IGBT - Field Stop, Trench

650 V, 40 A

FGH40T65SHDF

Description

Using novel field stop IGBT technology, ON Semiconductor's new series of field stop 3rd generation IGBTs offer superior conduction and switching performance and easy parallel operation. This device is well suited for the resonant or soft switching application such as induction heating and MWO.

Features

- Maximum Junction Temperature: T_J = 175°C
- Positive Temperature Co−efficient for Easy Parallel Operating
- High Current Capability
- Low Saturation Voltage: $V_{CE(sat)}$ = 1.45 V(Typ.) @ I_C = 40 A
- 100% of the Parts Tested for I_{LM} (Note 1)
- High Input Impedance
- Fast Switching
- Tighten Parameter Distribution
- This Device is Pb−Free and is RoHS Compliant

Applications

- Induction Heating, MWO

ON Semiconductor®

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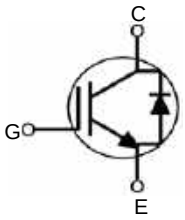
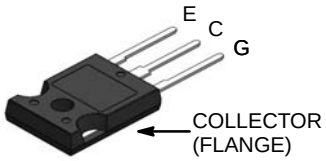
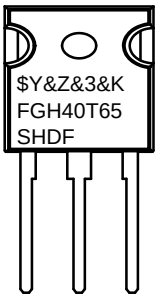




TO−247−3LD
CASE 340CH

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z	= Assembly Plant Code
&3	= Numeric Date Code
&K	= Lot Code
FGH40T65SHDF	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

ABSOLUTE MAXIMUM RATINGS

Description		Symbol	FGH40T65SHDF−F155	Unit
Collector to Emitter Voltage		V_{CES}	650	V
Gate to Emitter Voltage		V_{GES}	±20	V
Transient Gate to Emitter Voltage			±30	V
Collector Current	T_C = 25°C	I_C	80	A
Collector Current	T_C = 100°C		40	A
Pulsed Collector Current (Note 1)	T_C = 25°C	I_{LM}	120	A
Pulsed Collector Current (Note 2)		I_{CM}	120	A
Diode Forward Current	T_C = 25°C	I_F	40	A
Diode Forward Current	T_C = 100°C		20	A
Pulsed Diode Maximum Forward Current		I_{FM}	60	A
Maximum Power Dissipation	T_C = 25°C	P_D	268	W
Maximum Power Dissipation	T_C = 100°C		134	W
Operating Junction Temperature		T_J	−55 to +175	°C
Storage Temperature Range		T_{stg}	−55 to +175	°C
Maximum Lead Temp. for Soldering Purposes, 1/8” from Case for 5 Seconds		T_L	300	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. V_{CC} = 400 V, V_{GE} = 15 V, I_C = 120 A, R_G = 30 Ω, Inductive Load
2. Repetitive Rating: Pulse width limited by max. junction temperature.

THERMAL CHARACTERISTICS

Parameter	Symbol	FGH40T65SHDF−F155	Unit
Thermal Resistance, Junction to Case (IGBT)	$R_{\theta JC}$	0.56	°C/W
Thermal Resistance, Junction to Case (Diode)	$R_{\theta JC}$	1.75	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FGH40T65SHDF	FGH40T65SHDF−F155	TO−247−3LD	−	−	30

ELECTRICAL CHARACTERISTICS OF THE IGBT (T_C = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector to Emitter Breakdown Voltage	BV_{CES}	V_{GE} = 0 V, I_C = 1 mA	650	−	−	V
Temperature Coefficient of Breakdown Voltage	$\Delta BV_{CES}/\Delta T_J$	V_{GE} = 0 V, I_C = 1 mA		0.6		V/°C
Collector Cut−Off Current	I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0 V	−	−	250	μA
G−E Leakage Current	I_{GES}	V_{GE} = V_{GES}, V_{CE} = 0 V	−	−	±400	nA
ON CHARACTERISTICS						
G−E Threshold Voltage	$V_{GE(th)}$	I_C = 40 mA, V_{CE} = V_{GE}	3.5	5.5	7.5	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 40 A, V_{GE} = 15 V	−	1.45	1.85	V
		I_C = 40 A, V_{GE} = 15 V, T_C = 175°C	−	1.8	−	V