



MMBT3904-1AM

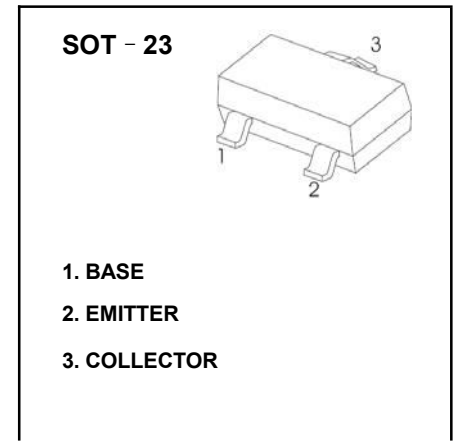
SOT-23 Plastic-Encapsulate Transistors

MMBT3904Z TRANSISTOR (NPN)

FEATURES

Complementary to MMBT3906

MARKING:1AM



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	200	mA
P_c	Collector Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	625	$^\circ\text{C}/\text{W}$
T_j	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-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	$V_{(BR)CBO}$	$I_c = 0.1\text{mA}$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_c = 1\text{mA}, I_B = 0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 0.1\text{mA}$	6			V
Collector cut-off current	I_{ce0}	$V_{CE} = 30\text{V}$,			1	μA
Collector cut-off current	I_{CBO}	$V_{CB} = 40\text{V}, I_E = 0$			100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$			100	nA
DC current gain	$h_{FE(1)}$	$V_{CE} = 1\text{V}, I_C = 10\text{mA}$	100		400	
	$h_{FE(2)}$	$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	60			
	$h_{FE(3)}$	$V_{CE} = 1\text{V}, I_C = 100\text{mA}$	30			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}, I_B = 5\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 50\text{mA}, I_B = 5\text{mA}$			1.0	V
Transition frequency	f_T	$V_{CE} = 20\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$	300			MHz
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	$V_{CC} = 3\text{V}, V_{BE(off)} = -0.5\text{V}, I_C = 10\text{mA}, I_{B1} = 1\text{mA}$			35	ns
Storage time	t_s	$V_{CC} = 3\text{V}, I_C = 10\text{mA}, I_{B1} = I_{B2} = 1\text{mA}$			200	ns
Fall time	t_f	$V_{CC} = 3\text{V}, I_C = 10\text{mA}, I_{B1} = I_{B2} = 1\text{mA}$			50	ns

HFE	100-300
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