Sep. 2024 Ver.1.5
TDK Corporation

Multilayer Chip Antenna

For Wifi6E/7

ANT Series 1.6x0.8mm [EIA 0603] TYPE

P/N: **ANT162450TT-3001A1**

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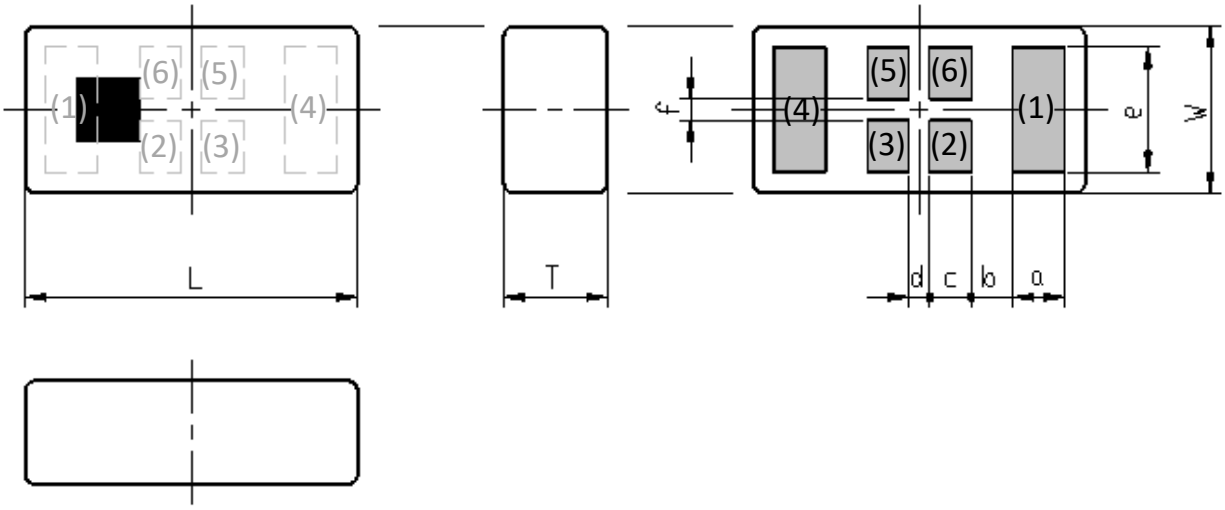
SHAPES AND DIMENSIONS

[Top View] [Bottom View]



Dimensions (mm)

L	W	T	a	b	c	d	e	f
1.60 +/-0.10	0.80 +/-0.10	0.45 Max	0.215 +/-0.10	0.25 +/-0.10	0.20 +/-0.10	(0.1)	0.63 +/-0.10	(0.1)

Terminal functions

(1)	Radiator electrode
(2)	GND
(3)	GND

(4)	Feed point
(5)	GND
(6)	GND

TERMINATION FINISH

Material
Au plate

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■ ELECTRICAL CHARACTERISTICS

(Measurement)

Parameter	Frequency (MHz)	TDK Spec		
		Min.	Typ.	Max.
VSWR	2400 to 2500	-	1.7	3.0
	5150 to 7125	-	1.8	3.0
Antenna Gain (dBi)**	2400 to 2500	-	1.8	-
	5150 to 7125	-	1.7	-
Polarization		Linear		
PCB Size (mm)		50x15x1		
Antenna keep-out Area (mm)		6.5x8.0		
Characteristic Impedance (ohm)		50 (Nominal)		

* This is typical antenna performance with the standard PCB.
** Reference value

■ MAXIMUM RATINGS

Parameter		TDK Spec	Conditions
Operating temperature (°C)		–40 to +85 °C	
Storage temperature (°C)		–40 to +85 °C	
Power Handling (W) *1	Frequency (MHz)		
	2400 to 2500	1	CW Duty 100%
	5150 to 7125	1	CW Duty 100%
Human Body Model : HBM	@Each Port (V)	+/-1000	100pF / 1500ohm
Machine Model : MM	@Each Port (V)	+/-150	200pF / 0ohm
Charged Device Model : CDM	@Each Port (V)	+/-500	Humidity : 60%RH max

*1 : Refer to 3GPP TS 38.101-1 V15.2.0

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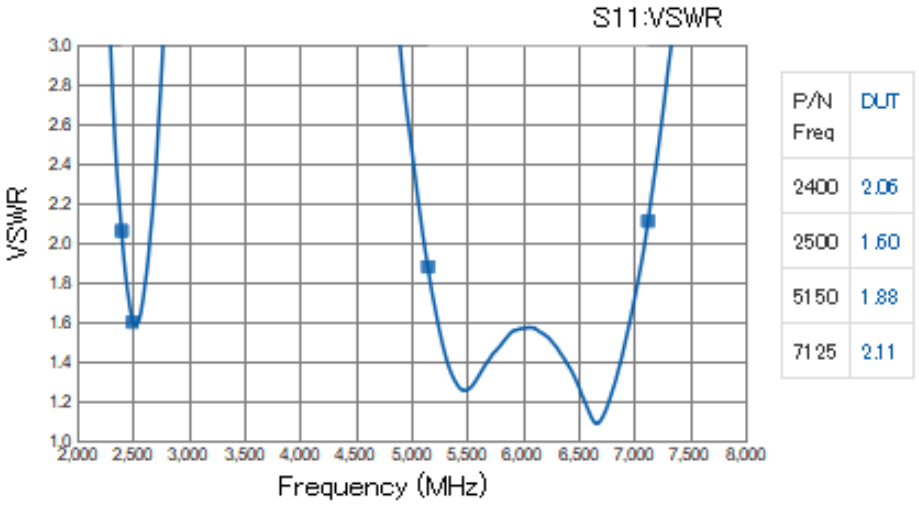
FREQUENCY CHARACTERISTICS

Note: Tested antenna has been soldered. Evaluation board size is 50x15x1 mm.

VSWR



P/N Freq	DUT
2400	2.06
2500	1.60
5150	1.88
7125	2.11

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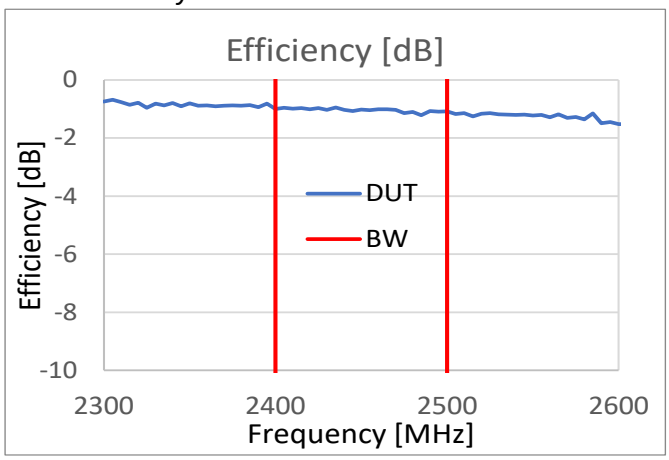

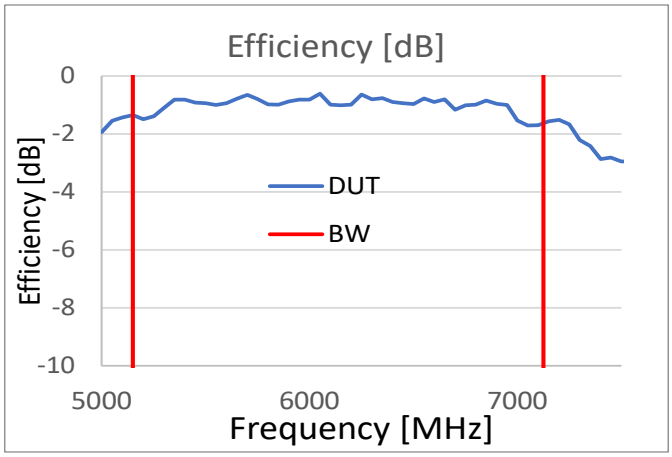

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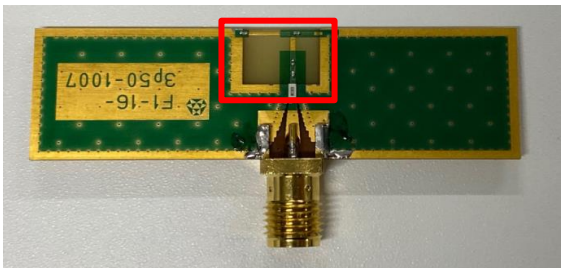
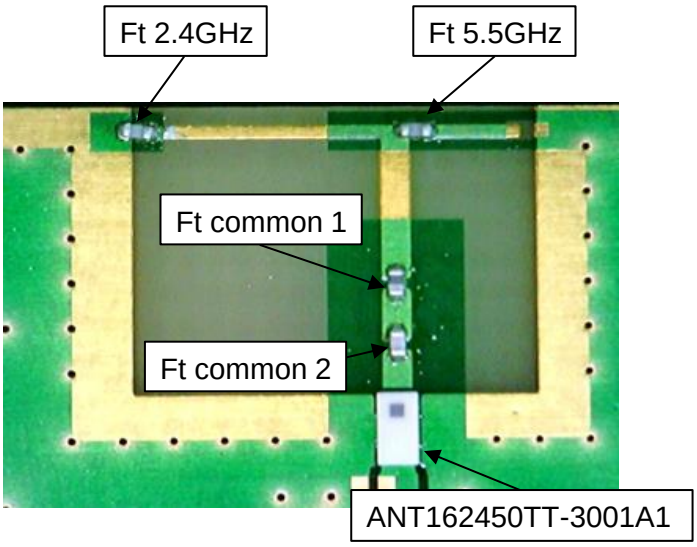
■ EVALUATION BOARD



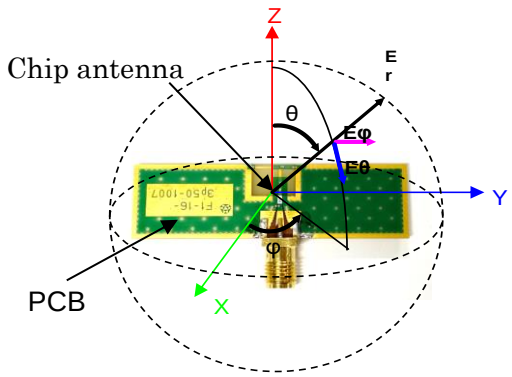


PCB size : 50mm x 20mm x 1mm
Antenna area : 8 x 5 mm

	Element Value
Ft 2.4GHz	0.6 pF
Ft 5.5GHz	1.6 pF
Ft Common1	0.5 nH(MLG0603S0N5B:TDK)
Ft Common2	1.8 pF

This evaluation board layout example is defined based on TDK standard.
Other board layouts can be used by optimizing their design.
Matching element values can be selected depending on the board layouts.
Getting more support, please access our website.
https://mytdk.tdk.com/ja/login

Measurement condition for Radiation Pattern



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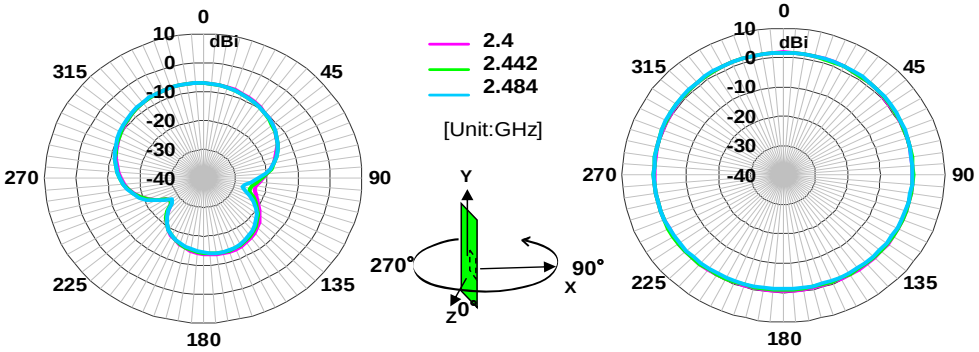
FREQUENCY CHARACTERISTICS

Note: Tested antenna has been soldered. Evaluation board size is 50x15x1 mm.

Radiation Pattern - 2.4 Band

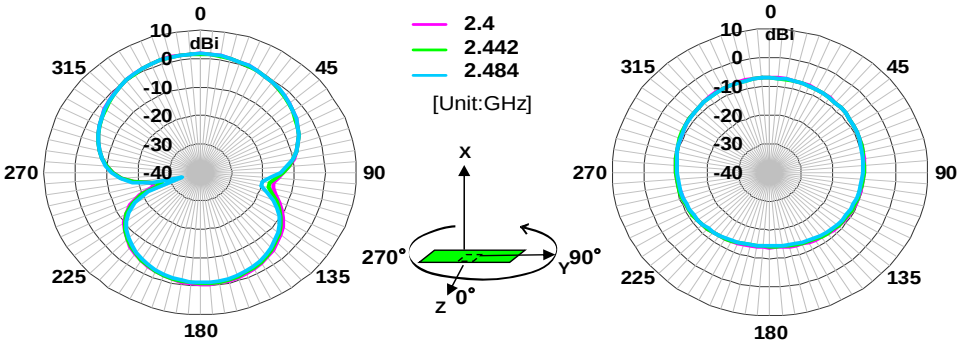


Horizontal Polarization

Frequency[GHz]	2.4	2.45	2.5
Average[dBi]	-11.6	-11.7	-11.6
Maximum[dBi]	-6.8	-6.9	-6.8
Minimum[dBi]	-27.5	-27.5	-27.6

Vertical Polarization

Frequency[GHz]	2.4	2.45	2.5
Average[dBi]	0.4	0.4	0.4
Maximum[dBi]	1.8	1.7	1.7
Minimum[dBi]	-0.6	-0.9	-1.2

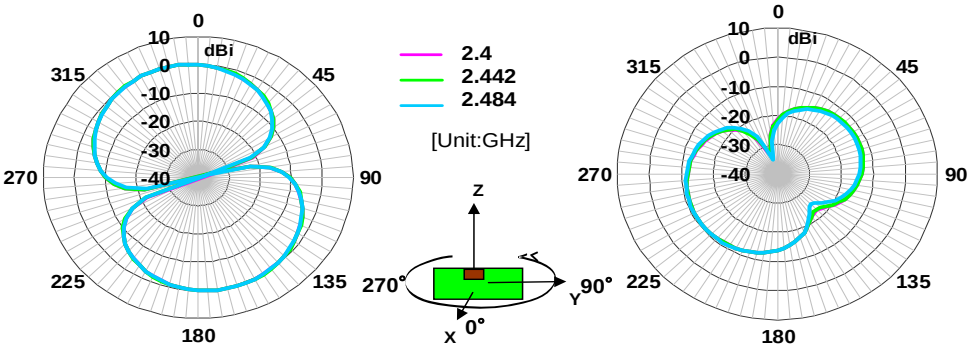


Horizontal Polarization

Frequency[GHz]	2.4	2.45	2.5
Average[dBi]	-2.5	-2.7	-2.8
Maximum[dBi]	1.8	1.7	1.8
Minimum[dBi]	-24.7	-27.4	-34.1

Vertical Polarization

Frequency[GHz]	2.4	2.45	2.5
Average[dBi]	-9.6	-9.7	-9.8
Maximum[dBi]	-6.9	-7.1	-7.0
Minimum[dBi]	-13.8	-14.2	-14.4



Horizontal Polarization

Frequency[GHz]	2.4	2.45	2.5
Average[dBi]	-2.6	-2.6	-2.7
Maximum[dBi]	0.6	0.6	0.5
Minimum[dBi]	-47.9	-44.7	-42.9

Vertical Polarization

Frequency[GHz]	2.4	2.45	2.5
Average[dBi]	-14.1	-14.1	-14.2
Maximum[dBi]	-10.8	-10.8	-10.6
Minimum[dBi]	-33.7	-33.9	-35.1

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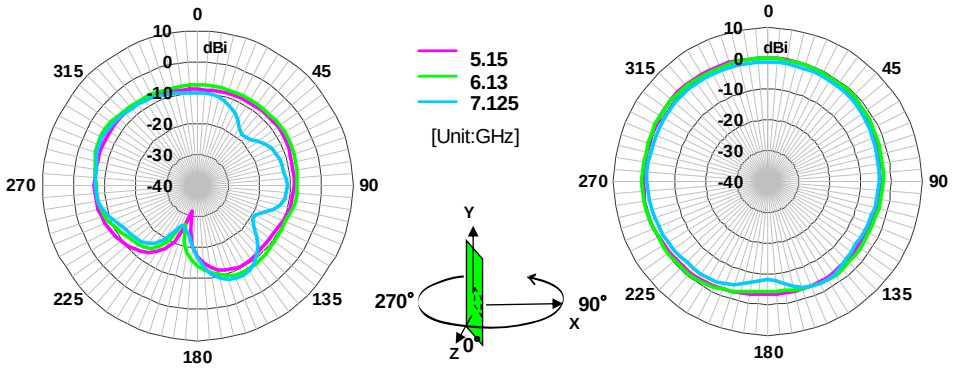
FREQUENCY CHARACTERISTICS

Note: Tested antenna has been soldered. Evaluation board size is 50x15x1 mm.

Radiation Pattern - 5-7GHzBand

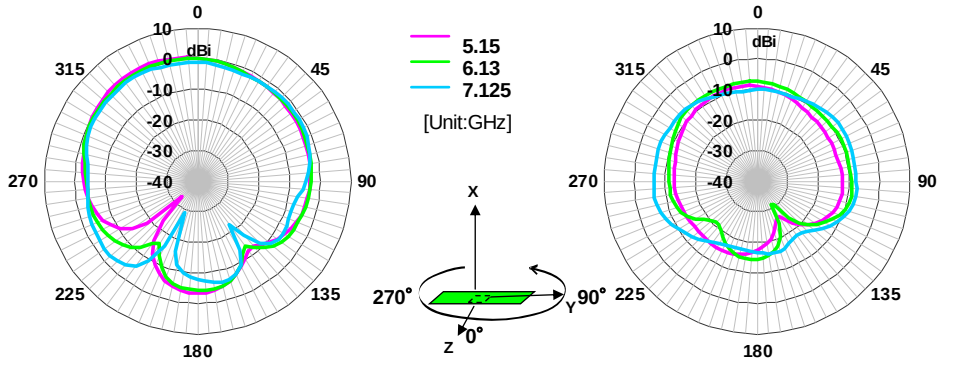


Horizontal Polarization

Frequency[GHz]	5.15	6.13	7.125
Average[dBi]	-9.0	-8.2	-10.3
Maximum[dBi]	-6.8	-5.1	-5.6
Minimum[dBi]	-31.7	-26.7	-26.2

Vertical Polarization

Frequency[GHz]	5.15	6.13	7.125
Average[dBi]	-1.1	-0.8	-2.3
Maximum[dBi]	1.1	1.2	-0.4
Minimum[dBi]	-4.2	-4.2	-7.9

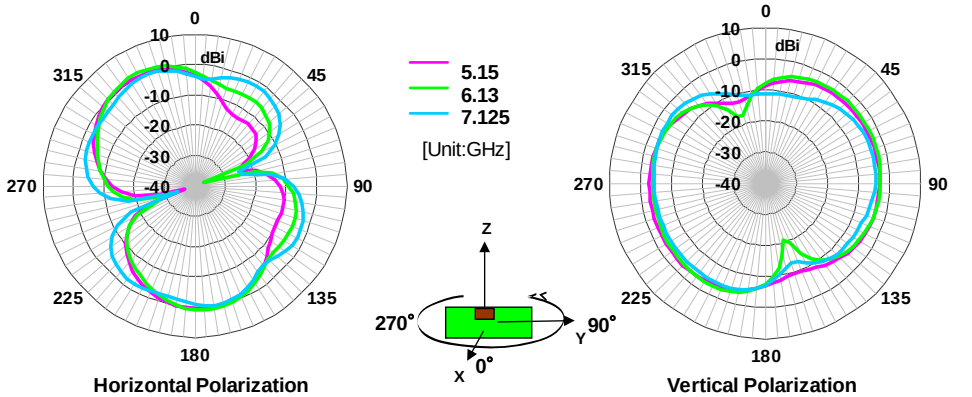


Horizontal Polarization

Frequency[GHz]	5.15	6.13	7.125
Average[dBi]	-2.5	-2.7	-3.2
Maximum[dBi]	1.5	0.6	-0.1
Minimum[dBi]	-32.6	-16.2	-28.9

Vertical Polarization

Frequency[GHz]	5.15	6.13	7.125
Average[dBi]	-12.4	-10.5	-9.2
Maximum[dBi]	-8.6	-7.2	-6.2
Minimum[dBi]	-26.2	-31.0	-18.2



Horizontal Polarization

Frequency[GHz]	5.15	6.13	7.125
Average[dBi]	-4.1	-3.4	-3.1
Maximum[dBi]	0.8	1.7	0.0
Minimum[dBi]	-36.5	-37.0	-34.2

Vertical Polarization

Frequency[GHz]	5.15	6.13	7.125
Average[dBi]	-4.6	-4.7	-5.8
Maximum[dBi]	-2.7	-2.6	-3.1
Minimum[dBi]	-12.6	-20.8	-12.9

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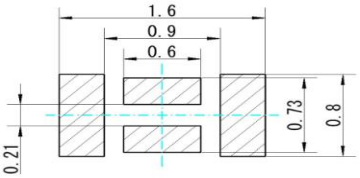
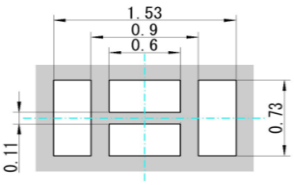
RECOMMENDED LAND PATTERN

Recommend land pattern and solder resist pattern

< Land pattern >

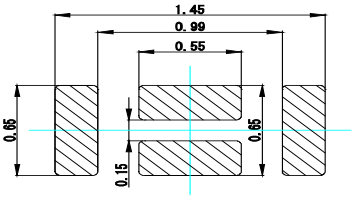


< Solder resist pattern >



Center line of Chip
Land Pattern
Resist Pattern

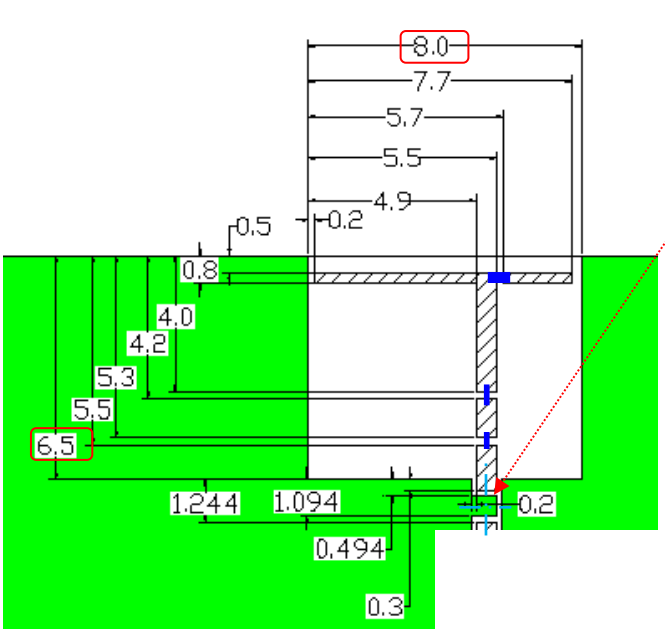
Recommend aperture size of metal mask for solder printing



Center line of Chip
Aperture of metal

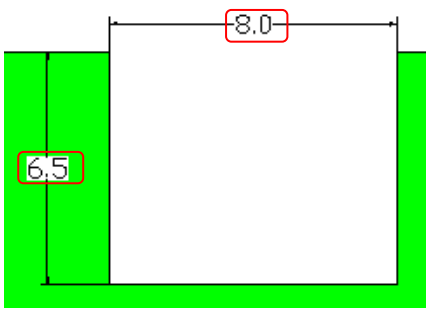
Example of Antenna pattern layout (TDK Standard PCB)

<Top Layer (Parts mounted side) >

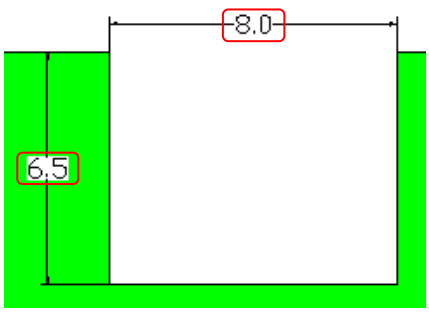


Center line of Chip antenna
Antenna keep out area (All Layer GND off)
Ft : Frequency tuning component
Antenna Pattern
GND
[Unit : mm]

<Inner Layer >



<Bottom Layer >



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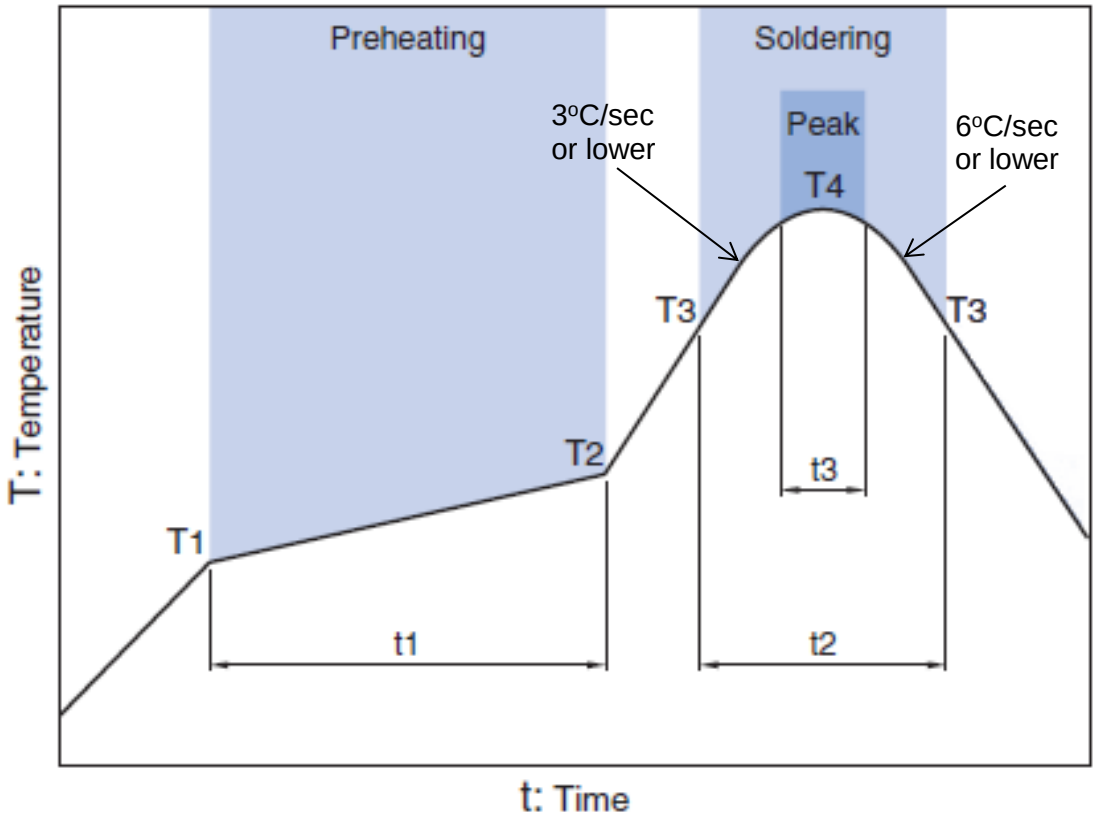
RECOMMENDED REFLOW PROFILE



Preheating			Soldering			
			Critical zone (T3 to T4)		Peak	
Temp.		Time	Temp.	Time	Temp.	Time
T1	T2	t1	T3	t2	T4	t3 *
150°C	200°C	60 to 120sec	217°C	60 to 120sec	240 to 260°C	30 sec Max

* t3 : Time within 5°C of actual peak temperature

The maximum number of reflow is 3.

Note: Lead free solder is recommended.
Recommended solder is Sn-3.0Ag-0.5Cu. (M705 by Senju Metal Industry)

GENERAL TECHNICAL INFORMATION

https://product.tdk.com/en/system/files?file=dam/doc/product/rf/rf/coupler/general_tech_info/rf_general-technical-info_02_en.pdf

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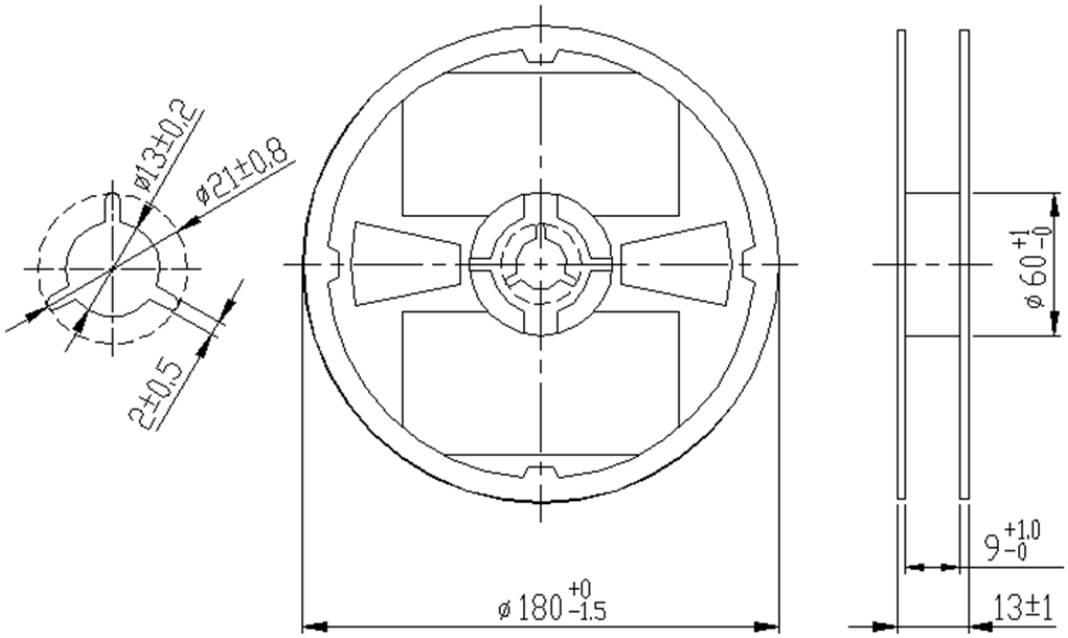
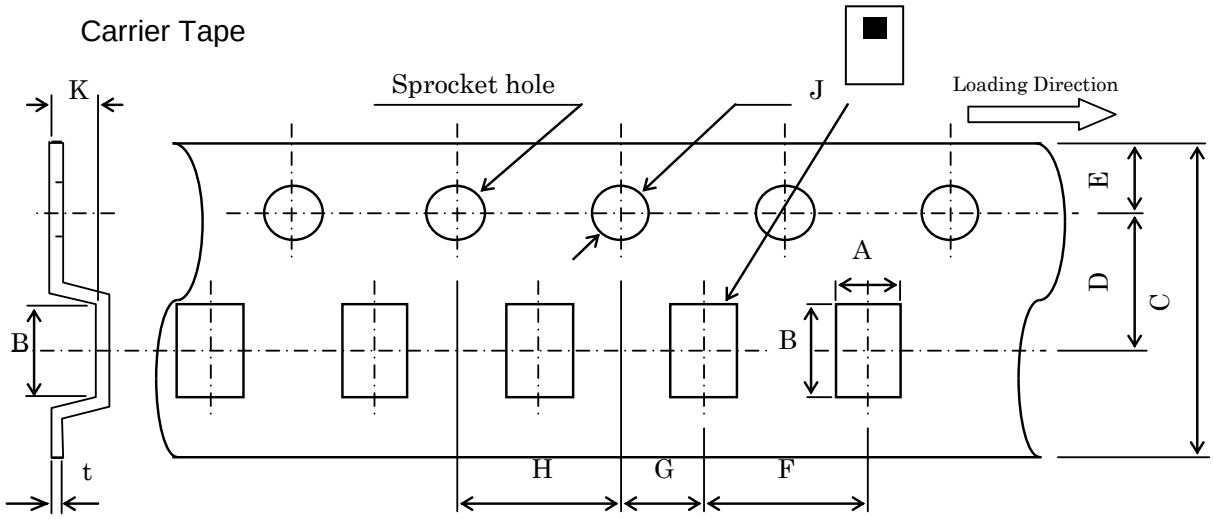
■ PACKAGING STYLE

Reel Dimensions



Dimensions in mm

Carrier Tape



Dimensions (mm)

A	B	C	D	E	F	G	H	J	K	t
0.97 +/-0.05	1.8 +/-0.05	8.0 +/-0.3	3.5 +/-0.05	1.75 +/-0.1	4.0 +/-0.1	2.0 +/-0.05	4.0 +/-0.1	1.5 +0.1/-0	0.65 MAX	0.25 +/-0.05

STANDARD PACKAGE QUANTITY (pieces/reel)
4,000

REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

⚠ REMINDERS

The products listed on this specification sheet are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet.

1. Aerospace/Aviation equipment
2. Transportation equipment (cars, electric trains, ships, etc.)
3. Medical equipment
4. Power-generation control equipment
5. Atomic energy-related equipment
6. Seabed equipment
7. Transportation control equipment
8. Public information-processing equipment
9. Military equipment
10. Electric heating apparatus, burning equipment
11. Disaster prevention/crime prevention equipment
12. Safety equipment
13. Other applications that are not considered general-purpose applications

When using this product in general-purpose applications, you are kindly requested to take into consideration securing protection circuit/equipment or providing backup circuits, etc., to ensure higher safety.