

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	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> (mA)		V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) @ I <sub>C</sub> (mA) Min Max	I <sub>C</sub> (mA) Max	C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz) Min Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.	
							Min	Max										
2N2904	TO-5	60	40	5	20	50	500	10	0.4	1.3	150	8	200	100			(Note 2)	63
							40	150		2.6	500							
							35	10		1.6								
							25	1										
2N2904A	TO-5	60	60	5	10	50	500	10	0.4	1.3	150	8	200	100			(Note 2)	63
							40	150		2.6	500							
							40	10		1.6								
							40	1										
2N2905 also Avail. JAN/TX/V Versions	TO-5	60	40	5	20	50	500	10	0.4	1.3	150	8	200	100			(Note 2)	63
							100	300		2.6	500							
							75	10		1.6								
							50	1										
2N2905A also Avail. JAN/TX/V Versions	TO-5	60	60	5	10	50	500	10	0.4	1.3	150	8	200	100			(Note 2)	63
							100	300		2.6	500							
							100	1		1.6								
							75	0.1										
2N2906	TO-18	60	40	5	20	50	500	10	0.4	1.3	150	8	200	100			(Note 2)	63
							40	150		2.6	500							
							35	10		1.6								
							25	1										

General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CS0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>EB0</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> Max Min Max (mA)	COB (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> Min Max (mA)	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N2906A	TO-18	60	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 1.3 150 1.6 2.6 500	8	200 50	100		(Note 2)	63
2N2907 also Avail. JAN/TX/V Versions	TO-18	60	40	5	20	50	35 500 10 100 300 150 10 75 10 10 10 50 1 10 35 0.1 10	0.4 1.3 150 1.6 2.6 500	8	200 50	100		(Note 2)	63
2N2907A also Avail. JAN/TX/V Versions	TO-18	60	60	5	10	50	50 500 10 100 300 150 10 100 1 10 75 0.1 10	0.4 1.3 150 1.6 2.6 500	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	25	5	100	20	60 300 50 5	0.25	12	100 50				63
2N3703	TO-92 (94)	50	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	20	5	500	20	50 300 100 10 40 10 10 10 20 0.1 10	0.4 1.5 100 0.4 1.5 100	10	100 10				63
2N4291	TO-92 (94)	40	30	6	200	30	100 300 100 10 50 10 10 10 30 0.1 10	0.4 1.5 100 0.4 1.5 100	10	100 10				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>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 10 10	0.5	1.1	150 15	15	100	20					63
2N5226	TO-92 (92)	25	25	4	300 15	50 10 10 10	30 25	600 50 10 10	0.8	1.0	100 20	20	50	20					63
2N5354	TO-92 (94)	25	25	4	100 25	50 1	40	120 50	0.25		50 8	8							63
2N5355	TO-92 (94)	25	25	4	100 25	50 1	100	300 50	0.25		50 8	8							63
2N5365	TO-92 (94)	40	40	4	100 40	300 5 50 1	20 40	300 50 10 10	0.25	1.1	50 8	8							63
2N5366	TO-92 (94)	40	40	4	100 40	300 5 50 1	40 100	300 50 10 10	0.25	1.1	50 8	8							63
2N5447	TO-92 (97)	40	25	5		50 8	60	300 50	0.25		50 12	12	100	50					63
2N5817	TO-92 (97)	50	40	5	100 25	500 2 2 2	25 100	500 2 200 2	0.75	1.2	500 15	15	100	50					63

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V)		V <sub>CEO</sub> (V)		V <sub>EBO</sub> (V)		I <sub>CB0</sub> <sup>*</sup> (nA)		V <sub>CB</sub> (V)		h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub>		V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V)		I <sub>C</sub> (mA)		COB (pF)		f <sub>T</sub> (MHz)		I <sub>C</sub> (mA)	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						
MPC2907	TO-116	60	40	5	50	50	50	75	100	50	10	10	10	10	0.4	1.3	150	300	10	10	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	50	5	0.25	50	12	100	50												63
MPS3703	TO-92 (92)	50	30	5	100	20	30	150	50	5	0.25	50	12	100	50												63
MPS6533	TO-92 (92)	40	40	4	50	30	25	40	120	100	1	1	1	1	0.5	1.0	100	6	6								63
MPS6534	TO-92 (92)	40	40	4	50	30	90	270	100	1	1	1	1	0.3	1.0	100	6	6									63
MPS6535	TO-92 (92)	30	30	4	100	20	30	100	1	1	0.5	100	6	6	0.5	1.2	100	6	6								63
PN2906	TO-92 (92)	60	40	5	20	50	20	40	120	150	10	10	10	10	0.4	1.3	150	500	10	8	200	50	100			(Note 2)	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>EB0</sub> (V) Min	ICES* I <sub>CB0</sub> (mA) Max	I <sub>CE</sub> (mA) Min	I <sub>CE</sub> (mA) Max	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) Min	f <sub>T</sub> (MHz) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
PN2906A	TO-92 (92)	60	60	5	10	40	500	0.4	1.3	150	8	200	50	100		(Note 2)	63
						40	150	1.6	2.6	500							
PN2907	TO-92 (92)	60	40	5	20	30	500	0.4	1.3	150	8	200	50	100		(Note 2)	63
						100	300	1.6	2.6	500							
PN2907A	TO-92 (92)	60	60	5	20	50	500	0.4	1.3	150	8	200	50	100		(Note 2)	63
						100	300	1.6	2.6	500							
PN3638	TO-92 (92)	25	25	4	35*	20	300	0.25	1.1	50	20	100	50	170		(Note 1)	63
						30	10	1.0	0.8	2.0	300						
PN3636A	TO-92 (92)	25	25	4	25*	20	300	0.25	1.1	50	10	150	50	170		(Note 1)	63
						100	10	1.0	0.8	2.0	300						
PN3644	TO-92 (92)	45	45	5	35*	20	300	0.25	1.0	50	8	200	20	100		(Note 4)	63
						80	240	0.4	1.3	150							
PN3645	TO-92 (92)	60	60	5	35*	20	300	0.25	1.0	50	8	200	20	100		(Note 4)	63
						80	240	0.4	1.3	150							

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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> (V) 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> @ V <sub>BE(SAT)</sub> (mA) Max	C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz) @		I <sub>OFF</sub> (mA) 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		
							50	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						
PN5143	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						
TIS91	TO-92 (94)	40	40	4	100	20	100	300	0.25	0.6	1.0						63		
TIS92	TO-92 (97)	40	40	5	100	20	100	300	0.25	0.6	1.0						63		
TIS93	TO-92 (97)	40	40	5	100	20	100	300	0.25								63		
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	1.6	2.6	500								
TN2905	TO-237 (91)	60	40	5			30	500	0.4	1.3	150	8	200	50	100	(Note 2)	63		
							100	300	10	1.6	2.6	500							
							75	10	10										
							50	1	10										

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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>CB0</sub> (mA) Max	I <sub>CB0</sub> (mA) Max	h <sub>FE</sub> Min	h <sub>FE</sub> Max	I <sub>C</sub> (mA) 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.
TN2905A	TO-237 (91)	60	60	5	10	50	50	100	500	10	0.4	1.3	150	8	200	100		(Note 2)	63
2N3905	TO-92 (92)	40	40	5		15	30	50	100	1	0.25	0.65	10	4.5	200	260	5	(Notes 5, 8)	66
2N3906	TO-92 (92)	40	40	5		30	50	100	100	1	0.4	0.95	50	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	25	50	150	50	1	0.4	0.95	50	4.5	200	10	5	(Note 8)	66
2N4126	TO-92 (92)	25	25	4	50	60	50	360	50	1	0.4	0.95	50	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	40	0.1	1	0.1	1	0.25	0.85	10	4.5					66

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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	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) 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 Max	I <sub>C</sub> (mA) Max	t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPS6700	TO-116	40	40	5	50 30	30 50 1 10	0.25 0.9	10	4.5	200	10				66(2) 23(2)
MPS3905	TO-92 (92)	40	40	5		30 40 150 30 15	0.25 0.65 0.85	10	4.5	200	10		5	(Note 6)	66
MPS3906	TO-92 (92)	40	40	5		60 80 100 300 60 30	0.25 0.65 0.85	10	4.5	250	10		4	(Note 6)	66
MPS6516	TO-92 (92)	40	40	4	50 30	30 50 100 2	0.4 0.95	50	4						66
MPS6517	TO-92 (92)	40	40	4	50 30	60 90 180	0.5	50	4						66
MPS6518	TO-92 (92)	40	40	4	500 30	90 150 300	0.5	50	4						66
PN3251	TO-92 (92)	50	40	5		80 90 100 300	0.25 0.6 0.9	10	6	300	10		6	(Note 6)	66
PN4121	TO-92 (92)	40	40	5	25* 30	15 70 60 40	0.13 0.14 0.3	1 10 1 50	4.5	400	10	150	4	(Notes 11, 8)	66
PN4122	TO-92 (92)	40	40	5	25* 30	30 150 150 100	0.13 0.14 0.3	1 10 1 50	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> <sup>*</sup> (mA)		I <sub>CE</sub> (mA)		I <sub>FE</sub> (mA)		V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V)		I <sub>C</sub> (mA)		C <sub>OB</sub> (pF) Max	f <sub>T</sub> (MHz)		t <sub>OFF</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
		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	400	10		(Notes 13, 8)	66
PN4917	TO-92 (92)	30	30	5	30	5	30	25*	15	30	50	1	0.13	0.75	1	4.5	150	4	450	10		(Notes 13, 8)	66	
PN5138	TO-92 (92)	30	30	5	30	5	30	50	20	50	10	10	0.3	1.0	10	7			30	0.5			66	
PN5139	TO-92 (92)	20	20	5	20	5	20	50*	15	15	50	10	0.2	0.7	1.0	5	200		300	10		(Note 13)	66	
ST3906	TO-92 (92)	40	40	5	40	5	40			30	0.1	10	0.5	0.75	1.25	50			250	10			66	
2N6076	TO-92 (94)	25	25	5	25	5	25	100	25	100	300	10	0.25	0.85	10	4.5							68	
MPQ200	TO-116	60	45	6	45	6	45	50	50	80	0.1	1	0.2	0.85	10	6	4	250	20			(Note 8)	68	
PN200	TO-92 (92)	60	45	6	45	6	45	50	50	80	0.1	1	0.2	0.85	10	6	4	250	20			(Note 8)	68	

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V <sub>CEO</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>BE0</sub> (V) Min	I <sub>CEO</sub> (mA) Max	I <sub>CB0</sub> (mA) Max	h <sub>FE</sub> @ I <sub>C</sub> V <sub>CE</sub> & (V)		V <sub>CE(SAT)</sub> V <sub>BE(SAT)</sub> (V) & (V)		I <sub>C</sub> (mA) Max	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	Max	Min								
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	1		4	(Note 15)	74
							70	1								10	(Note 16)	
							60	0.1								3	(Note 17)	
																3	(Note 18)	

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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