Aug. 2022 Ver.8.1
TDK Corporation

Multilayer Antenna

For 2.4GHz W-LAN & Bluetooth / 5GHz W-LAN

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

P/N: **ANT162442DT-2001A2**

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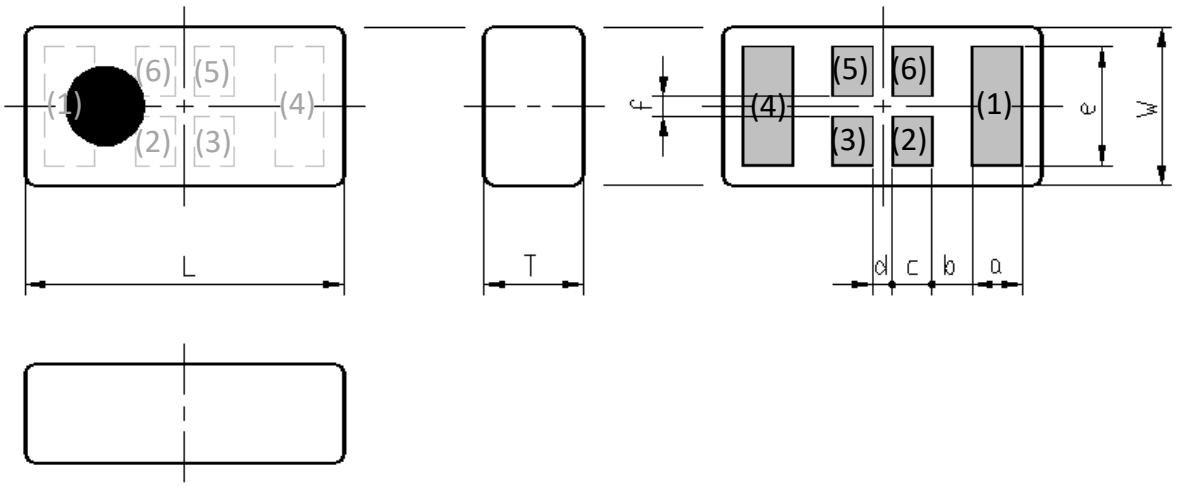
SHAPES AND DIMENSIONS



Dimensions (mm)

L	W	T	a	b	c	d	e	f
1.60 +/-0.10	0.80 +/-0.10	0.40 Max	0.215 +/-0.10	0.25 +/-0.10	0.20 +/-0.10	(0.10)	0.63 +/-0.10	(0.10)

Terminal functions

(1)	Radiator electrode for 2.4GHz ISM
(2)	Feed point
(3)	Feed point
(4)	Radiator electrode for 5.5GHz
(5)	Feed point
(6)	Feed point

***Terminal (2),(3),(5) and (6) :Connected in inner structure**

TERMINATION FINISH

Material
Au plate

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ELECTRICAL CHARACTERISTICS

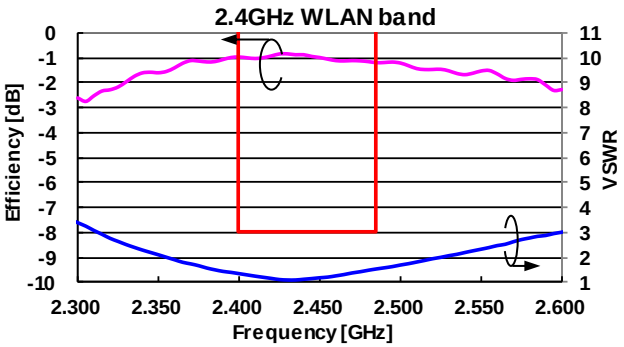
(Measurement)

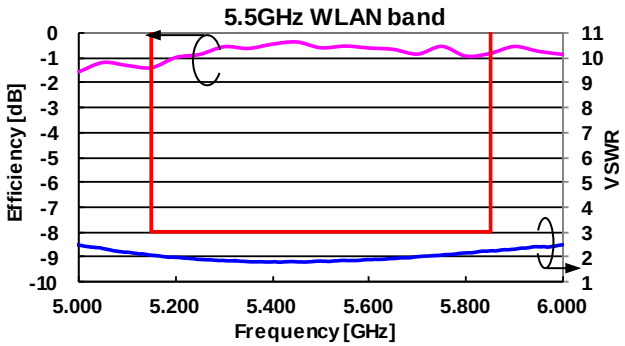
Parameter	Frequency (MHz)	TDK Spec		
		Min.	Typ.	Max.
VSWR	2400 to 2484	-	1.54	3.0
	5150 to 5850	-	1.58	3.0
Antenna Gain (dBi)**	2400 to 2484	-	2.13	-
	5150 to 5850	-	2.30	-
Polarization		Linear		
PCB Size (mm)		50 x 20		
Antenna keep-out Area (mm)		8x5		
Characteristic Impedance (ohm)		50 (Nominal)		

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

FREQUENCY CHARACTERISTICS

Note: Tested antenna has been soldered. Evaluation board size is 50x20x1 mm.





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■ MAXIMUM RATINGS

Parameter		TDK Spec	Conditions
Operating temperature (°C)		–40 to +85 °C	
Storage temperature (°C)		–40 to +85 °C	
Power Handling (W) *1		0.8	CW
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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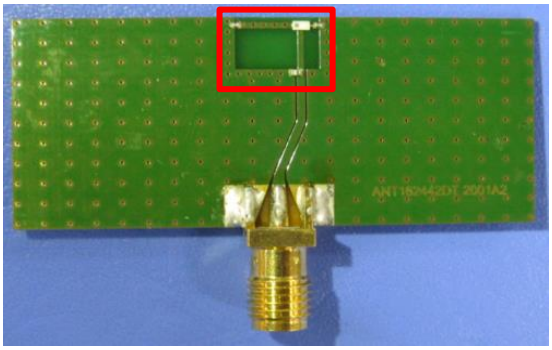
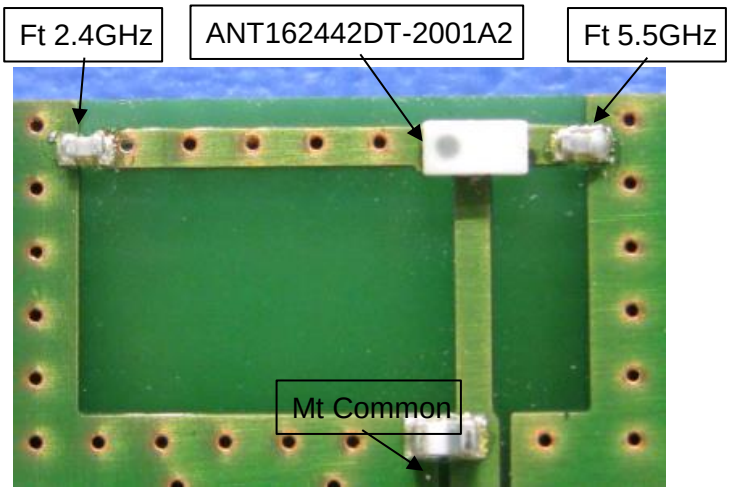
■ EVALUATION BOARD



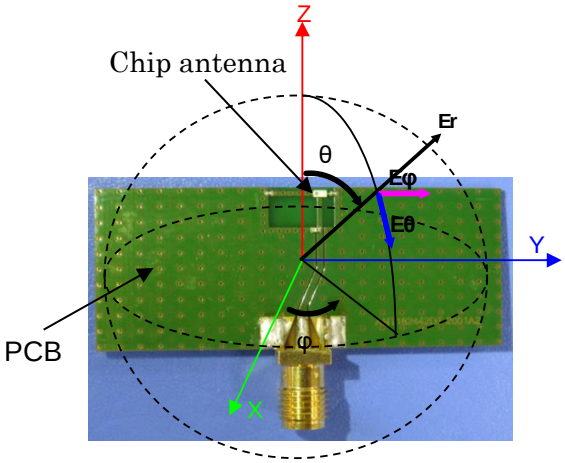


PCB size : 50mm x 20mm x 1mm
Antenna area : 8 x 5 mm

Element Value	
Ft 2.4GHz	6.2pF
Ft 5.5GHz	0.4pF
Mt Common	1.3nH(MLG1005S1N3C:TDK)

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
The following URL is a link to TDK's simple antenna simulator.
https://product.tdk.com/ja/search/rf/rf/antenna/simulation?pid=1000000249778

Measurement condition for Radiation Pattern



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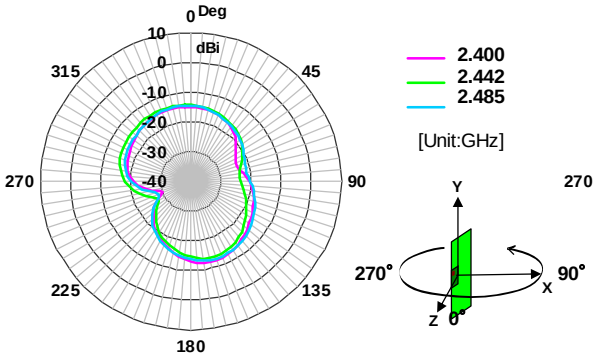
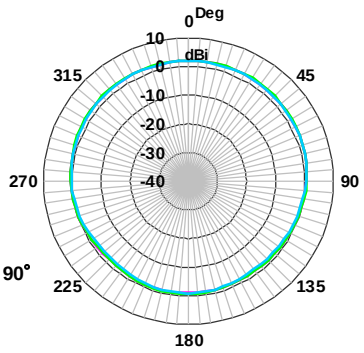
Radiation Pattern

Note: Tested antenna has been soldered. Evaluation board size is 50x20x1 mm.

2.4GHz ISM Band



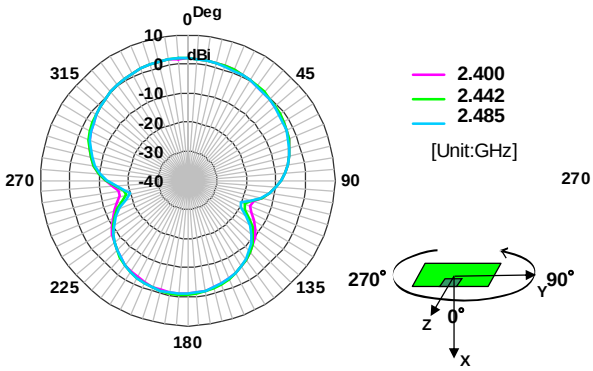


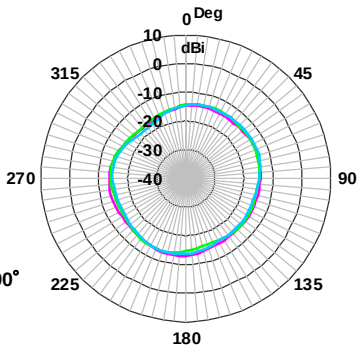
Horizontal Polarization

Frequency[GHz]	2.400	2.442	2.485
Average[dBi]	-16.54	-16.59	-16.37
Maximum[dBi]	-12.01	-13.47	-12.72
Minimum[dBi]	-30.09	-27.57	-28.66

Vertical Polarization

Frequency[GHz]	2.400	2.442	2.485
Average[dBi]	0.57	0.67	0.35
Maximum[dBi]	2.02	2.13	1.90
Minimum[dBi]	-1.35	-1.43	-2.16



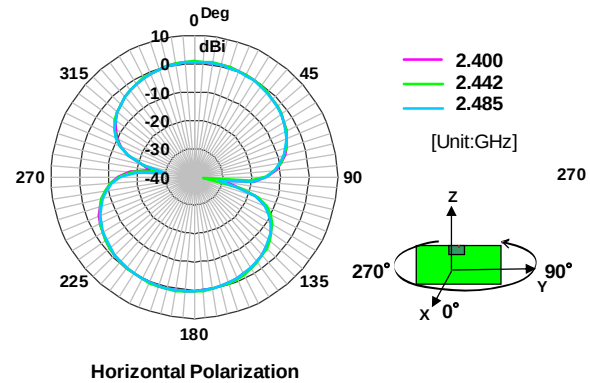


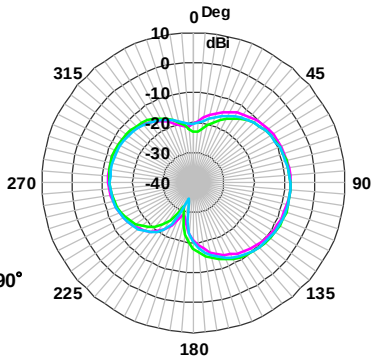
Horizontal Polarization

Frequency[GHz]	2.400	2.442	2.485
Average[dBi]	-2.27	-2.13	-2.37
Maximum[dBi]	1.94	2.08	1.96
Minimum[dBi]	-17.08	-18.95	-20.38

Vertical Polarization

Frequency[GHz]	2.400	2.442	2.485
Average[dBi]	-14.44	-14.68	-14.79
Maximum[dBi]	-12.83	-13.39	-13.42
Minimum[dBi]	-17.10	-16.69	-18.01





Horizontal Polarization

Frequency[GHz]	2.400	2.442	2.485
Average[dBi]	-2.32	-2.22	-2.51
Maximum[dBi]	0.69	0.81	0.54
Minimum[dBi]	-30.39	-36.66	-31.21

Vertical Polarization

Frequency[GHz]	2.400	2.442	2.485
Average[dBi]	-12.31	-12.26	-12.40
Maximum[dBi]	-8.06	-7.88	-7.97
Minimum[dBi]	-28.70	-31.60	-34.56

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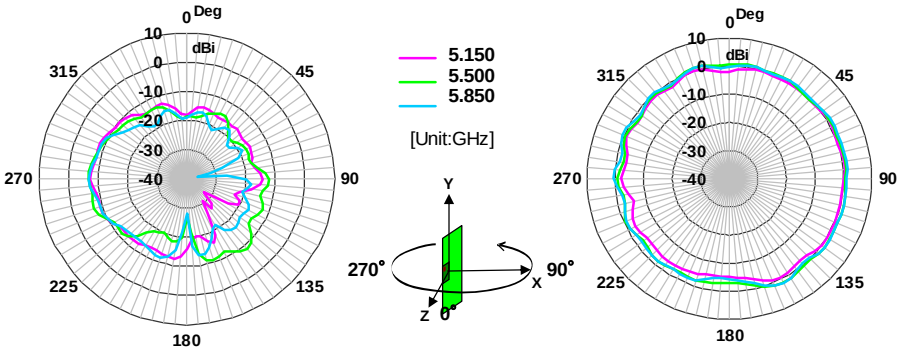
Radiation Pattern

Note: Tested antenna has been soldered. Evaluation board size is 50x20x1 mm.

5.5GHz Band

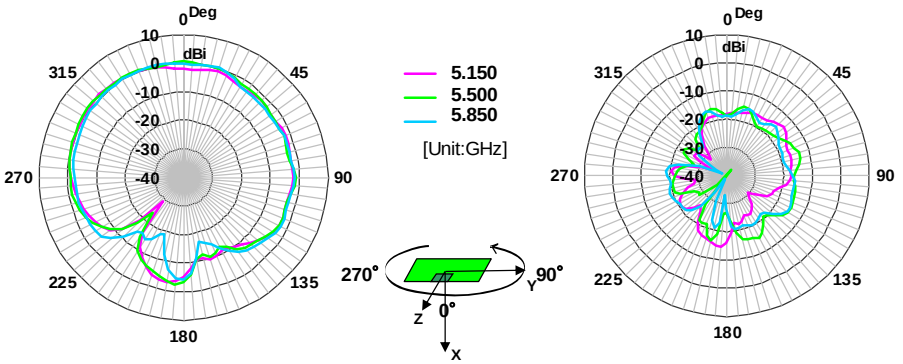


Horizontal Polarization

Frequency[GHz]	5.150	5.500	5.850
Average[dBi]	-12.97	-12.16	-13.58
Maximum[dBi]	-7.48	-6.62	-6.72
Minimum[dBi]	-32.51	-26.84	-36.34

Vertical Polarization

Frequency[GHz]	5.150	5.500	5.850
Average[dBi]	-1.43	-0.20	-0.08
Maximum[dBi]	0.62	1.47	1.73
Minimum[dBi]	-5.45	-3.08	-4.67

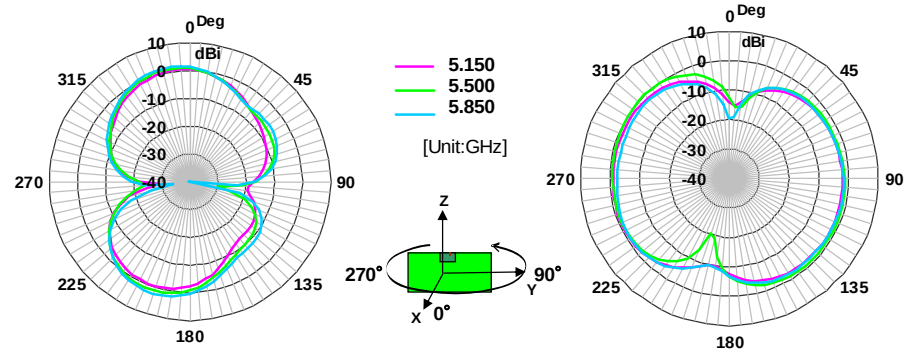


Horizontal Polarization

Frequency[GHz]	5.150	5.500	5.850
Average[dBi]	-2.51	-2.08	-2.65
Maximum[dBi]	1.01	1.13	0.37
Minimum[dBi]	-28.98	-23.90	-18.97

Vertical Polarization

Frequency[GHz]	5.150	5.500	5.850
Average[dBi]	-19.15	-18.18	-19.20
Maximum[dBi]	-13.54	-13.50	-14.93
Minimum[dBi]	-34.57	-42.62	-38.87



Horizontal Polarization

Frequency[GHz]	5.150	5.500	5.850
Average[dBi]	-4.50	-3.50	-2.84
Maximum[dBi]	0.42	1.37	2.30
Minimum[dBi]	-29.11	-29.74	-40.66

Vertical Polarization

Frequency[GHz]	5.150	5.500	5.850
Average[dBi]	-2.89	-2.23	-3.18
Maximum[dBi]	-0.68	0.24	-1.24
Minimum[dBi]	-15.19	-20.29	-19.75

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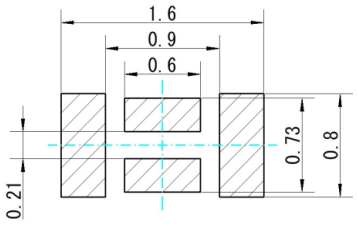
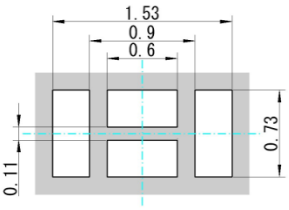
■ RECOMMENDED LAND PATTERN

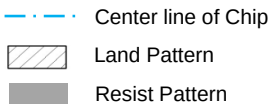
Recommend land pattern and solder resist pattern

< Land pattern >

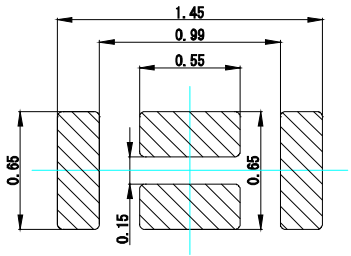


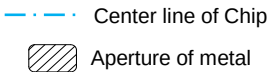
< Solder resist pattern >





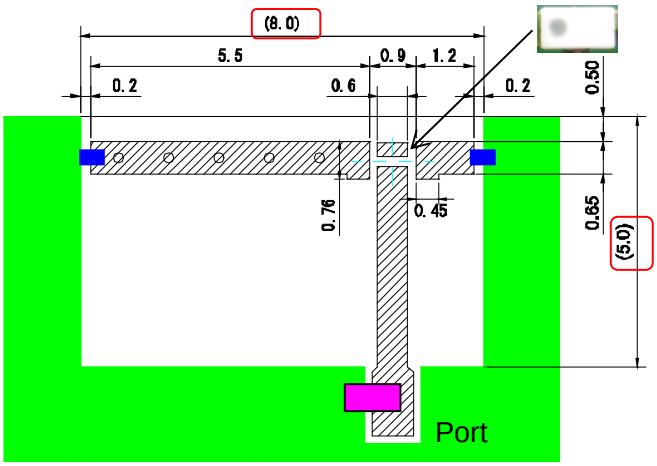
Recommend aperture size of metal mask for solder printing

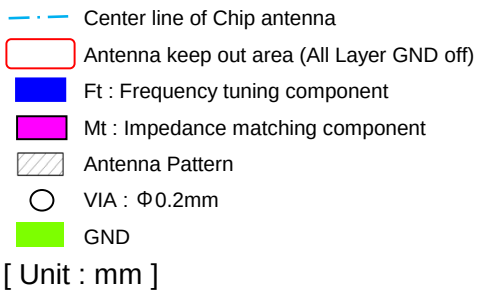




Example of Antenna pattern layout (TDK Standard PCB)

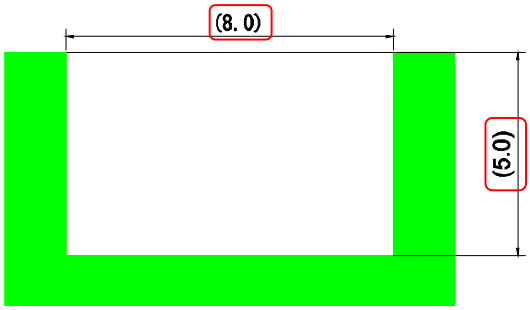
<Top Layer (Parts mounted side) >



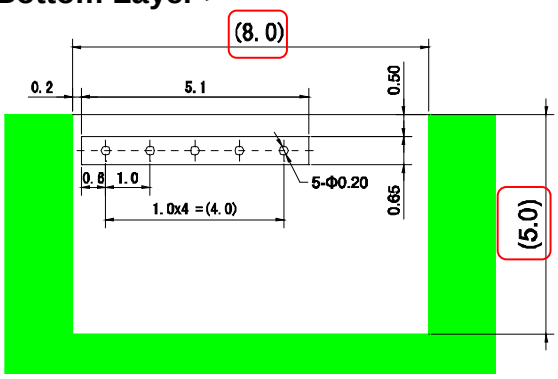


[Unit : mm]

<Inner Layer >



<Bottom Layer >



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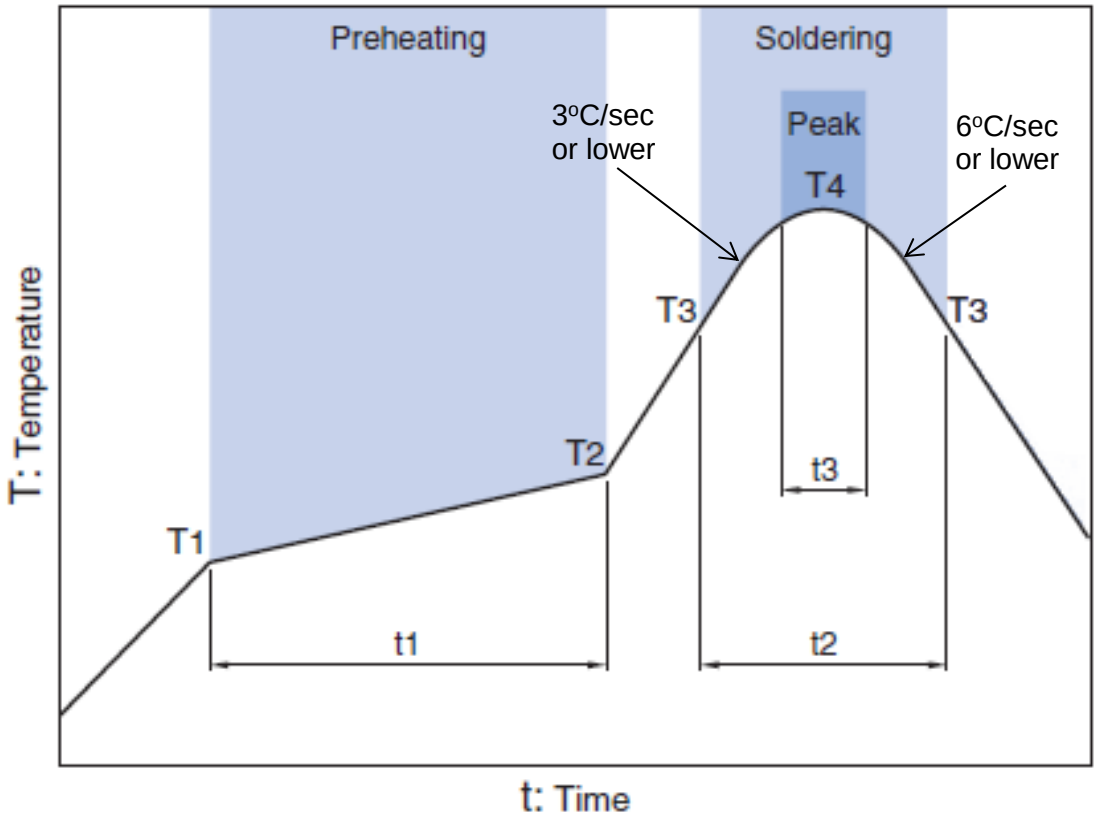
ENVIROMENT INFORMATION

RoHS Statement
RoHS Compliance

TDK Corporation

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)

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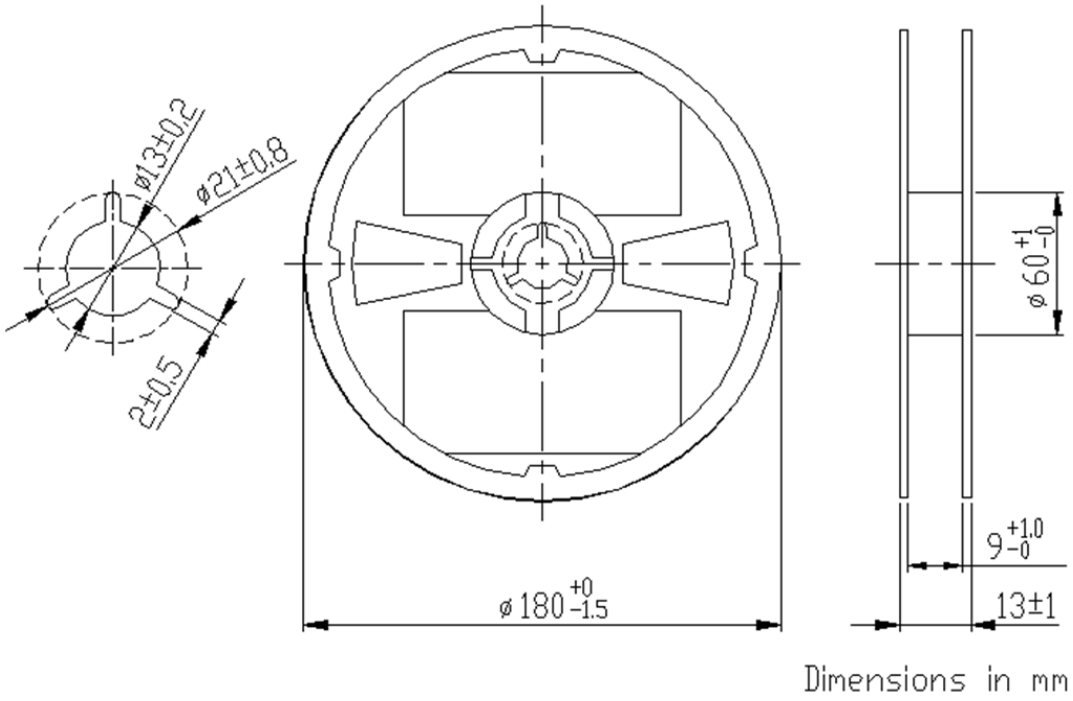
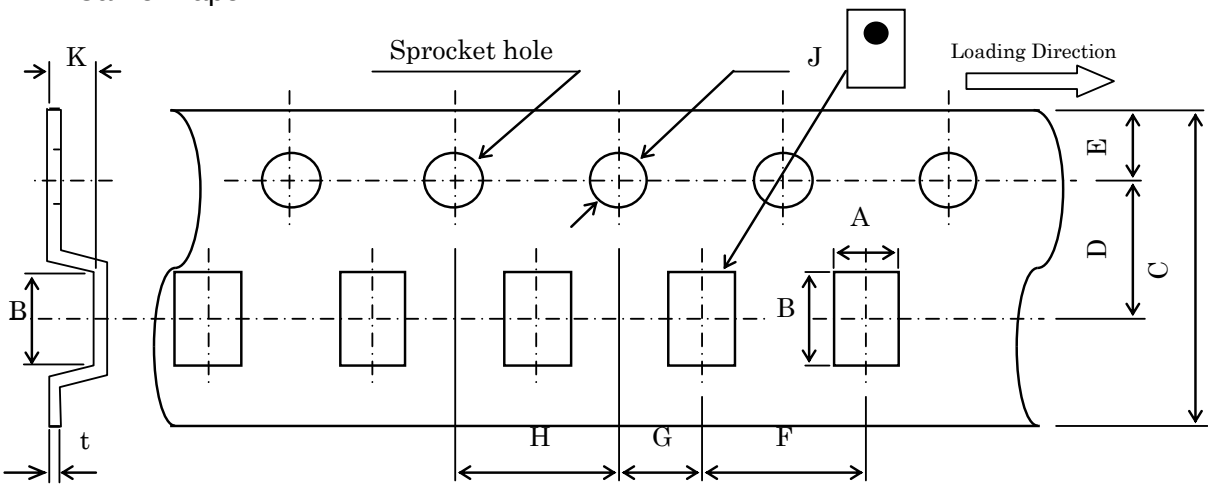
■ PACKAGING STYLE

Reel Dimensions



Material of the carrier tape : PS

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 +/-0.2	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	0.55 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.