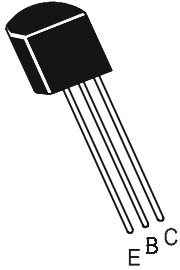


**NPN SILICON PLANAR EPITAXIAL TRANSISTORS**

**MPS2222  
MPS2222A**



**TO-92  
Plastic Package**

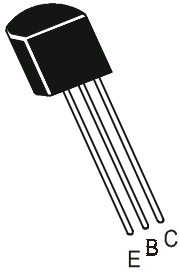
**General Purpose Transistors**

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

DESCRIPTION	SYMBOL	MPS2222	MPS2222A	UNITS
Collector Emitter Voltage	$V_{CEO}$	30	40	V
Collector Base Voltage	$V_{CBO}$	60	75	V
Emitter Base Voltage	$V_{EBO}$	5	6	V
Collector Current Continuous	$I_C$	600		mA
Power Dissipation@ Ta=25°C	$P_D$	625		mW
Derate Above 25°C		5.0		mW/°C
Power Dissipation@ Tc=25°C	$P_D$	1.5		W
Derate Above 25°C		12		mW/°C
Operating And Storage Junction Temperature Range	$T_j, T_{stg}$	-55 to +150		°C
<b>THERMAL RESISTANCE</b>				
Junction to ambient	$R_{th(j-a)}$	200		°C/W
Junction to case	$R_{th(j-c)}$	83.3		°C/W

# NPN SILICON PLANAR EPITAXIAL TRANSISTORS

**MPS2222**  
**MPS2222A**



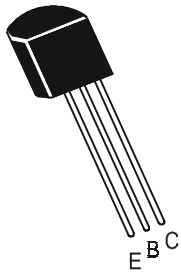
**TO-92**  
**Plastic Package**

## ELECTRICAL CHARACTERISTICS (Ta=25°C Unless Specified Otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MPS2222	MPS2222A	UNITS
Collector Emitter Voltage	$BV_{CEO}$	$I_C=10mA, I_B=0$	>30	>40	V
Collector Base Voltage	$BV_{CBO}$	$I_C=10\mu A, I_E=0$	>60	>75	V
Emitter Base Voltage	$BV_{EBO}$	$I_E=10\mu A, I_C=0$	>5	>6	V
Collector Cut off Current	$I_{CEX}$	$V_{CE}=60V, V_{BE}=3.0V$		<10	nA
Collector Cut off Current	$I_{CBO}$		<0.01		$\mu A$
	$I_{CBO}$	$V_{CB}=50V, I_E=0$		<0.01	$\mu A$
	$I_{CBO}$	$V_{CB}=60V, I_E=0$	<10		$\mu A$
	$I_{CBO}$	$V_{CB}=50V, I_E=0$ Ta= 125°C		<10	$\mu A$
	$I_{CBO}$	$V_{CB}=60V, I_E=0$ Ta= 125°C			
Emitter Cut off Current	$I_{EBO}$	$V_{BE}=3V, I_C=0$		<10	nA
Base Cut off Current	$I_{BL}$	$V_{CE}=60V, V_{BE}=3.0V$		<20	nA
DC Current Gain					$\mu A$
	$h_{FE}$	$V_{CE}=10V, I_C=0.1mA$	>35	>35	
		$V_{CE}=10V, I_C=1mA$	>50	>50	
		$V_{CE}=10V, I_C=10mA$	>75	>75	
		$V_{CE}=10V, I_C=10mA$ TA = -55 °C		>35	
		$V_{CE}=10V^*, I_C=150mA$	100-300	100-300	
		$V_{CE}=1V^*, I_C=150mA$	>50	>50	
		$V_{CE}=10V^*, I_C=500mA$	>30	>40	
	$V_{BE(sat)}^*$	$I_C=150mA, I_B=15mA$	<1.3	0.6-1.2	V
	$V_{BE(sat)}^*$	$I_C=500mA, I_B=50mA$	<2.6	<2.0	V
	$V_{CE(sat)}^*$	$I_C=150mA, I_B=15mA$	<0.4	<0.3	V
		$I_C=500mA, I_B=50mA$	<1.6	<1.0	V

# NPN SILICON PLANAR EPITAXIAL TRANSISTORS

**MPS2222**  
**MPS2222A**



**TO-92**  
**Plastic Package**

## ELECTRICAL CHARACTERISTICS (Ta=25°C Unless Specified Otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MPS2222	MPS2222A	UNITS
<b>DYNAMIC CHARACTERISTICS</b>					
Transition Frequency	$f_T$	$I_C=20\text{mA}, V_{CE}=20\text{V}$ $f=100\text{MHz}$	>250	>300	MHz
Output Capacitance	$C_{ob}$	$I_E=0, V_{CB}=10\text{V}$ $f=1\text{MHz}$		<8	pF
Input Capacitance	$C_{ib}$	$I_C=0, V_{EB}=0.5\text{V}$ $f=1\text{MHz}$	<30	<25	pF
Input Impedance	$h_{ie}$	$I_C=1\text{mA}, V_{CE}=10\text{V}$ $f=1\text{KHz}$		2.0-8.0	KW
		$I_C=10\text{mA}, V_{CE}=10\text{V}$ $f=1\text{KHz}$		0.25-1.25	KW
Reverse Voltage Transfer Ratio	$h_{re}$	$I_C=1\text{mA}, V_{CE}=10\text{V}$ $f=1\text{KHz}$		<8	$\times 10^{-4}$
		$I_C=10\text{mA}, V_{CE}=10\text{V}$ $f=1\text{KHz}$		<4	$\times 10^{-4}$
Output Admittance	$h_{oe}$	$I_C=1\text{mA}, V_{CE}=10\text{V}$ $f=1\text{KHz}$		5-35	$\mu\text{MHO}$
		$I_C=10\text{mA}, V_{CE}=10\text{V}$ $f=1\text{KHz}$		25-200	$\mu\text{MHO}$
Noise Figure	NF	$V_{CE}=10\text{V}, I_C=100\mu\text{A}$ $R_S=1\text{KOHMS}, f=1\text{KHz}$		<4	dB
Collector Base Time Constant	$r_b' C_c$	$V_{CE}=20\text{V}, I_C=20\text{mA}$ $f=31.8\text{MHz}$		<150	ps
Small Signal Current Gain	$ h_{fe} $	$V_{CE}=10\text{V}, I_C=1\text{mA}$ $f=1\text{KHz}$		50-300	
		$V_{CE}=10\text{V}, I_C=10\text{mA}$ $f=1\text{KHz}$		75-375	

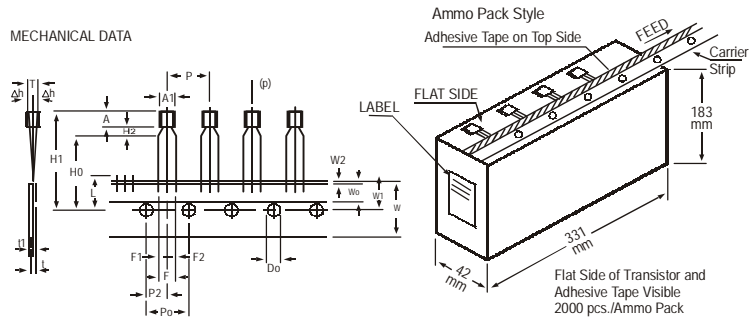
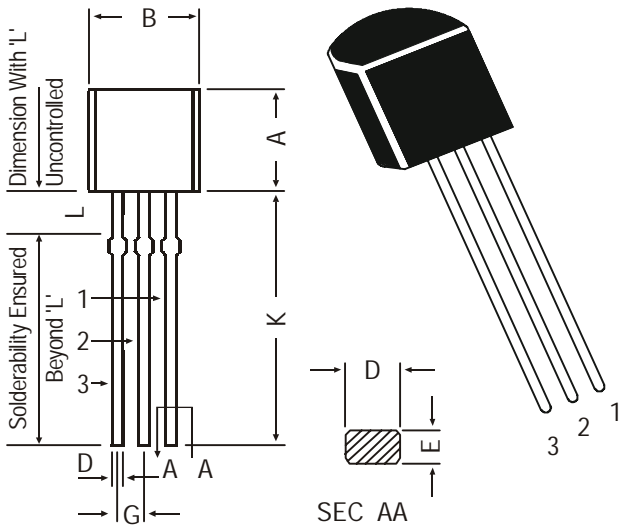
## SWITCHING CHARACTERISTICS

	SYMBOL	TEST CONDITION	MPS2222	MPS2222A	UNITS
Delay Time/Rise Time	$t_d$	$V_{CC}=30\text{V}, V_{EB}=0.5\text{V}$		<10	ns
	$t_r$	$I_C=150\text{mA}, I_{B1}=15\text{mA}$		<25	ns
Storage Time/Fall Time	$t_s$	$I_C=150\text{mA}, I_{B1}=I_{B2}=15\text{mA}$		<225	ns
	$t_f$	$V_{CC}=30\text{V}$		<60	ns

\*Pulse Condition: = Width  $\leq$  300us, Duty Cycle  $\leq$  2%.

**TO-92 Plastic Package**

**TO-92 Transistors on Tape and Ammo Pack**



All dimensions in mm unless specified otherwise

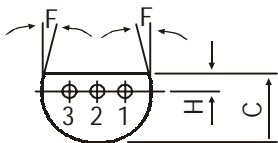
ITEM	SYMBOL	SPECIFICATION				REMARKS
		MIN.	NOM.	MAX.	TOL.	
BODY WIDTH	A1	4.0		4.8		
BODY HEIGHT	A	4.8		5.2		
BODY THICKNESS	T	3.9		4.2		
PITCH OF COMPONENT	P		12.7		±1	
FEED HOLE PITCH	Po		12.7		±0.3	CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH
FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		±0.4	TO BE MEASURED AT BOTTOM OF CLINCH
DISTANCE BETWEEN OUTER LEADS	F		5.08		+0.6 -0.2	
COMPONENT ALIGNMENT	$\Delta h$		0	1		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		1) 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.

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 dimensions in mm.



**PIN CONFIGURATION**

1. COLLECTOR
2. BASE
3. EMITTER

**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

### **Disclaimer**

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