



## 2SD439

# Low Frequency Power Amp, Medium Speed Switching Applications

372E

### Features

- Large allowable collector dissipation and wide ASO.
- Low saturation voltage and good linearity of  $h_{FE}$ .
- Suited for use in output stage of low-voltage high-output ( $P_o=2W/V_{CC}=4.5V$ ) AF amp.

( ) : 2SB559

### Absolute Maximum Ratings at $T_a=25^\circ C$

Parameter	Symbol	Value	unit
Collector to Base Voltage	$V_{CBO}$	(-)20	V
Collector to Emitter Voltage	$V_{CEO}$	(-)18	V
Emitter to Base Voltage	$V_{EBO}$	(-)5	V
Collector Current	$I_C$	(-)1.2	A
Peak Collector Current	$i_{cp}$	(-)2.0	A
Collector Dissipation	$P_C$	1	W
		8	W
		150	$^\circ C$
Junction Temperature	$T_j$		$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

### Electrical Characteristics at $T_a=25^\circ C$

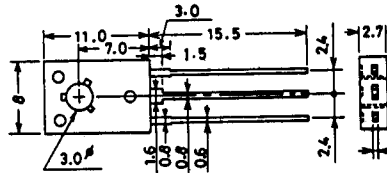
Parameter	Symbol	Test Conditions	min	typ	max	unit
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-)20			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)18			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$	(-)5			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)15V, I_E=0$			(-)1	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4V, I_C=0$			(-)1	$\mu A$
DC Current Gain	$h_{FE}(1)$	$V_{CE}=(-)2V, I_C=(-)500mA$	60*		320*	
	$h_{FE}(2)$	$V_{CE}=(-)2V, I_C=(-)1.5A_{(pulse)}$	(40)50			
Gain Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)50mA$		150		MHz
Collector Capacitance	$c_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(30)20		pF
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1A, I_B=(-)50mA$	(-)0.35	(-)0.7		V
			0.25	0.5		V
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$	(-)0.85	(-)1.2		V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		50		ns
Storage Time	$t_{stg}$	"		(60)70		ns
Fall Time	$t_f$	"		200		ns

\* The 2SB559/2SD439 are classified by  $h_{FE}$  at 500mA.

60	D	120	100	E	200	160	F	320
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### Case Outline 2009A

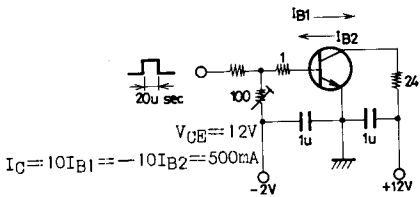
(unit:mm)



JEDEC: TO-126

B: Base  
C: Collector  
E: Emitter

### Switching Time Test Circuit



(For PNP, the polarity is reversed.)

For details, refer to the description of the 2SD439.