

TQTHDB12310

Thyristors Solid Protection Device Bidirectional transient voltage suppressors

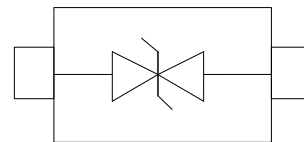
● Description

The TQTHDB12310 is designed with TECH CHIP Punch-Through process TVS technology to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium. Also because of its low capacitance, it is suited for use in high frequency designs such as USB 2.0 high speed, USB 3.0 super speed, VGA, DVI, HDMI, ESATA and other high speed line applications.

● Features

- For surface mounted applications to optimize board space
- Low profile package
- Bidirectional crowbar protection
- Low leakage current : $I = 5\mu\text{A max}$
- Low on-state voltage
- Low Capacitance
- Response Time is $< 1\mu\text{s}$
- YD/T 950 IEC 61000-4-5
- Solid-state silicon technology
- Meets MSL 1 Requirements
- ROHS compliant

● PIN configuration



SMB

● Applications

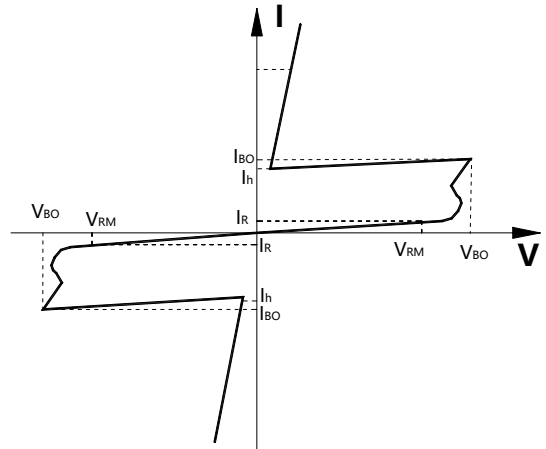
- Hand-Held Portable Applications
- Networking and Telecom (Ethernet 10/100/1000 Base T)
- USB Interface
- Automotive Electronics
- Serial and Parallel Ports
- Notebooks, Desktops, Servers

● Mechanical data

- Lead finish: 100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature: 260°C
- Device meets MSL 1 requirements
- Pure tin plating: 7 ~ 17 μm
- Pin flatness: $\leq 3\text{mil}$

● **Electronic Parameter**

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{BO}	Switching Voltage
I_{BO}	Breakover current
I_{RM}	Leakage current at V_{RM}
I_{PP}	Peak pulse current
I_H	Holding current
V_T	On-state Voltage at I_T
C_O	Off-state Capacitance



● **Absolute maximum rating @TA=25°C**

Parameter	Symbol	Value	Unit
Non-repetitive peak pulse current	I_{PP}	10/1000 us	100
		10/560 us	150
		5/310 us	150
		8/20 us	400
Non-repetitive peak pulse voltage	V_{PP}	6000	V
ESD Rating per IEC61000-4-2:	V_{ESD}	Contact	8
		Air	15
Storage temperature range	T_S	-40 to +150	°C
Maximum junction temperature	T_j	150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

*Other voltages may be available upon request.

● **Electrical Characteristics @TA=25°C**

Type	V _{RM}	I _{RM}	V _{BO}	I _{BO}	V _T	I _T	C _O	I _H
	Min.	Max.		Max.	Max.		Typ.	Typ.
	V	μA	V	mA	V	A	pF	mA
TQTHDB12310	275	5	350	800	4	2.2	35	150

● **Typical Performance Characteristics**

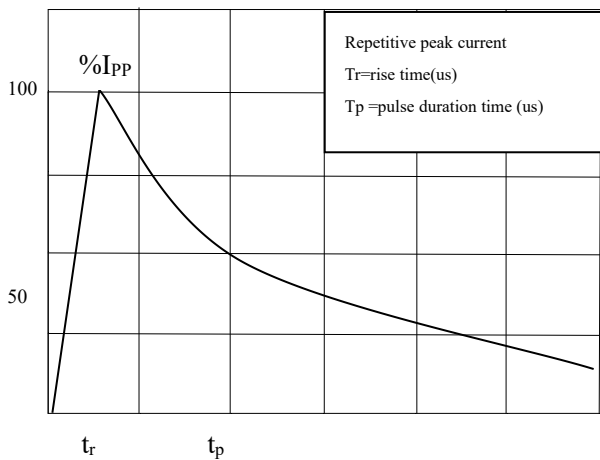


Fig.1 Pulse Waveform (5/310us)

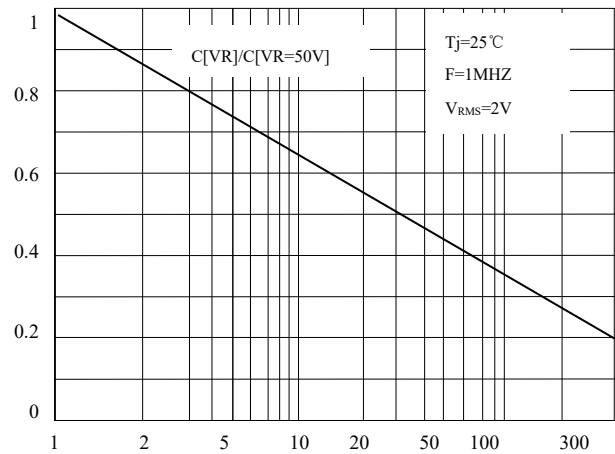


Fig. 2 Relation Variation Of Junction Capacitance

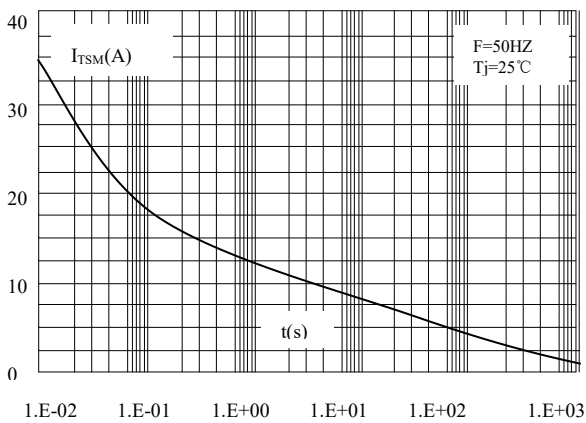


Fig.3 Non Repetitive Surge Peak On-State Current Versus Overload Duration

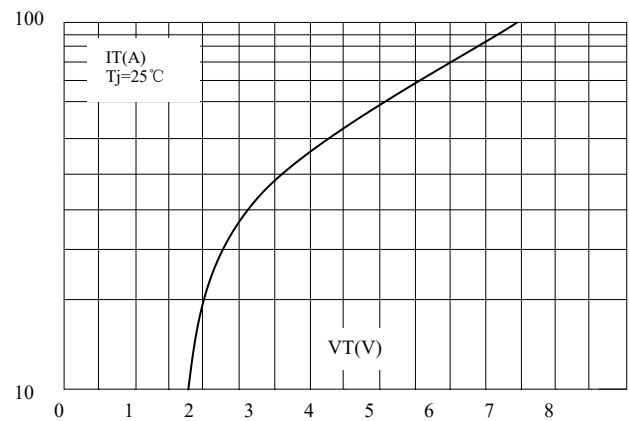


Fig.4 On-State Voltage Versus On-State Current (Typical Values)

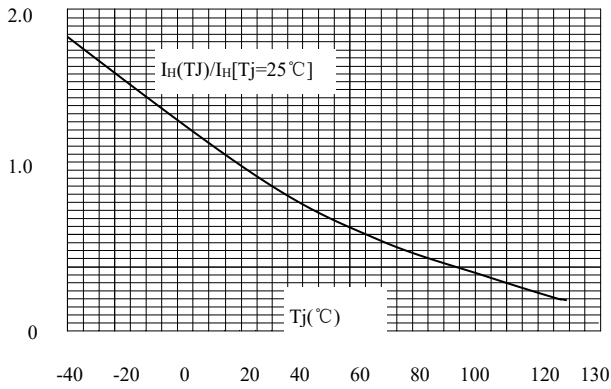


Fig.5 Relative Variation Of Hold Current Versus Junction Temperature

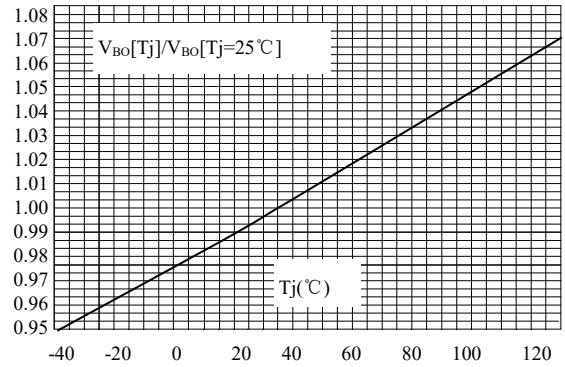


Fig.6 Relative Variation Of Break Over Voltage Versus Junction Temperature

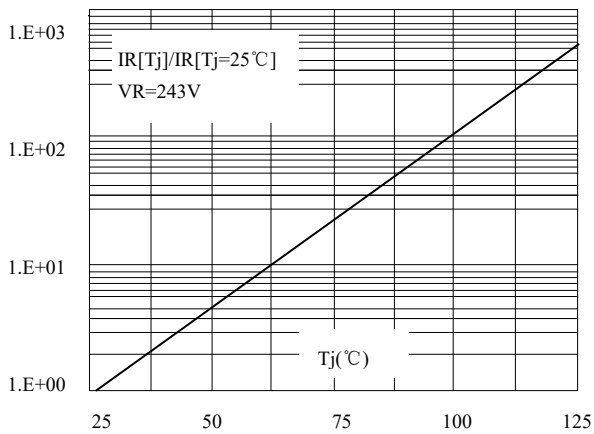


Fig.7 Relative Variation Of Leakage Current Versus Reverse Voltage (Typical Values)

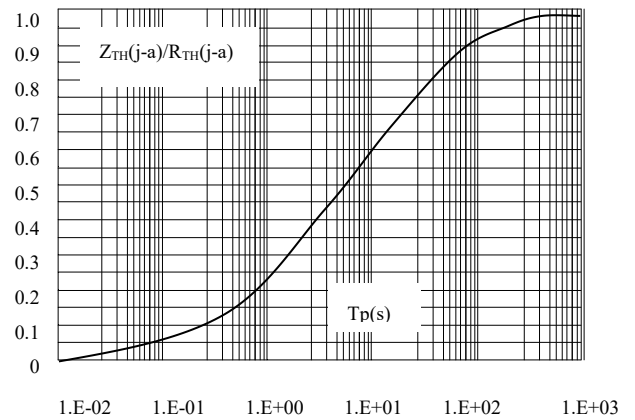
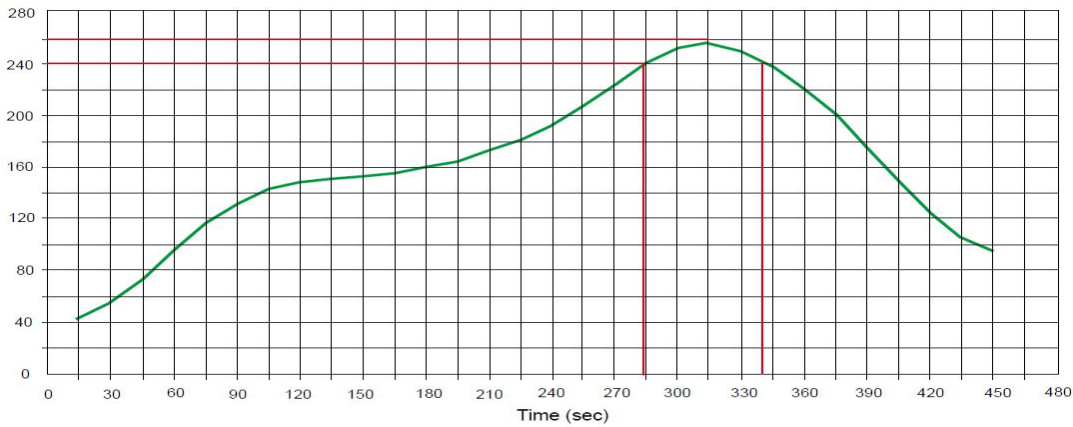


Fig.8 Variation Of Thermal Impedance Junction To Ambient Versus Pulse Duration

● **Solder Reflow Recommendation**

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



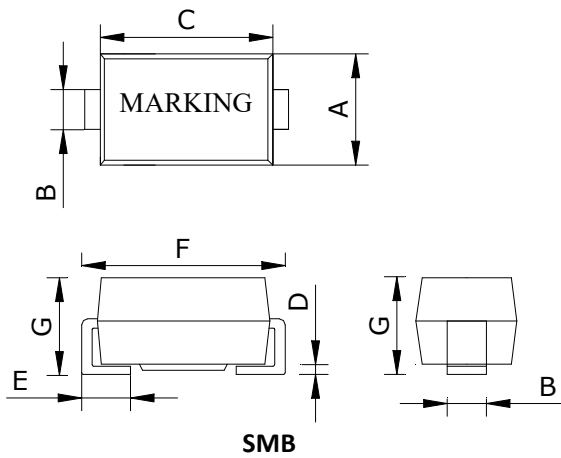
● **Package Information**

Ordering information

Device	Marking	Qty per Reel	Reel Size
TQTHDB12310	P31C	2500	13Inch

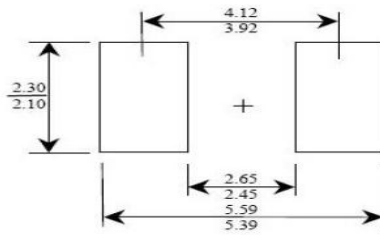
Mechanical Data

- Case: SMB
- Case Material: Molded Plastic. UL Flammability



DIM	Millimeters		
	Min	Nom	Max
A	3.30	3.60	3.94
B	1.80	2.00	2.21
C	4.05	4.45	5.30
D	0.051	0.20	0.203
E	0.76	1.14	1.52
F	5.08	5.25	5.59
G	2.05	2.30	2.45

Recommended Pad outline



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