Dec. 2024 Ver.10.0
TDK Corporation

Multilayer Antenna

For Sub-GHz band

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

P/N: **ANT160920ST-1204A1**

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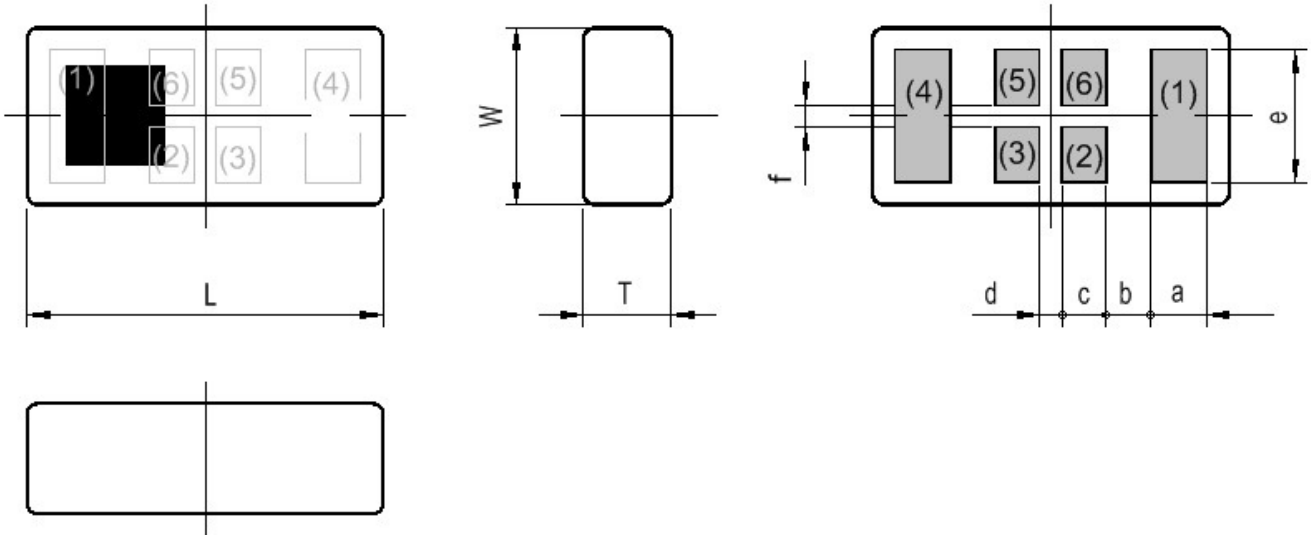
SHAPES AND DIMENSIONS



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
(2)	Dummy pad
(3)	Dummy pad
(4)	Feed point
(5)	Dummy pad
(6)	Dummy pad

TERMINATION FINISH

Material
Au plate

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ELECTRICAL CHARACTERISTICS

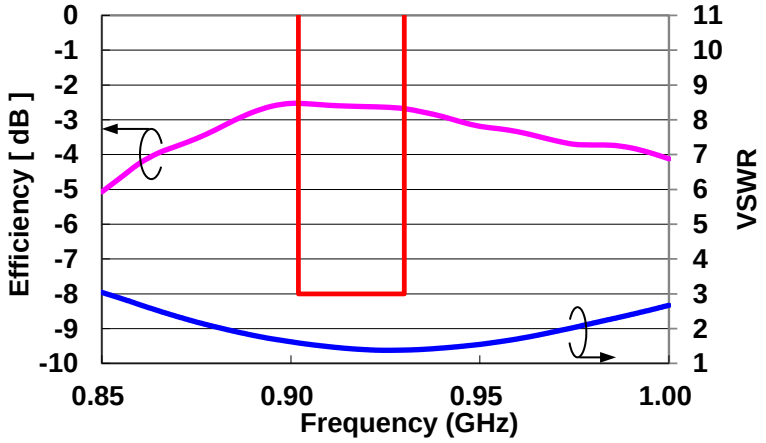
(Measurement)

Parameter	Frequency (MHz)	TDK Spec		
		Min.	Typ.	Max.
VSWR	902 to 930	-	1.60	3.0
Antenna Gain (dBi)**	902 to 930	-	0.50	-
Polarization		Linear		
PCB Size (mm)		100 x 20		
Antenna keep-out Area (mm)		20 x 10		
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 100x20x1 mm.
Efficiency and VSWR



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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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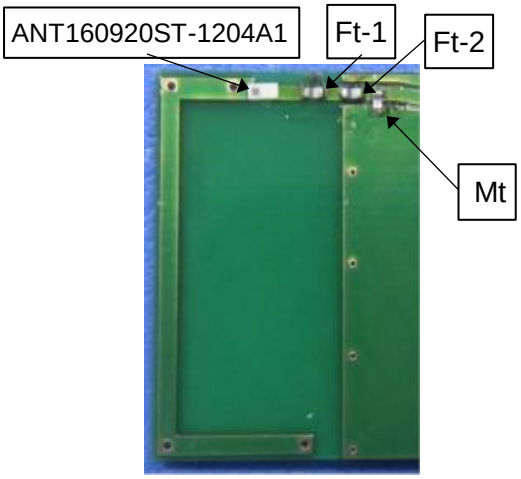
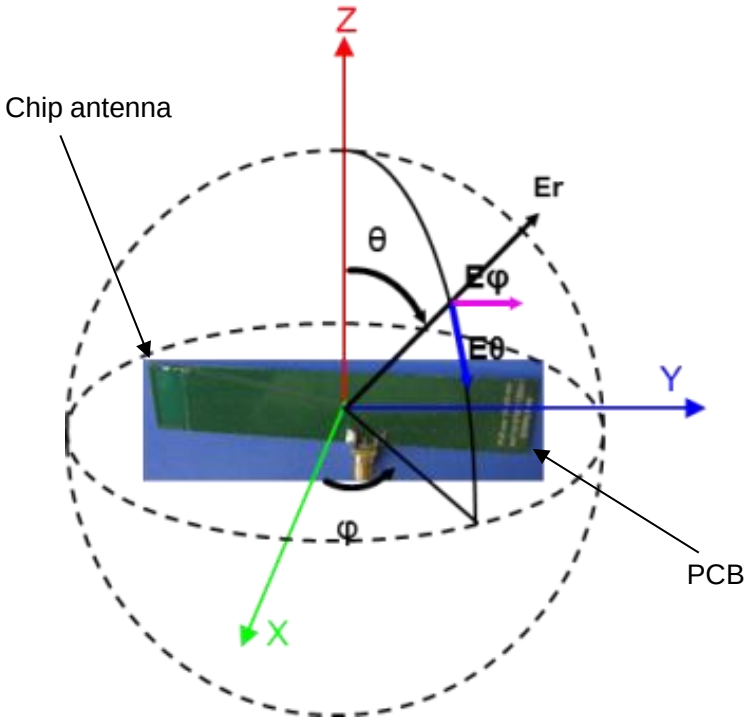
■ EVALUATION BOARD

PCB size : 100mm x 20mm x 1mm
Antenna area : 20 x 10 mm



	Element Value
Ft-1	2.4nH(MLG100S2N4:TDK)
Ft-2	1.5nH(MLG1005S1N5:TDK)
Mt	12nH(MLG1005S12N:TDK)

Measurement condition for Radiation pattern



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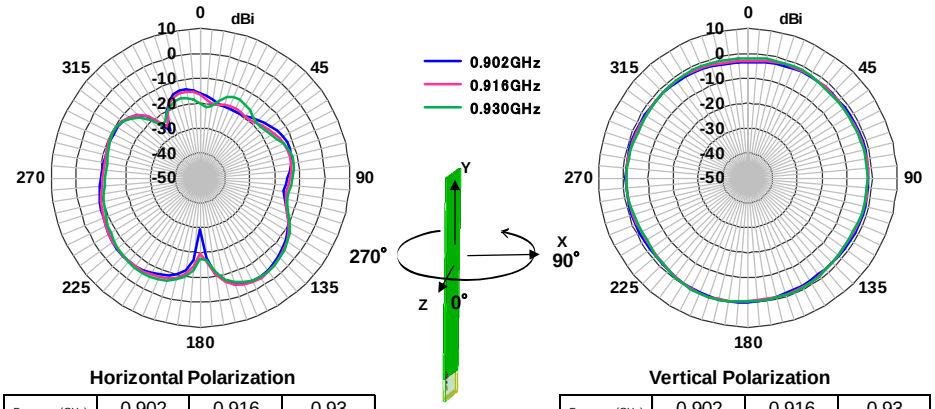
Radiation Pattern

Note: Tested antenna has been soldered. Evaluation board size is 100x20x1 mm.

Sub-GHz Band

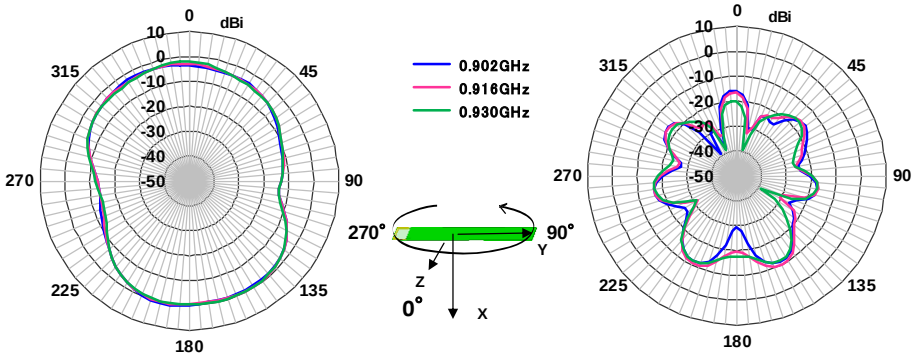


Horizontal Polarization

Frequency(GHz)	0.902	0.916	0.93
Average[dBi]	-9.7	-9.4	-9.6
Maximum[dBi]	-3.4	-3.0	-3.5
Minimum[dBi]	-29.1	-25.5	-23.6

Vertical Polarization

Frequency(GHz)	0.902	0.916	0.93
Average[dBi]	-1.44	-1.52	-1.44
Maximum[dBi]	0.28	0.25	0.37
Minimum[dBi]	-3.51	-2.82	-2.54

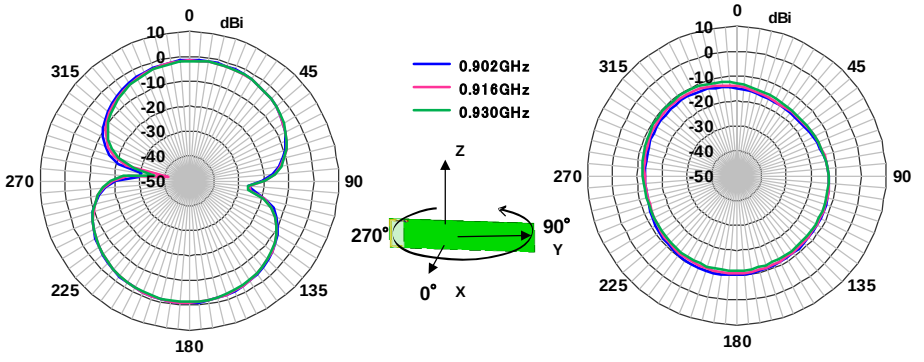


Horizontal Polarization

Frequency(GHz)	0.902	0.916	0.93
Average[dBi]	-3.9	-3.8	-3.8
Maximum[dBi]	0.5	0.1	0.0
Minimum[dBi]	-13.7	-13.9	-14.1

Vertical Polarization

Frequency(GHz)	0.902	0.916	0.93
Average[dBi]	-17.8	-17.1	-18.0
Maximum[dBi]	-11.2	-9.8	-11.5
Minimum[dBi]	-39.0	-32.8	-39.2



Horizontal Polarization

Frequency(GHz)	0.902	0.916	0.93
Average[dBi]	-4.2	-4.5	-4.6
Maximum[dBi]	-0.9	-1.0	-1.2
Minimum[dBi]	-30.8	-41.5	-36.0

Vertical Polarization

Frequency(GHz)	0.902	0.916	0.93
Average[dBi]	-12.4	-12.5	-12.5
Maximum[dBi]	-9.8	-10.6	-10.5
Minimum[dBi]	-16.9	-16.4	-15.6

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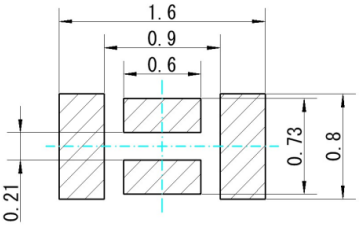
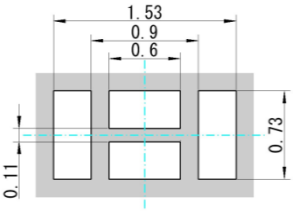
RECOMMENDED LAND PATTERN

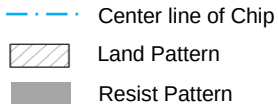
Recommend land pattern and solder resist pattern

< Land pattern >

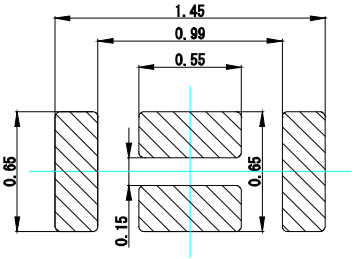


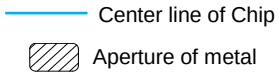
< Solder resist pattern >





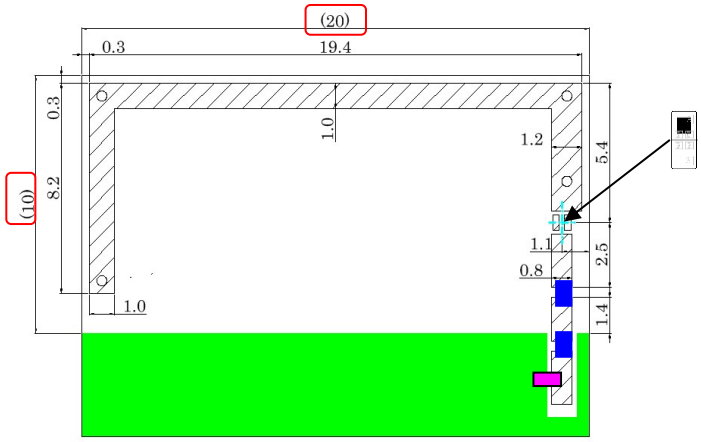
Recommend aperture size of metal mask for solder

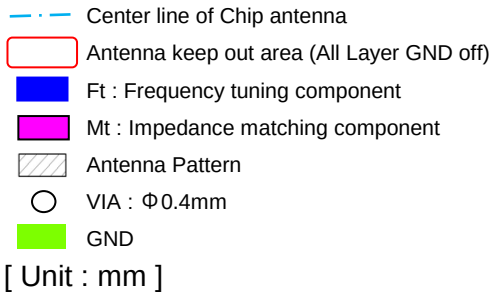




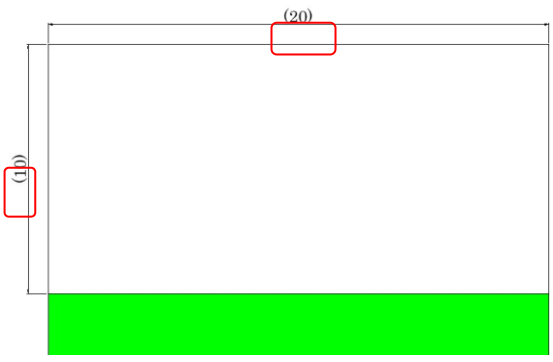
Example of Antenna pattern layout (TDK Standard PCB)

<Top Layer (Parts mounted side) >

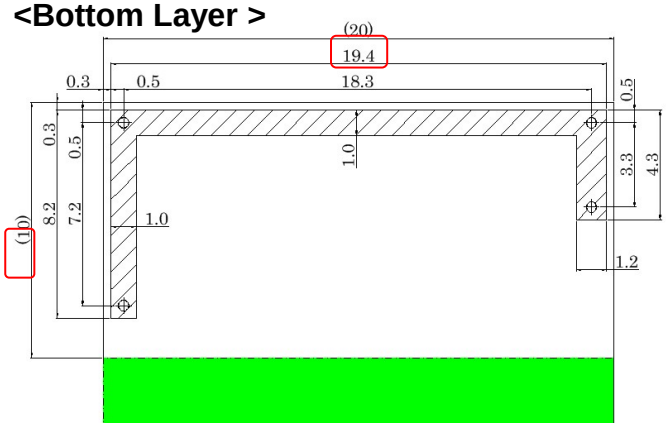




<Inner Layer >



<Bottom Layer >



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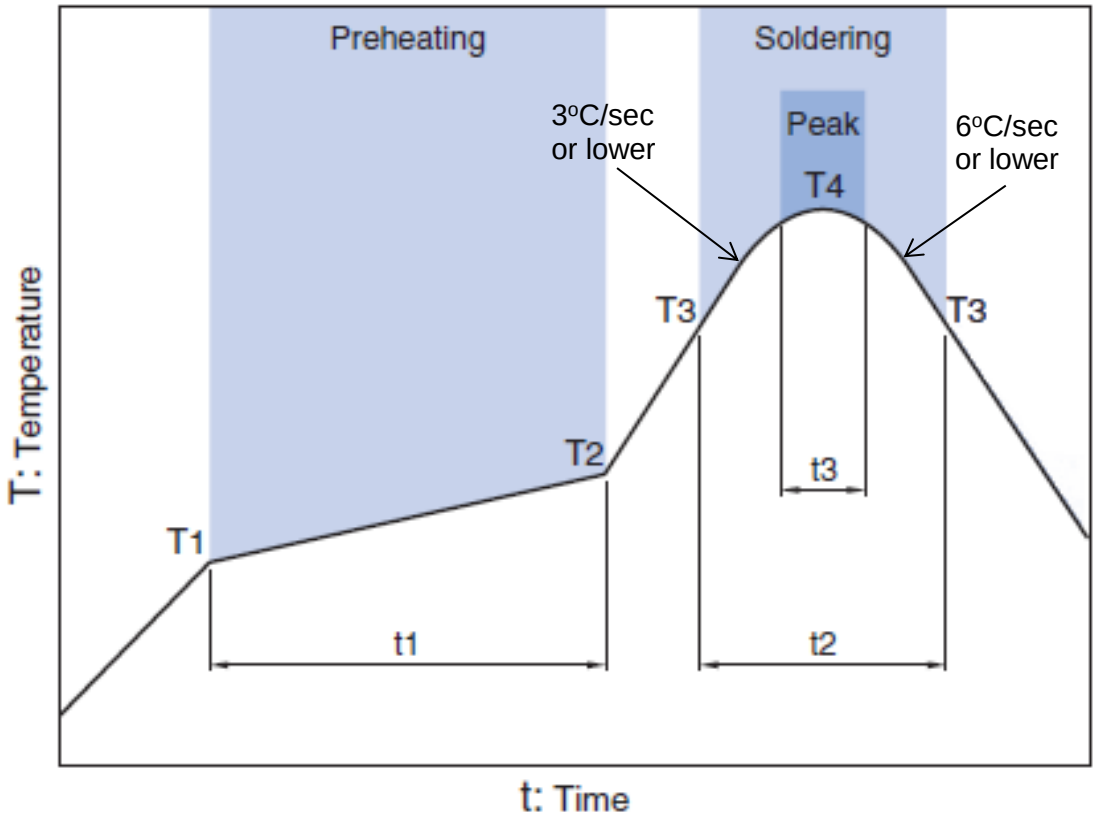
■ ENVIROMENT INFORMATION

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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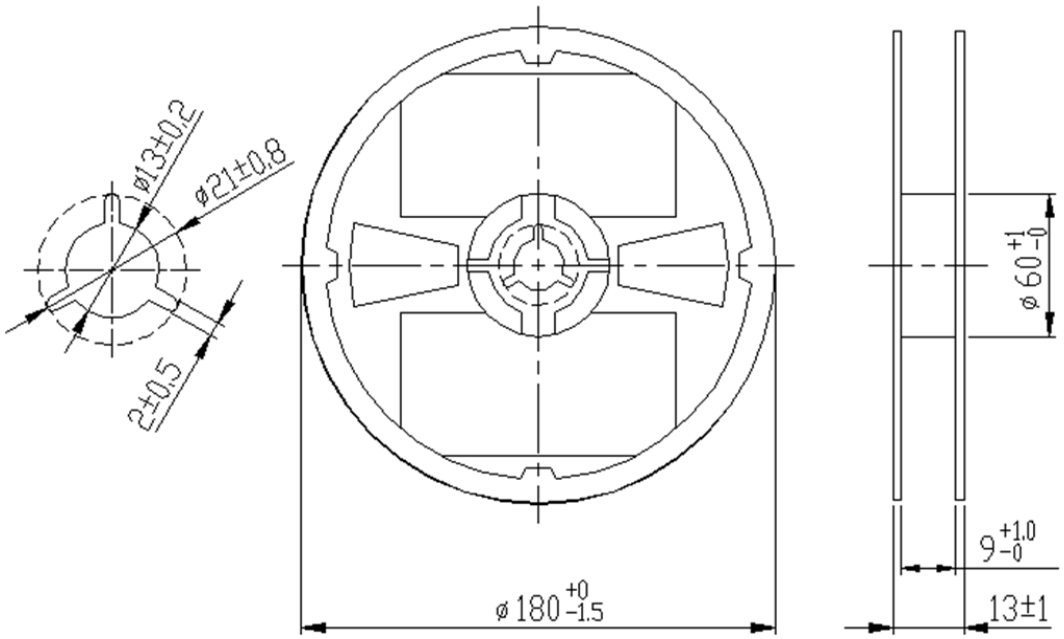
■ PACKAGING STYLE

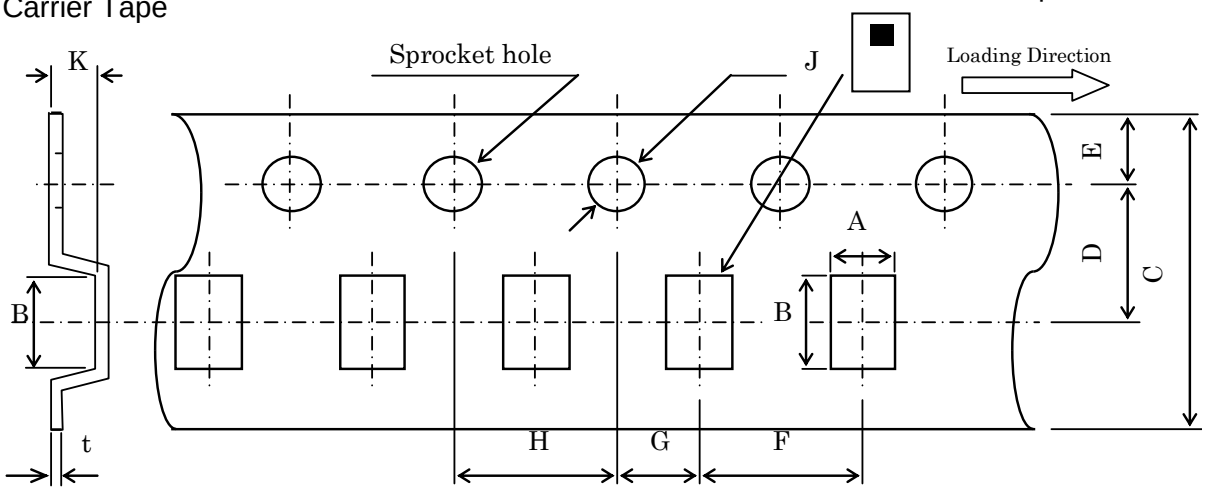
Reel Dimensions



Dimensions in mm

Carrier Tape

Material of the carrier tape : PS



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 catalog 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 catalog.

(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.