

These are epitaxial planar NPN silicon transistors.

Features

- available in a SST3 (SST, SOT-23) package, see page 300
- collector-to-emitter breakdown voltage, $V_{CEO} = 40 \text{ V}$ (min) at $I_C = 1.0 \text{ mA}$
- excellent gain linearity from $100 \mu\text{A}$ to 100 mA
- low noise, $NF = 2.0 \text{ dB}$ (max) at $I_C = 100 \mu\text{A}$, $f = 10 \text{ Hz}$ to 15.7 kHz
- high transition frequency, typically, $f_T = 300 \text{ MHz}$ (min) at $I_C = 10 \text{ mA}$

Device types

Package style	Part number	Part marking
SST3 (SOT-23)	SST6838	RBR
	BC847B	G1F
	BC848B BC848C	G1K G1L

Applications

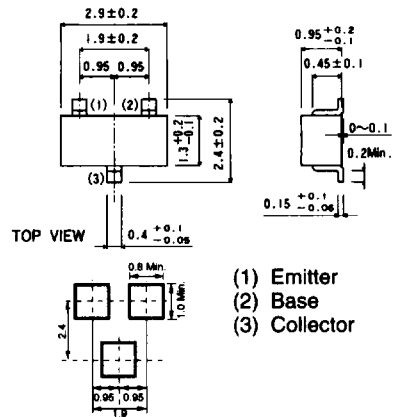
- low noise, high gain, general purpose transistor

Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	V_{CBO}	70	V	
Collector-to-emitter voltage	V_{CEO}	40	V	
Emitter-to-base voltage	V_{EBO}	6	V	
Collector current	I_C	200	mA	Direct current (DC)
Power dissipation	P_C	200	mW	For derating, see derating curve following
Junction temperature	T_j	-55 ~ +150	$^\circ\text{C}$	

Dimensions (Units : mm)

SST3



Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	BV_{CBO}	70			V	$I_C = 50 \mu\text{A}$
Collector-to-emitter breakdown voltage	BV_{CEO}	40			V	$I_C = 1.0 \text{ mA}$
Emitter-to-base breakdown voltage	BV_{EBO}	6			V	$I_E = 10 \mu\text{A}$
Collector cutoff current	I_{CBO}			10	nA	$V_{CB} = 60 \text{ V}$
Emitter cutoff current	I_{EBO}			10	nA	$V_{EB} = 5 \text{ V}$
DC current gain	h_{FE}	80	175	500		$I_C = 50 \mu\text{A}, V_{CE} = 5.0 \text{ V}$
		80	175	500		$I_C = 100 \text{ mA}, V_{CE} = 5.0 \text{ V}$
		100	200	600		$I_C = 500 \text{ mA}, V_{CE} = 5.0 \text{ V}$
		100	300	1000		$I_C = 1 \text{ mA}, V_{CE} = 5.0 \text{ V}$
		100	300	1000		$I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}$
		100	250	800		$I_C = 50 \text{ mA}, V_{CE} = 5.0 \text{ V}$
Collector-to-emitter saturation voltage	$V_{CE(sat)}$		0.08	0.15	V	$I_C/I_B = 10 \text{ mA}/1.0 \text{ mA}$
			0.18	0.30		$I_C/I_B = 50 \text{ mA}/5.0 \text{ mA}$
Base-to-emitter saturation voltage	$V_{BE(sat)}$		0.70	0.85	V	$I_C/I_B = 10 \text{ mA}/1.0 \text{ mA}$
				1.00		$I_C/I_B = 50 \text{ mA}/5.0 \text{ mA}$
AC current gain	h_{fe}	200	400	950		$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V}, f = 1 \text{ kHz}$
Collector output capacitance	C_{ob}		2.5	3	pF	$V_{CB} = 5.0 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Collector input capacitance	C_{ib}		8.5	10	pF	$V_{EB} = 0.5 \text{ V}, I_C = 0, f = 1 \text{ MHz}$
Transition frequency	f_T	300			MHz	$I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}, f = 100 \text{ MHz}$
Noise figure	NF		5	7	dB	$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}, R_S = 10 \text{ k}\Omega, f = 10 \text{ Hz}, \text{ bandwidth} = 1 \text{ Hz}$
			0.8	2		$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}, R_S = 10 \text{ k}\Omega, f = 1 \text{ kHz}, \text{ bandwidth} = 1 \text{ Hz}$
			0.8	2		$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}, R_S = 10 \text{ k}\Omega, f = 10 \text{ kHz}, \text{ bandwidth} = 1 \text{ Hz}$
			1	3		$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}, R_S = 10 \text{ k}\Omega, f = 10 \text{ Hz to } 15.7 \text{ kHz}$

C-22 Transistors (US/European) NPN

Electrical characteristic curves

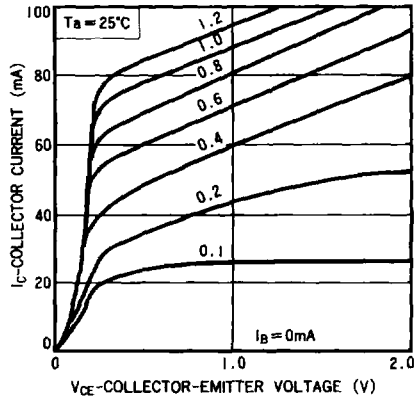


Figure 1

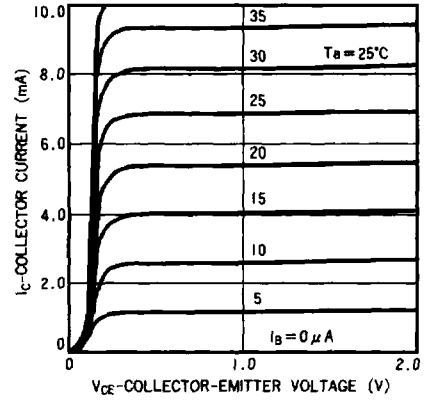


Figure 2

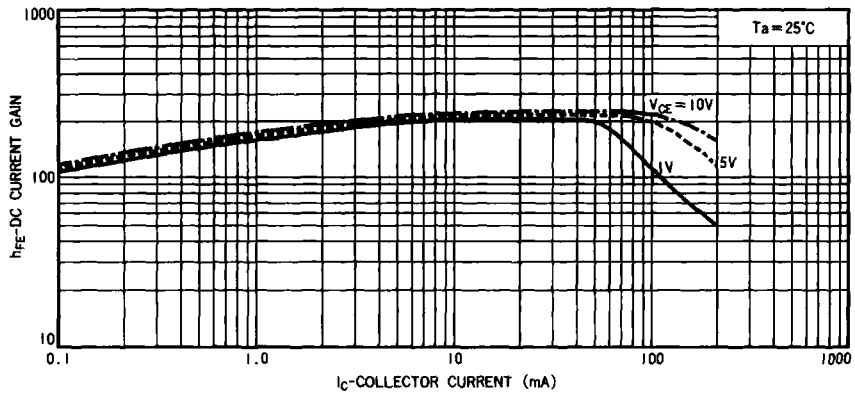


Figure 3

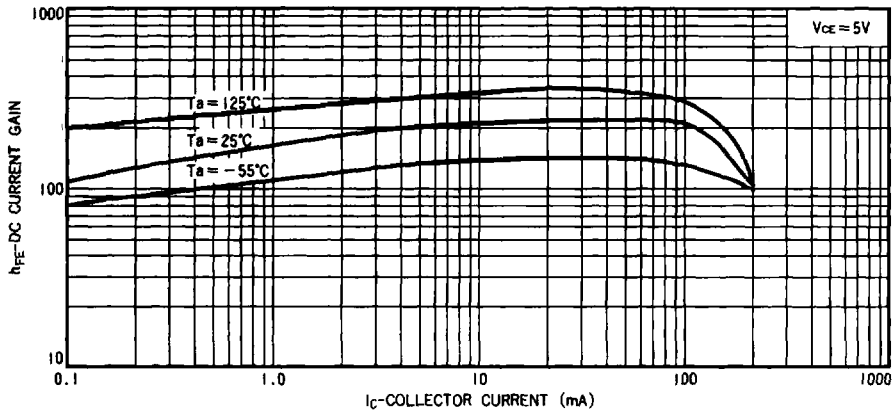


Figure 4

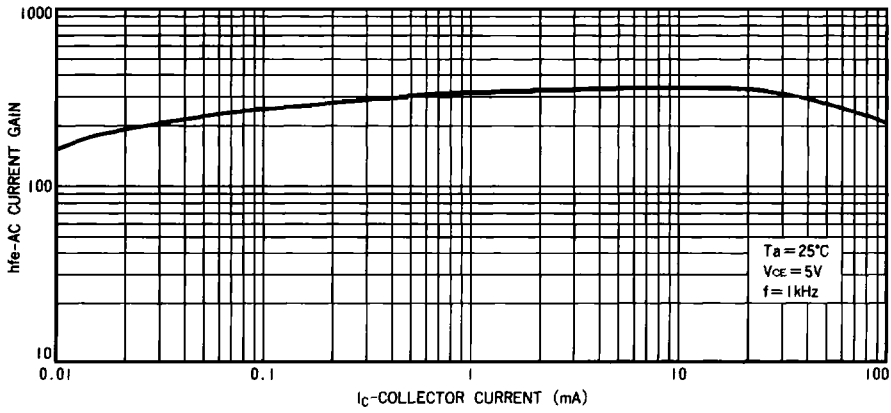


Figure 5

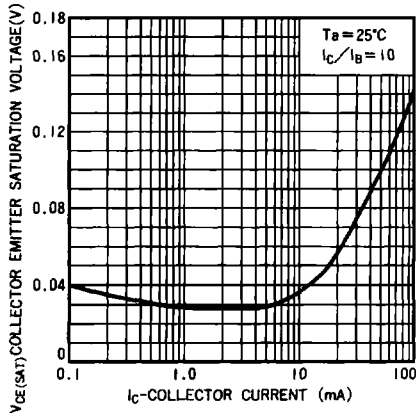


Figure 6

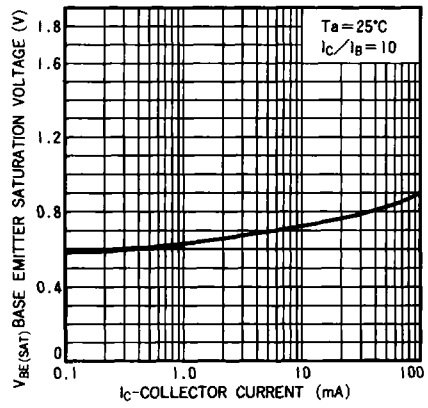


Figure 7

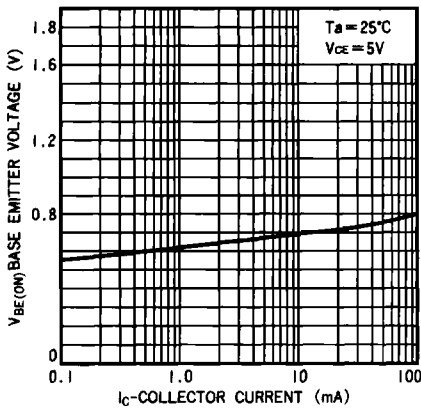


Figure 8

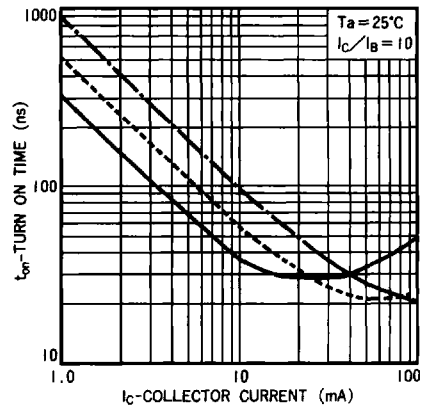


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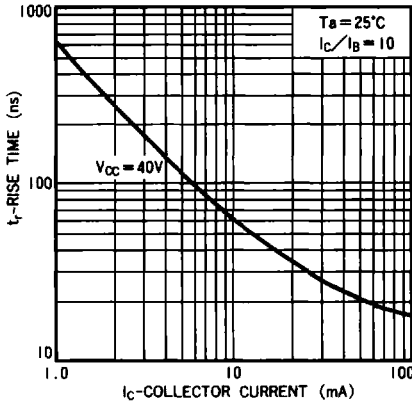


Figure 10

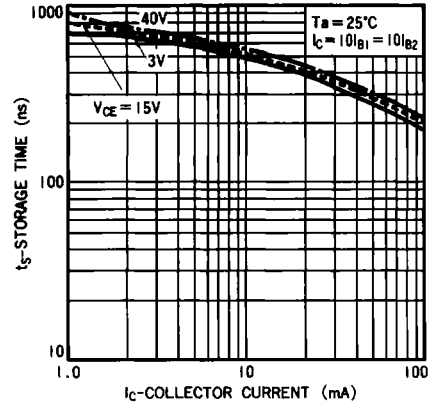


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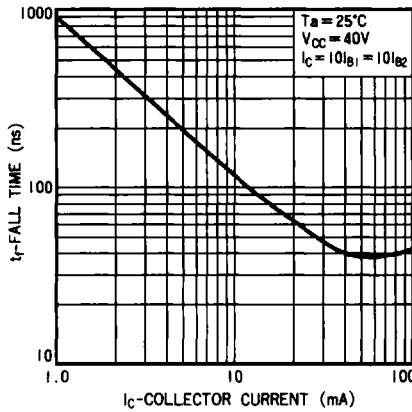


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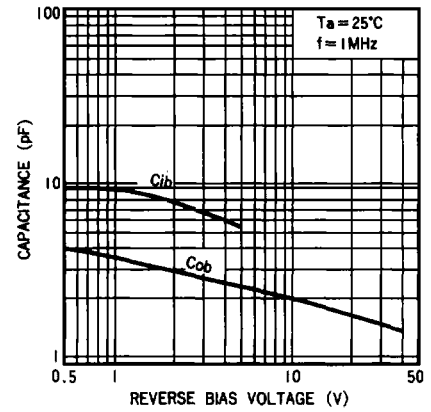


Figure 13

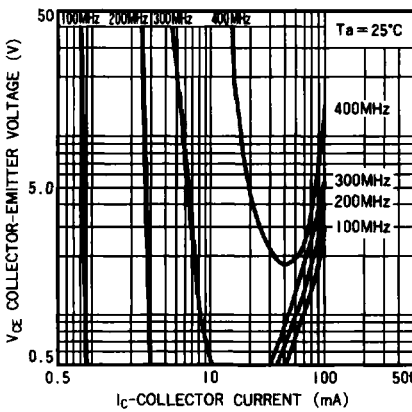


Figure 14

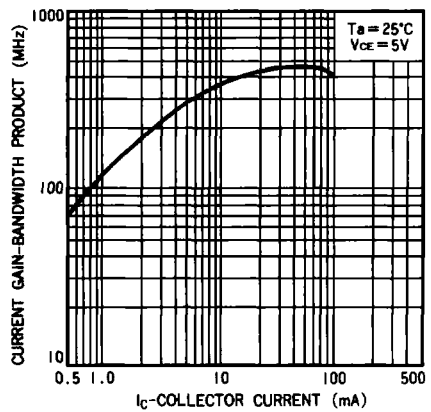


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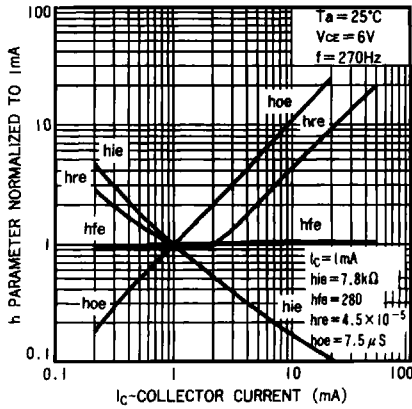


Figure 16

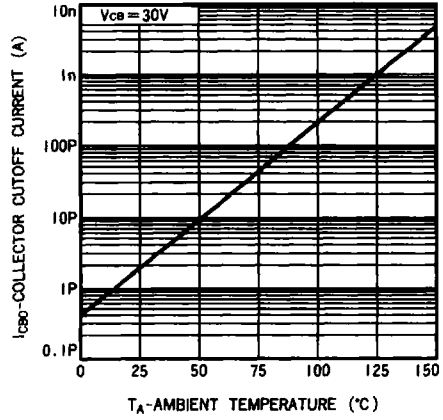


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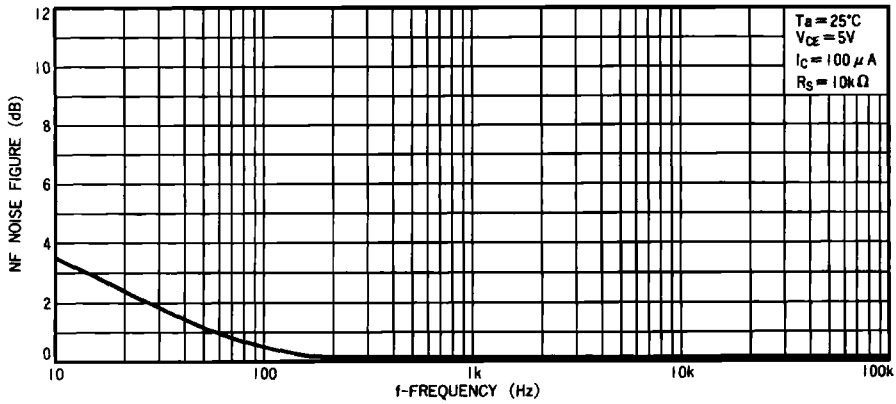


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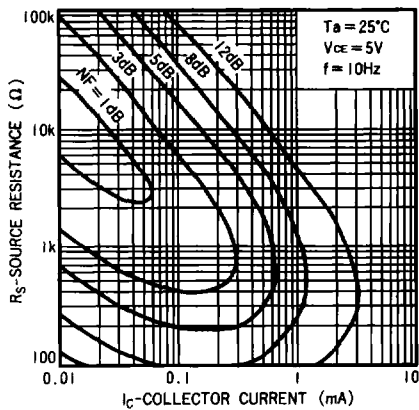


Figure 19

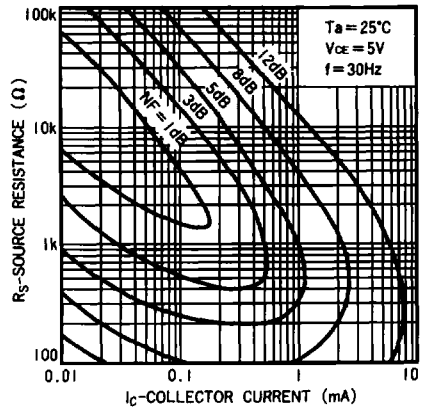


Figure 20

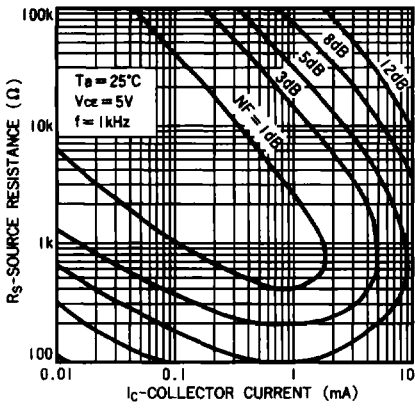


Figure 21

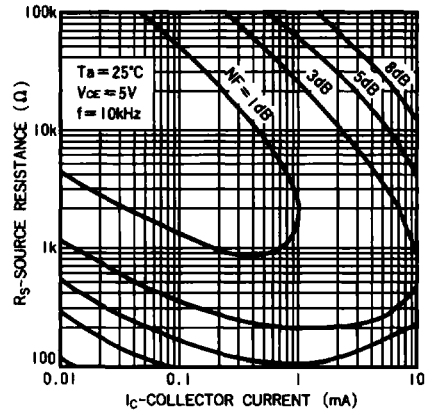


Figure 22

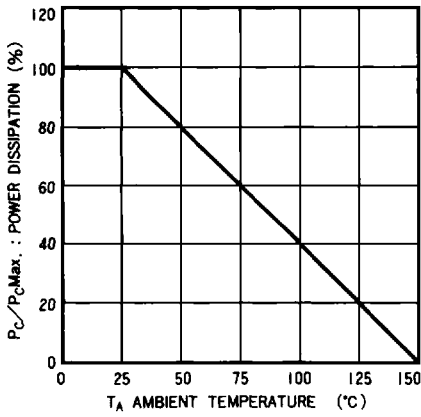


Figure 23