

ESD Protection Diode

DFN1006 package Ultra-low capacitance type



■ Features

1. RoHS compliant and halogen-free
2. Working voltage: 5V
3. Ultra-low capacitance: 0.3pF
4. Low clamping voltage
5. Low leakage current
6. IEC 61000-4-2 (ESD) $\pm 15\text{KV}$ (air), $\pm 8\text{KV}$ (contact)



■ Recommended Applications

1. Cell Phone Handsets and Accessories
2. Notebooks, Desktops and Servers
3. PCI express, SATA, USB 2.0, DVI, Display port
4. Portable Instrumentation

■ Mechanical Data

1. Case: DFN1006(0402), molded plastic meets UL flammability rating 94V-0
2. Terminal : Au plated, solderable per MIL-STD-750, method 2026
3. High temperature soldering guaranteed: $260^{\circ}\text{C}/10$ seconds
4. Meets MSL level 1, per J-STD-020

■ Part Number Code

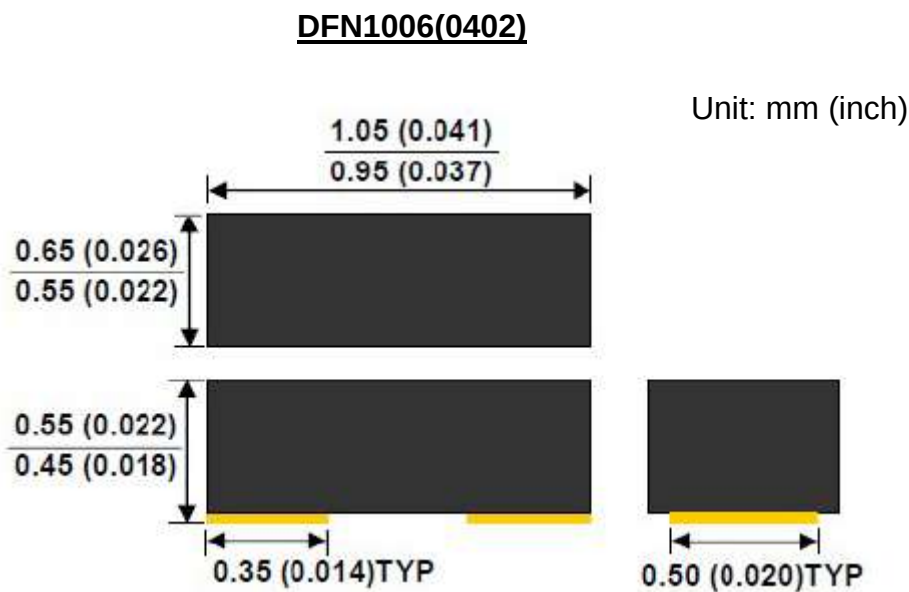
T		E		U		D		1		0		2		0		5		0		R		3		B	
1		2		3		4		5		6		7		8		9		10		11		12		13	
↓		↓		↓		↓		↓		↓		↓		↓		↓		↓		↓		↓		↓	
Product Series		Type code				Package				Reverse Stand off Voltage(V_{RWM})				Junction Capacitance(C_j)				Type Code							
TE	THINKING ESD Transient Voltage Suppression Diodes	D	Standard Capacitance >10pF			SD32	SOD-323, 2pins			05		5V		0R5	0.5pF		U	Uni-directional							
		L	Low Capacitance >1pF, ≤10pF			ST23	SOT-23, 3pins							030	3.0pF		B	Bi-directional,							
		U	Ultra-low Capacitance ≤1pF			D102	DFN1006, 2pins							03D	3.3pF										
														100		10pF									

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Structures and Dimensions



Schematic & PIN Configuration



Maximum Rating (Rating at 25°C ambient temperature unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power (tp= 8/20μs waveform)	P _{PPM}	30	W
ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	V _{ESD}	±15 ±8	KV
Operating junction temperature	T _J	-55~+125	°C
Storage temperature range	T _{STG}	-55~+150	°C

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■ Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse Stand-off Voltage	V_{RWM}	-			5	V
Breakdown Voltage	V_{BR}	$I_R = 1\text{mA}$	6		7.8	V
Reverse Leakage Current	I_R	$V_{RWM}=5\text{V}$			0.05	μA
Clamping Voltage	V_C	$I_{pp} = 1\text{A}$, $t_p = 8/20\mu\text{s}$			14	V
Junction Capacitance	C_j	Between I/O Pin and GND $V_R=0\text{V}$, $f=1\text{MHz}$		0.3	0.6	pF

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■ Rate and Characteristic Curve ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1 Power derating Curve

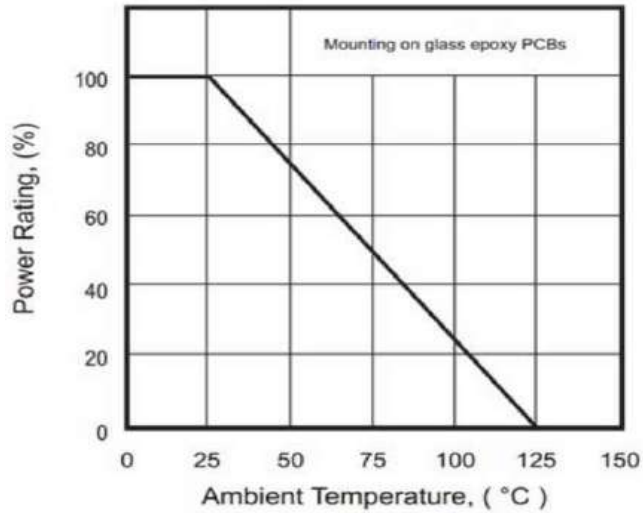


Figure 2

8/20 μ s peak pulse current waveform

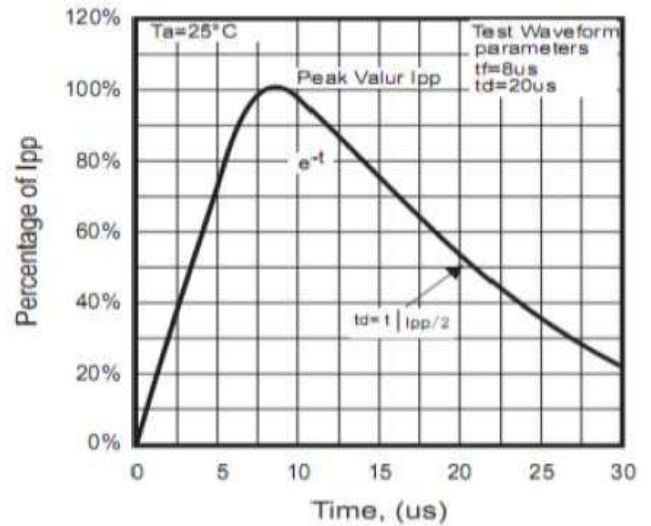


Figure 3 V_c vs I_{pp}

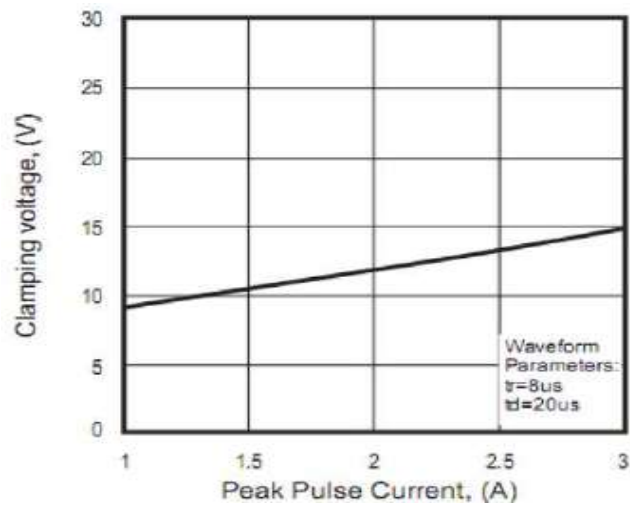


Figure 4 Capacitance vs. Reverse voltage

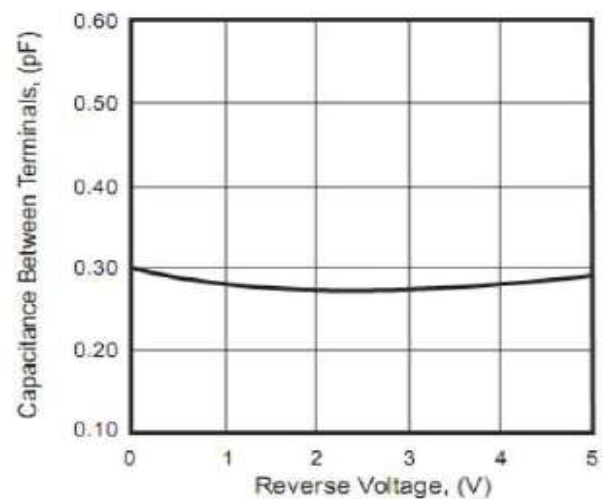
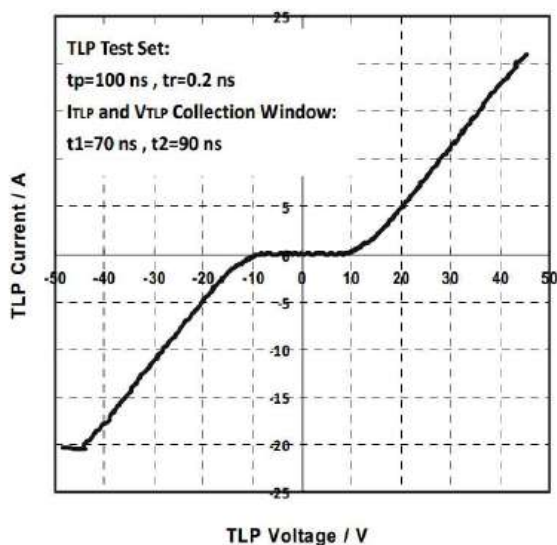
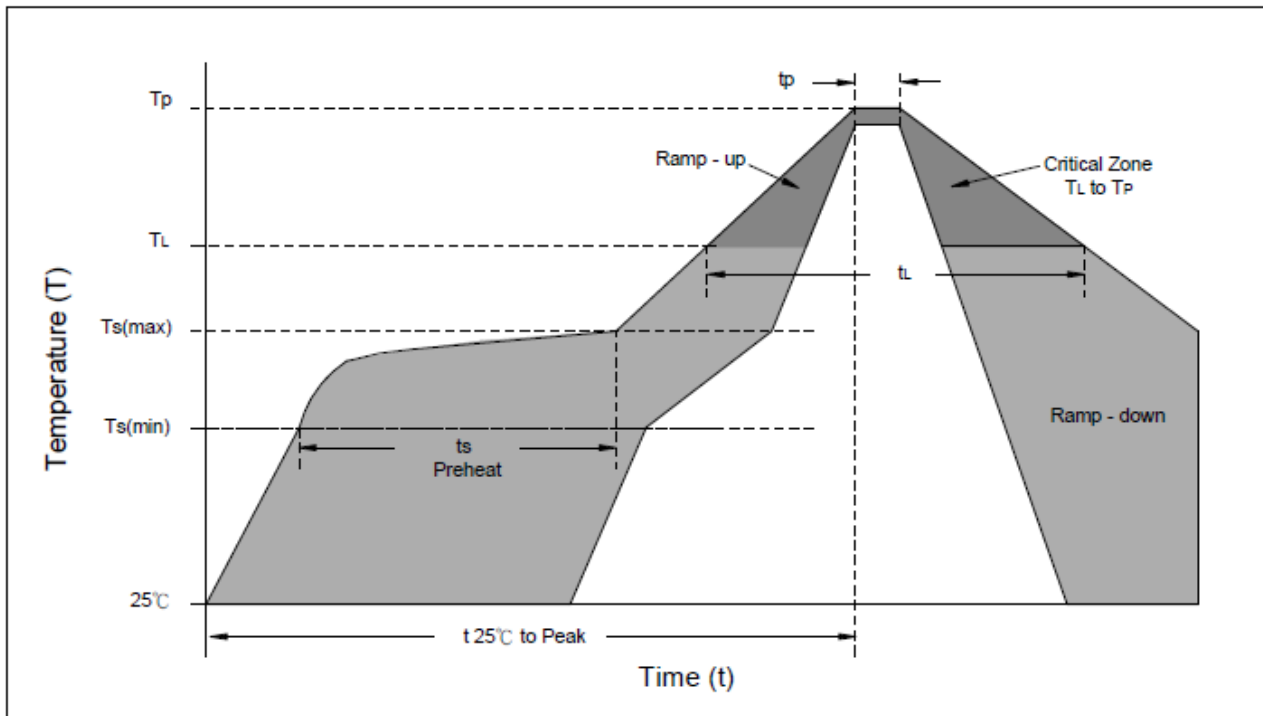


Figure 5 TLP V-I Curve

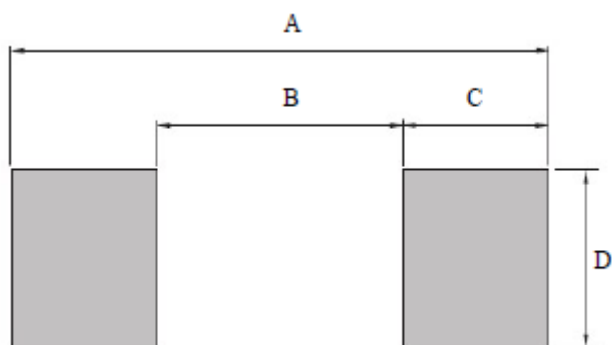


■ Soldering Recommendation



Reflow Condition	Lead-free assembly
Preheat	
-Temperature Min(Ts min)	150°C
-Temperature Min(Ts max)	200°C
-Time (min to max) (ts)	60 – 180 seconds
Average ramp up rate	
-Temperature Liquidus (TL) to peak	3°C/second max
Ts(max) to TL	
-Ramp-up Rate	3°C/second max.
Reflow	
-Temperature Liquidus (TL)	217°C
-Time (tL)	60 – 150 seconds
Peak Temperature (TP)	260°C
Time within 5°C of actual peak Temperature(tp)	20 – 40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to peak Temperature(TP)	8 minutes max.
Do not exceed	260°C

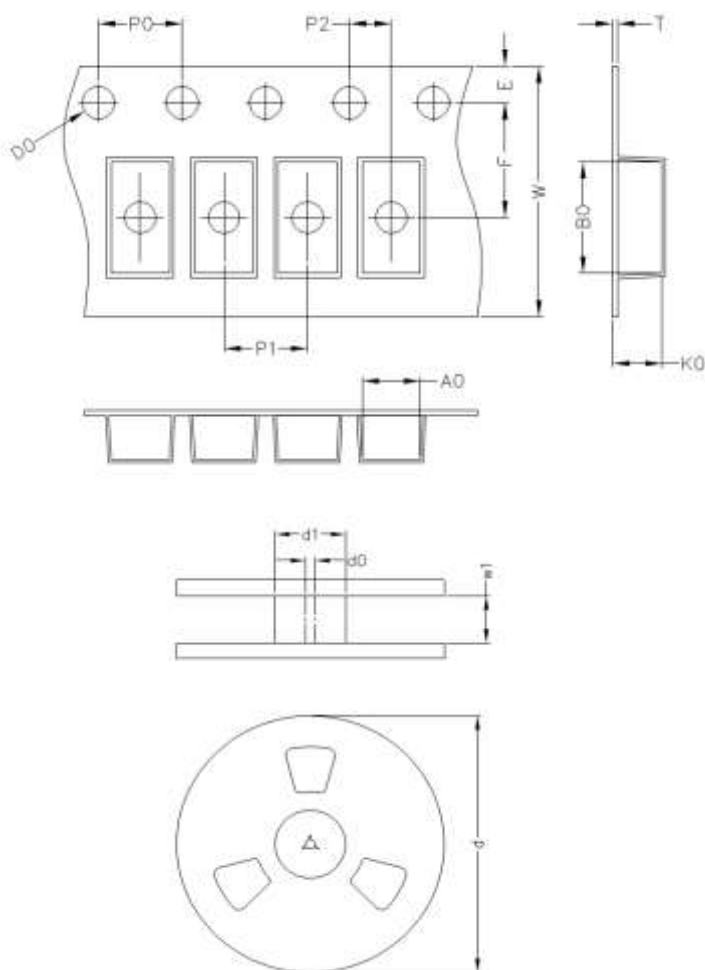
■ Recommended Soldering Pad Dimensions



Unit: mm

Package Type	A	B	C	D
DFN1006	1.3	0.3	0.5	0.7

■ Packaging



Symbol	DFN1006 (Unit: mm)
A0	0.67 ± 0.10
B0	1.12 ± 0.10
K0	0.60 ± 0.10
D0	1.50 ± 0.10
E	1.75 ± 0.10
F	3.50 ± 0.10
P0	4.00 ± 0.10
P1	4.00 ± 0.10
P2	2.00 ± 0.10
T	0.22 ± 0.05
W	8.00 ± 0.20
d (7")	178.00 ± 2.00
d1	MIN. 54.00
d0	13.00 ± 0.20
w1	MAX. 13.50



■ Quantity

Package Type	Marking Code	Reel Size (inch)	Reel (Kpcs)
DFN1006	S	7"	10

■ Warehouse Storage Conditions of product

- Storage condition:
 - 1.Storage Temperature: -10℃~+40℃
 - 2.Relative Humidity: $\leq 75\%RH$
 - 3.Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.