

## NPN Silicon Planar Small Signal Transistors

### LOW NOISE AMPLIFIER

#### DESCRIPTION

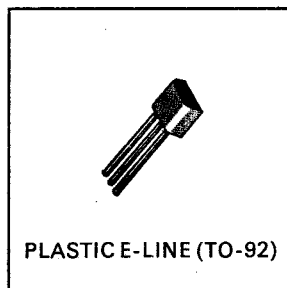
These plastic encapsulated transistors are particularly suitable for the low noise input stage of audio amplifiers and generally in all audio frequency equipment.

These transistors are available in selected gain categories.

The E-line package is formed by injection moulding a SILICONE plastic specially selected to provide a rugged one-piece encapsulation resistant to severe environments and allow the high junction temperature operation normally associated with metal can devices.

E-line encapsulated devices are approved for use in military, industrial and professional equipments.

Alternative lead configurations are available as plug-in replacements of TO-5/39 and TO-18 metal can types, and for flat mounting.



#### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	ZTX382	ZTX383	ZTX384	Unit
Collector-Base Voltage	$V_{CBO}$	50	45	45	Volts
Collector-Emitter Voltage	$V_{CEO}$	45	30	30	Volts
Emitter-Base Voltage	$V_{EBO}$	6	6	6	Volts
Continuous Collector Current	$I_C$	200	200	200	mA
Power Dissipation (at $T_{amb} = 25^\circ\text{C}$ ) Derating with Temperature	$P_{tot}$	350 2.33	350 2.33	350 2.33	mW mW/ $^\circ\text{C}$
Junction Temperature	$T_j$	175			$^\circ\text{C}$
Operating and Storage Temp. Range		-55 to +175			$^\circ\text{C}$

# ZTX382 Series

CHARACTERISTICS (at 25°C ambient temperature unless otherwise stated).

Parameter	Symbol	ZTX382			ZTX383			ZTX384			Unit	Conditions
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
Collector-base breakdown voltage	$V_{(BR)CBO}$	50	—	—	45	—	—	45	—	—	V	$I_C = 10 \mu A$ $I_E = 0$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	45	—	—	30	—	—	30	—	—	V	$I_C = 2 \text{ mA}$ $I_B = 0$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	6	—	—	6	—	—	6	—	—	V	$I_C = 0$ $I_B = 10 \mu A$
Collector-base cut off current	$I_{CBO}$	—	—	15	—	—	15	—	—	15	nA	$V_{CB} = 30 \text{ V}$ $I_E = 0$
Emitter-base cut off current	$I_{EBO}$	—	—	15	—	—	15	—	—	15	nA	$V_{EB} = 4 \text{ V}$ $I_C = 0$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	0.25	—	—	0.25	—	—	0.25	V	$I_C = 10 \text{ mA}^*$ $I_B = 0.5 \text{ mA}$
		—	—	0.6	—	—	0.6	—	—	0.6	V	$I_C = 100 \text{ mA}^*$ $I_B = 5 \text{ mA}$
Base-emitter saturation voltage	$V_{BE(sat)}$	—	—	1.2	—	—	1.2	—	—	1.2	V	$I_C = 100 \text{ mA}^*$ $I_B = 5 \text{ mA}$
Static forward current transfer ratio	$h_{FE}$	40	—	—	40	—	—	100	—	—		$V_{CE} = 5 \text{ V}$ $I_C = 10 \mu A$ $V_{CE} = 5 \text{ V}$ $I_C = 2 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $I_C = 100 \text{ mA}^*$
		100	—	850	100	—	850	250	400	—		
		80	—	—	80	—	—	130	—	—		
Small-signal static forward current transfer ratio Group B transfer ratio Group C	$h_{fe}$	240	—	900	240	—	900	240	—	900		$V_{CE} = 5 \text{ V}$ $I_C = 2 \text{ mA}$ $f = 1 \text{ kHz}$
		240	—	500	240	—	500	240	—	500		
		450	—	900	450	—	900	450	—	900		
Base-emitter voltage	$V_{BE}$	—	0.52	—	—	0.52	—	—	0.52	—	V	$I_C = 10 \mu A$ $V_{CE} = 5 \text{ V}$
		—	0.55	—	—	0.55	—	—	0.55	—	V	$I_C = 100 \mu A$ $V_{CE} = 5 \text{ V}$
		0.55	—	0.7	0.55	—	0.7	0.55	—	0.7	V	$I_C = 2 \text{ mA}$ $V_{CE} = 5 \text{ V}$
		—	0.68	—	—	0.68	—	—	0.68	—	V	$I_C = 10 \text{ mA}^*$ $V_{CE} = 5 \text{ V}$
Output capacitance	$C_{obo}$	—	2.5	5	—	2.5	5	—	2.5	5	pF	$V_{CB} = 10 \text{ V}$ $f = 1 \text{ MHz}$
Input capacitance	$C_{ibo}$	—	11	—	—	11	—	—	11	—	pF	$V_{EB} = 0.5 \text{ V}$ $f = 1 \text{ MHz}$
Transition frequency	$f_T$	150	—	—	150	—	—	150	—	—	MHz	$V_{CE} = 5 \text{ V}$ $I_C = 10 \text{ mA}$ $f = 100 \text{ MHz}$

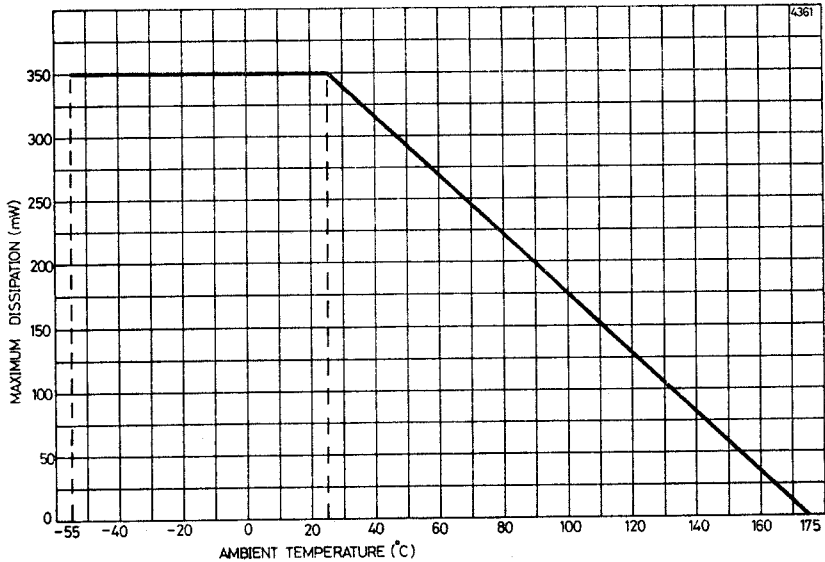
\*Measured under pulsed conditions. Pulse width = 300  $\mu s$ . Duty cycle  $\leq 2\%$ .

# ZTX382 Series

## CHARACTERISTICS (continued).

Parameter	Symbol	ZTX382			ZTX383			ZTX384			Unit	Conditions
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
Noise figure (wide band)	N	—	—	6	—	—	6	—	—	4	dB	$V_{CE} = 5V$ $I_C = 200 \mu A$ $R_S = 2 k\Omega$ $f = 30 \text{ Hz}$ to $15 \text{ kHz}$ at $-3 \text{ dB}$ points
Flicker noise	$N_f$	—	—	—	—	—	—	—	—	0.135	$\mu V$	$V_{CE} = 5V$ $I_C = 200 \mu A$ $R_S = 2 k\Omega$ $f = 10 \text{ Hz}$ to $50 \text{ Hz}$ at $-3 \text{ dB}$ points

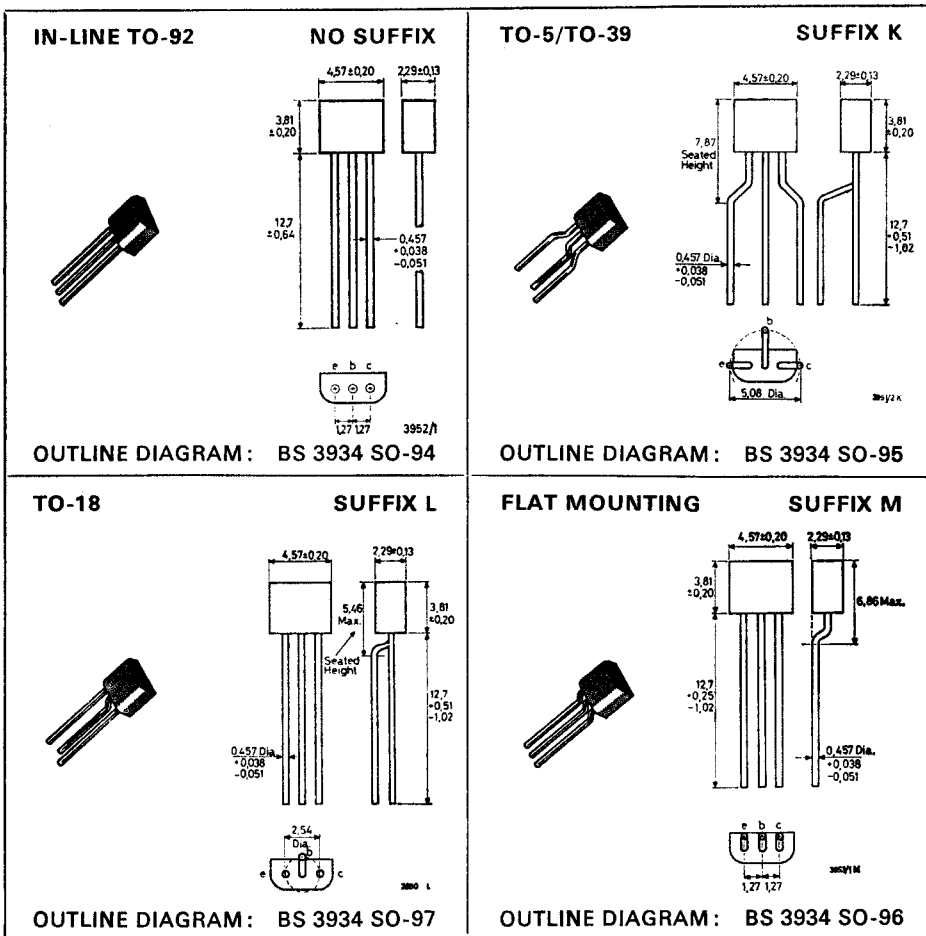
## DERATING CURVE



# ZTX382 Series

## LEAD CONFIGURATIONS

Devices can be ordered with the following lead configurations by adding the indicated suffix to the part number.



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