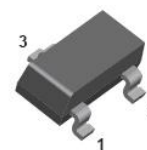
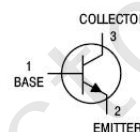


## FEATURES

- Epitaxial planar die construction.
- Complementary PNP type available (MMBT3906).
- Collector Current Capability  $I_{CM} = 200\text{mA}$ .
- Collector-emitter Voltage  $V_{CEO} = 40\text{V}$ .
- MSL 1


**SOT-23**


## APPLICATIONS

- General switching and amplification

## ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT3904	1AM	SOT-23

## MAXIMUM RATING @ $T_a = 25^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	Value	UNIT
$V_{CBO}$	collector-base voltage	open emitter	60	V
$V_{CEO}$	collector-emitter voltage	open base	40	V
$V_{EBO}$	emitter-base voltage	open collector	6	V
$I_C$	collector current (DC)		200	mA
$I_{CM}$	peak collector current		200	mA
$I_{BM}$	peak base current		100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	250	mW
$T_{stg}$	storage temperature		-65 to +150	$^\circ\text{C}$
$T_j$	junction temperature		150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified**

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = 30\text{ V}$	-	50	nA
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = 6\text{ V}$	-	50	nA
$h_{FE}$	DC current gain	$V_{CE} = 1\text{ V};$ $I_C = 0.1\text{ mA}$	60	-	
		$I_C = 1\text{ mA}$	80	-	
		$I_C = 10\text{ mA}$	100	300	
		$I_C = 50\text{ mA}$	60	-	
		$I_C = 100\text{ mA}$	30	-	
$V_{CE(sat)}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	-	200	mV
		$I_C = 50\text{ mA}; I_B = 5\text{ mA}$	-	300	mV
$V_{BE(sat)}$	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	650	850	mV
		$I_C = 50\text{ mA}; I_B = 5\text{ mA}$	-	950	mV
$C_{obo}$	Output Capacitance	$I_E = I_e = 0; V_{CB} = 5\text{ V};$ $f = 1\text{ MHz}$	-	4	pF
$C_{ibo}$	Input Capacitance	$I_C = I_c = 0; V_{BE} = 500\text{ mV};$ $f = 1\text{ MHz}$	-	8	pF
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 20\text{ V};$ $f = 100\text{ MHz}$	300	-	MHz
F	noise figure	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V};$ $R_S = 1\text{ k}\Omega; f = 10\text{ Hz to } 15.7\text{ kHz}$	-	5	dB
Switching times (between 10% and 90% levels);					
$t_d$	delay time	$V_{CC} = 3\text{ Vdc}, V_{BE} = -0.5\text{ Vdc}$	-	35	ns
$t_r$	rise time	$I_C = 10\text{ mA}, I_B = 1\text{ mA}$	-	35	ns
$t_s$	storage time	$V_{CC} = 3\text{ Vdc}, I_C = 10\text{ mA}$	-	200	ns
$t_f$	fall time	$I_B = I_{B2} = 1\text{ mA}$	-	50	ns

 Note Pulse test:  $t_p \leq 300\text{ ms}; d \leq 0.02$ .

TYPICAL CHARACTERISTICS @  $T_a=25^\circ\text{C}$  unless otherwise specified

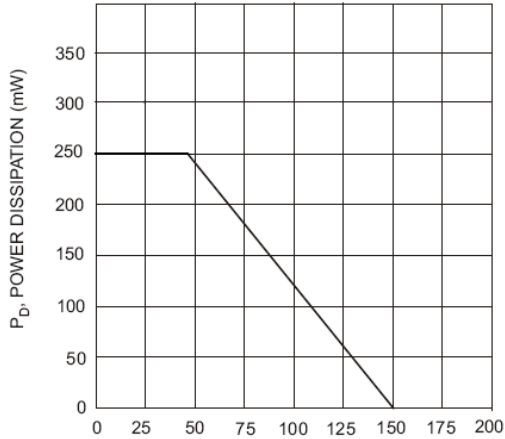


Fig. 1, Max Power Dissipation vs Ambient Temperature

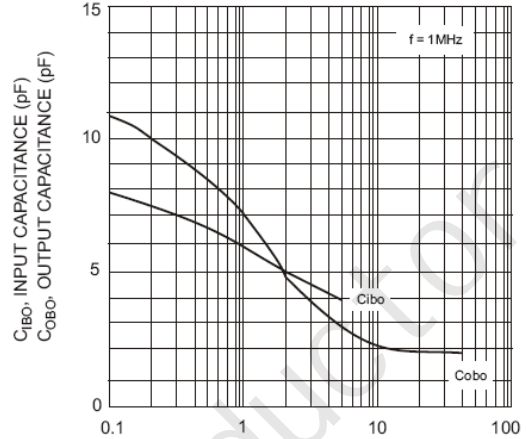


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

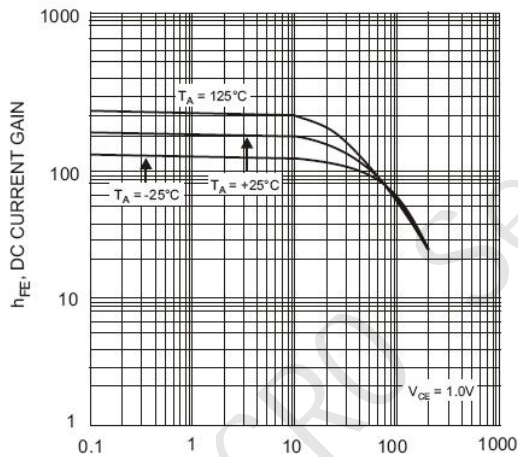


Fig. 3, Typical DC Current Gain vs Collector Current

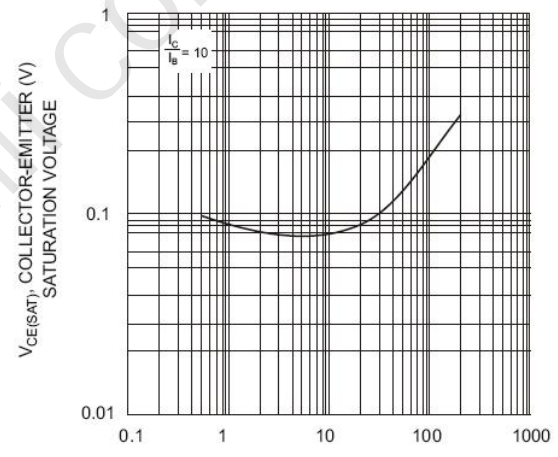


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

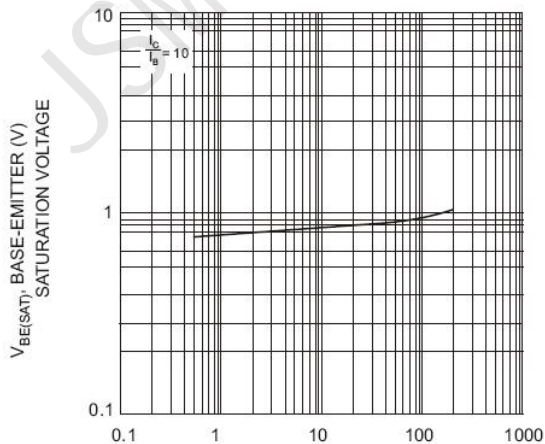
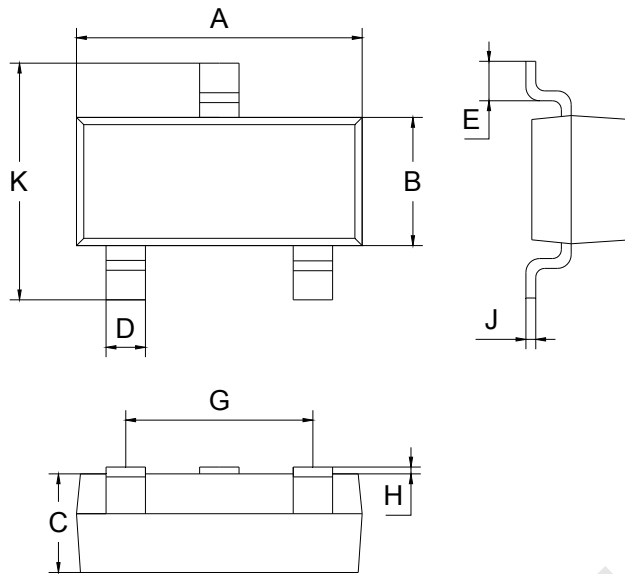


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

## PACKAGE OUTLINE

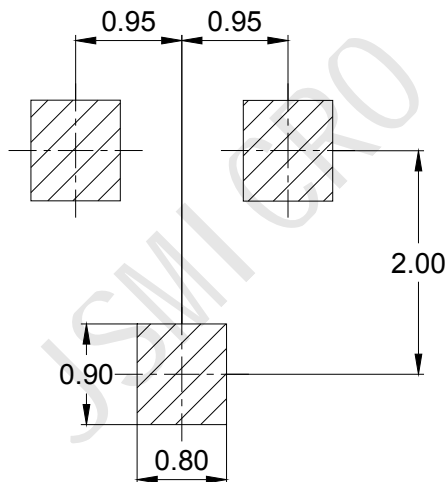
Plastic surface mounted package

SOT-23



SOT-23		
Dim	Min	Max
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60
All Dimensions in mm		

## SOLDERING FOOTPRINT



Unit: mm

## PACKAGE INFORMATION

Device	Package	Shipping
MMBT3904	SOT-23	3000pcs / Tape & Reel

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Bipolar Transistors - BJT category](#):*

*Click to view products by [JSMSEMI manufacturer](#):*

Other Similar products are found below :

[619691C](#) [MCH4017-TL-H](#) [MMBT-2369-TR](#) [BC546/116](#) [BC557/116](#) [BSW67A](#) [NJVMJD148T4G](#) [NTE123AP-10](#) [NTE153MCP](#) [NTE16](#)  
[NTE195A](#) [NTE92](#) [C4460](#) [2N4401-A](#) [2N6728](#) [2SA1419T-TD-H](#) [2SA2126-E](#) [2SB1204S-TL-E](#) [2SC2712S-GR,LF](#) [2SC5488A-TL-H](#)  
[2SD2150T100R](#) [SP000011176](#) [2N2907A](#) [2N3904-NS](#) [2N5769](#) [2SC2412KT146S](#) [2SD1816S-TL-E](#) [CPH6501-TL-E](#) [MCH4021-TL-E](#)  
[MJE340](#) [US6T6TR](#) [NJL0281DG](#) [732314D](#) [CPH3121-TL-E](#) [CPH6021-TL-H](#) [873787E](#) [IMZ2AT108](#) [UMX21NTR](#) [MCH6102-TL-E](#) [FP204-](#)  
[TL-E](#) [NJL0302DG](#) [2N3583](#) [2SA2014-TD-E](#) [2SC2812-5-TB-E](#) [30A02MH-TL-E](#) [NSV40301MZ4T1G](#) [NTE13](#) [NTE26](#) [NTE282](#) [NTE323](#)