

6501130 NATL SEMICOND, (DISCRETE)

28C 35412

D



MEDIUM POWER

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{BE0} (V) Min	V _{CE0} (V) Min	V _{BE(SAT)} & V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{CE(SAT)} (V) Max	I _C (mA) @ I _C (mA) Max	I _{CB0} (mA) Max	I _{CB} (V) @ I _{CB} (V) Max	h _{FE} Min	h _{FE} Max	I _C (mA) & V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C (mA) @ I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	I _C (mA) @ I _C (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N699	TO-39	120	60	5	60	1.5	1.3	150	20	2	60	40	120	150	5.0	1.3	150	20	50	50	50		12		12
2N1613	TO-5	75	35	7	60	1.5	1.3	150	25	10	60	40	120	150	1.5	1.3	150	25	60	50	50		12	1	12
2N1711	TO-5	75	35	7	60	1.5	1.3	150	25	10	60	40	120	150	1.5	1.3	150	25	70	50	50		8	1	12
2N2017	TO-39	60	60	8	30	2.0		200		10 μA	30	20	200	10	2.0		200								12
2N2102	TO-39	120	65	7	60	0.5	1.1	150	15	2	60	10	0.01	150	0.5	1.1	150	15	60	50	50				12
2N2192	TO-39	60	40	5	30	0.35	1.3	150	10	10	30	15	75	10	0.35	1.3	150	10	50	50	50				12
2N2192A	TO-39	60	40	5	30	0.25	1.3	150	20	10	30	75	100	10	0.25	1.3	150	20	50	50	50				12
2N2193	TO-39	80	50	8	80	0.35	1.3	150	20	10	80	15	30	10	0.35	1.3	150	20	50	50	50				12

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TEST CONDITIONS: (1) I_C = 50 mA, V_{CE} = 100V, I_B¹ = I_B² = 5 mA. (2) I_C = 500 μA, V_{CE} = 10V, f = 1 kHz. (3) I_C = 500 mA, V_{CE} = 30V, I_B¹ = I_B² = 50 mA. (4) I_C = 150 mA, V_{CE} = 30V, I_B¹ = I_B² = 15 mA. (5) I_C = 100 μA, V_{CE} = 10V, f = 1 kHz. (6) I_C = 500 mA, V_{CE} = 30V, I_B¹ = I_B² = 50 mA. (7) I_C = 2A, V_{CE} = 40V, I_B¹ = I_B² = 200 mA.

NPN Transistors

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NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

28C 35413 D

MEDIUM POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (nA) Max	VCB (V)	hFE Min	IC @ IC & VCE (mA) & (V)		VCE(SAT) (V) Max	VBE(SAT) (V) Min & Max		IC (mA) Max	Cob (pF) Max	fT (MHz) Min	ft (MHz) Min	IC (mA) Max	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.	
								Max	Min		Max	Min										
2N2193A	TO-39	80	50	8	10	60	15	0.1	10	0.25	1.3	150	20	20	50	50	50					12
2N2195	TO-39	45	25	5	100	30	20	150	1	0.35	1.3	150	20	20	50	50	50					12
2N2195A	TO-39	45	25	5	100	30	20	150	1	0.25	1.3	150	20	20	50	50	50					12
2N2243	TO-39	120	80	7	10	60	15	0.1	10	0.35	1.3	150	15	15	50	50	50					12
2N2243A	TO-39	120	80	7	10	60	15	0.1	10	0.25	1.3	150	15	15	50	50	50					12
2N2270	TO-39	60	45	7	50	60	30	1	10	0.9	1.2	150	15	15	100	50	50					12
2N3019	TO-39	140	80	7	10	90	50	0.1	10	0.2	1.1	150	12	12	100	50	50					12
2N3020	TO-39	140	80	7	10	90	30	100	0.1	0.2	1.1	150	12	12	80	50	50					12
2N3053	TO-39	60	40	5	250	30	25	150	2.5	1.4	1.7	150	15	15	100	50	50					12
2N3107	TO-39	100	60	7	10	60	35	0.1	10	0.25	1.1	150	20	20	70	50	50	1000				12
2N3108	TO-39	100	60	7	10	60	20	0.1	10	0.25	1.1	150	20	20	60	50	50	600				12

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6501130 NATL SEMICOND, (DISCRETE)

28C 35414 D

MEDIUM POWER (Continued)



Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} (mA) Max	I _{CB0} (mA) Max	h _{FE} Min	h _{FE} Max	I _C (mA) & V _{CE}	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N3109	TO-39	80	40	7	60	10*	0.1	35	300	10	0.25	1.1	150	25	70	50	1000	7	5/6 (See page 1-27)	12
2N3110	TO-39	80	40	7	60	10*	0.1	20	120	10	0.25	1.1	150	25	60	50	600	7	5/6 (See page 1-27)	12
2N3568	TO-92 (92)	Same as PN3568, see below for explanation																		
2N3665	TO-39	120	80	10	60	50	10	30	120	10	0.5	1.2	150	12	60	50				12
2N3666	TO-39	120	80	10	60	50	10	25	300	10	1.2	1.8	500	12	60	50				12
2N3700	TO-18	140	80	7	90	10	1	50	10	10	1.2	1.8	500	12	100	200	5			12
2N3945	TO-39	70	50	8	60	40	10	100	300	10	0.5	1.2	150	12	60	50				12
2N4924	TO-39	100	100	5	50	100	10	20	250	10	1.8	1.8	500	10	10	500	20			12
2N4945	TO-92 (92)	80	60	5	40	50	10	40	120	150	0.4	0.25	150	10	60	900	50			12
40314	TO-39		40		15	250	50	70	350	4	1.4		150							12
MPSA05	TO-92 (92)		60	4	60	100	10	50	100	1	0.25		100		100	100				12
MPSA06	TO-92 (92)		80	4	80	100	10	50	100	1	0.25		100		100	100				12
PN3568	TO-92 (92)	80	60	5	40	50	30	40	120	150	0.25		150	20	60	600	50			12
TN1711	TO-237 (91)	75		7	60	10	0.01	20	35	10	1.5		150	25						12

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PN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

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NPN Transistors

MEDIUM POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (mA) Max	hFE Min	IC @ VCE & VCE (V)		VCE(SAT) (V) Max	VBE(SAT) (V) Min	IC (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
							hFE Max	IC (mA) Max										
TN2017	TO-237 (91)	60	60	8	10 μA	35	10	10										12
TN2102	TO-237 (91)	120	65	7	10	10	0.01	10	0.5	1.1	150	15	60	50				12
TN2270	TO-237 (91)	60	45	7	50	30	1	10	0.9	1.2	150	15	100	50				12
TN3019	TO-237 (91)	140	80	7	10	50	1	10	0.2	1.1	150	12	100	50				12
TN3020	TO-237 (91)	140	80	7	10	30	100	1	0.2	1.1	150	12	80	50				12
TN3053	TO-237 (91)	60	40	5	250	25	150	2.5	1.4	1.7	150	15	100	50				12
2N3566	TO-92 (92)	40	30	5	50	50	250	10	1.0		100	25	4	100	30			13
2N3567	TO-92 (92)	80	40	5	50	40	120	1	0.25		150	20	60	600	50			13
2N3569	TO-92 (92)	80	40	5	50	100	300	1	0.25		150	20	60	600	50			13
PN3566	TO-92 (92)	Same as 2N3566, see above for explanation																
PN3567	TO-92 (92)	Same as 2N3567, see above for explanation																
PN3569	TO-92 (92)	Same as 2N3569, see above for explanation																
2N4237	TO-39		40		100 μA	15	1A	1	0.6	1.5	1A	100	1	100				14

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6501130 NATL SEMICOND, (DISCRETE)

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MEDIUM POWER (Continued)

Type No.	Case Style	V _{CEO} (V) Min	V _{CER} V _{CEO} (V) Min	V _{BE0} (V) Min	ICES* ICBO (nA) Max	V _{CB} (V)	h _{FE} @ I _C & V _{CE} (V)	V _{CE(SAT)} & 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.
MPS6560	TO-92 (92)	25	25	5	100	20	35 50 50	0.5 1.2*	500	30	60	10				14
MPS6561	TO-92 (92)	20	20	5	100	20	35 50 50	0.5 1.2*	350	30	60	10				14
NCBV14	TO-202 (55)	60	40	4	100	30	75	0.4	500	10	125	50				14
NSE871	TO-202 (51)	300			100	200	50				60	10				17
MPO3725	TO-39		40	6	500	40	35 25	0.45	500	10	250	50				25
TN3252	TO-237 (91)	60	30		500	40	30 30 25	0.3 0.7 1.3	150 500	12	200	50				25
TN3253	TO-237 (91)	75	40	5	500	60	25 25 20	0.35	150 375 750	12		150				25
TN3444	TO-237 (91)	80	50	5	500	60	20 20	0.35	150 500	12	150	50				25
TN3724	TO-237 (91)	50	30	6	1.7 μA	40	15 30 40 35 25 30	0.25	10 150 300 500 800 1A	12			60	6 (See page 1-27)	25	
TN3725	TO-237 (91)	80	50	6	1.7 μA	60	30 60 40 35 20 25	0.25	10 150 300 500 800 1A	10			60	6 (See page 1-27)	25	
2N2657	TO-39	80	50	8	100	60	15 40	0.5 3.0	1A 5A	150	20	200	15		2 (See page 1-27)	34
2N2658	TO-39	100	80	8	100	60	15 40	0.5 3.0	1A 5A		20	200	15		2 (See page 1-27)	34
2N2890	TO-39	100	80	5	50 μA	60	25 30 20	0.5	1A 2A 1A 100	70	30	200	15		3 (See page 1-27)	34

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MEDIUM POWER (Continued)

Type No.	Case Style	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{BE0} (V) Min	I _{CE0} (mA) Max	V _{CB} (V) Min	h _{FE}		I _C & V _{CE}		V _{CE(SAT)} & V _{BE(SAT)}		C _{ob} (pF) Max	f _T		t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.	
								Min	Max	Min	Max	Min	Max		Min	Max					Min
2N2891	TO-39	100	80	5		50 μA	60	50	300	10	10	0.5	1.2	70	30	200	15			3 (See page 1-27)	34
2N5148	TO-39		80			1 μA	60	20	90	5	5	0.46	1.2	70	60	200					34
2N5150	TO-39		80			1 μA	60	60	200	5	5	0.46	1.2	70	60	200					34
2N5336	TO-39		80			10 μA	80	30	120	2	2	0.7	1.2		30	500	2200			7 (See page 1-27)	34
2N5338	TO-39		100			10 μA	100	30	120	2	2	0.7	1.2		30	500	2200			7 (See page 1-27)	34
2N3440	TO-39		250			20 μA*	300	40	160	20	10	0.8	1.8								36
2N6591	TO-202 (55)	150	150	5		200	100	40	250	10	10	0.8	1.8								36
2N6592	TO-202 (55)	200	200	5		200	150	40	250	10	10	0.8	1.8								36
2N6593	TO-202 (55)	250	250	5		200	200	30	250	10	10	0.8	1.8								36
2N6720	TO-237 (91)	175	150	6		1 μA	150	25	50	10	10	0.5	1.2		30	300	50				36
2N6721	TO-237 (91)	225	200	6		1 μA	200	25	50	10	10	0.5	1.2		30	300	50				36
2N6722	TO-237 (91)	275	250	6		1 μA	250	25	50	10	10	0.5	1.2		30	300	50				36
2N6723	TO-237 (91)	325	300	6		1 μA	300	25	50	10	10	0.5	1.2		30	300	50				36

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MEDIUM POWER (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} (mA) Max	I _{CB0} (mA) Max	h _{FE} Min	h _{FE} Max	I _C (mA) & V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
92PU36	TO-237 (91)	175	150	6	1 μA	150	25	300	50 10 100 10 500 10	0.5		100							36
92PU36A	TO-237 (91)	225	200	6	1 μA	200	25	300	50 10 100 10 250 10 500 10	0.5		100							36
92PU36B	TO-237 (91)	275	250	6	1 μA	250	25	300	50 10 100 10 250 10 500 10	0.5		100							36
92PU36C	TO-237 (91)	325	300	6	1 μA	300	25	300	50 10 100 10 250 10 500 10	0.5		100							36
D40P1	TO-202 (55)		120		10 μA	200	20	2	10 10 80 10	1.0		100	15	10					36
D40P3	TO-202 (55)		180		10 μA	250	20	2	10 10 80 10	1.0	1.5	100	15	10					36
D40P5	TO-202 (55)		225		10 μA	300	20	2	10 10 80 10	1.0	1.5	100	15	10					36
NSD36	TO-202 (55)	175	150	6	1 μA	150	25	300	50 10 100 10 250 10 500 10	0.5			15	10					36
NSD36A	TO-202 (55)	225	200	6	1 μA	200	25	300	50 10 100 10 250 10 500 10	0.5			15	10					36
NSD36B	TO-202 (55)	275	250	6	1 μA	250	25	300	50 10 100 10 250 10 500 10	0.5			15	10					36
NSD36C	TO-202 (55)	325	300	6	1 μA	300	25	300	50 10 100 10 250 10 500 10	0.5			15	10					36
NSD3439	TO-202 (55)		350		20 μA	300	30	160	2 10 20 10	0.5	1.3	50	20	15					36

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NPN Transistors

Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (mA) Max	IC @ VCB (mA) Max	hFE Min	hFE Max	IC @ VCE (mA) Max	VCE(SAT) (V) Max	VBE(SAT) (V) & Min		IC (mA) Max	Cob (pF) Max	ft (MHz) Min	IC (mA) Max	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
											Max	Min								
NSD3440	TO-202 (55)		250		500 μA	200	30	40	2	10	0.5	1.3	50	20	15	10				36
TN3440	TO-237 (91)		250		20 μA	250	30	40	2	10	0.5	1.3	50		15	10				36
2N6714	TO-237 (91)	40	30	5	100	40	55	10	10	1	0.5		100		50	500				37
92PU01	TO-237 (90)		30	5	100	40	55	10	10	1	0.5		1A	30	100	50				37
92PU01A	TO-237 (90)		40	5	100	50	55	10	10	1	0.5		1A	30	100	50				37
D42C1	TO-202 (56)		30		1 μA	30	25	10	200	1	0.5	1.3	1A	30						37
D42C2	TO-202 (56)		30		1 μA	30	40	120	200	1	0.5	1.3	1A	30						37
D42C3	TO-202 (56)		30		1 μA	30	40	200	2A	1	0.5	1.3	1A	30						37
D42C4	TO-202 (56)		45		1 μA	45	25	200	1	1	0.5	1.3	1A	30						37
D42C5	TO-202 (56)		45		1 μA	45	40	120	200	1	0.5	1.3	1A	30						37
D42C6	TO-202 (56)		45		1 μA	45	40	200	1A	1	0.5	1.3	1A	30						37
NSD102	TO-202 (55)	60	45	5	100	60	40	10	5	5	0.2	0.9	100	30	60	50				37
NSD103	TO-202 (55)	60	45	5	100	60	50	360	100	5	0.4	1.2	500							37
NSDU01	TO-202 (55)	40	30	5	100	30	55	10	1	1	0.5	1.2	1A	30	50	50				37
NSDU01A	TO-202 (55)	50	40	5	100	40	55	10	1	1	0.5	1.2	1A	30	50	50				37

MEDIUM POWER (Continued)



6501130 NATL SEMICOND, (DISCRETE)

28C 35420

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MEDIUM POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCER* (V) Min	VEBO (V) Min	ICES* ICBO (mA) Max	VCB (V)	hFE		IC (mA) @ VCE & IC (mA)	VCE(SAT) VBE(SAT) (V) & (V)		IC (mA) @ IC (mA)	C _{ob} (pF) Max	f _T (MHz) @ IC (mA)		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max		Max	Min			Max	Min				
NSDU02	TO-202 (55)	60	40	5	100	40	60	50	10	10	0.4	150	20	50	20				37
NSE180	TO-202 (55)		40		100	60	50	250	100	1	0.3	500	100	50	100				37
2N5449	TO-92 (97)	50	30	5	100	20	100	300	50	2	0.6	100	50	5	50				38
2N6551	TO-202 (55)	60	60	5	100	40	60	80	10	1	0.5	500							38
2N6552	TO-202 (55)	80	80	5	100	60	60	250	50	1	1.0	1A		75	250	100			38
2N6705	TO-237 (90)	60	45	5	100	60	40	250	50	2	0.5	500		50	400	200			38
2N6706	TO-237 (90)	80	60	5	100	80	40	250	50	2	1.0	1A		50	400	200			38
2N6707	TO-237 (90)	100	80	5	100	100	40	250	50	2	1.0	1A		50	400	200			38
2N6715	TO-237 (91)	50	40	5	100	50	55	100	10	1	0.5	1A		50	400	50			38
2N6716	TO-237 (91)	60	60	5	100	40	80	250	50	1	0.35	250	50	50	500	50			38
92PE37A	TO-237 (90)		45		100	60	25	500	50	2	0.5	500	30	50	200				38
92PE37B	TO-237 (90)		60		100	80	40	250	50	2	1.0	1A	30	50	200				38
92PE37C	TO-237 (90)		80		100	100	25	500	50	2	1.0	1A	30	50	200				38

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NPN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

28C 35421 D

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} (mA) Max	I _{CB0} (mA) Max	I _{CB0} (mA) Max	I _{CE} (mA) & V _{CE} (V)	V _{CE(SAT)} (V) & V _{BE(SAT)} (V)		I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA) @	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
										Max	Min								
BD137-6	TO-126	60	60	5	100	30	40	100	150	2	0.5	500		50	50				38
BD137-10	TO-126	60	60	5	100	30	25	160	150	2	0.5	500		50	50				38
BD345	TO-126	60	60	5	500	60	40	250	200	1	0.4	200	15	50	50				38
D40D1	TO-202 (55)		30		100*	45	50	150	100		0.5	500							38
D40D2	TO-202 (55)		30		100*	45	120	360	100		0.5	500							38
D40D3	TO-202 (55)		30		100*	45	290	100	100		1.5	500							38
D40D4	TO-202 (55)		46		100*	60	50	150	100		0.5	500							38
D40D5	TO-202 (55)		45		100*	60	120	360	100		0.5	500							38
D40D6	TO-202 (55)		45		100*	60	50	150	100		1.0	500							38
D40D7	TO-202 (55)		60		100*	60	50	150	100		1.0	500							38
D40D8	TO-202 (55)		60		100*	75	120	360	100	2	1.0	500							38
D40D10	TO-202 (55)		75		100*	90	50	150	100	2	1.0	500							38
D40D11	TO-202 (55)		75		100*	90	120	360	100	2	1.0	500							38
D40D13	TO-202 (55)		75		100*	90	50	150	100	2	1.0	500							38
D40D14	TO-202 (55)		75		100*	90	120	360	100	2	1.0	500							38
D40E1	TO-202 (55)		30		100*	40	50	100	100	2	1.0	1.3 1A							38
D40E5	TO-202 (55)		60		100*	70	50	100	100	2	1.0	1.3 1A							38
D40E7	TO-202 (55)		80		100*	90	50	100	100	2	1.0	1.3 1A							38
MJE721	TO-126 (58)		60				40	150	150	1	1.0	1.3 1.5A							38
							20	500	500	1	0.15	150							38
							8	1A	1A	1	0.4	500							38

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MEDIUM POWER (Continued)



6501130 NATL SEMICOND, (DISCRETE)

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MEDIUM POWER (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CER} * V _{CEO} (V) Min	V _{EBO} (V) Min	I _{CS} * I _{CB0} (mA) Max	V _{CB} (V)	h _{FE} Min	I _C (mA)	V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	e (mA) Max	I _C (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
NSD6178	TO-202 (55)		75		500 μA	80	30	50	2	0.5	1.2	500								38
NSD6179	TO-202 (55)		50		500 μA	60	30	500	2	0.5	1.2	500								38
NSDU05	TO-202 (55)	60	60	4	100	60	80	50	1	0.35		250	30	50	200					38
NSE181	TO-202 (56)		60		100	80	50	250	1	0.3		500		50	100					38
2N6553	TO-202 (55)	100	100	5	100	80	60	10	1	1.0	1.5	1A		75	250	100				39
2N6717	TO-237 (91)	80	80	5	100	60	80	50	1	0.35		250		50	500	200				39
2N6718	TO-237 (91)	100	100	5	100	80	80	50	1	0.35		350		50	500	200				39
2N6731	TO-237 (91)	100	80	5	100	80	100	10	2	0.35		350		50	500	200				39
92PU05	TO-237 (90)		100		100	80	80	50	1	0.35		250	30	50	200					39
92PU06	TO-237 (90)		100		100	80	20	500	1	0.35		250	30	50	200					39
92PU07	TO-237 (91)		100		100	80	80	50	1	0.35		250	30	50	200					39
92PU100	TO-237 (91)	100	80		100	80	20	10	5	0.35		350	20	50	100					39
MJE722	TO-126 (58)		80				40	150	1	1.0	1.3	1.5A								39

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6501130 NATL SEMICOND, (DISCRETE)

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NPN Transistors

MEDIUM POWER (Continued)



Type No.	Case Style	V _{CE0} (V) Min	V _{CER} * V _{CEO} (V) Min	V _{BE0} (V) Min	I _{CE0} * I _{CBO} (mA) Max	V _{CB} (V)	h _{FE}		I _C & V _{CE}		V _{CE(SAT)} V _{BE(SAT)} (V) & (V) @ I _C (mA)		C _{ob} (pF) Max	f _T (MHz)		t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max	I _C (mA) Max	V _{CE} (V) Max	Max	Min		Max	Min				
NSD104	TO-202 (55)	100	80	7	100	100	20	50	10	5	0.2	0.9	30	60	50				39
NSD105	TO-202 (55)	100	80	7	100	100	10	120	10	5	0.2	0.9	30	60	50				39
NSD106	TO-202 (55)	140	100	7	100	140	20	50	10	5	0.2	0.9	30	60	50				39
NSDU06	TO-202 (55)	80	80	4	100	80	80	50	50	1	0.35	1.2	30	50	200				39
NSDU07	TO-202 (55)	100	100	4	100	100	80	50	50	1	0.35	1.2	30	50	200				39
2N3742	TO-39	300	300	7	200	200	10	15	3	10	0.75	1.0	6	60	10				48
2N4926	TO-39	200	200	7	100	100	10	20	3	10	1.0	1.2	6	30	20				48
2N4927	TO-39	250	250	7	100	150	10	15	3	10			6	30	20				48
2N6711	TO-237 (90)	160	160	7	50	100	15	30	1	10				40	10				48
2N6712	TO-237 (90)	250	250	7	50	200	15	30	1	10				40	10				48
2N6713	TO-237 (90)	300	300	7	50	250	15	30	1	10				40	10				48
2N6719	TO-237 (91)	300	300	7	100	200	25	40	1	10				30	15				48
2N6733	TO-237 (91)	200	200	6	100	160	25	40	1	10	2.0			50	10				48

6501130 NATL SEMICOND, (DISCRETE)

28C 35424 D

MEDIUM POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (mA) Max	VCB (V)	hFE Min	IC & VCE		VCE(SAT) (V) Max	VBE(SAT) (V) Min Max		IC (mA) Max	Cob (pF) Max	fT (MHz) Min Max	IC (mA) @	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
								IC (mA) Max	VCE (V) Max		IC (mA) Min	VBE (V) Max								
2N6734	TO-237 (91)	250	250	6	100	200	25	1	10	2.0			50	200	10					48
2N6735	TO-237 (91)	300	300	6	100	260	40	200	10				50	200	10					48
40321	TO-39		300		100	150	25	200	20				6	30	300	20				48
92PE487	TO-237 (90)	160	160	7	50	100	15	1	10	1.0			30							48
92PE488	TO-237 (90)	250	250	7	50	100	15	10	10	1.0			30							48
92PE489	TO-237 (90)	300	300	7	50	200	15	10	10	1.0			30							48
92PU10	TO-237 (91)		300		100	200	25	1	10	0.75			30	3.5						48
92PU391	TO-237 (91)	200	200	6	100	160	25	1	10	2.0			20	2.5	10					48
92PU392	TO-237 (91)	250	250	6	100	200	25	1	10	2.0			20	2.5	10					48
92PU393	TO-237 (91)	300	300	6	100	260	25	1	10	2.0			20	2.5	10					48
D40N1	TO-202 (55)		250		10 μA	250	20	4	10				50		20					48
D40N2	TO-202 (55)		250		10 μA	250	30	90	10				50		20					48
D40N3	TO-202 (55)		300		10 μA	300	20	180	10				50		20					48
D40N4	TO-202 (55)		300		10 μA	300	30	4	10				50		20					48
MPSA42	TO-92 (92)	300	300	6	100	200	25	1	10	0.5			3		10					48

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6501130 NATL SEMICOND, (DISCRETE)

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MEDIUM POWER (Continued)



Type No.	Case Style	V _{CB0} (V) Min	V _{CER} [*] V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CES} [*] I _{CB0} (mA) Max	V _{CB} (V) @ I _C	h _{FE} Min	h _{FE} Max	I _C (mA) @ V _{CE}	V _{CE(SAT)} & V _{BE(SAT)} (V) Max	V _{CE(SAT)} & V _{BE(SAT)} (V) Min	I _C (mA) @ V _{CE}	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	I _C (mA) @ V _{CE}	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPSA43	TO-92 (92)	200	200	6	100	160	25	40	1	0.4	0.9	20	4	50	10					48
NSD131	TO-202 (55)	250	250	7	100	150	15	30	1	1.0	0.85	20	3							48
NSD132	TO-202 (55)	250	250	7	100	150	15	30	1	1.0	0.85	20	3							48
NSD133	TO-202 (55)	300	300	7	100	150	15	30	1	1.0	0.85	20	3							48
NSD134	TO-202 (55)	300	300	7	100	150	15	30	1	1.0	0.85	20	3							48
NSD135	TO-202 (55)	375	375	7	100	150	15	30	1	1.0	0.85	20	3							48
NSD457	TO-202 (55)	160	160	5	50	100	25	30	30	1.0		30								48
NSD458	TO-202 (55)	250	250	5	50	200	25	30	30	1.0		30								48
NSD459	TO-202 (55)	300	300	5	50	250	25	30	30	1.0		30								48
NSDU10	TO-202 (55)	300	300	8	200	200	25	40	1	1.5	0.8	20	3	60						48
NSE457	TO-202 (56)	160	160	5	50	100	25	30	30	1.0		30								48
NSE458	TO-202 (56)	250	250	5	50	200	25	30	30	1.0		30								48
NSE459	TO-202 (56)	300	300	5	50	250	25	30	30	1.0		30								48
PN7055	TO-92 (92)	220	220	7	100	150	20	40	1	1.0	0.85	20	3.5	50	15					48
SE7055	TO-39	220	220	7	100	150	20	40	1	1.0	0.85	20	3.5	50	15					48

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MEDIUM POWER (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CER} * V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CE5} * I _{CB0} (mA) Max	I _{CE} * I _{CB0} (mA) Max	h _{FE} @ I _C & V _{CE}		V _{CE(SAT)} V _{BE(SAT)} @ I _C		C _{ob} (pF) Max	f _T (MHz) @ I _C		τ _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max	Max	Min		Max	Min				
SE7056	TO-39	300	300	7	100	200	20	1 20 40 20 40 30	1.0	0.85	20	3.5	50	15			48
SV7056	TO-202 (55)	300	300	7	100	200	20	1 20 40 20 40 30	1.0	0.85	20		50	15			48
TN3742	TO-237 (91)	300	300	7	200	200	10	3 10 15 10 20 30 20 50	0.75	1.0	10	6	30	10			48

POWER

Type No.	Case Style	V _{CB0} (V) Min	V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CEX} * I _{CB0} (μA) Max	V _{CB} (V) @ I _C	h _{FE} @ I _C & V _{CE}		V _{CE(SAT)} V _{BE(SAT)} @ I _C		C _{ob} (pF) Max	f _T (MHz) @ I _C		τ _{off} (ns) Min	NF (dB) Max	Test Conditions	Process No.
							Min	Max	Max	Min		Max	Min				
2N5655	TO-126		250		10	275	25	0.05 10 0.1 10 0.25 10 0.5 10	1.0	2.5							36
2N5656	TO-126		300		10	350	25	0.05 10 0.1 10 0.25 10 0.5 10	1.0	2.5	25	10	10				36
2N5657	TO-126		350		10	375	25	0.05 10 0.1 10 0.25 10 0.5 10	1.0	2.5	25	10	10				36
MJE340	TO-126		300		100	300	30	0.05 10 0.1 10 0.25 10 0.5 10	1.0	2.3							36
MJE341	TO-126		150		300	175	20	0.01 10 0.05 10 0.15 10	1.0	2.3	15	15	15				36
MJE344	TO-126		200		100	200	30	0.05 10 0.1 10 0.25 10 0.5 10	1.0	2.3	15	15	15				36

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NPN Transistors



NPN Transistors

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POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCEO (V) Min	VEBO (V) Min	ICEX* ICEB+ ICBO (μA) Max	VCB (V)	hFE Min Max	IC (A) & VCE (V)	VCE(SAT) (V) Max VBE(SAT) (V) Min	IC (A) @ (A) Max	Cob (pF) Max	fT (MHz) Min Max	IC (A) @ (A) Max	Process No.
MJE3439	TO-126		360		20	360	30 40	0.002 0.02	0.5	0.05	10	15	0.01	36
MJE3440	TO-126		250		20	250	30 40	0.002 0.02	0.5	0.05	10	15	0.01	36
MJE180	TO-126		40		0.1	60	50 30 12	0.1 0.5 1.5	0.3 0.9 1.7	0.5 1.5 3.0	30	50	0.05	37
MJE720	TO-126		40		100*	40	40 20 8	0.15 0.5 1	0.15 0.4 1.0	0.15 0.5 1.5				37
MJE181	TO-126		60		0.1	80	50 30 12	0.1 0.5 1.5	0.3 0.9 1.7	0.5 1.5 3.0	30	50	0.1	38
MJE182	TO-126 (58)		80		100	100	50 30 12	100 500 1.5A	0.3 0.9 1.7	500 1.5A 3A	30	50	0.1	39
2N6099	TO-220		60		2 mA	50	20 5	80 10	2.5	10				4A
2N6101	TO-220		70		2 mA	60	20 5	80 10	2.5	10				4A
2N6103	TO-220		40		2 mA	40	15 5	8 16	2.5	16				4A
2N6486	TO-220		40		100	35	20	5	1.3	5		5	1	4A
2N6487	TO-220		60		100	55	20	5	1.3	5		5	1	4A
2N6488	TO-220		80		100	75	20	5	1.3	5		5	1	4A
MJE2801T	TO-220		60		1 mA	70	25	3	1.1	4				4A
MJE3055T	TO-220		60		1 mA	70	20	4	8	10				4A
TIP41	TO-220		40		400*	40	30 15	0.3 3	1.5	6				4A
TIP41A	TO-220		60		400*	60	30 15	0.3 3	1.5	6				4A
TIP41B	TO-220		80		400*	80	30 15	0.3 3	1.5	6				4A
TIP41C	TO-220		100		400*	100	30 15	0.3 3	1.5	6				4A

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POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCEO (V) Min	VEBO (V) Min	ICEX* ICEB† ICBO (μA) Max	VCB (V) (100Ω)	hFE Min Max	IC & VCE (A) (V)	VCE(SAT) (V) Max VBE(SAT) (V) Min	IC (A) (A) Min Max	Cob (pF) Max	fT (MHz) Min Max	IC (A) Min Max	Process No.
2N5190	TO-126	40	40	40	100	40	25 100	1.5 2	0.6	1.5		2	1	4E
2N5191	TO-126	60	60	60	100	60	25 100	1.5 2	0.6	1.5		2	1	4E
2N5192	TO-126	80	80	80	100	80	20 80	1.5 2	0.6	1.5		2	1	4E
2N5294	TO-220	70	70	70	500†	50 (100Ω)	30 120	0.5 4	1	0.5		2	0.2	4E
2N5296	TO-220	40	40	40	100	35	30 120	1 4	1.0	1		2	0.2	4E
2N5298	TO-220	60	60	60	500†	50 (100Ω)	20 80	1.5 1	1.0	1.5		2	0.2	4E
2N5490	TO-220	40	40	40	5 mA*	55	20 100	2 4	2.0	0.5				4E
2N5492	TO-220	55	55	55	1 mA*	70	20 100	2.5 4	2.0	0.2				4E
2N5494	TO-220	40	40	40	1 mA*	55	20 100	3 4	2.0	0.5				4E
2N5496	TO-220	70	70	70	1 mA*	85	20 100	3.5 4	2.0	7				4E
2N6121	TO-220	45	45	45	100	45	25 100	1.5 2	0.6	1.5		2.5	1	4E
2N6122	TO-220	60	60	60	100	60	25 100	1.5 2	0.6	1.5		2.5	1	4E
2N6123	TO-220	80	80	80	100	80	20 80	1.5 2	0.6	1.5		2.5	1	4E
2N6129	TO-220	40	40	40	100	40	20 100	2.5 4	1.4	7				4E
2N6130	TO-220	60	60	60	100	60	20 100	2.5 4	1.4	7				4E
2N6131	TO-220	80	80	80	100	80	20 100	2.5 4	2.0	7				4E
2N6288	TO-220	30	30	30	100*	37.5	30 150	3 4	1.0	3	250	4	0.5	4E
2N6290	TO-220	50	50	50	100*	56	30 150	3 4	1.0	2.5	250	4	0.5	4E
2N6292	TO-220	70	70	70	100*	75	30 150	2 4	1.0	2	250	4	0.5	4E

NPN Transistors

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NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

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POWER (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CEX} [*] I _{CEB} [†] I _{CB0} (μA) Max	V _{CB} (V) @ I _C	h _{FE} Min h _{FE} Max @ I _C & V _{CE}	V _{CE(SAT)} (V) Max V _{BE(SAT)} (V) Min & I _C	I _C (A) @ V _{CE(SAT)} & I _C	C _{ob} (pF) Max	f _T (MHz) Min f _T Max	I _C (A) @ I _C	Process No.
MJE5190J	TO-126	40	40	100	100	40	25 10	0.6	1.5				4E
MJE5191J	TO-126	60	60	100	100	60	25 10	0.6	1.5				4E
MJE5192J	TO-126	80	80	100	100	80	50 7	0.6	1.5				4E
2N6473	TO-220	100	100	100*	100*	100	15 15	1.2	1.5	250			4F
2N6474	TO-220	120	120	100*	100*	120	15 15	1.2	1.5	250			4F
MJE520	TO-220	30	30	100	100	30	25						4F
MJE521	TO-220	40	40	100	100	40	40						4F
TIP29	TO-220	40	40	200*	200*	40	40 15	0.7	1		3	0.2	4F
TIP29A	TO-220	60	60	200*	200*	60	40 15	0.7	1		3	0.2	4F
TIP29B	TO-220	80	80	200*	200*	80	40 15	0.7	1		3	0.2	4F
TIP29C	TO-220	40	40	200*	200*	40	25 10	0.7	1		3	0.2	4F
TIP31	TO-220	40	40	200*	200*	40	25 10	1.2	3		3	0.5	4F
TIP31A	TO-220	60	60	200*	200*	60	25 10	1.2	3		3	0.5	4F
TIP31B	TO-220	80	80	200*	200*	80	25 10	1.2	3		3	0.5	4F
TIP31C	TO-220	100	100	200*	200*	100	25 10	1.2	3		3	0.5	4F
TIP61	TO-220	40	40	200*	200*	40	40 15	0.7	0.5		3	0.05	4F
TIP61A	TO-220	60	60	200*	200*	60	40 15	0.7	0.5		3	0.05	4F
TIP61B	TO-220	80	80	200*	200*	80	40 15	0.7	0.5		3	0.05	4F
TIP61C	TO-220	100	100	200*	200*	100	40 15	0.7	0.5		3	0.05	4F
2N4921	TO-220	40	40	100	100	40	40 20 10	0.6	1.3	100	300	0.25	4H

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POWER (Continued)

Type No.	Case Style	V _{CS0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	IC _{ES} [*] , IC _{EB} [*] , IC _{BO} (μA) Max	V _{CB} (V)	h _{FE} Min	h _{FE} Max	IC (A) & V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	IC (A) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	IC (A) Max	Process No.
2N4922	TO-220	60	60		100	60	40	100	0.05 1	0.6	1.3	0.25	100	300		0.25	4H
2N4923	TO-220	80	80		100	80	40	100	0.05 1	0.5	1.3	0.25	100	300		0.25	4H
D44C1	TO-220	30	30		10*	40	25	10	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C2	TO-220	30	30		10*	40	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C3	TO-220	30	30		10*	40	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C4	TO-220	45	45		10*	55	25	10	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C5	TO-220	45	45		100	55	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C6	TO-220	45	45		10*	55	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C7	TO-220	60	60		100	75	25	10	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C8	TO-220	60	60		100	70	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C9	TO-220	60	60		10*	70	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C10	TO-220	80	80		100	90	25	10	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C11	TO-220	80	80		10*	90	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
D44C12	TO-220	80	80		10*	90	40	20	0.2 1	0.5	1.3	0.02	100	3		0.02	4P
MJE200	TO-220	25	25		0.1	40	70	45	0.5 1	0.3	0.5	0.1	80	65		0.1	4P
MJE220	TO-220	100	100		0.1	60	40	20	0.2 1	0.3	0.5	0.1	80	50		0.1	4P
MJE221	TO-220	40	40		0.1	60	40	20	0.2 1	0.3	0.5	0.1	50	50		0.1	4P
MJE222	TO-220	40	40		0.1	60	25	10	0.2 1	0.3	1.8	0.1	50	50		0.1	4P

NPN Transistors

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NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

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T-33-01

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CEX} [†] I _{CEB} [†] I _{CB0} (μA) Max	V _{CB} (V)	h _{FE} Min	I _C @ (A) Max	V _{CE} (V) & V _{CE} (V)	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C @ (A) Max	C _{ob} (pF) Max	f _T (MHz) Min, Max	I _C (A)	Process No.
MJE223	TO-220		60		0.1	80	40	200	0.2	1	0.3	0.5	50	50	0.1	4P
MJE224	TO-220		60		0.1	80	40	150	0.2	1	0.3	0.5	50	50	0.1	4P
MJE225	TO-220		60		0.1	80	25	20	0.2	1	0.6	0.5	50	50	0.1	4P
MJE240	TO-220		80		0.1	80	40	200	0.2	1	0.3	0.5	50	40	0.1	4P
MJE241	TO-126		80		0.1	80	40	120	0.2	1	0.3	0.5	50	40	100	4P
MJE242	TO-126		80		0.1	80	20	1	1	1	0.6	1	2	40	100	4P
MJE243	TO-126		100		0.1	100	10	1	1	1	2.5	2	50	40	100	4P
MJE244	TO-126		100		0.1	100	40	120	0.2	1	0.3	0.5	50	40	100	4P
D44H1	TO-220		30		10	30	10	1	1	1	2.5	2	4	40	100	4P
D44H2	TO-220		30		10	30	60	2	1	1	1.0	1.5	8	40	100	4P
D44H4	TO-220		45		10	45	35	2	1	1	1.0	1.5	8	40	100	4P
D44H5	TO-220		45		10	45	20	4	1	1	1.0	1.5	8	40	100	4P
D44H7	TO-220		60		10	60	60	2	1	1	1.0	1.5	8	40	100	4P
D44H8	TO-220		60		10	60	35	2	1	1	1.0	1.5	8	40	100	4P
D44H10	TO-220		80		10	80	20	4	1	1	1.0	1.5	8	40	100	4P
D44H11	TO-220		80		10	80	60	2	1	1	1.0	1.5	8	40	100	4P

POWER (Continued)