JJMICROELECTRONICS

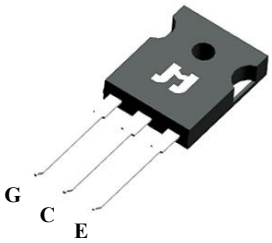
650V 40A Trench and Field Stop IGBT

JJT40N65UK

K :

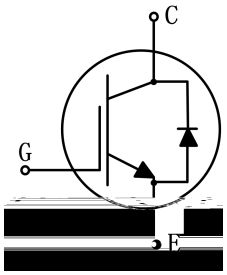
- $_{CE}$ =650V
- $_{C}$=40A@ $_{C}$=100
- $_{CE(sat)}$=1.9V

TO-247i



F :

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



B :

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

A :

- PFC applications
- Welding machines

P

Type	Marking	Package	Packaging Method
JJT40N65UK	T4065UK	TO-247i	Tube

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M

	P		
CES	Collector-emitter voltage	650	V
GES	Gate-emitter voltage	±20	V
C	Continuous collector current (C=25)	80	A
	Continuous collector current (C=100)	40	A
CM	Pulsed collector current, p limited by vjmax	160	A
F	Diode continuous forward current (C=100)	40	A
FM	Diode maximum current, p limited by vjmax	160	A
tot	Power dissipation (C=25)	174	W
	Power dissipation (C=100)	87	W
vj	Operating junction temperature range	-40 to +175	
stg	Storage temperature range	-55 to +150	

	P			
		.	M .	
th(j-c)	Thermal resistance, junction to case for IGBT	-	0.86	K/ W
th(j-c)	Thermal resistance, junction to case for Diode	-	1.4	K/ W
th(j-a)	Thermal resistance, junction to ambient	-	40	K/ W

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E IGB (vj=25 unless otherwise specified)

Static characteristics

	P					
			M .	.	M .	
CES	Collector-emitter breakdown voltage	GE=0V, I_C=250 A	650	-	-	V
CES	Collector-emitter leakage current	CE=650V, GE=0V	-	-	50	A
GES	Gate leakage current, forward	GE=20V, CE=0V	-	-	100	nA
	Gate leakage current, reverse	GE=-20V, CE=0V	-	-	-100	nA
GE(th)	Gate-emitter threshold voltage	GE= CE, C=1	4.0	5.0	6.0	V
CE(sat)	Collector-emitter saturation voltage	GE=15 V, C=40A	-	1.9	-	V
		GE=15V, C=40A, vj=175	-	2.6	-	V

Dynamic characteristics

	P					
			M .	.	M .	
ies	Input capacitance	CE=30V GE=0V =1MHz	-	2480	-	pF
oes	Output capacitance		-	95	-	pF
res	Reverse transfer capacitance		-	21	-	pF
g	Total gate charge	CC=520V GE=15V C=40A	-	78	-	nC

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Switching characteristics

	P					
			M .	.	M .	
d(on)	Turn-on delay time	$_{CC}$=400V $_{GE}$=0/15V $_{C}$=40A $_{G}$=10Ω Inductive load	-	32	-	ns
r	Rise time		-	55	-	ns
d(off)	Turn-off delay time		-	106	-	ns
f	Fall time		-	51	-	ns
on	Turn-on energy		-	0.9	-	mJ
off	Turn-off energy		-	0.5	-	mJ
ts	Total switching energy		-	1.4	-	mJ
d(on)	Turn-on delay time	$_{CC}$=400V $_{GE}$=0/15V $_{C}$=40A $_{G}$=10Ω Inductive load $_{vj}$=175	-	28	-	ns
r	Rise time		-	52	-	ns
d(off)	Turn-off delay time		-	128	-	ns
f	Fall time		-	75	-	ns
on	Turn-on energy		-	1.4	-	mJ
off	Turn-off energy		-	0.7	-	mJ
ts	Total switching energy		-	2.1	-	mJ

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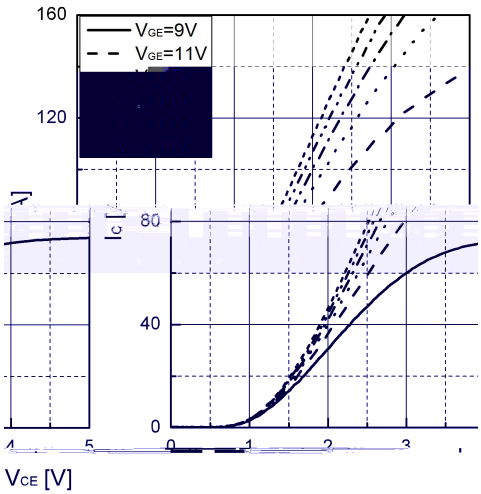

Fig 1. Typical output characteristic (vj=25)

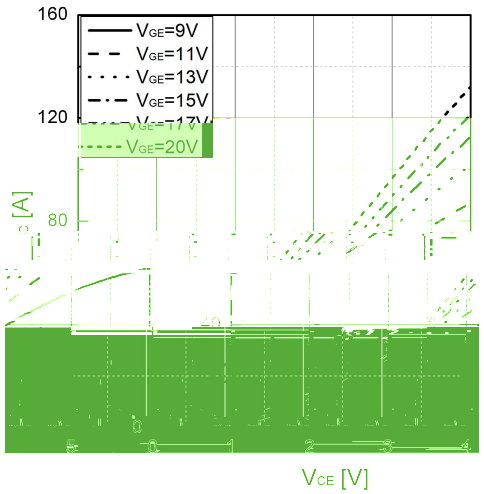

Fig 2. Typical output characteristic (vj=175)

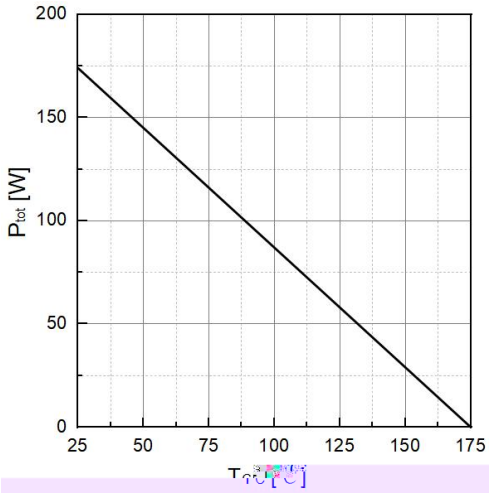

Fig 3. Power dissipation as a function of

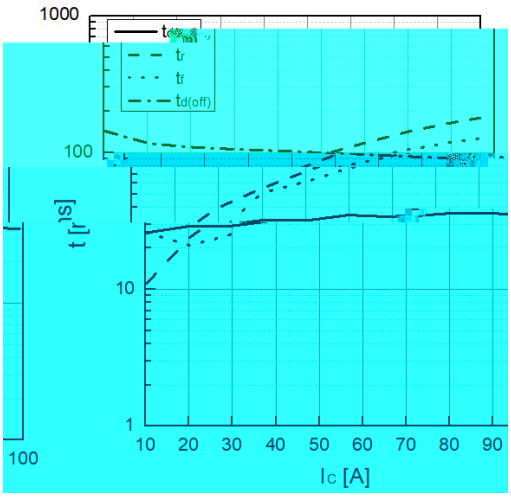

Fig 4. Typical switching time as a function of C

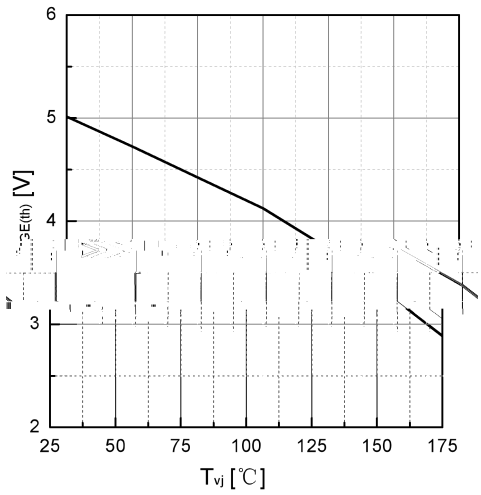

Fig 5. Typical GE(th) as a function of vj

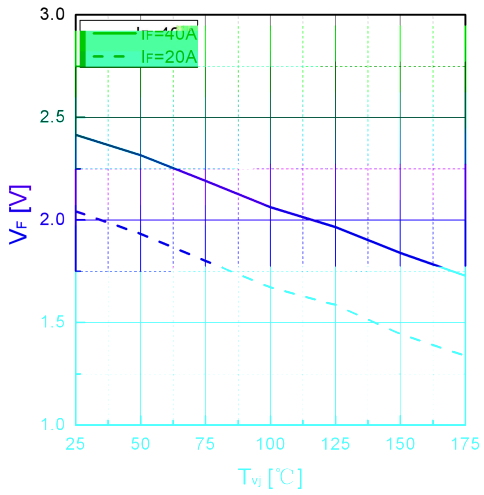

Fig 6. Typical F as a function of vj

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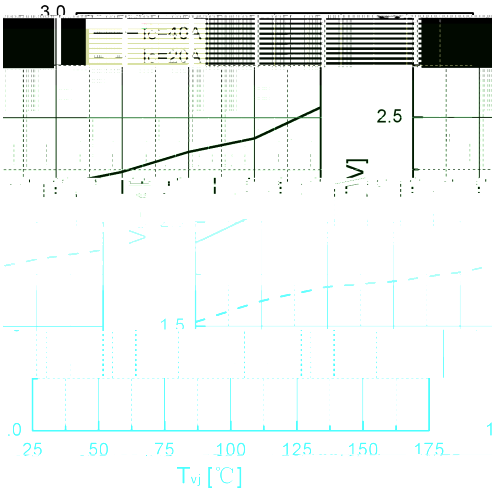

Fig 7. Typical $_{CEsat}$ as a function of $_{vj}$

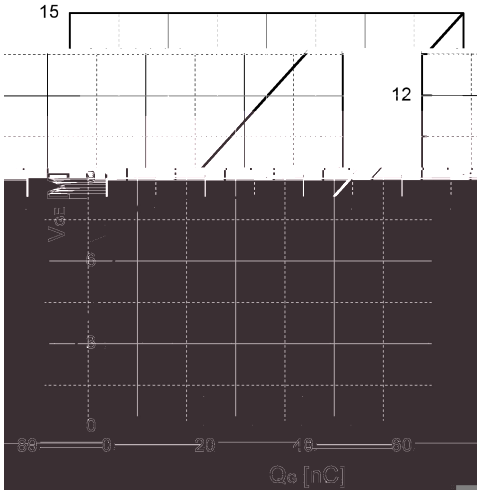

Fig 8. Typical Gate charge

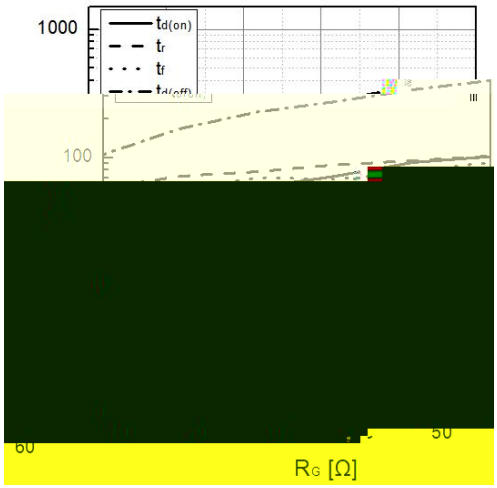

Fig 9. Typical switching times as a function of $_{G}$

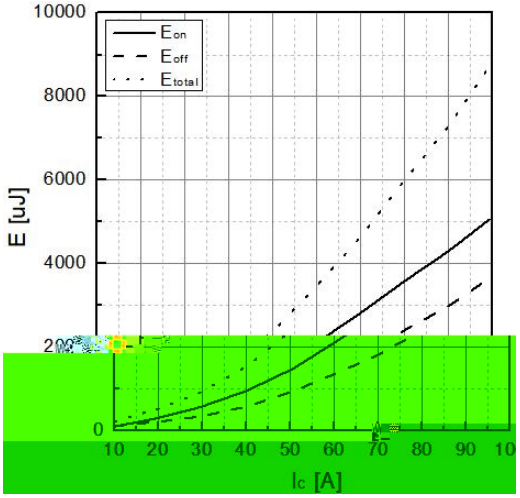

Fig 10. Typical switching energy losses as a function of $_{C}$

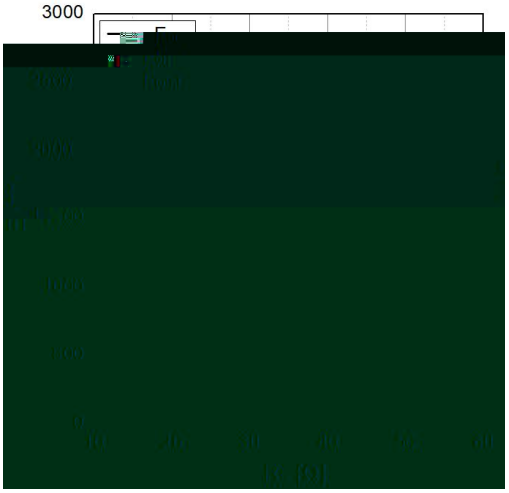

Fig 11. Typical switching energy losses as a function of $_{G}$

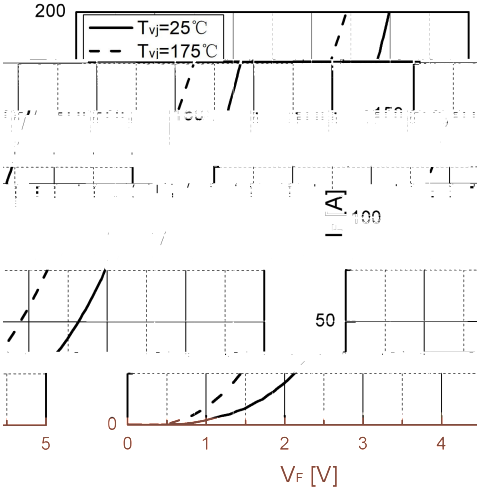

Fig 12. Typical $_{F}$ as a function of $_{F}$

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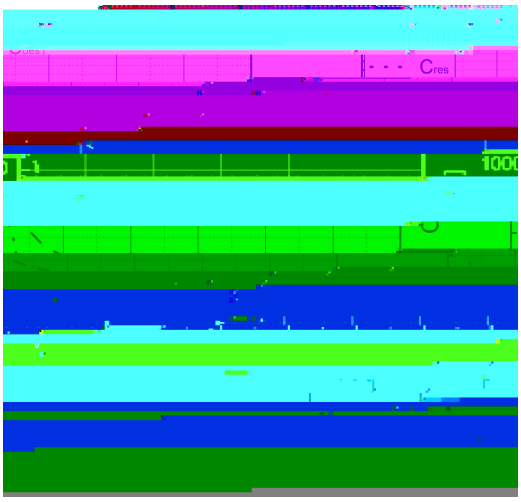

Fig 13. Typical capacitance as a function of $_{CE}$ (f=1Mhz, $_{GE}$=0V)

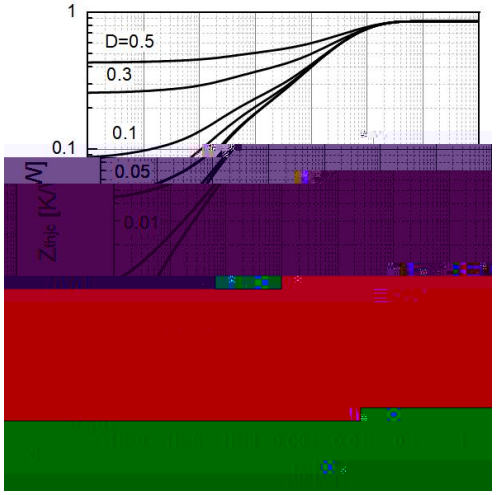

Fig 14. Transient thermal impedance of IGBT

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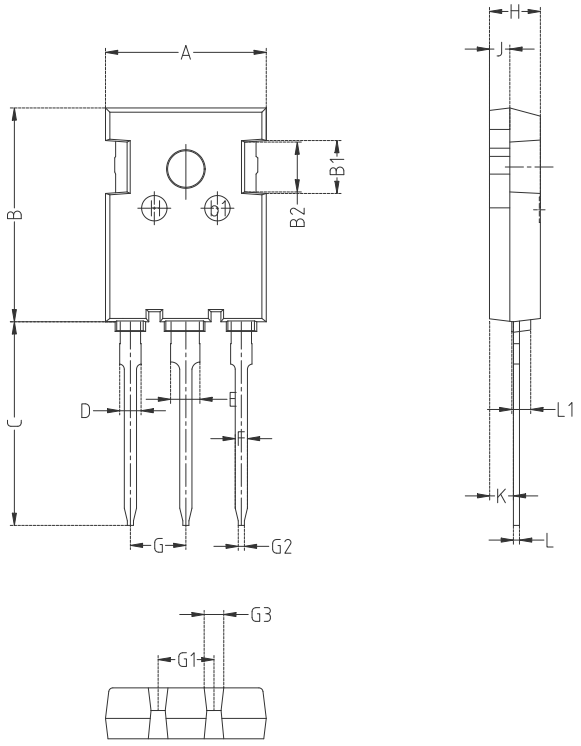

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.95	16.00	16.05	0.627	0.629	0.631
B	21.85	21.90	21.92	0.860	0.862	0.864
B1	5.15	5.20	5.25	0.202	0.204	0.206
B2	4.32	4.37	4.42	0.170	0.172	0.174
C	19.01	19.11	19.21	0.748	0.752	0.756
D	2.07	2.10	2.13	0.081	0.082	0.083
E	3.07	3.10	3.13	0.120	0.122	0.123
F	1.15	1.20	1.25	0.045	0.047	0.049
G	5.45REF			0.214REF		
G1	5.85	5.90	5.95	0.230	0.232	0.234
G2	-	0.60	-	-	0.023	-
G3	1.76	1.81	1.86	0.069	0.071	0.073
H	4.95	5.00	5.05	0.194	0.196	0.198
J	1.44	1.49	1.54	0.056	0.058	0.060
K	2.30	2.35	2.40	0.090	0.092	0.094
L	0.59	0.60	0.61	0.023	0.023	0.024
L1	1.85	1.90	1.95	0.072	0.074	0.076

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Date	Revision	Changes
2026-06-01	Rev 1.0	Release of the datasheet

D

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