

650V 40A Trench and Field Stop IGBT

JJT40N65LCN

Key performance:

- $V_{CE}=650V$
- $I_C=40A@T_C=100$
- $V_{CE(sat)}=1.4V^1$

Features:

- Trench and field-stop technology.
- Excellent switching capability.

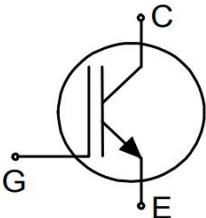
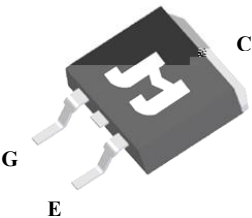
Benefits:

- High efficiency.
- High ruggedness.
- RoHS compliant.

Application:

- EV charger

TO-263



Package parameters

Item	Marking	Package	Package Method
JJT40N65LCN	T4065LCN	TO-263	Tape & Reel



S mbol	Pa ame e	Val e	Uni
V_{CES}	C ec -e e age	650	V
V_{GES}	Ga e-e e age	20	V
I_C	C c ec c e ($T_C=25$)	80	A
	C c ec c e ($T_C=100$)	40	A
I_{CM}	P ed c ec c e ,t ed b T_a	160	A
I_F	D de c f a d c e ($T_C=100$)	40	A
I_{FM}	D de a c e ,t ed b T_a	160	A
P	P e d a ($T_C=25$)	300	W
	P e d a ($T_C=100$)	150	W
T	O e a g c e e a e a ge	-40 +175	
T_g	S age e e a e a ge	-55 +150	



Static characteristics

Symbol	Parameter	Test condition	Value			Unit
			Min.	Typ.	Max.	
BV_{CES}	Collector-emitter breakdown voltage	$V_{GE}=0V, I_C=250\mu A$	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	A
	Gate leakage current, reverse	$V_{GE}=-20V, V_{CE}=0V$	-	-	-100	A
$V_{GE(h)}$	Gate-emitter threshold voltage	$V_{GE}=V_{CE}, I_C=1mA$	4.3	4.8	5.3	V
$V_{CE(a)}$	Collector-emitter avalanche voltage	$V_{GE}=15V, I_C=40A$	-	1.4	-	V
		$V_{GE}=15V, I_C=40A, T=175$	-	1.7	-	V

Dynamic characteristics

Symbol	Parameter	Test condition	Value			Unit
			Min.	Typ.	Max.	
C_{ie}	Input capacitance	$V_{CE}=30V$ $V_{GE}=0V$ $f=1MHz$	-	2540	-	F
C_{ie}	Output capacitance		-	143	-	F
C_{ie}	Reverse transfer capacitance		-	17	-	F
Q_g	Turn-on charge	$V_{CC}=520V$ $V_{GE}=15V$ $I_C=40A$	-	84	-	C



Switching characteristics

Symbol	Parameter	Test condition	Value			Unit
			Min.	Typ.	Max.	
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0/15V$ $I_C=40A$ $R_G=10\Omega$ Inductive load	-	27	-	
t_r	Rise time		-	53	-	
$t_{d(off)}$	Turn-off delay time		-	139	-	
t_f	Fall time		-	121	-	
E	Turn-on energy		-	1.3	-	J
E_{ff}	Turn-off energy		-	1.3	-	J
E	Switching energy		-	2.6	-	J
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0/15V$ $I_C=40A$ $R_G=10\Omega$ Inductive load $T=175$	-	26	-	
t_r	Rise time		-	54	-	
$t_{d(off)}$	Turn-off delay time		-	165	-	
t_f	Fall time		-	227	-	
E	Turn-on energy		-	1.4	-	J
E_{ff}	Turn-off energy		-	1.9	-	J
E	Switching energy		-	3.3	-	J

Typical performance characteristics

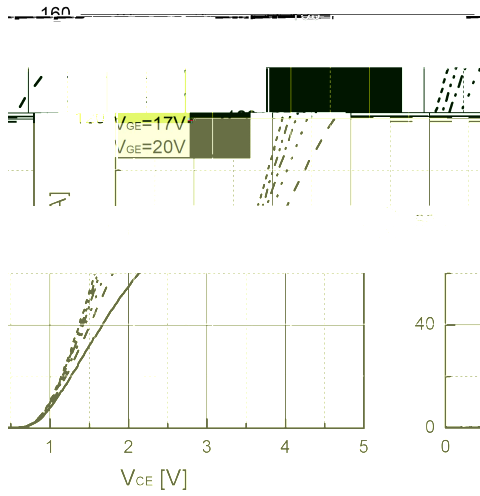


Fig 1. Typical transfer characteristics ($T_j = 25^\circ\text{C}$)

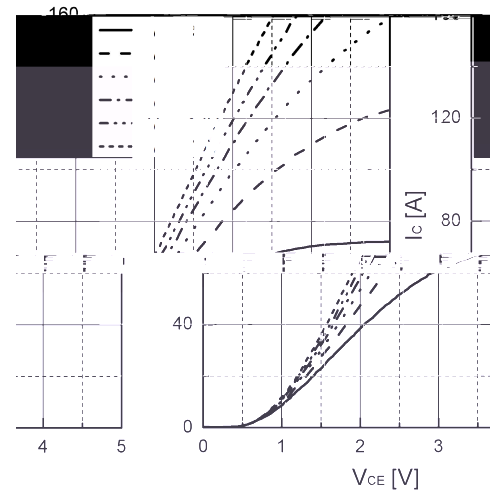


Fig 2. Typical transfer characteristics ($T_j = 175^\circ\text{C}$)

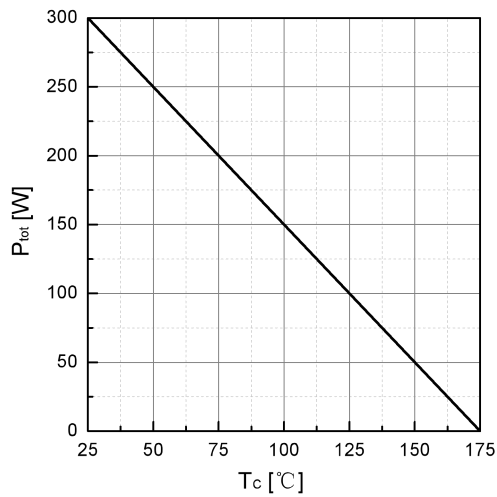


Fig 3. Power dissipation capability vs T_c

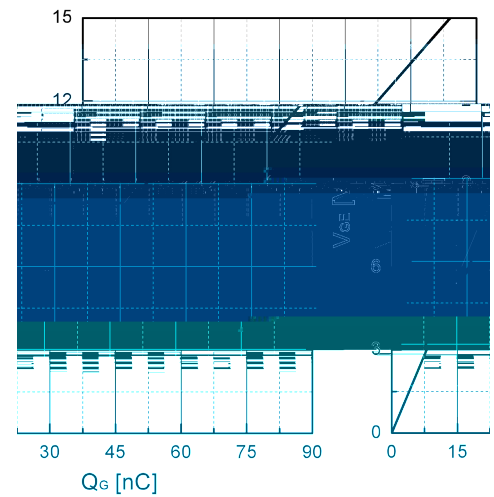


Fig 4. Typical gate charge

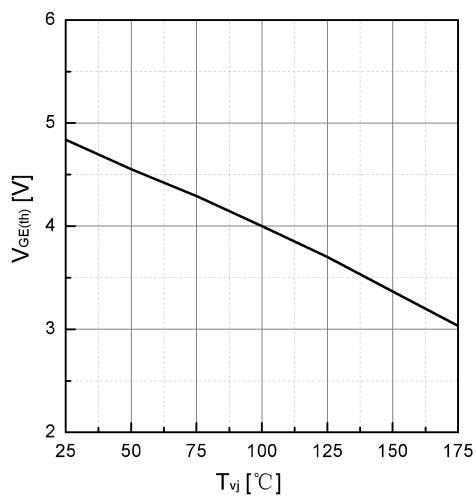


Fig 5. Typical $V_{GS(th)}$ vs T_j
($I_C = 1\text{ A}$)

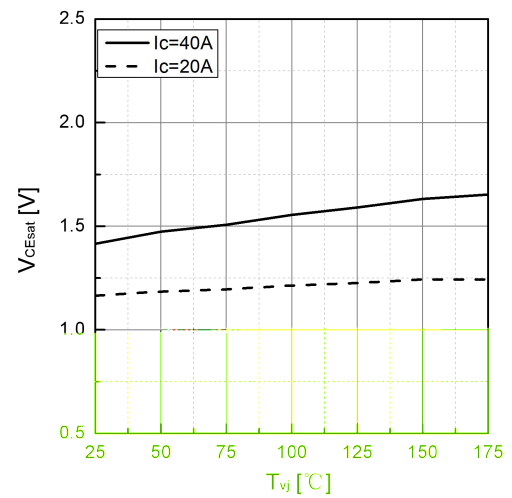


Fig 6. Typical $V_{CE(sat)}$ vs T_j

Typical performance characteristics

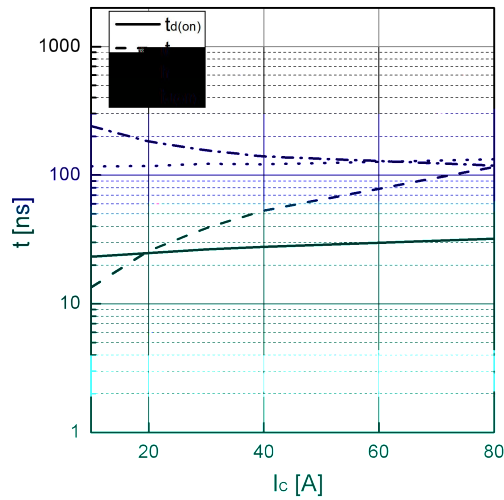


Fig 7. Typical switching delay time t_d vs I_C

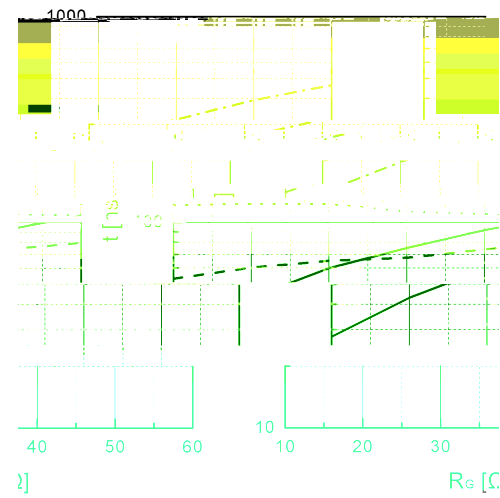


Fig 8. Typical switching delay time t_d vs R_G

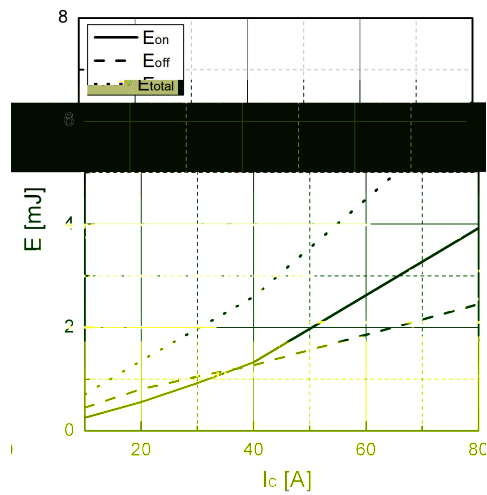


Fig 9. Typical switching energy E vs I_C

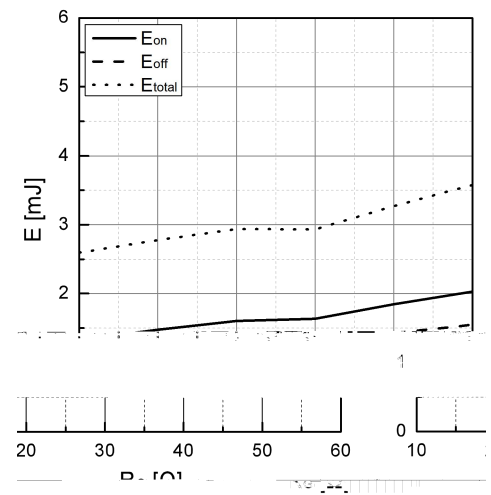


Fig 10. Typical switching energy E vs R_G

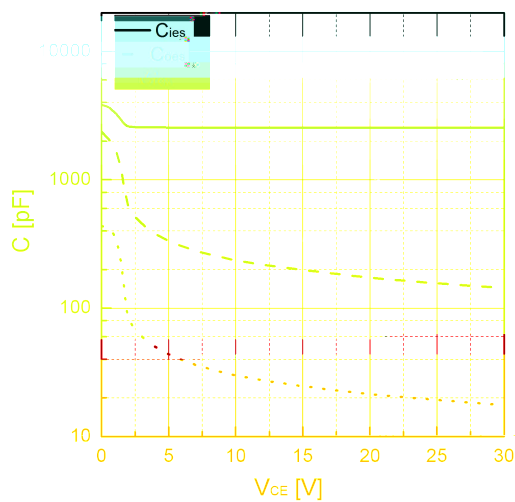
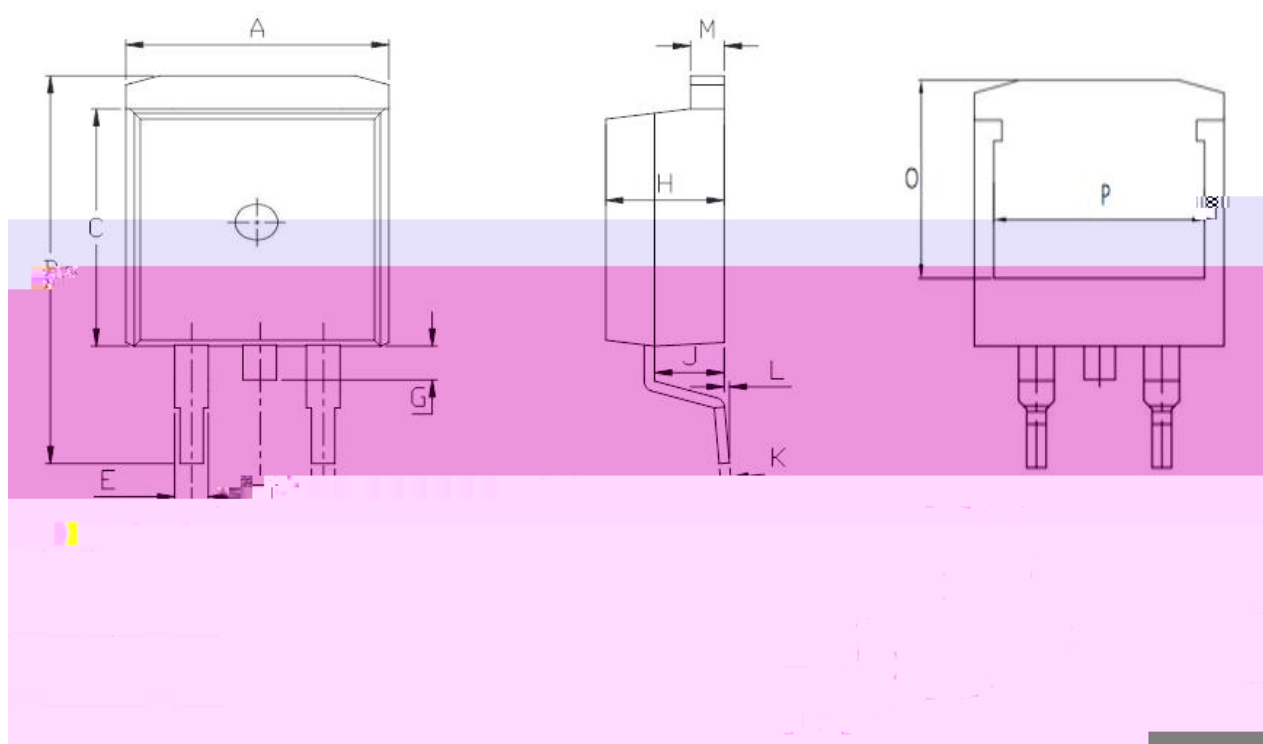


Fig 11. Typical capacitance C vs V_{CE}
($f=1\text{MHz}$, $V_{GE}=0\text{V}$)



Dimensioni

Ref.



Date	Revision	Change
2026-03-30	Rev 1.0	Initial