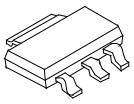
PZT2222A

NPN SILICON TRANSISTOR

NPN GENERAL PURPOSE AMPLIFIER



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SOT-223

■ FEATURES

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

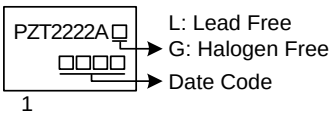
■ ORDERING INFORMATION

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

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

■ MARKING



■ ABSOLUTE MAXIMUM RATING (T_A=25°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	°C
Storage Temperature	T_{STG}	-55 ~ +150	°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	θ_{JA}	125	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

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

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING CHARACTERISTICS						
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 ≤ 300μs, Duty Cycle ≤ 2.0%.

■ TEST CIRCUIT

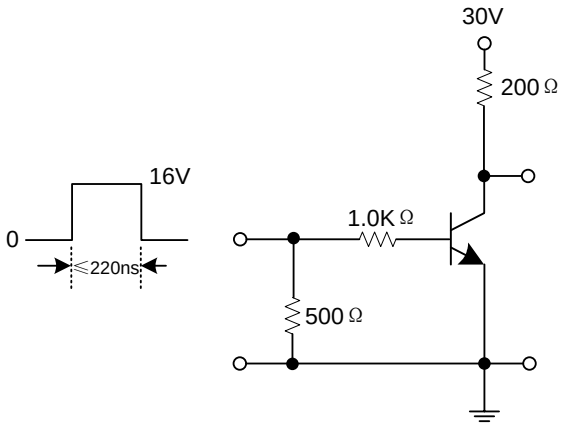


Fig 1. Saturated Turn-On Switching Time

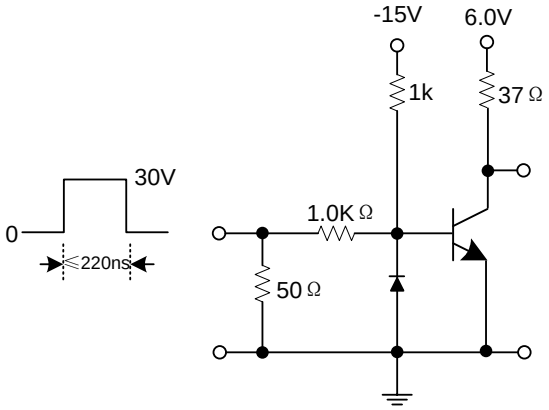
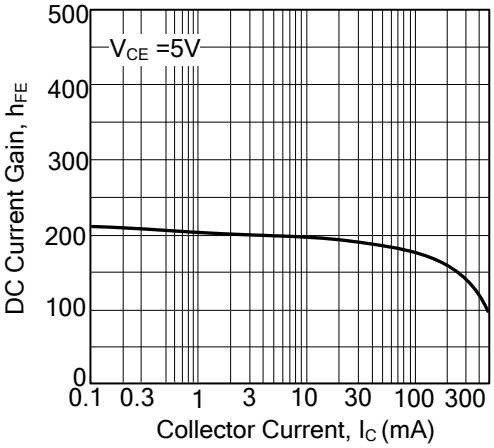


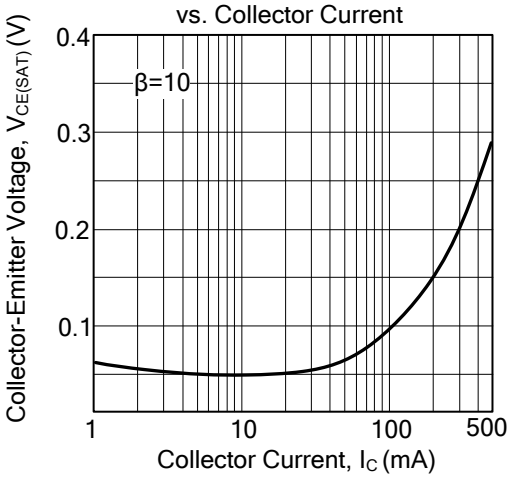
Fig 2. Saturated Turn-Off Switching Time

■ TYPICAL CHARACTERISTICS

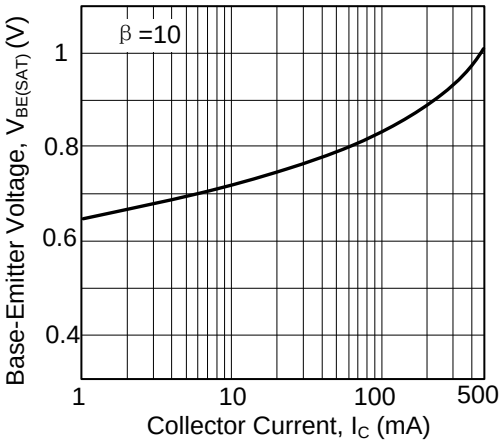
DC Current Gain vs. Collector Current



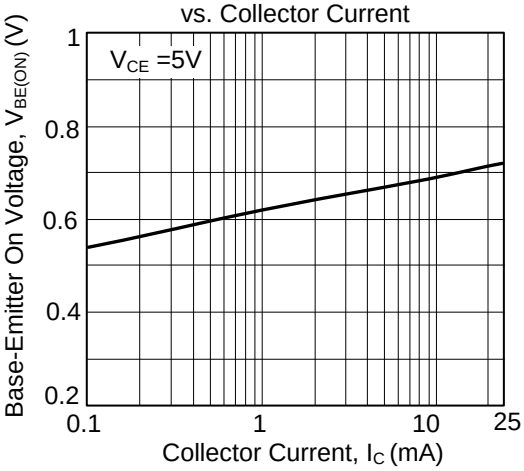
Collector-Emitter Saturation Voltage vs. Collector Current



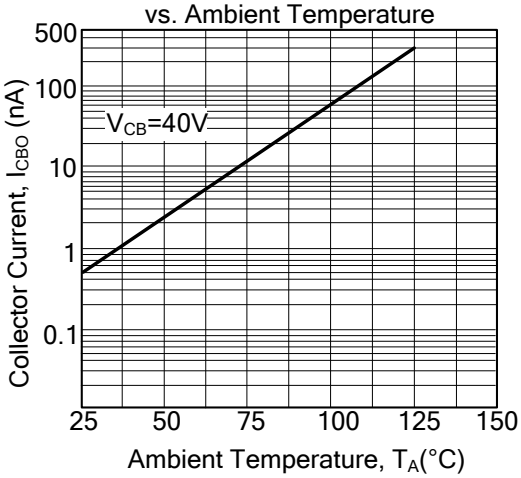
Base-Emitter Saturation Voltage vs. Collector Current



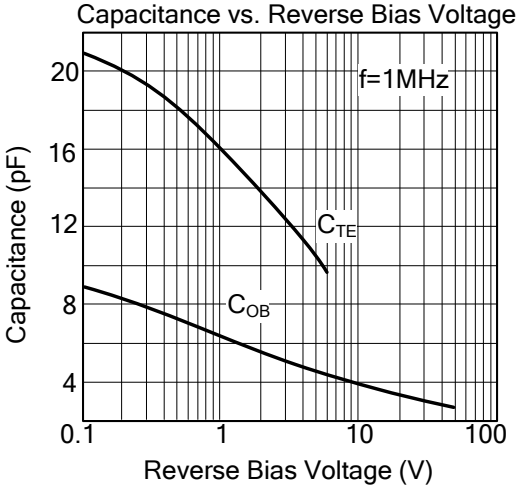
Base-Emitter On Voltage vs. Collector Current



Collector-Cutoff Current vs. Ambient Temperature

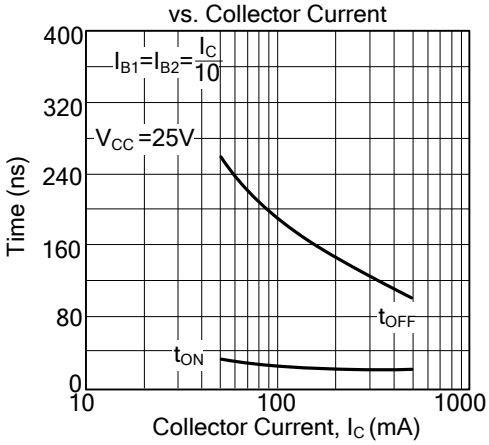


Emitter Transition and Output Capacitance vs. Reverse Bias Voltage

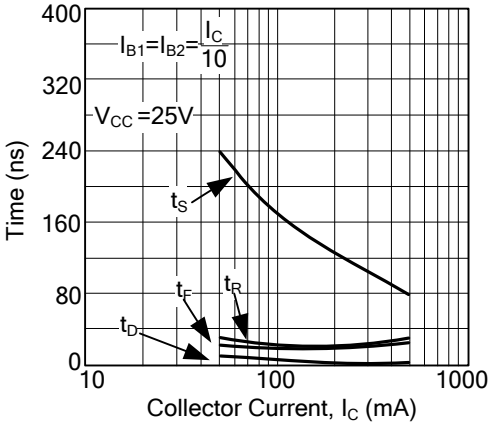


■ TYPICAL CHARACTERISTICS (Cont.)

Turn On and Turn Off Times vs. Collector Current



Switching Times vs. Collector Current



Power Dissipation vs. Ambient Temperature