

# LOW VOLTAGE HIGH CURRENT SMALL SIGNAL NPN TRANSISTOR

## ■ DESCRIPTION

The MMBT8050 is a low voltage high current small signal NPN transistor, designed for Class B push-pull audio amplifier and general purpose applications.

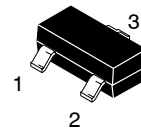
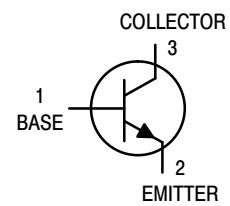
## ■ FEATURES

- \*Collector current up to 1000mA
- \*Collector-Emitter voltage up to 25V
- \*Complementary to MMBT8550

## ■ ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
MMBT8050	SOT-23 (Pb-Free)	3000 / Tape & Reel

<sup>†</sup>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	$V_{\text{CBO}}$	40	V
Collector-Emitter Voltage	$V_{\text{CEO}}$	25	V
Emitter-Base Voltage	$V_{\text{EBO}}$	5	V
Collector Current	$I_{\text{C}}$	1000	mA
Collector Dissipation( $T_A=25^{\circ}\text{C}$ )	SOT-23	$P_{\text{C}}$	1
	TO-92		1
Junction Temperature	$T_{\text{J}}$	+150	$^{\circ}\text{C}$
Storage Temperature	$T_{\text{STG}}$	-40 ~ +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 )**

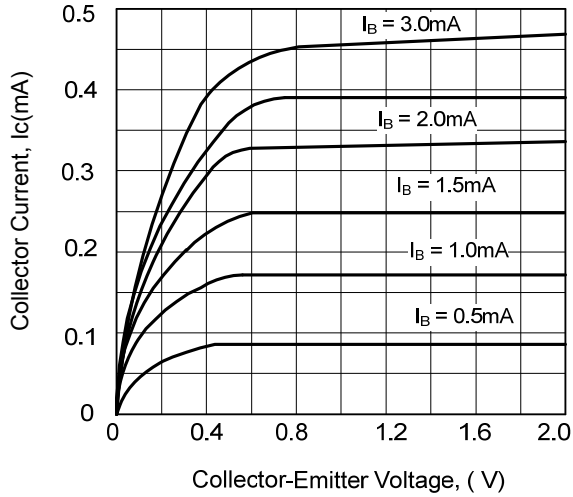
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$BV_{\text{CBO}}$	$I_{\text{C}} = 100\mu\text{A}, I_{\text{E}} = 0$	40			V
Collector-Emitter Breakdown Voltage	$BV_{\text{CEO}}$	$I_{\text{C}} = 1\text{mA}, I_{\text{B}} = 0$	25			V
Emitter-Base Breakdown Voltage	$BV_{\text{EBO}}$	$I_{\text{E}} = 100\mu\text{A}, I_{\text{C}} = 0$	5			V
Collector Cut-Off Current	$I_{\text{CBO}}$	$V_{\text{CB}} = 35\text{V}, I_{\text{E}} = 0$			100	nA
Emitter Cut-Off Current	$I_{\text{EBO}}$	$V_{\text{EB}} = 5\text{V}, I_{\text{C}} = 0$			100	nA
DC Current Gain(note)	$h_{\text{FE1}}$	$V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 1\text{mA}$	100		400	
	$h_{\text{FE2}}$	$V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 150\text{mA}$	120			
	$h_{\text{FE3}}$	$V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 500\text{mA}$	40			
Collector-Emitter Saturation Voltage	$V_{\text{CE SAT}}$	$I_{\text{C}} = 800\text{mA}, I_{\text{B}} = 80\text{mA}$			0.5	V
Base-Emitter Saturation Voltage	$V_{\text{BE SAT}}$	$I_{\text{C}} = 800\text{mA}, I_{\text{B}} = 80\text{mA}$			1.2	V
Base-Emitter Saturation Voltage	$V_{\text{BE SAT}}$	$V_{\text{CE}} = 1\text{V}, I_{\text{C}} = 10\text{mA}$			1.0	V
Current Gain Bandwidth Product	$f_{\text{T}}$	$V_{\text{CE}} = 6\text{V}, I_{\text{C}} = 20\text{mA}$	100			MHz
Output Capacitance	$C_{\text{ob}}$	$V_{\text{CB}} = 10\text{V}, I_{\text{E}} = 0, f = 1\text{MHz}$		9.0		pF

**■ CLASSIFICATION OF  $h_{\text{FE2}}$** 

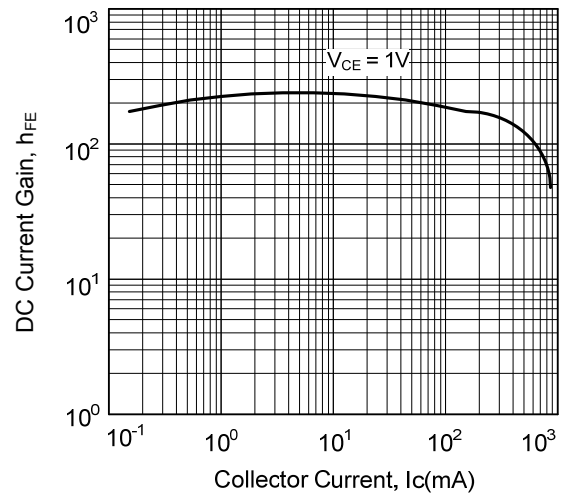
RANK	C	D	E
RANGE	120-200	160-300	280-400

■ TYPICAL CHARACTERISTICS

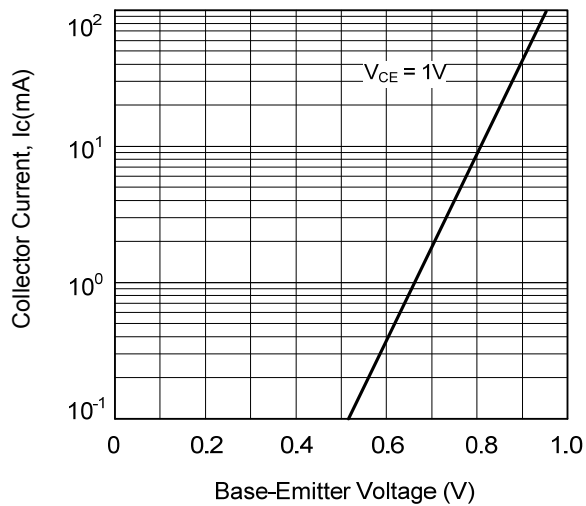
Static Characteristics



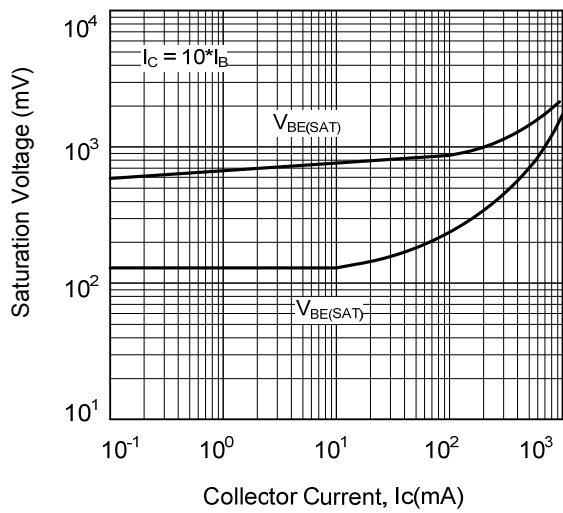
DC Current Gain



Base-Emitter on Voltage

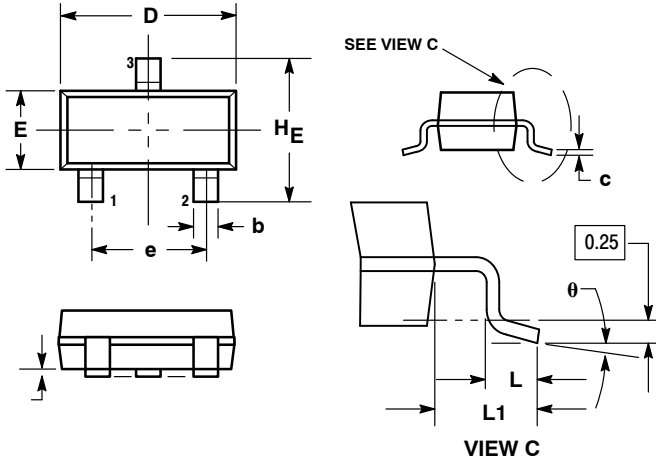


Saturation Voltage



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
HE	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°	---	10°	0°	---	10°

- STYLE 6:  
 PIN 1. BASE  
 2. EMITTER  
 3. COLLECTOR

SOLDERING FOOTPRINT

