

SGR20N40L / SGU20N40L

General Description

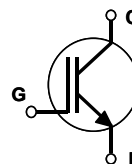
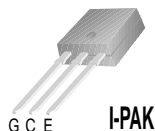
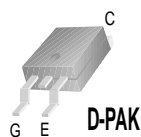
Insulated Gate Bipolar Transistors (IGBTs) with trench gate structure have superior performance in conduction and switching to planar gate structure, and also have wide noise immunity. These devices are well suitable for strobe applications

Features

- High Input Impedance
- High Peak Current Capability (150A)
- Easy Gate Drive

Application

Strobe Flash



Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Description	SGR / SGU20N40L	Units
V _{CES}	Collector - Emitter Voltage	400	V
V _{GES}	Gate - Emitter Voltage	± 6	V
I _{CM (1)}	Pulsed Collector Current	150	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 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 Current	$V_{GE} = V_{GES}, V_{CE} = 0V$	--	--	± 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	$I_C = 150A, V_{GE} = 4.5V$	2.0	4.5	8.0	V
Dynamic Characteristics						
C_{ies}	Input Capacitance	$V_{GE} = 0V, V_{CE} = 30V,$ $f = 1MHz$	--	3800	--	pF
C_{oes}	Output Capacitance		--	50	--	pF
C_{res}	Reverse Transfer Capacitance		--	35	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{CC} = 300V, I_C = 150A,$ $V_{GE} = 4.5V, R_G = 15\Omega^*$ Resistive Load	--	0.2	--	μs
t_r	Rise Time		--	1.7	--	μs
$t_{d(off)}$	Turn-Off Delay Time		--	0.3	0.5	μs
t_f	Fall Time		--	1.5	2.0	μs

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

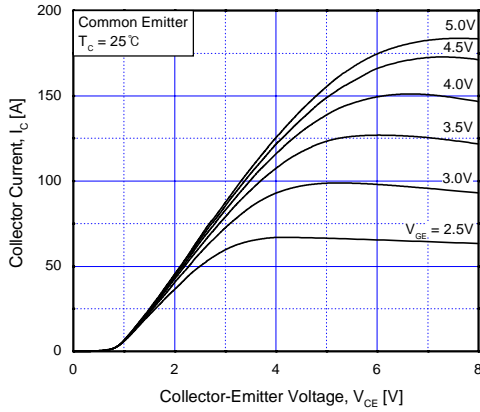


Fig 1. Typical Output Characteristics

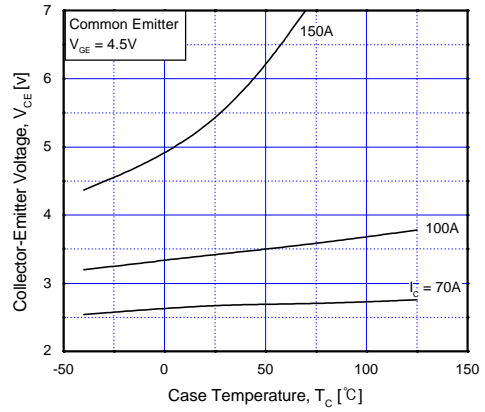


Fig 2. Saturation Voltage vs. Case Temperature at Variant Current Level

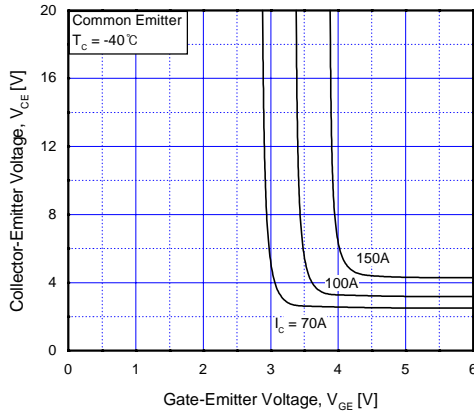


Fig 3. Saturation Voltage vs. V_{GE}

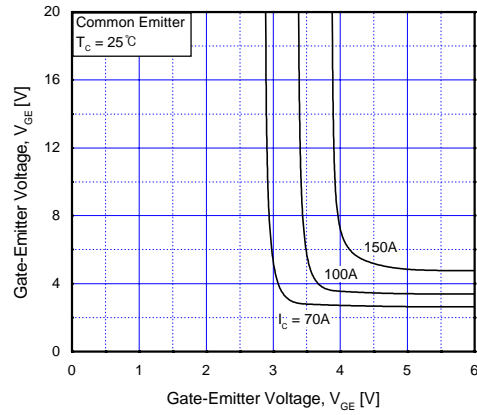


Fig 4. Saturation Voltage vs. V_{GE}

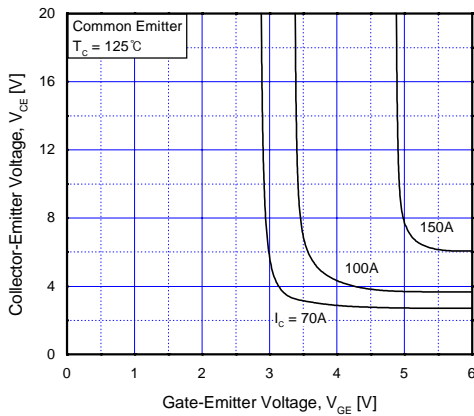


Fig 5. Saturation Voltage vs. V_{GE}

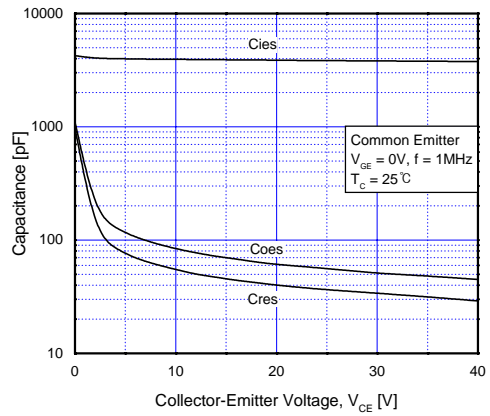


Fig 6. Capacitance Characteristics

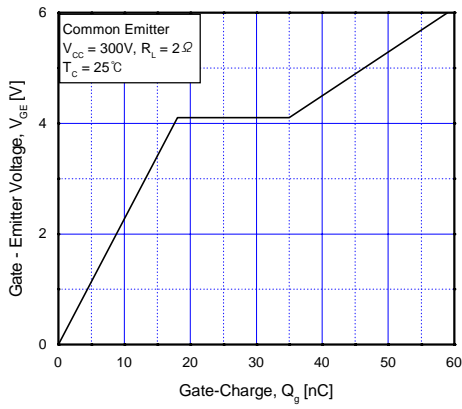


Fig 7. Turn-On Characteristics vs. Gate Resistance

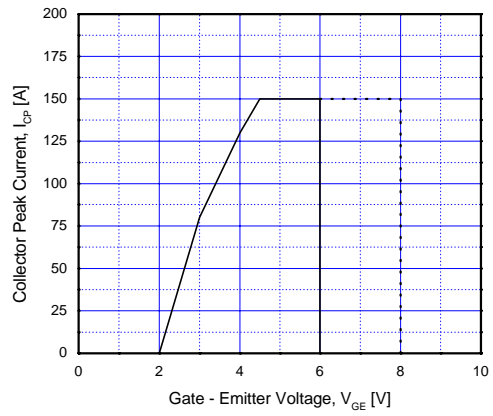


Fig 8. Collector Current Limit vs. Gate - Emitter Voltage Limit

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