Jan. 2022 Ver.3.0
TDK Corporation

Multilayer Triplexer

For 698-960MHz / 1427-2170MHz / 2496-5000MHz

TPX Series 2.5x2.0mm [EIA 1008] TYPE

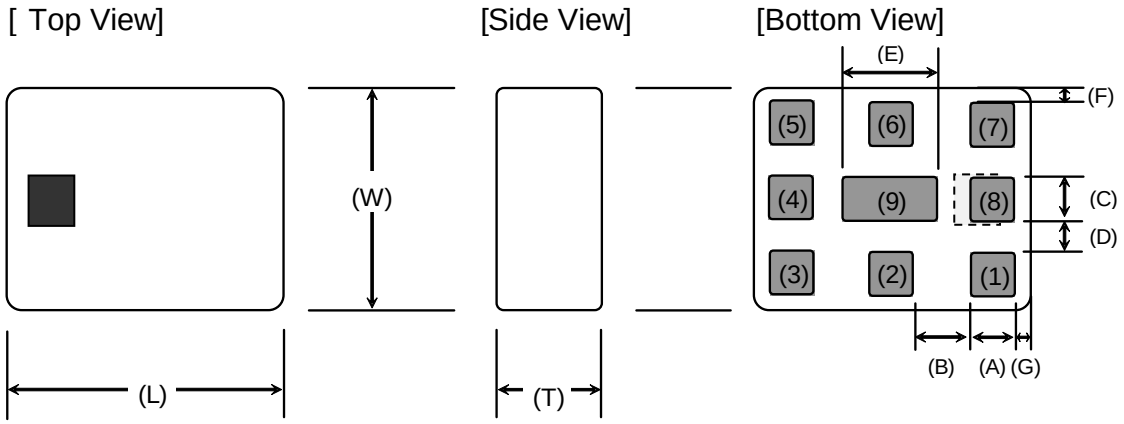
P/N: **TPX255000MT-7019B6**

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Jan. 2022 Ver.3.0
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TPX255000MT-7019B6

SHAPES AND DIMENSIONS



Dimensions (mm)

L	W	T	A	B	C	D	E	F	G
2.50 +/-0.10	2.00 +/-0.10	0.90 +/-0.10	0.40 +/-0.10	0.55 +/-0.10	0.40 +/-0.10	0.30 +/-0.10	0.90 +/-0.10	0.10 +/-0.10	0.10 +/-0.10

Terminal functions

(1)	High-Band Port
(2)	GND
(3)	Middle-Band Port
(4)	GND
(5)	Low-Band Port

(6)	GND
(7)	Common Port
(8)	GND
(9)	GND

TERMINATION FINISH

Material
Au plate

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Jan. 2022 Ver.3.0
TDK Corporation

TPX255000MT-7019B6

■ ELECTRICAL CHARACTERISTICS

(Measurement)

Parameter	Frequency (MHz)	TDK Spec		
		Min.	Typ.	Max.
Insertion Loss (dB)	698 to 960	-	0.50	0.70
Return Loss (dB)	698 to 803	14	17.0	-
	803 to 960	14	20.7	-
Attenuation (dB)	1427 to 1511	7	10.7	-
	1710 to 2170	12	15.3	-
	2500 to 2690	27	32.2	-
	3400 to 3600	35	51.3	-
	3300 to 4200	35	44.3	-
	3300 to 3800	35	48.0	-
	4400 to 5000	35	51.3	-
Characteristic Impedance (ohm)		50 (Nominal)		

Ta = +25+/-5°C

Middle-Band

Parameter	Frequency (MHz)	TDK Spec		
		Min.	Typ.	Max.
Insertion Loss (dB)	1427 to 1511	-	0.98	1.20
	1710 to 2170	-	0.83	1.20
Return Loss (dB)	1427 to 1511	14	20.5	-
	1710 to 2170	14	16.4	-
Attenuation (dB)	698 to 960	14	18.2	-
	2500 to 2690	10	15.4	-
	3400 to 3600	15	19.2	-
	3300 to 4200	15	18.1	-
	3300 to 3800	15	18.1	-
	4400 to 5000	15	29.4	-
Characteristic Impedance (ohm)		50 (Nominal)		

Ta = +25+/-5°C

High-Band

Parameter	Frequency (MHz)	TDK Spec		
		Min.	Typ.	Max.
Insertion Loss (dB)	2496 to 2690	-	1.32	1.50
	3400 to 3800	-	0.29	0.60
	3300 to 4200	-	0.43	0.60
	3300 to 3800	-	0.43	0.60
	4400 to 5000	-	0.50	0.60
Return Loss (dB)	2496 to 2690	14	17.7	-
	3400 to 3800	14	15.9	-
	3300 to 4200	10	15.4	-
	3300 to 3800	14	17.8	-
	4400 to 5000	10	12.3	-
Attenuation (dB)	698 to 960	18	20.3	-
	1427 to 1511	16	18.9	-
	1710 to 2170	15	21.7	-
Characteristic Impedance (ohm)		50 (Nominal)		

Ta = +25+/-5°C

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Jan. 2022 Ver.3.0
TDK Corporation

TPX255000MT-7019B6

■ ELECTRICAL CHARACTERISTICS

(Measurement)

Common

Parameter		Frequency (MHz)	TDK Spec		
			Min.	Typ.	Max.
Isolation (dB)	LB - MB	698 to 960	14	17.4	-
		1427 to 1511	7	10.4	-
		1710 to 2170	13	16.5	-
		3300 to 4200	13	18.3	-
		3300 to 3800	13	18.1	-
		4400 to 5000	13	19.0	-
	LB - HB	698 to 960	15	19.6	-
		2496 to 2690	30	37.4	-
		3400 to 3800	30	38.7	-
		3300 to 4200	30	38.3	-
		3300 to 3800	30	38.3	-
		4400 to 5000	30	42.0	-
	MB - HB	1427 to 1511	15	19.4	-
		1710 to 2170	15	20.0	-
		2496 to 2690	13	16.7	-
		3400 to 3800	15	19.5	-
		3300 to 4200	15	19.0	-
		3300 to 3800	15	19.0	-
		4400 to 5000	15	31.1	-
Return Loss (dB)		698 to 803	14	17.0	-
		803 to 960	14	20.7	-
		1427 to 1511	14	20.5	-
		1710 to 2170	14	16.4	-
		2496 to 2690	14	17.7	-
		3400 to 3800	14	15.9	-
		3300 to 4200	10	15.4	-
		3300 to 3800	14	17.8	-
		4400 to 5000	10	12.3	-

Ta = +25+/-5°C

■ 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)		
	Low-Band	698 to 960	4	CW Duty 50%
	Middle-Band	1427 to 2170	3	CW Duty 50%
	High-Band	2496 to 5000	1	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

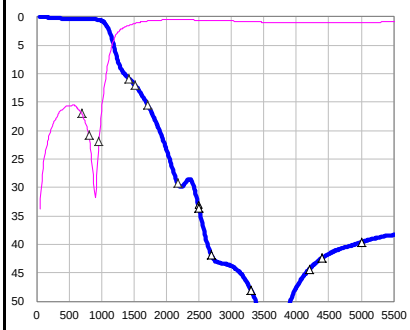
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TPX255000MT-7019B6

FREQUENCY CHARACTERISTICS

Low - Band



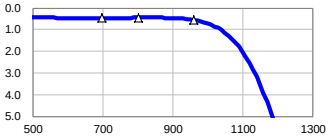
Attenuation

1427 MHz	10.9 dB
1511 MHz	12.0 dB
1710 MHz	15.5 dB
2170 MHz	29.3 dB
2496 MHz	33.1 dB
2500 MHz	33.6 dB
2690 MHz	41.9 dB
3300 MHz	48.0 dB
3800 MHz	54.0 dB
4200 MHz	44.4 dB
4400 MHz	42.4 dB
5000 MHz	39.6 dB

Return Loss

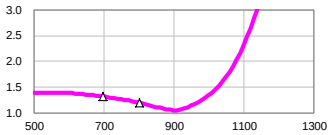
698 MHz	17.0 dB
803 MHz	20.8 dB
960 MHz	21.9 dB

Insertion Loss



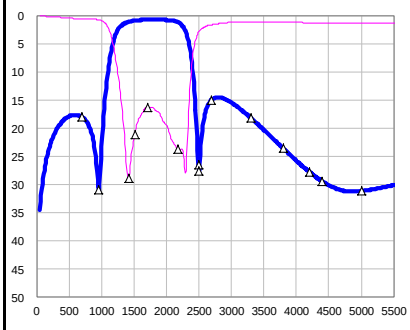
698 MHz	0.47 dB
803 MHz	0.45 dB
960 MHz	0.56 dB

VSWR



698 MHz	1.33
803 MHz	1.20
960 MHz	1.17

Middle - Band



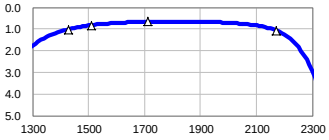
Attenuation

698 MHz	17.9 dB
960 MHz	30.9 dB
2496 MHz	26.5 dB
2500 MHz	27.5 dB
2690 MHz	14.9 dB
3300 MHz	18.1 dB
3800 MHz	23.6 dB
4200 MHz	27.7 dB
4400 MHz	29.4 dB
5000 MHz	31.1 dB

Return Loss

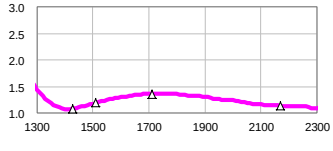
1427 MHz	28.8 dB
1511 MHz	21.2 dB
1710 MHz	16.3 dB
2170 MHz	23.6 dB

Insertion Loss



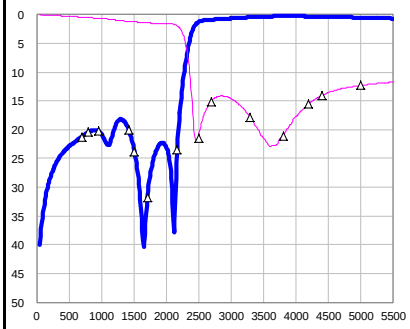
1427 MHz	1.04 dB
1511 MHz	0.82 dB
1710 MHz	0.67 dB
2170 MHz	1.07 dB

VSWR



1427 MHz	1.08
1511 MHz	1.19
1710 MHz	1.36
2170 MHz	1.14

High - Band



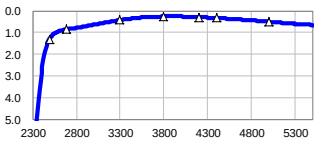
Attenuation

698 MHz	21.3 dB
803 MHz	20.4 dB
960 MHz	20.2 dB
1427 MHz	20.0 dB
1511 MHz	23.8 dB
1710 MHz	31.8 dB
2170 MHz	23.5 dB

Return Loss

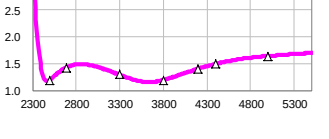
2496 MHz	21.5 dB
2690 MHz	15.1 dB
3300 MHz	17.8 dB
3800 MHz	21.1 dB
4200 MHz	15.4 dB
4400 MHz	14.0 dB
5000 MHz	12.3 dB

Insertion Loss



2496 MHz	1.30 dB
2690 MHz	0.86 dB
3300 MHz	0.43 dB
3800 MHz	0.26 dB
4200 MHz	0.30 dB
4400 MHz	0.33 dB
5000 MHz	0.50 dB

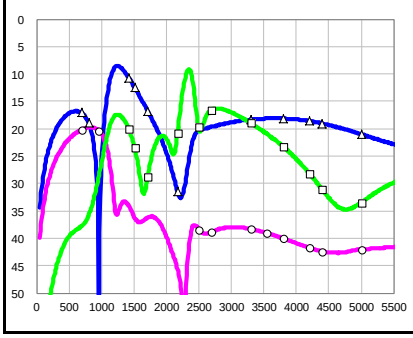
VSWR



2496 MHz	1.18
2690 MHz	1.43
3300 MHz	1.30
3800 MHz	1.19
4200 MHz	1.41
4400 MHz	1.50
5000 MHz	1.64

Isolation

Isolation



Low - Middle

698 MHz	17.1 dB
803 MHz	18.9 dB
960 MHz	65.8 dB
1427 MHz	10.7 dB
1511 MHz	12.5 dB
1710 MHz	16.8 dB
2170 MHz	31.5 dB
3300 MHz	18.3 dB
3800 MHz	18.1 dB
4200 MHz	18.6 dB
4400 MHz	19.1 dB
5000 MHz	21.0 dB

Low - High

698 MHz	20.2 dB
960 MHz	20.4 dB
3550 MHz	39.1 dB
2500 MHz	38.4 dB
2690 MHz	38.8 dB
3300 MHz	38.3 dB
3800 MHz	40.0 dB
4200 MHz	41.8 dB
4400 MHz	42.4 dB
5000 MHz	42.0 dB

Middle - High

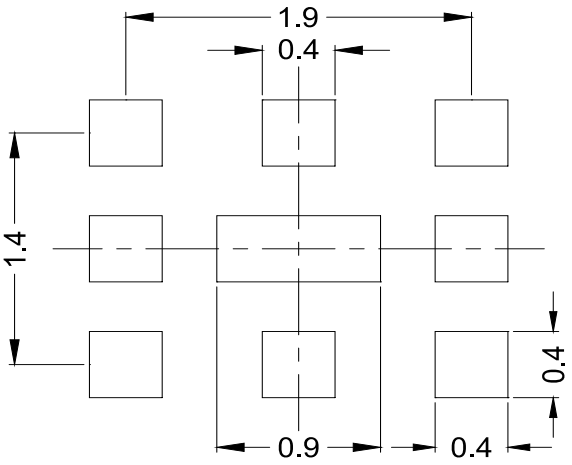
1427 MHz	20.1 dB
1511 MHz	23.6 dB
1710 MHz	28.8 dB
2170 MHz	20.8 dB
2496 MHz	19.6 dB
2690 MHz	16.6 dB
3300 MHz	19.0 dB
3800 MHz	23.3 dB
4200 MHz	28.2 dB
4400 MHz	31.1 dB
5000 MHz	33.5 dB

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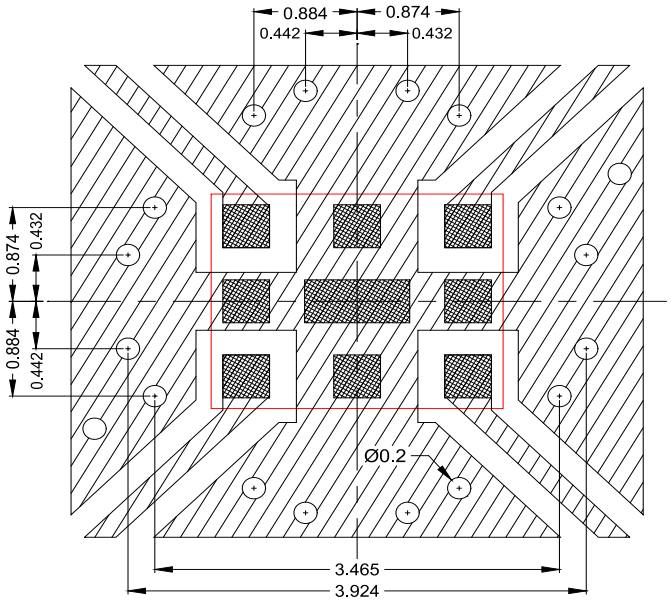
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RECOMMENDED LAND PATTERN



unit : mm

EVALUATION BOARD



Thru Hole
Surface Pattern
Land Pattern
DUT

Material & Layer	Thickness
Copper Surface Pattern	0.035 mm
FR-4	0.10 mm
Inner GND	0.018 mm
FR-4	0.30 mm
Copper Bottom GND	0.035 mm

unit : mm

* Line width should be designed to match 50 ohm characteristic impedance depending on PCB material and thickness.
** The position of the throuh hole which have possibility of influence to the prerformance are indicated by dimension line.

ENVIRONMENT INFORMATION

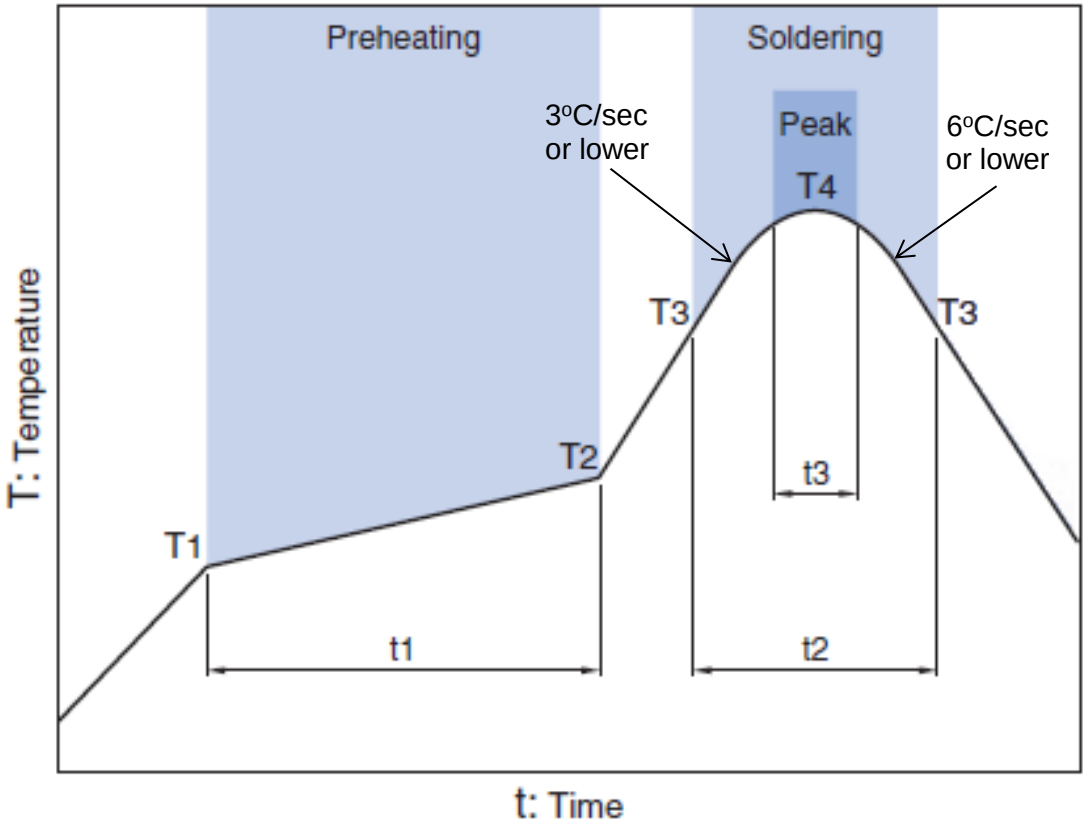
RoHS Statement
RoHS Compliance

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TPX255000MT-7019B6

■ 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)

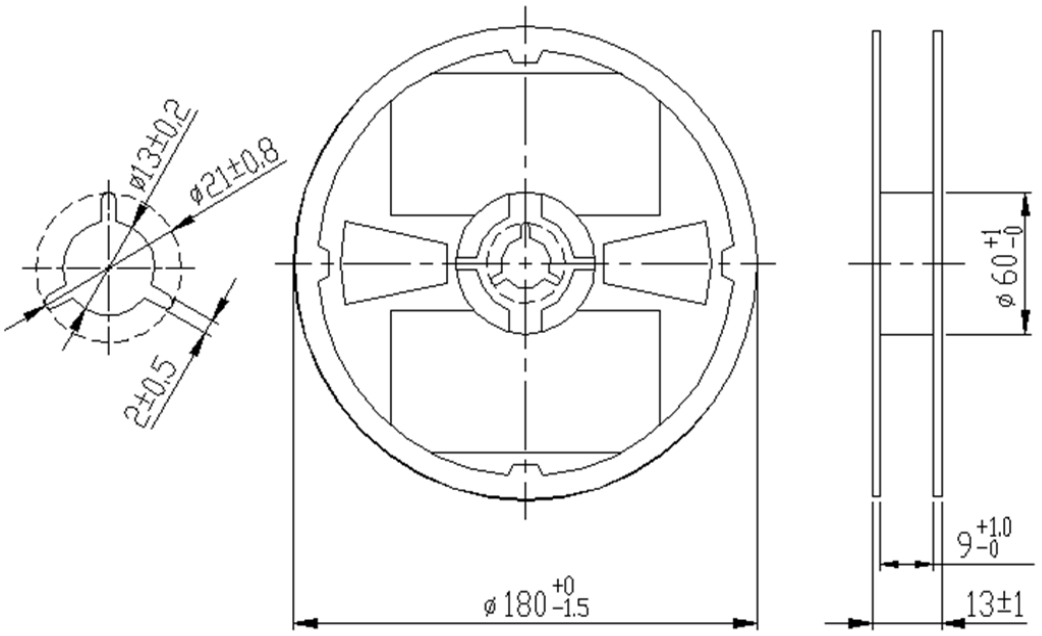
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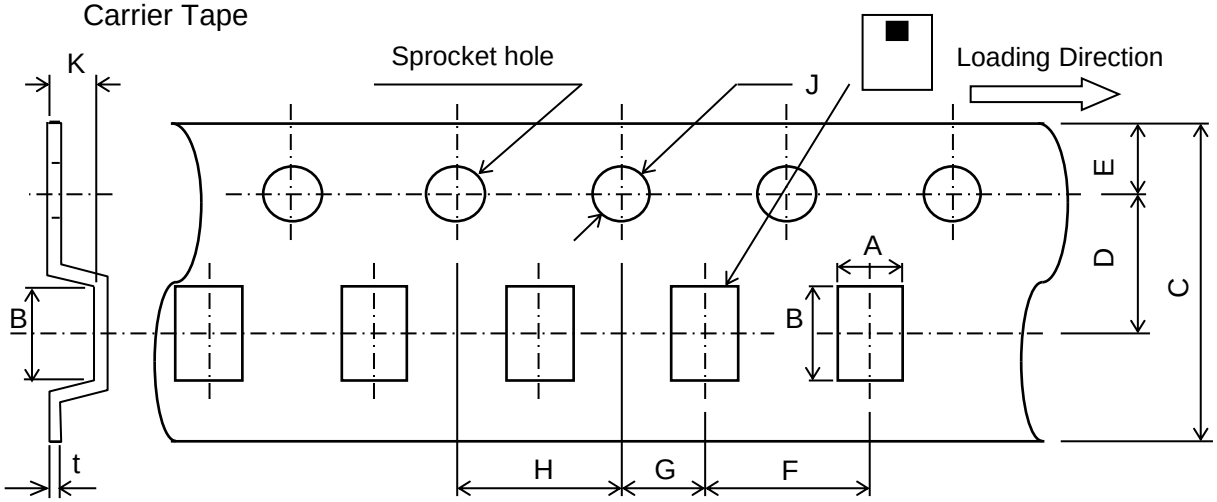
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■ PACKAGING STYLE

Reel Dimensions



Carrier Tape



Dimensions (mm)

A	B	C	D	E	F	G	H	J	K	t
2.2 +/-0.05	2.7 +/-0.05	8.0 +0.3/-0.1	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	1.15 MAX	0.25 +/-0.05

STANDARD PACKAGE QUANTITY (pieces/reel)
2,000

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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.