

SGP20N60RUF

N-CHANNEL IGBT

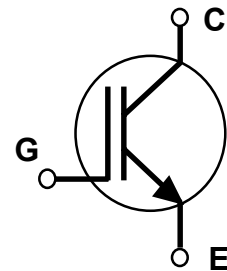
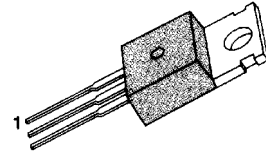
FEATURES

- * Short Circuit rated 10uS @Tc=100℃
- * High Speed Switching
- * Low Saturation Voltage
: $V_{CE(sat)} = 2.0\text{ V @ } I_C=20\text{A}$
- * High Input Impedance

APPLICATIONS

- * AC & DC Motor controls
- * General Purpose Inverters
- * Robotics , Servo Controls
- * Power Supply
- * Lamp Ballast

TO-220



ABSOLUTE MAXIMUM RATINGS

Symbol	Characteristics	Rating	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Collector Current @ Tc = 25℃	32	A
	Collector Current @ Tc = 100℃	20	A
$I_{CM(1)}$	Pulsed Collector Current	60	A
P_C	Maximum Power Dissipation @Tc = 25℃	190	W
	Maximum Power Dissipation @Tc = 100℃	75	W
Tsc	Short Circuit Withstand Time	10	uS
Tj	Operating Junction Temperature	-55 ~ 150	℃
Tstg	Storage Temperature Range	-55 ~ 150	℃
TL	Maximum Lead Temp. For Soldering Purposes, 1/8" from case for 5 seconds	300	℃

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

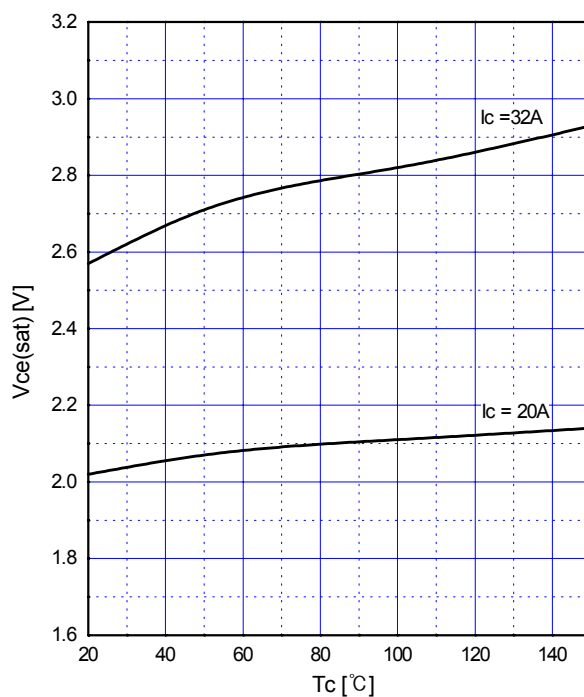
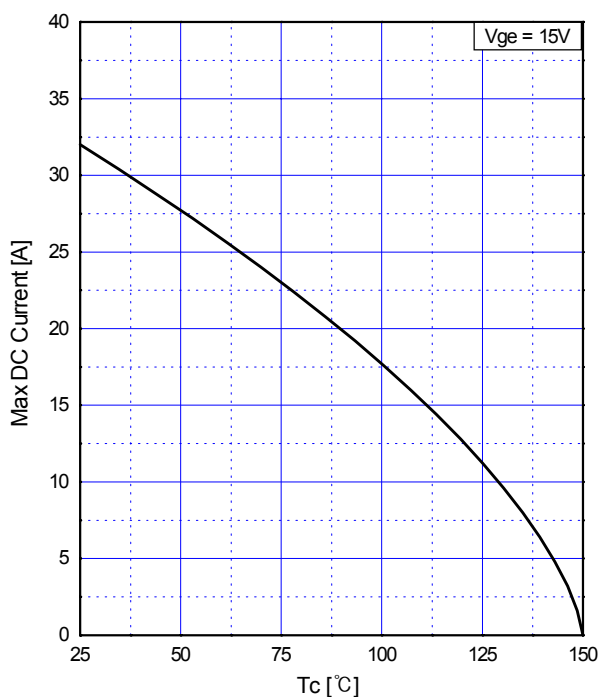
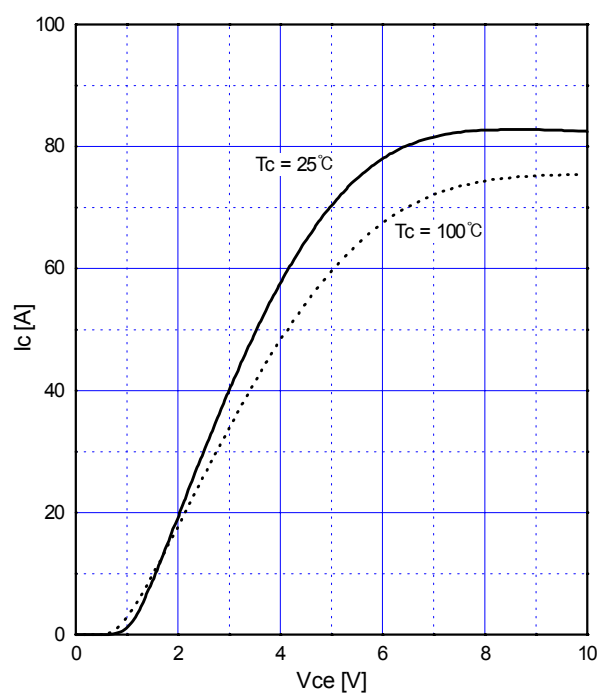
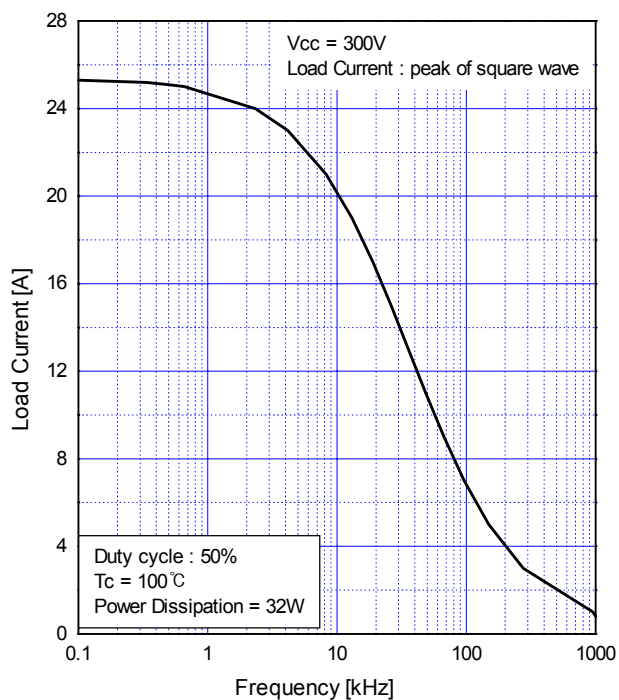
ELECTRICAL CHARACTERISTICS

(T_c=25°C, Unless Otherwise Specified)

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
BV _{CES}	C - E Breakdown Voltage	V _{GE} = 0V, I _C = 250μA	600	-	-	V
ΔV _{CES} / ΔT _J	Temperature Coeff. of Breakdown Voltage	V _{GE} = 0V, I _C = 1mA	-	0.6	-	V/°C
V _{GE(th)}	G - E threshold voltage	I _C = 20mA, V _{CE} = V _{GE}	5.0	6.0	8.0	V
I _{CES}	Collector cutoff Current	V _{CE} = V _{CES} , V _{GE} = 0V	-	-	250	μA
I _{GES}	G - E leakage Current	V _{GE} = V _{GES} , V _{CE} = 0V	-	-	100	nA
V _{CE(sat)}	Collector to Emitter	I _C = 20A, V _{GE} = 15V	-	2.0	2.7	V
	saturation voltage	I _C = 32A, V _{GE} = 15V	-	2.4	-	V
C _{ies}	Input capacitance	V _{GE} = 0V, f = 1MHz V _{CE} = 30V	-	1260	-	pF
C _{oes}	Output capacitance		-	115	-	pF
C _{res}	Reverse transfer capacitance		-	45	-	pF
t _{d(on)}	Turn on delay time	V _{CC} = 300V, I _C = 20A V _{GE} = 15V R _G = 10 Ω Inductive Load	-	18	-	nS
t _r	Turn on rise time		-	22	-	nS
t _{d(off)}	Turn off delay time		-	65	95	nS
t _f	Turn off fall time		-	84	168	nS
E _{on}	Turn on Switching Loss		-	0.1	-	mJ
E _{off}	Turn off Switching Loss		-	0.5	-	mJ
E _{ts}	Total Switching Loss		-	0.6	0.7	mJ
T _{sc}	Short Circuit withstand Time	V _{CC} = 300V, V _{GE} = 15V @T _c = 100°C	10	-	-	μS
Q _g	Total Gate Charge	V _{CC} = 300V V _{GE} = 15V I _C = 20A	-	83	124	nC
Q _{ge}	Gate-Emitter Charge		-	20	30	nC
Q _{gc}	Gate-Collector Charge		-	32	48	nC

THERMAL RESISTANCE

Symbol	Characteristics	Min	Typ	Max	Units
$R_{\theta JC}$	Junction-to-Case	-	-	0.64	°C/W
$R_{\theta JA}$	Junction-to-Ambient	-	-	80	°C/W
$R_{\theta CS}$	Case-to-Sink	-	0.5	-	°C/W



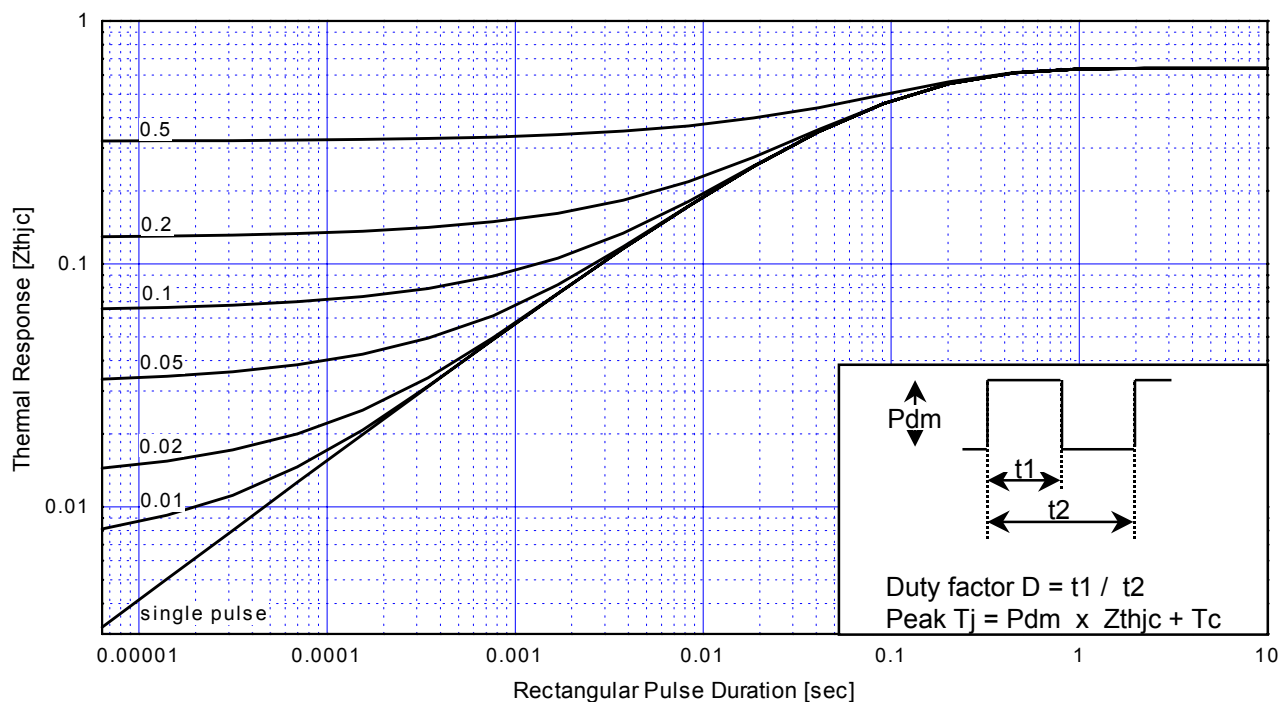
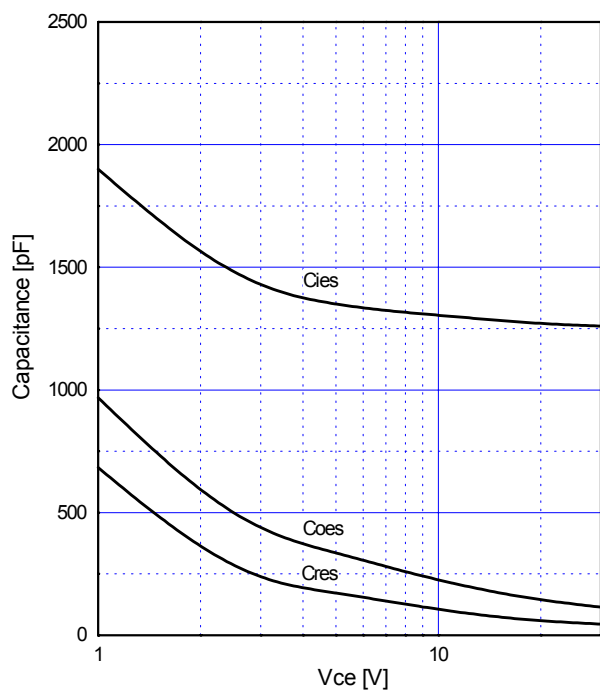
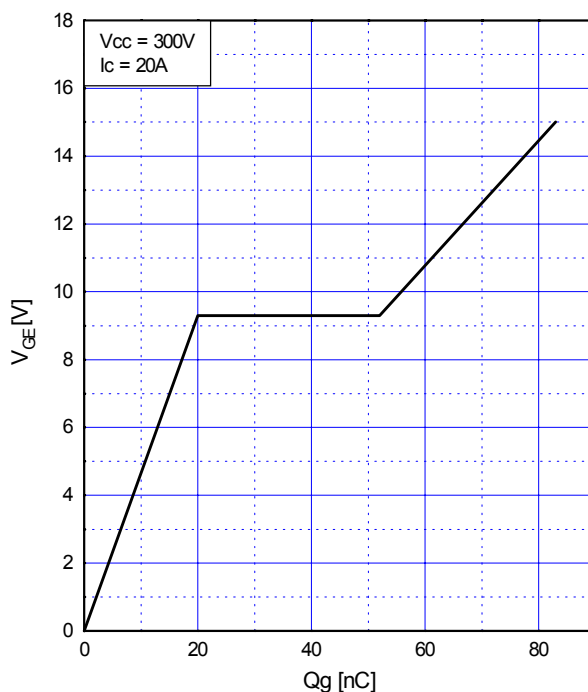


Fig.5 Maximum Effective Transient Thermal Impedance, Junction to Case

Fig.6 Typical Capacitance vs.
Collector to Emitter VoltageFig.7 Typical Gate Charge vs.
Gate to Emitter Voltage

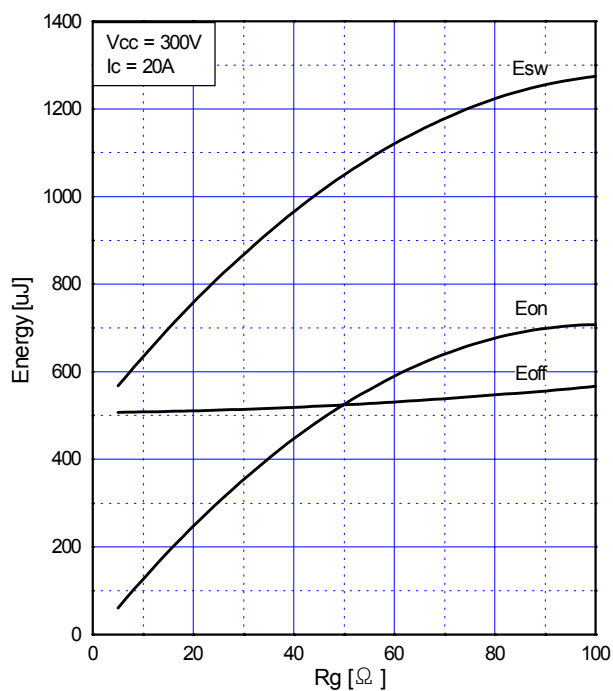


Fig.8 Typical Switching Loss vs. Gate Resistance

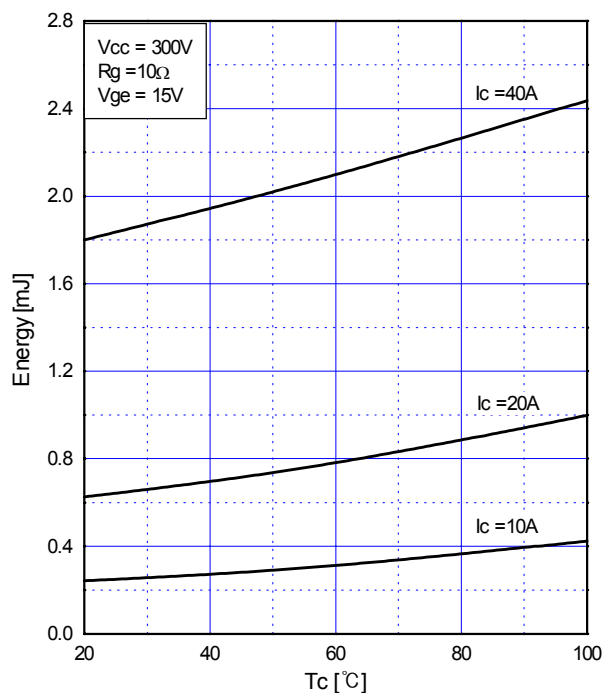


Fig.9 Typical Switching Loss vs. Case Temperature

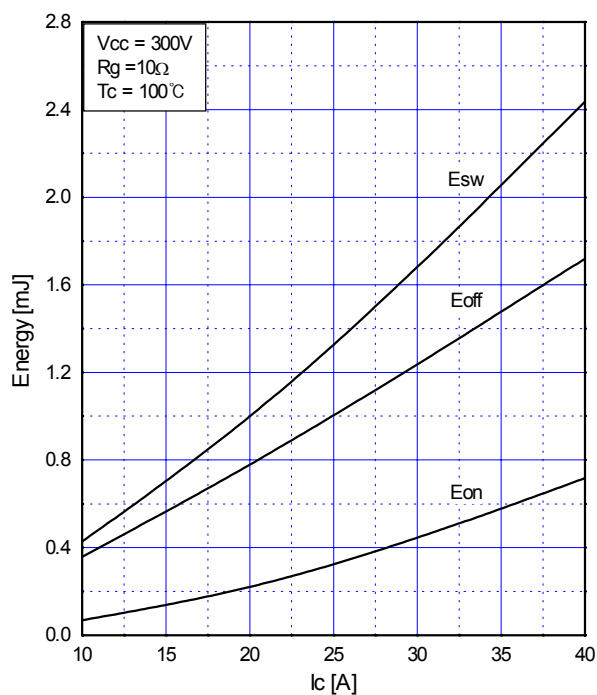


Fig.10 Typical Switching loss vs. Collector to Emitter Current

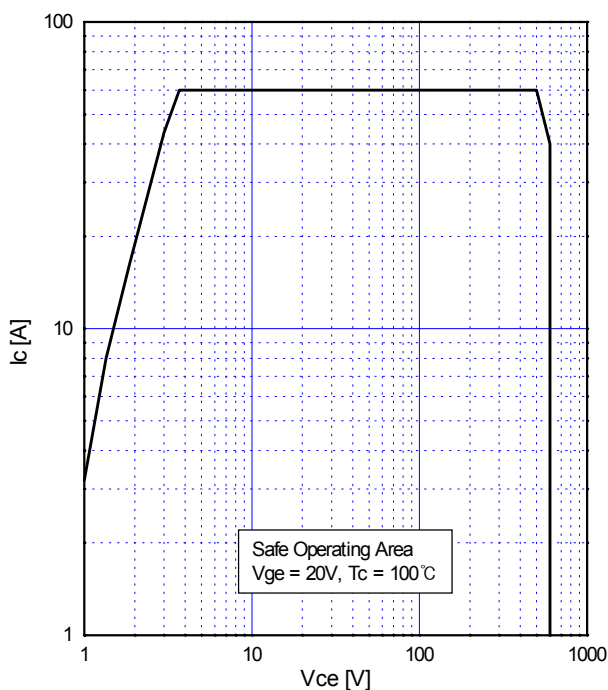


Fig.11 Turn-off SOA