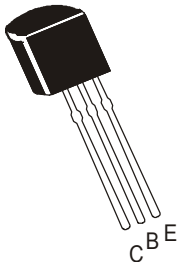
NPN SILICON HIGH SPEED SWITCHING TRANSISTOR

P2N2369A

TO - 92
Plastic Package



LOW POWER AND HIGH SPEED SWITCHING APPLICATIONS

ABSOLUTE MAXIMUM RATINGS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Emitter Voltage	V_{CEO}	15	V
Collector Base Voltage	V_{CBO}	40	V
Collector Emitter Voltage (V_{BE}=0)	V_{CES}	40	V
Emitter Base Voltage	V_{EBO}	4.5	V
Collector Current Peak	I_{CM}	500	mA
Power Dissipation @ Ta=25ºC	P_D	625	mW
Operating And Storage Junction Temperature Range	T_j, T_{stg}	-65 to +200	ºC

THERMAL RESISTANCE

Junction to Ambient in free air	$R_{th(j-a)}$	200	ºC/W

ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	VALUE		UNIT
			MIN	MAX	
Collector Emitter Breakdown Voltage	$BV_{CEO\ (sus)}$*	I_C=10mA, I_B=0	15		V
Collector Emitter Breakdown Voltage	BV_{CES}	I_C=10µA, V_{BE}=0	40		V
Collector Base Breakdown Voltage	BV_{CBO}	I_C=10µA, I_E=0	40		V
Emitter Base Breakdown Voltage	BV_{EBO}	I_E=10µA, I_C=0	4.5		V
Collector Cutoff Current	I_{CBO}	V_{CB}=20V, I_E=0 Ta=150ºC		30	µA
Collector Cutoff Current	I_{CES}	V_{CE}=20V, V_{BE}=0		0.4	µA
Base Current	I_B	V_{CE}=20V, V_{BE}=0		0.4	µA
Collector Emitter Saturation Voltage	$V_{CE(sat)}$*	I_C=10mA, I_B=1mA		0.20	V
		I_C=30mA, I_B=3mA		0.25	V
		I_C=100mA, I_B=10mA		0.5	V
		I_C=10mA, I_B=1mA Ta=125ºC		0.3	V

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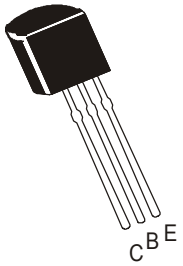

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ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	VALUE		UNIT
			MIN	MAX	
Base Emitter Saturation Voltage	$V_{BE(sat)}$ *	I_C=10mA, I_B=1mA	0.7	0.85	V
		I_C=30mA, I_B=3mA		0.15	V
		I_C=100mA, I_B=10mA		1.60	V
		I_C=10mA, I_B=1mA Ta=+125ºC	0.59		V
		I_C=10mA, I_B=1mA Ta= -55ºC		1.02	V
DC Current Gain	h_{FE}*	I_C=10mA, V_{CE}=1V	40	120	
		I_C=10mA, V_{CE}=1V Ta= -55ºC	20		
		I_C=30mA, V_{CE}=0.4V	30		
		I_C=100mA, V_{CE}=1V	20		
		I_C=10mA, V_{CE}=0.35v	40	120	

DYNAMIC CHARACTERISTICS

Output Capacitance	C_{ob}	I_E=0, V_{CB}=5V f=140KHz		4	pF
Transition Frequency	f_T	V_{CE} =10V,I_C=10mA f=100MH_Z	500		MHz

SWITCHING CHARCTERISTICS

Turn on Time	t_{on}	I_C=10mA, I_{B1}=3mA, I_{B2}=1.5mA, V_{CC}=3V		12	ns
Turn off Time	t_{off}	I_C=10mA, I_{B1}=3mA, V_{CC}=3V,I_{B2}=1.5mA		15	ns
Storage Time	t_s	I_C=100mA, I_{B1}=10mA, I_{B2}= 10mA, V_{CC} =10V		13	ns

***Pulse Condition: Width ≤ 300µs, Duty Cycle ≤ 2%.**

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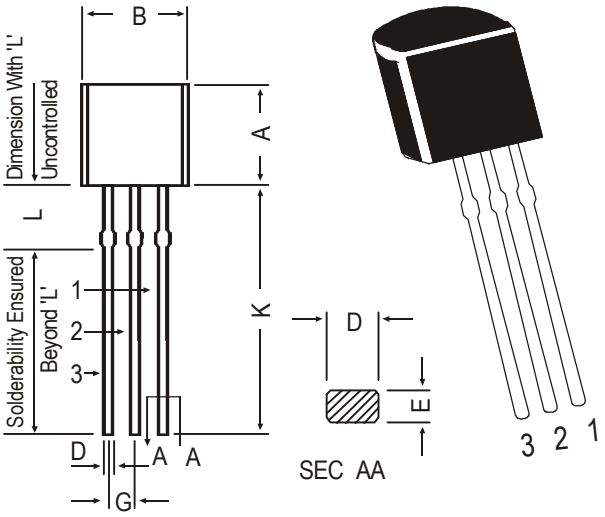
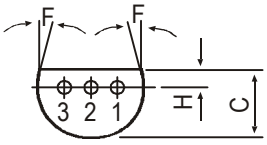
TO-92 Transistors in Tape and Ammo Pack

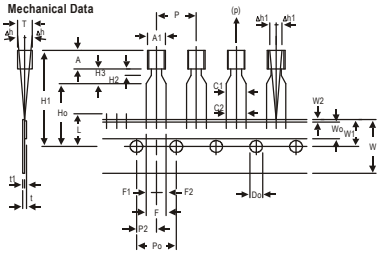


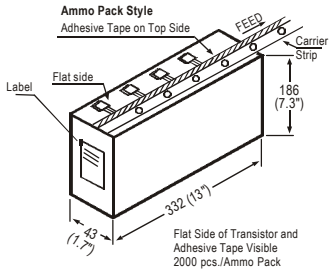


PIN CONFIGURATION
1. EMITTER
2. BASE
3. COLLECTOR

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	—
L	1.982	2.082

All diminsions in mm.





All dimensions in mm

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		± 1.0	
FEED HOLE PITCH	Po		12.7		± 0.3	CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH
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	
COMPONENT ALIGNMENT SIDE VIEW	Δh		0	1.0		AT TOP OF BODY
COMPONENT ALIGNMENT FRONT VIEW	Δh1		0	1.3		AT TOP OF BODY
TAPE WIDTH	W		18		± 0.5	
HOLD-DOWN TAPE WIDTH	Wo		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		t1 0.3-0.6
LEAD - TO - LEAD DISTANCE	F1, F2		2.54		+ 0.4 - 0.1	
STAND OFF	H2	0.45		1.45		
CLINCH HEIGHT	H3			3.0		
LEAD PARALLELISM	| C1 - C2 |			0.22		
PULL - OUT FORCE	(P)	6N				

NOTES
1. Maximum alignment deviation between leads will not to be greater than 0.2mm.
2. Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
3. Holddown tape will not exceed beyond the edge(s) of carrier tape and there shall be no exposure of adhesive.
4. There will be no more than three (3) consecutive missing components in a tape.
5. A tape trailer, having at least three feed holes are provided after the last component in a tape.
6. Splices should not interfere with the sprocket feed holes.

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"	5K	17" x 15" x 13.5"	80K	23 kgs
TO-92 T&A	2K/ammo box	645 gm/2K pcs	12.5" x 8" x 1.8"	2K	17" x 15" x 13.5"	32K	12.5 kgs

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