Die no. A-32

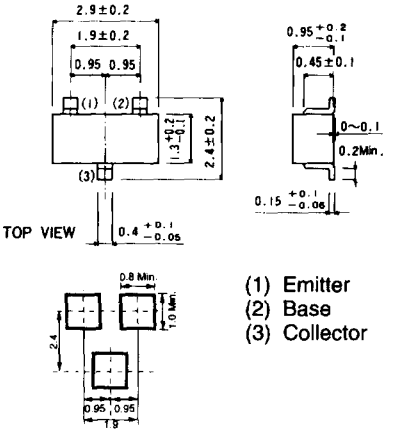
PNP small signal transistor

Features

- available in an SST3 (SST, SOT-23) package, see page 300
- collector-to-emitter breakdown voltage, BV_{CEO} = 40 V (min) at I_C = 1.0 mA
- excellent gain linearity from 100 µA to 100 mA
- high transition frequency, f_T = 250 MHz (min) at I_C = 10 mA
- low noise, NF = 3.0 dB max at I_C = 100 µA, f = 10 Hz to 15.7 kHz

Dimensions (Units : mm)

SST3



(1) Emitter
(2) Base
(3) Collector

Device types

Package	Part number	Part marking
SST3 (SOT-23)	SST6839	RFQ
	BC857B	G3F
	BC858B	G3K

Applications

- low noise, high gain, general purpose transistor

Absolute maximum ratings (T_a = 25°C)

Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	V_{CBO}	50	V	
Collector-to-emitter voltage	V_{CEO}	40	V	
Emitter-to-base voltage	V_{EBO}	5	V	
Collector current	I_C	200	mA	DC
Power dissipation	P_C	200	mW	For derating, see derating curve following
Junction temperature	T_j	−55 ~ +150	°C	

Electrical characteristics (unless otherwise noted, T_a = 25°C)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	BV_{CBO}	50			V	I_C = 50 µA
Collector-to-emitter breakdown voltage	BV_{CEO}	40			V	I_C = 1.0 mA
Emitter-to-base breakdown voltage	BV_{EBO}	5			V	I_E = 10 µA
Collector cutoff current	I_{CBO}			10	nA	V_{CB} = 35 V
Emitter cutoff current	I_{EBO}			50	nA	V_{EB} = 5 V
DC current gain	h_{FE}	80	175	400		I_C = 50 µA, V_{CE} = 5.0 V
		80	175	400		I_C = 100 µA, V_{CE} = 5.0 V
		100	200	500		I_C = 500 µA, V_{CE} = 5.0 V
		100	300	800		I_C = 1 mA, V_{CE} = 5.0 V
		100	300	800		I_C = 10 mA, V_{CE} = 5.0 V
		100	250	600		I_C = 50 mA, V_{CE} = 5.0 V
Collector-to-emitter saturation voltage	$V_{CE(sat)}$		0.08	0.15	V	I_C/I_B = 10 mA/1.0 mA
			0.18	0.30		I_C/I_B = 50 mA/5.0 mA
Base-to-emitter saturation voltage	$V_{BE(sat)}$		0.70	0.85	V	I_C/I_B = 10 mA/1.0 mA
				1.00		I_C/I_B = 50 mA/5.0 mA
AC current gain	h_{fe}	200	300	750		I_C = 1.0 mA, V_{CE} = 5.0 V, f = 1 kHz
Collector output capacitance	C_{ob}		4.0	5.0	pF	V_{CB} = 10 V, I_E = 0, f = 1 MHz
Collector input capacitance	C_{ib}		16	20	pF	V_{EB} = 0.5 V, I_C = 0, f = 1 MHz
Transition frequency	f_T	250			MHz	V_{EB} = 0.5 V, I_C = 10 mA, f = 100 MHz
Noise figure	NF		5	7	dB	I_C = 100 µA, V_{CE} = 5.0 V, R_S = 10 kΩ, f = 10 Hz, bandwidth = 1 Hz
			0.8	2		I_C = 100 µA, V_{CE} = 5.0 V, R_S = 10 kΩ, f = 1 kHz, bandwidth = 1 Hz
			0.8	2		I_C = 100 µA, V_{CE} = 5.0 V, R_S = 10 kΩ, f = 10 kHz, bandwidth = 1 Hz
			1	3		I_C = 100 µA, V_{CE} = 5.0 V, R_S = 10 kΩ, f = 10 Hz to 15.7 kHz

Note: Minus sign for PNP transistor is omitted

Electrical characteristic curves

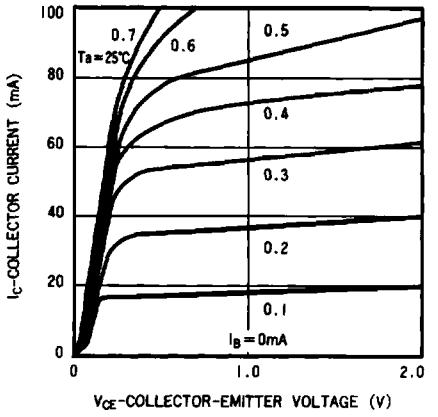


Figure 1

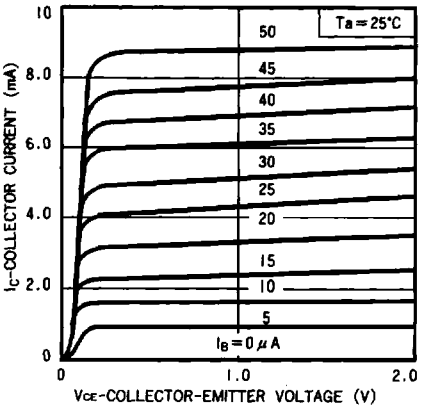
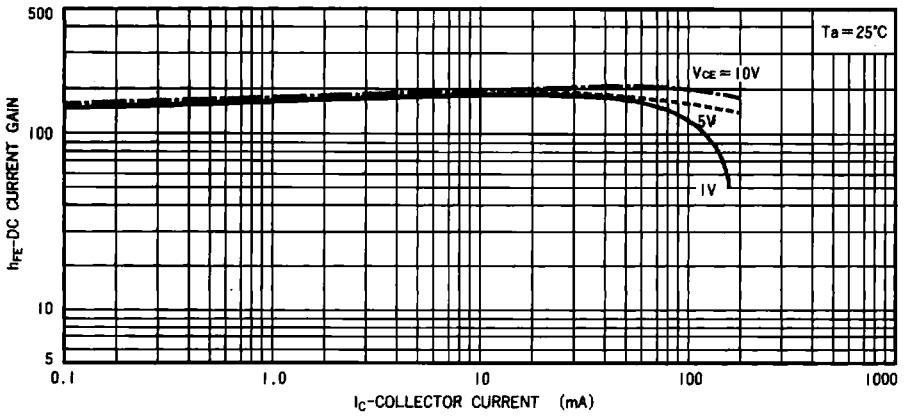


Figure 2



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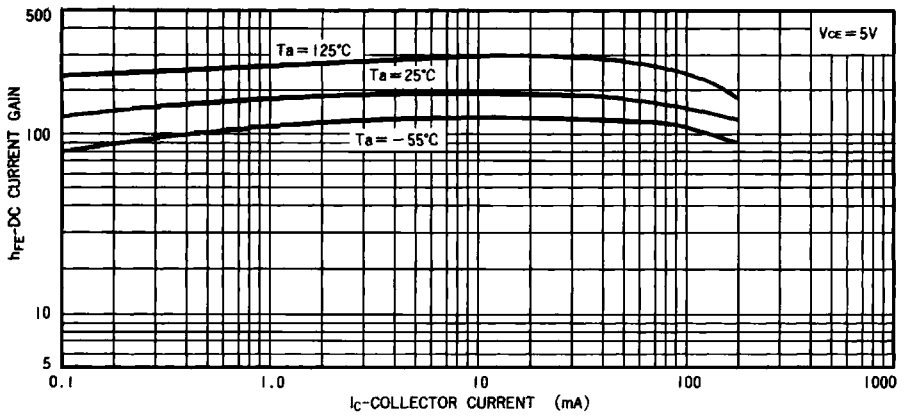

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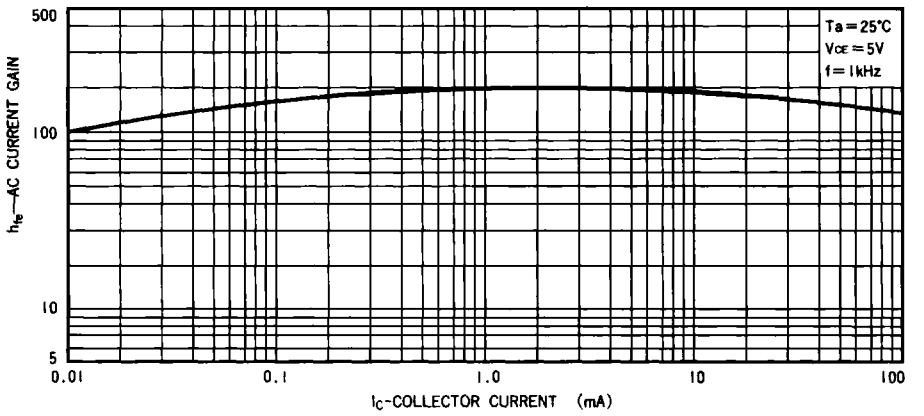

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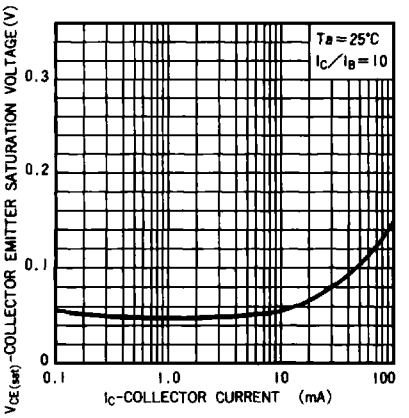

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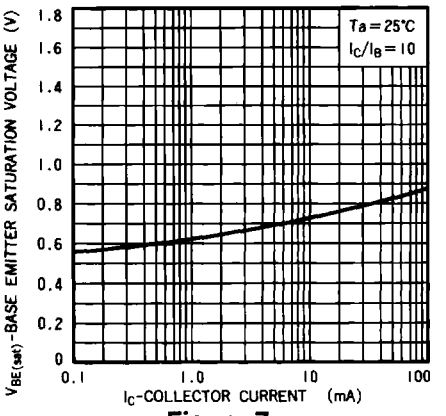

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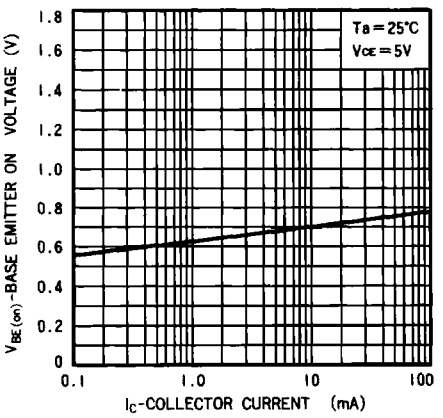

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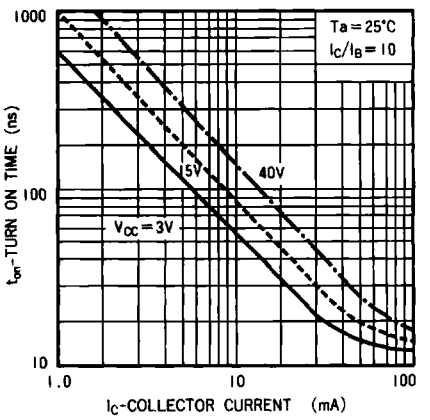

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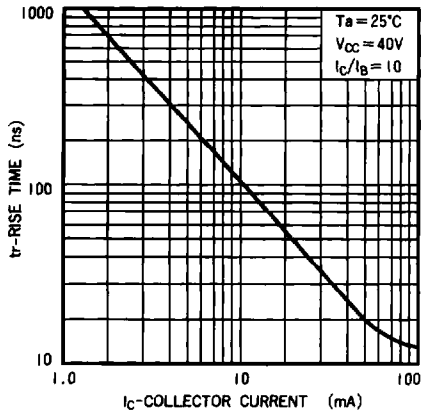

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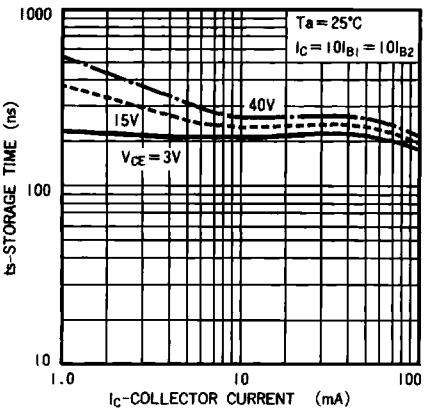

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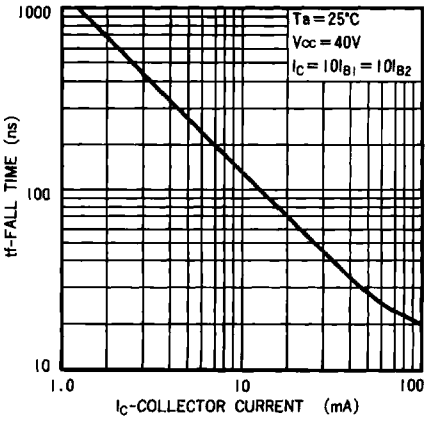

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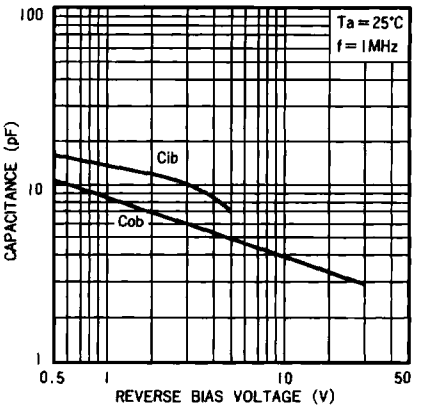
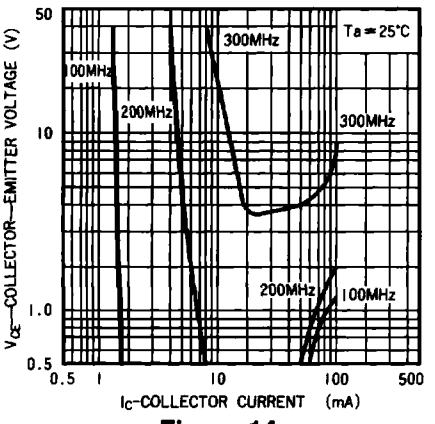


Figure 13



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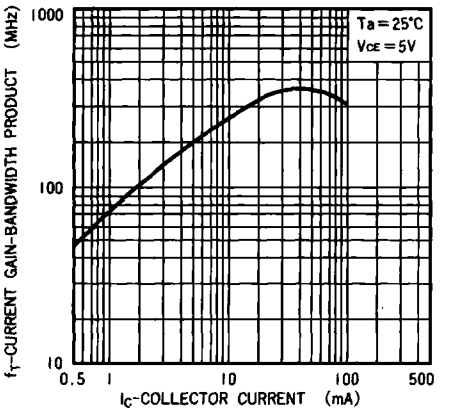

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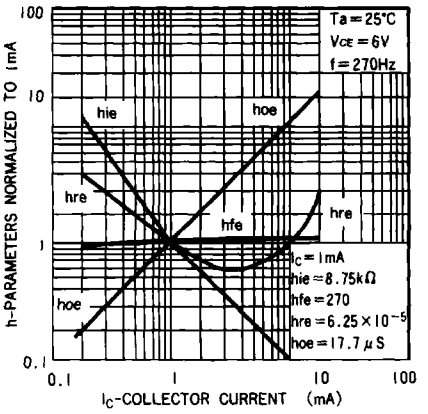

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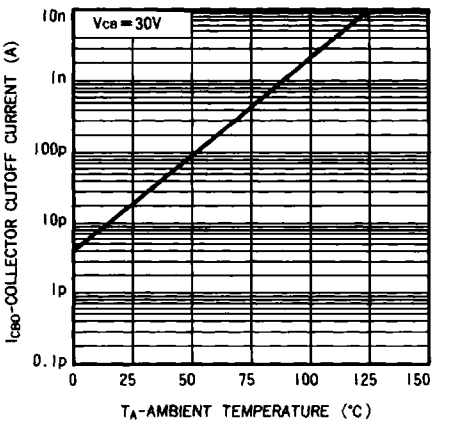

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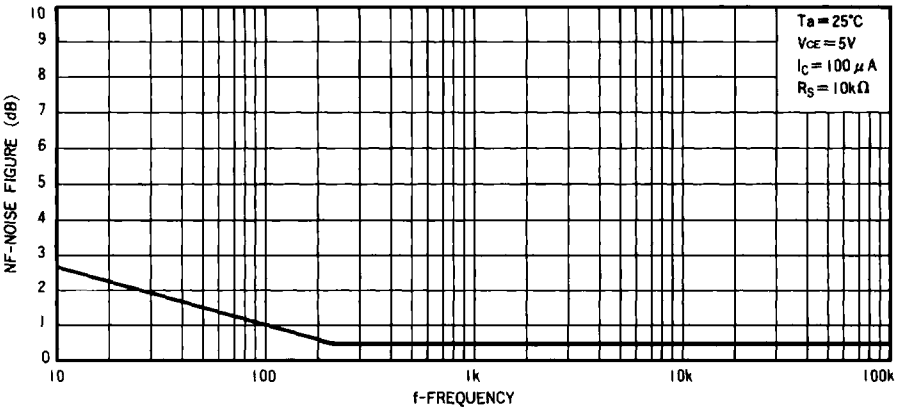

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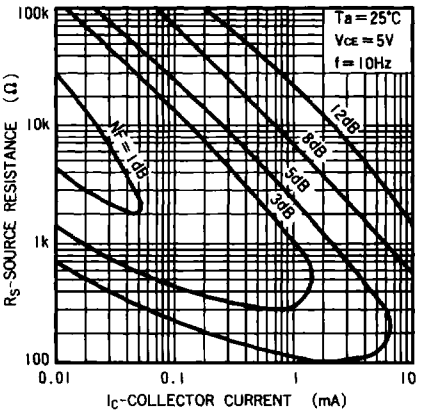

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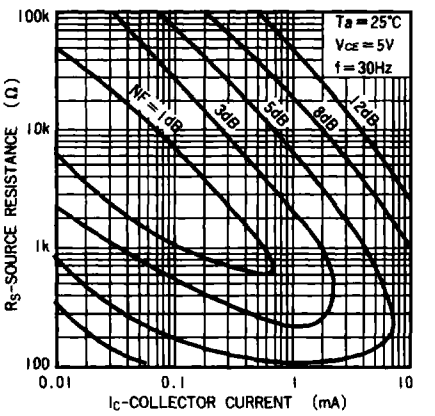

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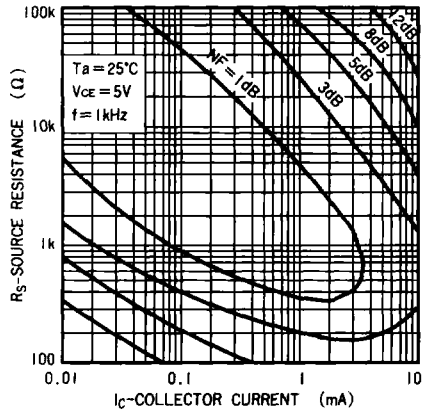

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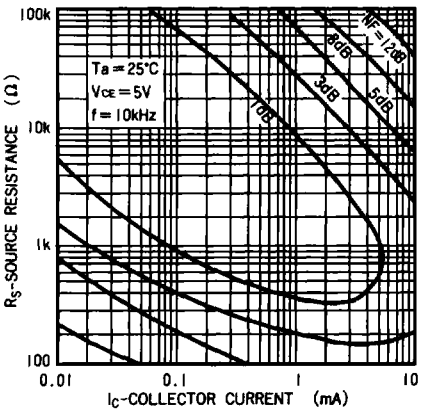

Figure 22

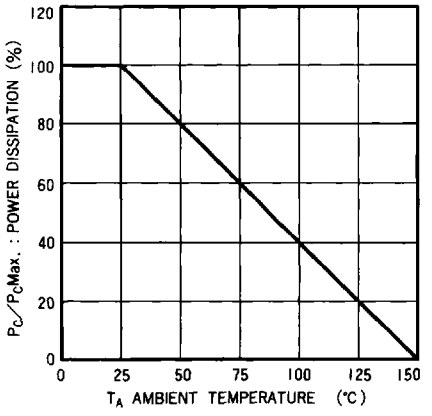

Figure 23

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