

34mm Half Bridge IGBT Module

$V_{CES}=650V$, $I_C=75A$, $V_{CE(sat)}=2.0V$

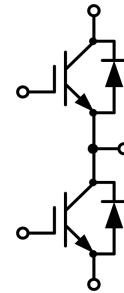
Features:

- Low collector to emitter saturation voltage
- Switching-Loss rating includes all "tail" losses
- Optimized for Fast Switching
- Short circuit withstands time (10us min.)



Applications:

- Uninterruptible Power Supply
- Inverter for motor drive
- AC and DC Servo Drive Amplifier
- Electric welding machine



IGBT Inverter Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector to Emitter Voltage	V_{CES}		650	V
Continuous Gate to Emitter Voltage	V_{GES}		± 20	V
Continuous Collector Current	$I_{C\ nom}$	$T_C=100^\circ C$	75	A
		$T_C=25^\circ C$	150	A
Repetitive peak collector current	I_{CRM}	$t_p=1ms$	150	A
Maximum Power Dissipation (IGBT)	P_D	$T_C=25^\circ C, T_J=125^\circ C$	244	W
Short Circuit Withstand Time	t_{sc}	$V_{CC}=300V, V_{GE}\leq 15V$	10	us

Characteristics Values

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C=1mA, V_{CE}=V_{GE}, T_J=25^\circ C$	4.6	5.6	6.6	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=75A, V_{GE}=15V$	$T_J=25^\circ C$		2.0	V
			$T_J=125^\circ C$		2.4	
Collector-Emitter Leakage Current	I_{CES}	$V_{GE}=0V, V_{CE}=V_{CES}, T_J=25^\circ C$			1	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{GE}=\pm 20V, V_{CE}=0V, T_J=25^\circ C$			100	nA

Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz$		5		nF
Reverse Transfer Capacitance	C_{res}			0.24		
Integrated gate resistor	R_{gint}	$T_{vj}=25^{\circ}C$		0.9		Ω
Turn-on Delay Time	$t_{d(on)}$	$V_{CC}=300V,$ $I_C=75A,$ $V_{GE}=\pm 15V,$ $L=1000\mu H,$ $R_g=3.3\Omega$	$T_J=25^{\circ}C$	31		ns
			$T_J=125^{\circ}C$	29		
Rise Time	t_r		$T_J=25^{\circ}C$	51		ns
			$T_J=125^{\circ}C$	53		
Turn-off Delay Time	$t_{d(off)}$		$T_J=25^{\circ}C$	135		ns
			$T_J=125^{\circ}C$	139		
Fall Time	t_f		$T_J=25^{\circ}C$	86		ns
			$T_J=125^{\circ}C$	108		
Turn-on Switching Loss	E_{on}		$T_J=25^{\circ}C$	0.7		mJ
			$T_J=125^{\circ}C$	1		
Turn-off Switching Loss	E_{off}	$T_J=25^{\circ}C$	1		mJ	
		$T_J=125^{\circ}C$	1.5			
Junction-To-Case (IGBT)	$R_{\theta JC}$			0.41		K/W

Diode, Inverter Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj}=25^{\circ}C$	650	V
Diode Continuous Forward Current	I_F	$T_C=100^{\circ}C$	75	A
Peak FWD Current Repetitive	I_{FM}	$t_p=1ms$	150	A

Characteristics Values

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward Voltage	V_{FM}	$I_F=75A, V_{GE}=0V$	$T_J=25^{\circ}C$	1.2		V
			$T_J=125^{\circ}C$		1.1	
Peak Reverse Recovery Current	I_{RM}	$I_F=75A$	$T_J=25^{\circ}C$	56		A
			$T_J=125^{\circ}C$		96	
Reverse Recovery Charge	Q_{rr}	$V_{CC}=300V$ $L=1000\mu H$ $R_g=3.3\Omega$	$T_J=25^{\circ}C$	3.2		μC
			$T_J=125^{\circ}C$		7.3	
Reverse Recovery Energy	E_{rec}	$R_g=3.3\Omega$	$T_J=25^{\circ}C$	0.5		mJ
			$T_J=125^{\circ}C$		1.4	
Junction-To-Case Diode	$R_{\theta JC}$			0.52		K/W

Module Characteristics Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation Voltage	V_{ISOL}	f=50Hz, t=1min			2.5	KV
Maximum Junction Temperature	T_J				150	°C
Maximum Operating Junction Temperature Range	T_{JOP}		-40		+150	°C
Storage Temperature	T_{stg}		-40		+150	°C
Case-To-Sink (Conductive Grease Applied)	$R_{\theta CS}$			0.1		K/W
Power Terminals Screw:M5	M		2.5		5	N·m
Mounting Screw:M6	M		3		5	N·m
Weight	G			149		g

Typical Characteristics

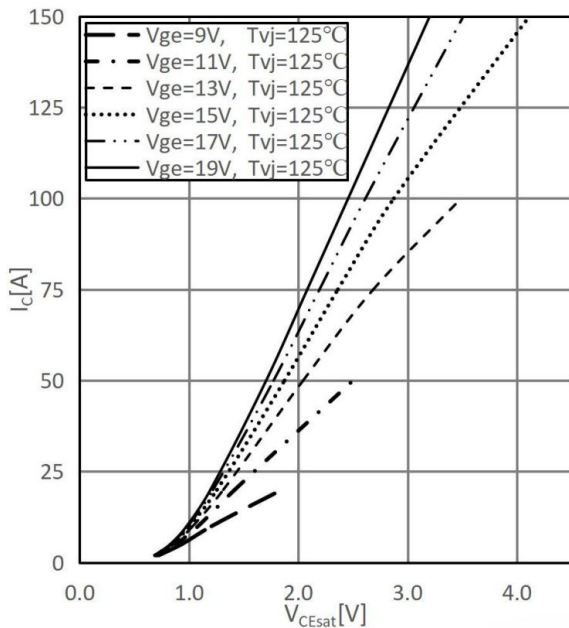


Fig.1 output characteristic IGBT Inverter (typical)

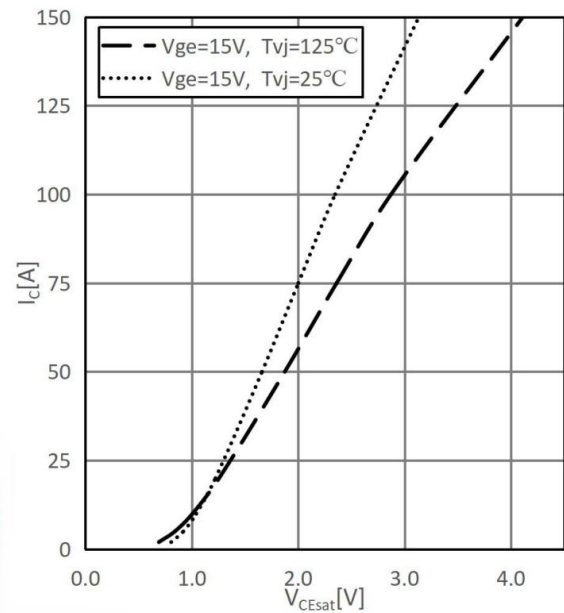


Fig.2 output characteristic IGBT Inverter (typical)

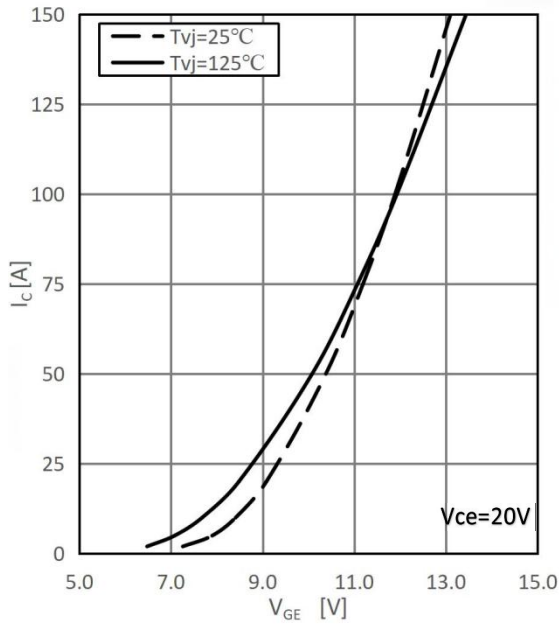


Fig.3 transfer characteristic IGBT Inverter (typical)

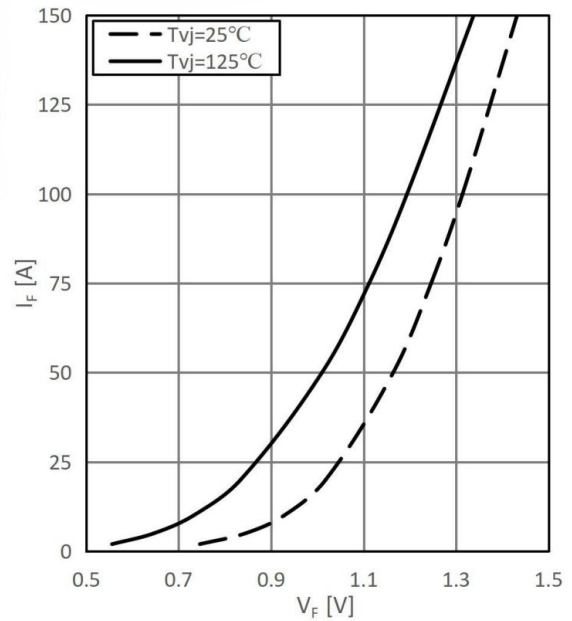


Fig.4 forward characteristic of Diode, Inverter (typical)

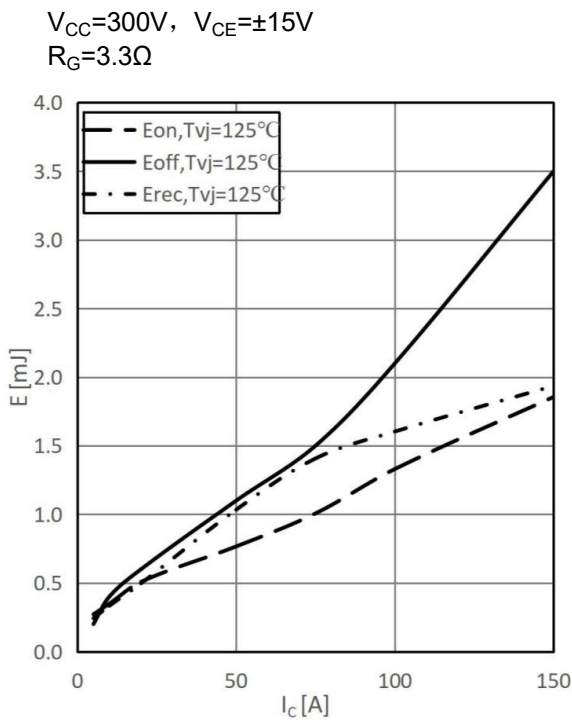


Fig.5 switching losses IGBT Inverter (typical)

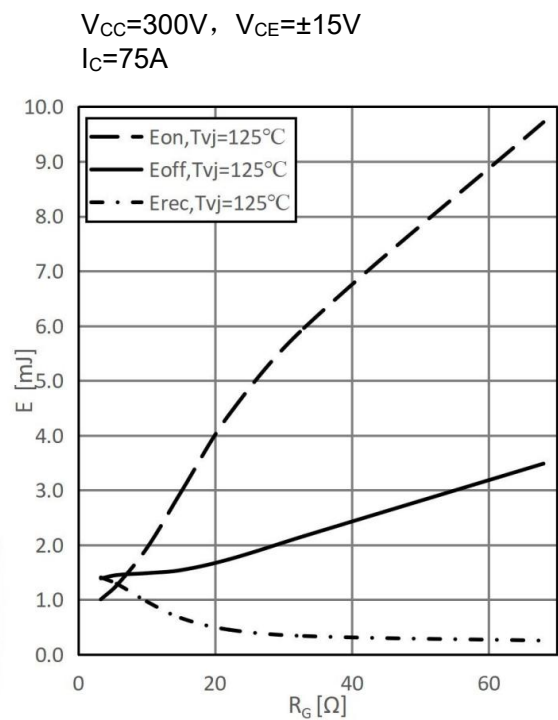


Fig.6 switching Losses vs. Gate Resistance (Typical)

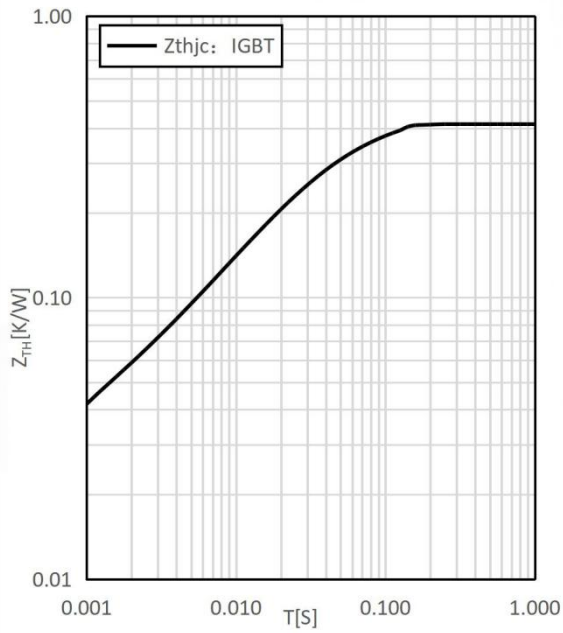


Fig.7 Transient thermal impedance IGBT

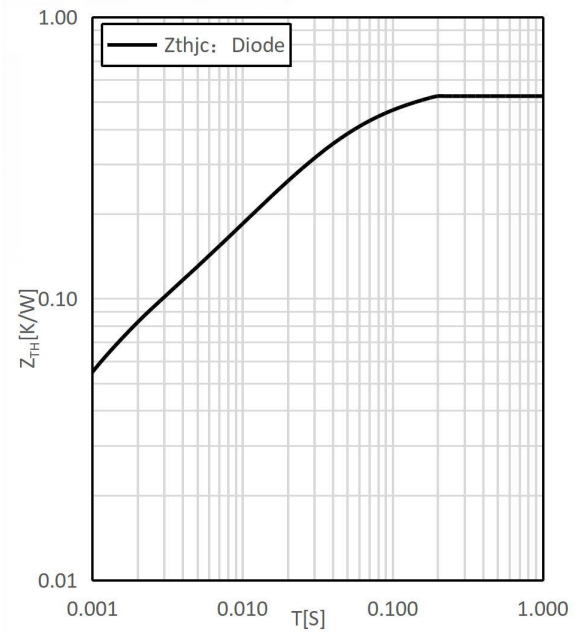


Fig.8 Transient thermal impedance Diode

Circuit Diagram

