JJMICROELECTRONICS

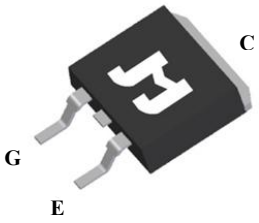
650V 75A Trench and Field Stop IGBT

JJT75N65HCN

Key performance:

TO-263

- V_{CE}=650V
- I_C=75A@T_C=100℃
- $V_{CE(sat)}$=1.8V

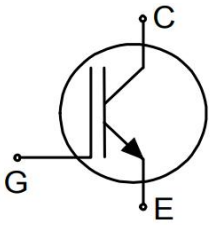


Features:

- Trench and field-stop technology.
- Easy parallel switching capability.

Benefits:

- High efficiency for inverters.
- High ruggedness performance.
- RoHS compliant.



Applications:

- Hair removal device
- Flash light

Package parameters

Type	Marking	Package	Packaging Method
JJT75N65HCN	T7565HCN	TO-263	Tape and reel

Maximum ratings

Symbol	Parameter	Values	Unit
V_{CES}	Collector-emitter voltage	650	V
V_{GES}	Gate-emitter voltage	±20	V
I_C	Continuous collector current (T_C=25℃)	125	A
	Continuous collector current (T_C=100℃)	75	A
I_{CM}	Pulsed collector current, t_p limited by T_{vjmax}	300	A
P_{tot}	Power dissipation (T_C=25℃)	600	W
	Power dissipation (T_C=100℃)	300	W
T_{vj}	Operating junction temperature range	-40 to +175	℃
T_{stg}	Storage temperature range	-55 to +150	℃

Thermal characteristics

Symbol	Parameter	Values		Unit
		Typ.	Max.	
$R_{th(j-c)}$	Thermal resistance, junction to case for IGBT	-	0.25	K/ W
$R_{th(j-a)}$	Thermal resistance, junction to ambient	-	40	K/ W

Electrical characteristics of IGBT (T_{vj}=25℃ unless otherwise specified)

Static characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
BV_{CES}	Collector-emitter breakdown voltage	V_{GE}=0V, I_C=250μA	650	-	-	V
I_{CES}	Collector-emitter leakage current	V_{CE}=650V, V_{GE}=0V	-	-	50	μA
I_{GES}	Gate leakage current, forward	V_{GE}=20V, V_{CE}=0V	-	-	100	nA
	Gate leakage current, reverse	V_{GE}=-20V, V_{CE}=0V	-	-	-100	nA
$V_{GE(th)}$	Gate-emitter threshold voltage	V_{GE}=V_{CE}, I_C=1mA	5.0	5.4	5.6	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	V_{GE}=15 V, I_C=75A	-	1.8	-	V
		V_{GE}=15V, I_C=75A, T_{vj} =175℃	-	2.3	-	V

Dynamic characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
C_{ies}	Input capacitance	V_{CE}=30V V_{GE}=0V f=1MHz	-	4250	-	pF
C_{oes}	Output capacitance		-	205	-	pF
C_{res}	Reverse transfer capacitance		-	31	-	pF
Q_g	Total gate charge	V_{CC}=520V V_{GE}=15V I_C=75A	-	130	-	nC

Switching characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
$t_{d(on)}$	Turn-on delay time	V_{CC}=400V V_{GE}=0/15V I_C=75A R_G=10Ω Inductive load	-	53	-	ns
t_r	Rise time		-	132	-	ns
$t_{d(off)}$	Turn-off delay time		-	162	-	ns
t_f	Fall time		-	95	-	ns
E_{on}	Turn-on energy		-	3.3	-	mJ
E_{off}	Turn-off energy		-	2.2	-	mJ
E_{ts}	Total switching energy		-	5.5	-	mJ
$t_{d(on)}$	Turn-on delay time	V_{CC}=400V V_{GE}=0/15V I_C=75A R_G=10Ω Inductive load T_{vj} =175℃	-	53	-	ns
t_r	Rise time		-	128	-	ns
$t_{d(off)}$	Turn-off delay time		-	181	-	ns
t_f	Fall time		-	107	-	ns
E_{on}	Turn-on energy		-	4.8	-	mJ
E_{off}	Turn-off energy		-	2.7	-	mJ
E_{ts}	Total switching energy		-	7.5	-	mJ

Typical performance characteristics

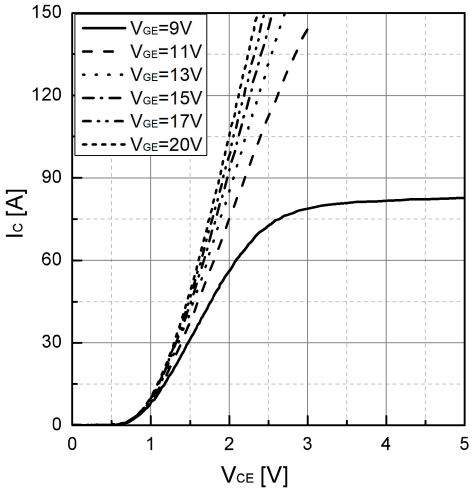


Fig 1. Typical output characteristic (T_{vj}=25℃)

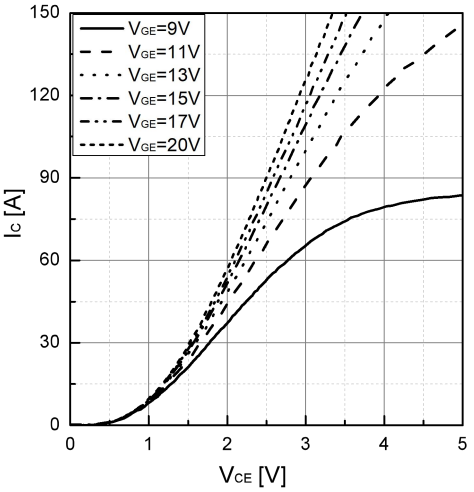


Fig 2. Typical output characteristic(T_{vj}=175℃)

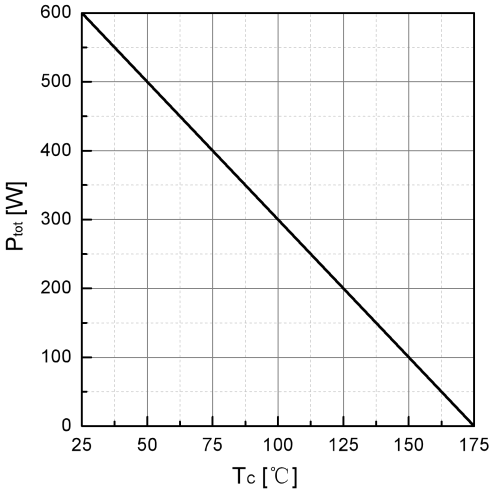


Fig 3. Power dissipation as a function of T_C

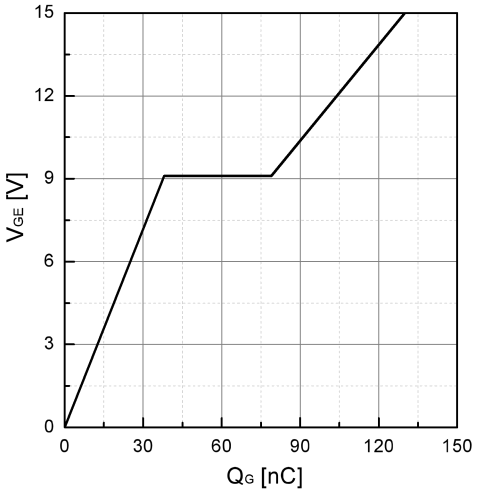


Fig 4. Typical gate charge

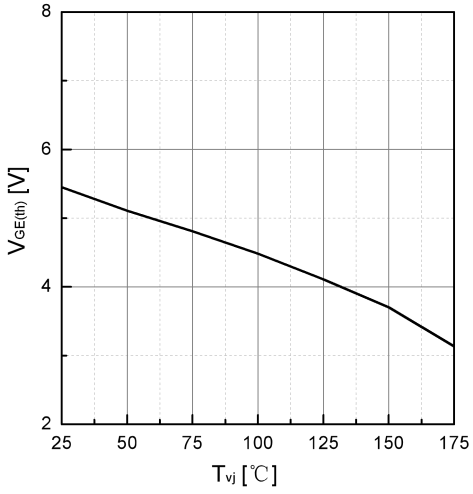


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj} (I_C=1mA)

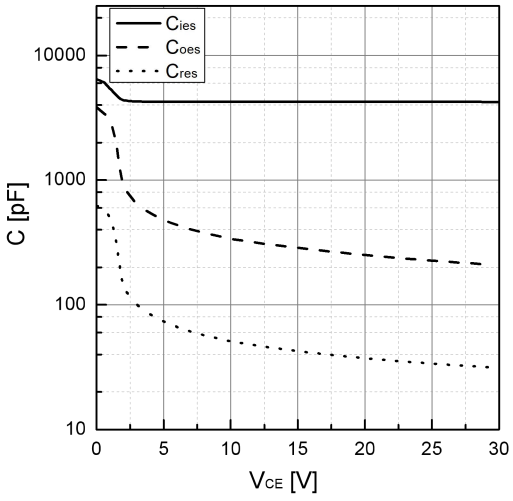


Fig 6. Typical capacitance as a function of V_{CE} (f=1Mhz, V_{GE}=0V)

Typical performance characteristics

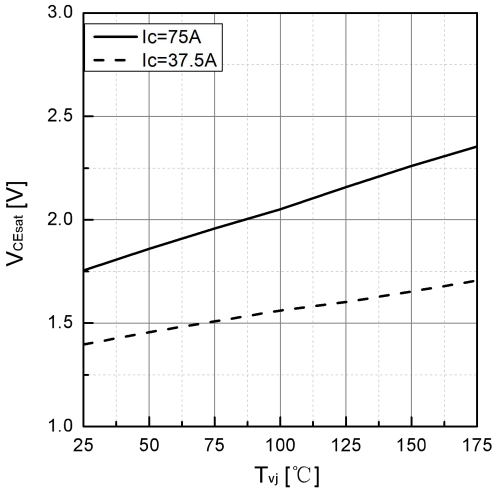


Fig 7. Typical V_{CEsat} as a function of T_{vj}

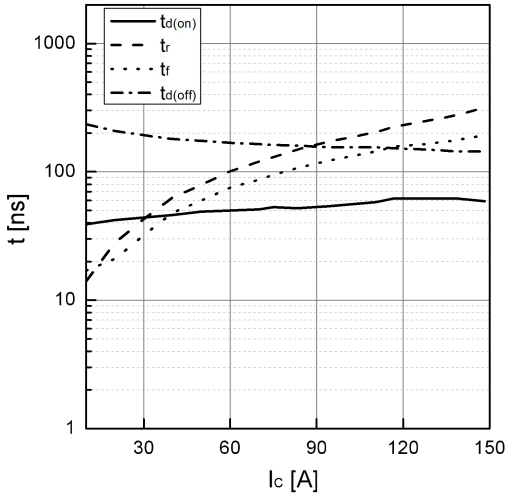


Fig 8. Typical switching time as a function of I_C

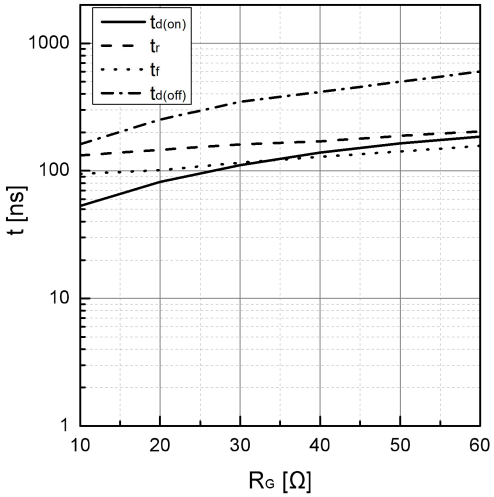


Fig 9. Typical switching times as a function of R_G

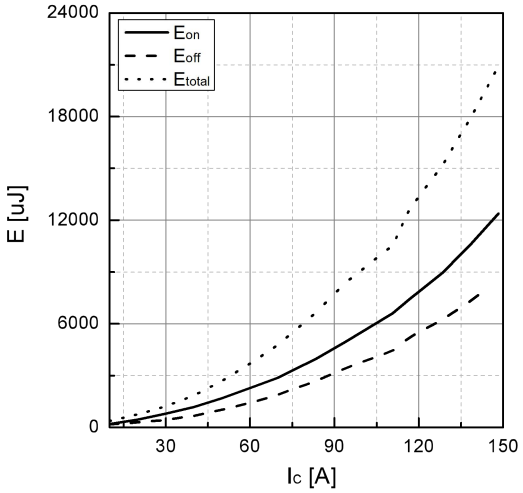


Fig 10. Typical switching energy losses as a function of I_C

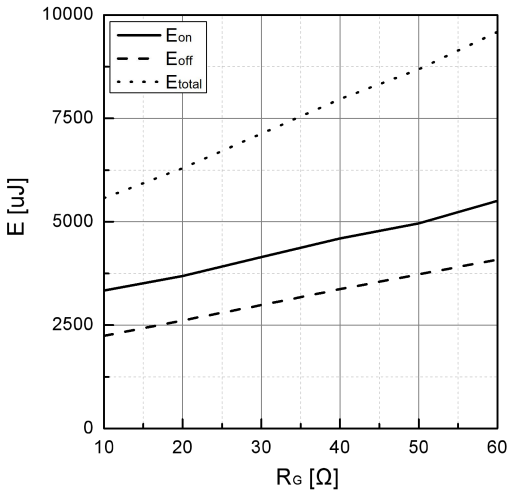


Fig 11. Typical switching energy losses as a function of R_G

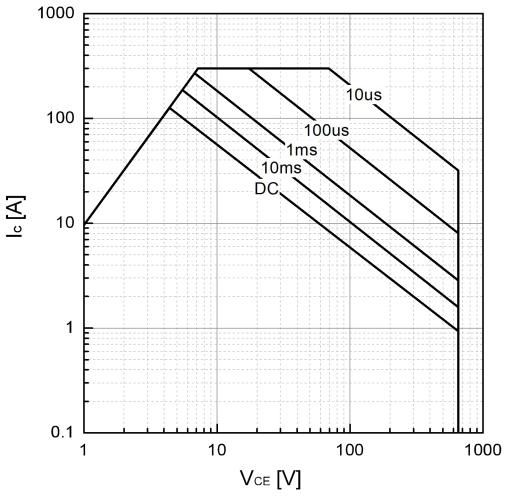


Fig 12. Safe operating area

Typical performance characteristics

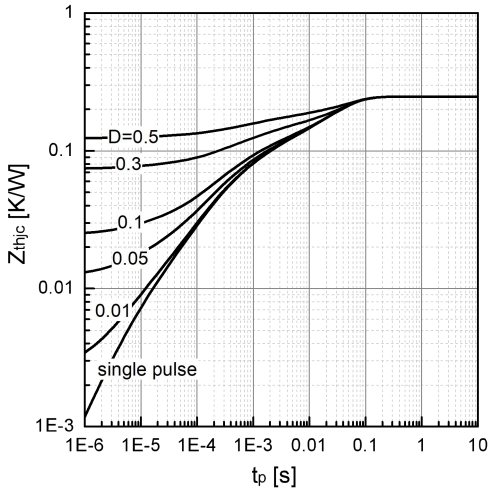
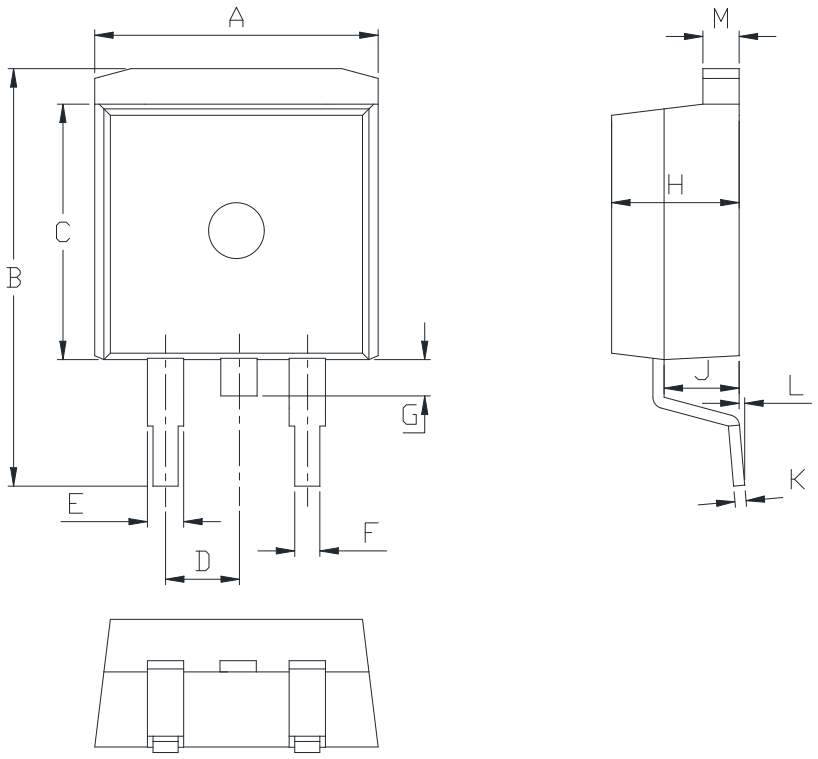


Fig 13. Transient thermal impedance, IGBT

Package dimension

TO-263



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90	-	10.20	0.390	-	0.402
B	14.70	-	15.80	0.579	-	0.622
C	9.4	-	9.6	0.37	-	0.378
D	-	2.54	-	-	0.100	-
E	1.20	-	1.40	0.047	-	0.055
F	0.75	-	0.85	0.029	-	0.033
G	-	-	1.75	-	-	0.069
H	4.40	-	4.70	0.173	-	0.185
J	2.30	-	2.70	0.091	-	0.106
K	0.38	-	0.55	0.015	-	0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25	-	1.35	0.049	-	0.053

Revision history

Date	Revision	Changes
2024-03-20	Rev 1.2	Update
2024-08-20	Rev 2.0	Update
2024-09-12	Rev 2.1	Update

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