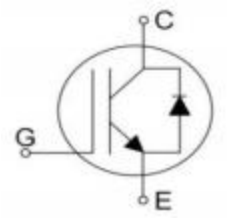
DESCRIPTION

Parameter	Value	Unit
VCE	650	V
IC(@TC=100°C)	75	A
VCE(SAT)	1.8	V



FEATURES

- Trench and field-stop technology.
- Easy parallel switching capability.
- High ruggedness performance.
- RoHS compliant.

APPLICATIONS

- PFC applications
- Uninterruptible power supplies
- Solar inverters
- High efficiency inverters.

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage		VCES	650	V
DC collector current, limited by Tjmax	TC = 25°C	IC	150	A
	TC = 100°C		75	
Diode continuous forward current TC = 100°C		IF	75	A
Gate-Emitter voltage		VGES	±20	V
Diode maximum current,tp limited by Tvjmax		IFM	300	A
Pulsed collector current, tp limited by Tvjmax		ICM	300	A
Power dissipation (TC=25°C)		Ptot	535	W
Power dissipation (TC=100°C)			267	W
Operating Junction Temperature		Tvj	-40 to 175	°C
Storage Temperature		Tstg	-55 to 150	°C

THERMAL RESISTANCE

Parameter	Symbol	Typ	Unit
Thermal Resistance, Junction-Ambient	Rth(j-a)	40	K /W
Thermal Resistance, Junction to case for IGBT	Rth(j-c)	0.28	
Thermal Resistance, Junction to case for Diode	Rth(j-c)	0.48	

ELECTRICAL CHARACTERISTICS (Tj =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristic						
Collector-Emitter Breakdown Voltage	BVCES	VGE=0V , IC=250uA	650	-	-	V
Gate-Emitter Threshold Voltage	VGE(th)	VGE = VCE IC = 1mA	5	5.4	5.6	V
Collector-Emitter Saturation Voltage	VCE(sat)	VGE=15V Tj=25°C IC=75A	-	1.8	-	V
		Tj=175°	-	2.3	-	
Collector-Emitter Leakage Current	ICES	VCE=650V,VGE=0V	-	-	50	uA
Gate Leakage Current, Forward	IGES	VCE = 0V VGE = ±20V	-	-	± 100	nA
Dynamic Characteristic						
Input Capacitance	Cies	VCE=30V, VGE=0V f=1MHz		4250		pF
Output Capacitance	Coes			205		pF
Reverse Transfer Capacitance	Cres			31		pF
Gate Charge	QG	VCC=520V, IC=75A VGE=15V		130	-	nC
IGBT Characteristics						
Turn-On DelayTime	tD(on)	VCC=400V VGE=15.0V IC = 75A Rg = 10Ω, Inductive load Tvj=25°C	-	53	-	ns
Turn-On Rise Time	tr		-	132	-	ns
Turn-Off DelayTime	tD(off)		-	162	-	ns
Turn-Off Fall Time	tf		-	95	-	ns
Turn-on Energy	Eon		-	3.3	-	mJ
Turn-off Energy	Eoff		-	2.2	-	mJ
Total switching energy	Ets		-	5.5	-	mJ
Diode Characteristics						
Forward Voltage Drop	VF	IF= 75A, TJ = 25°C	-	1.8	-	V
Diode Reverse Recovery Time	Trr	VR=400V,IF=75A diF/dt=-450A/μs Tvj=25°C		129		ns
Diode peak reverse recovery current	Irrm			14		A
Diode Reverse Recovery Charge	Qrr		-	778	-	nC

Switching Characteristics (@ TJ = 175°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
IGBT Characteristics						
Turn-On DelayTime	tD(on)	VCC=400V VGE=15.0V IC = 75A Rg = 10Ω, Inductive load Tvj=175°C	-	53	-	ns
Turn-On Rise Time	tr		-	128	-	ns
Turn-Off DelayTime	tD(off)		-	181	-	ns
Turn-Off Fall Time	tf		-	107	-	ns
Turn-on Energy	Eon		-	4.8	-	mJ
Turn-off Energy	Eoff		-	2.7	-	mJ
Total switching energy	Ets		-	7.5	-	mJ
Diode Characteristics						
Forward Voltage Drop	VF	IF= 75A, TJ = 175°C	-	1.4	-	V
Diode Reverse Recovery Time	Trr	VR=400V IF=75A,diF/dt=-450A μs Tvj=175°C		172		ns
Diode peak reverse recovery current	Irrm			22		A
Diode Reverse Recovery Charge	Qrr		-	2200	-	nC

CHARACTERISTICS DIAGRAMS

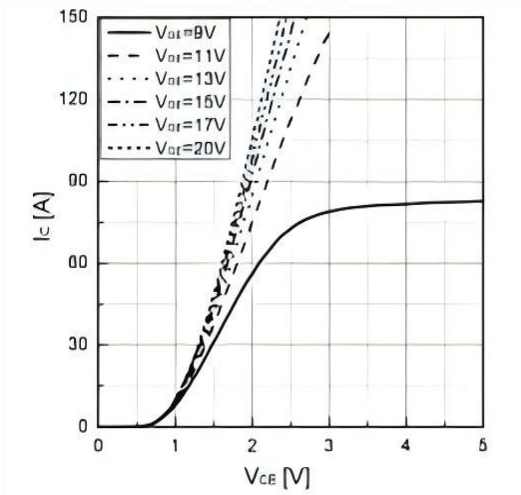


Fig 1 Typical output characteristic (T_{vj}=25℃)

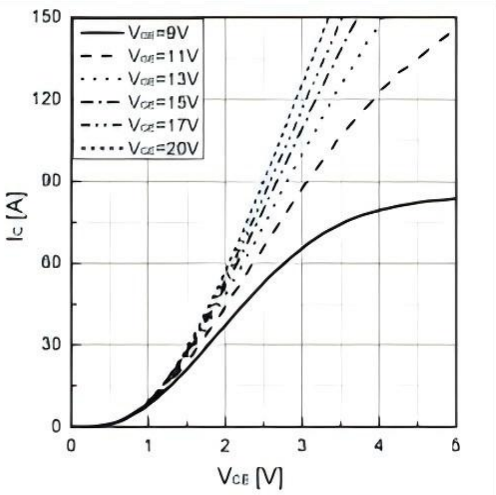


Fig 2. Typical output characteristic(T_{vj}=175℃)

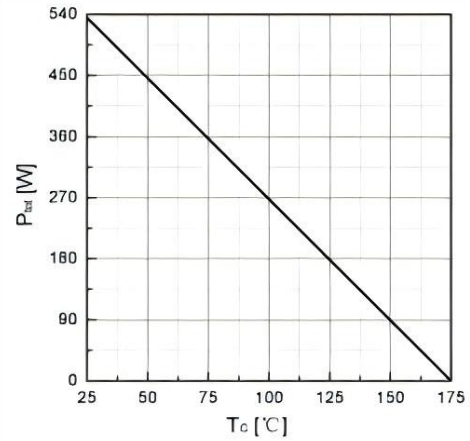


Fig 3. Power dissipation as a function of T_C

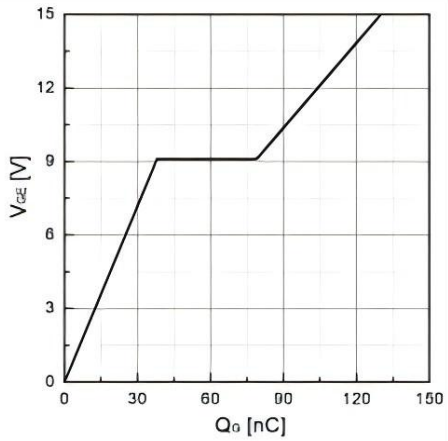


Fig 4. Typical Gate charge

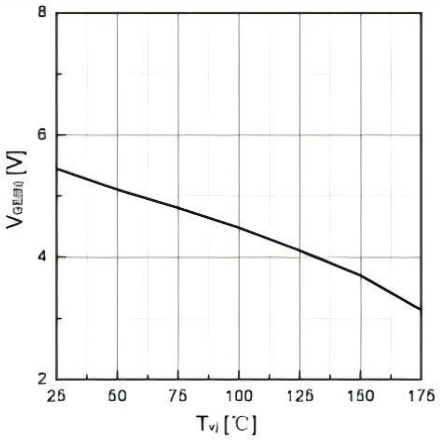


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj}
(I_C=1mA)

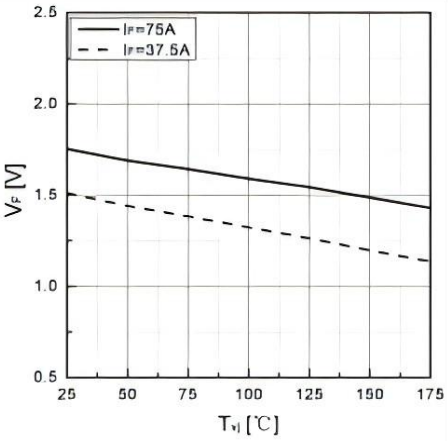


Fig 6. Typical V_F as a function of T_{vj}

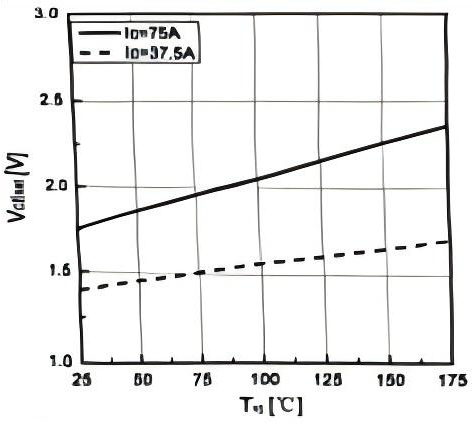


Fig 7. Typical $V_{CE(sat)}$ as a function of T_{vj}

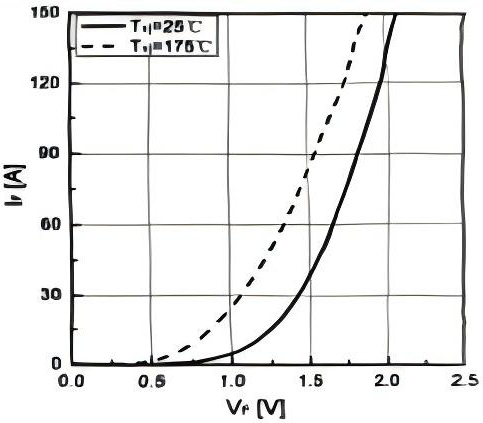


Fig 8. Typical I_F as a function of V_F

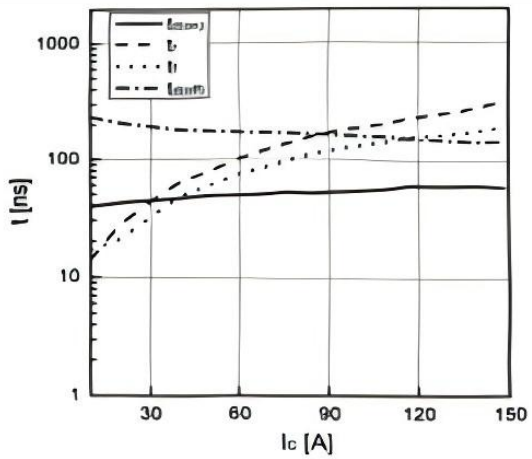


Fig 9. Typical switching time as a function of I_C

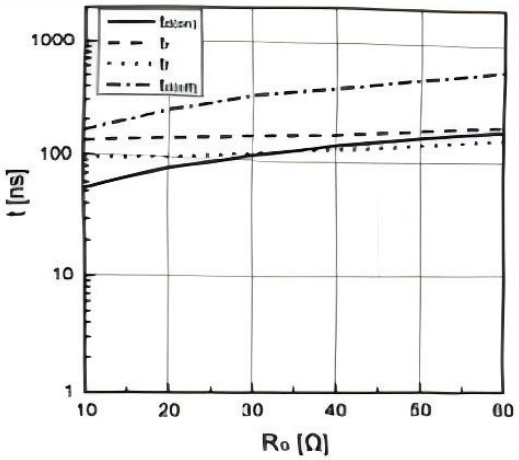


Fig 10. Typical switching times as a function of

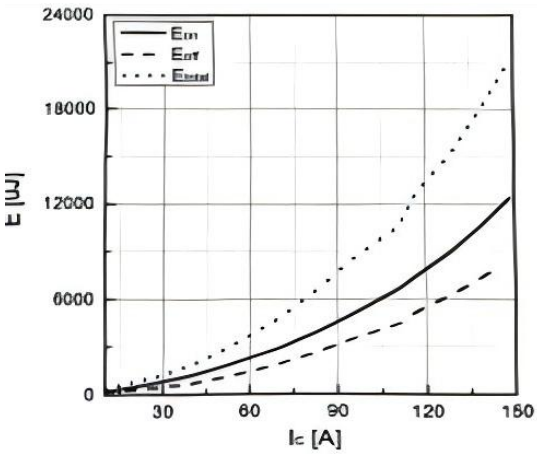


Fig 11. Typical switching energy losses as a function of I_C

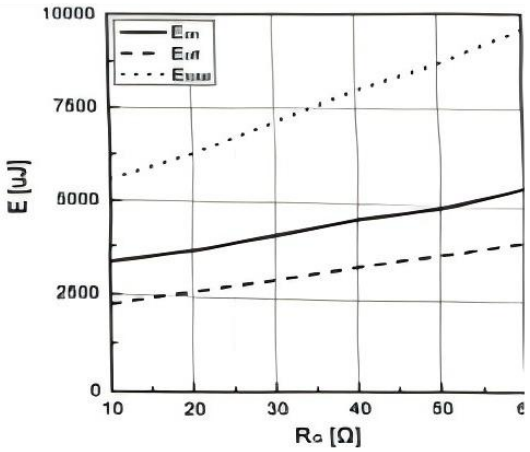


Fig 12. Typical switching energy losses as function of R_G

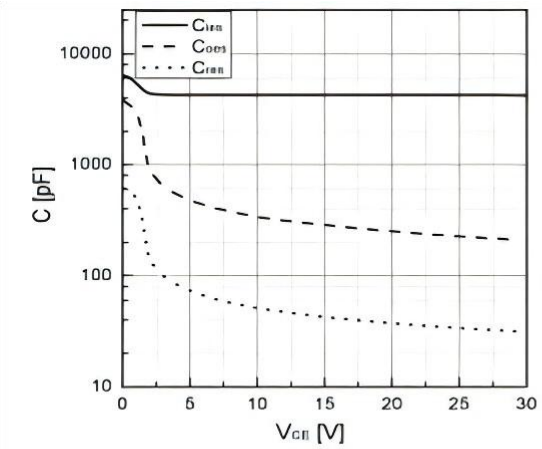


Fig 13. Typical capacitance as a function of V_{CE} (f=1Mhz, V_{GE}=0V)

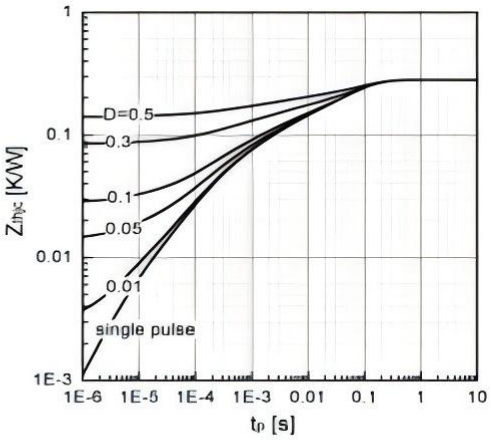
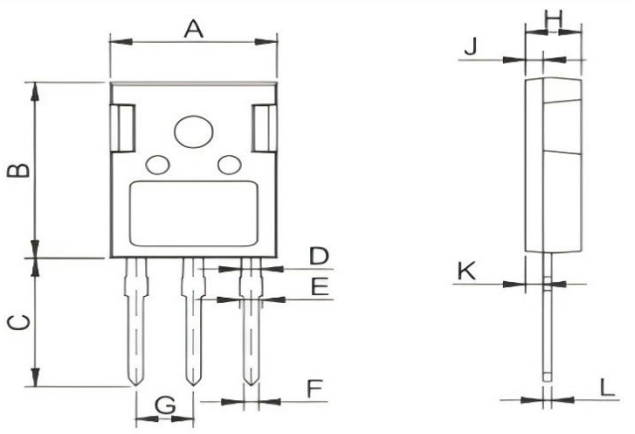


Fig 14. Transient thermal impedance of IGBT

PACKAGE OUTLINES

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.50	15.80	16.10	0.610	0.622	0.634
B	20.80	21.00	22.20	0.819	0.828	0.874
C	19.70	20.00	20.30	0.776	0.787	0.799
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.90	2.10	2.30	0.075	0.083	0.091
F	1.00	1.20	1.40	0.039	0.047	0.055
G		5.44			0.214	
H	4.80	5.00	5.20	0.189	0.197	0.205
J	1.90	2.00	2.10	0.075	0.079	0.083
K	2.20	2.35	2.50	0.087	0.093	0.098
L	0.41	0.60	0.79	0.016	0.024	0.031



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2) Implement redundancy, fire-prevention measures, and malfunction prevention protocols;
3) Mitigate risks of accidents, fires, or societal damages resulting from product use.
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