

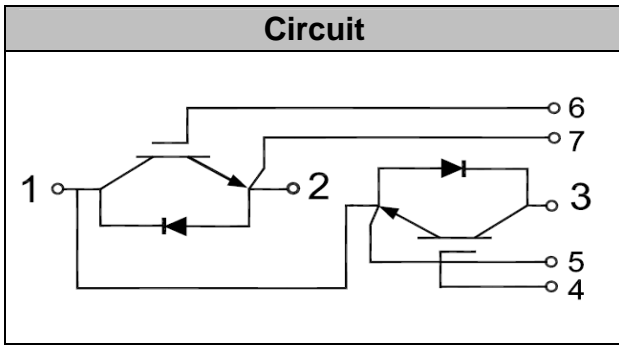
IGBT Modules



V_{CES} 1700V
I_C 75A

Applications

- Industrial Inverters
- Servo Applications



Features

- Short Circuit Rated 10μs
- Low Stray Inductance
- Low Saturation Voltage
- Ultra Low loss
- HI-REL Power Terminals
- Lead Free, Compliant With RoHS Requirement

◆ IGBT

Maximum Ratings (T_C = 25°C unless otherwise specified)

Symbol	Description	Values	Units
V _{CES}	Collector - Emitter Voltage	1700	V
V _{GES}	Gate-Emitter Voltage	±20	V
I _C	DC Collector Current	T _C =25°C	120 A
		T _C =80°C	75 A
I _{CM(1)}	Peak Collector Current Repetitive	T _J = 150°C	150 A
t _{SC}	Short Circuit Withstand Time	>10	μs
P _D	Maximum Power Dissipation (IGBT)	T _C = 25°C, T _{Jmax} =150°C	440 W

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
V _{GE(th)}	Gate - Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =3mA	4.5	6	6.5	V
V _{CE(sat)}	Collector – Emitter Saturation Voltage	I _C =75A, V _{GE} =15V		2.3		V
		I _C =75A, V _{GE} =15V, T _J =125°C		2.7		V



I_{CES}	Collector Leakage Current	$V_{CE}=1700V, V_{GE}=0V,$			1	mA	
		$V_{CE}=1700V, V_{GE}=0V,$ $T_J=125^{\circ}C$			5	mA	
I_{GES}	Gate Leakage Current	$V_{CE}=0V, V_{GE}=\pm 20V$	-400		400	nA	
C_{ies}	Input Capacitance	$V_{CE} = 25V, V_{GE} = 0V,$ $f = 1MHz$		5.1		nF	
C_{oes}	Output Capacitance			0.27			nF
$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 900V, I_C = 75A,$ $R_G = 4.7\Omega, V_{GE} = \pm 15V,$ Inductive Load, $T_J = 25^{\circ}C$		250		ns	
t_r	Rise Time			105		ns	
$t_{d(off)}$	Turn-off Delay Time			250		ns	
T_f	Fall Time			250		ns	
E_{on}	Turn-on Switching Loss			20.8		mJ	
E_{off}	Turn-off Switching Loss			11.0		mJ	
$t_{d(on)}$	Turn-on Delay Time		$V_{CC} = 900V, I_C = 75A,$ $R_G = 4.7\Omega, V_{GE} = \pm 15V,$ Inductive Load, $T_J = 125^{\circ}C$		265		ns
t_r	Rise Time				105		ns
$t_{d(off)}$	Turn-off Delay Time			280		ns	
T_f	Fall Time			370		ns	
E_{on}	Turn-on Switching Loss			26.7		mJ	
E_{off}	Turn-off Switching Loss			17.2		mJ	
Q_{ge}	Gate Charge	$V_{CC}=900V, I_C=450A,$ $V_{GE}=\pm 15V$			440		nC
RBSOA	Reverse Bias Safe Operating Area	$I_C = 150A, V_{CC} = 900V,$ $V_p = 1700V, R_g = 4.7\Omega,$ $V_{GE} = +15V \text{ to } 0V, T_J$ $= 150^{\circ}C$		Trapezoid			
SCSOA	Short Circuit Safe Operating Area	$V_{CC} = 900V, V_{GE} = 15V,$ $T_J = 150^{\circ}C$	10			μs	

◆ Free-Wheeling Diode

Maximum Ratings ($T_C = 25^{\circ}C$ unless otherwise specified)

Symbol	Description	Values	Units
V_{RRM}	Repetitive peak reverse voltage	1700	V
I_F	Diode Continuous Forward Current	75	A
I_{FM}	Peak FWD Current Repetitive	150	A

Electrical Characteristics ($T_J = 25^{\circ}C$ unless otherwise specified)

Symbol	Item	Conditions	Values	Units	
V_{FM}	Forward Voltage	$I_F = 75A, V_{GE} = 0V$	$T_J = 25^{\circ}C$	1.80	V
			$T_J = 125^{\circ}C$	2.00	
t_{rr}	Reverse Recovery Time	$I_F = 75A,$ $di/dt = 650A/\mu s,$ $V_{rr} = 900V,$ $V_{GE} = -15V$	$T_J = 25^{\circ}C$	40	ns
			$T_J = 125^{\circ}C$	50	
Q_{rr}	Reverse Recovery Charge	$I_F = 75A,$ $di/dt = 650A/\mu s,$ $V_{rr} = 900V,$ $V_{GE} = -15V$	$T_J = 25^{\circ}C$	15.9	A
			$T_J = 125^{\circ}C$	24.4	
E_{rec}	Reverse Recovery Energy	$I_F = 75A,$ $di/dt = 650A/\mu s,$ $V_{rr} = 900V,$ $V_{GE} = -15V$	$T_J = 25^{\circ}C$	8.7	μC
			$T_J = 125^{\circ}C$	14.3	



◆ Module

Symbol	Description	MIN.	Typ.	Max.	Units
V_{iso}	Isolation Voltage(All Terminals Shorted) $f = 50\text{Hz}$, 1minute		3000		V
T_J	Maximum Junction Temperature		150		$^{\circ}\text{C}$
T_{JOP}	Maximum Operating Junction Temperature Range		-40 +150		$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-40 +125		$^{\circ}\text{C}$
$R_{\theta JC}$	Junction-To-Case (IGBT Part, Per Leg)		0.25		$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Junction-To-Case (Diode Part, Per Leg)		0.46		$^{\circ}\text{C}/\text{W}$
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)		0.1		$^{\circ}\text{C}/\text{W}$
M	Power Terminals Screw:M5	3		5	N·m
M	Mounting Screw:M6	4		6	N·m
Weight	Weight Of Module			180	g

Performance Curves

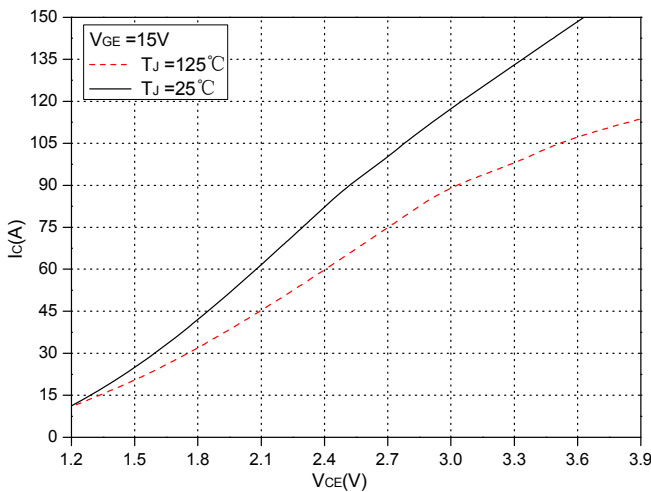


Fig.1 Typical Saturation Voltage Characteristics

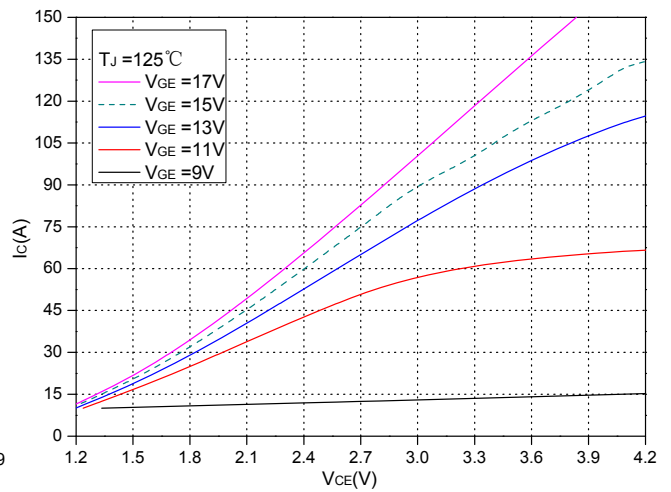


Fig.2 Typical Output Characteristics

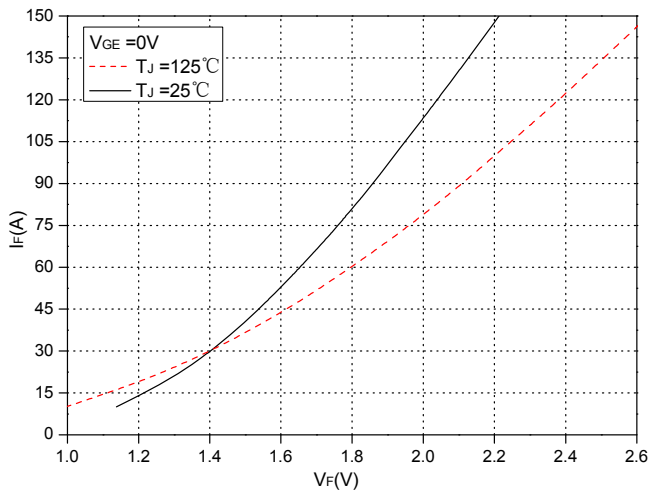


Fig.3 Forward Characteristics of FWD

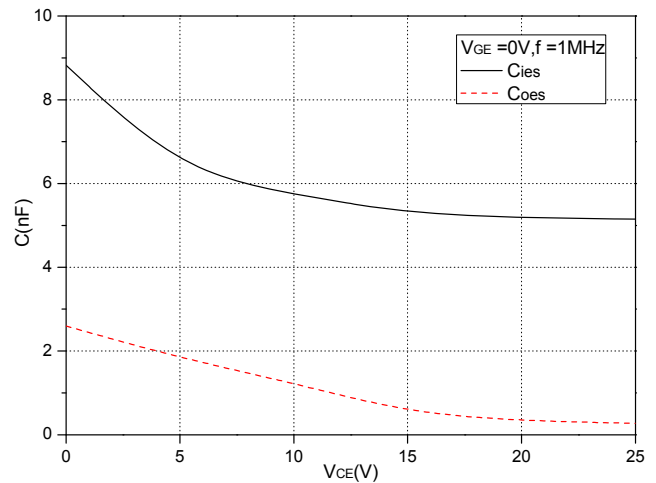


Fig.4 Capacitance Characteristics

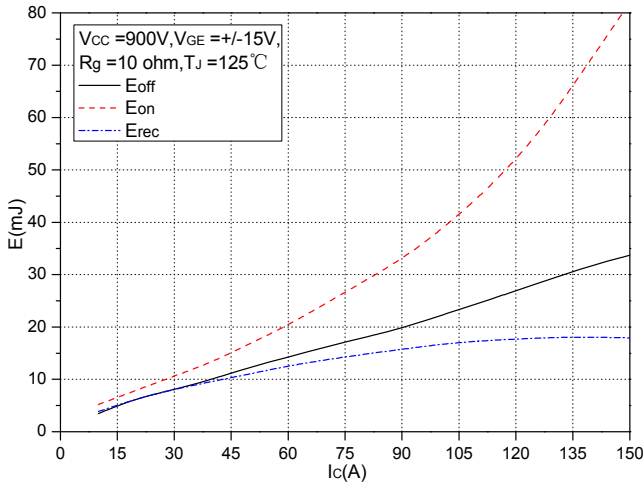


Fig.5 Typical Switching Loss vs. Collector Current (T_J=125°C)

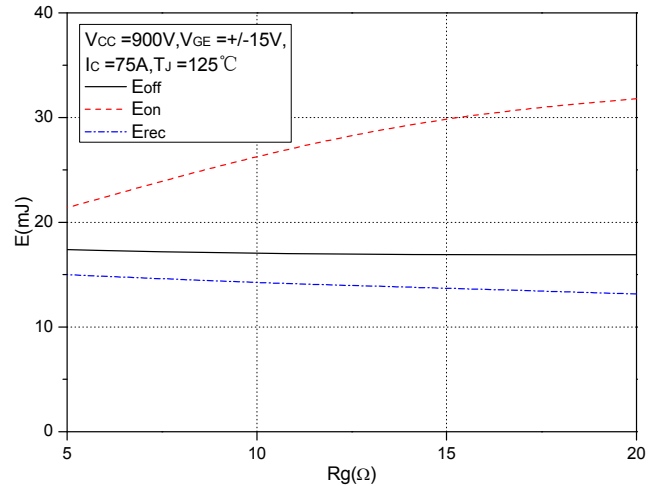


Fig.6 Typical Switching Loss vs. Gate Resistance (T_J=125°C)

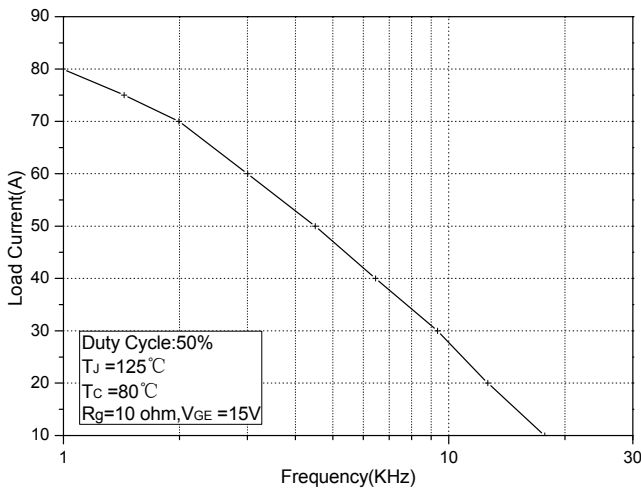


Fig.7 Typical Load Current vs. Frequency

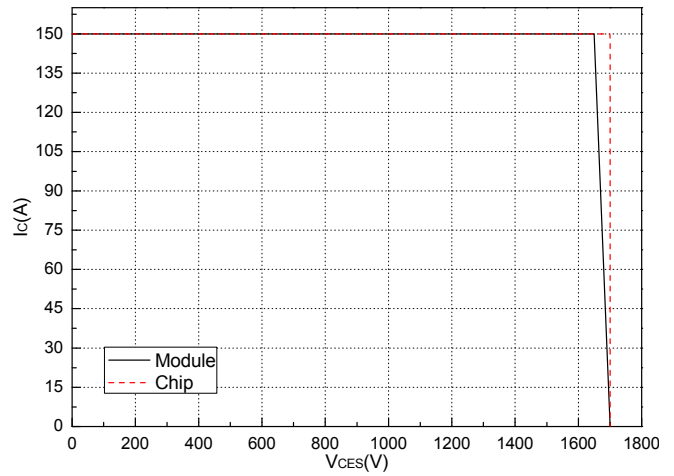


Fig.8 Reverse Bias Safe Operation Area (RBSOA)

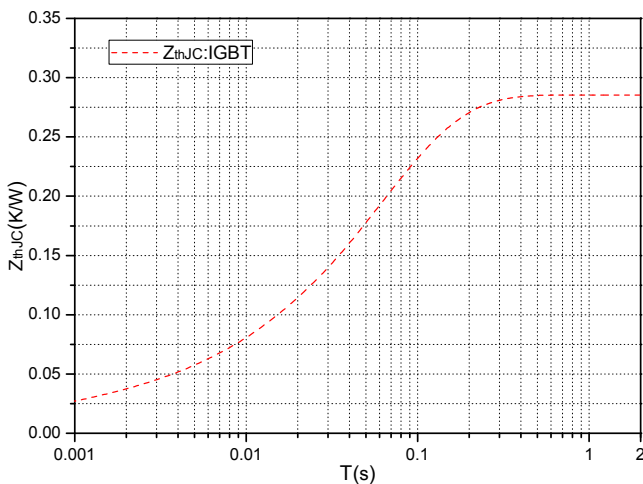


Fig.9 Transient thermal impedance (IGBT)

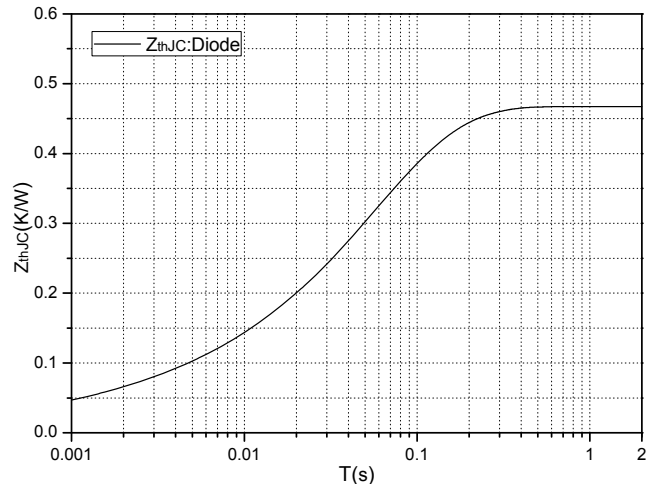
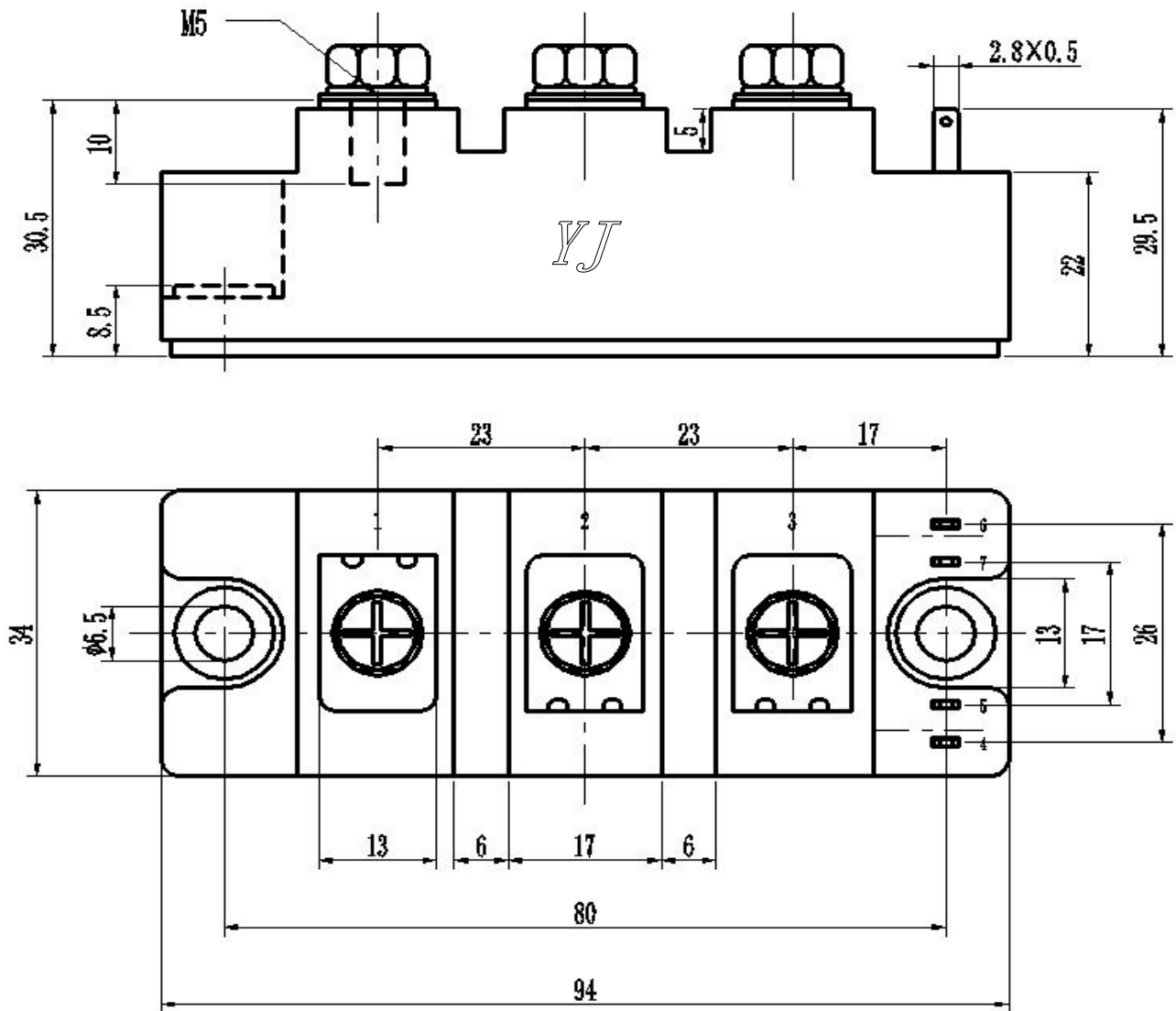


Fig.10 Transient thermal impedance (Diode)

Package Outline Information

CASE: C1



Dimensions in mm