

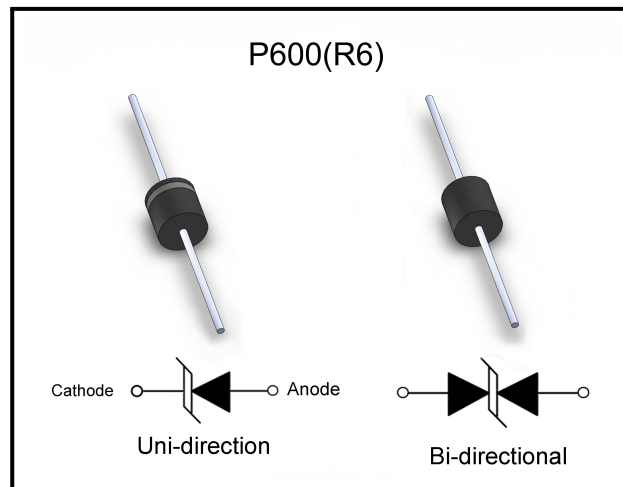
5KPxxxP Series

Transient Voltage Suppressor

Features

- Excellent clamping capability
- Low leakage current
- Better heat dissipation capability
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time: typically less than 1.0ps from 0 Volts to VBR min

Package



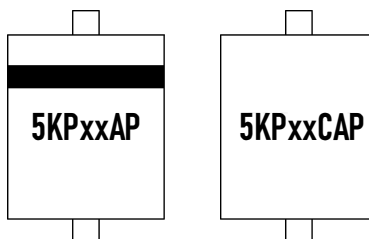
Mechanical Characteristics

- Package: P600 plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Telecom
- Computer
- Industrial electronic
- Consumer electronic

Making Code



Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
P600	Tape/Box,Box	300	BORN SPEC
	Tape/Reel,13" reel	800	EIA STD RS-296

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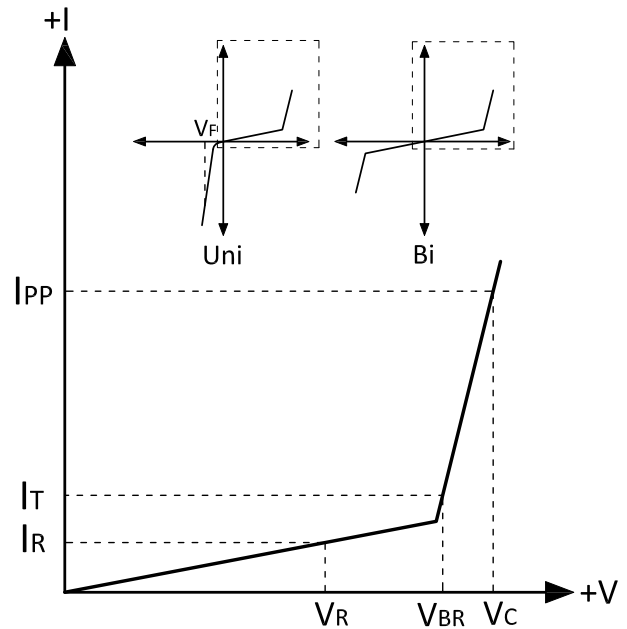


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Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified I_{PPM}
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



Absolute Maximum Ratings ($T_A=+25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation(Note1)	P_{PPM}	>5000	W
Steady State Power Dissipation (Note2)	P_D	8	W
Peak Forward Surge Current (Note3)	I_{FSM}	400	A
Maximum Instantaneous Forward Voltage at 100A (Note4)	V_{FM}	3.5/5	V
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	8	$^{\circ}\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 to 150	$^{\circ}\text{C}$
Storage Temperature Range	T_{SJG}	-55 to 150	$^{\circ}\text{C}$

Notes:

- (1) Non-repetitive current pulse , 10/1000us Waveform.
- (2) Infinite Heat Sink at $T_L=75^{\circ}\text{C}$, at 0.375"(9.5mm) lead length, P.C.B. mounted.
- (3) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.
- (4) For Unidirectional Only, $V_{FW}<3.5\text{V}$ for $V_{BR}\leq 200\text{V}$ and $V_{FM}<5.0\text{V}$ for $V_{BR}\geq 201\text{V}$.



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Part Number		Reverse Stand-Off Voltage V_R	Breakdown Voltage $V_{BR}@ I_T$		Test Current I_T	Maximum Clamping Voltage $V_C@ I_{PP}$	Maximum Peak Pulse Current I_{PP}	Maximum Reverse Leakage $I_R@ V_R$
(Uni)	(Bi)	(V)	Min.(V)	Max.(V)	(mA)	(V)	(A)	(uA)
5KP5.0AP	5KP5.0CAP	5	6.4	7	50	9.2	554	5000
5KP6.0AP	5KP6.0CAP	6	6.67	7.37	50	10.3	495	5000
5KP6.5AP	5KP6.5CAP	6.5	7.22	7.98	50	11.2	455	2000
5KP7.0AP	5KP7.0CAP	7	7.78	8.6	50	12	425	1000
5KP7.5AP	5KP7.5CAP	7.5	8.33	9.21	5	12.9	395	250
5KP8.0AP	5KP8.0CAP	8	8.89	9.83	5	13.6	375	150
5KP8.5AP	5KP8.5CAP	8.5	9.44	10.4	5	14.4	354	50
5KP9.0AP	5KP9.0CAP	9	10	11.1	5	15.4	331	20
5KP10AP	5KP10CAP	10	11.1	12.3	5	17	300	15
5KP11AP	5KP11CAP	11	12.2	13.5	5	18.2	280	2
5KP12AP	5KP12CAP	12	13.3	14.7	5	19.9	256	2
5KP13AP	5KP13CAP	13	14.4	15.9	5	21.5	237	2
5KP14AP	5KP14CAP	14	15.6	17.2	5	23.2	220	2
5KP15AP	5KP15CAP	15	16.7	18.5	5	24.4	209	2
5KP16AP	5KP16CAP	16	17.8	19.7	5	26	196	2
5KP17AP	5KP17CAP	17	18.9	20.9	5	27.6	185	2
5KP18AP	5KP18CAP	18	20	22.1	5	29.2	175	2
5KP20AP	5KP20CAP	20	22.2	24.5	5	32.4	157.4	2
5KP22AP	5KP22CAP	22	24	26.9	5	35.5	143.7	2
5KP24AP	5KP24CAP	24	26.7	29.5	5	38.9	131.1	2
5KP26AP	5KP26CAP	26	28.9	31.9	5	42.1	121.1	2
5KP28AP	5KP28CAP	28	31.1	34.4	5	45.4	112.3	2
5KP30AP	5KP30CAP	30	33.3	36.8	5	48.4	105.4	2
5KP33AP	5KP33CAP	33	36.7	40.6	5	53.3	95.7	2
5KP36AP	5KP36CAP	36	40	44.2	5	58.1	87.8	2
5KP40AP	5KP40CAP	40	44.4	49.1	5	64.5	79.1	2
5KP43AP	5KP43CAP	43	47.8	52.8	5	69.4	73.5	2
5KP45AP	5KP45CAP	45	50	55.3	5	72.7	70.2	2
5KP48AP	5KP48CAP	48	53.3	58.9	5	77.4	65.9	2
5KP51AP	5KP51CAP	51	56.7	62.7	5	82.4	61.9	2

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Part Number		Reverse Stand-Off Voltage V_R	Breakdown Voltage $V_{BR}@ I_T$		Test Current I_T	Maximum Clamping Voltage $V_C@ I_{PP}$	Maximum Peak Pulse Current I_{PP}	Maximum Reverse Leakage $I_R@ V_R$
(Uni)	(Bi)	(V)	Min.(V)	Max.(V)	(mA)	(V)	(A)	(uA)
5KP54AP	5KP54CAP	54	60	66.3	5	87.1	58.6	2
5KP58AP	5KP58CAP	58	64.4	71.2	5	93.6	54.5	2
5KP60AP	5KP60CAP	60	66.7	73.7	5	96.8	52.7	2
5KP64AP	5KP64CAP	64	71.1	78.6	5	103	49.5	2
5KP70AP	5KP70CAP	70	77.8	86	5	113	45.1	2
5KP75AP	5KP75CAP	75	83.3	92.1	5	121	42.1	2
5KP78AP	5KP78CAP	78	86.7	95.8	5	126	40.5	2
5KP85AP	5KP85CAP	85	94.4	104	5	137	37.2	2
5KP90AP	5KP90CAP	90	100	111	5	146	34.9	2
5KP100AP	5KP100CAP	100	110	123	5	162	31.5	2
5KP110AP	5KP110CAP	110	122	135	5	177	28.8	2
5KP120AP	5KP120CAP	120	133	147	5	193	26.4	2
5KP130AP	5KP130CAP	130	144	159	5	209	24.4	2
5KP150AP	5KP150CAP	150	167	185	5	243	21	2
5KP160AP	5KP160CAP	160	178	197	5	259	19.7	2
5KP170AP	5KP170CAP	170	189	209	5	275	18.5	2
5KP180AP	5KP180CAP	180	200	221	5	292	17.5	2
5KP190AP	5KP190CAP	190	211	233	5	310	16.5	2
5KP200AP	5KP200CAP	200	222	246	5	329.2	15.5	2
5KP210AP	5KP210CAP	210	233	258	5	349.5	14.6	2
5KP220AP	5KP220CAP	220	244	270	5	371.1	13.7	2
5KP250AP	5KP250CAP	250	277	306	5	425	12	2
5KP350AP	5KP350CAP	350	392	428	5	567	8.8	2



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Ratings and Characteristic Curves ($T_A = +25^\circ\text{C}$, unless otherwise noted)

Figure 1: Peak Pulse Power Rating

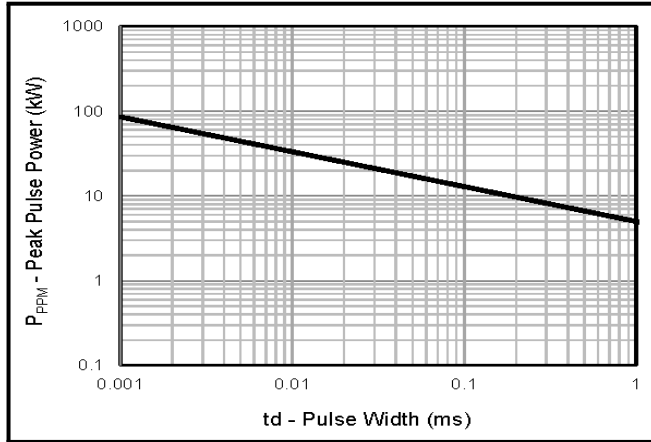


Figure 2: Pulse Derating Curve

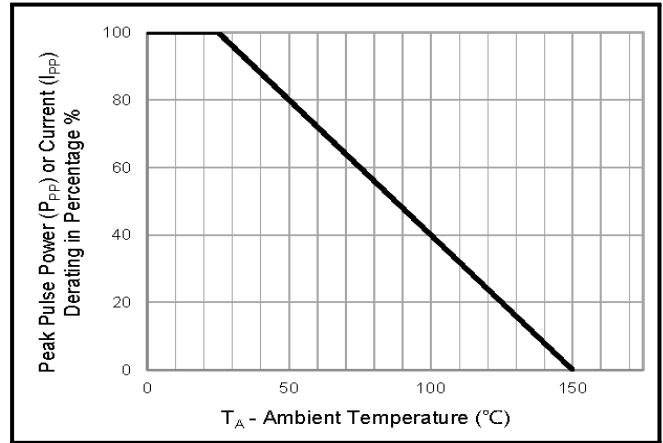


Figure 3: Pulse Waveform

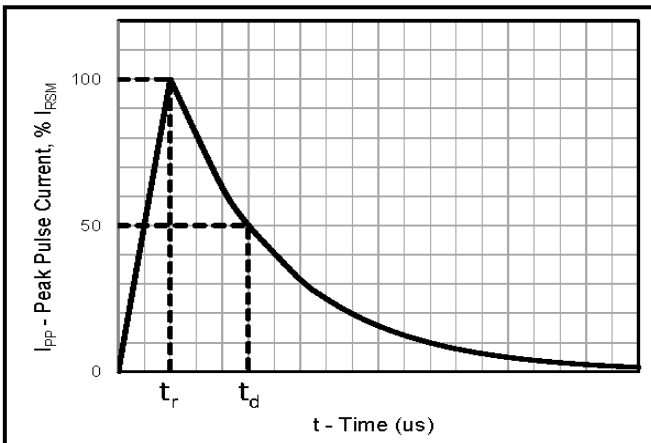


Figure 4 : Typical Junction Capacitance

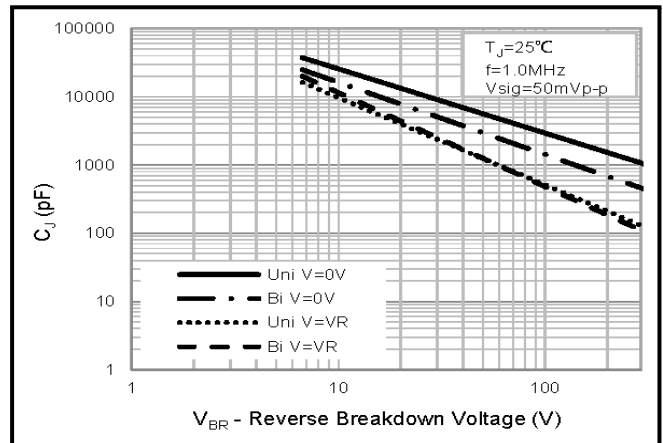


Figure 5: Steady State Power Dissipation Derating

Curve

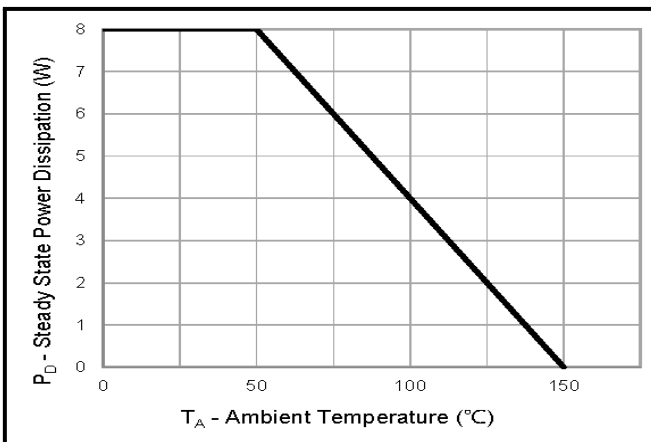
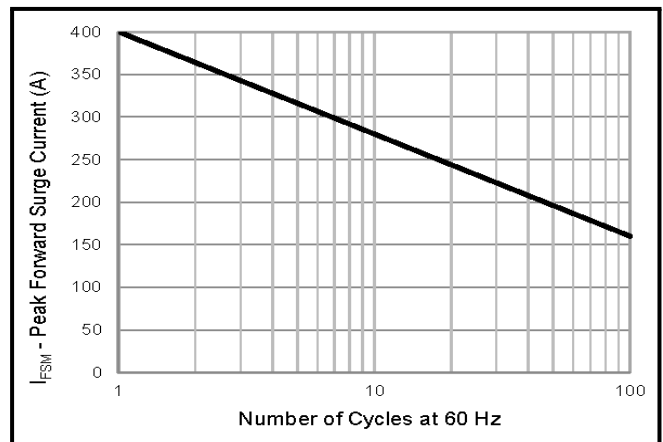


Figure 6 : Maximum Non-Repetitive Peak Forward

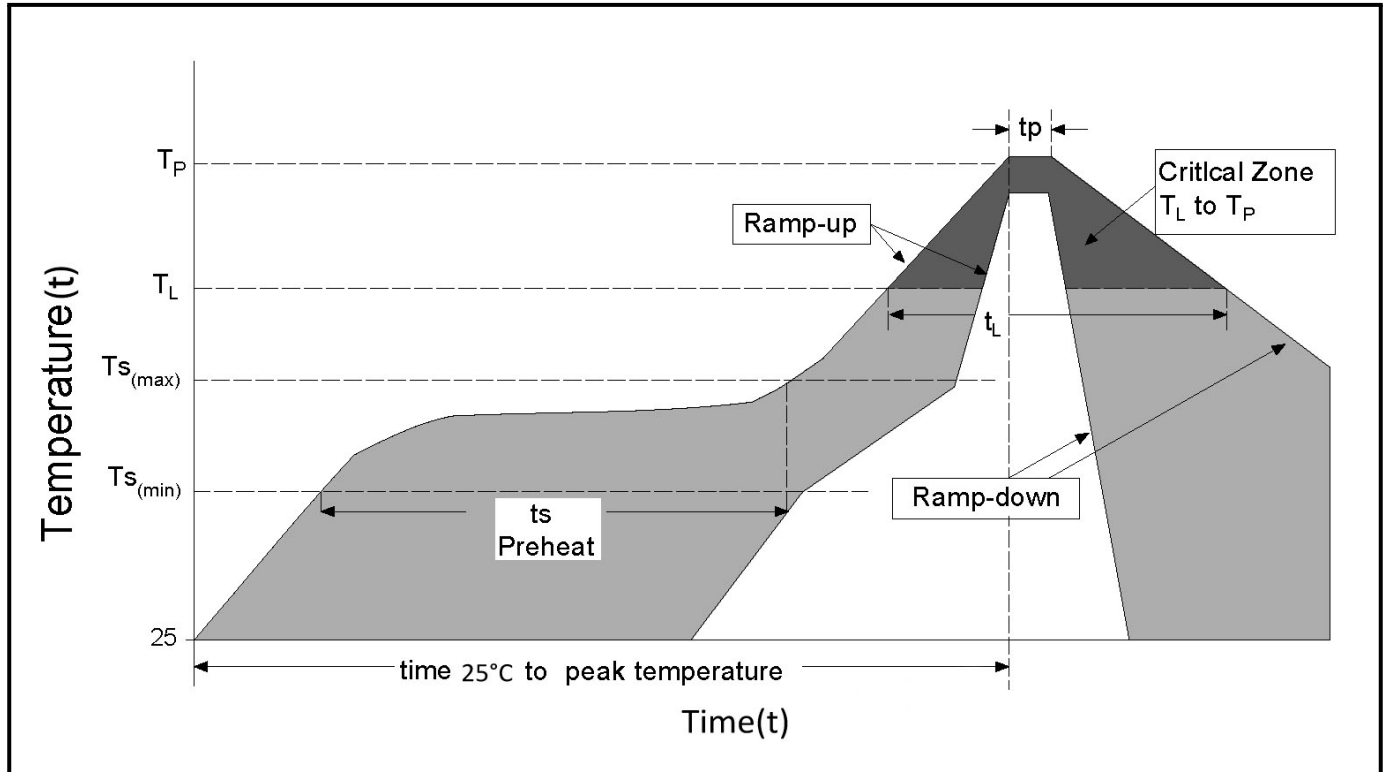
Surge Current Uni-Directional Only



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Soldering Parameters



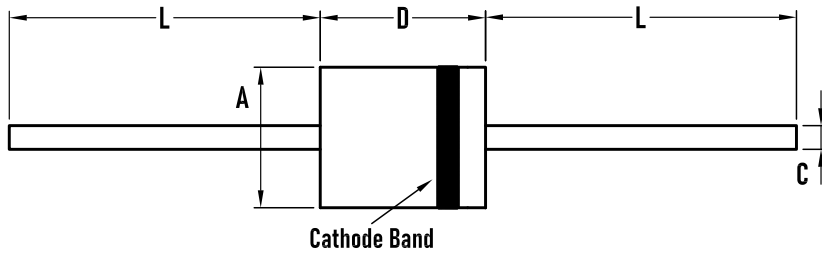
Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{S(min)}$)	150°C
	- Temperature Max ($T_{S(max)}$)	200°C
	- Time (min to max) (t_s)	60 - 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 - 150 secs
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 - 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C



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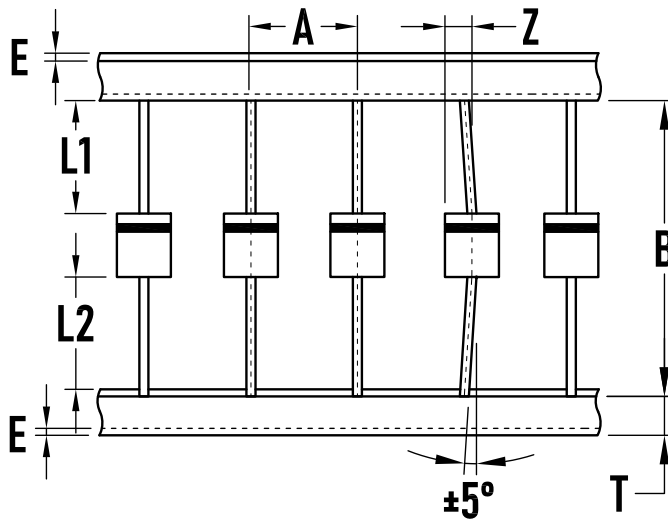
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Package Mechanical Data - P600



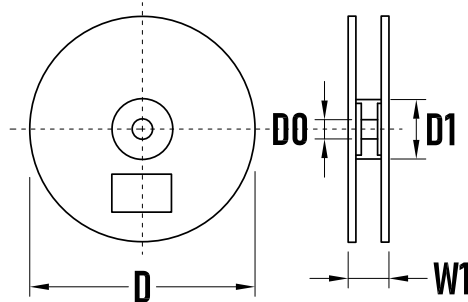
SYMBOL	Inches		MILLIMETER	
	MIN	MAX	MIN	MAX
A	0.339	0.358	8.6	9.1
C	0.048	0.052	1.22	1.32
D	0.339	0.358	8.6	9.1
L	1	—	25.4	—

Packaging Tape-P600



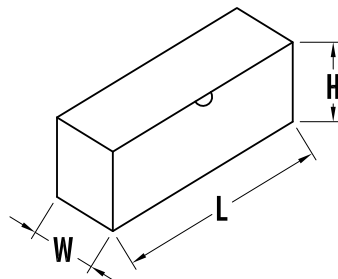
SYMBOL	Dimension(mm)
A	10.0 $\pm$ 0.5
B	53.0 $\pm$ 1.0
Z	1.2Max.
T	6.0 $\pm$ 0.4
E	0.8Max.
L1-L2	1.0Max.

Packaging Reel



SYMBOL	Dimension(mm)
D	330.0 $\pm$ 3.0
D0	16.4 $\pm$ 2.0
D1	86.0 $\pm$ 2.0
W1	76.0 $\pm$ 3.0
Quantity	800PCS

Packaging BOX



SYMBOL	Dimension(mm)
L	250.0 $\pm$ 5.0
W	75.0 $\pm$ 5.0
H	114.0 $\pm$ 5.0
Quantity	300PCS

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