

**Key performance:**

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

**Features:**

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

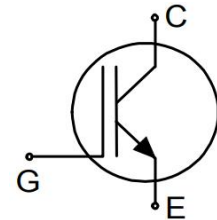
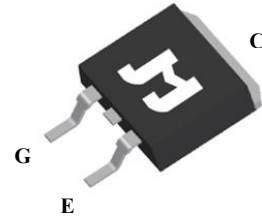
**Benefits:**

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

**Applications:**

- EV chargers

TO-263


**Package parameters**

Type	Marking	Package	Packaging Method
JJT40N65LCN	T4065LCN	TO-263	Tape&Reel

**Electrical characteristics of IGBT** ( $T_{vj}=25^{\circ}\text{C}$  unless otherwise specified)  
**Maximum ratings**

Symbol	Parameter	Values	Unit
$V_{CES}$	Collector-emitter voltage	650	V
$V_{GES}$	Gate-emitter voltage	$\pm 20$	V
$I_C$	Continuous collector current ( $T_C=25^{\circ}\text{C}$ )	80	A
	Continuous collector current ( $T_C=100^{\circ}\text{C}$ )	40	A
$I_{CM}$	Pulsed collector current, $t_p$ limited by $T_{vjmax}$	160	A
$I_F$	Diode continuous forward current ( $T_C=100^{\circ}\text{C}$ )	40	A
$I_{FM}$	Diode maximum current, $t_p$ limited by $T_{vjmax}$	160	A
$P_{tot}$	Power dissipation ( $T_C=25^{\circ}\text{C}$ )	300	W
	Power dissipation ( $T_C=100^{\circ}\text{C}$ )	150	W
$T_{vj}$	Operating junction temperature range	-40 to +175	$^{\circ}\text{C}$
$T_{stg}$	Storage temperature range	-55 to +150	$^{\circ}\text{C}$

**Thermal characteristics**

Symbol	Parameter	Values		Unit
		Typ.	Max.	
$R_{th(j-c)}$	Thermal resistance, junction to case for IGBT	-	0.5	K/ W
$R_{th(j-a)}$	Thermal resistance, junction to ambient	-	40	K/ W

**Static characteristics**

Symbol	Parameter	Test condition	Values			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	$\mu A$
$I_{GES}$	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	$V_{GE}=V_{CE}, I_C=1mA$	4.3	4.8	5.3	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_{GE}=15V, I_C=40A$	-	1.4	-	V
		$V_{GE}=15V, I_C=40A, T_{vj}=175^\circ C$	-	1.7	-	V

**Dynamic characteristics**

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
$C_{ies}$	Input capacitance	$V_{CE}=30V$ $V_{GE}=0V$ $f=1MHz$	-	2540	-	pF
$C_{oes}$	Output capacitance		-	143	-	pF
$C_{res}$	Reverse transfer capacitance		-	17	-	pF
$Q_g$	Total gate charge	$V_{CC}=520V$ $V_{GE}=15V$ $I_C=40A$	-	84	-	nC

**Switching characteristics**

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0/15V$ $I_C=40A$ $R_G=10\Omega$ Inductive load	-	27	-	ns
$t_r$	Rise time		-	53	-	ns
$t_{d(off)}$	Turn-off delay time		-	139	-	ns
$t_f$	Fall time		-	121	-	ns
$E_{on}$	Turn-on energy		-	1.3	-	mJ
$E_{off}$	Turn-off energy		-	1.3	-	mJ
$E_{ts}$	Total switching energy		-	2.6	-	mJ
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0/15V$ $I_C=40A$ $R_G=10\Omega$ Inductive load $T_{vj}=175^\circ C$	-	26	-	ns
$t_r$	Rise time		-	54	-	ns
$t_{d(off)}$	Turn-off delay time		-	165	-	ns
$t_f$	Fall time		-	227	-	ns
$E_{on}$	Turn-on energy		-	1.4	-	mJ
$E_{off}$	Turn-off energy		-	1.9	-	mJ
$E_{ts}$	Total switching energy		-	3.3	-	mJ

## Typical performance characteristics

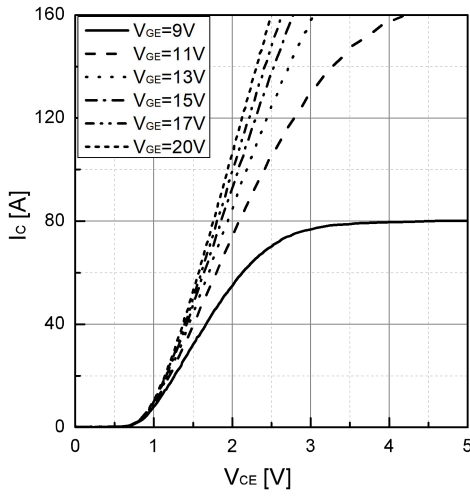


Fig 1. Typical output characteristic ( $T_{vj}=25^{\circ}\text{C}$ )

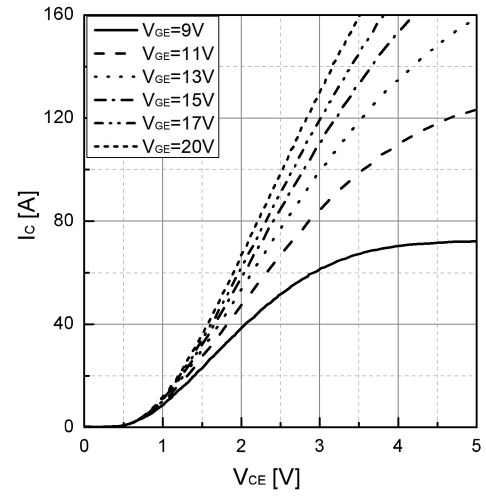


Fig 2. Typical output characteristic ( $T_{vj}=175^{\circ}\text{C}$ )

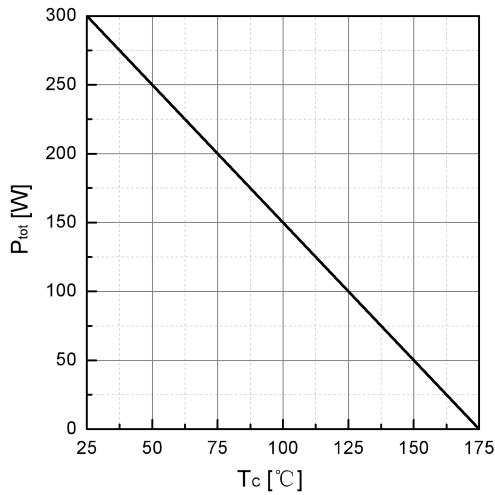


Fig 3. Power dissipation as a function of  $T_c$

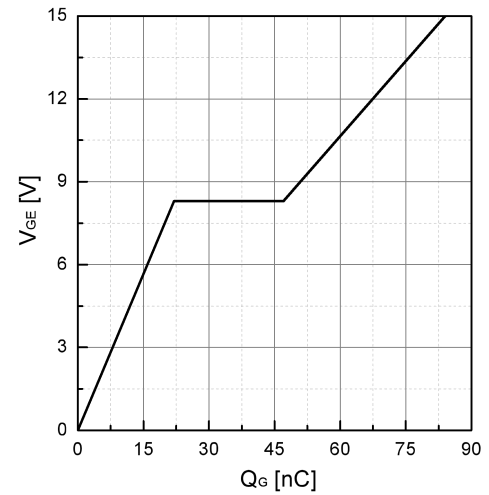


Fig 4. Typical Gate charge

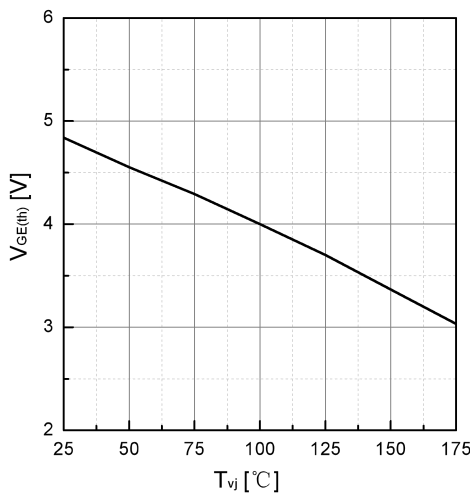


Fig 5. Typical  $V_{GE(th)}$  as a function of  $T_{vj}$   
( $I_c=1\text{mA}$ )

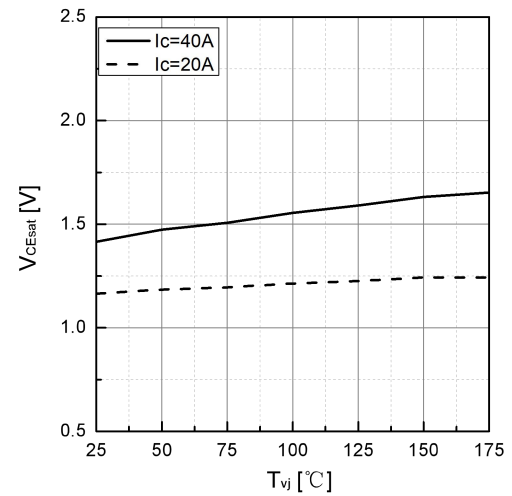


Fig 6. Typical  $V_{CEsat}$  as a function of  $T_{vj}$

## Typical performance characteristics

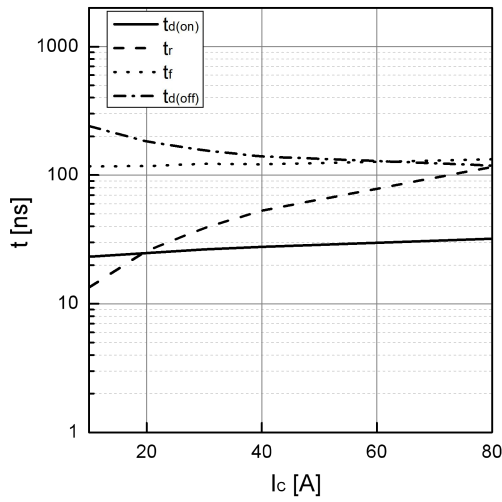


Fig 7. Typical switching time as a function of  $I_c$

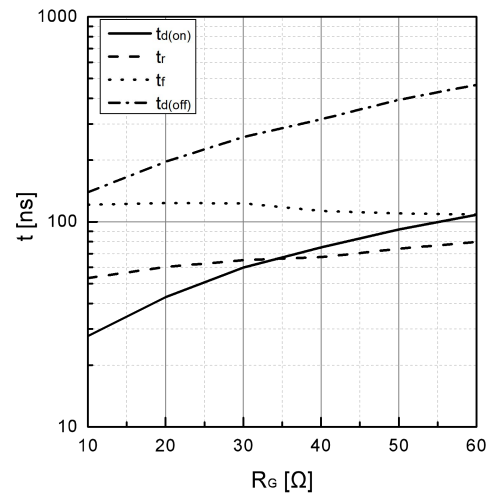


Fig 8. Typical switching times as a function of  $R_G$

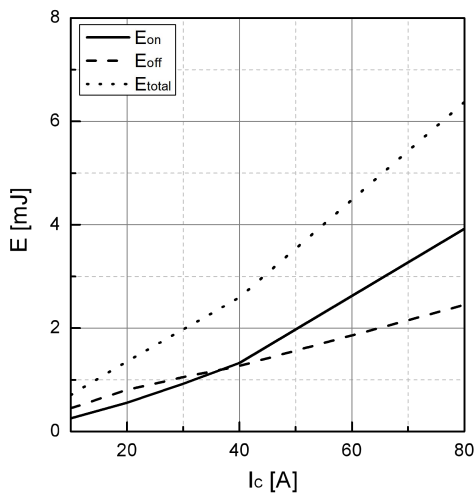


Fig 9. Typical switching energy losses as a function of  $I_c$

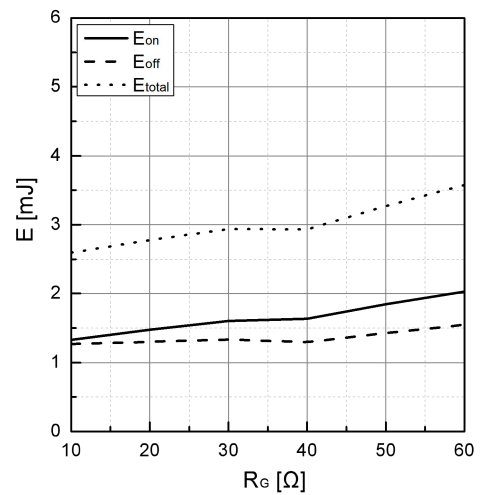


Fig 10. Typical switching energy losses as a function of  $R_G$

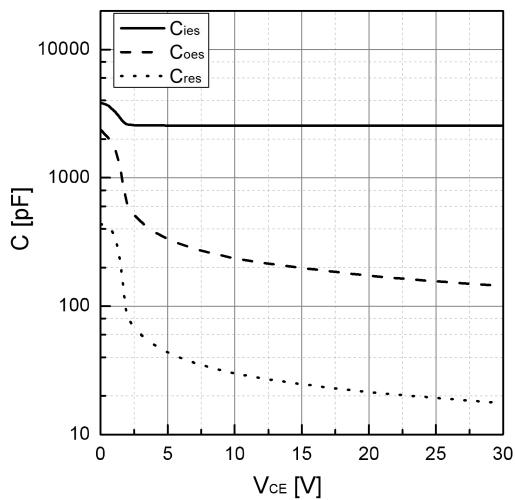
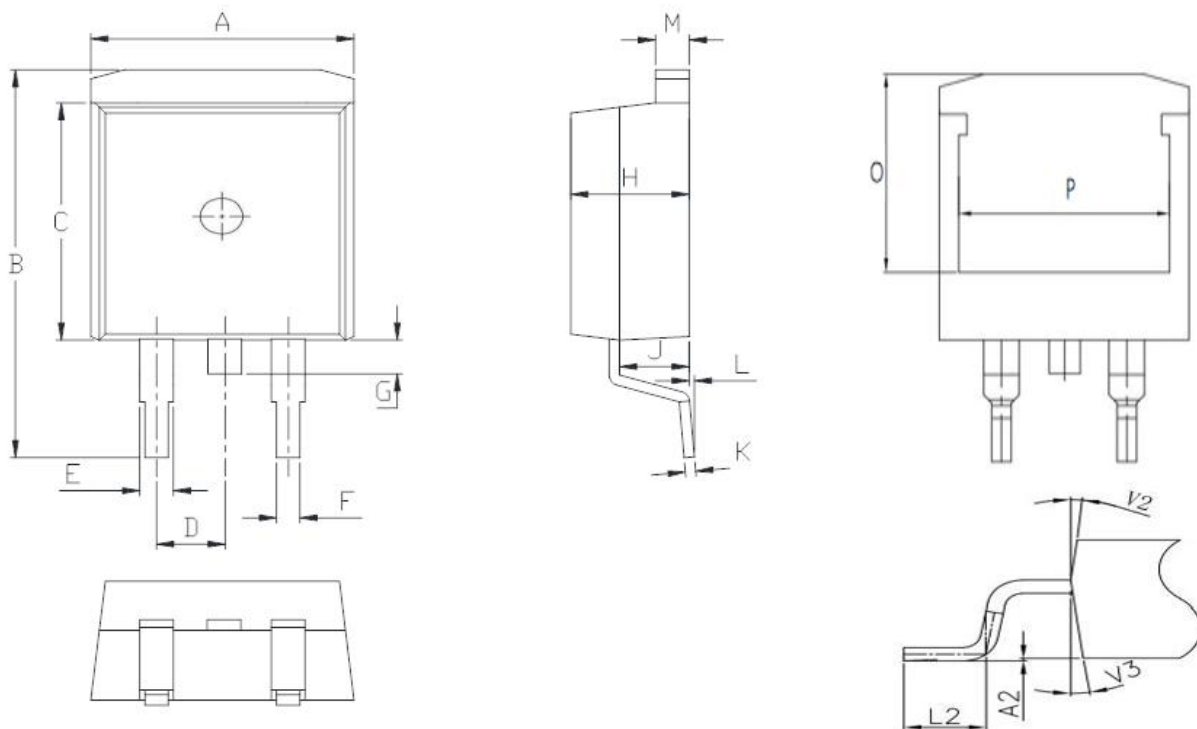


Fig 11. Typical capacitance as a function of  $V_{CE}$   
( $f=1\text{MHz}$ ,  $V_{GE}=0\text{V}$ )

**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	8.8	-	9.4	0.346	-	0.370
D	-	2.54	-	-	0.100	-
E	1.37	-	1.57	0.054	-	0.062
F	0.75	-	0.85	0.029	-	0.033
G	-	-	1.75	-	-	0.069
H	4.30	-	4.70	0.169	-	0.185
J	2.30	-	2.70	0.091	-	0.106
K	0.38	-	0.55	0.015	-	0.022
L	0	0.15	0.25	0	0.006	0.010
M	1.25	-	1.35	0.049	-	0.053
O	7.4	7.65	7.9	0.291	0.301	0.311
P	8.3	8.6	8.9	0.327	0.339	0.350
L2	2.20	2.35	2.50	0.087	0.093	0.098

## Revision history

Date	Revision	Changes
2026-03-30	Rev 1.0	Initial Release

## Disclaimer

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