

FGL40N150D

General Description

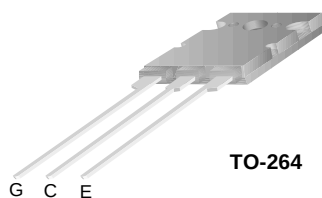
Fairchild's Insulated Gate Bipolar Transistor (IGBT) provides low conduction and switching losses. The FGL40N150D is designed for induction heating applications.

Features

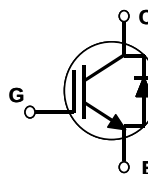
- High speed switching
- Low saturation voltage : $V_{CE(sat)} = 3.5 \text{ V @ } I_C = 40\text{A}$
- High input impedance
- Built-in fast recovery diode

Applications

Home appliances, induction heaters, IH JAR, and microwave ovens.



TO-264



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Description	FGL40N150D	Units
V_{CES}	Collector-Emitter Voltage	1500	V
V_{GES}	Gate-Emitter Voltage	± 25	V
I_C	Collector Current @ $T_C = 25^\circ\text{C}$	40	A
	Collector Current @ $T_C = 100^\circ\text{C}$	20	A
$I_{CM(1)}$	Pulsed Collector Current	120	A
I_F	Diode Continuous Forward Current @ $T_C = 100^\circ\text{C}$	10	A
I_{FM}	Diode Maximum Forward Current	100	A
P_D	Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$	200	W
	Maximum Power Dissipation @ $T_C = 100^\circ\text{C}$	80	W
T_J	Operating Junction Temperature	-55 to +150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum Lead Temp. for Soldering Purposes, 1/8" from Case for 5 Seconds	300	$^\circ\text{C}$

Notes :

(1) Repetitive rating : Pulse width limited by max. junction temperature

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}(\text{IGBT})$	Thermal Resistance, Junction-to-Case	--	0.625	$^\circ\text{C/W}$
$R_{\theta JC}(\text{DIODE})$	Thermal Resistance, Junction-to-Case	--	0.83	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	--	25	$^\circ\text{C/W}$

Electrical Characteristics of the IGBT $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
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Off Characteristics

BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 3mA$	1500	--	--	V
I_{CES}	Collector Cut-Off Current	$V_{CE} = V_{CES}, V_{GE} = 0V$	--	--	3.0	mA
I_{GES}	G-E Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0V$	--	--	± 100	nA

On Characteristics

$V_{GE(th)}$	G-E Threshold Voltage	$I_C = 40mA, V_{CE} = V_{GE}$	3.5	5.0	7.5	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C = 40A, V_{GE} = 15V$	2.5	3.5	4.5	V

Dynamic Characteristics

C_{ies}	Input Capacitance	$V_{CE} = 30V, V_{GE} = 0V,$ $f = 1MHz$	--	2450	--	pF
C_{oes}	Output Capacitance		--	220	--	pF
C_{res}	Reverse Transfer Capacitance		--	75	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{CC} = 600V, I_C = 40A,$ $R_G = 51\Omega, V_{GE} = 15V,$ Resistive Load, $T_C = 25^\circ\text{C}$	--	100	200	ns
t_r	Rise Time		--	350	700	ns
$t_{d(off)}$	Turn-Off Delay Time		--	200	400	ns
t_f	Fall Time		--	100	300	ns
Q_g	Total Gate Charge	$V_{CE} = 600V, I_C = 40A,$ $V_{GE} = 15V$	--	110	170	nC
Q_{ge}	Gate-Emitter Charge		--	15	25	nC
Q_{gc}	Gate-Collector Charge		--	40	60	nC

Electrical Characteristics of DIODE $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{FM}	Diode Forward Voltage	$I_F = 10A$	--	1.3	1.8	V
t_{rr}	Diode Reverse Recovery Time	$I_F = 10A, di/dt = 200A/\mu s$	--	170	300	ns