

NPN Silicon Epitaxial Planar Transistor

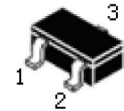
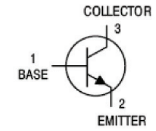


Features:

- Epitaxial planar die construction.
- Complementary PNP type available (MMST4403).
- Ultra-small surface mount package.
- Also available in lead free version.

Applications:

- Audio frequency general purpose amplifier.



SOT-323

Maximum Rating: @ $T_A = 25^\circ\text{C}$ 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}	4	
Collector Current-continuous	I_{C}	600	mA
Collector Dissipation	P_{C}	200	mW
Thermal resistance ,Junction to ambient	R_{BJA}	625	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	$T_{\text{j}}, T_{\text{stg}}$	-50 to 150	$^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Collector-base Breakdown Voltage	$V_{(\text{BR})\text{CBO}}$	$I_{\text{C}} = 100\mu\text{A}, I_{\text{E}} = 0$	60		V
Collector-emitter Breakdown Voltage	$V_{(\text{BR})\text{CEO}}$	$I_{\text{C}} = 1\text{mA}, I_{\text{B}} = 0$	40		
Emitter-base Breakdown Voltage	$V_{(\text{BR})\text{EBO}}$	$I_{\text{E}} = 100\mu\text{A}, I_{\text{C}} = 0$	6		
Collector Cut-off Current	I_{CEX}	$V_{\text{CE}} = 35\text{V}, V_{\text{EB}(\text{OFF})} = 0.4\text{V}$		0.1	μA
Base Cut-off Current	I_{BL}	$V_{\text{CE}} = 35\text{V}, V_{\text{EB}(\text{OFF})} = 0.4\text{V}$		0.1	
DC Current Gain	h_{FE}	$V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 0.1\text{mA}$ $V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 1\text{mA}$ $V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 10\text{mA}$ $V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 150\text{mA}$ $V_{\text{CE}} = 2\text{V}, I_{\text{C}} = 500\text{mA}$	20 40 80 100 40	300	

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Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$		0.4 0.75	V
Base-emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$		0.95 1.2	
Transition Frequency	f_T	$V_{CE} = 10\text{V}, I_E = 20\text{mA}, f = 100\text{MHz}$	250		MHz
Collector Output Capacitance	C_{ob}	$V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$		6.5	pF
Delay Time	t_d	$V_{CC} = 30\text{V}, V_{BE} = 2\text{V},$ $I_C = 150\text{mA}, I_B = 15\text{mA}$		15	nS
Rise Time	t_r			20	
Storage Time	t_s	$V_{CC} = 30\text{V}, I_C = 150\text{mA},$ $I_{B1} = I_{B2} = 15\text{mA}$		225	
Fall Time	t_f			30	

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

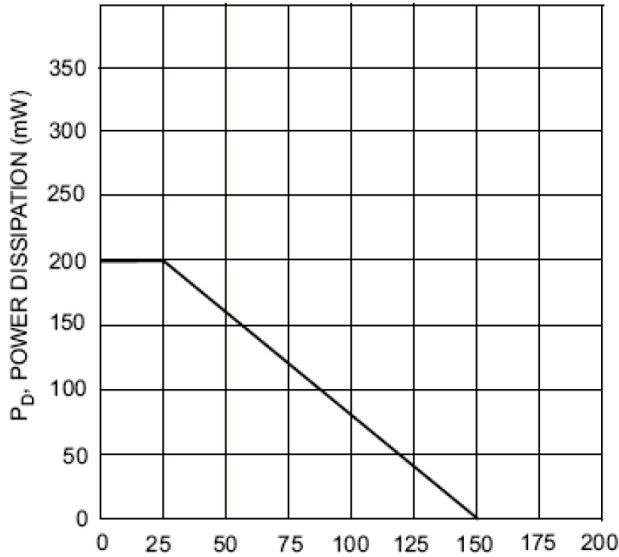


Fig. 1, Max Power Dissipation vs Ambient Temperature

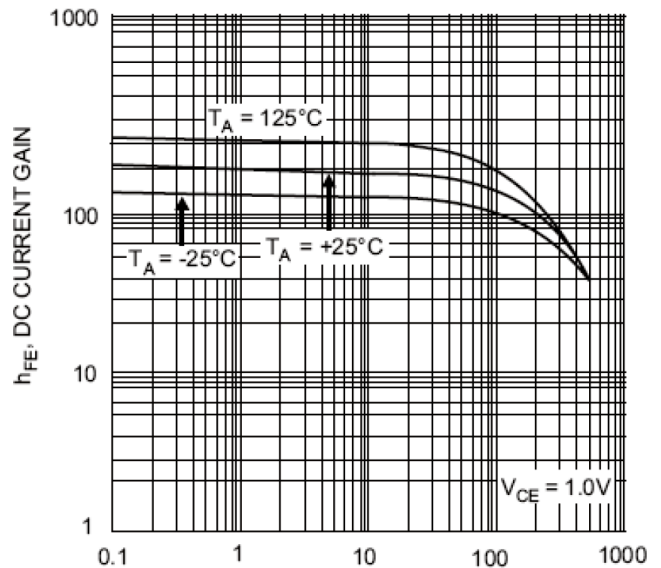


Fig. 2 Typical DC Current Gain vs Collector Current



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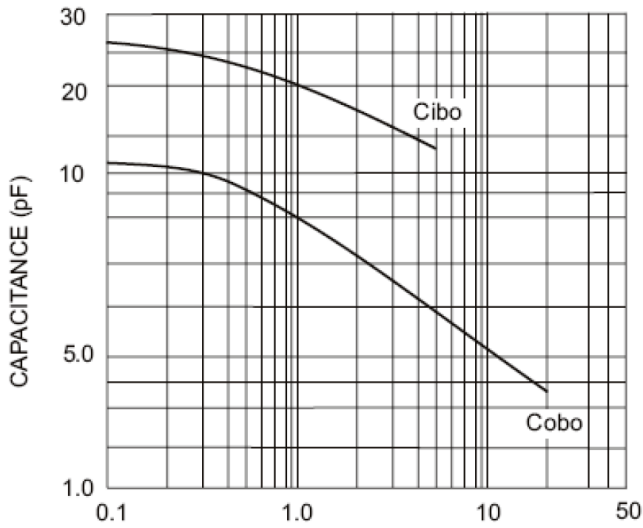


Fig. 3 Typical Capacitance

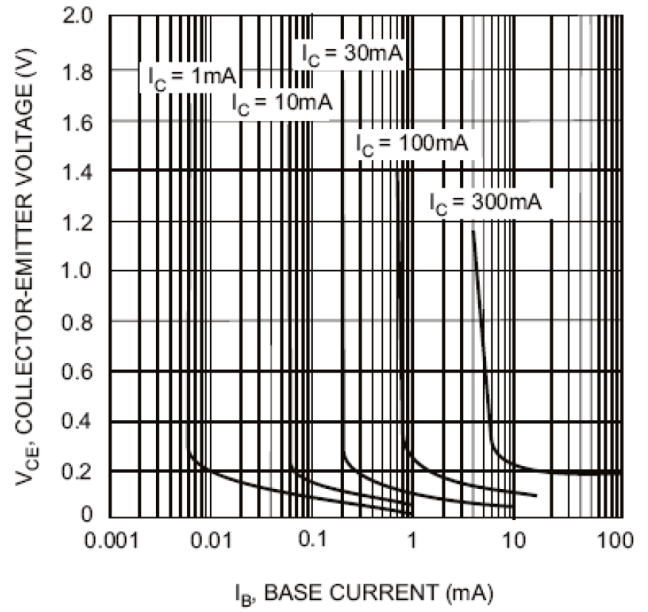


Fig. 4 Typical Collector Saturation Region

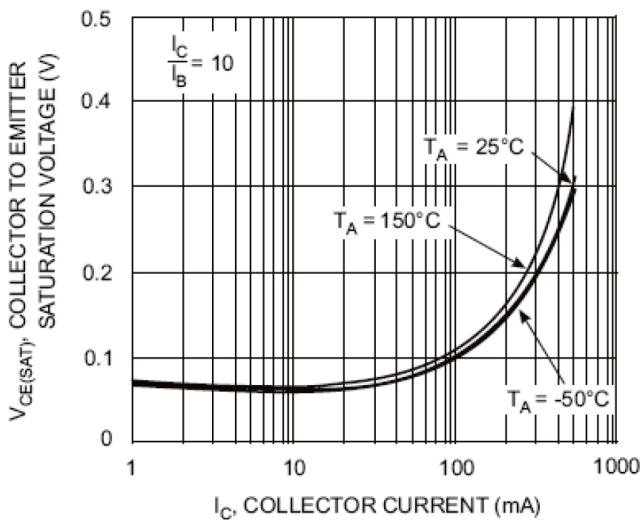


Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current

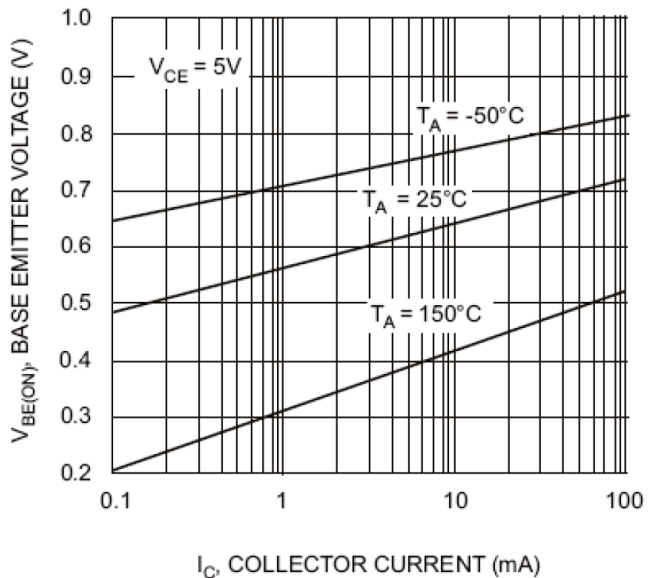


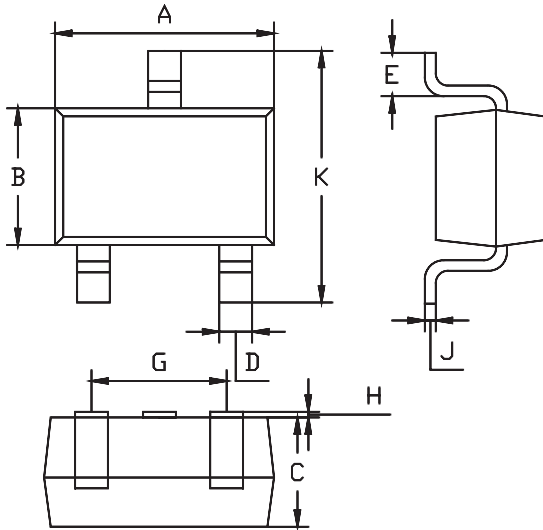
Fig. 6 Base Emitter Voltage vs. Collector Current



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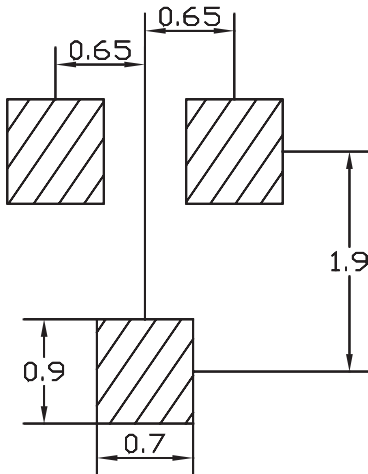


Package Outline:



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
All Dimensions in mm		

Soldering Footprint:



Dimensions : Millimetres

Part Number Table

Description	Part Number
Transistor, Bipolar, NPN, 40V, 600mA, SOT-323	MMST4401-7-F

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