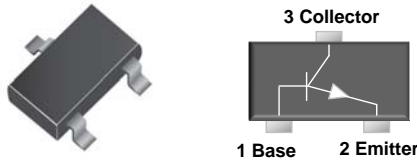


**Small Signal Transistor**

**SOT-23**

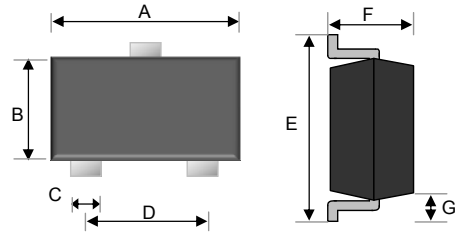


**Features**

- ✧ Epitaxial planar die construction
- ✧ Surface device type mounting
- ✧ Moisture sensitivity level 1
- ✧ Matte Tin(Sn) lead finish with Nickel(Ni) underplate
- ✧ Pb free version and RoHS compliant
- ✧ Green compound (Halogen free) with suffix "G" on packing code and prefix "G" on date code

**Mechanical Data**

- ✧ Case : SOT- 23 small outline plastic package
- ✧ Terminal: Matte tin plated, lead free., solderable per MIL-STD-202, Method 208 guaranteed
- ✧ High temperature soldering guaranteed: 260°C/10s
- ✧ Weight : 0.008gram (approximately)
- ✧ Marking Code : 1AM

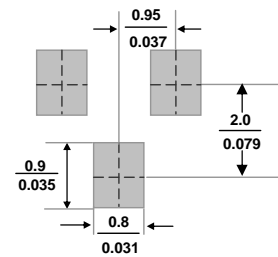


Dimensions	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	2.80	3.00	0.110	0.118
B	1.20	1.40	0.047	0.055
C	0.30	0.50	0.012	0.020
D	1.80	2.00	0.071	0.079
E	2.25	2.55	0.089	0.100
F	0.90	1.20	0.035	0.043
G	0.550 REF		0.022 REF	

**Ordering Information**

Package	Part No.	Packing	Marking
SOT-23	MMBT3904 RF	3K / 7" Reel	1AM
SOT-23	MMBT3904 RFG	3K / 7" Reel	1AM

**Suggested PAD Layout**



**Maximum Ratings and Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

**Maximum Ratings**

Type Number	Symbol	Value	Units
Power Dissipation	$P_D$	300	mW
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	200	mA
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to + 150	°C

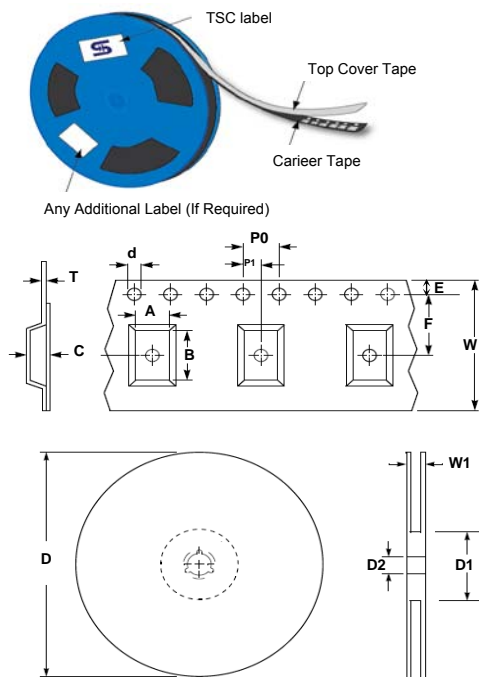
Notes:1. Valid provided that electrodes are kept at ambient temperature

**Small Signal Transistor**

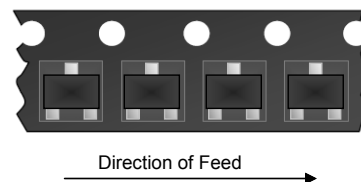
**Electrical Characteristics**

Type Number			Symbol	Min	Max	Units	
Collector-Base Breakdown Voltage	$I_C = 10\mu A$	$I_E = 0$	$V_{(BR)CBO}$	60	-	V	
Collector-Emitter Breakdown Voltage	$I_C = 1mA$	$I_B = 0$	$V_{(BR)CEO}$	40	-	V	
Emitter-Base Breakdown Voltage	$I_E = 10\mu A$	$I_C = 0$	$V_{(BR)EBO}$	6	-	V	
Collector Cut-off Current	$V_{CB} = 60V$	$I_E = 0$	$I_{CBO}$	-	0.1	$\mu A$	
Collector Cut-off Current	$V_{CE} = 30V$	$V_{BE(OFF)} = 3V$	$I_{CEO}$	-	50	nA	
Emitter Cut-off Current	$V_{EB} = 5V$	$I_C = 0$	$I_{EBO}$	-	0.1	$\mu A$	
DC current gain	$V_{CE} = 1V$	$I_C = 10mA$	$h_{FE}$	100	400		
	$V_{CE} = 1V$	$I_C = 50mA$		60	-		
	$V_{CE} = 1V$	$I_C = 100mA$		30	-		
Collector-Emitter saturation voltage	$I_C = 50mA$	$I_B = 5mA$	$V_{CE(sat)}$	-	0.3	V	
Base-Emitter saturation voltage	$I_C = 50mA$	$I_B = 5mA$	$V_{BE(sat)}$	-	0.95	V	
Transition frequency	$V_{CE} = 20V$	$I_C = 10mA$	$f_T$	250	-	MHz	
Delay time	$V_{CC} = 3V$	$V_{BE} = 0.5V$	$I_C = 10mA$	$I_{B1} = 1.0mA$	-	35	nS
Rise time	$V_{CC} = 3V$	$V_{BE} = 0.5V$	$I_C = 10mA$	$I_{B1} = 1.0mA$	-	35	nS
Storage time	$V_{CC} = 3V$	$I_C = 10mA$	$I_{B1} = I_{B2} = 1.0mA$	-	200	nS	
Fall time	$V_{CC} = 3V$	$I_C = 10mA$	$I_{B1} = I_{B2} = 1.0mA$	-	50	nS	

**Tape & Reel specification**



Item	Symbol	Dimension(mm)
Carrier width	A	3.15 ± 0.10
Carrier length	B	2.77 ± 0.10
Carrier depth	C	1.22 ± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178 ± 1
Reel inner diameter	D1	55 Min
Feed hole width	D2	13.0 ± 0.20
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.05
Sprocket hole pitch	P0	4.00 ± 0.10
Embossment center	P1	2.00 ± 0.05
Overall tape thickness	T	0.229 ± 0.013
Tape width	W	8.10 ± 0.20
Reel width	W1	12.30 ± 0.20



**Small Signal Transistor**

**Rating and Characteristic Curves**

