



General Purpose Amplifiers and Switches

Type No.	Case Style	V _{CBO} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CS} * I _{CBO} (mA) Max	I _{FE} Min Max	I _C @ (mA) Max	V _{CE(SAT)} (V) & V _{BE(SAT)} (V) Max Min	I _C (mA) Max	COB (pF) Max	f _T (MHz) Min Max	I _C (mA) Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N2904	TO-5	60	40	5	20 50	20 40 35 25 20	500 150 10 1 0.1	0.4 1.6	1.3 2.6	8	200	50	100		(Note 2)	63
2N2904A	TO-5	60	60	5	10 50	40 40 40 40 40	500 150 10 1 0.1	0.4 1.6	1.3 2.6	8	200	50	100		(Note 2)	63
2N2905 also Avail. JAN/TX/V Versions	TO-5	60	40	5	20 50	30 100 75 50 35	500 150 10 1 0.1	0.4 1.6	1.3 2.6	8	200	50	100		(Note 2)	63
2N2905A also Avail. JAN/TX/V Versions	TO-5	60	60	5	10 50	50 100 100 100 75	500 150 10 1 0.1	0.4 1.6	1.3 2.6	8	200	50	100		(Note 2)	63
2N2906	TO-18	60	40	5	20 50	20 40 35 25 20	500 150 10 1 0.1	0.4 1.6	1.3 2.6	8	200	50	100		(Note 2)	63

General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CEO} (V) Min	V _{EBO} (V) Min	I _{CB0} (mA) Max	V _{CB} (V) Max	h _{FE} @ I _C & V _{CE} Min Max (mA) (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min Max	I _C (mA) Max	COB (pF) Max	f _T (MHz) Min Max	I _C (mA) Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N2906A	TO-18	60	60	5	10	50	40 500 40 120 40 150 40 10 40 10 40 1 40 0.1	0.4	1.3	150	8	200	50	100		(Note 2)	63
2N2907 also Avail. JAN/TX/V Versions	TO-18	60	40	5	20	50	35 500 100 300 75 10 50 1 35 0.1	0.4	1.3	150	8	200	50	100		(Note 2)	63
2N2907A also Avail. JAN/TX/V Versions	TO-18	60	60	5	10	50	50 500 100 300 100 10 100 1 75 0.1	0.4	1.3	150	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		50	12	100	50				63
2N3703	TO-92 (94)	50	30	5	100	20	30 150 50 5	0.25		50	12	100	50				63
2N3742		Same as PN4142															
2N3743		Same as PN4143															
2N3790	TO-92 (94)	30	20	5	500	20	50 300 40 10 20 0.1	0.4	1.5	100	10	100	10				63
2N3791	TO-92 (94)	40	30	6	200	30	100 300 50 10 30 0.1	0.4	1.5	100	10	100	10				63

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CE0} (V) Min	V _{BE0} (V) Min	I _{CE0} (mA) Max	V _{CB} (V) Max	I _{FE} Min	I _C Max	V _{CE} (V)	V _{CE(SAT)} (V) & Max	V _{BE(SAT)} (V) & Min	I _C (mA) Max	COB (pF) Max	f _T (MHz) Min	I _C (mA) Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N4402	TO-92 (94)	40	40	5		20	500	2	0.4	0.7	0.95	10	150	20	255		(Note 4)	63
						50	150	2	0.75	1.3	500							
						30	1	1										
2N4403	TO-92 (92)	40	40	5		20	500	2	0.4	0.75	0.95	10	200	20	255		(Note 4)	63
						100	300	2			150							
						100	10	1										
						60	1	1	0.75	1.3	500							
						30	0.1	1										
2N4971		Same as PN2806																
2N4972		Same as PN2907																
2N5142		Same as PN5142																
2N5143		Same as PN5143																
2N5221	TO-92 (92)	15	15	3	100	30	600	50	0.5	1.1	150	15	100	20				63
2N5226	TO-92 (92)	25	25	4	300	30	600	50	0.8	1.0	100	20	50	20				63
2N5354	TO-92 (94)	25	25	4	100	25	40	120	0.25		50	8						63
2N5355	TO-92 (94)	25	25	4	100	25	100	300	0.25		50	8						63
2N5356	TO-92 (94)	40	40	4	100	40	20	300	0.25	1.1	50	8						63
2N5357	TO-92 (94)	40	40	4	100	40	40	120	1.0	2.0	200							63
2N5358	TO-92 (94)	40	40	4	100	40	32	2	0.25									63
2N5359	TO-92 (94)	40	40	4	100	40	40	300	0.25	1.1	50	8						63
2N5360	TO-92 (94)	40	40	4	100	40	100	300	1.0	2.0	200							63
2N5361	TO-92 (94)	40	40	4	100	40	80	2	1.0	2.0	200							63
2N5362	TO-92 (97)	40	25	5		60	300	50	0.25		50	12	100	50				63
2N5363	TO-92 (97)	50	40	5	100	25	25	500	0.75	1.2	500	15	100	50				63
2N5364	TO-92 (97)	50	40	5	100	25	100	200										63

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CEO} (V)		V _{EBO} (V)		ICES* I _{CBO} (nA) @ (V)		h _{FE} @ I _C & V _{CE} (V)		V _{CE(SAT)} (V) & V _{BE(SAT)} (V) @ I _C (mA)		COB (pF)		f _T (MHz) @ I _C (mA)		t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max				
MPO2907	TO-116	60	40	5	50	50	50	75	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	20	60	300	50	5	0.25	50	12	100	50			63
MPS3703	TO-92 (92)	50	30	5	100	20	20	30	150	50	0.25	50	12	100	50				63
MPS6533	TO-92 (92)	40	40	4	50	30	30	25	500	10	0.5	1.0	100	6					63
MPS6534	TO-92 (92)	40	40	4	50	30	30	90	270	100	0.3	1.0	100	6					63
MPS6535	TO-92 (92)	30	30	4	100	20	20	30	100	1	0.5	1.2	100	6					63
PN2306	TO-92 (92)	60	40	5	20	50	50	20	500	10	0.4	1.3	150	8	200	50	100	(Note 2)	63

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	ICES* ICB0 @ V _{CB} (nA) Max	h _{FE} @ I _C (mA) Min Max	V _{CE(SAT)} (V) Max & V _{BE(SAT)} (V) Min Max	I _C (mA) Min Max	COB (pF) Max	f _T (MHz) Min Max	I _C (mA) Min Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
PN2906A	TO-92 (92)	60	60	5	10	50	0.4	1.3	8	200	50	100		(Note 2)	63
PN2907	TO-92 (92)	60	40	5	20	30	0.4	1.3	8	200	50	100		(Note 2)	63
PN2907A	TO-92 (92)	60	60	5	20	50	0.4	1.3	8	200	50	100		(Note 2)	63
PN3638	TO-92 (92)	25	25	4	35*	20	0.25	1.1	20	100	50	170		(Note 1)	63
PN3836A	TO-92 (92)	25	25	4	25*	20	0.25	1.1	10	150	50	170		(Note 1)	63
PN3834	TO-92 (92)	45	45	5	35*	20	0.25	1.0	8	200	20	100		(Note 4)	63
PN3835	TO-92 (92)	60	60	5	35*	20	0.25	1.0	8	200	20	100		(Note 4)	63

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{BE0} (V) Min	I _{CS} * I _{CS0} (nA) @ V _{CB} (V) Max	h _{FE} @ I _C (mA) & V _{CE} (V) Min Max	V _{CE(SAT)} (V) & V _{BE(SAT)} (V) @ I _C (mA) Min Max	I _C (mA) Min Max	C _{OB} (pF) Max	f _T (MHz) @ I _C (mA) Min Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
PN4142	TO-92 (92)	60	40	5		20 500 10 20 150 1 40 120 150 10 35 10 10 25 1 10 20 0.1 10	0.4 1.3 150 1.6 2.6 500	1.3 150 2.6 500	8	200 50	100		(Note 12)	63
PN4143	TO-92 (92)	60	40	5		30 500 10 50 150 1 100 300 150 10 75 10 10 50 1 10 35 0.1 10	0.4 1.3 150 1.6 2.6 500	1.3 150 2.6 500	8	200 50	100		(Note 12)	63
PN5142	TO-92 (92)	20	20	4	50*	15 300 10 30 50 1	0.5 1.5 50 0.2 0.8 2.5 300	1.5 50 2.5 300	10	100 50	200		(Note 1)	63
PN5143	TO-92 (92)	20	20	4	50*	15 300 10 30 50 1	0.5 1.5 50 0.2 0.8 2.5 300	1.5 50 2.5 300	10	100 50	200		(Note 1)	63
TIS91	TO-92 (94)	40	40	4	100	100 300 50 2	0.25 0.6 1.0 50	0.6 1.0 50						63
TIS92	TO-92 (97)	40	40	5	100	100 300 50 2	0.25 0.6 1.0 50	0.6 1.0 50						63
TIS93	TO-92 (97)	40	40	5	100	100 300 50 2	0.25 0.6 1.0 50	0.6 1.0 50						63
TN2904A	TO-237 (91)	60	60	5	10	40 0.1 10 40 1.0 10 40 10 10 40 120 150 10 40 500 10	0.4 1.3 150 1.6 2.6 500	1.3 150 2.6 500	8	200 50	100		(Note 2)	63
TN2905	TO-237 (91)	60	40	5	20	30 500 10 100 300 150 10 75 10 10 50 1 10 35 0.1 10	0.4 1.3 150 1.6 2.6 500	1.3 150 2.6 500	8	200 50	100		(Note 2)	63

General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CS} * I _{CS0} (mA) Max	V _{CB} (V)	h _{FE} @ I _C V _{CE} & (V) 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 Max	I _C (mA) Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
TN2905A	TO-237 (91)	60	60	5	10	50	500 10 100 300 150 10 100 10 10 10 100 1 10 10 75 0.1 10	0.4	1.3 150 8 2.6 500	50	8	200	50	100		(Note 2)	63
2N3905	TO-92 (92)	40	40	5			100 1 50 1 150 10 1 40 1 1 30 0.1 1	0.25	0.65 0.85 10 4.5 0.4 0.95 50	10	4.5	200	10	260	5	(Notes 5, 8)	66
2N3906	TO-92 (92)	40	40	5			100 1 80 50 1 100 300 10 1 80 1 1 60 0.1 1	0.25	0.65 0.85 10 4.5 0.4 0.95 50	10	4.5	250	10	300	4	(Notes 5, 8)	66
2N4121		Same as PN4121															
2N4122		Same as PN4122															
2N4125	TO-92 (92)	30	30	4	50	20	50 1 150 2 1	0.4	0.95 50 4.5	10	4.5	200	10		5	(Note 8)	66
2N4126	TO-92 (92)	25	25	4	50	20	50 1 120 360 2 1	0.4	0.95 50 4.5	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															
MF2906	TO-116	60	40	6	50	30	0.1 1 60 1 1 75 10 1	0.25	0.85 10 4.5	10	4.5						66

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} * (mA) Max	V _{CB} (V) Max	I _{hFE} Min	I _C @ (mA) Max	V _{CE(SAT)} (V) & Max	V _{BE(SAT)} (V) Min	I _C (mA) Max	COB (pF) Max	f _T (MHz) Min	f _T (MHz) Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPO6700	TO-116	40	40	5	50	30	0.1	10	0.25	0.9	10	4.5	200	10				66 (2) 23 (2)
MPS3905	TO-92 (92)	40	40	5		30	0.1	10	0.25	0.65	10	4.5	200	10		5	(Note 8)	66
MPS3906	TO-92 (92)	40	40	5		60	0.1	10	0.25	0.65	10	4.5	250	10		4	(Note 8)	66
MPS6516	TO-92 (92)	40	40	4	50	30	100	10	0.5	0.95	50	4						66
MPS6517	TO-92 (92)	40	40	4	50	60	100	10	0.5	0.95	50	4						66
MPS6518	TO-92 (92)	40	40	4	500	90	180	2	0.5	0.95	50	4						66
PN3251	TO-92 (92)	50	40	5		80	0.1	1	0.25	0.6	10	6	300	10		6	(Note 6)	66
PN3251	TO-92 (92)	40	40	5	25*	15	50	1	0.13	0.75	1	4.5	400	10	150	4	(Notes 11, 8)	66
PN3252	TO-92 (92)	40	40	5	25*	30	50	1	0.13	0.75	1	4.5	450	10	150	4	(Notes 11, 8)	66

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PNP Transistors

General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	ICES* ICBO @ V _{CB} (nA) Max	h _{FE} @ I _C & V _{CE} (mA) & (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) @ I _C Min Max	COB (pF) Max	f _T (MHz) @ I _C Min Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
PN4916	TO-92 (92)	30	30	5	25* 15	15 200 70 10 60 1 40 0.1	0.13 0.14 0.3	0.75 0.9 1.1	4.5	400	150	4	(Notes 13, 8)	66
PN4917	TO-92 (92)	30	30	5	25* 15	30 50 150 300 150 1 100 0.1	0.13 0.14 0.3	0.75 0.9 1.1	4.5	450	150	4	(Notes 13, 8)	66
PN5138	TO-92 (92)	30	30	5	50 20	50 10 50 1 50 0.1	0.3	1.0	7	30	0.5			66
PN5139	TO-92 (92)	20	20	5	50* 15	15 50 40 10 40 1 30 0.1	0.2 0.7	1.0 1.0	5	300	200		(Note 13)	66
ST3906	TO-92 (92)	40	40	5		60 0.1 80 1 100 300 60 50 30 300	0.25 0.4	0.85 0.95	4.5	250	10			66
2N6076	TO-92 (94)	25	25	5	100 25	100 300 10 10	0.25	0.8						68
MPQ200	TO-116	60	45	6	50 50	80 0.1 100 450 100 100 100 350	0.2 0.4	0.85 1.0	6	250	20	4	(Note 8)	68
PN2000	TO-92 (92)	60	45	6	50 50	80 0.1 100 450 100 100 100 350	0.2 0.4	0.85 1.0	6	250	20	4	(Note 8)	68

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General Purpose Amplifiers and Switches (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CS} * I _{CB0} (nA) Max	I _{CB0} (nA) Max	V _{CB} (V) Max	h _{FE}		I _C & V _{CE}		V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) & Min		I _C (mA) Max	COB (pF) Max	f _T (MHz) Min	I _C (mA) Max	t _{OFF} (ns) Max	NF (dB) Max	Test Conditions	Process No.
								Min	Max	I _C (mA) Min	V _{CE} (V) Max		I _C (mA) Min	V _{BE(SAT)} (V) Max								
PN200A	TO-92 (92)	60	45	6	50	50	50	300	600	10	1	0.2	0.85	10	6	250	20		4	(Note 8)	68	
PN201	TO-92 (92)	80	65	6	50	50	60	75	375	0.1	1	0.2	0.85	10	4.5	100	10		4	(Note 8)	69	
2N5400	TO-92 (92)	130	120	5	100	100	100	40	180	50	5	0.2	1.0	10	6	100	10		8	(Note 9)	74	
2N5401	TO-92 (92)	160	150	5	50	120		50	240	50	5	0.2	1.0	10	6	100	10		8	(Note 9)	74	
MPSL51	TO-92 (92)	100	100	4	1 μA	50	50	40	250	50	5	0.25	1.2	10	8	60	10				74	
PN4888	TO-92 (92)	150	150	6	50	100	100	40	400	10	10	0.5	0.9	10	4	30	60				74	
PN4889	TO-92 (92)	150	150	6	10	100	100	80	300	10	10	0.5	0.9	10	4	40	160		4	(Note 15)	74	

TEST CONDITIONS:

Note 1: I_C = 300 mA, V_{CC} = 10V, I_{B1} = I_{B2} = 30 mA.
 Note 2: I_C = 150 mA, V_{CC} = 6V, I_{B1} = I_{B2} = 15 mA.
 Note 3: I_C = 300 mA, V_{CC} = 15V, I_{B1} = I_{B2} = 30 mA.
 Note 4: I_C = 300 mA, V_{CC} = 30V, I_{B1} = I_{B2} = 30 mA.
 Note 5: I_C = 10 mA, V_{CC} = 3V, I_{B1} = I_{B2} = 1 mA.
 Note 6: I_C = 100 μA, V_{CE} = 5V, f = 100 Hz.

Note 7: I_C = 30 μA, V_{CE} = 5V, f = 1 kHz.
 Note 8: I_C = 100 μA, V_{CE} = 5V, f = 1 kHz.
 Note 9: I_C = 250 μA, V_{CE} = 5V, f = 1 kHz.
 Note 10: I_C = 10 μA, V_{CE} = 5V, f = 1 kHz.
 Note 11: I_C = 50 mA, V_{CC} = 30V, I_{B1} = I_{B2} = 5 mA.
 Note 12: I_C = 150 mA, V_{CC} = 30V, I_{B1} = I_{B2} = 15 mA.

Note 13: I_C = 50 mA, V_{CC} = 10V, I_{B1} = I_{B2} = 5 mA.
 Note 14: I_C = 500 mA, V_{CC} = 30V, I_{B1} = I_{B2} = 50 mA.
 Note 15: I_C = 100 μA, V_{CC} = 10V, f = 1 kHz.
 Note 16: I_C = 200 μA, V_{CE} = 5V, f = 1 kHz.
 Note 17: I_C/I_B = 40.
 Note 18: I_C/I_B = 20.

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