

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>EBO</sub> (V) Min	I <sub>CB0</sub> * I <sub>CB0</sub> (mA) Max	V <sub>CE</sub> * V <sub>CB</sub> (V)	h <sub>FE</sub> Min	I <sub>C</sub> @ (mA) Max	V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V) 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.
2N1699	TO-39	120	60	5	2	60	40	120	150	10	20	50	50			12
2N1613 also Avail. JAN/TX/V Versions	TO-5	75	35	7	10	60	20	40	500	10	25	60	50	12	(Note 1)	12
2N1711	TO-5	75	35	7	10	60	35	10	100	10	25	70	50	8	(Note 1)	12
2N1890	TO-39	100	60	7	10	75	100	300	150	10	15	60	50			12
2N1893 also Avail. JAN/TX/V Versions	TO-39	100	80	7	10	90	40	120	150	10	15	50	50			12
2N2102	TO-39	120	65	7	2	60	10	0.01	10	10	15	60	50			12
2N2192	TO-39	60	40	5	10	30	15	0.01	10	10	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> (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) 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 0.01 75 100 300 10 10 10 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)	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) 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.
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	80 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	100 50	15	100 50				12
2N3107	TO-39	100	60	7	10	60	35 0.1 10 100 300 150 10 40 500 10	0.25 1.1 150 20	70 50	20	70 50	1000	7	(Notes 5 & 6)	12
2N3108	TO-39	100	60	7	10	60	20 0.1 10 40 120 150 10 25 500 10	0.25 1.1 150 20	60 50	20	60 50	600	7	(Notes 5 & 6)	12
2N3109	TO-39	80	40	7	10*	60	35 0.1 10 100 300 150 10 40 500 10	0.25 1.1 150 25	70 50	25	70 50	1000	7	(Notes 5 & 6)	12
2N3110	TO-39	80	40	7	10*	60	20 0.1 10 40 120 150 10 25 500 10	0.25 1.1 150 25	60 50	25	60 50	600	7	(Notes 5 & 6)	12
2N3568		Same as PN3568													
2N3665	TO-39	120	80	10	50*	60	30 10 10 40 120 150 10 25 500 10	0.5 1.2 150 12	60 50	12	60 50				12
2N3666	TO-39	120	80	10	50*	60	70 10 10 100 300 150 10 50 500 10	0.5 1.2 150 12	60 50	12	60 50				12
2N3700	TO-18	140	80	7	10	90	50 1 10 90 10 10 100 300 150 10 50 500 10 15 1A 10	0.2 1.1 150 12	100 200 5	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	150	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 @ VCB (nA) Max	hFE @ IC & VCE (mA) (V) Min Max	VCE(SAT) (V) & VBE(SAT) (V) Max	IC (mA) @ VBE(SAT) (V) Min Max	Cob (pF) Max	fT (MHz) @ IC (mA) Min Max	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
TN3020	TO-237 (91)	140	80	7	10	30 100 1 10 10 10 10 10 10 10	0.2	1.1 150	12	80 50				12
TN3053	TO-237 (91)	60	40	5	250 30	25 50 250 150 10 10 10 10 10 10	1.4	1.7 150	15	100 50				12
PN3566	TO-92 (92)	40	30	5	50 20	150 600 10 10 10 10 2 10	1.0	100	25	4 100 30				13
PN3567	TO-92 (92)	80	40	5	50 40	40 120 150 1 30 1	0.25	150	20	60 600 50				13
PN3569	TO-92 (92)	80	40	5	50 40	100 300 150 1 30 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 40 120 5A 1A 2 6 2	0.5 3.0	1.5 2.5 1A 5A	150	20 200 15	15		2	34
2N2658	TO-39	100	80	8	100 60	15 40 120 5A 1A 2 6 2	0.5 3.0	1.5 2.5 1A 5A		20 200 15	15		2	34
2N2890	TO-39	100	80	5	50 μA 60	25 30 90 2A 1A 2 5 2 20 100 2	0.5	1.2 1A	70	30 200 15	15		3	34
2N2891	TO-39	100	80	5	50 μA 60	50 300 50 10 35 100 80 150 1A 2A 40 2A 8	0.5 0.75	1.2 1.3 1A 2A	70	30 200 15	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> & V <sub>CE</sub> (V) Min Max	I <sub>C</sub> (mA) Min Max	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min Max	I <sub>C</sub> (mA) 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	10			36
D40P3	TO-202 (55)		180		10 μA	250	20 40	2 80	1.0	1.5	100 100	10			36
D40P5	TO-202 (55)		225		10 μA	300	20 40	2 80	1.0	1.5	100 100	10			36

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Medium Power (Continued)

Type No.	Case Style	V <sub>CS0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>CE0</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CS0</sub> (mA) Max	V <sub>CB</sub> (V) Max	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	150	1 μA	150	25 50 100 10 30 300 250 10 15 250 500 10	0.5	50 100 10 300 250 500 10	15	10				36
NSD36A	TO-202 (55)	225	200	6	200	1 μA	200	25 50 100 10 30 300 250 10 15 250 500 10	0.5	50 100 10 300 250 500 10	15	10				36
NSD36B	TO-202 (55)	275	250	6	250	1 μA	250	25 50 100 10 30 300 250 10 15 250 500 10	0.5	50 100 10 300 250 500 10	15	10				36
NSD36C	TO-202 (55)	325	300	6	300	1 μA	300	25 50 100 10 30 300 250 10 15 250 500 10	0.5	50 100 10 300 250 500 10	15	10				36
NSD3439	TO-202 (55)		350			20 μA	300	30 2 10 40 160 20 10	0.5	1.3 50 10 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 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 1.3 50 10		15				36
2N6714	TO-237 (91)	40	30	5	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	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	IC <sub>ES</sub> <sup>*</sup> IC <sub>BO</sub> (nA) Max	V <sub>CB</sub> (V)	h <sub>FE</sub> Min Max	IC (mA) V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min Max	IC (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.
D40D2	TO-202 (55)		30		100*	45	120 360 20	100 1A	0.5	1.5	500						37
D40D3	TO-202 (55)		30		100*	45	290 10	100 1A		1.5	500						37
D40E1	TO-202 (55)		30		100*	40	50 10	100 2 1A 2	1.0	1.3	1A						37
D42C1	TO-202 (56)		30		1 μA	30	25 10	200 1 1A 1	0.5	1.3	1A	30					37
D42C2	TO-202 (56)		30		1 μA	30	40 20	200 1 1A 1	0.5	1.3	1A	30					37
D42C3	TO-202 (56)		30		1 μA	30	40 20	200 1 2A 1	0.5	1.3	1A	30					37
NSDU01	TO-202 (55)	40	30	5	100	30	55 60 50	100 1 1A 1	0.5	1.2	1A	30	50				37
92PU01A	TO-237 (91)		40	5	100	50	55 60 50	10 100 1 1A 1	0.5		1A	30	100				38 *
92PU05	TO-237 (91)	60	100 60	4	100	80	80 50 250 20	50 1 500 1	0.35		250	30	50				38
D40D4	TO-202 (55)		45		100*	60	50 10	100 1A	0.5	1.5	500						38
D40D5	TO-202 (55)		45		100*	60	120 360 10	100 1A	0.5	1.5	500						38
D40D6	TO-202 (55)		45		100*	60	50 10	100 1A	1.0	1.5	500						38
D40D7	TO-202 (55)		60		100*	60	50 10	100 1A	1.0	1.5	500						38
D40D8	TO-202 (55)		60		100*	75	120 360 10	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> (mA) 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	100 1A	2 2	1.0 1.3	1A					38
D42C4	TO-202 (56)		45		1 μA	45	25 10	200 1A	1 1	0.5 1.3	1A	30				38
D42C5	TO-202 (56)		45		1 μA	45	40 20	120 1A	1 1	0.5 1.3	1A	30				38
D42C6	TO-202 (56)		45		1 μA	45	40 20	200 2A	1 1	0.5 1.3	1A	30				38
MPS6715	TO-237 TO-226 (99)		40	5	100	50	55 60 50	10 100 1A	1 1 1	0.5	1A	30	50			38
MPS6717	TO-226 (99)	80	80	5	100	60	80 50 20	50 250 500	1 1 1	0.35	250		50 500 200			38
MPSW01	TO-226 (99)		40	5	100	50	55 60 50	10 100 1A	1 1 1	0.5	1A	30	100			38
NSD102	TO-202 (55)	60	45	5	100	60	40 50 40 25	10 100 500 1A	5 5 5 5	0.2 0.4	100 100 500	30	60			38
NSD103	TO-202 (55)	60	45	5	100	60	50 120 50 30	10 360 500 1A	5 5 5 5	0.2 0.4	100 100 500	30	60			38
NSD6179	TO-202 (55)		50		500 μA	60	30 40 10	500 500 1A	2 2 2	0.5	1.2	500			T-27-01	38
NSDU01A	TO-202 (55)	50	40	5	100	40	55 60 50	10 100 1A	1 1 1	0.5	1.2	1A	50			38

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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	I <sub>CB0</sub> (nA) Max	V <sub>CB</sub> (V)	I <sub>CE</sub> (mA) Min	I <sub>CE</sub> (mA) Max	V <sub>CE</sub> (V) Min	V <sub>CE</sub> (V) Max	V <sub>BE(SAT)</sub> (V) Min	V <sub>BE(SAT)</sub> (V) Max	I <sub>C</sub> (mA) Min	I <sub>C</sub> (mA) Max	t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
NSDU05	TO-202 (55)	60	60	4	100	100	60	50	500	1	0.35	250	250	50	200				38
NSE181	TO-202 (56)		60		100	100	80	10	500	1	0.3	500	500	50	200				38
2N6553	TO-202 (55)	100	100	5	100	100	80	10	500	1	1.0	1A	1.5A	75	250				39
2N6717	TO-237 (91)	80	80	5	100	100	60	50	500	1	0.35	250	250	50	200				39
2N6718	TO-237 (91)	100	100	5	100	100	80	50	500	1	0.35	350	350	50	200				39
2N6731	TO-237 (91)	100	80	5	100	100	80	100	300	2	0.35	350	350	50	200				39
92PU06	TO-237 (91)	80	100	4	100	100	80	500	500	1	0.35	250	250	50	200				39
92PU07	TO-237 (91)	100	100	4	100	100	80	50	500	1	0.35	250	250	50	200				39
92PU100	TO-237 (91)	100	80		100	100	80	10	500	2	0.35	350	350	50	100				39
D40D10	TO-202 (55)		75		100*	100*	90	150	360	2	1.0	1.5	500						39
D40D11	TO-202 (55)		75		100*	100*	80	100	360	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>CB0</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	V <sub>CB</sub> (V)	h <sub>FE</sub> @ I <sub>C</sub> (mA) Min Max	I <sub>C</sub> & V <sub>CE</sub> (V)	V <sub>CE(SAT)</sub> (V) & 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.
92PU993	TO-237 (91)	300	300	6	100	260	25 40	1 10 10	2.0	2.0 20	2.5	50				48
D40N1	TO-202 (55)		250		10 μA	250	20 30 20	4 10 10		20		50				48
D40N2	TO-202 (55)		250		10 μA	250	30 60 30	4 10 10		20		50				48
D40N3	TO-202 (55)		300		10 μA	300	20 30 20	4 10 10		20		50				48
D40N4	TO-202 (55)		300		10 μA	300	30 60 30	4 10 10		20		50				48
MPS6733	TO-226 (99)	200	200	6	100	160	25 40	1 10 10	2.0	20		50 200				48
MPS6734	TO-226 (99)	250	250	6	100	200	25 40	1 10 10	2.0			50 200				48
MPS6735	TO-226 (99)	300	300	6	100	260	25 40	1 10 10				50 200				48
MPSA42	TO-92 (92)	300	300	6	100	200	25 40	1 10 10	0.5	20	3	50				48
MPSA43	TO-92 (92)	200	200	6	100	160	25 40 50	1 10 30	0.4	20	4	50				48
92PU10 MPSW10	TO-226 (99)		300		100	200	25 40	1 10 30	0.75	30	3.5					48
MPSA42 MPSW42	TO-226 (99)	300	300	6	100	200	25 40	1 10 30	0.5	20	3	50				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>CB0</sub> (V) Min	V <sub>CER</sub> <sup>*</sup> V <sub>CEO</sub> (V) Min	V <sub>EB0</sub> (V) Min	I <sub>CB0</sub> (mA) Max	I <sub>CES</sub> <sup>*</sup> I <sub>CB0</sub> (mA) Max	h <sub>FE</sub> @ I <sub>C</sub> (mA) Min Max	V <sub>CE</sub> (V) Min V <sub>CE</sub> (V) 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 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 40 5	1 10 10 10 10	0.4 0.9	20 10	4	50				48
NSD131	TO-202 (55)	250	250	7	100	150	15 15 30	1 10 10 10 10	1.0 0.85	20 20	3					48
NSD132	TO-202 (55)	250	250	7	100	150	15 30 60	1 10 10 10 10	1.0 0.85	20 20	3					48
NSD133	TO-202 (55)	300	300	7	100	150	15 15 30	1 10 10 10 10	1.0 0.85	20 20	3					48
NSD134	TO-202 (55)	300	300	7	100	150	15 30 60	1 10 10 10 10	1.0 0.85	20 20	3					48
NSD135	TO-202 (55)	375	375	7	100	150	15 30 30	1 10 10 10 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 40 40	1 15 15 15 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) Min	V <sub>CE</sub> <sup>*</sup>		V <sub>EB0</sub> (V) Min	I <sub>CB0</sub> (mA) Max	h <sub>FE</sub> @ I <sub>C</sub> & V <sub>CE</sub>		V <sub>CE(SAT)</sub> (V) & V <sub>BE(SAT)</sub> (V)		C <sub>ob</sub> (pF) Max	f <sub>T</sub> (MHz) @ I <sub>C</sub> (mA)	t <sub>off</sub> (ns) Max	NF (dB) Max	Test Conditions	Process No.
			V <sub>CE0</sub> (V) Min	V <sub>CE1</sub> (V) Min			Min	Max	Max	Min						
NSE459	TO-202 (55)	300	300	5	50	250	25	30	10	1.0	30					48
TN3742	TO-237 (91)	300	300	7	100	200	10	3	10	0.75	1.0	10	10			48
							15	10	10	1.0	1.2	30	30			

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.