

Silicon Field Stop(FS) Planar IGBT

Description

The THG75N65SQKH is use advanced field stop(FS) technology.

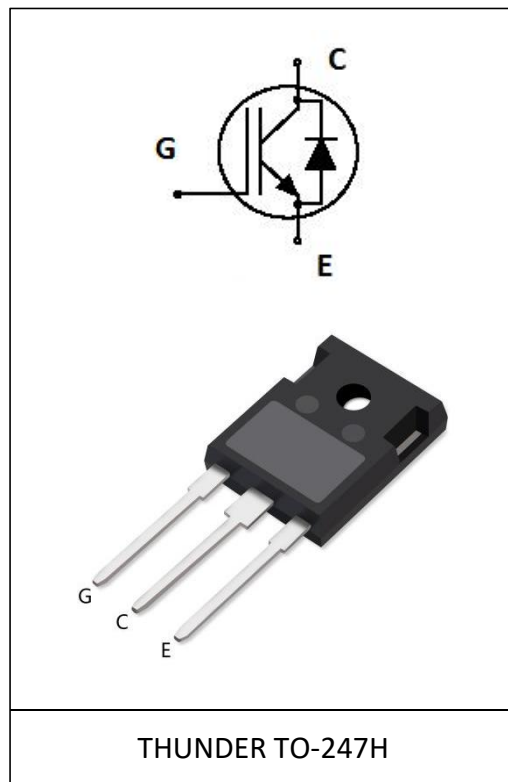
The 650V FS IGBT offers superior conduction and switching performances.

General Features

- 650V Breakdown Voltage
- Low saturation voltage: $V_{CE(sat).typ}=2.2V@I_C=75A$
- FS Planar Technology,Positive temperature coefficient
- High speed switch & Low power loss

Application

- Solar Converters
- Welding Converters
- UPS



Product Summary

V_{CE}	650V
$V_{CE(sat).typ}$	2.2V
I_C	75A

MAXIMUM RATINGS ($T_J = 25^{\circ}C$ 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	$T_C=25^{\circ}C$	I_C	150	A
	$T_C=100^{\circ}C$		75	
Power Dissipation	$T_C=25^{\circ}C$	P_D	652	W
	$T_C=100^{\circ}C$		326	

Pulsed Collector Current	$T_C=25^{\circ}\text{C}$ $t_p=10\mu\text{s}$ (Note 1)	I_{CM}	225	A
Diode Forward Current	$T_C=25^{\circ}\text{C}$	I_F	150	
	$T_C=100^{\circ}\text{C}$		75	
Pulsed Diode Forward Current	$T_C=25^{\circ}\text{C}$ $t_p=10\mu\text{s}$ (Note 1)	I_{FM}	225	
Short Circuit Withstand Time $V_{GE} = 15\text{ V}$, $V_{CC} = 400\text{ V}$, $T_C = 150^{\circ}\text{C}$		T_{SC}	10	μs
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 T_o +175	$^{\circ}\text{C}$
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	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	

ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

OFF CHARACTERISTICS

Collector-to-Emitter Breakdown Voltage	BV_{CES}	650	-	-	V	$V_{GE}=0\text{ V}$, $I_C=1\text{ mA}$
Zero Gate Voltage Collector Current	I_{CES}	-	-	40	μA	$V_{GE}=0\text{ V}$, $V_{CE}=V_{CES}$
Gate-to-Emitter leakage Current	I_{GES}	-	-	± 400	nA	$V_{GE}=\pm 30\text{ V}$, $V_{CE}=0\text{ V}$

ON CHARACTERISTICS

Gate-to-Emitter Threshold Voltage	$V_{GE(th)}$	4.8	-	6.6	V	$V_{GE}=V_{CE}$, $I_C=1\text{ mA}$, $T_J=25^{\circ}\text{C}$
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	-	2.2	2.7	V	$V_{GE}=15\text{ V}$, $I_C=75\text{ A}$, $T_J=25^{\circ}\text{C}$

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{IES}	-	3052	-	pF	$V_{CE}=25\text{ V}, V_{GE}=0\text{ V},$ $f = 1\text{ MHz}$
Output Capacitance	C_{OES}	-	459	-		
Reverse Transfer Capacitance	C_{RES}	-	294	-		
Total Gate Charge	Q_G	-	310	-	nC	$V_{CE}=400\text{ V}, V_{GE}=15\text{ V},$ $I_C=75\text{ A}$

SWITCHING CHARACTERISTICS

Turn-On Delay Time	$t_{d(on)}$	-	114	-	ns	$V_{CE}=400\text{ V}$ $V_{GE}=0/15\text{ V}$ $I_C=75\text{ A}$ $R_G=30\ \Omega$ $T_J=25^{\circ}\text{C}$
Turn-Off Delay Time	$t_{d(off)}$	-	206	-		
Rise time	t_r	-	71	-		
Fall time	t_f	-	65	-		
Turn-On Switching Loss	E_{on}	-	6.1	-	mJ	
Turn-Off Switching Loss	E_{off}	-	1.2	-		
Total Switching Loss	E_{ts}	-	7.3	-		

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified) (continued)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

SWITCHING CHARACTERISTICS
DIODE CHARACTERISTICS

Diode Forward Voltage	V_F	-	1.75	2.8	-	$I_F=75\text{ A}, T_J=25^\circ\text{C}$
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DIODE SWITCHING CHARACTERISTICS, INDUCTIVE LOAD

Reverse Recovery Time	t_{rr}	-	31	-	ns	$V_R=400\text{ V}, I_F=75\text{ A},$ $dI_F/dt=200\text{ A}/\mu\text{s}$ $T_J=25^\circ\text{C}$
Reverse Recovery Charge	Q_{rr}	-	0.33	-	nC	
Reverse Recovery Energy	E_{rec}	-	0.02	-	mJ	
Peak Reverse Recovery Current	I_{RRM}	-	16	-	A	

Typical Performance Characteristics

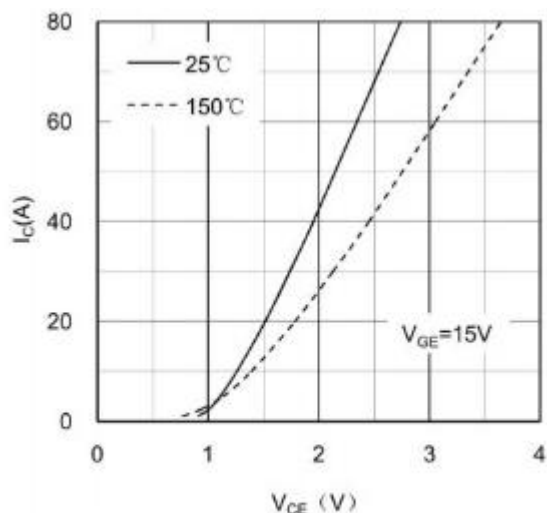


Figure 1. Typical Output Characteristics IGBT

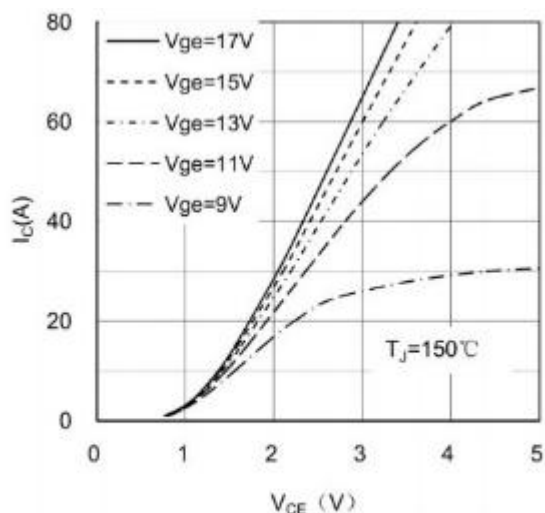


Figure 2. Typical Output Characteristics IGBT

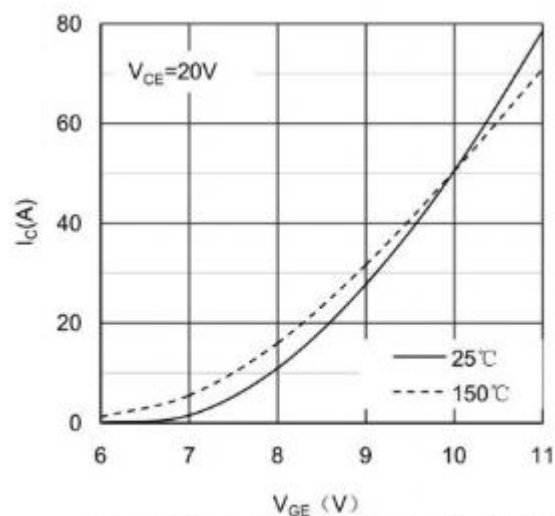


Figure 3. Typical Transfer characteristics IGBT

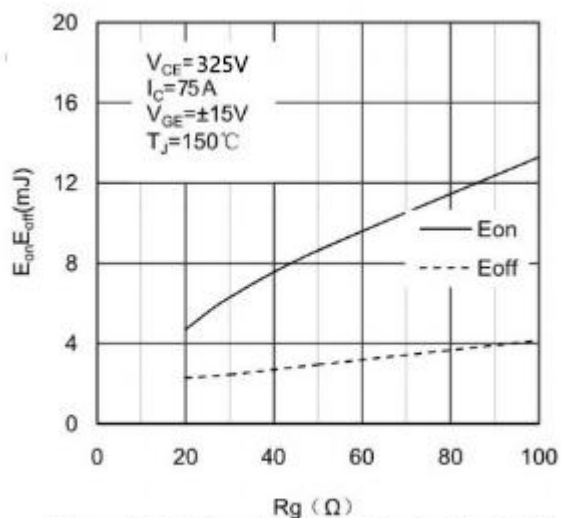


Figure 4. Switching Energy vs Gate Resistor IGBT

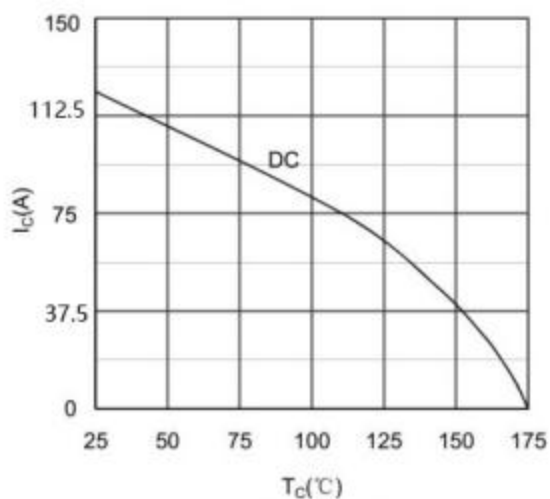


Figure 5 . Collector Current vs Case temperature IGBT

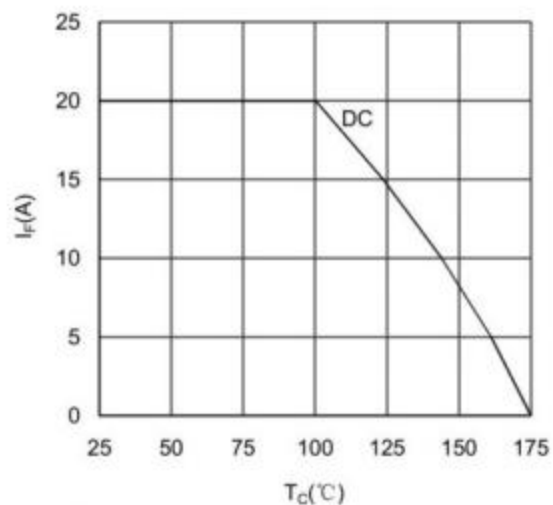


Figure 6. Forward current vs Case temperature Diode

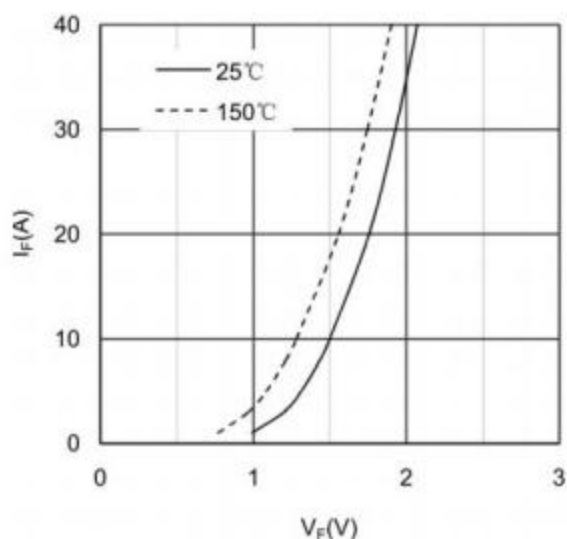


Figure 7. Diode Forward Characteristics Diode

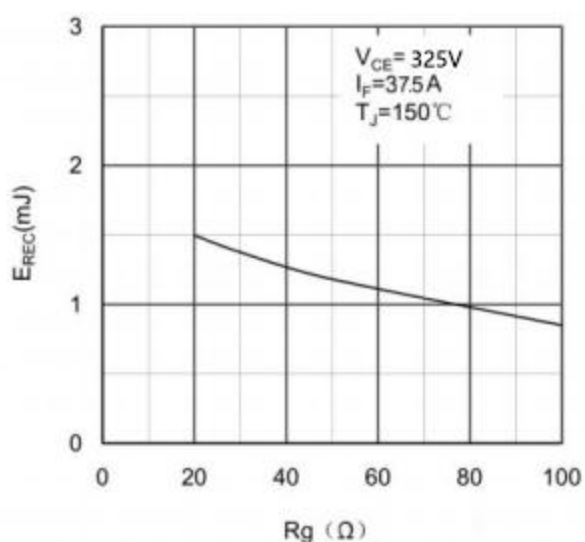


Figure 8 . Switching Energy vs Gate Resistor Diode

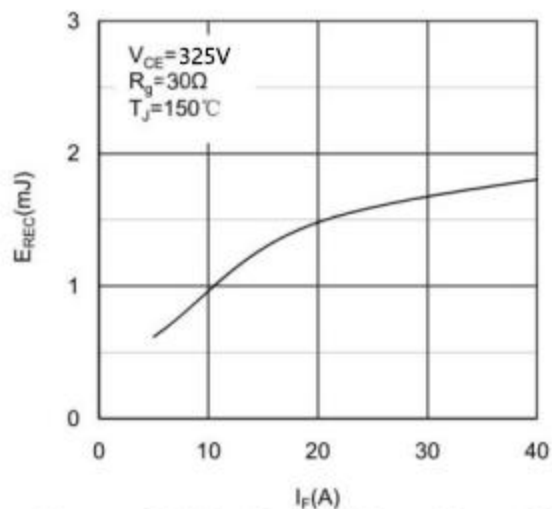


Figure 9 . Switching Energy vs Forward Current Diode

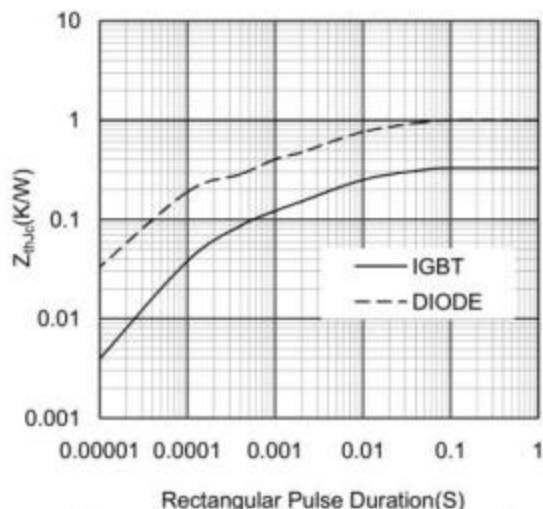
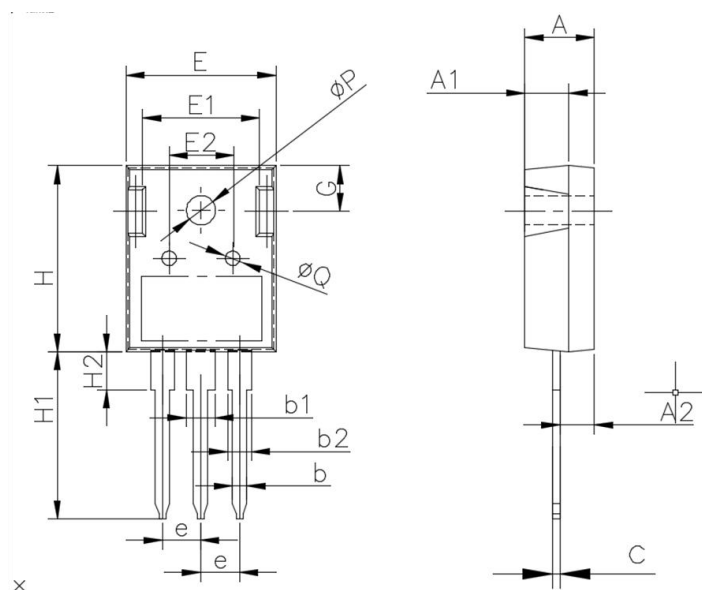


Figure 10. Transient Thermal Impedance of Diode and IGBT

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

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