

**Features :**

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

**Typical Applications :**

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible Power Supply System

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT	
			Min	Type	Max		
$V_{CES}$	Collector-Emitter voltage	$T_J=25^{\circ}C$			1700	V	
$V_{GES}$	Gate-Emitter voltage	$T_J=25^{\circ}C$			$\pm 20$	V	
$I_C$	Collector current	Continuous@ $T_C=100^{\circ}C$			400	A	
$I_{CP}$		$T_P=1ms$			800	A	
$P_C$	Collector power dissipation	$T_J=175^{\circ}C$ , 1 device			2380	W	
$T_J$	Junction temperature	/			175	$^{\circ}C$	
$T_{stg}$	Storage temperature	/	-40		125	$^{\circ}C$	
$V_{iso}$	Isolation between terminal and copper base	$T_J=25^{\circ}C$ , AC: 1minute	4000			V	
$I_{CES}$	Zero gate voltage collector current	$T_J=25^{\circ}C$ , $V_{CE}=1700V$ , $V_{GE}=0V$			5.0	mA	
$I_{GES}$	Gate-Emitter leakage current	$T_J=25^{\circ}C$ , $V_{CE}=0V$ , $V_{GE}=\pm 20V$			0.7	$\mu A$	
$V_{GE(th)}$	Gate-Emitter threshold voltage	$T_J=25^{\circ}C$ , $V_{CE}=20V$ , $I_C=16mA$	5.6	6.2	6.8	V	
$V_{CE(sat)}$	Collector-Emitter saturation voltage	$T_J=25^{\circ}C$ , $V_{GE}=15V$ , $I_C=400A$		1.85	2.20	V	
		$T_J=125^{\circ}C$ , $V_{GE}=15V$ , $I_C=400A$		2.25		V	
		$T_J=150^{\circ}C$ , $V_{GE}=15V$ , $I_C=400A$		2.35		V	
$Q_G$	Gate charge	$V_{GE}=\pm 15V$		3.77		$\mu C$	
$R_{Gint}$	Internal gate resistor	$T_J=25^{\circ}C$		1.88		$\Omega$	
$C_{ies}$	Input capacitance	$T_J=25^{\circ}C$ , $V_{CE}=25V$ , $V_{GE}=0V$ , $f=1MHz$		48.2		nF	
$C_{res}$	Reverse transfer capacitance			1.17		nF	
$T_{d(on)}$	Turn-on time	$T_J=150^{\circ}C$ , $V_{CC}=900V$ , $I_C=400A$ , $V_{GE}=\pm 15V$ , $R_g=0.82\Omega$ , Inductive load		216		ns	
$t_r$				50		ns	
$T_{d(off)}$	Turn-off time			544		ns	
$t_f$				204		ns	
$E_{on}$	Turn-on energy loss per pulse			161		mJ	
$E_{off}$	Turn-off energy loss per pulse			137		mJ	
$I_{sc}$	SC data		$V_{GE}\leq 15V$ , $V_{CC}=100V$ , $V_{CEmax}=1700V$ , $t_P\leq 10\mu s$ , $T_{vj}=150^{\circ}C$		1600		A
$t_{sc}$	Short circuit withstand time		$T_J=150^{\circ}C$ , $V_{CC}=720V$ , $V_{GE}=\pm 15V$ , $R_g=7.5\Omega$	10			$\mu s$

V <sub>F</sub>	Forward on voltage	T <sub>j</sub> =25°C , I <sub>F</sub> =400A	1.80	2.25	V
		T <sub>j</sub> =125°C , I <sub>F</sub> =400A	1.90		V
		T <sub>j</sub> =150°C , I <sub>F</sub> =400A	1.95		V
I <sub>RM</sub>	Peak reverse recovery current		640		A
Q <sub>r</sub>	Recovered charge	I <sub>F</sub> =400 A, -diF/dt=8800 A/μs (T <sub>vj</sub> =150°C), V <sub>R</sub> =900V, V <sub>GE</sub> =-15V, T <sub>j</sub> =150°C	209		μC
E <sub>rec</sub>	Reverse recovery energy		132		mJ
t <sub>rr</sub>	Reverse recovery time	T <sub>j</sub> =150°C , I <sub>F</sub> =600A	250		ns
R <sub>th(j-c)</sub>	Thermal resistance(1 device)	IGBT		0.063	°C/W
		FWD		0.105	°C/W
R <sub>th(c-f)</sub>	Contact thermal resistance (1 device)	With thermal compound	0.010		°C/W
Screw torque	Mounting(M6)	/	3.5	5.0	N·m
	Terminals(M6)	/	3.5	5.0	N·m
W <sub>t</sub>	Weight			300	g
Outline	<b>M42</b>				

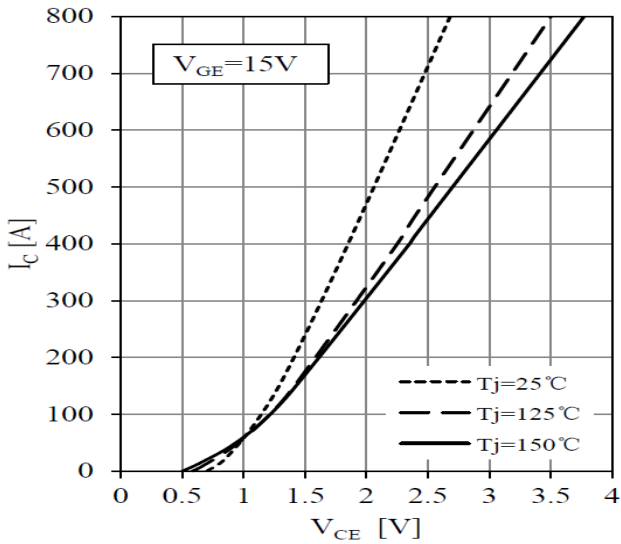


Fig 1. IGBT Output Characteristics

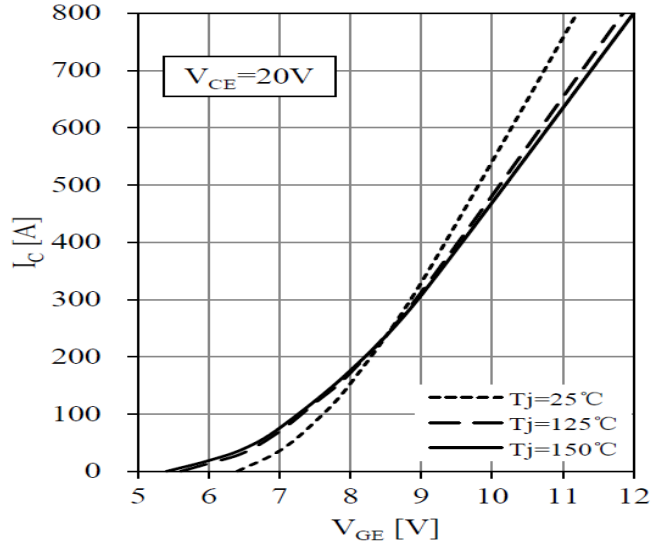


Fig 2. IGBT Transfer Characteristics

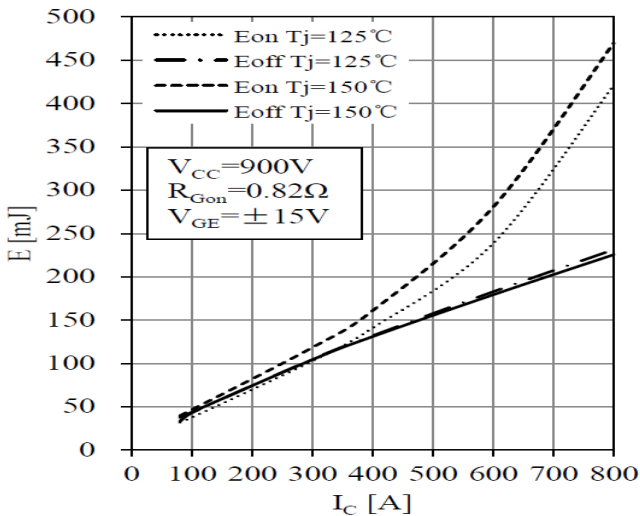


Fig 3. IGBT Switching Loss vs. Ic

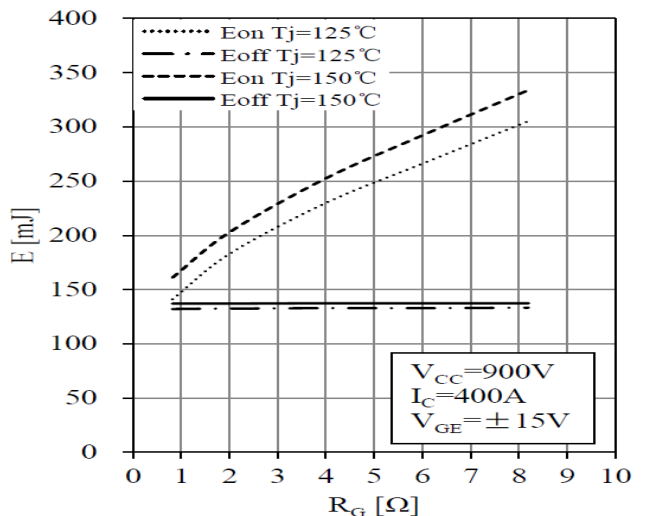


Fig 4. IGBT Switching Loss vs. Rg

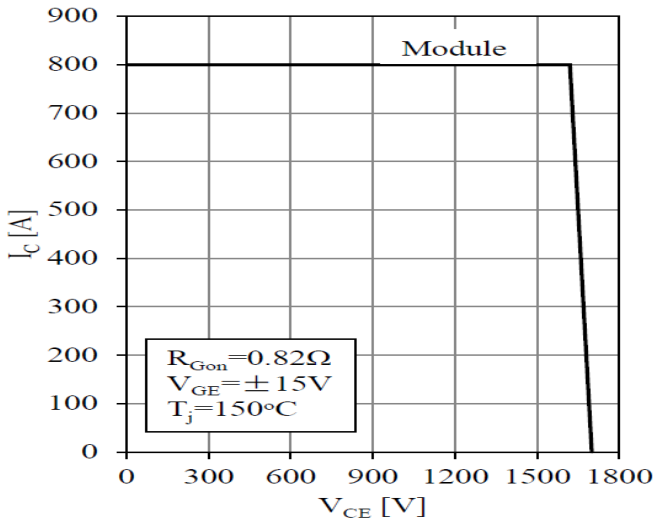


Fig 5. RBSOA

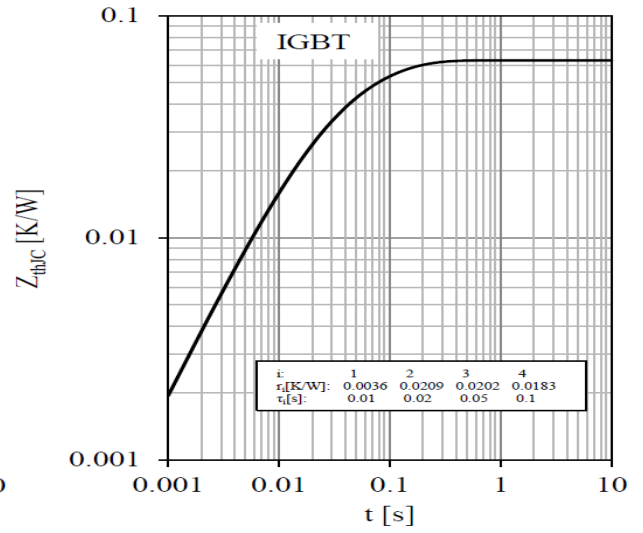


Fig 6. IGBT Transient Thermal Impedance

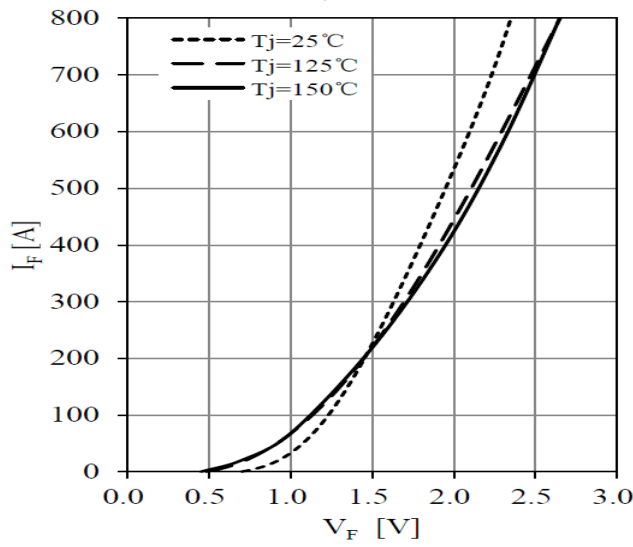


Fig 7. Diode Forward Characteristics

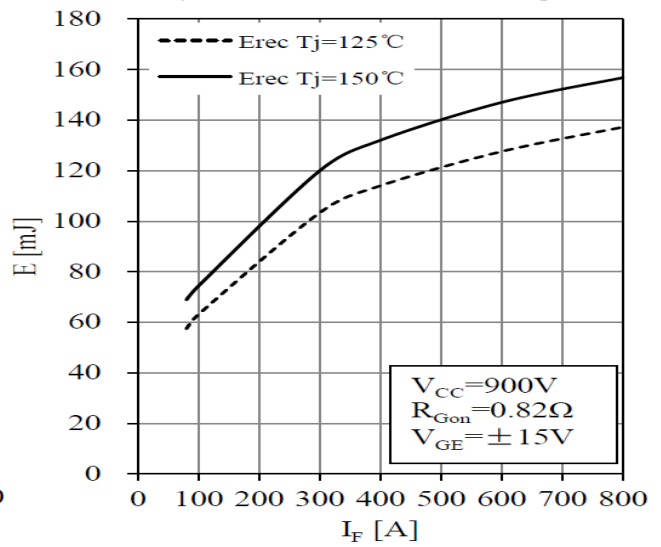


Fig 8. Diode Switching Loss vs.  $I_F$

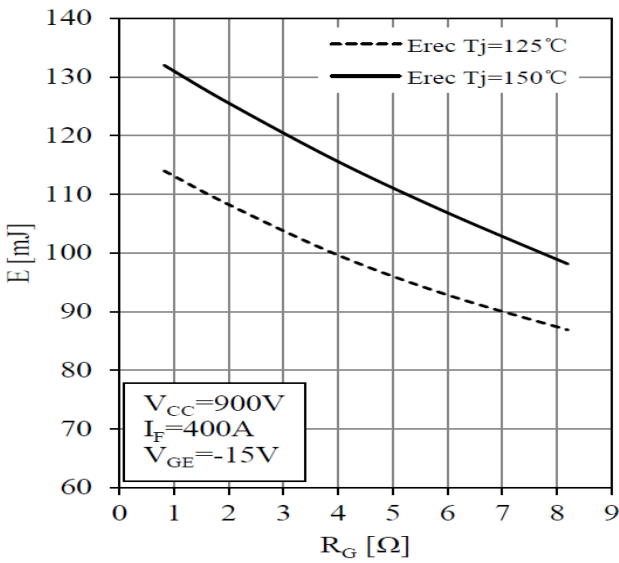


Fig 9. Diode Switching Loss vs.  $R_G$

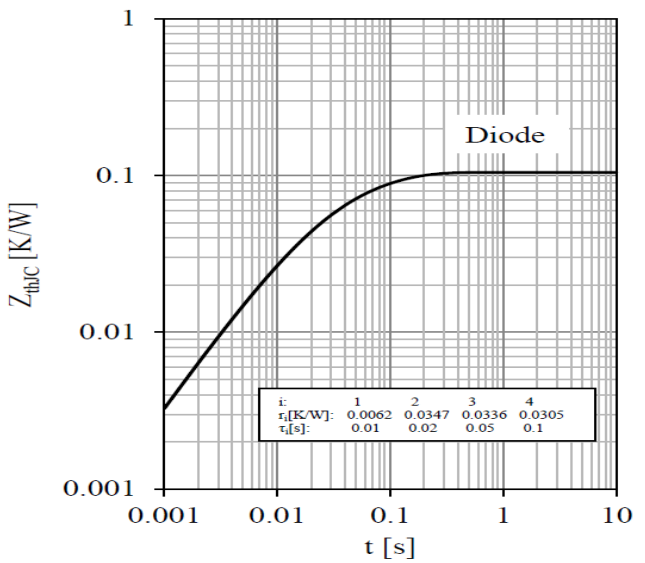
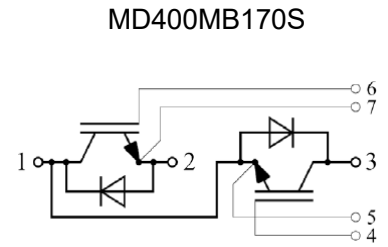
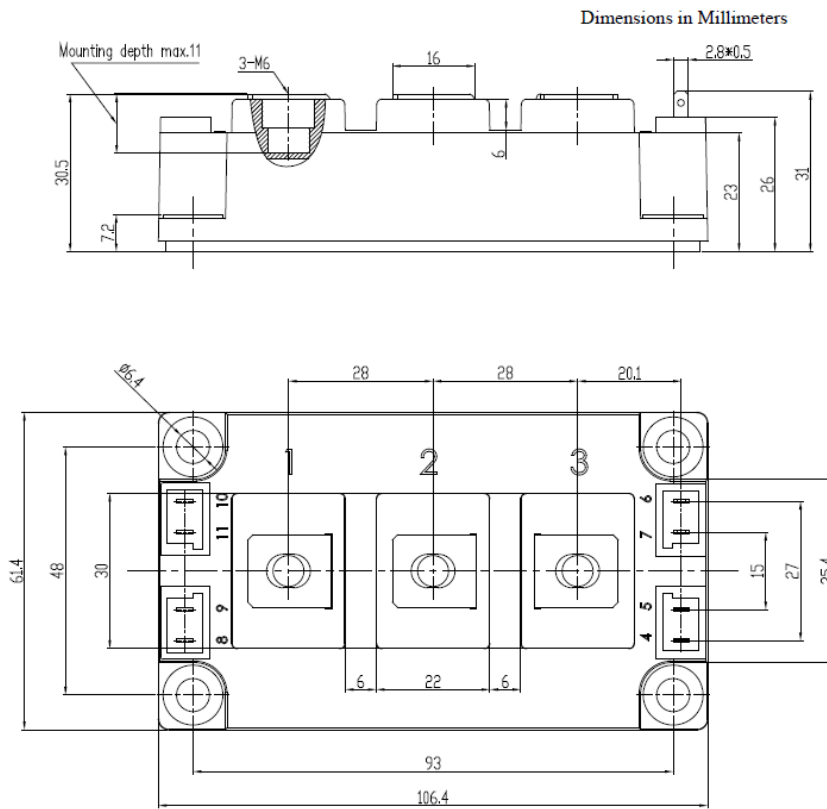


Fig 10. Diode Transient Thermal Impedance

**Outline & Circuit Diagram**



Unmarked dimensional tolerance:  $\pm 0.5\text{mm}$

NIPS reserves the right to change specifications without notice.