

# “HALF-BRIDGE” IGBT

**$V_{CES} = 1200V$**   
 **$I_c = 75A$**   
 **$V_{CE(ON)} \text{ typ.} = 2.8V$**   
**@  $I_c = 75A$**

### Features

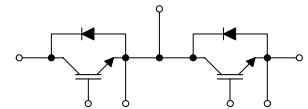
- IGBT NPT Technology
- 10µs Short circuit capability
- Low turn-off losses
- Short tail current
- Positive  $V_{CE(on)}$  temperature coefficient

### Applications

- AC & DC Motor controls
- General purpose inverters
- Optimized for high current inverter (AC TIG Welding machines)
- Servo Controls
- UPS, Robotics



Package : V1



### Absolute Maximum Ratings @ $T_c = 25^\circ C$ (per leg)

Symbol	Parameter	Condition	Ratings	Unit
$V_{CES}$	Collector-to-Emitter Voltage	$V_{GE} = 0V, I_c = 500\mu A$	1200	V
$V_{GES}$	Gate emitter voltage		± 20	V
$I_c$	Continuous Collector Current	$T_c = 70^\circ C$	75	A
$I_{CM}$	Pulsed collector current	$T_c = 70^\circ C$	150	A
$I_F$	Diode Continuous Forward Current	$T_c = 70^\circ C$	75	A
$I_{FM}$	Diode Maximum Forward Current		150	A
$T_{SC}$	Short Circuit Withstand Time		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 @ $T_j = 25^\circ C$ (unless otherwise specified)

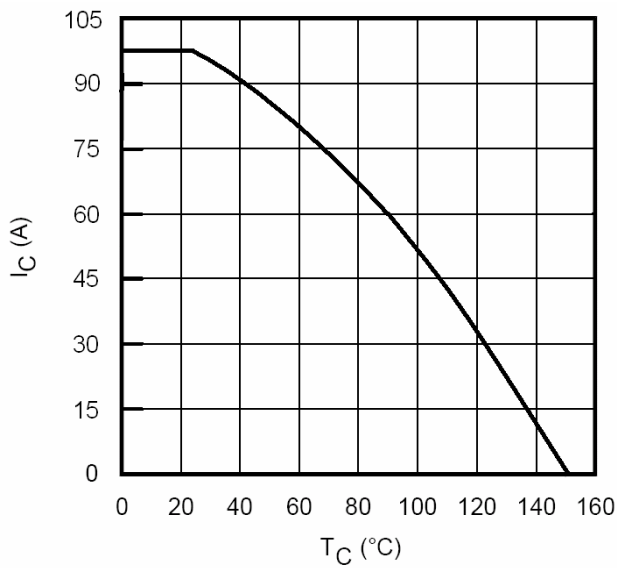
Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	1200	-	-	V	$V_{GE} = 0V, I_c = 500\mu A$
$V_{CE(ON)}$	Collector-to-Emitter Saturation Voltage	-	2.8	3.05		$I_c = 75A, V_{GE} = 15V$
$V_{GE(th)}$	Gate Threshold Voltage	4.0	5.0	6.0		$V_{CE} = V_{GE}, I_c = 250\mu A$
$I_{CES}$	Zero Gate Voltage Collector Current	-	-	500	µA	$V_{GE} = 0V, V_{CE} = 1200V$
$I_{GES}$	Gate-to-Emitter Leakage Current	-	-	± 100	nA	$V_{CE} = 0V, V_{GE} = \pm 20V$
$V_{FM}$	Diode Forward Voltage Drop	-	2.1	2.4	V	$I_c = 75A$

**Switching Characteristic @ T<sub>j</sub> = 25°C (unless otherwise specified)**

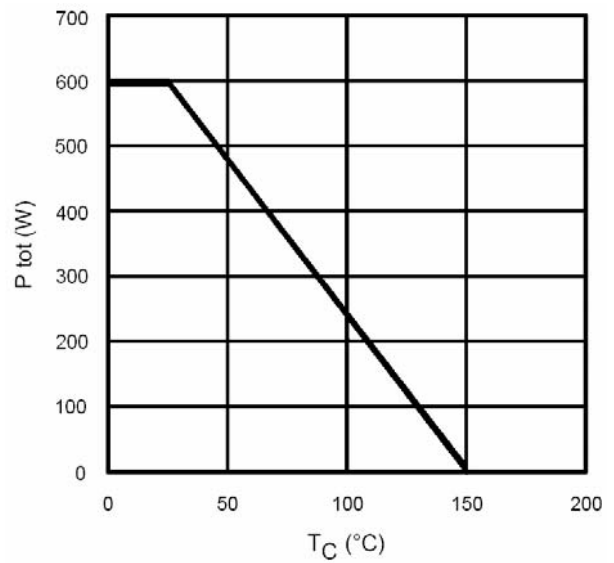
Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
C <sub>ies</sub>	Input capacitance	-	4100	-	pF	V <sub>CC</sub> = 30V, V <sub>GE</sub> = 0V f = 1.0MHz
C <sub>oss</sub>	Output capacitance	-	395	-		
C <sub>res</sub>	Reverse transfer capacitance	-	160	-		
t <sub>d(on)</sub>	Turn-on delay time	-	72	-	ns	T <sub>j</sub> = 125°C, V <sub>CC</sub> = 600V I <sub>C</sub> = 75A, V <sub>GE</sub> = 15V R <sub>G</sub> = 4.7Ω
t <sub>r</sub>	Rise time	-	32	-		
t <sub>d(off)</sub>	Turn-off delay time	-	366	-		
t <sub>f</sub>	Fall time	-	46	-		
I <sub>rr</sub>	Diode Peak Reverse Recovery current	-	55	-	A	T <sub>j</sub> = 125°C, V <sub>CC</sub> = 600V I <sub>F</sub> = 75A, V <sub>GE</sub> = 15V R <sub>G</sub> = 4.7Ω, di/dt=1200A/us
t <sub>rr</sub>	Diode Reverse Recovery time	-	180	-	ns	

**Thermal Characteristic Values**

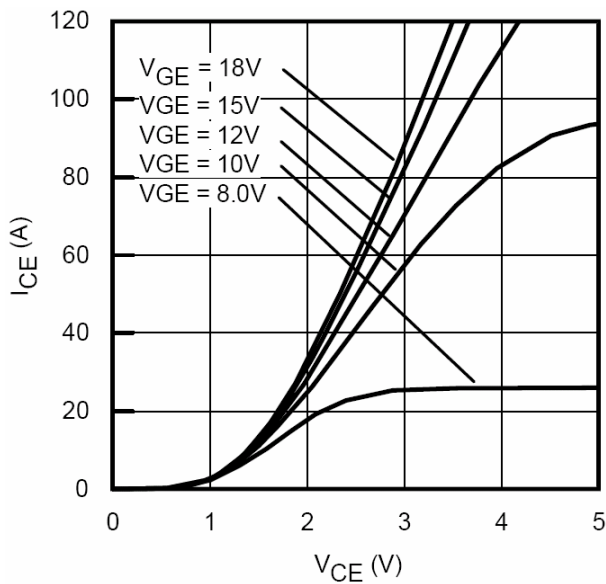
Symbol	Parameters	Min	Typ	Max	Unit
R <sub>θJC</sub>	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.26	°C/W
R <sub>θJC</sub>	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.54	
R <sub>θCS</sub>	Case-to-Heat Sink (Conductive grease applied)	-	0.05	-	



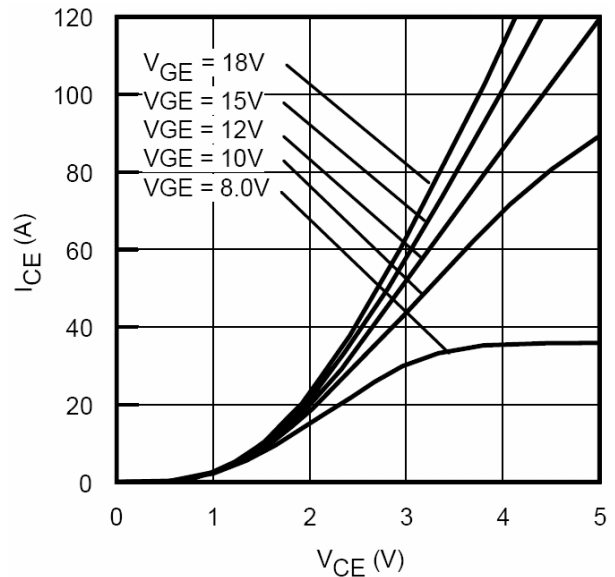
**Fig 1. Maximum DC Collector Current vs. Case Temperature**



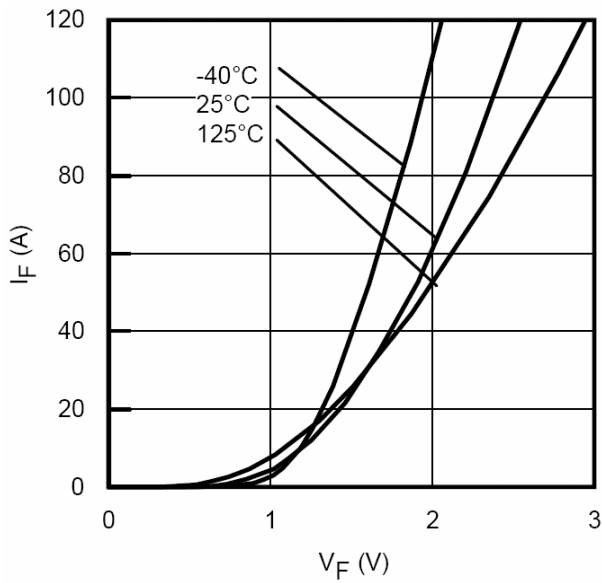
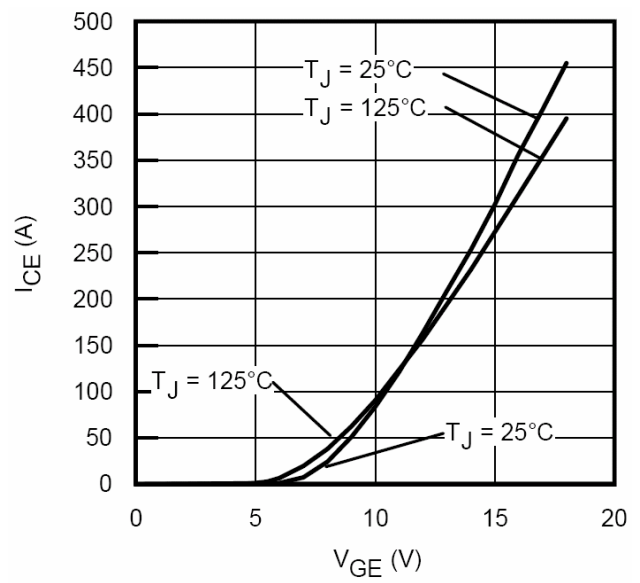
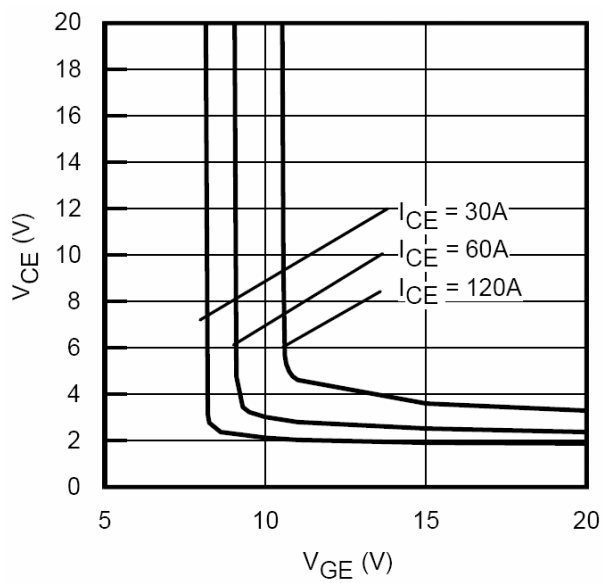
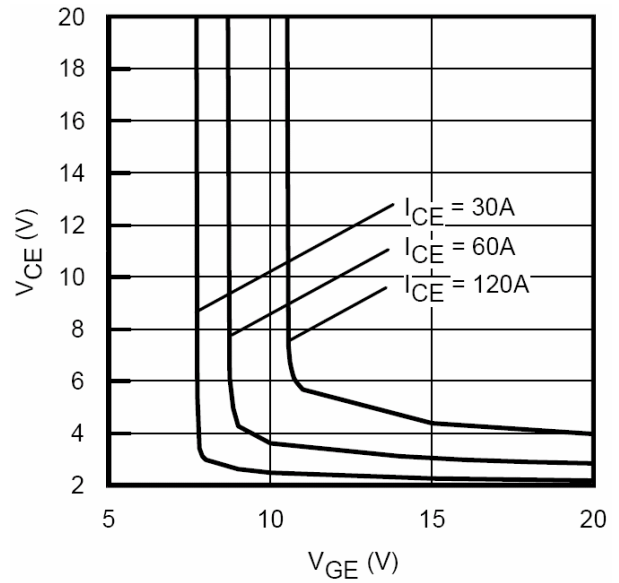
**Fig 2. Power Dissipation vs. Case Temperature**

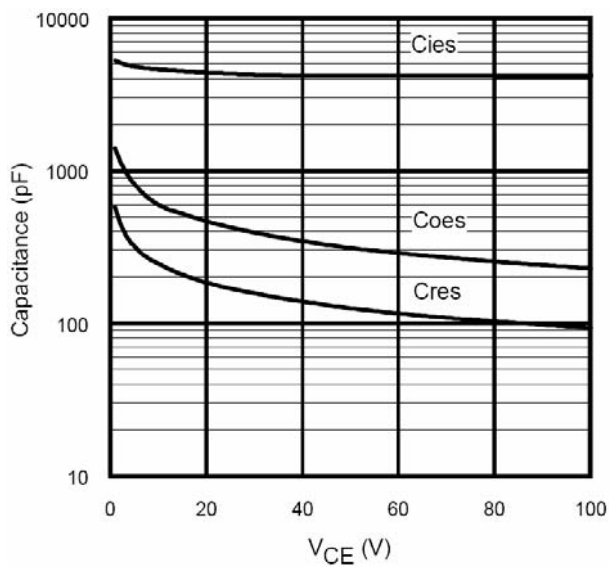
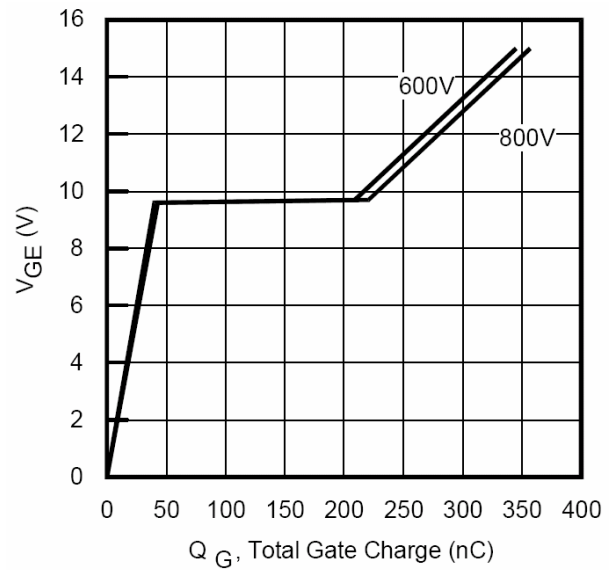
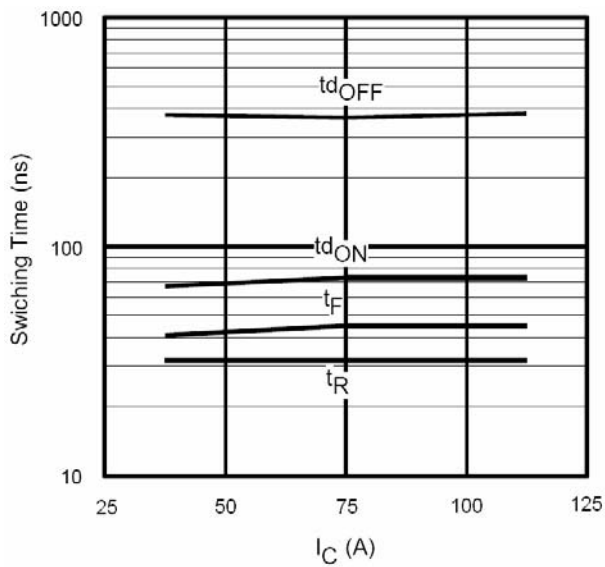
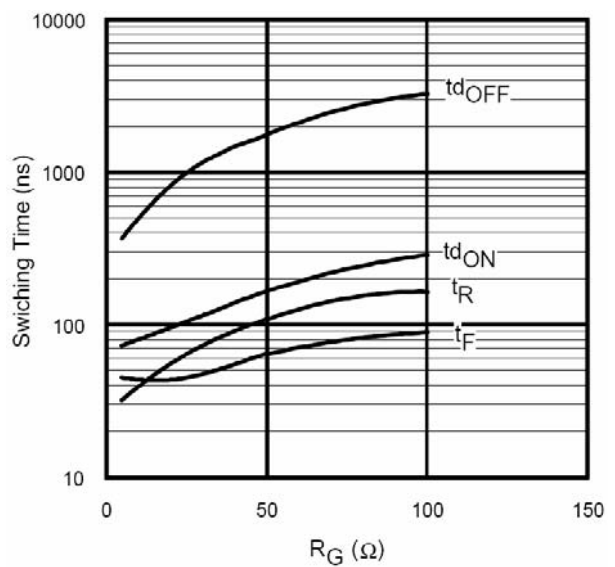


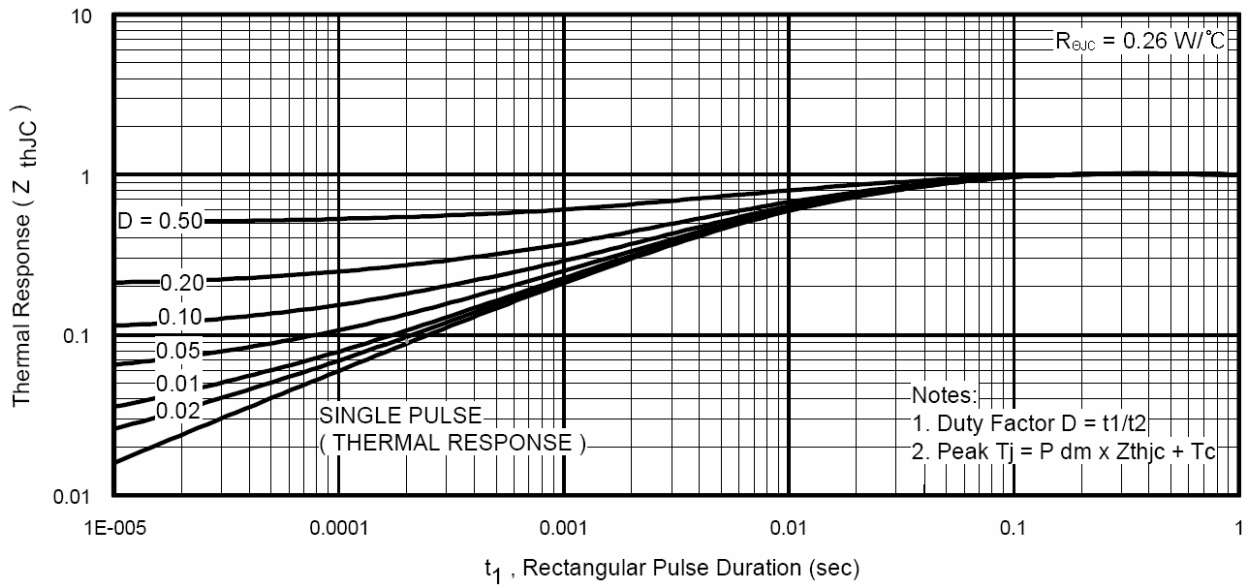
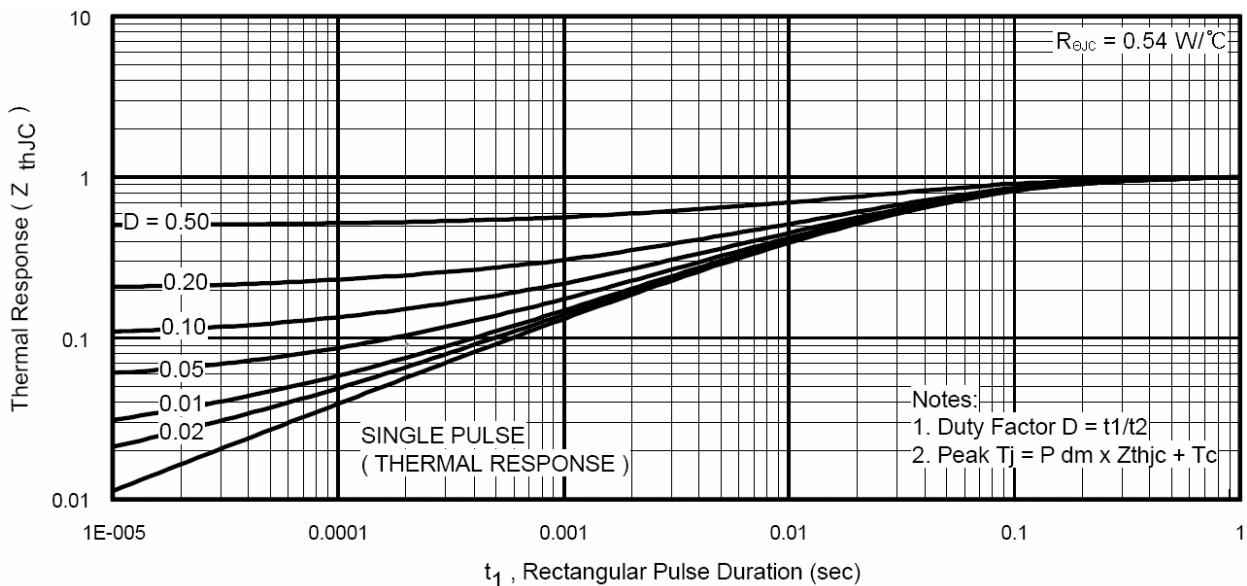
**Fig 3. Typ. IGBT Output Characteristics**  
 $T_J = 25^\circ\text{C}; t_p = 80\mu\text{s}$

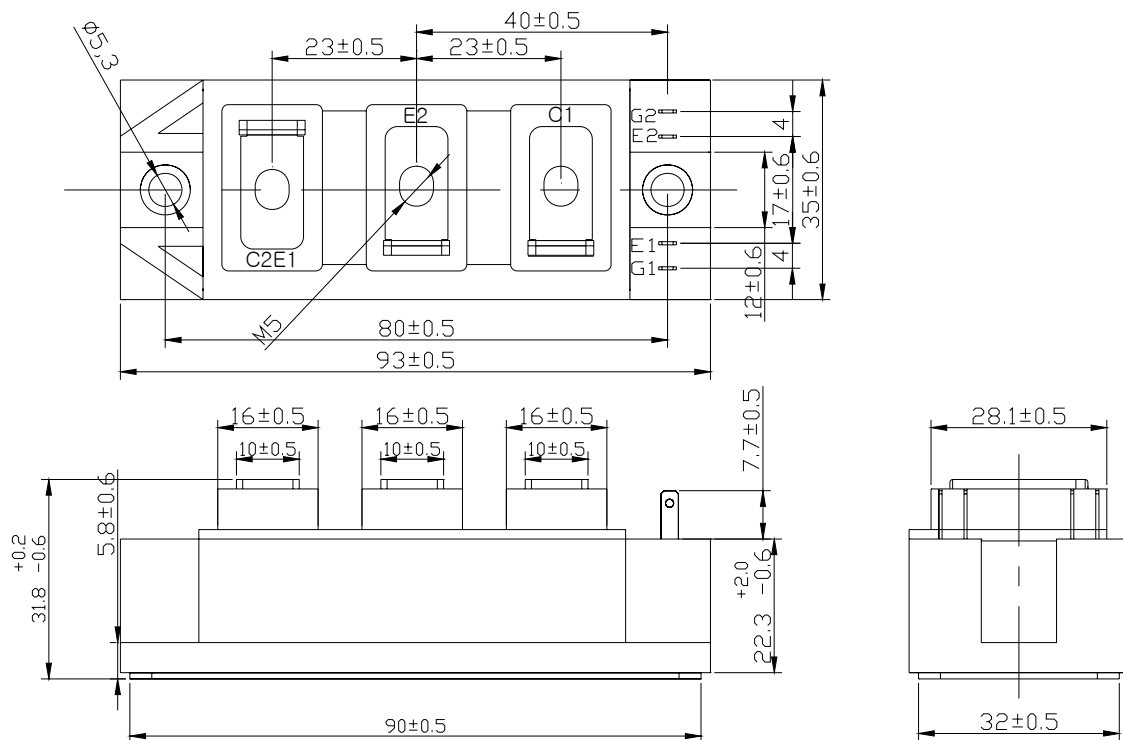


**Fig 4. Typ. IGBT Output Characteristics**  
 $T_J = 125^\circ\text{C}; t_p = 80\mu\text{s}$


**Fig 5. Typ. Diode Forward Characteristics**
 $t_p = 80\mu\text{s}$ 

**Fig 6. Typ. Transfer Characteristics**
 $V_{CE} = 50\text{V}; t_p = 10\mu\text{s}$ 

**Fig 7. Typical  $V_{CE}$  vs.  $V_{GE}$** 
 $T_J = 25^\circ\text{C}$ 

**Fig 8. Typical  $V_{CE}$  vs.  $V_{GE}$** 
 $T_J = 125^\circ\text{C}$


**Fig 9. Typ. Capacitance vs. Vce**
 $V_{GE} = 0V; f = 1MHz$ 

**Fig 10. Typical Gate Charge vs. Vge**
 $I_{CE} = 60A; L = 600\mu H$ 

**Fig 11. Typ. Switching Time vs. Ic**
 $T_J = 125^\circ C; L = 200\mu H; V_{CE} = 600V$ 
 $R_G = 4.7\Omega; V_{GE} = 15V$ 

**Fig 12. Typ. Switching Time vs. Rg**
 $T_J = 125^\circ C; L = 200\mu H; V_{CE} = 600V$ 
 $I_{CE} = 75A; V_{GE} = 15V$


**Fig 13. Normalized Transient Thermal Impedance, Junction-to-Case (IGBT)**

**Fig 14. Normalized Transient Thermal Impedance, Junction-to-Case (DIODE)**

**Package Outline** (dimensions in mm)


Data and specifications subject to change without notice.

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