

Plastic-Encapsulate Transistors

TRANSISTOR (NPN)

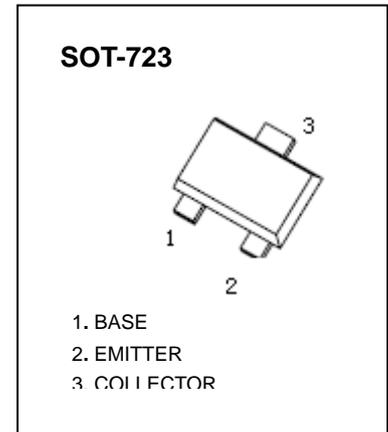
FEATURE

- Complementary to MMBT3906M
- Small Package

MARKING: 1N

MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CB0}	Collector-Base Voltage	60	V
V_{CE0}	Collector-Emitter Voltage	40	V
V_{EB0}	Emitter-Base Voltage	6	V
I_c	Collector Current -Continuous	0.2	A
P_c	Power Dissipation	0.1	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	1250	$^\circ\text{C/W}$
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	$^\circ\text{C}$



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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_c=10\mu\text{A}, I_E=0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_c=1\text{mA}, I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu\text{A}, I_c=0$	6			V
Collector cut-off current	I_{CEX}	$V_{CE}=30\text{V}, V_{EB(off)}=3\text{V}$			50	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=5\text{V}, I_c=0$			100	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=1\text{V}, I_c=0.1\text{mA}$	40			
	$h_{FE(2)}$	$V_{CE}=1\text{V}, I_c=1\text{mA}$	70			
	$h_{FE(3)}$	$V_{CE}=1\text{V}, I_c=10\text{mA}$	100		300	
	$h_{FE(4)}$	$V_{CE}=1\text{V}, I_c=50\text{mA}$	60			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_c=10\text{mA}, I_B=1\text{mA}$			0.2	V
	$V_{CE(sat)2}$	$I_c=50\text{mA}, I_B=5\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_c=10\text{mA}, I_B=1\text{mA}$	0.65		0.85	V
	$V_{BE(sat)2}$	$I_c=50\text{mA}, I_B=5\text{mA}$			0.95	V
Transition frequency	f_T	$V_{CE}=20\text{V}, I_c=10\text{mA}, f=100\text{MHz}$	300			MHz
Output capacitance	C_{ob}	$V_{CB}=5\text{V}, I_E=0, f=1\text{MHz}$			4	pF
Input capacitance	C_{ib}	$V_{EB}=0.5\text{V}, I_c=0, f=1\text{MHz}$			8	pF
Noise figure	NF	$V_{CE}=5\text{V}, I_c=0.1\text{mA}, f=1\text{MHz}, R_S=1\text{k}\Omega$			5	dB
Delay time	t_d	$V_{CC}=3\text{V}, V_{BE(off)}=-0.5\text{V}, I_c=10\text{mA}, I_{B1}=1\text{mA}$			35	ns
Rise time	t_r				35	ns
Storage time	t_s		$V_{CC}=3\text{V}, I_c=10\text{mA}$			200
Fall time	t_f	$I_{B1}=I_{B2}=1\text{mA}$			50	ns

Typical Characteristics

