

IGBT Modules



V_{RRM} 1200V

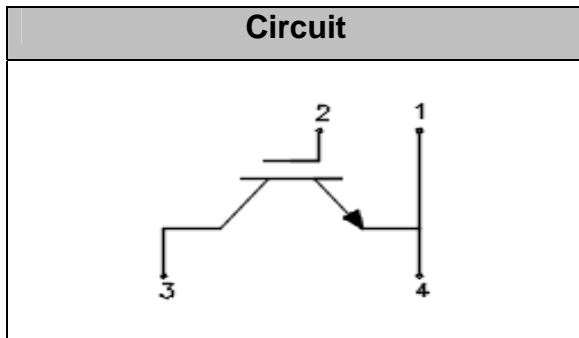
I_{FAV} 100 A

Applications

- Inverter
- Uninterruptible Power Supply (UPS)
- Converter
- Welder
- SMPS
- Converter

Features

- Ultra Low Loss
- Positive Temperature Coefficient
- High Ruggedness
- Fully isolated package
- High Short Circuit Capability
- Popular SOT-227 Package



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

Symbol	Description	Values	Units
V _{CES}	Collector - Emitter Voltage	1200	V
V _{GES}	Gate-Emitter Voltage	±20	V
I _C	DC Collector Current	T _C =25°C	150 A
		T _C =80°C	100 A
I _{CM}	Pulsed collector current	T _J = 80°C	200 A
P _D	Maximum Power Dissipation (IGBT)	T _C = 25°C, T _{Jmax} =150°C	690 W
T _J	Maximum Junction Temperature	150	°C
T _{JOP}	Operating Temperature	-40 ~ +150	°C
T _{stg}	Storage Temperature	-40 ~ +125	°C
Visol	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1min	3000 V
Weight	Weight Of Module	27	g
Mounting Torque	Module-to-Sink:M4	1.2	N*m
	Module Electrodes:M4	1.1	N*m



Electrical Characteristics of IGBT ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
OFF Characteristics						
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 1mA$	1200			V
I_{CES}	Collector Leakage Current	$V_{CE}=V_{CES}, V_{GE}=0V,$			300	μA
		$V_{CE}=V_{CES}, V_{GE}=0V,$ $T_J=125^\circ\text{C}$			3	mA
I_{GES}	Gate Leakage Current	$V_{CE}=0V, V_{GE}=\pm 20V$	-200		200	nA
ON Characteristics						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=1mA$	5	5.5	6.5	V
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage	$I_C=100A, V_{GE}=15V$		1.9		V
		$I_C=100A, V_{GE}=15V,$ $T_J=125^\circ\text{C}$		2.3		V
Dynamic Characteristics						
C_{ies}	Input Capacitance	$V_{CE} = 25V, V_{GE} = 0V,$ $f = 1MHz$		7.43		nF
C_{oes}	Output Capacitance			0.52		nF
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 600V, I_C = 100A,$ $R_G = 15\Omega, V_{GE} = \pm 15V,$ Inductive Load, $T_J = 25^\circ\text{C}$		125		ns
t_r	Rise Time			60		ns
$t_{d(off)}$	Turn-off Delay Time			420		ns
T_f	Fall Time			60		ns
E_{on}	Turn-on Switching Loss			6.6		mJ
E_{off}	Turn-off Switching Loss			6.8		mJ
$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 600V, I_C = 100A,$ $R_G = 15\Omega, V_{GE} = \pm 15V,$ Inductive Load, $T_J = 125^\circ\text{C}$		135		ns
t_r	Rise Time			60		ns
$t_{d(off)}$	Turn-off Delay Time			490		ns
T_f	Fall Time			75		ns
E_{on}	Turn-on Switching Loss			12.4		mJ
E_{off}	Turn-off Switching Loss			10.8		mJ
Q_{ge}	Gate Charge	$V_{CC}=600V, I_C=100A,$ $V_{GE}=\pm 15V$		1050		nC
RBSOA	Reverse Bias Safe Operating Area	$I_C = 200A, V_{CC} = 600V,$ $V_p = 1200V, R_g = 22\Omega,$ $V_{GE} = +15V \text{ to } 0V,$ $L = 500\mu\text{H}, T_J = 150^\circ\text{C}$	Trapezoid			
SCSOA	Short Circuit Safe Operating Area	$V_{CC} = 600V, V_{GE} = 15V,$ $T_J = 150^\circ\text{C}$	10			μs



Thermal Resistance Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-To-Case (IGBT Part, Per Leg)			0.18	$^{\circ}C/W$
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)		0.05		$^{\circ}C/W$

Performance Curves

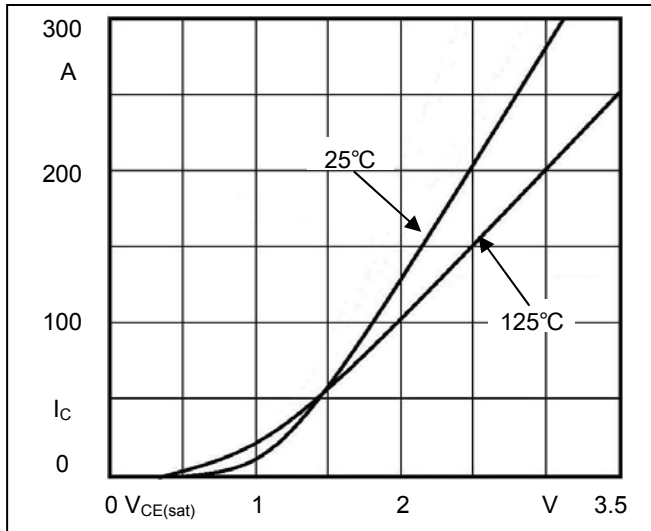


Fig1. Typical Output characteristics

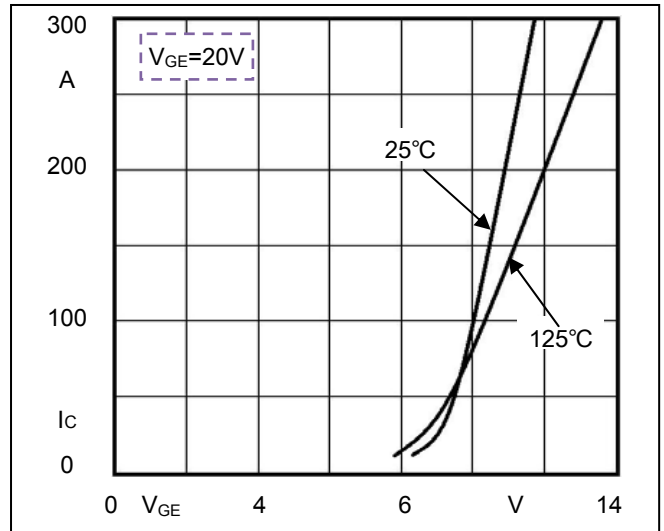


Fig2. Typical Transfer characteristics

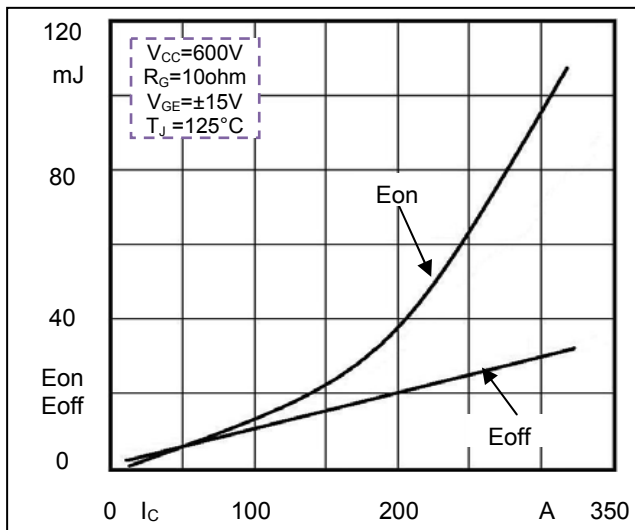


Fig3. Switching Energy vs. Collector Current

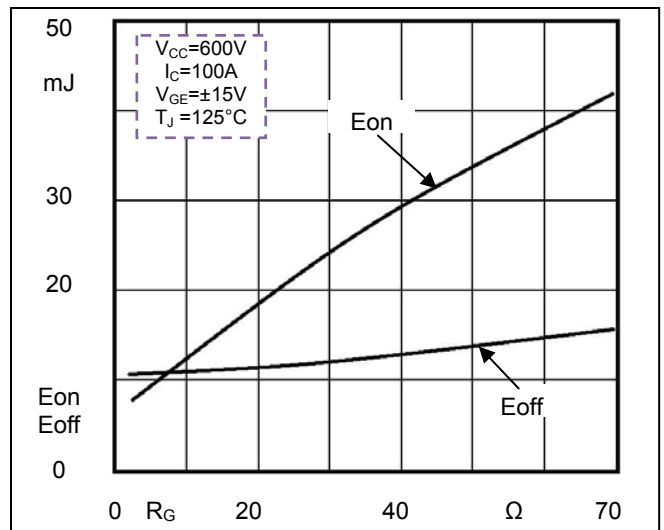


Fig4. Switching Energy vs. Gate Resistor

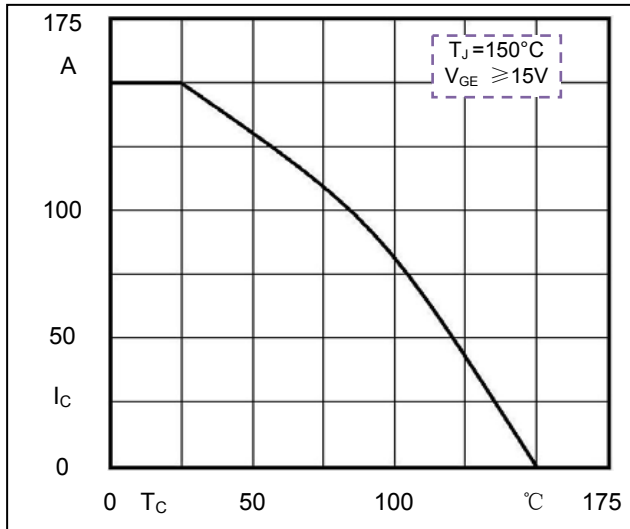


Fig5. Rated Current vs. TC

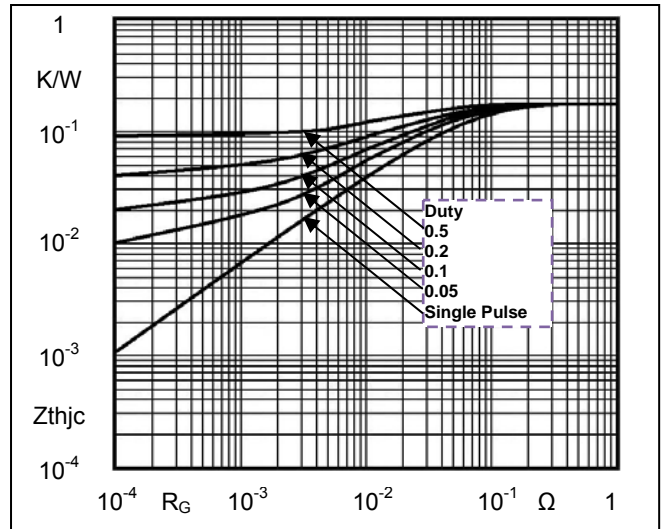


Fig6. Transient Thermal Impedance

Package Outline Information

