

SGR15N40L / SGU15N40L

General Description

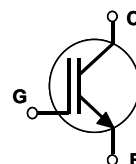
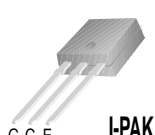
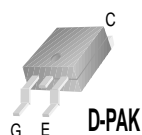
Insulated Gate Bipolar Transistors (IGBTs) with a trench gate structure provide superior conduction and switching performance in comparison with transistors having a planar gate structure. They also have wide noise immunity. These devices are very suitable for strobe applications

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°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 ≥ 15Ω

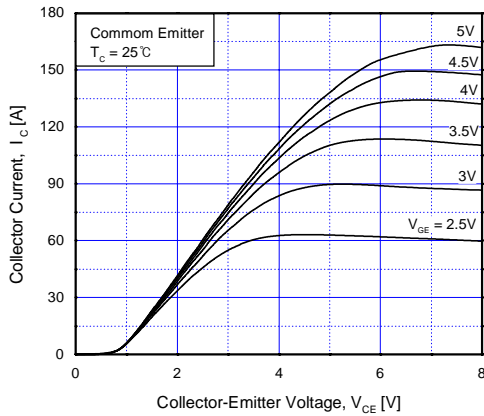


Fig 1. Typical Output Characteristics

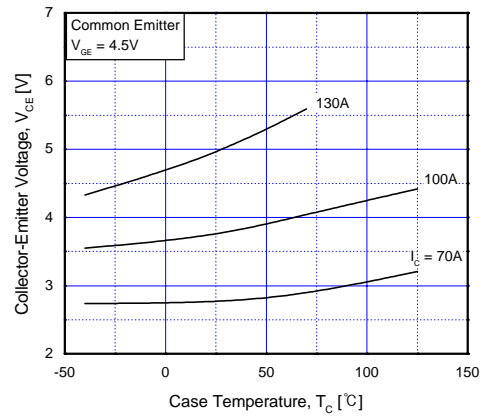


Fig 2. Saturation Voltage vs. Case Temperature at Variant Current Level

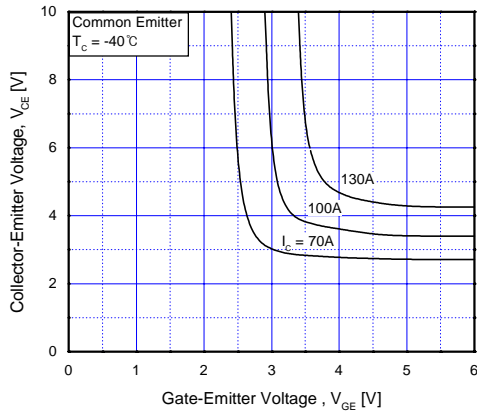


Fig 3. Saturation Voltage vs. V_{GE}

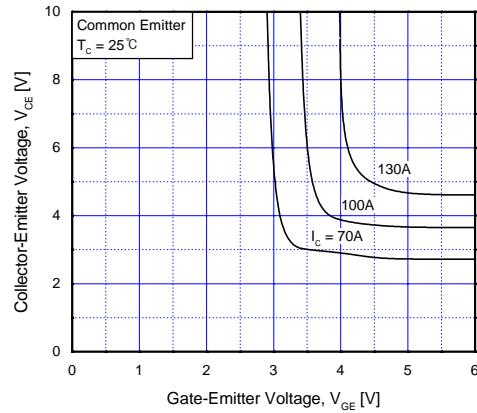


Fig 4. Saturation Voltage vs. V_{GE}

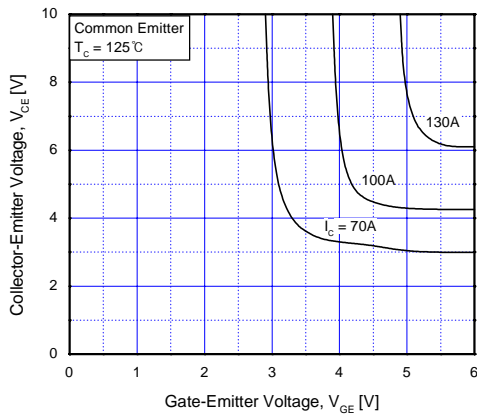


Fig 5. Saturation Voltage vs. V_{GE}

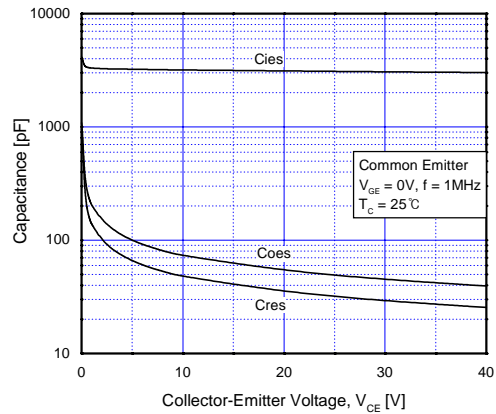


Fig 6. Capacitance Characteristics

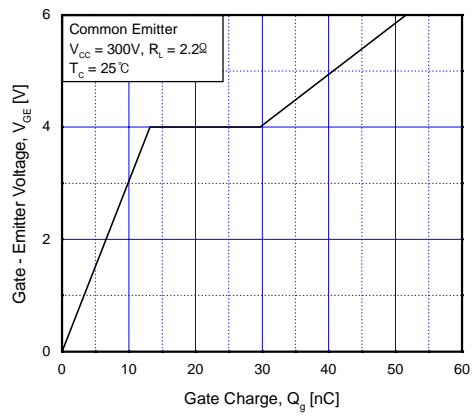


Fig 7. Gate Charge Characteristics

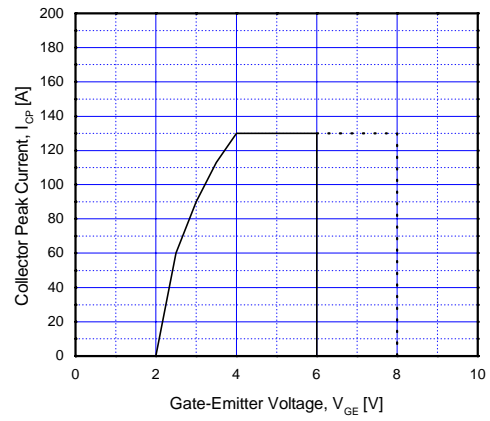


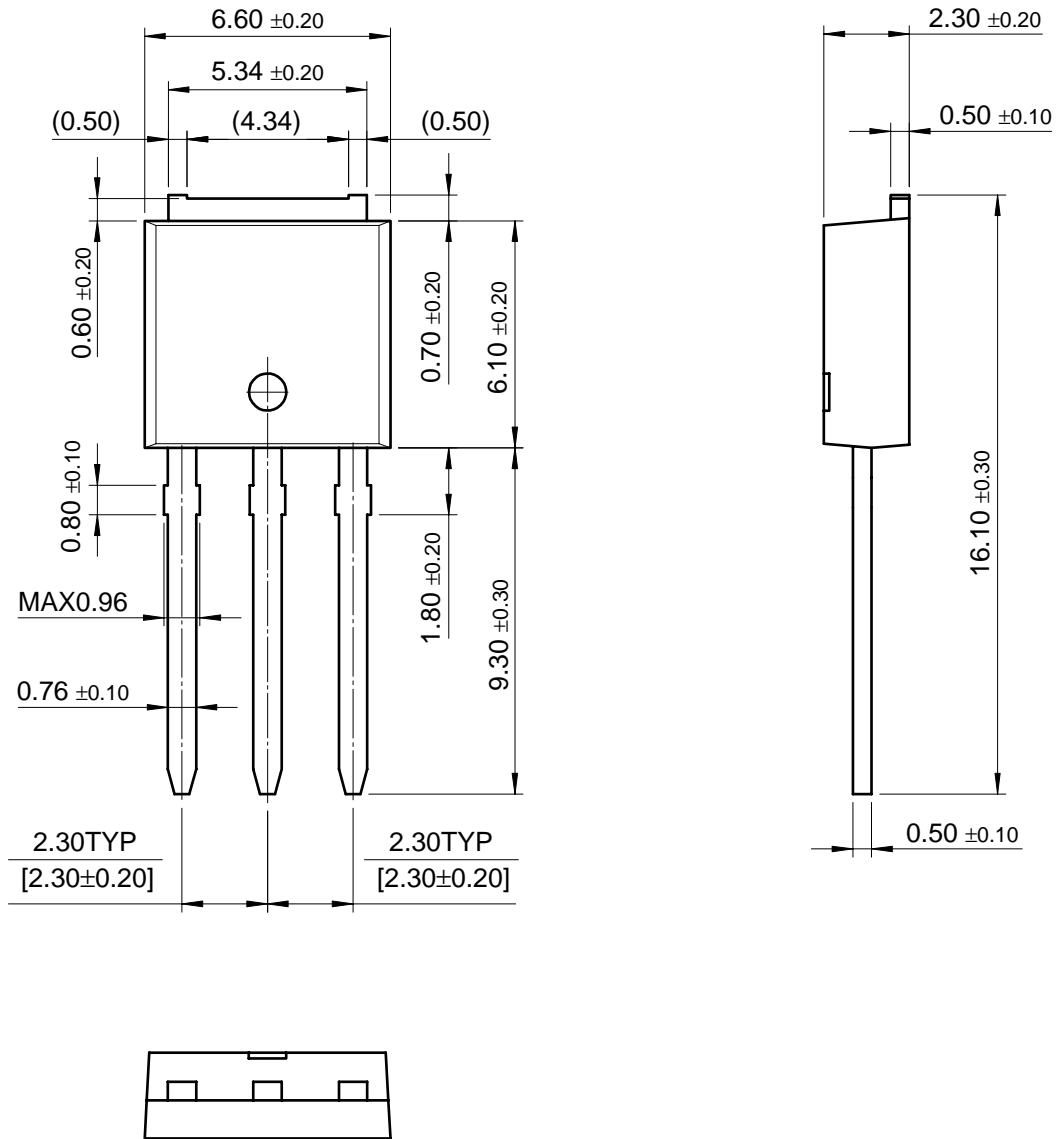
Fig 8. Collector Current Limit vs. Gate - Emitter Voltage Limit

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Package Dimension (Continued)

I-PAK



Dimensions in Millimeters

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| EnSigna TM | LittleFET TM | QS TM | SyncFET TM | |
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|--------------------------|------------------------|---|
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