JJMICROELECTRONICS

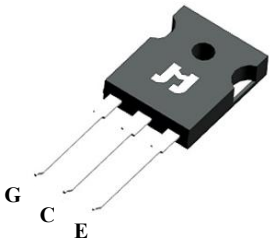
650V 40A Trench and Field Stop IGBT

JJT40N65UE

K :

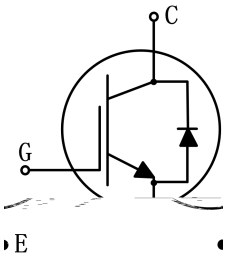
- $_{CE}$ =650V
- $_{C}$=40A@ $_{C}$=100
- $_{CE(sat)}$=1.9V

TO-247



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
JJT40N65UE	T4065UE	TO-247	Tube

All product information is copyrighted and subject to legal disclaimers.

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)	300	W
	Power dissipation (C=100)	150	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	-	0.5	K/ W
th(j-c)	Thermal resistance, junction to case for Diode	-	0.9	K/ W
th(j-a)	Thermal resistance, junction to ambient	-	40	K/ W

All product information is copyrighted and subject to legal disclaimers.

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

All product information is copyrighted and subject to legal disclaimers.

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

All product information is copyrighted and subject to legal disclaimers.

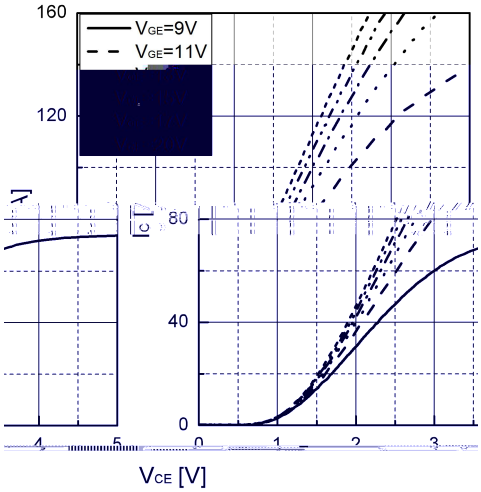


Fig 1. Typical output characteristic (vj=25)

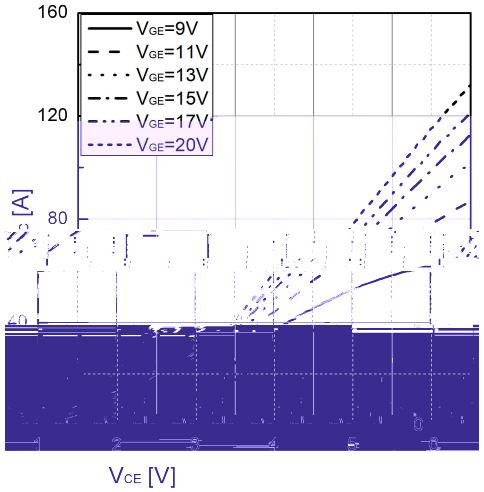


Fig 2. Typical output characteristic (vj=175)

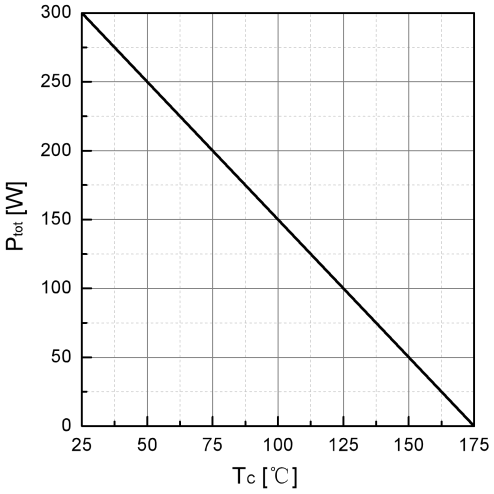


Fig 3. Power dissipation as a function of

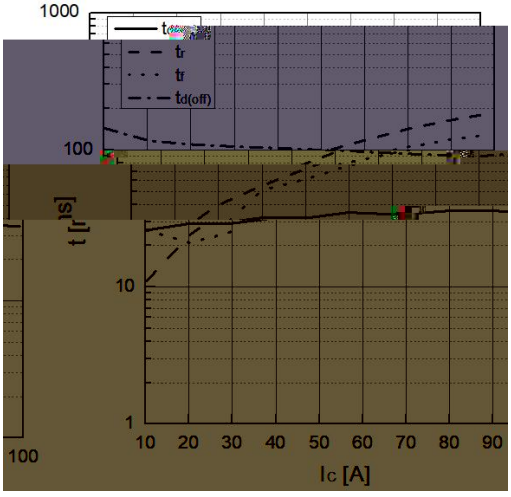


Fig 4. Typical switching time as a function of C

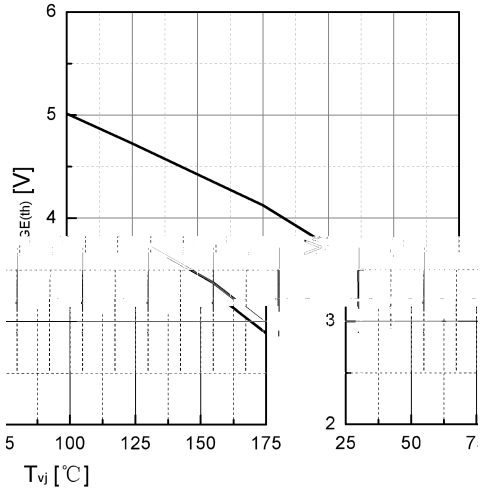


Fig 5. Typical GE(th) as a function of vj

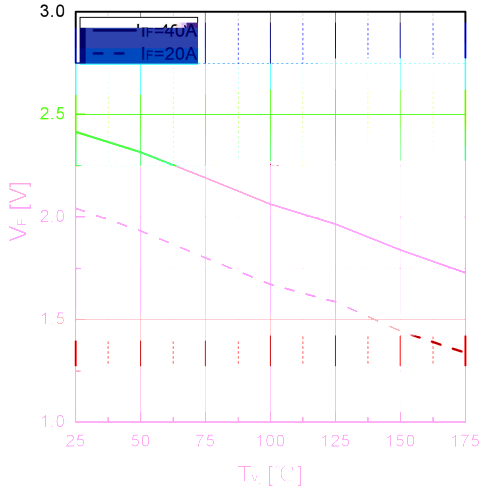


Fig 6. Typical F as a function of vj

All product information is copyrighted and subject to legal disclaimers.

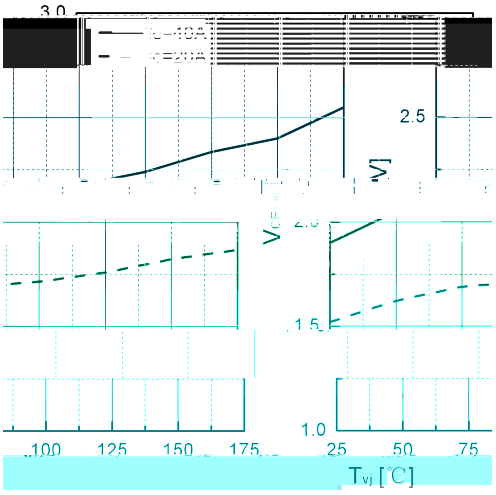


Fig 7. Typical $_{CEsat}$ as a function of $_{vj}$

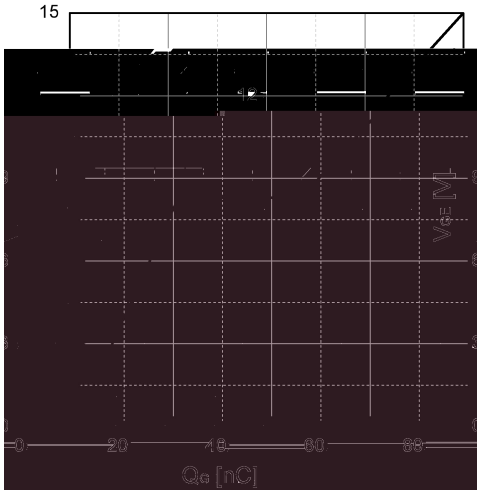


Fig 8. Typical Gate charge

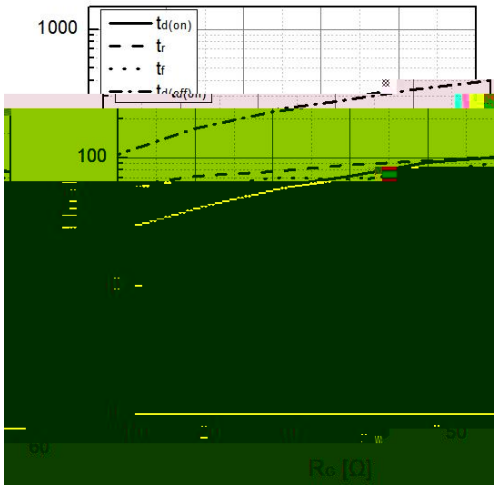


Fig 9. Typical switching times as a function of $_{G}$

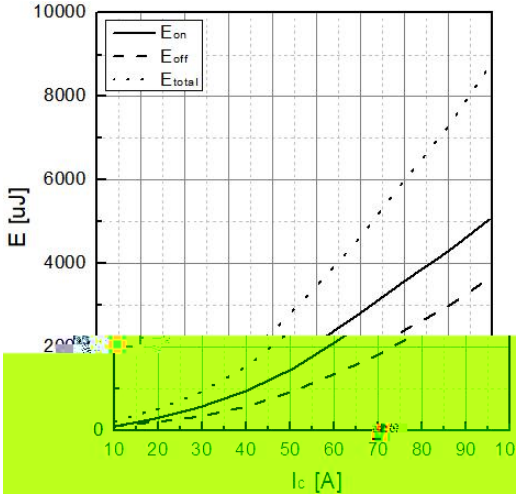


Fig 10. Typical switching energy losses as a function of $_{C}$

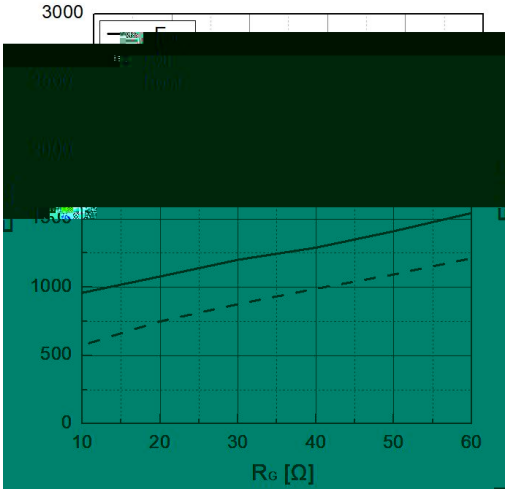


Fig 11. Typical switching energy losses as a function of $_{G}$

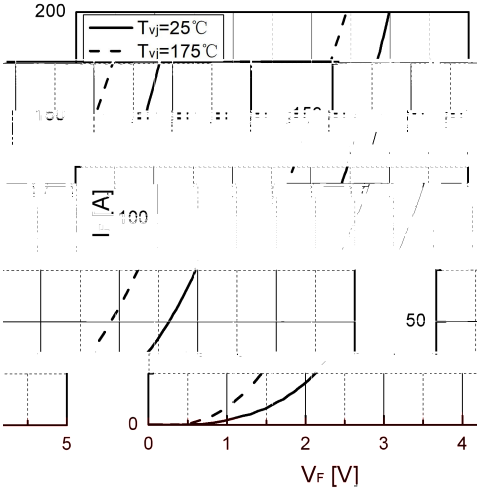


Fig 12. Typical $_{F}$ as a function of $_{F}$

All product information is copyrighted and subject to legal disclaimers.

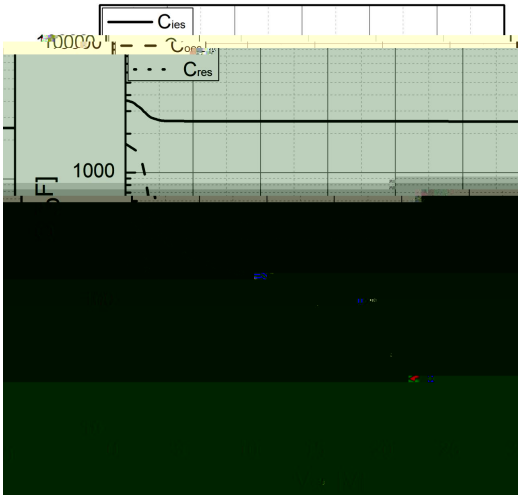


Fig 13. Typical capacitance as a function of $_{CE}$ (f=1Mhz, $_{GE}$=0V)

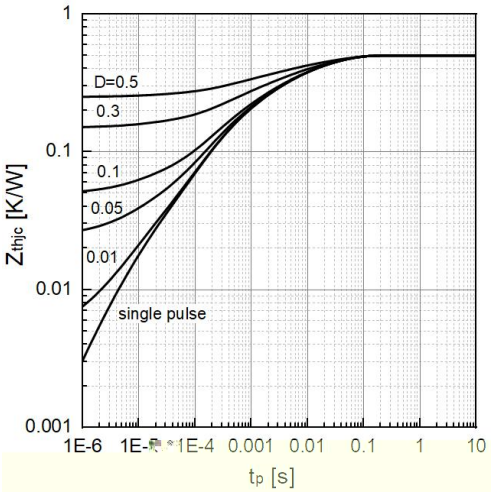


Fig 14. Transient thermal impedance of IGBT

All product information is copyrighted and subject to legal disclaimers.

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	21.20	0.819	0.827	0.835
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	5.25	-	5.65	0.207	-	0.222
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
M	2.80	3.00	3.20	0.110	0.118	0.126
N	2.90	3.10	3.30	0.114	0.122	0.130

All product information is copyrighted and subject to legal disclaimers.

Date	Revision	Changes
2023-11-20	Rev 1.0	Release of the datasheet
2024-04-17	Rev 1.1	Update
2024-05-17	Rev 1.2	Update
2026-06-25	Rev 1.3	Update thermal

D

PLEASE NOTE - Jiangsu JieJie Microelectronics Co., Ltd ("JJM") reserves the right to amend, correct, modify and enhance the product and/or this document at any time without prior notice. If you intend to purchase this product, please obtain the latest information available before placing your order. The sale of JJM products is governed by JJM's prevailing terms and conditions at the time of purchase and purchasers are solely responsible for the selection and use of the products with no liability on JJM's part to supply application assistance or customization. Purchase of JJM products does not grant the purchaser license, express or implied, to JJM's intellectual property. Any warranties provided with JJM products are null and void upon resale unless accompanied by the information set forth herein in its entirety. The JJM name and logo are registered trademarks of Jiangsu JieJie Microelectronics Co., Ltd. This document supersedes all previous versions. ©2024 JJM - All rights reserved