



## M28S

## NPN SILICON TRANSISTOR

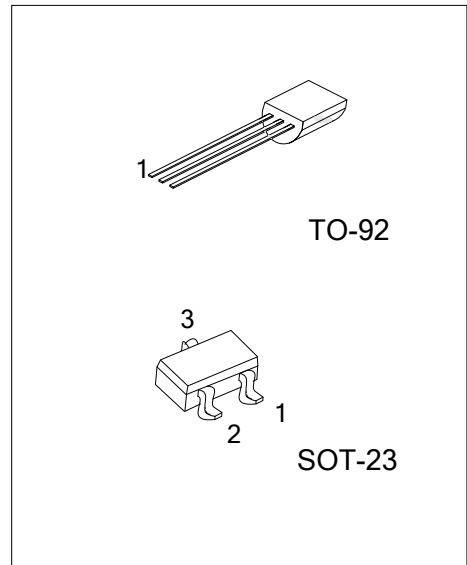
### AUDIO OUTPUT DRIVER AMPLIFIER

#### ■ FEATURES

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

#### ■ APPLICATION

- \* Audio Output Driver Amplifier
- \* General Purpose Switch

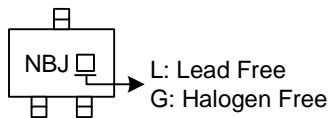


#### ■ ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
M28S-x-AE3-R	M28SL-x-AE3-R	M28SG-x-AE3-R	SOT-23	E	C	B	Tape Reel
M28S-x-T92-B	M28SL-x-T92-B	M28SG-x-T92-B	TO-92	E	C	B	Tape Box
M28S-x-T92-K	M28SL-x-T92-K	M28SG-x-T92-K	TO-92	E	C	B	Bulk

<p>M28SL-x-AE3-R</p> <p>(1)Packing Type (2)Package Type (3)Rank (4)Lead Plating</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel (2) AB3: SOT-23, T92: TO-92 (3) x: refer to Classification of <math>h_{FE1}</math> (4) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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#### ■ MARKING



■ ABSOLUTE MAXIMUM RATING ( $T_a=25^{\circ}\text{C}$ , 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	mA
Base Current	$I_B$	0.4	mA
Power Dissipation( $T_a=25^{\circ}\text{C}$ )	$P_D$	850	mW
Junction Temperature	$T_J$	+150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

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 ( $T_a=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Voltage	$V_{CBO}$	$I_C=0.1\text{mA}$	40			V
Collector-Emitter Voltage	$V_{CEO}$	$I_C=1\text{mA}$	20			V
Emitter-Base Voltage	$V_{EBO}$	$I_E=0.1\text{mA}$	6			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=35\text{V}, I_E=0$			100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=5\text{V}, I_C=0$			100	nA

**ON CHARACTERISTICS**

DC Current Gain (Note)	$h_{FE1}$	$V_{CE}=1\text{V}, I_C=1\text{mA}$	290			
	$h_{FE2}$	$V_{CE}=1\text{V}, I_C=0.1\text{A}$	300		1000	
	$h_{FE3}$	$V_{CE}=1\text{V}, I_C=0.3\text{A}$	300			
	$h_{FE4}$	$V_{CE}=1\text{V}, I_C=0.5\text{A}$	300			
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=600\text{mA}, I_B=20\text{mA}$			0.55	V

**SMALL-SIGNAL CHARACTERISTICS**

Current Gain Bandwidth Product	$f_T$	$V_{CE}=10\text{V}, I_C=50\text{mA}, f=1\text{MHz}$	100			MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		9		pF

■ CLASSIFICATION OF  $h_{FE2}$

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

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