

PNP Transistors

General Purpose Amplifiers and Switches



Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CE0</sub> * (nA) Max	I <sub>CB0</sub> (nA) Max	I <sub>C</sub> & V <sub>CE</sub> (V)		V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min	I <sub>C</sub> (mA) Max	C <sub>0B</sub> (pF) Max	f <sub>T</sub> (MHz) Min	I <sub>C</sub> (mA) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.								
							h <sub>FE</sub> Min	h <sub>FE</sub> Max																		
2N2904	TO-5	60	40	5	20	50	500	10	0.4	1.3	50	8	200	50	100		(Note 2)	63								
							150	10	1.6	2.6																
							10	10																		
							1	10																		
2N2904A	TO-5	60	60	5	10	50	500	10	0.4	1.3	50	8	200	50	100		(Note 2)	63								
							150	10	1.6	2.6																
							10	10																		
							1	10																		
2N2905 also Avail. JAN/TX/V Versions	TO-5	60	40	5	20	50	500	10	0.4	1.3	50	8	200	50	100		(Note 2)	63								
							150	10	1.6	2.6																
							10	10																		
							1	10																		
2N2905A also Avail. JAN/TX/V Versions	TO-5	60	60	5	10	50	500	10	0.4	1.3	50	8	200	50	100		(Note 2)	63								
							150	10	1.6	2.6																
							10	10																		
							1	10																		
2N2906	TO-18	60	40	5	20	50	500	10	0.4	1.3	50	8	200	50	100		(Note 2)	63								
							150	10	1.6	2.6																
							10	10																		
							1	10																		

General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CE0</sub> (V) Min	V <sub>BE0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>BE0</sub> (V) Min	I <sub>CS</sub> <sup>*</sup> I <sub>CB0</sub> (mA) Max	V <sub>CB</sub> (V)	I <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> Min Max (mA)	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA) Max Min Max	COB (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA) Min Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N2906A	TO-18	60	5	60	5	10	50	40 500 10 40 120 150 10 40 10 10 10 40 1 10 10 40 0.1 10	0.4 1.6	8	200 50	100		(Note 2)	63
2N2907 also Avail. JAN/TX/V Versions	TO-18	60	5	40	5	20	50	35 500 10 100 300 150 10 75 10 10 10 50 1 10 35 0.1 10	0.4 1.6	8	200 50	100		(Note 2)	63
2N2907A also Avail. JAN/TX/V Versions	TO-18	60	5	60	5	10	50	50 500 10 100 300 150 10 100 10 10 10 100 1 10 75 0.1 10	0.4 1.6	8	200 50	100		(Note 2)	63
2N3638		Same as PN3638													
2N3638A		Same as PN3638A													
2N3644		Same as PN3644													
2N3645		Same as PN3645													
2N3702	TO-92 (94)	40	5	25	5	100	20	60 300 50 5	0.25	12	100 50				63
2N3703	TO-92 (94)	50	5	30	5	100	20	30 150 50 5	0.25	12	100 50				63
2N4142		Same as PN4142													
2N4143		Same as PN4143													
2N4290	TO-92 (94)	30	5	20	5	500	20	50 300 100 10 40 10 10 10 20 0.1 10	0.4	10	100 10				63
2N4291	TO-92 (94)	40	6	30	6	200	30	100 300 100 10 50 10 10 10 30 0.1 10	0.4	10	100 10				63

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Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CS</sub> <sup>*</sup> I <sub>CB0</sub> (mA) Max	I <sub>C</sub> (mA) & V <sub>CE</sub> (V)	h <sub>FE</sub> Min	h <sub>FE</sub> Max	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min	I <sub>C</sub> (mA) Max	C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz) Min	f <sub>T</sub> (MHz) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.	
2N4402	TO-92 (94)	40	40	5		500 2 150 2 10 1 1 1	20 50 50 30	150 10 1	0.4 0.75	0.7 1.3	150 500	10	150	20	255		(Note 4)	63	
2N4403	TO-92 (92)	40	40	5		500 2 150 2 10 1 1 1	20 100 100 60 30	150 2 150 2 10 1 1 1	0.4 0.75	0.75 1.3	150 500	10	200	20	255		(Note 4)	63	
2N4971		Same as PN2906																	
2N4972		Same as PN2907																	
2N5142		Same as PN5142																	
2N5143		Same as PN5143																	
2N5221	TO-92 (92)	15	15	3	100 10	50 10 10 10	30 30	600 50	0.5	1.1	150 150	15	100	20				63	
2N5226	TO-92 (92)	25	25	4	300 15	50 10 10 10	30 25	600 100	0.8	1.0	100 200	20	50	20				63	
2N5354	TO-92 (94)	25	25	4	100 25	50 1	40	120	0.25		50	8						63	
2N5355	TO-92 (94)	25	25	4	100 25	50 1	100	300	0.25		50	8						63	
2N5365	TO-92 (94)	40	40	4	100 40	300 5 50 1	20 40 32	300 50 2	0.25 1.0	1.1 2.0	50 200	8						63	
2N5366	TO-92 (94)	40	40	4	100 40	300 5 50 1	40 100 80	300 50 2	0.25 1.0	1.1 2.0	50 200	8						63	
2N5447	TO-92 (97)	40	25	5		50 8	60	300	0.25		50	12	100	50				63	
2N5817	TO-92 (97)	50	40	5	100 25	500 2 2 2	25 100	500 200	0.75	1.2	500 500	15	100	50				63	

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CB0</sub> * (nA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> Min	I <sub>C</sub> (mA) Max	V <sub>CE</sub> (V) Min	I <sub>C</sub> (mA) Max	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA)		COB (pF) Max	f <sub>T</sub> (MHz) Min	I <sub>C</sub> (mA) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
												Min	Max							
MPC2907	TO-116	60	40	5	50	50	75	10	10	10	0.4	1.3	150	8	200	20				63
MPS3638	TO-92 (92)	Same as PN3638																		
MPS3638A	TO-92 (92)	Same as PN3638A																		
MPS3644	TO-92 (92)	Same as PN3644																		
MPS3645	TO-92 (92)	Same as PN3645																		
MPS3702	TO-92 (92)	40	25	5	100	20	60	300	5	5	0.25	50	12	100	50					63
MPS3703	TO-92 (92)	50	30	5	100	20	30	150	5	5	0.25	50	12	100	50					63
MPS6533	TO-92 (92)	40	40	4	50	30	25	500	10	10	0.5	1.0	100	6						63
							40	120	1	1										
MPS6534	TO-92 (92)	40	40	4	50	30	30	500	10	10	0.3	1.0	100	6						63
							90	270	1	1										
MPS6535	TO-92 (92)	30	30	4	100	20	30	100	1	1	0.5	1.2	100	6						63
PN2906	TO-92 (92)	60	40	5	20	50	20	500	10	10	0.4	1.3	150	8	200	50	100		(Note 2)	63
							40	120	10	10	1.6	2.6	500							
							35	10	10	10										
							25	1	10	10										
							20	0.1	10	10										

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	ICES* I <sub>CB0</sub> (mA) Max	V <sub>CB</sub> (V) Min	I <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (mA) Min Max	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA) Max Min Max	COB (pF) Max	f <sub>T</sub> (MHz) Min Max	I <sub>C</sub> (mA) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
PN2906A	TO-92 (92)	60	60	5	10	50	40	0.4	8	200	50	100		(Note 2)	63
							40	1.6							
PN2907	TO-92 (92)	60	40	5	20	50	30	0.4	8	200	50	100		(Note 2)	63
							100	1.6							
PN2907A	TO-92 (92)	60	60	5	20	50	50	0.4	8	200	50	100		(Note 2)	63
							100	1.6							
PN3638	TO-92 (92)	25	25	4	35*	15	20	0.25	20	100	50	170		(Note 1)	63
							30	1.0							
PN3636A	TO-92 (92)	25	25	4	25*	15	20	0.25	10	150	50	170		(Note 1)	63
							80	1.0							
PN3644	TO-92 (92)	45	45	5	35*	30	20	0.25	8	200	20	100		(Note 4)	63
							100	0.4							
PN3645	TO-92 (92)	60	60	5	35*	50	20	0.25	8	200	20	100		(Note 4)	63
							80	1.0							

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CES</sub> <sup>*</sup> ICBO @ V <sub>CB</sub> (nA) Max	I <sub>CES</sub> <sup>*</sup> ICBO @ V <sub>CB</sub> (nA) Max	h <sub>FE</sub> Min	I <sub>C</sub> @ V <sub>CE</sub> (mA) Min	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min	I <sub>C</sub> (mA) Max	C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		I <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.			
													Max	Min							
PN4142	TO-92 (92)	60	40	5			20	500	0.4	1.3	150	8	200	50	100		(Note 12)	63			
							20	150	1												
							40	150	10	1.6	2.6	500									
							35	10	10												
PN4143	TO-92 (92)	60	40	5			20	500	0.4	1.3	150	8	200	50	100		(Note 12)	63			
							30	150	1												
							100	300	10	1.6	2.6	500									
							75	10	10												
PN5142	TO-92 (92)	20	20	4	50*	12	15	300	0.5	1.5	50	10	100	50	200		(Note 1)	63			
							30	50	1	0.2	0.8	2.5	300								
							15	300	10	0.5	1.5	50	10	100	50	200			(Note 1)	63	
							30	50	1	0.2	0.8	2.5	300								
TIS91	TO-92 (94)	40	40	4	100	20	100	300	0.25	0.6	1.0						63				
							50	50	2												
TIS92	TO-92 (97)	40	40	5	100	20	100	300	0.25	0.6	1.0						63				
							50	50	2												
TIS93	TO-92 (97)	40	40	5	100	20	100	300	0.25		50						63				
							50	50	2												
TN2904A	TO-237 (91)	60	60	5	10	50	40	0.1	0.4	1.3	150	8	200	50	100		(Note 2)	63			
							40	1.0	10	1.6	2.6	500									
							40	10	10												
							40	120	150												
TN2905	TO-237 (91)	60	40	5	20	50	30	500	0.4	1.3	150	8	200	50	100		(Note 2)	63			
							100	300	150	10	10	10									
							75	10	10												
							50	1	10	1.6	2.6	500									

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Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CB0</sub> (mA) Max	V <sub>CB</sub> (V) Max	I <sub>CB0</sub> (mA) Max	I <sub>CE0</sub> (mA) Min	I <sub>CE0</sub> (mA) Max	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min	I <sub>C</sub> (mA) Min	I <sub>C</sub> (mA) Max	C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz) Min	f <sub>T</sub> (MHz) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
TN2905A	TO-237 (91)	60	60	5	10	50	50	500	10	0.4	1.3	150	50	8	200	100			(Note 2)	63
2N3905	TO-92 (92)	40	40	5				15	100	0.25	0.65	10	10	4.5	200	260		5	(Notes 5, 8)	66
2N3906	TO-92 (92)	40	40	5				30	100	0.25	0.65	10	10	4.5	250	300		4	(Notes 5, 8)	66
2N4121		Same as PN4121																		
2N4122		Same as PN4122																		
2N4125	TO-92 (92)	30	30	4	50	20	50	25	50	0.4	0.95	50	10	4.5	200	10		5	(Note 8)	66
2N4126	TO-92 (92)	25	25	4	50	20	60	60	50	0.4	0.95	50	10	4.5	250	10		4	(Note 8)	66
2N4916		Same as PN4916																		
2N4917		Same as PN4917																		
2N5138		Same as PN5138																		
2N5139		Same as PN5139																		
MPQ3906	TO-116	60	40	6	50	30	40	0.1	1	0.25	0.85	10	4.5							66

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Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	ICES* IC <sub>BO</sub> @ V <sub>CB</sub> (mA) Max	h <sub>FE</sub> Min Max @ I <sub>C</sub> & V <sub>CE</sub> (mA) (V)	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA) Max Min	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA) Max Min	C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA) Min Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPS6700	TO-116	40	40	5	50 30	30 0.1 50 1 70 10	0.25 0.9 10 10	4.5 10	4.5	200 10				66(2) 23(2)
MPS3905	TO-92 (92)	40	40	5		30 0.1 40 1 50 10 50 150 30 50 15 100	0.25 0.85 10 10	4.5 10	4.5	200 10		5	(Note 6)	66
MPS3906	TO-92 (92)	40	40	5		60 0.1 80 1 100 300 60 50 30 100	0.25 0.85 10 10	4.5 10	4.5	250 10		4	(Note 6)	66
MPS6516	TO-92 (92)	40	40	4	50 30	30 100 50 100	0.5 50 10 10	4 4						66
MPS6517	TO-92 (92)	40	40	4	50 30	60 100 90 180	0.5 50 10 10	4 4						66
MPS6518	TO-92 (92)	40	40	4	500 30	90 100 150 300	0.5 50 10 10	4 4						66
PN3251	TO-92 (92)	50	40	5		80 0.1 90 0.001 100 300 30 50	0.25 0.9 10 10	6 10	6	300 10		6	(Note 6)	66
PN4121	TO-92 (92)	40	40	5	25* 30	15 50 70 200 60 1 40 0.1	0.13 0.75 10 10	4.5 10	4.5	400 10	150	4	(Notes 11, 8)	66
PN4122	TO-92 (92)	40	40	5	25* 30	30 50 150 300 150 1 100 0.1	0.13 0.75 10 10	4.5 10	4.5	450 10	150	4	(Notes 11, 8)	66

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V)		V <sub>CE0</sub> (V)		V <sub>EB0</sub> (V)		I <sub>CB0</sub> (mA)		I <sub>CB0</sub> (mA)		I <sub>CB0</sub> (mA)		I <sub>CB0</sub> (mA)		I <sub>CB0</sub> (mA)		I <sub>CB0</sub> (mA)		I <sub>CB0</sub> (mA)		f <sub>T</sub> (MHz)	t <sub>OFF</sub> (ns)	NF (dB)	Test Conditions	Process No.		
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						Min	Max
PN4916	TO-92 (92)	30	30	5	30	5	30	25*	15	15	200	50	1	0.13	0.75	1	4.5	150	4							66	(Notes 13, 8)	66
PN4917	TO-92 (92)	30	30	5	30	5	30	25*	15	300	50	1	0.13	0.75	1	4.5	150	4								66	(Notes 13, 8)	66
PN5138	TO-92 (92)	30	30	5	30	5	30	50	20	10	10	10	1	0.3	1.0	10	7									66		66
PN5139	TO-92 (92)	20	20	5	20	5	20	50*	15	50	10	10	1	0.2	0.7	10	5	200								66	(Note 13)	66
ST3906	TO-92 (92)	40	40	5	40	5	40			0.1	1	1	1	0.25	0.65	10	4.5									66		66
2N6076	TO-92 (94)	25	25	5	25	5	25	100	25	10	10	10	1	0.25	0.8	10										68		68
MPQ200	TO-116	60	45	6	45	6	45	50	50	0.1	1	1	1	0.2	0.85	10	6									68	(Note 8)	68
PN200	TO-92 (92)	60	45	6	45	6	45	50	50	0.1	1	1	1	0.2	0.85	10	6									68	(Note 8)	68

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Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>BE0</sub> (V) Min	I <sub>CE0</sub> (mA) Max	V <sub>CB</sub> (V) Max	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub>		V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min	I <sub>C</sub> (mA) Max	COB (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub>		t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max					Min	Max				
PN200A	TO-92 (92)	60	45	6	50	50	300	600	0.2	0.85	10	6	250	20		4	(Note 8)	68
PN201	TO-92 (92)	80	65	6	50	60	60	375	0.2	1.0	200	4.5	100	10		4	(Note 8)	69
2N5400	TO-92 (92)	130	120	5	100	100	40	180	0.2	1.0	10	6	100	10		8	(Note 9)	74
2N5401	TO-92 (92)	160	150	5	50	120	30	240	0.2	1.0	50	6	100	10		8	(Note 9)	74
MP5L51	TO-92 (92)	100	100	4	1 μA	50	40	250	0.25	1.2	10	8	60	10				74
PN4888	TO-92 (92)	150	150	6	50	100	40	400	0.5	0.9	10	4	30	60				74
PN4889	TO-92 (92)	150	150	6	10	100	80	300	0.5	0.9	10	4	40	160		4	(Note 15)	74

TEST CONDITIONS:

- Note 1: I<sub>C</sub> = 300 mA, V<sub>CC</sub> = 10V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 30 mA.
- Note 2: I<sub>C</sub> = 150 mA, V<sub>CC</sub> = 8V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 15 mA.
- Note 3: I<sub>C</sub> = 300 mA, V<sub>CC</sub> = 15V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 30 mA.
- Note 4: I<sub>C</sub> = 300 mA, V<sub>CC</sub> = 30V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 30 mA.
- Note 5: I<sub>C</sub> = 10 mA, V<sub>CC</sub> = 3V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 1 mA.
- Note 6: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 100 Hz.

- Note 7: I<sub>C</sub> = 30 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 8: I<sub>C</sub> = 100 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 9: I<sub>C</sub> = 250 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 10: I<sub>C</sub> = 10 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 11: I<sub>C</sub> = 50 mA, V<sub>CC</sub> = 30V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 5 mA.
- Note 12: I<sub>C</sub> = 150 mA, V<sub>CC</sub> = 30V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 15 mA.

- Note 13: I<sub>C</sub> = 50 mA, V<sub>CC</sub> = 10V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 5 mA.
- Note 14: I<sub>C</sub> = 500 mA, V<sub>CC</sub> = 30V, I<sub>B</sub><sup>1</sup> = I<sub>B</sub><sup>2</sup> = 50 mA.
- Note 15: I<sub>C</sub> = 100 μA, V<sub>CC</sub> = 10V, f = 1 kHz.
- Note 16: I<sub>C</sub> = 200 μA, V<sub>CE</sub> = 5V, f = 1 kHz.
- Note 17: I<sub>C</sub>/I<sub>B</sub> = 40.
- Note 18: I<sub>C</sub>/I<sub>B</sub> = 20.

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