JJMICROELECTRONICS

750V 120A Trench and Field Stop IGBT

JJT120N75SA

Key performance:

- V_{CE}=750V
- I_C=120A@T_C=100℃
- $V_{CE(sat)}$=1.4V

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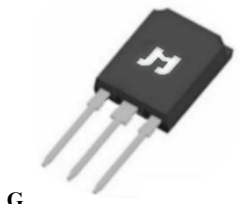

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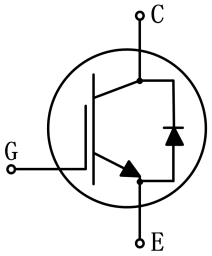

Features:

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

Benefits:

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

Applications:

- PFC applications
- Uninterruptible power supplies
- Solar inverters

Package parameters

Type	Marking	Package	Packaging Method
JJT120N75SA	T12075SA	TO-247PLUS	Tube

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Maximum ratings

Symbol	Parameter	Values	Unit
V_{CES}	Collector-emitter voltage	750	V
V_{GES}	Gate-emitter voltage	±20	V
I_C	Continuous collector current (T_C=25℃)	150	A
	Continuous collector current (T_C=100℃)	120	A
I_{CM}	Pulsed collector current, t_p limited by T_{vjmax}	300	A
I_F	Diode continuous forward current (T_C=25℃)	120	A
I_{FM}	Diode maximum current, t_p limited by T_{vjmax}	500	A
t_{sc}	Short circuit withstand time	10	μs
P_{tot}	Power dissipation (T_C=25℃)	394	W
	Power dissipation (T_C=100℃)	197	W
T_{vj}	Operating junction temperature range	-40 to +175	℃
T_{stg}	Storage temperature range	-55 to +150	℃

Thermal characteristics

Symbol	Parameter	Values		Unit
		Typ.	Max.	
$R_{th(j-c)}$	Thermal resistance, junction to case for IGBT	-	0.135	K/ W
$R_{th(j-c)}$	Thermal resistance, junction to case for Diode	-	0.15	K/ W
$R_{th(j-a)}$	Thermal resistance, junction to ambient	-	40	K/ W

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Electrical characteristics of IGBT (T_{vj}=25℃ unless otherwise specified)

Static characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
BV_{CES}	Collector-emitter breakdown voltage	V_{GE}=0V, I_C=250μA	750	-	-	V
I_{CES}	Collector-emitter leakage current	V_{CE}=750V, V_{GE}=0V	-	-	50	μA
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	4.5	5.0	5.5	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	V_{GE}=15V, I_C=120A	-	1.4	-	V
		V_{GE}=15V, I_C=120A, T_{vj}=175℃	-	1.7	-	V

Dynamic characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
C_{ies}	Input capacitance	V_{CE}=25V V_{GE}=0V f=1MHz	-	11245	-	pF
C_{oes}	Output capacitance		-	390	-	pF
C_{res}	Reverse transfer capacitance		-	88	-	pF
Q_g	Total gate charge	V_{CC}=600V V_{GE}=15V I_C=120A	-	382	-	nC

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Switching characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
$t_{d(on)}$	Turn-on delay time	V_{CC}=470V V_{GE}=0/15V I_C=120A R_G=4.7Ω Inductive load	-	48	-	ns
t_r	Rise time		-	141	-	ns
$t_{d(off)}$	Turn-off delay time		-	265	-	ns
t_f	Fall time		-	130	-	ns
E_{on}	Turn-on energy		-	7.9	-	mJ
E_{off}	Turn-off energy		-	6.5	-	mJ
E_{ts}	Total switching energy		-	14.5	-	mJ

Electrical characteristics of Diode (T_{vj}=25℃ unless otherwise specified)

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
V_F	Diode forward voltage	I_F=120A	-	1.8	-	V
		I_F=60A,T_{vj}=175℃	-	1.76	-	V
t_{rr}	Diode reverse recovery time	V_R=400V I_F=60A di_F/dt=-450A/μs	-	158	-	ns
I_{rrm}	Diode peak reverse recovery current		-	38	-	A
Q_{rr}	Diode reverse recovery charge		-	3.9	-	nC

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Package dimension

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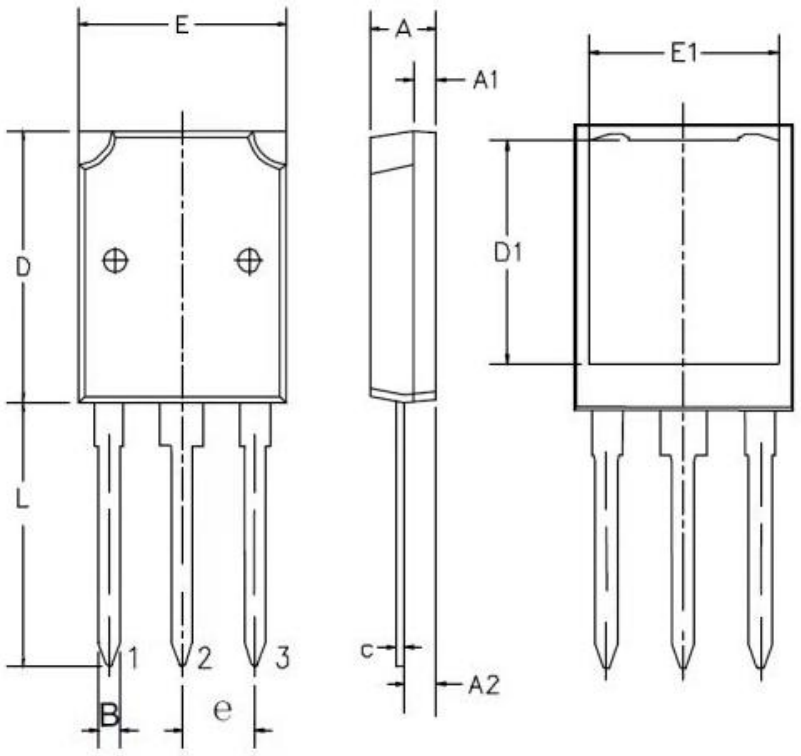

Ref.	Min.(mm)	Typ.(mm)	Max.(mm)
A	4.92	5.00	5.08
A1	2.27	2.35	2.43
A2	1.92	2.00	2.08
B	1.16	1.20	1.24
C	0.58	0.60	0.62
D	20.80	20.90	21.00
E	15.80	15.90	16.00
E1	13.94	14.02	14.10
e	5.34	5.44	5.54
L	19.80	20.00	20.20

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Revision history

Date	Revision	Changes
2025-01-10	Rev 1.0	Release of the preliminary datasheet.
2025-02-21	Rev 1.1	Replace sketch

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