



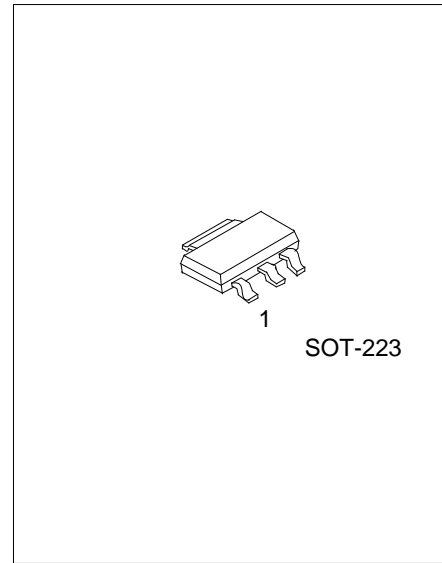
## PZT2222A

## NPN SILICON TRANSISTOR

### NPN GENERAL PURPOSE AMPLIFIER

#### FEATURES

\* This device is for use as a medium power amplifier and switch requiring collector currents up to 500mA.



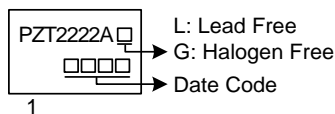
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
PZT2222AL-AA3-R	PZT2222AG-AA3-R	SOT-223	B	C	E	Tape Reel

Note: Pin Assignment: B: Base C: Collector E: Emitter

<p>PZT2222AG-AA3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AA3: SOT-223 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



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■ **ABSOLUTE MAXIMUM RATING** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	$V_{CBO}$	75	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	0.6	A
Total Device Dissipation	$P_C$	1	W
Junction Temperature	$T_J$	+150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

Note: 1. 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.

2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	125	$^{\circ}\text{C}/\text{W}$

■ **ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=10\mu\text{A}, I_E=0$	75			V
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=10\text{mA}, I_B=0$	40			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=10\mu\text{A}, I_C=0$	6			V
Collector Cut-off Current	$I_{CEO}$	$V_{CE}=60\text{V}, V_{EB(OFF)}=3.0\text{V}$			10	nA
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=60\text{V}, I_E=0$			0.01	$\mu\text{A}$
		$V_{CB}=60\text{V}, I_E=0, T_A=150^{\circ}\text{C}$			10	$\mu\text{A}$
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=3.0\text{V}, I_C=0$			10	nA
Base Cut-Off Current	$I_{BL}$	$V_{CE}=60\text{V}, V_{EB(OFF)}=3.0\text{V}$			20	nA
<b>ON CHARACTERISTICS</b>						
DC Current Gain	$h_{FE}$	$I_C=0.1\text{mA}, V_{CE}=10\text{V}$	35			
		$I_C=1.0\text{mA}, V_{CE}=10\text{V}$	50			
		$I_C=10\text{mA}, V_{CE}=10\text{V}$	75			
		$I_C=10\text{mA}, V_{CE}=10\text{V}, T_A=-55^{\circ}\text{C}$	35			
		$I_C=150\text{mA}, V_{CE}=10\text{V}$ (Note)	100		300	
		$I_C=150\text{mA}, V_{CE}=1.0\text{V}$ (Note)	50			
		$I_C=500\text{mA}, V_{CE}=10\text{V}$ (Note)	40			
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$			0.3	V
		$I_C=500\text{mA}, I_B=50\text{mA}$			1.0	V
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$	0.6		1.2	V
		$I_C=500\text{mA}, I_B=50\text{mA}$			2.0	V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	$f_T$	$I_C=20\text{mA}, V_{CE}=20\text{V}, f=100\text{MHz}$	300			MHz
Output Capacitance	$C_{OBO}$	$V_{CB}=10\text{V}, I_E=0, f=100\text{kHz}$			8.0	pF
Input Capacitance	$C_{IBO}$	$V_{EB}=0.5\text{V}, I_C=0, f=100\text{kHz}$			25	pF
Collector Base Time Constant	$\tau_{B'CC}$	$I_C=20\text{mA}, V_{CB}=20\text{V}, f=31.8\text{MHz}$			150	pS
Noise Figure	NF	$I_C=100\mu\text{A}, V_{CE}=10\text{V}, R_S=1.0\text{k}\Omega, f=1.0\text{kHz}$			4.0	dB
Real Part of Common-Emitter High Frequency Input Impedance	$R_{E(HJE)}$	$I_C=20\text{mA}, V_{CB}=20\text{V}, f=300\text{MHz}$			60	$\Omega$

### ■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SWITCHING CHARACTERISTICS</b>						
Delay time	$t_D$	$V_{CC}=30V, V_{BE(OFF)}=0.5V,$			10	ns
Rise time	$t_R$	$I_C=150mA, I_{B1}=15mA$			25	ns
Storage time	$t_S$	$V_{CC}=30V, I_C=150mA,$			225	ns
Fall time	$t_F$	$I_{B1}= I_{B2}=15mA$			60	ns

Note: Pulse test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$ .

## ■ TEST CIRCUIT

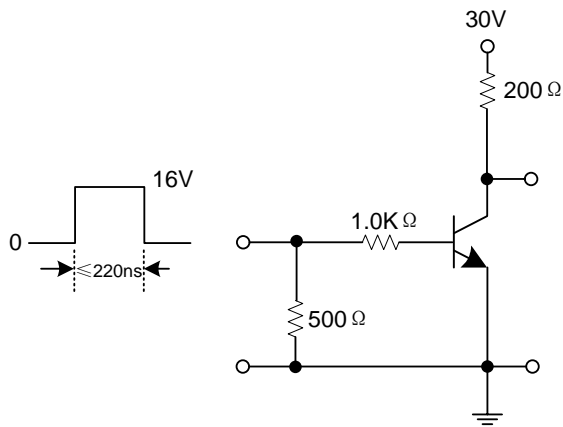


Fig 1. Saturated Turn-On Switching Time

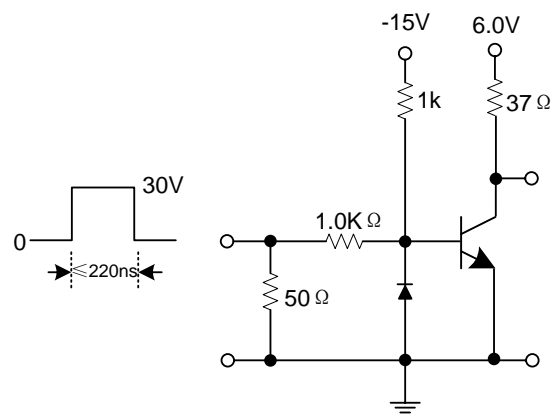
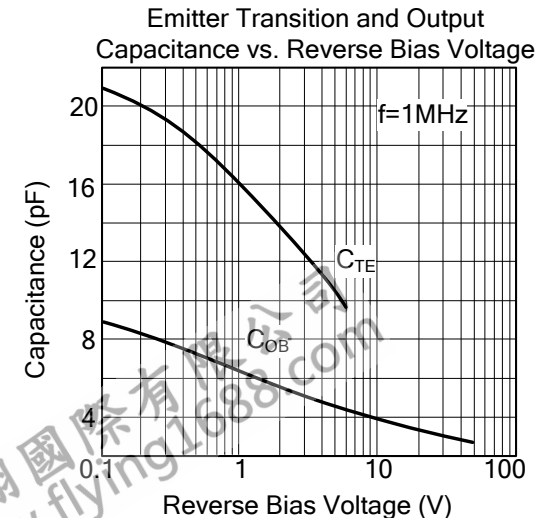
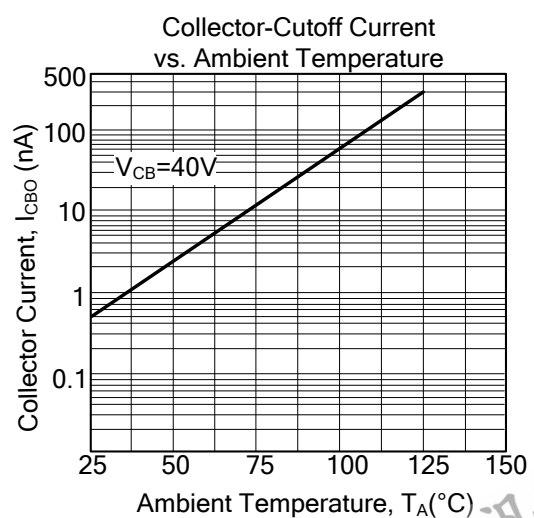
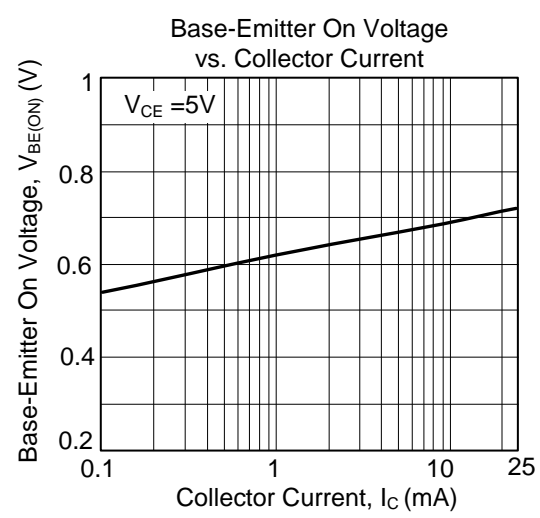
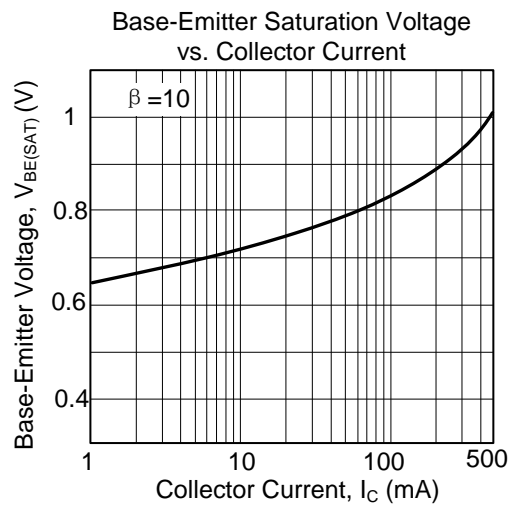
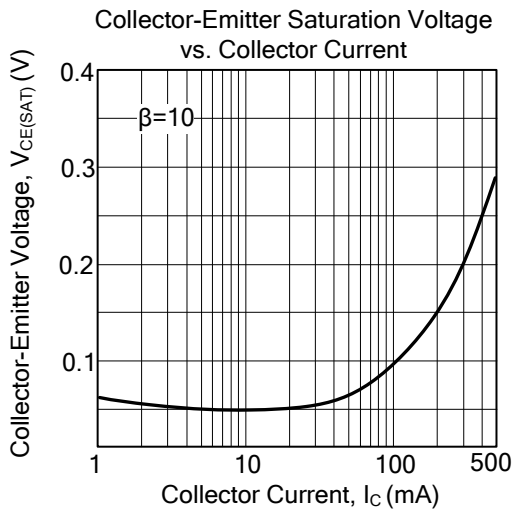
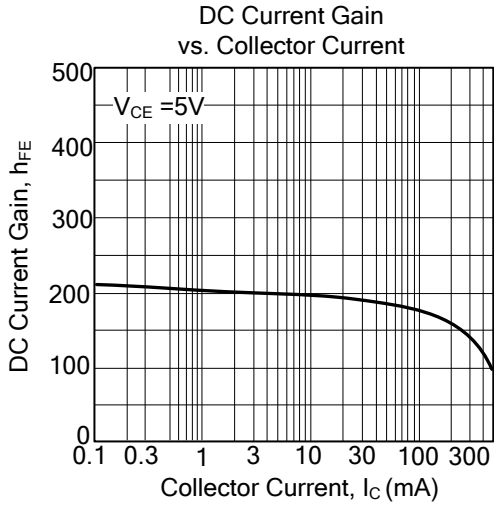
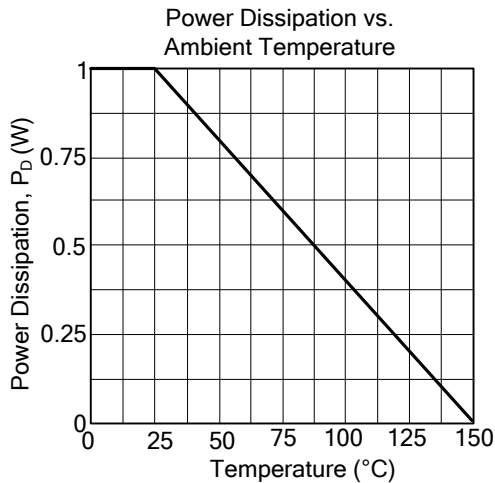
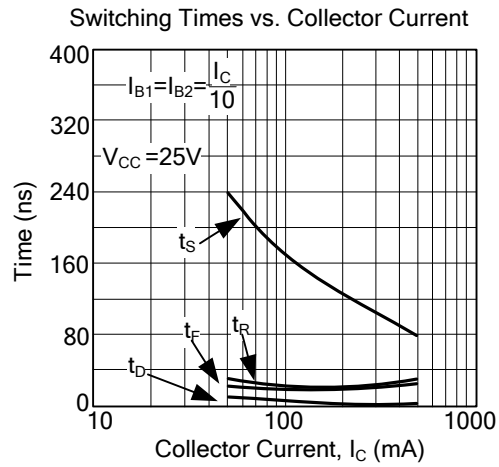
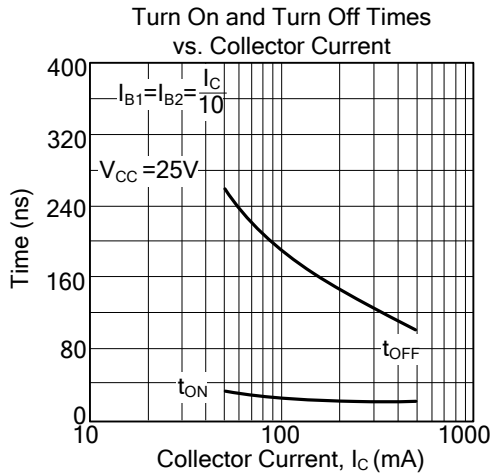


Fig 2. Saturated Turn-Off Switching Time

### TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



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