

Standard Gate Silicon Controlled - Rectifiers

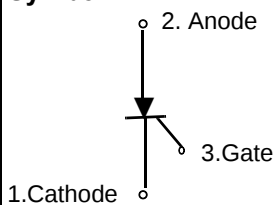
Features

Repetitive Peak Off-State Voltage : 600V
R.M.S On-State Current ($I_{T(RMS)} = 12\text{ A}$)
Low On-State Voltage (1.5V(Typ.)@ I_{TM})
Isolation Voltage ($V_{ISO} = 2500\text{V AC}$)

General Description

Standard gate triggering thyristor is fully isolated package suitable for the application where requiring high bidirectional blocking voltage capability and also suitable for over voltage protection ,motor control circuit in power tool, inrush current limit circuit and heating control system.

Symbol

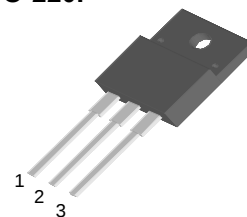


$$BV_{DRM} = 600V$$

$$I_{T(RMS)} = 12\text{ A}$$

$$I_{TSM} = 120\text{ A}$$

TO-220F



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

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage	sine wave, 50 to 60Hz, gate open	600	V
$I_{T(AV)}$	Average On-State Current	half sine wave : $T_C = 78^\circ\text{C}$	7.6	A
$I_{T(RMS)}$	R.M.S On-State Current	180° Conduction Angle	12	A
I_{TSM}	Surge On-State Current	1/2 Cycle, 60Hz, Sine Wave Non-Repetitive	120	A
I^2t	I^2t for Fusing	$t = 8.3\text{ms}$	72	A^2s
di/dt	Critical rate of rise of on-state current		50	$\text{A}/\mu\text{s}$
P_{GM}	Forward Peak Gate Power Dissipation	$T_C = 78^\circ\text{C}$, pulse width $\leq 1.0\mu\text{s}$	5	W
$P_{G(AV)}$	Forward Average Gate Power Dissipation	$T_C = 78^\circ\text{C}$, pulse width $\leq 1.0\mu\text{s}$	0.5	W
I_{FGM}	Forward Peak Gate Current	$T_C = 78^\circ\text{C}$, pulse width $\leq 1.0\mu\text{s}$	2	A
V_{RGM}	Reverse Peak Gate Voltage	$T_C = 78^\circ\text{C}$, pulse width $\leq 1.0\mu\text{s}$	5	V
V_{ISO}	Isolation Breakdown Voltage(R.M.S.)	A.C. 1 minute	2500	V
T_J	Operating Junction Temperature		- 40 ~ 125	$^\circ\text{C}$
T_{STG}	Storage Temperature		- 40 ~ 150	$^\circ\text{C}$

DBT151F-600

Electrical Characteristics ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Symbol	Items	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current	$V_{\text{AK}} = V_{\text{DRM}}$ $T_C = 25\text{ }^{\circ}\text{C}$ $T_C = 125\text{ }^{\circ}\text{C}$	— —	— —	10 200	μA
V_{TM}	Peak On-State Voltage (1)	$I_{\text{TM}} = 23\text{ A}$ $t_p = 380\mu\text{s}$	—	—	1.7	V
I_{GT}	Gate Trigger Current (2)	$V_{\text{AK}} = 6\text{ V(DC)}$, $R_L = 10\text{ }\Omega$ $T_C = 25\text{ }^{\circ}\text{C}$	—	—	15	mA
V_{GT}	Gate Trigger Voltage (2)	$V_D = 6\text{ V(DC)}$, $R_L = 10\text{ }\Omega$ $T_C = 25\text{ }^{\circ}\text{C}$	—	—	1.5	V
V_{GD}	Non-Trigger Gate Voltage (1)	$V_{\text{AK}} = 12\text{ V}$, $R_L = 100\text{ }\Omega$ $T_C = 125\text{ }^{\circ}\text{C}$	0.2	—	—	V
dv/dt	Critical Rate of Rise Off-State Voltage	Linear slope up to $V_D = V_{\text{DRM}}$ 67%, Gate open $T_J = 125\text{ }^{\circ}\text{C}$	200	—	—	V/ μs
I_{H}	Holding Current	$I_T = 100\text{ mA}$, Gate Open $T_C = 25\text{ }^{\circ}\text{C}$	—	—	20	mA
$R_{\text{th(j-c)}}$	Thermal Impedance	Junction to case	—	—	3.8	$^{\circ}\text{C/W}$
$R_{\text{th(j-a)}}$	Thermal Impedance	Junction to Ambient	—	—	60	$^{\circ}\text{C/W}$

Notes :

1. Pulse Width $\leq 1.0\text{ ms}$, Duty cycle $\leq 1\%$
2. R_{GK} Current not Included in measurement.

DBT151F-600

Fig 1. Gate Characteristics

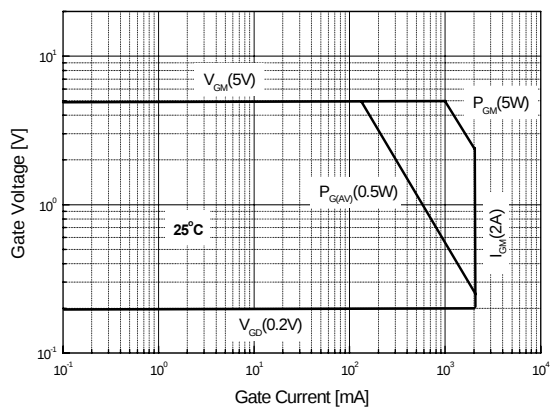


Fig 2. Maximum Case Temperature

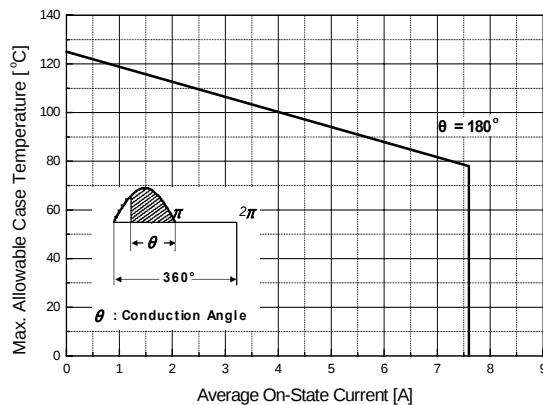


Fig 3. Typical Forward Voltage

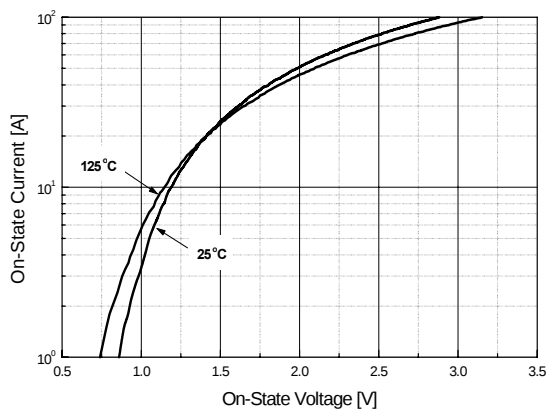


Fig 4. Thermal Response

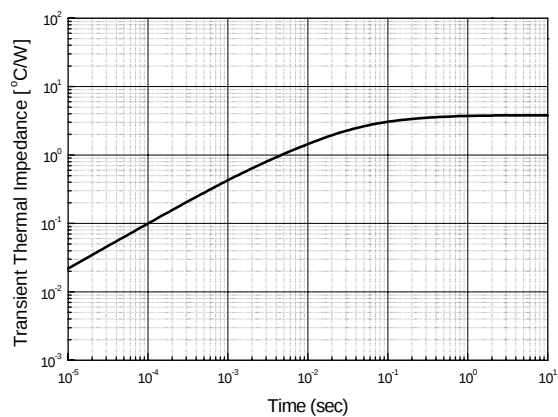


Fig 5. Typical Gate Trigger Voltage vs. Junction Temperature

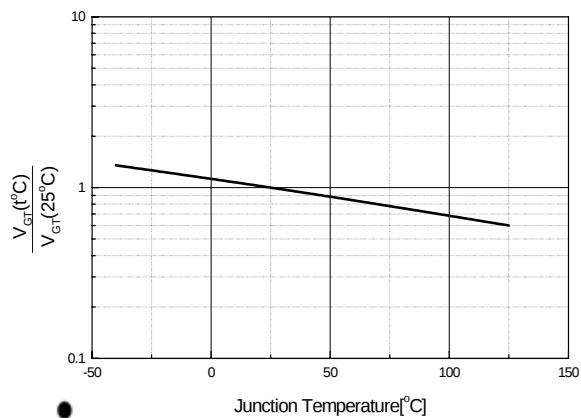
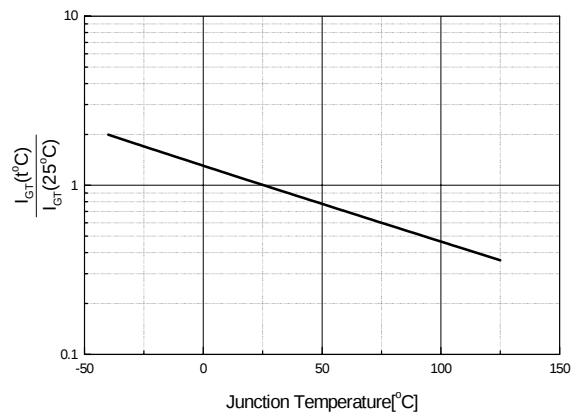


Fig 6. Typical Gate Trigger Current vs. Junction Temperature



DBT151F-600

Fig 7. Typical Holding Current

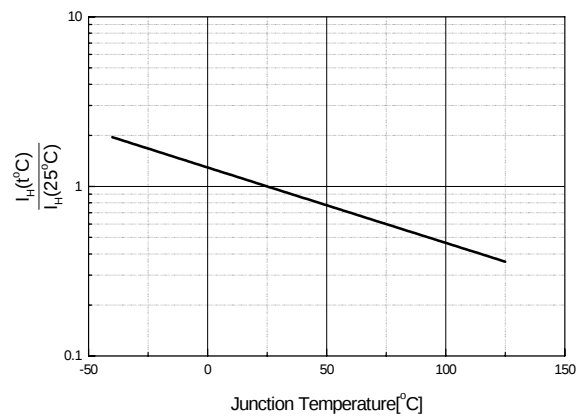
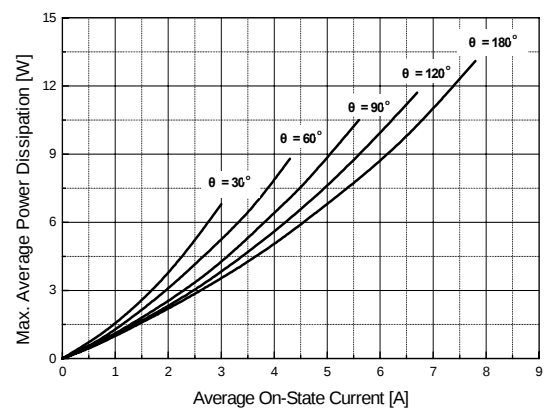


Fig 8. Power Dissipation



DBT151F-600

TO-220F Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	10.4		10.6	0.409		0.417
B	6.18		6.44	0.243		0.254
C	9.55		9.81	0.376		0.386
D	13.47		13.73	0.530		0.540
E	6.05		6.15	0.238		0.242
F	1.26		1.36	0.050		0.054
G	3.17		3.43	0.125		0.135
H	1.87		2.13	0.074		0.084
I	2.57		2.83	0.101		0.111
J		2.54			0.100	
K		5.08			0.200	
L	2.51		2.62	0.099		0.103
M	1.25		1.55	0.049		0.061
N	0.45		0.63	0.018		0.025
O	0.6		1.0	0.024		0.039
ϕ		3.7			0.146	
$\phi 1$		3.2			0.126	
$\phi 2$		1.5			0.059	

