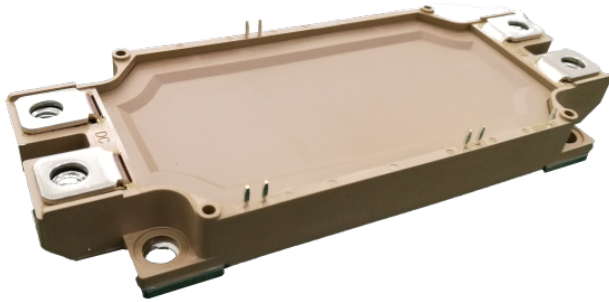


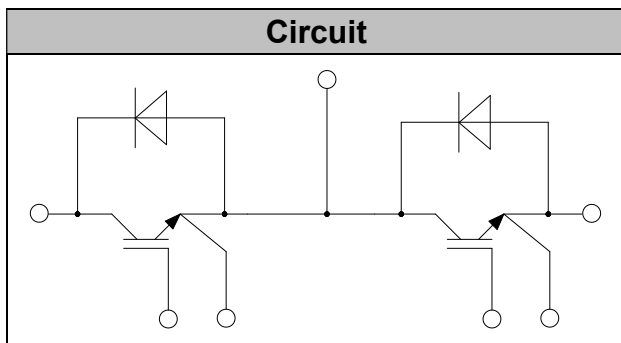
IGBT Modules



V_{CEs}	1200V
I_c	300A

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine



Features

- Low $V_{ce(sat)}$ with Planner technology
- $V_{ce(sat)}$ with positive temperature coefficient
- High short circuit capability(10us)
- Including fast & soft recovery anti-parallel FWD
- Low inductance module structure

● 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
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 (IGBT-inverter)	P_{tot}	$T_c=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	2083	W



● IGBT Characteristics

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=12mA, T_{vj}=25^\circ C$	5.0	5.8	6.5	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^\circ C$			1.0	mA	
		$V_{CE}=1200V, V_{GE}=0V, T_{vj}=125^\circ C$			5.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=300A, V_{GE}=15V, T_{vj}=25^\circ C$		1.95	2.25	V	
		$I_C=300A, V_{GE}=15V, T_{vj}=125^\circ C$		2.15		V	
Gate Charge	Q_G			3.40		uC	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz, T_{vj}=25^\circ C$		19.3		nF	
Output Capacitance	C_{oes}			1.35		nF	
Reverse Transfer Capacitance	C_{res}			1.20		nF	
Internal Gate Resistance	R_{gint}			0.85		Ω	
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^\circ C$			400	nA	
Turn-on Delay Time	$t_{d(on)}$	$I_C=300A, V_{CE}=600V, V_{GE}=\pm 15V, R_G=4.7\Omega, T_{vj}=25^\circ C$		114		ns	
Rise Time	t_r			108		ns	
Turn-off Delay Time	$t_{d(off)}$			797		ns	
Fall Time	t_f			38		ns	
Energy Dissipation During Turn-on Time	E_{on}			46.0		mJ	
Energy Dissipation During Turn-off Time	E_{off}			18.8		mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=300A, V_{CE}=600V, V_{GE}=\pm 15V, R_G=4.7\Omega, T_{vj}=125^\circ C$		135		ns
Rise Time	t_r				132		ns
Turn-off Delay Time	$t_{d(off)}$				950		ns
Fall Time	t_f				44		ns
Energy Dissipation During Turn-on Time	E_{on}			64.2		mJ	
Energy Dissipation During Turn-off Time	E_{off}			26.5		mJ	
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V, T_{vj}=150^\circ C, V_{cc}=600V, V_{CEM} \leq 1200V$		2200		A	



● Diode Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode DC Forward Current	I_F	$T_c=100^\circ\text{C}$		300		A
Diode Peak Forward Current	I_{FRM}	$t_p=1\text{ms}$		600		A
Forward Voltage	V_F	$I_F=300\text{A}, T_{vj}=25^\circ\text{C}$		1.70	2.0	V
		$I_F=300\text{A}, T_{vj}=125^\circ\text{C}$		1.75		V

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Recovered Charge	Q_{rr}	$I_F=300\text{A}$ $V_R=600\text{V}$ $-di_F/dt=2700\text{A/us}$ $T_{vj}=25^\circ\text{C}$		19.6		μC
Peak Reverse Recovery Current	I_{rr}			125		A
Reverse Recovery Time	t_{rr}			310		ns
Reverse Recovery Energy	E_{rec}			10.4		mJ
Recovered Charge	Q_{rr}	$I_F=300\text{A}$ $V_R=600\text{V}$ $-di_F/dt=2700\text{A/us}$ $T_{vj}=125^\circ\text{C}$		38.7		μC
Peak Reverse Recovery Current	I_{rr}			204		A
Reverse Recovery Time	t_{rr}			380		ns
Reverse Recovery Energy	E_{rec}			21.0		mJ

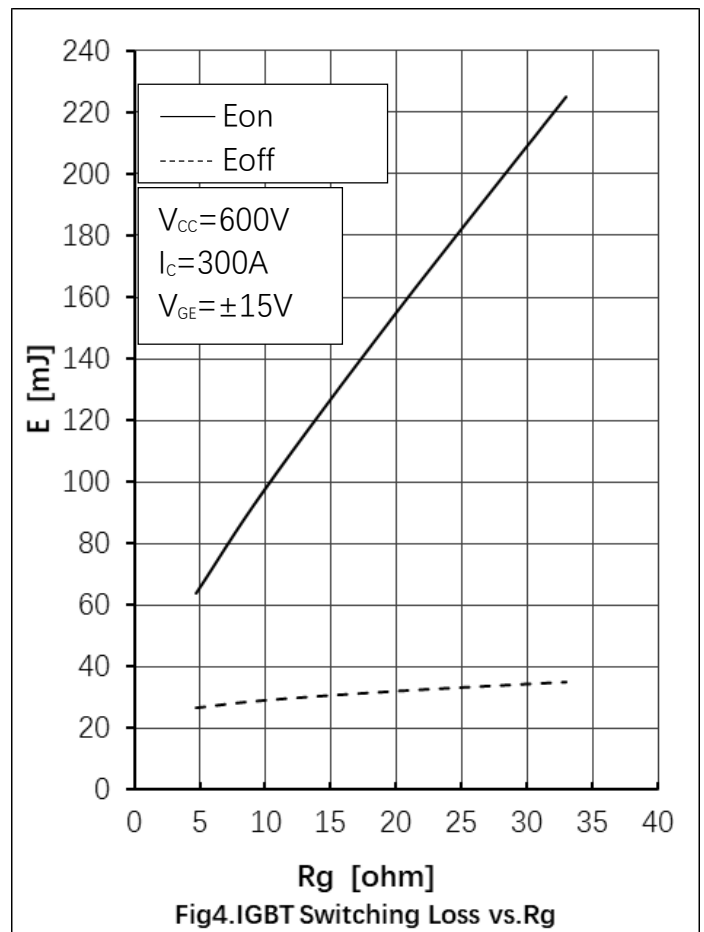
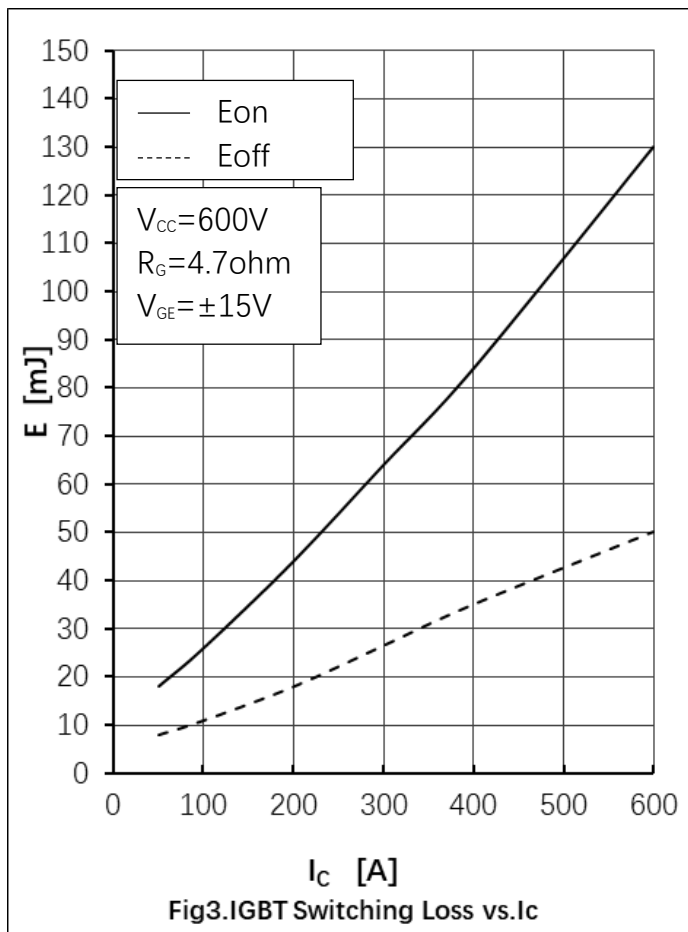
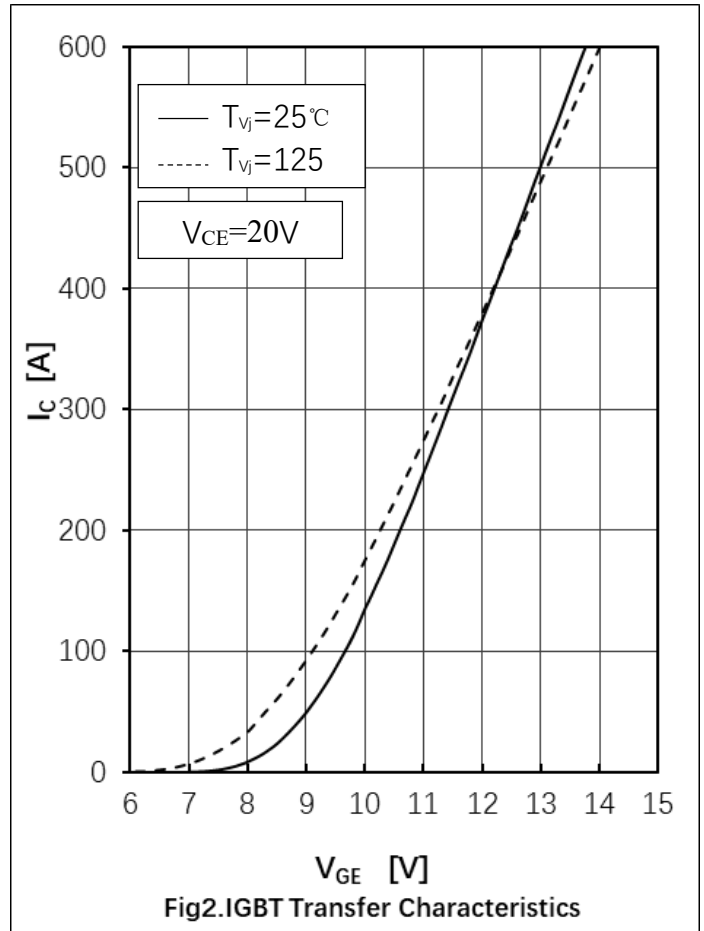
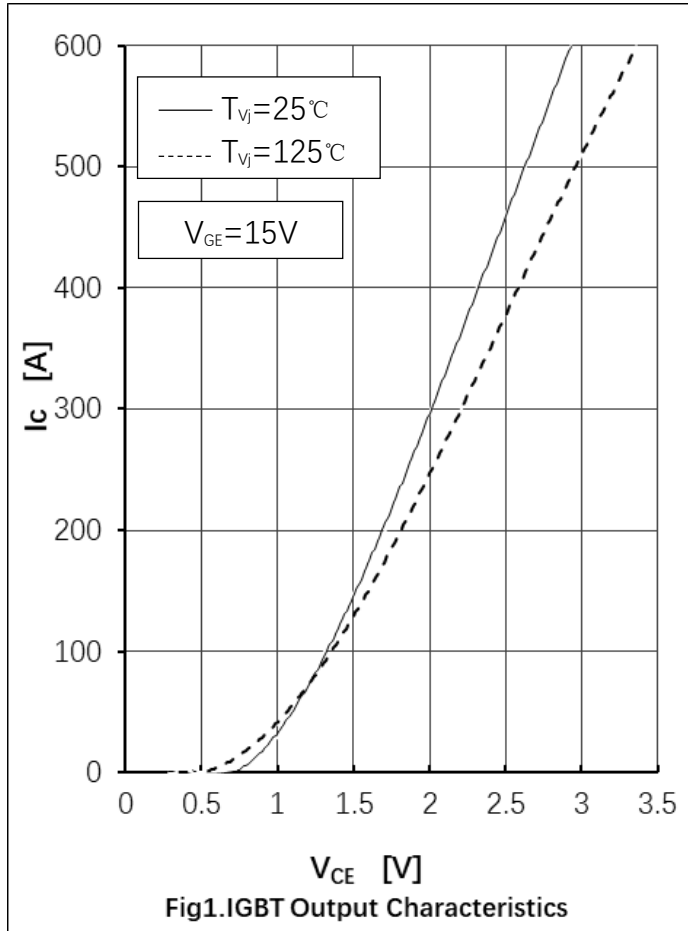


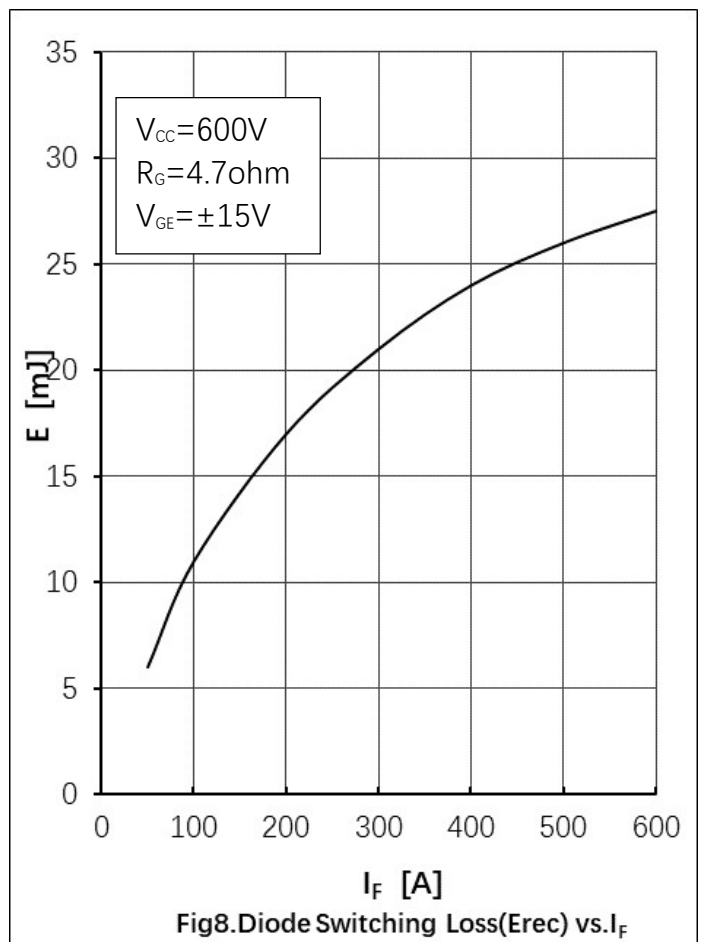
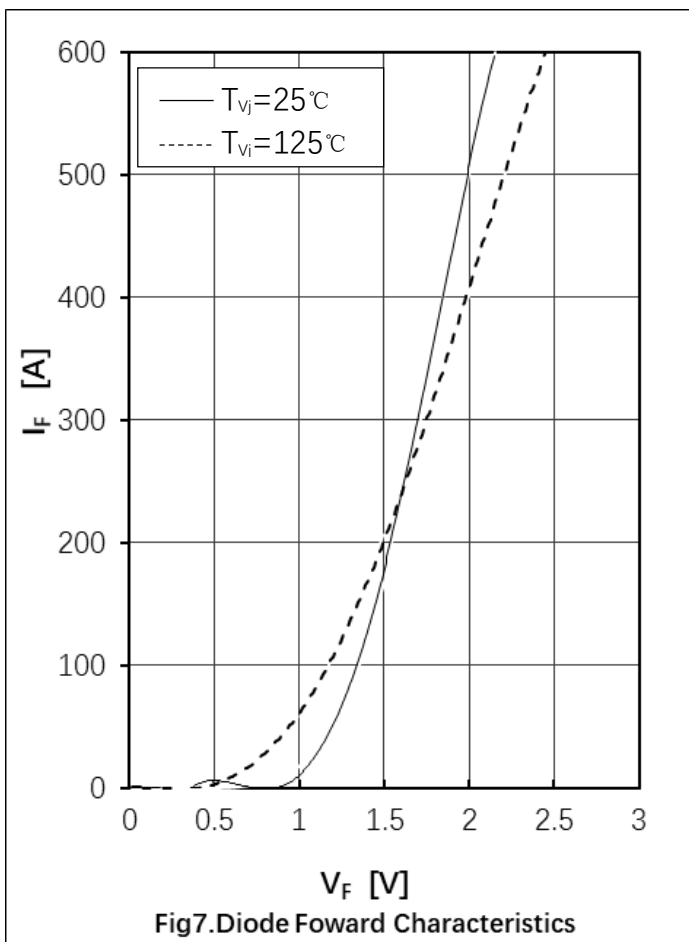
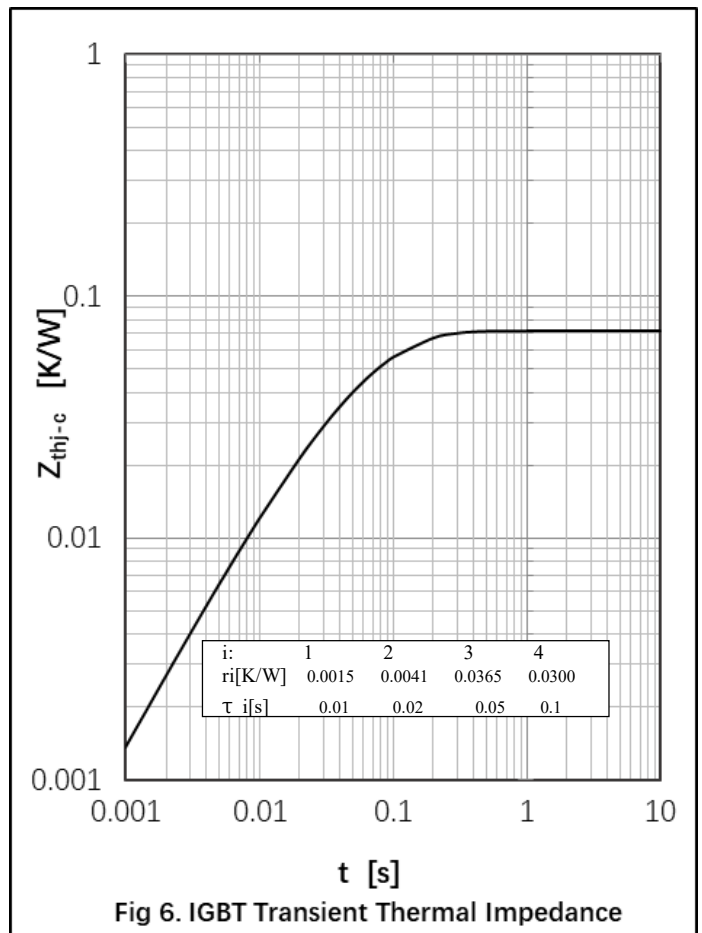
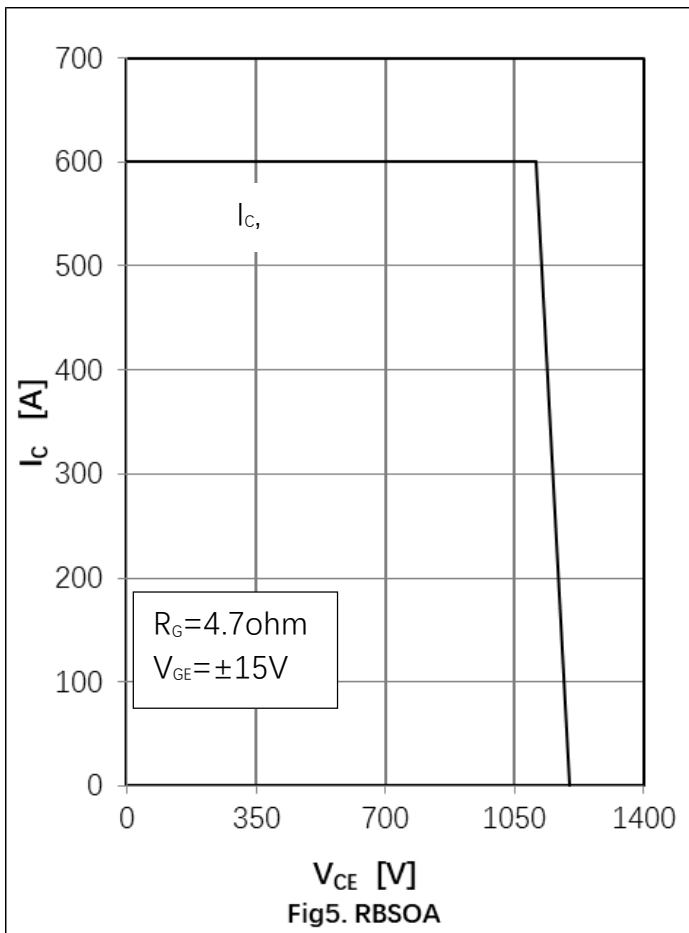
● **Module Characteristics** $T_c=25^\circ\text{C}$ unless otherwise specified

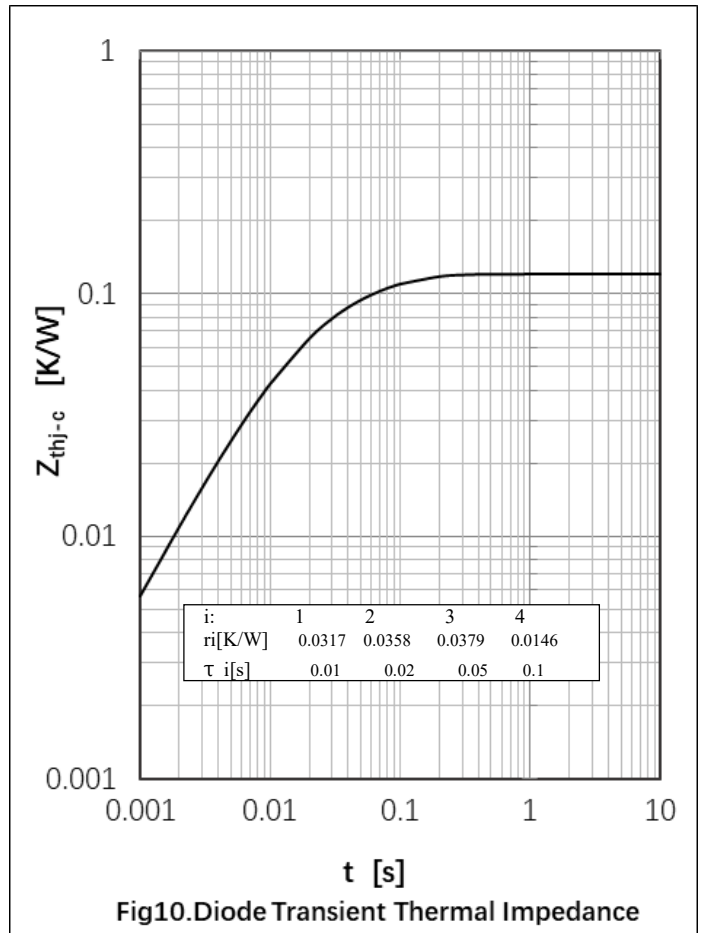
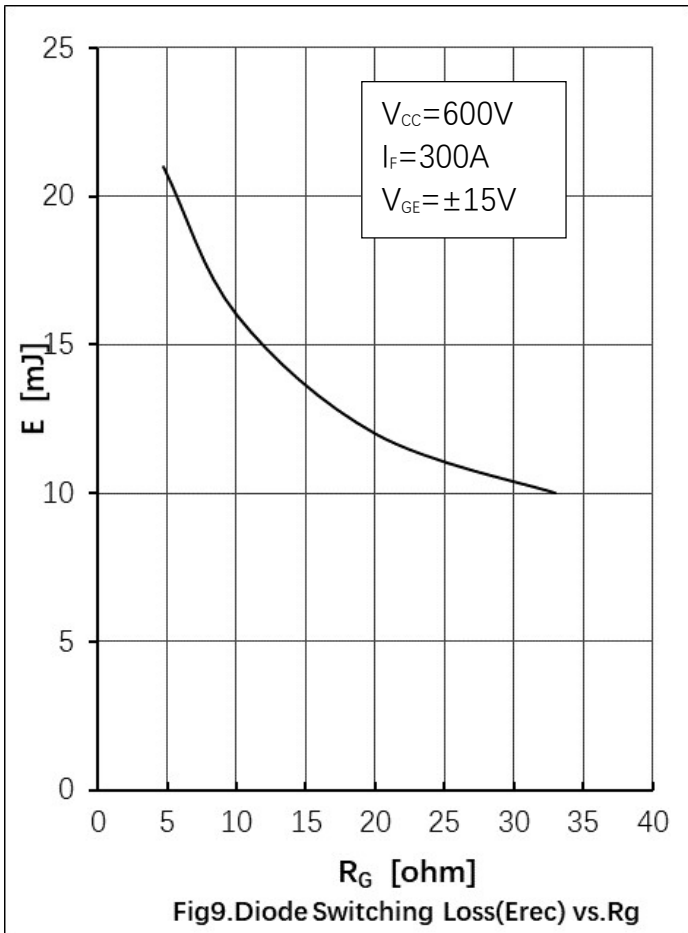
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
					4000	V
Maximum Junction Temperature	T_{jmax}			175	$^\circ\text{C}$	
Operating Junction Temperature	$T_{\text{vj op}}$		-40	150	$^\circ\text{C}$	
Storage Temperature	T_{stg}		-40	125	$^\circ\text{C}$	
Stray Inductance	L_{CE}			20	nH	
Module Lead Resistance , Terminal to Chip	$R_{\text{CC}'+\text{EE}'}$			1.1	$\text{m}\Omega$	
Junction-to Case	$R_{\theta \text{jc}}$	per IGBT-inverter			0.072	K/W
		per Diode-inverter			0.120	K/W
Case to Sink (Conductive grease applied)	$R_{\theta \text{cs}}$	per IGBT		0.030		K/W
		per Diode		0.045		K/W
Module Electrodes Torque	M_{t}	Recommended(M5)	2.5		5.0	N·m
Module-to-Sink Torque	M_{s}	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			300		g



Performance Curves





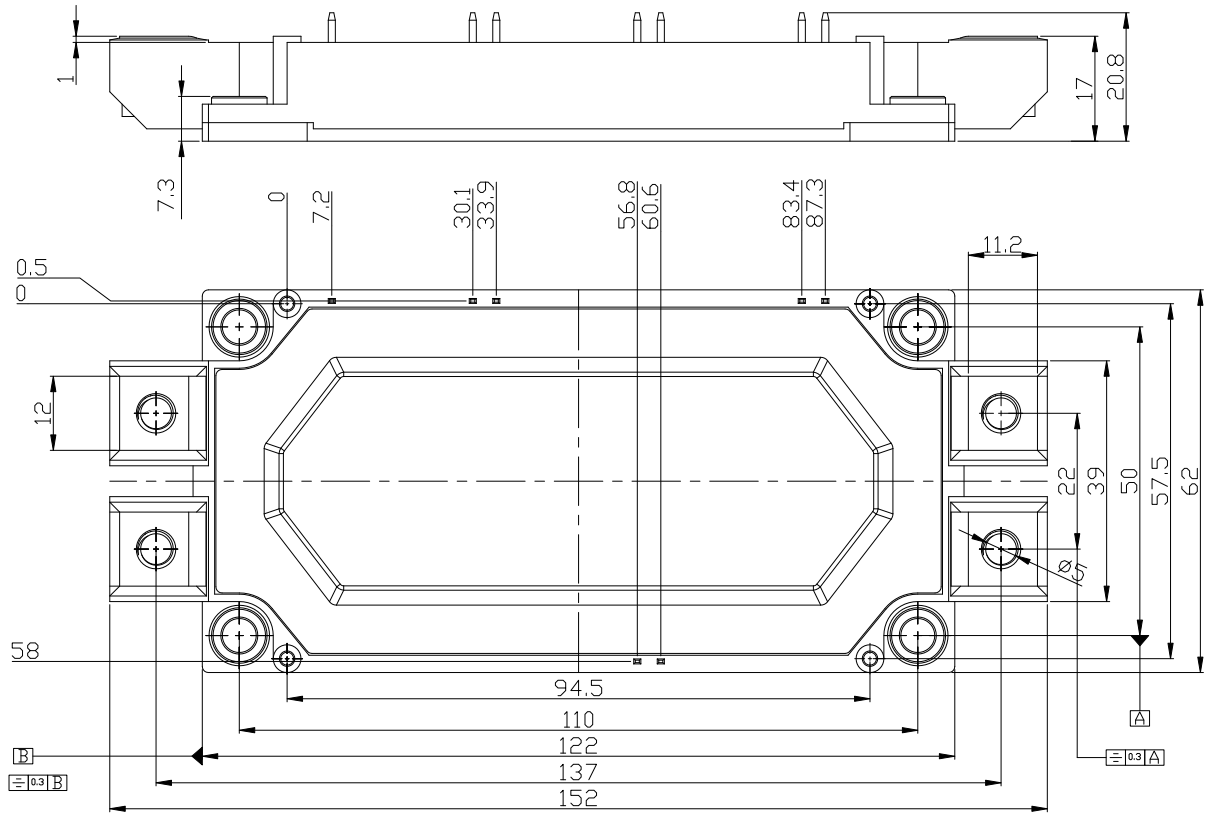




Package Outline Information

CASE: E3

Dimensions in Millimeters



Dimensions in mm