MMBT3903

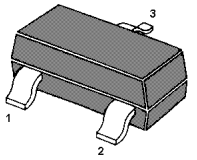
NPN Silicon Epitaxial Planar Transistor

for switching and amplifier applications.

As complementary types the PNP transistors MMBT3905 are recommended.

On special request, these transistors can be manufactured in different pin configurations.

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

Absolute Maximum Ratings (T_a = 25 °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
Power Dissipation	P_{tot}	350	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	- 55 to + 150	°C

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Characteristics at T_a = 25 °C

Parameter		Symbol	Min.	Max.	Unit
DC Current Gain at V_{CE} = 1 V, I_C = 0.1 mA	MMBT3903	h_{FE}	20	-	-
at V_{CE} = 1 V, I_C = 1 mA	MMBT3903	h_{FE}	35	-	-
at V_{CE} = 1 V, I_C = 10 mA	MMBT3903	h_{FE}	50	150	-
at V_{CE} = 1 V, I_C = 50 mA	MMBT3903	h_{FE}	30	-	-
at V_{CE} = 1 V, I_C = 100 mA	MMBT3903	h_{FE}	15	-	-
Collector Base Cutoff Current at V_{CB} = 30 V		I_{CBO}	-	50	nA
Emitter Base Cutoff Current at V_{EB} = 6 V		I_{EBO}	-	50	nA
Collector Base Breakdown Voltage at I_C = 10 µA		$V_{(BR)CBO}$	60	-	V
Collector Emitter Breakdown Voltage at I_C = 1 mA		$V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at I_E = 10 µA		$V_{(BR)EBO}$	6	-	V
Collector Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA		 $V_{CE(sat)}$ $V_{CE(sat)}$	 - -	 0.2 0.3	V
Base Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA		 $V_{BE(sat)}$ $V_{BE(sat)}$	 - -	 0.85 0.95	V
Gain Bandwidth Product at V_{CE} = 20 V, I_C = 10 mA, f = 100 MHz	MMBT3903	f_T	250	-	MHz
Collector Base Capacitance at V_{CB} = 5 V, f = 100 KHz		C_{ob}	-	4	pF
Delay Time at V_{CC} = 3 V, V_{BE} = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA		t_d	-	35	ns
Rise Time at V_{CC} = 3 V, V_{BE} = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA		t_r	-	35	ns
Storage Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = -I_{B2} = 1 mA		t_s	-	200	ns
Fall Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = -I_{B2} = 1 mA		t_f	-	50	ns

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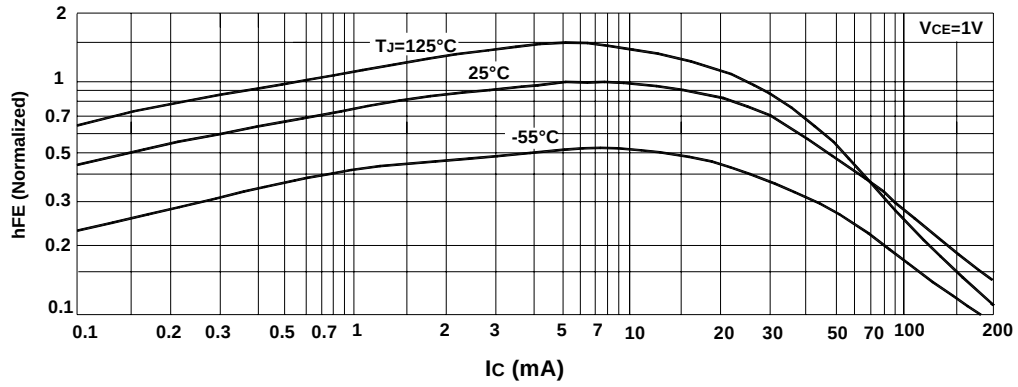
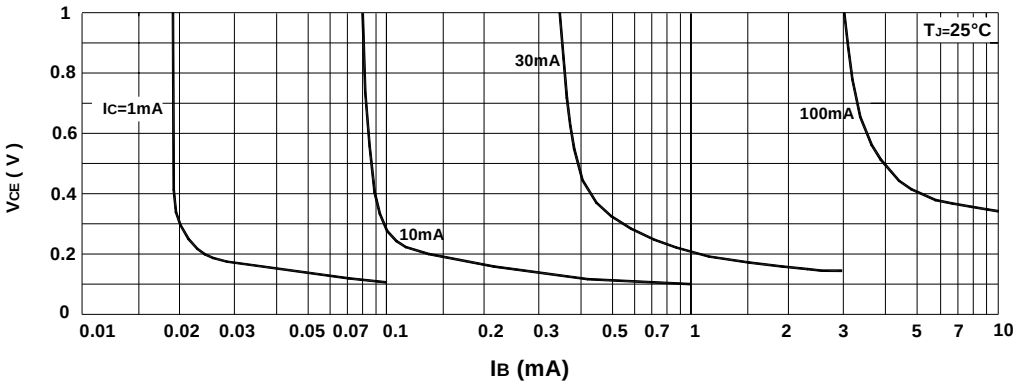
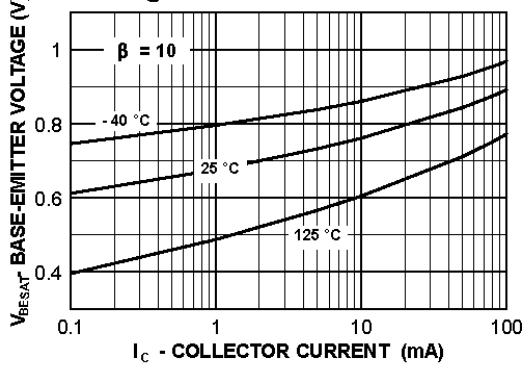
DC Current Gain



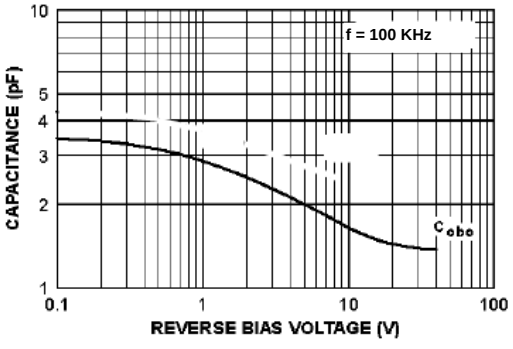
Collector Saturation Region



Base-Emitter Saturation Voltage vs Collector Current

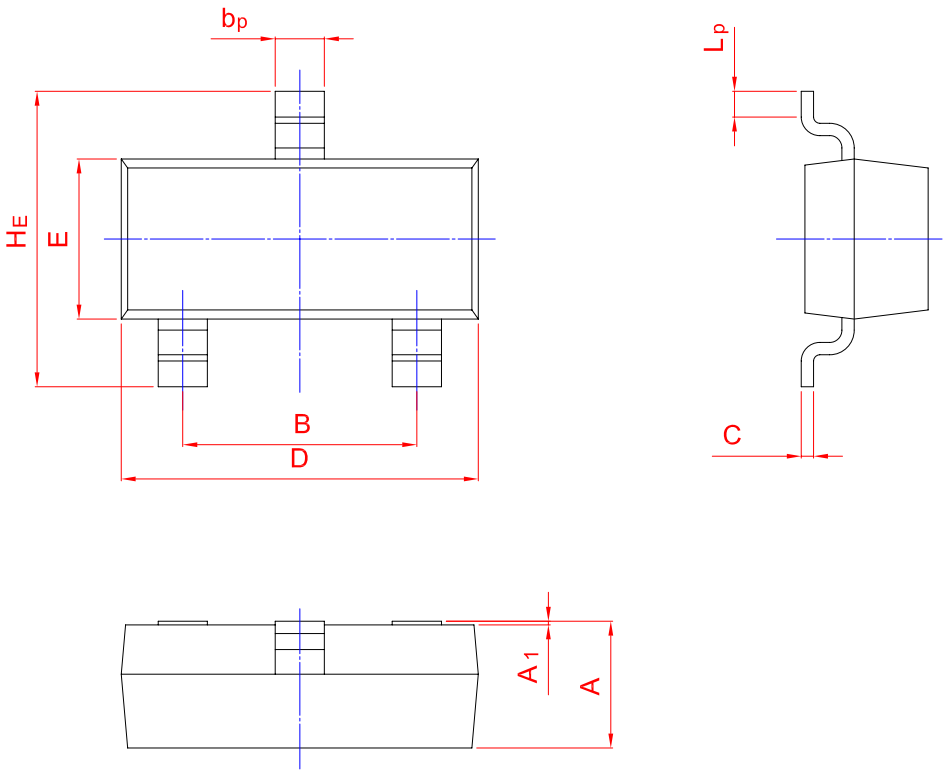


Capacitance vs Reverse Bias Voltage



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**



UNIT	A	B	bp	C	D	E	HE	A1	Lp
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