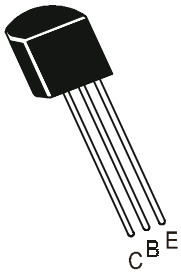


NPN SILICON PLANAR SWITCHING TRANSISTORS

P2N2222
P2N2222A
EBC
TO-92



Complementary Silicon Transistors For Switching And Linear Applications
DC Amplifier & Driver For Industrial Applications.

ABSOLUTE MAXIMUM RATINGS(Ta=25deg C unless otherwise specified)

DESCRIPTION	SYMBOL	2222	2222A	UNIT
Collector -Emitter Voltage	VCEO	30	40	V
Collector -Base Voltage	VCBO	60	75	V
Emitter -Base Voltage	VEBO	5.0	6.0	V
Collector Current Continuous	IC		600	mA
Power Dissipation @Ta=25 degC	PD		625	mW
Derate Above 25deg C			5	mW/deg C
@ Tc=25 degC	PD		1.5	W
Derate Above 25deg C			12	mW/deg C
Operating And Storage Junction Temperature Range	Tj, Tstg		-55 to +150	deg C

THERMAL RESISTANCE

Junction to Case	Rth(j-c)		83.3	deg C/W
Junction to Ambient	Rth(j-a)		200	deg C/W

ELECTRICAL CHARACTERISTICS (Ta=25 deg C Unless Otherwise Specified)

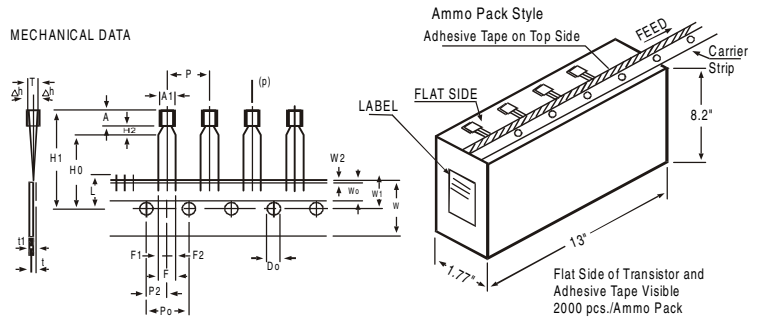
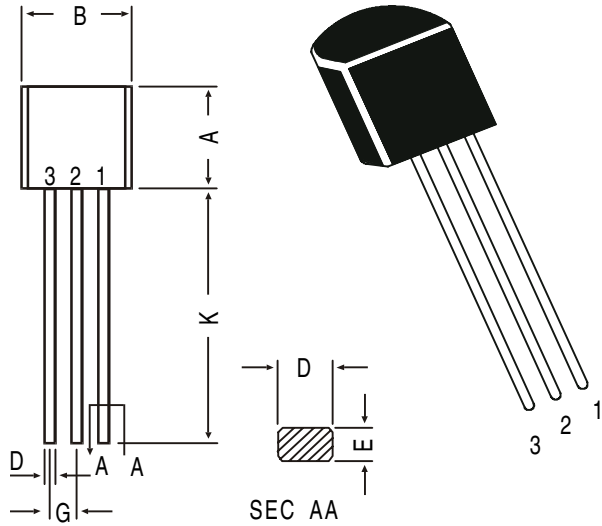
DESCRIPTION	SYMBOL	TEST CONDITION	2222	2222A	UNIT	
Collector -Emitter Voltage	VCEO	IC=10mA, IB=0	>30	>40	V	
Collector -Base Voltage	VCBO	IC=10uA, IE=0	>60	>75	V	
Emitter-Base Voltage	VEBO	IE=10uA, IC=0	>5.0	>6.0	V	
Collector-Cut off Current	ICBO	VCB=50V, IE=0	<10	-	nA	
		VCB=60V, IE=0	-	<10	nA	
		Ta=150 deg C				
		VCB=50V, IE=0	<10	-	uA	
		VCB=60V, IE=0	-	<10	uA	
Emitter-Cut off Current	ICEX	VCE=60V, VBE=3V	-	<10	nA	
		VCE=10V, IB=0	<10	<10	nA	
Base-Cut off Current	IEBO	VEB=3V, IC=0	-	<10	nA	
Collector Emitter Saturation Voltage	VCE(Sat)*	IC=150mA, IB=15mA	<0.4	<0.3	V	
		IC=500mA, IB=50mA	<1.6	<1.0	V	
Base Emitter Saturation Voltage	VBE(Sat) *	IC=150mA, IB=15mA	<1.3	0.6-1.2	V	
		IC=500mA, IB=50mA	<2.6	<2.0	V	

ELECTRICAL CHARACTERISTICS (Ta=25 deg C Unless Otherwise Specified)			P2N2222, P2N2222A			
DESCRIPTION	SYMBOL	TEST CONDITION	2222	2222A	UNIT	
DC Current Gain	hFE	IC=0.1mA, VCE=10V	>35	>35		
		IC=1mA, VCE=10V	>50	>50		
		IC=10mA, VCE=10V	>75	>75		
		IC=10mA, VCE=10V	-	>35		
		Ta=55 deg C				
		IC=150mA, VCE=10V	100-300	100-300		
		IC=150mA, VCE=1V	>50	>50		
		IC=500mA, VCE=10V	>30	>40		
DYNAMIC CHARACTERISTICS						
Small Signal Current Gain	hfe	ALL f=1kHz				
		IC=1mA, VCE=10V	-	50-300		
Input Impedence	hie	IC=10mA, VCE=10V	-	75-375		
		IC=1mA, VCE=10V	-	2.0-8.0	kohms	
Voltage Feedback Ratio	hre	IC=10mA, VCE=10V	-	0.25-1.25		
		IC=1mA, VCE=10V	-	8.0 x 10 ⁻⁴		
Out put Adimttance	hoe	IC=10mA, VCE=10V	-	4.0		
		IC=1mA, VCE=10V	-	5.0-35	umhos	
Collector Base Time Constant	rb'Cc	IC=10mA, VCE=10V	-	25-200		
		IE=20mA, VCB=20V	-	<150	ps	
Noise Figure	NF	f=31.8MHz				
		IC=100uA, VCE=10V	-	<4.0	dB	
		Rs=1kohms, f=1kHz				
DYNAMIC CHARACTERISTICS						
Transistors Frequency	ft	IC=20mA, VCE=20V	>250	>300	MHz	
Out-Put Capacitance	Cob	f=100MHz				
		VCB=10V, IE=0	<8.0	<8.0	pF	
Input Capacitance	Cib	f=1MHz				
		VEB=0.5V, IC=0	<30	<25	pF	
		f=1MHz				
SWITCHING Time						
Delay time	td	IC=150mA, IB1=15mA		<10	ns	
Rise time	tr	VCC=30V, VBE=0.5V	-	<25	ns	
Storage time	ts	IC=150mA, IB1=		<225	ns	
Fall time	tf	IB2=15mA, VCC=30V	-	<60	ns	

*Pulse Condition: Length =300us, Duty Cycle=2%

TO-92 Plastic Package

TO-92 Transistors on Tape and Ammo Pack



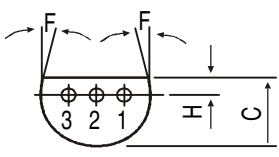
All dimensions in mm unless specified otherwise

ITEM	SYMBOL	SPECIFICATION				REMARKS
		MIN.	NOM.	MAX.	TOL.	
BODY WIDTH	A1	4.0		4.8		
BODY HEIGHT	A	4.8		5.2		
BODY THICKNESS	T	3.9		4.2		
PITCH OF COMPONENT	P		12.7		±1	CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH
FEED HOLE PITCH	Po		12.7		±0.3	
FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		±0.4	TO BE MEASURED AT BOTTOM OF CLINCH
DISTANCE BETWEEN OUTER LEADS	F		5.08		+0.6 -0.2	AT TOP OF BODY
COMPONENT ALIGNMENT	Δh		0	1		
TAPE WIDTH	W		18		±0.5	
HOLD-DOWN TAPE WIDTH	W0		6		±0.2	
HOLE POSITION	W1		9		+0.7 -0.5	
HOLD-DOWN TAPE POSITION	W2		0.5		±0.2	
LEAD WIRE CLINCH HEIGHT	Ho		16		±0.5	
COMPONENT HEIGHT	H1			23.25		
LENGTH OF SNIPPED LEADS	L			11.0		
FEED HOLE DIAMETER	Do		4		±0.2	
TOTAL TAPE THICKNESS	t			1.2		±0.3 - 0.6
LEAD - TO - LEAD DISTANCE F1,	F2		2.54		+0.4 -0.1	
CLINCH HEIGHT	H2			3		
PULL - OUT FORCE	(P)		6N			

- NOTES**
1. MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2 mm.
 2. MAXIMUM NON-CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1 mm IN 20 PITCHES.
 3. HOLDDOWN TAPE NOT TO EXCEED BEYOND THE EDGE(S) OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
 4. NO MORE THAN 3 CONSECUTIVE MISSING COMPONENTS ARE PERMITTED.
 5. A TAPE TRAILER, HAVING AT LEAST THREE FEED HOLES ARE REQUIRED AFTER THE LAST COMPONENT.
 6. SPLICES SHALL NOT INTERFERE WITH THE SPROCKET FEED HOLES.

All dimensions in mm.

DIM	MIN.	MAX.
A	4.32	5.33
B	4.45	5.20
C	3.18	4.19
D	0.41	0.55
E	0.35	0.50
F	5 DEG	
G	1.14	1.40
H	1.14	1.53
K	12.70	—



- PIN CONFIGURATION**
1. EMITTER
 2. BASE
 3. COLLECTOR

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-92 Bulk	1K/polybag	200 gm/1K pcs	3" x 7.5" x 7.5"	5.0K	17" x 15" x 13.5"	80.0K	23 kgs
TO-92 T&A	2K/ammo box	645 gm/2K pcs	12.5" x 8" x 1.8"	2.0K	17" x 15" x 13.5"	32.0K	12.5 kgs