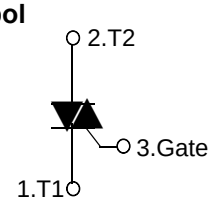
Discrete & Integration SEMICONDUCTOR

DBT138F-600

UL No. E256958

Triac / Sensitive Gate

Symbol

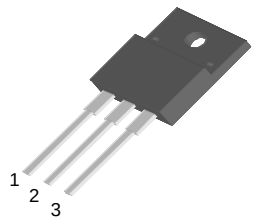


BV_{DRM} = 600V

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

I_{TSM} = 110 A

TO-220F



Features

- ◆ Repetitive Peak Off-State Voltage : 600V
- ◆ R.M.S On-State Current ($I_{T(RMS)}$= 12 A)
- ◆ High Commutation dv/dt
- ◆ Sensitive Gate Triggering 3 Mode (I_{GT} = 10mA)
- ◆ Isolation Voltage (V_{ISO} = 2500V AC)

General Description

This device is fully isolated package suitable for sensitive gate triggering , direct coupling to TTL, HTL, CMOS and application such as various logic functions,medium power AC switching applications, such as fan speed control, lighting controllers and home appliance equipment.

Absolute Maximum Ratings (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage	Sine wave, 50 to 60 Hz,Gate Open	600	V
$I_{T(RMS)}$	R.M.S On-State Current	T_C = 58 °C	12	A
I_{TSM}	Surge On-State Current	One Cycle, 50Hz/60Hz, Peak, Non-Repetitive	100/110	A
I^2t	I^2t for fusing	t =10ms	50	A^2s
P_{GM}	Peak Gate Power Dissipation	T_C =58 °C, Pulse width ≤ 1.0us	5.0	W
$P_{G(AV)}$	Average Gate Power Dissipation	Over any 20ms period	0.5	W
I_{GM}	Peak Gate Current	tp = 20us, T_J=125°C	2.0	A
V_{GM}	Peak Gate Voltage	tp = 20us, T_J=125°C	10	V
V_{ISO}	Isolation Breakdown Voltage(R.M.S.)	A.C. 1 minute	2500	V
T_J	Operating Junction Temperature		- 40 ~ 125	°C
T_{STG}	Storage Temperature		- 40 ~ 150	°C
	Mass		2.0	g

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 °C	—	—	2.0	mA
V_{TM}	Peak On-State Voltage		I_T = 15 A, Inst. Measurement	—	—	1.65	V
I^+_{GT1}	I	Gate Trigger Current	V_D = 6 V, R_L=10 Ω	—	—	10	mA
I^-_{GT1}	II			—	—	10	
I^-_{GT3}	III			—	—	10	
I^+_{GT3}	IV			—	25	—	
V^+_{GT1}	I	Gate Trigger Voltage	V_D = 6 V, R_L=10 Ω	—	—	1.5	V
V^-_{GT1}	II			—	—	1.5	
V^-_{GT3}	III			—	—	1.5	
V^+_{GT3}	IV			—	—	2.5	
V_{GD}	Non-Trigger Gate Voltage		T_J = 125 °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 °C, [di/dt]c = -4.0 A/ms, V_D=2/3 V_{DRM}	10	—	—	V/μs
I_H	Holding Current			—	15	—	mA
$R_{th(j-c)}$	Thermal Impedance		Junction to case	—	—	3.7	°C/W

Fig 1. Gate Characteristics

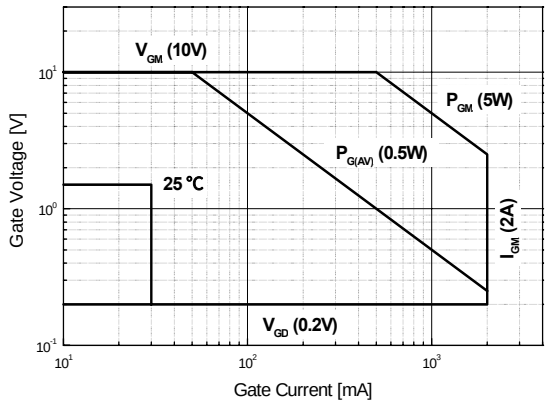


Fig 2. On-State Voltage

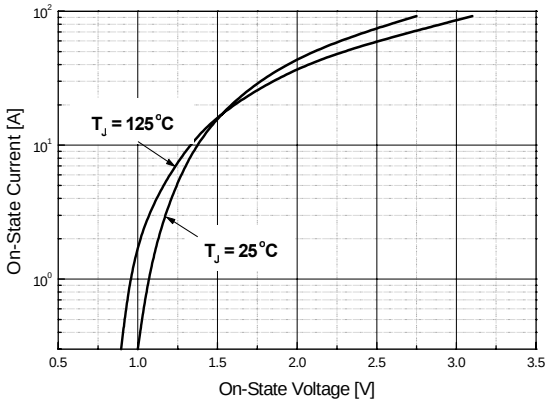


Fig 3. On State Current vs. Maximum Power Dissipation

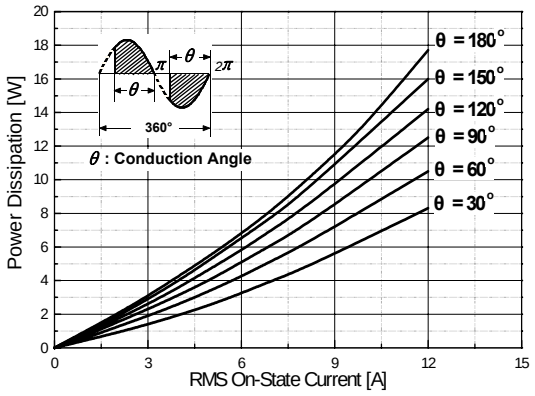


Fig 4. On State Current vs. Allowable Case Temperature

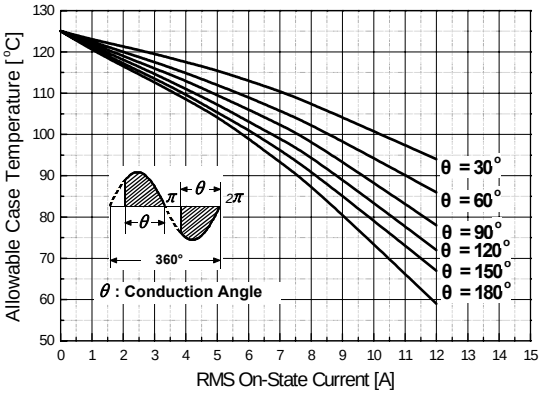


Fig 5. Surge On-State Current Rating (Non-Repetitive)

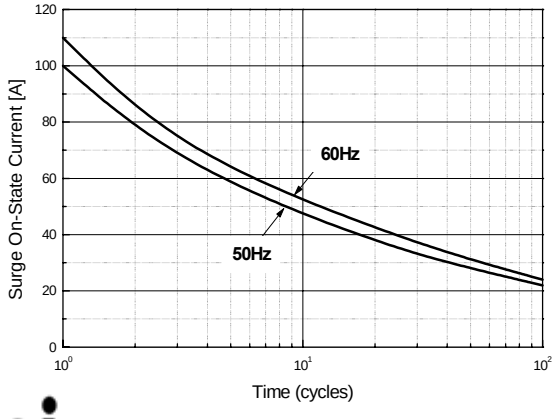


Fig 6. Gate Trigger Voltage vs. Junction Temperature

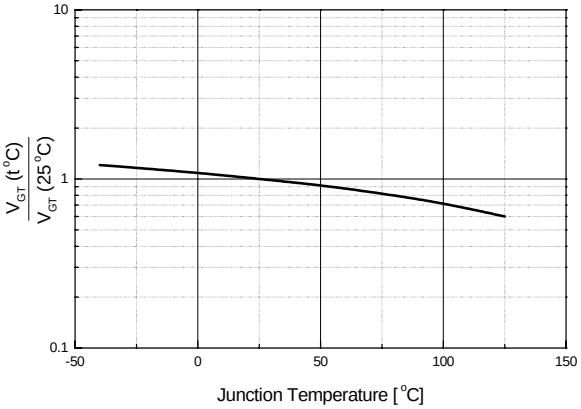


Fig 7. Gate Trigger Current vs. Junction Temperature

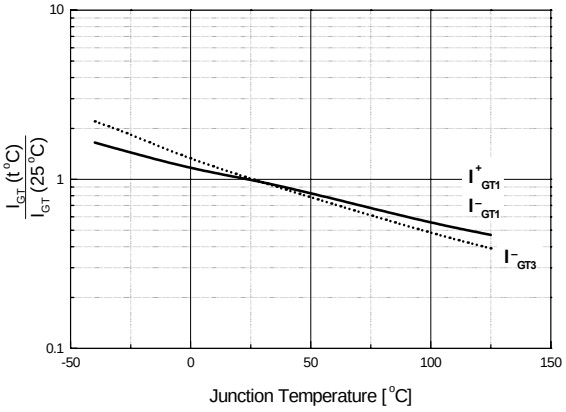


Fig 8. Transient Thermal Impedance

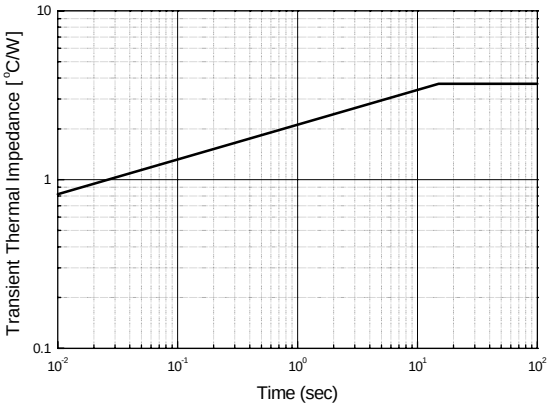
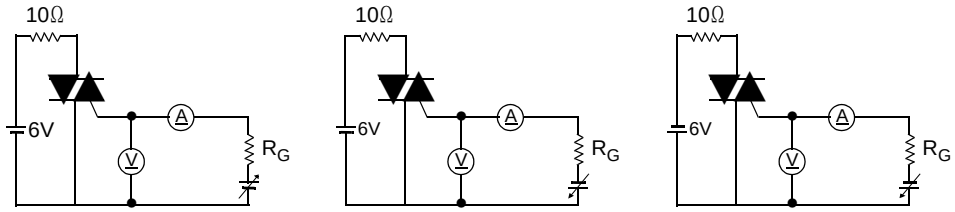


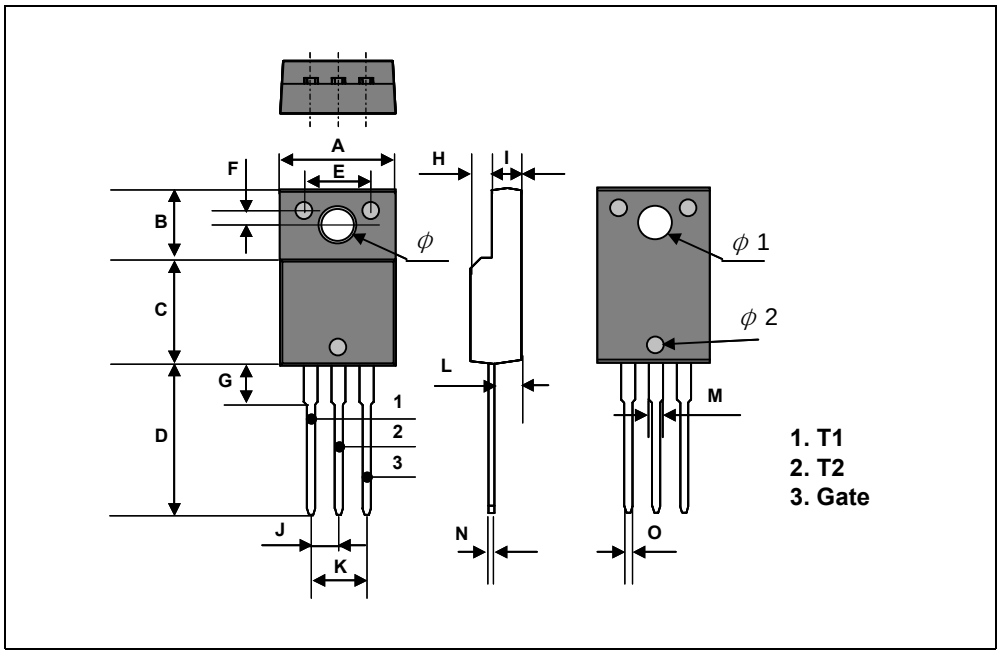
Fig 9. Gate Trigger Characteristics Test Circuit



Test Procedure Ⅰ　　Test Procedure Ⅱ　　Test Procedure Ⅲ

TO-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	
ϕ 1		3.2			0.126	
ϕ 2		1.5			0.059	



DBT138F-600

TO-220F Package Dimension, Forming

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	8.4		8.66	0.331		0.341
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
P		5.0			0.197	
ϕ		3.7			0.146	
ϕ 1		3.2			0.126	
ϕ 2		1.5			0.059