FAIRCHILD
SEMICONDUCTOR®

IGBT

SGL40N150

General Description

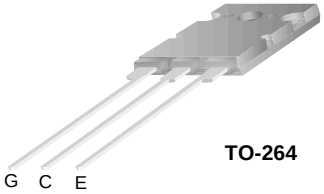
Fairchild's Insulated Gate Bipolar Transistor (IGBT) provides low conduction and switching losses.
The SGL40N150 is designed for induction heating applications.

Features

- High speed switching
- Low saturation voltage : $V_{CE(sat)}$ = 3.7 V @ I_C = 40A
- High input impedance

Applications

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



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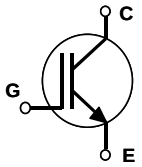

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Description		SGL40N150	Units
V_{CES}	Collector-Emitter Voltage		1500	V
V_{GES}	Gate-Emitter Voltage		± 25	V
I_C	Collector Current	@ T_C = 25°C	40	A
	Collector Current	@ T_C = 100°C	20	A
$I_{CM\ (1)}$	Pulsed Collector Current		120	A
P_D	Maximum Power Dissipation	@ T_C = 25°C	200	W
	Maximum Power Dissipation	@ T_C = 100°C	80	W
T_J	Operating Junction Temperature		-55 to +150	°C
T_{stg}	Storage Temperature Range		-55 to +150	°C
T_L	Maximum Lead Temp. for Soldering Purposes, 1/8" from Case for 5 Seconds		300	°C

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

Thermal Characteristics

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

Electrical Characteristics of the IGBT T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
BV_{CES}	Collector-Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 250uA	1500	--	--	V
I_{CES}	Collector Cut-Off Current	V_{CE} = V_{CES}, V_{GE} = 0V	--	--	250	uA
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	--	3.7	4.7	V
Dynamic Characteristics						
C_{ies}	Input Capacitance	V_{CE} = 10V, V_{GE} = 0V, f = 1MHz	--	4000	--	pF
C_{oes}	Output Capacitance		--	700	--	pF
C_{res}	Reverse Transfer Capacitance		--	300	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{CC} = 600V, I_C = 40A, R_G = 51Ω, V_{GE} = 15V, Resistive Load, T_C = 25°C	--	90	200	ns
t_r	Rise Time		--	230	700	ns
$t_{d(off)}$	Turn-Off Delay Time		--	245	400	ns
t_f	Fall Time		--	230	400	ns
Q_g	Total Gate Charge	V_{CE} = 600V, I_C = 40A, V_{GE} = 15V	--	140	170	nC
Q_{ge}	Gate-Emitter Charge		--	25	25	nC
Q_{gc}	Gate-Collector Charge		--	45	60	nC

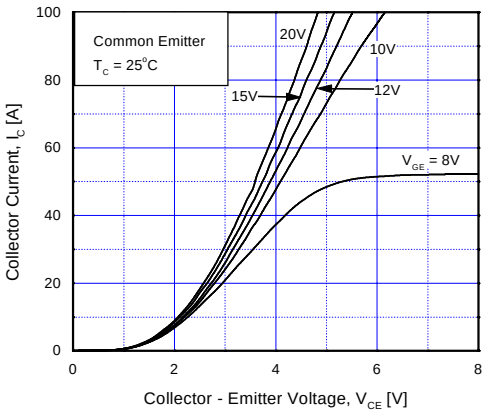

Fig 1. Typical Output Characteristics

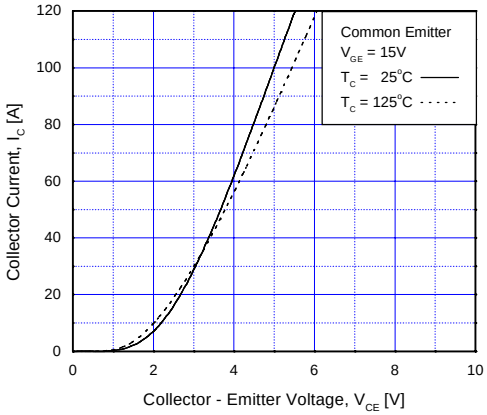

Fig 2. Typical Output Characteristics

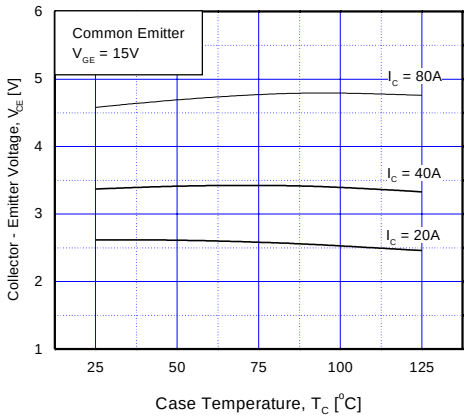

Fig 3. Collector to Emitter Saturation Voltage vs. Case Temperature

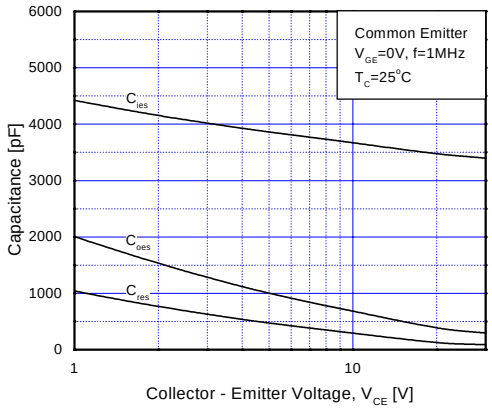

Fig 4. Typical Capacitance vs. Collector to Emitter Voltage

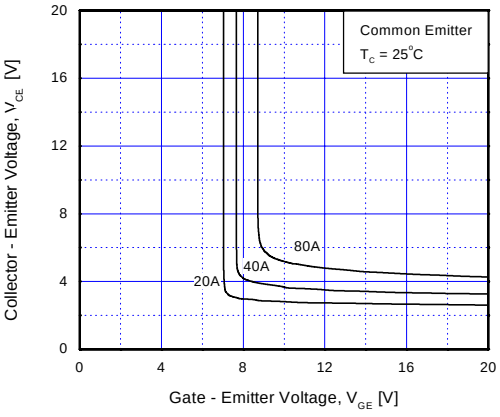

Fig 5. Saturation Voltage vs. V_{GE}

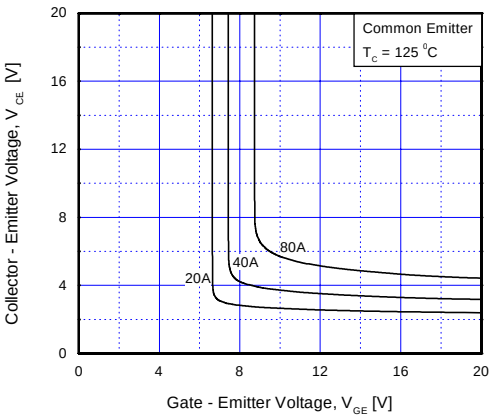

Fig 6. Saturation Voltage vs. V_{GE}

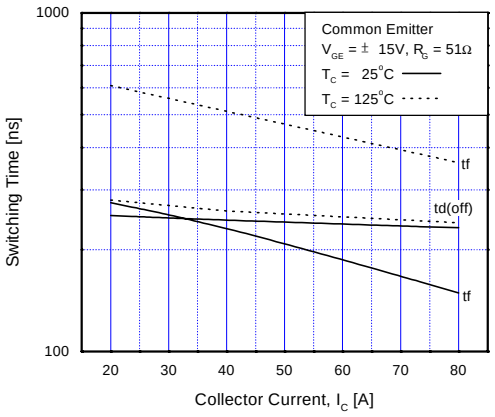

Fig 7. Turn-Off Characteristics vs. Collector Current

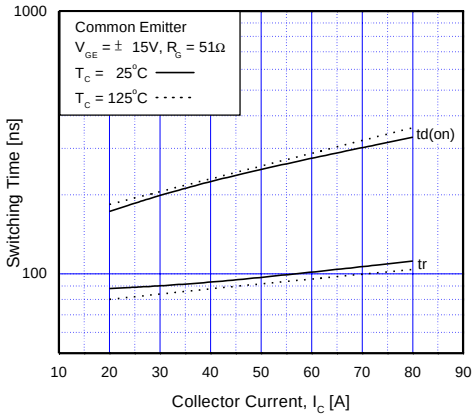

Fig 8. Turn-On Characteristics vs. Collector Current

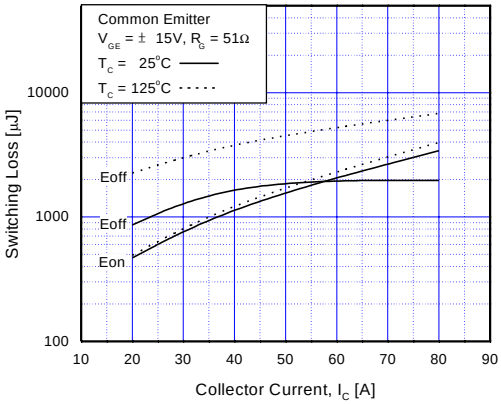

Fig 9. Switching Loss vs. Collector Current

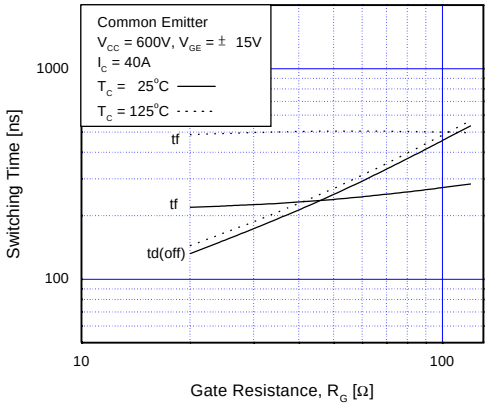

Fig 10. Turn-Off Characteristics vs. Gate Resistance

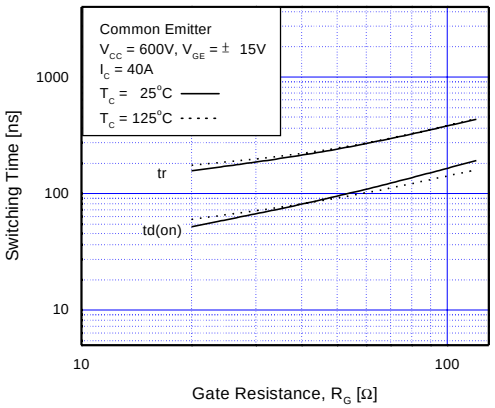

Fig 11. Turn-On Characteristics vs. Gate Resistance

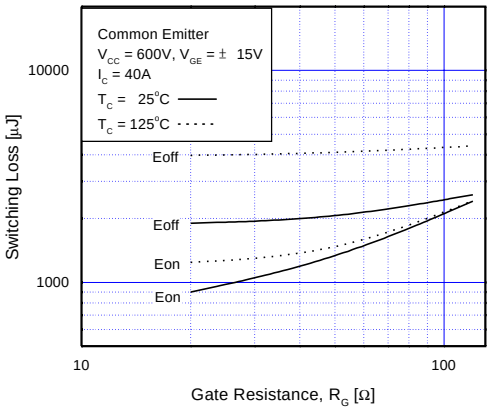

Fig 12. Switching Loss vs. Gate Resistance

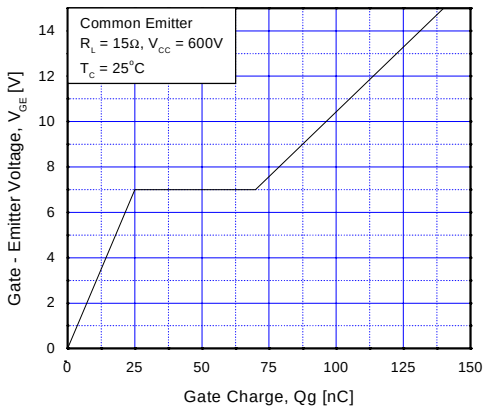

Fig 13. Gate Charge Characteristics

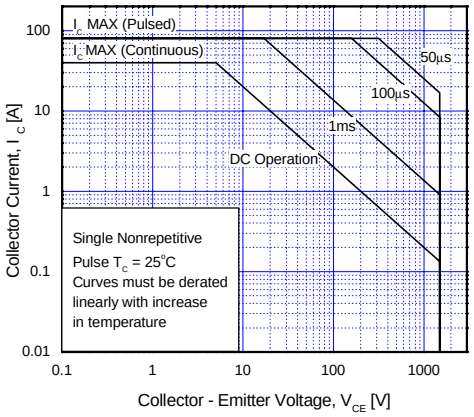

Fig 14. SOA Characteristics

Package Dimension

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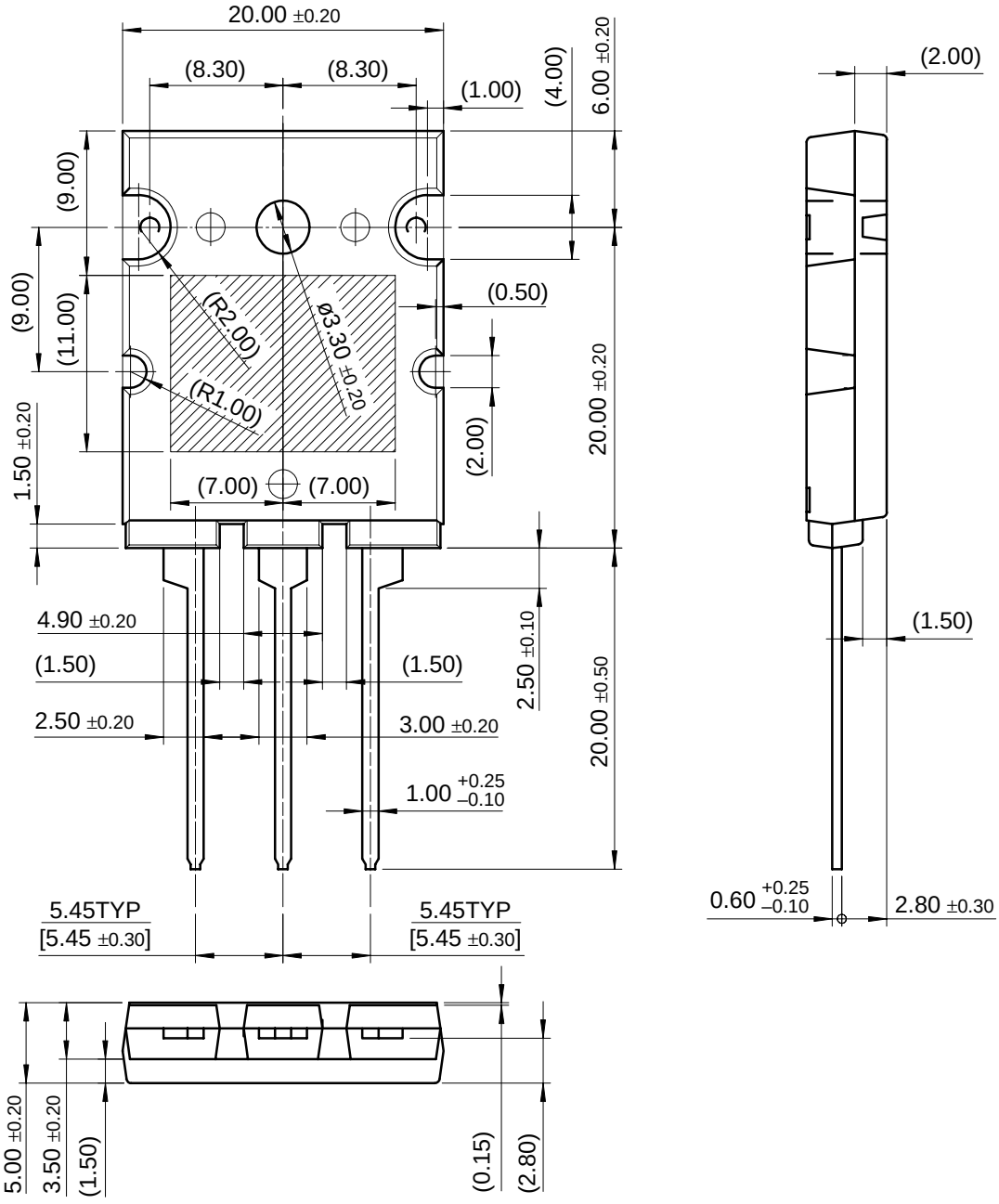

Dimensions in Millimeters

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Definition of Terms

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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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SGL40N150
Discrete, IGBT

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General description

Fairchild’s Insulated Gate Bipolar Transistor (IGBT) provides low conduction and switching losses. SGL40N150 is designed for the Induction Heating applications.

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Features

- High Speed Switching
- Low Saturation Voltage : $V_{CE(sat)}$ = 3.7 V @ I_C = 40A
- High Input Impedance

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Applications

- Home Appliance
- Induction Heater
- IH JAR
- Micro Wave Oven

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
SGL40N150TU	Full Production	$11.78	TO-264	3	RAIL

* 1,000 piece Budgetary Pricing

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