



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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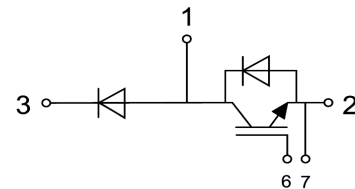
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$V_{CES} = 1200V$
$I_C = 150A$ at $T_C = 80^\circ C$
$t_{SC} \geq 10\mu sec$
$V_{CE(ON)} = 1.90V$ at $I_C = 150A$

**Low-Side Chopper IGBT with High-Side Diode  
POWIR 62™ Package**



**Applications:**

- Industrial Motor Drive
- Uninterruptible Power Supply
- Welding and Cutting Machine
- Switched Mode Power Supply

Features	Benefits
Low $V_{CE(ON)}$ and Switching Losses	High Efficiency in a Wide Range of Applications
RBSOA Tested	Rugged Transient Performance
10 $\mu sec$ Short Circuit Safe Operating Area	
<b>POWIR 62™</b> Package	Industry Standard
Lead Free	RoHS Compliant, Environmental Friendly

Base Part Number	Package Type	Standard Pack	Quantity	Orderable Part Number
IRG7T150CL12B	<b>POWIR 62™</b>	Box	45	IRG7T150CL12B

**Absolute Maximum Ratings of IGBT**

$V_{CES}$	Collector to Emitter Voltage	1200	V
$V_{GES}$	Continuous Gate to Emitter Voltage	±20	V
$I_C$	Continuous Collector Current	$T_C = 80^\circ C$	150 A
		$T_C = 25^\circ C$	300 A
$I_{CM}$	Pulse Collector Current	$T_J = 175^\circ C$	300 A
$P_D$	Maximum Power Dissipation (IGBT)	$T_C = 25^\circ C, T_J = 175^\circ C$	910 W
$T_J$	Maximum IGBT Junction Temperature	175	°C
$T_{JOP}$	Maximum Operating Junction Temperature Range	-40 to +150	°C
$T_{stg}$	Storage Temperature	-40 to +125	°C

**Electrical Characteristics of IGBT at  $T_J = 25^\circ\text{C}$  (Unless Otherwise Specified)**

Parameter		Min.	Typ.	Max.	Unit	Test Conditions	
$V_{(BR)CES}$	Collector to Emitter Breakdown Voltage	1200			V	$V_{GE} = 0V, I_C = 1mA$	
$V_{GE(th)}$	Gate Threshold Voltage	5.0	5.8	6.5	V	$I_C = 7mA, V_{CE} = V_{GE}$	
$V_{CE(ON)}$	Collector to Emitter Saturation Voltage		1.90	2.20	V	$T_J = 25^\circ\text{C}$	$I_C = 150A, V_{GE} = 15V$
			2.20		V	$T_J = 125^\circ\text{C}$	
$I_{CES}$	Collector to Emitter Leakage Current			1	mA	$V_{GE} = 0V, V_{CE} = V_{CES}$	
$I_{GES}$	Gate to Emitter Leakage Current			400	nA	$V_{GE} = \pm 20V, V_{CE} = 0$	
$R_{Gint}$	Internal Gate Resistance		1.25		$\Omega$		

**Switching Characteristics of IGBT**

Parameter		Min.	Typ.	Max.	Unit	Test Conditions	
$t_{d(on)}$	Turn-on Delay Time		235		ns	$T_J = 25^\circ\text{C}$	$V_{CC}=600V, I_C = 150A, R_G = 6.2\Omega, V_{GE}=\pm 15V, \text{Inductive Load}$
			220			$T_J = 125^\circ\text{C}$	
$t_r$	Rise Time		115		ns	$T_J = 25^\circ\text{C}$	
			120			$T_J = 125^\circ\text{C}$	
$t_{d(off)}$	Turn-off Delay Time		360		ns	$T_J = 25^\circ\text{C}$	
			380			$T_J = 125^\circ\text{C}$	
$t_f$	Fall Time		160		ns	$T_J = 25^\circ\text{C}$	
			230			$T_J = 125^\circ\text{C}$	
$E_{on}$	Turn-on Switching Loss		9.1		mJ	$T_J = 25^\circ\text{C}$	
			12.2			$T_J = 125^\circ\text{C}$	
$E_{off}$	Turn-off Switching Loss		7.5		mJ	$T_J = 25^\circ\text{C}$	
			11.5			$T_J = 125^\circ\text{C}$	
$Q_g$	Total Gate Charge		1230		nC	$T_J = 25^\circ\text{C}$	
$C_{ies}$	Input Capacitance		20.2		nF	$V_{CE} = 25V, V_{GE} = 0V, f = 1MHz, T_J = 25^\circ\text{C}$	
$C_{oes}$	Output Capacitance		1.15				
$C_{res}$	Reverse Transfer Capacitance		0.75				
RBSOA	Reverse Bias Safe Operating Area	Trapezoid				$I_C = 300A, V_{CC} = 960V, V_P = 1200V, R_G = 15\Omega, V_{GE} = +15V \text{ to } 0V, T_J = 150^\circ\text{C}$	
SCSOA	Short Circuit Safe Operating Area	10			$\mu\text{s}$	$V_{CC} = 600V, V_{GE} = 15V, T_J = 150^\circ\text{C}$	

**Absolute Maximum Ratings of Freewheeling Diode**

$V_{RRM}$	Repetitive Peak Reverse Voltage	1200	V
$I_F$	Diode Continuous Forward Current, $T_C = 25^\circ\text{C}$	300	A
	Diode Continuous Forward Current, $T_C = 80^\circ\text{C}$	150	
$I_{FM}$	Pulse Diode Current	200	A

**Electrical and Switching Characteristics of Freewheeling Diode**

Parameter		Typ.	Max.	Unit	Test Conditions	
$V_F$	Forward Voltage	2.20	2.70	V	$T_J = 25^\circ\text{C}$	$I_F = 150\text{A}$ , $V_{GE} = 0\text{V}$
		2.40			$T_J = 125^\circ\text{C}$	
$I_{rr}$	Peak Reverse Recovery Current	75		A	$T_J = 25^\circ\text{C}$	$I_F = 150\text{A}$ , $di/dt = 1560\text{A}/\mu\text{s}$ , $V_{rr} = 600\text{V}$ , $V_{GE} = -15\text{V}$
		110			$T_J = 125^\circ\text{C}$	
$Q_{rr}$	Reverse Recovery Charge	7.1		$\mu\text{C}$	$T_J = 25^\circ\text{C}$	
		13.0			$T_J = 125^\circ\text{C}$	
$E_{rec}$	Reverse Recovery Energy	3.0		mJ	$T_J = 25^\circ\text{C}$	
		5.6			$T_J = 125^\circ\text{C}$	

**Absolute Maximum Ratings of Brake-Chopper Diode**

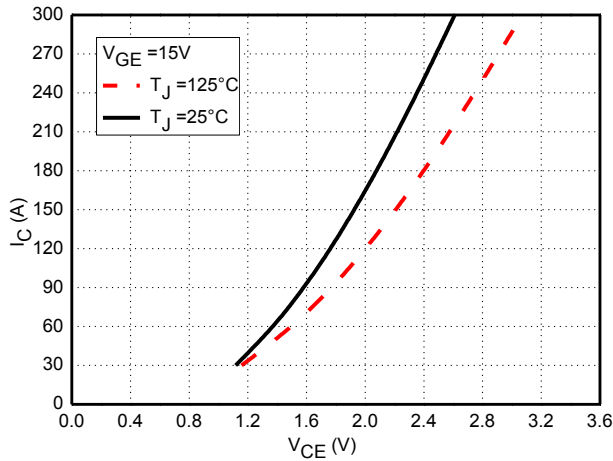
$V_{RRM}$	Repetitive Peak Reverse Voltage	1200	V
$I_F$	Diode Continuous Forward Current, $T_C = 25^\circ\text{C}$	300	A
	Diode Continuous Forward Current, $T_C = 80^\circ\text{C}$	150	
$I_{FM}$	Pulse Diode Current	300	A

**Electrical and Switching Characteristics of Brake-Chopper Diode**

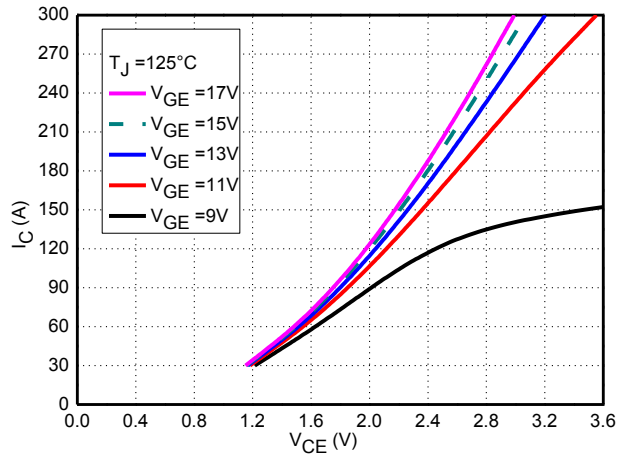
Parameter		Typ.	Max.	Unit	Test Conditions	
$V_F$	Forward Voltage	2.20	2.70	V	$T_J = 25^\circ\text{C}$	$I_F = 150\text{A}$ , $V_{GE} = 0\text{V}$
		2.40			$T_J = 125^\circ\text{C}$	
$I_{rr}$	Peak Reverse Recovery Current	75		A	$T_J = 25^\circ\text{C}$	$I_F = 150\text{A}$ , $di/dt = 1560\text{A}/\mu\text{s}$ , $V_{rr} = 600\text{V}$ , $V_{GE} = -15\text{V}$
		110			$T_J = 125^\circ\text{C}$	
$Q_{rr}$	Reverse Recovery Charge	7.1		$\mu\text{C}$	$T_J = 25^\circ\text{C}$	
		13.0			$T_J = 125^\circ\text{C}$	
$E_{rec}$	Reverse Recovery Energy	3.0		mJ	$T_J = 25^\circ\text{C}$	
		5.6			$T_J = 125^\circ\text{C}$	

**Module Characteristics**

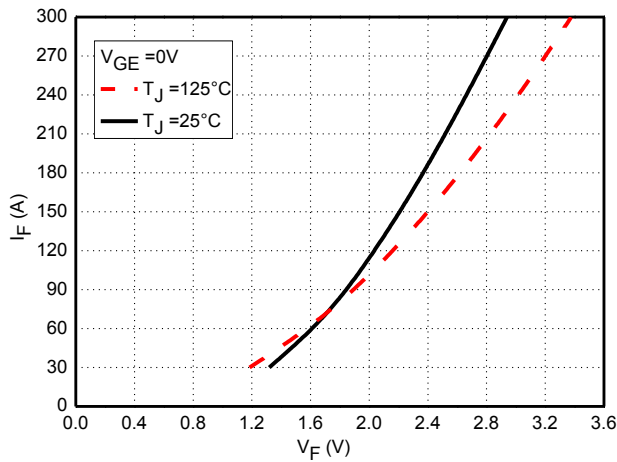
Parameter		Min.	Typ.	Max.	Unit
V <sub>iso</sub>	Isolation Voltage (All Terminals Shorted), f = 50Hz, 1minute			2500	V
R <sub>θJC</sub>	Junction-to-Case (IGBT)		0.165		°C/W
R <sub>θJC</sub>	Junction-to-Case (Freewheeling Diode)		0.280		°C/W
R <sub>θJC</sub>	Junction-to-Case (Brake-Chopper Diode)		0.28		°C/W
R <sub>θCS</sub>	Case-To-Sink (Conductive Grease Applied)		0.1		°C/W
M	Power Terminals Screw: M6	3.0		5.0	N·m
M	Mounting Screw: M6	4.0		6.0	N·m
G	Weight		230		g



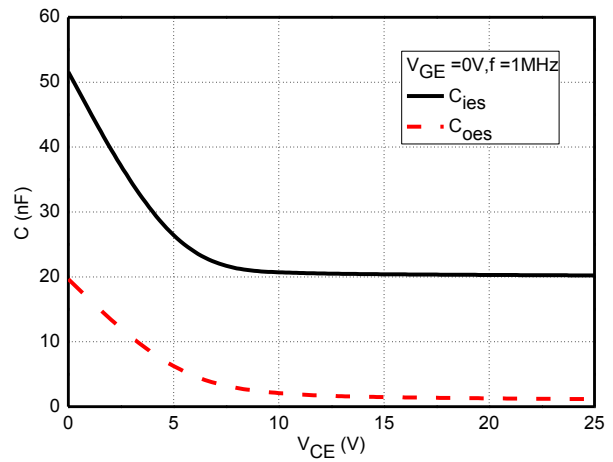
**Fig.1 Typical IGBT Saturation Characteristics**



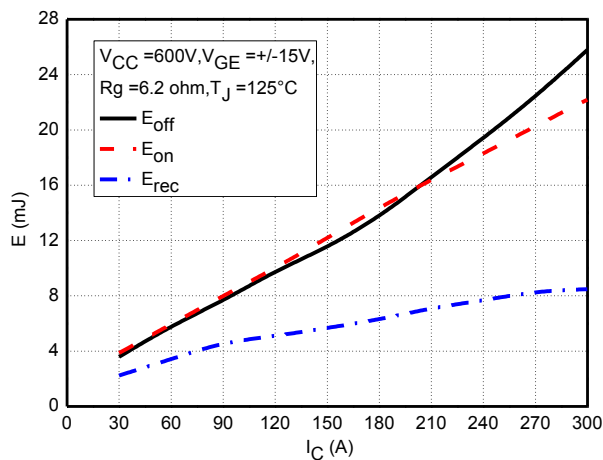
**Fig.2 Typical IGBT Output Characteristics**



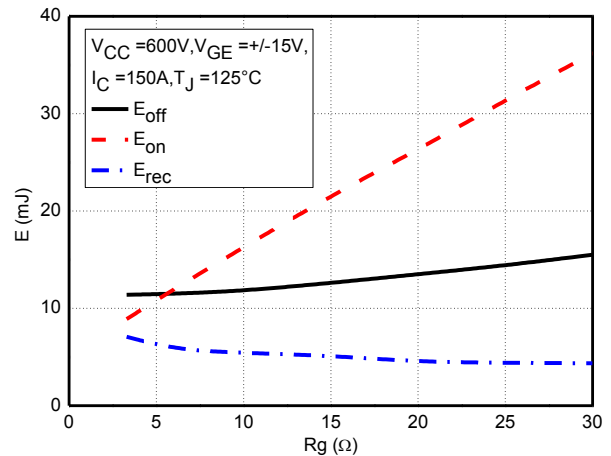
**Fig.3 Typical Forward Characteristics, Freewheeling Diode**



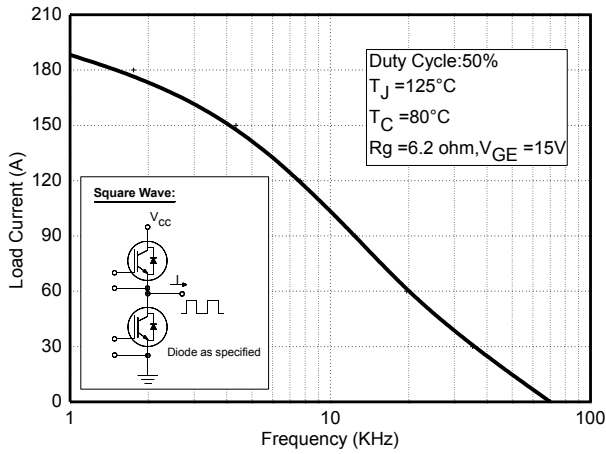
**Fig. 4 Typical Capacitance Characteristics**



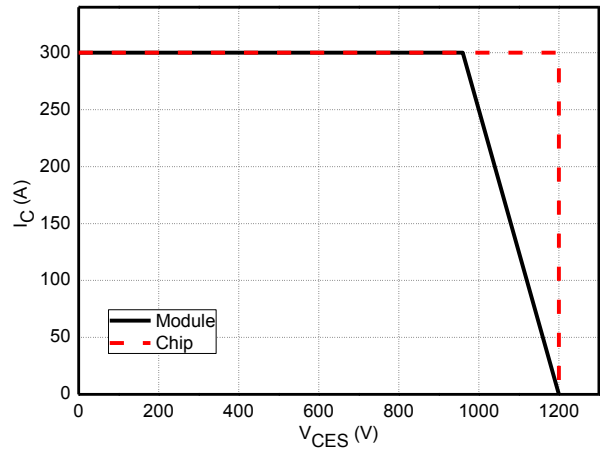
**Fig.5 Typical Switching Loss vs. Collector Current**



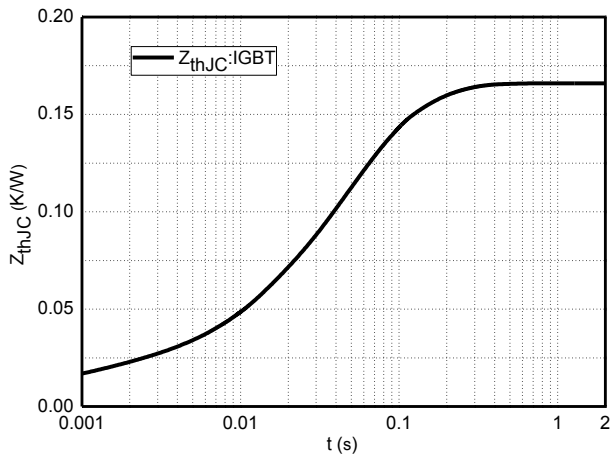
**Fig.6 Typical Switching Loss vs. Gate Resistance**



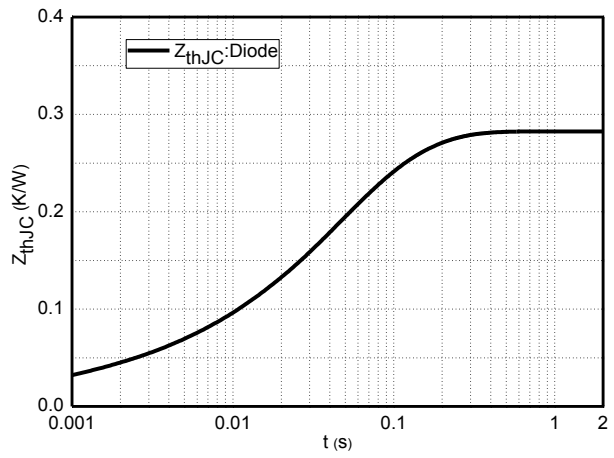
**Fig.7 Typical Load Current vs. Frequency**



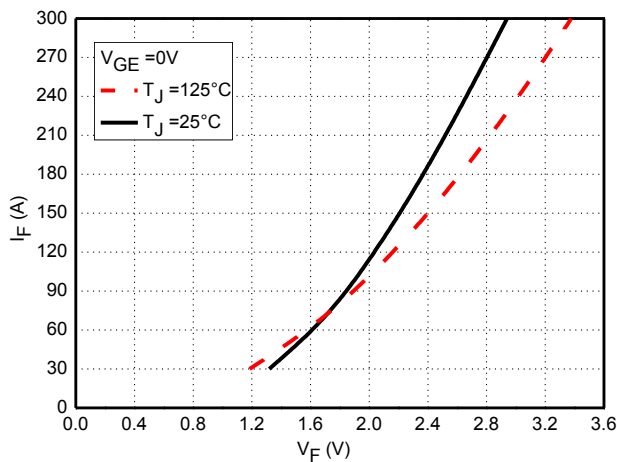
**Fig.8 Reverse Bias Safe Operation Area (RBSOA)**



**Fig.9 Typical Transient Thermal Impedance (IGBT)**



**Fig.10 Typical Transient Thermal Impedance (Diode)**



**Fig.11 Typical Forward Characteristics, Brake-Chopper Diode**





**Qualification Information†**

<b>Qualification Level</b>	Industrial
<b>Moisture Sensitivity Level</b>	Not Applicable
<b>RoHS Compliant</b>	Yes

† Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability/>