

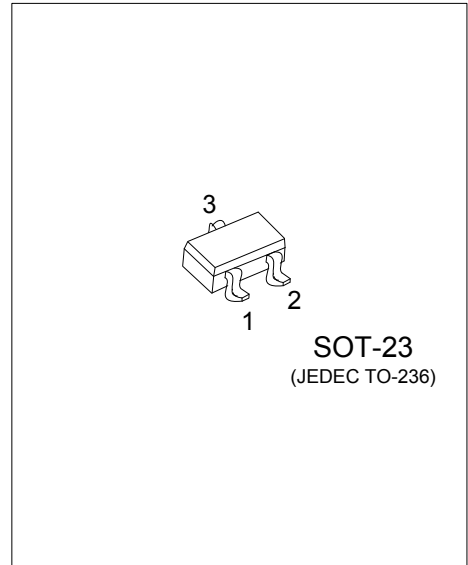


# UNISONIC TECHNOLOGIES CO., LTD

## 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

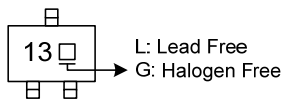
### ORDERING INFORMATION

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

MMBT9013G-x-AE3-R	
(1) Packing Type	(1) R: Tape Reel
(2) Package Type	(2) AE3: SOT-23
(3) Rank	(3) x: refer to Classification of $h_{FE1}$
(4) Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

### 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
Junction Temperature	$T_J$	+150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

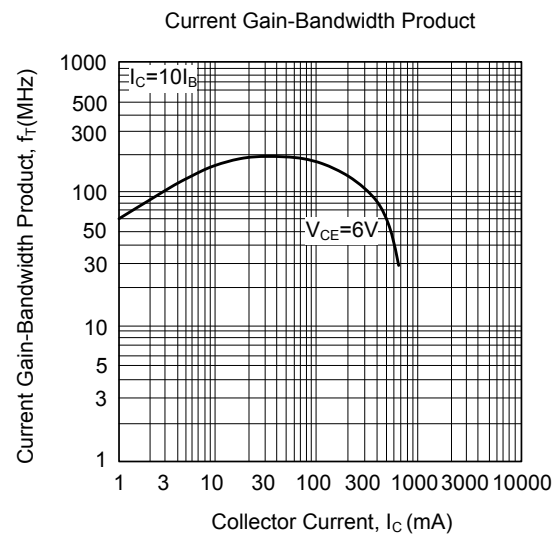
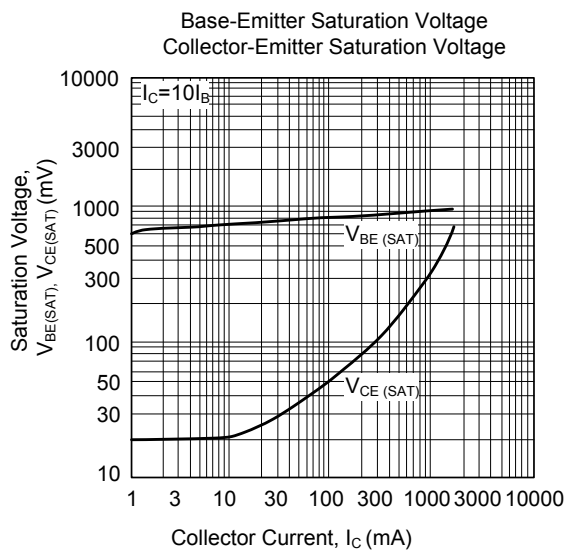
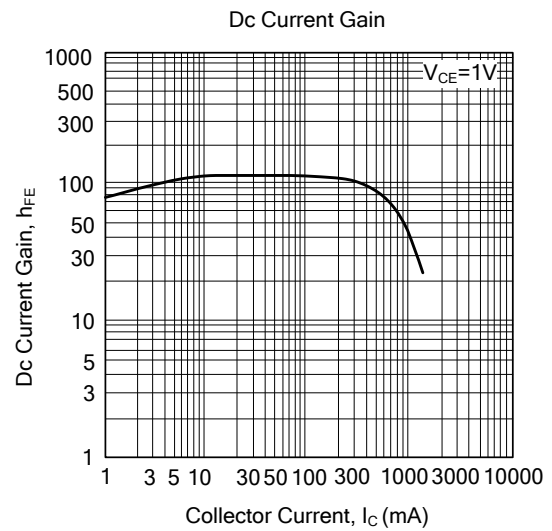
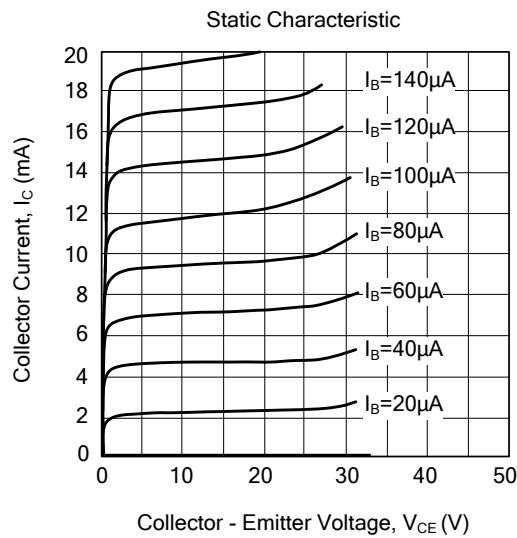
### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

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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