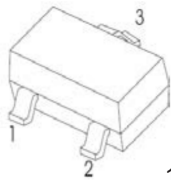


FEATURES

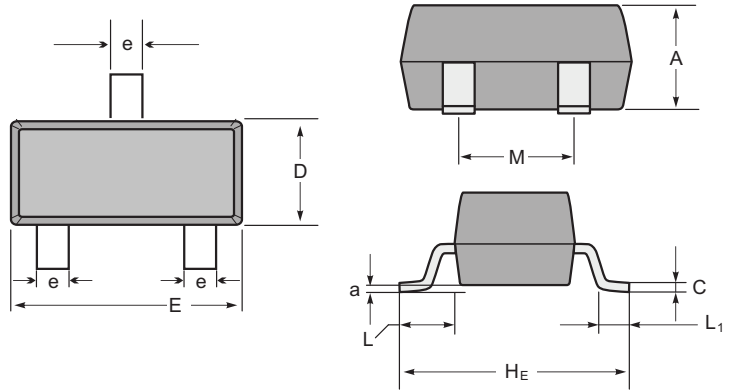
- Complementary to MMBT3906



1.BASE
2.EMITTER
3.COLLECTOR

Marking

Type number	Marking code
2N3904	1AM



SOT-23 mechanical data

UNIT		A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

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 — Continuous	I _C	200	mA
Collector Power Dissipation	P _C	200	mW
Thermal Resistance From Junction To Ambient	R _{thJA}	625	°C/W
Operation Junction and Storage Temperature Range	T _J , T _{stg}	-55~+150	°C

2N3904

CLASSIFICATION OF h_{FE}

HFE	100-300	
Rank	L	H
Range	100-200	200-300

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

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}	$V_{CE} = 30\text{V}, V_{BE(off)} = 3\text{V}$			50	nA
Collector cut-off current	I_{CBO}	$V_{CB} = 60\text{V}, I_E = 0$			100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$			100	nA
DC current gain	h_{FE1}	$V_{CE} = 1\text{V}, I_C = 10\text{mA}$	100		300	
	h_{FE2}	$V_{CE} = 1\text{V}, I_C = 50\text{mA}$	60			
	h_{FE3}	$V_{CE} = 1\text{V}, I_C = 100\text{mA}$	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	$V_{BE(sat)}$	$I_C = 50\text{mA}, I_B = 5\text{mA}$			0.95	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				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				50	ns

RATING AND CHARACTERISTIC CURVES (2N3904)

