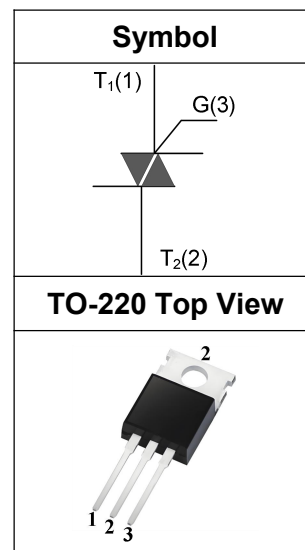


Features

- ◆ Five-layer NPNPN-Structured Silicon Bidirectional Device
- ◆ Single-Side Trenching Technology and Mesa Glass Passivation Process
- ◆ Backside Multilayer Metallized Electrode
- ◆ High Blocking Voltage and Superior Temperature Stability

Application

- ◆ Solid State Relay
- ◆ Heating Controller (Temperature Adjustment)
- ◆ Motor Speed Controllers for Vacuum Cleaners, Power Tools, and Similar Applications



Product Summary

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
V_{DRM}	800	V
V_{RRM}	800	

■ Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
$I_{T(RMS)}$	RMS On-State Current	$T_C = 90^\circ\text{C}$	12	A
I_{TSM}	Non-Repetitive Surge Peak On-State Current	$F = 50\text{Hz}, t = 20\text{ms}$	120	
I^2t	I^2t Value for Fusing	$t_p = 10\text{ms}$	72	A^2s
d_i/d_t	Critical Rate of Rise of On-State Current	$T_J = 125^\circ\text{C}$	50	$\text{A}/\mu\text{s}$
V_{DRM}	Repetitive Peak Off-State Voltage	$T_J = 25^\circ\text{C}$	800	V
V_{RRM}	Repetitive Peak Reverse Voltage	$T_J = 25^\circ\text{C}$	800	
I_{GM}	Peak Gate Current	$t_p = 20\mu\text{s}, T_J = 150^\circ\text{C}$	4.0	A
$P_{G(AV)}$	Average Gate Power Dissipation	$T_J = 150^\circ\text{C}$	10	W
T_{stg}	Storage Junction Temperature Range	-	-40 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-	-40 to 125	



BT12C80X(W)

12A Bidirectional Thyristor

Thermal Characteristics

Symbol	Parameter	Test Condition	Value(Max)	Unit
R _{th(j-c)}	Junction to Case (AC)	Insulated	2.05	°C/W
		Non-Insulated	1.25	

Electrical Characteristics (3 Quadrants)

Symbol	Parameter	Test Condition	Quadrant	Value		Unit
I _{GT}	Gate Trigger Current	V _D = 12V, R _L = 100Ω	I-II-III	Max	50	mA
V _{GT}	Gate Trigger Voltage				1.5	
V _{GD}	Gate Non-Trigger Voltage	T _J = 150°C		Min	0.2	V
I _H	Holding Current	I _T = 0.5A		Max	60	mA
I _L	Latching Current	I _G = 1.2I _{GT}	I-III		60	
			II		100	
d _V /d _t	Critical Rate-of-Rise of Off-Stage Voltage	V _D = 2/3V _{DRM} , T _J = 150°C		Min	500	V/μs
(d _V /d _t) _c	Critical Rate-of-Rise of Commutation Voltage	T _J = 150°C			8.0	

Electrical Characteristics (4 Quadrants)

Symbol	Parameter	Test Condition	Quadrant	Value		Unit
I _{GT}	Gate Trigger Current	V _D = 12V, R _L = 100Ω	I-II-III	Max	50	mA
			IV		120	
V _{GT}	Gate Trigger Voltage		T _J = 125°C		I-II-III-IV	Min
V _{GD}	Gate Non-Trigger Voltage	0.2				
I _H	Holding Current	I _T = 0.5A		Max	60	mA
I _L	Latching Current	I _G = 1.2I _{GT}	I-III-IV		60	
			II		100	
d _V /d _t	Critical Rate-of-Rise of Off-Stage Voltage	V _D = 2/3V _{DRM} , T _J = 150°C		Min	500	V/μs
(d _V /d _t) _c	Critical Rate-of-Rise of Commutation Voltage	T _J = 150°C			10	

Static Characteristics

Symbol	Parameter	Test Condition	Value(Max)	Unit
V _{TM}	Peak ON-State Voltage	I _{TM} = 24A, T _J = 25°C	1.4	V
V _{TO}	Threshold Voltage	T _J = 150°C	0.88	
R _D	Dynamic Resistance	T _J = 150°C	17.6	mΩ
I _{DRM}	Repetitive Peak Off-State Current	V _D = V _{DRM} , V _R = V _R RM, T _J = 25°C	5.0	μA
I _{RRM}	Repetitive Peak Reverse Current	V _D = V _{DRM} , V _R = V _R RM, T _J = 150°C	1.0	mA

■ Characteristic Curve

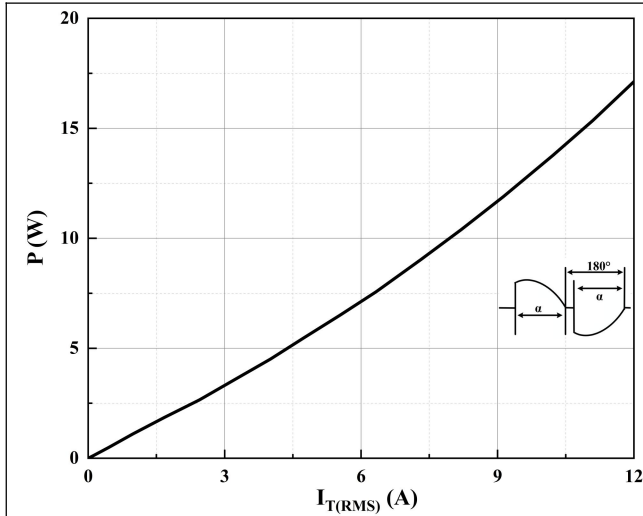


Figure 1. Power Dissipation vs. RMS On-State Current

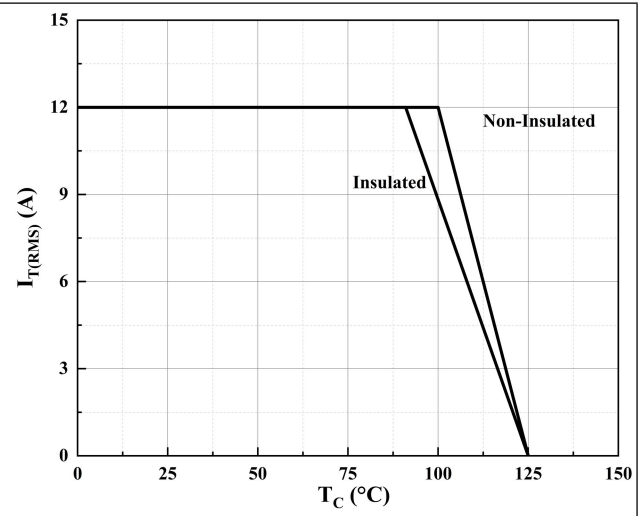


Figure 2. RMS On-State Current vs. Case Temperature

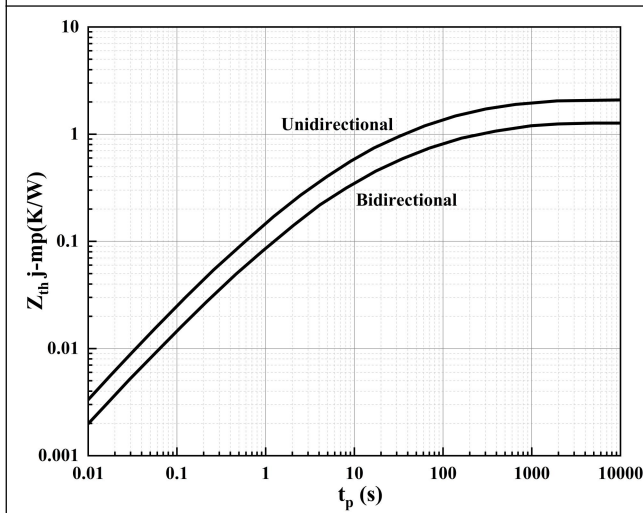


Figure 3. Relative Variation of Thermal Impedance Junction to Case vs. Pulse Duration

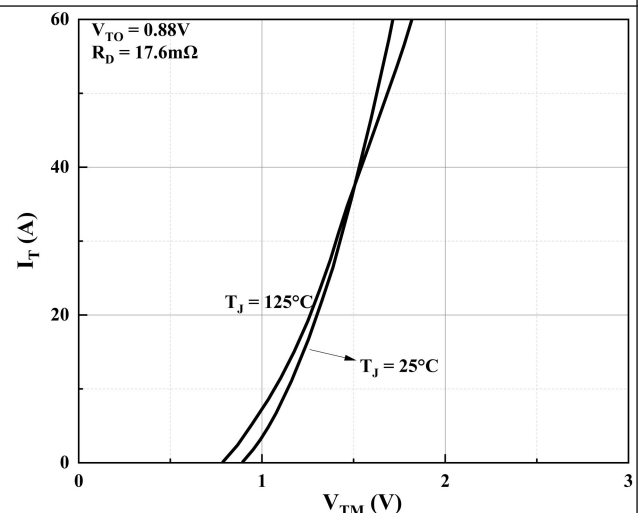


Figure 4. On-State Current vs. Peak ON-State Voltage

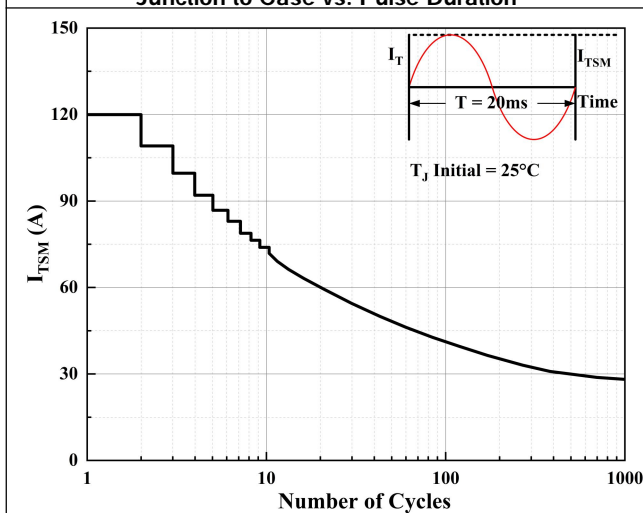


Figure 5. Surge Peak On-State Current vs. Number of Cycles

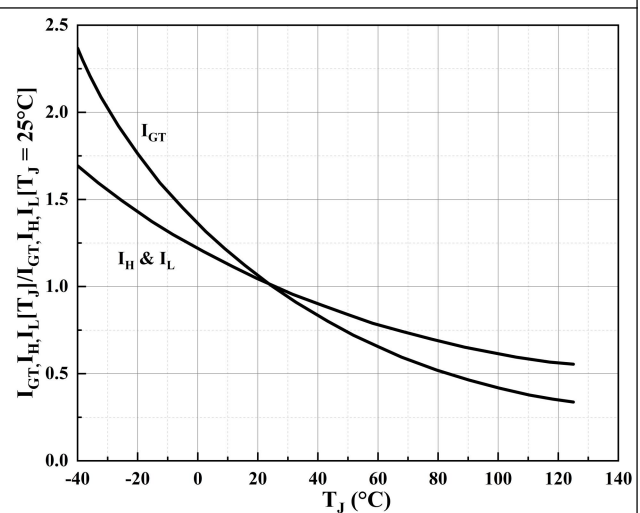


Figure 6. Gate Trigger Current, Holding Current and Latching Current vs. Junction Temperature

Characteristic Curve

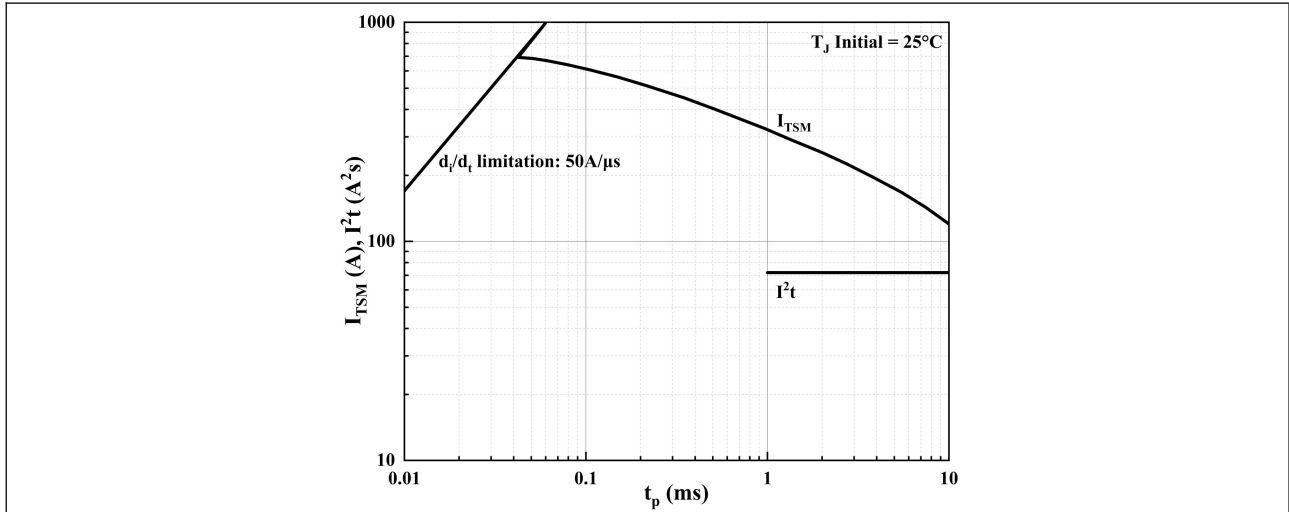


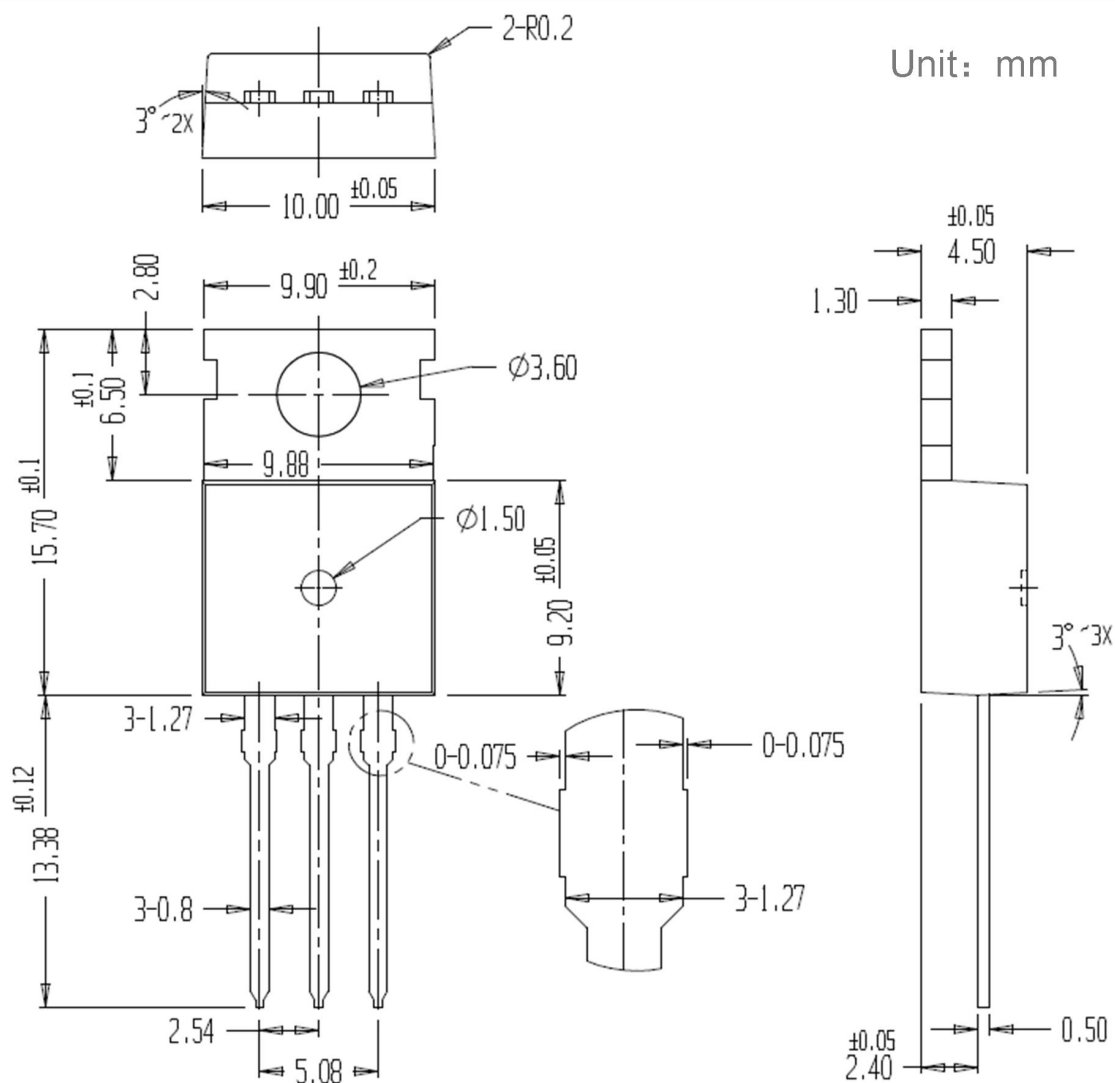
Figure 7. Non-Repetitive Surge Peak On-State Current for a Sinusoidal Pulse with Width $t_p < 10\text{ms}$ and Corresponding Value of I^2t ($d_i/d_t < 50\text{A}/\mu\text{s}$)

Ordering Information

BT	(A)	12	C	80	X	(W)	(H)
Triacs	A: Insulated None: Non-insulated	$I_{T(RMS)}: 12\text{A}$	TO-220	$V_{DRM} \geq 800\text{V}$ $V_{RRM} \geq 800\text{V}$		W: 3 Quadrants None: 4 Quadrants	None: $T_j = 125^\circ\text{C}$ H: $T_j = 150^\circ\text{C}$
						C: $I_{GT1-3} \leq 25\text{mA}$ B: $I_{GT1-3} \leq 50\text{mA}$ C: $I_{GT1-3} \leq 25\text{mA}$, $I_{GT4} \leq 50\text{mA}$ B: $I_{GT1-3} \leq 50\text{mA}$, $I_{GT4} \leq 120\text{mA}$	

■ Package Information

TO-220



■ Revision History

Version	Date	Subjects (major changes since last revision)
1.0	2025-05-08	Datasheet Complete
1.1	2026-09-16	Add Ordering Information