

## MRI300.17

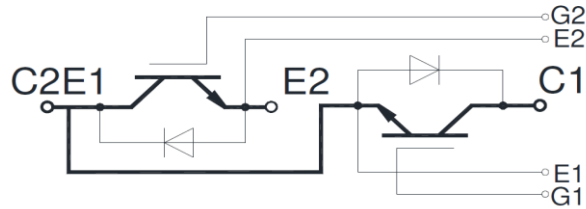
### 2 in 1 IGBT Modules

#### Features:

- Low  $V_{CE(sat)}$  trench IGBT technology
- Maximum junction temperature 175°C
- $V_{CE(sat)}$  with positive temperature coefficient
- 10 $\mu$ s short circuit capability

#### Typical applications:

- AC and DC servo driver amplifier
- Inverter and power supplies
- Uninterruptible power supply (UPS)
- Photovoltaic/Fuel cell



Symbol	Characteristics	Test Conditions	Value			Unit
			Min	Typ	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 @ $T_c = 80^\circ\text{C}$ , $T_{jmax} = 175^\circ\text{C}$			300	A
$I_{CM}$	Repetitive peak collector current	$T_p = 1\text{ ms}$			600	A
$P_C$	Collector power dissipation	$T_j = 175^\circ\text{C}$ , 1 device			1829	W
$T_j$	Junction temperature	/	-40		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: 1 minute	4000			V
Screw torque	Mounting (M6)	/	3.0		5.0	N·m
	Terminals (M6)	/	2.5		5.0	N·m
$I_{CES}$	Zero gate voltage collector current	$T_j = 25^\circ\text{C}$ , $V_{CE} = V_{CES}$ , $V_{GE} = 0\text{V}$			1.0	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	$T_j = 25^\circ\text{C}$ , $V_{CE} = 20\text{V}$ , $I_C = 12\text{mA}$	5.6	6.2	6.8	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	$T_j = 25^\circ\text{C}$ , $V_{GE} = 15\text{V}$ , $I_C = 300\text{A}$		1.85	2.20	V
		$T_j = 125^\circ\text{C}$ , $V_{GE} = 15\text{V}$ , $I_C = 300\text{A}$		2.25		V
		$T_j = 150^\circ\text{C}$ , $V_{GE} = 15\text{V}$ , $I_C = 300\text{A}$		2.35		V
$R_{Gint}$	Internal gate resistor	$T_j = 25^\circ\text{C}$		2.5		$\Omega$
$C_{ies}$	Input capacitance	$T_j = 25^\circ\text{C}$ , $V_{CE} = 25\text{V}$ , $V_{GE} = 0\text{V}$ , $f = 1\text{MHz}$		36.1		nF
$C_{res}$	Reverse transfer capacitance			0.88		nF
$t_{on}$	Turn-on time	$T_j = 125^\circ\text{C}$ , $V_{CC} = 900\text{V}$ , $I_C = 300\text{A}$ , $V_{GE} = \pm 15\text{V}$ , $R_G = 2.4\Omega$ , inductive load		224		ns
$t_r$				55		ns
$t_{off}$	Turn-off time			611		ns
$t_f$				159		ns
$E_{on}$	Turn-on energy loss per pulse			96.8		mJ
$E_{off}$	Turn-off energy loss per pulse			99.0		mJ
$I_{SC}$	SC data	$t_{SC} \leq 10\mu\text{s}$ , $V_{GE} = 15\text{V}$ , $T_j = 150^\circ\text{C}$ , $V_{CC} = 1000\text{V}$ , $V_{CEM} \leq 1700\text{V}$		1200		A
$V_F$	Forward on voltage	$T_j = 25^\circ\text{C}$ , $I_F = 300\text{A}$ , $V_{GE} = 0\text{V}$		1.80	2.25	V
		$T_j = 125^\circ\text{C}$ , $I_F = 300\text{A}$ , $V_{GE} = 0\text{V}$		1.90		
		$T_j = 150^\circ\text{C}$ , $I_F = 300\text{A}$ , $V_{GE} = 0\text{V}$		1.95		V
$I_{RM}$	Peak reverse recovery current			357		A
$Q_r$	Recovered charge	$I_F = 300\text{A}$ , $-diF/dt = 5400\text{A}/\mu\text{s}$ , $V_R = 900\text{V}$ , $V_{GE} = -15\text{V}$ , $T_j = 125^\circ\text{C}$		116		$\mu\text{C}$
$E_{rec}$	Reverse recovery energy			68.2		mJ

Symbol	Characteristics	Test Conditions	Value			Unit
			Min	Typ	Max	
$R_{th(j-c)}$	Thermal resistance (1 device)	IGBT			0.082	°C/W
		FWD			0.129	°C/W
$R_{th(c-f)}$	Contact thermal resistance (1 device)	with thermal compound		0.033		°C/W
$W_t$	Weight				300	g
Outline	454H3P					

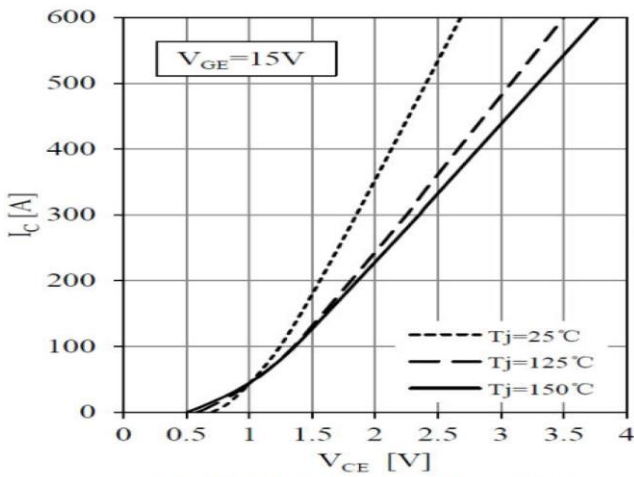


Fig 1. IGBT Typical Output Characteristics

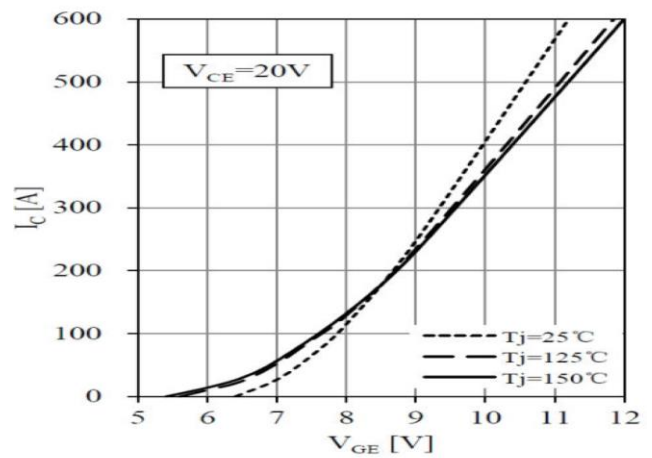


Fig 2. IGBT Typical Transfer Characteristics

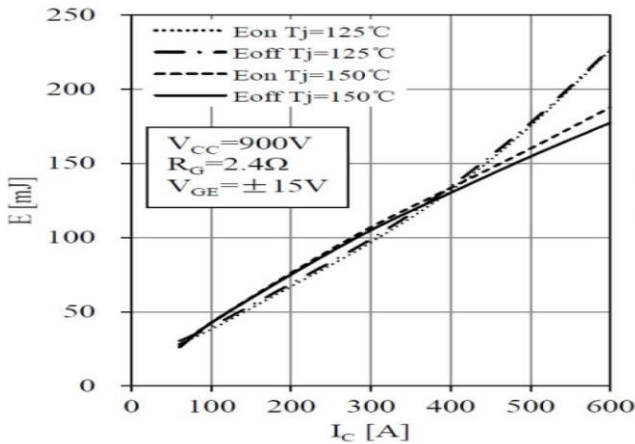


Fig 3. IGBT Switching Loss vs.  $I_c$

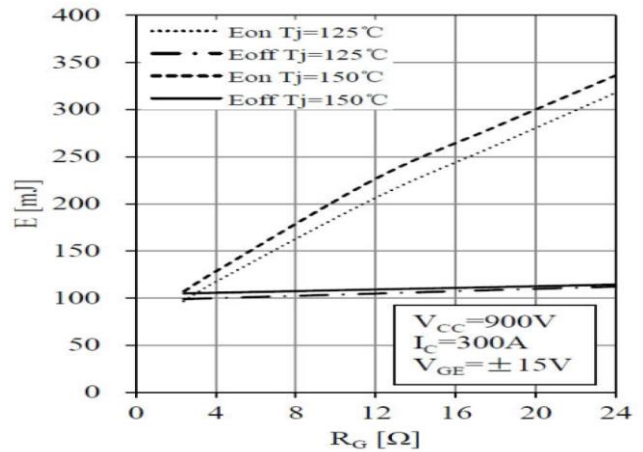


Fig 4. IGBT Switching Loss vs.  $R_G$

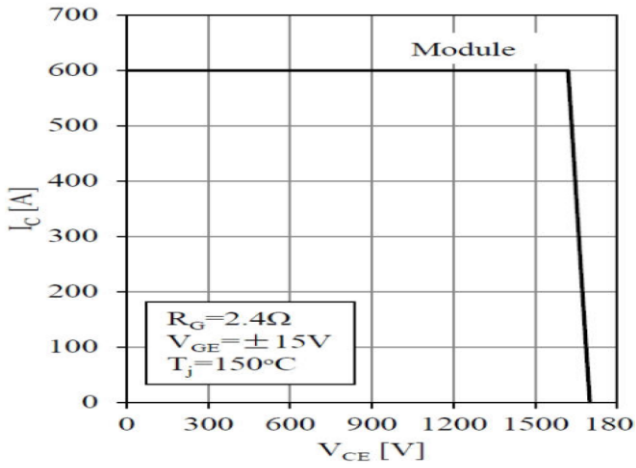


Fig 5. RBSOA

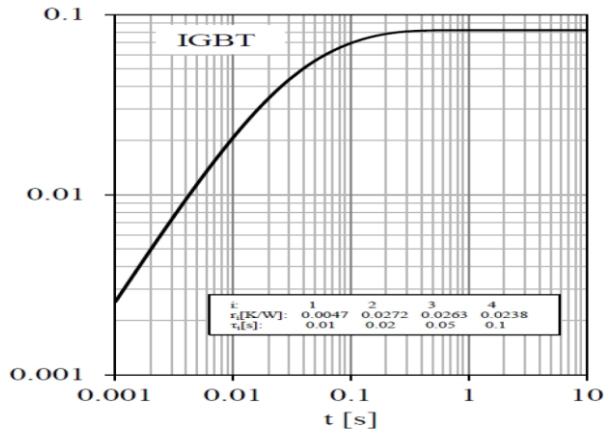


Fig 6. IGBT Transient Thermal Impedance

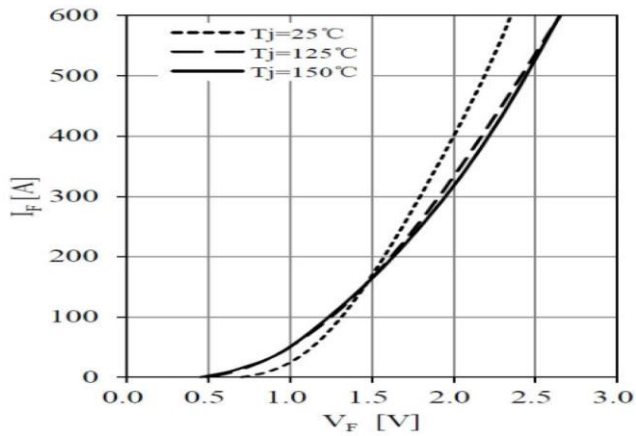


Fig 7. Forward Characteristics of Diode

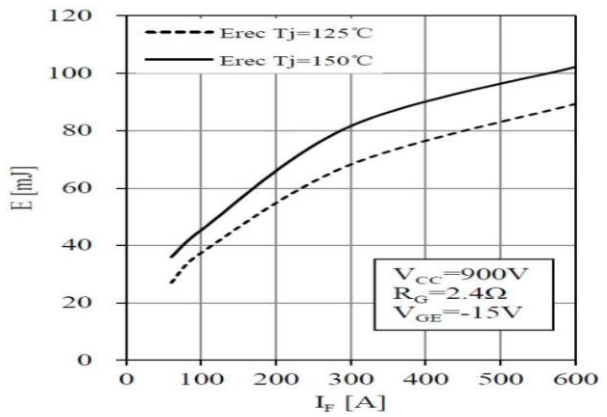


Fig 8. Diode Switching Loss vs.  $I_F$

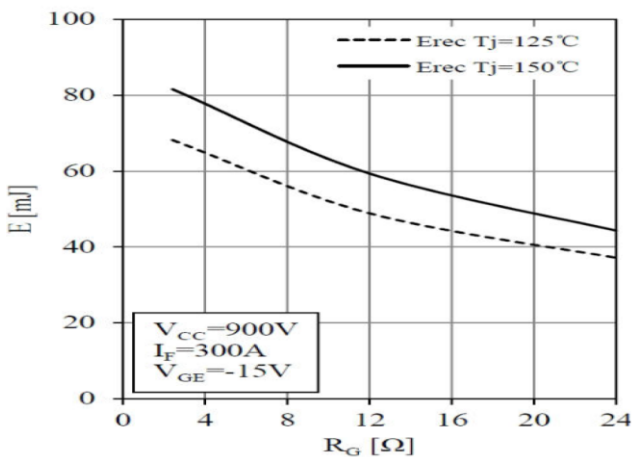


Fig9. Diode Switching Loss vs.  $R_G$

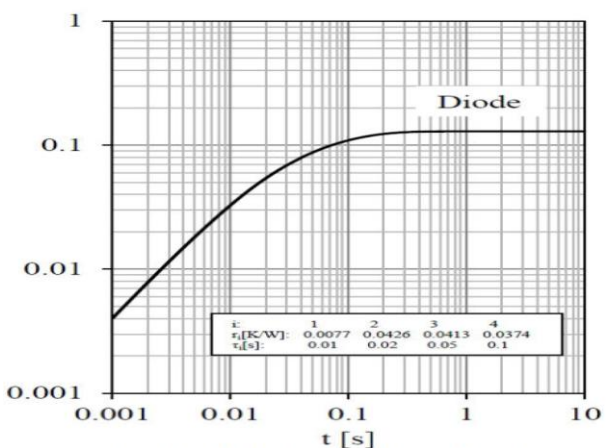
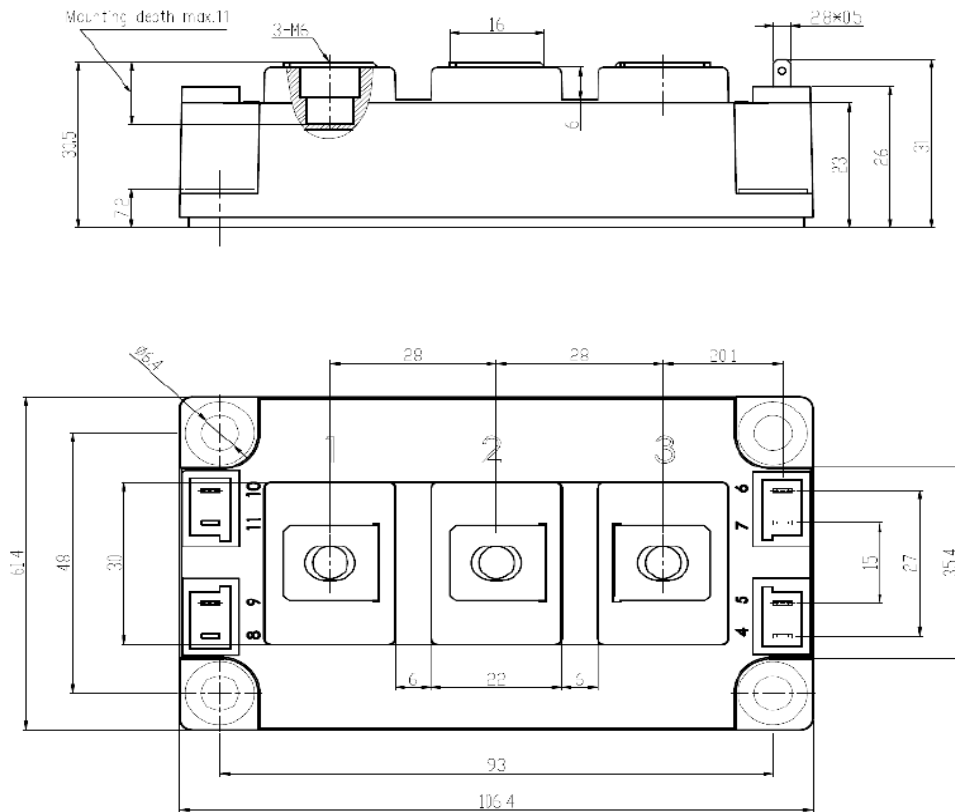


Fig 10. Diode Transient Thermal Impedance

### Outline:

Outline:



*(dimensions in mm)*

#### S.CO.M.E.S. Srl

Via Enrico Mattei, 6/8 - 26283 - Castiglione d'Adda (LO) - Italy

Phone: +39 0377 901243 Fax: +39 0377 900206