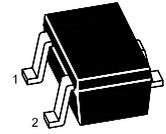


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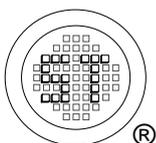
NPN Silicon Epitaxial Planar Transistor
for switching and amplifier applications



1.Base 2.Emitter 3.Collector
SOT-323 Plastic Package

Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_S	-55 to +150	$^\circ\text{C}$



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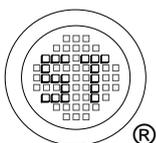
ISO/TS 16949 : 2002 Certificate No. 05103
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Dated : 15/03/2006

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Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain				
at $V_{CE} = 1\text{ V}$, $I_C = 0.1\text{ mA}$	h_{FE}	40	-	-
at $V_{CE} = 1\text{ V}$, $I_C = 1\text{ mA}$	h_{FE}	70	-	-
at $V_{CE} = 1\text{ V}$, $I_C = 10\text{ mA}$	h_{FE}	100	300	-
at $V_{CE} = 1\text{ V}$, $I_C = 50\text{ mA}$	h_{FE}	60	-	-
at $V_{CE} = 1\text{ V}$, $I_C = 100\text{ mA}$	h_{FE}	30	-	-
Collector Base Voltage at $I_C = 10\text{ }\mu\text{A}$	V_{CBO}	60	-	V
Collector Emitter Voltage at $I_C = 1\text{ mA}$	V_{CEO}	40	-	V
Emitter Base Voltage at $I_E = 10\text{ }\mu\text{A}$	V_{EBO}	6	-	V
Collector Emitter Cutoff Current at $V_{CB} = 30\text{ V}$	I_{CES}	-	50	nA
Emitter Base Cutoff Current at $V_{EB} = 3\text{ V}$	I_{EBO}	-	50	nA
Collector Emitter Saturation Voltage at $I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$ $I_C = 50\text{ mA}$, $I_B = 5\text{ mA}$	$V_{CE(sat)}$	- -	0.2 0.3	V
Base Emitter Saturation Voltage at $I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$ $I_C = 50\text{ mA}$, $I_B = 5\text{ mA}$	$V_{BE(sat)}$	0.65 -	0.85 0.95	V
Transition Frequency at $V_{CE} = 20\text{ V}$, $-I_E = 10\text{ mA}$, $f = 100\text{ MHz}$	f_T	300	-	MHz
Collector Output Capacitance at $V_{CB} = 10\text{ V}$, $f = 100\text{ KHz}$	C_{ob}	-	4	pF
Emitter Input Capacitance at $V_{EB} = 0.5\text{ V}$, $f = 100\text{ KHz}$	C_{ib}	-	8	pF
Delay Time at $V_{CC} = 3\text{ V}$, $V_{BE(OFF)} = 0.5\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 1\text{ mA}$	t_d	-	35	ns
Rise Time at $V_{CC} = 3\text{ V}$, $V_{BE(OFF)} = 0.5\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 1\text{ mA}$	t_r	-	35	ns
Storage Time at $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = -I_{B2} = 1\text{ mA}$	t_{stg}	-	200	ns
Fall Time at $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = -I_{B2} = 1\text{ mA}$	t_f	-	50	ns



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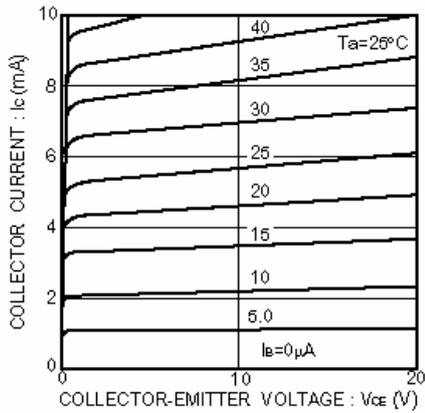


Fig.1 Grounded emitter output characteristics

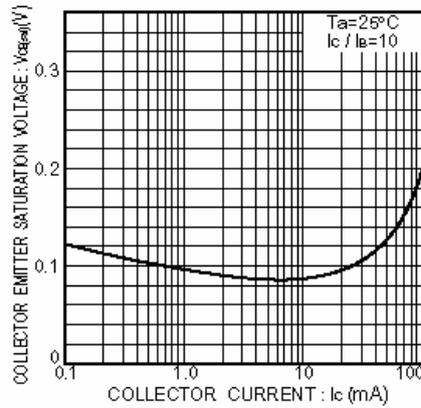


Fig.2 Collector-emitter saturation voltage vs. collector current

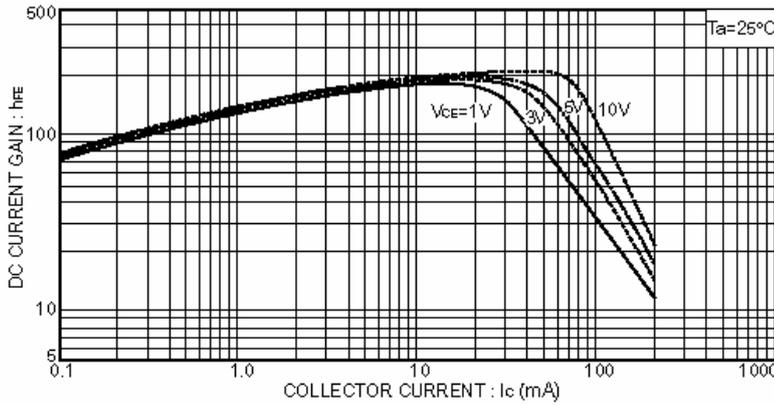


Fig.3 DC current gain vs. collector current (I)

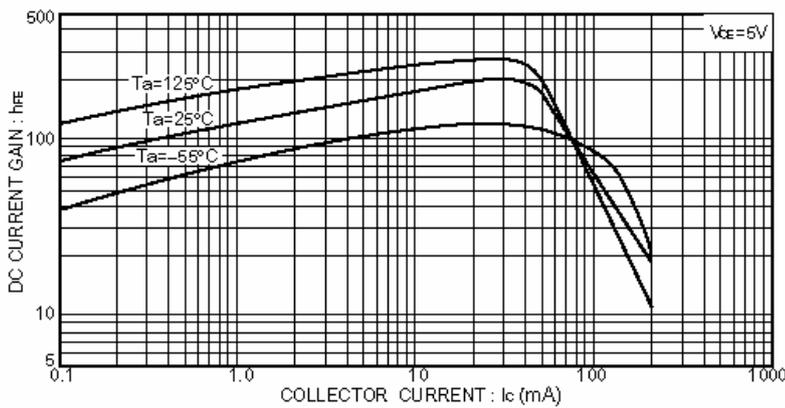
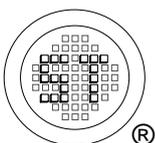


Fig.4 DC current gain vs. collector current (II)



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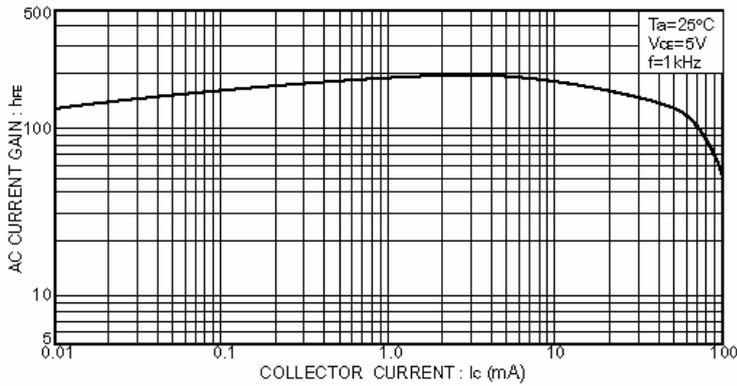


Fig. 5 AC current gain vs. collector current

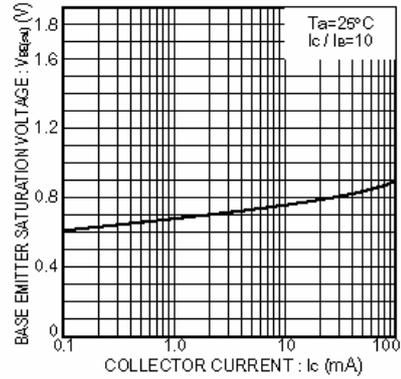


Fig. 6 Base-emitter saturation voltage vs. collector current

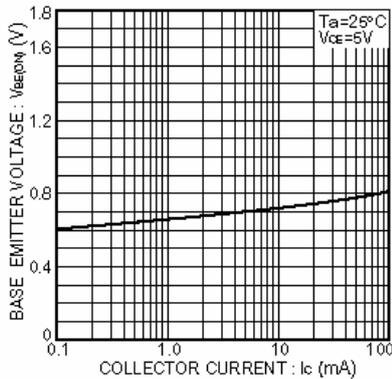


Fig. 7 Grounded emitter propagation characteristics

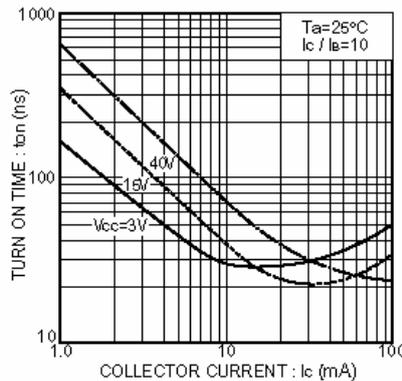


Fig. 8 Turn-on time vs. collector current

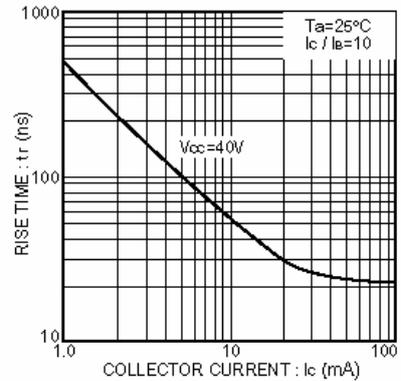


Fig. 9 Rise time vs. collector current

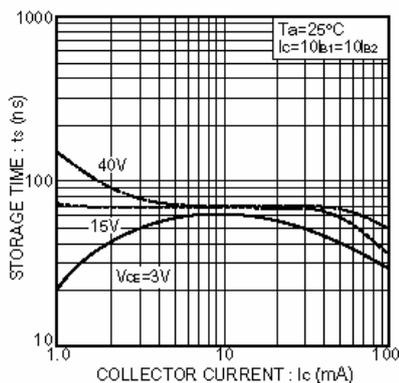


Fig. 10 Storage time vs. collector current

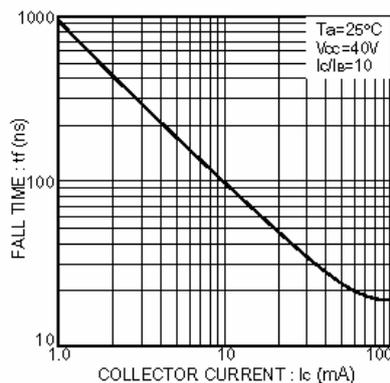


Fig. 11 Fall time vs. collector current

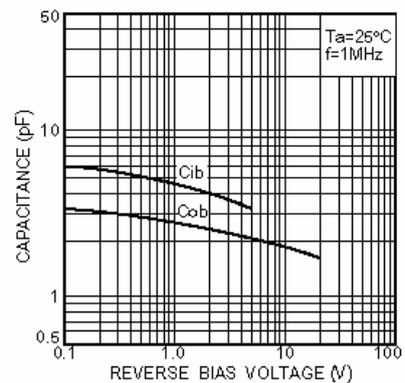
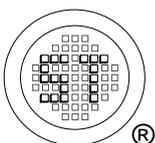


Fig. 12 Input/output capacitance vs. voltage



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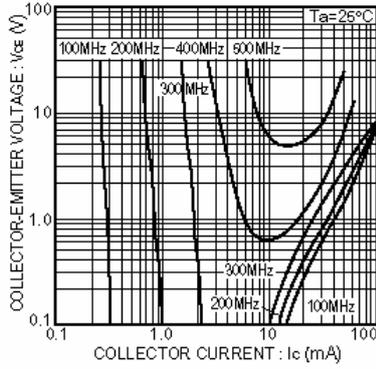


Fig. 13 Gain bandwidth product

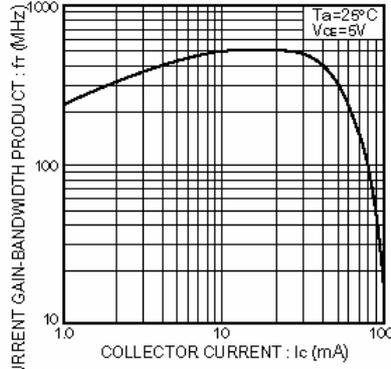


Fig. 14 Gain bandwidth product vs. collector current

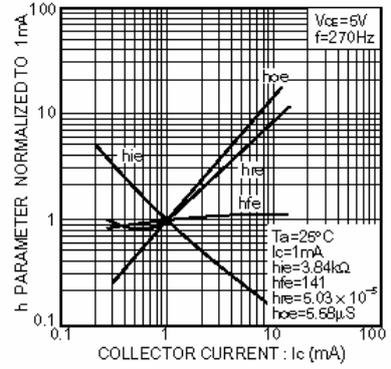


Fig. 15 h parameter vs. collector current

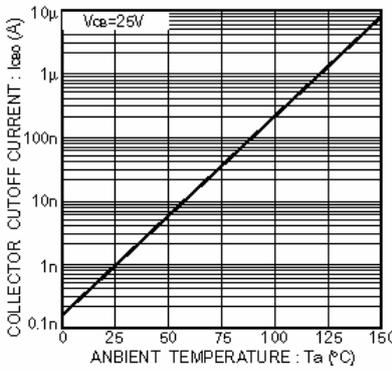


Fig. 16 Noise characteristics (I)

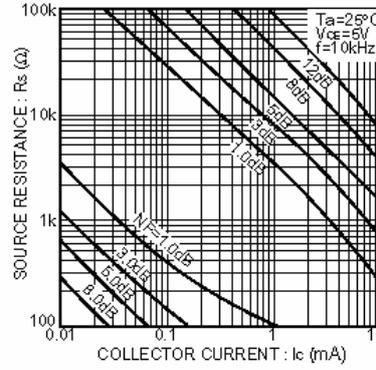


Fig. 17 Noise characteristics (II)

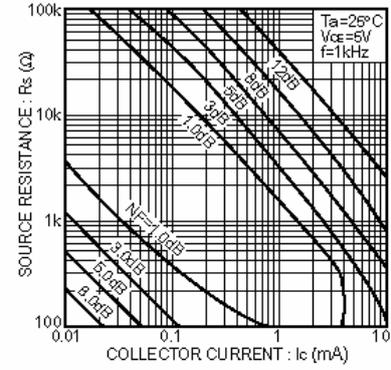


Fig. 18 Noise characteristics (III)

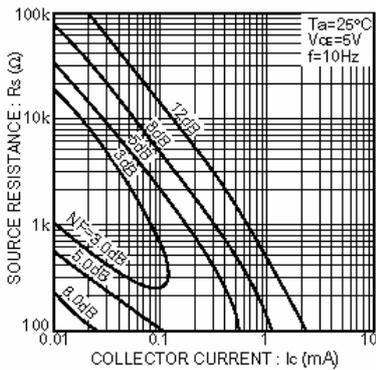


Fig. 19 Noise characteristics (IV)

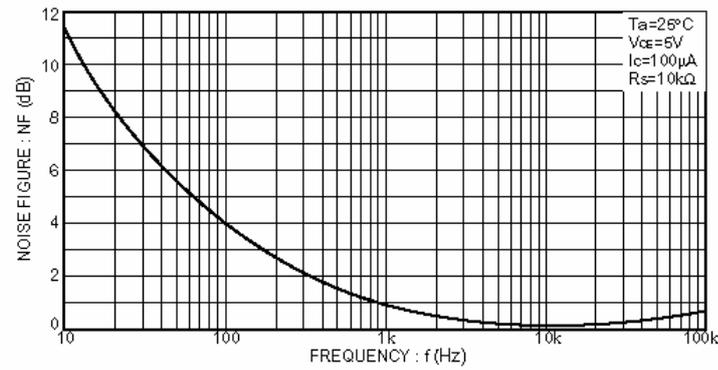
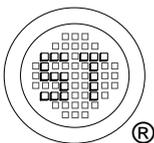


Fig. 20 Noise vs. collector current



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