

TQTHDB1XXXX Series

Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors Protection

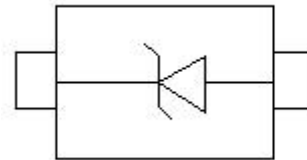
● Description

The TQTHDB1XXXX is low capacitance transient voltage suppressor array for high speed data interface that designed to protect sensitive electronics from damage or latch-up due to ESD lightning, and other voltage induced transient events. All pins are rated to withstand 30kV ESD pulses using the IEC 61000-4-2 air discharge method, which can meet the requirement of level 4.

● Feature

- Voltage Range 5V - 440V
- 600W Peak Pulse Power Dissipation
- For surface mounted applications
- Reliable low cost construction utilizing molded plastic technique
- Response Time is Typically < 1 ns
- Uni-direction, less than 5.0ns for Bi-direction, form 0 Volts to BV min
- ESD Rating of above 16 kV per Human Body Model
- ESD Rating of above 30 kV (Contact Discharge) per IEC61000-4-2
- EFT (Electrical Fast Transients) Rating of 40 A per IEC61000-4-4
- Plastic material has UL flammability classification 94V-0
- Meets MSL 1 Requirements
- Solid-state silicon avalanche technology
- ROHS compliant

● PIN configuration



● 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

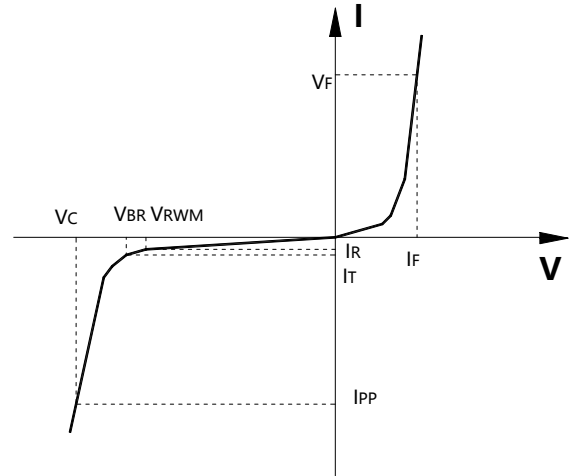
- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260°C
- Device meets MSL 1 requirements
- Pure tin plating: 7 ~ 17 um
- Pin flatness:≤3mil

Ordering information

Device	Qty per Reel	Reel Size
TQTHDB1XXXX	500	7Inch

● Electronic 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	Junction Capacitance



● Absolute maximum rating @TA=25°C

Parameter	Symbol	Value	Unit
Peak Power Dissipation At $T_j = 25^\circ\text{C}$, $T_p = 1\text{ms}$ (Note 1,2)	P_{PPP}	600	Watts
Peak Forward Surge Current 8.3ms single half sine-wave super	I_{FSM}	100	A
Lead Soldering Temperature	T_L	260 (10 sec.)	°C
Operating Temperature Range	T_J	-55 ~ 150	°C
Storage Temperature Range	T_{STG}	-55 ~ 150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Non-repetitive current pulse, per fig. 4 and derated above $T_A = 25^\circ\text{C}$ per fig.1.
2. Thermal Resistance junction to Lead
3. 8.3ms single half-sine wave duty cycle= 4 pulses maximum per minute (unidirectional units only).
4. Ratings at 25°C ambient temperature unless otherwise specified.
5. Single phase, half wave, 60Hz, resistive or inductive load.
6. For Capacitive Load, Derate Current By 20%

● Electrical Characteristics @TA=25°C

SMBJ PART NUMBER		MARKING CODE		V_{RWM}	$V_{BR} @ I_T$ (V)		I_T	$I_R @$ V_{RWM}	$V_C(\text{Max})$	$I_{PP}(\text{Max})$
Uni-polar	Bi-polar	Uni	Bi	(V)	Min	Max	(m A)	(μA)	(V)	(A)
TQTHDB115V0	TQTHDB125V0	KE	AE	5.0	6.38	7.35	10	800	9.2	65.3

TQTHDB116V0	TQTHDB126V0	KG	AG	6.0	6.67	7.89	10	800	10.3	58.3
TQTHDB116V5	TQTHDB126V5	KK	AK	6.5	7.22	8.30	10	500	11.2	53.6
TQTHDB117V0	TQTHDB127V0	KM	AM	7.0	7.78	8.95	10	200	12.0	50.0
TQTHDB117V5	TQTHDB127V5	KP	AP	7.5	8.33	9.58	1	100	12.9	46.5
TQTHDB118V0	TQTHDB128V0	KR	AR	8.0	8.89	10.23	1	50	13.6	44.1
TQTHDB118V5	TQTHDB128V5	KT	AT	8.5	9.44	10.82	1	20	14.4	41.7
TQTHDB119V0	TQTHDB129V0	KV	AV	9.0	10.0	11.5	1	10	15.4	39.0
TQTHDB1110V	TQTHDB1210V	KX	AX	10	11.1	12.8	1	5	17.0	35.3
TQTHDB1111V	TQTHDB1211V	KZ	AZ	11	12.2	14.0	1	5	18.2	33.0
TQTHDB1112V	TQTHDB1212V	LE	BE	12	13.3	15.3	1	5	19.9	30.2
TQTHDB1113V	TQTHDB1213V	LG	BG	13	14.4	16.5	1	5	21.5	27.9
TQTHDB1114V	TQTHDB1214V	LK	BK	14	15.6	17.9	1	5	23.2	25.9
TQTHDB1115V	TQTHDB1215V	LM	BM	15	16.7	19.2	1	5	24.4	24.6
TQTHDB1116V	TQTHDB1216V	LP	BP	16	17.8	20.5	1	5	26.0	23.1
TQTHDB1117V	TQTHDB1217V	LR	BR	17	18.9	21.7	1	5	27.6	21.7
TQTHDB1118V	TQTHDB1218V	LT	BT	18	20.0	23.3	1	5	29.2	20.5
TQTHDB1120V	TQTHDB1220V	LV	BV	20	22.2	25.5	1	5	32.4	18.5
TQTHDB1122V	TQTHDB1222V	LX	BX	22	24.4	28.0	1	5	35.5	16.9
TQTHDB1124V	TQTHDB1224V	LZ	BZ	24	26.7	30.7	1	5	38.9	15.4
TQTHDB1126V	TQTHDB1226V	ME	CE	26	28.9	33.2	1	5	42.1	14.3
TQTHDB1128V	TQTHDB1228V	MG	CG	28	31.1	35.8	1	5	45.4	13.2
TQTHDB1130V	TQTHDB1230V	MK	CK	30	33.3	38.3	1	5	48.4	12.4
TQTHDB1133V	TQTHDB1233V	MM	CM	33	36.7	42.2	1	5	53.3	11.3
TQTHDB1136V	TQTHDB1236V	MP	CP	36	40.0	46.0	1	5	58.1	10.3
TQTHDB1140V	TQTHDB1240V	MR	CR	40	44.4	51.1	1	5	64.5	9.3
TQTHDB1143V	TQTHDB1243V	MT	CT	43	47.8	54.9	1	5	69.4	8.6
TQTHDB1145V	TQTHDB1245V	MV	CV	45	50.0	57.5	1	5	72.7	8.3
TQTHDB1148V	TQTHDB1248V	MX	CX	48	53.3	61.3	1	5	77.4	7.8
TQTHDB1151V	TQTHDB1251V	MZ	CZ	51	56.7	65.2	1	5	82.4	7.3
TQTHDB1154V	TQTHDB1254V	NE	DE	54	60.0	69.0	1	5	87.1	6.9
TQTHDB1158V	TQTHDB1258V	NG	DG	58	64.4	74.1	1	5	93.6	6.4
TQTHDB1160V	TQTHDB1260V	NK	DK	60	66.7	76.7	1	5	96.8	6.2
TQTHDB1164V	TQTHDB1264V	NM	DM	64	71.1	81.8	1	5	103	5.8
TQTHDB1170V	TQTHDB1270V	NP	DP	70	77.8	89.5	1	5	113	5.3
TQTHDB1175V	TQTHDB1275V	NR	DR	75	83.0	95.8	1	5	121	5.0
TQTHDB1178V	TQTHDB1278V	NT	DT	78	86.0	99.7	1	5	126	4.8
TQTHDB1185V	TQTHDB1285V	NV	DV	85	94.0	108.2	1	5	137	4.4
TQTHDB1190V	TQTHDB1290V	NX	DX	90	100	115.5	1	5	146	4.1
TQTHDB11100	TQTHDB12100	NZ	DZ	100	111	128.0	1	5	162	3.7
TQTHDB11110	TQTHDB12110	PE	EE	110	122	140.5	1	5	177	3.4

TQTHDB11120	TQTHDB12120	PG	EG	120	133	153.0	1	5	193	3.1
TQTHDB11130	TQTHDB12130	PK	EK	130	144	165.5	1	5	209	2.9
TQTHDB11150	TQTHDB12150	PM	EM	150	167	192.5	1	5	243	2.5
TQTHDB11160	TQTHDB12160	PP	EP	160	178	205.0	1	5	259	2.3
TQTHDB11170	TQTHDB12170	PR	ER	170	189	217.5	1	5	275	2.2
TQTHDB11180	TQTHDB12180	PT	ET	180	200	230.4	1	5	290	2.1
TQTHDB11190	TQTHDB12190	PV	EV	190	211	243.2	1	5	306	2.0
TQTHDB11200	TQTHDB12200	PX	EX	200	222	256.0	1	5	322	1.9
TQTHDB11210	TQTHDB12210	PZ	EZ	210	233	268.8	1	5	339	1.8
TQTHDB11220	TQTHDB12220	QE	FE	220	244	281.6	1	5	355	1.7
TQTHDB11250	TQTHDB12250	QG	FG	250	278	309.0	1	5	403	1.5
TQTHDB11300	TQTHDB12300	QK	FK	300	333	371.0	1	5	484	1.2
TQTHDB11350	TQTHDB12350	QM	FM	350	389	432.0	1	5	565	1.1
TQTHDB11400	TQTHDB12400	QP	FP	400	444	494.0	1	5	645	0.9
TQTHDB11440	TQTHDB12440	QR	FR	440	489	543.0	1	5	710	0.8

● Typical Performance Characteristics

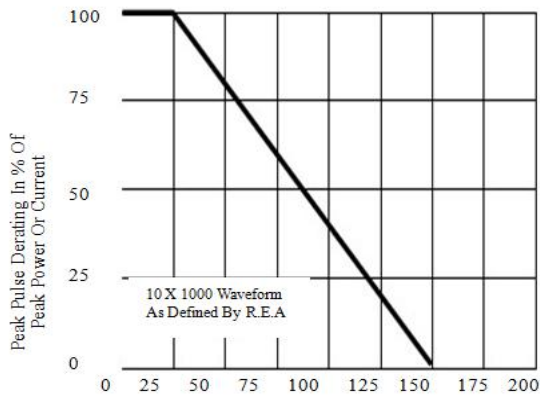


Fig. 1 Pulse Derating Curve

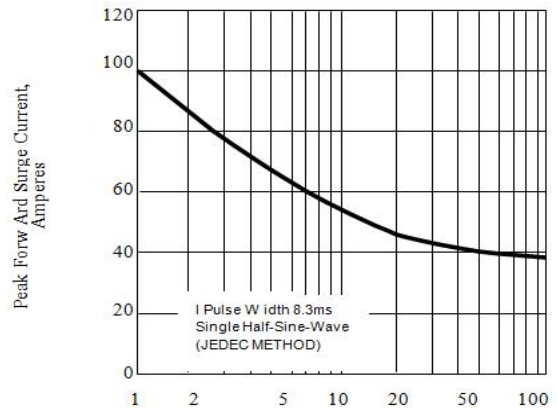


Fig.2 Maximum Non-Repetitive Surge Current

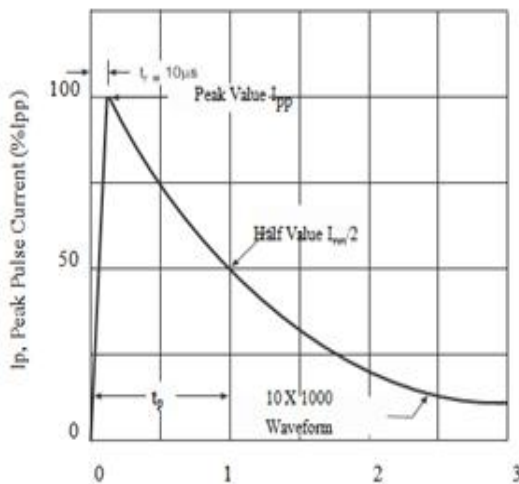


Fig.3 Pulse Rating Curve

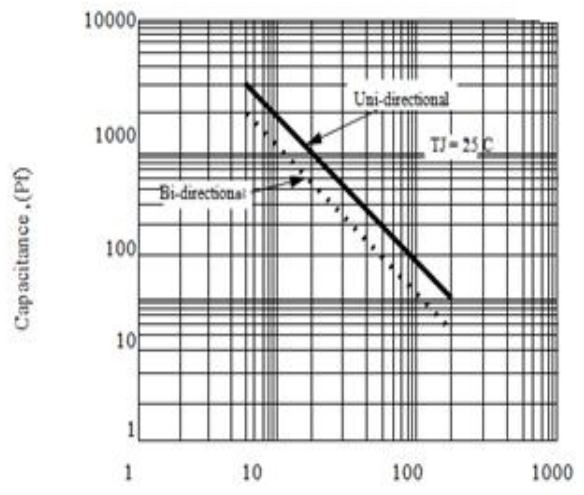


Fig.4 Typical Junction Capacitance

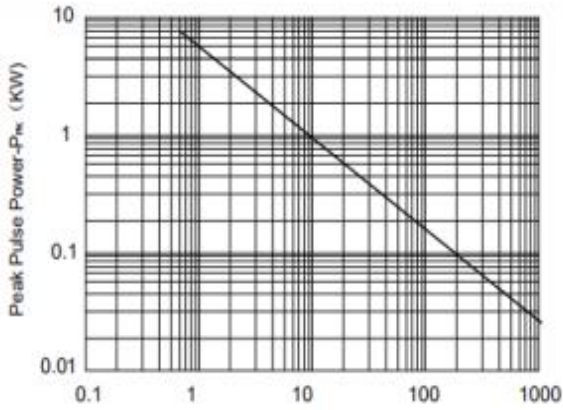


Fig.5 Non-Repetitive Peak Pulse Power vs.Pulse Time

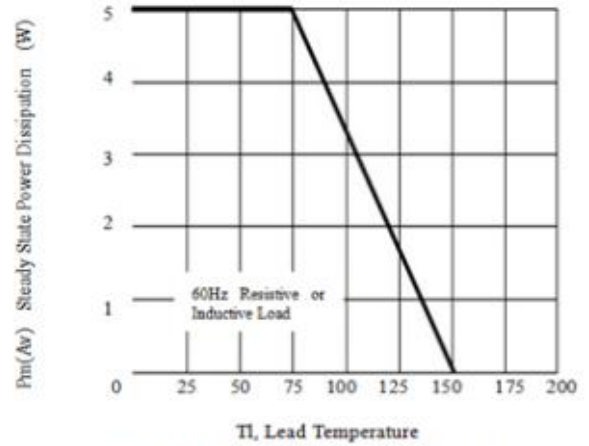
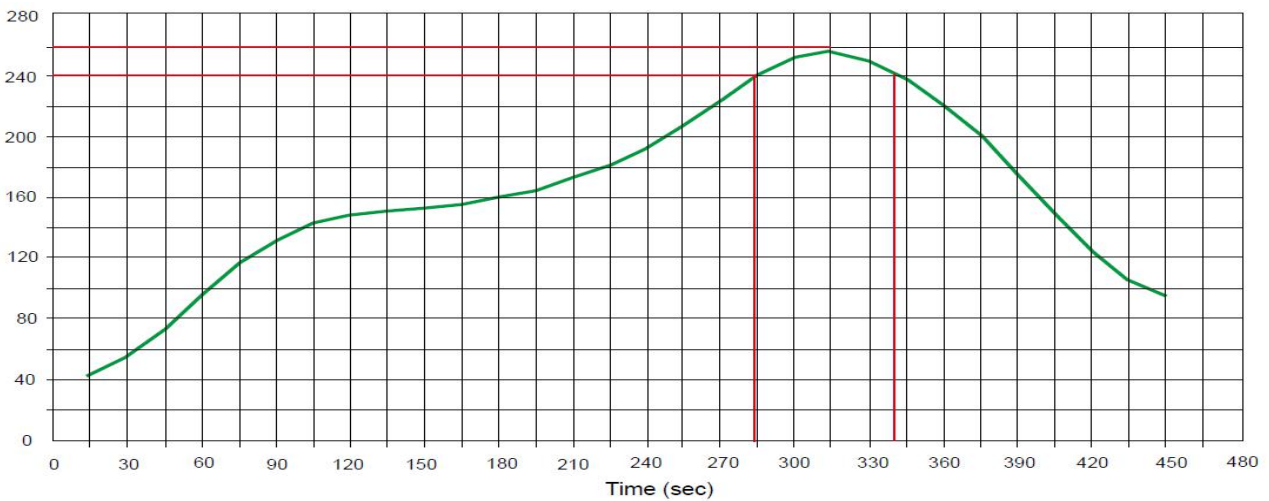


Fig.6 Steady State Power Derating Curve

● **Solder Reflow Recommendation**

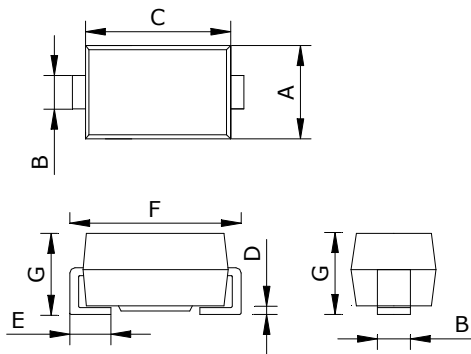
Peak Temp=257°C, Ramp Rate=0.802deg. °C/sec



● **Package Information**

Mechanical Data

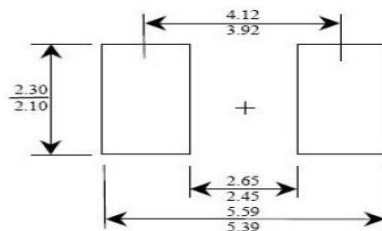
- Case: SMB
- Case Material: Molded Plastic. UL Flammability



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

SMB

Recommended Pad outline



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