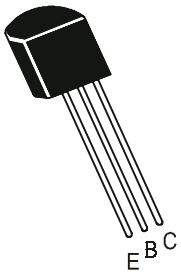
Transys Electronics LIMITED

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

MPS2222
MPS2222A



TO-92
Plastic Package

General Purpose Transistors

ABSOLUTE MAXIMUM RATINGS(Ta=25ºC 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=25ºC	P_D	625		mW
Derate Above 25ºC		5.0		mW/ºC
Power Dissipation@ Tc=25ºC	P_D	1.5		W
Derate Above 25ºC		12		mW/ºC
Operating And Storage Junction Temperature Range	T_j, T_{stg}	-55 to +150		ºC
THERMAL RESISTANCE				
Junction to ambient	$R_{th(j-a)}$	200		ºC/W
Junction to case	$R_{th(j-c)}$	83.3		ºC/W

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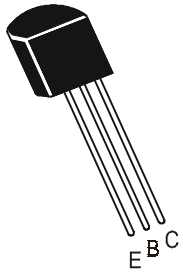

TO-92
Plastic Package

ELECTRICAL CHARACTERISTICS (Ta=25ºC 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=10µA,I_E=0	>60	>75	V
Emitter Base Voltage	BV_{EBO}	I_E=10µA, 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		µA
	I_{CBO}	V_{CB}=50V, I_E = 0		<0.01	µA
	I_{CBO}	V_{CB}=60V, I_E = 0	<10		µA
	I_{CBO}	V_{CB}=50V, I_E = 0 Ta= 125ºC		<10	µA
	I_{CBO}	V_{CB}=60V, I_E = 0 Ta= 125ºC			
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					µA
	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 ºC		>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

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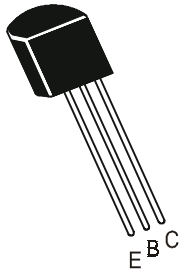

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ELECTRICAL CHARACTERISTICS (Ta=25ºC Unless Specified Otherwise)

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

SWITCHING CHARCTERISTICS

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

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

MPS2222
MPS2222A

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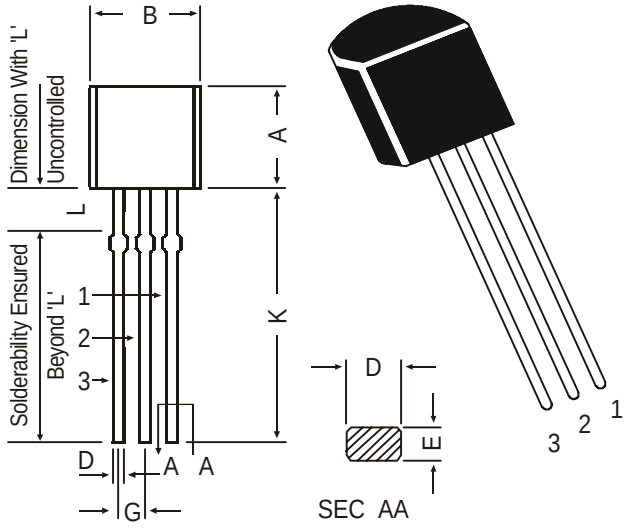
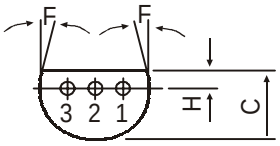


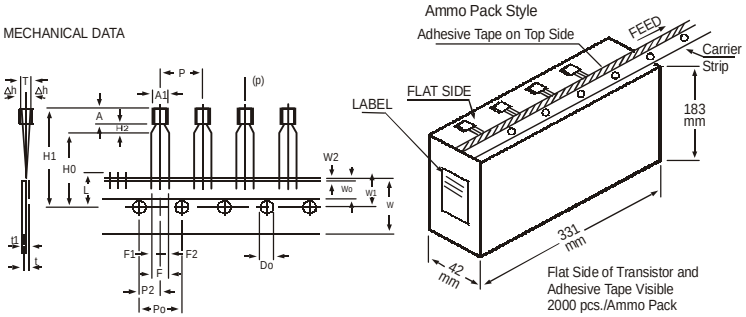


PIN CONFIGURATION
1. COLLECTOR
2. BASE
3. EMITTER

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.

TO-92 Transistors on Tape and Ammo Pack



All dimensions in mm unless specified otherwise

ITEM	SYMBOL	SPECIFICATION MIN.	NOM.	MAX.	TOL .	REMARKS
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	△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		t1 0.3 - 0.6
LEAD - TO - LEAD DISTANCEF1,	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.

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