

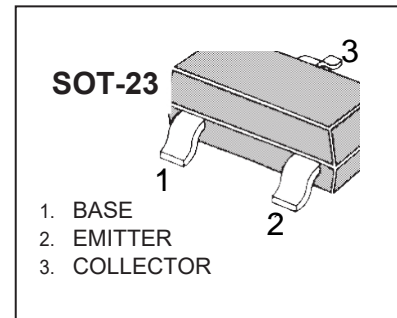
## SOT-23 Plastic-Encapsulate Transistors

### MMBT1616/MMBT1616A TRANSISTOR (NPN)

#### FEATURES

- Audio frequency power amplifier
- Medium speed switching

MARKING:MMBT1616 "16"  
MMBT1616A "16A"



#### ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage	1616	$V_{CBO}$	60	V
	1616A		120	V
Collector-Emitter Voltage	1616	$V_{CEO}$	50	V
	1616A		60	V
Emitter to Base Voltage		$V_{EBO}$	6	V
Collector Current	DC	$I_C$	1	A
	Pulse*	$I_C$	2	A
Total Power Dissipation ( $T_a=25^\circ\text{C}$ )		$P_C$	350	mW
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

Note (\*) Pulse width $\leq$ 10ms, Duty cycle $<$ 50%

1. 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.

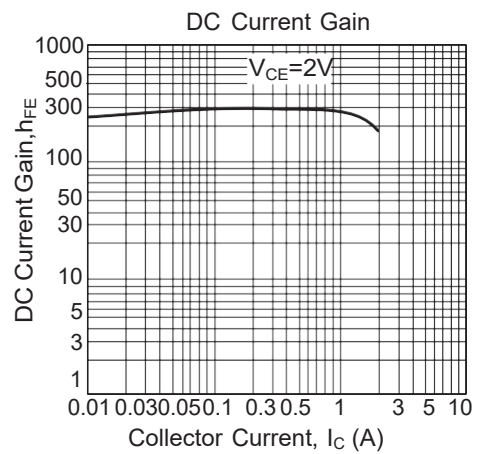
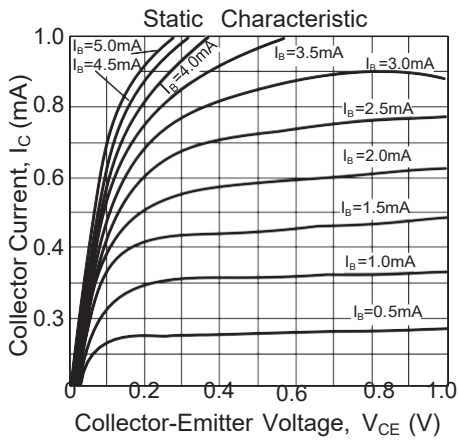
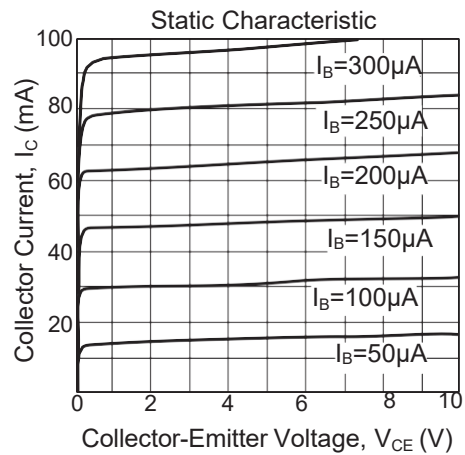
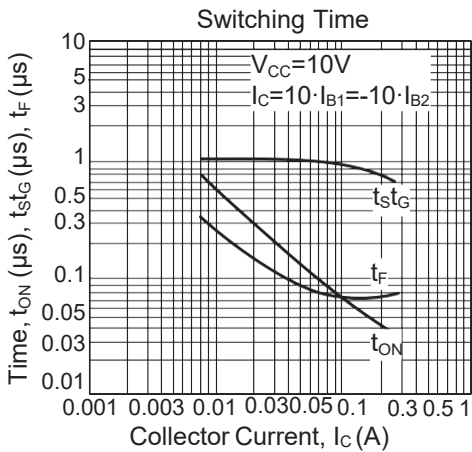
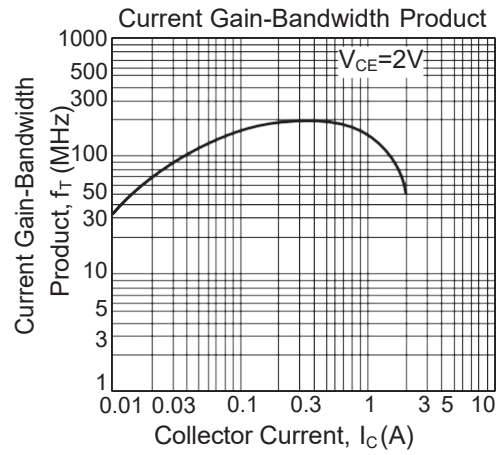
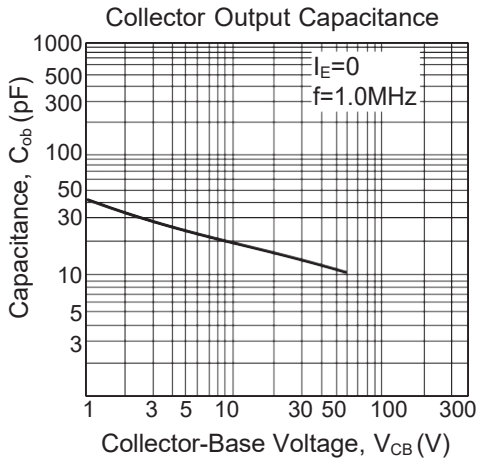
#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=60\text{V}$			100	nA
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=6\text{V}$			100	nA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=1\text{A}, I_B=50\text{mA}$		0.15	0.3	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=1\text{A}, I_B=50\text{mA}$		0.9	1.2	V
Base Emitter On Voltage	$V_{BE(ON)}$	$V_{CE}=2\text{V}, I_C=50\text{mA}$	600	640	700	mV
DC Current Gain	$h_{FE1}$	$V_{CE}=2\text{V}, I_C=100\text{mA}$	135		600	
	$h_{FE2}$		$V_{CE}=2\text{V}, I_C=1\text{A}$	81		400
Current Gain Bandwidth Product	$f_T$	$V_{CE}=2\text{V}, I_C=100\text{mA}$	100	160		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}, f=1\text{MHz}$			19	pF
Turn On Time	$t_{ON}$	$V_{CE}=10\text{V}, I_C=100\text{mA}$		0.07		us
Storage Time	$t_S$	$I_{B1}=-I_{B2}=10\text{mA}$		0.95		us
Fall Time	$t_F$	$V_{BE(OFF)}=-2 \sim -3\text{V}$		0.07		us

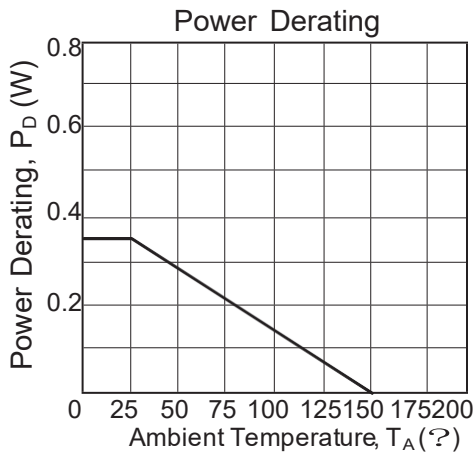
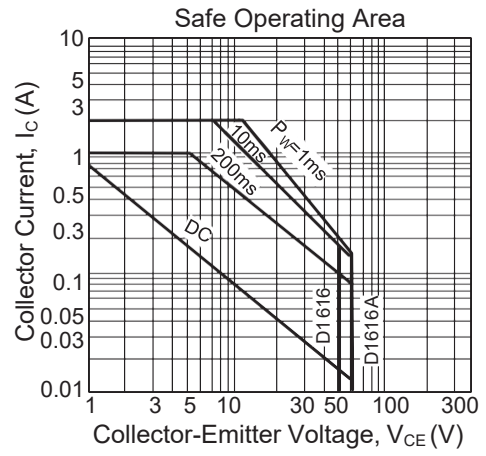
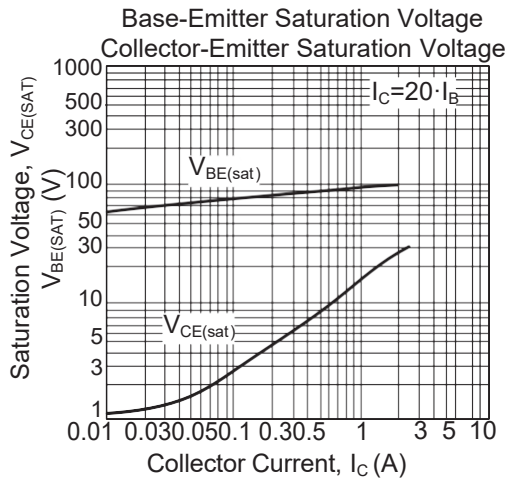
#### CLASSIFICATION OF $h_{FE1}$

RANK	Y	G	L
$h_{FE1}$	135-270	200-400	300-600

Typical Characteristics



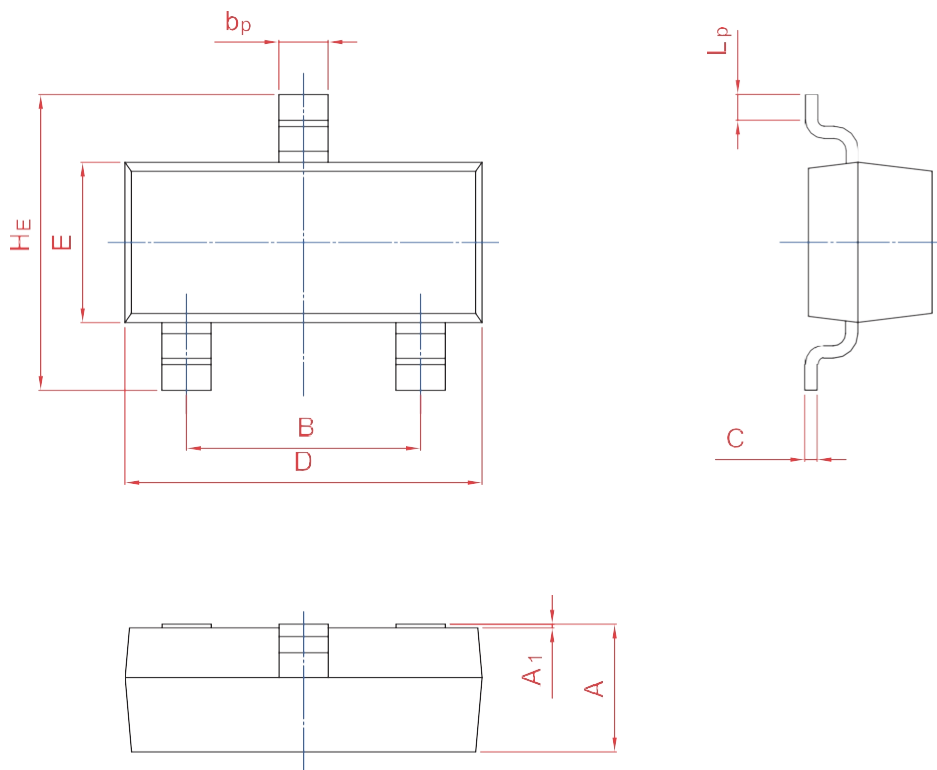
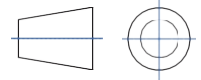
Typical Characteristics



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b <sub>p</sub>	C	D	E	H <sub>E</sub>	A <sub>1</sub>	L <sub>p</sub>
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20