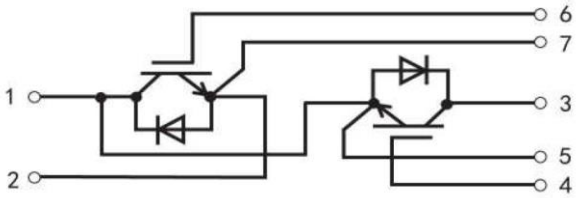
MRI600.12F

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 = 100 °C, Tvj max = 150°C				600	A
I_{CRM}	Repetitive peak collector current	t_p = 1 ms				1200	A
P_{tot}	Total power dissipation	T_C = 25°C, Tj = 175°C				1875	W
T_j	Junction temperature			-40		+150	°C
T_{stg}	Storage temperature			-40		+125	°C
V_{ISO}	Isolation terminal/copper base	Tj = 25°C, AC: 1 minute				2500	V
Screw torque	Mounting (M6)			3.0		6.0	N·m
	Terminals (M6)			3.0		5.0	N·m
L_{SCE}	Stray inductance module				20		nH
I_{CES}	Zero gate voltage collector current	Tj = 25°C, V_{CE} = 1200V, V_{GE} = 0V				4	mA
I_{GES}	Gate-Emitter leakage current	Tj = 25°C, V_{CE} = 0V, V_{GE} = 20V				400	nA
$V_{GE(th)}$	Gate-Emitter threshold voltage	Tj = 25°C, V_{CE} = V_{GE}, I_C = 22.8mA		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	Tj = 25°C, V_{GE} = 15V, I_C = 600A			1.45	1.90	V
		Tj = 125°C, V_{GE} = 15V, I_C = 600A			1.60		V
		Tj = 150°C, V_{GE} = 15V, I_C = 600A			1.65		V
C_{ies}	Input capacitance	Tj = 25°C, V_{CE} = 25V, V_{GE} = 0V, f = 1MHz			86		nF
C_{res}	Reverse transfer capacitance	Tj = 25°C, V_{CE} = 25V, V_{GE} = 0V, f = 1MHz			0.6		nF
Q_g	Gate charge	V_{GE} = -15V … +15V			6.9		µC
R_{Gint}	Internal gate resistor	Tj = 25°C			0.53		Ω
$t_{d,on}$	Turn-on time	V_{CE} = 600V, I_C = 600A, V_{GE} = ±15V, R_G = 1.6Ω, inductive load	Tj = 25°C		0.19		µs
			Tj = 125°C		0.19		µs
			Tj = 150°C		0.20		µs
t_r	Rise time	V_{CE} = 600V, I_C = 600A, V_{GE} = ±15V, R_G = 1.6Ω, inductive load	Tj = 25°C		0.11		µs
			Tj = 125°C		0.11		µs
			Tj = 150°C		0.11		µs
$t_{d,off}$	Turn-off time	V_{CE} = 600V, I_C = 600A, V_{GE} = ±15V, R_G = 1.6Ω, inductive load	Tj = 25°C		0.60		µs
			Tj = 125°C		0.60		µs
			Tj = 150°C		0.62		µs
t_f	Fall time	V_{CE} = 600V, I_C = 600A, V_{GE} = ±15V, R_G = 1.6Ω, inductive load	Tj = 25°C		0.15		µs
			Tj = 125°C		0.31		µs
			Tj = 150°C		0.33		µs

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Symbol	Characteristcs	Test Conditions		Value			Unit
				Min	Typ	Max	
E_{on}	Turn-on energy loss per pulse	V_{CE} = 600V, I_C = 600A, L_s = 20nH, V_{GE} = ±15V, di/dt = 4300A/µs, R_G = 1.6Ω (T_j = 150°C)	Tj = 25°C		51.9		mJ
			Tj = 125°C		52.6		mJ
			Tj = 150°C		57.2		mJ
E_{off}	Turn-off energy loss per pulse	V_{CE} = 600V, I_C = 600A, L_s = 20nH, V_{GE} = ±15V, dv/dt = 3500V/µs, R_G = 1.6Ω (T_j = 150°C)	Tj = 25°C		69.3		mJ
			Tj = 125°C		81.7		mJ
			Tj = 150°C		88.0		mJ
I_{SC}	SC data	V_{GE} ≤ 15V, V_{CC} = 600V, tp ≤ 8µs, Tj = 150°C, C_{GCE} = 0.0µF, V_{CEmax} = V_{CES} - L_{sCE} • di/dt			3100		A
$R_{th\ (j-c)}$	Thermal resistance, junction to case	Per IGBT				0.08	°C/W
• Diode, Inverter							
V_{RRM}	Repetitive peak reverse voltage	Tj = 25°C				1200	V
I_F	Forward current	Continuous				600	A
I_{FRM}	Repetitive peak forward current	T_p = 1ms				1200	A
V_F	Forward voltage	V_{GE} = 0V, I_F = 600A	Tj = 25°C		2.00	2.40	V
			Tj = 125°C		1.65		V
			Tj = 150°C		1.60		V
I_{RM}	Peak reverse recovery current	V_R = 600V, I_F = 600A, V_{GE} = -15V, - di_F/dt = 1750A/µs, (T_j = 150°C)	Tj = 25°C		290		A
			Tj = 125°C		480		A
			Tj = 150°C		520		A
Q_r	Recovery charge	V_R = 600V, I_F = 600A, V_{GE} = -15V, - di_F/dt = 1750A/µs, (T_j = 150°C)	Tj = 25°C		38.4		µC
			Tj = 125°C		96.5		µC
			Tj = 150°C		118.0		µC
E_{rec}	Reverse recovery energy	V_R = 600V, I_F = 600A, V_{GE} = -15V, - di_F/dt = 1750A/µs, (T_j = 150°C)	Tj = 25°C		10.7		mJ
			Tj = 125°C		27.0		mJ
			Tj = 150°C		32.8		mJ
$R_{th\ (j-c)}$	Thermal resistance, junction to case	Per diode				0.10	°C/W
W_t	Weight				340		g

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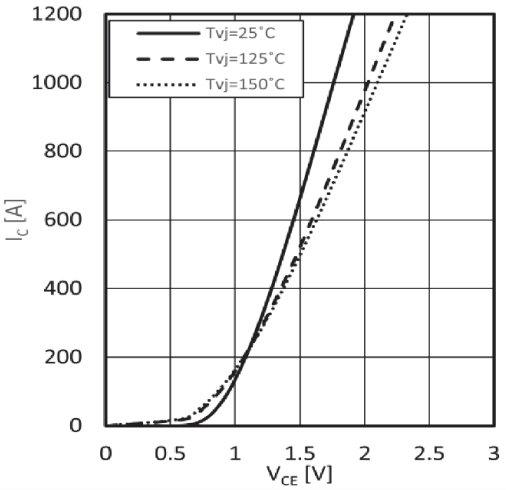


Fig1: OutputcharacteristicIGBT,Inverter (typical)

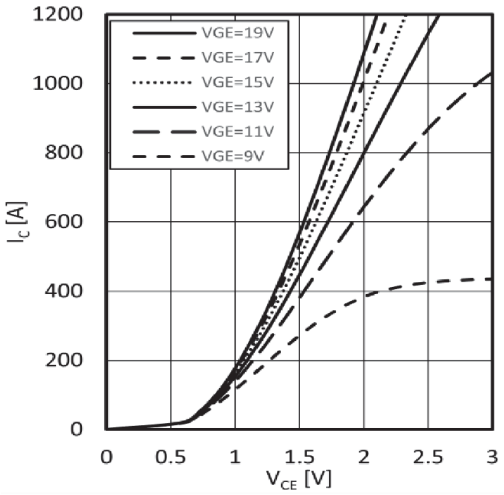


Fig2: OutputcharacteristicIGBT,Inverter (typical)

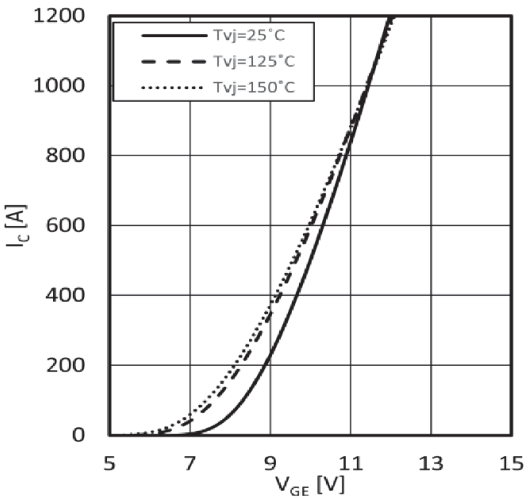


Fig3: Transfer characteristic IGBT, Inverter(typical)

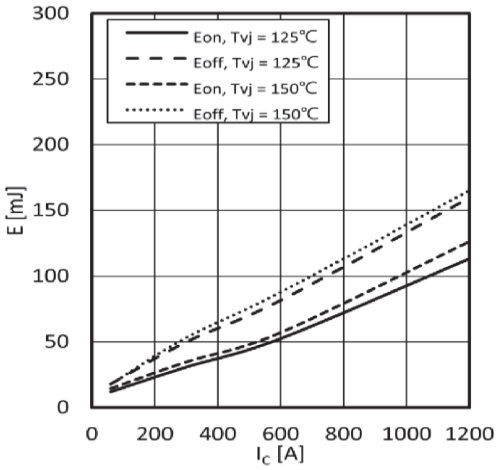


Fig4: SwitchinglossesIGBT,Inverter(typical)

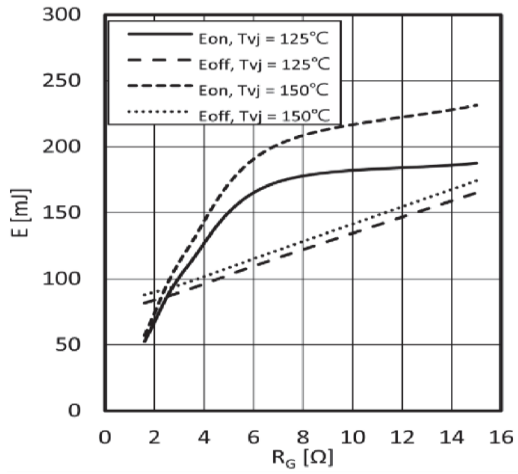


Fig5: SwitchinglossesIGBT,Inverter(typical)

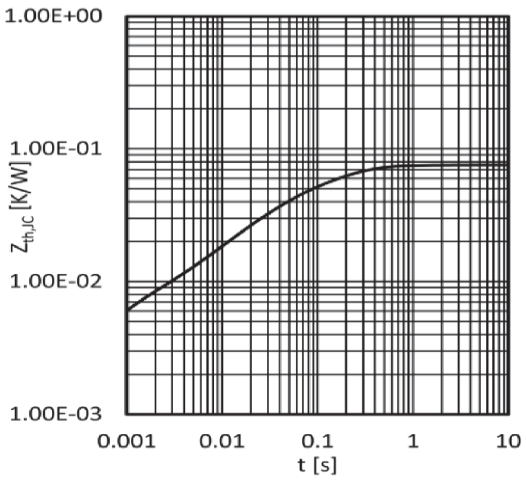


Fig6: Transient thermal impedance IGBT, Inverter

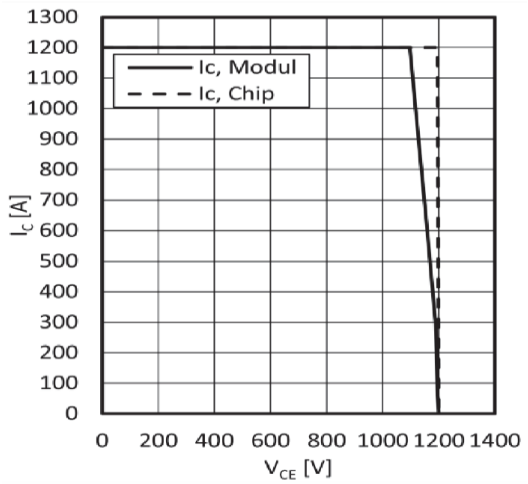


Fig7: ReversebiassafeoperatingareaIGBT,Inverter (RBSOA)

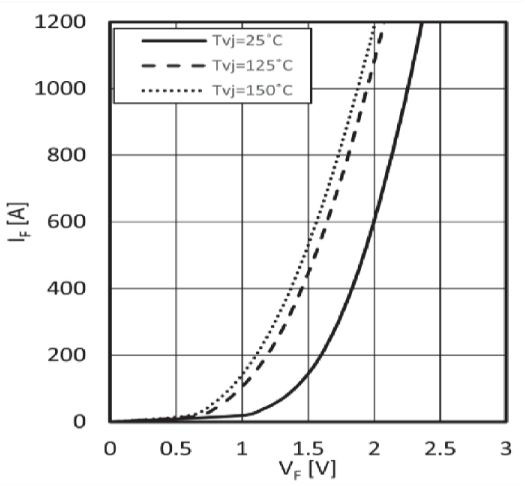


Fig8: ForwardcharacteristicofDiode,Inverter(typical)

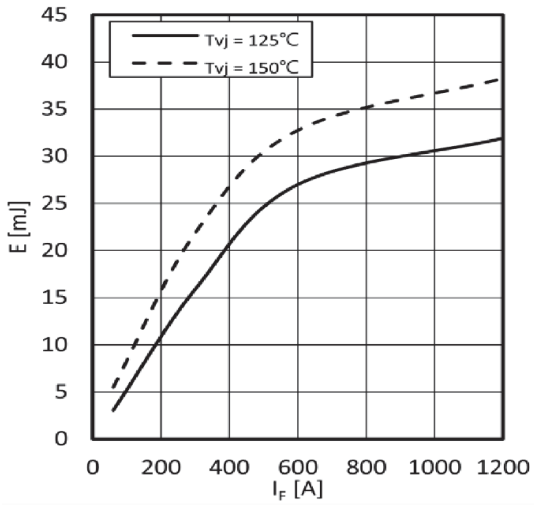


Fig9: SwitchinglossesDiode,Inverter (typical)

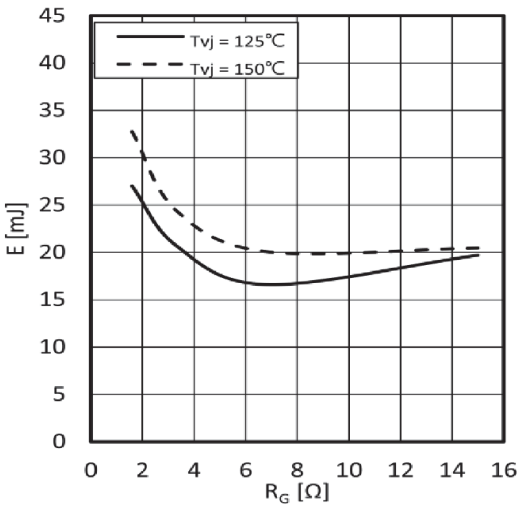


Fig10: SwitchinglossesDiode,Inverter (typical)

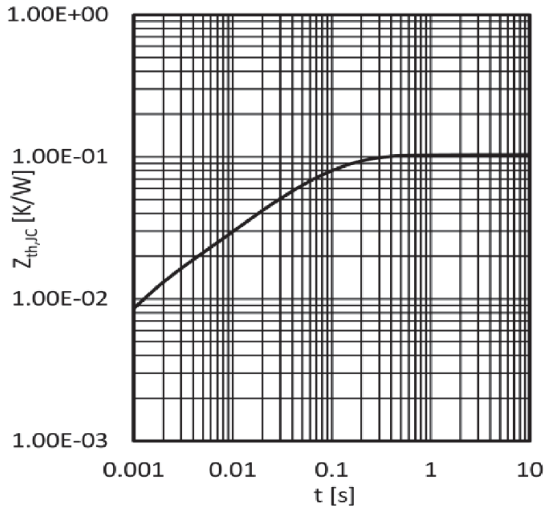
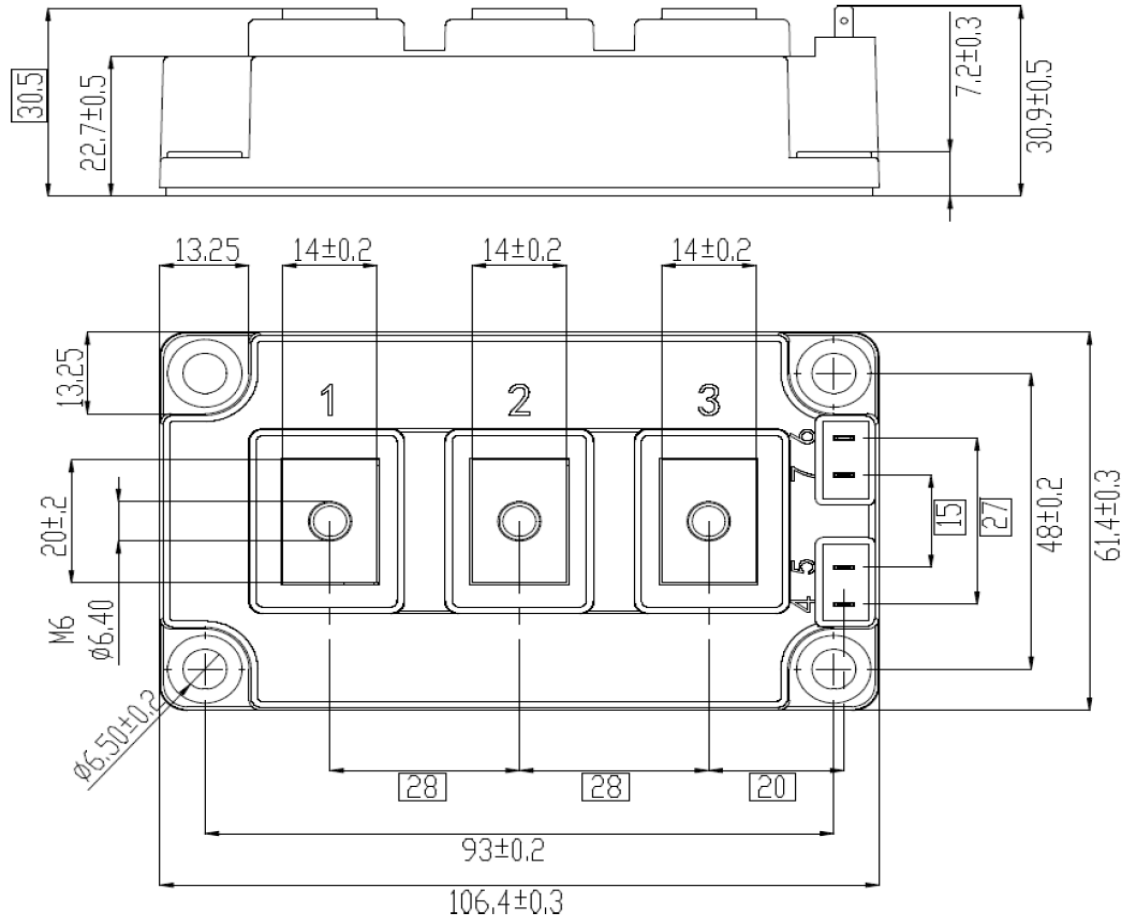


Fig11: Transient thermal impedance Diode Inverter

Outline:



(dimensions in mm)

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