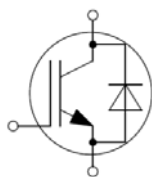




IGBT Modules

V_{CE}	1200	V
I_C	10	A
$V_{CE(SAT)} I_C=10A$	1.85	V

Circuit



Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

Features

- Low $V_{CE(sat)}$ Trench-FS IGBT technology
- Maximum junction temperature 175°C
- Positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	1200	V
DC Collector Current, limited by T_{jmax} $T_C=25^{\circ}C$ $T_C=100^{\circ}C$	I_C	20 10	A
Diode Forward Current, limited by T_{jmax} $T_C=25^{\circ}C$ $T_C=100^{\circ}C$	I_F	20 10	A
Continuous Gate-Emitter Voltage	V_{GE}	± 20	V
Transient Gate-Emitter Voltage	V_{GE}	± 30	V
Turn off Safe Operating Area $V_{CE} \leq 1200V$, $T_j \leq 150^{\circ}C$		40	A
Pulsed Collector Current, $V_{GE}=15V$, tp limited by T_{jmax}	I_{CM}	40	A
Diode Pulsed Current, tp limited by T_{jmax}	I_{Fpuls}	40	A
Short Circuit Withstand Time, $V_{GE}=15V$, $V_{CC}=900V$, $V_{CEM} \leq 1200V$	T_{sc}	10	μs
Power Dissipation , $T_j=175^{\circ}C$, $T_c=25^{\circ}C$	P_{tot}	157	W

Operating Junction Temperature	T_j	-40...+175	°C
Storage Temperature	T_s	-55...+150	°C
Soldering Temperature, wave soldering 1.6mm (0.063in.) from case for 10s		260	°C

Electrical Characteristics of the IGBT ($T_j = 25^\circ\text{C}$ unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Collector-Emitter Breakdown Voltage	BV_{CES}	$V_{GE}=0V, I_C=250\mu A$	1200		-	V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=500\mu A$	5.0	5.8	6.6	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=10A$ $T_j=25^\circ\text{C},$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$		1.85 2.15 2.25	2.20	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V$ $T_j=25^\circ\text{C},$ $T_j=150^\circ\text{C}$			0.25 5.00	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 20V$			400	nA

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic						
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1\text{MHz}$	-	0.75	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.035	-	
Gate Charge	Q_G	$V_{CC}=960V, I_C=10A,$ $V_{GE}=15V$	-	0.08	-	uC
Short Circuit Collector Current	I_{SC}	$V_{GE}=15V, t_{sc}\leq 10\mu s,$ $V_{CC}=900V, T_j\leq 150^\circ\text{C}$	-	50	-	A

Electrical Characteristics of the Diode (T_j= 25°C unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Diode Forward Voltage	V _F	I _F = 10A T _j = 25°C, T _j = 125°C T _j = 150°C		2.0 2.1 2.1		V

Switching Characteristic, Inductive Load

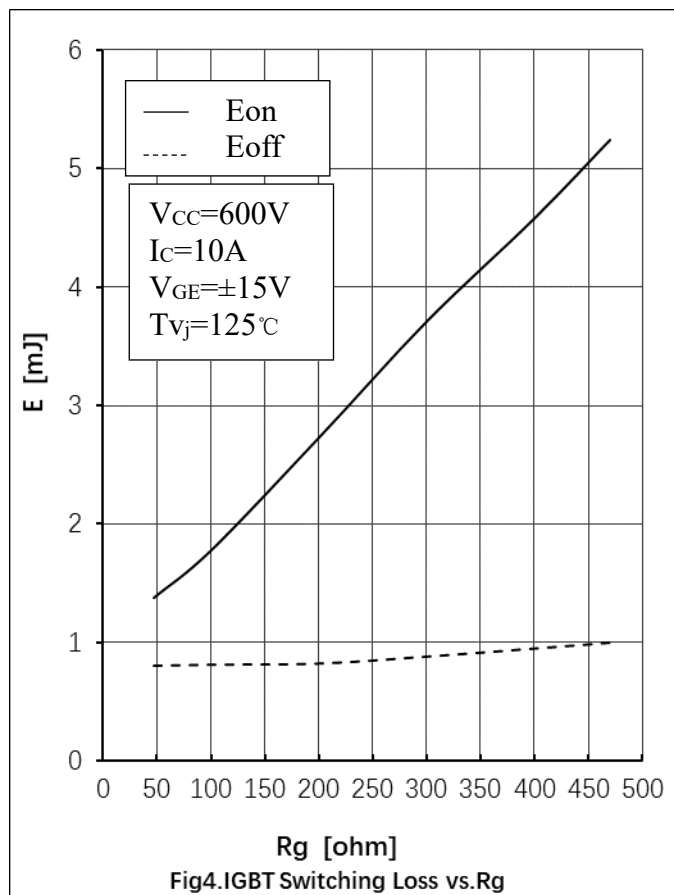
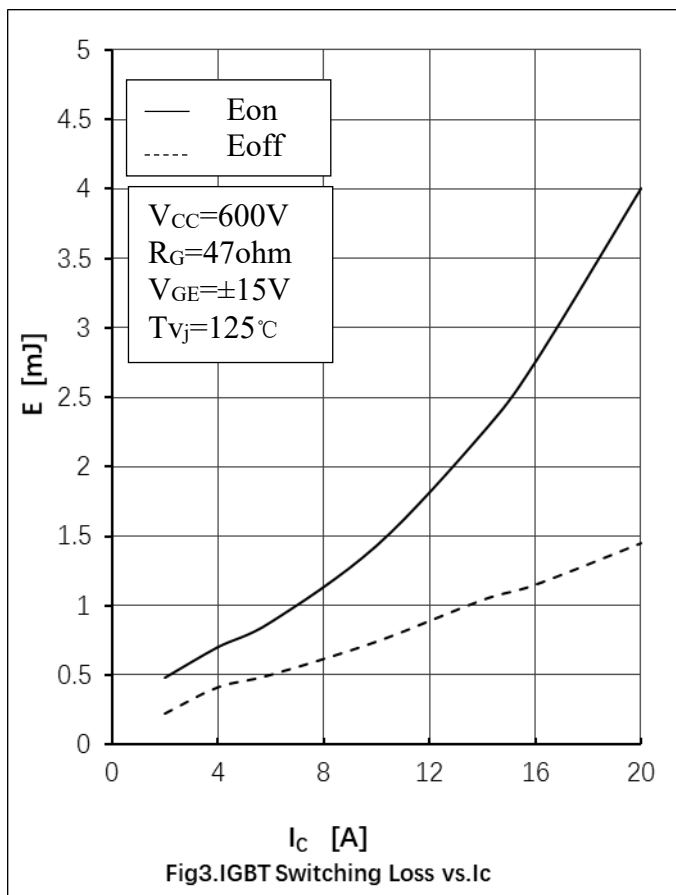
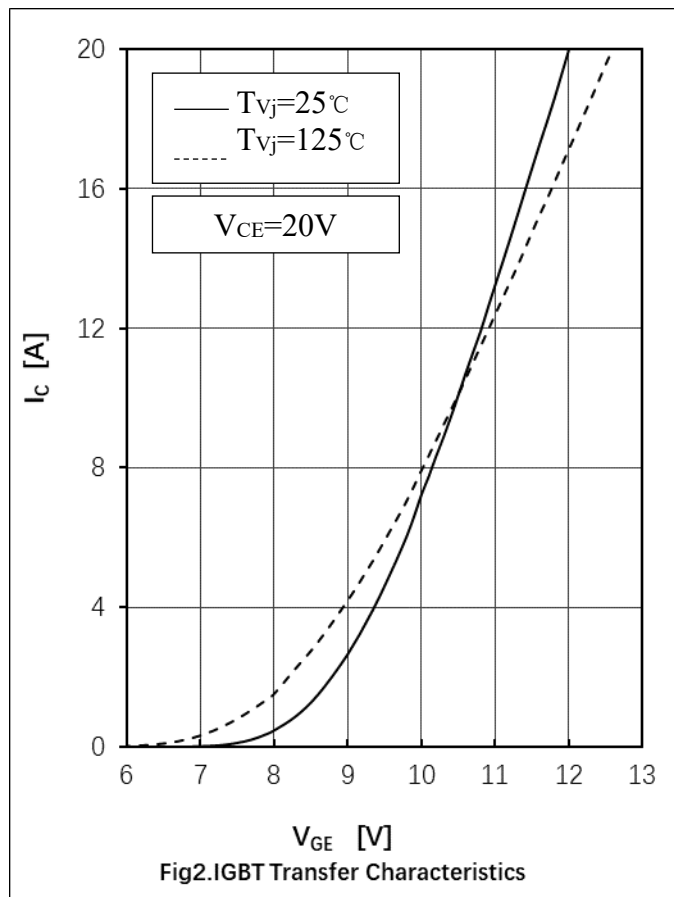
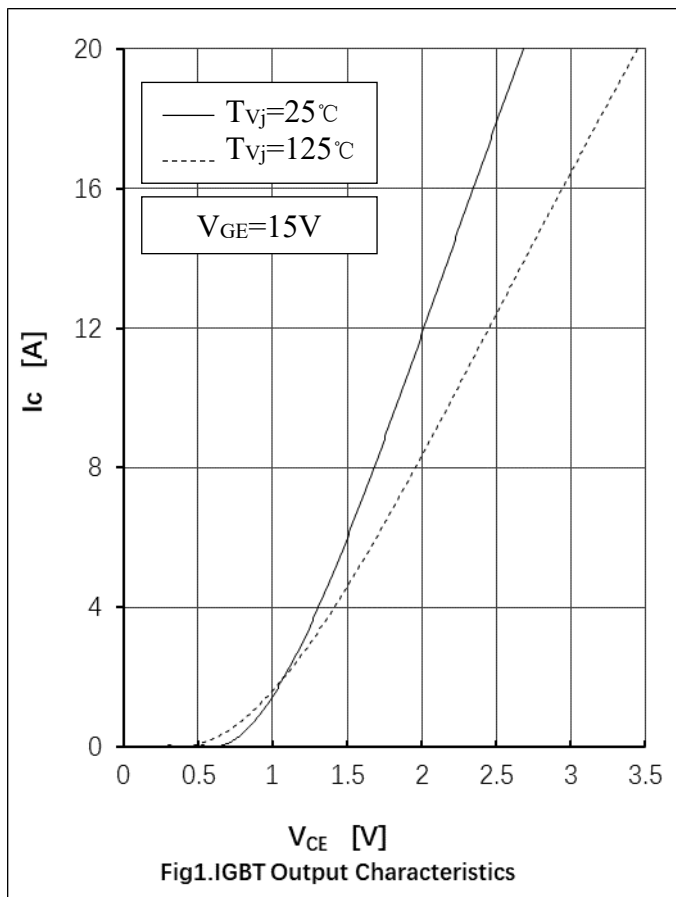
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =10A, V _{GE} = -15v~15V, R _g =47 Ω	-	85	-	ns
Rise Time	t _r		-	50	-	ns
Turn-on Energy	E _{on}		-	0.98	-	mJ
Turn-off Delay Time	t _{d(off)}		-	262	-	ns
Fall Time	t _f		-	140	-	ns
Turn-off Energy	E _{off}		-	0.48	-	mJ
Dynamic , at T _j = 125℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =10A, V _{GE} = -15v~15V, R _g =47Ω	-	90	-	ns
Rise Time	t _r		-	60	-	ns
Turn-on Energy	E _{on}		-	1.33	-	mJ
Turn-off Delay Time	t _{d(off)}		-	285	-	ns
Fall Time	t _f		-	150	-	ns
Turn-off Energy	E _{off}		-	0.9	-	mJ
Dynamic , at T _j = 150℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =10A, V _{GE} = -15v~15V, R _g =47Ω	-	95	-	ns
Rise Time	t _r		-	65	-	ns
Turn-on Energy	E _{on}		-	1.68	-	mJ
Turn-off Delay Time	t _{d(off)}		-	308	-	ns
Fall Time	t _f		-	160	-	ns
Turn-off Energy	E _{off}		-	1.05	-	mJ

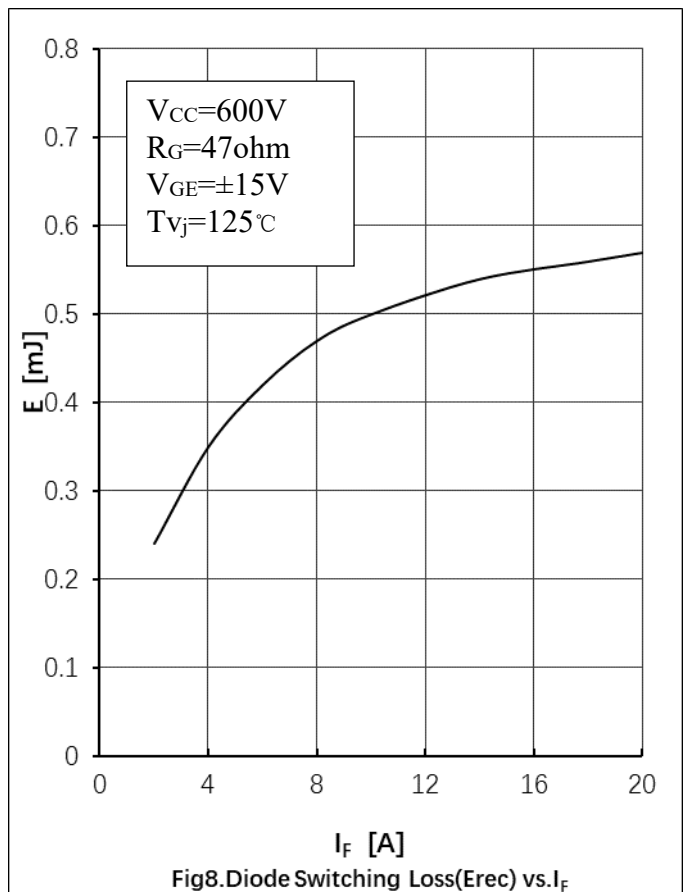
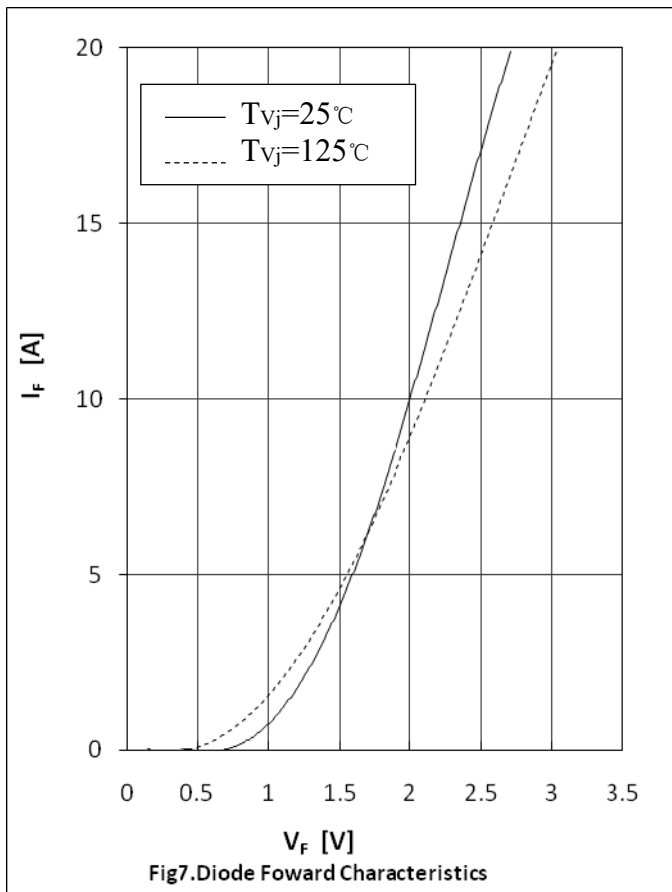
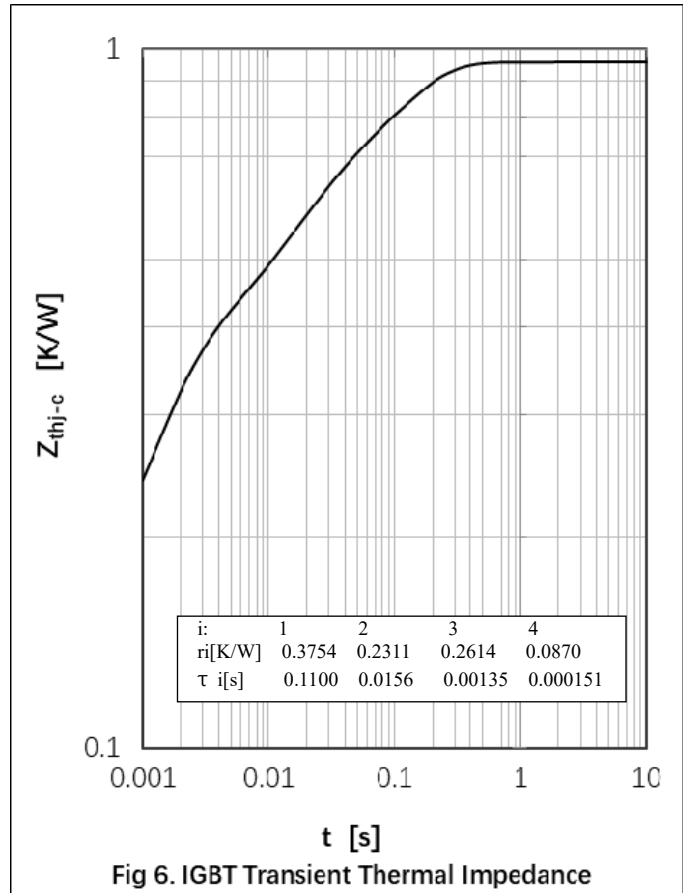
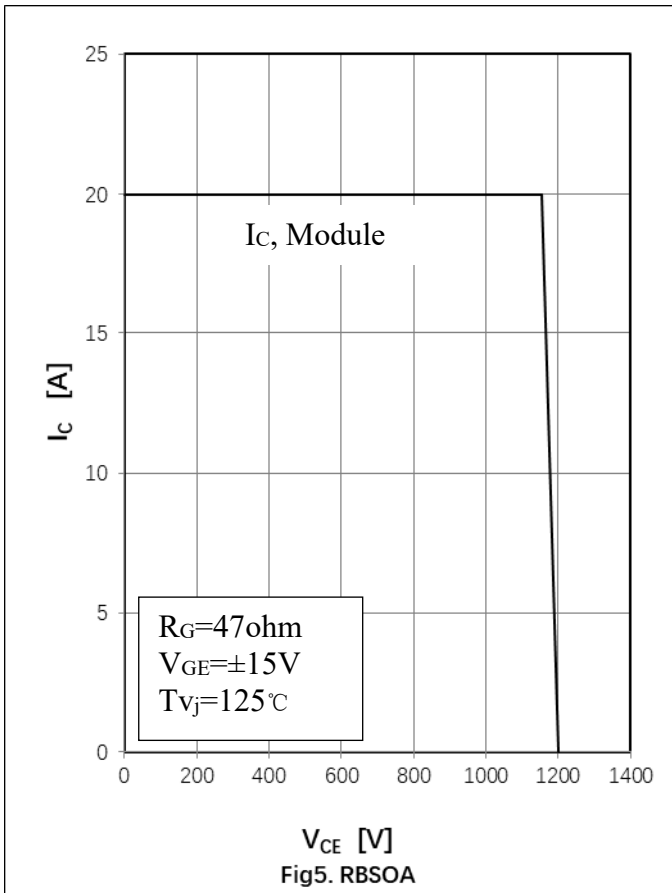
Electrical Characteristics of the DIODE

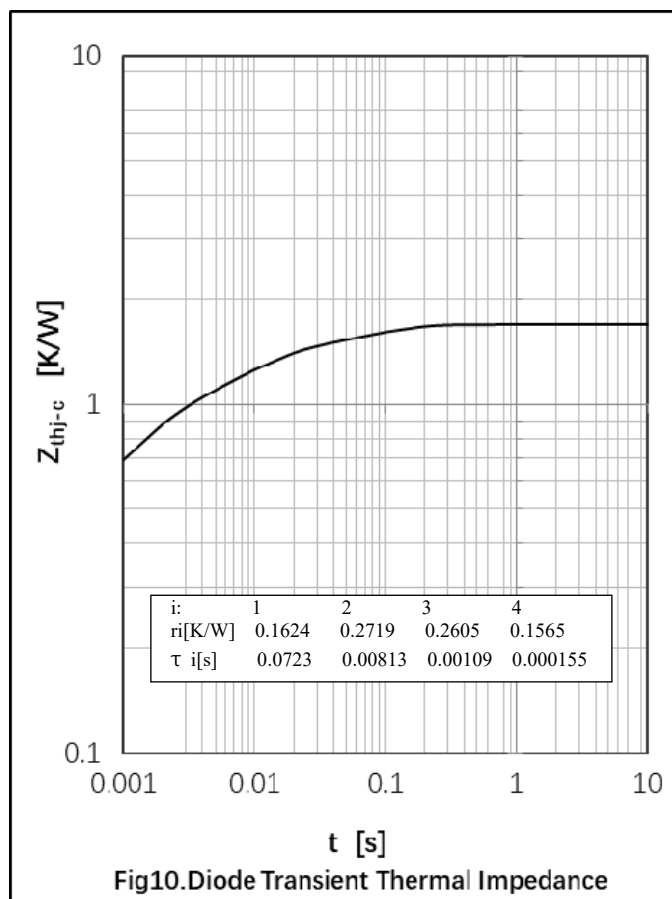
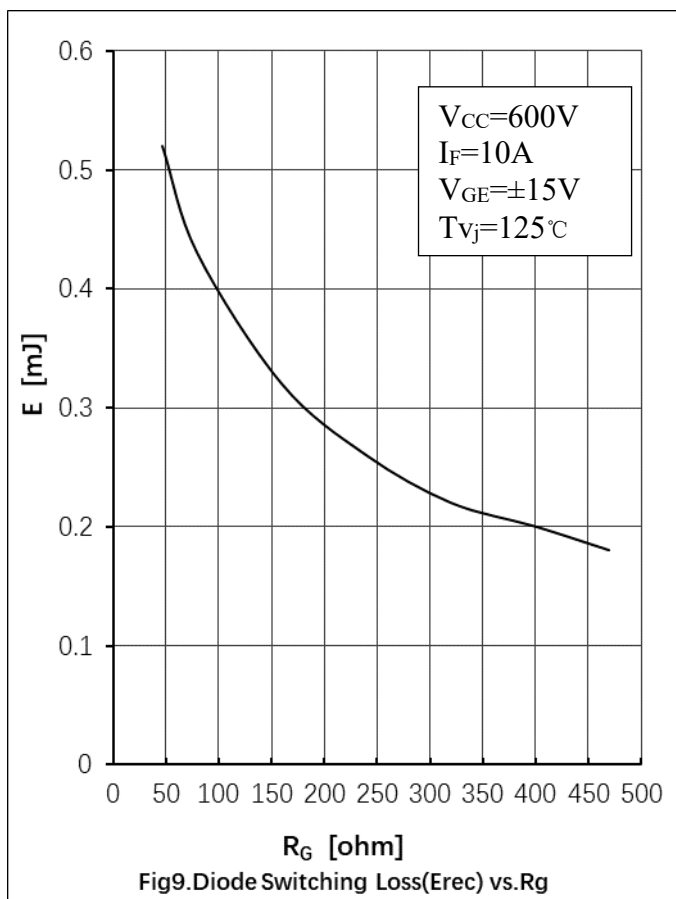
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25°C						
Reverse Recovery Current	I _{rr}	I _F =10A, V _R =600V, -di/dt=500A/μs,	-	12.5	-	A
Reverse Recovery Charge	Q _{rr}		-	0.9	-	uC
Reverse Recovery Energy	E _{rec}		-	0.25		mJ
Dynamic , at T _j = 125°C						
Reverse Recovery Current	I _{rr}	I _F =10A, V _R =600V, -di/dt=500A/μs,	-	14.4	-	A
Reverse Recovery Charge	Q _{rr}		-	1.7	-	uC
Reverse Recovery Energy	E _{rec}		-	0.5		mJ
Dynamic , at T _j = 150°C						
Reverse Recovery Current	I _{rr}	I _F =10A, V _R =600V, -di/dt=500A/μs,	-	15.3	-	A
Reverse Recovery Charge	Q _{rr}		-	2.0	-	uC
Reverse Recovery Energy	E _{rec}		-	0.58		mJ

Thermal Resistance

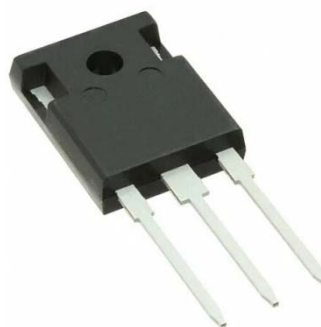
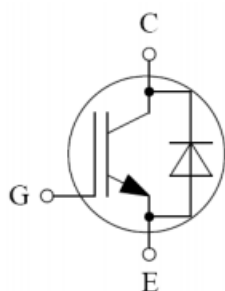
Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R _{th(j-c)}	0.95	K/W
Diode Thermal Resistance, Junction - Case	R _{th(j-c)}	1.70	K/W
Thermal Resistance, Junction - Ambient	R _{th(j-a)}	40	K/W







- Circuit Diagram



● Package Outline Information

CASE: TO 247

