



**General
Semiconductor
Industries, Inc.**

SQUARE D COMPANY

**GSRU15030
GSRU15030A
GSRU15035
GSRU15035A
GSRU15040
GSRU15040A**

T-33 -15

HIGH POWER NPN *Switch Plus[®] III* TRANSISTORS

"A" Suffix units have 100° C specifications guaranteed.

The GSRU series of NPN silicon transistors is designed for high speed switching systems. This unique series features General Semiconductor Industries' C²R[®] manufacturing process to provide surface stabilization for high voltage operation and to enhance long term reliability.

- High Speed
- Rugged
- Off-line Power Supplies
- Switching Amplifiers
- Inverters/Converters
- Switching Regulators

MAXIMUM RATINGS (T _c = 25° C unless otherwise noted.)					
SYMBOL	DESCRIPTION	GSRU15030, A	GSRU15035, A	GSRU15040, A	UNIT
V _{CB0}	Collector-Base Voltage	400	450	500	Volts
V _{CE0}	Collector-Emitter Voltage	300	350	400	Volts
V _{EB0}	Emitter-Base Voltage	8.0			Volts
I _C	Collector Current—Continuous	20			Amps
I _{CM}					
I _B	Base Current—Continuous	10			Amps
P _D	Total Power Dissipation @ T _c = 25° C	175			Watts
T _{J(oper)} T _{stg}	Operating and Storage Junction Temperature Range	-65 to +200			° C

ELECTRICAL CHARACTERISTICS (Applies to all types unless otherwise noted.)

				T _C = 25°C		T _C = 100°C, A only		
SYMBOL	CONDITIONS		PART NO.	MIN.	MAX.	MIN.	MAX.	UNIT
OFF-STATE								
V _{CB0} V _{CES} V _{CEX}	I _C = 1.0mA V _{EB} = 1.5V (V _{CEX} Only)		GSRU15030, A GSRU15035, A GSRU15040, A	400 450 500				Volts
V _{CE0}	I _C = 50mA		GSRU15030, A GSRU15035, A GSRU15040, A	300 350 400				Volts
V _{EB0}	I _E = 1.0mA			8				Volts
I _{CEX}	V _{CE} = 80% of Rated V _{CB0} , V _{EB} = 1.5V				10		100	μA
I _{EB0}	V _{EB} = 5.0V				10			μA
ON-STATE								
h _{FE}	V _{CE} = 5.0V, I _C = 15A†			10				
V _{CE(sat)}	I _C = 15A, I _B = 3A†				1.0		1.0	Volts
V _{BE(sat)}	I _C = 15A, I _B = 3A†				1.5			Volts
DYNAMIC								
f _T	V _{CE} = 10V, I _C = 1A,† f = 10MHz			15	50			MHz
C _{obo}	V _{CB} = 10V, f = 1MHz			200	500			pF
t _d	Resistive Load I _C = 15A I _{B1} = I _{B2} = 3A t _p = 50μsec V _{CC} = 250V				0.07			μs
t _r					0.40			μs
t _s					2.20			μs
t _f					0.20			μs
t _{sd} (t _r)					1.50		2.00	μs
t _{sv}	Inductive Load I _C = 15A I _{B1} = I _{B2} = 3A t _p = 50 μs V _{CLAMP} = 250V L = 100μH				2.40		3.00	μs
t _{rv}					0.35		0.40	μs
t _{fi}					0.12		0.20	μs
t _c					0.40		0.60	μs

THERMAL

R _{θJC}	V _{CE} = 10V, I _C = 10A			1.0				° C/W
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†Pulse measurement conditions Length 300μsec, Duty Cycle 2% (measured using separate current carrying and voltage sensing leads)



**TO-204AA
(TO-3)**

NPN

**400,
350,
300V
V_{CE0}**

**20 A
I_C(MAX.)**

**15 A
SWITCHING**

**35ns
t_c
TYPICAL**

Switch Plus[®] III



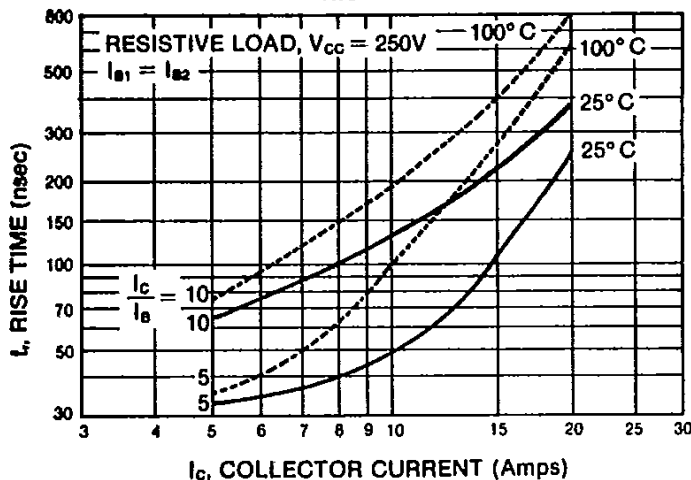
General Semiconductor Industries, Inc.

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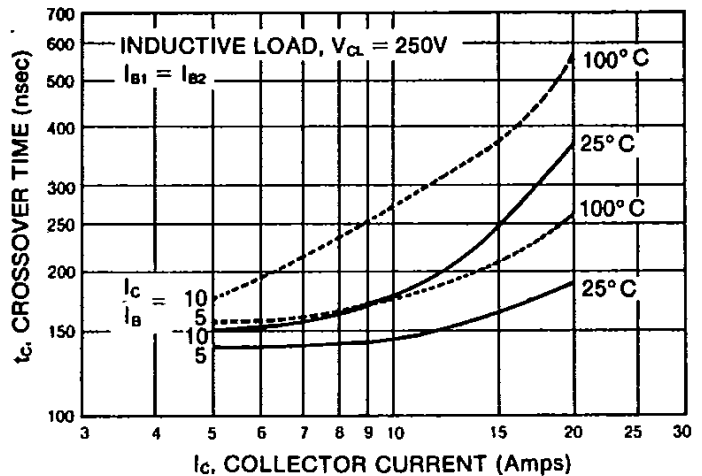
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TYPICAL SWITCHING CHARACTERISTICS & RATINGS

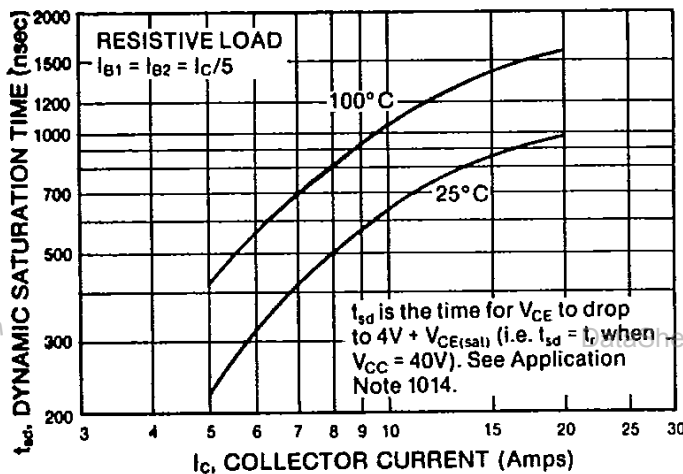
RISE TIME



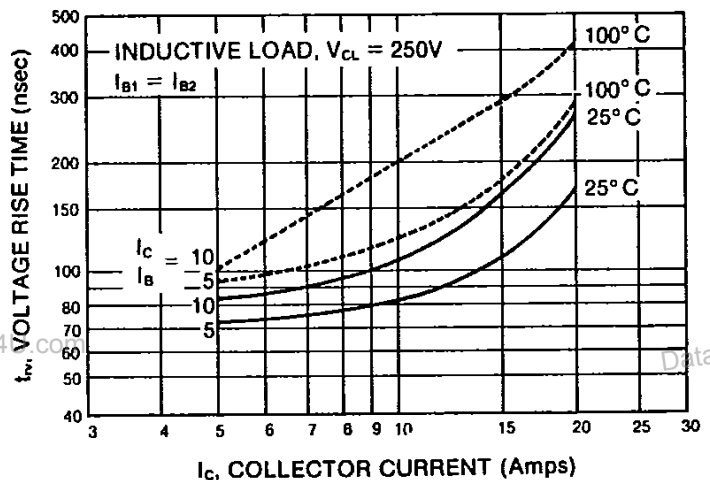
CROSSOVER TIME



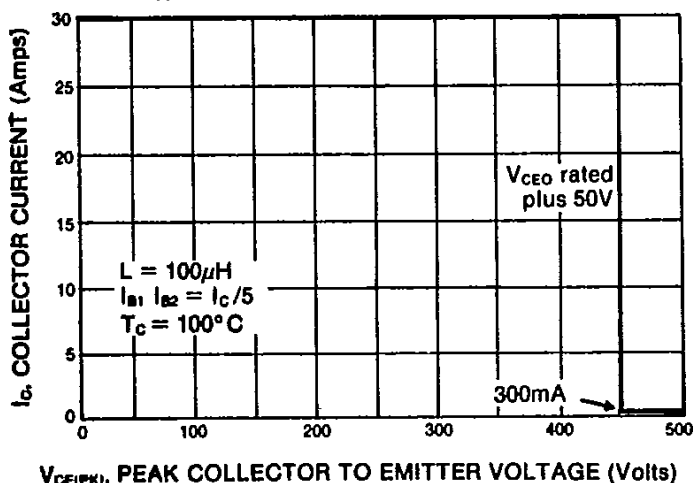
DYNAMIC SATURATION TIME



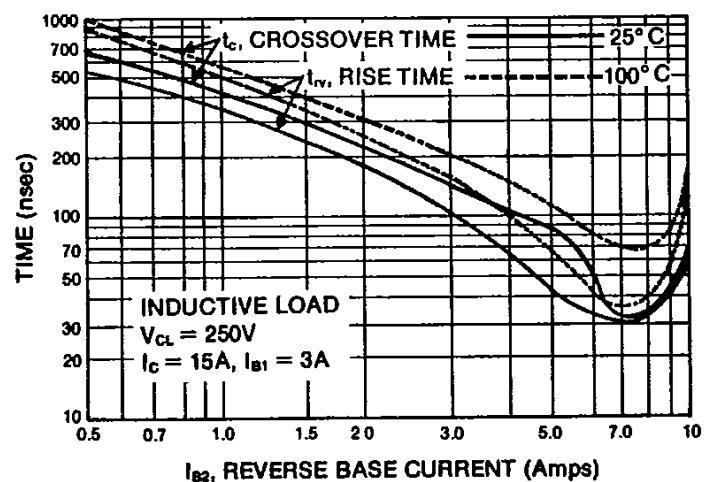
TURN-OFF VOLTAGE RISE TIME



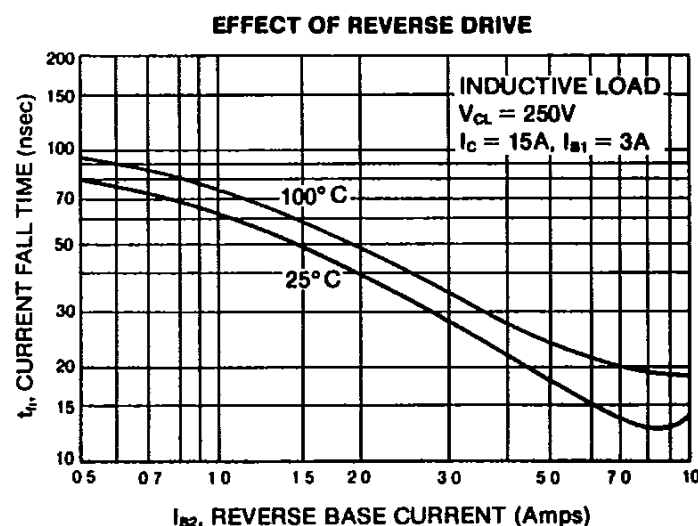
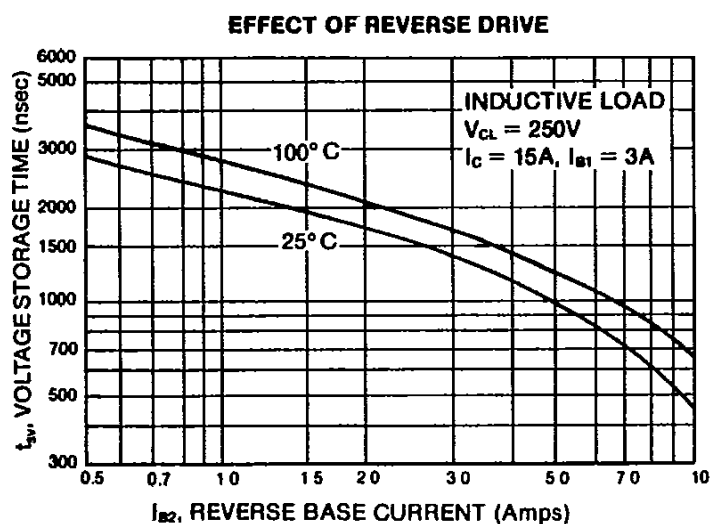
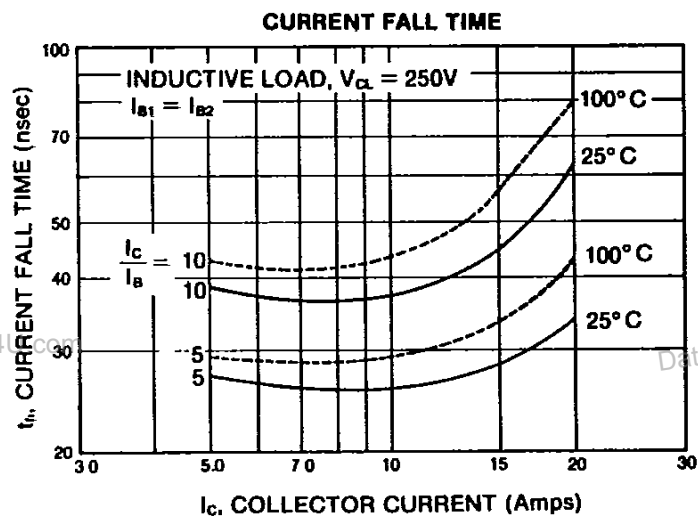
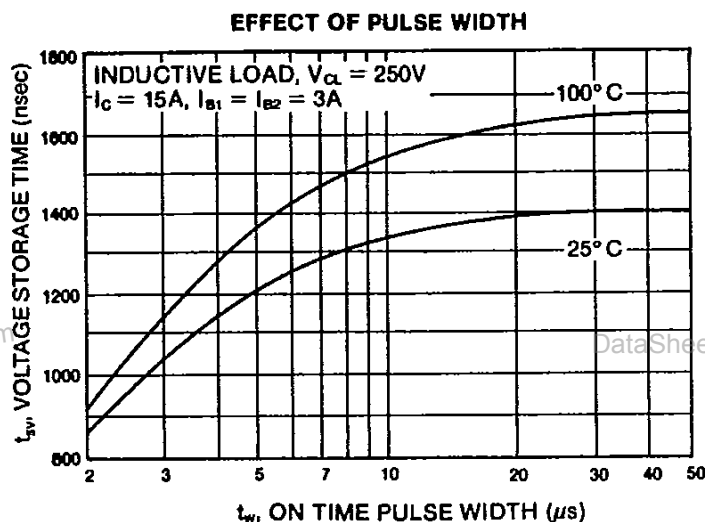
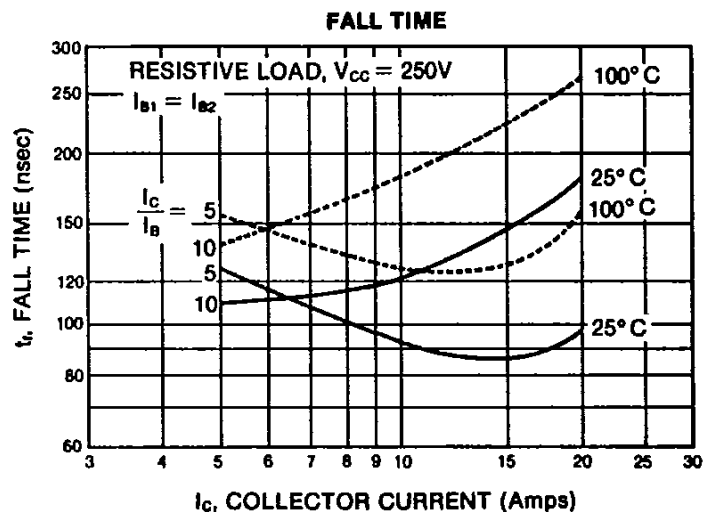
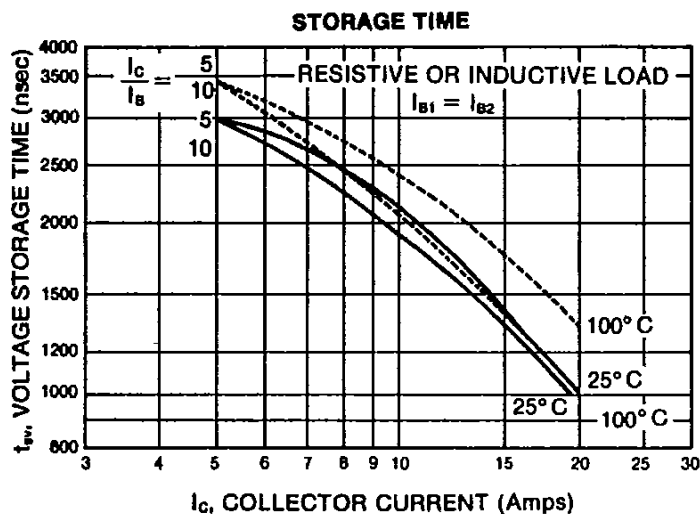
REVERSE BIAS SAFE OPERATING AREA



EFFECT OF REVERSE DRIVE

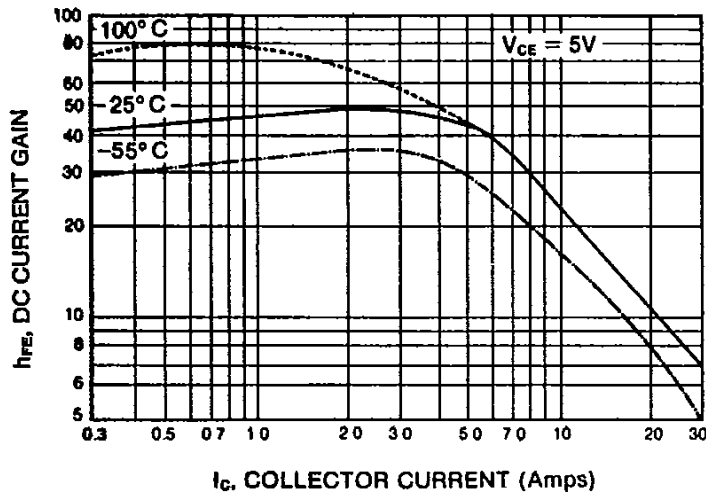


TURN-OFF CHARACTERISTICS

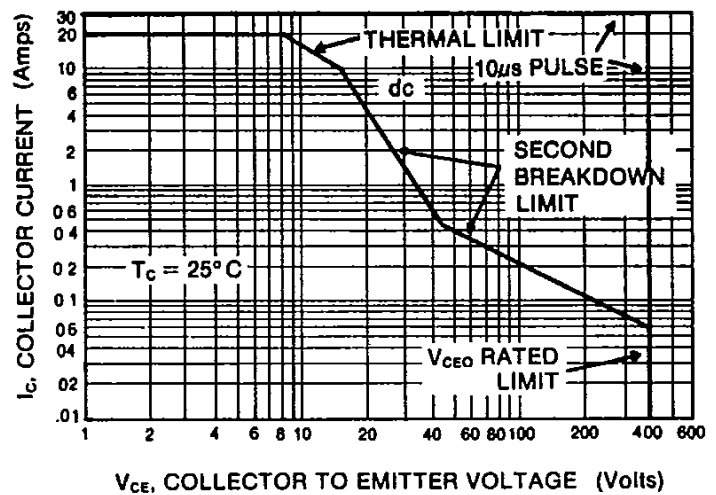


TYPICAL DC CHARACTERISTICS & RATINGS

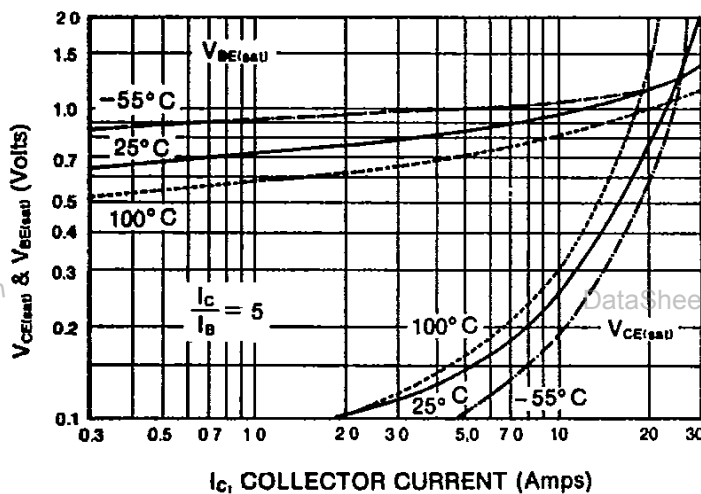
DC CURRENT GAIN



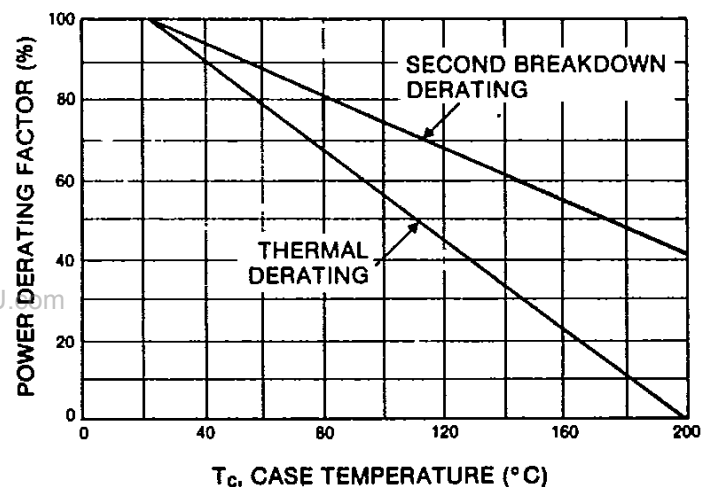
FORWARD BIASED SAFE OPERATING AREA



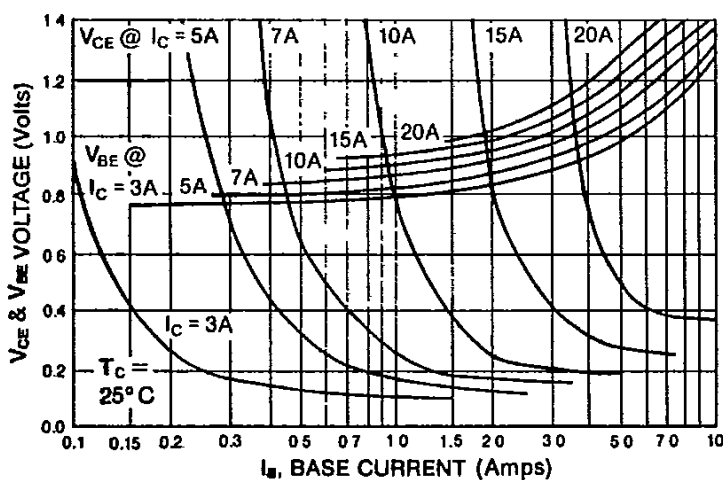
SATURATION VOLTAGE



POWER DERATING



SATURATION REGION



PACKAGE OUTLINE

