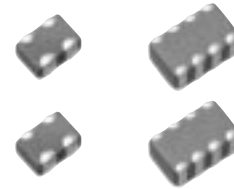


Multilayer Varistor for ESD pulse

Series **EZJZS**
Series **EZJZR**



■ Features

- Multilayer monolithic ceramic construction
- Excellent solderability and superior heat resistance
- Large surge current and energy capabilities in withstanding small size.

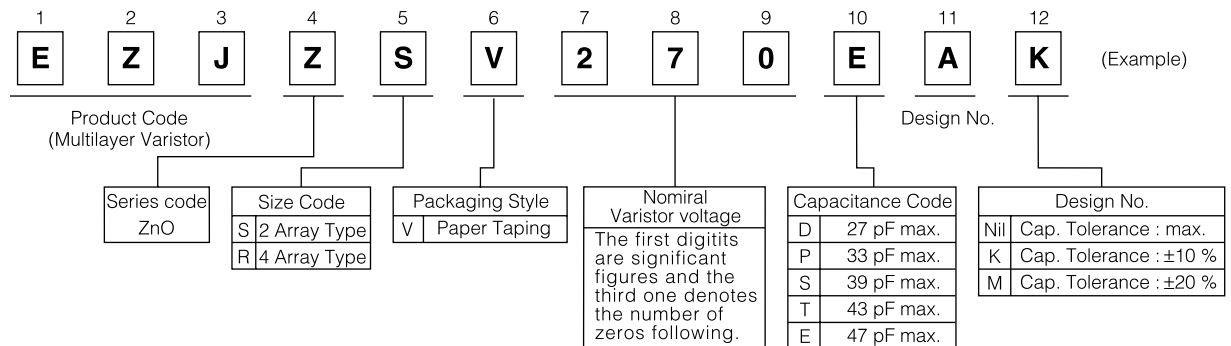
■ Precautions for Handling
see Page 112 to 118

■ Packing method
see Page 111, 182

● Series EZJZS, R

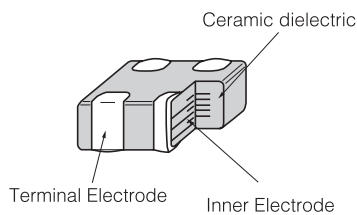
- Multilayer varistor of Zinc oxide ceramic.
suppresses the pulse noise(ESD, burst-noise) and protects the equipment from the transient surge.
- This Varistor is suitable for high-speed signal line due to small capacitance.
-

■ Explanation of Part Numbers

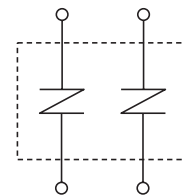


■ Construction

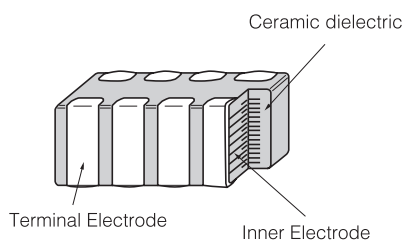
[2 Array Type]



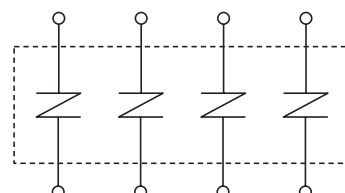
Schematic



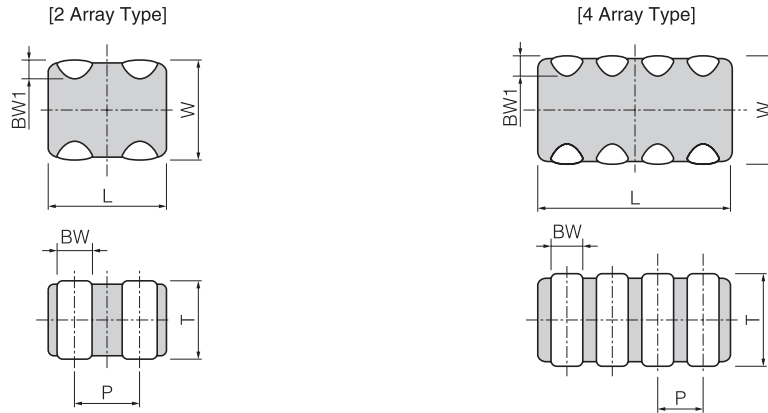
[4 Array Type]



Schematic



■ Dimension in mm(not to scale)



(Unit:mm)

Type	Part Numbers	L	W	T	BW	BW1	P
2 Array Type	EZJZS□□□□□A	1.37±0.15	1.0±0.1	0.60±0.06	0.36±0.10	0.2±0.1	0.64±0.10
4 Array Type	EZJZR□□□□□A	2.00±0.15	1.25±0.15	0.85±0.10	0.25±0.10	0.2 ^{+0.3} _{-0.1}	0.5±0.1

■ Ratings and Characteristics

Type	Size Code (EIA)	Prat Numbers	Maximum Allowable Voltage	Varistor Voltage @ 1mA	Capacitance @ 1MHz	Maximum Peak Current @8/20 μs	Maximum ESD IEC61000-4-2
2 Array Type	0504	EZJZSV120JA	DC 6.7 V	12 V	220 pF max.	5 A	Contact Discharge Voltage: 8 kV Air Gap Discharge Voltage: 15 kV
		EZJZSV270RA	DC 16 V	27 V	20 pF max.	3 A	
		EZJZSV270EA	DC 16 V	27 V	47 pF max.	5 A	
		EZJZSV800AA	DC 18 V	80 V	3 pF max.	—	
		EZJZSV171AA	DC 18 V	170 V	3 pF max.	—	
4 Array Type	0805	EZJZRV120JA	DC 6.7 V	12 V	220 pF max.	5 A	Contact Discharge Voltage: 8 kV Air Gap Discharge Voltage: 15 kV
		EZJZRV270RA	DC 16 V	27 V	20 pF max.	3 A	
		EZJZRV270EA	DC 16 V	27 V	47 pF max.	5 A	
		EZJZRV800AA	DC 18 V	80 V	3 pF max.	—	
		EZJZRV171AA	DC 18 V	170 V	3 pF max.	—	

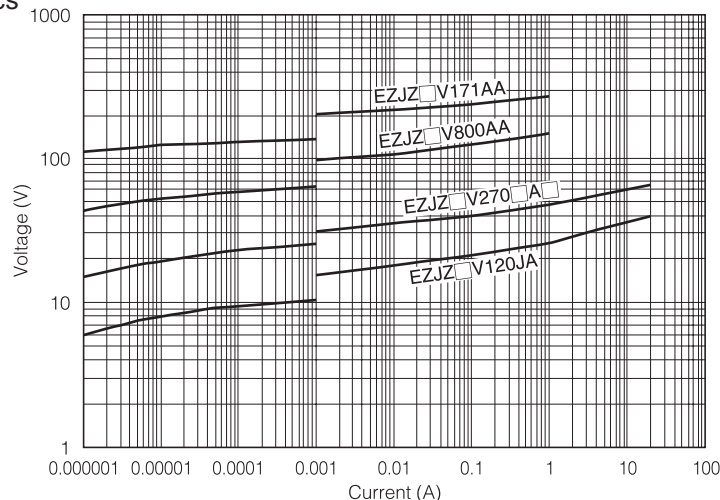
Type	Size Code (EIA)	Prat Numbers	Maximum Allowable Voltage	Varistor Voltage @ 1mA	Capacitance @ 1MHz	Maximum Peak Current @8/20 μs	Maximum ESD IEC61000-4-2
2 Array Capacitance Control Type	0504	EZJZSV270DA□	DC 16 V	27 V	27 pF	5 A	Contact Discharge Voltage: 8 kV Air Gap Discharge Voltage: 15 kV
		EZJZSV270PA□			33 pF		
		EZJZSV270SA□			39 pF		
		EZJZSV270TA□			43 pF		
		EZJZSV270EA□			47 pF		

● Operating Temperature Range: -40 to 85 °C

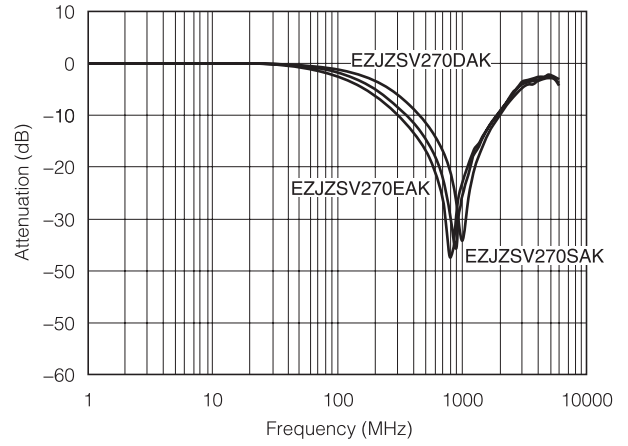
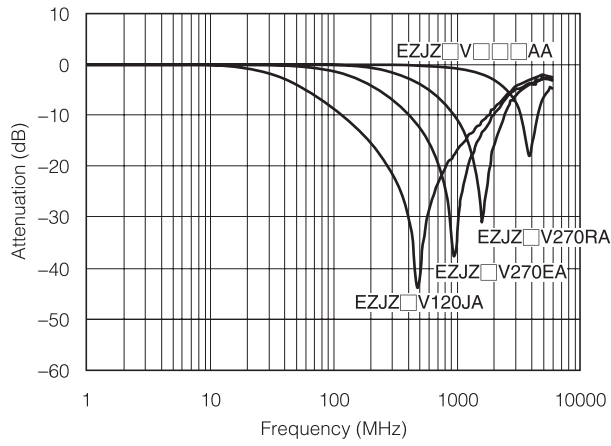
● □:Capacitance Tolerance Code (K:±10 %, M:±20 %)

■ Typical Characteristics

● Voltage vs. Current



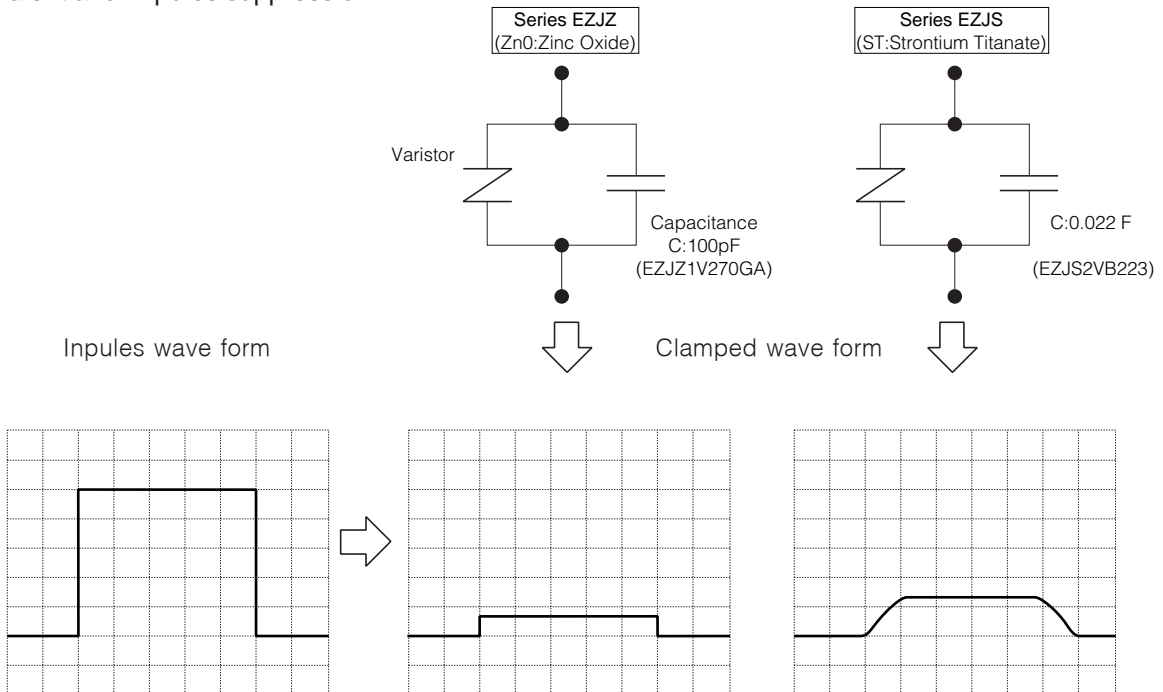
Frequency Characteristics



Recommended Applications

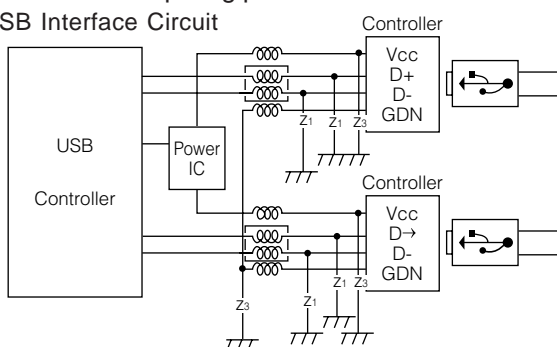
Applications Examples		Series		Recommended Applications			
				DC	1k	1M	1G ^(Hz)
PC mother board	Photoelectric sensor	Series EZJZ	Ultra low capacitance (3 pF max.)	[Bar chart showing high performance at 1k and 1M Hz]		DC to some tens of GHz Power, Relay. signal line High frequency circuit (USB, IEEE1394, etc)	
HDD	Proximity sensor		Low capacitance (20 to 330 pF)	[Bar chart showing high performance at 1k and 1M Hz]		DC to some tens of GHz Power, Relay. signal line High frequency circuit (RC232C, etc)	
CD-ROM	Pressure switch		High capacitance (1800 to 22000 pF)	[Bar chart showing high performance at 1k and 1M Hz]		DC to some hundreds of kHz Power, Relay. Audio signal	
DSC	Flowmeter	Series EZJS	High capacitance (1800 to 22000 pF)	[Bar chart showing high performance at 1k and 1M Hz]		DC to some hundreds of kHz Power, Relay. Audio signal	
Cellular telepone, PHS	SSR						
PDA	motor			[Bar chart showing high performance at 1k and 1M Hz]			

Equivalent and Impulses suppression

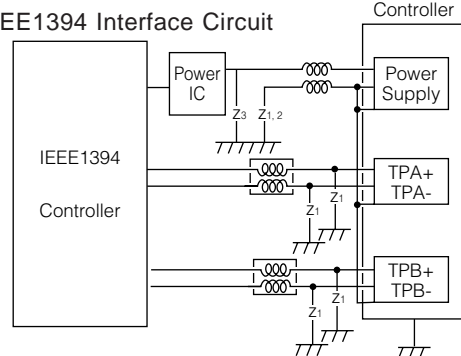


Typical circuits requiring protection

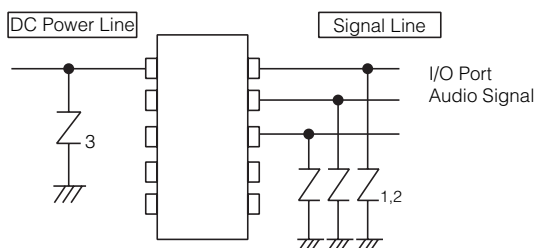
USB Interface Circuit



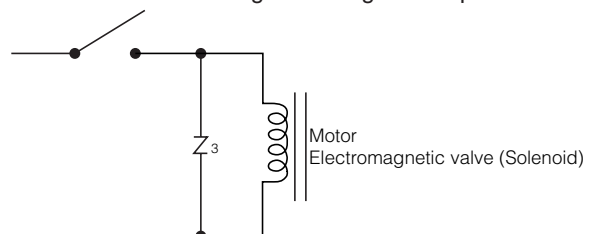
IEEE1394 Interface Circuit



IC Protection



Motor or Electromagnetic surge absorption



Z₁ : EZJZ Series(EZJZ□V171AA)
 Z₂ : EZJZ Series
 Z₃ : EZJZ Series or EZJS Series

■ Performance Characteristics

● Electrical

Characteristics	Test Method	Specifications
Standard Test Condition	Unless otherwise specified all test and measurements shall be made at a temperature of 15 to 35 °C and at a relative humidity of 45 to 75 %RH. If results obtained are doubted a further test should be carried out at a temperature of 20±2 °C and a relative humidity of 60 to 70 %RH.	—
Maximum allowable Voltage	The maximum DC voltage that can be applied continuously in the specified operating temperature.	To meet the specified value.
Varistor voltage	The voltage between two terminals with the specified measuring current C_{mA} DC applied is called V_c or V_{cmA} . The measurement shall be made as fast as possible to avoid heat affection.	
Capacitance	Capacitance shall be measured with the specified measuring frequency, 0.2 to 2.0 Vms., 0V bias and 20 °C.	
Maximum peak current	The Maximum current within the varistor voltage change of ±10 % when a standard impulse current of 8/20 μs is applied two times with an interval of 5 minutes.	
Maximum ESD	The maximum ESD within the varistor voltage change of ±30% when impressing 10 times of ESD (five times of positive-negatives for each polarity) which is based on IEC61000-4-2	
Temperature coefficient Varistor Voltage	Coefficient indicating dependency of V-I characteristics on temperature. This is shown by the change of V_{cmA} per °C at the ambient operating temperature.	EZJZ Series: ±0.1 %/°C EZJS Series: ±0.3 %/°C
Temperature coefficient capacitance	This is shown by the maximum capacitance change at the ambient operating temperature.	EZJZ Series: ±20 % EZJS Series: ±10 %

● Mechanical requirements

Characteristics	Test Method	Specifications									
Solderability	After securing the specimen by the body with tweezers and dipping in to the specified soldering flux, the specimen shall be completely immersed into a soldering bath having a temperature of 235±5 °C for 4±1 seconds. And then the specimen shall be visually examined. Use the specified soldering flux and solder following: Soldering Flux: Ethanol solution of rosin about 25 % by weight Solder: Eutectic solder (Sn 63 : Pb 37)	Approximately 75 % of the terminals shall be covered with new solder uniformly,									
Resistance to soldering heat	After preheating the specimen according to the following conditions in Table-1, the specimen shall be completely immersed into a soldering bath having a temperature of 270±5 °C for 3±0.5 seconds. And then be stored at room temperature for 24±2 hours. Thereafter, the change of V_c and the mechanical damage shall be examined.	No remarkable mechanical $\Delta V_c/V_c \leq \pm 10 \%$									
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Period</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>80 to 100 °C</td> <td>300 to 360 s</td> </tr> <tr> <td>2</td> <td>150 to 200 °C</td> <td>300 to 360 s</td> </tr> </tbody> </table>		Step	Temperature	Period	1	80 to 100 °C	300 to 360 s	2	150 to 200 °C	300 to 360 s	
Step	Temperature	Period									
1	80 to 100 °C	300 to 360 s									
2	150 to 200 °C	300 to 360 s									

- Performance Characteristics
- Environmental

Characteristics	Test Methods	Specifications																	
Temperature Cycle	<p>Before the measurement after test, the specimen shall be left to stand and mechanical damage shall be examined.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Step</th> <th style="text-align: center;">Temperature</th> <th style="text-align: center;">Period</th> <th style="text-align: center;">Cycles</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">T_L</td> <td style="text-align: center;">30 min.</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">5 cycles</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Room Temp.</td> <td style="text-align: center;">15 min.</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">T_U</td> <td style="text-align: center;">30 min.</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Room Temp.</td> <td style="text-align: center;">15 min.</td> </tr> </tbody> </table> <p>T_L : Lower operating temperature T_U : Upper operating temperature</p>	Step	Temperature	Period	Cycles	1	T _L	30 min.	5 cycles	2	Room Temp.	15 min.	3	T _U	30 min.	4	Room Temp.	15 min.	To meet the specified value.
Step	Temperature	Period	Cycles																
1	T _L	30 min.	5 cycles																
2	Room Temp.	15 min.																	
3	T _U	30 min.																	
4	Room Temp.	15 min.																	
Damp Heat Load	<p>Allowable Voltage shall be applied continuously to the specimen at specified conditions for specified period and then stored at room temperature and normal humidity for 24±2 hours. Thereafter, the change of V_c and mechanical damage shall be examined.</p> <p>Ambient condition : 40±2 °C, 90 to 95 %RH Period : 500+24 hours -0</p>	<p>No remarkable mechanical damage</p> <p>$\Delta V_c/V_c \leq \pm 10 \%$</p>																	
High Temperature Load (Dry Heat Load)	<p>Allowable Voltage shall be applied continuously to the specimen at specified conditions for specified period and then stored at room temperature and normal humidity for 24±2hours. Thereafter, the change of V_c and mechanical damage shall be examined.</p> <p>Ambient temp. : Upper operating temperature Period : 500+24 hours -0</p>	<p>No remarkable mechanical damage</p> <p>$\Delta V_c/V_c \leq \pm 10 \%$</p>																	

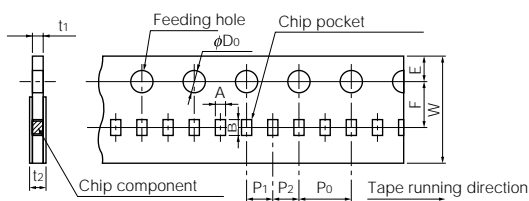
■ Packaging Specifications

● Standard Packing Quantity

Series	Size Code (EIA)	Thickness	Paper taping	Embossed taping
EZJZ	0201	0.3 mm	Pitch: 2 mm 15,000 pcs./reel	—
	0402	0.5 mm	Pitch: 2 mm 10,000 pcs./reel	—
	0603	0.8 mm	Pitch: 4 mm 4,000 pcs./reel	—
	2 Array Type	0.6 mm	Pitch: 4 mm 4,000 pcs./reel	—
	4 Array Type	0.85 mm	Pitch: 4 mm 4,000 pcs./reel	—
EZJS	0603	0.8 mm	Pitch: 4 mm 4,000 pcs./reel	—
	0805	0.8 mm	Pitch: 4 mm 5,000 pcs./reel	—
		1.25 mm	—	Pitch: 4 mm 2,000 pcs./reel

● Paper Taping

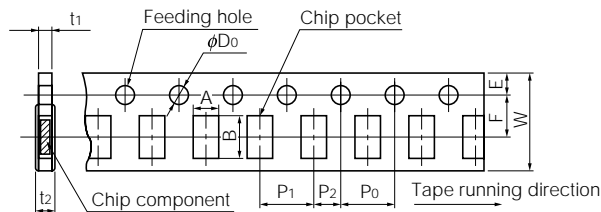
P₁: 2mm



(Unit: mm)

Symbol	A	B	W	F	E	P ₁	P ₂	P ₀	φD	t ₁	t ₂
0201	0.37 ±0.03	0.67 ±0.03	8.0 ±0.2	3.50 ±0.05	1.75 ±0.10	2.00 ±0.05	2.00 ±0.05	4.0 ±0.05	1.5 +0.1 0	0.5 max.	0.8 max.
0402	0.62 ±0.05	1.12 ±0.05	8.0 ±0.2	3.50 ±0.05	1.75 ±0.10	2.00 ±0.05	2.00 ±0.05	4.0 ±0.05	1.5 +0.1 0	0.7 max.	1.0 max.

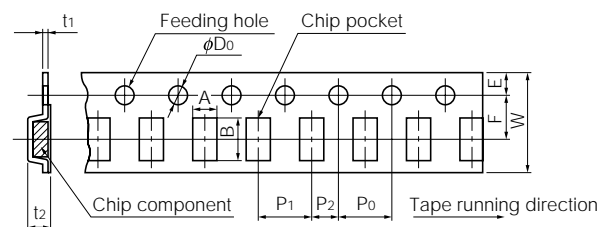
P₁: 4mm



(Unit: mm)

Symbol	A	B	W	F	E	P ₁	P ₂	P ₀	φD	t ₁	t ₂
0603	1.18 ±0.10	1.63 ±0.10	8.0 ±0.2	3.50 ±0.05	1.75 ±0.10	4.0 ±0.1	2.00 ±0.05	4.0 ±0.1	1.5 +0.1 0	1.1 max.	1.4 max.
0805 4 Array Type	1.65 ±0.2	2.4 ±0.2	8.0 ±0.2	3.50 ±0.05	1.75 ±0.10	4.0 ±0.1	2.00 ±0.05	4.0 ±0.1	1.5 +0.1 0	1.1 max.	1.4 max.
0504 2 Array Type	1.0 ±0.1	1.8 ±0.1	8.0 ±0.2	3.50 ±0.05	1.75 ±0.10	4.0 ±0.1	2.00 ±0.05	4.0 ±0.1	1.5 +0.1 0	1.1 max.	1.4 max.

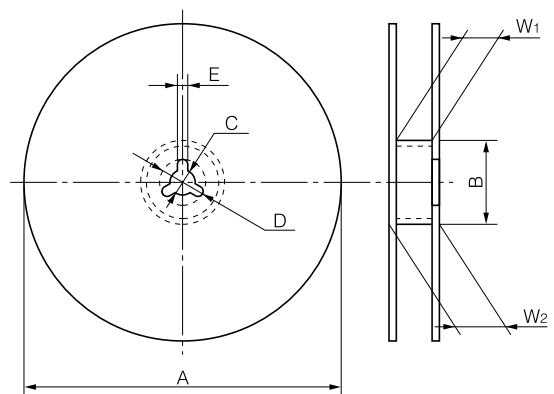
● Embossed Taping



(Unit: mm)

Symbol	A	B	W	F	E	P ₁	P ₂	P ₀	φD	t ₁	t ₂
0805	1.55 ±0.20	2.35 ±0.20	8.0 ±0.2	3.50 ±0.05	1.75 ±0.10	4.0 ±0.1	2.00 ±0.05	4.0 ±0.1	1.5 +0.1 0	0.6 max.	1.5 max.

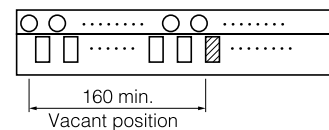
● Reel



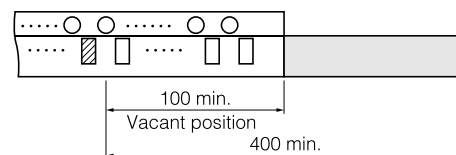
Symbol	A	B	C	D	E	W ₁	W ₂
Dim. (mm)	φ180 ^{-0.1}	φ60.0±0.5	13.0±0.5	21.0±0.8	2.0±0.5	9.0±0.3	11.4±1.00

● Leader Part and Taped End

Tape end



Leader part



Unit : mm