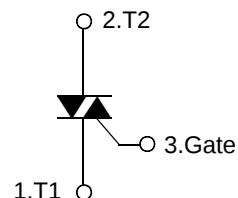


Bi-Directional Triode Thyristor

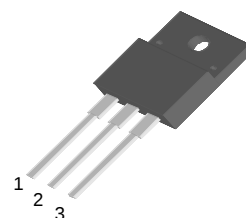
Features

- ◆ Repetitive Peak Off-State Voltage : 600V
- ◆ R.M.S On-State Current ($I_{T(RMS)} = 4\text{ A}$)
- ◆ High Commutation dv/dt

Symbol



TO-220F



General Description

This device is suitable for direct coupling to TTL, HTL, CMOS and application such as various logic functions, low power AC switching applications, such as fan speed, small light controllers and home appliance equipment.

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	$T_C = 99^\circ\text{C}$	4.0	A
I_{TSM}	Surge On-State Current	One Cycle, 50Hz/60Hz, Peak, Non-Repetitive	30/33	A
I^2_t	I^2_t		4.5	A^2s
P_{GM}	Peak Gate Power Dissipation		1.5	W
$P_{G(AV)}$	Average Gate Power Dissipation		0.1	W
I_{GM}	Peak Gate Current		1.0	A
V_{GM}	Peak Gate Voltage		7.0	V
T_J	Operating Junction Temperature		- 40 ~ 125	$^\circ\text{C}$
T_{STG}	Storage Temperature		- 40 ~ 150	$^\circ\text{C}$
	Mass		2.0	g

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Electrical Characteristics

Symbol	Items		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current		$V_{\text{D}} = V_{\text{DRM}}$, Single Phase, Half Wave $T_{\text{J}} = 125\text{ }^{\circ}\text{C}$	—	—	1.0	mA
V_{TM}	Peak On-State Voltage		$I_{\text{T}} = 6\text{ A}$, Inst. Measurement	—	—	1.6	V
I_{GT1}^{+}	I	Gate Trigger Current	$V_{\text{D}} = 6\text{ V}$, $R_{\text{L}}=10\text{ }\Omega$	—	—	20	mA
I_{GT1}^{-}	II			—	—	20	
I_{GT3}^{-}	III			—	—	20	
V_{GT1}^{+}	I	Gate Trigger Voltage	$V_{\text{D}} = 6\text{ V}$, $R_{\text{L}}=10\text{ }\Omega$	—	—	1.5	V
V_{GT1}^{-}	II			—	—	1.5	
V_{GT3}^{-}	III			—	—	1.5	
V_{GD}	Non-Trigger Gate Voltage		$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$, $V_{\text{D}} = 1/2\text{ }V_{\text{DRM}}$	0.2	—	—	V
$(dv/dt)_c$	Critical Rate of Rise Off-State Voltage at Commutation		$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$, $[di/dt]_c = -2.0\text{ A/ms}$, $V_{\text{D}}=2/3\text{ }V_{\text{DRM}}$	5.0	—	—	$\text{V}/\mu\text{s}$
I_{H}	Holding Current			—	5.0	—	mA
$R_{\text{th(j-c)}}$	Thermal Impedance		Junction to case	—	—	4.0	$^{\circ}\text{C/W}$

Fig 1. Gate Characteristics

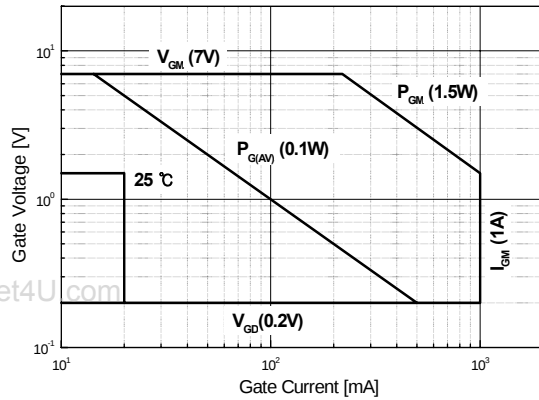


Fig 2. On-State Voltage

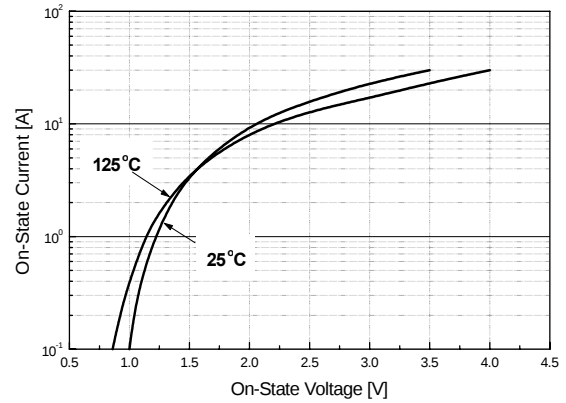


Fig 3. On State Current vs. Maximum Power Dissipation

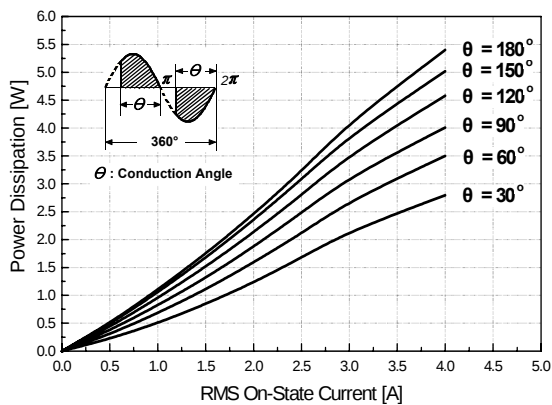


Fig 4. On State Current vs. Allowable Case Temperature

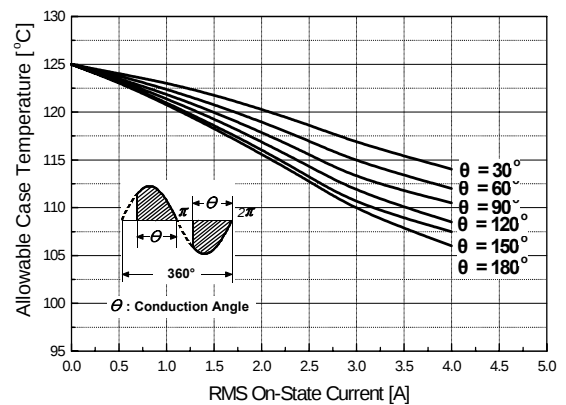


Fig 5. Surge On-State Current Rating (Non-Repetitive)

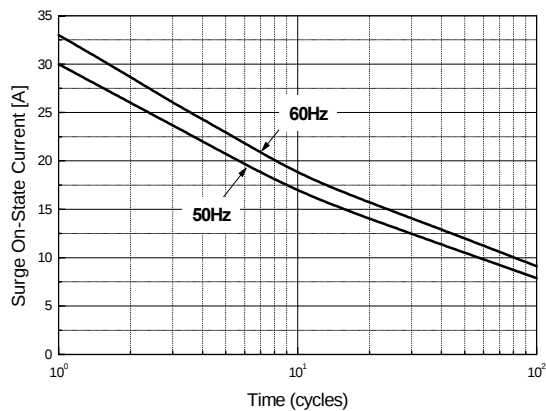
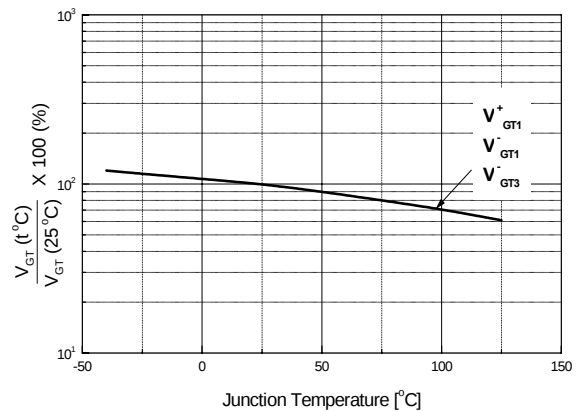


Fig 6. Gate Trigger Voltage vs. Junction Temperature



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Fig 7. Gate Trigger Current vs. Junction Temperature

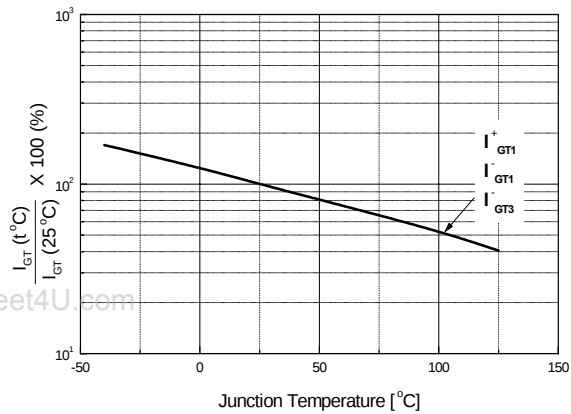


Fig 8. Transient Thermal Impedance

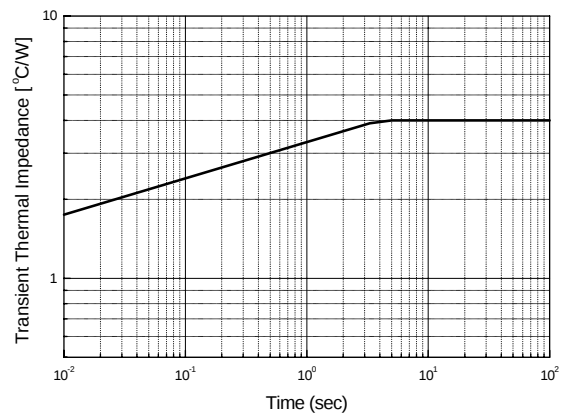
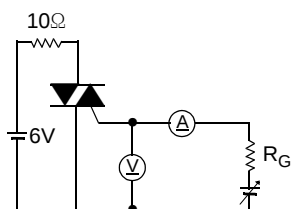
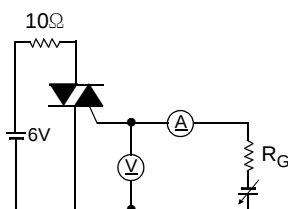


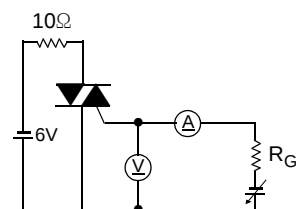
Fig 9. Gate Trigger Characteristics Test Circuit



Test Procedure I



Test Procedure II

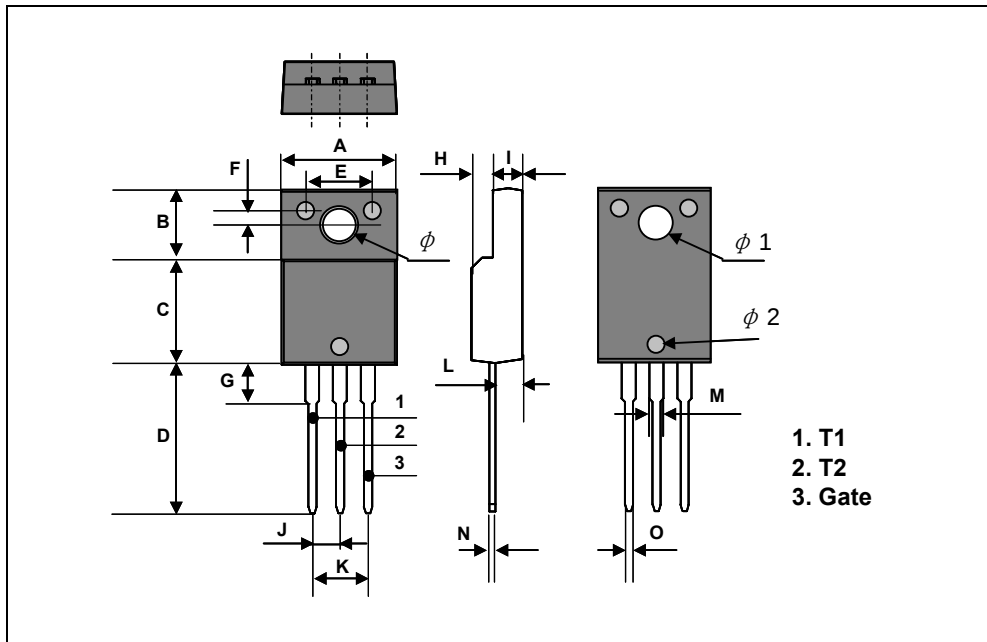


Test Procedure III

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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	



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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	
$\phi 1$		3.2			0.126	
$\phi 2$		1.5			0.059	

