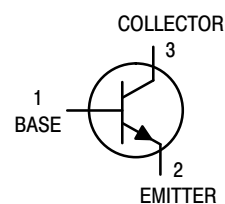


GENERAL PURPOSE APPLICATION

■ FEATURES

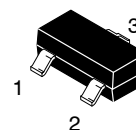
- * Collector-Emitter Voltage: $V_{CEO}=40V$
- * Collector Dissipation: $P_{D\ MAX}=350mW$
- * Complementary to MMBT3906



■ ORDERING INFORMATION

Device	Package	Shipping [†]
MMBT3904	SOT-23 (Pb-Free)	3000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.



SOT-23

■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Collector Dissipation	P_C	350	mW
Junction Temperature	T_J	+150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

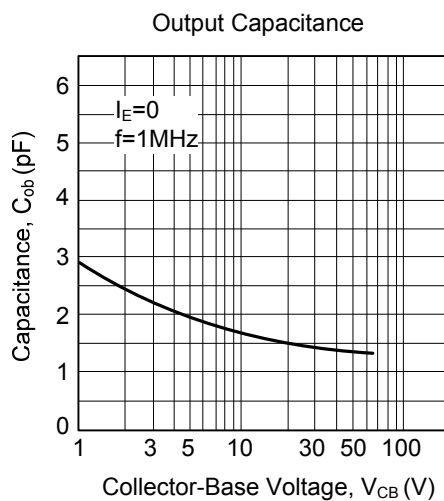
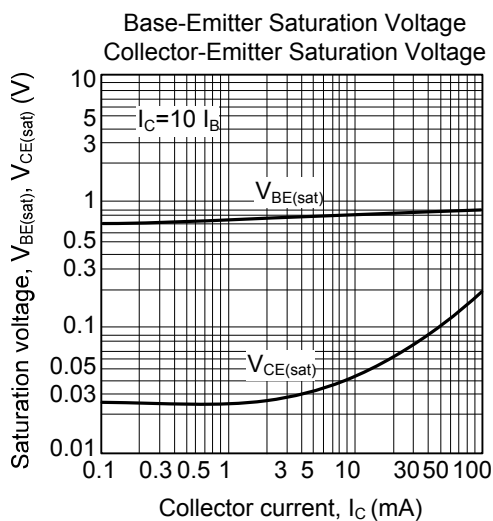
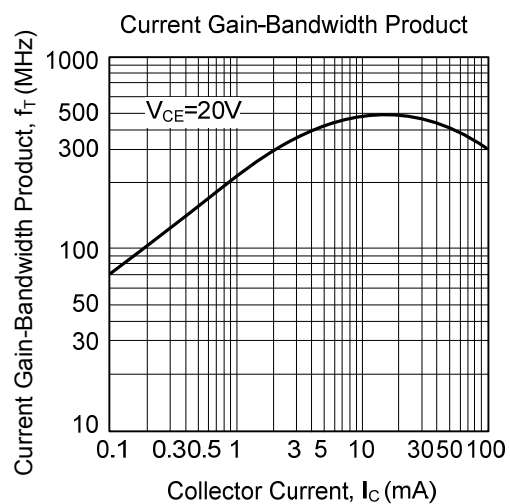
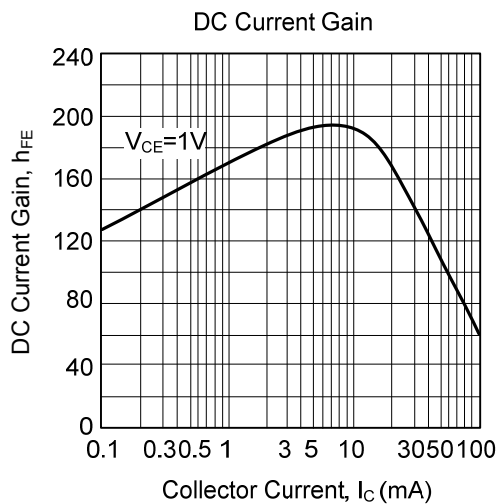
Note Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	V_{CBO}	$I_C=10\mu\text{A}$, $I_E=0$	60			V
Collector-Emitter Breakdown Voltage	V_{CEO}	$I_C=1\text{mA}$, $I_B=0$ (Note)	40			V
Emitter-Base Breakdown Voltage	V_{EBO}	$I_E=10\mu\text{A}$, $I_C=0$	6			V
Collector-Emitter Saturation Voltage (Note)	$V_{CE\text{ SAT }1}$	$I_C=10\text{mA}$, $I_B=1\text{mA}$			0.2	V
	$V_{CE\text{ SAT }2}$	$I_C=50\text{mA}$, $I_B=5\text{mA}$			0.3	V
Base-Emitter Saturation Voltage (Note)	$V_{BE\text{ SAT }1}$	$I_C=10\text{mA}$, $I_B=1\text{mA}$	0.65		0.85	V
	$V_{BE\text{ SAT }2}$	$I_C=50\text{mA}$, $I_B=5\text{mA}$			0.95	V
Collector Cut-Off Current	I_{CE}	$V_{CE}=30\text{V}$, $V_{EB}=3\text{V}$			50	nA
Base Cut-Off Current	I_{BL}	$V_{CE}=30\text{V}$, $V_{EB}=3\text{V}$			50	nA
DC Current Gain (Note)	h_{FE1}	$V_{CE}=1\text{V}$, $I_C=0.1\text{mA}$	40			
	h_{FE2}	$V_{CE}=1\text{V}$, $I_C=1\text{mA}$	70			
	h_{FE3}	$V_{CE}=1\text{V}$, $I_C=10\text{mA}$	100		300	
	h_{FE4}	$V_{CE}=1\text{V}$, $I_C=50\text{mA}$	60			
	h_{FE5}	$V_{CE}=1\text{V}$, $I_C=100\text{mA}$	30			
Current Gain Bandwidth Product	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
Turn On Time	t_{ON}	$V_{CC}=3\text{V}$, $V_{BE}=0.5\text{V}$, $I_C=10\text{mA}$, $I_{B1}=1\text{mA}$			70	ns
Turn Off Time	t_{OFF}	$I_{B1}=I_{B2}=1\text{mA}$			250	ns

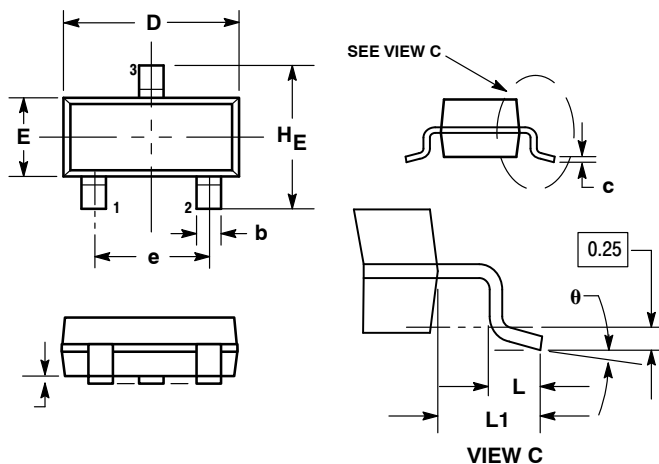
Note: Pulse test: $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

TYPICAL CHARACTERISTICS



PACKAGE DIMENSIONS

SOT-23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
H_E	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°	---	10°	0°	---	10°

STYLE 6:

- PIN 1. BASE
- EMITTER
- COLLECTOR

SOLDERING FOOTPRINT

