

NPN Transistors



Medium Power

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> * V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CB0</sub> * (mA) Max	V <sub>CB</sub> (V)	I <sub>FE</sub> Min	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	f <sub>T</sub> (MHz) Max	t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N1699	TO-39	120	60	5	2	60	40	120 150 10	5.0	1.3	150	20	50	50				12
2N1613 also Avail. JAN/TX/V Versions	TO-5	75	35	7	10	60	20 40	500 150 10 120 150 10	1.5	1.3	150	25	60	50			(Note 1)	12
2N1711	TO-5	75	35	7	10	60	35 20	10 10 100 μA 10	1.5	1.3	150	25	70	50			(Note 1)	12
2N1890	TO-39	100	60	7	10	75	100	300 150 10	1.2 5.0	0.9 1.3	50 150	15	60	50				12
2N1893 also Avail. JAN/TX/V Versions	TO-39	100	80	7	10	90	40 35 20	150 10 10 10 10 0.1 10	1.2 5.0	0.9 1.3	50 150	15	50	50				12
2N2102	TO-39	120	65	7	2	60	10 20 35	0.01 10 0.1 10 10 10	0.5	1.1	150	15	60	50				12
2N2192	TO-39	60	40	5	10	30	15 75 100	0.01 10 0.1 10 300 10 10	0.35	1.3	150	10	50	50				12

Medium Power (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> * V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CB0</sub> * (mA) Max	I <sub>CB0</sub> @ V <sub>CB</sub> (mA) Max	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> Min Max	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) Min Max	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.
2N2192A	TO-39	60	40	5	10	30	15 75 100 300 70 150 10 35 500 10 15 1A 10	0.25 1.3 150	50	20	50	50				12
2N2193	TO-39	80	50	8	10	80	15 30 40 120 10 10 30 150 10 20 500 10 15 1A 10	0.35 1.3 150	50	20	50	50				12
2N2193A	TO-39	80	50	8	10	60	15 30 40 120 10 10 30 150 1 20 500 10 15 1A 10	0.25 1.3 150	50	20	50	50				12
2N2243	TO-39	120	80	7	10	60	15 30 40 120 150 10 30 150 1 15 500 10	0.35 1.3 150	50	15	50	50				12
2N2243A	TO-39	120	80	7	10	60	15 30 40 120 150 10 30 150 1 15 500 10	0.25 1.3 150	50	15	50	50				12
2N3019 also Avail. JAN/TX/V Versions	TO-39	140	80	7	10	90	50 90 100 300 150 10 50 500 10 15 1A 10	0.2 1.1 150	50	12	100	50			T-27-01	12

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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>CB0</sub> (mA) Max	V <sub>CB</sub> (V) Max	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (V) Min Max	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) Max Min	I <sub>C</sub> (mA) @ V <sub>BE(SAT)</sub> (V) Min Max	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.
2N3020	TO-39	140	80	7	10	90	30 100 0.1 10 40 120 10 10 40 120 150 10 30 100 500 10 15 1A 10	0.2 1.1 150 12	1.1 150 50	12	80 50				12
2N3053	TO-39	60	40	5	250	30	25 150 2.5 10 50 250 150 10	1.4 1.7 150 15	1.7 150 50	15	100 50				12
2N3107	TO-39	100	60	7	10	60	35 100 0.1 10 100 300 150 10 40 500 10	0.25 1.1 150 20	1.1 150 50	20	70 50	1000	7	(Notes 5 & 6)	12
2N3108	TO-39	100	60	7	10	60	20 40 0.1 10 40 120 150 10 25 500 10	0.25 1.1 150 20	1.1 150 50	20	60 50	600	7	(Notes 5 & 6)	12
2N3109	TO-39	80	40	7	10*	60	35 100 0.1 10 100 300 150 10 40 500 10	0.25 1.1 150 25	1.1 150 50	25	70 50	1000	7	(Notes 5 & 6)	12
2N3110	TO-39	80	40	7	10*	60	20 40 0.1 10 40 120 150 10 25 500 10	0.25 1.1 150 25	1.1 150 50	25	60 50	600	7	(Notes 5 & 6)	12
2N3568		Same as PN3568													12
2N3665	TO-39	120	80	10	50*	60	30 40 10 10 40 120 150 10 25 500 10	0.5 1.2 150 12	1.2 150 50	12	60 50				12
2N3666	TO-39	120	80	10	50*	60	70 100 10 10 100 300 150 10 50 500 10	0.5 1.2 150 12	1.2 150 50	12	60 50				12
2N3700	TO-18	140	80	7	10	90	50 90 1 10 90 10 10 10 100 300 150 10 50 500 10 15 1A 10	0.2 1.1 150 12	1.1 150 50	12	100 200 5			T-27-01	12

Medium Power (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> * V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CS</sub> * I <sub>CB0</sub> (mA) Max	h <sub>FE</sub> I <sub>C</sub> & V <sub>CE</sub> (V) Min Max	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min Max	I <sub>C</sub> (mA) Min 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.
2N3701	TO-18	140	80	7	10	40 120 150 10 40 120 10 10 30 100 0.1 10 30 100 500 10 15 1 10	0.2	150	150	12	80				12
2N3945	TO-39	70	50	8	40	25 10 10 40 250 150 10 20 500 10	0.5	1.2 150 1.8 500	50	12	60				12
2N4945	TO-92 (92)	80	80	5	50	40 120 150 1 40 30	0.25	150	150		60				12
MPSA05	TO-92 (92)		60	4	100	50 10 1 50 100 1	0.25	100	100		100				12
MPSA06	TO-92 (92)		80	4	100	50 10 1 50 100 1	0.25	100	100		100				12
PN3568	TO-92 (92)	80	60	5	50	40 30 1 40 120 150 1	0.25	150	150	20	60				12
TN1711	TO-237 (91)	75		7	10	20 0.01 10 35 0.1 10 75 10 11 100 150 10 40 300 500 10	1.5 1.3	150 150	25						12
TN2102	TO-237 (91)	120	65	7	10	10 0.01 10 20 0.1 10 35 10 10 40 120 150 10 25 500 10 10 1A 10	0.5	1.1 150	15		60				12
TN3019	TO-237 (91)	140	80	7	10	50 1 10 90 10 10 100 300 150 10 50 500 10 15 1A 10	0.2 0.5	1.1 150 500	12		100			T-27-01	12

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Medium Power (Continued)

Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO @ (nA) Max	VCE @ VCB (V)	hFE @ IC & VCE (V)		VCE(SAT) (V) & VBE(SAT) (V) Max	VCE(SAT) (V) Min	IC @ (mA) Max	Cob (pF) Max	fT (MHz)		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.	
							Min	Max					Min	Max					
TN3020	TO-237 (91)	140	80	7	10	90	100 1 10	0.2	1.1	150	12	80	50					12	
TN3053	TO-237 (91)	60	40	5	250	30	150 2.5 10	1.4	1.7	150	15	100	50					12	
PN3566	TO-92 (92)	40	30	5	50	20	600 10 10	1.0		100	25	4	100 30					13	
PN3567	TO-92 (92)	80	40	5	50	40	120 150 1	0.25		150	20	60	600 50					13	
PN3569	TO-92 (92)	80	40	5	50	40	300 150 1	0.25		150	20	60	600 50					13	
2N3566		Same as PN3566																	
2N3567		Same as PN3567																	
2N3569		Same as PN3569																	
2N2657	TO-39	80	50	8	100	60	15 5A 6 40 120 1A 2	0.5 3.0	1.5 2.5	1A 5A	150	20	200	15			2	34	
2N2658	TO-39	100	80	8	100	60	15 5A 6 40 120 1A 2	0.5 3.0	1.5 2.5	1A 5A		20	200	15			2	34	
2N2890	TO-39	100	80	5	50 μA	60	25 2A 5 30 90 1A 2 20 100 2	0.5	1.2	1A	70	30	200	15			3	34	
2N2891	TO-39	100	80	5	50 μA	60	50 300 50 10 35 100 80 150 1A 2 40 2A 8	0.5 0.75	1.2 1.3	1A 2A	70	30	200	15			3	34	

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Medium Power (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> * V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CS</sub> * I <sub>CB0</sub> (mA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (mA) (V) Min Max	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.
2N5148	TO-39		80		1 μA	60	20 50 5 30 90 1A 5 15 2A 5 5 3A 5	0.46 1.2 0.85 1.5	70	60 200				34
2N5150	TO-39		80		1 μA	60	60 50 5 70 200 1A 5 30 2A 5 15 3A 5	0.46 1.2 5.0 3A	70	60 200				34
2N5336	TO-39		80		10 μA	80	30 600 2 30 120 2A 2 20 5A 2	0.7 1.2 1.2 1.8		30 500	2200		7	34
2N5338	TO-39		100		10 μA	100	30 600 2 30 120 2A 2 20 5A 2	0.7 1.2 1.2 1.8		30 500	2200		7	34
2N3439	TO-39	450	350	7	20 μA	360	40 160 20 10	0.5 1.3	10	15 10			10	36
2N3440	TO-39		250		20 μA*	300	40 160 20 10							36
2N6591	TO-202 (55)	150	150	5	200	100	40 250 10 10 40 200 100 10	0.8 200						36
2N6592	TO-202 (55)	200	200	5	200	150	30 250 10 10 40 200 100 10	0.8 200						36
2N6593	TO-202 (55)	250	250	5	200	200	30 250 10 10 30 200 100 10	0.8 200						36
2N6720	TO-237 (91)	175	150	6	1 μA	150	25 50 10 30 100 10 15 250 10 10 50 500 10	0.5 100		30 300 50				36
2N6721	TO-237 (91)	225	200	6	1 μA	200	25 50 10 30 100 10 15 250 10 10 50 500 10	0.5 100		30 300 50			T-27-01	36

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Medium Power (Continued)																	
Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> * V <sub>CE0</sub> (V) Min	V <sub>EBO</sub> (V) Min	ICES* ICBO (mA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> (mA) Min Max	V <sub>CE</sub> & V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min Max	I <sub>C</sub> (mA) Min 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.
2N6722	TO-237 (91)	275	250	6	1 μA	250	25 30 15 10	50 100 250 500	0.5		100		30 300				36
2N6723	TO-237 (91)	325	300	6	1 μA	300	25 30 15 10	50 100 250 500	0.5		100		30 300				36
92PU36	TO-237 (91)	175	150	6	1 μA	150	25 30 15 10	50 100 250 500	0.5		100						36
92PU36A	TO-237 (91)	225	200	6	1 μA	200	25 30 15 10	50 100 250 500	0.5		100						36
92PU36B	TO-237 (91)	275	250	6	1 μA	250	25 30 15 10	50 100 250 500	0.5		100						36
92PU36C	TO-237 (91)	325	300	6	1 μA	300	25 30 15 10	50 100 250 500	0.5		100						36
D40P1	TO-202 (55)		120		10 μA	200	20 40	2 80	1.0		100	15	10				36
D40P3	TO-202 (55)		180		10 μA	250	20 40	2 80	1.0	1.5	100 100	15	10				36
D40P5	TO-202 (55)		225		10 μA	300	20 40	2 80	1.0	1.5	100 100	15	10				36

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Medium Power (Continued)

Type No.	Case Style	V <sub>CSO</sub> (V) Min	V <sub>CE1</sub> <sup>*</sup> V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CS</sub> <sup>*</sup> I <sub>CS0</sub> (mA) Max	V <sub>CB</sub> (V)	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) 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.
NSD36	TO-202 (55)	175	150	6	1 μA	150	25 50 100 10 30 300 100 10 15 250 10 10 500 10	0.5	50	15	10				36
NSD36A	TO-202 (55)	225	200	6	1 μA	200	25 50 100 10 30 300 100 10 15 250 10 10 500 10	0.5	50	15	10				36
NSD36B	TO-202 (55)	275	250	6	1 μA	250	25 50 100 10 30 300 100 10 15 250 10 10 500 10	0.5	50	15	10				36
NSD36C	TO-202 (55)	325	300	6	1 μA	300	25 50 100 10 30 300 100 10 15 250 10 10 500 10	0.5	50	15	10				36
NSD3439	TO-202 (55)		350		20 μA	300	30 2 10 40 160 20 10	0.5	1.3 50 10	20	15				36
NSD3440	TO-202 (55)		250		500 μA	200	30 2 10 40 160 20 10	0.5	1.3 50 10	20	15				36
TN3440	TO-237 (91)		250		20 μA	250	30 2 10 40 160 20 10	0.5	1.3 50 10		15				36
2N6714	TO-237 (91)	40	30	5	100	40	55 10 1 60 100 1 50 250 1A 1	0.5	100		50 500 50			T-27-01	37
92PU01	TO-237 (91)		30	5	100	40	55 10 1 60 100 1 50 1A 1	0.5	1A	30	100				37
D40D1	TO-202 (55)		30		100*	45	50 150 100 10 1A	0.5	1.5 500						37

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Medium Power (Continued)																	
Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> <sup>*</sup> V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CS</sub> <sup>*</sup> I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V)	I <sub>FE</sub> Min Max	I <sub>C</sub> (mA) V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) 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.
D40D2	TO-202 (55)		30		100*	45	120 360 100 20 1A	100 1A	0.5	1.5	500						37
D40D3	TO-202 (55)		30		100*	45	290 100 10 1A	100 1A		1.5	500						37
D40E1	TO-202 (55)		30		100*	40	50 100 2 10 1A 2	100 2 1A 2	1.0	1.3	1A						37
D42C1	TO-202 (56)		30		1 μA	30	25 200 1 10 1A 1	200 1 1A 1	0.5	1.3	1A	30					37
D42C2	TO-202 (56)		30		1 μA	30	40 120 200 1 20 1A 1	200 1 1A 1	0.5	1.3	1A	30					37
D42C3	TO-202 (56)		30		1 μA	30	40 200 1 20 2A 1	200 1 2A 1	0.5	1.3	1A	30					37
NSDU01	TO-202 (55)	40	30	5	100	30	55 10 1 60 100 1 50 1A 1	10 1 100 1 1A 1	0.5	1.2	1A	30	50				37
92PU01A	TO-237 (91)		40	5	100	50	55 10 1 60 100 1 50 1A 1	10 1 100 1 1A 1	0.5	1A	1A	30	100				38 *
92PU05	TO-237 (91)	60	100 60	4	100	80	80 50 1 50 250 1 20 500 1	50 1 50 1 1A 1	0.35	250	250	30	50				38
D40D4	TO-202 (55)		45		100*	60	50 150 100 10 1A	100 1A	0.5	1.5	500						38
D40D5	TO-202 (55)		45		100*	60	120 360 100 10 1A	100 1A	0.5	1.5	500						38
D40D6	TO-202 (55)		45		100*	60	50 150 100 10 1A	100 1A	1.0	1.5	500						38
D40D7	TO-202 (55)		60		100*	60	50 150 100 10 1A	100 1A	1.0	1.5	500						38
D40D8	TO-202 (55)		60		100*	75	120 360 100 2 10 1A 2	100 2 1A 2	1.0	1.5	500						38

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Medium Power (Continued)

Type No.	Case Style	V <sub>CS0</sub> (V) Min	V <sub>CER</sub> <sup>*</sup> V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CS</sub> <sup>*</sup> I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (V) Min Max	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min Max	I <sub>C</sub> (mA) Min 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.
D40E5	TO-202 (55)		60		100*	70	50 10	1.0	1.3	1A						38
D42C4	TO-202 (56)		45		1 μA	45	25 10	0.5	1.3	1A	30					38
D42C5	TO-202 (56)		45		1 μA	45	40 20	0.5	1.3	1A	30					38
D42C6	TO-202 (56)		45		1 μA	45	40 20	0.5	1.3	1A	30					38
MPS6715	TO-237 TO-226 (99)		40	5	100	50	55 60 50	0.5		1A	30	50				38
MPS6717	TO-226 (99)	80	80	5	100	60	80 50 20	0.35		250		50 500 200				38
MPSW01	TO-226 (99)		40	5	100	50	55 60 50	0.5		1A	30	100				38
NSD102	TO-202 (55)	60	45	5	100	60	40 50 40 25	0.2	0.9	100 500	30	60				38
NSD103	TO-202 (55)	60	45	5	100	60	50 120 50 30	0.2	0.9	100 500	30	60				38
NSD6179	TO-202 (55)		50		500 μA	60	30 40 10	0.5	1.2	500					T-27-01	38
NSDU01A	TO-202 (55)	50	40	5	100	40	55 60 50	0.5	1.2	1A	30	50				38

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Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (nA) Max	VCB (V) Max	hFE @ IC (mA) Min Max	IC & VCE (V) Min Max	VCE(SAT) (V) Max	VBE(SAT) (V) Min Max	IC (mA) Min Max	Cob (pF) Max	fT (MHz) Min Max	IC (mA) Min Max	t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
NSDU05	TO-202 (55)	60	60	4	100	60	80 50 1 250 1 500 1	0.35	250	30	50 200							38
NSE181	TO-202 (56)		60		100	80	50 10 1 500 1 1.5A	0.3	500		50 200							38
2N6553	TO-202 (55)	100	100	5	100	80	60 10 1 250 1 500 1	1.0	1A		75 250 100							39
2N6717	TO-237 (91)	80	80	5	100	60	80 50 1 250 1 500 1	0.35	250		50 500 200							39
2N6718	TO-237 (91)	100	100	5	100	80	80 50 1 250 1 500 1	0.35	350		50 500 200							39
2N6731	TO-237 (91)	100	80	5	100	80	100 10 2 300 350 2	0.35	350		50 500 200							39
92PU06	TO-237 (91)	80	100 80	4	100	80	20 500 500 1 50 250 250 1 80 50 50 1	0.35	250	30	50 200							39
92PU07	TO-237 (91)	100	100	4	100	80	80 50 1 250 1 500 1	0.35	250	30	50 200							39
92PU100	TO-237 (91)	100	80		100	80	20 10 5 150 100 5 10 1A 5	0.35	350	20	50 100							39
D40D10	TO-202 (55)		75		100*	90	50 150 100 2 10 1A 2	1.0	1.5 500									39
D40D11	TO-202 (55)		75		100*	80	120 360 100 2 10 1A 2	1.0	1.5 500									39

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Medium Power (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> * V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CS</sub> * I <sub>CB0</sub> (mA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> Min Max (mA) (V)	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) Max Min	I <sub>C</sub> (mA) @ I <sub>C</sub> 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.
D40D13	TO-202 (55)		75		100*	90	50 150 100 2	1.0	1.5 500							39
D40D14	TO-202 (55)		75		100*	90	120 360 100 2	1.0	1.5 500							39
D40E7	TO-202 (55)		80		100*	90	50 100 2 1A 2	1.0	1.3 1A							39
MPSW06	TO-226 (99)	80	80	4	100	80	80 50 1 50 250 1 20 500 1	0.35	250	30	50	200				39
NSD104	TO-202 (55)	100	80	7	100	100	20 10 5 50 150 100 5 10 1A 5	0.2	0.9 100 50	30	60	50				39
NSD105	TO-202 (55)	100	80	7	100	100	10 10 5 120 360 100 5 10 1A 5	0.2	0.9 100 50	30	60	50				39
NSD106	TO-202 (55)	140	100	7	100	140	20 10 5 50 150 100 5 25 500 5	0.2	0.9 100 50	30	60	50				39
NSD6178	TO-202 (55)		75		500 μA	80	30 50 2 40 250 500 2 10 1A 2	0.5	1.2 500							39
NSDU06	TO-202 (55)	80	80	4	100	80	80 50 1 50 250 1 20 500 1	0.35	250	30	50	200				39
NSDU07	TO-202 (55)	100	100	4	100	100	80 50 1 50 250 1 20 500 1	0.35	250	30	50	200			T-27-01	39
2N6711	TO-237 (90)	160	160	7	50	100	15 1 10 15 10 10 30 200 30 10				40	200 10				48

PNP Transistors



NPN Transistors

Medium Power (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>CS0</sub> (nA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (mA) (V)	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) Min Max	I <sub>C</sub> (mA) Max	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.	
2N6712	TO-237 (90)	250	250	7	50	200	15 15 30	1 10 200	10 10 10		40	200	10			48
2N6713	TO-237 (90)	300	300	7	50	250	15 15 30	1 10 200	10 10 10		40	200	10			48
2N6719	TO-237 (91)	300	300	7	100	200	25 40 40	1 10 200	10 10 10		30	300	15			48
2N6733	TO-237 (91)	200	200	6	100	160	25 40 40	1 200 10	10 10 10	2.0	50	200	10			48
2N6734	TO-237 (91)	250	250	6	100	200	25 40	1 200	10 10	2.0	50	200	10			48
2N6735	TO-237 (91)	300	300	6	100	260	25 40	1 200	10 10		50	200	10			48
92PE487	TO-237 (90)	160	160	7	50	100	15 15 30	1 10 30	10 10 10	1.0						48
92PE488	TO-237 (90)	250	250	7	50	100	15 15 30	1 10 30	10 10 10	1.0						48
92PE489	TO-237 (90)	300	300	7	50	200	15 15 30	1 10 30	10 10 10	1.0						48
92PU10	TO-237 (91)		300		100	200	25 40 40	1 10 30	10 10 10	0.75						48
92PU391	TO-237 (91)	200	200	6	100	160	25 40	1 10	10 10	2.0	50					48
92PU382	TO-237 (91)	250	250	6	100	200	25 40	1 10	10 10	2.0	50					48

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Medium Power (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V) Min	V <sub>CER</sub> <sup>*</sup> V <sub>CEO</sub> (V) Min	V <sub>EBO</sub> (V) Min	I <sub>CB0</sub> <sup>*</sup> (nA) Max	I <sub>CB</sub> (mA) Min	I <sub>CB</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.
92PU993	TO-237 (91)	300	300	6	100	260	1 10 10	2.0	2.0	20	2.5	50	10				48
D40N1	TO-202 (55)		250		10	250	4 10 10			20		50	20				48
D40N2	TO-202 (55)		250		10	250	4 10 10			20		50	20				48
D40N3	TO-202 (55)		300		10	300	4 10 10			20		50	20				48
D40N4	TO-202 (55)		300		10	300	4 10 10			20		50	20				48
MPS6733	TO-226 (99)	200	200	6	100	160	1 10 10	2.0		20		50	200				48
MPS6734	TO-226 (99)	250	250	6	100	200	1 10 10	2.0		20		50	200				48
MPS6735	TO-226 (99)	300	300	6	100	260	1 10 10			20		50	200				48
MPSA42	TO-92 (92)	300	300	6	100	200	1 10 10	0.5	0.9	20	3	50	10				48
MPSA43	TO-92 (92)	200	200	6	100	160	1 10 10	0.4	0.9	20	4	50	10				48
92PU10 MPSW10	TO-226 (99)		300		100	200	1 10 10	0.75		30	3.5						48
MPSA42 MPSW42	TO-226 (99)	300	300	6	100	200	1 10 10	0.5	0.9	20	3	50	10				48

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NPN Transistors

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NPN Transistors

NATL SEMICONDUCTOR DISCRETE LINE D 6501130 0037058 3

Medium Power (Continued)

Type No.	Case Style	V <sub>CE0</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> @ I <sub>C</sub> & V <sub>CE</sub> (V) Min 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 Max	t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPSA43 MPSW43	TO-226 (99)	200	200	6	100	160	25 1 10 40 10 10 5 2000 30 10	0.4 0.9 20 20	4	50	10				48
NSD131	TO-202 (55)	250	250	7	100	150	15 1 10 15 10 10 30 90 30 10	1.0 0.85 20 20	3						48
NSD132	TO-202 (55)	250	250	7	100	150	15 1 10 30 10 10 60 180 30 10	1.0 0.85 20 20	3						48
NSD133	TO-202 (55)	300	300	7	100	150	15 1 10 15 10 10 30 90 30 10	1.0 0.85 20 20	3						48
NSD134	TO-202 (55)	300	300	7	100	150	15 1 10 30 10 10 60 180 30 10	1.0 0.85 20 20	3						48
NSD135	TO-202 (55)	375	375	7	100	150	15 1 10 30 10 10 30 30 10	1.0 0.85 20 20	3						48
NSD457	TO-202 (55)	160	160	5	50	100	25 30 10	1.0	30						48
NSD458	TO-202 (55)	250	250	5	50	200	25 30 10	1.0	30						48
NSD459	TO-202 (55)	300	300	5	50	250	25 30 10	1.0	30						48
NSDU10	TO-202 (55)	300	300	8	200	200	25 1 15 40 10 15 40 30 10	1.5 0.8 20 20	3	60					48
NSE457	TO-202 (55)	160	160	5	50	100	25 30 10	1.0	30						48
NSE458	TO-202 (55)	250	250	5	50	200	25 30 10	1.0	30						48

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NPN Transistors

Medium Power (Continued)

Type No.	Case Style	V <sub>CB0</sub> (V)		V <sub>CE</sub> <sup>*</sup> (V)		V <sub>BE(SAT)</sub> (V) & V <sub>CE(SAT)</sub> (V)		h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub> (V)		I <sub>CB0</sub> @ V <sub>CB</sub> (V)		V <sub>BE(SAT)</sub> (V) & V <sub>CE(SAT)</sub> (V)		f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)		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				
NSE459	TO-202 (55)	300	300	300	300	5	5	1.0	1.0	25	250	30	10	30	10				48
TN3742	TO-237 (91)	300	300	300	300	7	7	0.75	1.0	10	200	3	10	1.0	10	30	10		48

TEST CONDITIONS:

Note 1: I<sub>C</sub> = 50 mA, V<sub>CC</sub> = 100V, I<sub>B1</sub> = I<sub>B2</sub> = 5 mA.

Note 2: I<sub>C</sub> = 500 μA, V<sub>CE</sub> = 10V, f = 1 kHz.

Note 3: I<sub>C</sub> = 500 mA, V<sub>CC</sub> = 30V, I<sub>B1</sub> = I<sub>B2</sub> = 50 mA.

Note 4: I<sub>C</sub> = 150 mA, V<sub>CC</sub> = 30V, I<sub>B1</sub> = I<sub>B2</sub> = 15 mA.

Note 5: I<sub>C</sub> = 100 μA, V<sub>CC</sub> = 10V, f = 1 kHz.

Note 6: I<sub>C</sub> = 500 mA, V<sub>CC</sub> = 30V, I<sub>B1</sub> = I<sub>B2</sub> = 50 mA.

Note 7: I<sub>C</sub> = 2A, V<sub>CC</sub> = 40V, I<sub>B1</sub> = I<sub>B2</sub> = 200 mA.

Note 8: I<sub>C</sub> = 1 mA, V<sub>CE</sub> = 6V, f = 60 kHz.

Note 9: I<sub>C</sub>/I<sub>B</sub> = 8.

Note 10: I<sub>C</sub>/I<sub>B</sub> = 12.5.