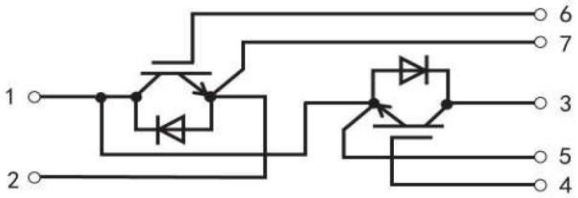
MRI225.065

2 in 1 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			Unit
				Min	Typ	Max	
● IGBT, Inverter							
V_{CES}	Collector-Emitter voltage	Tj = 25°C				650	V
V_{GES}	Gate-Emitter voltage					±20	V
I_C	Collector current	Continuous @ T_c = 80 °C, Tvj max = 150°C				225	A
I_{CRM}	Repetitive peak collector current	T_p = 1 ms				450	A
P_C	Collector power dissipation	T_C = 25°C, Tj = 175°C				650	W
T_j	Junction temperature			-40		150	°C
T_{stg}	Storage temperature			-40		125	°C
V_{ISO}	Isolation terminal/copper base	AC: 1 minute				4000	V
Screw torque	Mounting (M6)			3.0		6.0	N·m
	Terminals (M5)			2.5		5.0	N·m
L_{SCE}	Stray inductance module				30		nH
I_{CES}	Zero gate voltage collector current	Tj = 25°C, V_{CE} = 650V, V_{GE} = 0V				1	mA
I_{GES}	Gate-Emitter leakage current	Tj = 25°C, V_{CE} = 0V, V_{GE} = 20V				100	nA
$V_{GE(th)}$	Gate-Emitter threshold voltage	Tj = 25°C, V_{CE} = V_{GE}, I_C = 1mA		4.4	5.4	6.4	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	Tj = 25°C, V_{GE} = 15V, I_C = 225A			1.26		V
		Tj = 125°C, V_{GE} = 15V, I_C = 225A			1.29		V
		Tj = 150°C, V_{GE} = 15V, I_C = 225A			1.31		V
C_{ies}	Input capacitance	Tj = 25°C, V_{CE} = 25V, V_{GE} = 0V, f = 1MHz			22.7		nF
C_{res}	Reverse transfer capacitance	Tj = 25°C, V_{CE} = 25V, V_{GE} = 0V, f = 1MHz			0.40		nF
R_{Gint}	Internal gate resistor	Tj = 25°C			1.30		Ω
$t_{d,on}$	Turn-on time	V_{CE} = 300V, I_C = 225A, V_{GE} = ±15V, R_G = 4.1Ω, inductive load	Tj = 25°C		0.07		µs
			Tj = 125°C		0.08		µs
			Tj = 150°C		0.08		µs
t_r	Rise time	V_{CE} = 300V, I_C = 225A, V_{GE} = ±15V, R_G = 4.1Ω, inductive load	Tj = 25°C		0.08		µs
			Tj = 125°C		0.09		µs
			Tj = 150°C		0.09		µs
$t_{d,off}$	Turn-off time	V_{CE} = 300V, I_C = 225A, V_{GE} = ±15V, R_G = 4.1Ω, inductive load	Tj = 25°C		0.26		µs
			Tj = 125°C		0.29		µs
			Tj = 150°C		0.30		µs
t_f	Fall time	V_{CE} = 300V, I_C = 225A, V_{GE} = ±15V, R_G = 4.1Ω, inductive load	Tj = 25°C		0.05		µs
			Tj = 125°C		0.10		µs
			Tj = 150°C		0.12		µs

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Symbol	Characteristcs	Test Conditions		Value			Unit
				Min	Typ	Max	
E_{on}	Turn-on energy loss per pulse	V_{CE} = 300V, I_C = 225A, L_s = 30nH, V_{GE} = ±15V, di/dt = 1990A/µs, R_G = 4.1Ω (T_j = 150°C)	Tj = 25°C		2.01		mJ
			Tj = 125°C		2.74		mJ
			Tj = 150°C		2.87		mJ
E_{off}	Turn-off energy loss per pulse	V_{CE} = 300V, I_C = 225A, L_s = 30nH, V_{GE} = ±15V, dv/dt = 3030V/µs, R_G = 4.1Ω (T_j = 150°C)	Tj = 25°C		5.26		mJ
			Tj = 125°C		7.81		mJ
			Tj = 150°C		8.23		mJ
$R_{th\ (j-c)}$	Thermal resistance, junction to case	Per IGBT				0.23	°C/W
• Diode, Inverter							
V_{RRM}	Repetitive peak reverse voltage	Tj = 25°C				650	V
I_F	Forward current	Continuous				225	A
I_{FRM}	Repetitive peak forward current	T_p = 1ms				450	A
V_F	Forward voltage	V_{GE} = 0V, I_F = 225A	Tj = 25°C		1.41		V
			Tj = 125°C		1.48		V
			Tj = 150°C		1.50		V
I_{RM}	Peak reverse recovery current	V_R = 300V, I_F = 225A, V_{GE} = -15V, - di_F/dt = 5300A/µs, (T_j = 150°C)	Tj = 25°C		105		A
			Tj = 125°C		183		A
			Tj = 150°C		199		A
Q_r	Recovery charge	V_R = 300V, I_F = 225A, V_{GE} = -15V, - di_F/dt = 5300A/µs, (T_j = 150°C)	Tj = 25°C		4.40		µC
			Tj = 125°C		11.90		µC
			Tj = 150°C		14.40		µC
E_{rec}	Reverse recovery energy	V_R = 300V, I_F = 225A, V_{GE} = -15V, - di_F/dt = 5300A/µs, (T_j = 150°C)	Tj = 25°C		0.33		mJ
			Tj = 125°C		1.17		mJ
			Tj = 150°C		1.56		mJ
$R_{th\ (j-c)}$	Thermal resistance, junction to case	Per diode				0.30	°C/W
W_t	Weight				160		g

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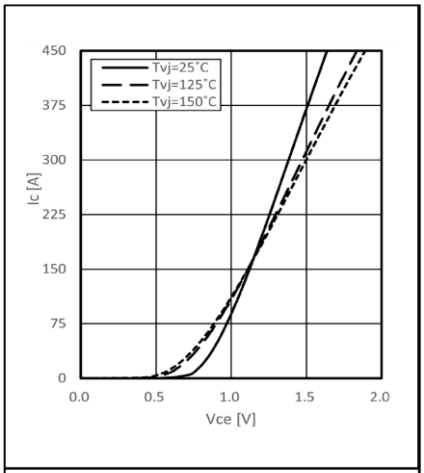
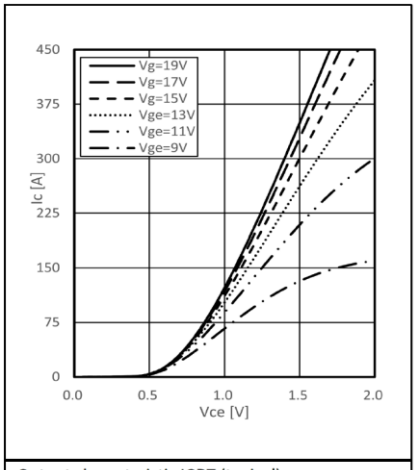
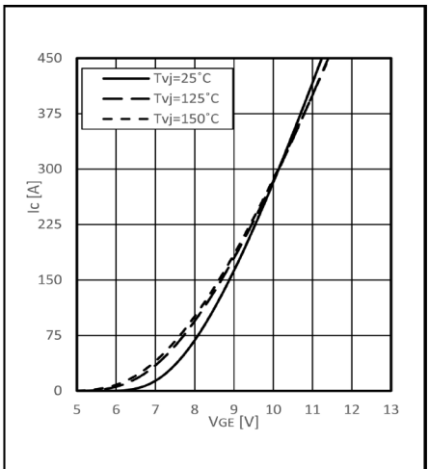


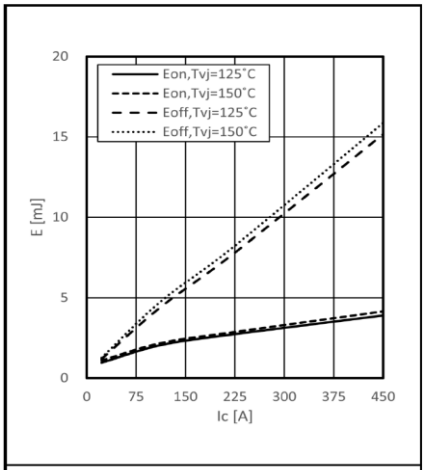
Output characteristic IGBT (typical)
$I_C = f(V_{CE})$
$V_{GE} = 15V$



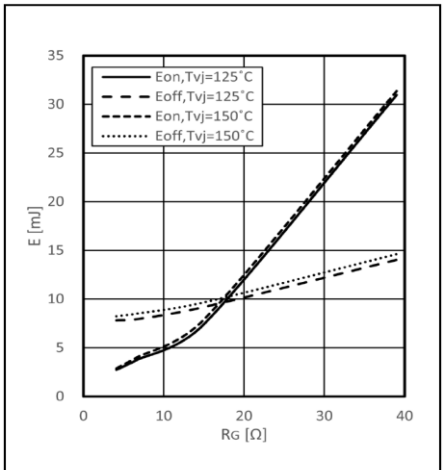
Output characteristic IGBT (typical)
$I_C = f(V_{CE})$
$T_{vj} = 150°C$



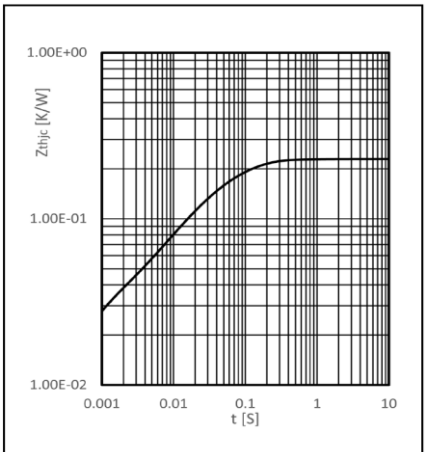
Transfer characteristic IGBT (typical)
$I_C = f(V_{GE})$
$V_{CE} = 20V$



Switching losses IGBT (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
$R_{Goff} = 4.1\ \Omega$, $R_{Gon} = 4.1\ \Omega$, $V_{CE} = 300\ V$, $V_{GE} = \pm 15\ V$



Switching losses IGBT (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
$I_C = 225\ A$, $V_{CE} = 300\ V$, $V_{GE} = \pm 15\ V$



Transient thermal impedance IGBT
$Z_{thJC} = f(t)$

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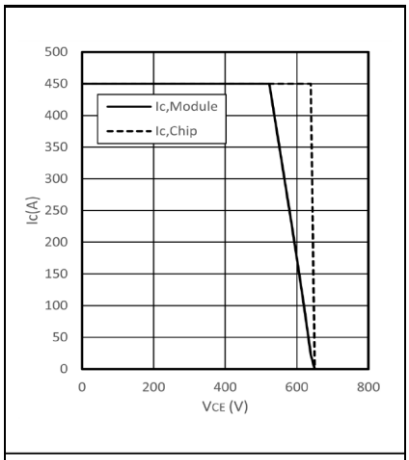
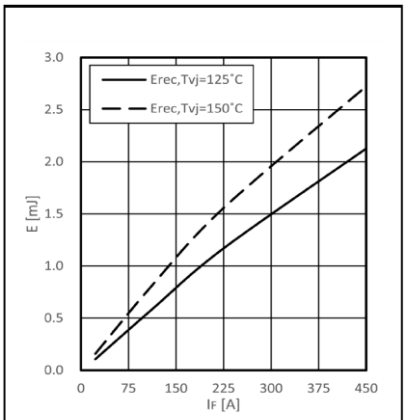
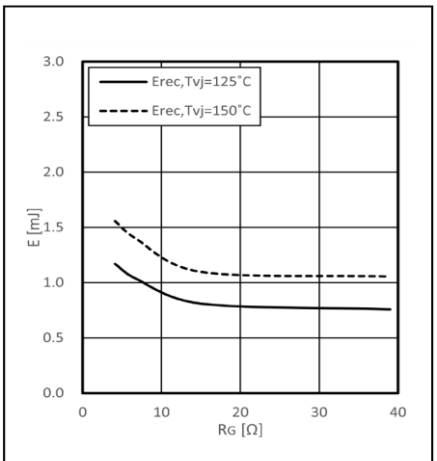


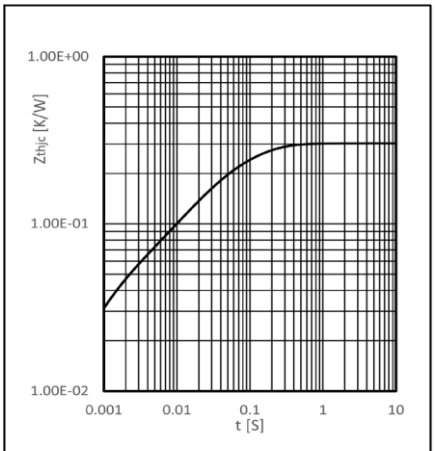
Reverse bias safe operating area IGBT (RBSOA)
$I_C = f(V_{CE})$
$V_{GE} = 15$ V, $R_{Goff} = 4.1\ \Omega$, $T_{vj} = 150$ °C



Switching losses Diode (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 4.1\ \Omega$, $V_{CE} = 300$ V



Switching losses Diode (typical)
$E_{rec} = f(R_G)$
$I_F = 225$ A, $V_{CE} = 300$ V



Transient thermal impedance Diode
$Z_{thJC} = f(t)$

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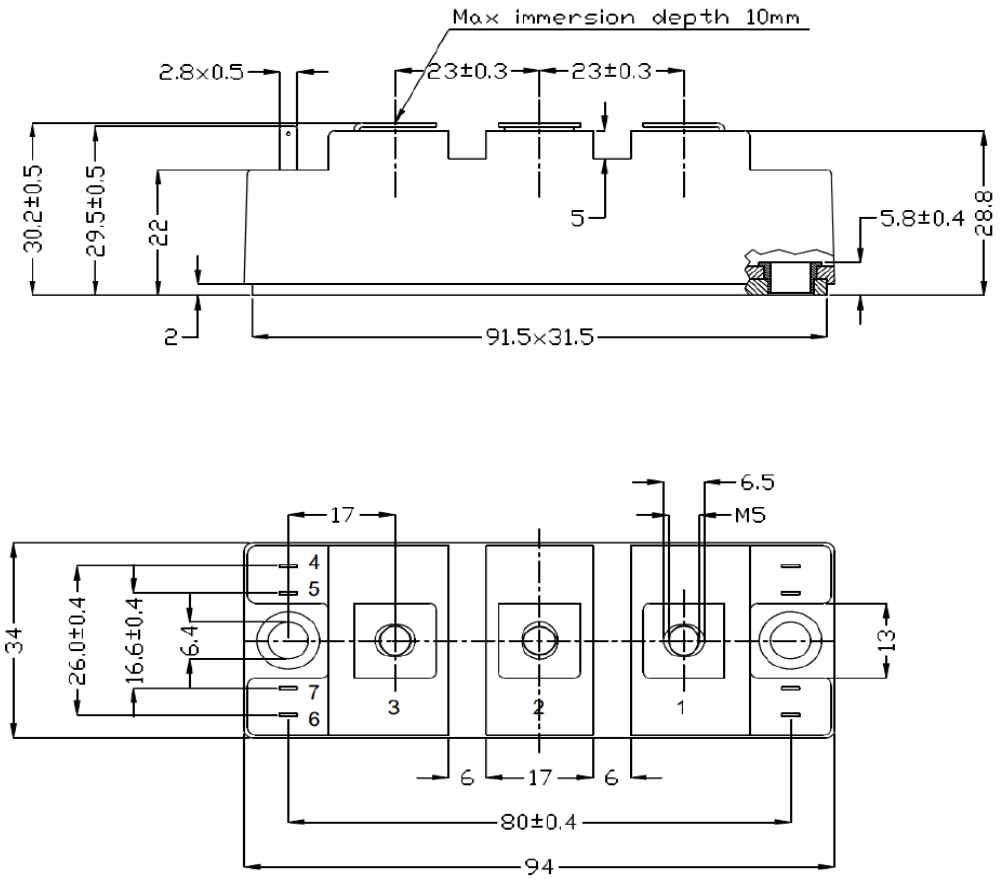
Outline:



(dimensions in mm)

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