

Electrical Features

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



Typical Applications

- UPS System
- Welding Machine
- High Frequency Switching Application

IGBT, Inverter

Maximum Rated Values							
Symbol	Item	Conditions	Rating			Unit	
IGBT							
V_{CES}	Collector-emitter voltage	$T_{vj}=25^{\circ}C$	1200			V	
V_{GES}	Gate-emitter voltage	-	± 20			V	
I_C	Collector current,DC	$T_C=100^{\circ}C, T_{vj}=175^{\circ}C$	300			A	
I_{CRM}	Repetitive peak collector current	$t_p=1ms$	600			A	
P_{tot}	Total power dissipation	$T_C=25^{\circ}C, T_{vj}=175^{\circ}C$	1666			W	
Characteristics Values							
Symbol	Item	Conditions	Values			Unit	
			Min.	Typ.	Max.		
IGBT							
I_{CES}	Collector-emitter cut-off current	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$	-	-	1	mA	
I_{GES}	Gate leakage current	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$	-	-	250	nA	
$V_{GE(th)}$	Gate-emitter threshold voltage	$I_C=11.5mA, V_{CE}=V_{GE}, T_{vj}=25^{\circ}C$	5	5.6	7	V	
V_{CESat}	Collector-emitter saturation voltage	$I_C=300A$ $V_{GE}=15V$	$T_{vj}=25^{\circ}C$	-	1.87		-
			$T_{vj}=125^{\circ}C$	-	2.22		-
			$T_{vj}=150^{\circ}C$	-	2.29	-	
C_{ies}	Input capacitance	$V_{CE}=25V, V_{GE}=0V$	-	19.4	-	nF	
C_{res}	Reverse transfer capacitance	$f=1MHz, T_{vj}=25^{\circ}C$	-	0.6	-		
Q_G	Gate charge	$V_{CC}=600V, I_C=300A, V_{GE}=15V$	-	2.4	-	μC	

t _{d(on)}	Turn-on delay time	V _{CC} =600V I _C =300A V _{GE} =±15V R _{G(on)} =8.2 Ω R _{G(off)} =8.2 Ω Inductive load	T _{vj} =25°C	-	75.2	-	ns	
			T _{vj} =125°C	-	105.6	-		
			T _{vj} =150°C	-	108.8	-		
t _r	Rise time		T _{vj} =25°C	-	67.2	-		
			T _{vj} =125°C	-	86.4	-		
			T _{vj} =150°C	-	84.8	-		
t _{d(off)}	Turn-off delay time		T _{vj} =25°C	-	340.8	-		
			T _{vj} =125°C	-	539.2	-		
			T _{vj} =150°C	-	667.2	-		
t _f	Fall time		T _{vj} =25°C	-	89.6	-		
			T _{vj} =125°C	-	110.4	-		
			T _{vj} =150°C	-	112.0	-		
E _{on}	Turn-on energy (per pulse)	V _{CC} =600V, I _C =300A V _{GE} =±15V, R _{G(on)} =8.2Ω di/dt=3750A/μs(T _{vj} =150°C)	T _{vj} =25°C	-	13.47	-	mJ	
			T _{vj} =125°C	-	42.06	-		
			T _{vj} =150°C	-	46.62	-		
E _{off}	Turn-off energy (per pulse)		T _{vj} =25°C	-	18.02	-		
			T _{vj} =125°C	-	25.17	-		
			T _{vj} =150°C	-	26.20	-		
R _{thJC}	Thermal resistance, junction to case	per IGBT	-	-	0.09	K/W		
R _{thCH}	Thermal resistance, case to heatsink	per IGBT/ λgrease=1W/(m·K)	-	0.03	-	K/W		
T _{vjop}	Temperature under switching conditions		-40		150	°C		
Diode, Inverter								
Maximum Rated Values								
Symbol	Item	Conditions		Rating		Unit		
V _{RRM}	Repetitive peak reverse voltage	T _{vj} =25°C		1200		V		
I _F	Forward current, DC			200		A		
I _{FRM}	Repetitive peak forward current	t _p =1ms		400		A		
Characteristic Values								
V _F	Continuous forward voltage	I _F =200A V _{GE} =0V	T _{vj} =25°C	-	1.66	-	V	
			T _{vj} =125°C	-	1.41	-		
			T _{vj} =150°C	-	1.36	-		
I _{RM}	Peak reverse recovery current		T _{vj} =25°C	-	295	-	A	
			T _{vj} =125°C	-	307	-		
			T _{vj} =150°C	-	311	-		
t _{rr}	Reverse recovery time		V _R =600V I _F =300A V _{GE} =-15V -di _F /dt=3560A/μs (T _{vj} =150°C)	T _{vj} =25°C	-	156.1	-	ns
				T _{vj} =125°C	-	249.2	-	
				T _{vj} =150°C	-	287.1	-	
Q _r	Recovered charge	T _{vj} =25°C		-	24.89	-	μC	
		T _{vj} =125°C		-	56.36	-		
		T _{vj} =150°C		-	66.85	-		
E _{rec}	Reverse recovery energy	T _{vj} =25°C		-	17.56	-	mJ	
		T _{vj} =125°C		-	25.54	-		
		T _{vj} =150°C		-	30.03	-		

R_{thJC}	Thermal resistance, junction to case	per diode	-	-	0.15	K/W
R_{thCH}	Thermal resistance, case to heatsink	per diode/ $\lambda_{grease}=1W/(m \cdot K)$	-	0.052	-	K/W
T_{vjop}	Temperature under switching conditions		-40		150	°C

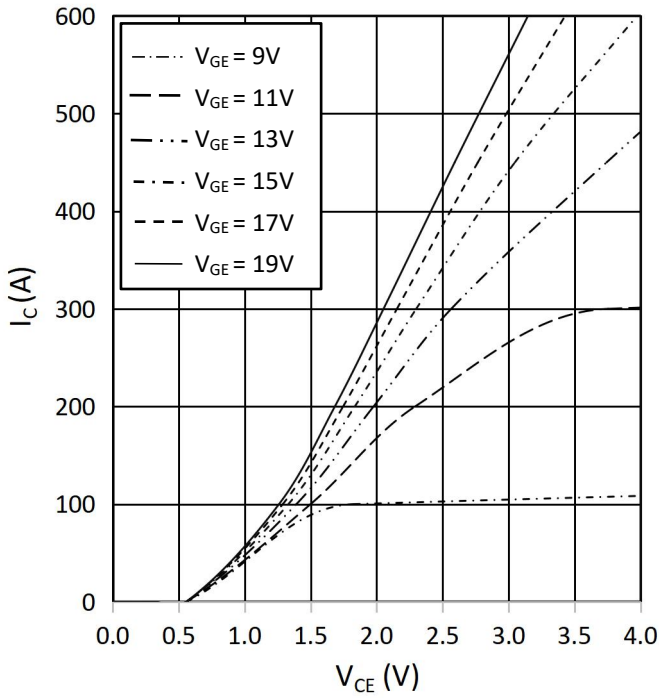
Module

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_2O_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	-	6.0	Nm
	Terminal connection torque	Screw M6	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	-	-	315	-	g

output characteristic IGBT, Inverter (typical)

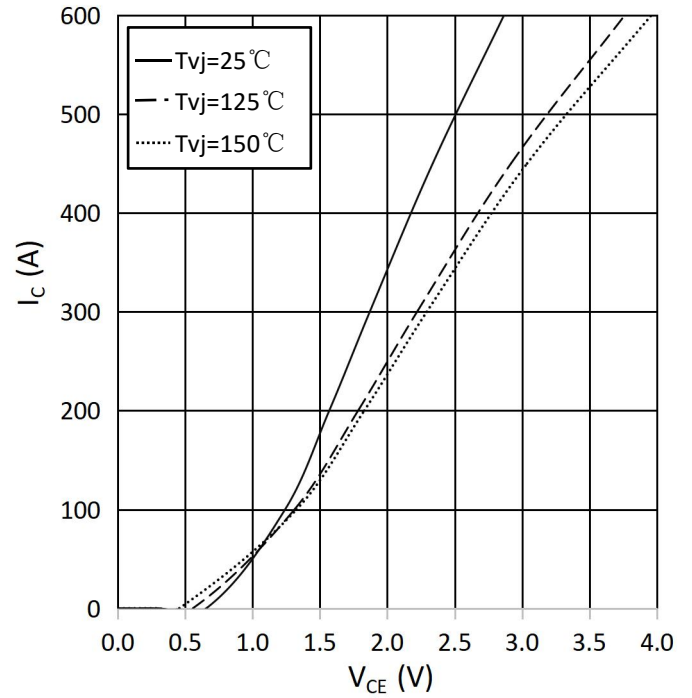
$I_C = f(V_{CE})$

$T_{vj} = 150^\circ\text{C}$


output characteristic IGBT, Inverter (typical)

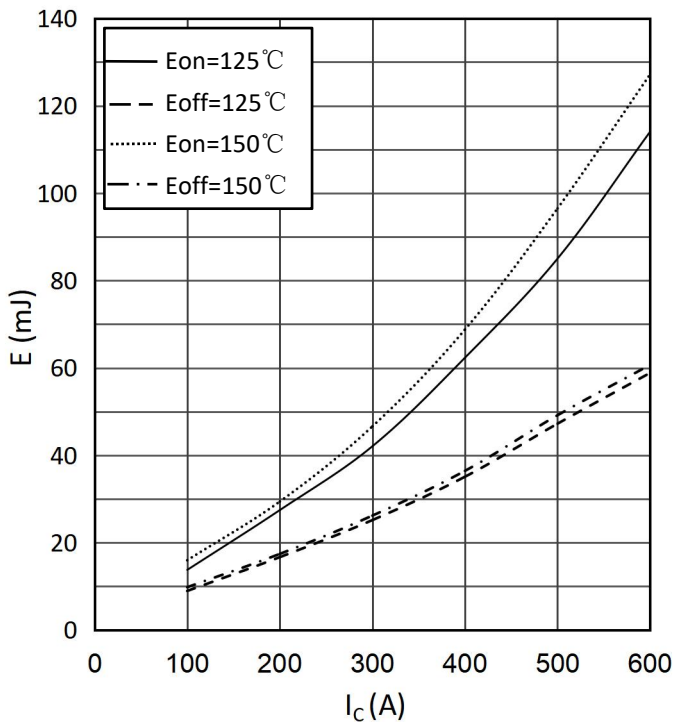
$I_C = f(V_{CE})$

$V_{GE} = 15\text{ V}$


switching losses IGBT, Inverter (typical)

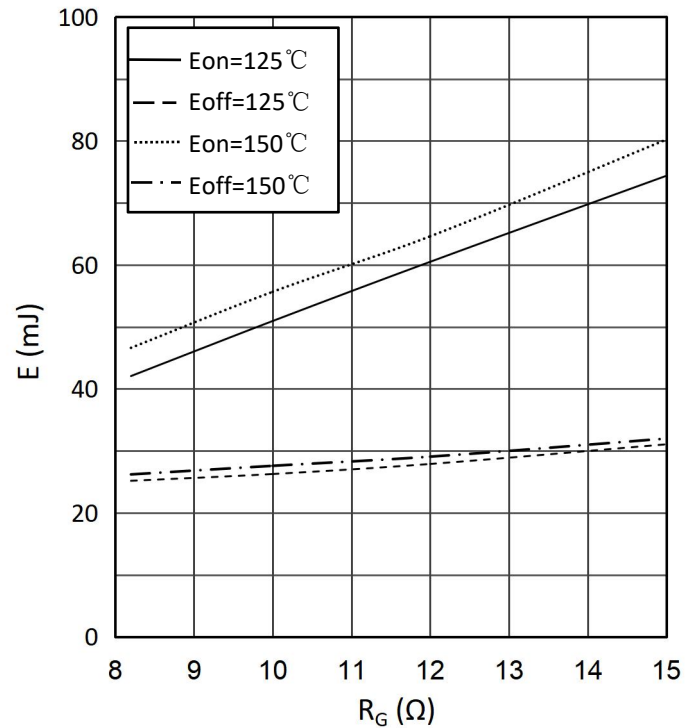
$E_{on} = f(I_C), E_{off} = f(I_C)$

$V_{GE} = \pm 15\text{ V}, R_{Gon} = 8.2\ \Omega, R_{Goff} = 8.2\ \Omega, V_{CE} = 600\text{ V}$


switching losses IGBT, Inverter (typical)

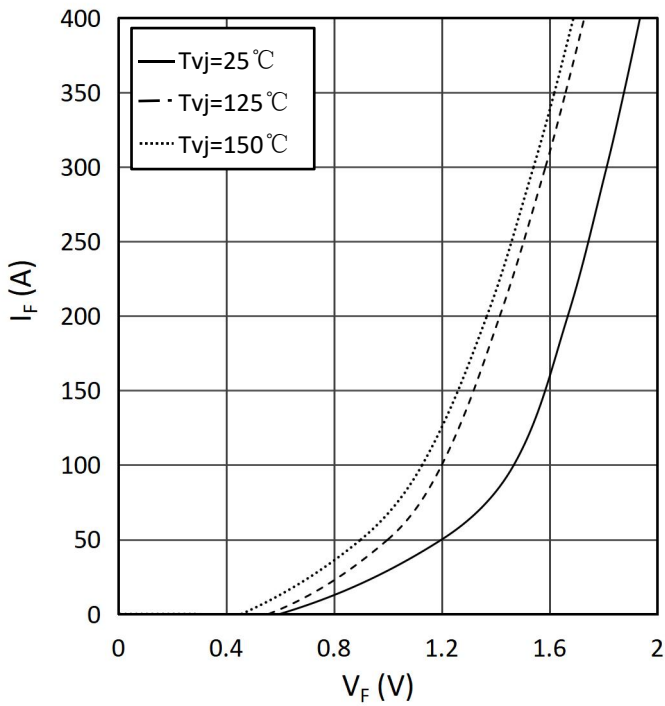
$E_{on} = f(R_G), E_{off} = f(R_G)$

$V_{GE} = \pm 15\text{ V}, I_C = 300\text{ A}, V_{CE} = 600\text{ V}$



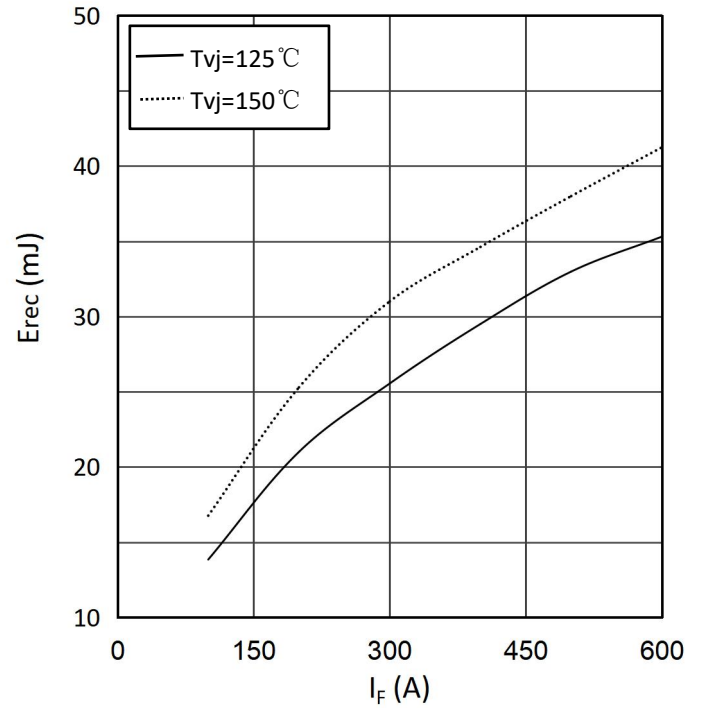
forward characteristic of Diode, Inverter (typical)

$$I_F = f(V_F)$$


switching losses Diode, Inverter (typical)

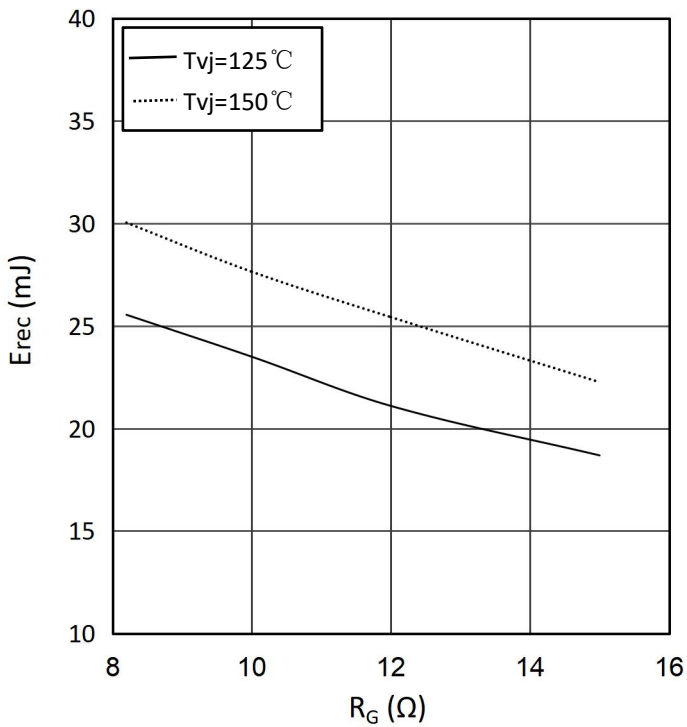
$$E_{rec} = f(I_F)$$

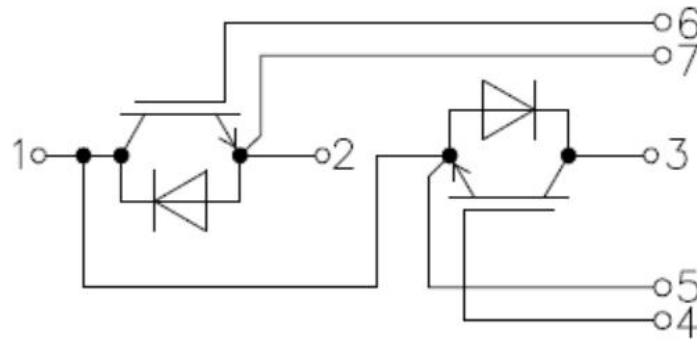
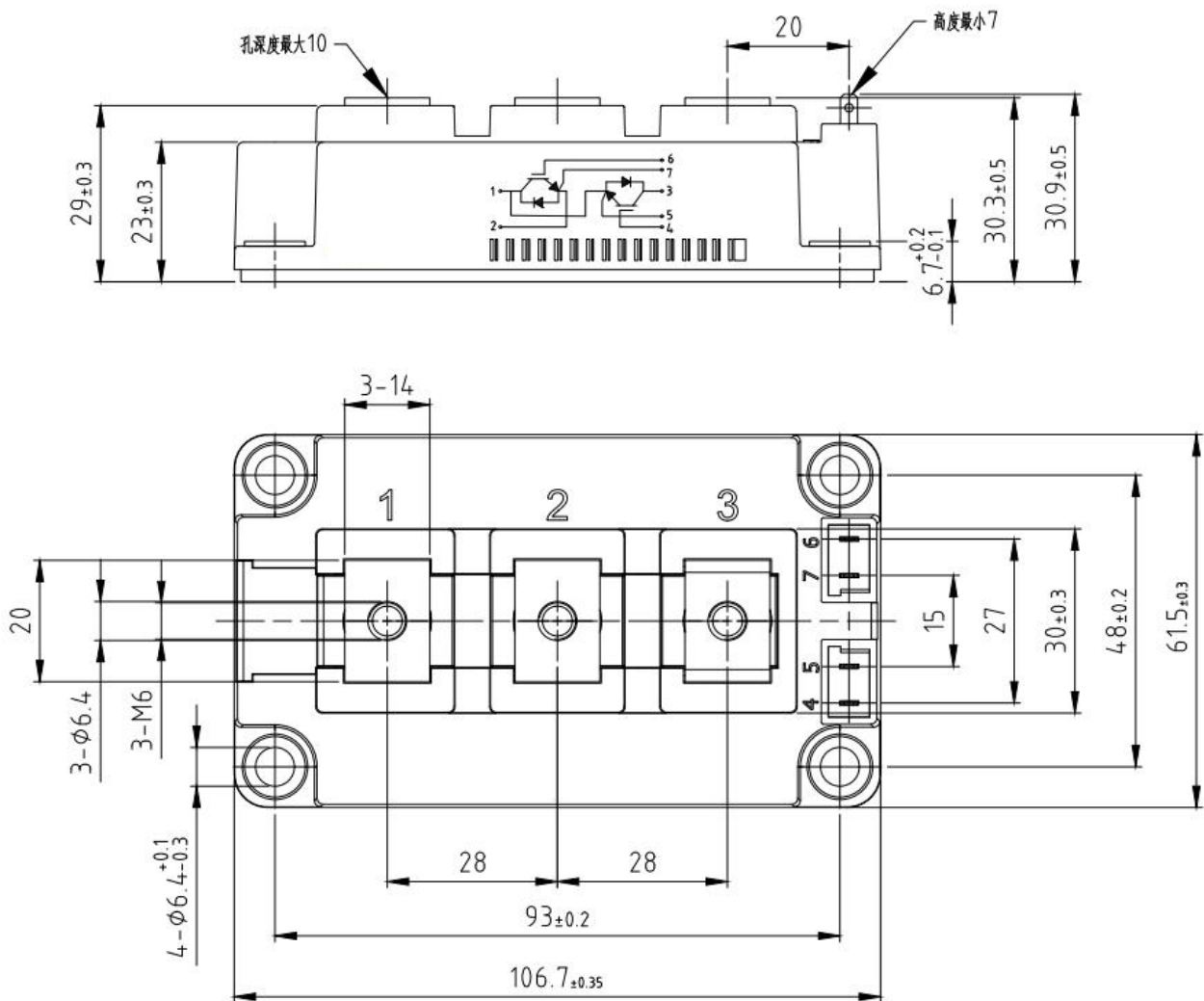
$$R_{Gon}=8.2\Omega, V_{CE}=600V$$


switching losses Diode, Inverter (typical)

$$E_{rec} = f(R_G)$$

$$I_F=300A, V_{CE}=600V$$



Circuit diagram headline

Package outlines (Unit: mm)


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