

### Key performance:

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

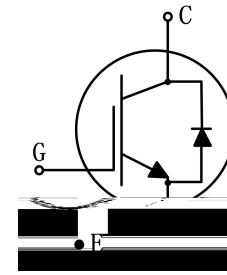
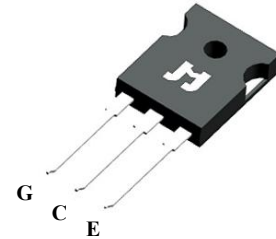
TO-247

### Features:

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

### Benefits:

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



### Applications:

- EV chargers

### Package parameters

Type	Marking	Package	Packaging Method
JJT40N65LE	T4065LE	TO-247	Tube



Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
CES	Collector-emitter breakdown voltage	$V_{GE}=0V, I_C=250\text{ A}$	650	-	-	V
CES	Collector-emitter leakage current	$V_{CE}=650V, V_{GE}=0V$	-	-	50	A
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
GE(th)	Gate-emitter threshold voltage	$V_{GE}=V_{CE}, I_C=1$	4.3	4.8	5.3	V
CE(sat)	Collector-emitter saturation voltage	$V_{GE}=15\text{ V}, I_C=40\text{ A}$	-	1.4	-	V
		$V_{GE}=15\text{ V}, I_C=40\text{ A}, f_{vj}=175$	-	1.7	-	V

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
Cies	Input capacitance	$V_{CE}=30V$	-	2540	-	pF
Coes	Output capacitance	$V_{GE}=0V$ $f=1\text{ MHz}$	-	143	-	pF
Cre	Reverse transfer capacitance	$V_{CC}=520V$	-	17	-	pF
Qg	Total gate charge	$V_{GE}=15V$ $I_C=40\text{ A}$	-	-	-	nC

Symbol	Parameter	Test condition	Values			Unit
			Min.	T p.	Max.	
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0.15V$ $I_C=40A$ $R_G=10\Omega$ Inductive				

75

AV

\* 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20

0.19s

time

Gal a =

**Electrical characteristics of Diode** (  $v_j=25$  unless otherwise specified)

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
F	Diode forward voltage	$I_F=40A$	-	1.4	-	V
		$I_F=40A, v_j=175$	-	1.2	-	V
$t_{rr}$	Diode reverse recovery time	$V_R=400V$ $I_F=40A$ $d I_F/d t = -400A/ s$	-	194	-	ns
$I_{rrm}$	Diode peak reverse recovery current		-	12	-	A
$Q_{rr}$	Diode reverse recovery charge		-	1803	-	nC
$t_{rr}$	Diode reverse recovery time	$V_R=400V$ $I_F=40A$ $d I_F/d t = -400A/ s$ $v_j=175$	-	305	-	ns
$I_{rrm}$	Diode peak reverse recovery current		-	22	-	A
$Q_{rr}$	Diode reverse recovery charge		-	3466	-	nC

## Typical performance characteristics

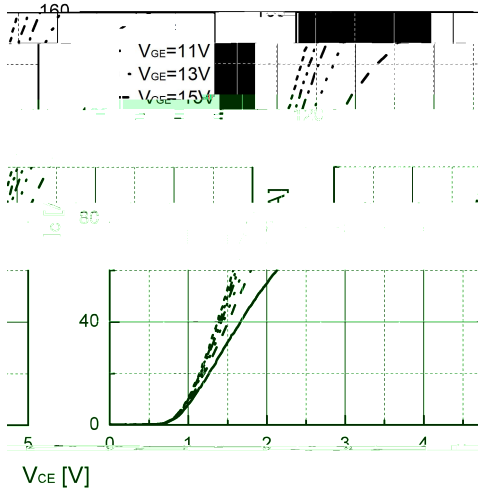


Fig 1. Typical output characteristic (  $v_j=25$  )

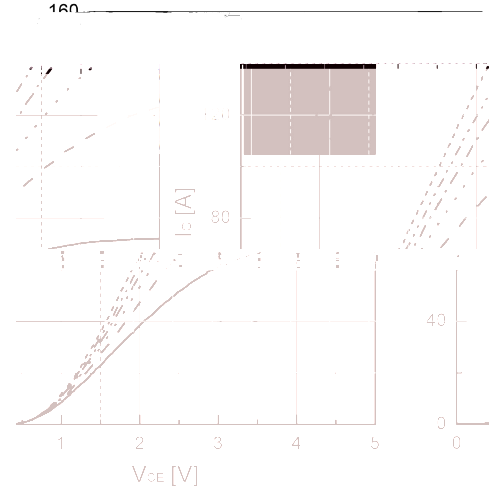


Fig 2. Typical output characteristic(  $v_j=175$  )

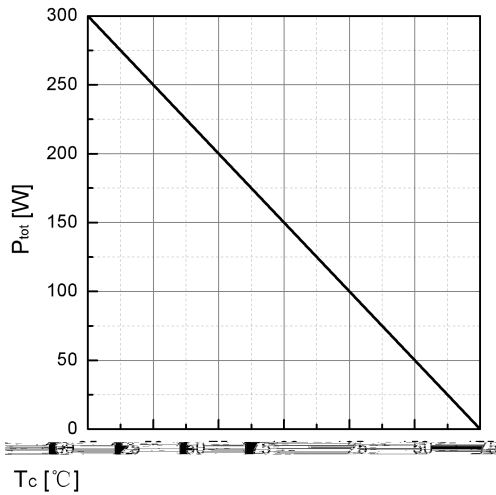


Fig 3. Power dissipation as a function of

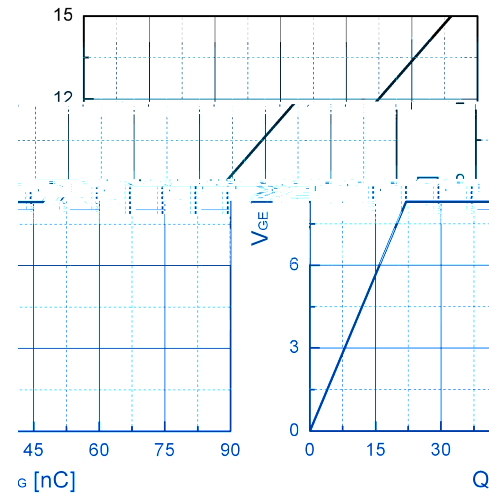


Fig 4. Typical Gate charge

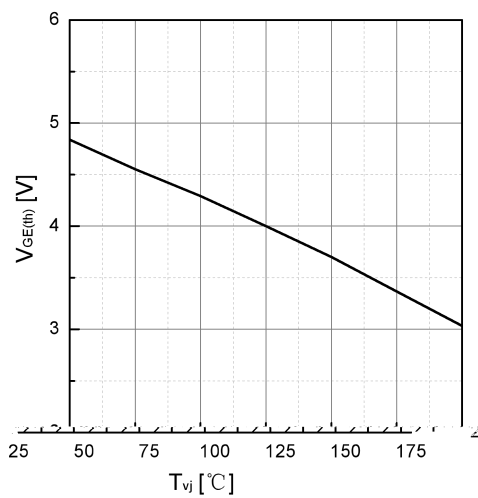


Fig 5. Typical  $V_{GE(th)}$  as a function of  $v_j$   
(  $i_c=1mA$  )

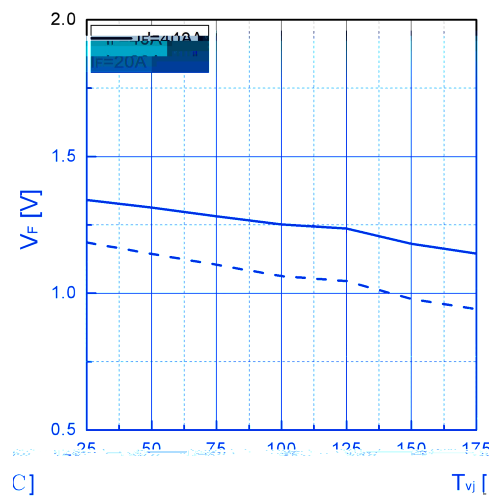


Fig 6. Typical  $V_F$  as a function of  $v_j$

## Typical performance characteristics

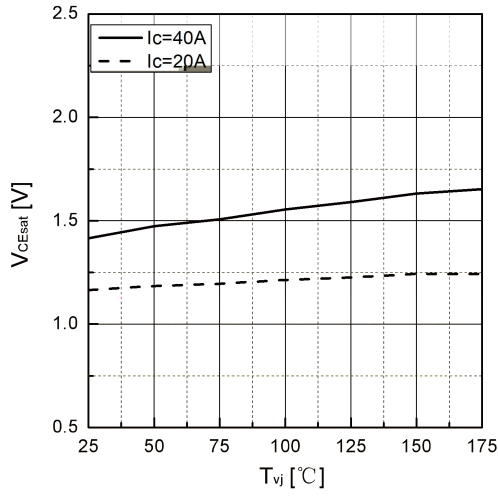


Fig 7. Typical  $V_{CEsat}$  as a function of  $T_{vj}$

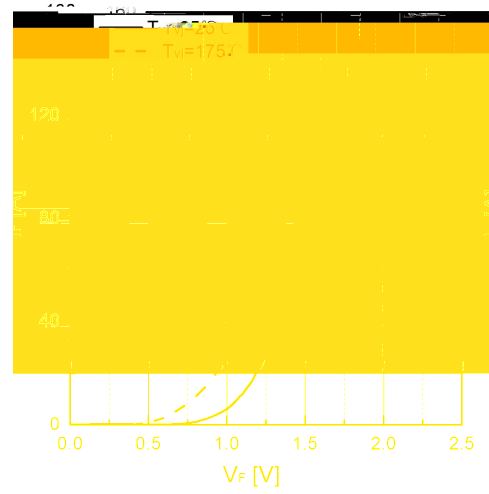


Fig 8. Typical  $I_F$  as a function of  $V_F$

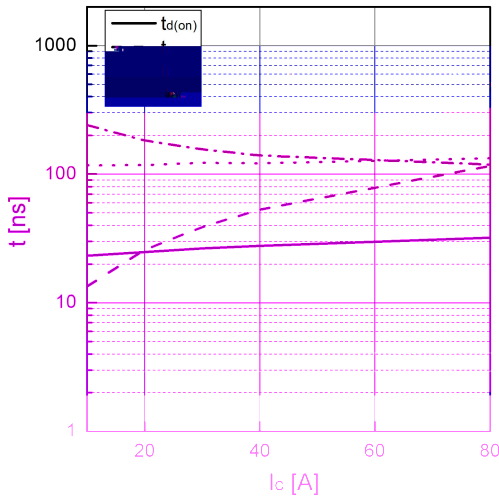


Fig 9. Typical switching time as a function of  $I_c$

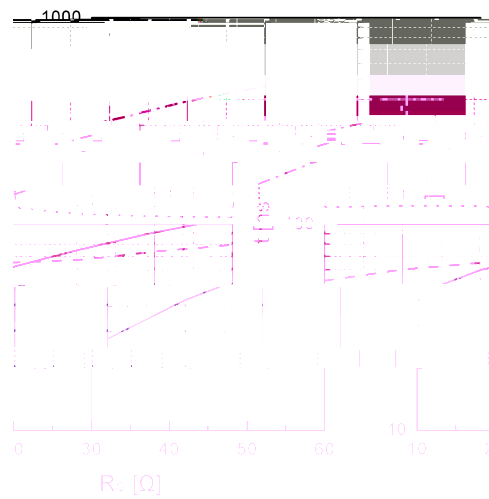


Fig 10. Typical switching times as a function of  $R_e$

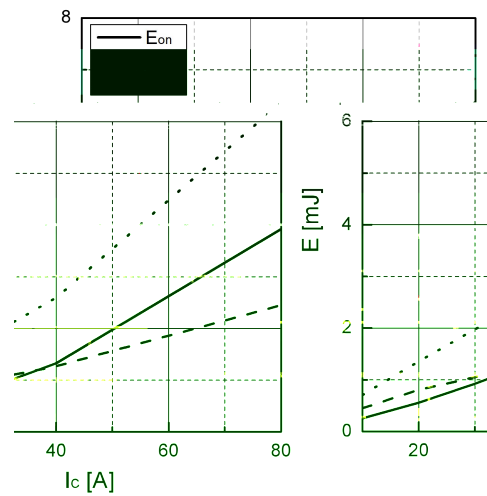


Fig 11. Typical switching energy losses as a function of  $I_c$

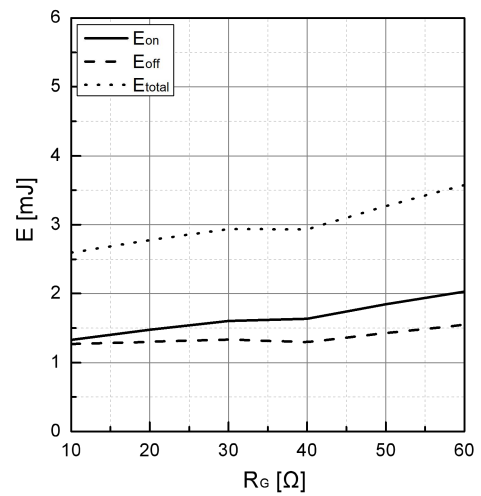
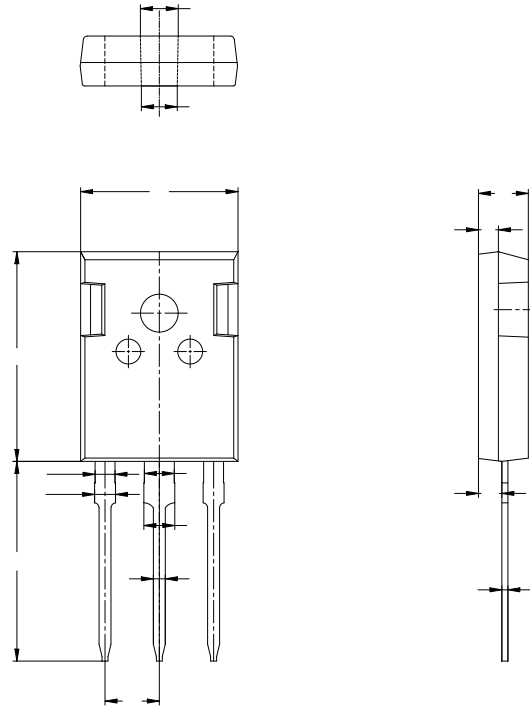


Fig 12. Typical switching energy losses as a function of  $R_e$



**Package dimension**

TO-247



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

## Revision histor

Date	Revision	Changes
2024-09-10	Rev 1.0	Release of the datasheet
2025-04-30	Rev 1.1	Add graph and character update

## Disclaimer

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