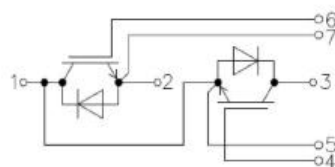


Features

- Trench/Fieldstop IGBT
- Half-bridge
- Standard package
- High short circuit capability
- Including anti-parallel FWD



Application

- Frequency converter
- UPS
- High Power Converters
- Motor Drives
- Wind Turbines



Halogen-Free

IGBT, Inverter

Absolute Maximum Ratings (TC=25°C unless otherwise noted)				
Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{CES}	Collector Emitter Voltage	T _j =25°C	1200	V
V _{GES}	Gate Emitter Voltage		±20	V
I _C	DC Collector Current	Tc=100°C, T _{jmax} =175°C	400	A
I _{CRM}	Repetitive peak collector current	tp=1ms	800	A
t _{SC}	Short circuit withstand time	V _{GE} =15V, V _{CC} =600V, T _{vj} ≤150°C	10	us
P _{tot}	Power Dissipation Per IGBT	Tc=25°C, T _{jmax} =175°C	2419	W

Diode, Inverter

Absolute Maximum Ratings (TC=25°C unless otherwise noted)				
Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{RRM}	Repetitive Reverse Voltage	T _J =25°C	1200	V
I _F	Forward current,DC		400	A
I _{FRM}	Repetitive peak forward current	tp=1ms	800	A

IGBT, Inverter

Electrical Characteristics (TC=25°C unless otherwise noted)								
Symbol	Parameter	Condition		Min	Typ	Max	Unit	
Static Electrical Characteristics @ TC= 25°C (unless otherwise stated)								
V _{GE(th)}	Gate Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =16mA		5.2	5.7	6.4	V	
V _{CE(sat)}	Collector - Emitter Saturation Voltage	I _C =400A, V _{GE} =15V, T _J =25°C		--	1.65	--	V	
		I _C =400A, V _{GE} =15V, T _J =125°C		--	1.90	--	V	
		I _C =400A, V _{GE} =15V, T _J =150°C		--	1.93	--	V	
I _{CES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25°C		--	--	1.0	mA	
I _{GES}	Gate Leakage Current	V _{CE} =0V, V _{GE} =±20V, T _J =25°C		--	--	250	nA	
Q _g	Gate Charge	V _{CE} =600V, I _C =400A , V _{GE} =15V		--	4.1	--	μC	
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		--	43.6	--	nF	
C _{res}	Reverse Transfer Capacitance			--	1.4	--	nF	
R _g	Internal gate resistance	T _J =25°C		--	0.43	--	Ω	
t _{d(on)}	Turn-on Delay Time	V _{CC} =600V, I _C =400A R _{G(on)} =5.1Ω, R _{G(off)} =5.1Ω V _{GE} =±15V, Lload=100uH di/dt=5390A/μs (Tvj=150°C) du/dt=2546V/μs (Tvj=150°C)	T _J =25°C	--	166	--	ns	
			T _J =125°C	--	156	--	ns	
			T _J =150°C	--	155	--	ns	
t _r	Turn-on Rise Time		T _J =25°C	--	163	--	ns	
			T _J =125°C	--	163	--	ns	
			T _J =150°C	--	169	--	ns	
t _{d(off)}	Turn-Off Delay Time		T _J =25°C	--	833	--	ns	
			T _J =125°C	--	924	--	ns	
			T _J =150°C	--	931	--	ns	
t _f	Turn-Off Fall Time		T _J =25°C	--	134	--	ns	
			T _J =125°C	--	270	--	ns	
			T _J =150°C	--	296	--	ns	
E _{on}	Turn on Energy		T _J =25°C		67.7		mJ	
			T _J =150°C	--	93.3	--	mJ	
E _{off}	Turn off Energy	V _{CC} =600V, I _C =200A R _{G(on)} =2.5Ω, R _{G(off)} =2.5Ω V _{GE} =±15V, Inductive Load	T _J =25°C	--	52.5	--	mJ	
			T _J =150°C	--	67.4	--	mJ	
R _{thCH}	Thermalresistance,case to heatsink (Per IGBT/λgrease=1W/(m·K))			--	--	--	K/W	
T _{vjop}	Temperature under switching conditions			-40	--	150	°C	
R _{thJC}	Junction to Case Thermal Resistance (Per IGBT)			--	0.062	--	K/W	

Diode, Inverter

Absolute Maximum Ratings (TC=25℃ unless otherwise noted)							
Symbol	Parameter			Min	Typ	Max	Unit
Common Ratings (TC=25℃ Unless Otherwise Noted)							
V _F	Forward Voltage	I _F =400A , V _{GE} =0V, T _J =25℃		--	1.60	--	V
		I _F =400A , V _{GE} =0V, T _J =125℃		--	1.35	--	
		I _F =400A , V _{GE} =0V, T _J =150℃		--	1.30	--	
t _{rr}	Reverse Recovery Time	I _F =400A , V _R =600V dI _F /dt=-4264A/μs T _J =150℃	T _J =25℃	--	202	--	ns
			T _J =125℃	--	388	--	ns
			T _J =150℃	--	547	--	ns
I _{RM}	Peak reverse recovery current		T _J =25℃	--	191	--	A
			T _J =125℃	--	328	--	A
			T _J =150℃	--	364	--	A
Q _R	Recovered charge		T _J =25℃	--	30.1	--	μC
			T _J =125℃	--	82.1	--	μC
			T _J =150℃	--	101.9	--	μC
E _{rec}	Reverse Recovery Energy	T _J =25℃	--	11.1	--	mJ	
		T _J =125℃	--	31.6	--	mJ	
		T _J =150℃	--	39.6	--	mJ	
T _{vjop}	Temperature under switching conditions			-40	--	150	℃
R _{thJCD}	Junction to Case Thermal Resistance （Per Diode）			--	0.11	--	K/W

Module

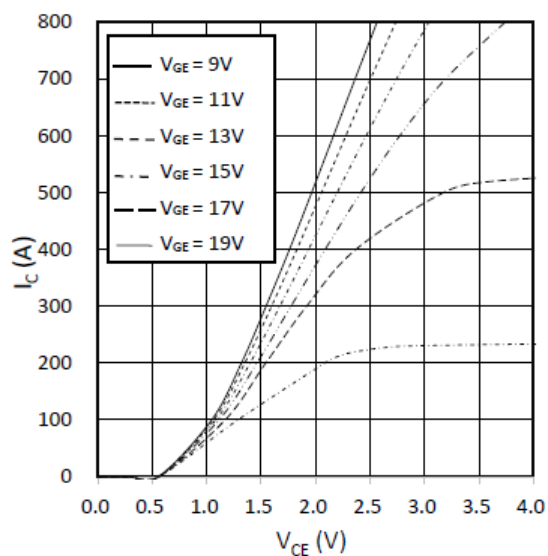
Absolute Maximum Ratings (TC=25℃unless otherwise noted)						
Symbol	Parameter		Rating			Unit
Common Ratings (TC=25℃ Unless Otherwise Noted)						
V _{ISOL}	Isolation voltage	Terminals to baseplate, RMS,f=50Hz,t=1min	4000			V
-	Material of module baseplate	-	Cu			
-	Internal isolation	Basic insulation(class 1, IEC 61140)	Al ₂ O ₃			
T _{stg}	Storage Temperature		-40~125			℃
Symbol	Parameter		Min	Typ	Max	Unit
M	Mounting torque for module mounting	Screw M6	3	-	6	Nm
	Terminal connection torque	Screw M6	2.5	-	5	Nm
ds	Creepage distance	Terminal to terminal	-	23	-	mm
		Terminal to base plate	-	29	-	mm
da	Clearance	Terminal to terminal	-	11	-	mm
		Terminal to base plate	-	23	-	
m	Weight			315		g

Typical Operating Characteristics

output characteristic IGBT, Inverter (typical)

$$I_C = f(V_{CE})$$

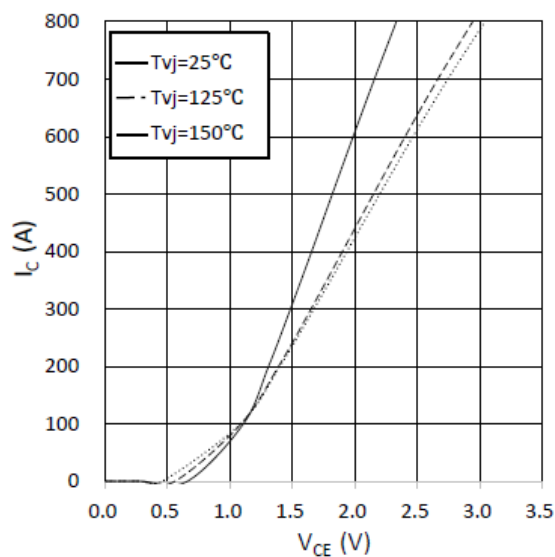
$$T_{vj} = 150^{\circ}\text{C}$$



output characteristic IGBT, Inverter (typical)

$$I_C = f(V_{CE})$$

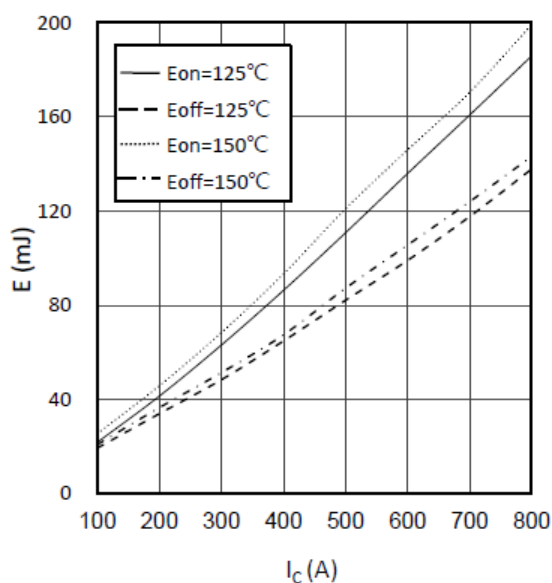
$$V_{GE} = 15\text{ V}$$



switching losses IGBT, Inverter (typical)

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

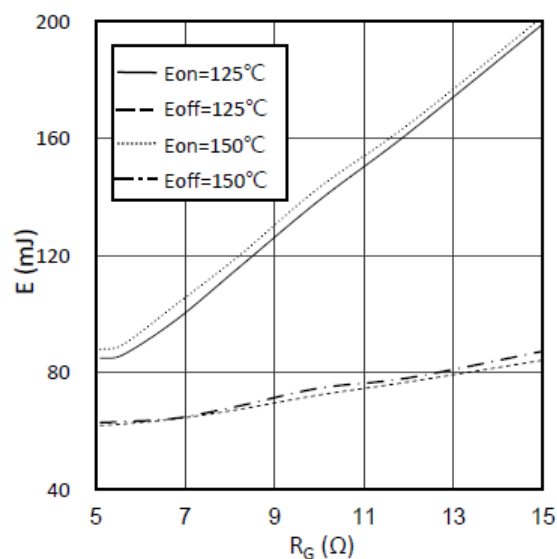
$$V_{GE} = \pm 15\text{V}, R_{Gon} = 5.1\Omega, R_{Goff} = 5.1\Omega, V_{CE} = 600\text{V}$$



switching losses IGBT, Inverter (typical)

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

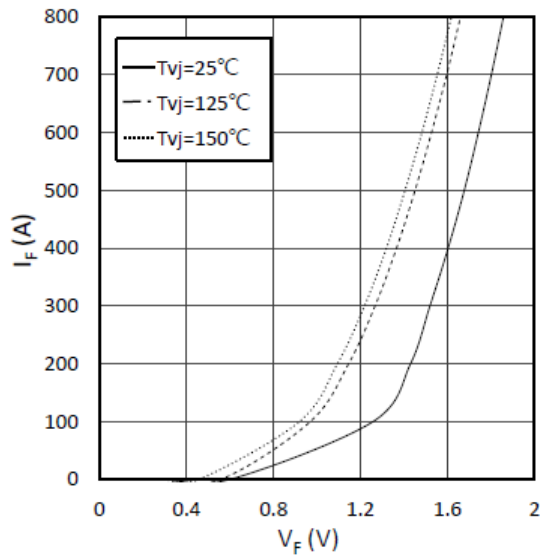
$$V_{GE} = \pm 15\text{V}, I_C = 400\text{A}, V_{CE} = 600\text{V}$$



Typical Operating Characteristics

forward characteristic of Diode, Inverter (typical)

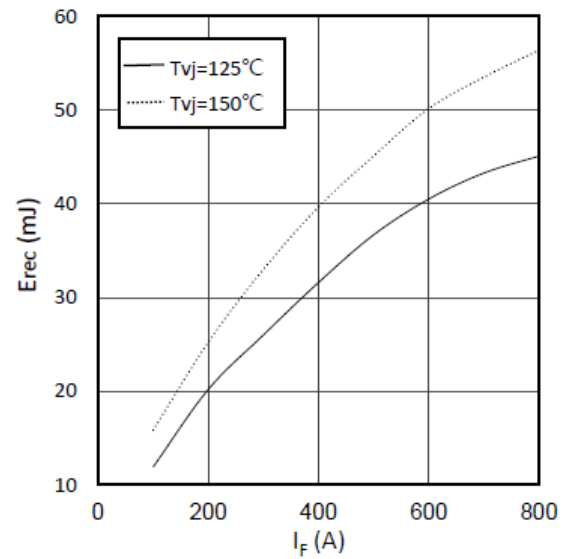
$$I_F = f(V_F)$$



switching losses Diode, Inverter (typical)

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

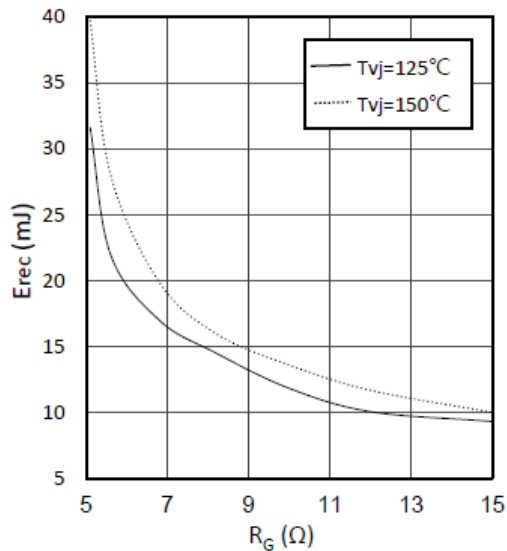
$$R_{Gon}=5.1\Omega, V_{CE}=600V$$



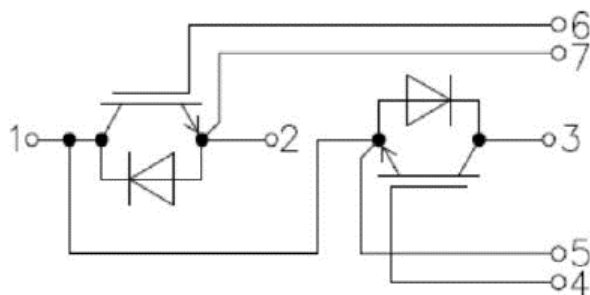
switching losses Diode, Inverter (typical)

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

$$I_F=400A, V_{CE}=600V$$



Circuit diagram headline



Package outlines (Unit: mm)

