

IGBT Modules

V_{CES} 1200V
 I_C 300A



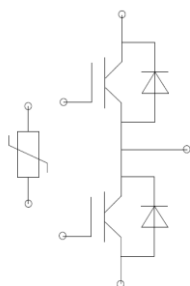
Applications

- Motion/sevo control
- High frequency switching application
- UPS (Uninterruptible Power Supplies)
- Welding machine

Features

- Low $V_{CE(sat)}$ with Trench technology
- Low switching losses especially Eoff
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance package
- Maximum junction temperature 175°C

Circuit



● IGBT

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V$, $I_C=1mA$, $T_{vj}=25^{\circ}C$	1200	V
Continuous Collector Current	I_C	$T_C=100^{\circ}C$	300	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	600	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation	P_{tot}	$T_C=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	1850	W

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, $I_C=11mA$, $T_{vj}=25^{\circ}C$	5.2	5.8	6.4	V
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V$, $V_{GE}=0V$, $T_{vj}=25^{\circ}C$			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=300A$, $V_{GE}=15V$, $T_{vj}=25^{\circ}C$		1.90	2.30	V
		$I_C=300A$, $V_{GE}=15V$, $T_{vj}=125^{\circ}C$		2.20		
		$I_C=300A$, $V_{GE}=15V$, $T_{vj}=150^{\circ}C$		2.35		
Gate Charge	Q_G			2.65		μC
Internal Gate Resistance	R_{Gint}			1.25		Ω
Input Capacitance	C_{ies}	$V_{CE}=25V$, $V_{GE}=0V$, $f=1MHz$, $T_{vj}=25^{\circ}C$		26.4		nF
Reverse Transfer Capacitance	C_{res}			0.81		nF
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V$, $V_{GE}=20V$, $T_{vj}=25^{\circ}C$			400	nA
Turn-on Delay Time	$t_{d(on)}$	$I_C=300A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=1.3\Omega$ $T_{vj}=25^{\circ}C$		86		ns
Rise Time	t_r			58		ns
Turn-off Delay Time	$t_{d(off)}$			226		ns
Fall Time	t_f			190		ns
Energy Dissipation During Turn-on Time	E_{on}			26.3		mJ
Energy Dissipation During Turn-off Time	E_{off}			21.6		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=300A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=1.3\Omega$ $T_{vj}=150^{\circ}C$		91		ns
Rise Time	t_r			64		ns
Turn-off Delay Time	$t_{d(off)}$			259		ns
Fall Time	t_f			246		ns
Energy Dissipation During Turn-on Time	E_{on}			37.8		mJ
Energy Dissipation During Turn-off Time	E_{off}			25.8		mJ
SC Data	I_{sc}	$t_p \leq 10\mu s$, $V_{GE}=15V$, $T_{vj}=150^{\circ}C$, $V_{CC}=900V$, $V_{CEM} \leq 1200V$		1200		A

● Diode

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	$T_{vj}=25^{\circ}C$	1200	V
Continuous DC Forward Current	I_F		300	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1ms$	600	A
I^2t -value	I^2t	$V_R=0V, t_p=10ms, T_{vj}=125^{\circ}C$	18200	A ² s
		$V_R=0V, t_p=10ms, T_{vj}=150^{\circ}C$	14500	

Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=300A, T_{vj}=25^{\circ}C$		1.95		V
		$I_F=300A, T_{vj}=125^{\circ}C$		1.80		
		$I_F=300A, T_{vj}=150^{\circ}C$		1.75		
Recovered Charge	Q_{rr}	$I_F=300A$		20.6		uC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$		153		A
Reverse Recovery Energy	E_{rec}	$-di_F/dt=1800A/us$ $T_{vj}=25^{\circ}C$		7.4		mJ
Recovered Charge	Q_{rr}	$I_F=300A$		47.2		uC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$		210		A
Reverse Recovery Energy	E_{rec}	$-di_F/dt=1800A/us$ $T_{vj}=150^{\circ}C$		17.6		mJ

● NTC-Thermistor

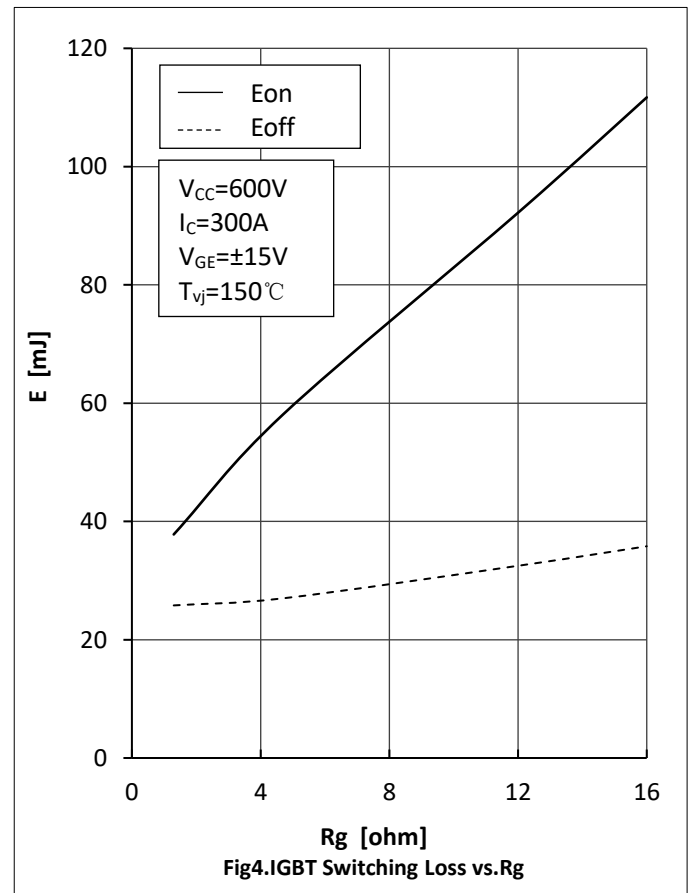
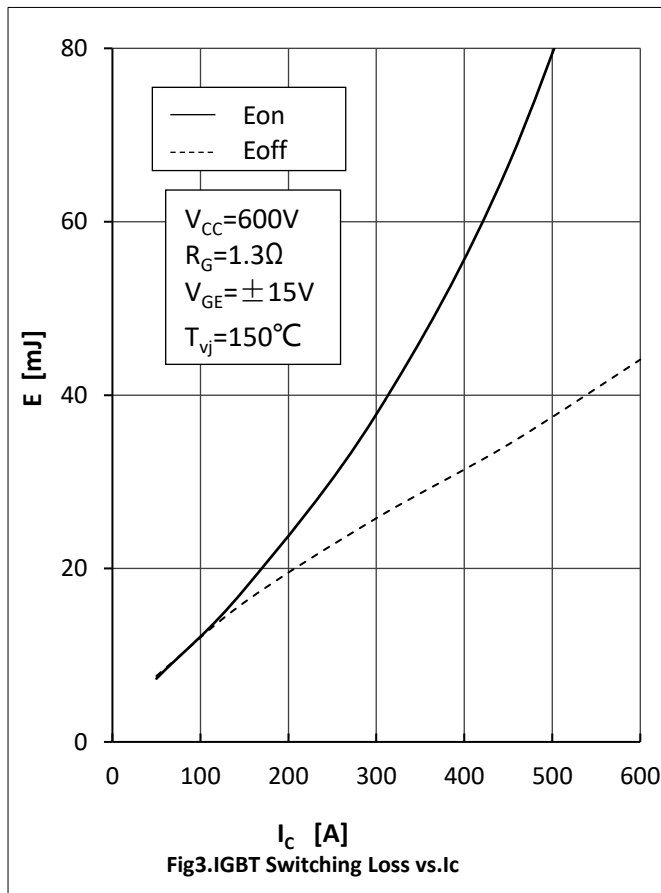
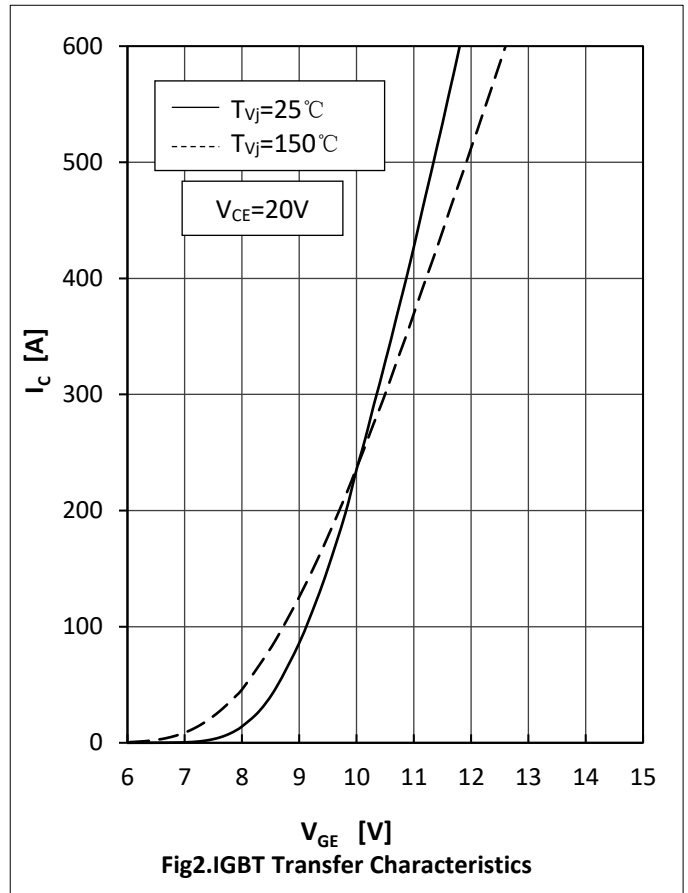
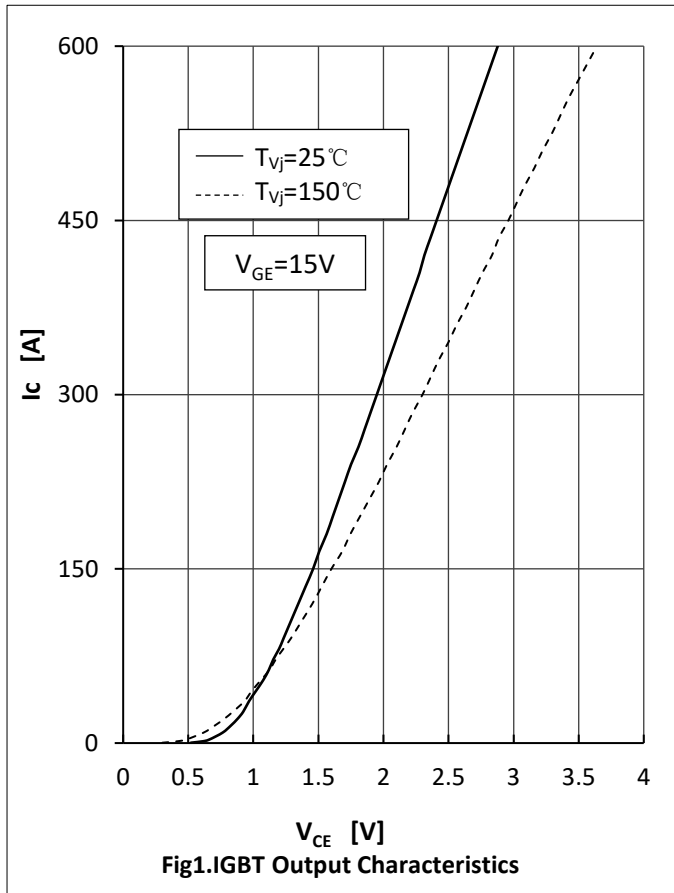
Characteristic values

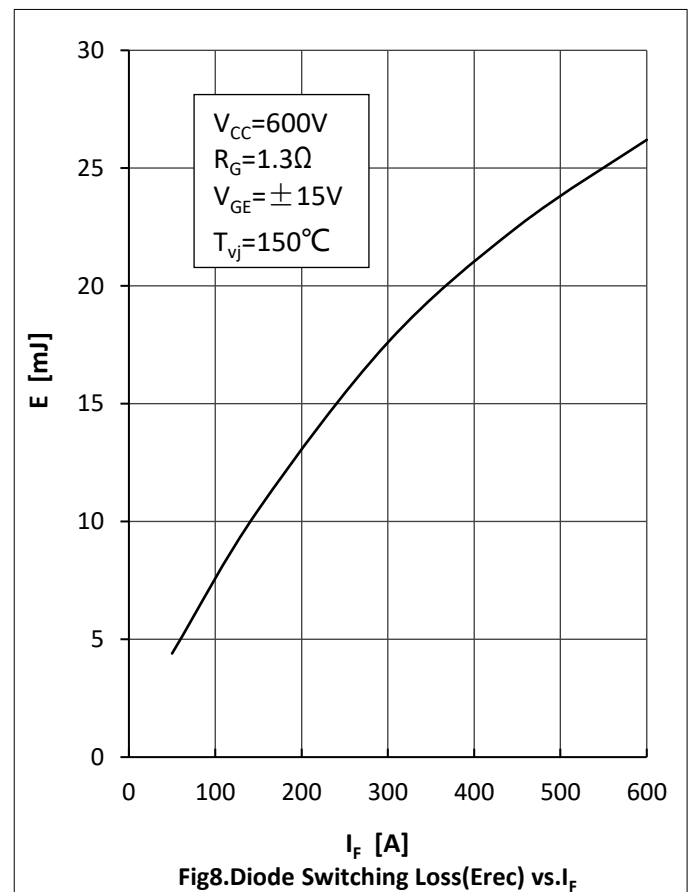
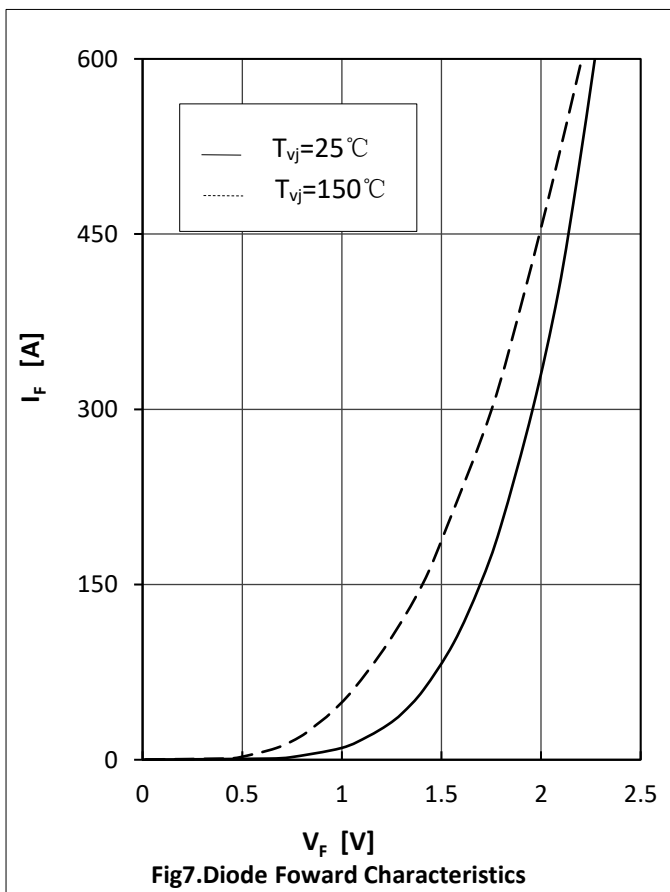
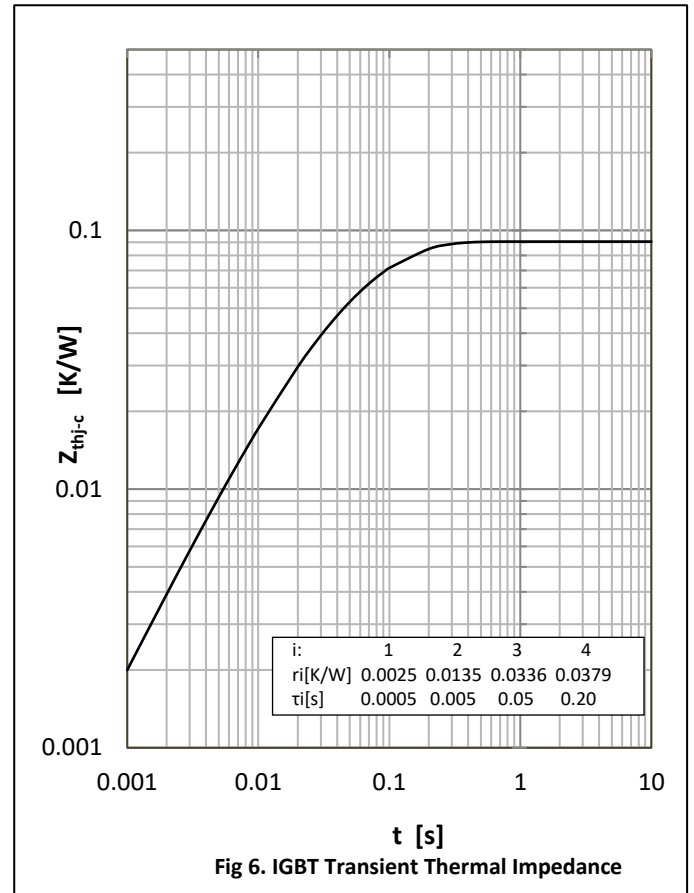
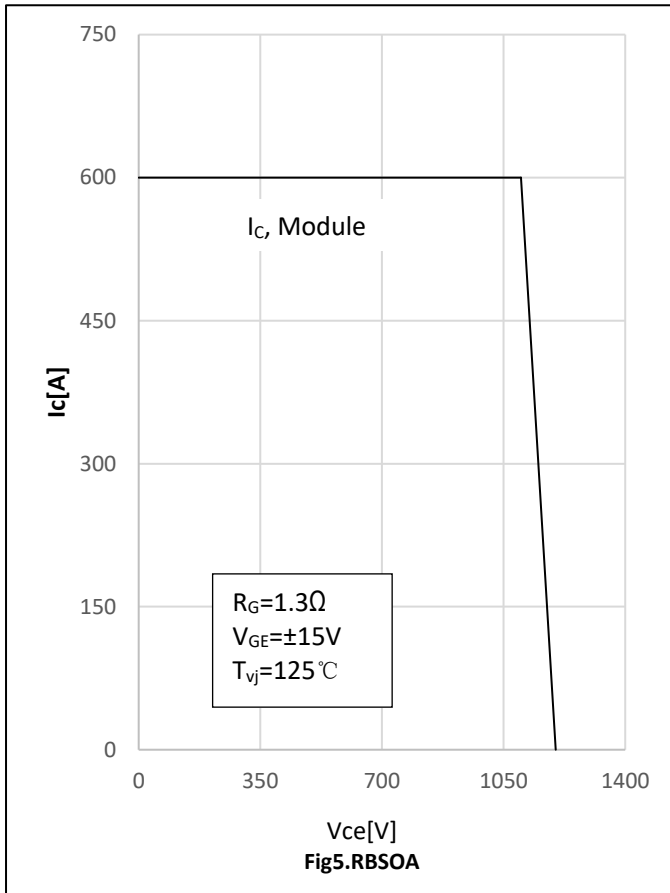
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		kΩ
Deviation of R100	$\Delta R/R$	$T_C=100, R_{100}=493.3\Omega$	-5		5	%
Power Dissipation	P_{25}				20.0	mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3375		K

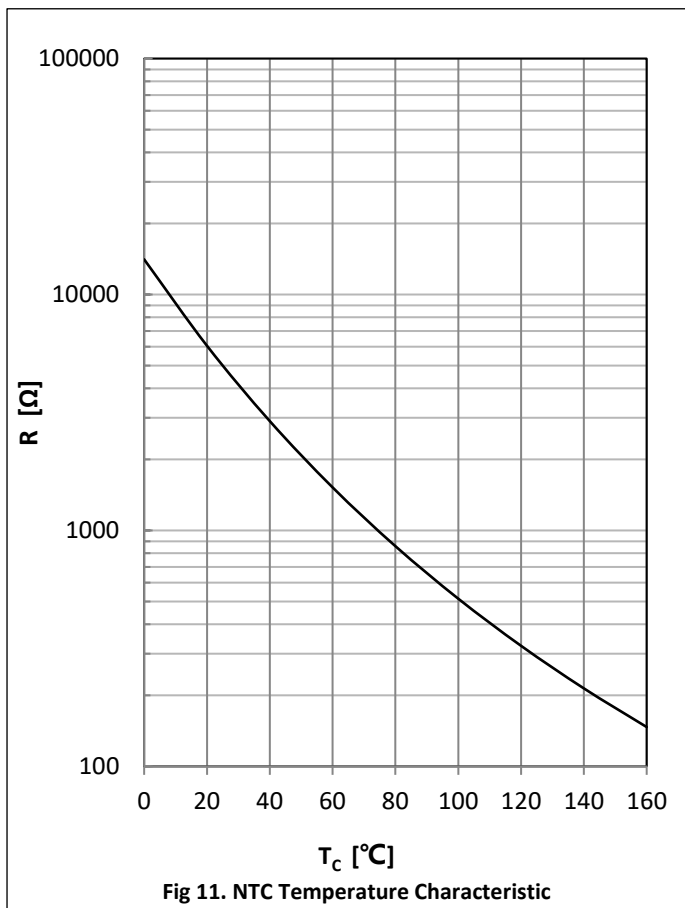
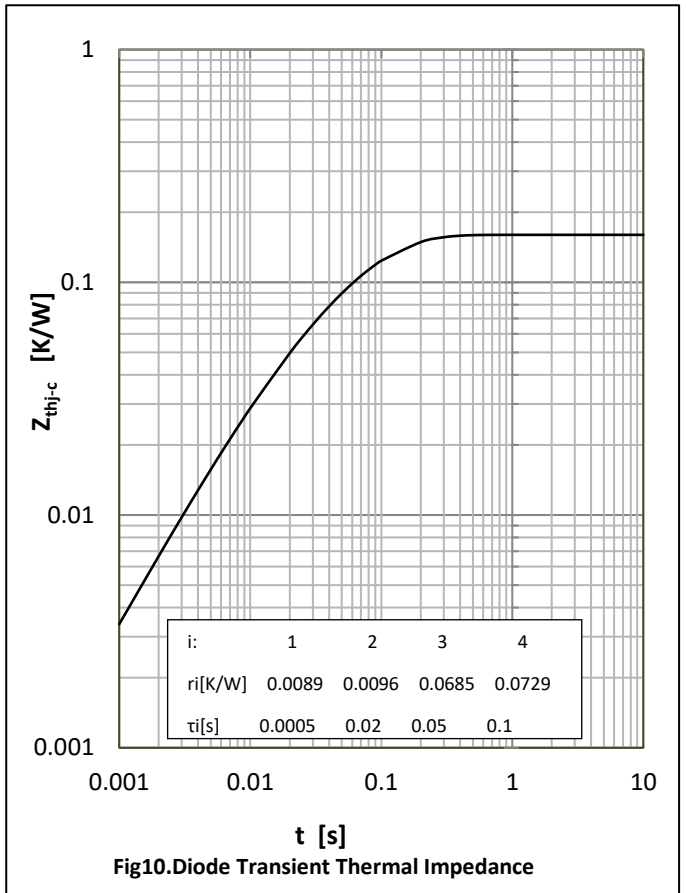
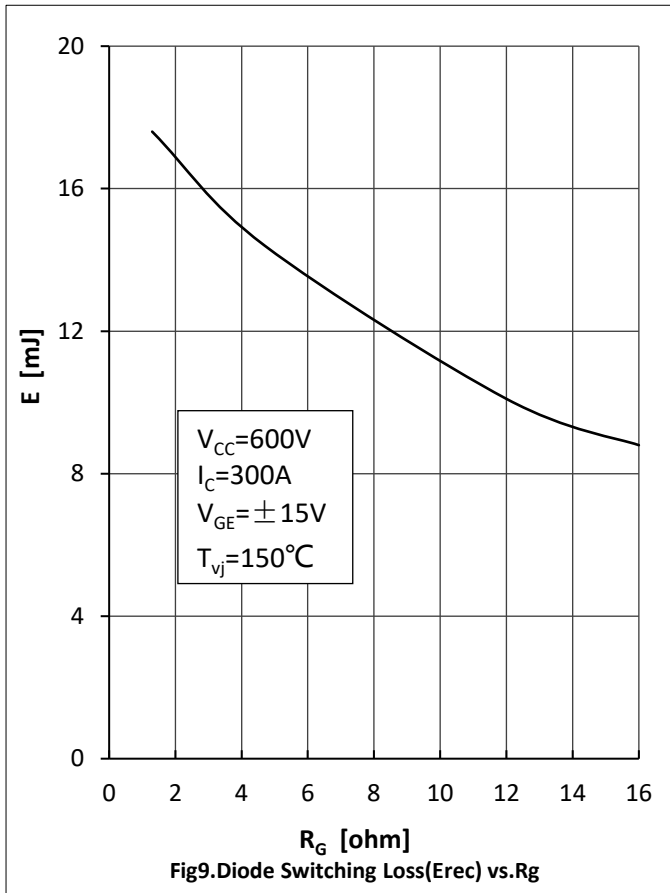
● Module Characteristics

$T_c=25^{\circ}\text{C}$ unless otherwise specified

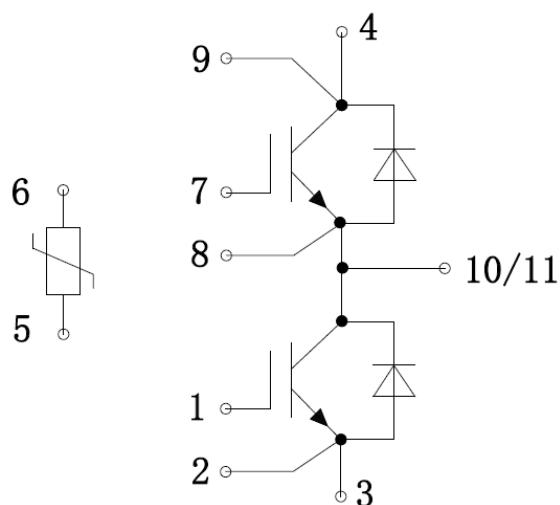
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				175	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Thermal Resistance Junction-to Case	$R_{\theta\text{JC}}$	per IGBT			0.09	K/W
		per Diode			0.16	
Thermal Resistance Case-to Sink	$R_{\theta\text{CS}}$	Conductive grease applied		0.009		K/W
Comparative Tracking Index	CTI		200			
Module Electrodes Torque	M_t	Recommended(M6)	4.0		5.0	N·m
Module-to-Sink Torque	M_s	Recommended(M5)	3.0		6.0	N·m
Weight of Module	G			345		g



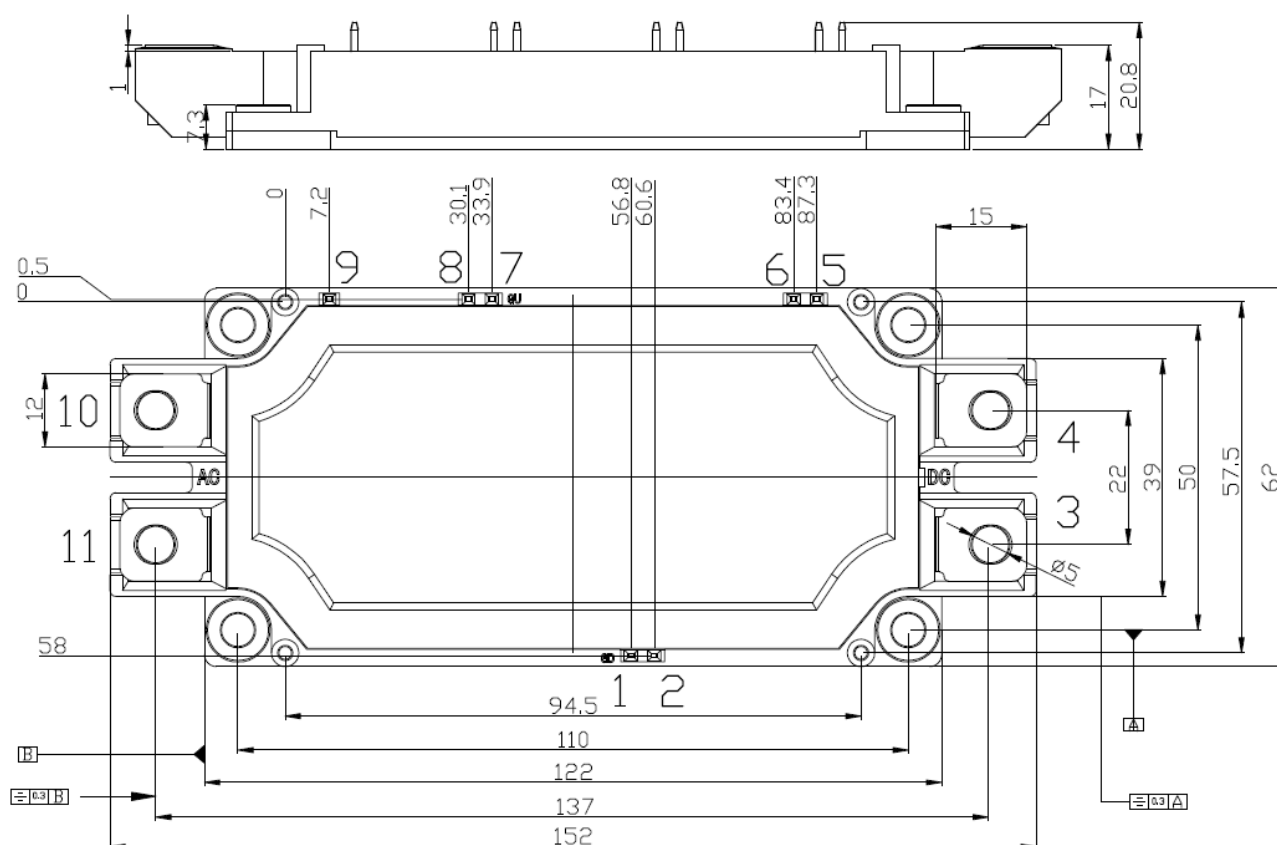




● Circuit Diagram



● Package Outline Information



Disclaimer

The information presented in this document is for reference only. Shanghai Sunco Electronics Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Russiansunco or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.russiansunco.com](http://www.russiansunco.com) , or consult your nearest Russiansunco's sales office for further assistance.