



## DESCRIPTION

This part is suitable for motor control, water heaters, lighting control, induction motor starting circuits, solid-state relays, on/off switching etc. The part is available in TO-220 package and is suitable for general purpose power switching applications.

## FEATURES

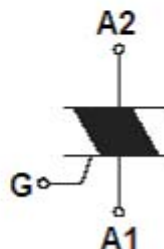
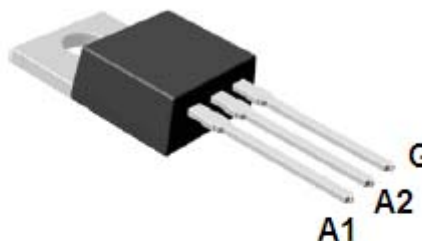
- TRIAC
- TO-220 Package
- Isolated Heatsink
- $I_{T(RMS)} = 16\text{ A}$
- $V_{DRM} = 600/800\text{ Volt}$
- $V_{RRM} = 600/800\text{ Volt}$
- $I_{GT} = 30\text{ mA}$

## APPLICATIONS

- AC power switching applications
- Washing Machine
- Vacuum Cleaner
- Rice Cookers
- Microwave Ovens
- Hair Dryers
- Copier Machines
- Motor Controls
- Dimmers
- Heater Controls
- Vending Machines

## PIN-OUT

### TO-220 Package





## SPECIFICATIONS

### ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$ )

PARAMETER		MAX VALUE	UNIT
Repetitive Peak Off-State Current, $I_{\text{DRM1}}$	$V_D = 600/800 \text{ V}$	2	mA
Peak On-state Voltage, $V_{\text{TM}}$	$I_T = 25\text{A}$	1.4	V
Gate Threshold Current, 1 <sup>st</sup> quadrant, $I_{\text{GT1}}^+$	$V_D = 6\text{V}, R_L = 10\Omega$	30	mA
Gate Threshold Current, 2 <sup>nd</sup> quadrant, $I_{\text{GT1}}^-$	$V_D = 6\text{V}, R_L = 10\Omega$	30	mA
Gate Threshold Current, 3 <sup>rd</sup> quadrant, $I_{\text{GT3}}^+$	$V_D = 6\text{V}, R_L = 10\Omega$	-	mA
Gate Threshold Current, 4 <sup>th</sup> quadrant, $I_{\text{GT3}}^-$	$V_D = 6\text{V}, R_L = 10\Omega$	30	mA
Gate Threshold Voltage, 1 <sup>st</sup> quadrant, $V_{\text{GT1}}^+$	$V_D = 6\text{V}, R_L = 10\Omega$	1.5	V
Gate Threshold Voltage, 2 <sup>nd</sup> quadrant, $V_{\text{GT1}}^-$	$V_D = 6\text{V}, R_L = 10\Omega$	1.5	V
Gate Threshold Voltage, 3 <sup>rd</sup> quadrant, $V_{\text{GT3}}^+$	$V_D = 6\text{V}, R_L = 10\Omega$	-	V
Gate Threshold Voltage, 4 <sup>th</sup> quadrant, $V_{\text{GT3}}^-$	$V_D = 6\text{V}, R_L = 10\Omega$	1.5	V
Gate-Drain On-Voltage, $V_{\text{GD}}$	$T_j = 125^\circ\text{C}, V_D = 0.5V_{\text{DRM}}$	0.2	V
dV/dt	$T_j = 125^\circ\text{C}, V_D = 400\text{V}$ $di/dt = -8\text{A/ms}$	10	V/ $\mu\text{s}$
Holding Current, $I_H$		25	mA

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

PARAMETER	VALUE	UNIT
	$V_{\text{DRM}}$	600/800 V
RMS on-state current (full sine wave)	$I_{\text{T(RMS)}}$	16 A
Non-repetitive surge peak current	$I_{\text{TSM}}$	170 A
Value for fusing	$I^2t$	120 $\text{A}^2\text{s}$
Peak gate power dissipation	$P_{\text{GM}}$	5 W
Average peak gate power dissipation	$P_{\text{G(AV)}}$	0.5 W
Peak gate current	$I_{\text{GM}}$	2 A
Peak gate voltage	$V_{\text{GM}}$	10 V
Operating junction temperature	$T_j$	-40~+125 $^\circ\text{C}$



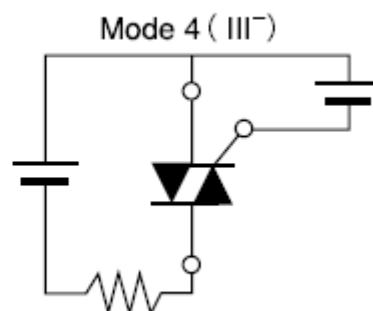
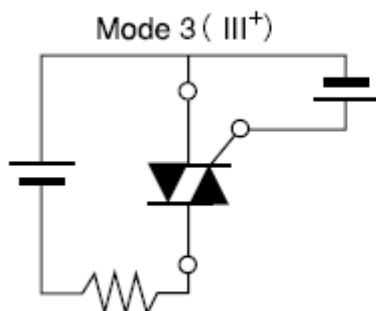
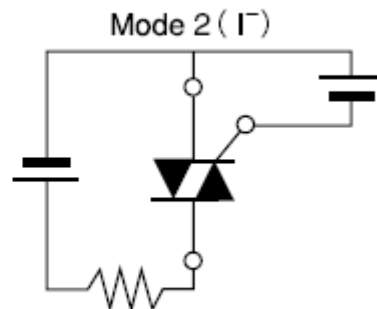
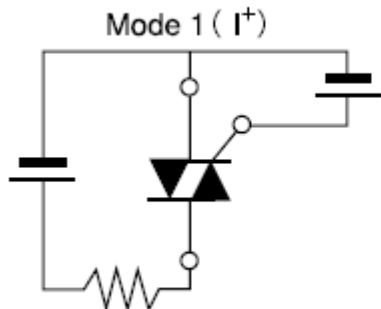
**THERMAL RESISTANCE**

PARAMETER	PACKAGE	VALUE	UNIT
$R_{th(j-c)}$	TO-220 Non-insulated	3.0	°C/W
$R_{th(j-a)}$	TO-220 Non-insulated	60	°C/W

**OTHERS**

PARAMETER		MIN	TYP	MAX	UNIT
Isolation Resistance	At 1000VDC, 1 min	-	-	1,000	MΩ
Isolation Voltage	Between pins and heatsink	-	-	1.5	kV
Temperature range		-40	-	125	°C
Relative humidity		35	-	65	%
Shock resistance	Destruction	-	-	100	G
	Malfunction	-	-	100	G
Vibration resistance	Destruction: 10 - 55 Hz	-	-	1.5	mm
	Malfunction: 10 - 55 Hz	-	-	1.5	mm

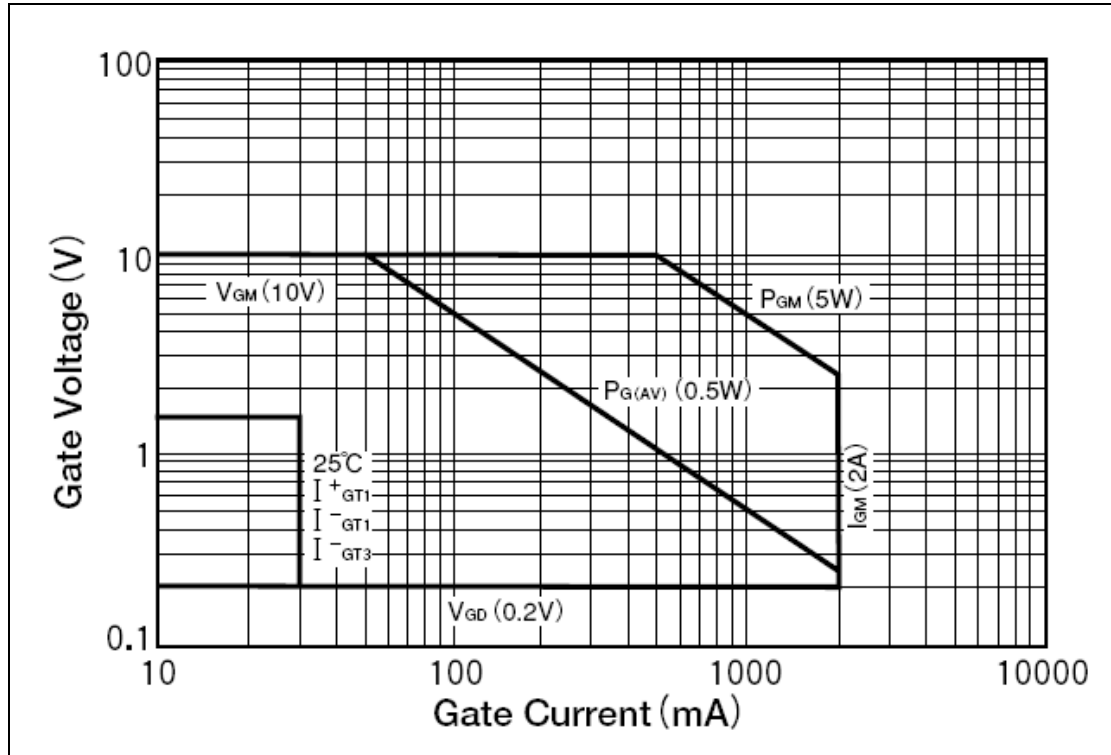
**TRIGGER MODES**



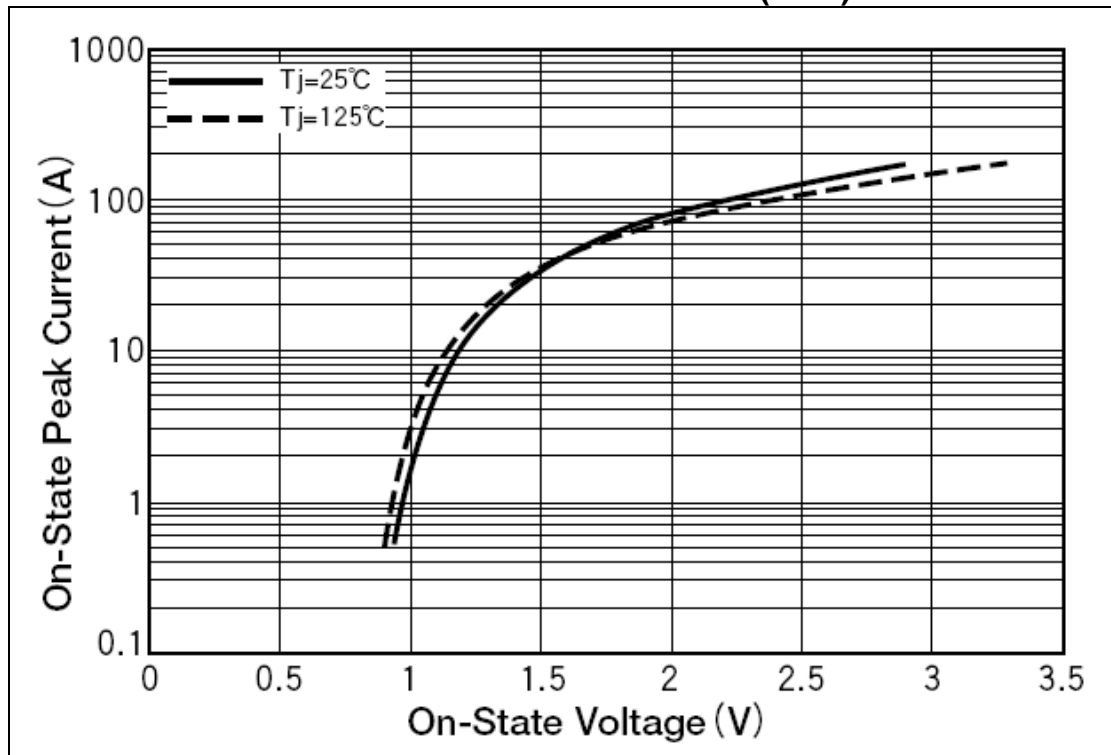


# TYPICAL CHARACTERISTICS

## GATE CHARACTERISTICS



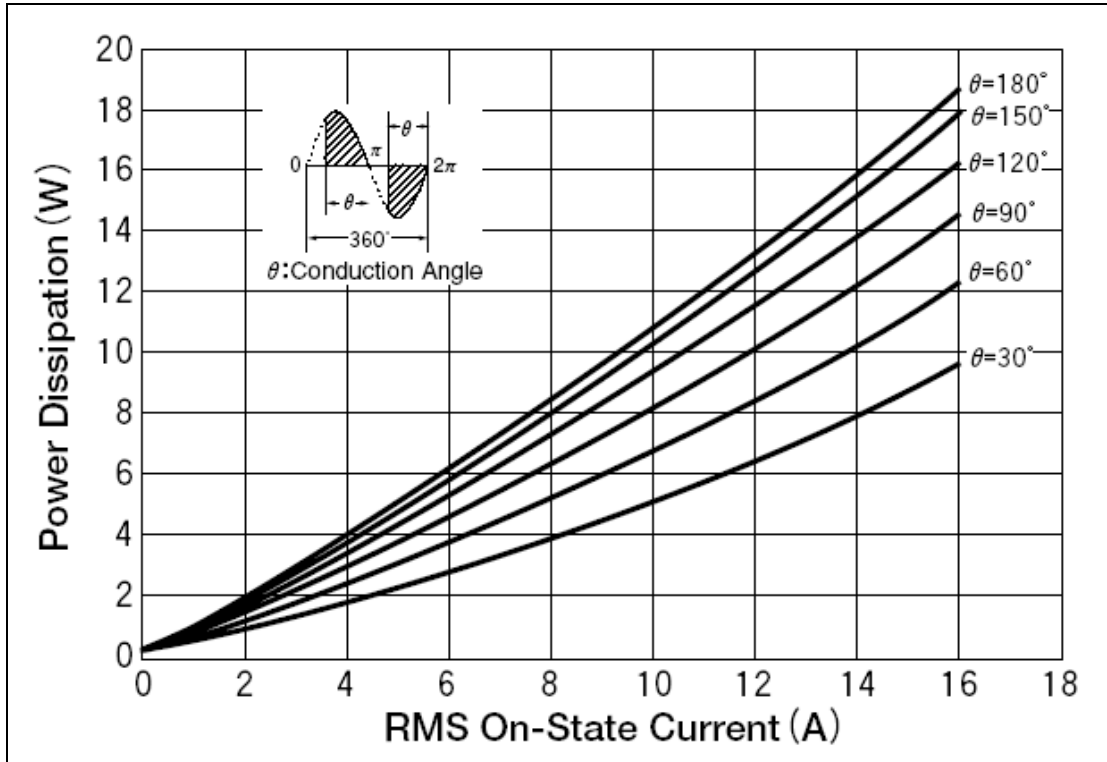
## ON-STATE CHARACTERISTICS (MAX)



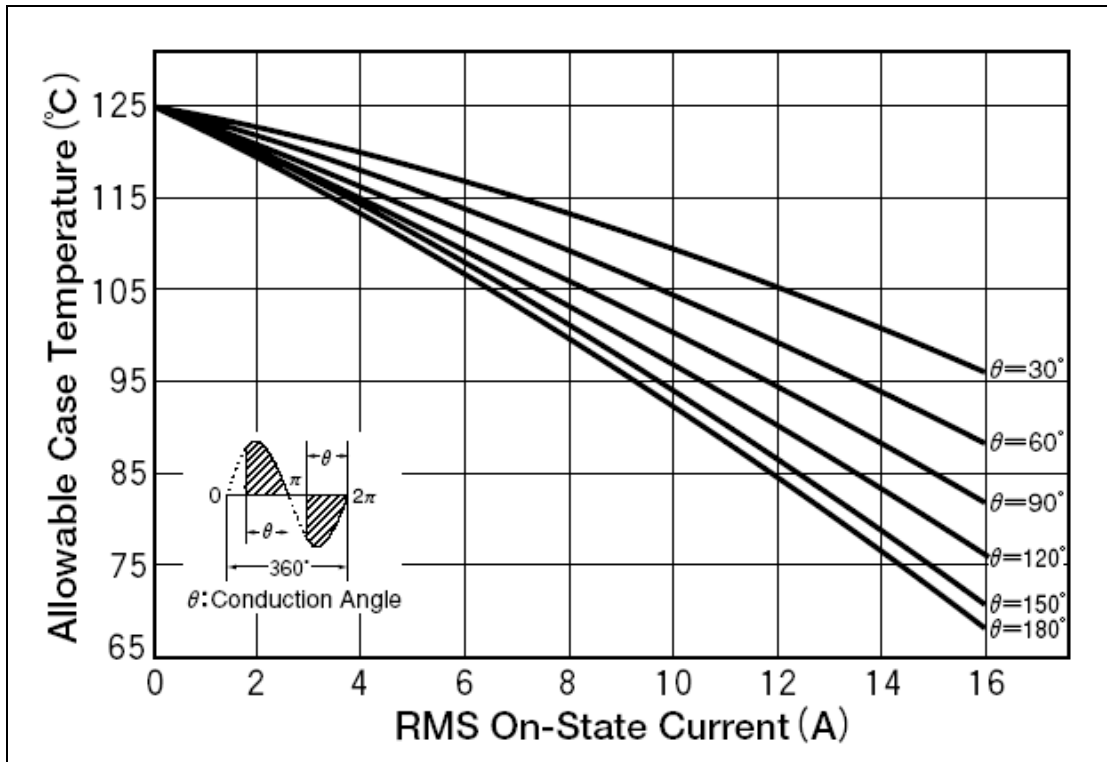


## TYPICAL CHARACTERISTICS – CONTINUED

**RMS ON-STATE CURRENT VS MAXIMUM POWER DISSIPATION**



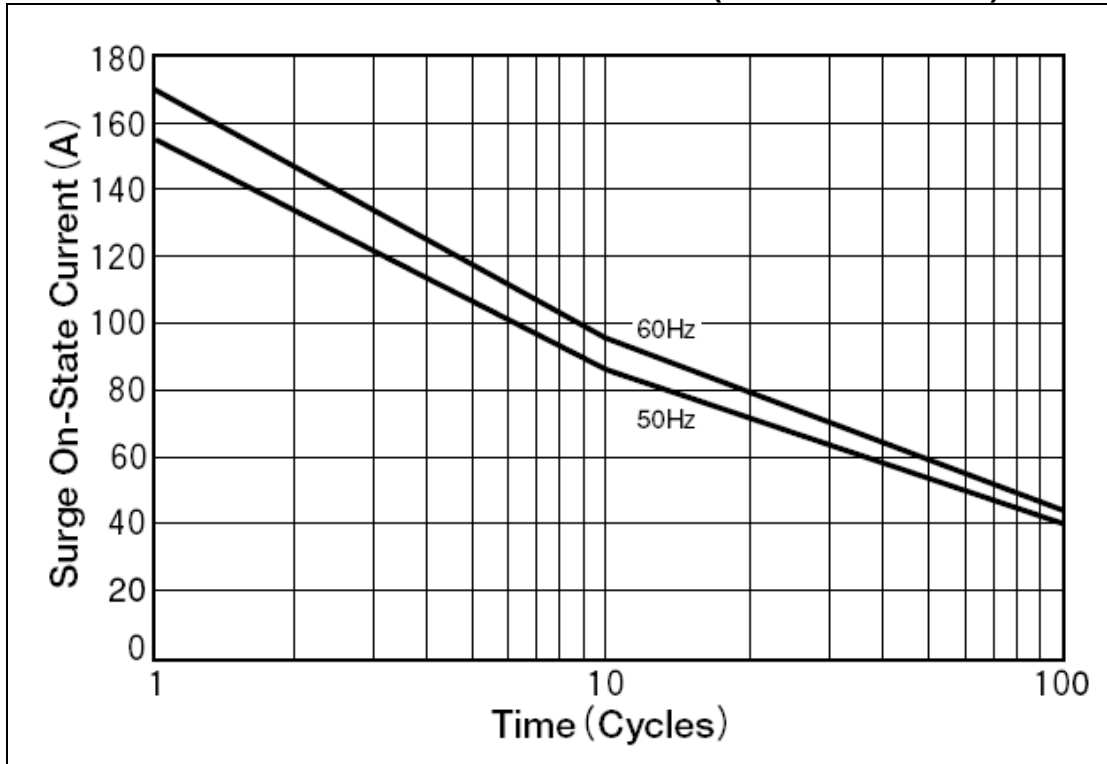
**RMS ON-STATE VS ALLOWABLE CASE TEMPERATURE**



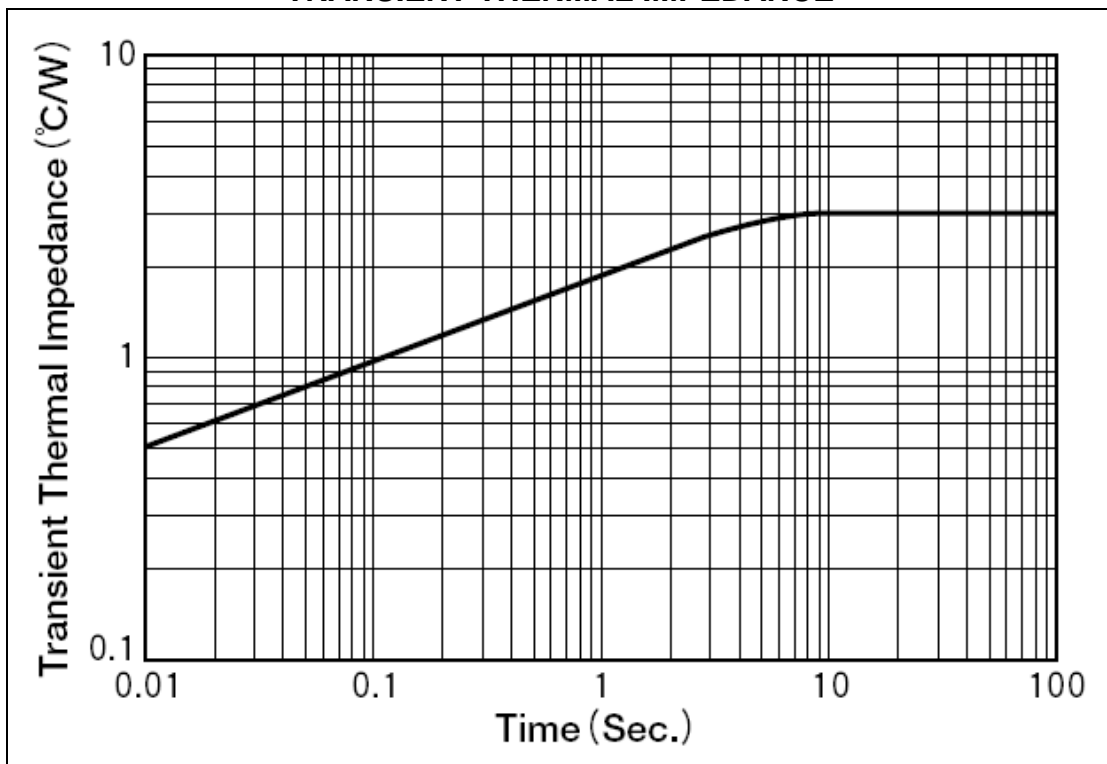


## TYPICAL CHARACTERISTICS – CONTINUED

**SURGE ON-STATE CURRENT RATING (NON-REPETITIVE)**



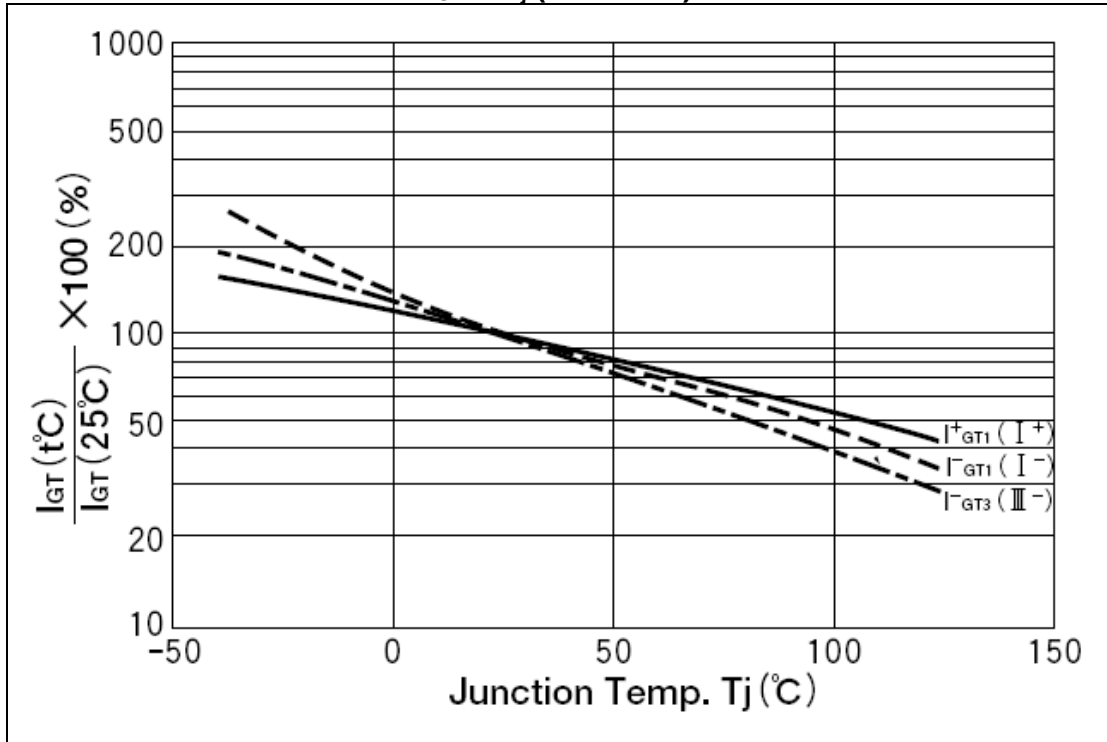
**TRANSIENT THERMAL IMPEDANCE**



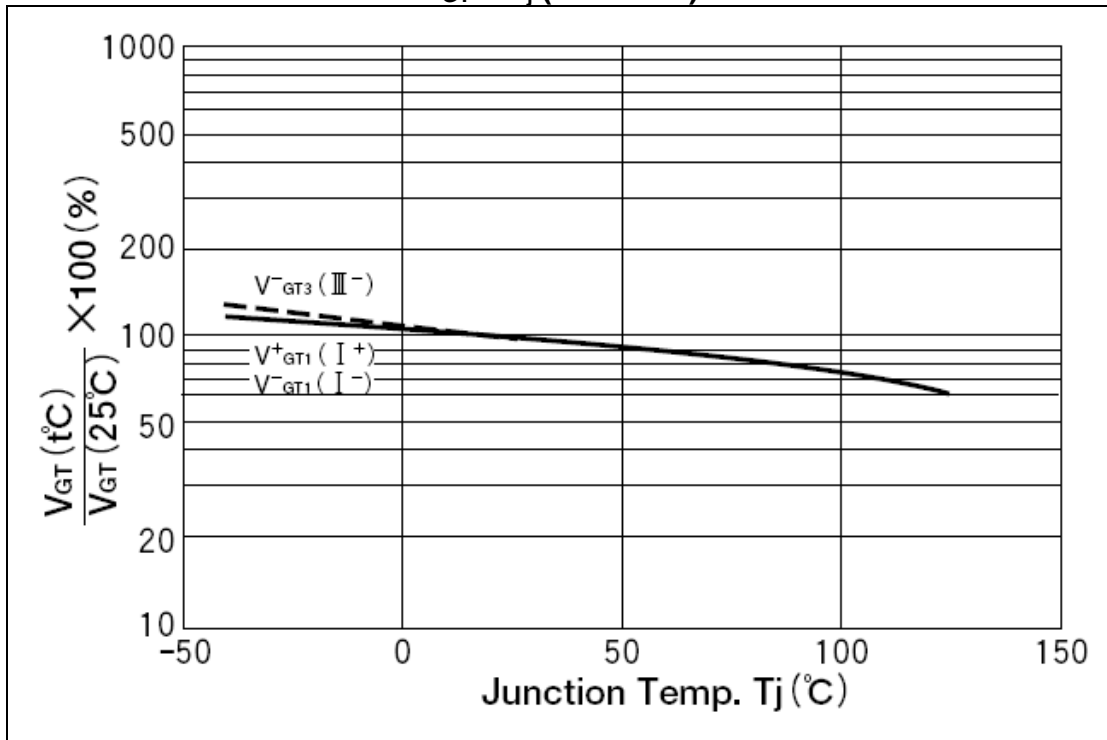


## TYPICAL CHARACTERISTICS – CONTINUED

$I_{GT} - T_j$  (TYPICAL)



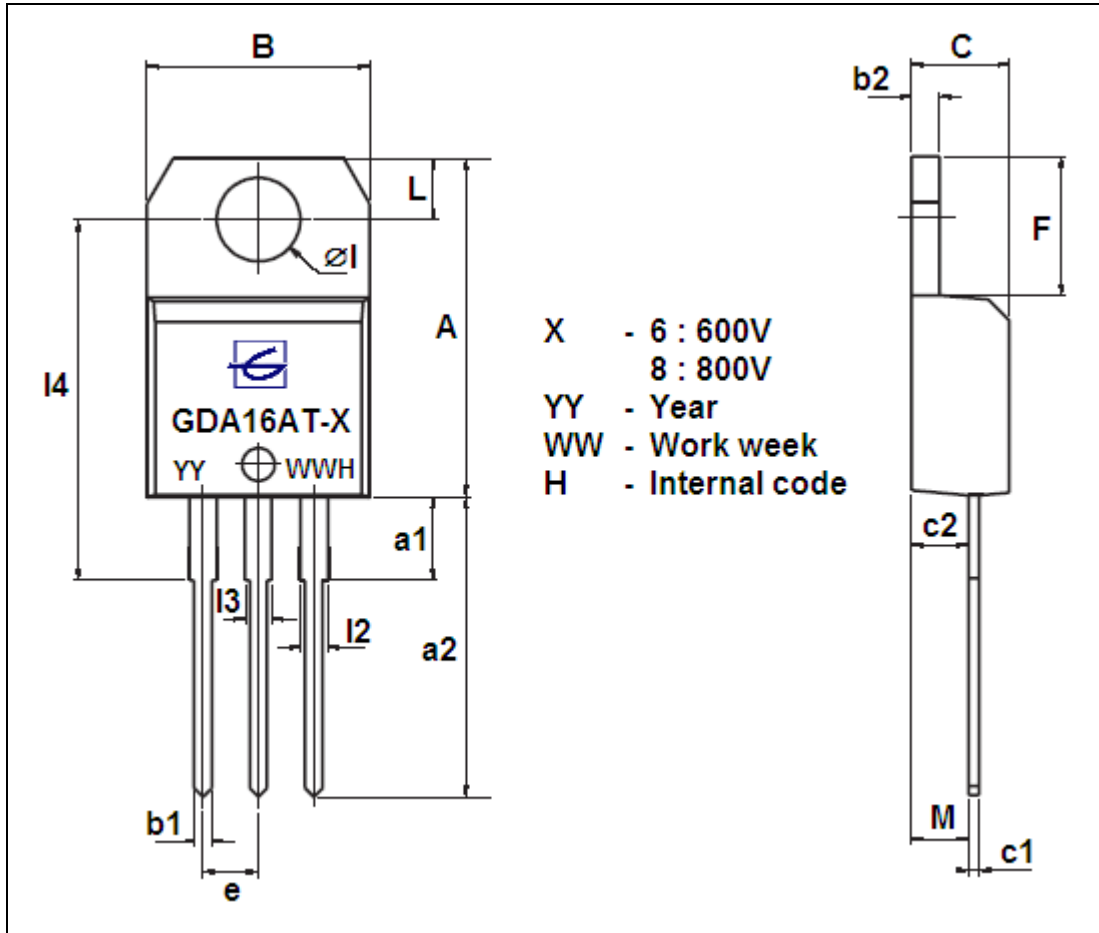
$V_{GT} - T_j$  (TYPICAL)





# PACKAGING

## DIMENSIONS AND MARKING FOR TO-220 PACKAGE



TO-220		A	a1	a2	B	b1	b2	C	c1	c2
MM	Min	15.20		13.00	10.00	0.61	1.23	4.40	0.49	2.40
	Typ		3.75							
	Max	15.90		14.00	10.40	0.88	1.32	4.60	0.70	2.72
INCHES	Min	0.598		0.512	0.394	0.024	0.048	0.173	0.019	0.094
	Typ		0.148							
	Max	0.626		0.551	0.409	0.035	0.052	0.181	0.028	0.107

TO-220		e	F	L	I	I2	I3	I4	M
MM	Min	2.40	3.00	2.65	3.75	1.14	1.14	15.8	
	Typ							16.4	2.6
	Max	2.72	6.60	2.95	3.85	1.70	1.70	16.8	
INCHES	Min	0.094	0.118	0.104	0.148	0.045	0.045	0.622	
	Typ							0.646	0.102
	Max	0.107	0.260	0.116	0.152	0.067	0.067	0.661	





## ORDERING INFORMATION

PART NUMBER	$V_{DRM}/V_{RRM}$ (V)	PACKAGE
GDA16AT-6	600	TO-220
GDA16AT-8	800	TO-220

The information presented in this data sheet is believed to be accurate and reliable. Application circuits shown are typical examples illustrating the operation of the device.  
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Reference to products of other manufacturers are solely for convenience and do not imply total equivalency of design, performance, or otherwise.