

62mm Half Bridge IGBT Module

$V_{CES} = 1200V$, $I_C = 150A$, $V_{CE(sat)} = 2.5V$

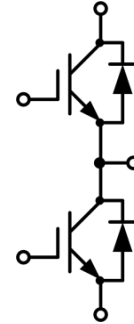
Features

- Low collector to emitter saturation voltage
- Switching-Loss rating includes all “tail” losses
- Optimized for Fast Switching



Applications

- Uninterruptible Power Supply
- Induction Heating
- High Power Converters
- Electric welding machine



IGBT, Inverter Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Collector-Emitter voltage	V_{CES}	$T_{vj}=25^{\circ}C$	1200	V
Continuous DC collector current	$I_{C\ nom}$	$T_C=100^{\circ}C$	150	A
Repetitive peak collector current	I_{CRM}	$t_P=1ms$	300	A
Total power dissipation	P_{tot}	$T_C=25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	937	W
Gate emitter voltage	V_{GE}		± 20	V

Characteristics Values

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C=1mA, V_{CE}=V_{GE}, T_J=25^{\circ}C$	4.8	5.8	6.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=150A, V_{GE}=15V$	$T_J=25^{\circ}C$	2.5		V
			$T_J=150^{\circ}C$	3.3		
Collector-Emitter Leakage Current	I_{CES}	$V_{GE}=0V, V_{CE}=V_{CES}, T_J=25^{\circ}C$			1.0	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{GE}=\pm 20V, V_{CE}=0V, T_J=25^{\circ}C$	-100		100	nA
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz$		9.2		pF
Reverse transfer Capacitance	C_{res}			0.32		
Internal gate resistor	R_{gint}			0.45		Ω
Turn-on Delay Time	$t_{d(on)}$		$T_J=25^{\circ}C$	31		ns
			$T_J=150^{\circ}C$	28		

Rise Time	t_r	$V_{CC}=600V,$ $I_C=150A,$ $V_{GE}=\pm 15V,$ $L=525\mu H,$ $R_g=10\Omega$	$T_J=25^\circ C$		55		ns
			$T_J=150^\circ C$		61		
Turn-off Delay Time	$t_{d(off)}$		$T_J=25^\circ C$		223		ns
			$T_J=150^\circ C$		239		
Fall Time	t_f		$T_J=25^\circ C$		126		ns
			$T_J=150^\circ C$		166		
Turn-on Switching Loss	E_{on}		$T_J=25^\circ C$		10.6		mJ
			$T_J=150^\circ C$		16.8		
Turn-off Switching Loss	E_{off}		$T_J=25^\circ C$		4.6		mJ
			$T_J=150^\circ C$		6.6		
Junction-To-Case (IGBT)	$R_{\theta JC}$			0.16		K/W	

Diode, Inverter Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj}=25^\circ C$	1200	V
Continuous DC forward current	I_F		150	A
Repetitive peak forward current	I_{FRM}	$t_p=1ms$	300	A

Characteristics Values

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward Voltage	V_{FM}	$I_F=150A, V_{GE}=0V$	$T_J=25^\circ C$		2.8	V
			$T_J=150^\circ C$		2.3	
Peak Reverse Recovery Current	I_{RM}	$I_F=150A,$ $V_{CC}=600V,$ $V_{GE}=-15V,$ $L=525\mu H,$ $R_g=10\Omega$	$T_J=25^\circ C$		70	A
			$T_J=150^\circ C$		88	
Reverse Recovery Charge	Q_{rr}		$T_J=25^\circ C$		7	μC
			$T_J=150^\circ C$		16.4	
Reverse Recovery Energy	E_{rec}		$T_J=25^\circ C$		2.4	mJ
			$T_J=150^\circ C$		5.4	
Junction-To-Case Diode	$R_{\theta JC}$			0.33		K/W

Characteristics Values(Module)

Parameter	Symbol	Test Condition	Value	Unit
Isolation test voltage	V_{ISOL}	RMS, $f=50Hz, t=1min$	4000	V
Maximum Junction Temperature	T_J			175 $^\circ C$
Storage temperature	T_{stg}		-40	150 $^\circ C$
Mounting torque for module mounting	M		3.0	5.0 Nm
Weight	W		317	g

Typical Characteristics

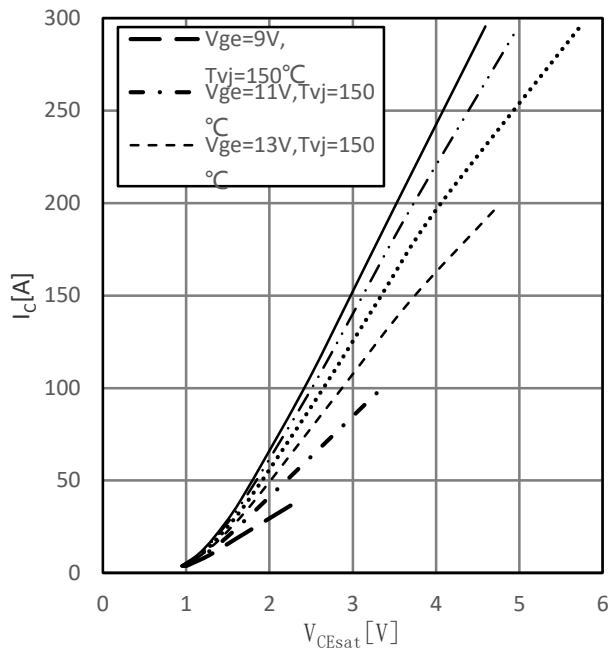


Fig.1 output characteristic IGBT Inverter (typical)

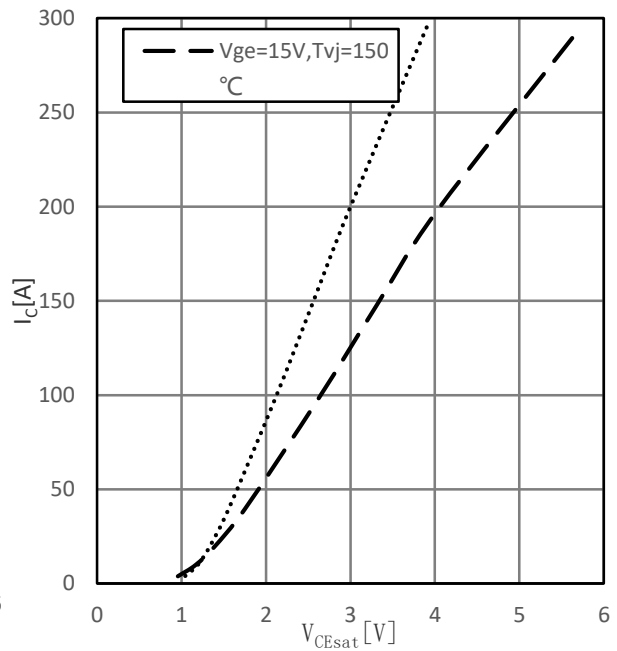


Fig.2 output characteristic IGBT Inverter (typical)

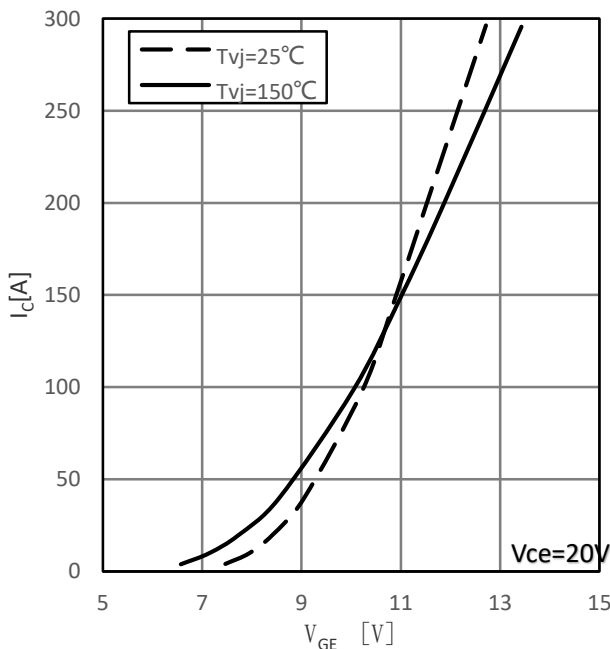


Fig.3 transfer characteristic IGBT Inverter (typical)

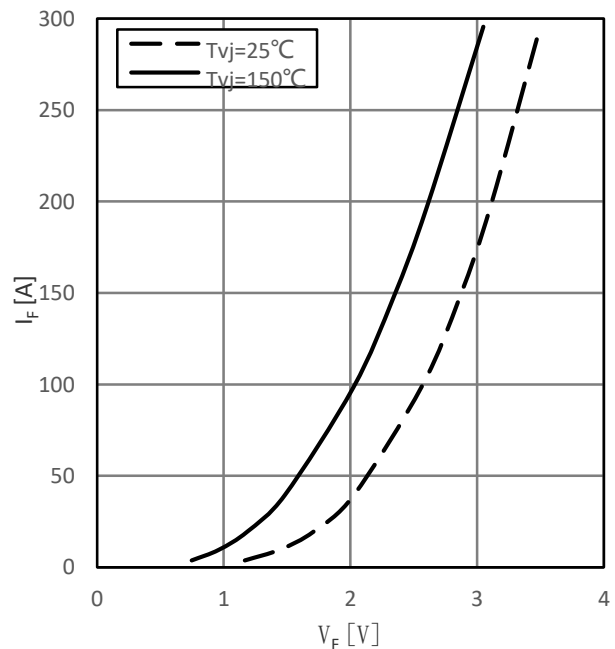


Fig.4 forward characteristic of Diode, Inverter (typical)

$V_{CC}=600V$, $V_{CE}=\pm 15V$
 $R_G=10\Omega$

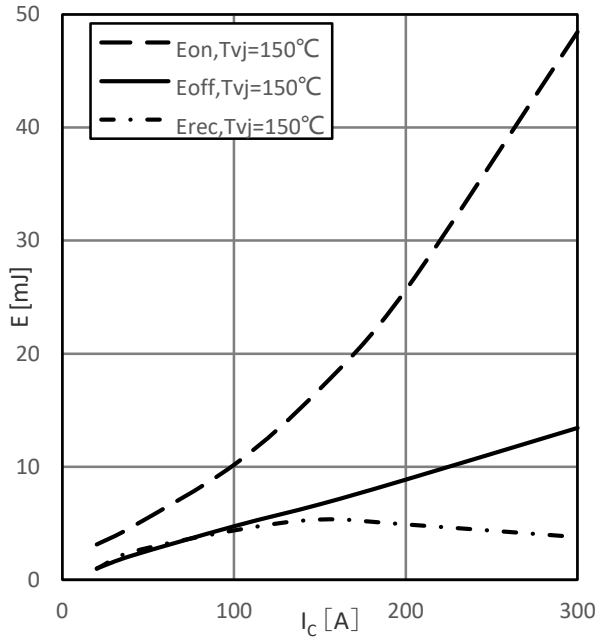


Fig.5 switching losses IGBT Inverter (typical)

$V_{CC}=600V$, $V_{CE}=\pm 15V$
 $I_C=150A$

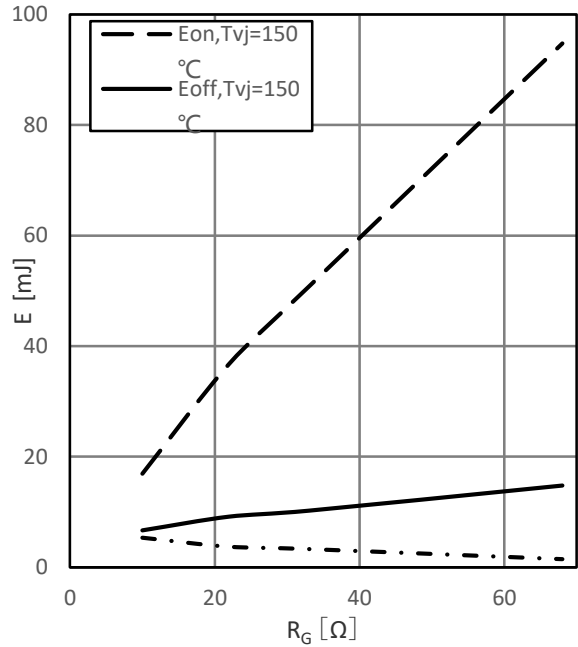


Fig.6 switching Losses vs. Gate Resistance (Typical)

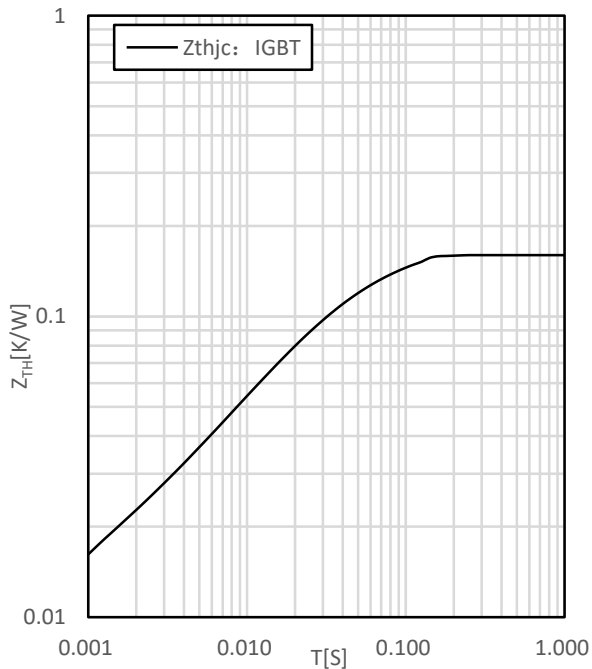


Fig.7 Transient thermal impedance IGBT

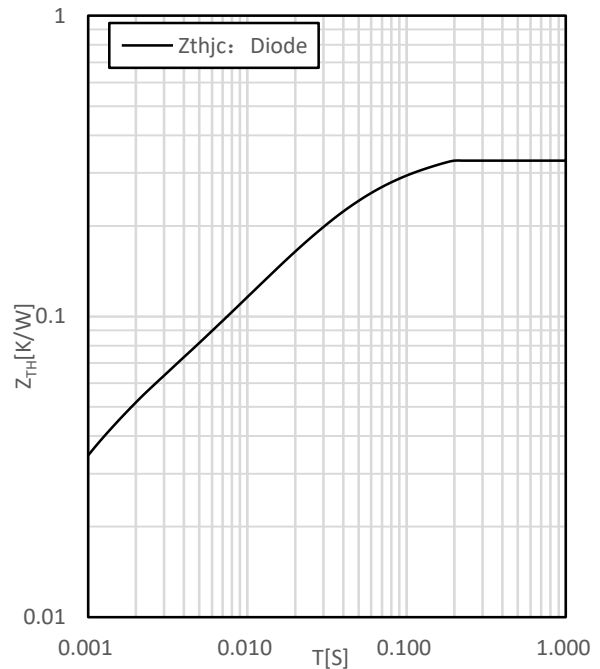
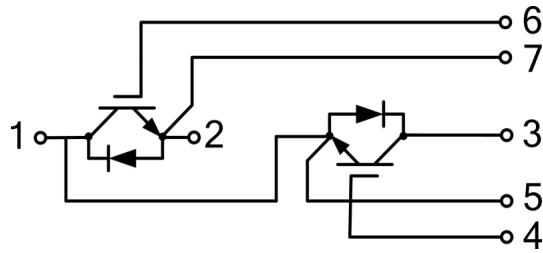
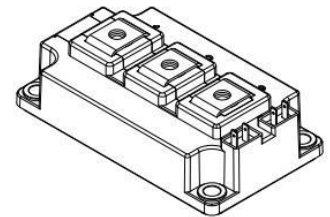
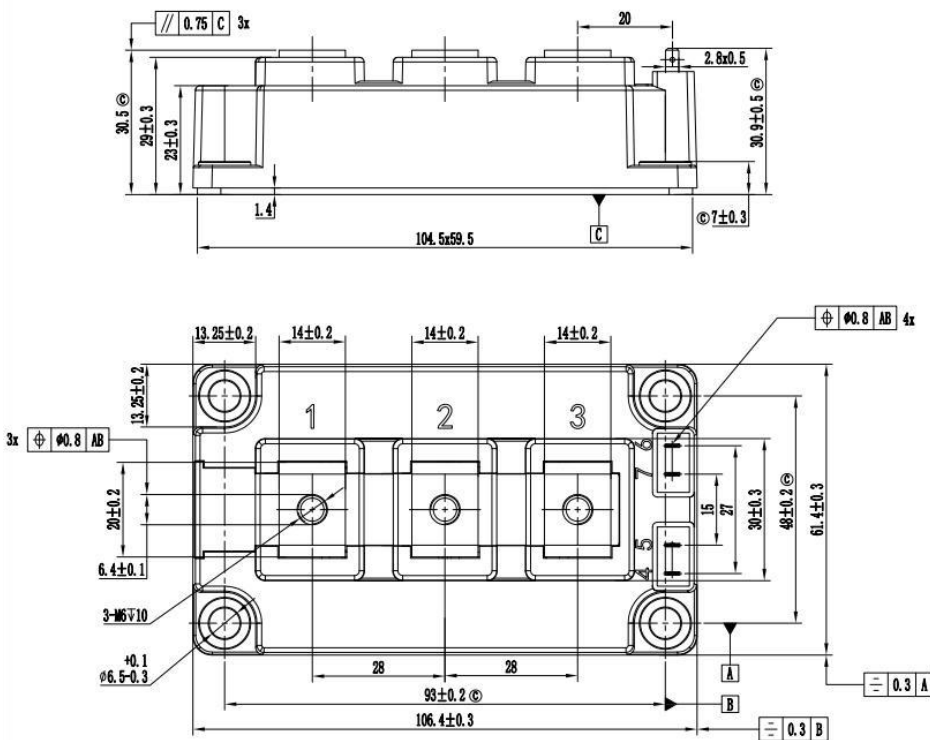


Fig.8 Transient thermal impedance Diode

Circuit Diagram



Package Outlines(Unit: mm)



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