

**Features :**

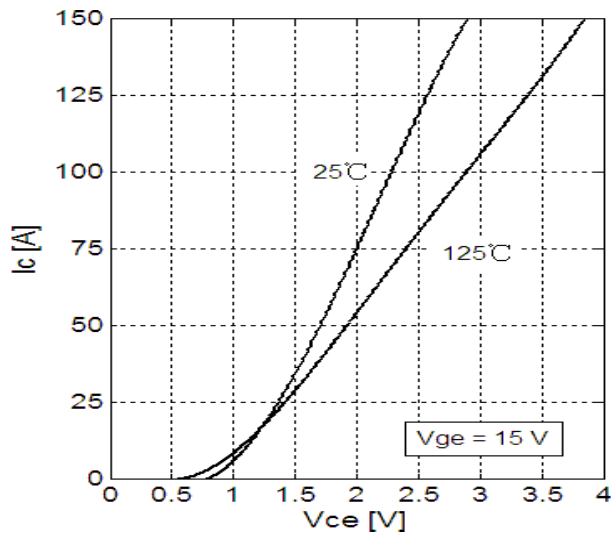
- Low  $V_{CE(sat)}$  trench IGBT technology
- Low switching losses
- 10 $\mu$ s short circuit capability
- $V_{CE(sat)}$  with positive temperature coefficient

**Typical Applications :**

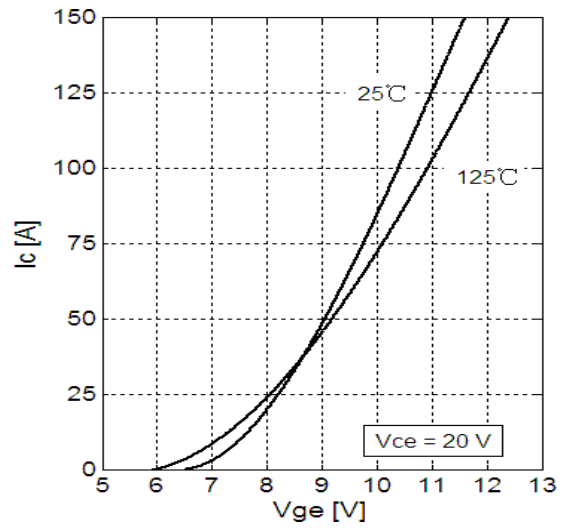
- AC inverter drives mains 575-750V AC
- Public transport (auxiliary syst.)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT	
			Min	Type	Max		
$V_{CES}$	Collector-Emitter voltage	$T_j=25^\circ\text{C}$			1700	V	
$V_{GES}$	Gate-Emitter voltage	$T_j=25^\circ\text{C}$			$\pm 20$	V	
$I_c$	Collector current	Continuous@ $T_c=80^\circ\text{C}$			75	A	
$I_{CP}$		$T_P=1\text{ms}$			150	A	
$P_D$	Maximum Power Dissipation	$T_j=175^\circ\text{C}$ , 1 device			600	W	
$T_j$	Junction temperature	/			175	$^\circ\text{C}$	
$T_{stg}$	Storage temperature	/	-40		125	$^\circ\text{C}$	
$V_{iso}$	Isolation between terminal and copper base	$T_j=25^\circ\text{C}$ , AC: 1minute	4000			V	
Screw torque	Mounting(M5)	/	2.4		3.0	N·m	
	Terminals(M6)	/	3.5		5.0	N·m	
$I_{CES}$	Zero gate voltage collector current	$T_j=25^\circ\text{C}$ , $V_{CE}=1700\text{V}$ , $V_{GE}=0\text{V}$			3.0	mA	
$I_{GES}$	Gate-Emitter leakage current	$T_j=25^\circ\text{C}$ , $V_{CE}=0\text{V}$ , $V_{GE}=\pm 20\text{V}$			$\pm 0.4$	$\mu\text{A}$	
$V_{GE(th)}$	Gate-Emitter threshold voltage	$T_j=25^\circ\text{C}$ , $V_{CE}=20\text{V}$ , $I_c=3\text{mA}$	5.2	5.8	6.4	V	
$V_{CE(sat)}$	Collector-Emitter saturation voltage	$T_j=25^\circ\text{C}$ , $V_{GE}=15\text{V}$ , $I_c=75\text{A}$		2.0		V	
		$T_j=125^\circ\text{C}$ , $V_{GE}=15\text{V}$ , $I_c=75\text{A}$		2.4		V	
$R_{Gint}$	Internal gate resistor	$T_j=25^\circ\text{C}$		8.5		$\Omega$	
$C_{ies}$	Input capacitance	$T_j=25^\circ\text{C}$ , $V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$		6.80		nF	
$C_{res}$	Reverse transfer capacitance			0.22		nF	
$t_{on}$	Turn-on time	$T_j=125^\circ\text{C}$ , $V_{CC}=900\text{V}$ , $I_c=75\text{A}$ , $V_{GE}=\pm 15\text{V}$ , $R_g=6.8\Omega$ , Inductive load		400		ns	
$t_r$				50		ns	
$t_{off}$	Turn-off time			800		ns	
$t_f$				300		ns	
$E_{on}$	Turn-on energy loss per pulse			24.0		mJ	
$E_{off}$	Turn-off energy loss per pulse			23.5		mJ	
$I_{sc}$	SC data		$V_{GE}=15\text{V}$ , $V_{CC}=1000\text{V}$ , $t_{sc}\leq 10\mu\text{s}$ , $T_{vj}=125^\circ\text{C}$ , $V_{CEM}\leq 1700\text{V}$		300		A
$t_{sc}$	Short circuit withstand time		$T_j=125^\circ\text{C}$	10			$\mu\text{s}$

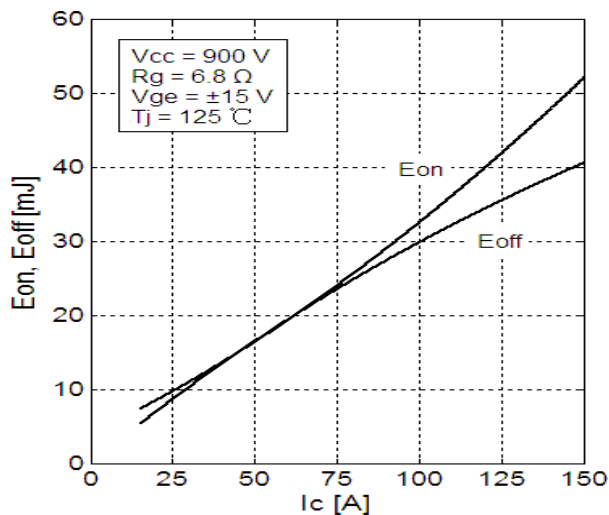
V <sub>F</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>F</sub> =75A	1.80	V
		T <sub>J</sub> =125°C, I <sub>F</sub> =75A	1.90	V
I <sub>RM</sub>	Peak reverse recovery current	I <sub>F</sub> =75A, -diF/dt=1800 A/μs, V <sub>R</sub> =900V, V <sub>GE</sub> =-15V, T <sub>J</sub> =125°C	125	A
Q <sub>r</sub>	Recovered charge		36.5	μC
E <sub>rec</sub>	Reverse recovery energy		20.5	mJ
R <sub>th(j-c)</sub>	Thermal resistance(1 device)	IGBT	0.25	°C/W
		FWD	0.46	°C/W
R <sub>th(c-f)</sub>	Contact thermal resistance (1 device)	With thermal compound	0.050	°C/W
W <sub>t</sub>	Weight		150	g
Outline	<b>M37</b>			



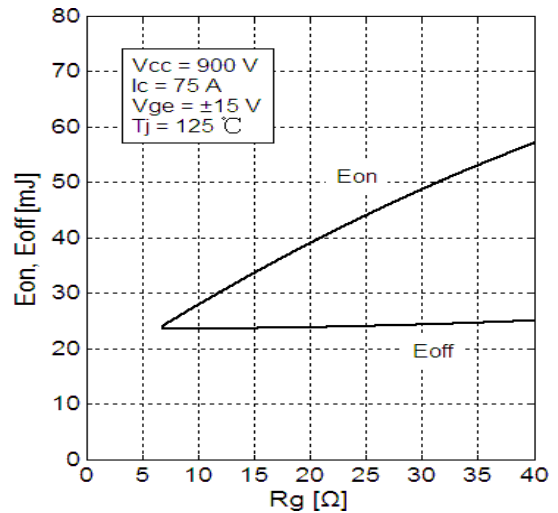
**Fig 1. IGBT Typical Output Characteristics**



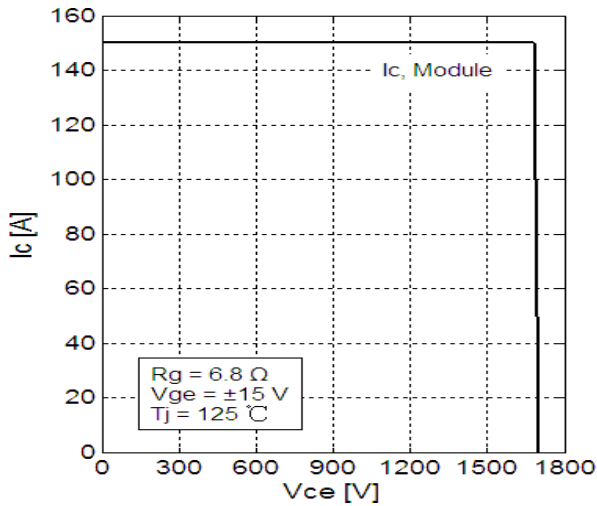
**Fig 2. IGBT Typical Transfer Characteristics**



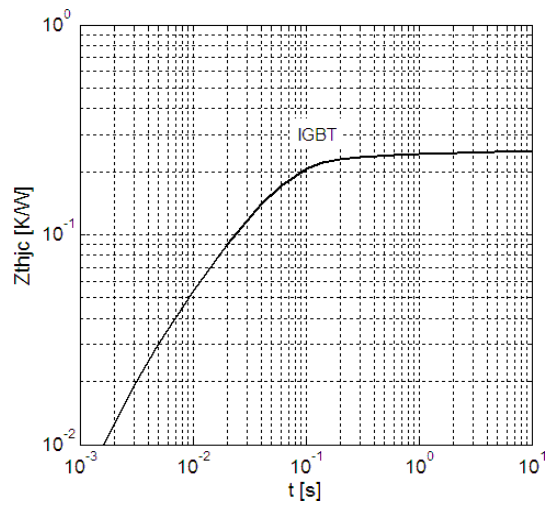
**Fig 3. IGBT Switching Loss vs. Collector Current**



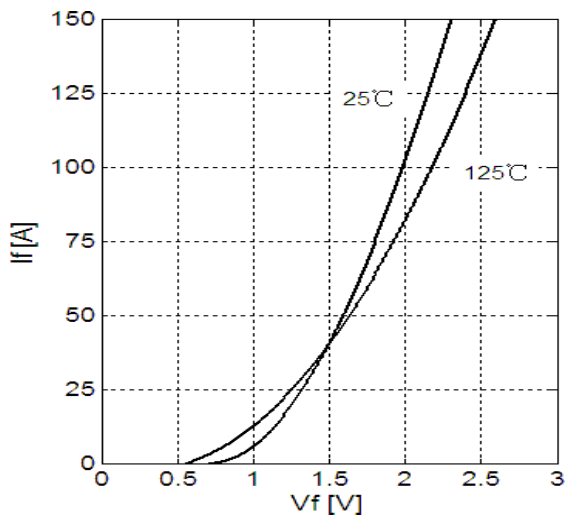
**Fig 4. IGBT Switching Loss vs. Gate Resistor**



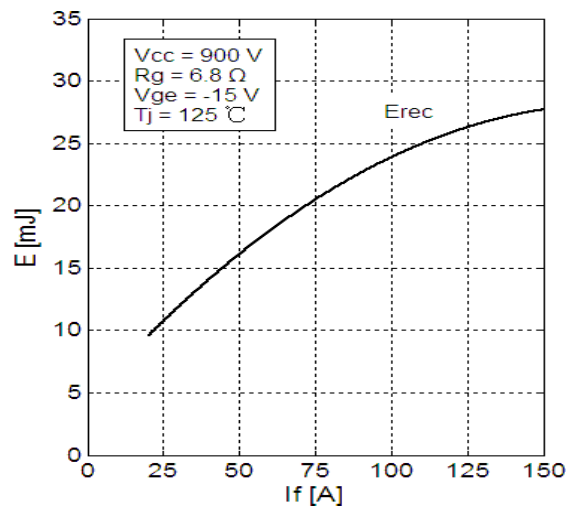
**Fig 5. RBSOA**



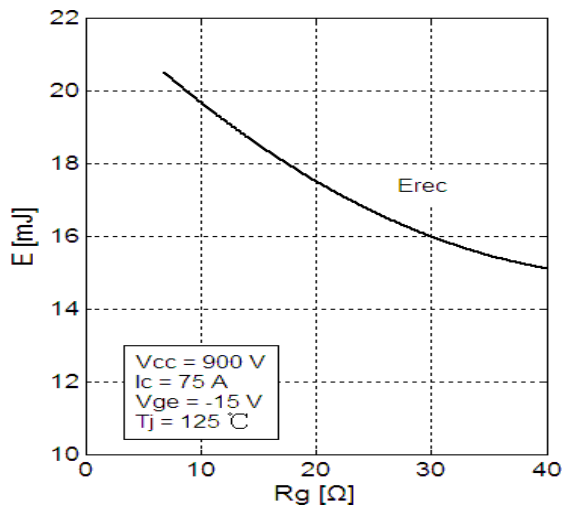
**Fig 6. IGBT Transient Thermal Impedance**



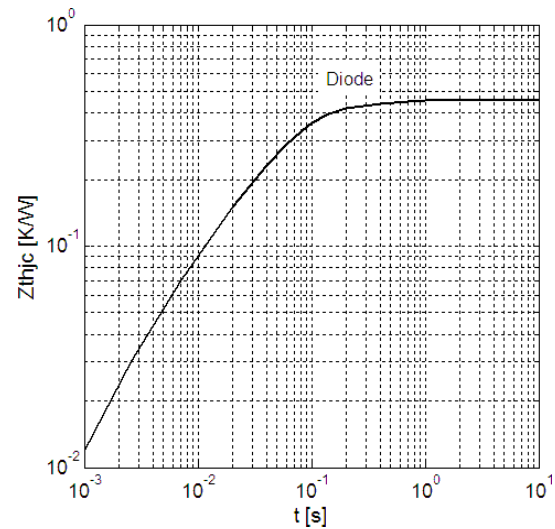
**Fig 7. Forward Characteristics of Diode**



**Fig 8. Diode Switching Loss vs. Collector Current**

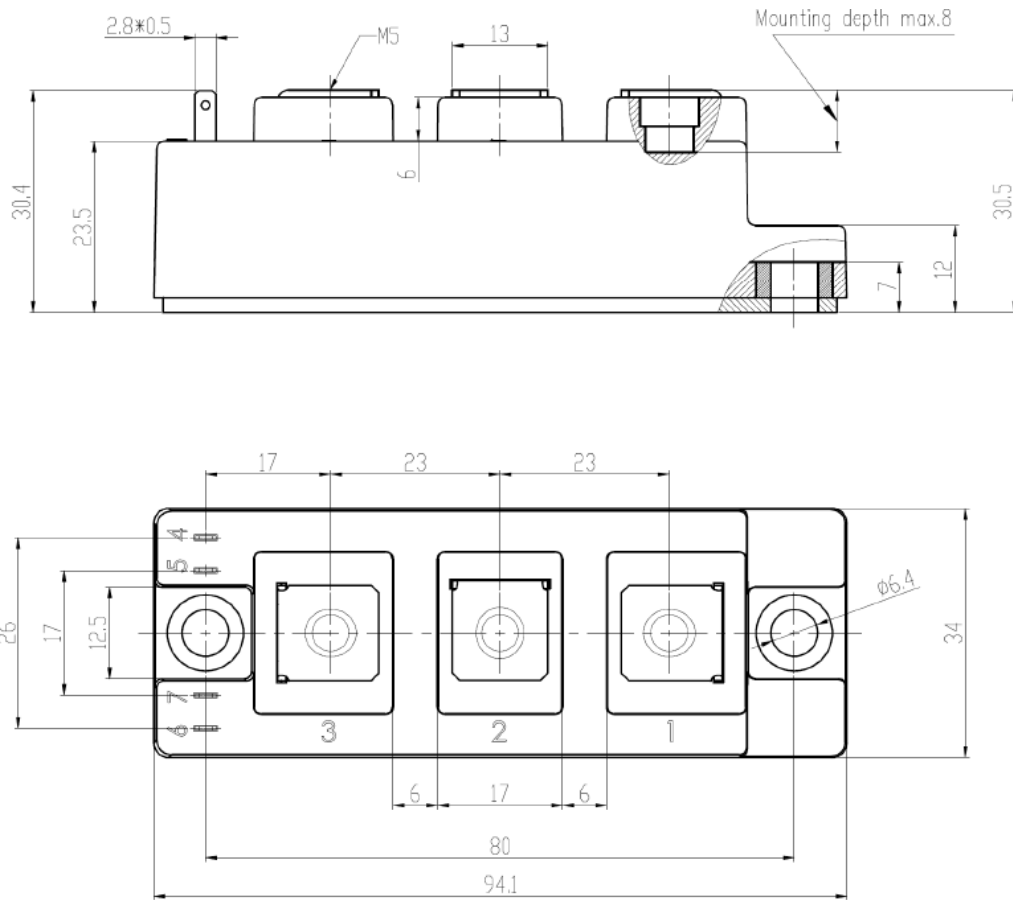


**Fig 9. Diode Switching Loss vs. Gate Resistor**



**Fig 10. Diode Transient Thermal Impedance**

**Outline & Circuit Diagram**



Unmarked dimensional tolerance :  $\pm 0.5$ mm

**MD75MB170S**

