

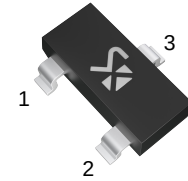
SOT-23 Plastic-Encapsulate Transistors

NPN Darlington Transistor

MARKING CODE: MMBTA13:1M

MMBTA14:1N

For general purpose application, darlington transistor



SOT-23

1. BASE 2. EMITTER 3. COLLECTOR

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

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	30	V
Collector Emitter Voltage	V_{CEO}	30	V
Emitter Base Voltage	V_{EBO}	10	V
Collector Current	I_C	0.3	A
Power Dissipation	P_{tot}	0.3	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

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

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain				
at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$	MMBTA13 h_{FE}	5000	-	-
at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$	MMBTA14 h_{FE}	10000	-	-
at $V_{CE} = 5\text{ V}$, $I_C = 100\text{ mA}$	MMBTA13 h_{FE}	10000	-	-
at $V_{CE} = 5\text{ V}$, $I_C = 100\text{ mA}$	MMBTA14 h_{FE}	20000	-	-
Collector Cutoff Current at $V_{CB} = 30\text{ V}$	I_{CBO}	-	100	nA
Emitter Cutoff Current at $V_{EB} = 10\text{ V}$	I_{EBO}	-	100	nA
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CBO}$	30	-	V
Collector Emitter Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CEO}$	30	-	V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$	$V_{(BR)EBO}$	10	-	V
Collector Emitter Saturation Voltage at $I_C = 100\text{ mA}$, $I_B = 0.1\text{ mA}$	$V_{CE(sat)}$	-	1.5	V
Base Emitter Voltage at $V_{CE} = 5\text{ V}$, $I_C = 100\text{ mA}$	V_{BE}	-	2	V
Transition Frequency at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$, $f=100\text{ MHz}$	f_T	125	-	MHz

Typical Characteristics

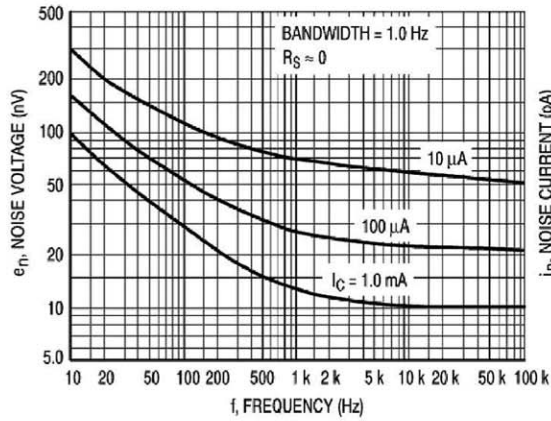


Figure 2. Noise Voltage

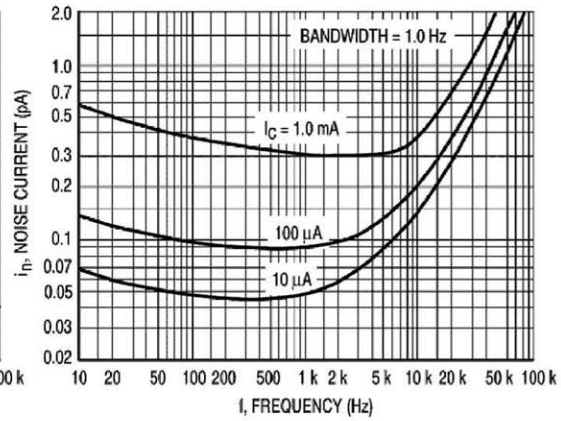


Figure 3. Noise Current

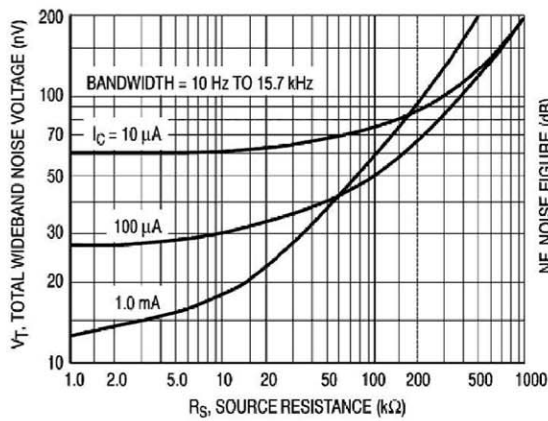


Figure 4. Total Wideband Noise Voltage

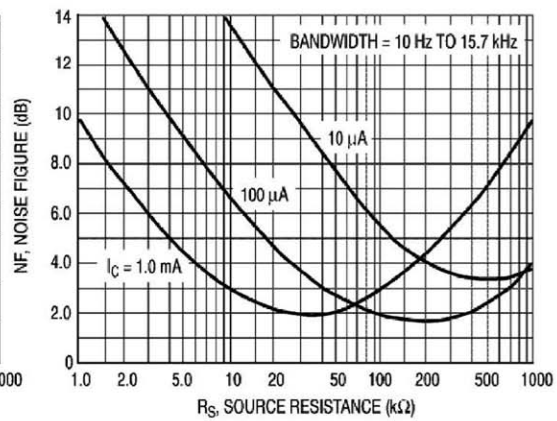


Figure 5. Wideband Noise Figure

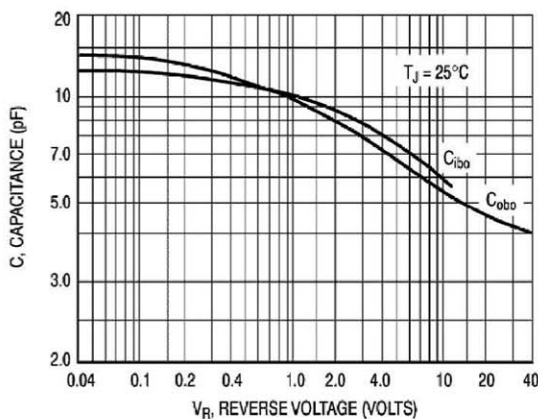


Figure 6. Capacitance

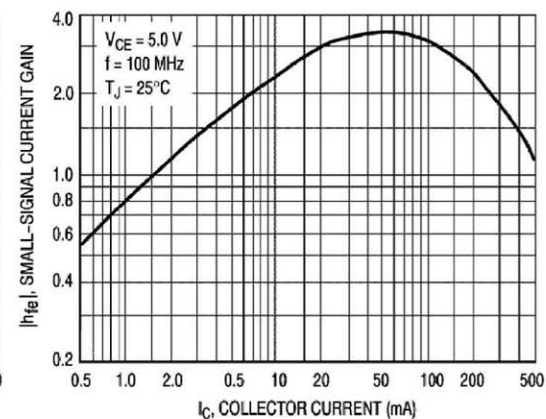


Figure 7. High Frequency Current Gain

Typical Characteristics

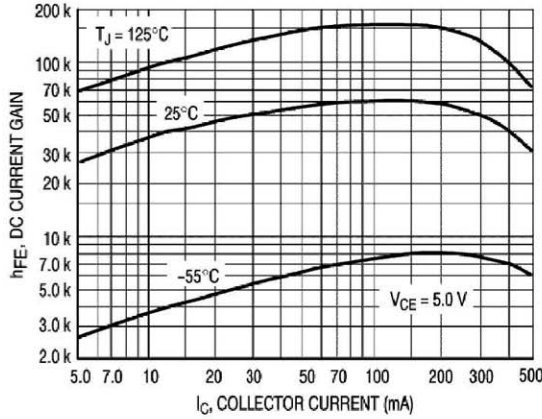


Figure 8. DC Current Gain

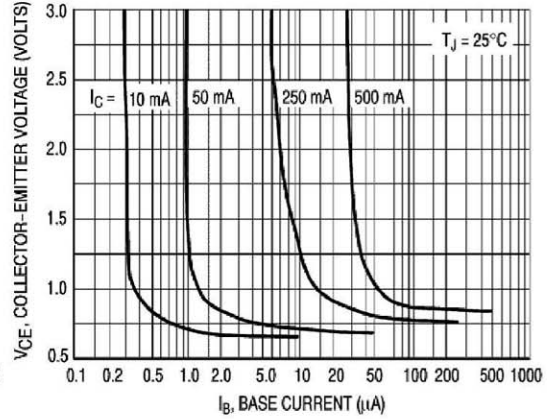


Figure 9. Collector Saturation Region

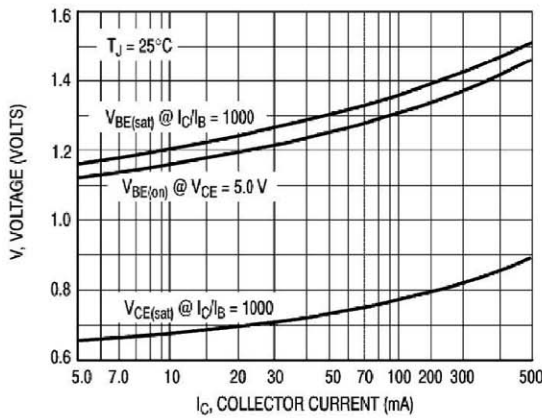


Figure 10. "On" Voltages

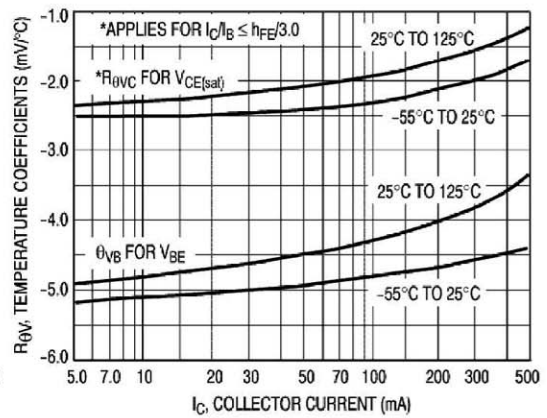


Figure 11. Temperature Coefficients

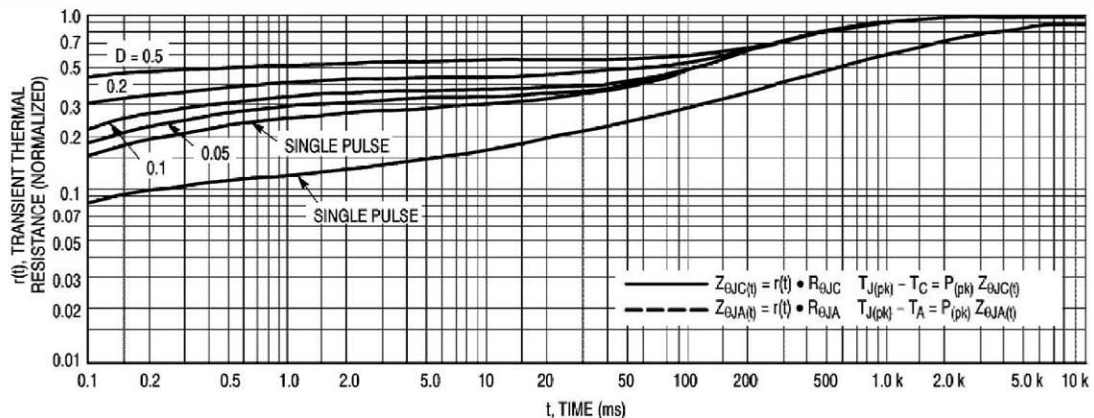
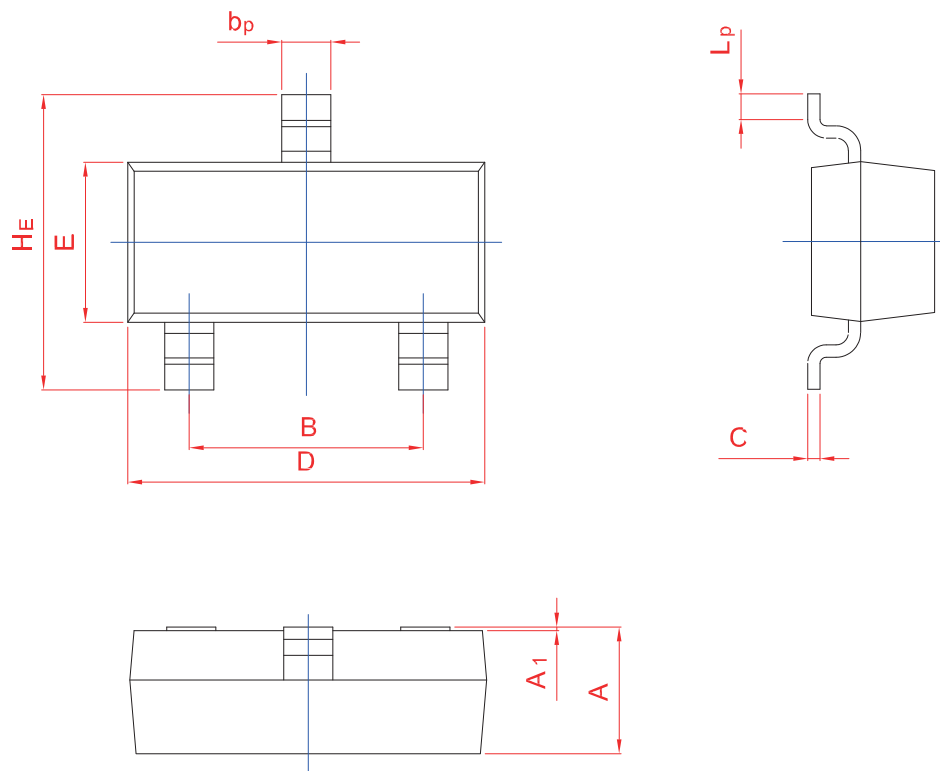


Figure 12. Thermal Response

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b _p	C	D	E	HE	A ₁	L _p
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20