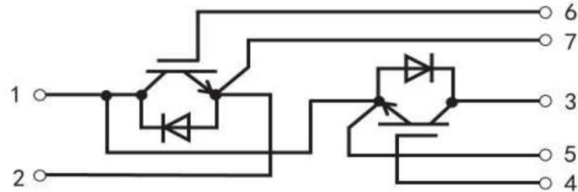
SCOMES

MRI150.12F

2 in 1 Fast IGBT Modules

Features:

- Low switching losses
- Low inductance
- Fast switching and short tail current
- High power and thermal cycling capaility
- Al_2O_3 substrate with low thermal resistance
- Copper base plate



Typical applications:

- High frequency switching application
- Motor drives
- UPS system

Symbol	Characteristcs	Test Conditions	Value Min	Value Typ	Value Max	Unit
● IGBT, Inverter						
V_{CES}	Collector-Emitter voltage	Tj = 25°C			1200	V
V_{GES}	Gate-Emitter voltage				±20	V
I_C	Collector current	Continuous @ T_c = 25 °C, Tvj max = 175°C			238	A
		Continuous @ T_c = 100 °C, Tvj max = 175°C			150	A
I_{CRM}	Repetitive peak collector current	T_p = 1 ms			300	A
P_{tot}	Power dissipation per IGBT	T_C = 25°C, Tj = 175°C			1000	W
T_{jmax}	Max junction temperature				175	°C
T_j	Operating temperature		-40		150	°C
T_{stg}	Storage temperature		-40		125	°C
V_{ISO}	Isolation terminal/copper base	AC: 1 minute			3000	V
Screw torque	Mounting (M6)		3.0		5.0	N·m
	Terminals (M5)		2.5		5.0	N·m
I_{CES}	Zero gate voltage collector current	Tj = 25°C, V_{CE} = 1200V, V_{GE} = 0V			1	mA
		Tj = 150°C, V_{CE} = 1200V, V_{GE} = 0V			5	mA
I_{GES}	Gate-Emitter leakage current	Tj = 25°C, V_{CE} = 0V, V_{GE} = ±20V	-400		400	nA
$V_{GE(th)}$	Gate-Emitter threshold voltage	Tj = 25°C, V_{CE} = V_{GE}, I_C = 8mA	5.2	6.0	6.5	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	Tj = 25°C, V_{GE} = 15V, I_C = 150A		2.0	2.4	V
		Tj = 125°C, V_{GE} = 15V, I_C = 150A		2.25		V
		Tj = 150°C, V_{GE} = 15V, I_C = 150A		2.35		V
C_{ies}	Input capacitance	Tj = 25°C, V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		15.6		nF
C_{res}	Reverse transfer capacitance	Tj = 25°C, V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		600		pF
Q_g	Gate charge	V_{CE} = 600V, I_C = 150A, V_{GE} = 15V		0.95		µC
R_{Gint}	Internal gate resistor	Tj = 25°C		2.5		Ω
$t_{d,on}$	Turn-on time	V_{CE} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 5.1Ω, inductive load; Tj = 25°C		160		ns
		Tj = 125°C		170		ns
		Tj = 150°C		180		ns
t_r	Rise time	V_{CE} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 5.1Ω, inductive load; Tj = 25°C		60		ns
		Tj = 125°C		65		ns
		Tj = 150°C		65		ns

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Symbol	Characteristcs	Test Conditions		Value			Unit
				Min	Typ	Max	
$t_{d,off}$	Turn-off time	V_{CE} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 4.1Ω, inductive load	Tj = 25°C		400		ns
			Tj = 125°C		450		ns
			Tj = 150°C		460		ns
t_f	Fall time	V_{CE} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 4.1Ω, inductive load	Tj = 25°C		50		ns
			Tj = 125°C		55		ns
			Tj = 150°C		55		ns
E_{on}	Turn-on energy loss per pulse	V_{CE} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 5.1Ω , inductive load	Tj = 125°C		21.5		mJ
			Tj = 150°C		24		mJ
E_{off}	Turn-off energy loss per pulse	V_{CE} = 600V, I_C = 150A, V_{GE} = ±15V, R_G = 5.1Ω , inductive load	Tj = 125°C		7.3		mJ
			Tj = 150°C		7.7		mJ
I_{SC}	SC data	V_{GE} = 15V, V_{CC} = 600V, Tj = 150°C, tpsc ≤ 10µs			900		A
$R_{th\ (j-c)}$	Thermal resistance, junction to case	Per IGBT				0.15	°C/W
• Diode, Inverter							
V_{RRM}	Repetitive peak reverse voltage	Tj = 25°C				1200	V
I_F	Forward current	Continuous				150	A
I_{FRM}	Repetitive peak forward current	T_p = 1ms				300	A
I^2t		Tj = 125°C, t = 10ms, V_R = 0V				3200	A^2s
V_F	Forward voltage	V_{GE} = 0V, I_F = 150A	Tj = 25°C		2.0	2.5	V
			Tj = 125°C		2.05		V
			Tj = 150°C		2.05		V
t_{rr}	Reverse recovery time	V_R = 600V, I_F = 150A, di_F/dt = 1900A/µs, Tj = 150°C			140		ns
I_{RRM}	Max reverse recovery current				119		A
Q_{RR}	Reverse recovery charge				14.6		µC
E_{rec}	Reverse recovery energy				4.7		mJ
$R_{th\ (JCD)}$	Thermal resistance, junction to case	Per diode				0.30	°C/W
W_t	Weight				160		g

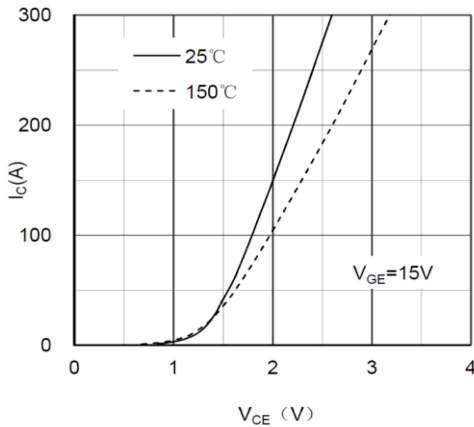

Figure 1. Typical Output Characteristics IGBT-inverter

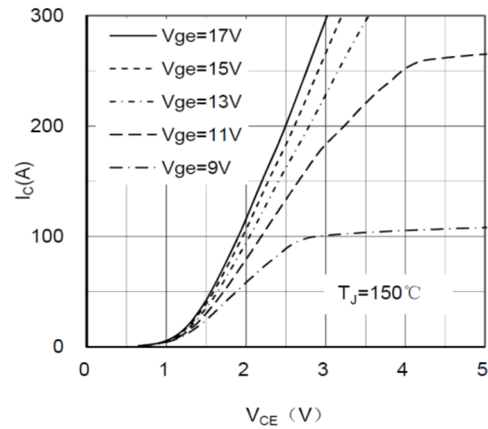

Figure 2. Typical Output Characteristics IGBT-inverter

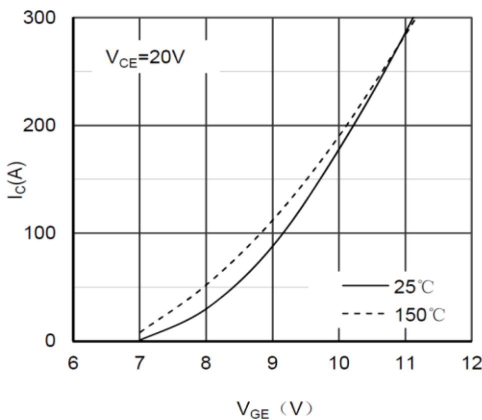

Figure 3. Typical Transfer characteristics IGBT-inverter

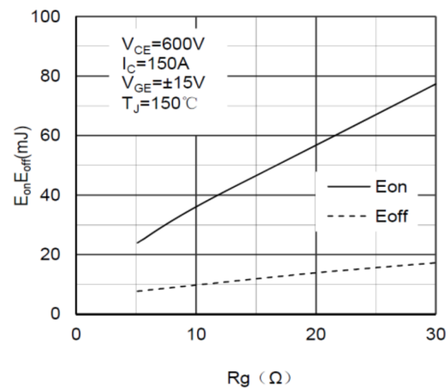

Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

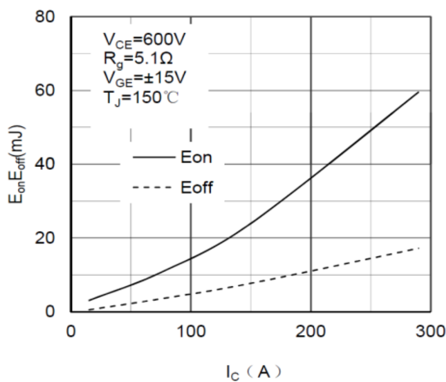

Figure 5. Switching Energy vs Collector Current IGBT-inverter

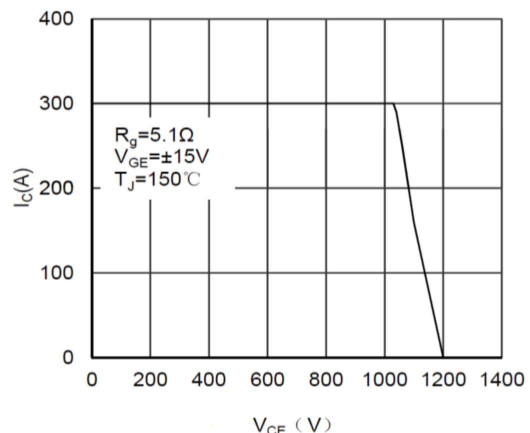

Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

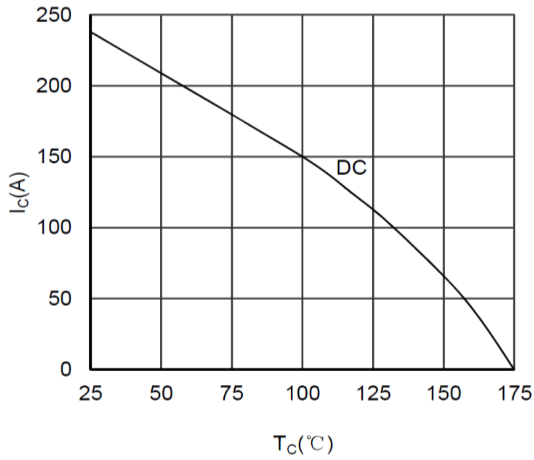

Figure 7. Collector Current vs Case temperature IGBT -inverter

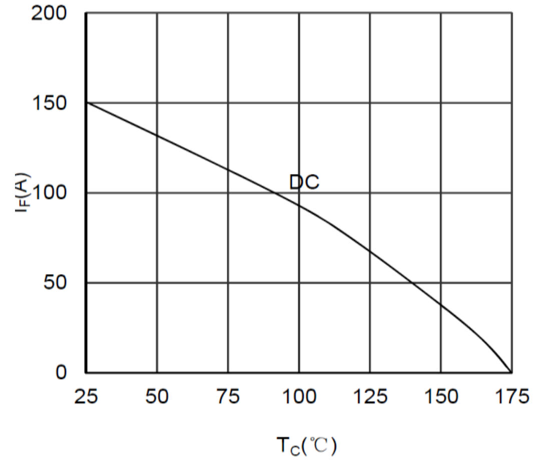

Figure 8. Forward current vs Case temperature Diode -inverter

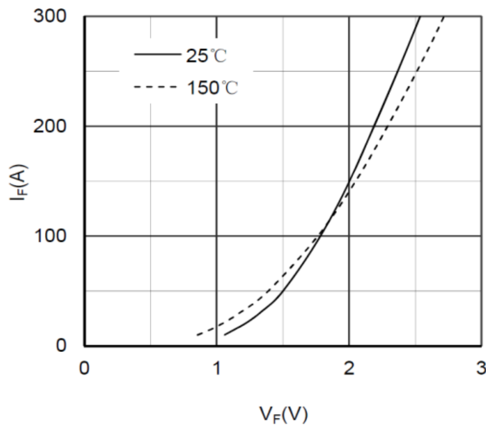

Figure 9. Diode Forward Characteristics Diode -inverter

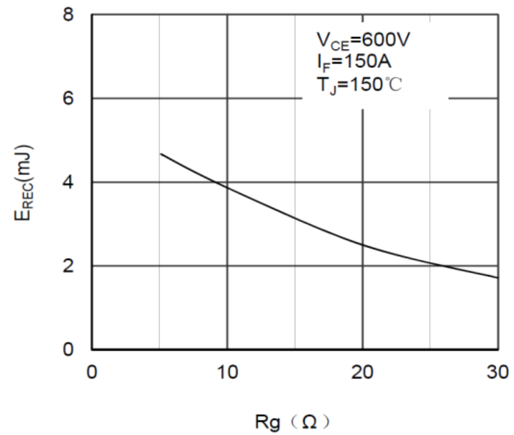

Figure 10. Switching Energy vs Gate Resistor Diode -inverter

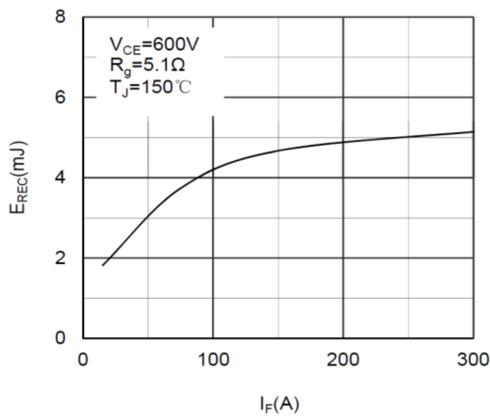

Figure 11. Switching Energy vs Forward Current Diode-inverter

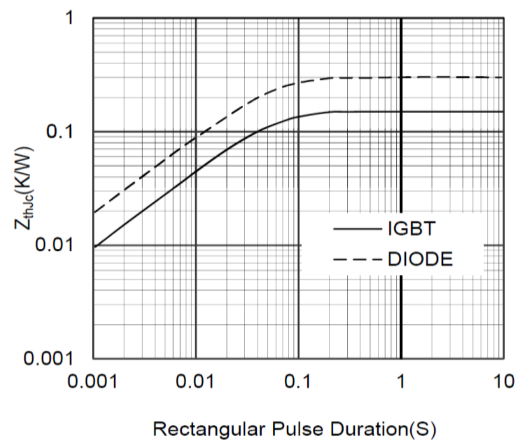

Figure 12. Transient Thermal Impedance of Diode and IGBT-inverter

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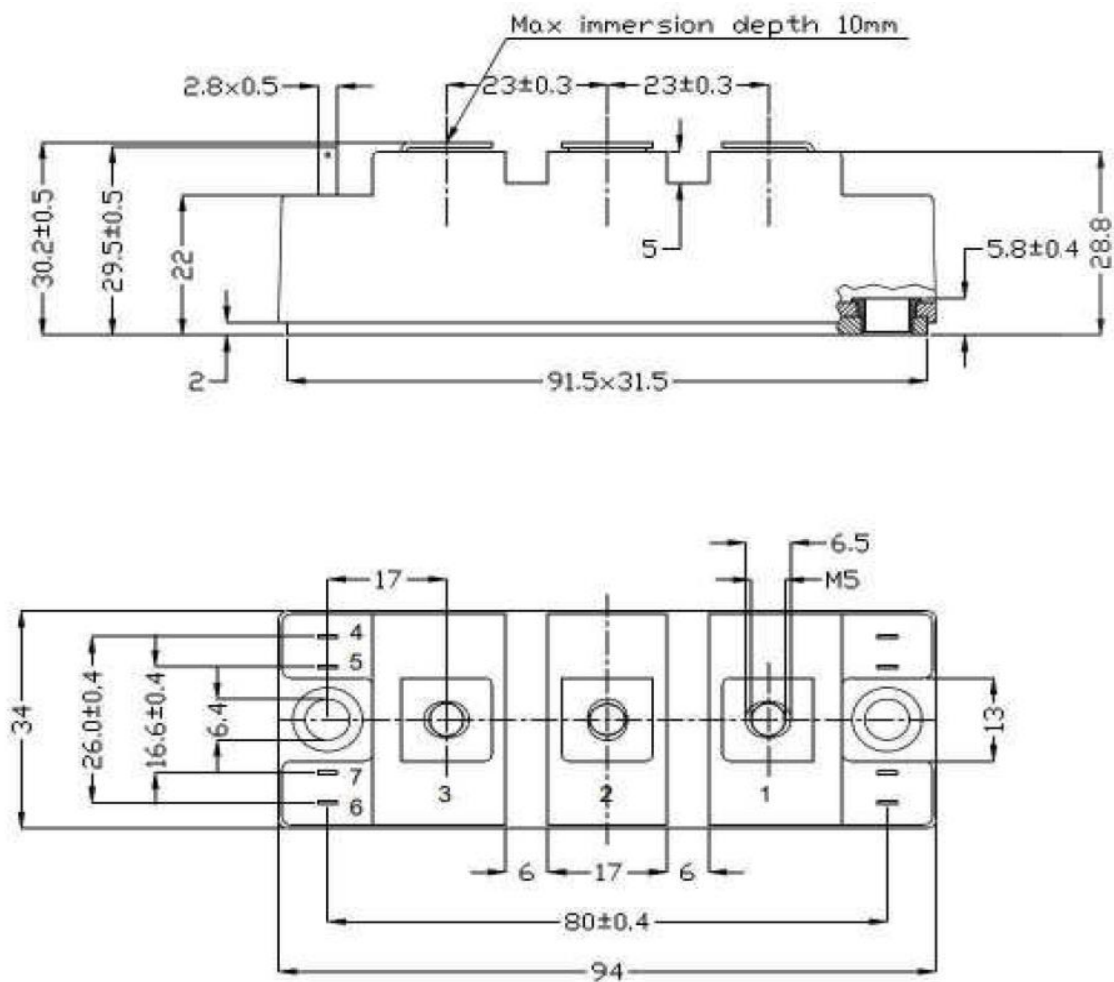
Outline:



(dimensions in mm)

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