

# “HALF-BRIDGE” IGBT

## Features

- 10μs short circuit capability
- Low turn-off losses
- Short tail current

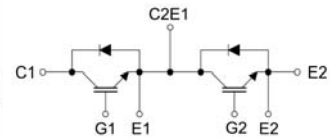
## Applications

- AC & DC motor controls
- General purpose inverters
- Optimized for high current inverter stages (AC TIG welding machines)
- Servo controls
- UPS
- Robotics

**V<sub>CES</sub> = 600V**  
**I<sub>c</sub> = 75A**  
**V<sub>CE(ON)</sub> typ. = 1.9V**  
**@ I<sub>c</sub> = 75A**



Package : V1



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## Absolute Maximum Ratings @ T<sub>c</sub> = 25 °C (per leg)

Symbol	Parameter	Test condition	Rating	Unit
V <sub>CES</sub>	Collector-to-Emitter Voltage	V <sub>GE</sub> = 0V, I <sub>c</sub> = 250μA	600	V
V <sub>GES</sub>	Gate emitter voltage		± 20	V
I <sub>c</sub>	Continuous Collector Current	T <sub>c</sub> = 70 °C (25 °C)	75(100)	A
I <sub>CM</sub>	Pulsed collector current	T <sub>c</sub> = 70 °C (25 °C)	150(200)	A
I <sub>F</sub>	Diode Continuous Forward Current	T <sub>c</sub> = 70 °C (25 °C)	70(90)	A
I <sub>FM</sub>	Diode Maximum Forward Current		200	A
T <sub>SC</sub>	Short Circuit Withstand Time	T <sub>c</sub> = 100 °C	10	μs
V <sub>iso</sub>	Isolation Voltage test	AC 1 minute	2500	V
T <sub>j</sub>	Junction Temperature		-40 ~ 150	°C
T <sub>stg</sub>	Storage Temperature		-40 ~ 125	°C
Weight	Weight of Module		190	g
Mounting	Power Terminal Screw : M5		3.5	Nm
Torque	Terminal connection Screw : M5		3.5	Nm

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

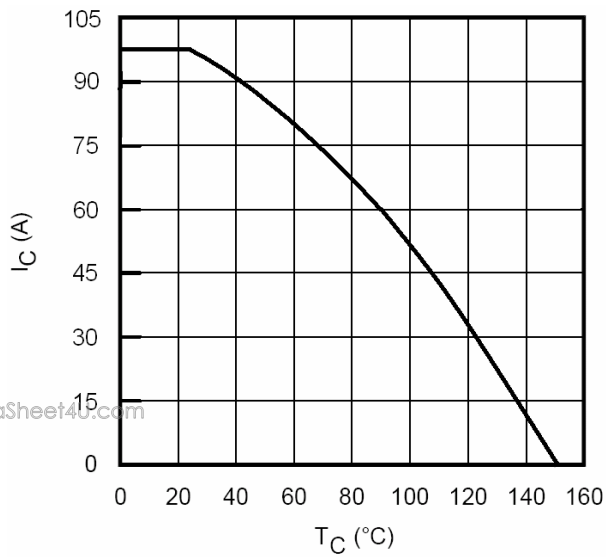
Symbol	Parameter	Min	Typ	Max	Unit	Test condition
V <sub>(BR)CES</sub>	Collector-to-Emitter Breakdown Voltage	600	-	-	V	V <sub>GE</sub> = 0V, I <sub>c</sub> = 250μA
V <sub>CE(ON)</sub>	Collector-to-Emitter Saturation Voltage	-	1.9	2.3		I <sub>c</sub> = 75A, V <sub>GE</sub> = 15V
V <sub>GE(th)</sub>	Gate Threshold Voltage	3.0	4.5	6.0		V <sub>CE</sub> = V <sub>GE</sub> , I <sub>c</sub> = 250μA
I <sub>CES</sub>	Zero Gate Voltage Collector Current	-	-	500	μA	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 600V
I <sub>GES</sub>	Gate-to-Emitter Leakage Current	-	-	±100	nA	V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V
V <sub>FM</sub>	Diode Forward Voltage Drop	-	1.50	1.8	V	I <sub>c</sub> = 75A

**Switching Characteristics @  $T_j = 25^\circ\text{C}$  (unless otherwise specified)**

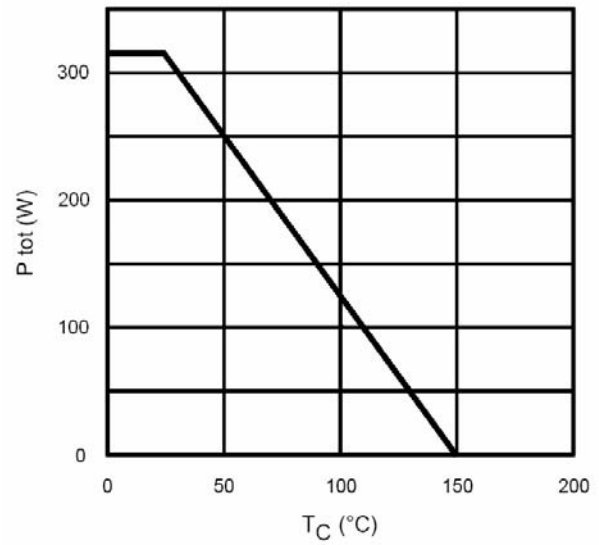
Symbol	Parameter	Min	Typ	Max	Unit	Test condition
$C_{ies}$	Input capacitance	-	6900	-	pF	$V_{CE} = 30\text{V}, V_{GE} = 0\text{V}$ $f = 1.0\text{MHz}$
$C_{oss}$	Output capacitance	-	730	-		
$C_{res}$	Reverse transfer capacitance	-	190	-		
$t_{d(on)}$	Turn-on delay time	-	82	-	ns	$T_j = 25^\circ\text{C}, V_{CC} = 480\text{V}$ $I_C = 60\text{A}, V_{GE} = 15\text{V}$ $R_G = 5.0\Omega$
$t_r$	Rise time	-	107	-		
$t_{d(off)}$	Turn-off delay time	-	282	423		
$t_f$	Fall time	-	97	146		
$I_{rr}$	Diode Peak Reverse Recovery current	-	13	20	A	$T_j = 125^\circ\text{C}, V_R = 200\text{V}$
$t_{rr}$	Diode Reverse Recovery time	-	140	210	ns	$I_F = 60\text{A}$

**Thermal Characteristics**

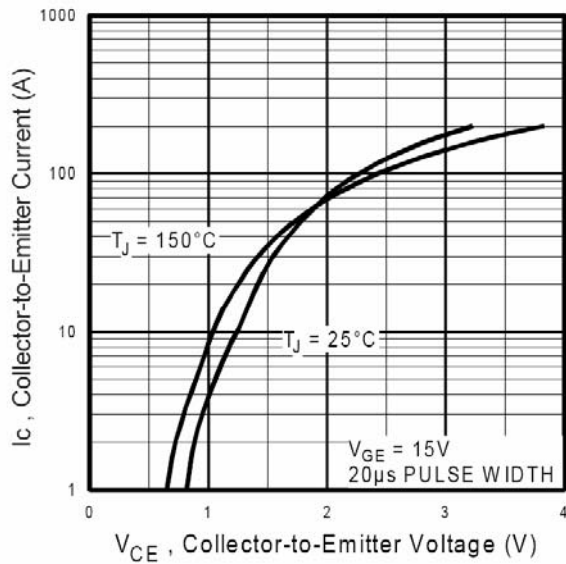
Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.4	$^\circ\text{C/W}$
$R_{\theta JC}$	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.9	
$R_{\theta CS}$	Case-to-Heat Sink (Conductive grease applied)	-	0.05	-	



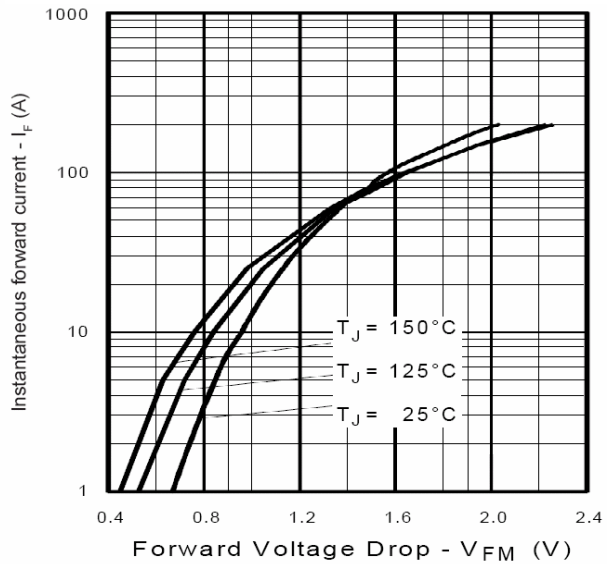
**Fig 1. Maximum DC Collector Current vs. Case Temperature**



**Fig 2. Power Dissipation vs. Case Temperature**



**Fig 3. Typ. IGBT Output Characteristics**



**Fig 4. Maximum Forward Voltage Drop vs. Instantaneous Forward Current**

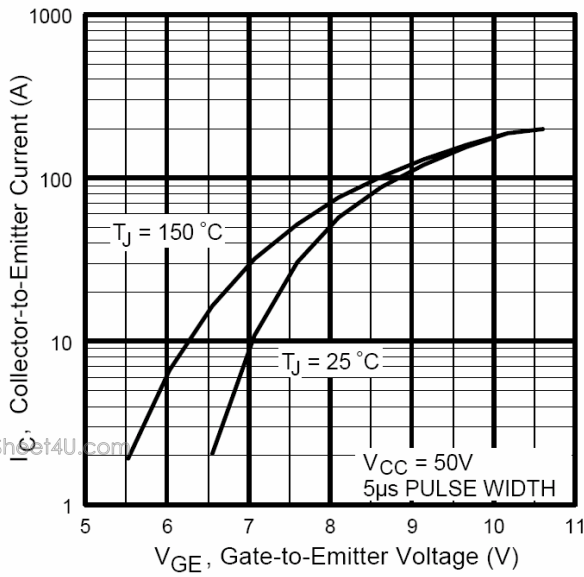


Fig 5. Typical Transfer Characteristics

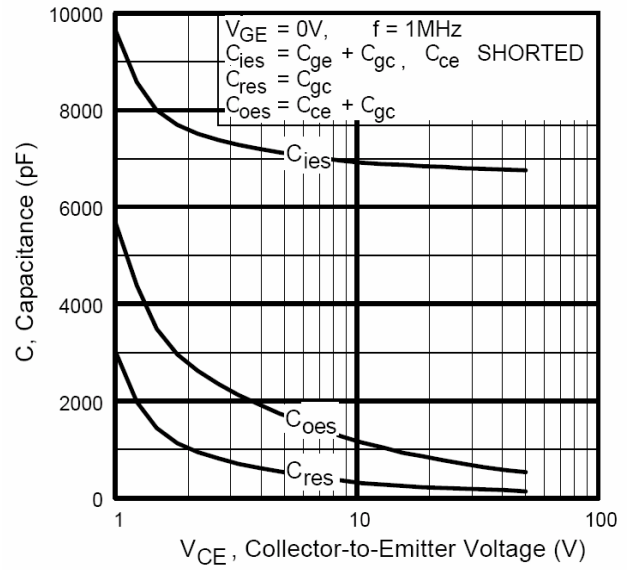


Fig 6. Typ. Capacitance vs.  $V_{CE}$

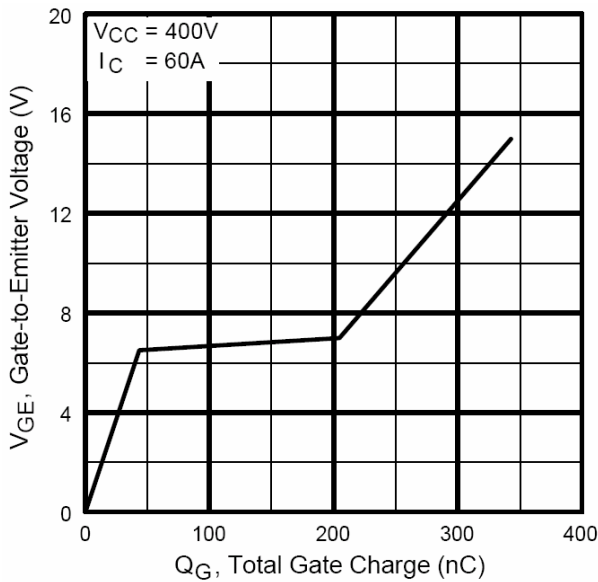


Fig 7. Typical Gate Charge vs.  $V_{GE}$

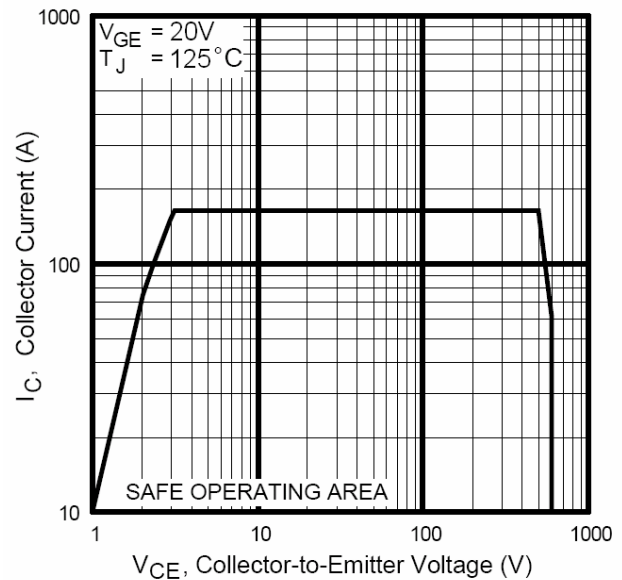


Fig 8. Turn-off SOA

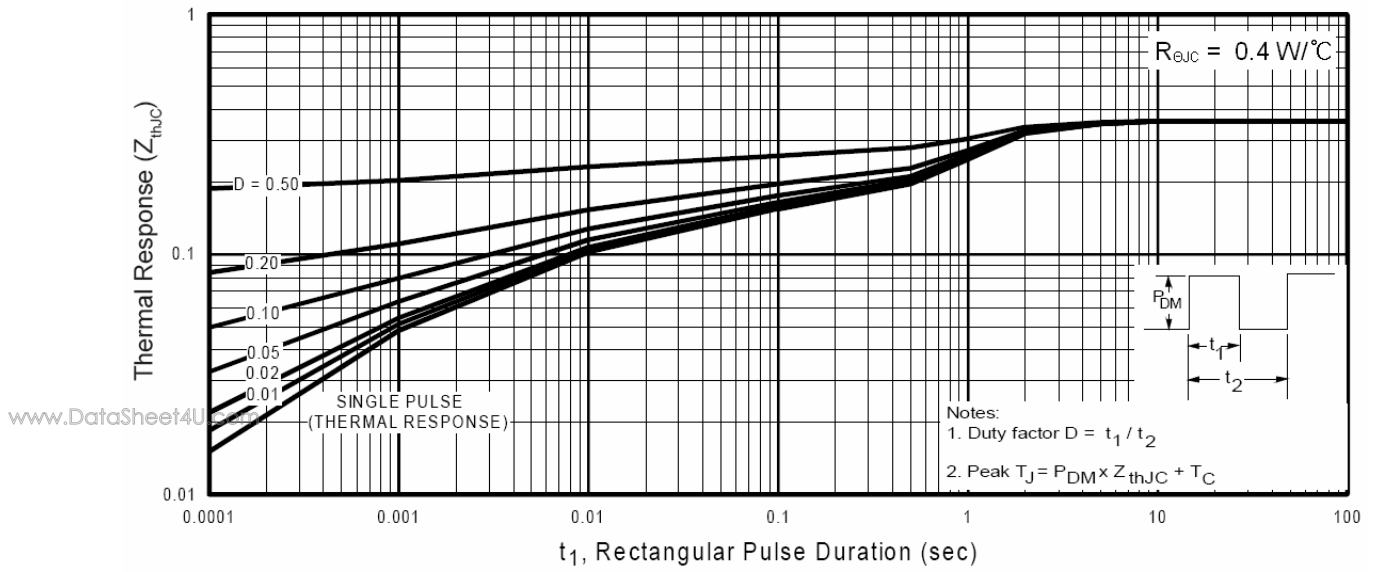
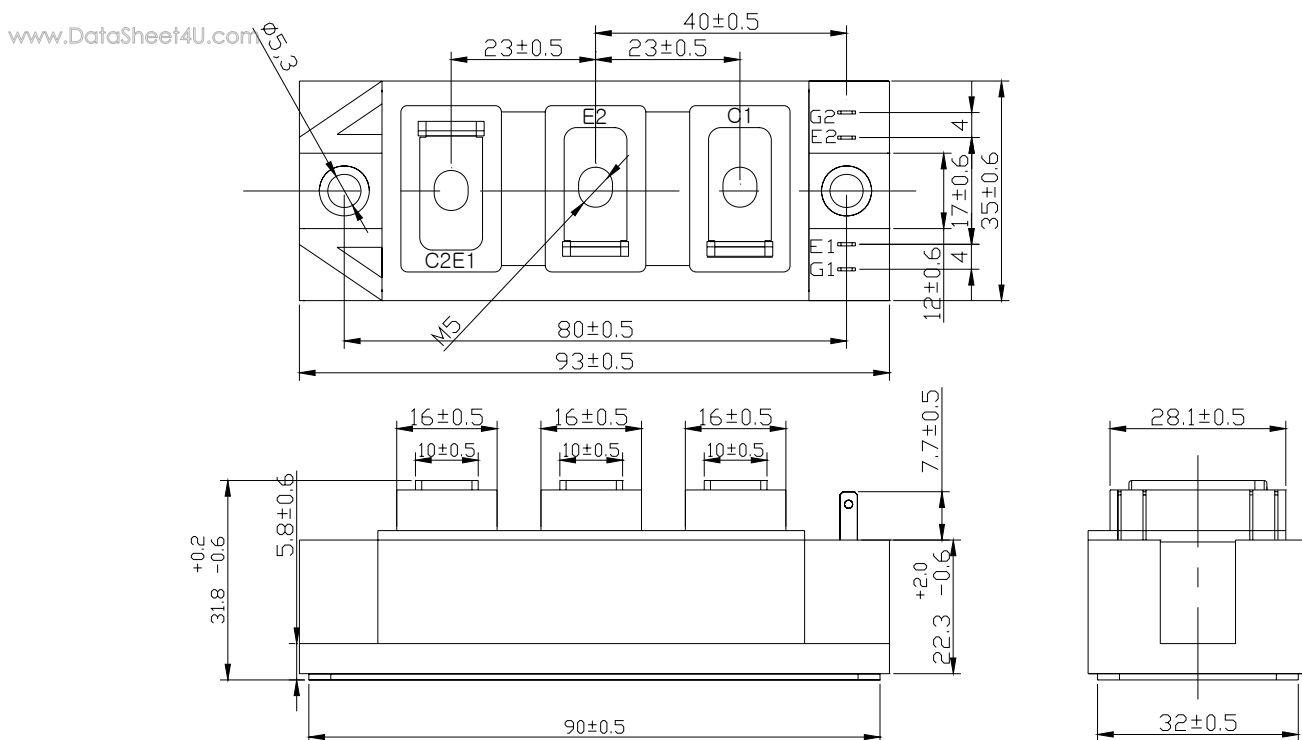


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case

**Package Outline** (dimensions in mm)


Data and specifications subject to change without notice.

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