

### Features

- ◆ Repetitive Peak Off-State Voltage : 800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)} = 1 A$  )
- ◆ High Commutation dv/dt

### General Description

This device is suitable for low power AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay where high sensitivity is required in all four quadrants.

This device may substitute for BTA12-600, BTB12-600, BT138-600, BCR12CM12L, TM1261M/S series.

### Absolute Maximum Ratings ( $T_j = 25^\circ C$ unless otherwise specified )

Symbol	Parameter	Condition	Ratings	Units
$V_{DRM}$	Repetitive Peak Off-State Voltage	Sine wave, 50 to 60 Hz	800	V
$I_{T(RMS)}$	R.M.S On-State Current	$T_j = 125^\circ C$ , Full Sine wave	12	A
$I_{TSM}$	Surge On-State Current	One Cycle, 50Hz/60Hz, Peak, Non-Repetitive	120/126	A
$I^2t$	$i^2t$	$t_p = 10ms$	72	$A^2s$
$P_{G(AV)}$	Average Gate Power Dissipation	$T_j = 125^\circ C$	1	W
$I_{GM}$	Peak Gate Current	$T_j = 125^\circ C$	2	A
$T_j$	Operating Junction Temperature		- 40 ~ 125	$^\circ C$
$T_{STG}$	Storage Temperature		- 40 ~ 150	$^\circ C$



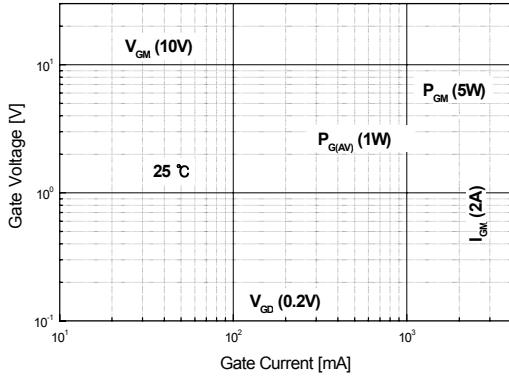
# TF12A80

## Electrical Characteristics (T<sub>J</sub>=25 °C unless otherwise specified)

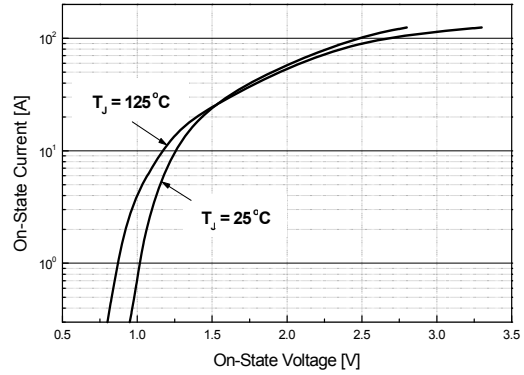
Symbol	Items	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I <sub>DRM</sub>	Repetitive Peak Off-State Current	V <sub>D</sub> = V <sub>DRM</sub> , Single Phase, Half Wave T <sub>J</sub> = 125 °C	---	---	2.0	mA
V <sub>TM</sub>	Peak On-State Voltage	I <sub>TM</sub> = 17 A, t <sub>p</sub> =380 μs	---	---	1.55	V
I <sup>+</sup> <sub>GT1</sub>	I	Gate Trigger Current V <sub>D</sub> = 12V, R <sub>L</sub> =30 Ω	—	—	30	mA
I <sup>-</sup> <sub>GT1</sub>	II		—	—	30	
I <sup>-</sup> <sub>GT3</sub>	III		—	—	30	
V <sup>+</sup> <sub>GT1</sub>	I	Gate Trigger Voltage V <sub>D</sub> = 12 V, R <sub>L</sub> =30 Ω	—	—	1.5	V
V <sub>GT1</sub>	II		—	—	1.5	
V <sub>GT3</sub>	III		—	—	1.5	
V <sub>GD</sub>	Non-Trigger Gate Voltage	T <sub>J</sub> = 125 °C, V <sub>D</sub> = V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ	0.2	—	-	V
dv/dt	Critical Rate of Rise Off-State Voltage	T <sub>J</sub> = 125 °C V <sub>D</sub> =2/3 V <sub>DRM</sub>	200	—	—	V/μs
I <sub>H</sub>	Holding Current	I <sub>T</sub> =0.2A	—	--	50	mA



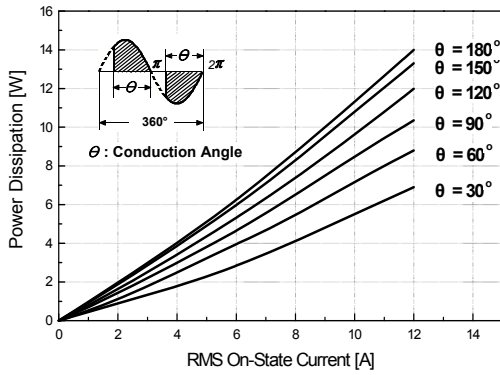
**Fig 1. Gate Characteristics**



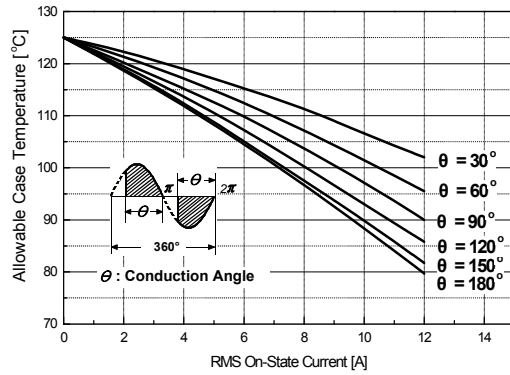
**Fig 2. On-State Voltage**



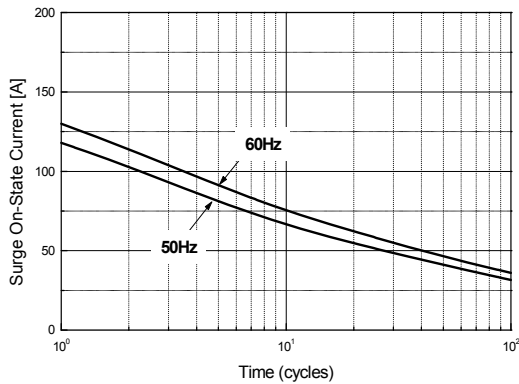
**Fig 3. On State Current vs. Maximum Power Dissipation**



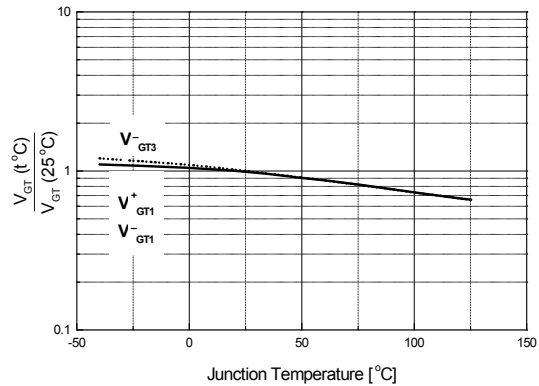
**Fig 4. On State Current vs. Allowable Case Temperature**



**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

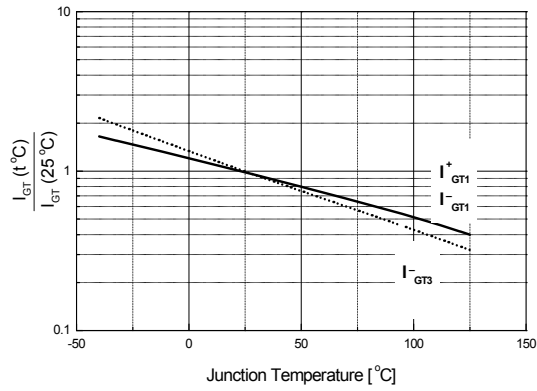
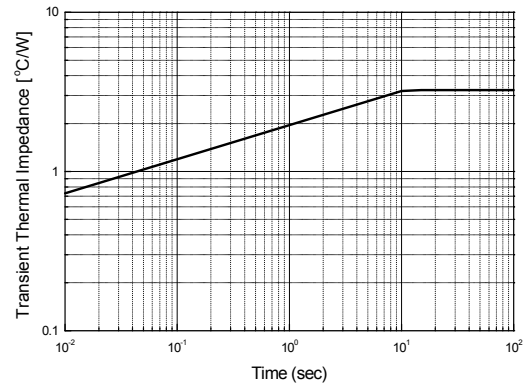


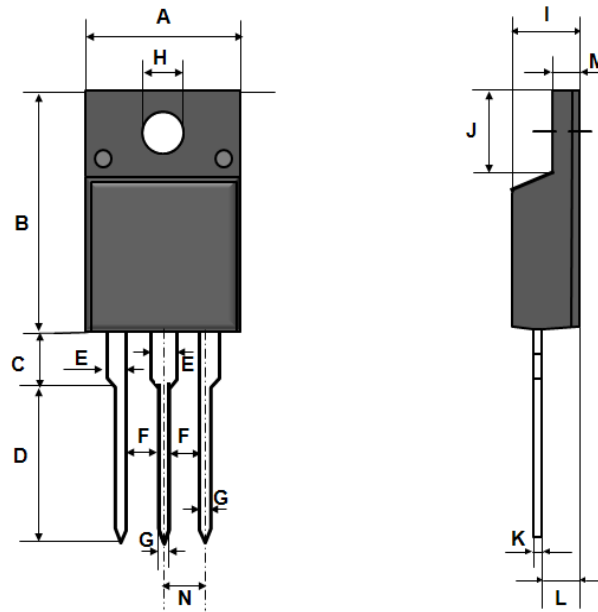
Fig 8. Transient Thermal Impedance





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## TO-220F Package Dimension



Symbol	INCHES			MILLIMETERS		
	MIN	TYP	MAX		MIN	TYP
A	9.88	10.08	10.28	25.10	25.60	26.11
B	15.30	15.50	15.70	38.86	39.37	39.88
C	2.95	3.00	3.05	7.49	7.62	7.75
D	10.30	10.50	10.70	26.16	26.67	27.18
E	0.95	1.08	1.20	2.41	2.74	3.05
F	1.81	1.84	1.87	4.60	4.67	4.75
G	0.50	0.70	0.90	1.27	1.78	2.29
H	3.00	3.20	3.40	7.62	8.13	8.64
I	4.35	4.45	4.55	11.05	11.30	11.56
J	6.20	6.40	6.60	15.75	16.26	16.76
K	0.41	0.51	0.61	1.03	1.28	1.54
L	2.30	2.50	2.70	5.84	6.35	6.86
M	2.53	2.73	2.93	6.43	6.93	7.44
N	2.34	2.54	2.74	5.94	6.45	6.96



## 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	1.23		1.36	0.048		0.054
N	0.45		0.63	0.018		0.025
O	0.65		0.78	0.0025		0.031
P		5.0			0.197	
$\phi$		3.7			0.146	
$\phi 1$		3.2			0.126	
$\phi 2$		1.5			0.059	

