JJMICROELECTRONICS

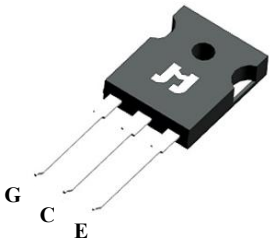
1350V 25A Trench and Field Stop IGBT

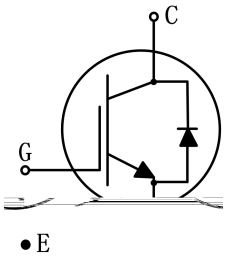
JJT25N135UE

Key performance:

- $_{CE}$ =1350V
- $_{C}$=25A@ $_{C}$=100
- $_{CE(sat)}$=1.65V

TO-247





Features:

- Trench and field-stop technology
- High speed switching
- Positive VCE (sat) temperature coefficient.
- Fast switching and short tail current.
- High ruggedness performance

Applications:

- Induction cooking
- Resonant converters

Package parameters

Type	Marking	Package	Packaging Method
JJT25N135UE	T25135UE	TO-247	Tube

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Maximum ratings

Symbol	Parameter	Values	Unit
CES	Collector-emitter voltage	1350	V
GES	Gate-emitter voltage	±20	V
C	Continuous collector current (C=25)	50	A
	Continuous collector current (C=100)	25	A
CM	Pulsed collector current, p limited by vjmax	100	A
F	Diode continuous forward current (C=100)	25	A
FM	Diode maximum current, p limited by vjmax	100	A
tot	Power dissipation (C=25)	283	W
	Power dissipation (C=100)	142	W
vj	Operating junction temperature range	-40 to +175	
stg	Storage temperature range	-55 to +150	

Thermal characteristics

Symbol	Parameter	Values		Unit
		Typ.	Max.	
th(j-c)	Thermal resistance, junction to case for IGBT	0.53	-	K/ W
th(j-c)	Thermal resistance, junction to case for Diode	1.40	-	K/ W
th(j-a)	Thermal resistance, junction to ambient	32	-	K/ W

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Electrical characteristics of IGBT (vj=25 unless otherwise specified)

Static characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
CES	Collector-emitter breakdown voltage	GE=0V, I_C=1mA	1480	-	-	V
CES	Collector-emitter leakage current	CE=1350V, GE=0V	-	-	100	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=1mA	5.0	5.4	6.0	V
CE(sat)	Collector-emitter saturation voltage	GE=15 V, C=25A	-	1.65	-	V
		GE=15V, C=25A, vj=175	-	2.05	-	V

Dynamic characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
ies	Input capacitance	CE=30V GE=0V =1MHz	-	4530	-	pF
oes	Output capacitance		-	47	-	pF
res	Reverse transfer capacitance		-	20	-	pF
g	Total gate charge	CC=1080V =15V =25A	-	147	-	nC

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Switching characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
d(on)	Turn-on delay time	CC=600V GE=0/15V C=25A G=10Ω Inductive load	-	37	-	ns
r	Rise time		-	29	-	ns
d(off)	Turn-off delay time		-	192	-	ns
f	Fall time		-	183	-	ns
on	Turn-on energy		-	1.2	-	mJ
off	Turn-off energy		-	1.1	-	mJ
ts	Total switching energy		-	2.3	-	mJ
d(on)	Turn-on delay time	CC=600V GE=0/15V C=25A G=10Ω, vj=175 Inductive load	-	34	-	ns
r	Rise time		-	28	-	ns
d(off)	Turn-off delay time		-	203	-	ns
f	Fall time		-	231	-	ns
on	Turn-on energy		-	1.3	-	mJ
off	Turn-off energy		-	1.6	-	mJ
ts	Total switching energy		-	2.9	-	mJ

Electrical characteristics of Diode (vj=25 unless otherwise specified)

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
F	Diode forward voltage	F=25A	-	1.75	-	V
		F=25A, vj=175	-	1.70	-	V

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Typical performance characteristics

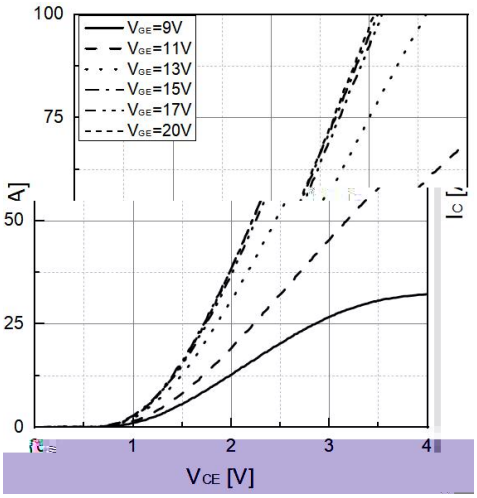

Fig 1. Typical output characteristic (vj=25)

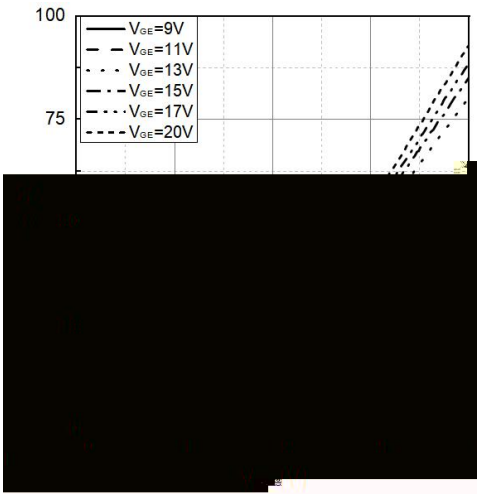

Fig 2. Typical output characteristic(vj=175)

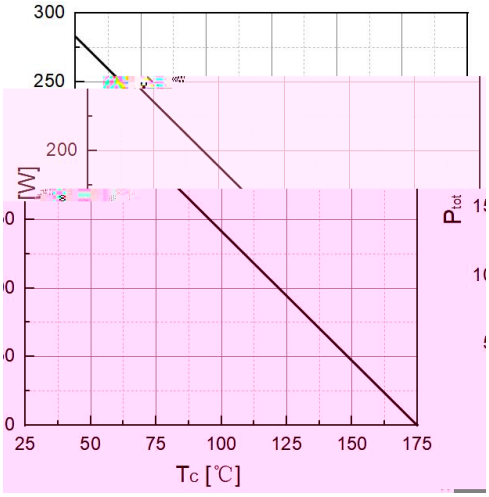

Fig 3. Power dissipation as a function of

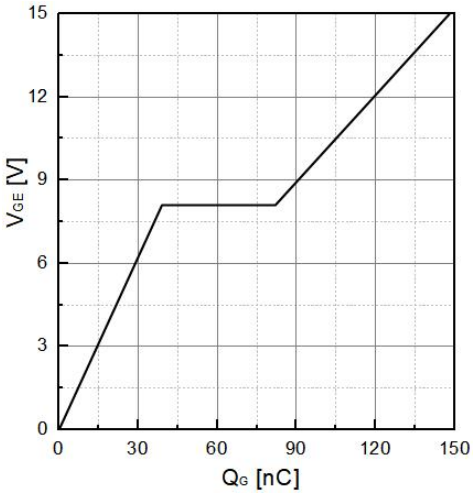

Fig 4. Typical Gate charge

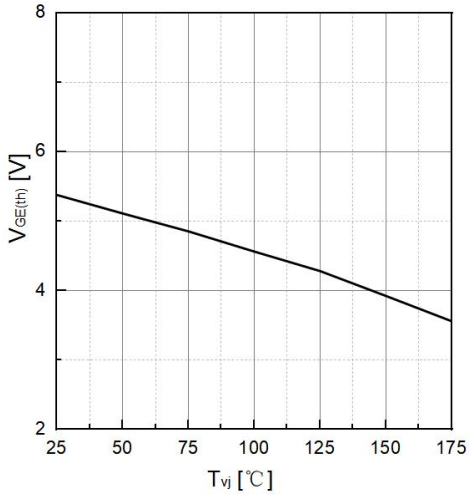

Fig 5. Typical GE(th) as a function of vj (C=1mA)

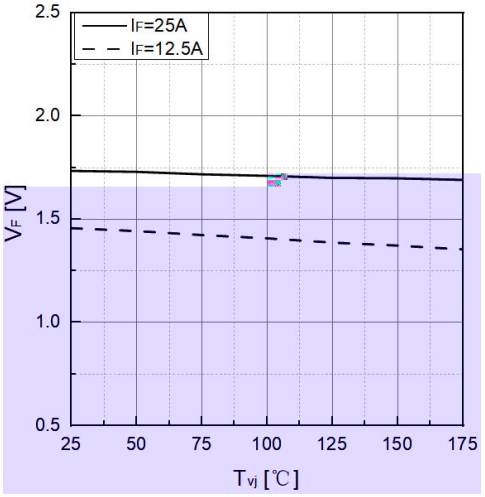

Fig 6. Typical F as a function of vj

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Typical performance characteristicVi . . . . . p

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Typical performance characteristics

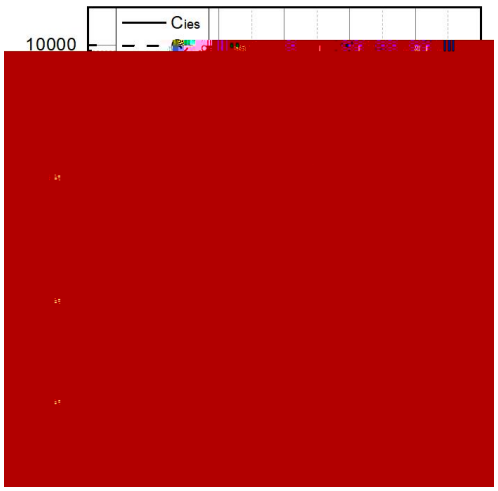

Fig 13. Typical capacitance as a function of $_{CE}$
(f=1Mhz, $_{GE}$=0V)

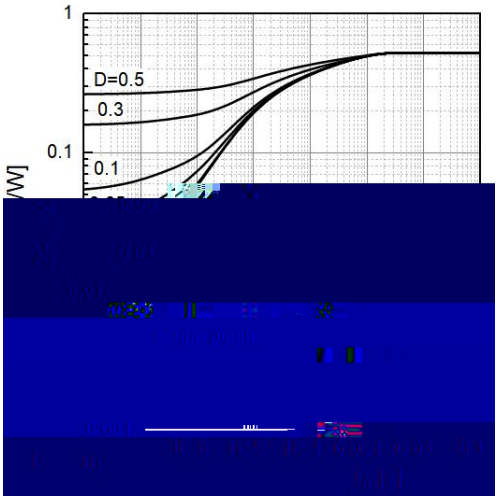

Fig 14. Transient thermal impedance of IGBT

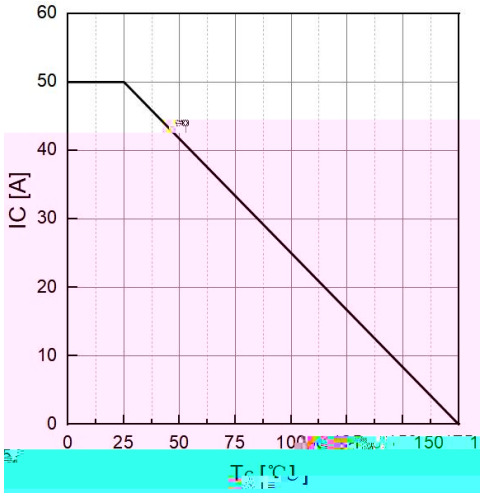

Fig 15. Continuous collector current as a function of Tc
Tvj 175

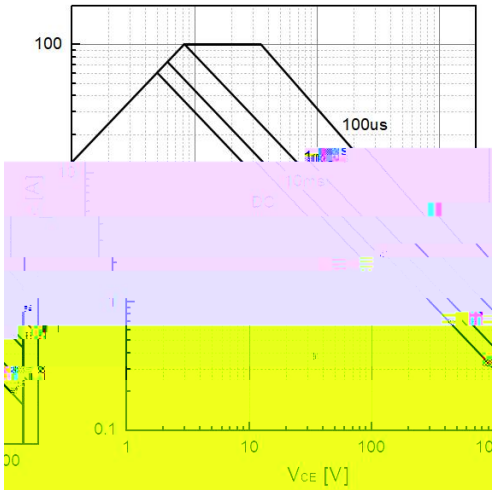

Fig.16 Forward bias safe operating area

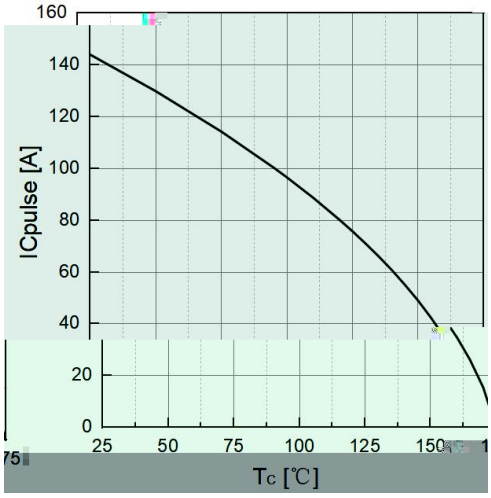

Fig 17. Pulsed collector current as a function of Tc
(Tvj 175 D=1 tp=1ms)

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Package dimension

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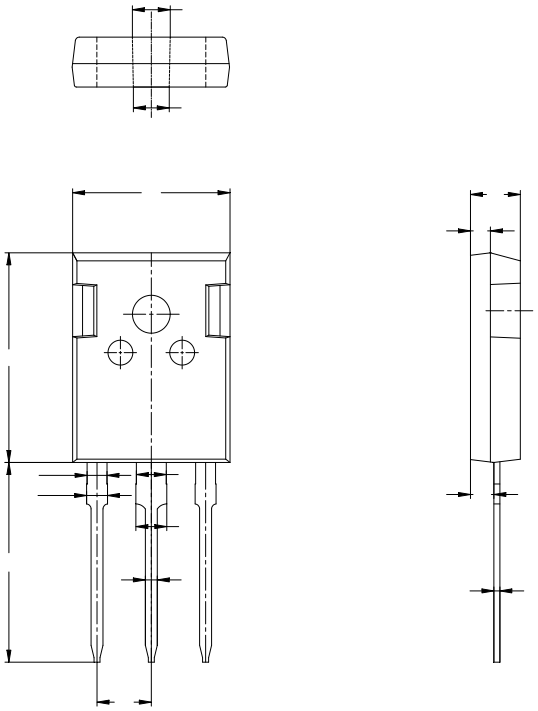

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.50	15.80	16.10	0.610	0.622	0.634
B	20.80	21.00	21.20	0.819	0.827	0.835
C	19.70	20.00	20.30	0.776	0.787	0.799
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.90	2.10	2.30	0.075	0.083	0.091
F	1.00	1.20	1.40	0.039	0.047	0.055
G	5.25	-	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

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