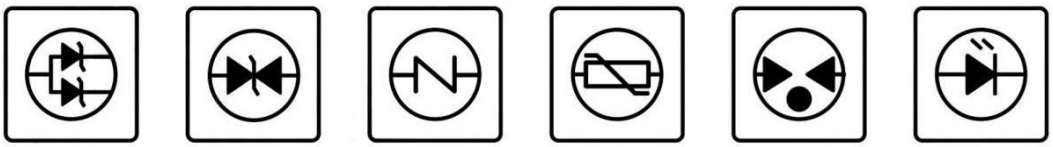
MSKSEMI 美森科
SEMICONDUCTOR



TPD1E1B04DPYR-MS

Product specification

Description

The TPD1E1B04DPYR-MS protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, low operating voltage. It gives designer the flexibility to protect one bi-directional line in applications where arrays are not practical.

Features

- 100W peak pulse power per line (tP = 8/20μs)
- DFN1006-2L package
- Replacement for MLV(0402)
- Bidirectional configurations
- Response time is typically < 1ns
- Low clamping voltage
- RoHS compliant
- Transient protection for data lines to
  IEC61000-4-2(ESD) ±15KV(air), ±12KV(contact);
  IEC61000-4-4 (EFT) 40A (5/50ns)

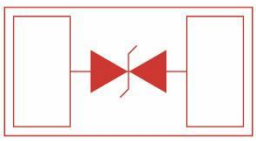
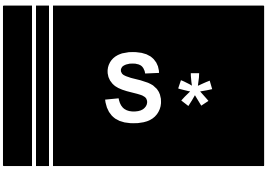
Applications

- Cellular phones
- Portable devices
- Digital cameras
- Power supplies

MechanicalCharacteristics

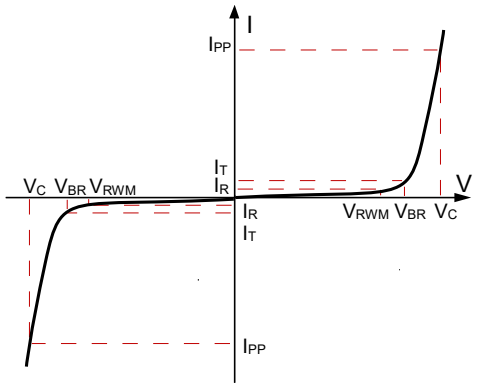
- Mounting position: Any
- Qualified max reflow temperature:260℃
- Device meets MSL 1 requirements
- DFN1006-2L without plating

Reference News

PACKAGE OUTLINE	PIN Configuration	Marking
 DFN1006		

Electronics Parameter

Symbol	Parameter
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
P_{PP}	Peak Pulse Power
C_J	Junction Capacitance
I_F	Forward Current
V_F	Forward Voltage @ I_F



Electrical characteristics per line@25℃ (unless otherwisespecified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	I_t = 1mA	5.6			V
Reverse Leakage Current	I_R	V_{RWM} = 5V T=25℃			1.0	μA
Maximum Reverse Peak Pulse Current	I_{PP}			5.5		A
Clamping Voltage	V_C	I_{PP}=1A			10	V
Clamping Voltage	V_C	I_{PP}=3A			15	V
Clamping Voltage	V_C	I_{PP}=5A			21	V
Junction Capacitance	C_j	V_R=0V f = 1MHz		1		pF

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Peak Pulse Power (t_p=8/20μs)	P_{pp}	100	W
Peak Pulse Current (t_p=8/20μs)	I_{pp}	5	A
Operating Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃

TypicalCharacteristics

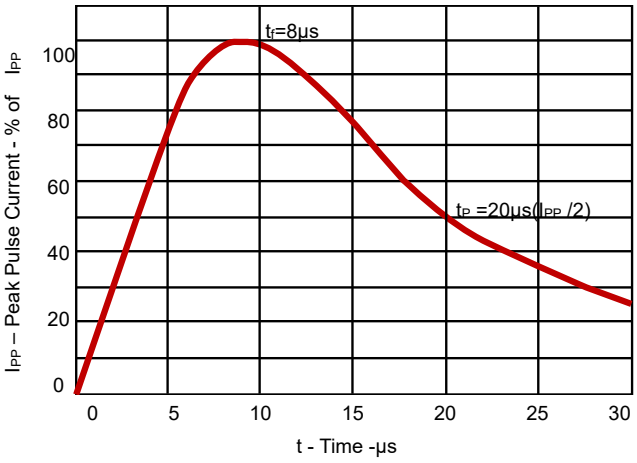


Fig 1.Pulse Waveform

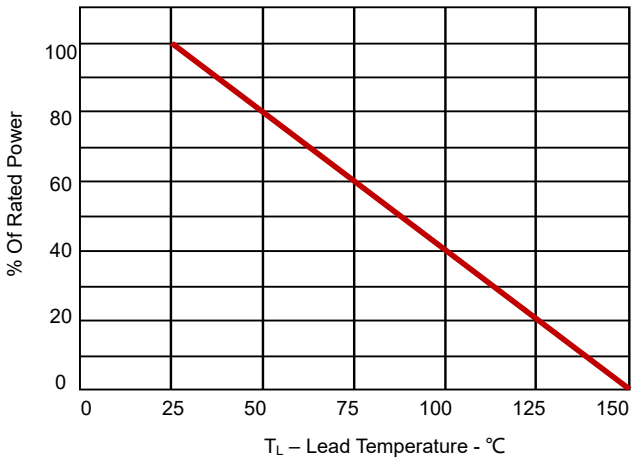


Fig 2.Power Derating Curve

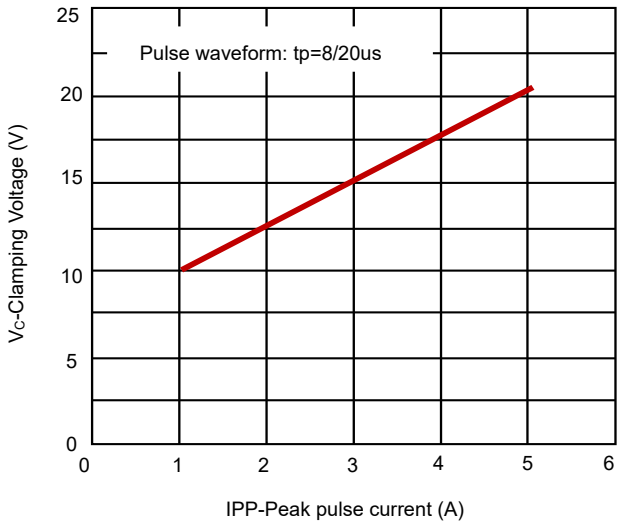


Fig 3. Clamping voltage vs. Peak pulse current

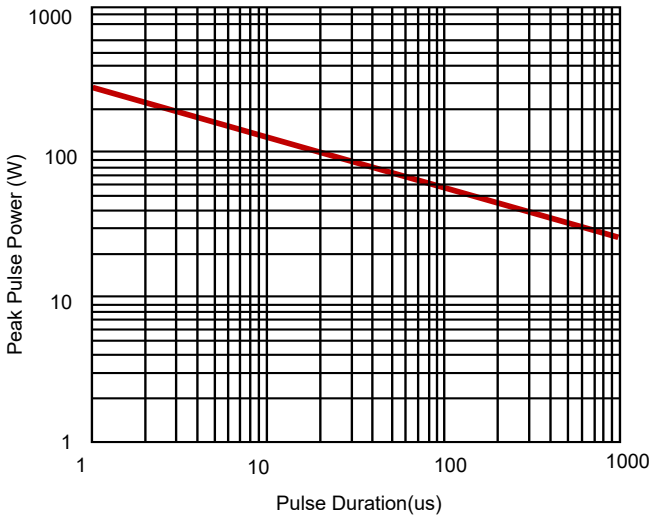


Fig 4. Non-Repetitive Peak Pulse Power vs. Pulse time

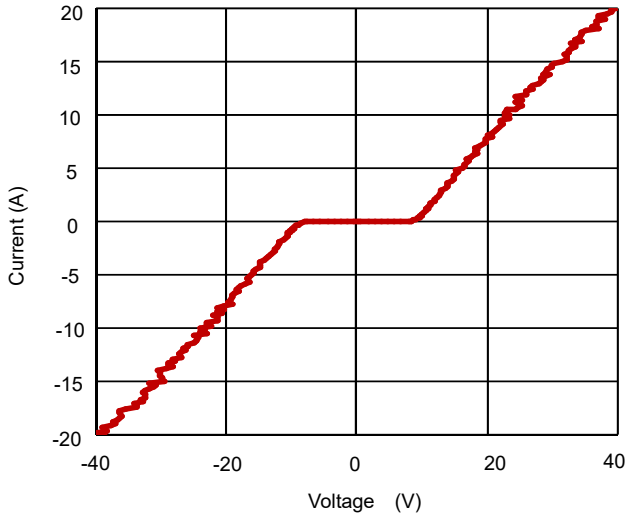


Fig 5. TLP Measurement

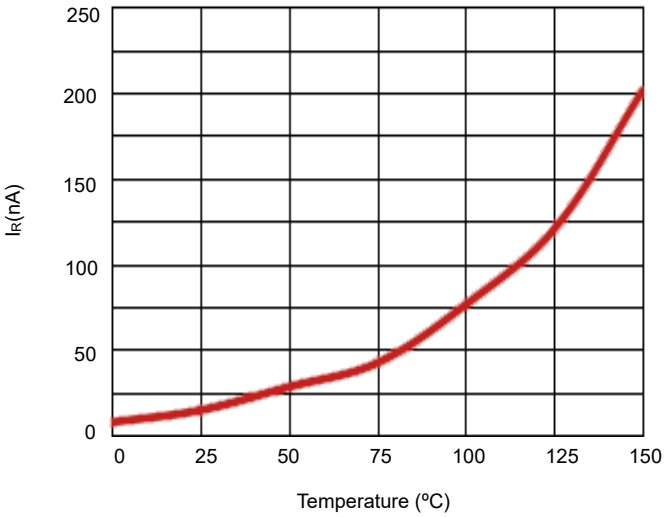


Fig 6.Typical Leakage Current vs. Temperature

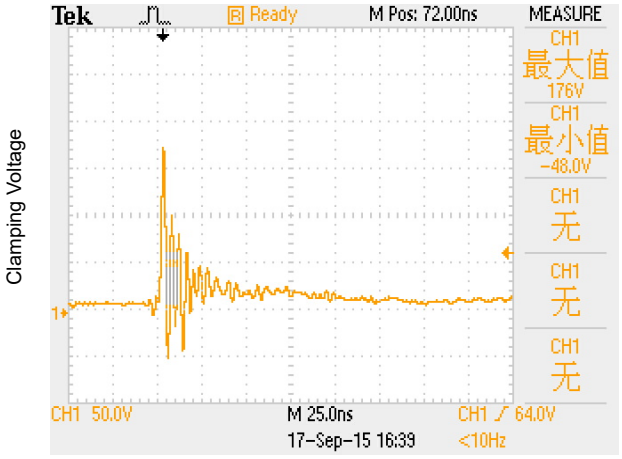
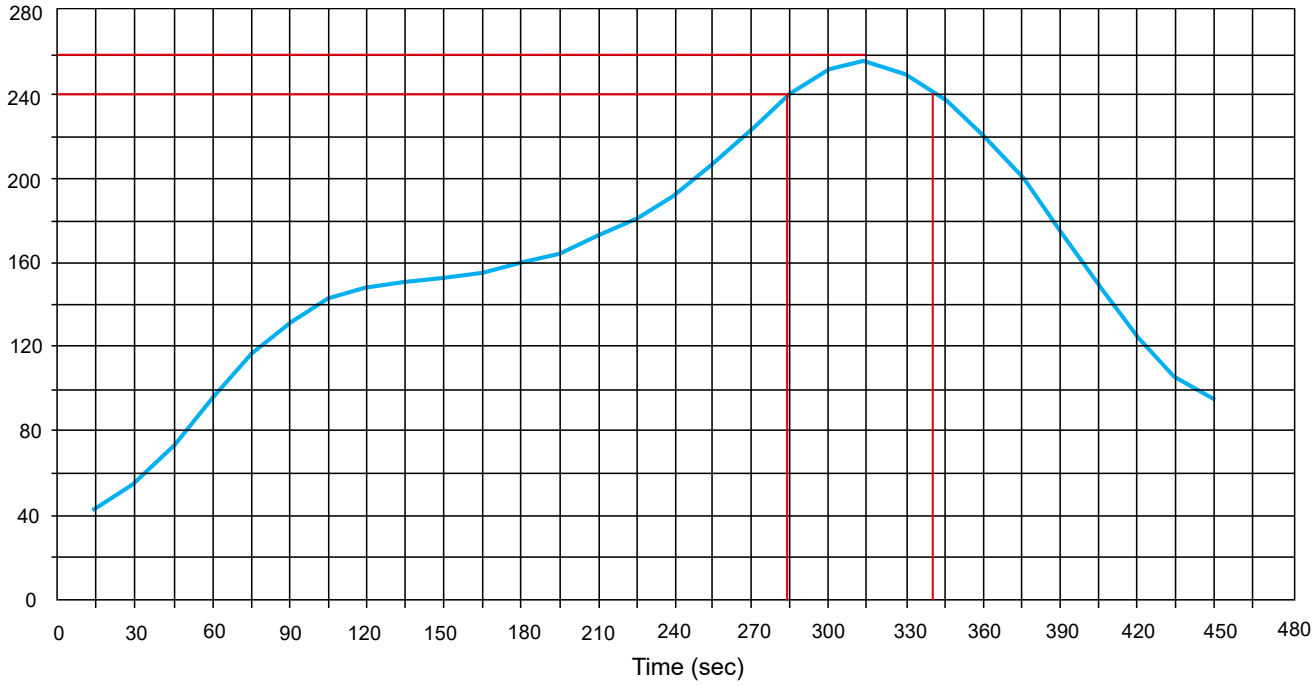


Fig 7 (8kV contact discharge per IEC61000-4-2)

SolderReflowRecommendation

Peak Temp=257℃, Ramp Rate=0.802deg. ℃/sec

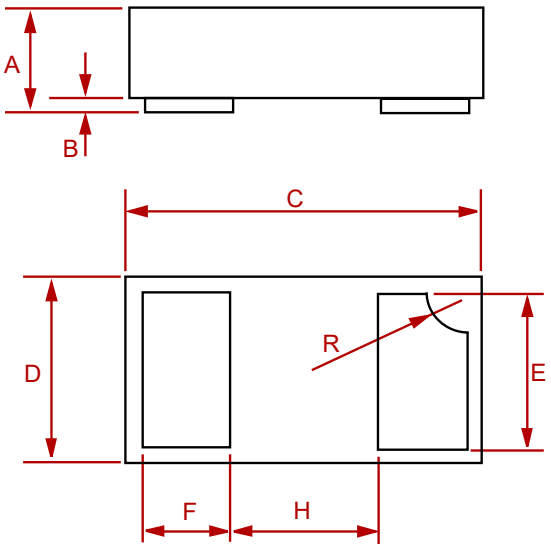


PCB Design

For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

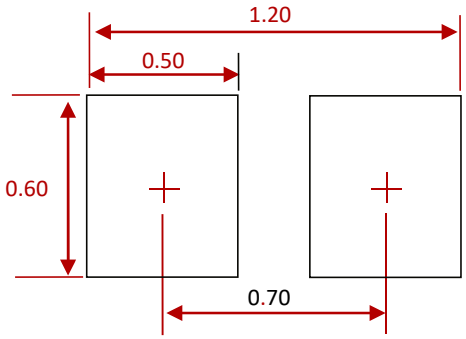
- Do not use stubs, but place the cathode of the TVS diode directly on the signal trace.
- Do not make false economies and save copper for the ground connection.
- Place via holes to ground as close as possible to the anode of the TVS diode.
- Use as many via holes as possible for the ground connection.
- Keep the length of via holes in mind! The longer the more inductance they will have.

PACKAGEMECHANICALDATA



Dim	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.0125	0.02	0.32	0.52
B	0.000	0.002	0.00	0.05
C	0.037	0.043	0.95	1.080
D	0.022	0.027	0.55	0.680
E	0.016	0.024	0.40	0.60
F	0.008	0.012	0.20	0.30
H	0.015Typ.		0.40Typ.	
R	0.001	0.005	0.05	0.15

Suggested Pad Layout



NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY.
   CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR
   COMPANY'S MANUFACTURING GUIDELINES ARE MET.

REEL SPECIFICATION

P/N	PKG	QTY
TPD1E1B04DPYR-MS	DFN1006	10000

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