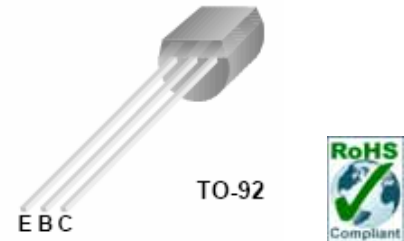


NPN General Purpose Transistor

Features

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

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Absolute Maximum Ratings (Tamb=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
Collector-Emitter Voltage	VCEO	40	V
Collector-Base Voltage	VCBO	75	V
Emitter-Base Voltage	VEBO	6	V
Collector Current	IC	1.0	A
Storage Temperature	TSTG	-55 ~ 150	°C

Caution:

1. These ratings are based on a maximum junction temperature of 150°C
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

NPN General Purpose Transistor

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Electrical Characteristics (Tamb=25°C unless otherwise noted)

Parameter	Test Condition	Symbol	Min.	Max.	Unit
Off Characteristics					
Collector-Base Breakdown Voltage	IC=10uA, IE=0	BVCBO	75		V
Collector-Emitter Breakdown Voltage *	IC=10mA, IB=0	BVCEO	40		V
Emitter-Base Breakdown Voltage	IE=10uA, IC=0	BVEBO	6		V
Collector Cut-off Current	VCB=60V, IE=0	ICBO		0.01	uA
Emitter Cut-off Current	VEB=3V, IC=0	IEBO		10	nA
On Characteristics					
DC Current Gain	VCE=10V, IC =0.1mA	hFE	35	300	
	VCE =10V, IC =1mA		50		
	VCE =10V *, IC =10mA (Tamb=-55°C)		75		
	VCE =10V *, IC =150mA		100		
	VCE =10V *, IC =500mA		40		
Collector- Emitter Saturation Voltage *	IC =150mA, IB=15mA IC =500mA, IB=50mA	VCE(sat)		0.3 1	V
Base-Emitter Saturation Voltage *	IC =150mA, IB =15mA IC =500mA, IB =50mA	VBE(sat)	0.6	1.2 2	V
* Pulse Test: Pulse Width≤300us, Duty Cycles≤2.0%					
Small Signal Characteristics					
Current Gain Bandwidth Product	IC=20mA, VCE=20V, f=100MHz	fT	300		MHz
Output Capacitance	VCB=10V, IE=0, f=1MHz	Cobo		8.0	pF
Input Capacitance	VEB=0.5V, IC =0, f=1MHz	Cibo		25	pF
Collector Base Time Constant	IC =20mA, VCB=20V, f=31.8MHz	rb' Cc		150	pS
Noise Figure	IC =100uA, VCE=10V Rs=1.0kΩ, f=1.0KHz	NF		4.0	dB
Real Part of Common-Emitter High Frequency Input Impedance	IC =20mA, VCE=20V, f=300MHz	Re(hie)		60	Ω
Switching Characteristics					
Delay Time	VCC=30V, VEB(off)=0.5V IC=150mA, IB1=15mA	td		10	ns
Rise Time		tr		25	ns
Storage Time	VCC=30V, IC=150mA IB1=IB2=15mA	ts		225	ns
Fall Time		tf		60	ns

NPN General Purpose Transistor

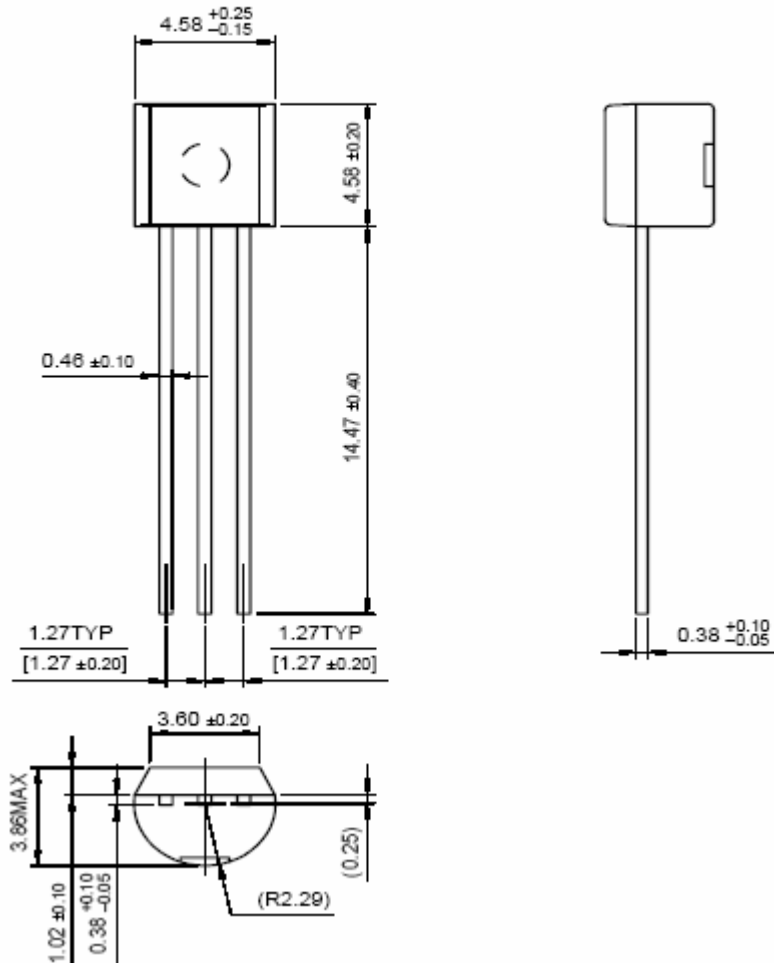
PN2222A

Thermal Characteristics					
Total Device Dissipation Derate above 25°C		PD		625 5.0	mW mW/°C
Thermal Resistance, Junction to case		RθJC		83.3	°C/W
Thermal Resistance, Junction to Ambient		RθJA		200	°C/W

Dimensions (Unit:mm)

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Typical Characteristics Curves

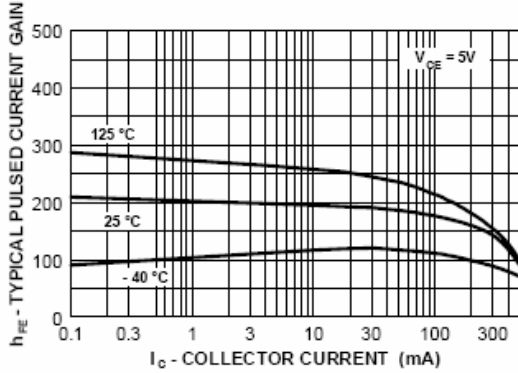


Figure 1. Typical Pulsed Current Gain vs Collector Current

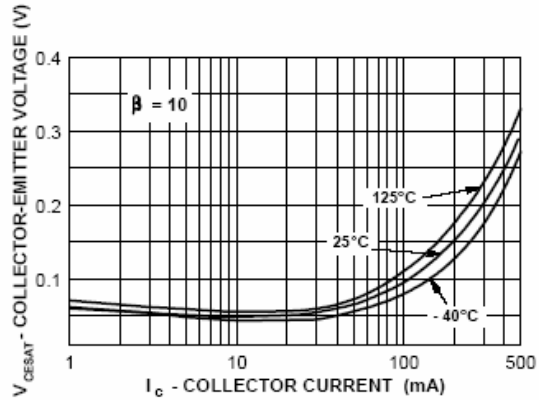


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

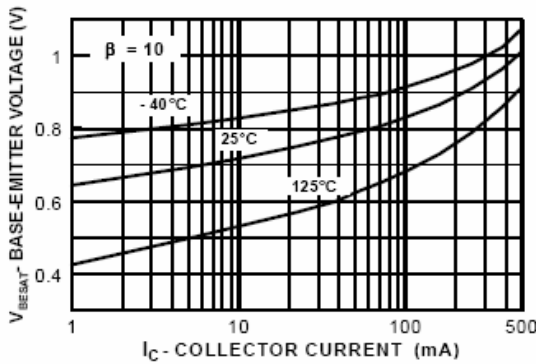


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

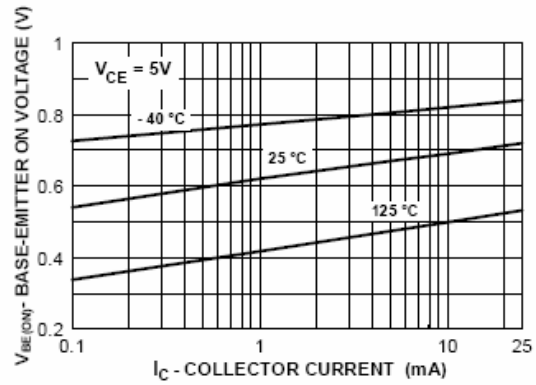


Figure 4. Base-Emitter On Voltage vs Collector Current

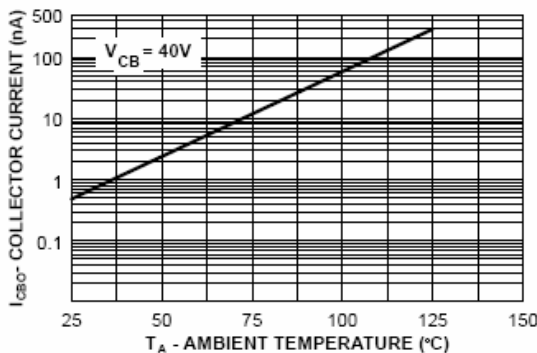


Figure 5. Collector Cutoff Current vs Ambient Temperature

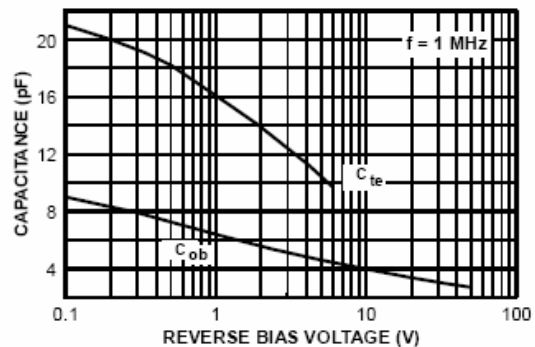


Figure 6. Emitter Transition and Output Capacitance vs Reverse Bias Voltage

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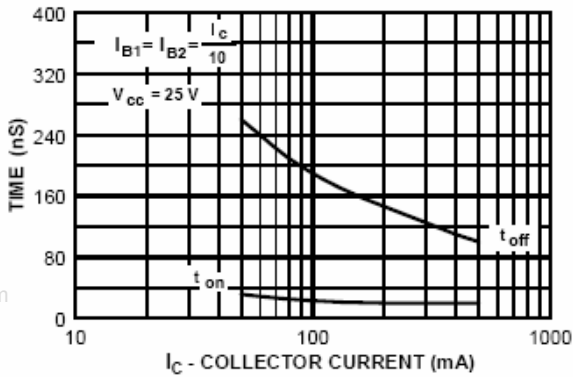


Figure 7. Turn On and Turn Off Times vs Collector Current

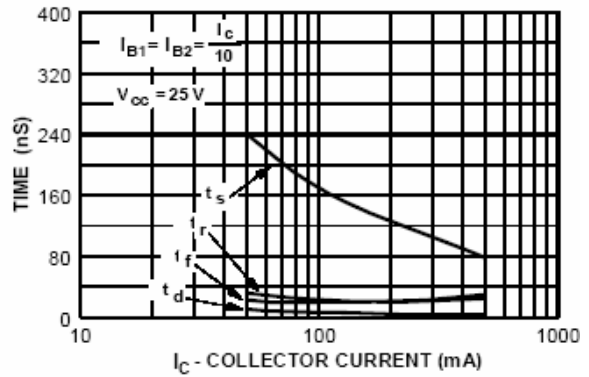


Figure 8. Switching Times vs Collector Current

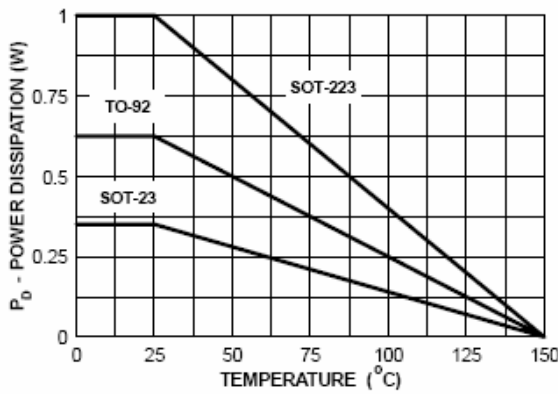


Figure 9. Power Dissipation vs Ambient Temperature

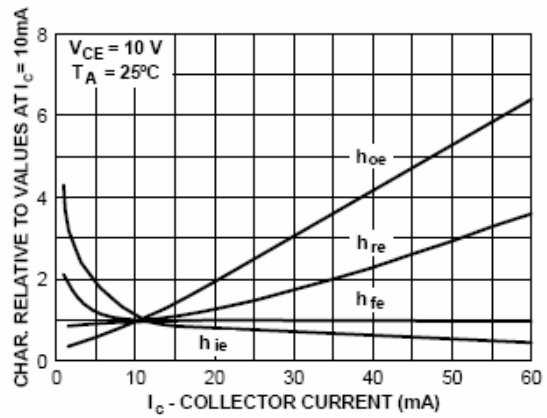


Figure 10. Common Emitter Characteristics

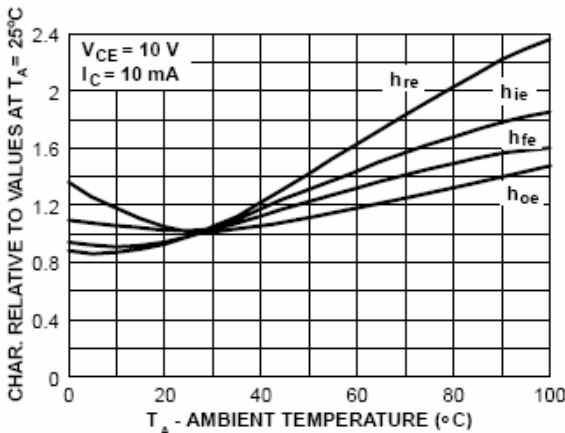


Figure 11. Common Emitter Characteristics

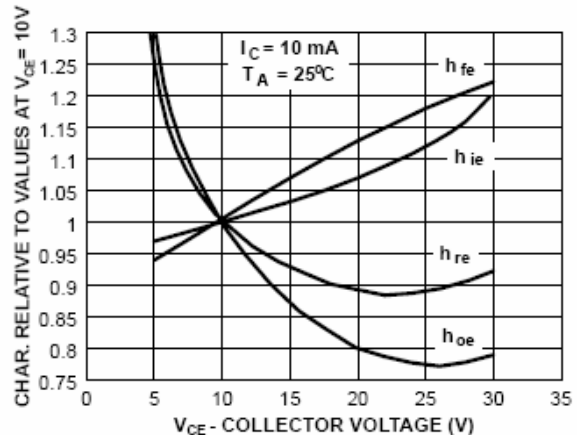


Figure 12. Common Emitter Characteristics

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