

MMBT3903

NPN EPITAXIAL SILICON TRANSISTOR

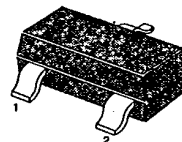
GENERAL PURPOSE TRANSISTOR

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Rating	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
Collector Dissipation	P_C	350	mW
Storage Temperature	Tstg	150	$^\circ\text{C}$

*Refer to MMBT3904 for graphs

SOT-23



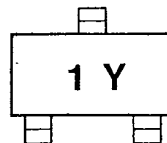
1. Base 2. Emitter 3. Collector

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C = 10\mu\text{A}, I_E = 0$	60		V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = 1\text{mA}, I_B = 0$	40		V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E = 10\mu\text{A}, I_C = 0$	6		V
Collector Cutoff Current	I_{CEX}	$V_{CE} = 30\text{V}, V_{EB} = 3\text{V}$		50	nA
*DC Current Gain	h_{FE}	$V_{CE} = 1\text{V}, I_C = 0.1\text{mA}$	20		
		$V_{CE} = 1\text{V}, I_C = 1\text{mA}$	35		
		$V_{CE} = 1\text{V}, I_C = 10\text{mA}$	50	150	
		$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	30		
		$V_{CE} = 1\text{V}, I_C = 100\text{mA}$	15		
*Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$		0.2	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$		0.3	V
*Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	0.65	0.85	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$		0.95	V
Current Gain-Bandwidth Product	f_T	$I_C = 10\text{mA}, V_{CE} = 20\text{V}$ $f = 100\text{MHz}$	250		MHz
Output Capacitance	C_{ob}	$V_{CB} = 5\text{V}, I_E = 0$ $f = 1\text{MHz}$		4	pF
Noise Figure	NF	$I_C = 100\mu\text{A}, V_{CE} = 5\text{V}$ $R_S = 1\text{K}\Omega$		6	dB
Turn On Time	t_{on}	$f = 10\text{Hz to } 15.7\text{KHz}$ $V_{CC} = 3\text{V}, V_{BE} = 0.5\text{V}$		70	ns
Turn Off Time	t_{off}	$I_C = 10\text{mA}, I_{B1} = 1\text{mA}$ $V_{CC} = 3\text{V}, I_C = 10\text{mA}$ $I_{B1} = I_{B2} = 1\text{mA}$		225	ns

*Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

Marking



SAMSUNG SEMICONDUCTOR