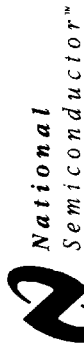


NPN Transistors

Discrete POWER & Signal Technologies



NPN General Purpose Amplifiers and Switches

Device No.	Case Style	V _{CE0} (V) Min	V _{CEB0} (V) Min	V _{EBO} (V) Min	I _{CBO} (nA) Max	V _{CB} (V) @ I _C & V _{CE} (V)	h _{FE} @ I _C (mA) Min Max	V _{CE(SAT)} (V) Max & V _{BE(SAT)} (V) Min Max	I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA) Max	t _(on) (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N3390	TO-92 (94)	25	25	5	100	18	400 800	2 4.5	2	10						10
2N3391A	TO-92 (94)	25	25	5	100	18	250 500	2 4.5	2	10				5	(Note 5)	10
2N3392	TO-92 (94)	25	25	5	100	18	150 300	2 4.5	2	10						10
2N3393	TO-92 (94)	25	25	5	100	18	90 180	2 4.5	2	10						10
2N3415	TO-92 (94)	25	25	5	100	25	180 540	2 4.5	2 1.3 50							10
2N3416	TO-92 (94)	50	50	5	100	25	75 225	2 4.5	2 1.3 50							10
2N3417	TO-92 (94)	50	50	5	100	25	180 540	2 4.5	2 1.3 50							10
2N3704	TO-92 (94)	50	30	5	100	20	100 300	2 2	50 100	12	100	50				10
2N5172	TO-92 (94)	25	25	5	100	25	100 500	10 10	10	10						10
MPS8098	TO-92 (92)	60	60	6	100	60	100 300	1 5	100 100 75	6	150	10				10
MPSA20	TO-92 (92)		40	4	100	30	40 400	5 10	5	4	125	5				10

NPN General Purpose Amplifiers and Switches (continued)

Device No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CES} [*] I _{CB0} (nA) Max	V _{CB} (V) @	I _{FE} Min Max	I _C & I _{CE} (mA)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Max	I _C (mA) @	C _{ob} (pF) Max	f _T (MHz) Min Max	I _C (mA) @	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
PN100	TO-92 (92)	75	45	6	50	60	80 100 100 100	0.1 10 100 150	0.2 0.4	0.85 1	10 200	4.5	250	20		5	(Note 3)	10 (5-1)
PN100A	TO-92 (92)	75	45	6	50	60	240 300 100 100	0.1 10 100 150	0.2 0.4	0.85 1	10 200	4.5	250	20		4	(Note 3)	10 (5-1)
PN3565	TO-92 (92)	30	25	6	50	25	150	600	0.35		1	4	40	240	1			10
PN3642	TO-92 (92)	60	45	5	50*	50	15 40	500 150	0.22		150	8	150	50				10
PN3643	TO-92 (92)	60	30	5	50*	50	20 100	500 300	0.22		150	8	250	50				10
PN4141	TO-92 (92)	60	30	5			30 50 100 75 50 35	500 150 150 10 10 0.1	0.4 1.6	1.3 2.6	150 500	8	250	20	310		(Note 2)	10
T1S98	TO-92 (97)		60		10	40	100	300	0.5		100		2	10				10
2N4410	TO-92 (92)	120	80	5	10	100	60 60	400 10	0.2	0.8	1	12	60	300	10			16
2N5551	TO-92 (92)	180	160	6	50	120	30 80 80	50 250 1	0.15 0.2	1 1	10 50	6	100	300	10		(Note 4)	16 (5-11B)
2N5830	TO-92 (92)	120	100	5	50	100	60 80	500 10	0.15	0.8	1		100	500	10			16

NOTE: National preferred device for each process in **bold**. Number shown in parentheses indicates location (section-page) of device datasheet.

NPN Transistors

NPN General Purpose Amplifiers and Switches (continued)

Device No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EBO} (V) Min	I _{CB0} (nA) @ V _{CB} (V) Max	h _{FE} @ I _C & V _{CE} (V)	V _{CE(SAT)} (V) Max & V _{BE(SAT)} (V) Min @ I _C (mA)	I _C (mA)	C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA) @	t _{on} (ns) Max	NF (dB) Max	Test Conditions	Process No.				
MPSL01	TO-92 (92)	140	120	6	10	40	50	300	10	5	0.2	1.2	10	8	60	10	16		
2N4400	TO-92 (92)	60	40	6		20	500	2	0.4	0.75	0.95	150	6.5		200	20	19		
						50	150	1											
						40	10	1	0.75	1.2	500								
2N4401	TO-92 (92)	60	40	6		40	500	2	0.4	0.75	0.95	150	6.5		250	20	19		
						100	150	1	0.75	1.2	500								
						80	10	1											
2N4953	TO-92 (94)	60	30	5	50	200	600	10	0.3	1.3	150	8			250	20	19		
						150	10	10											
						75	1	10											
MPS6531	TO-92 (92)	60	40	5	50	50	500	10	0.3	1	100	5				19			
						90	270	100	1										
						60	10	1											
PN2222	TO-92 (92)	60	30	5	10	30	500	10	0.4	1.3	150	8			250	20	19		
						50	150	1											
						100	300	150	10	1.6	2.6	500							
PN2222A	TO-92 (92)	75	40	6	10	40	500	10	0.3	0.6	1.2	150	8		300	20	19		
						50	150	1											
						100	300	150	10	1	2	500							
						50	1	10											
						35	0.1	10											
						35	0.1	10											

NOTE: National preferred device for each process in **bold**. Number shown in parentheses indicates location (**section-page**) of device datasheet.

NPN General Purpose Amplifiers and Switches (continued)

Device No.	Case Style	V _{CSO} (V) Min	V _{CEO} (V) Min	V _{EBO} (V) Min	I _{CSO} (nA) @ V _{CB} (V) Max	h _{FE} @ I _C & V _{CE} (V)		V _{CE(SAT)} (V) & V _{BE(SAT)} (V) @ I _C (mA)		C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA)	t _(on) (ns) Max	NF (dB) Max	Test Conditions	Process No.
						Min	Max	Min	Max							
TN2219A	TO-226 (99)	75	40	6	10 60	40 500 50 150 100 300 75 10 50 1 35 0.01	10 1 1 1 10 10 10 10 10 10 10 10	0.6 1.2 2 2	150 500	8	300	20			(Note 2)	19
2N3903	TO-92 (92)	60	40	6		15 100 30 50 50 10 35 1 20 0.1	1 1 1 1 1 1 1 1 1 1	0.2 0.6 0.3 0.95	10 10 50 50	4	250	10	255		(Note 6) (Note 7)	23
2N3904	TO-92 (92)	60	40	6		30 100 60 50 100 300 70 1 40 0.01	1 1 1 1 1 1 1 1 1 1	0.2 0.65 0.3 0.95	10 10 50 50	4	300	10	250	5	(Note 6) (Note 7)	23 (5-65)
2N4123	TO-92 (92)	40	30	5	50 20	25 50 50 150	1 1 2 1	0.3 0.95	50 50	4	250	10		6	(Note 7)	23
2N4124	TO-92 (92)	30	25	5	50 20	60 50 120 360	1 1 2 1	0.3 0.95	50 50	4	300	10		5	(Note 7)	23
MPS6513	TO-92 (92)	40	30	4	50 30	60 100 90 180	10 10 2 10	0.5	50	3.5						23
MPS6514	TO-92 (92)	40	25	4	50 30	90 100 150 300	10 10 2 10	0.5	50	3.5						23
MPS6515	TO-92 (92)	40	25	4	50 30	150 100 250 500	10 10 2 10	0.5	50	3.5						23

TEST CONDITIONS

Note 1: I_C = 10 μA, V_{CE} = 5V, f = 10 Hz - 15.7 kHz.
 Note 2: I_C = 150 mA, V_{CC} = 30V, I_B¹ = I_B² = 15 mA.

Note 3: I_C = 200 μA, V_{CE} = 5V, f = 1 kHz.

Note 4: I_C = 250 μA, V_{CE} = 5V, f = 10 Hz - 15.7 kHz.

Note 5: I_C = 100 μA, V_{CE} = 4.5V, f = 10 Hz - 15.7 kHz.

Note 6: I_C = 10 mA, V_{CC} = 3V, I_B¹ = I_B² = 1 mA.

Note 7: I_C = 100 μA, V_{CE} = 5V, f = 10 Hz - 15.7 kHz.

Note 8: I_C = 100 μA, R_S = 1.0 kΩ, f = 1.0 kHz.

NOTE: National preferred device for each process in **bold**. Number shown in parentheses indicates location (**section-page**) of device datasheet.