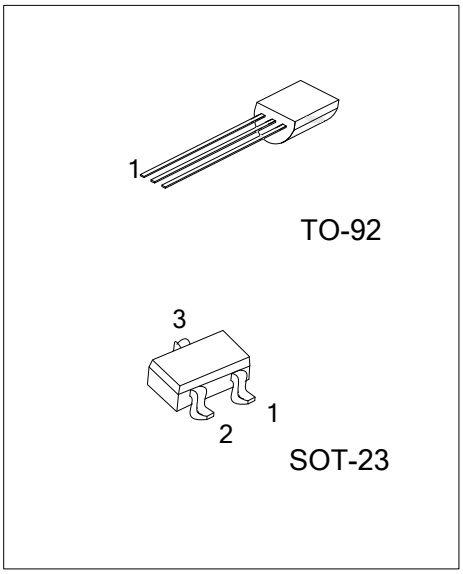
# M28S

**NPN SILICON TRANSISTOR**

## AUDIO OUTPUT DRIVER AMPLIFIER




### ■ FEATURES

* Excellent HFE Linearity
* High DC Current Gain
* High Power Dissipation

### ■ APPLICATION

* Audio Output Driver Amplifier
* General Purpose Switch

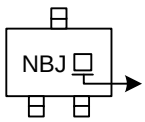
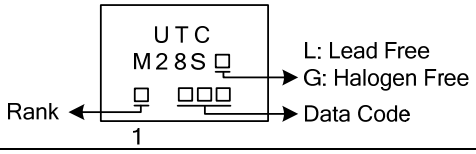
### ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| M28SL-x-AE3-R | M28SG-x-AE3-R | SOT-23 | E | C | B | Tape Reel |
| M28SL-x-T92-B | M28SG-x-T92-B | TO-92 | E | C | B | Tape Box |
| M28SL-x-T92-K | M28SG-x-T92-K | TO-92 | E | C | B | Bulk |

M28SL-x-AE3-R
(1)Packing Type
(2)Packing Type
(3)Rank
(4)Lead Free

(1) B: Tape Box, K: Bulk, R: Tape Reel
(2) AB3: SOT-23, T92: TO-92
(3) x: refer to Classification of $h_{FE1}$
(4) G: Halogen Free, L: Lead Free

### ■ MARKING

| SOT-23 | TO-92 |
|---|---|
|  |  |

## ■ ABSOLUTE MAXIMUM RATING ($T_A$=25°C, unless otherwise specified )

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 40 | V |
| Collector-emitter Voltage | $V_{CEO}$ | 20 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 6 | V |
| Collector Current | $I_C$ | 1.25 | A |
| Base Current | $I_B$ | 0.4 | A |
| Power Dissipation ($T_A$=25°C) | $P_D$ | 850 | mW |
| Junction Temperature | $T_J$ | +150 | °C |
| Storage Temperature | $T_{STG}$ | -55 ~ +150 | °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°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | $I_C$=0.1mA | 40 | | | V |
| Collector-Emitter Voltage | $V_{CEO}$ | $I_C$=1mA | 20 | | | V |
| Emitter-Base Voltage | $V_{EBO}$ | $I_E$=0.1mA | 6 | | | V |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$=35V, $I_E$=0 | | | 100 | nA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=5V, $I_C$=0 | | | 100 | nA |
| **ON CHARACTERISTICS** | | | | | | |
| DC Current Gain (Note) | $h_{FE1}$ | $V_{CE}$=1V, $I_C$=1mA | 290 | | | |
| | $h_{FE2}$ | $V_{CE}$=1V, $I_C$=0.1A | 300 | | 1000 | |
| | $h_{FE3}$ | $V_{CE}$=1V, $I_C$=0.3A | 300 | | | |
| | $h_{FE4}$ | $V_{CE}$=1V, $I_C$=0.5A | 300 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C$=600mA, $I_B$=20mA | | | 0.55 | V |
| **SMALL-SIGNAL CHARACTERISTICS** | | | | | | |
| Current Gain Bandwidth Product | $f_T$ | $V_{CE}$=10V, $I_C$=50mA, f=1MHz | 100 | | | MHz |
| Output Capacitance | $C_{OB}$ | $V_{CB}$=10V, $I_E$=0, f=1MHz | | 9 | | pF |

## ■ CLASSIFICATION OF $h_{FE2}$

| RANK | B | C | D |
|---|---|---|---|
| RANGE | 300-550 | 500-700 | 650-1000 |