

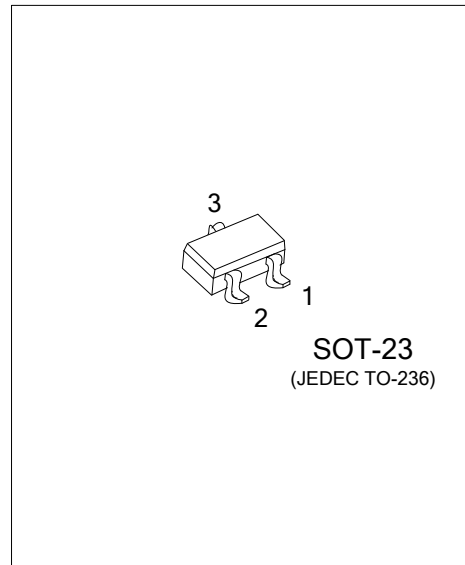


# UNISONIC TECHNOLOGIES CO., LTD

## MMBT9012

## 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 hFE linearity
- \*Complementary to UTC MMBT9013

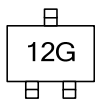
### ORDERING INFORMATION

| Ordering Number   | Package | Pin Assignment |   |   | Packing   |
|-------------------|---------|----------------|---|---|-----------|
|                   |         | 1              | 2 | 3 |           |
| MMBT9012G-x-AE3-R | SOT-23  | E              | B | C | Tape Reel |

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

|                          |   |
|--------------------------|---|
| <p>MMBT9012G-x-AE3-R</p> | <p>(1) R: Tape Reel</p> <p>(2) AE3: SOT-23</p> <p>(3) x: refer to Classification of <math>h_{FE1}</math></p> <p>(4) G: Halogen Free and Lead Free</p> |
|--------------------------|---|

### MARKING



# MMBT9012

## 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 | $^{\circ}\text{C}$ |

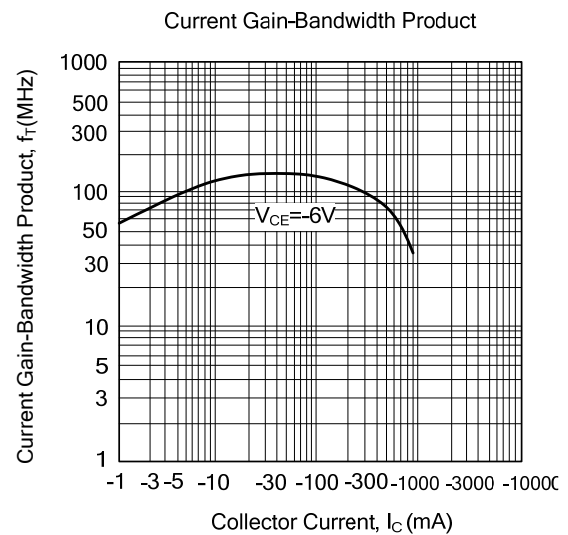
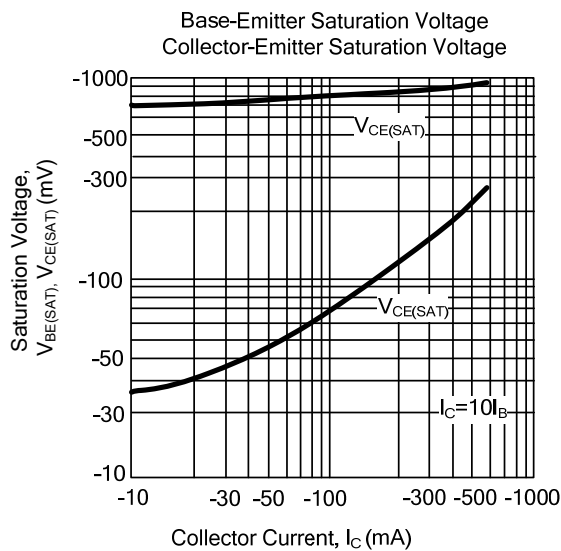
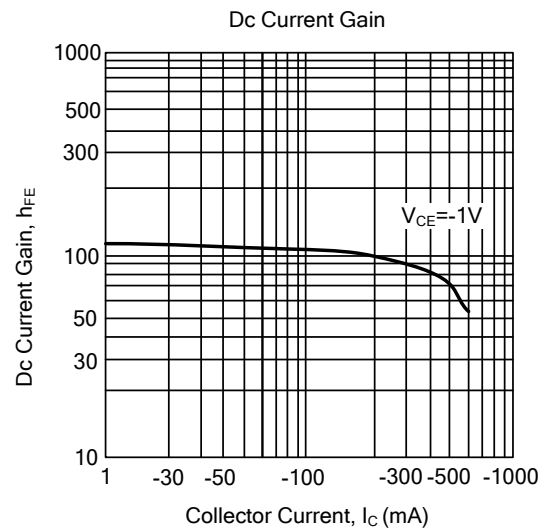
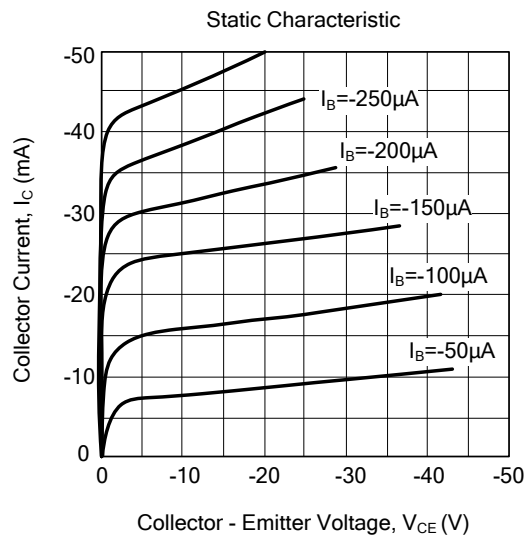
### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                            | SYMBOL    | TEST CONDITIONS                               | MIN  | TYP   | MAX  | UNIT |
|--------------------------------------|-----------|---|------|-------|------|------|
| Collector-base breakdown voltage     | BVCBO     | $I_C = -100\mu\text{A}$ , $I_E = 0$           | -40  |       |      | V    |
| Collector-emitter breakdown voltage  | BVCEO     | $I_C = -1\text{mA}$ , $I_B = 0$               | -20  |       |      | V    |
| Emitter-base breakdown voltage       | BVEBO     | $I_E = -100\mu\text{A}$ , $I_C = 0$           | -5   |       |      | V    |
| Collector cutoff current             | ICBO      | $V_{CB} = -25\text{V}$ , $I_E = 0$            |      |       | -100 | nA   |
| Emitter cutoff current               | IEBO      | $V_{EB} = -3\text{V}$ , $I_C = 0$             |      |       | -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   | 90    |      |      |
| Collector-emitter saturation voltage | VCE(sat)  | $I_C = -500\text{mA}$ , $I_B = -50\text{mA}$  |      | -0.18 | -0.6 | V    |
| Base-emitter saturation voltage      | VBE(sat)  | $I_C = -500\text{mA}$ , $I_B = -50\text{mA}$  |      | -0.95 | -1.2 | V    |
| Base-emitter on voltage              | VBE(on)   | $V_{CE} = -1\text{V}$ , $I_C = -10\text{mA}$  | -0.6 | -0.67 | -0.7 | V    |

### ■ 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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