3.3V Transient Voltage Suppressor

Features

- Small Body Outline Dimensions
- 70 Watts Peak Pulse Power per Line (tp=8/20μs)
- Protects one I/O or Power Line
- Low Clamping Voltage
- Working Voltage: 3.3 V
- Low Leakage Current

IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 7A (8/20μs)

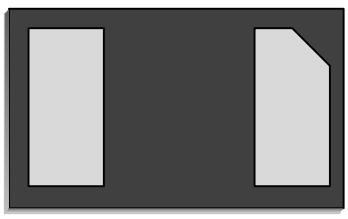
Mechanical Characteristics

- DFN1006-2L package
- Packaging: Tape and Reel
- Marking : Marking Code
- RoHS Compliant
- MSL1

Applications

- Cellular Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras

Schematic & PIN Configuration



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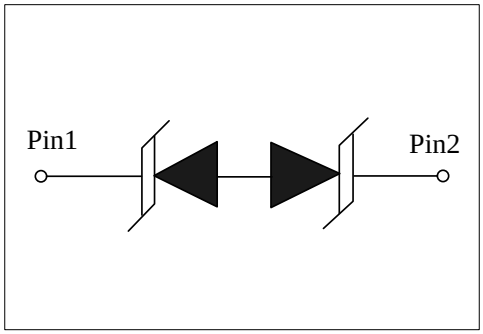
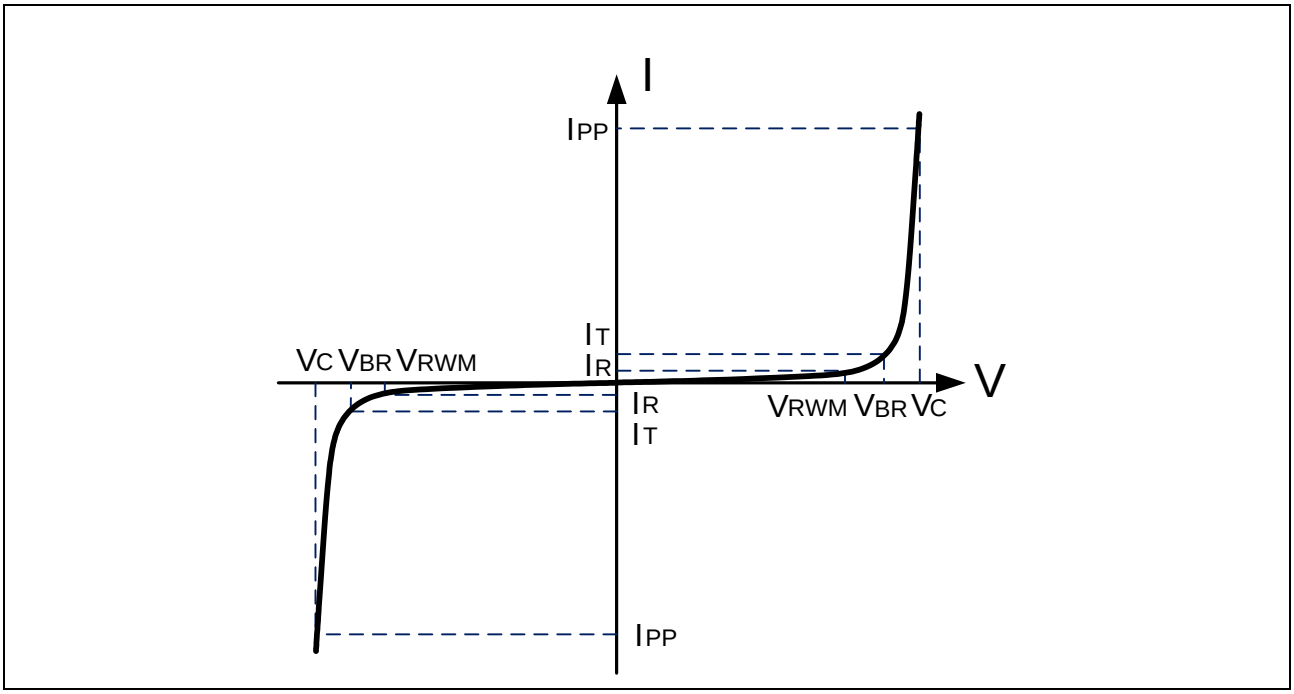


Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Peak Pulse Power (t_p = 8/20μs)	P_{PP}	70	Watts
Peak Pulse Current (t_p = 8/20μs)	I_{PP}	7	A
Operating Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Reverse Stand-Off Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current



Electrical Characteristics(T=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Stand-Off Voltage	V_{RWM}				3.3	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	3.7			V
Reverse Leakage Current	I_R	V_{RWM}=3.3V			500	nA
Clamping Voltage	V_C	I_{PP}=7A,t_p=8/20μs		8	10	V
ESD Clamping Voltage (1)	V_C	I_{PP} = 4A t_p = 0.2/100ns		6.3		V
ESD Clamping Voltage (1)	V_C	I_{PP} = 16A t_p = 0.2/100ns		9.4		V
Dynamic Resistance (1) (2)	R_{DYN}	TLP=0.2/100ns		0.3		Ω
Junction Capacitance	C_j	V_R = 0V, f = 1MHz		15	20	pF

Note1.TLP Setting：t_p=100ns, t_r=0.2ns, I_{TLP} and V_{TLP} sample window:t_1=70ns to t_2=90ns.

Note2.Dynamic resistance calculated from I_{PP}=4A to I_{PP}=16A using “Best Fit”

Typical Characteristics

Figure 1: Peak Pulse Power Vs Pulse Time

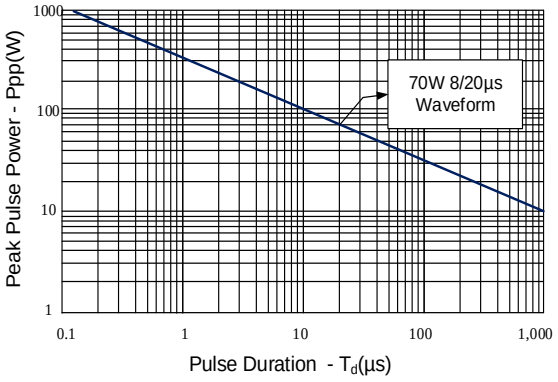


Figure 2: Power Derating Curve

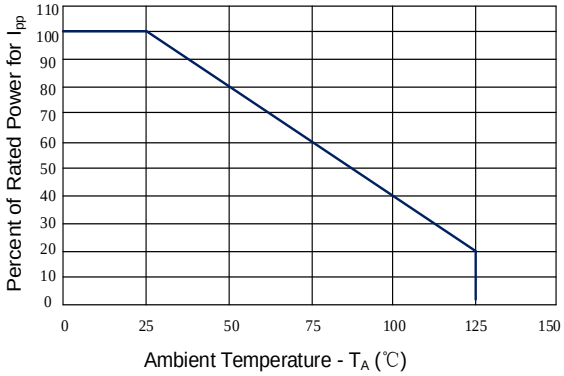


Figure 3: Clamping Voltage vs. Peak Pulse Current

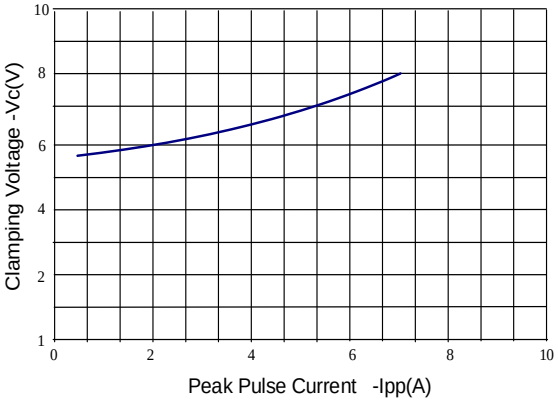


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

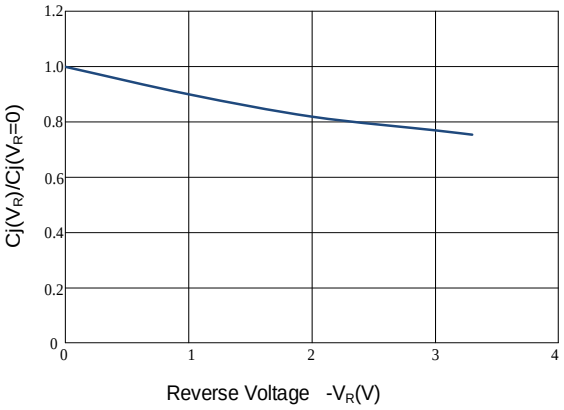


Figure 5: TLP Positive I-V Curve

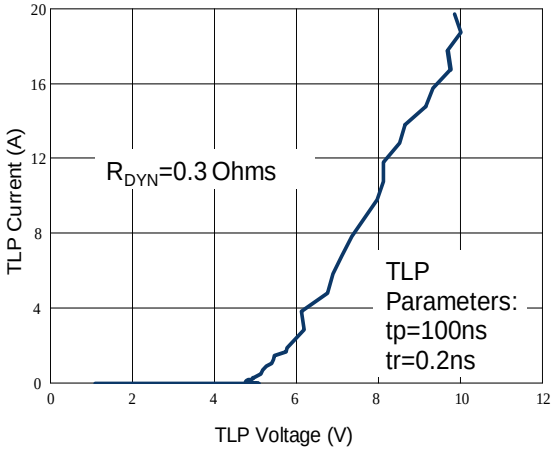
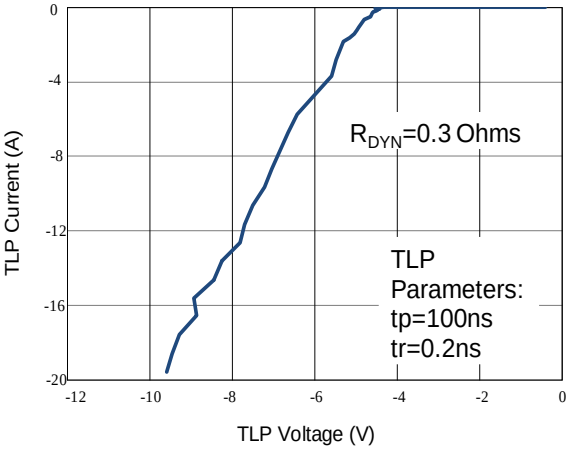
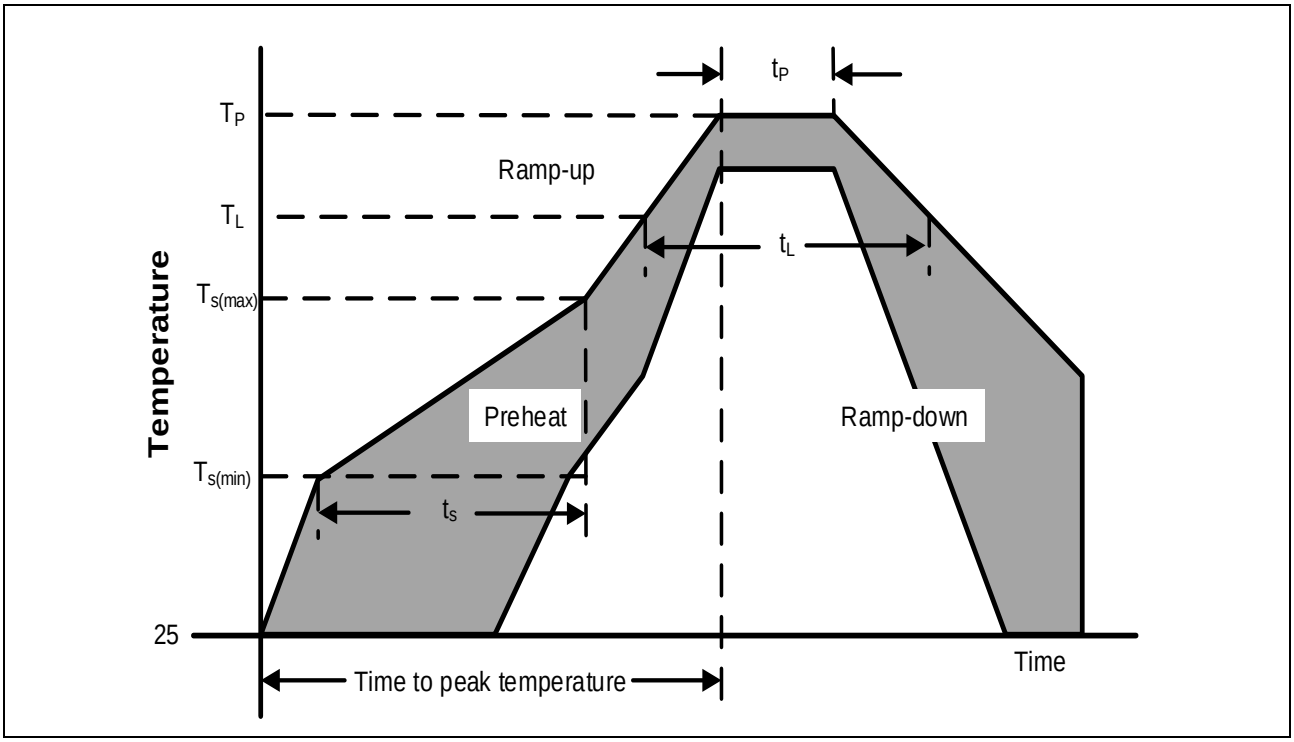


Figure 6: TLP Negative I-V Curve



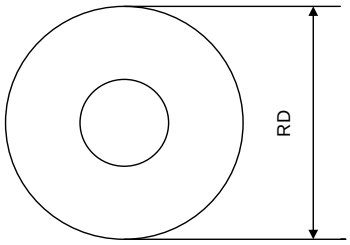
Soldering Parameters

Reflow Condition		Pb – 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 – 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{S(max)}$ to T_L——Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260+0/-5 °C
Time within actual peak Temperature (t_P)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C

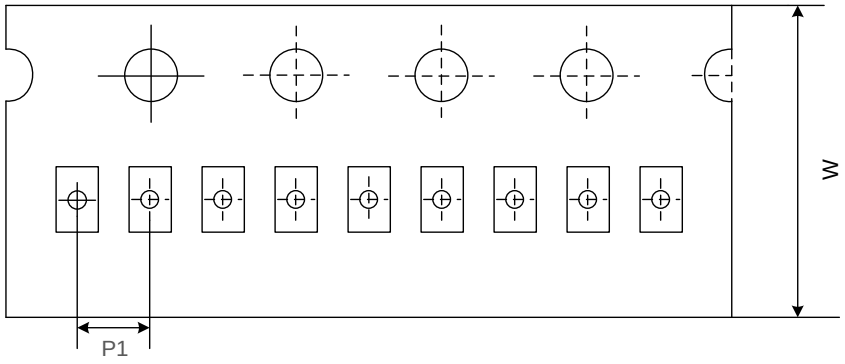


Tape And Reel Information

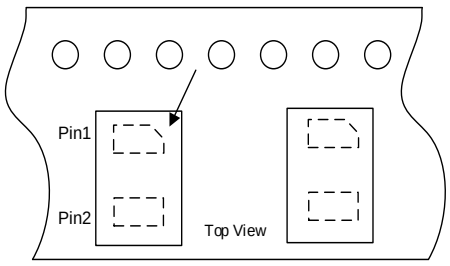
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape

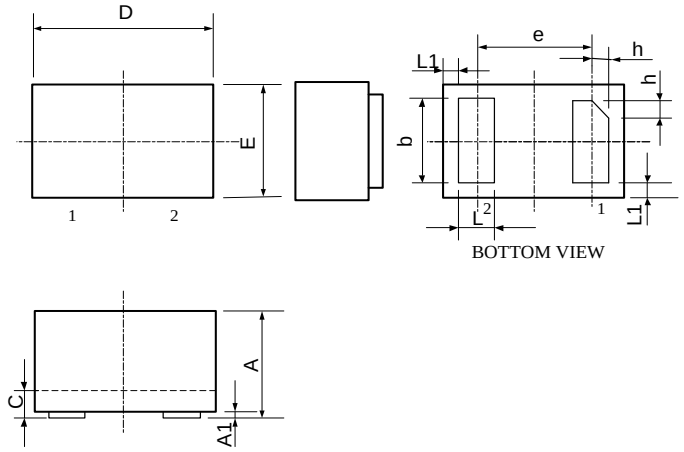


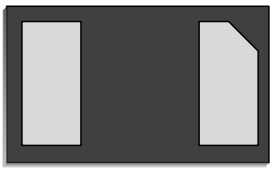
User Direction of Feed

RD	Reel Dimensions	7 inch
W	Overall width of the carrier tape	8 mm
P1	Pitch between successive cavity centers	2 mm

Package Dimension

PACKAGE OUTLINE





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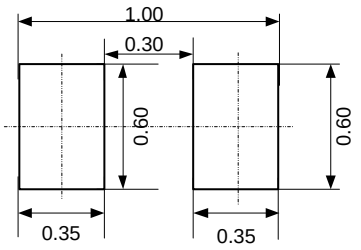
SYMBOL	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0	0.02	0.05
b	0.45	0.50	0.55
C	0.12	0.15	0.18
D	0.95	1.00	1.05
e	0.65 REF		
E	0.55	0.60	0.65
L	0.20	0.25	0.30
L1	0.05 REF		
h	0.07	0.12	0.17

Land Pattern



Ordering Information

Part	Package	Marking	Packing Information
E33DFB	DFN1006-2L	3B	10k/Reel

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2018-10-26	Released Version	Liu Jia Ying	Qi Shu Kun	Liu Jia Ying
1.1	2022-11-23	Update Typeset	Chen Zu Xiong	Qi Shu Kun	Liu Jia Ying