

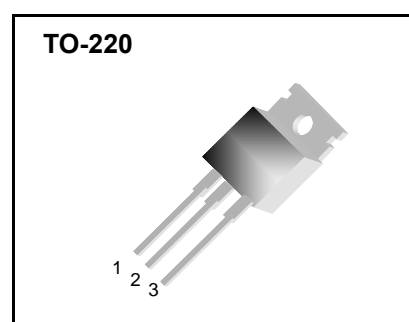
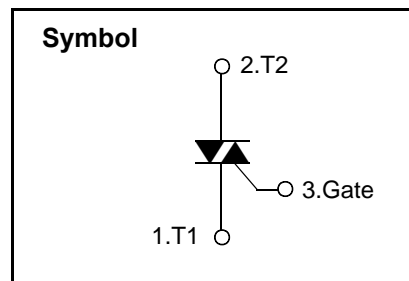
Bi-Directional Triode Thyristor

Features

- ◆ Repetitive Peak Off-State Voltage : 600V
- ◆ R.M.S On-State Current ($I_{T(RMS)} = 16\text{ A}$)
- ◆ High Commutation dv/dt
- ◆ Isolation Voltage ($V_{ISO} = 1500\text{V AC}$)

General Description

This device is suitable for AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay.



Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage		600	V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 100^\circ\text{C}$	16	A
I_{TSM}	Surge On-State Current	One Cycle, 50Hz/60Hz, Peak, Non-Repetitive	145/155	A
I^2t	I^2t for fusing	$t = 10\text{ms}$	105	A^2s
P_{GM}	Peak Gate Power Dissipation		5.0	W
$P_{G(AV)}$	Average Gate Power Dissipation	Over any 20ms period	0.5	W
I_{GM}	Peak Gate Current		2.0	A
V_{GM}	Peak Gate Voltage		10	V
T_J	Operating Junction Temperature		- 40 ~ 125	$^\circ\text{C}$
T_{STG}	Storage Temperature		- 40 ~ 150	$^\circ\text{C}$
	Mass		2.0	g

BT139-600

Electrical Characteristics

Symbol	Items		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current		$V_D = V_{DRM}$, Single Phase, Half Wave $T_J = 125\text{ }^\circ\text{C}$	—	—	2.0	mA
V_{TM}	Peak On-State Voltage		$I_T = 20\text{ A}$, Inst. Measurement	—	—	1.6	V
I_{GT1}^+	I	Gate Trigger Current	$V_D = 6\text{ V}$, $R_L = 10\text{ }\Omega$	—	—	25	mA
I_{GT1}^-	II			—	—	25	
I_{GT3}^-	III			—	—	25	
V_{GT1}^+	I	Gate Trigger Voltage	$V_D = 6\text{ V}$, $R_L = 10\text{ }\Omega$	—	—	1.5	V
V_{GT1}^-	II			—	—	1.5	
V_{GT3}	III			—	—	1.5	
V_{GD}	Non-Trigger Gate Voltage		$T_J = 125\text{ }^\circ\text{C}$, $V_D = 1/2 V_{DRM}$	0.2	—	—	V
$(dv/dt)_c$	Critical Rate of Rise Off-State Voltage at Commutation		$T_J = 125\text{ }^\circ\text{C}$, $[di/dt]_c = -6.0\text{ A/ms}$, $V_D = 2/3 V_{DRM}$	10	—	—	$V/\mu\text{s}$
I_H	Holding Current			—	20	—	mA
$R_{th(j-c)}$	Thermal Impedance		Junction to case	—	—	1.2	$^\circ\text{C/W}$



Fig 1. Gate Characteristics

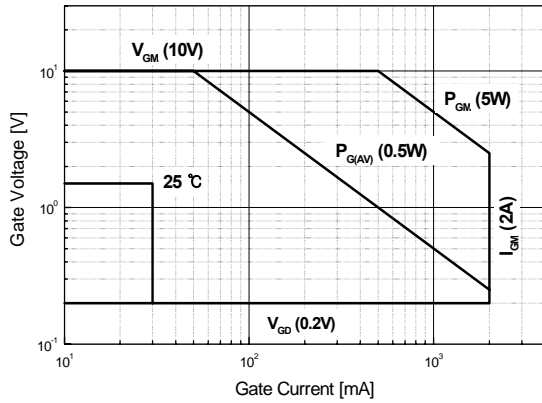


Fig 2. On-State Voltage

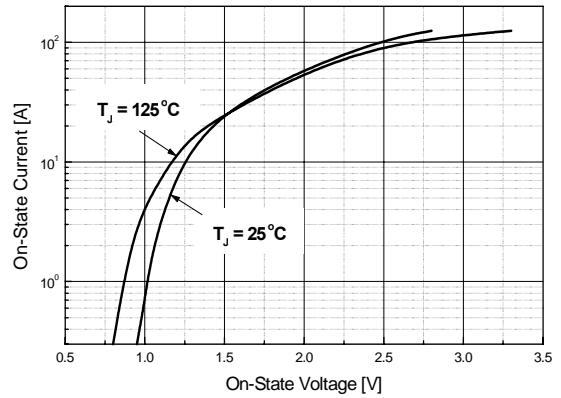


Fig 3. On State Current vs. Maximum Power Dissipation

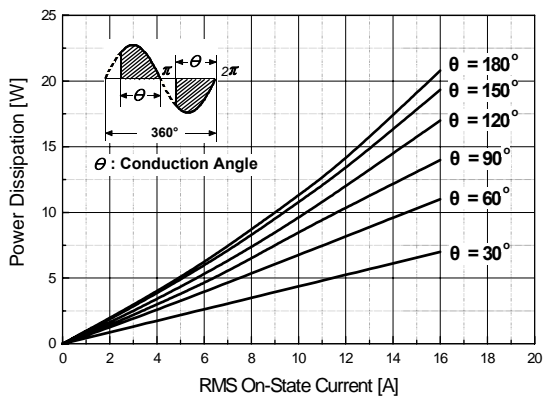


Fig 4. On State Current vs. Allowable Case Temperature

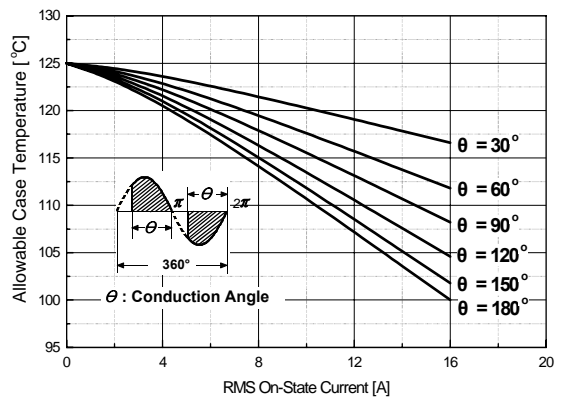


Fig 5. Surge On-State Current Rating (Non-Repetitive)

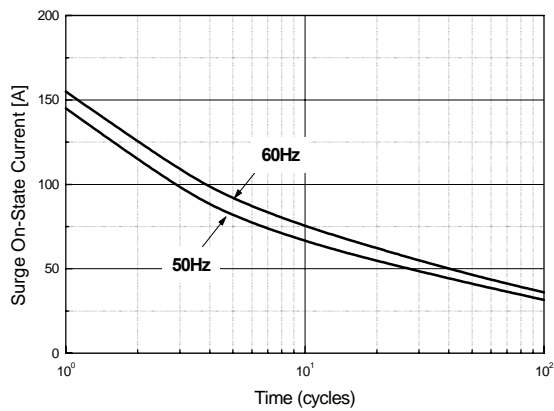
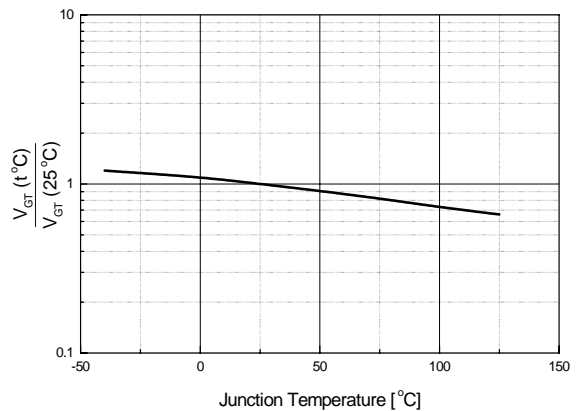


Fig 6. Gate Trigger Voltage vs. Junction Temperature



BT139-600

Fig 7. Gate Trigger Current vs. Junction Temperature

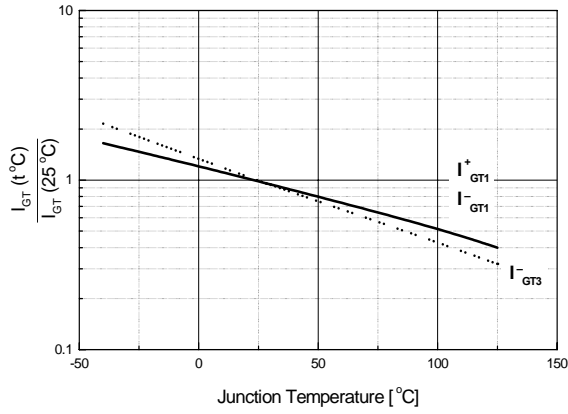


Fig 8. Transient Thermal Impedance

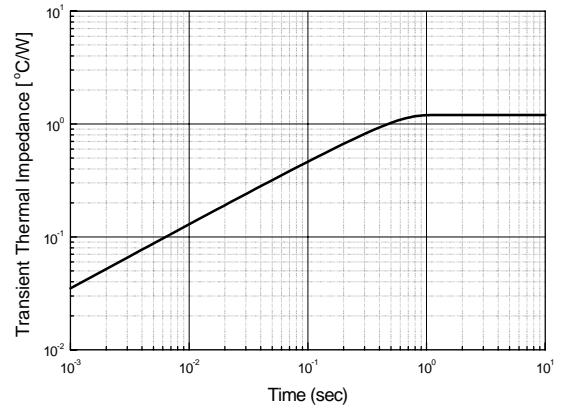
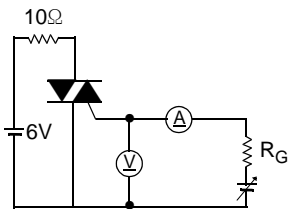
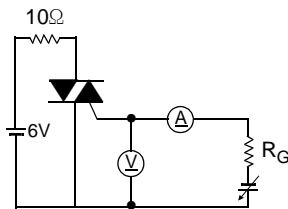


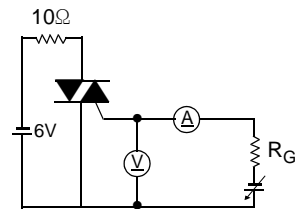
Fig 9. Gate Trigger Characteristics Test Circuit



Test Procedure I



Test Procedure II



Test Procedure III



TO-220 Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.7		10.1	0.382		0.398
B	6.3		6.7	0.248		0.264
C	9.0		9.47	0.354		0.373
D	12.8		13.3	0.504		0.524
E	1.2		1.4	0.047		0.055
F		1.7			0.067	
G		2.5			0.098	
H	3.0		3.4	0.118		0.134
I	1.25		1.4	0.049		0.055
J	2.4		2.7	0.094		0.106
K	5.0		5.15	0.197		0.203
L	2.2		2.6	0.087		0.102
M	1.25		1.55	0.049		0.061
N	0.45		0.6	0.018		0.024
O	0.6		1.0	0.024		0.039
ϕ		3.6			0.142	

