

SGR15N40L / SGU15N40L

General Description

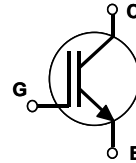
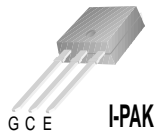
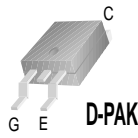
Insulated Gate Bipolar Transistors (IGBTs) with a trench gate structure provide superior conduction and switching performance in comparison with transistors having a planar gate structure. They also have wide noise immunity. These devices are very suitable for strobe applications

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 _{θJC}	Thermal Resistance, Junction-to-Case	--	3.0	°C/W
R _{θJA (D-PAK)}	Thermal Resistance, Junction-to-Ambient (PCB Mount) (2)	--	50	°C/W
R _{θJA (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 $T_C = 25^\circ\text{C}$ 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	μA
I_{GES}	G - E Leakage Voltage	$V_{GE} = V_{GES}, V_{CE} = 0V$	--	--	± 0.1	μA
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	$V_{CC} = 300V, I_C = 130A,$ $V_{GE} = 4.5V, R_G = 15\Omega$ Resistive Load	--	0.08	--	μs
t_r	Rise Time		--	1.4	--	μs
$t_{d(off)}$	Turn-Off Delay Time		--	0.1	0.5	μs
t_f	Fall Time		--	1.1	2.0	μs

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

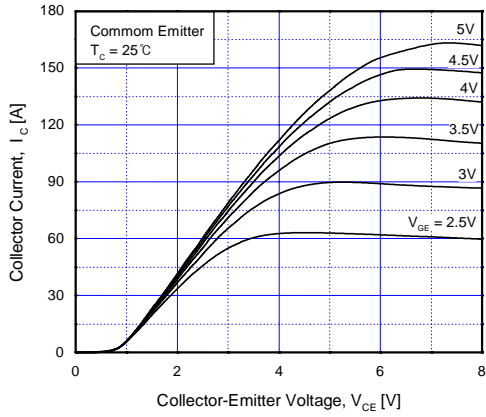


Fig 1. Typical Output Characteristics

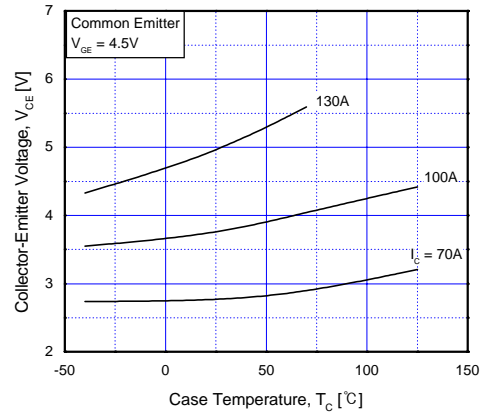


Fig 2. Saturation Voltage vs. Case Temperature at Variant Current Level

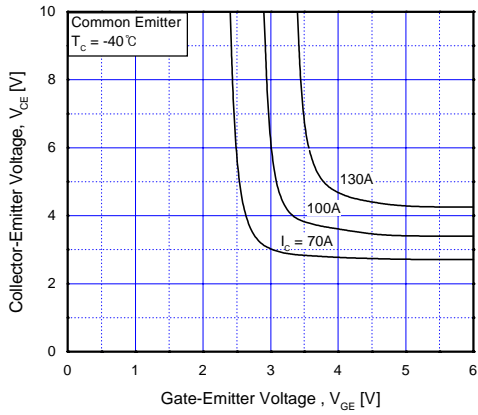


Fig 3. Saturation Voltage vs. V_{GE}

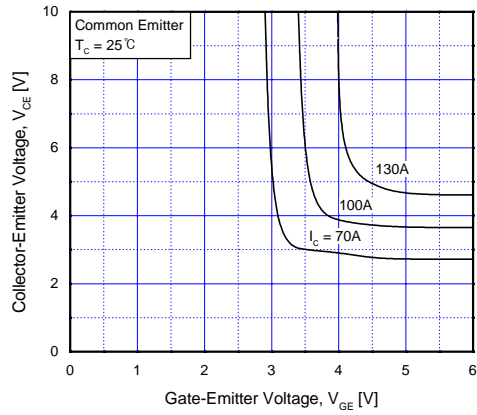


Fig 4. Saturation Voltage vs. V_{GE}

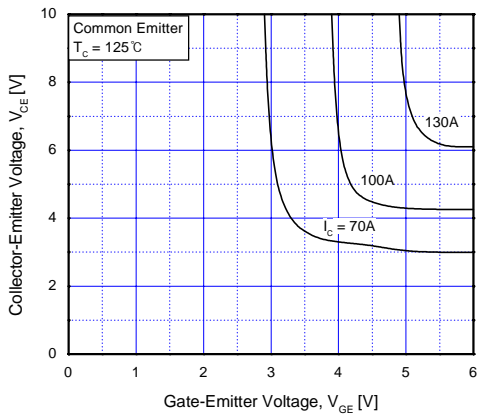


Fig 5. Saturation Voltage vs. V_{GE}

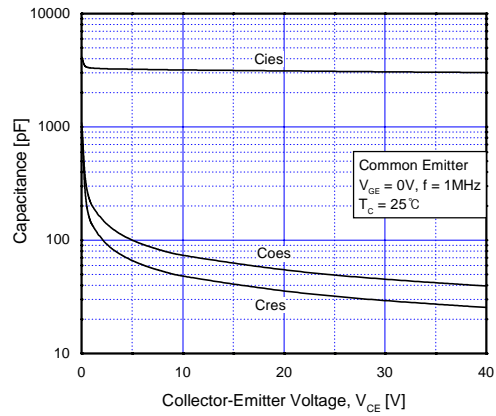


Fig 6. Capacitance Characteristics

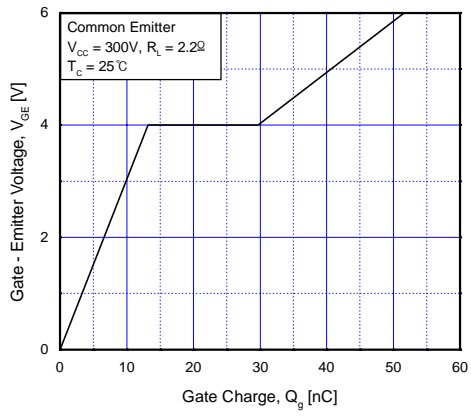


Fig 7. Gate Charge Characteristics

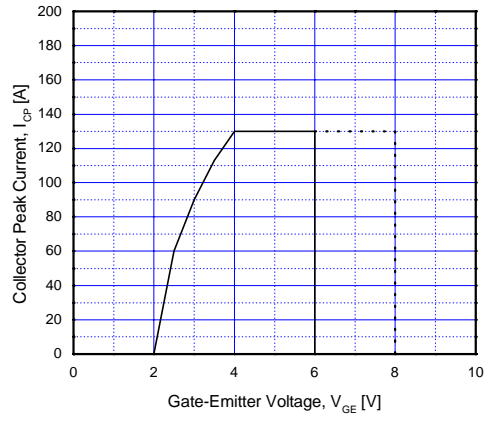
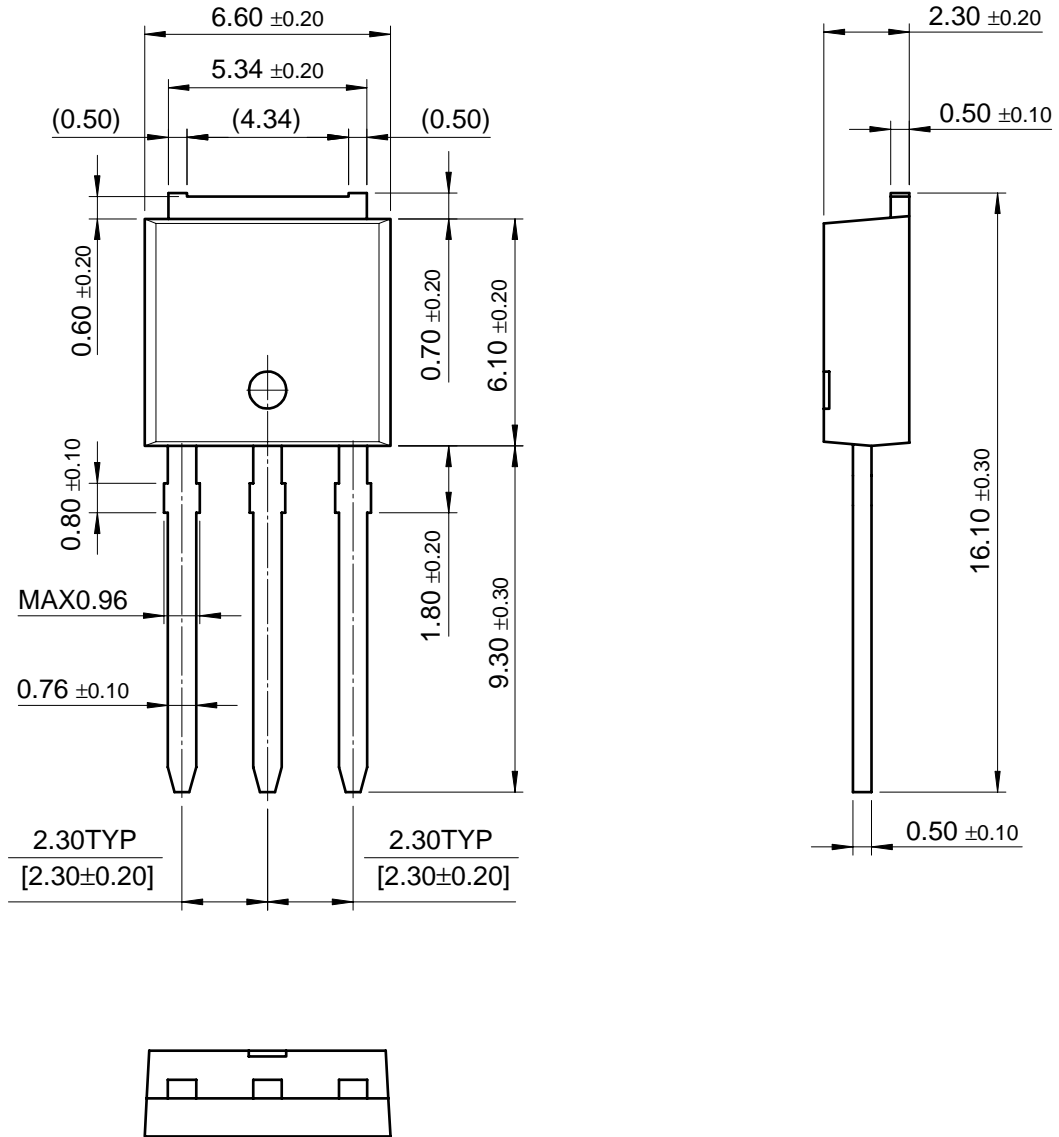


Fig 8. Collector Current Limit vs. Gate - Emitter Voltage Limit

Package Dimension (Continued)

I-PAK



Dimensions in Millimeters

SGR15N40L / SGU15N40L

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SGU15N40L
Discrete, IGBT

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Product	Product status	Pricing*	Inventory check & ordering	Package type	Leads	Packing method
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SGU15N40LTU	Full Production	\$1.88	Purchase	TO-251(IPAK)	3	RAIL
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* Fairchild 1,000 piece Budgetary Pricing

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Application notes

[AN-9006: AN-9006 IGBT Application Note for Camera Strobe](#) (146 K)

Sep 27, 2002

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