62mm Half Bridge IGBT Module

DESCRIPTION：
- 1200V Trench / Field Stop Technology
- Low Switching Power Loss
- Positive Temperature Coefficient

TYPICAL APPLICATIONS：
- Variable-frequency Drive
- Servo
- UPS
- Inverter

V_{CES}=1200V，$I_{C\ nom}$=300A / I_{CRM}=600A

IGBT, Inverter

MAXIMUM RATINGS

Characteristic	Condition	Symbol	Value	Unit
Collector- Emitter Voltage	Tvj=25℃	V_{CES}	1200	V
Continuous DC collector current	Tc=100℃, Tvj max=175℃	$I_{C\ nom}$	300	A
Repetitive peak collector current	t_P=1ms	I_{CRM}	600	A
Gate emitter voltage		V_{GE}	±20	V

ELECTRICAL CHARATERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector-Emitter saturation voltage VGE=15V, IC=300A Tvj=25℃ VGE=15V, IC=300A Tvj=125℃ VGE=15V, IC=300A Tvj=150℃	$V_{CE(SAT)}$		2.00 2.45 2.60	2.50	V
Gate-Emitter threshold voltage IC=11.5mA, VGE= VCE Tvj=25℃	$V_{GE(th)}$	5.3	5.9	6.5	V
Gate charge VGE = -15 V ... +15 V	Q_G		1.60		uC
Internal gate resistor	R_{Gint}		1.70		Ω
Input capacitance f=1 MHz, VCE=25V, VGE=0V Tvj=25℃	C_{ies}		27.50		nF

Reverse transfer capacitance f=1 MHz, VCE=25V, VGE=0V Tvj=25℃	C_{res}		0.85		nF
Collector-emitter cut-off current VCE=1200V, VGE=0V Tvj=25℃	I_{CES}			2	mA
Gate-emitter leakage current VCE=0V, VGE=20V Tvj=25℃	I_{GES}			200	nA
Turn-on delay time IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=2Ω Tvj=125℃ (inductive load) Tvj=150℃	$td_{(ON)}$		185 194 194		ns
Rise time IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=2Ω Tvj=125℃ (inductive load) Tvj=150℃	tr		48 52 54		ns
Turn-off delay time IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=2Ω Tvj=125℃ (inductive load) Tvj=150℃	$td_{(OFF)}$		245 287 297		ns
Fall time IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=2Ω Tvj=125℃ (inductive load) Tvj=150℃	tf		153 221 224		ns
Turn-on energy loss per pulse IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=2.5Ω Tvj=125℃ dv/dt = 5513V/µs (Tvj = 150°C) Tvj=150℃ (inductive load)	$E_{(ON)}$		13.00 26.90 31.40		mJ
Turn-off energy loss per pulse IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=2.5Ω Tvj=125℃ dv/dt = 5513V/µs (Tvj = 150°C) Tvj=150℃ (inductive load)	$E_{(OFF)}$		19.90 25.90 27.27		mJ
Short circuit (SC) data VGE≦15 V, VCE=800 V VCEmax=V_{CES}-Ls_{CE}·di/dt t_P≤10us, Tvj=150 C	I_{SC}		927		A
Temperature under switching conditions	Tvj op	-40		150	℃

Diode, Inverter

MAXIMUM RATINGS

Characteristic	Condition	Symbol	Value	Unit
Repetitive peak reverse voltage	Tvj=25℃	V_{RRM}	1200	V
Continuous DC forward current		I_F	300	A
Repetitive peak forward current	t_P=1ms	I_{FRM}	600	A
I²t -value	t_P=10ms, sin180°, Tvj=125°C	I^2t	34848	A^2s

ELECTRICAL CHARATERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Forward voltage IF=300A, VGE=0 V Tvj=25℃ IF=300A, VGE=0 V Tvj=125℃ IF=300A, VGE=0 V Tvj=150℃	V_F		2.00 1.75 1.64	2.75	V
Peak reverse recovery current IF=300 A, Tvj=25℃ -diF/dt =4840A/µs(Tvj=150°C) Tvj=125℃ VR=600 V ,VGE= -15 V Tvj=150℃	I_{RM}		256 339 358		A
Recovered charge IF=300 A, Tvj=25℃ -diF/dt =4840A/µs(Tvj=150°C) Tvj=125℃ VR=600 V ,VGE= -15 V Tvj=150℃	Q_r		27.07 56.26 64.18		uC
Reverse recovered energy IF=300 A, Tvj=25℃ -diF/dt =4840A/µs(Tvj=150°C) Tvj=125℃ VR=600 V ,VGE= -15 V Tvj=150℃	E_{rec}		11.54 22.01 24.23		mJ
Temperature under switching conditions	Tvj op	-40		150	℃

Module

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Isolation test voltage RMS, f=50Hz, t=1min	V_{ISOL}		4000		V
Internal isolation			AL_2O_3		

Storage temperature	T_{STG}	-40		125	℃
Mounting torque for modul mounting	M	3		6	Nm
Weight	W		315		g

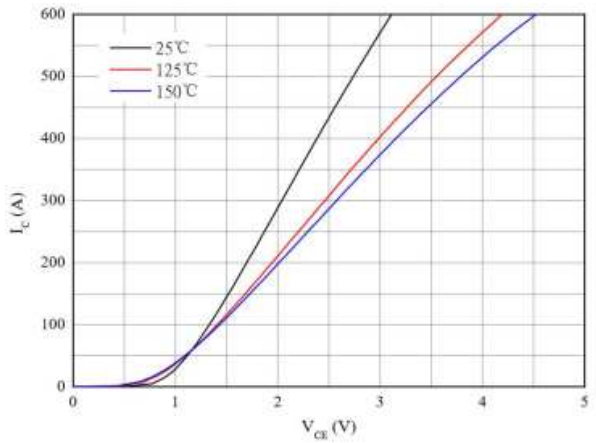


Figure 1. Typical output characteristics (VGE=15V)

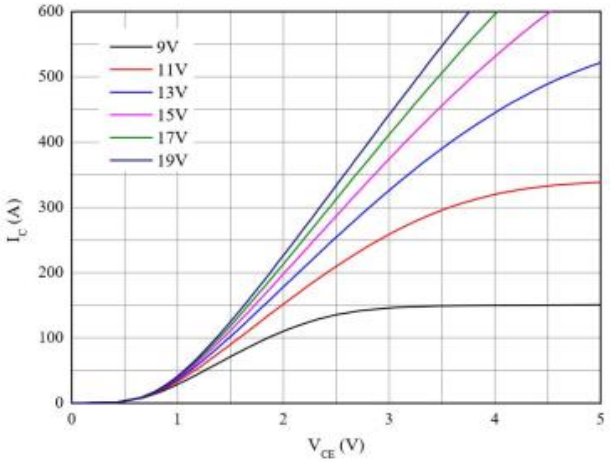


Figure 2. Typical output characteristics (Tvj=150℃)

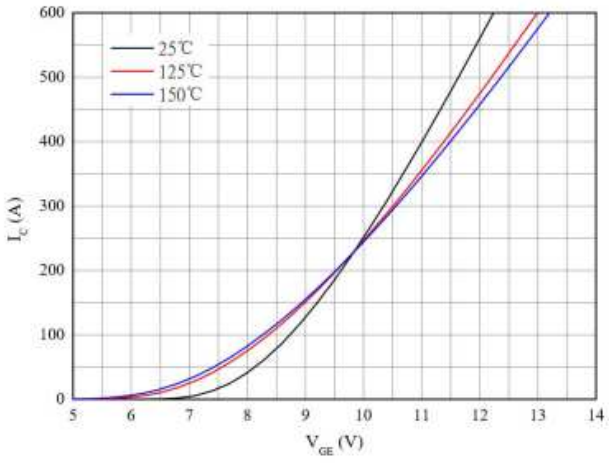


Figure 3. Typical transfer characteristic(VCE=20V)

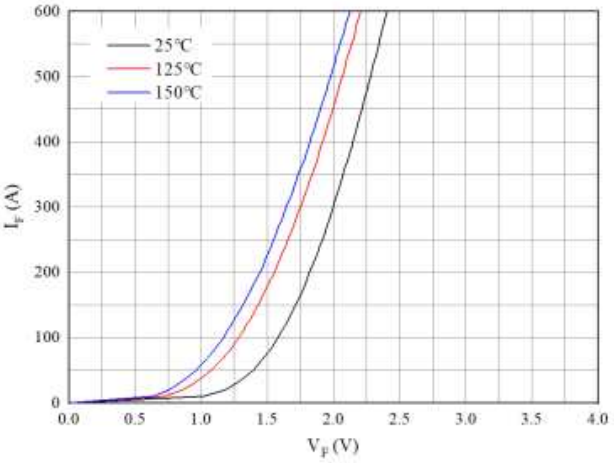


Figure 4. Forward characteristic of Diode

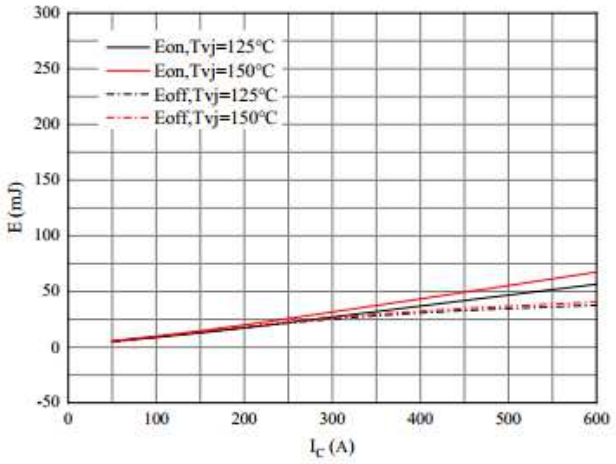


Figure 5. Switching losses of IGBT
VGE=± 15V, RGon=2Ω, RGoff=2Ω, VCE=600V

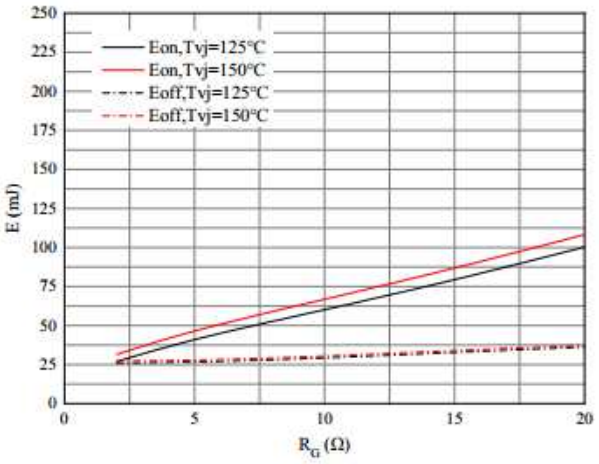


Figure 6. Switching losses of IGBT
VGE=± 15V, IC=300A, VCE=600V

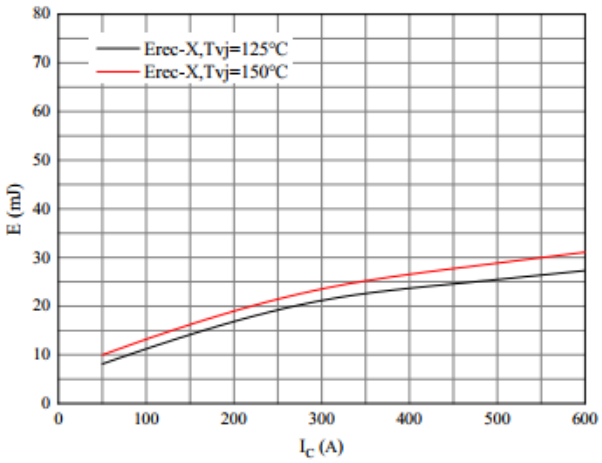


Figure 7. Switching losses of Diode
RGon=2Ω, VCE=600V

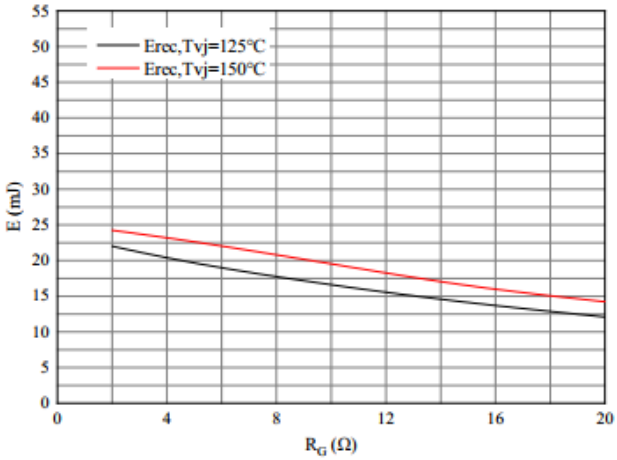


Figure 8. Switching losses of Diode
IF=300A, VCE=600V

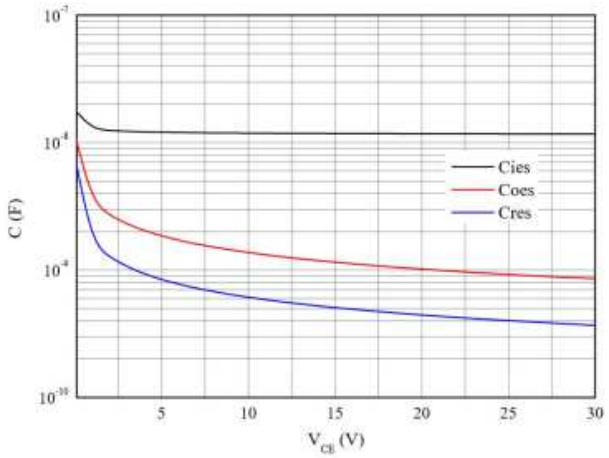
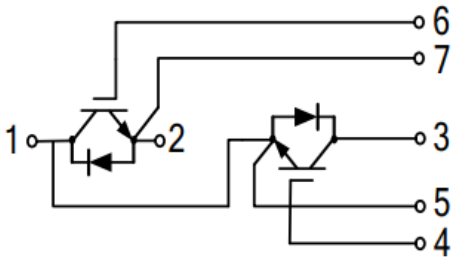
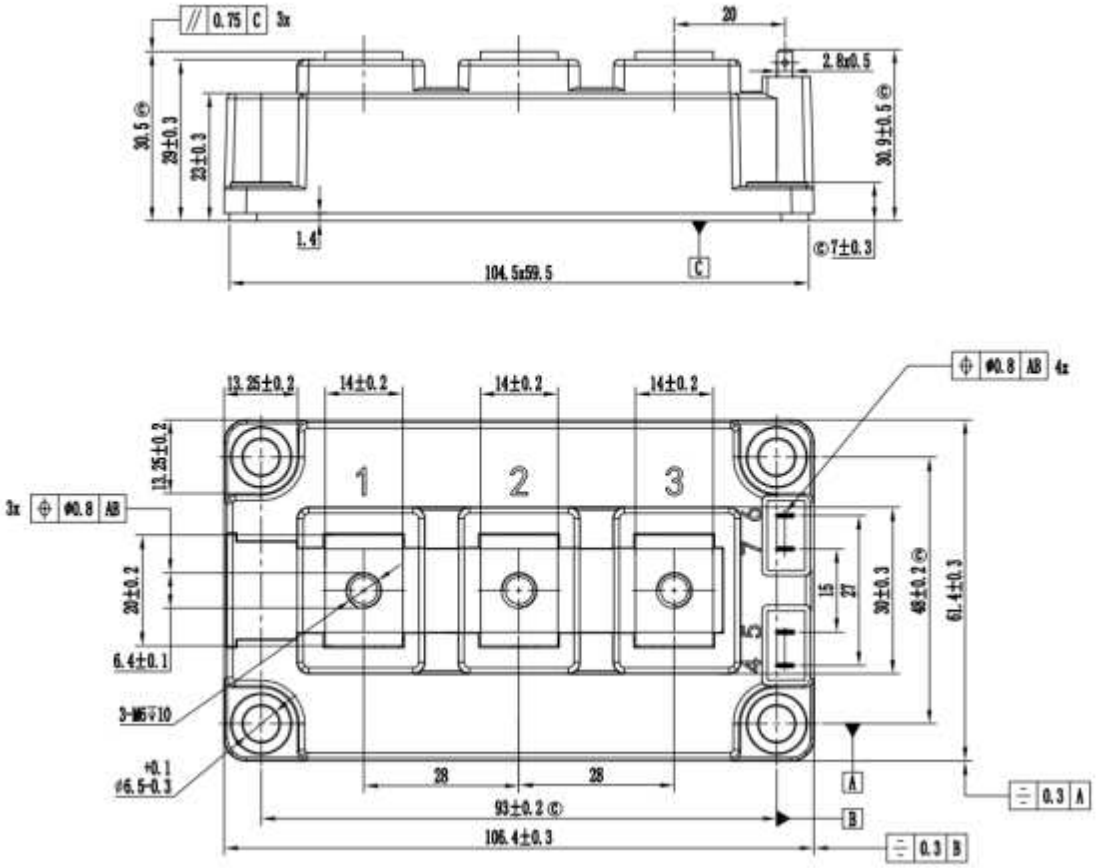


Figure 9. Capacitance characteristic

• Circuit diagram



• Package outlines : Dimensions in (mm)



Remark: 1. © control key dimensions
2.Unmarked tolerances shall be implemented in accordance with GB/T1804-m

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