

BKE120N075HS1

1200V 75A Trench FS IGBT

Description

The BKE120N075HS1 is a Trench FS IGBT utilizing bestirpower's advanced technology, which achieves an exceptionally low gate charge. It achieves significantly higher efficiency through optimized gate charge management, while its user-friendly design offers designers advantages such as low EMI and reduced switching losses.

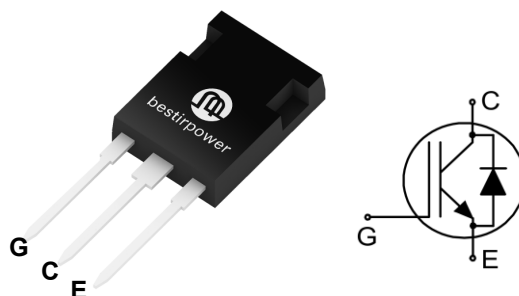
V _{CE}	I _C (T _C = 100°C)	T _{rr}	Q _{g,typ}
1200 V	75 A	90 ns	170 nC

Applications

- Uninterrupted Power Supply
- Solar Inverters
- Energy Storage System

Features

- Maximum junction temperature T_{vjmax} = 175°C
- Low saturation voltage V_{CEsat} = 2.20 V at T_{vj} = 25°C
- V_{CEsat} is a positive temperature coefficient, suitable for parallel applications



Absolute Maximum Ratings

Symbol	Parameter		Value max	Unit	Note
V _{CE}	Collector-emitter voltage (T _{vj} ≥ 25 °C)		1200	V	
V _{GE}	Gate-emitter voltage		±20	V	
I _C	DC collector current, limited by T _{vjmax}	T _C = 25°C	150	A	
		T _C = 100°C	75	A	
I _{Cpulse}	Pulsed collector current, t _p limited by T _{vjmax}		300	A	
I _F	Diode forward current, limited by T _{vjmax}	T _C = 25°C	150	A	
		T _C = 100°C	75		
I _{Fpulse}	Diode pulsed current, t _p limited by T _{vjmax}		300	A	
P _{tot}	Power Dissipation	T _C = 25°C	833	W	
		T _C = 100°C	417		
T _J	Junction temperature range		-40 ~ 175	°C	
T _{STG}	Storage temperature range		-40 ~ 175	°C	

Thermal Resistance

Symbol	Parameter	Value	Unit
R _{thJC}	IGBT thermal resistance, junction-case	0.18	°C/W
R _{thJC}	Diode thermal resistance, junction-case	0.30	
T _{sold}	Soldering temperature, wave soldering only allowed at leads	260	°C

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Electrical Characteristics (T_J= 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit	Note	
Statistic Characteristics								
V _{(BR)CES}	Collector-emitter Breakdown Voltage	V _{GE} =0V, I _C =2mA	1200	-	-	V		
I _{CES}	Collector Cut-off Current	V _{CE} =1200V, V _{GS} =0V	-	6.24	40	μA		
I _{GES}	Gate-emitter Leakage Current	V _{GE} =±20V, V _{GE} =0V	-	±50	±100	nA		
V _{GE(TH)}	Gate Threshold Voltage	V _{CE} =V _{GE} , I _C =2mA	5.0	5.8	6.5	V	Fig.3	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} =15V	T _J =25°C	-	2.20	2.40	V	Fig.1
		I _C =75A	T _J =150°C	-	2.85	-		Fig.2
V _F	Forward On-Voltage	I _F =75A,V _{GE} =0V	-	2.68	-	V	Fig.4	

Dynamic Characteristics

C _{IES}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=100KHz	-	5774	-	pF	Fig.6
C _{OES}	Output Capacitance		-	313.8	-		
C _{RES}	Reverse Transfer Capacitance		-	36.72	-		

Switching Parameters

t _{d(on)}	Turn-on Delay Time	V _{CE} =600V, I _{DC} =75A R _G =4.7Ω, V _{GE} =0/+15V	T _J =25°C	-	93	-	ns	
			T _J =125°C	-	102	-	ns	
			T _J =175°C	-	100	-	ns	
t _r	Rise Time		T _J =25°C	-	48	-	ns	
			T _J =125°C	-	50	-	ns	
			T _J =175°C	-	51	-	ns	
t _{d(off)}	Turn-off Delay Time		T _J =25°C	-	109	-	ns	
			T _J =125°C	-	111	-	ns	
			T _J =175°C	-	115	-	ns	
t _f	Fall Time		T _J =25°C	-	158	-	ns	
			T _J =125°C	-	196	-	ns	
			T _J =175°C	-	219	-	ns	
E _{on}	Turn-on Switching Energy		T _J =25°C	-	2.4	-	mJ	
			T _J =125°C	-	2.9	-	mJ	
			T _J =175°C	-	3.5	-	mJ	
E _{off}	Turn-off Switching Energy		T _J =25°C	-	2.8	-	mJ	
			T _J =125°C	-	3.7	-	mJ	
			T _J =175°C	-	4.2	-	mJ	

T_{rr}	Diode Reverse Recovery Time	$V_R=600\text{ V}$, $R_G=4.7\Omega$, $I_F=75\text{ A}$, $di/dt=400\text{ A}/\mu\text{s}$	-	90	-	ns	
Q_{rr}	Diode Reverse Recovery Charge		-	3.087	-	μC	
I_{rrm}	Diode Peak Reverse Recovery Current		-	49.3	-	A	
E_{rec}	Reverse Recovery Energy	$V_R=600\text{ V}$, $R_G=4.7\Omega$, $I_F=75\text{ A}$,	-	1.21	-	mJ	
t_{sc}	Short-circuit Withstand Time	$T_{vj}=150^\circ\text{C}$, $V_{CC}=600\text{ V}$, $V_{GE}=15\text{ V}$	-	10	-	ns	

Gate Charge Characteristics

Q_g	Gate Charge Total	$V_{CC}=960\text{ V}$, $I_C=75\text{ A}$ $V_{GE}=0\text{ to }15\text{ V}$	-	170	-	nC	
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Typical Performance Characteristics

Fig.1 Typical Saturation Voltage Characteristics

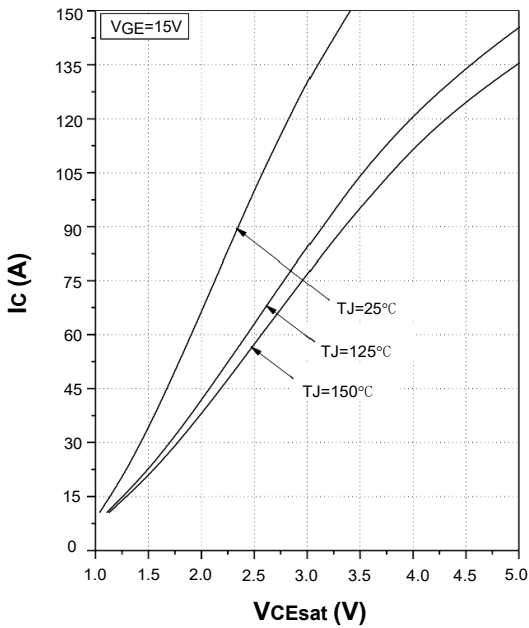


Fig.2 Typical Output Characteristics

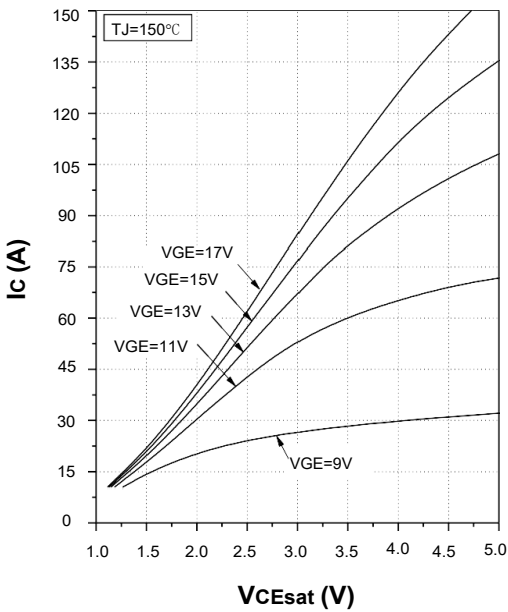


Fig.3 Transfer Characteristic

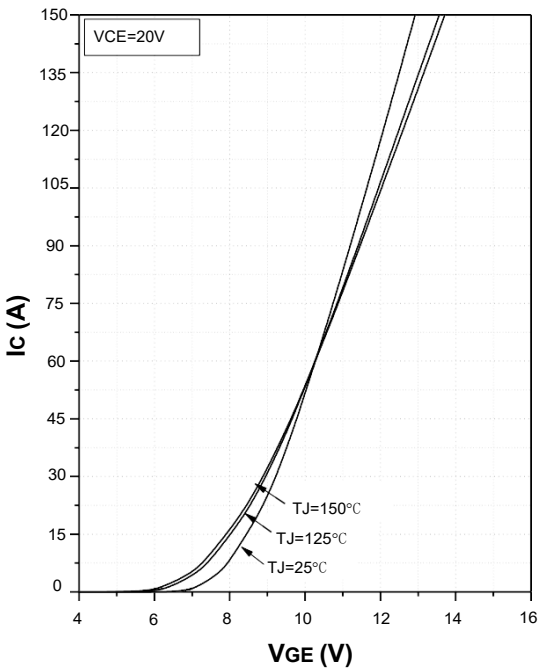
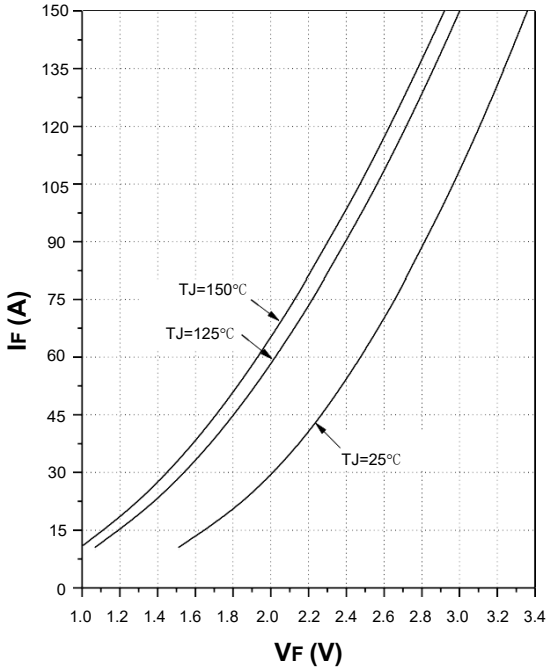
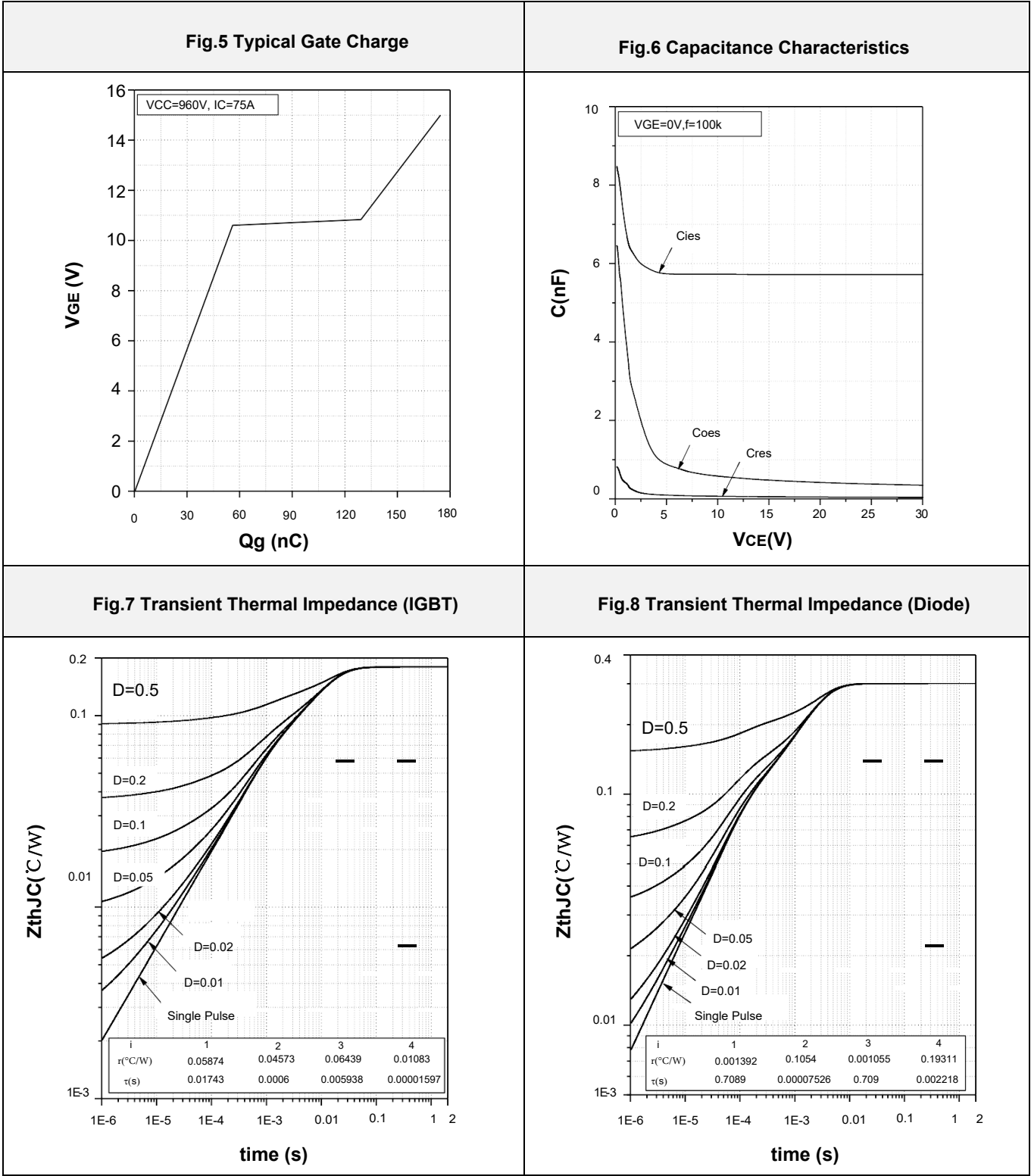


Fig.4 Forward Characteristics of Diode

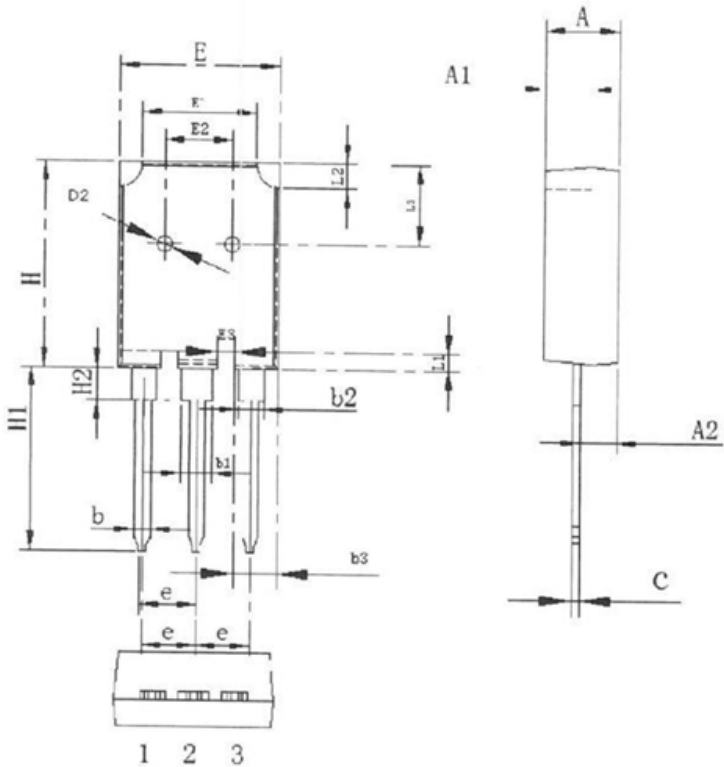


Typical Performance Characteristics



Package Outlines

TO247PLUS-3



Symbol	单位 mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.80	3.0	3.20
A2	1.80	2.0	2.20
b	1.00	1.20	1.40
b1	2.90	3.10	3.30
b2	1.90	2.10	2.30
b3	3.90	4.10	4.30
c	0.45	0.60	0.75
e	5.25	5.45	5.65
E	15.6	15.8	16.0
E1	10.2	10.6	11.0
E2	6.30	6.06	6.90
E3	1.60	1.80	2.00
L1	0.35	0.50	0.65
L2	1.80	2.00	2.20
L3	9.50	10.0	10.5
H	20.5	21.0	21.5
H1	19.5	20.0	20.5
H2	3.50	4.00	4.50

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BKE120N075HS1	BKE120N075HS1	TO247PLUS-3L	Tube	30 units

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