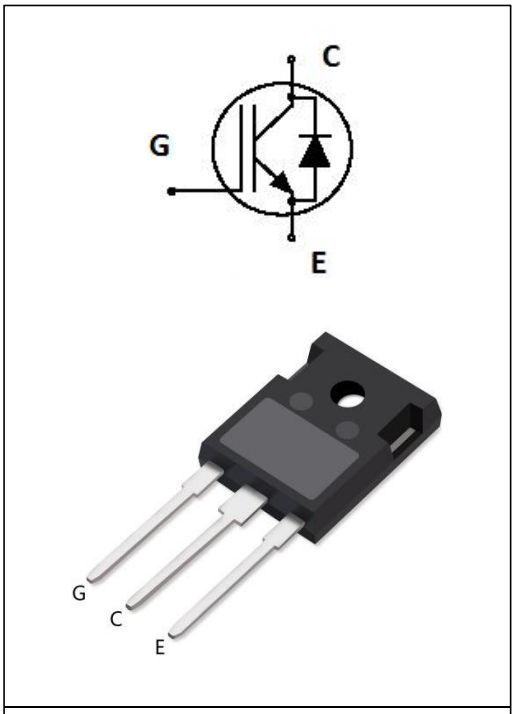
Thunder High speed FS IGBT Products

Silicon Field Stop(FS) Planar IGBT

Description

The THG75N65HQKH is use advanced field stop(FS) technology.

The 650V FS IGBT offers superior conduction and switching performances.



THUNDER TO-247H

General Features

- 650V Breakdown Voltage
- Low saturation voltage:$V_{CE(sat)}$, typ=1.9V@I_C=75A
- FS Planar Technology,Positive temperature coefficient
- High speed switch & Low power loss

Application

- Solar Converters
- Welding Converters
- UPS

Product Summary

V_{CE}	650V
$V_{CE(sat)}$	1.9V
I_C	75A

MAXIMUM RATINGS (T_J = 25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Collector–to–Emitter Voltage		V_{CE}	650	V
Gate–to–Emitter Voltage		V_{GE}	±30	V
Collector Current	T_C=25℃	I_C	150	A
	T_C=100℃		75	
Power Dissipation	T_C=25℃	P_D	652	W
	T_C=100℃		326	

Pulsed Collector Current	T_C=25℃ t_p=10μs (Note 1)	I_{CM}	225	A
Diode Forward Current	T_C=25℃	I_F	150	
	T_C=100℃		75	
Pulsed Diode Forward Current	T_C=25℃ t_p=10μs (Note 1)	I_{FM}	225	
Short Circuit Withstand Time V_{GE} = 15 V, V_{CC} = 400 V, T_C = 150℃		T_{SC}	10	μs
Operating Junction and Storage Temperature Range		T_J,T_{stg}	-55 To +175	℃
Lead Temperature for Soldering Purposes		T_L	270	

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction−to−Case for IGBT	R_{thJC}	0.23	℃/W
Thermal Resistance, Junction−to−Ambient	R_{thJA}	62.5	

ELECTRICAL CHARACTERISTICS (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
OFF CHARACTERISTICS						
Collector−to−Emitter Breakdown Voltage	BV_{CES}	650	-	-	V	V_{GE}=0V,I_C=1mA
Zero Gate Voltage Collector Current	I_{CES}	-	-	40	μA	V_{GE}=0V,V_{CE}=V_{CES}
Gate−to−Emitter leakage Current	I_{GES}	-	-	±400	nA	V_{GE}=±30V,V_{CE}=0V
ON CHARACTERISTICS						
Gate−to−Emitter Threshold Voltage	$V_{GE(th)}$	4.8	-	6.6	V	V_{GE}=V_{CE},I_C=1mA, T_J=25℃
Collector−to−Emitter Saturation Voltage	$V_{CE(sat)}$	-	1.9	2.3	V	V_{GE}=15V,I_C=75A, T_J=25℃

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{IES}	-	3032	-	pF	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz
Output Capacitance	C_{OES}	-	464	-		
Reverse Transfer Capacitance	C_{RES}	-	297	-		
Total Gate Charge	Q_G	-	310	-	nC	V_{CE} = 400 V, V_{GE} = 15 V, I_C = 75 A

SWITCHING CHARACTERISTICS

Turn−On Delay Time	$t_{d(on)}$	-	90	-	ns	V_{CE} = 400 V V_{GE} = 0/15 V I_C = 75 A R_G = 30 Ω T_J = 25°C
Turn−Off Delay Time	$t_{d(off)}$	-	233	-		
Rise time	t_r	-	39	-		
Fall time	t_f	-	84	-		
Turn−On Switching Loss	E_{on}	-	7	-	mJ	
Turn−Off Switching Loss	E_{off}	-	1.7	-		
Total Switching Loss	E_{ts}	-	8.7	-		

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified) (continued)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
SWITCHING CHARACTERISTICS						
DIODE CHARACTERISTICS						
Diode Forward Voltage	V_F	-	1.85	2.8	-	I_F = 75 A, T_J = 25°C
DIODE SWITCHING CHARACTERISTICS, INDUCTIVE LOAD						
Reverse Recovery Time	t_{rr}	-	32	-	ns	VR = 400 V, IF = 75 A, dIF/dt = 200 A/μs TJ = 25°C
Reverse Recovery Charge	Q_{rr}	-	0.34	-	nC	
Reverse Recovery Energy	E_{rec}	-	0.02	-	mJ	
Peak Reverse Recovery Current	I_{RRM}	-	16	-	A	

Typical Performance Characteristics

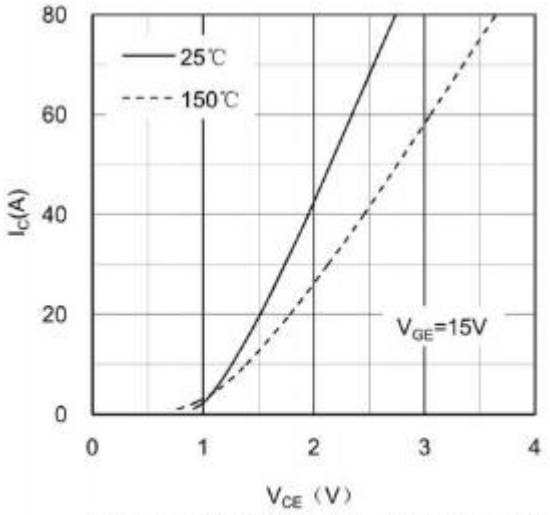


Figure 1. Typical Output Characteristics IGBT

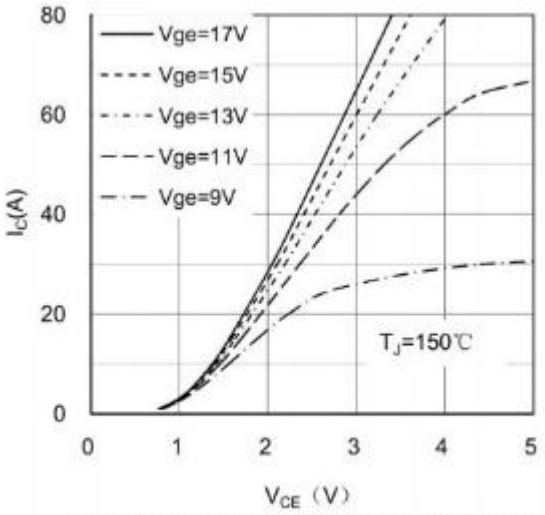


Figure 2. Typical Output Characteristics IGBT

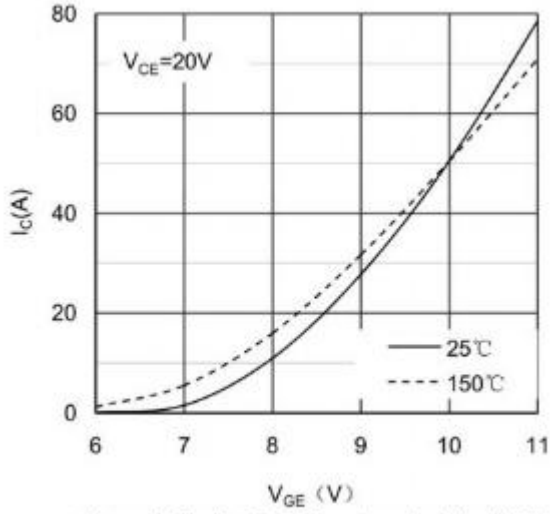


Figure 3. Typical Transfer characteristics IGBT

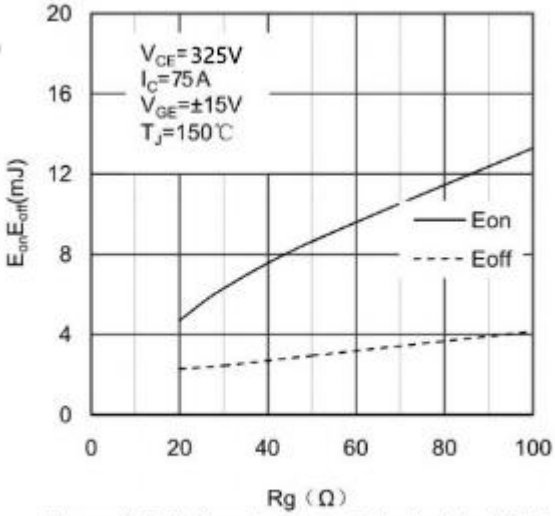


Figure 4. Switching Energy vs Gate Resistor IGBT

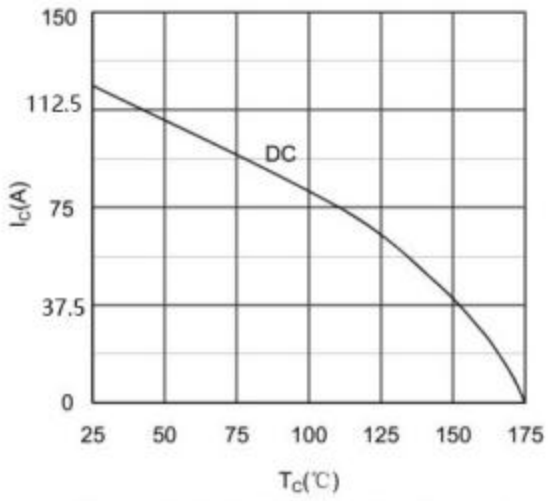


Figure 5. Collector Current vs Case temperature
IGBT

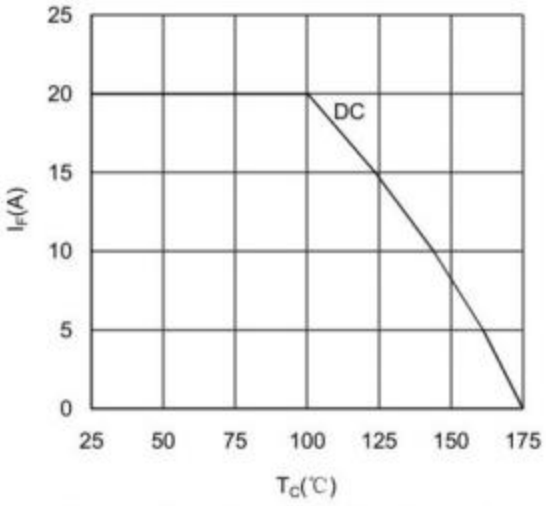


Figure 6. Forward current vs Case temperature
Diode

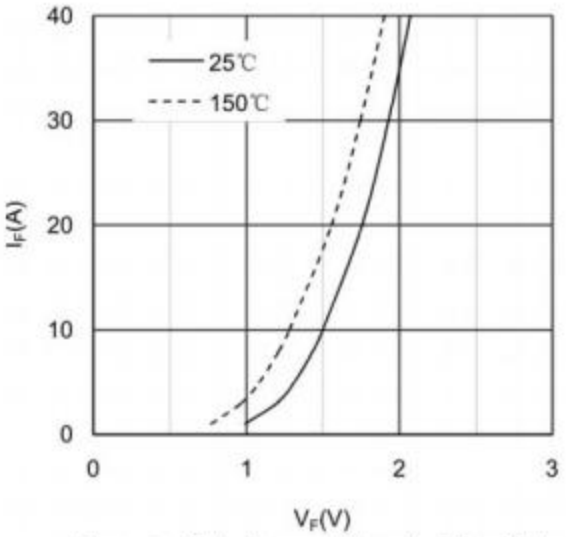


Figure 7. Diode Forward Characteristics Diode

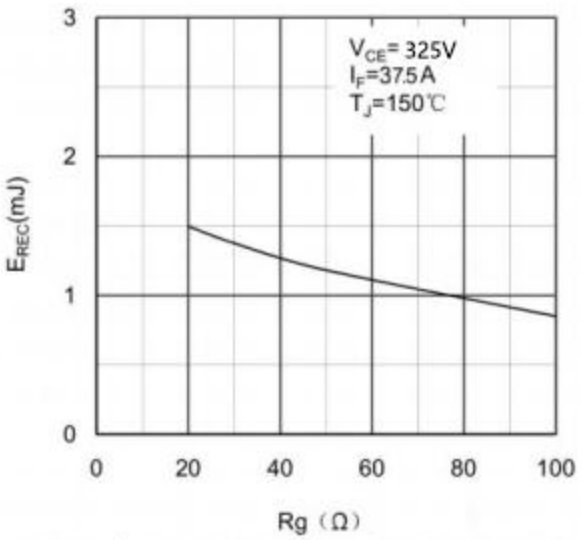


Figure 8 . Switching Energy vs Gate Resistor Diode

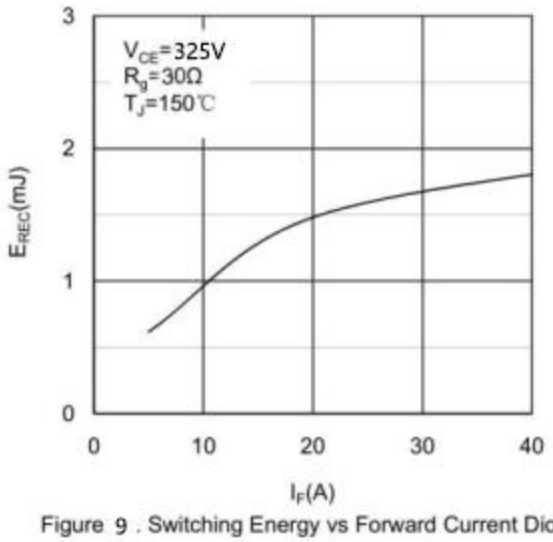


Figure 9 . Switching Energy vs Forward Current Diode

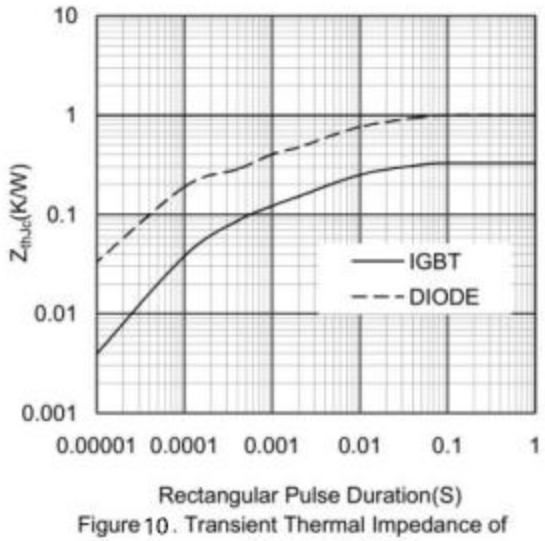
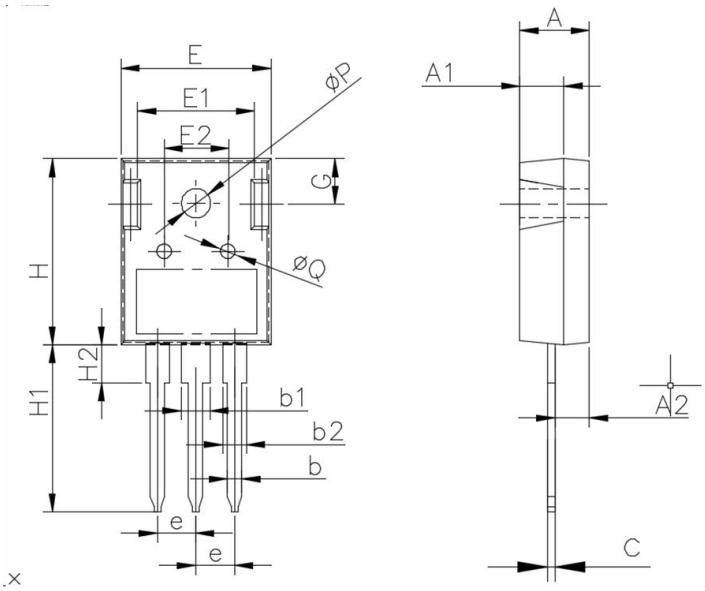


Figure 10. Transient Thermal Impedance of
Diode and IGBT

Package Information

TO-247H PACKAGE



基本尺寸

Symbol	单位 mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.20	2.40	2.60
b	1.05	1.20	1.35
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
e	5.35	5.45	5.75
E	15.6	15.80	16.0
E1	12.3	12.50	12.7
E2	6.00	6.20	6.40
H	20.8	21.0	21.2
H1	19.5	20.0	20.5
H2	3.70	4.00	4.30
G	5.70	5.90	6.10
ΦP	3.30	3.50	3.70
ΦQ	2.30	2.50	2.70

Notice

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