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MRI450.17-E

2 in 1 IGBT Modules

Features：

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

Typical Applications：

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE			UNIT
			Min	Type	Max	
V_{CES}	Collector-Emitter voltage	T_j=25°C			1700	V
V_{GES}	Gate-Emitter voltage	T_j=25°C			±20	V
I_C	Collector current	T_c=100°C			450	A
I_{CM}	Repetitive peak collector current	t_P=1ms			900	A
P_D	Maximum Power Dissipation	T_j=175°C			2542	W
T_{jmax}	Junction temperature	/			175	℃
T_{jop}	Operating junction temperature		-40		150	℃
T_{stg}	Storage temperature	/	-40		125	℃
V_{iso}	Isolation between terminal and copper base	T_j=25°C , AC：1minute	4000			V
I_{CES}	Zero gate voltage collector current	T_j=25°C ,V_{CE}=1700V，V_{GE}=0V			5	mA
I_{GES}	Gate-Emitter leakage current	T_j=25°C ,V_{CE}=0V，V_{GE}=±20V			0.4	μA
$V_{GE(th)}$	Gate-Emitter threshold voltage	T_j=25°C ,V_{CE}=20V，I_C=18mA	5.6	6.2	6.8	V
$V_{CE(sat)}$	Collector-Emitter saturation voltage	T_j=25°C ,V_{GE}=15V，I_C=450A		1.85	2.2	V
		T_j=125°C ,V_{GE}=15V，I_C=450A		2.25		
		T_j=150°C ,V_{GE}=15V，I_C=450A		2.35		
R_{Gint}	Integrated gate resistor			1.67		Ω

$t_{(d)on}$	Turn-on time	V_{CC}=900V，I_C=450A，V_{GE}=±15V，R_g=3.3Ω，Inductive load	T_j=25°C		179		ns
			T_j=125°C		208		ns
			T_j=150°C		208		ns
t_r			T_j=25°C		105		ns
			T_j=125°C		120		ns
			T_j=150°C		120		ns
$t_{(d)off}$	Turn-off time		T_j=25°C		680		ns
			T_j=125°C		784		ns
			T_j=150°C		800		ns
t_f			T_j=25°C		375		ns
			T_j=125°C		613		ns
			T_j=150°C		720		ns
E_{on}	Turn-on switching loss		T_j=25°C		116		mJ
			T_j=125°C		152		mJ
			T_j=150°C		167		mJ
E_{off}	Turn-off switching loss		T_j=25°C		113		mJ
			T_j=125°C		171		mJ
			T_j=150°C		179		mJ
I_{sc}	SC data	V_{GE}=15V, V_{CC}=1000V, T_j=150°C, V_{CEM}≤1700V			1800		A
V_F	Forward on voltage	T_j=25°C ,I_F=450A			1.8	2.25	V
		T_j=125°C ,I_F=450A			1.95		V
		T_j=150°C ,I_F=450A			1.90		V
Q_r	Recovered charge	V_R=900V, I_F=450A, -di/dt=4580A/μs, V_{GE}=-15V	T_j=25°C		105		μC
			T_j=125°C		187		μC
			T_j=150°C		209		μC
I_{RM}	Peak reverse recovery current		T_j=25°C		198		A
			T_j=125°C		578		A
			T_j=150°C		585		A
E_{rec}	Reverse recovery energy		T_j=25°C		69		mJ
			T_j=125°C		129		mJ
			T_j=150°C		150		mJ
R_{25}	Rated resistance				5.0		kΩ
ΔR/R	Deviation of R_{100}	T_C=100°C, R_{100}=493.3Ω		-5		5	%
P_{25}	Power dissipation					20	mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T2-1/(298.15K))]$			3375		K
$B_{25/80}$	B-value	$R_2=R_{25}\exp[B_{25/80}(1/T2-1/(298.15K))]$			3411		K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T2-1/(298.15K))]$			3433		K
L_{CE}	Stray inductance				20		nH
$R_{CC'+EE'}$	Module lead resistance, terminal to chip				1.10		mΩ
$R_{th(j-c)}$	Thermal resistance(per chip)	IGBT			0.059		℃/W
		FWD			0.083		℃/W
W_t	Weight					350	g
Outline	465H3P						

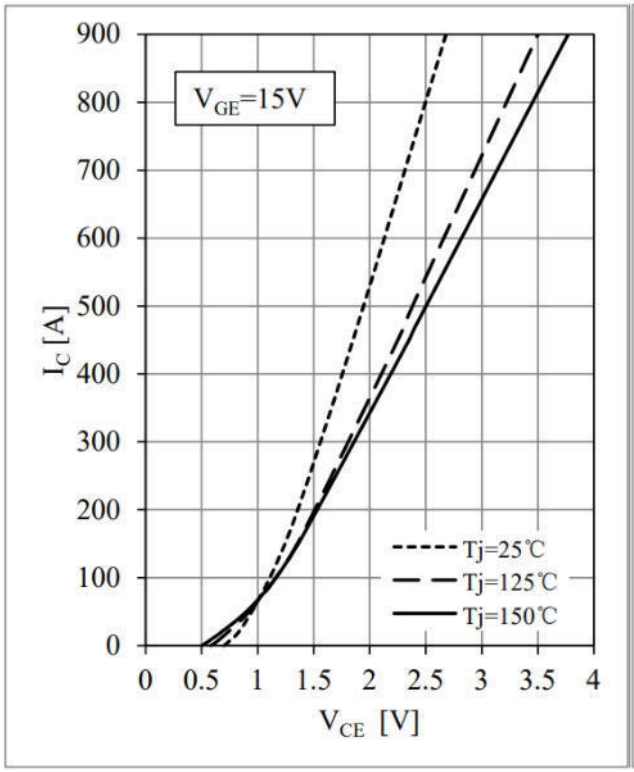


Fig 1. IGBT Output Characteristics

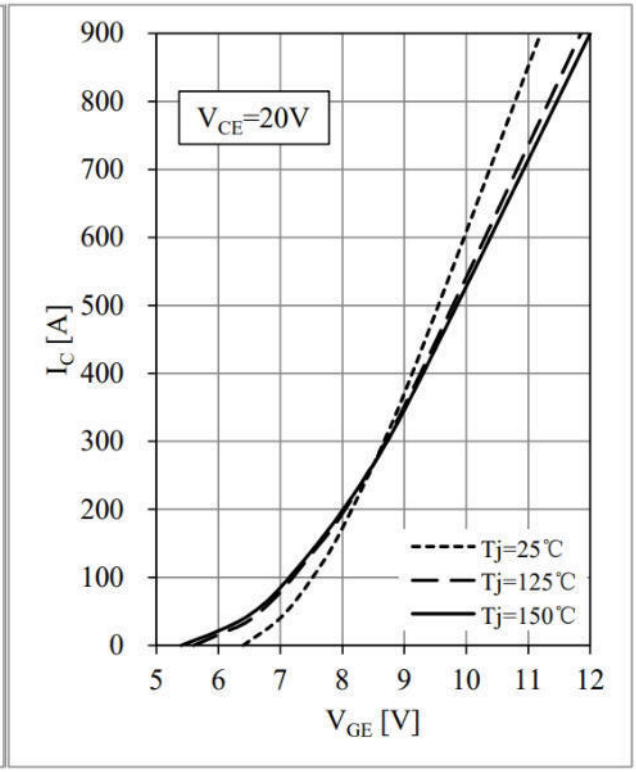


Fig 2. IGBT Transfer Characteristics

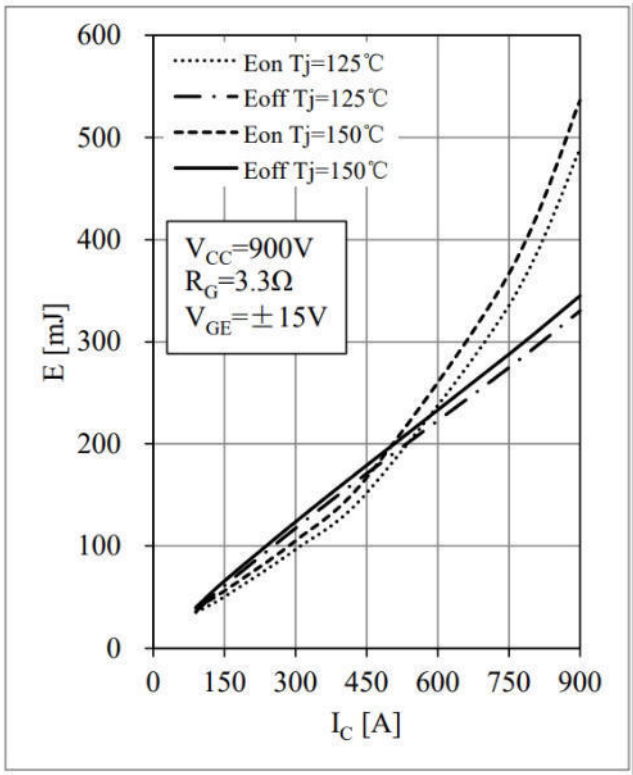


Fig 3. IGBT Switching Loss vs. I_C

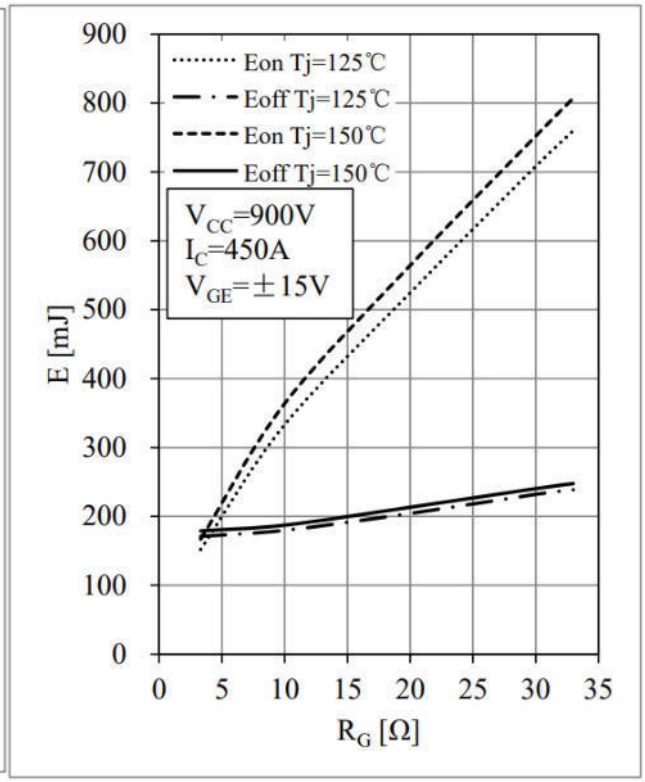


Fig 4. IGBT Switching Loss vs. R_G

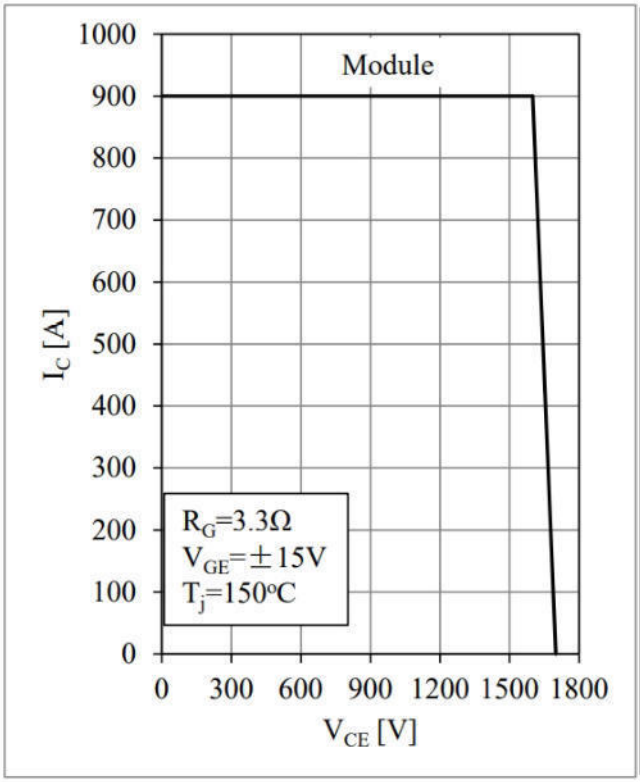


Fig 5. RBSOA

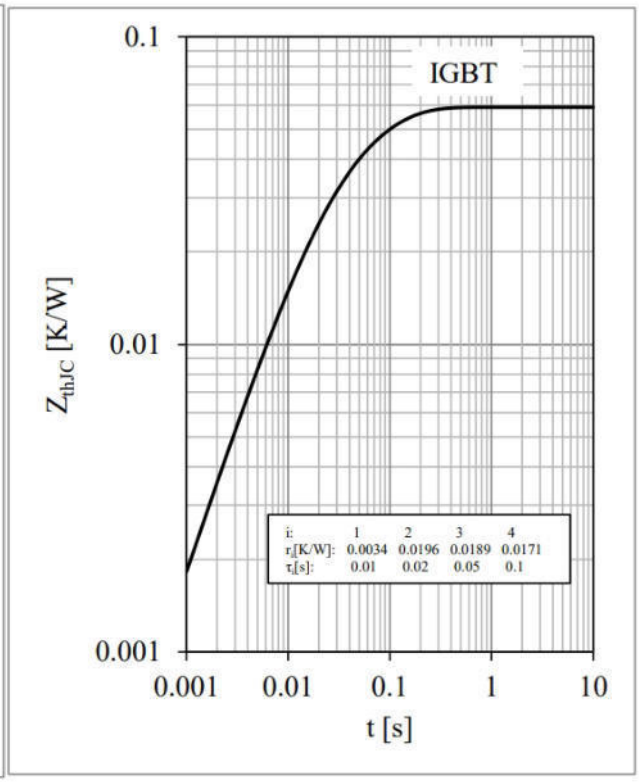


Fig 6. IGBT Transient Thermal Impedance

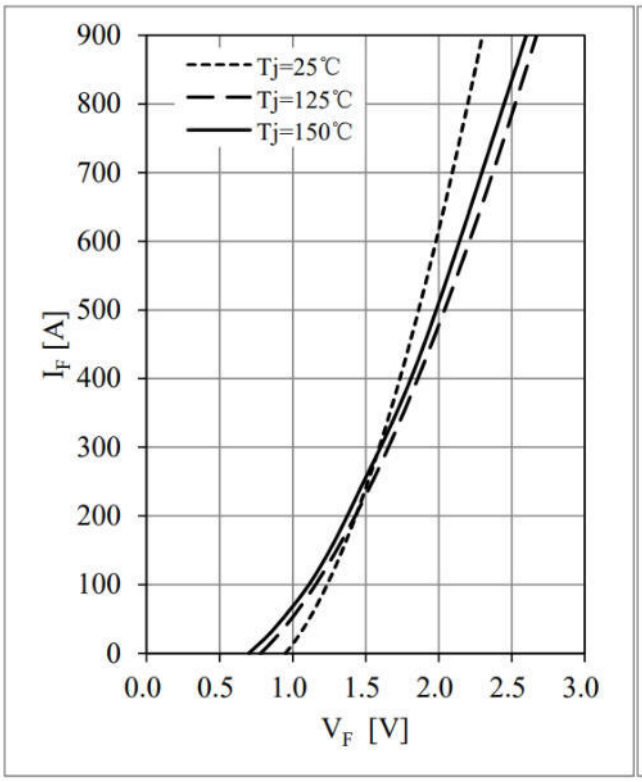


Fig 7. Diode Forward Characteristics

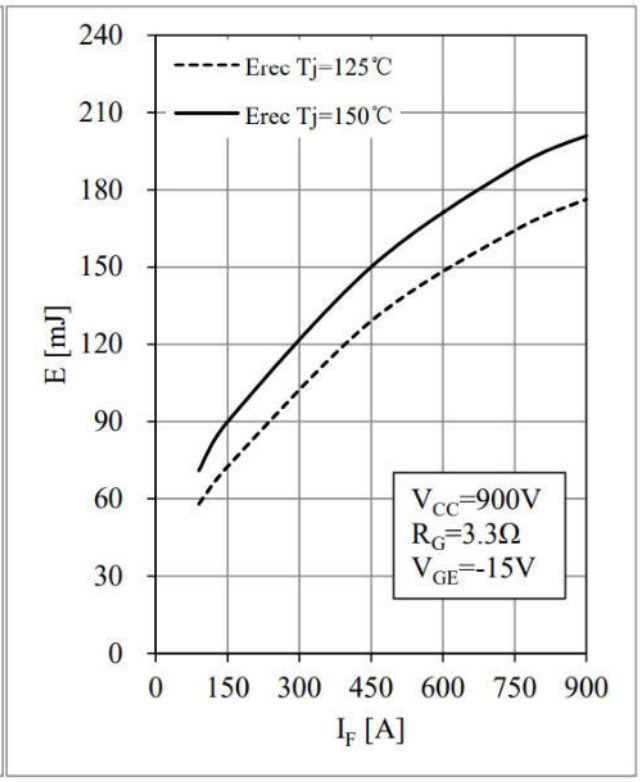


Fig 8. Diode Switching Loss vs. I_F

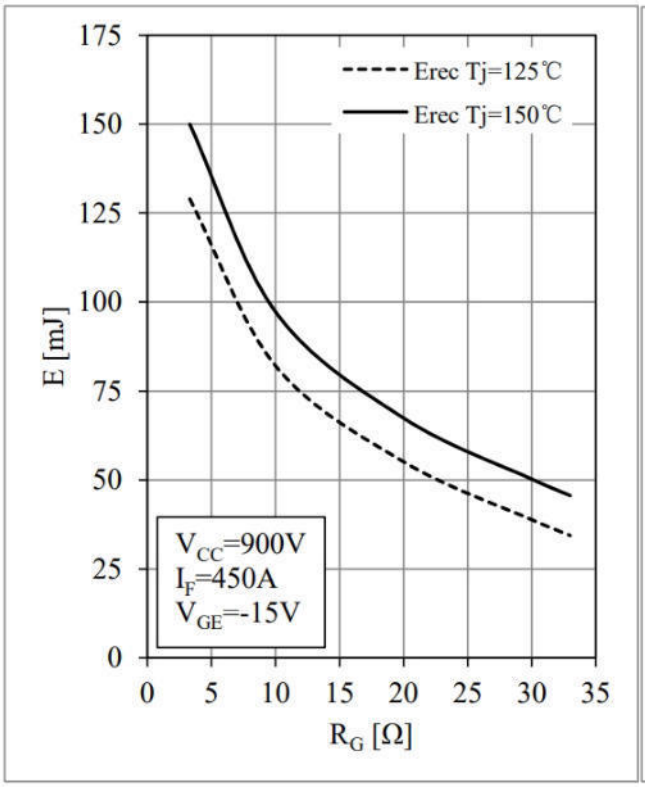


Fig 9. Diode Switching Loss vs. R_G

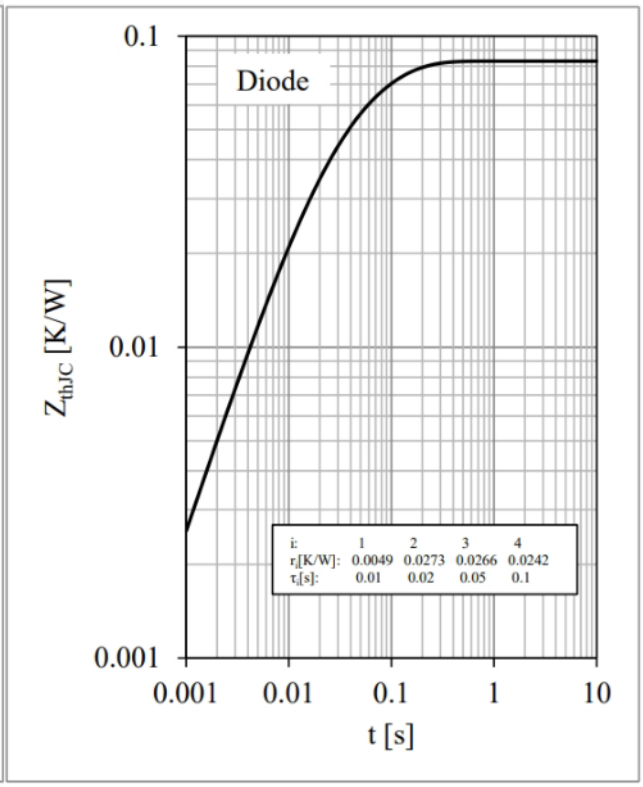


Fig 10. Diode Transient Thermal Impedance

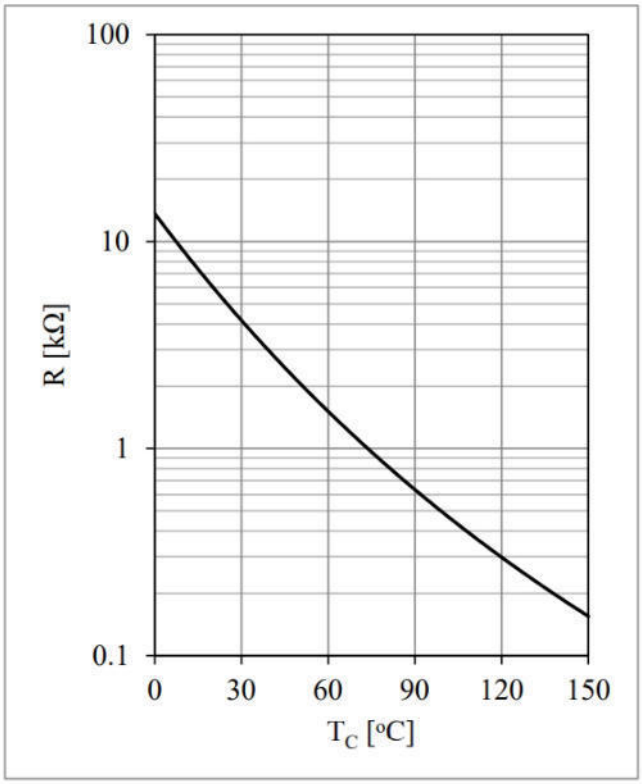
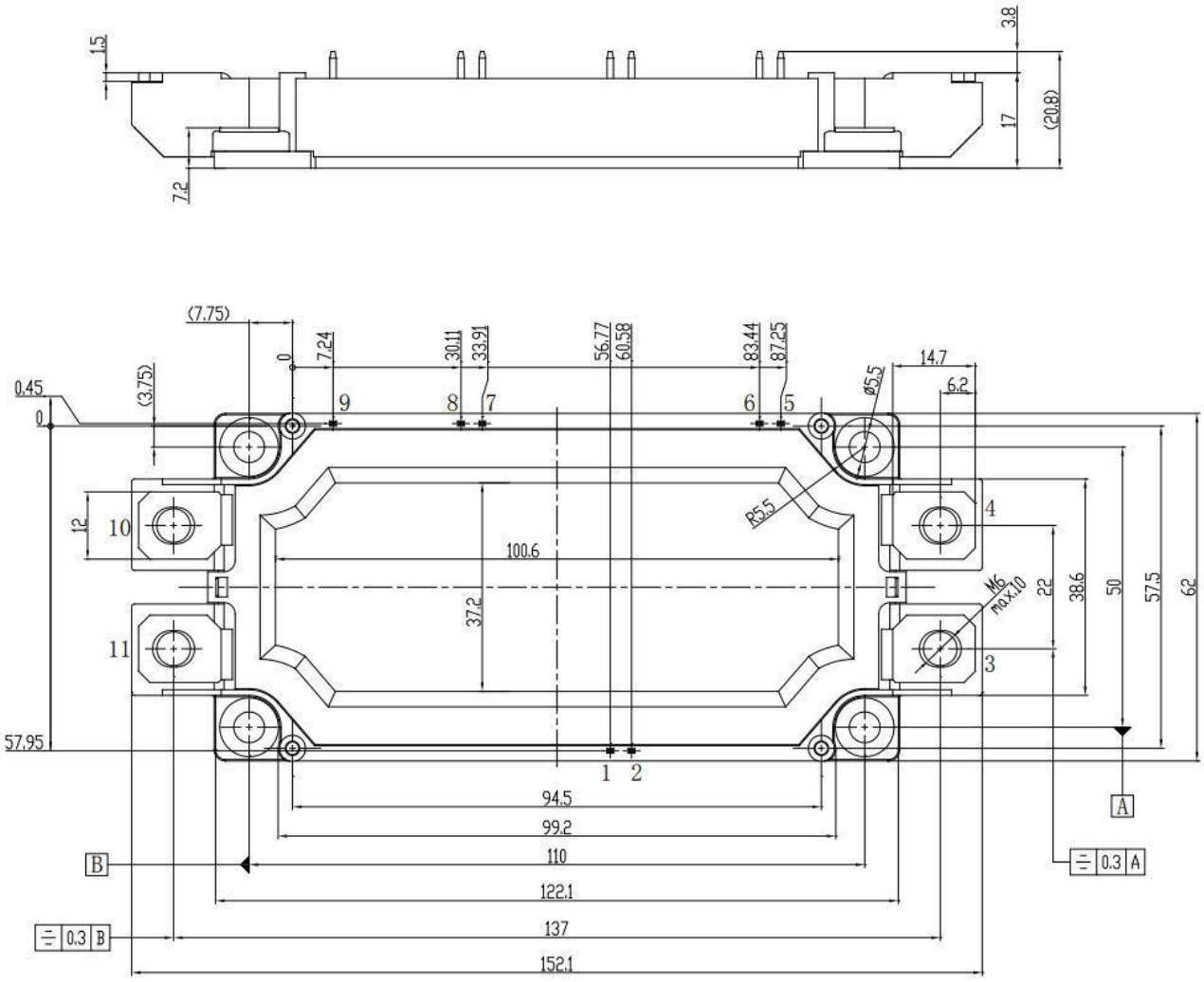
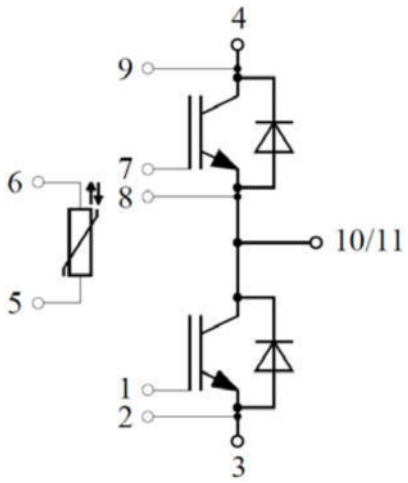


Fig 11. NTC Temperature Characteristic

Outline:





Unmarked dimensional tolerance：±0.5mm