

“HALF-BRIDGE” IGBT

Features

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

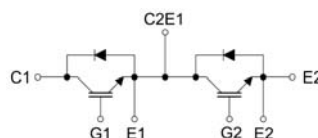
Applications

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



Package : V1

V_{CES} = 600V
I_c = 100A
V_{CE(ON)} typ. = 2.2V
@ I_c = 100A



Absolute Maximum Ratings @ T_c = 25 °C (per leg)

Symbol	Parameter	Test condition	Rating	Unit
V _{CES}	Collector-to-Emitter Voltage	V _{GE} = 0V, I _c = 250μA	600	V
V _{GES}	Gate emitter voltage		± 20	V
I _c	Continuous Collector Current	T _c = 70 °C (25 °C)	100(130)	A
I _{CM}	Pulsed collector current	T _c = 70 °C (25 °C)	200(260)	A
I _F	Diode Continuous Forward Current	T _c = 70 °C (25 °C)	80(100)	A
I _{FM}	Diode Maximum Forward Current		200	A
T _{SC}	Short Circuit Withstand Time	T _c = 100 °C	10	μs
V _{iso}	Isolation Voltage test	AC 1 minute	2500	V
T _j	Junction Temperature		-40 ~ 150	°C
T _{stg}	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_j = 25 °C (unless otherwise specified)

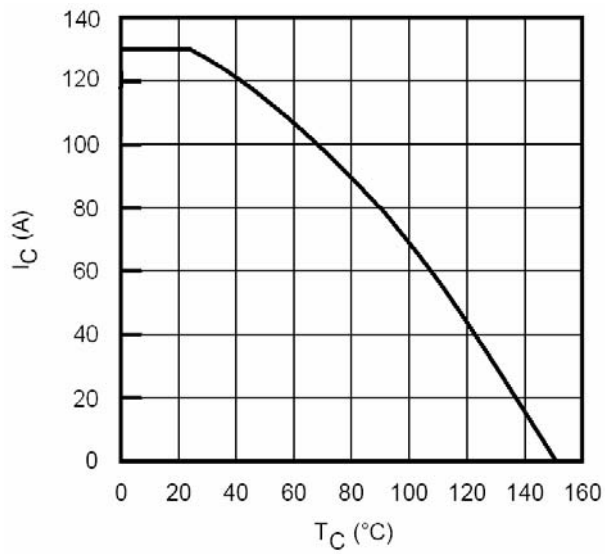
Symbol	Parameter	Min	Typ	Max	Unit	Test condition
V _{(BR)CES}	Collector-to-Emitter Breakdown Voltage	600	-	-	V	V _{GE} = 0V, I _c = 250μA
V _{CE(ON)}	Collector-to-Emitter Saturation Voltage	-	2.2	2.7		I _c = 100A, V _{GE} = 15V
V _{GE(th)}	Gate Threshold Voltage	3.0	4.5	6.0		V _{CE} = V _{GE} , I _c = 250μA
I _{CES}	Zero Gate Voltage Collector Current	-	-	500	μA	V _{GE} = 0V, V _{CE} = 600V
I _{GES}	Gate-to-Emitter Leakage Current	-	-	±100	nA	V _{CE} = 0V, V _{GE} = ±20V
V _{FM}	Diode Forward Voltage Drop	-	1.6	1.9	V	I _c = 100A

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

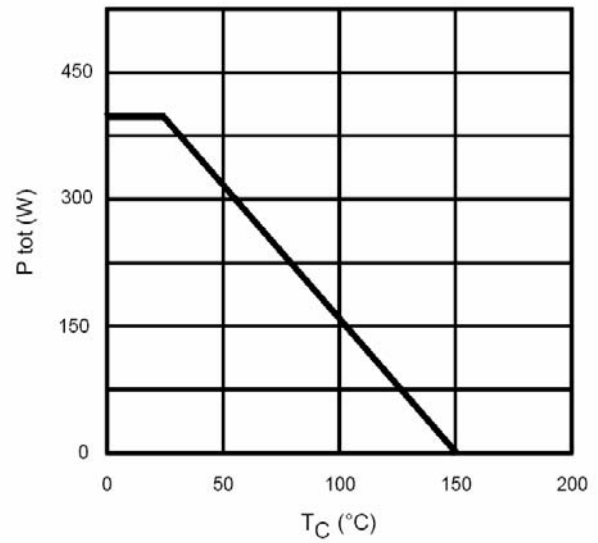
Symbol	Parameter	Min	Typ	Max	Unit	Test condition
C_{ies}	Input capacitance	-	6900	-	pF	$V_{CE} = 30V$, $V_{GE} = 0V$ $f = 1.0\text{MHz}$
C_{oss}	Output capacitance	-	730	-		
C_{res}	Reverse transfer capacitance	-	190	-		
$t_{d(on)}$	Turn-on delay time	-	82	-	ns	$T_j = 25^\circ\text{C}$, $V_{CC} = 480V$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

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.31	$^\circ\text{C/W}$
$R_{\theta JC}$	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.7	
$R_{\theta CS}$	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**

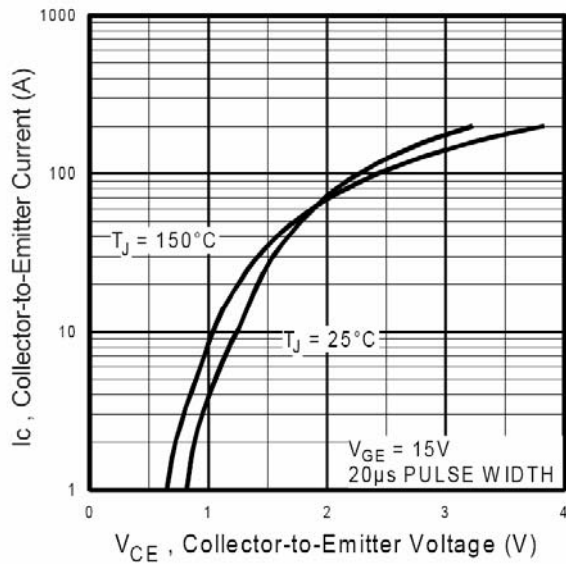
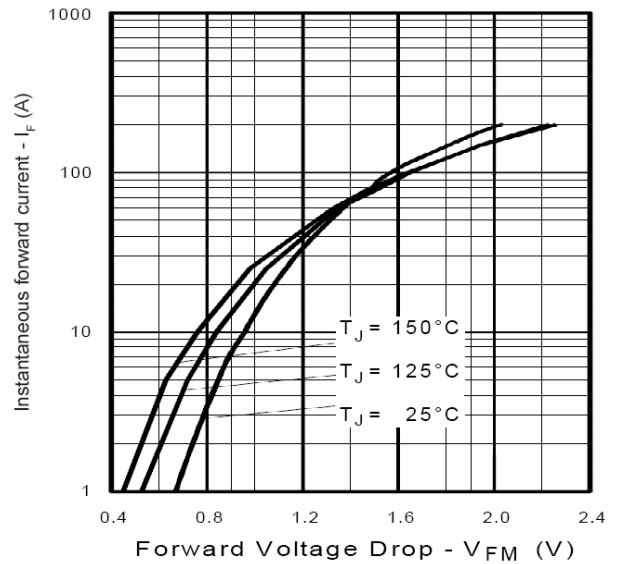


Fig 3. Typ. IGBT Output Characteristics



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

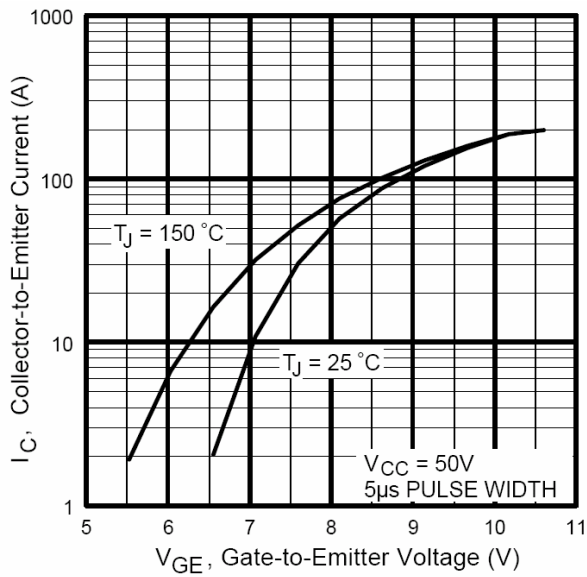


Fig 5. Typical Transfer Characteristics

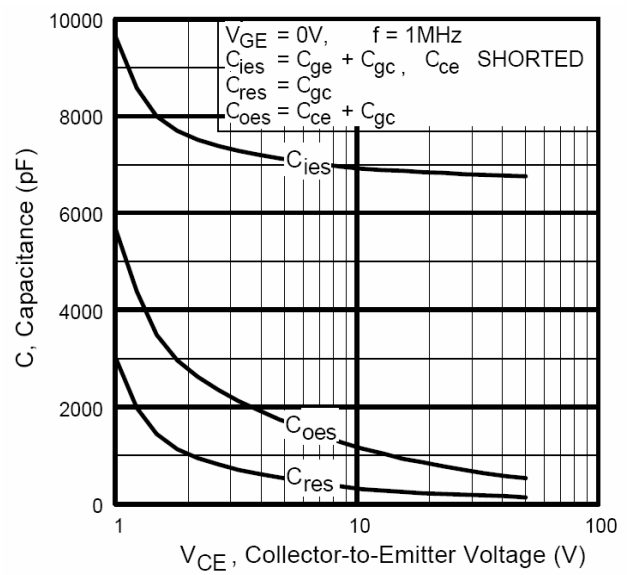


Fig 6. Typ. Capacitance vs. V_{CE}

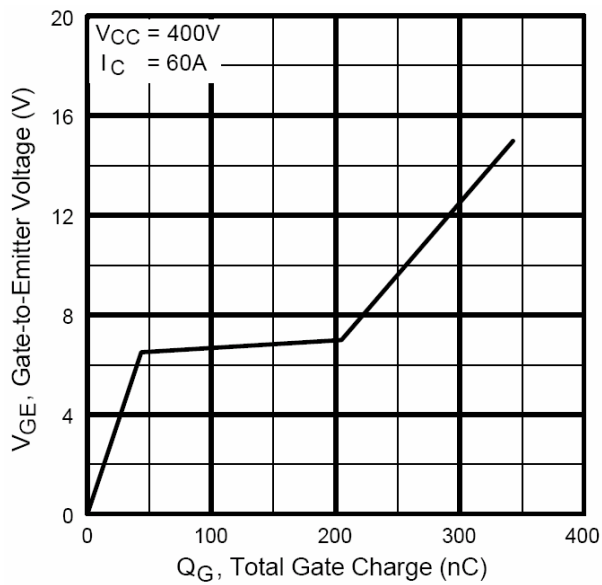


Fig 7. Typical Gate Charge vs. V_{GE}

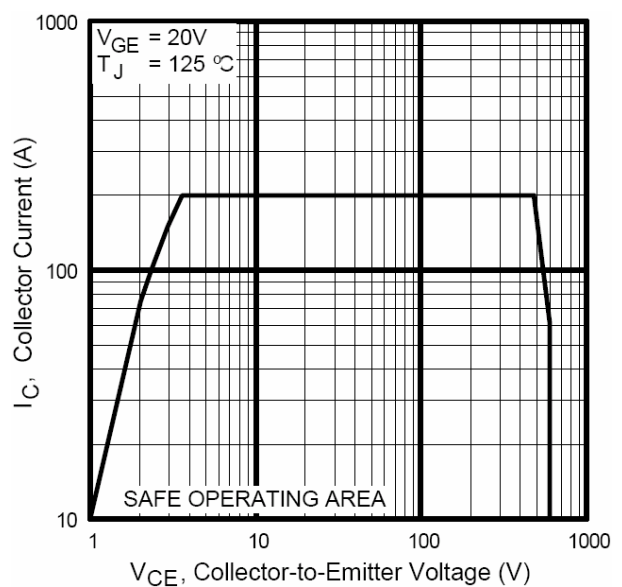


Fig 8. Turn-off SOA

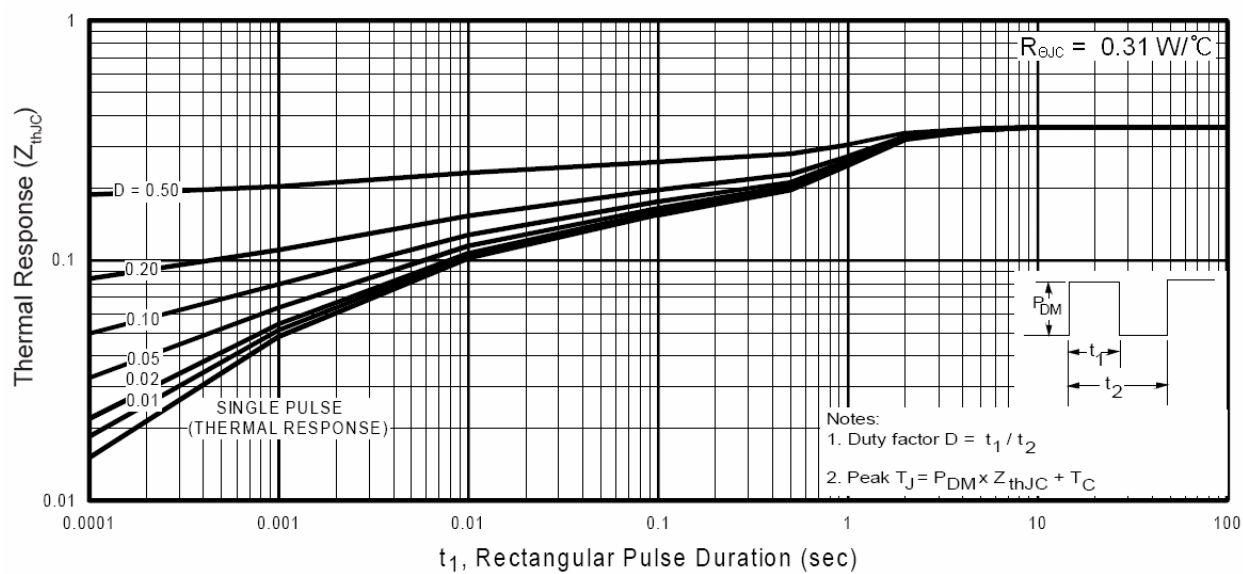
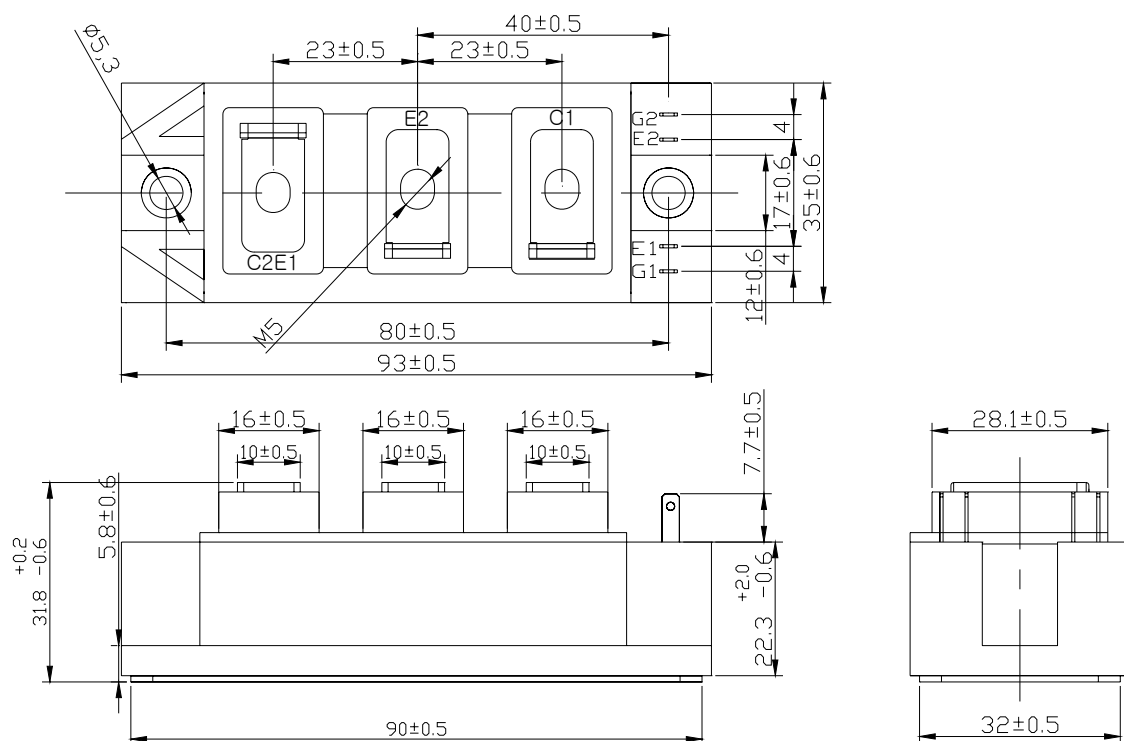


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Outline (dimensions in mm)



Data and specifications subject to change without notice.

May 2006

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