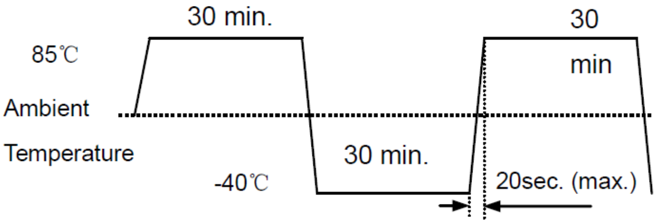
</td></tr>
<tr><td>Vibration</td><td>No visible mechanical damage</td><td>

1. Solder the chip to the testing jig (glass epoxy board shown as the following figure) using leadfree solder.
2. The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz
3. The frequency range from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hrs. in each 3 mutually perpendicular directions (total of 6 hrs.)



</td></tr>
</table>

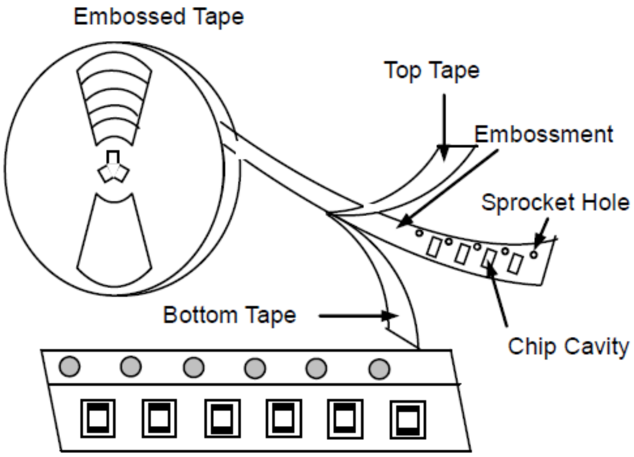
Reliability Test

Dropping	No visible mechanical damage	Drop the chip 10 times on a concrete floor from the height of 100 cm.
Solderability	1) No visible mechanical damage 2) Wetting shall be exceeded 75% coverage	1. Solder temperature: 240 ± 2°C 2. Duration: 3 sec 3. Solder: Sn/3.0Ag/0.5Cu 4. Flux: 25% Resin and 75% ethanol in weight
Resistance to Soldering Heat	No visible mechanical damage	1. Solder temperature: 260 ± 2°C 2. Duration: 5 sec 3. Solder: Sn/3.0Ag/0.5Cu 4. Flux: 25% Resin and 75% ethanol in weight 5. The chip shall be stabilized at normal condition for 1 ~ 2 hrs before measuring
Thermal Shock	1) No visible mechanical damage 2) Satisfy electrical characteristic	1. Temperature and time: -40°C for 30 ± 3 min → 85°C for 30 ± 3 min 2. Transforming interval: Max. 20 sec 3. Tested cycle: 100 cycles 4. The chip shall be stabilized at normal condition for 1 ~ 2 hours before measuring 
Damp Heat (Steady States)	1) No visible mechanical damage 2) Satisfy electrical characteristic	1. Temperature: 60 ± 2°C 2. Duration: 500^{+24} hours 3. The chip shall be stabilized at normal condition for 1~2 hours before measuring
Resistance to High Temperature	1) No visible mechanical damage 2) Satisfy electrical characteristic	1. Temperature: 85 ± 2°C 2. Duration: 500^{+24} hours 3. The chip shall be stabilized at normal condition for 1~2 hours before measuring

Packaging

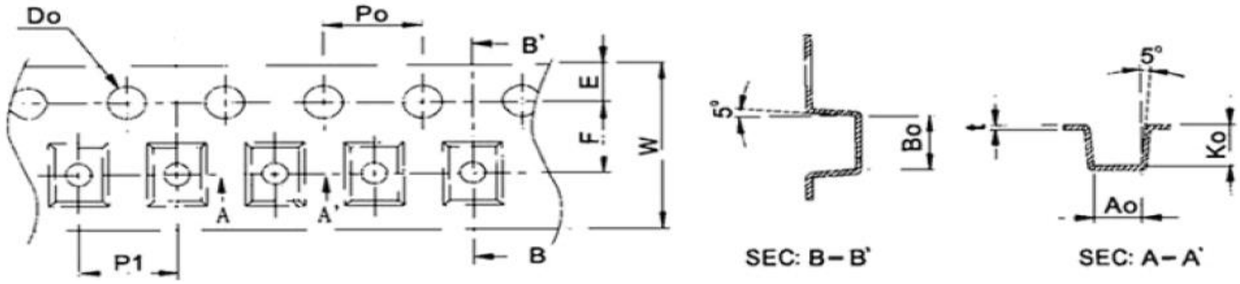
Type	3216[1206]
Tape	Embossed Tape
Quantity	3K

Taping Drawings (Unit: mm)



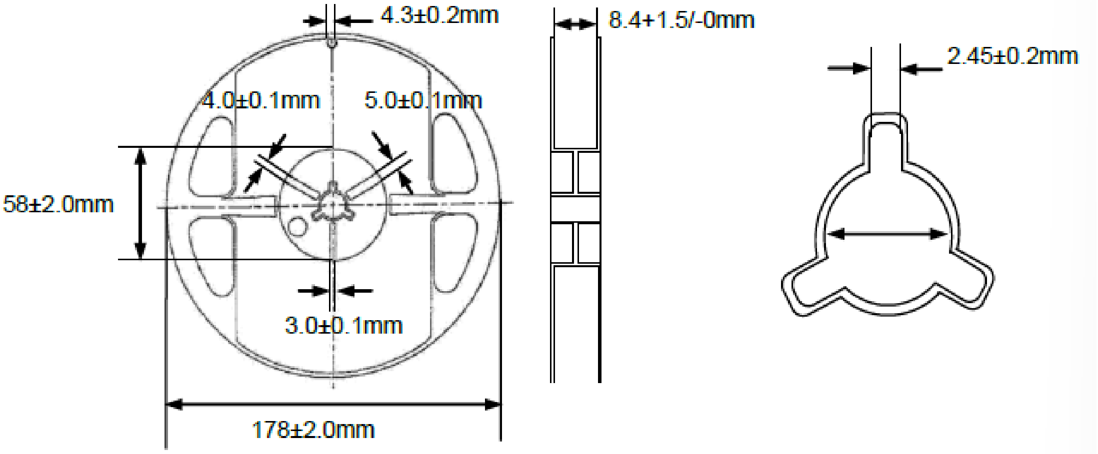
Remark: The sprocket holes are to the right as the tape is pulled toward the user.

Taping Dimensions (Unit: mm)



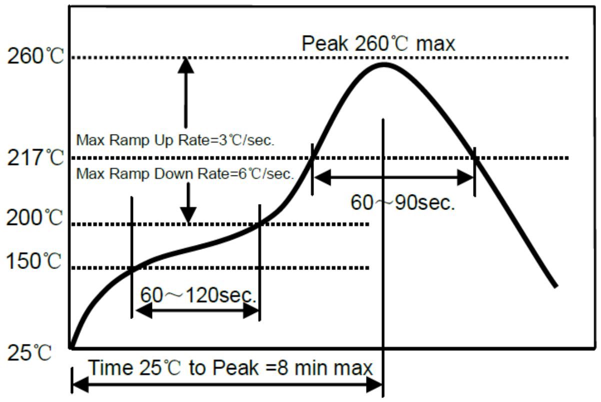
Type	W	P1	E	F	D0	P0	K0	A0	B0	t
Dimensions (mm)	8 ± 0.1	4 ± 0.1	1.75 ± 0.1	3.5 ± 0.2	1.5 +0.1/-0.0	4 ± 0.1	1.5± 0.1	1.8 ± 0.1	3.5 ± 0.1	0.22 ± 0.05

Reel Dimensions (Unit: mm)



a. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40°C or less and 70 % RH or less
b. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H_2S)
c. Packaging material may be deformed if package stored where they are exposed to heat of direct sunlight
d. Resistance to Soldering heat shall be guaranteed for 6 months from the date of delivery on condition that they are stored at the environment specified in the testing conditions. For those parts, which passed more than 6 months shall be checked solder-ability before use.

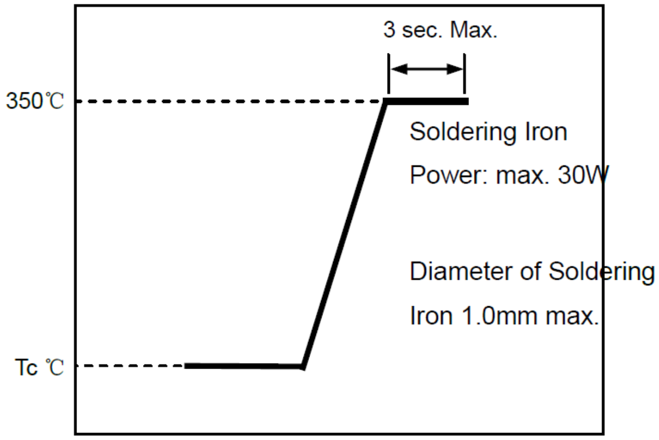
Recommended Soldering Technologies



Re-flowing Profile

- Preheat condition: 150 ~ 200°C / 60 ~120 sec.
- Allowed time above 217 °C: 60 ~ 90 sec.
- Max temp: 260 °C
- Max time at max temp: 10 sec.
- Solder paste: Sn/3.0Ag/0.5Cu
- Allowed Reflow time: 2x max

[Note: the reflow profile in the above table is only for qualification and is not meant to specify board assembly profiles. Actual board assembly profiles must be based on the customer’s specific board design. Solder paste and process, and should not exceed the parameters as the Reflow profile shows]



Iron Soldering Profile

- Iron soldering power: Max 30W
- Pre-heating: 150 °C / 60 sec.
- Soldering Tip temperature: 350 °C max.
- Soldering time: 3 sec max
- Solder paste: Sn/3.0Ag/0.5Cu
- Max.1 time for iron soldering

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]