



UNISONIC TECHNOLOGIES CO., LTD

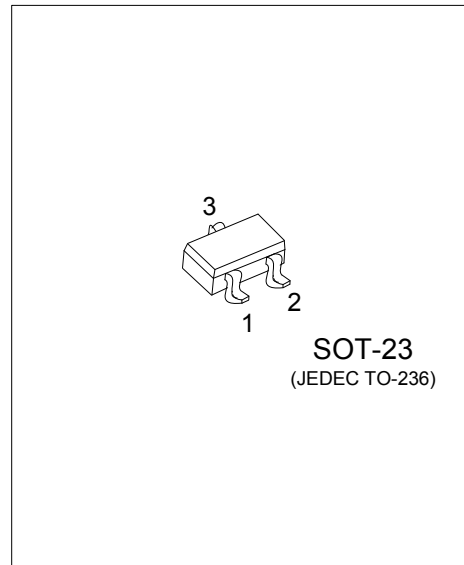
MMBT9013

NPN SILICON TRANSISTOR

1W OUTPUT AMPLIFIER OF
POTABLE RADIOS IN CLASS
B PUSH-PULL OPERATION

FEATURES

- *High total Power Dissipation. (625mW)
- *High Collector Current. (500mA)
- *Excellent h_{FE} linearity.
- *Complementary to UTC MMBT9012



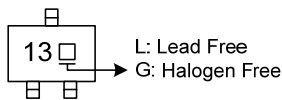
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MMBT9013L-x-AE3-R	MMBT9013G-x-AE3-R	SOT-23	B	E	C	Tape Reel

Note: Pin Assignment: B: Base E: Emitter C: Collector

<p>MMBT9013G-x-AE3-R</p>	<p>(1) R: Tape Reel</p> <p>(2) AE3: SOT-23</p> <p>(3) x: refer to Classification of h_{FE1}</p> <p>(4) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



MMBT9013

NPN SILICON TRANSISTOR

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

PARAMETER	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	500	mA
Collector Dissipation	P_C	225	mW
Operating Junction Temperature	T_J	-40 ~ +150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

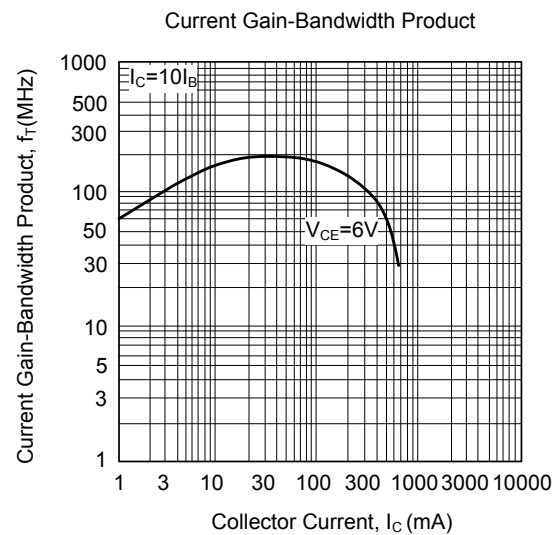
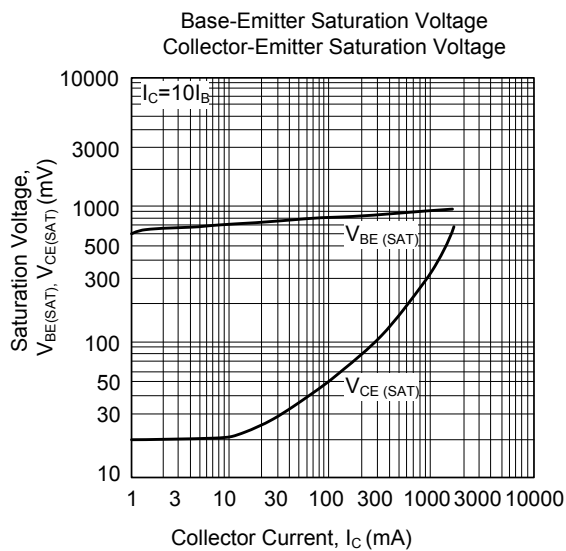
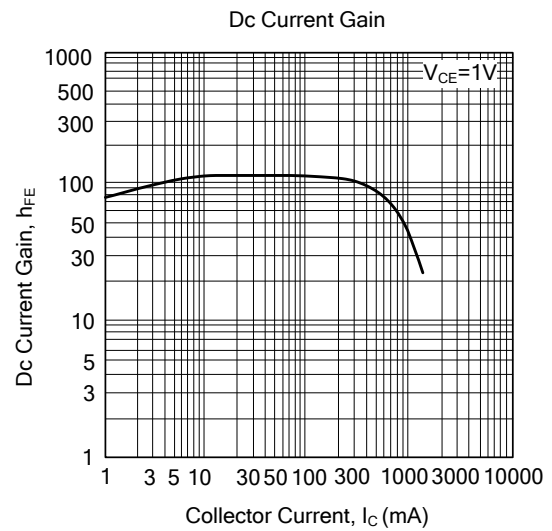
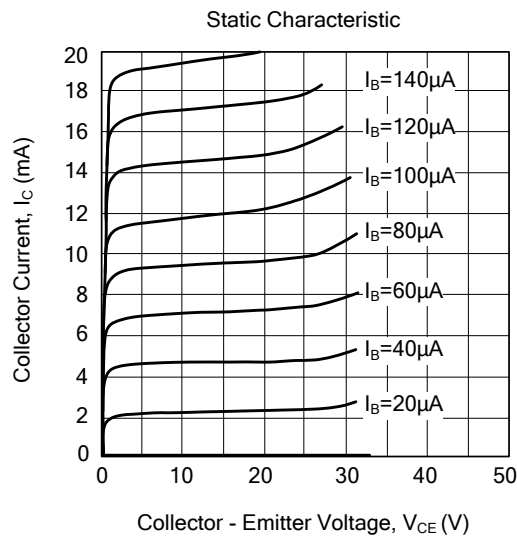
■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=100\mu\text{A}, I_E=0$	40			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=1\text{mA}, I_B=0$	20			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=100\mu\text{A}, I_C=0$	5			V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$		0.16	0.6	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$		0.91	1.2	V
Base-Emitter On Voltage	$V_{BE(ON)}$	$V_{CE}=1\text{V}, I_C=10\text{mA}$	0.6	0.67	0.7	V
Collector Cutoff Current	I_{CBO}	$V_{CB}=25\text{V}, I_E=0$			100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=3\text{V}, I_C=0$			100	nA
DC Current Gain	h_{FE1}	$V_{CE}=1\text{V}, I_C=50\text{mA}$	64	120	300	
	h_{FE2}	$V_{CE}=1\text{V}, I_C=500\text{mA}$	40	120		

■ CLASSIFICATION OF h_{FE1}

RANK	D	E	F	G	H	I
RANGE	64-91	78-112	96-135	112-166	144-202	190-300

TYPICAL CHARACTERISTICS



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