



# STZT2222A

## SMALL SIGNAL NPN TRANSISTOR

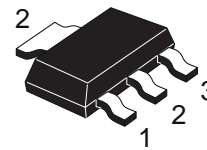
PRELIMINARY DATA

Type	Marking
STZT2222A	N22A

- SILICON EPITAXIAL PLANAR NPN TRANSISTOR
- SOT-223 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE AND REEL PACKING
- THE PNP COMPLEMENTARY TYPE IS STZT2907A

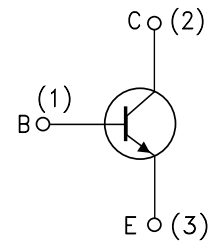
### APPLICATIONS

- WELL SUITABLE FOR SMD MOTHER BOARD ASSEMBLY
- SMALL LOAD SWITCH TRANSISTOR WITH HIGH GAIN AND LOW SATURATION VOLTAGE



SOT-223

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	75	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	40	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	6	V
$I_C$	Collector Current	0.6	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	0.8	A
$P_{tot}$	Total Dissipation at $T_{amb} = 25$ °C	1.3	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

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## THERMAL DATA

$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	96.1	$^{\circ}\text{C}/\text{W}$
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• Device mounted on a PCB area of  $1\text{ cm}^2$

## ELECTRICAL CHARACTERISTICS ( $T_{case} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = 50\text{ V}$			10	nA
		$V_{CB} = 50\text{ V}$ $T_j = 125\text{ }^{\circ}\text{C}$			10	$\mu\text{A}$
$I_{CEX}$	Collector Cut-off Current ( $V_{BE} = -3\text{V}$ )	$V_{CE} = 60\text{ V}$			10	nA
$I_{BEX}$	Base Cut-off Current ( $V_{BE} = -3\text{V}$ )	$V_{CE} = 60\text{ V}$			20	nA
$I_{EBO}$	Emitter Cut-off Current ( $I_E = 0$ )	$V_{EB} = 3\text{ V}$			10	nA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = 10\text{ }\mu\text{A}$	75			V
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = 10\text{ mA}$	40			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = 10\text{ }\mu\text{A}$	6			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 150\text{ mA}$ $I_B = 15\text{ mA}$			0.3	V
		$I_C = 500\text{ mA}$ $I_B = 50\text{ mA}$			1	V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 150\text{ mA}$ $I_B = 15\text{ mA}$	0.6		1.2	V
		$I_C = 500\text{ mA}$ $I_B = 50\text{ mA}$			2	V
$h_{FE}^*$	DC Current Gain	$I_C = 0.1\text{ mA}$ $V_{CE} = 10\text{ V}$	35		300	
		$I_C = 1\text{ mA}$ $V_{CE} = 10\text{ V}$	50			
		$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$	75			
		$I_C = 150\text{ mA}$ $V_{CE} = 10\text{ V}$	100			
		$I_C = 150\text{ mA}$ $V_{CE} = 1\text{ V}$	50			
		$I_C = 500\text{ mA}$ $V_{CE} = 10\text{ V}$	40			
$h_{fe}$	Small Signal Current Gain	$I_C = 1\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$	50		300	
		$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$	75		375	
$h_{ie}$	Input Impedance	$I_C = 1\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$	2		8	$\Omega$
		$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$	0.25		1.25	$\Omega$
$h_{re}$	Reverse Voltage Ratio	$I_C = 1\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$			$8 \times 10^{-4}$	
		$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$			$4 \times 10^{-4}$	
$h_{oe}$	Output Impedance	$I_C = 1\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$	5		35	$\mu\text{S}$
		$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 1\text{ KHz}$	25		200	$\mu\text{S}$
$f_T$	Transition Frequency	$I_C = 20\text{ mA}$ $V_{CE} = 20\text{ V}$ $f = 100\text{ MHz}$		270		MHz
$C_{CBO}$	Collector-Base Capacitance	$I_E = 0$ $V_{CB} = 10\text{ V}$ $f = 100\text{ KHz}$		4	8	pF
$C_{EBO}$	Emitter-Base Capacitance	$I_C = 0$ $V_{EB} = 0.5\text{ V}$ $f = 100\text{ KHz}$		20	25	pF
NF	Noise Figure	$f = 1\text{ KHz}$ $\Delta F = 200\text{ Hz}$ $R_G = 1\text{K}\Omega$ $I_C = 0.1\text{ mA}$ $V_{CE} = 10\text{ V}$		4		dB

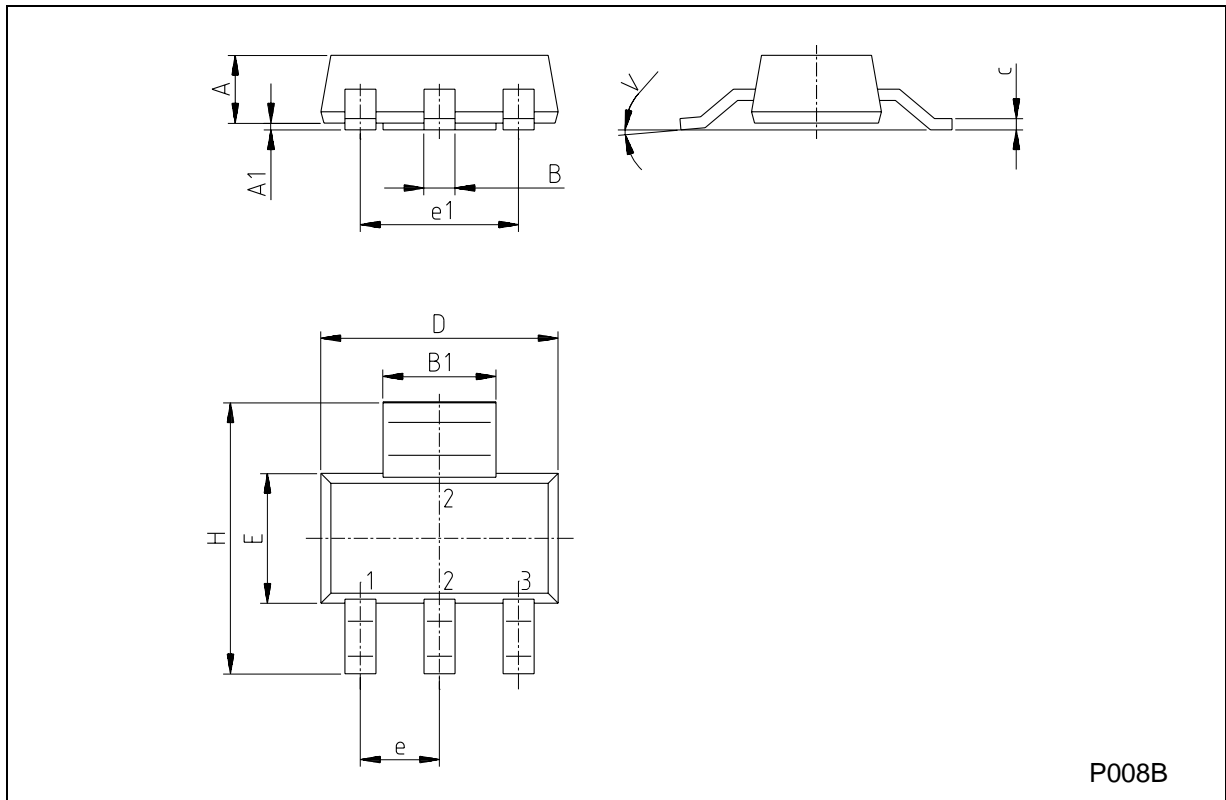
**ELECTRICAL CHARACTERISTICS** ( $T_{\text{case}} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_d$	Delay Time	$I_C = 150\text{ mA}$ $I_B = 15\text{ mA}$ $V_{CC} = 30\text{ V}$		5	10	ns
$t_r$	Rise Time			12	25	ns
$t_s$	Storage Time	$I_C = 150\text{ mA}$ $V_{CC} = 30\text{ V}$ $I_{B1} = -I_{B2} = 15\text{ mA}$		185	225	ns
$t_f$	Fall Time			24	60	ns

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$

**SOT-223 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.80			0.071
B	0.60	0.70	0.80	0.024	0.027	0.031
B1	2.90	3.00	3.10	0.114	0.118	0.122
c	0.24	0.26	0.32	0.009	0.010	0.013
D	6.30	6.50	6.70	0.248	0.256	0.264
e		2.30			0.090	
e1		4.60			0.181	
E	3.30	3.50	3.70	0.130	0.138	0.146
H	6.70	7.00	7.30	0.264	0.276	0.287
V			10°			10°
A1		0.02				



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