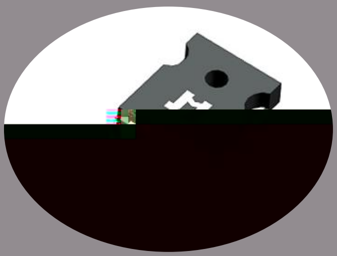
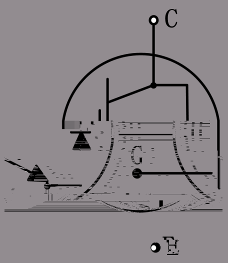
650V 50A Trench and Field Stop IGBT

JJT50N65SE

- $_{CE}$ =650V
- $_{C}$=50A@ $_{C}$=100
- $_{CE(sat)}$=1.65V

TO-247





- Trench and field-stop technology
- 10μs short circuit capability
- Easy parallel switching capability

- High efficiency for motor control
- High ruggedness performance
- RoHS compliant

- Motor drives
- Fan, Pumps, Vacuum cleaner

Type	Marking	Package	Packaging Method
JJT50N65SE	T5065SE	TO-247	Tube

$_{CES}$	Collector-emitter voltage	650	V
$_{GES}$	Gate-emitter voltage	±20	V
$_{C}$	Continuous collector current ($_{C}$=25)	100	A
	Continuous collector current ($_{C}$=100)	50	A
$_{CM}$	Pulsed collector current, $_{p}$ limited by $_{vjmax}$	200	A
$_{F}$	Diode continuous forward current ($_{C}$=100)	50	A
$_{FM}$	Diode maximum current, $_{p}$ limited by $_{vjmax}$	200	A
$_{sc}$	Short circuit withstand time	10	µs
$_{tot}$	Power dissipation ($_{C}$=25)	500	W
	Power dissipation ($_{C}$=100)	250	W
$_{vj}$	Operating junction temperature range	-40 to +175	
$_{stg}$	Storage temperature range	-55 to +150	

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($_{vj}$=25 unless otherwise specified)

Static characteristics

$_{CES}$	Collector-emitter breakdown voltage	$_{GE}$=0V, I_C=250μA	650	-	-	V
$_{CES}$	Collector-emitter leakage current	$_{CE}$=650V, $_{GE}$=0V	-	-	50	μA
$_{GES}$	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	$_{GE}$= $_{CE}$, $_{C}$=1mA	5.3	5.7	6.1	V
$_{CE(sat)}$	Collector-emitter saturation voltage	$_{GE}$=15 V, $_{C}$=50A	-	1.65	-	V
		$_{GE}$=15V, $_{C}$=50A, $_{vj}$=175	-	2.10	-	V

Dynamic characteristics

$_{ies}$	Input capacitance	$_{CE}$=30V $_{GE}$=0V =1MHz	-	2890	-	pF
$_{oes}$	Output capacitance		-	170	-	pF
$_{res}$	Reverse transfer capacitance		-	34	-	pF
$_{g}$	Total gate charge	$_{CC}$=520V $_{GE}$=15V $_{C}$=50A	-	185	-	nC

($_{vj}$=25 unless otherwise specified)

$_F$	Diode forward voltage	$_F$=50A	-	1.60	-	V
		$_F$=50A, $_{vj}$=175	-	1.35	-	V
$_{rr}$	Diode reverse recovery time	$_R$=400V $_F$=50A d $_F$/d =-400A/μs	-	106	-	ns
$_{rrm}$	Diode peak reverse recovery current		-	8	-	A
$_{rr}$	Diode reverse recovery charge		-	500	-	nC
$_{rr}$	Diode reverse recovery time	$_R$=400V $_F$=50A d $_F$/d =-400A/μs $_{vj}$=175	-	161	-	ns
$_{rrm}$	Diode peak reverse recovery current		-	20	-	A
$_{rr}$	Diode reverse recovery charge		-	1853	-	nC

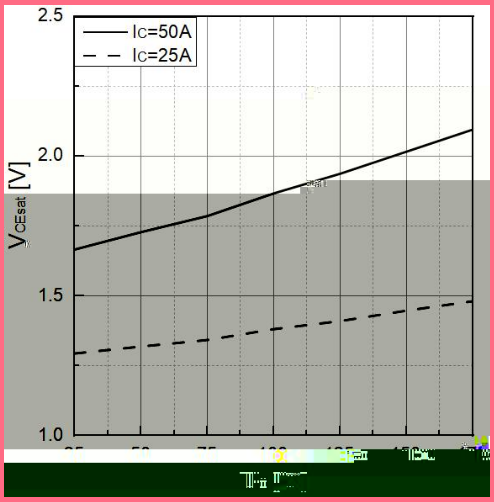
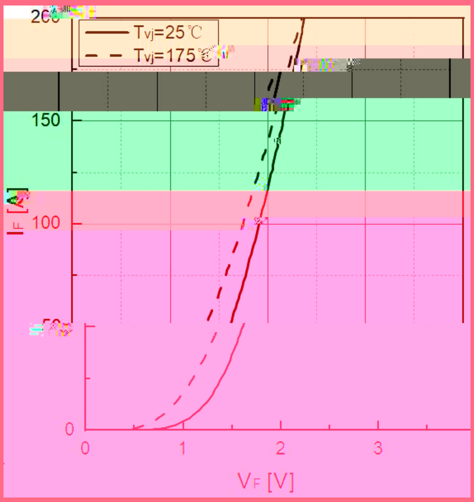

2.5
2.0
1.5
1.0
IC=50A
IC=25A
VCEsat [V]
50
75

Fig 7. Typ l


Tvj=25℃
Tvj=175℃
150
100
0
IF [A]
0
1
2
3
VF [V]

Date	Revision	Changes
2025-04-21	Rev 1.0	Release of the preliminary datasheet.
2025-12-10	Rev 1.1	