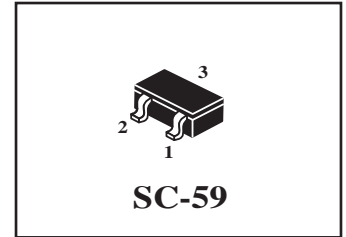
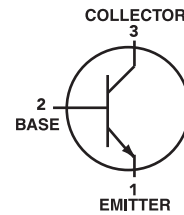


### NPN Low Voltage Output Amplifiers

 Lead(Pb)-Free



#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	25	Vdc
Collector-Base Voltage	$V_{CBO}$	20	Vdc
Emitter-Base Voltage	$V_{EBO}$	12	Vdc
Collector Current-Continuous	$I_C$	500	mAdc
Collector Current-Peak	$I_{c(p)}$	1000	mAdc

#### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) $T_A=25^{\circ}\text{C}$ Derate above $25^{\circ}\text{C}$	$P_D$	200	mW
		1.6	$\text{mW}/^{\circ}\text{C}$
Junction Temperature	$T_j$	150	$^{\circ}\text{C}/\text{W}$
Storage, Temperature	$T_{stg}$	-55 to +150	$^{\circ}\text{C}$

#### DEVICE MARKING

MSD1328=1DR

#### ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
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#### OFF CHARACTERISTICS

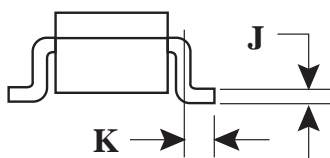
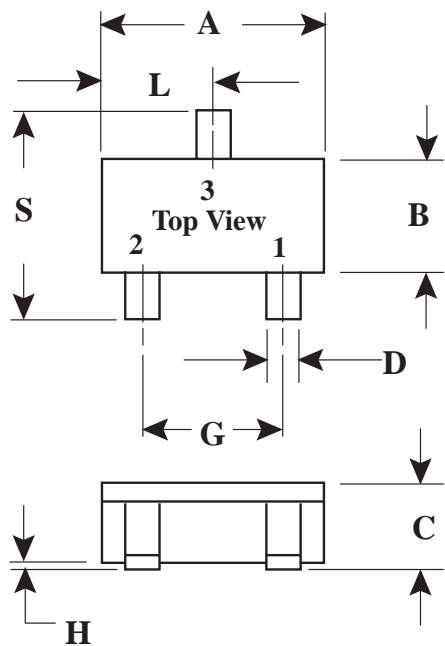
Collector-Emitter Breakdown Voltage ( $I_C=-1.0\text{ mAdc}$ , $I_B=0$ )	$V_{(BR)CEO}$	20	-	Vdc
Collector-Base Breakdown Voltage ( $I_C=10\text{ }\mu\text{Adc}$ , $I_E=0$ )	$V_{(BR)CBO}$	25	-	Vdc
Emitter-Base Breakdown Voltage ( $I_E=10\text{ }\mu\text{Adc}$ , $I_C=0$ )	$V_{(BR)EBO}$	12	-	Vdc
Collector Cutoff Current ( $V_{CB}=25\text{ Vdc}$ , $I_E=0$ )	$I_{CBO}$	-	-0.1	$\mu\text{Adc}$
DC Current Gain <sup>(1)</sup> ( $V_{CE}=2.0\text{ Vdc}$ , $I_C=500\text{ mAdc}$ )	$h_{FE}$	200	350	
Collector-Emitter Saturation Voltage ( $I_C=500\text{ mVdc}$ , $I_B=20\text{ mAdc}$ )	$V_{CE(sat)}$	-	0.4	Vdc
Base-Emitter Saturation Voltage ( $I_C=500\text{ mVdc}$ , $I_B=50\text{ mAdc}$ )	$V_{BE(sat)}$	-	1.2	Vdc

Note:

1. Pulse Test: Pluse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$

**SC-59 Outline Dimension**

Unit:mm



SC-59		
Dim	Min	Max
A	2.70	3.10
B	1.30	1.70
C	1.00	1.30
D	0.35	0.50
G	1.70	2.30
H	0.00	0.10
J	0.10	0.26
K	0.20	0.60
L	1.25	1.65
S	2.25	3.00
All Dimension in mm		