

Silicon Epitaxial Planar Transistor

NPN, 40V, 200mA

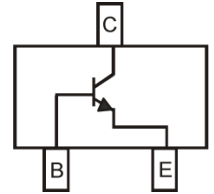


Features:

- Power dissipation. ($P_C=0.2W$)

Applications:

- Audio frequency general purpose amplifier



Maximum Rating: @ $T_A = 25^\circ C$ unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	
Emitter-Base Voltage	V_{EBO}	5	
Collector Current -Continuous	I_C	200	mA
Collector Dissipation	P_C	200	mW
Junction and Storage Temperature	T_j, T_{stg}	-55 to 150	$^\circ C$

Electrical Characteristics: @ $T_A = 25^\circ C$ unless otherwise specified

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	40		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	5		
Collector cut-off current	I_{CBO}	$V_{CB}=60V, I_E=0$		0.05	μA
Collector cut-off current	I_{CEO}	$V_{CE}=40V, I_B=0$		0.5	
Emitter cut-off current	I_{EBO}	$V_{EB}=5V, I_C=0$		0.05	
DC current gain	h_{FE}	$V_{CE}=1V, I_C=0.1mA$ $V_{CE}=1V, I_C=1mA$ $V_{CE}=1V, I_C=10mA$ $V_{CE}=1V, I_C=50mA$ $V_{CE}=1V, I_C=100mA$	40 70 100 60 30	300	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=10mA, I_B=1mA$ $I_C=50mA, I_B=5mA$		0.25 0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=10mA, I_B=1mA$ $I_C=50mA, I_B=5mA$	0.65	0.85 0.95	
Transition frequency	f_T	$V_{CE}=20V, I_E=10mA$ $f=100MHz$	300		MHz

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Electrical Characteristics: @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector output capacitance	C_{ob}	$V_{CB}=5\text{V}, I_E=0, f=1\text{MHz}$		4	pF
Noise figure	NF	$V_{CE}=5\text{V}, I_C=0.1\text{mA}, f=1\text{KHz}, R_g=1\text{K}\Omega$		5	dB
Delay time	t_d	$V_{CC}=3\text{V}, V_{BE}=0.5\text{V}, I_C=10\text{mA}, I_B=1\text{mA}$		35	nS
Rise time	t_r			35	
Storage time	t_s	$V_{CC}=3\text{V}, I_C=10\text{mA}, I_{B1}=I_{B2}=1\text{mA}$		200	
Fall time	t_f			50	

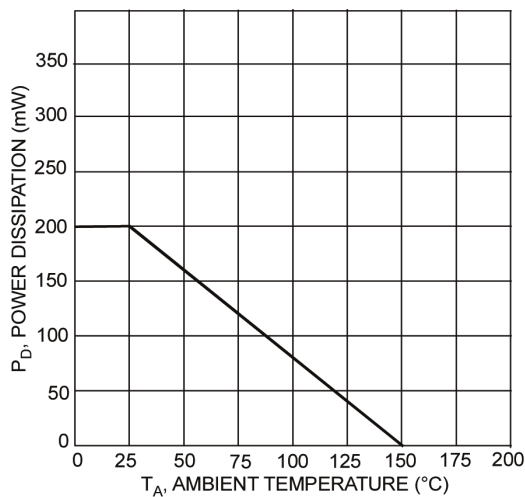


Fig. 1 Max Power Dissipation vs. Ambient Temperature

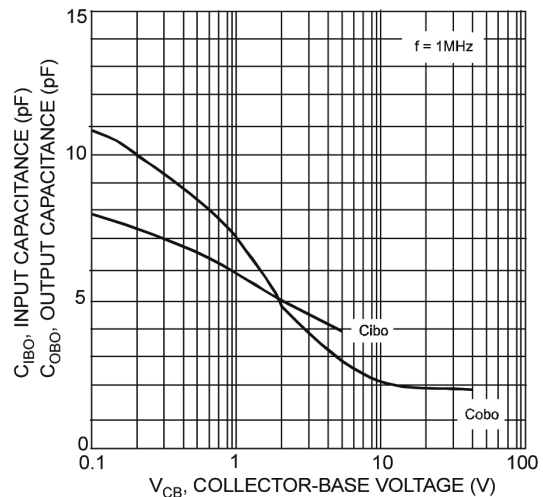


Fig. 2 Input and Output Capacitance vs. Collector-Base Voltage

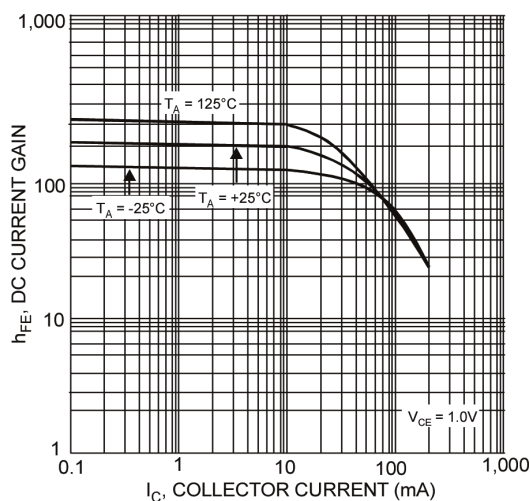


Fig. 3 Typical DC Current Gain vs. Collector Current

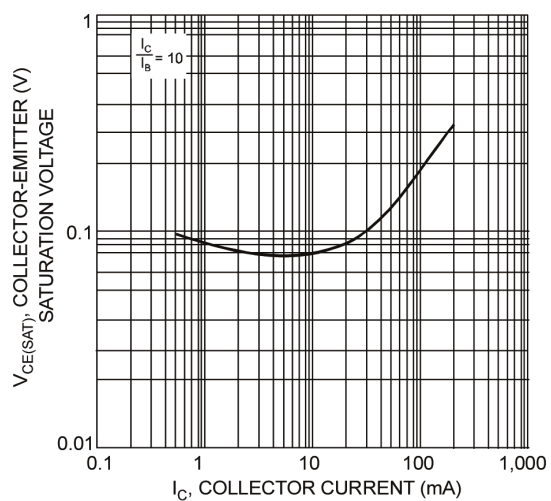


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current



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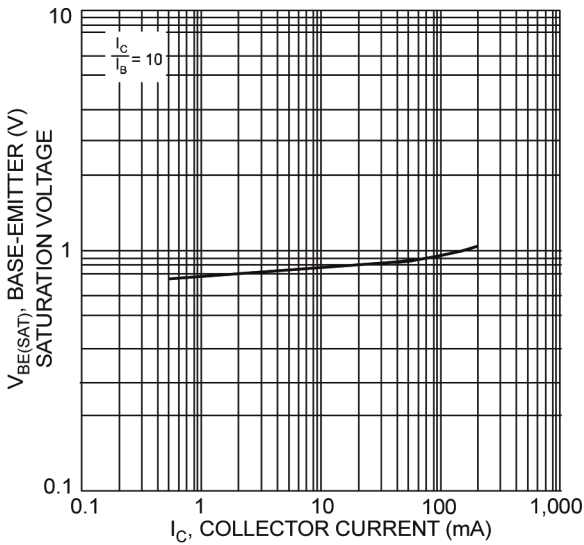
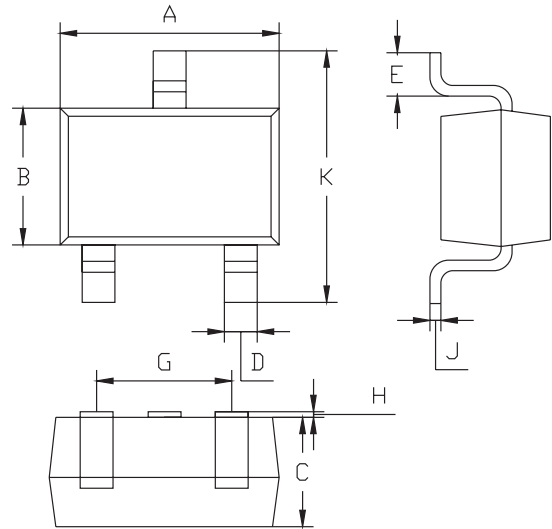
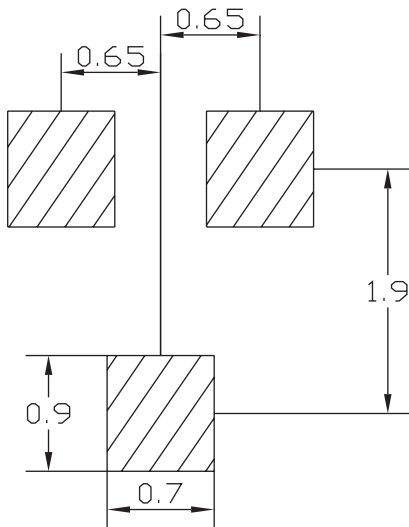


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

Package Outline:



Soldering Footprint:



Dimensions : Millimetres

SOT-323		
Dim.	Min.	Max.
A	1.8	2.2
B	1.15	1.35
C	1 Typical	
D	0.15	0.35
E	0.25	0.4
G	1.2	1.4
H	0.02	0.1
J	0.1 Typical	
K	2.1	2.3

Part Number Table

Description	Part Number
Transistor, Bipolar, NPN, 40V, 200mA	MMST3904-7-F

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