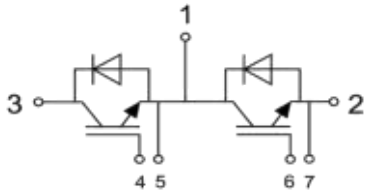
V_{CES} = 1200V
I_C = 300A at T_C = 80°C
t_{SC} ≥ 10µsec
$V_{CE(ON)}$ = 1.90V at I_C = 300A

IGBT Half-Bridge
POWIR 62™ Package





Applications:

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

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

Base Part Number	**Package Type**	**Standard Pack**	**Quantity**	**Orderable Part Number**
IRG7T300HF12B	***POWIR 62™***	Box	45	IRG7T300HF12B

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°C	300	A
		T_C = 25°C	570	A
I_{CM}	Pulse Collector Current	T_J = 175°C	600	A
P_D	Maximum Power Dissipation (IGBT)	T_C = 25°C, T_J = 175°C	1600	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

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Electrical Characteristics of IGBT at T_J = 25°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 = 4mA	
$V_{GE(th)}$	Gate Threshold Voltage	5.0	5.8	6.5	V	I_C = 14mA, V_{CE} = V_{GE}	
$V_{CE(ON)}$	Collector to Emitter Saturation Voltage		1.90	2.20	V	T_J = 25°C	I_C = 300A, V_{GE} = 15V
			2.20		V	T_J = 125°C	
I_{CES}	Collector to Emitter Leakage Current			4	mA	V_{GE} = 0V, V_{CE} = V_{CES}	
I_{GES}	Gate to Emitter Leakage Current			400	nA	V_{GE} = ±20V, V_{CE} = 0	
R_{Gint}	Internal Gate Resistance		1.25		Ω		

Switching Characteristics of IGBT

Parameter		Min.	Typ.	Max.	Unit	Test Conditions	
$t_{d(on)}$	Turn-on Delay Time		300		ns	T_J = 25°C	V_{CC}=600V, I_C = 300A, R_G = 3.3Ω, V_{GE}=±15V, Inductive Load
			290			T_J = 125°C	
t_r	Rise Time		200		ns	T_J = 25°C	
			210			T_J = 125°C	
$t_{d(off)}$	Turn-off Delay Time		540		ns	T_J = 25°C	
			600			T_J = 125°C	
t_f	Fall Time		175		ns	T_J = 25°C	
			195			T_J = 125°C	
E_{on}	Turn-on Switching Loss		16.9		mJ	T_J = 25°C	
			21.4			T_J = 125°C	
E_{off}	Turn-off Switching Loss		24.8		mJ	T_J = 25°C	
			31.7			T_J = 125°C	
Q_g	Total Gate Charge		1760		nC	T_J = 25°C	
C_{ies}	Input Capacitance		42.4		nF	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz, T_J = 25°C	
C_{oes}	Output Capacitance		2.18				
C_{res}	Reverse Transfer Capacitance		1.27				
RBSOA	Reverse Bias Safe Operating Area	Trapezoid				I_C = 600A, V_{CC} = 960V, V_P =1200V, R_G = 15Ω, V_{GE} = +15V to 0V, T_J = 150°C	
SCSOA	Short Circuit Safe Operating Area	10			µs	V_{CC} = 600V, V_{GE} = 15V, T_J = 150°C	

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Absolute Maximum Ratings of Freewheeling Diode

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current, T_C = 25°C	600	A
	Diode Continuous Forward Current, T_C = 80°C	300	
I_{FM}	Pulse Diode Current	600	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°C	I_F = 300A , V_{GE} = 0V
		2.40			T_J = 125°C	
I_{rr}	Peak Reverse Recovery Current	145		A	T_J = 25°C	I_F=300A, di/dt=1670A/µs, V_{rr} = 600V, V_{GE} = -15V
		180			T_J = 125°C	
Q_{rr}	Reverse Recovery Charge	18.9		µC	T_J = 25°C	
		32.6			T_J = 125°C	
E_{rec}	Reverse Recovery Energy	7.6		mJ	T_J = 25°C	
		15.2			T_J = 125°C	

Module Characteristics

Parameter		Min.	Typ.	Max.	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted), f = 50Hz, 1minute			2500	V
$R_{\theta JC}$	Junction-to-Case (IGBT)		0.099		°C/W
$R_{\theta JC}$	Junction-to-Case (Diode)		0.136		°C/W
$R_{\theta CS}$	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

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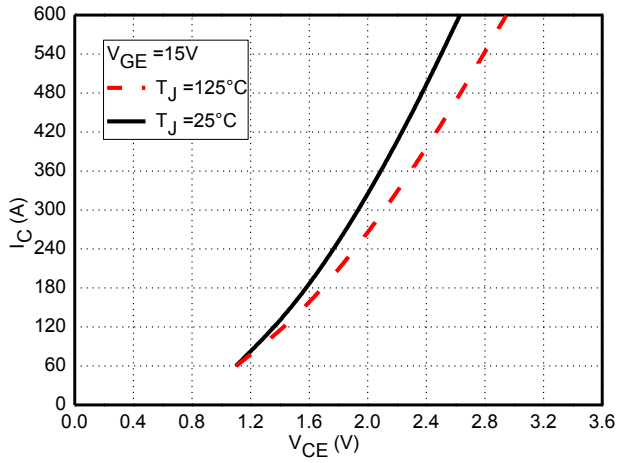


Fig.1 Typical IGBT Saturation Characteristics

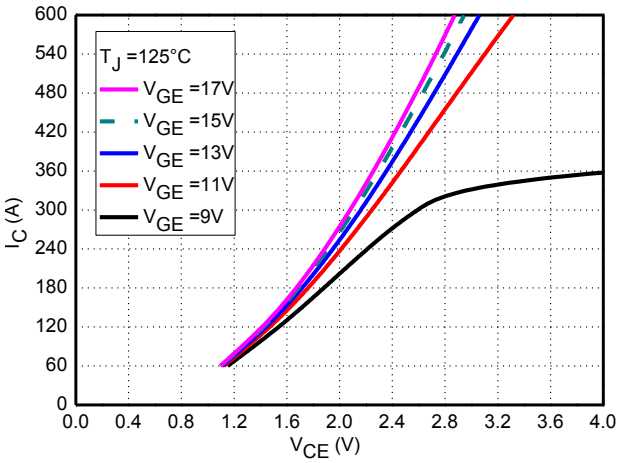


Fig.2 Typical IGBT Output Characteristics

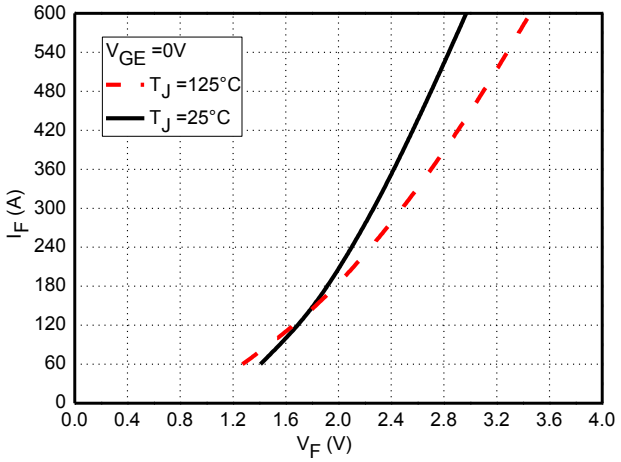


Fig.3 Typical Freewheeling Diode Characteristics

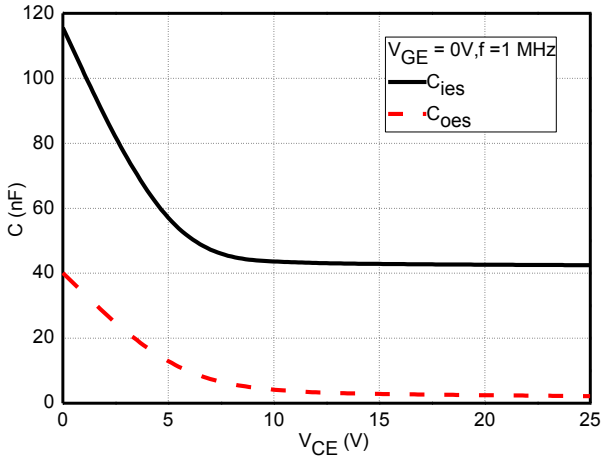


Fig. 4 Typical Capacitance Characteristics

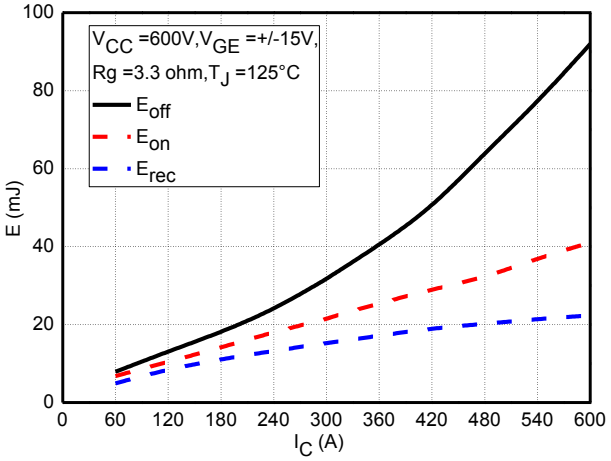


Fig.5 Typical Switching Loss vs. Collector Current

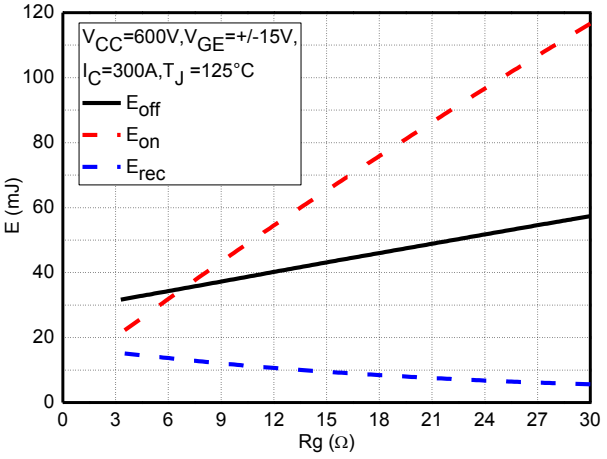


Fig.6 Typical Switching Loss vs. Gate Resistance

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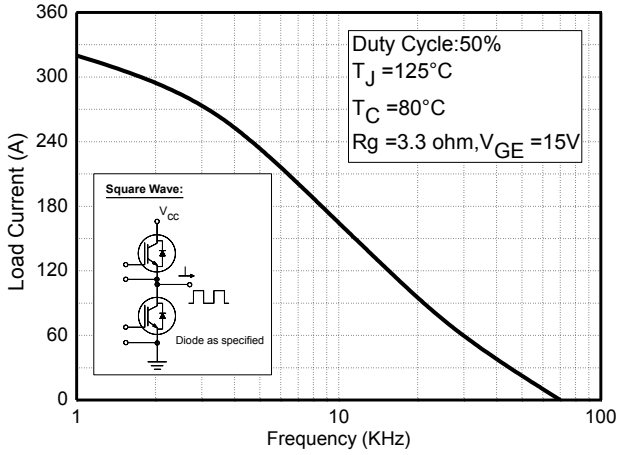


Fig.7 Typical Load Current vs. Frequency

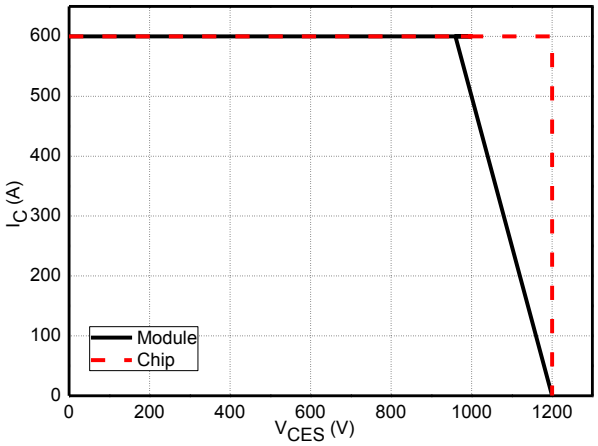


Fig.8 Reverse Bias Safe Operation Area (RBSOA)

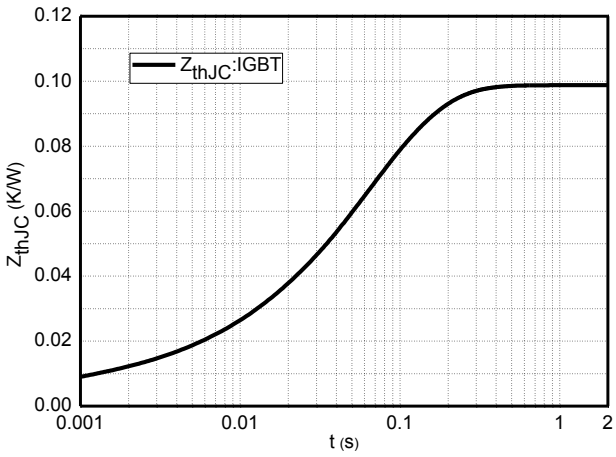


Fig.9 Typical Transient Thermal Impedance (IGBT)

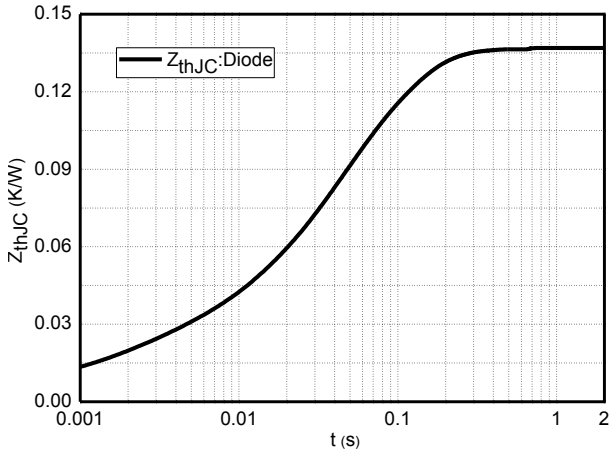
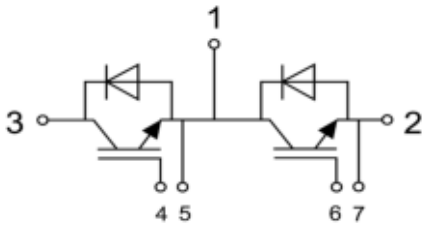


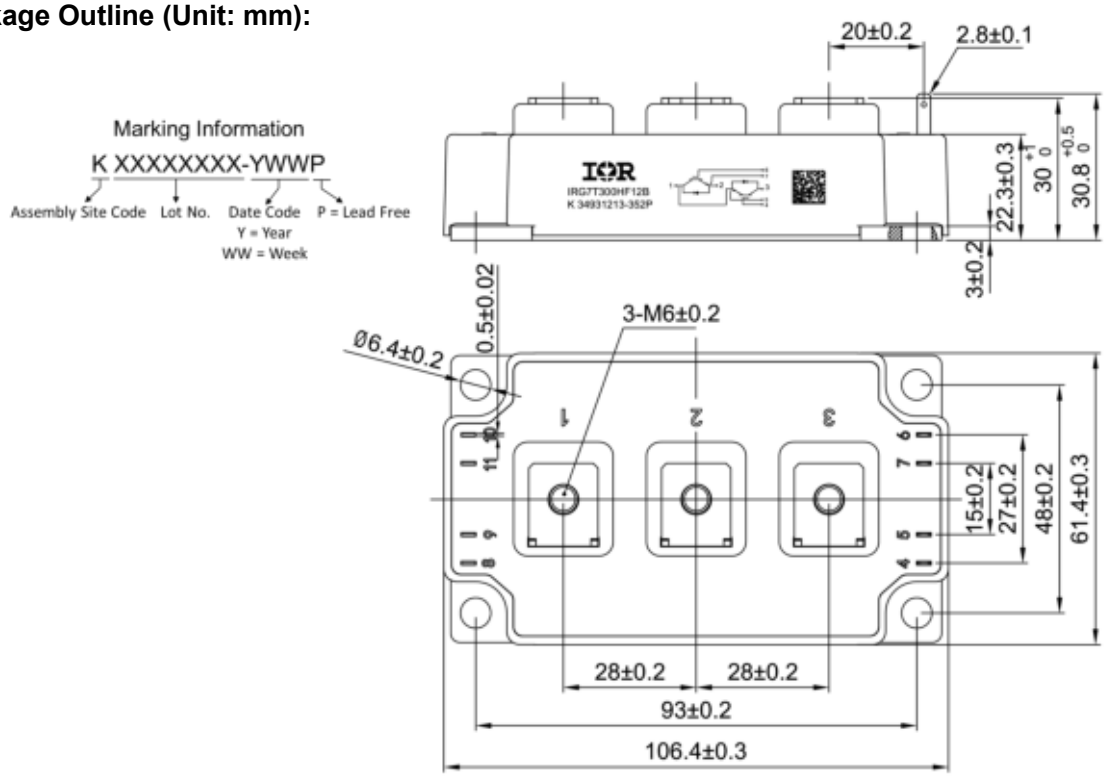
Fig.10 Typical Transient Thermal Impedance (Diode)

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Internal Circuit:



Package Outline (Unit: mm):



Qualification Information†

Qualification Level	Industrial
Moisture Sensitivity Level	Not Applicable
RoHS Compliant	Yes

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

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