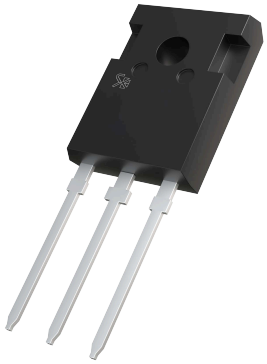
SKIF75N65U-T7

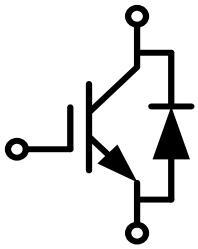
Type	V_{CE}	I_C	V_{CEsat}, T_{vj}=25°C	T_{vjmax}	Package
SKIF75N65U-T7	650V	75A	1.56V	150°C	TO-247

IGBT Discrete with Anti-Parallel Diode

Features

- 650V trench gate/field termination process
- Low switching loss
- Vcesat has a positive temperature coefficient.





V_{CES} =650V，$I_{C\ nom}$ =75A / I_{CRM} =300A

Applications

- Charging pile
- Uninterruptible power supplies
- Solar converters

Ordering Information

Part Number	Package
SKIF75N65U-T7	TO-247

IGBT

Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Collector-Emitter voltage	T_{vj}=25°C	V_{CES}	650	V
Continuous DC collector current	T_C=100°C, $T_{vj\ max}$=175°C	$I_{C\ nom}$	75	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	300	A
Total power dissipation	T_C = 25°C T_C = 100°C	P_{tot}	520 260	W
Gate emitter voltage	 tp≤10μs,D<0.010	V_{GE}	±20 ±30	V

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Collector-Emitter saturation voltage	V_{GE}=15V, I_C=75A V_{GE}=15V, I_C=75A V_{GE}=15V, I_C=75A	T_{vj}=25°C T_{vj}=150° C T_{vj}=175°C	V_{CEsat}		1.56 1.86 1.90	2.00	V
Gate-Emitter threshold voltage	I_C=0.75mA, V_{GE}= V_{CE}	T_{vj}=25°C	$V_{GE(th)}$	3.8	4.4	5.0	
Transconductance	V_{CE}=20V，I_C=75A		G_{fs}		58		S
Input capacitance	f=100kHz, V_{CE}=25 V, V_{GE}=0 V	T_{vj}=25°C	C_{ies}		4472		pF
Output capacitance			C_{oes}		171		
Reverse transfer capacitance			C_{res}		20		
Collector-emitter cut-off current	V_{CE}=650V , V_{GE}= 0 V	T_{vj}=25°C	I_{CES}			1	mA
Gate-emitter leakage current	V_{CE}=0 V, V_{GE}= 20 V	T_{vj}=25°C	I_{GES}			200	nA
Turn-on delay time	I_C=75A,V_{CE}=300V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25°C T_{vj}=175°C	$t_{d\ on}$		25 27		ns
Rise time	I_C=75A,V_{CE}=300V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25°C T_{vj}=175°C	t_r		130 122		
Turn-off delay time	I_C=75A,V_{CE}=300V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25°C T_{vj}=175°C	$t_{d\ off}$		82 112		
Fall time	I_C=75A,V_{CE}=300V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25°C T_{vj}=175°C	t_f		57 87		
Turn-on energy loss per pulse	I_C=75A,V_{CE}=300V,V_{GE}=±15V,R_G=8Ω di/dt=500A/us(Tvj=175°C) (inductive load)	T_{vj}=25°C T_{vj}=175°C	E_{on}		2.68 3.24		mJ
Turn-off energy loss per pulse	I_C=75A,V_{CE}=300V,V_{GE}=±15V,R_G=8Ω di/dt=7800V/us(Tvj=175°C) (inductive load)	T_{vj}=25°C T_{vj}=175°C	E_{off}		1.03 1.51		
IGBT thermal resistance, junction			R_{thJC}		0.29		K/W
Temperature under switching conditions			$T_{vj\ op}$	-40		175	°C
Gate charge	IC=75A,VGE=15V,VCE=520V		Q_G		273		nC

Diode

Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Repetitive peak reverse voltage	T_{vj}=25°C	V_{RRM}	650	V
Continuous DC forward current	T_C=100°C, $T_{vj\ max}$=175°C	I_F	75	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	300	A

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F=75A,V_{GE}=0V I_F=75A,V_{GE}=0V I_F=75A, V_{GE}=0V	T_{vj}=25°C T_{vj}=150°C T_{vj}=175°C	V_F		1.55 1.69 1.70	2.0	V
Peak reverse recovery current	I_F=75A, -di$_F$/dt=500A/µs(T_{vj}=175°C) V_R=300V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=175°C	I_{RM}		16 26		A
Reverse Recovered charge	I_F=75A, -di$_F$/dt=500A/µs(T_{vj}=175°C) V_R=300V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=175°C	Q_{rr}		1.28 3.18		µC
Reverse Recovery Time	I_F=75A, -di$_F$/dt=500A/µs(T_{vj}=175°C) V_R=300V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=175°C	t_{rr}		156 226		ns
Reverse recovered energy	I_F=75A, -di$_F$/dt=500A/µs(T_{vj}=175°C) V_R=300V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=175°C	E_{rec}		0.19 0.54		mJ
Diode thermal resistance junction			R_{thJC}		0.35		K/W
Temperature under switching conditions			$T_{vj\ op}$	-40		175	°C

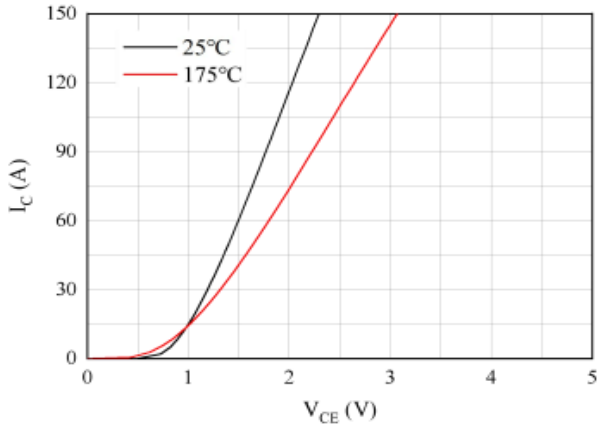


Figure 1. Typical output characteristics (V_{GE}=15V)

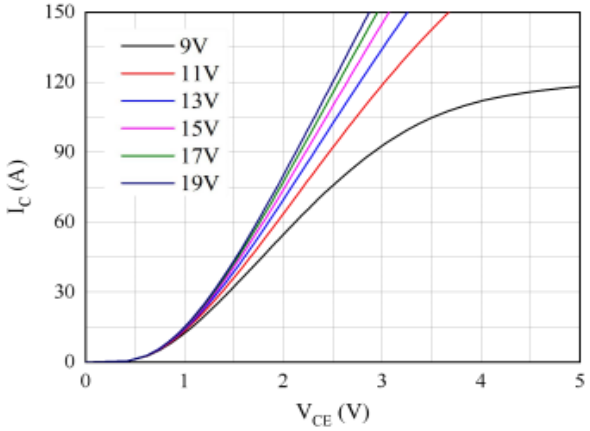


Figure 2. Typical output characteristics (T_{vj}=175℃)

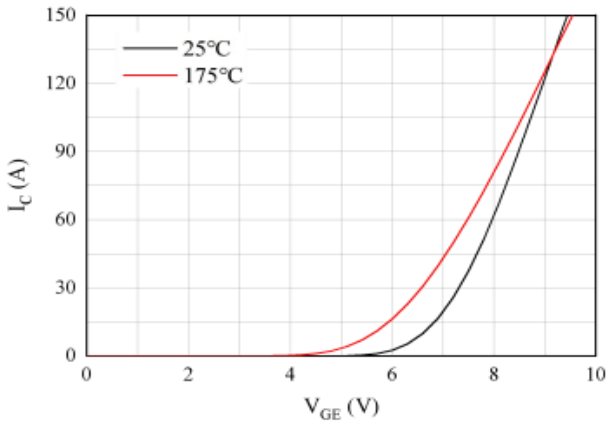


Figure 3. Typical transfer characteristic(V_{CE}=20V)

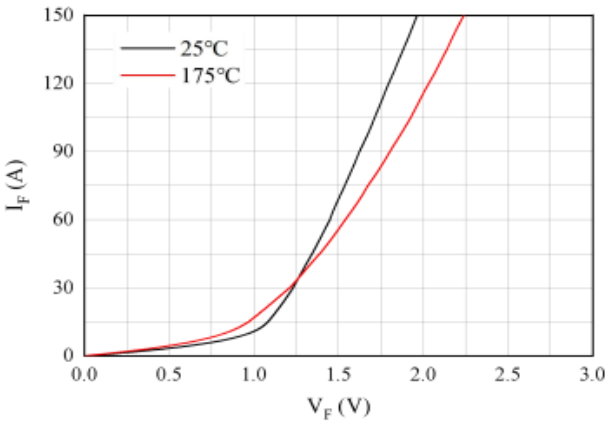


Figure 4. Forward characteristic of Diode

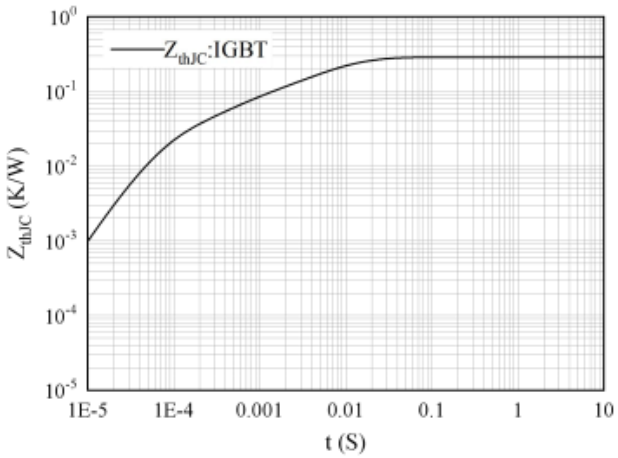


Figure 5. Transient thermal impedance IGBT, Z_{thJC}=f(t)

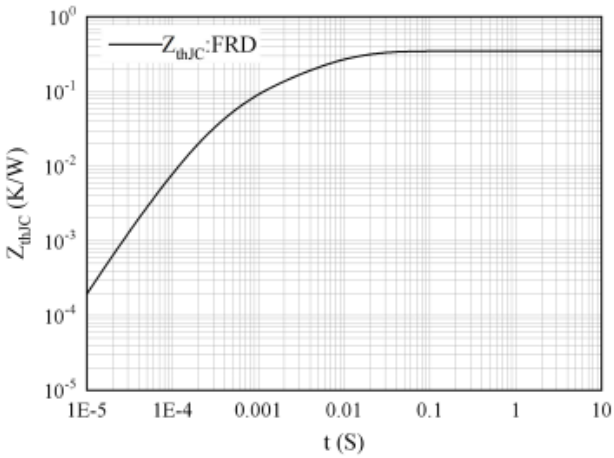


Figure 6. Transient thermal impedance FRD, Z_{thJC}=f(t)

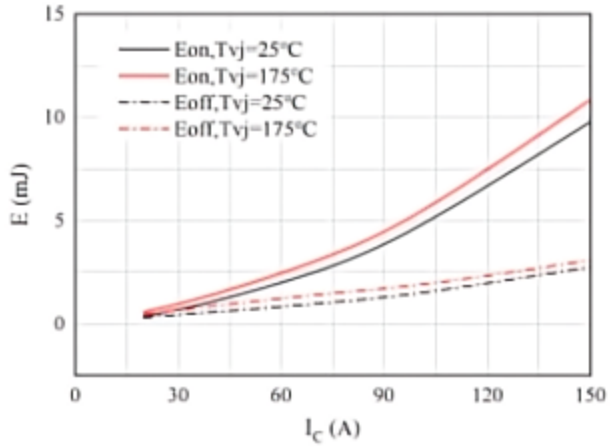


Figure 7. Switching losses of IGBT
V_{GE}=± 15V, Rgon=8Ω, Rgoff=8Ω, V_{CE}=300V

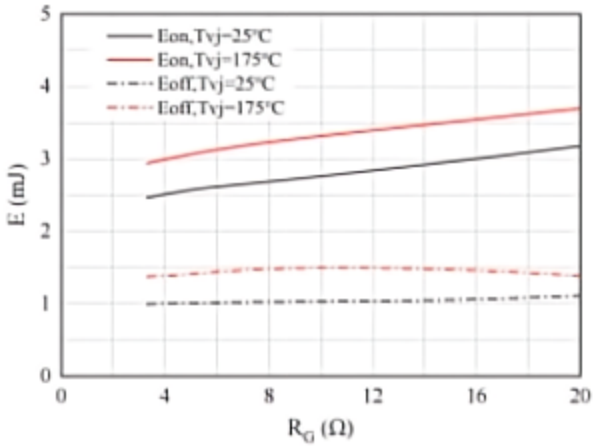


Figure 8. Switching losses of IGBT
V_{GE}=± 15V, I_C=75A, V_{CE}=300V

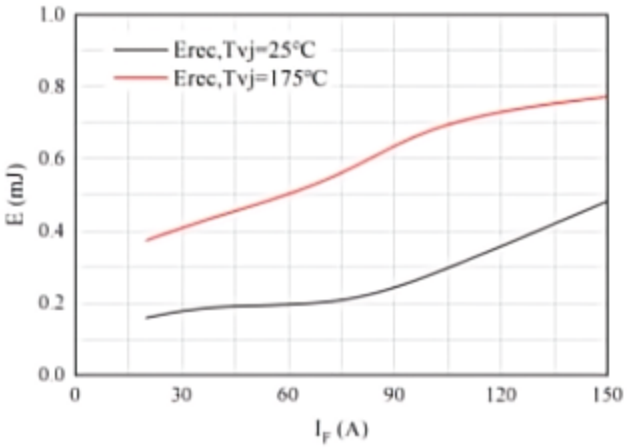


Figure 9. Switching losses of Diode
Rgon=8Ω, V_{CE}=300V

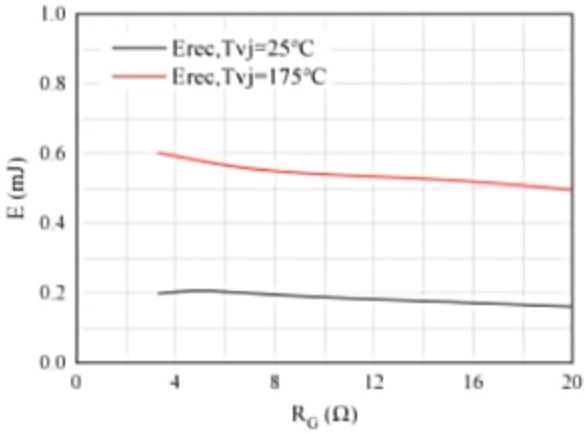


Figure 10. Switching losses of Diode
I_F=75A, V_{CE}=300V

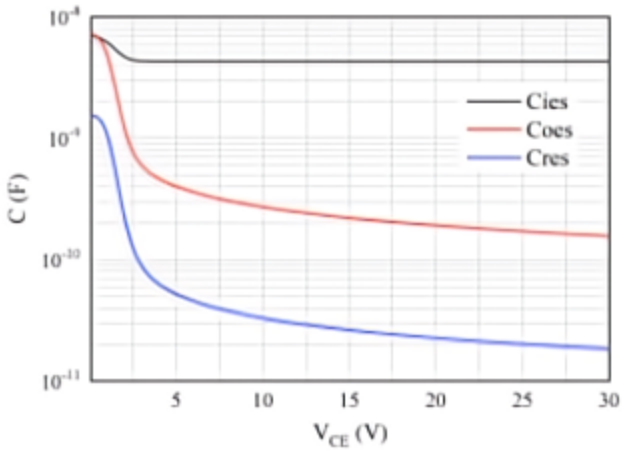
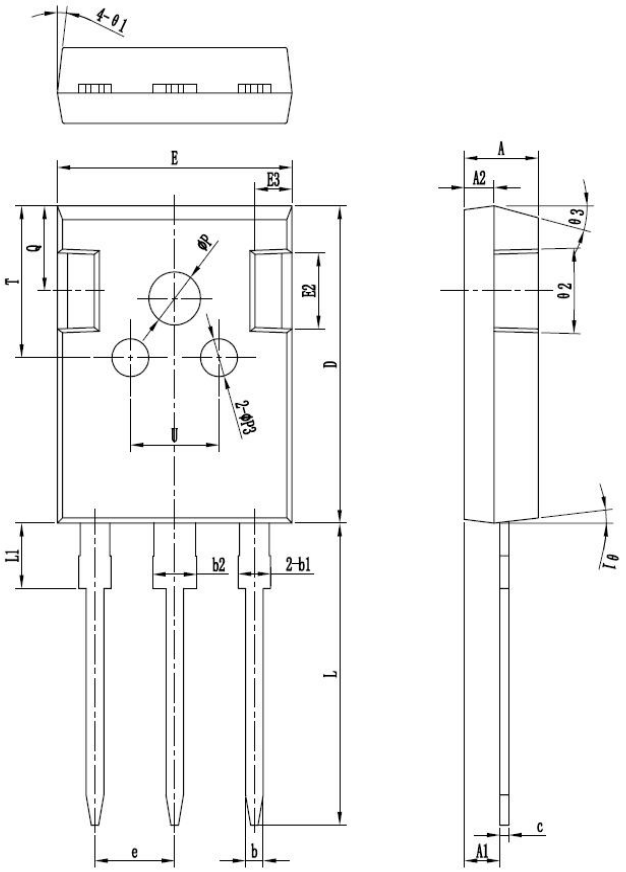


Figure 11. Capacitance characteristic

Package outlines



符号	单位:mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.92	20.10
*L1	-	-	4.30
*φP	3.70	3.80	3.90
*φP1	3.50	3.60	3.70
φP2	7.00	7.20	7.40
φP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
*S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°