MRI450.17-E

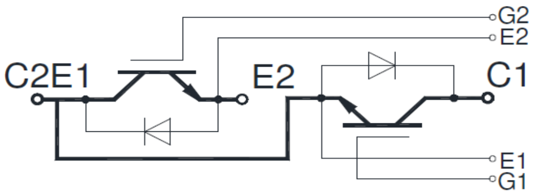
2 in 1 IGBT Modules

Features:

- V_{CEsat} with positive temperature coefficient
- 10µs short circuit capability
- Low V_{CEsat} trench IGBT technology
- Fast & soft reverse recovery anti-parallel FWD
- Isolated copper baseplate using DBC technology

Typical applications:

- AC motor control
- Inverter and power supplies
- Motion/servo control
- Photovoltaic/Fuel cell
- Uninterruptible Power Supply System



Symbol	Characteristics	Test Conditions		Value Min	Value Typ	Value Max	Unit
V_{CES}	Collector-Emitter voltage	Tj = 25°C				1700	V
V_{GES}	Gate-Emitter voltage	Tj = 25°C				±20	V
I_C	Collector current	Continuous @ T_c = 100 °C				450	A
I_{CM}	Repetive peak collector current	T_p = 1 ms				900	A
P_C	Collector power dissipation	Tj = 175°C				2542	W
T_j	Junction temperature	/		-40		+175	°C
T_{jop}	Operating junction temperature	/		-40		+150	°C
T_{stg}	Storage temperature	/		-40		+125	°C
V_{ISO}	Isolation between terminal and copper base	Tj = 25°C, AC: 1 minute		4000			V
Screw torque	Mounting (M5)	/		3.0		6.0	N·m
	Terminals (M6)	/		3.0		6.0	N·m
I_{CES}	Zero gate voltage collector current	Tj = 25°C, $V_{CE} = V_{CES}$, V_{GE} = 0V				5.0	mA
I_{GES}	Gate-Emitter leakage current	Tj = 25°C, V_{CE} = 0V, V_{GE} = ±20V				0.40	µA
$V_{GE(th)}$	Gate-Emitter threshold voltage	Tj = 25°C, V_{CE} = 20V, I_C = 18mA		5.6	6.2	6.8	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	Tj = 25°C, V_{GE} = 15V, I_C = 450A			1.85	2.20	V
		Tj = 125°C, V_{GE} = 15V, I_C = 450A			2.25		V
		Tj = 150°C, V_{GE} = 15V, I_C = 450A			2.35		V
R_{Gint}	Internal gate resistor	Tj = 25°C			1.67		Ω
t_{on}	Turn-on time	V_{CC} = 900V, I_C = 450A, V_{GE} = ±15V, R_G = 3.3Ω, inductive load	Tj = 25°C		179		ns
			Tj = 125°C		208		ns
			Tj = 150°C		208		ns
t_r			Tj = 25°C		105		ns
			Tj = 125°C		120		ns
			Tj = 150°C		120		ns
t_{off}	Turn-off time	V_{CC} = 900V, I_C = 450A, V_{GE} = ±15V, R_G = 3.3Ω, inductive load	Tj = 25°C		680		ns
			Tj = 125°C		784		ns
			Tj = 150°C		800		ns
t_f			Tj = 25°C		375		ns
			Tj = 125°C		613		ns
			Tj = 150°C		720		ns
E_{on}	Turn-on energy loss per pulse	V_{CC} = 900V, I_C = 450A, V_{GE} = ±15V, R_G = 3.3Ω, inductive load	Tj = 25°C		116		mJ
			Tj = 125°C		152		mJ
			Tj = 150°C		167		mJ

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Symbol	Characteristcs	Test Conditions		Value Min	Value Typ	Value Max	Unit
E_{off}	Turn-off energy loss per pulse	V_{CC} = 900V, I_C = 450A, V_{GE} = ±15V, R_G = 3.3Ω, inductive load	Tj = 25°C		113		mJ
			Tj = 125°C		171		mJ
			Tj = 150°C		179		mJ
I_{SC}	Short circuit	Tj = 150°C, V_{CC} = 1000V, V_{GE} = 15V			1800		A
V_F	Forward on voltage	V_{CC} = 900V, I_C = 450A, V_{GE} = ±15V, R_G = 3.3Ω, inductive load	Tj = 25°C		1.80	2.25	V
			Tj = 125°C		1.95		V
			Tj = 150°C		1.90		V
Q_r	Recevered charge	V_R = 900V, I_C = 450A, V_{GE} = -15V, di/dt = 4580A/µs	Tj = 25°C		105		µC
			Tj = 125°C		187		µC
			Tj = 150°C		209		µC
I_{RM}	Peak reverse recovery current	V_R = 900V, I_C = 450A, V_{GE} = -15V, di/dt = 4580A/µs	Tj = 25°C		198		A
			Tj = 125°C		578		A
			Tj = 150°C		585		A
E_{rec}	Reverse recovery energy	V_R = 900V, I_C = 450A, V_{GE} = -15V, di/dt = 4580A/µs	Tj = 25°C		69		mJ
			Tj = 125°C		129		mJ
			Tj = 150°C		150		mJ
R_{25}	Rated resistance	Tc = 25°C			5.0		kΩ
ΔR/R	Deviation of R100	Tc = 100°C, R_{100}=493.3W		-5		5	%
P_{25}	Power dissipation	Tc = 25°C				20	mW
$B_{25/50}$	B-value	R_2=R_{25} exp [$B_{25/50}$ (1/T_2-1/(298,15 K))]			3375		K
$B_{25/80}$	B-value	R_2=R_{25} exp [$B_{25/80}$ (1/T_2-1/(298,15 K))]			3411		K
$B_{25/100}$	B-value	R_2=R_{25} exp [$B_{25/100}$ (1/T_2-1/(298,15 K))]			3433		K
L_{CE}	Stray inductance module				20		nH
$R_{CC'+EE'}$	Module lead resistance, terminals - chip	Tc = 25°C, per switch			1.10		mΩ
$R_{th(j-c)}$	Thermal resistance (per chip)	IGBT				0.059	°C/W
		FWD				0.083	°C/W
W_t	Weight					350	g
Outline	465H3P						

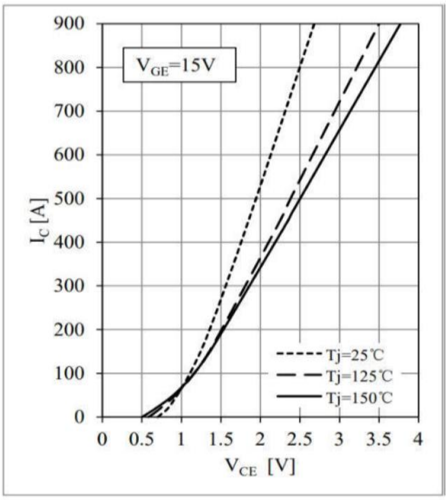

Fig 1. IGBT Output Characteristics

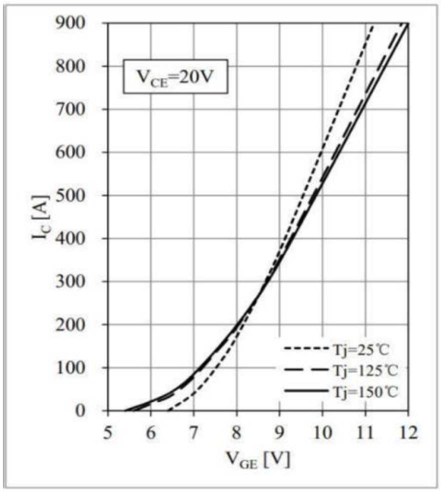

Fig 2. IGBT Transfer Characteristics

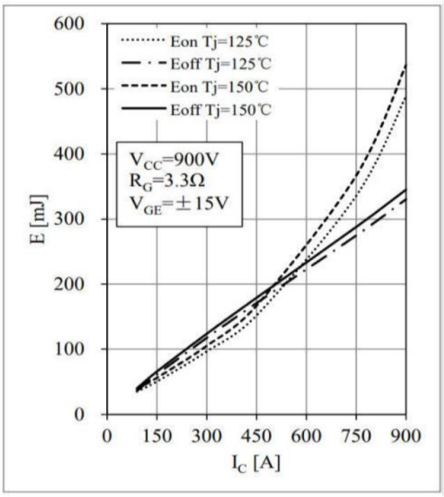

Fig 3. IGBT Switching Loss vs. I_C

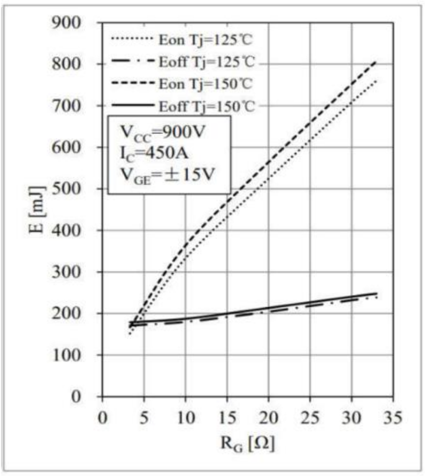

Fig 4. IGBT Switching Loss vs. R_G

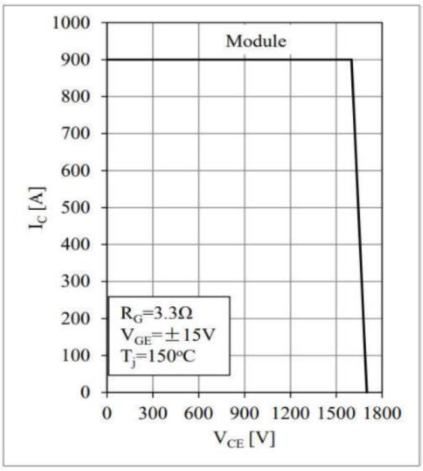

Fig 5. RBSOA

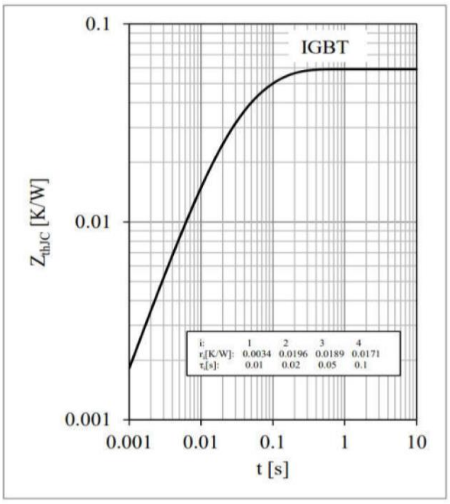

Fig 6. IGBT Transient Thermal Impedance

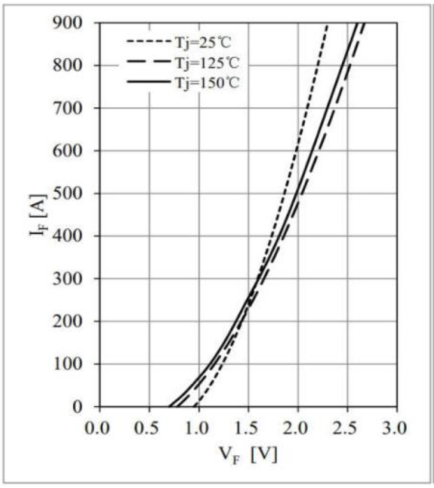

Fig 7. Diode Forward Characteristics

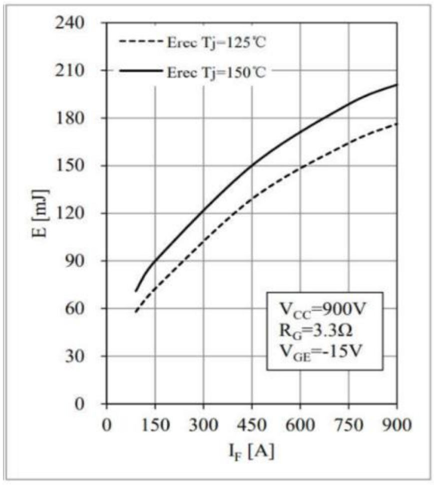

Fig 8. Diode Switching Loss vs. I_F

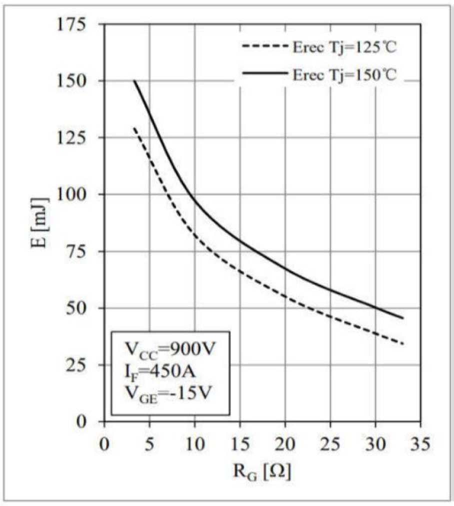

Fig 9. Diode Switching Loss vs. R_G

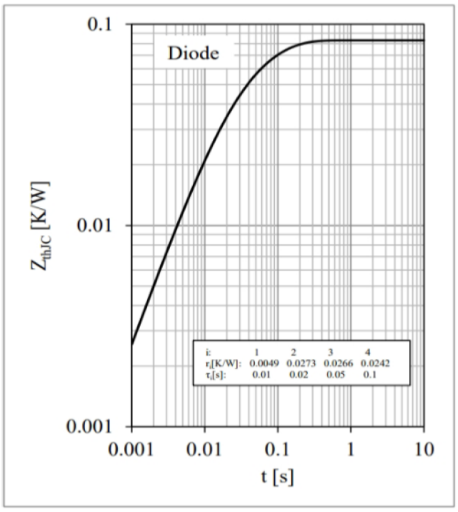

Fig 10. Diode Transient Thermal Impedance

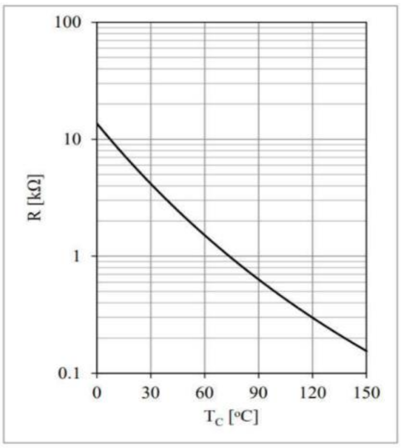

Fig 11. NTC Temperature Characteristic

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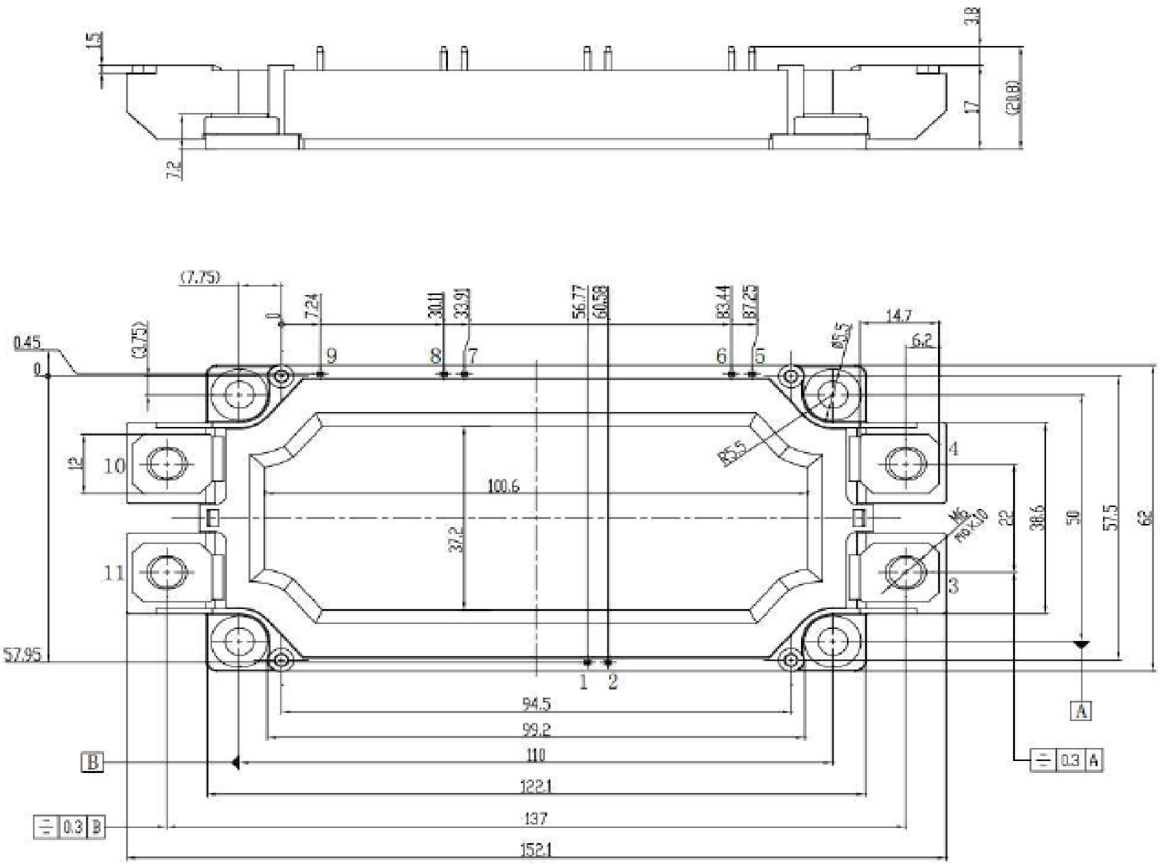
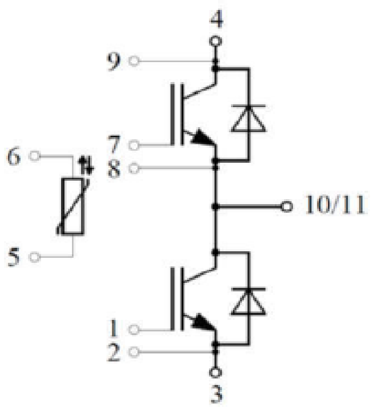
Outline:





(dimensions in mm)

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