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FAIRCHILD
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IGBT

SGR15N40L / SGU15N40L

General Description

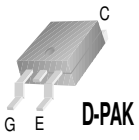
Insulated Gate Bipolar Transistors (IGBTs) with a trench gate structure provide superior conduction and switching performance in comparison with transistors having a planar gate structure. They also have wide noise immunity. These devices are very suitable for strobe applications

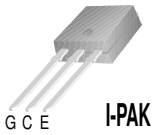
Features

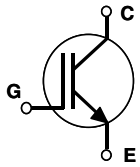
- High input impedance
- High peak current capability (130A)
- Easy gate drive

Application

Strobe flash.







Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Description	SGR / SGU15N40L	Units
V_{CES}	Collector - Emitter Voltage	400	V
V_{GES}	Gate - Emitter Voltage	± 6	V
$I_{CM\ (1)}$	Pulsed Collector Current	130	A
P_C	Maximum Power Dissipation @ T_C = 25°C	45	W
T_J	Operating Junction Temperature	-40 to +150	°C
T_{stg}	Storage Temperature Range	-40 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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	--	3.0	°C/W
$R_{\theta JA}$ (D-PAK)	Thermal Resistance, Junction-to-Ambient (PCB Mount) (2)	--	50	°C/W
$R_{\theta JA}$ (I-PAK)	Thermal Resistance, Junction-to-Ambient	--	110	°C/W

Notes :
(2) Mounted on 1" square PCB (FR4 or G-10 Material)

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 = 1mA	450	--	--	V
I_{CES}	Collector Cut-Off Current	V_{CE} = V_{CES}, V_{GE} = 0V	--	--	10	uA
I_{GES}	G - E Leakage Voltage	V_{GE} = V_{GES}, V_{CE} = 0V	--	--	± 0.1	uA
On Characteristics						
$V_{GE(th)}$	G - E Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE}	0.5	1.0	1.4	V
$V_{CE(sat)}$	C - E Saturation Current	I_C = 130A, V_{GE} = 4.5V	2.0	4.5	8.0	V
Dynamic Characteristics						
C_{ies}	Input Capacitance	V_{GE} = 0V, V_{CE} = 30V, f = 1MHz	--	3000	--	pF
C_{oes}	Output Capacitance		--	45	--	pF
C_{res}	Reverse Transfer Capacitance		--	30	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{CC} = 300V, I_C = 130A, V_{GE} = 4.5V, R_G = 15Ω Resistive Load	--	0.08	--	us
t_r	Rise Time		--	1.4	--	us
$t_{d(off)}$	Turn-Off Delay Time		--	0.1	0.5	us
t_f	Fall Time		--	1.1	2.0	us

* Notes : Recommendation of R_G Value : $R_G \geq 15\Omega$

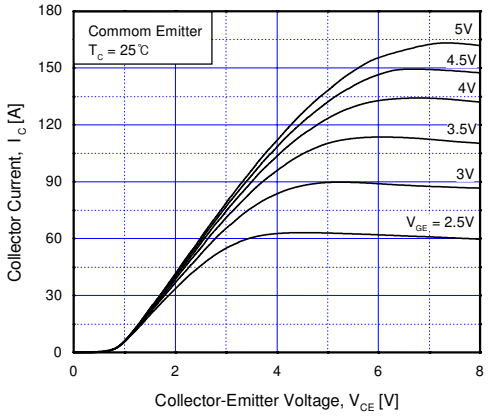


Fig 1. Typical Output Characteristics

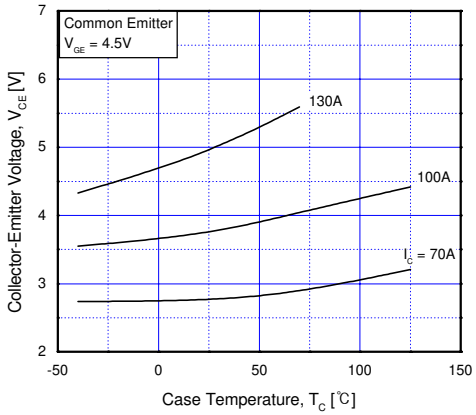


Fig 2. Saturation Voltage vs. Case Temperature at Variant Current Level

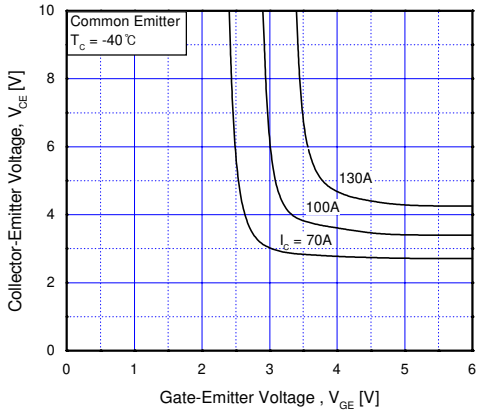


Fig 3. Saturation Voltage vs. V_{GE}

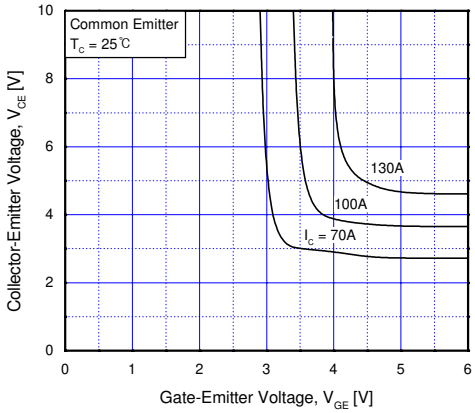


Fig 4. Saturation Voltage vs. V_{GE}

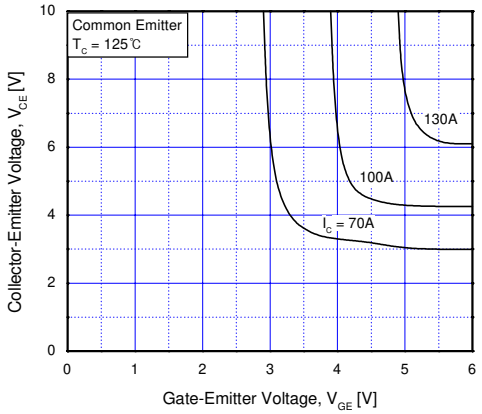


Fig 5. Saturation Voltage vs. V_{GE}

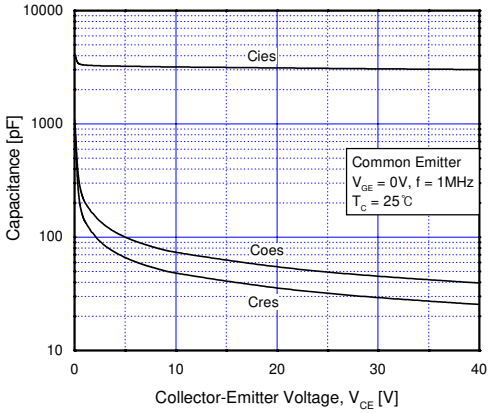


Fig 6. Capacitance Characteristics

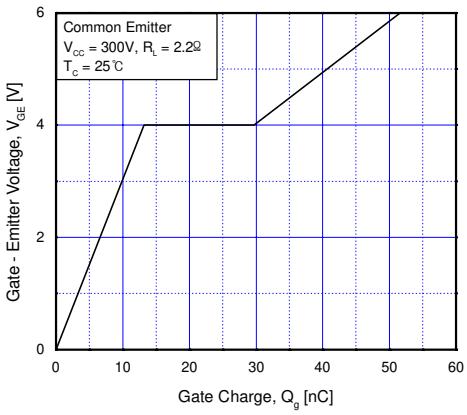


Fig 7. Gate Charge Characteristics

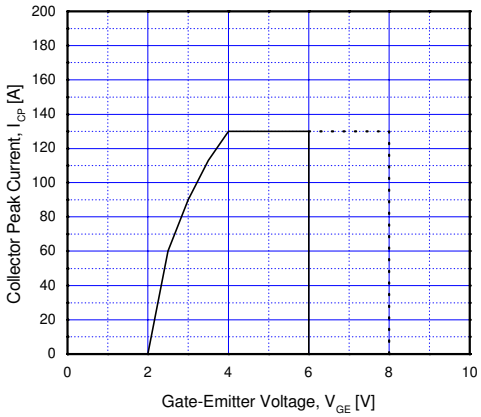
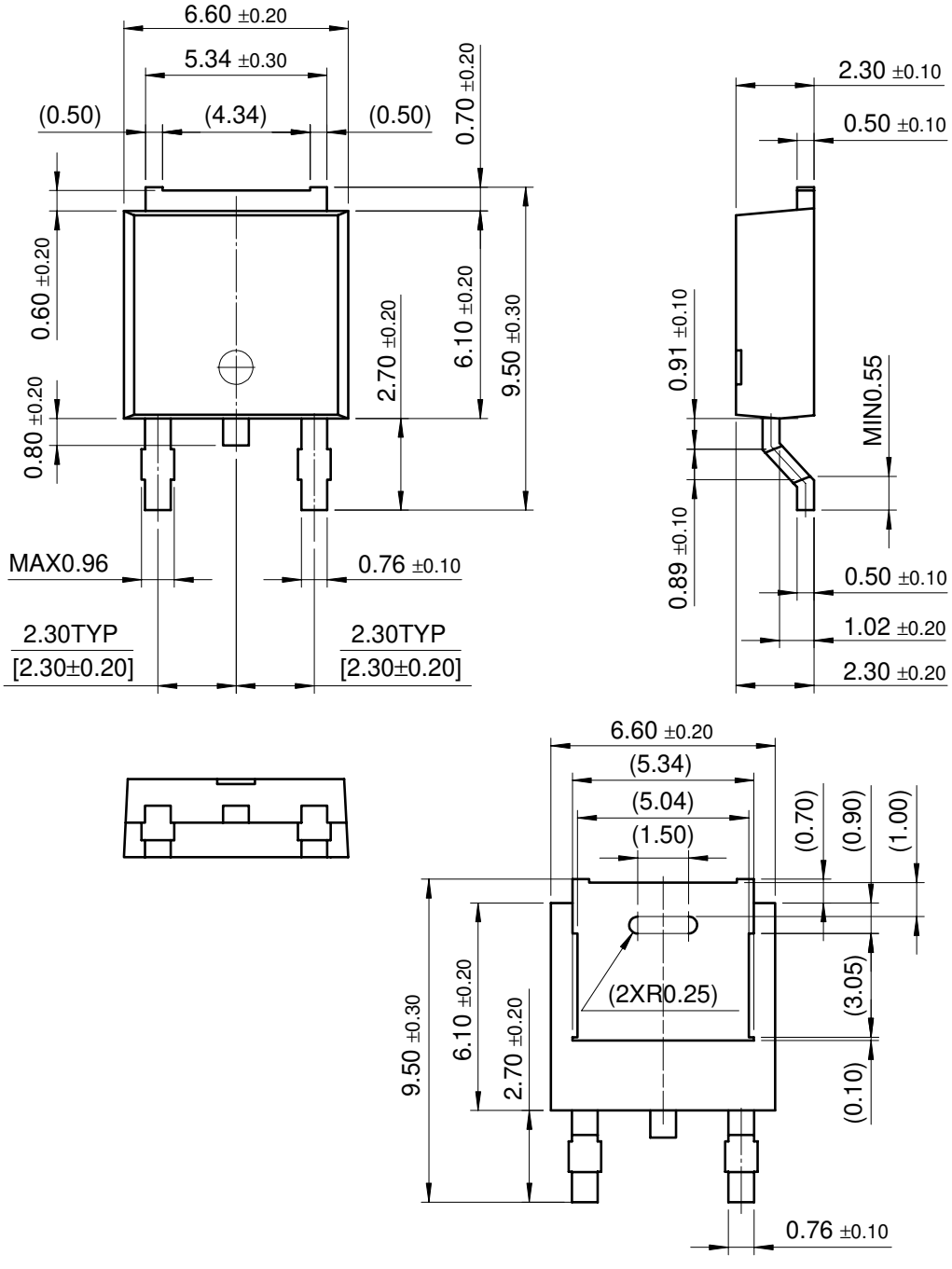


Fig 8. Collector Current Limit vs. Gate - Emitter Voltage Limit

Package Dimension

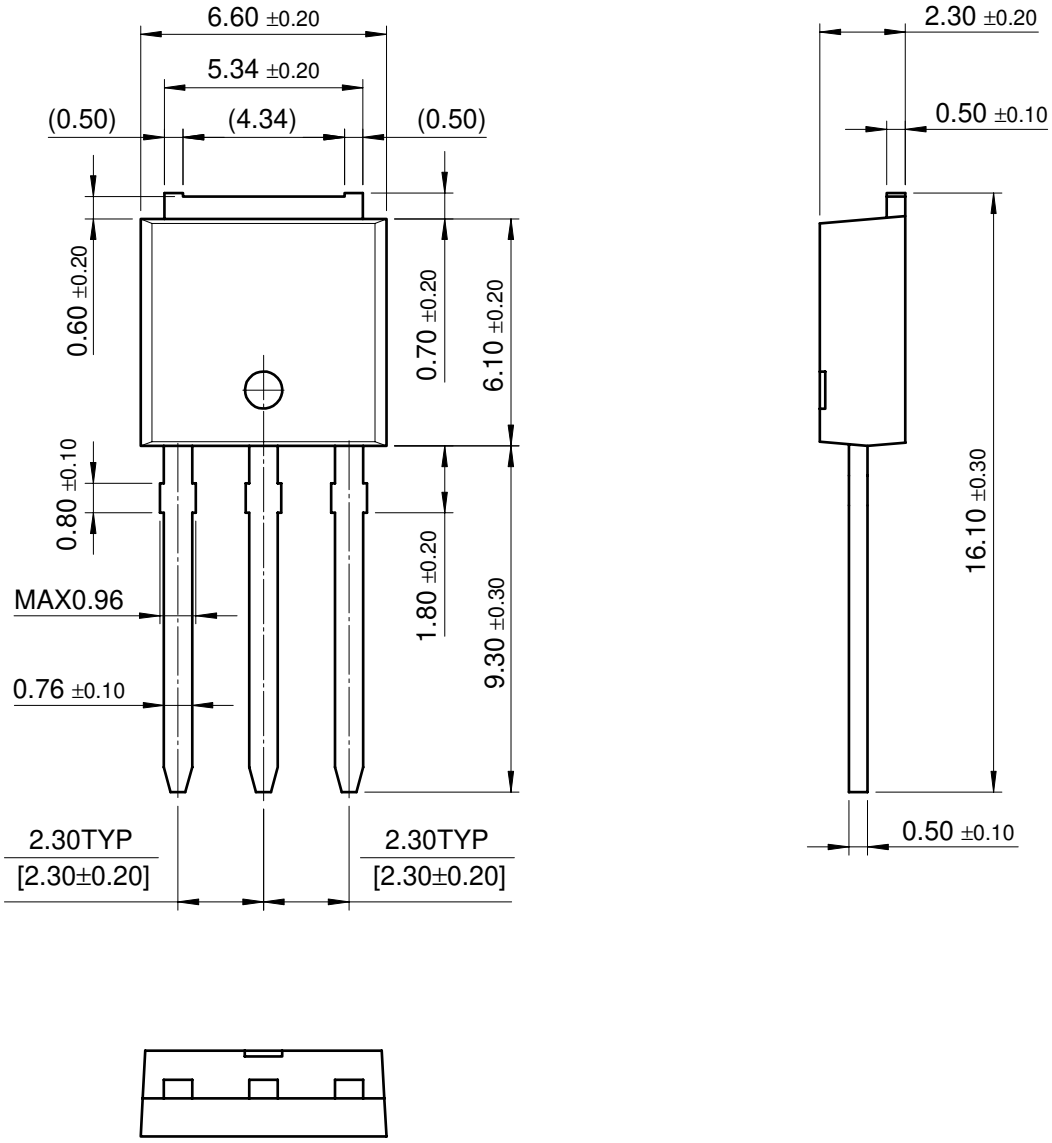
D-PAK



Dimensions in Millimeters

Package Dimension (Continued)

I-PAK



Dimensions in Millimeters

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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.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.