

IGBT Modules



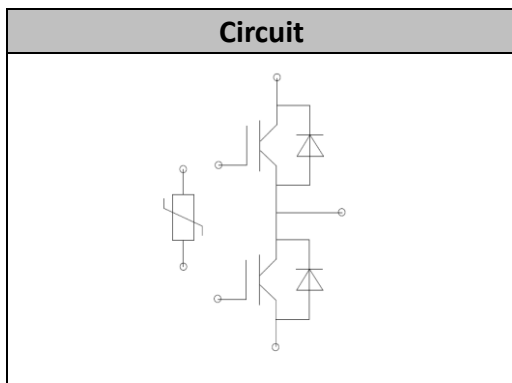
V_{CES}	1200V
I_C	225A

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 E_{off}
- $V_{CE(sat)}$ 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



● 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	$T_C=100^{\circ}C$	225	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	450	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation	P_{tot}	$T_C=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	1540	W

Characteristic values

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=12mA, T_{vj}=25^{\circ}C$	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	$V_{CE(sat)}$	$I_C=225A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.90	2.30	V	
		$I_C=225A, V_{GE}=15V, T_{vj}=125^{\circ}C$		2.20			
		$I_C=225A, V_{GE}=15V, T_{vj}=150^{\circ}C$		2.32			
Gate Charge	Q_G			1.38		μC	
Internal Gate Resistance	R_{Gint}			3.3		Ω	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		15.6		nF	
Reverse Transfer Capacitance	C_{res}			0.64		nF	
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA	
Turn-on Delay Time	$t_{d(on)}$	$I_C=225A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=1.5\Omega$ $T_{vj}=25^{\circ}C$		213		ns	
Rise Time	t_r			70		ns	
Turn-off Delay Time	$t_{d(off)}$			284		ns	
Fall Time	t_f			81		ns	
Energy Dissipation During Turn-on Time	E_{on}			22.6		mJ	
Energy Dissipation During Turn-off Time	E_{off}			9.1		mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=225A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=1.5\Omega$ $T_{vj}=150^{\circ}C$		223		ns
Rise Time	t_r				75		ns
Turn-off Delay Time	$t_{d(off)}$				350		ns
Fall Time	t_f				164		ns
Energy Dissipation During Turn-on Time	E_{on}			33.1		mJ	
Energy Dissipation During Turn-off Time	E_{off}			15.4		mJ	
SC Data	I_{sc}	$t_p \leq 10\mu s, V_{GE}=15V,$ $T_{vj}=150^{\circ}C, V_{CC}=900V,$ $V_{CEM} \leq 1200V$		1100		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		225	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1ms$	450	A
I^2t -value	I^2t	$V_R=0V, t_p=10ms, T_{vj}=125^{\circ}C$	11000	A ² s
		$V_R=0V, t_p=10ms, T_{vj}=150^{\circ}C$	8500	

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=225A, T_{vj}=25^{\circ}C$		2.15		V
		$I_F=225A, T_{vj}=125^{\circ}C$		1.95		
		$I_F=225A, T_{vj}=150^{\circ}C$		1.90		
Recovered Charge	Q_{rr}	$I_F=225A$		11.9		uC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$ $-di_F/dt=2500A/us$		65		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25^{\circ}C$		4.3		mJ
Recovered Charge	Q_{rr}	$I_F=225A$		51.1		uC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$ $-di_F/dt=2500A/us$		103		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=150^{\circ}C$		11.5		mJ

● NTC-Thermistor

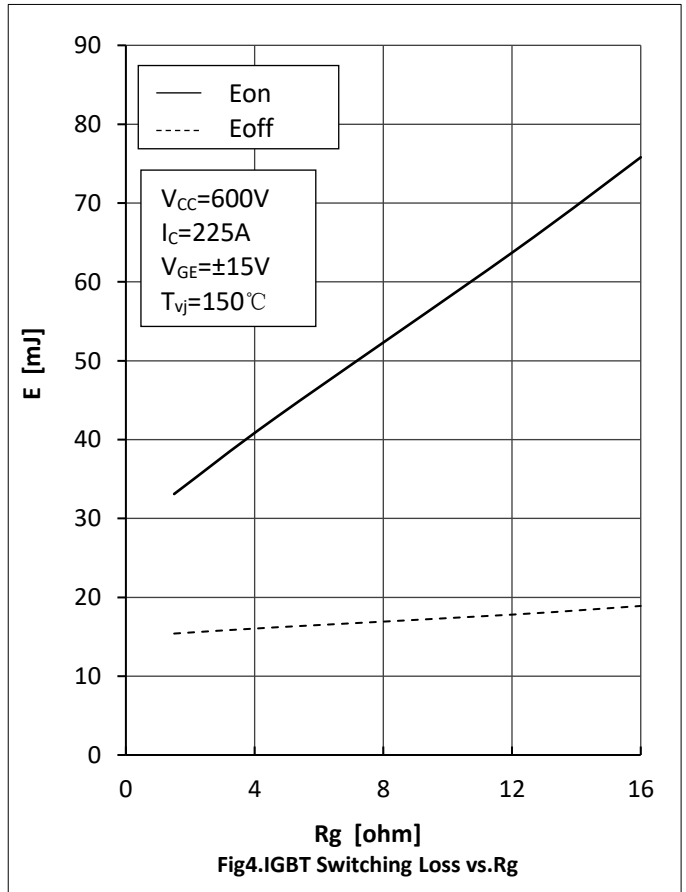
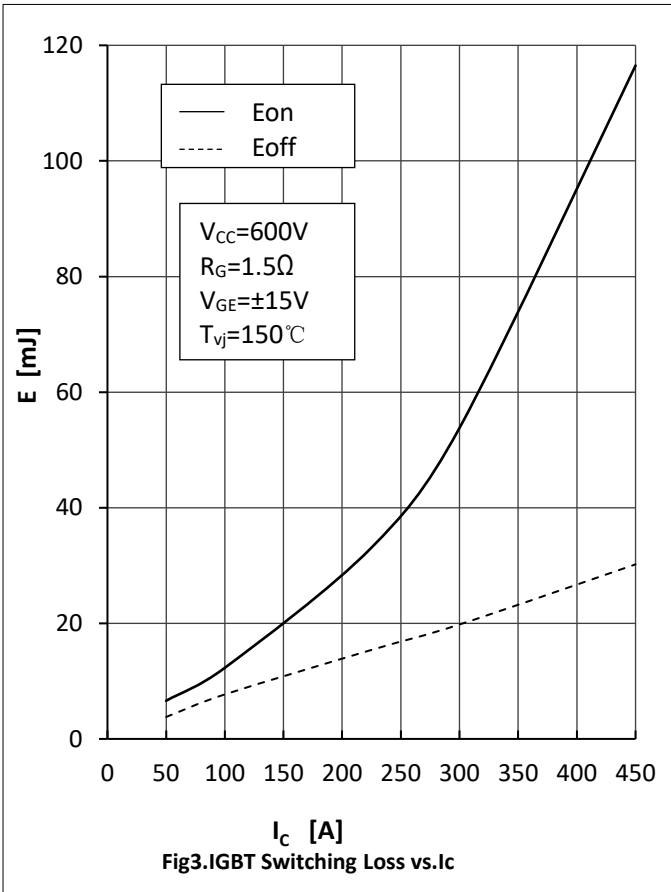
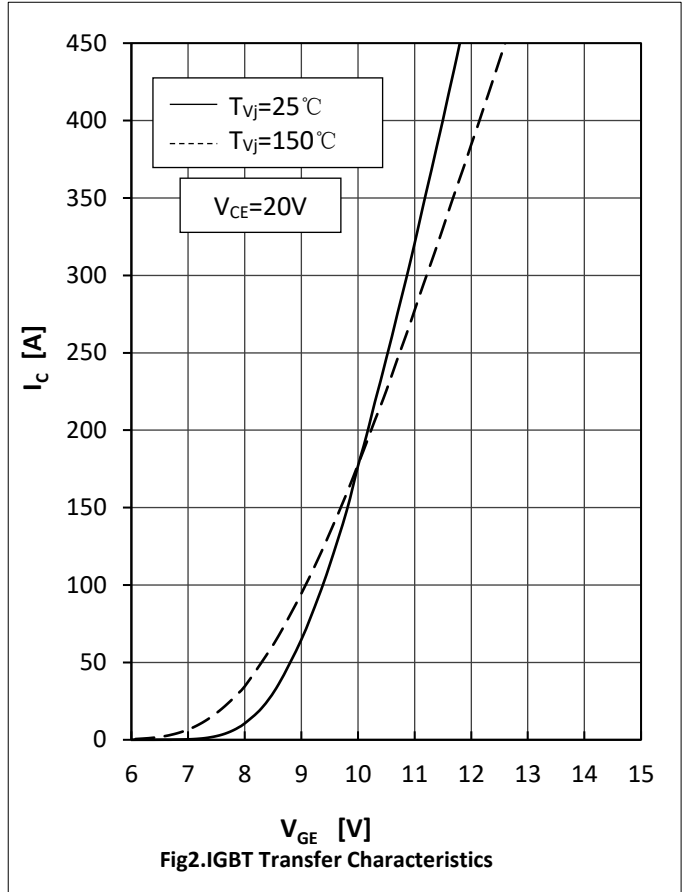
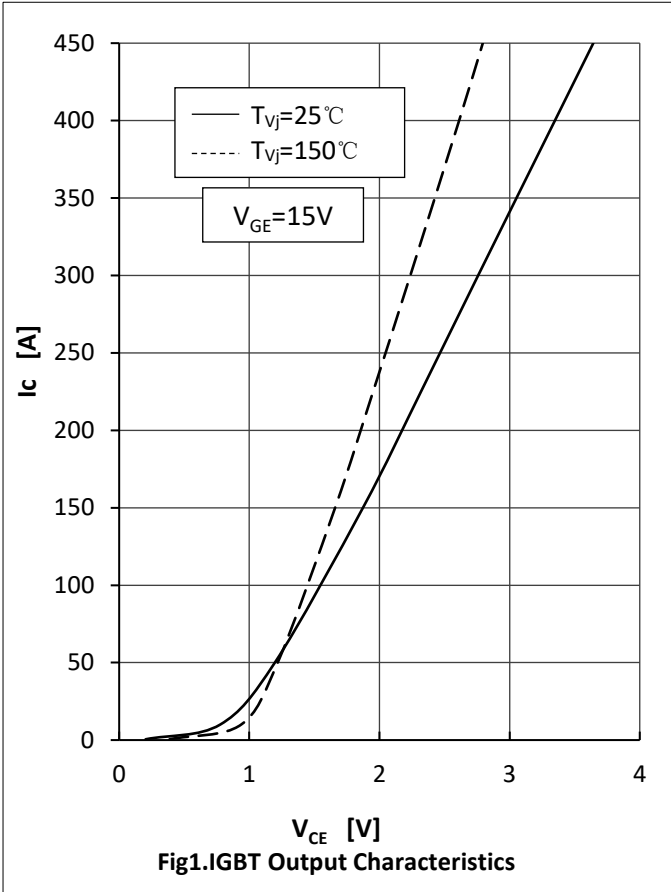
Characteristic values

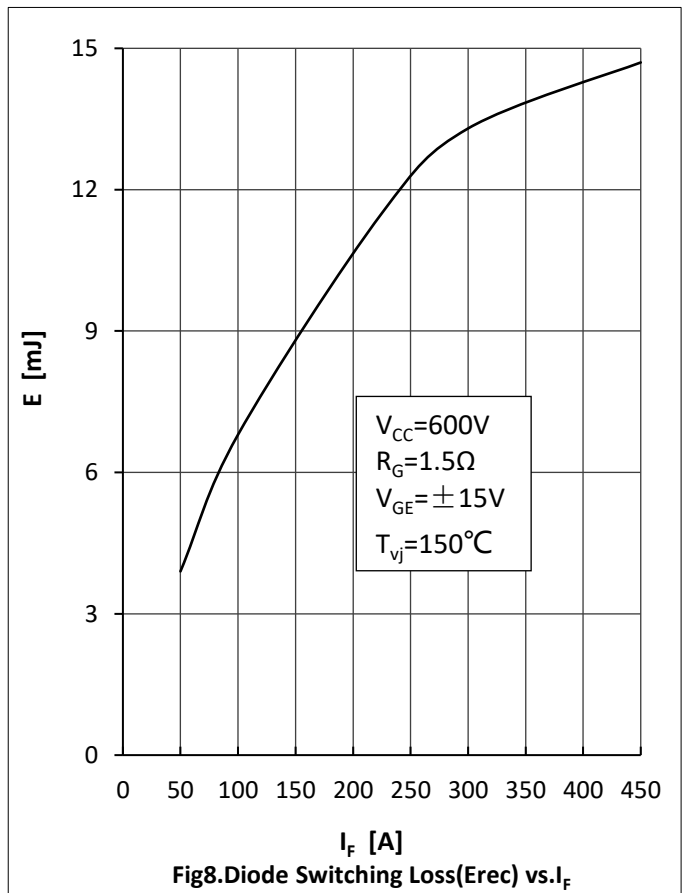
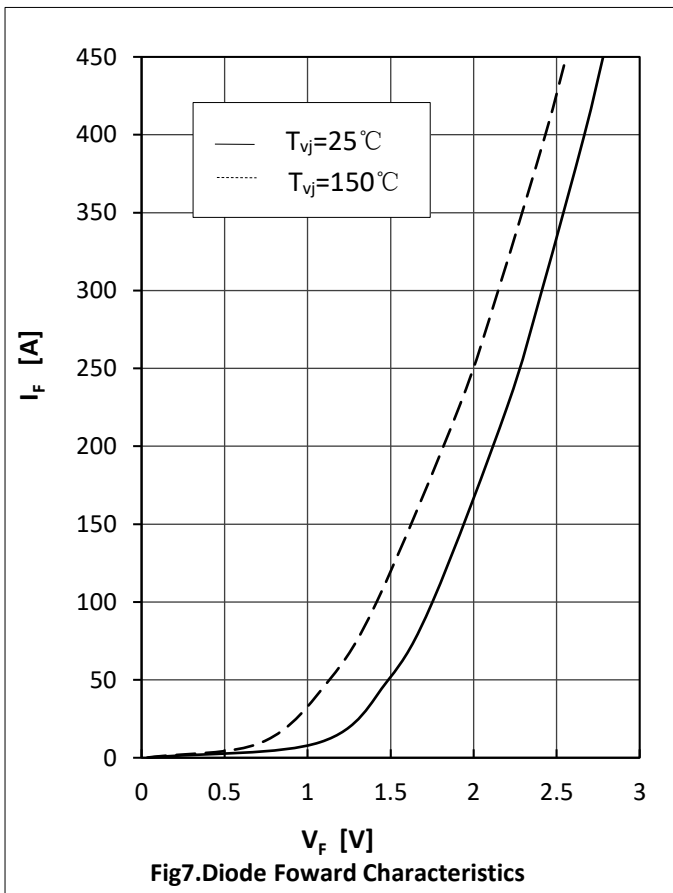
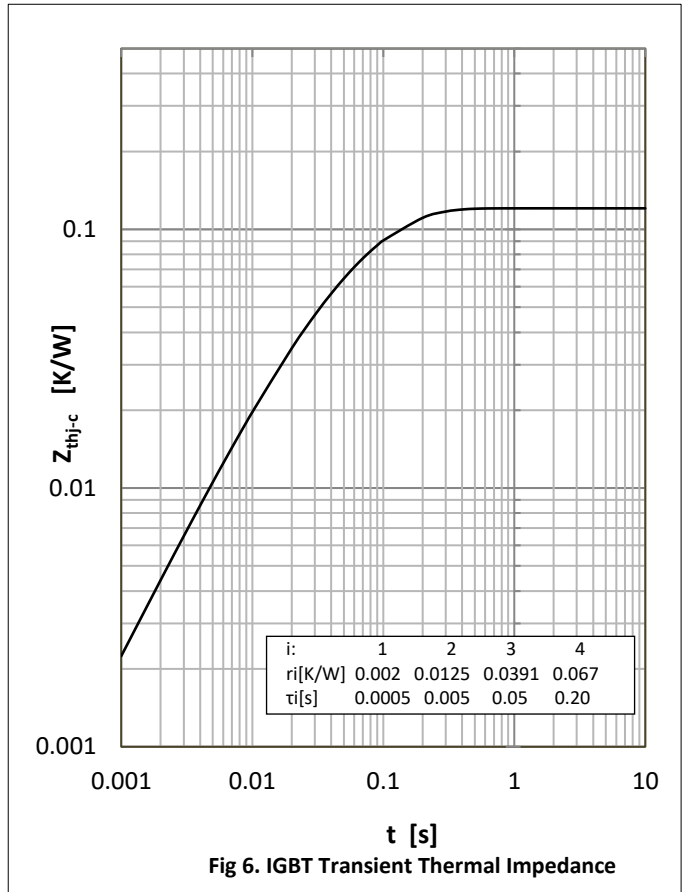
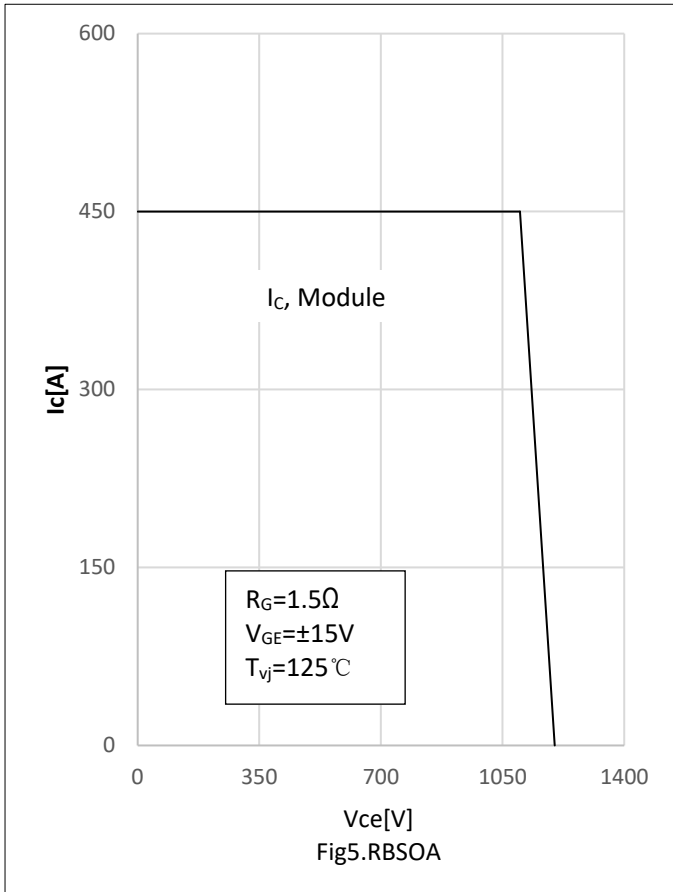
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		kΩ
Deviation of R100	$\Delta R/R$	$T_C=100, R_{100}=493.3\Omega$	-5		5	%
Power Dissipation	P_{25}				20.0	mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3375		K

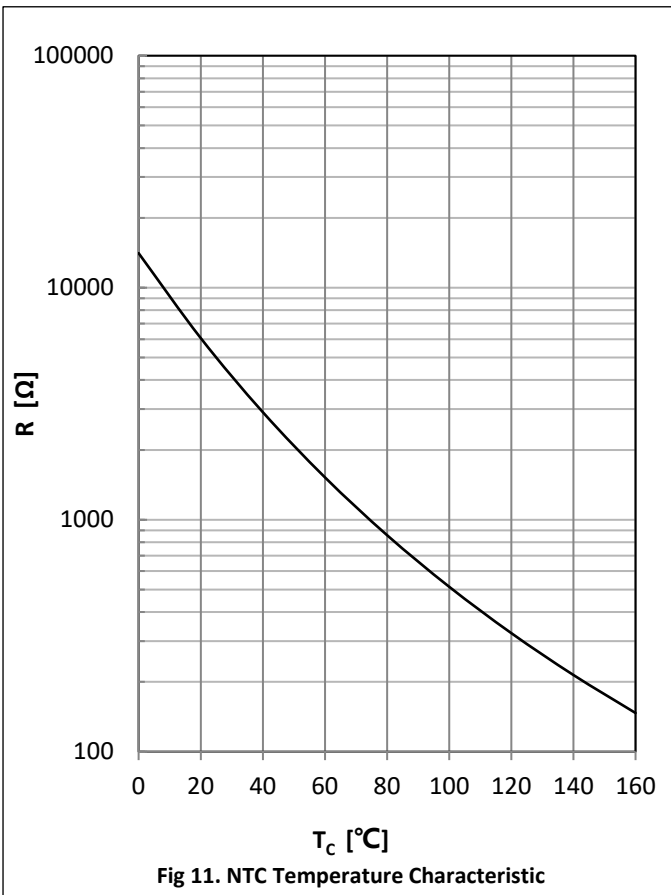
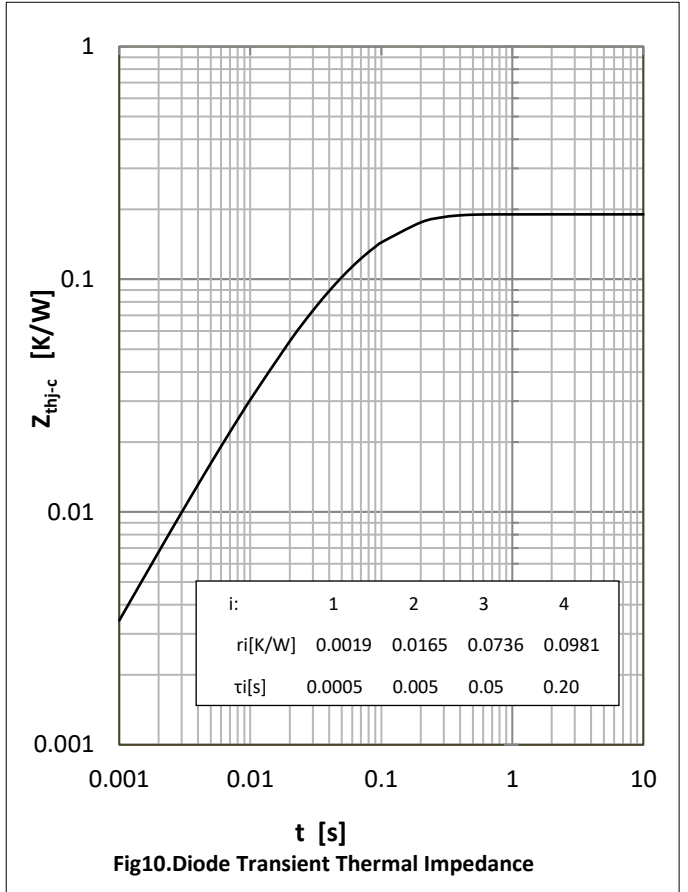
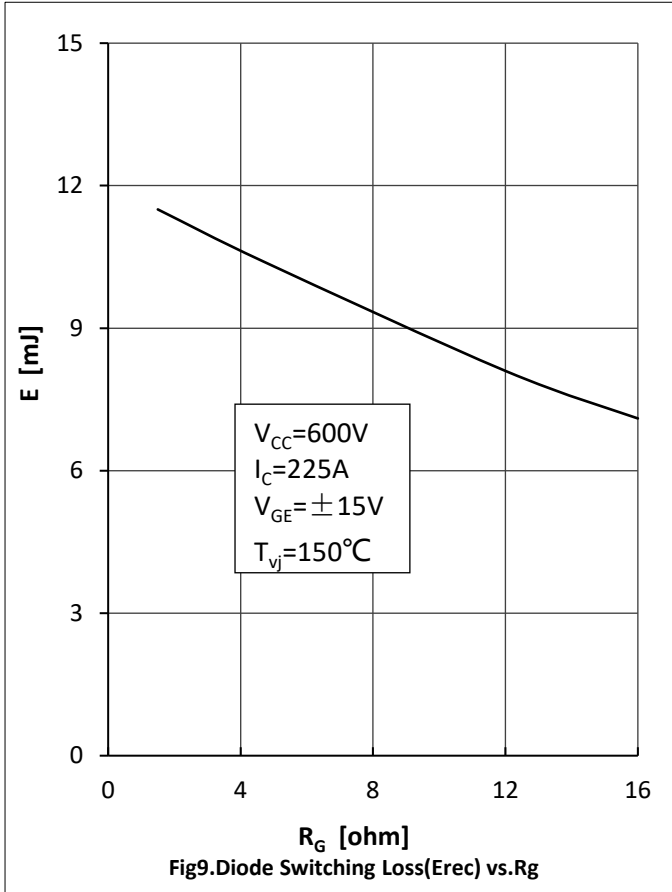
● Module Characteristics

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

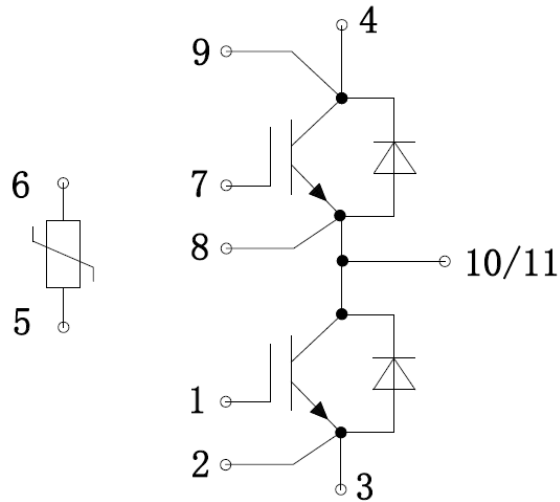
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				175	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{vj\ op}$		-40		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Thermal Resistance Junction-to Case	$R_{\theta JC}$	per IGBT			0.12	K/W
		per Diode			0.19	
Thermal Resistance Case-to Sink	$R_{\theta CS}$	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



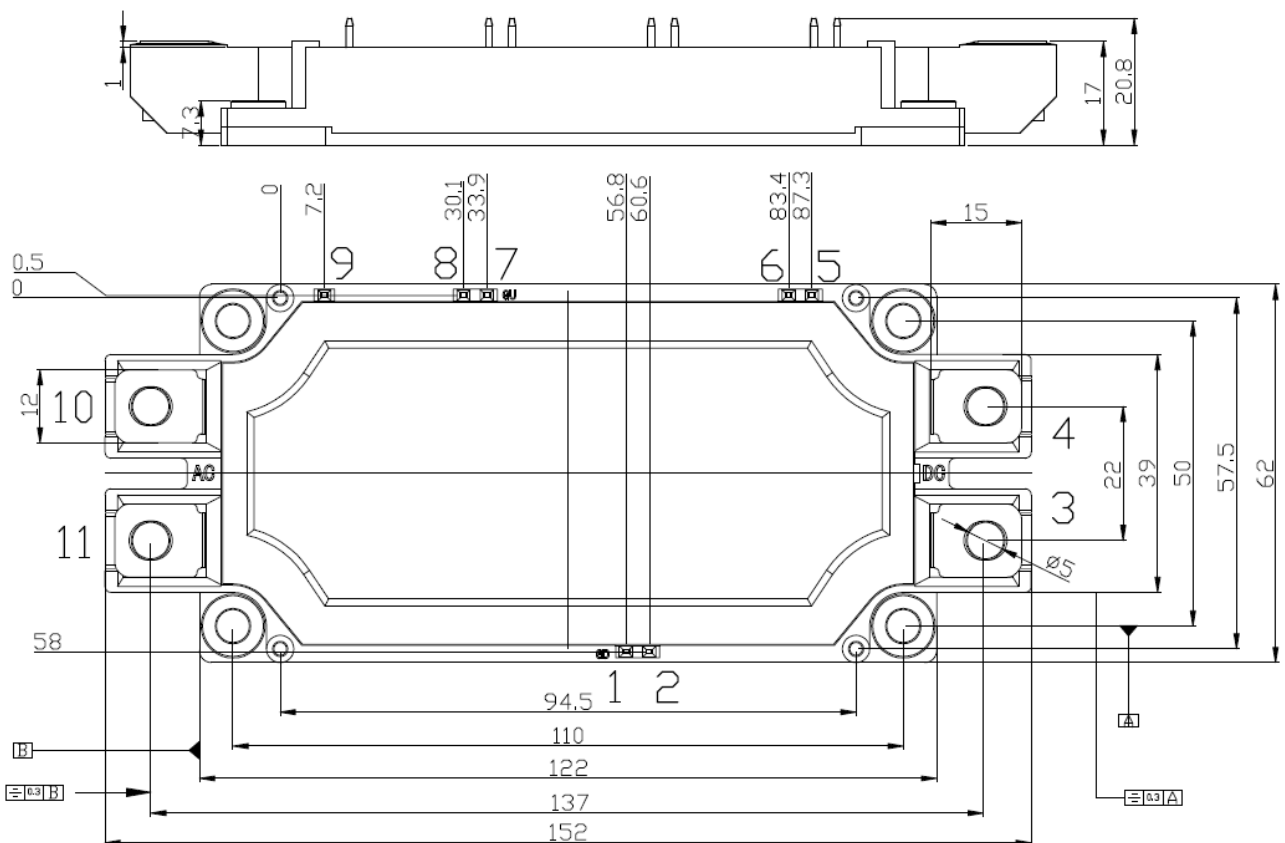




● Circuit Diagram



● 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 which 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.