

Electrical Features

- Trench/Fieldstop IGBT
- Half-bridge
- Standard package
- Including anti-parallel FWD



Typical Applications

- High Power Converters
- UPS Systems
- Welding Machine

IGBT, Inverter

Maximum Rated Values							
Symbol	Item	Conditions	Rating			Unit	
IGBT							
V_{CES}	Collector-emitter voltage	$T_{vj}=25^{\circ}\text{C}$	1200			V	
V_{GES}	Gate-emitter voltage	-	± 20			V	
I_C	Collector current,DC	$T_C=100^{\circ}\text{C}, T_{vj}=175^{\circ}\text{C}$	50			A	
I_{CRM}	Repetitive peak collector current	$t_p=1\text{ms}$	100			A	
P_{tot}	Total power dissipation	$T_C=25^{\circ}\text{C}, T_{vj}=175^{\circ}\text{C}$	579			W	
Characteristics Values							
Symbol	Item	Conditions	Values			Unit	
IGBT			Min.	Typ.	Max.		
I_{CES}	Collector-emitter cut-off current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$	-	-	1	mA	
I_{GES}	Gate leakage current	$V_{CE}=0\text{V}, V_{GE}=20\text{V}, T_{vj}=25^{\circ}\text{C}$	-	-	250	nA	
$V_{GE(th)}$	Gate-emitter threshold voltage	$I_C=1\text{mA}, V_{CE}=V_{GE}, T_{vj}=25^{\circ}\text{C}$	5.2	5.7	6.4	V	
V_{CEsat}	Collector-emitter saturation voltage	$I_C=50\text{A}$ $V_{GE}=15\text{V}$	$T_{vj}=25^{\circ}\text{C}$	-	1.9		2.3
			$T_{vj}=125^{\circ}\text{C}$	-	2.4		-
			$T_{vj}=150^{\circ}\text{C}$	-	2.4	-	
C_{ies}	Input capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}$	-	3.9	-	nF	
C_{res}	Reverse transfer capacitance	$f=1\text{MHz}, T_{vj}=25^{\circ}\text{C}$	-	0.1	-		
Q_G	Gate charge	$V_{GE}=-15\text{V}\dots+15\text{V}$	-	0.61	-	uC	

$t_{d(on)}$	Turn-on delay time	$V_{CC}=600V,$ $I_C=50A,$ $V_{GE}=\pm 15V,$ $R_{G(on)}=10\ \Omega,$ $R_{G(off)}=10\ \Omega,$ $di/dt=1220A/\mu s$ $(T_{vj}=125^\circ C)$ $du/dt=6765V/\mu s$ $(T_{vj}=125^\circ C)$	$T_{vj}=25^\circ C$	-	69	-	ns
			$T_{vj}=125^\circ C$	-	63	-	
			$T_{vj}=150^\circ C$	-	62	-	
t_r	Rise time		$T_{vj}=25^\circ C$	-	54	-	
			$T_{vj}=125^\circ C$	-	51	-	
			$T_{vj}=150^\circ C$	-	49	-	
$t_{d(off)}$	Turn-off delay time		$T_{vj}=25^\circ C$	-	146	-	
			$T_{vj}=125^\circ C$	-	158	-	
			$T_{vj}=150^\circ C$	-	159	-	
t_f	Fall time		$T_{vj}=25^\circ C$	-	159	-	
			$T_{vj}=125^\circ C$	-	200	-	
			$T_{vj}=150^\circ C$	-	217	-	
E_{on}	Turn-on energy (per pulse)	$T_{vj}=25^\circ C$	-	3.58	-	mJ	
		$T_{vj}=125^\circ C$	-	4.67	-		
		$T_{vj}=150^\circ C$	-	4.99	-		
E_{off}	Turn-off energy (per pulse)	$T_{vj}=25^\circ C$	-	1.70	-		
		$T_{vj}=125^\circ C$	-	2.09	-		
		$T_{vj}=150^\circ C$	-	2.53	-		
R_{thJC}	Thermal resistance, junction to case	per IGBT	-	0.259	-	K/W	
R_{thCH}	Thermal resistance, case to heatsink	per IGBT/ $\lambda_{grease}=1W/(m \cdot K)$	-	0.159	-	K/W	
T_{vjop}	Temperature under switching conditions		-40		150	$^\circ C$	

Diode, Inverter

Maximum Rated Values

Symbol	Item	Conditions	Rating	Unit
V_{RRM}	Repetitive peak reverse voltage	$T_{vj}=25^\circ C$	1200	V
I_F	Forward current, DC	$T_C=100^\circ C, T_{vj}=175^\circ C$	25	A
I_{FRM}	Repetitive peak forward current	$t_p=1ms$	50	A

Characteristic Values

V_F	Continuous forward voltage	$I_F=25A$ $V_{GE}=0V$	$T_{vj}=25^\circ C$	-	1.8	2.45	V
			$T_{vj}=125^\circ C$	-	1.4	-	
			$T_{vj}=150^\circ C$	-	1.4	-	
I_{RM}	Peak reverse recovery current		$T_{vj}=25^\circ C$	-	34	-	A
			$T_{vj}=125^\circ C$	-	47	-	
			$T_{vj}=150^\circ C$	-	53	-	
t_{rr}	Reverse recovery time	$V_R=600V$ $I_F=50A$ $-di_F/dt=1220A/\mu s$ $(T_{vj}=125^\circ C)$	$T_{vj}=25^\circ C$	-	107	-	ns
			$T_{vj}=125^\circ C$	-	232	-	
			$T_{vj}=150^\circ C$	-	246	-	
Q_r	Recovered charge		$T_{vj}=25^\circ C$	-	2.2	-	μC
			$T_{vj}=125^\circ C$	-	4.8	-	
			$T_{vj}=150^\circ C$	-	5.8	-	

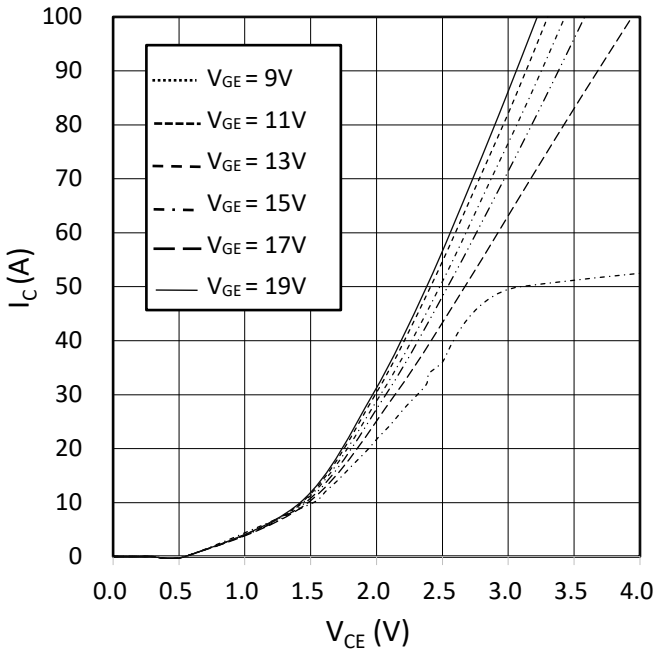
E _{rec}	Reverse recovery energy		T _{vj} =25°C	-	0.73	-	mJ
			T _{vj} =125°C	-	2.02	-	
			T _{vj} =150°C	-	2.48	-	
R _{thJC}	Thermal resistance, junction to case	per diode	-	0.54	-	K/W	
R _{thCH}	Thermal resistance, case to heatsink	per diode/ λgrease=1W/(m·K)	-	0.175	-	K/W	
T _{vjop}	Temperature under switching conditions		-40		150	°C	

Module

Symbol	Item	Conditions	Rating			Unit
V _{ISOL}	Isolation voltage	Terminals to baseplate, RMS, f=50Hz, t=1min	2500			V
-	Material of module baseplate	-	Cu			-
-	Internal isolation	Basic insulation(class 1, IEC 61140)	Al ₂ O ₃			-
T _{stg}	Storage temperature	-	-40~125			°C
Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
M	Mounting torque for module mounting	Screw M6	3.0	-	5.0	Nm
	Terminal connection torque	Screw M5	2.5	-	5.0	Nm
ds	Creepage distance	Terminal to terminal	-	23	-	mm
		Terminal to base plate	-	29	-	
da	Clearance	Terminal to terminal	-	11	-	mm
		Terminal to base plate	-	23	-	
m	Weight	-	-	150	-	g

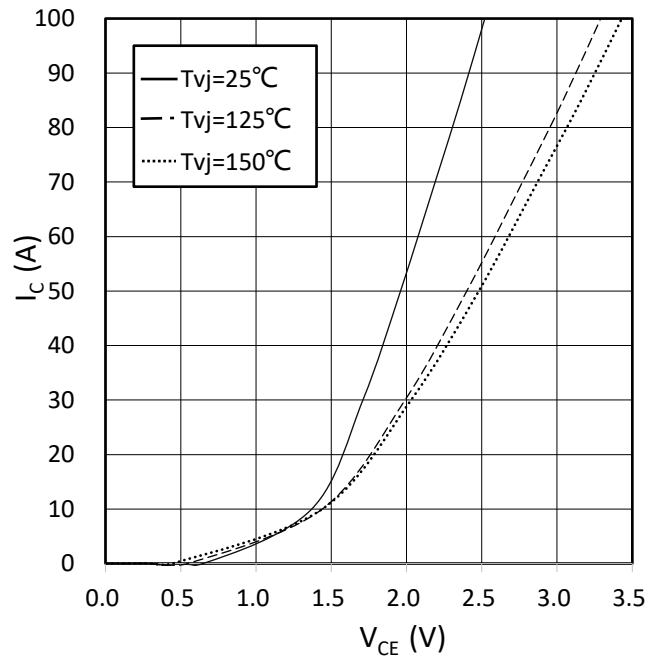
output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
 $T_{vj} = 150^\circ\text{C}$



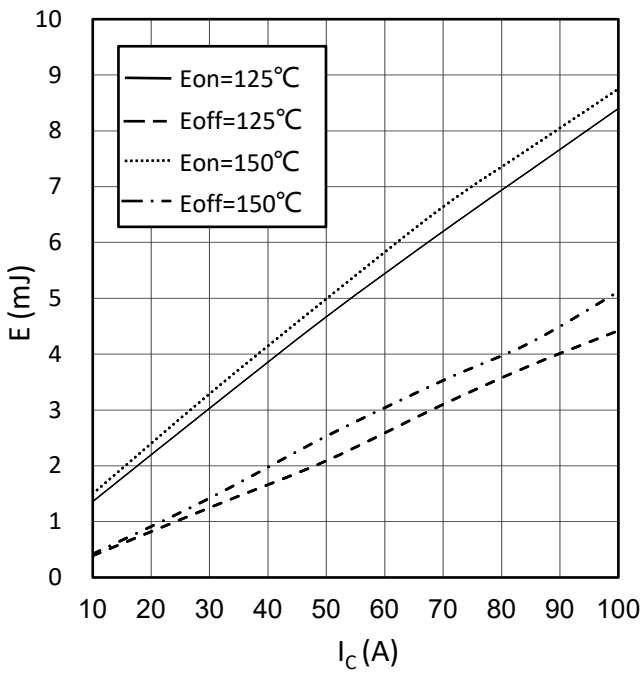
output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
 $V_{GE} = 15\text{ V}$



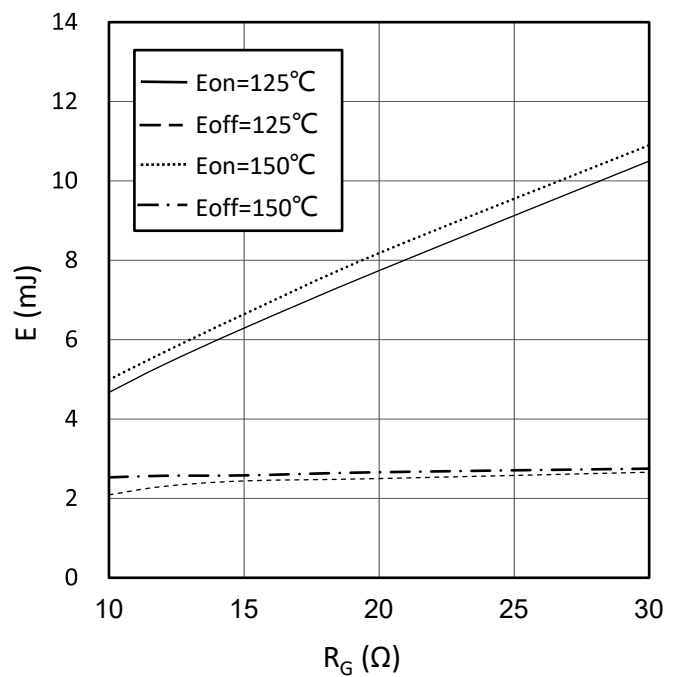
switching losses IGBT, Inverter (typical)

$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{V}$, $R_{Gon} = 10\Omega$, $R_{Goff} = 10\Omega$, $V_{CE} = 600\text{V}$



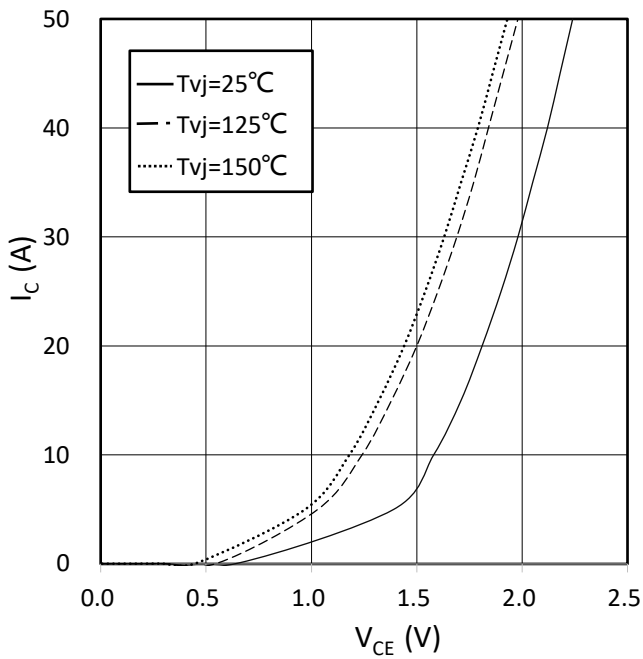
switching losses IGBT, Inverter (typical)

$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
 $V_{GE} = \pm 15\text{V}$, $I_C = 50\text{A}$, $V_{CE} = 600\text{V}$



forward characteristic of Diode, Inverter (typical)

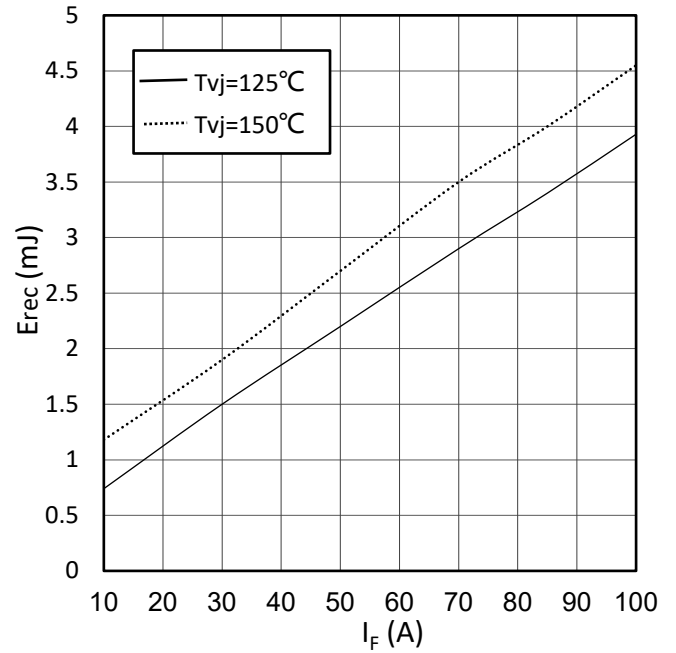
$I_F = f(V_F)$



switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$

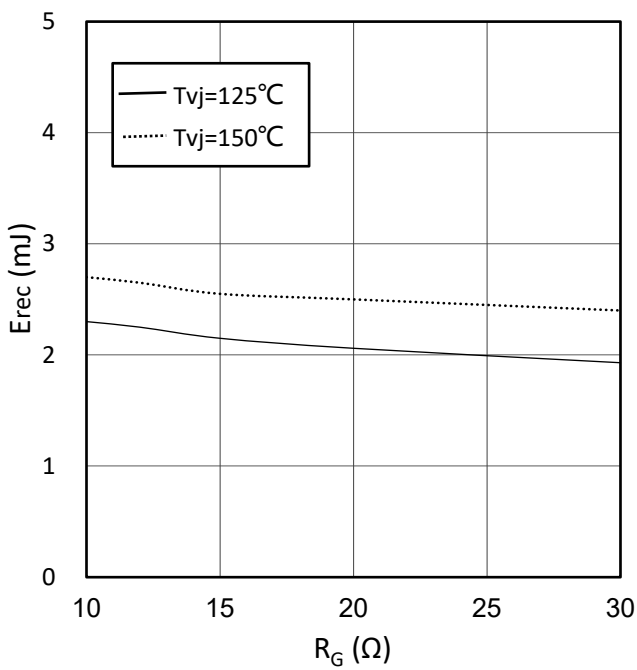
$R_{Gon}=10\Omega, V_{CE}=600V$



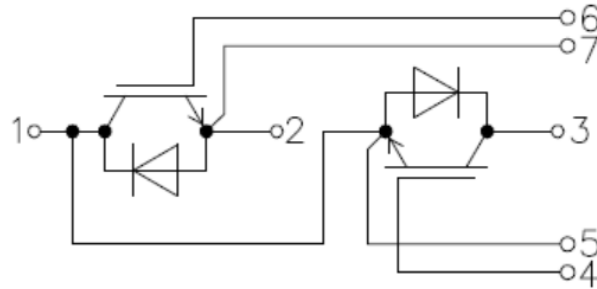
switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$

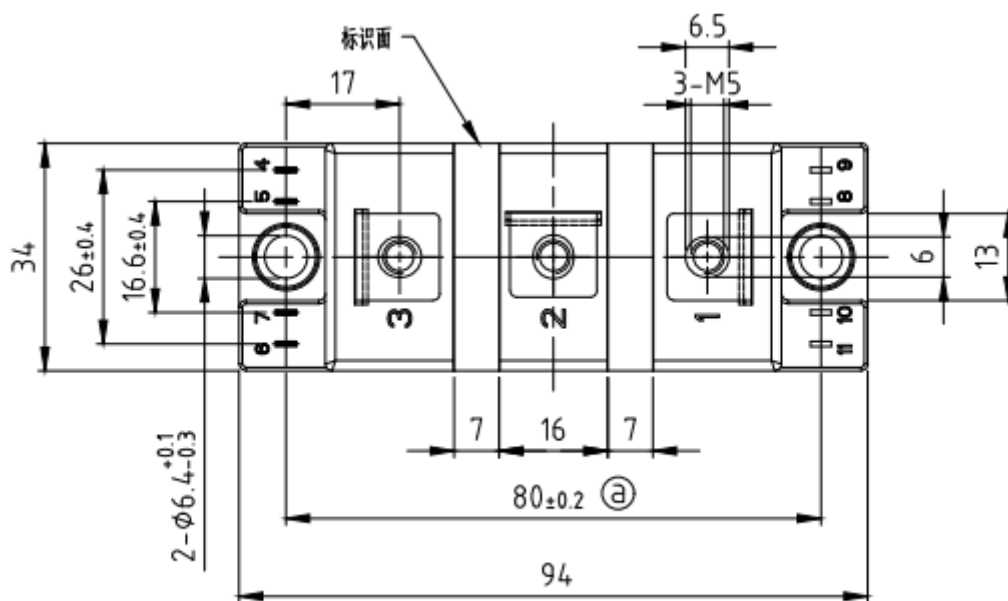
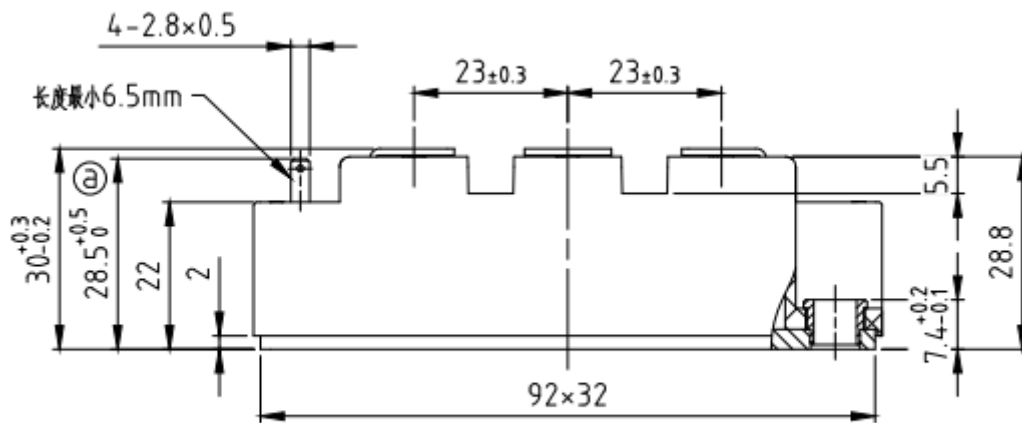
$I_F=50A, V_{CE}=600V$



Circuit diagram headline



Package outlines (Unit: mm)



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序号 Item	日期Date	变更记录及描述 Change History Description	版本序号 Rev. item	经办人 Responsibility
1	22/11/14	初版规格书发布, 版本为V1.0	2022 11 Ver1.0	梁华文
2	23/2/11	更新热阻、功率, 版本为V1.1	2023 02 Ver1.1	梁华文