

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 _{CB0} (mA) @ V _{CB} (V)	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	5.0	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	200	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	150	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	15	75	150	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	150	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 @ VCE & VCE (V)		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		Max	Min								
2N2193A	TO-39	80	50	8	10	60	15	0.1	10	0.25	1.3	150	20	50	50					12
2N2195	TO-39	45	25	5	100	30	20	150	1	0.35	1.3	150	20	50	50					12
2N2195A	TO-39	45	25	5	100	30	20	150	1	0.25	1.3	150	20	50	50					12
2N2243	TO-39	120	80	7	10	60	15	0.1	10	0.35	1.3	150	15	50	50					12
2N2243A	TO-39	120	80	7	10	60	15	0.1	10	0.25	1.3	150	15	50	50					12
2N2270	TO-39	60	45	7	50	60	30	1	10	0.9	1.2	150	15	100	50					12
2N3019	TO-39	140	80	7	10	90	50	0.1	10	0.2	1.1	150	12	100	50					12
2N3020	TO-39	140	80	7	10	90	30	100	10	0.2	1.1	150	12	80	50					12
2N3053	TO-39	60	40	5	250	30	25	150	2.5	1.4	1.7	150	15	100	50					12
2N3107	TO-39	100	60	7	10	60	35	0.1	10	0.25	1.1	150	20	70	50	1000			5/6 (See page 1-27)	12
2N3108	TO-39	100	60	7	10	60	20	0.1	10	0.25	1.1	150	20	60	50	600			5/6 (See page 1-27)	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 _{BE0} (V) Min	I _{CB0} (mA) Max	h _{FE} Min	I _C (mA) Max	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N3109	TO-39	80	40	7	10*	35	0.1	0.25	1.1	150	25	70	50	1000	7	5/6 (See page 1-27)	12
2N3110	TO-39	80	40	7	10*	20	0.1	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	50	30	10	0.5	1.2	150	12	60	50				12
2N3666	TO-39	120	80	10	50	25	500	1.2	1.8	500	12	60	50				12
2N3700	TO-18	140	80	7	10	50	1	0.2	1.1	150	12	100	200	5			12
2N3945	TO-39	70	50	8	40	100	10	0.5	1.2	150	12	60	50				12
2N4924	TO-39	100	100	5	100	20	500	1.8	1.8	500	10	10	500	20			12
2N4945	TO-92 (92)	80	60	5	50	40	120	0.4		150		60	900	50			12
40314	TO-39		40		250	70	350	1.4		150							12
MPSA05	TO-92 (92)		60	4	100	50	100	0.25		100		100	100				12
MPSA06	TO-92 (92)		80	4	100	50	100	0.25		100		100	100				12
PN3568	TO-92 (92)	80	60	5	50	40	120	0.25		150	20	60	600	50			12
TN1711	TO-237 (91)	75		7	10	20	0.01	1.5		150	25						12

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PN Transistors

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6501130 NATL SEMICONDUCTOR, (DISCRETE)

28C 35415 D

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 Max	IC @ VCE (mA) & (V)	VCE(SAT) (V) Max	VBE(SAT) (V) Min Max	IC (mA)	C _{ob} (pF) Max	f _T (MHz) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
TN2017	TO-237 (91)	60	60	8	10 μA	35 50 20	10 200 10	10 10								12
TN2102	TO-237 (91)	120	65	7	10	10 20 35 40 25 10	0.01 0.1 10 150 500 1A	0.5	1.1	150	15	60	50			12
TN2270	TO-237 (91)	60	45	7	50	30 50	1 200	0.9	1.2	150	15	100	50			12
TN3019	TO-237 (91)	140	80	7	10	50 90 100 50	1 10 150 500	0.2 0.5	1.1	150 500	12	100	50			12
TN3020	TO-237 (91)	140	80	7	10	30 40 40 30 15	100 1 10 150 500 1A	0.2 0.5	1.1	150 500	12	80	50			12
TN3053	TO-237 (91)	60	40	5	250	25 50	150 250	1.4	1.7	150	15	100	50			12
2N3566	TO-92 (92)	40	30	5	50	150 80	10 2	1.0		100	25	4	100 30			13
2N3567	TO-92 (92)	80	40	5	50	40 40	120 150	0.25		150	20	60	600 50			13
2N3568	TO-92 (92)	80	40	5	50	100 100	300 30	0.25		150	20	60	600 50			13
PN3566	TO-92 (92)	Same as 2N3566, see above for explanation														13
PN3567	TO-92 (92)	Same as 2N3567, see above for explanation														13
PN3568	TO-92 (92)	Same as 2N3568, see above for explanation														13
2N4237	TO-39	40	40		100 μA	15 30 30	1A 500 250	0.6 0.3	1.5	1A 500	100	1	100			14

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6501130 NATL SEMICOND, (DISCRETE)

28C 35416

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MEDIUM POWER (Continued)

Type No.	Case Style	V _{CEO} (V) Min	V _{CE} (V) Min	V _{CE0} (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	10	0.5	1.2*	500	30	60	10			14
MPS6561	TO-92 (92)	20	20	5	100	20	50	100	0.5	1.2*	350	30	60	10			14
NCBV14	TO-202 (55)	60	40	4	100	30	50	200	0.4		500	10	125	50			14
NSE871	TO-202 (51)	300			100	200	50	25				60	60	10			17
MPO3725	TO-39		40	6	500	40	35	200	0.45	0.8	1.0	10	250	50			25
TN3252	TO-237 (91)	60	30		500	40	30	150	0.3	1.0	150	12	200	50			25
TN3253	TO-237 (91)	75	40	5	500	60	25	150	0.35	1.0	150	12					25
TN3444	TO-237 (91)	80	50	5	500	60	20	60	0.35	1.0	150	12	150	50			25
TN3724	TO-237 (91)	50	30	6	1.7 μA	40	15	1A	0.6	1.3	500	12				6	25
TN3725	TO-237 (91)	80	50	6	1.7 μA	60	30	10	0.25	0.76	10	12				6	25
2N2657	TO-39	80	50	8	100	60	30	150	0.5	1.5	1A	150	20	200	15		34
2N2658	TO-39	100	80	8	100	60	40	120	3.0	2.5	5A		20	200	15		34
2N2890	TO-39	100	80	5	50 μA	60	25	2A	0.5	1.2	1A	70	30	200	15		34

NPN Transistors

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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 _{CE0} (V) Min	V _{CE0} (V) Min	V _{CE0} (V) Min	V _{BE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Min	V _{BE(SAT)} (V) Max	I _C (mA) Max	I _C (mA) Max	I _C (mA) Max	I _C (mA) Max	I _C (mA) Max	f _T (MHz) Min	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N2891	TO-39	100	80	5	60	0.5	1.2	1A	2A	300	50	100	100	100	30	200	15		(See page 1-27)	34
2N5148	TO-39		80		60	0.46	1.2	100	200	20	50	5	5	60	200					34
2N5150	TO-39		80		60	0.46	1.2	100	200	60	50	5	5	60	200					34
2N5336	TO-39		80		80	0.7	1.2	2A	5A	30	600	2	2	30	500	2200			(See page 1-27)	34
2N5338	TO-39		100		100	0.7	1.2	2A	5A	30	600	2	2	30	500	2200			(See page 1-27)	34
2N3440	TO-39		250		300	0.8	1.8	200	200	40	160	20	10							36
2N6591	TO-202 (55)		150	5	100	0.8	1.8	100	100	40	250	10	10							36
2N6592	TO-202 (55)		200	5	150	0.8	1.8	100	100	40	250	10	10							36
2N6593	TO-202 (55)		250	5	200	0.8	1.8	100	100	40	250	10	10							36
2N6720	TO-237 (91)		175	6	150	0.5	1.2	100	100	30	250	10	10	30	300	50				36
2N6721	TO-237 (91)		225	6	200	0.5	1.2	100	100	25	50	10	10	30	300	50				36
2N6722	TO-237 (91)		275	6	250	0.5	1.2	100	100	25	50	10	10	30	300	50				36
2N6723	TO-237 (91)		325	6	300	0.5	1.2	100	100	25	50	10	10	30	300	50				36

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28C 35418 D

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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) @ V _{CE(SAT)} (V) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	I _C (mA) @ 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	0.5		100								36
92PU36A	TO-237 (91)	225	200	6	1 μA	200	25	300	50 10	0.5		100								36
92PU36B	TO-237 (91)	275	250	6	1 μA	250	25	300	50 10	0.5		100								36
92PU36C	TO-237 (91)	325	300	6	1 μA	300	25	300	50 10	0.5		100								36
D40P1	TO-202 (55)		120		10 μA	200	20	2	10 10	1.0		100	15	10	80					36
D40P3	TO-202 (55)		180		10 μA	250	20	2	10 10	1.0	1.5	100	15	10	80					36
D40P5	TO-202 (55)		225		10 μA	300	20	2	10 10	1.0	1.5	100	15	10	80					36
NSD36	TO-202 (55)	175	150	6	1 μA	150	25	300	50 10	0.5		100	15	10	50					36
NSD36A	TO-202 (55)	225	200	6	1 μA	200	25	300	50 10	0.5		100	15	10	50					36
NSD36B	TO-202 (55)	275	250	6	1 μA	250	25	300	50 10	0.5		100	15	10	50					36
NSD36C	TO-202 (55)	325	300	6	1 μA	300	25	300	50 10	0.5		100	15	10	50					36
NSD3439	TO-202 (55)		350		20 μA	300	30	160	2 10	0.5	1.3	50	20	15	10					36

NPN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

28C 35419 D

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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 Max	IC @ VCE (mA) & VCE (V)	VCE(SAT) (V) Max	VBE(SAT) (V) Min Max	IC @ VBE(SAT) (mA) Max	Cob (pF) Max	ft (MHz)		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
													Min	Max				
NSD3440	TO-202 (55)		250		500 μA	200	30 40 160 20	2 10 20 10	0.5	1.3	50 10	20	15					36
TN3440	TO-237 (91)		250		20 μA	250	30 40 160 20	2 10 20 10	0.5	1.3	50 10		15					36
2N6714	TO-237 (91)	40	30	5	100	40	55 10 100 100 1A	10 1 100 1A	0.5		100 50		50 500					37
92PU01	TO-237 (90)		30	5	100	40	55 10 100 100 1A	10 1 100 1A	0.5		1A 50	30	100					37
92PU01A	TO-237 (90)		40	5	100	50	55 10 100 100 1A	10 1 100 1A	0.5		1A 50	30	100					37
D42C1	TO-202 (56)		30		1 μA	30	25 10 200 1A	200 1 1A 1	0.5	1.3	1A 30	30						37
D42C2	TO-202 (56)		30		1 μA	30	40 120 200 1A	200 1 1A 1	0.5	1.3	1A 30	30						37
D42C3	TO-202 (56)		30		1 μA	30	40 200 2A	200 1 1A 1	0.5	1.3	1A 30	30						37
D42C4	TO-202 (56)		45		1 μA	45	25 10 200 1A	200 1 1A 1	0.5	1.3	1A 30	30						37
D42C5	TO-202 (56)		45		1 μA	45	40 120 200 1A	200 1 1A 1	0.5	1.3	1A 30	30						37
D42C6	TO-202 (56)		45		1 μA	45	40 200 2A	200 1 1A 1	0.5	1.3	1A 30	30						37
NSD102	TO-202 (55)	60	45	5	100	60	40 10 50 150 40 500 25	10 5 100 5 500 1A 5	0.2	0.9	100 50	30	60					37
NSD103	TO-202 (55)	60	45	5	100	60	50 120 360 50 500 30	10 5 100 5 500 1A 5	0.2	1.2	100 50	30	60					37
NSDU01	TO-202 (55)	40	30	5	100	30	55 10 60 50	10 1 100 1A	0.5	1.2	1A 50	30	50					37
NSDU01A	TO-202 (55)	50	40	5	100	40	55 10 60 50	10 1 100 1A	0.5	1.2	1A 50	30	50					37

MEDIUM POWER (Continued)



6501130 NATL SEMICOND, (DISCRETE)

28C 35420

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Type No.	Case Style	VCBO (V) Min	VCER* (V) Min	VEBO (V) Min	ICES* (mA)		VCB (V)	hFE		VCE & VCE (V)	VCE(SAT) (V) & VBE(SAT) (V)		IC (mA)	C _{ob} (pF) Max	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					
NSDU02	TO-202 (55)	60	40	5	100	40	40	60	10	10	0.4	1.3	150	20	50	20					37
NSE180	TO-202 (55)		40		100	60	60	50	250	1	0.3		500	100	50						37
2N5449	TO-92 (97)	50	30	5	100	20	20	100	300	2	0.6	1.5	1.5A	50	5	50					38
2N6551	TO-202 (55)	60	60	5	100	40	40	60	10	1	0.5		500								38
2N6552	TO-202 (55)	80	80	5	100	60	60	60	250	1	1.0		1A		75	250	100				38
2N6705	TO-237 (90)	60	45	5	100	60	60	40	250	2	0.5		500		50	400	200				38
2N6706	TO-237 (90)	80	60	5	100	80	80	40	250	2	1.0		1A		50	400	200				38
2N6707	TO-237 (90)	100	80	5	100	100	100	40	250	2	1.0		1A		50	400	200				38
2N6715	TO-237 (91)	50	40	5	100	50	50	55	10	1	0.5		1A		50	400	50				38
2N6716	TO-237 (91)	60	60	5	100	40	40	80	250	1	0.35		250		50	500	50				38
92PE37A	TO-237 (90)		45		100	60	60	25	50	2	0.5		500	30	50	200					38
92PE37B	TO-237 (90)		60		100	80	80	40	500	2	1.0		1A		50	200					38
92PE37C	TO-237 (90)		80		100	100	100	25	500	2	1.0		1A	30	50	200					38

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NPN Transistors

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MEDIUM POWER (Continued)

NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

28C 35421 D



MEDIUM POWER (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{BE0} (V) Min	V _{ES} [*] (V) Min	V _{BO} (V) Min	I _{CB0} (mA) Max	I _{ES} [*] (mA) Max	I _C & V _{CE}		V _{CE(SAT)} & V _{BE(SAT)}		C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA) @	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
									hFE Min	hFE Max	I _C (mA)	V _{CE} (V)							
BD137-6	TO-126	60	60	5	100	30	100	40	150	2	0.5	500		50	50				38
BD137-10	TO-126	60	60	5	100	30	100	25	150	2	0.5	500		50	50				38
BD345	TO-126	60	60	5	500	60	500	40	250	1	0.4	200	15	50	50				38
D40D1	TO-202 (55)		30		100*	45	100*	50	150	100	0.5	500							38
D40D2	TO-202 (55)		30		100*	45	100*	20	360	100	0.5	500							38
D40D3	TO-202 (55)		30		100*	45	100*	10	100	100	1.5	500							38
D40D4	TO-202 (55)		46		100*	60	100*	50	150	100	0.5	500							38
D40D5	TO-202 (55)		45		100*	60	100*	120	360	100	0.5	500							38
D40D6	TO-202 (55)		45		100*	60	100*	50	150	100	1.0	500							38
D40D7	TO-202 (55)		60		100*	60	100*	50	150	100	1.0	500							38
D40D8	TO-202 (55)		60		100*	75	100*	10	360	100	1.0	500							38
D40D10	TO-202 (55)		75		100*	90	100*	50	150	100	1.0	500							38
D40D11	TO-202 (55)		75		100*	90	100*	10	360	100	1.0	500							38
D40D13	TO-202 (55)		75		100*	90	100*	50	150	100	1.0	500							38
D40D14	TO-202 (55)		75		100*	90	100*	120	360	100	1.0	500							38
D40E1	TO-202 (55)		30		100*	40	100*	50	100	2	1.0	1A							38
D40E5	TO-202 (55)		60		100*	70	100*	50	100	2	1.0	1A							38
D40E7	TO-202 (55)		80		100*	90	100*	50	100	2	1.0	1A							38
MJE721	TO-126 (58)		60					40	150	1	1.0	1.5A							38
								20	500	1	0.15	150							
								8	1A	1	0.4	500							

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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 _{CE0} (mA) Max	V _{CB} (V)	h _{FE} Min	I _C (mA) Max	V _{CE} (V) Max	V _{BE(SAT)} (V)		I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min	I _C (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
											Min	Max								
NSD6178	TO-202 (55)		75		500 μA	500 μA	80	30	50	2	0.5	1.2	500							38
NSD6179	TO-202 (55)		50		500 μA	500 μA	60	30	500	2	0.5	1.2	500							38
NSDU05	TO-202 (55)	60	60	4	100	100	60	80	50	1	0.35		250	30	50	200				38
NSE181	TO-202 (56)		60		100	100	80	50	250	1	0.3		500		50	100				38
2N6553	TO-202 (55)	100	100	5	100	100	80	60	10	1	1.0	1.5	1A		75	250	100			39
2N6717	TO-237 (91)	80	80	5	100	100	60	80	50	1	0.35		250		50	500	200			39
2N6718	TO-237 (91)	100	100	5	100	100	80	80	50	1	0.35		350		50	500	200			39
2N6731	TO-237 (91)	100	80	5	100	100	80	100	10	2	0.35		350		50	500	200			39
92PU05	TO-237 (90)		100		100	100	80	80	50	1	0.35		250	30	50	200				39
92PU06	TO-237 (90)		100		100	100	80	20	500	1	0.35		250	30	50	200				39
92PU07	TO-237 (91)		100		100	100	80	80	50	1	0.35		250	30	50	200				39
92PU100	TO-237 (91)	100	80		100	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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NPN Transistors

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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 @ (mA) & V _{CE} (V)	V _{CE(SAT)} V _{BE(SAT)} (V) & Min Max		I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz)		t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max		Max	Min			Max	Min				
NSD104	TO-202 (55)	100	80	7	100	100	20	50	10	5	0.2	100	30	60					39
NSD105	TO-202 (55)	100	80	7	100	100	10	150	10	5	0.5	500	30	60					39
NSD106	TO-202 (55)	140	100	7	100	140	20	150	10	5	0.2	100	30	60					39
NSDU06	TO-202 (55)	80	80	4	100	80	80	50	50	1	0.35	250	30	50					39
NSDU07	TO-202 (55)	100	100	4	100	100	80	50	50	1	0.35	250	30	50					39
2N3742	TO-39	300	300	7	200	200	10	200	3	10	0.75	10	6	60					48
2N4926	TO-39	200	200	7	100	100	10	200	3	10	1.0	30	6	60					48
2N4927	TO-39	250	250	7	100	150	10	150	3	10		20	6	30	300	20			48
2N6711	TO-237 (90)	160	160	7	50	100	15	10	1	10		10		40	200	10			48
2N6712	TO-237 (90)	250	250	7	50	200	15	200	1	10		10		40	200	10			48
2N6713	TO-237 (90)	300	300	7	50	250	15	10	1	10		10		40	200	10			48
2N6719	TO-237 (91)	300	300	7	100	200	25	40	1	10		10		30	300	15			48
2N6733	TO-237 (91)	200	200	6	100	160	25	200	1	10	2.0	20		50	200	10			48

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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 @ (mA) Max	VCE & VCE (V)	VCE(SAT) (V) Max	VBE(SAT) (V) Min	IC (mA) Max	Cob (pF) Max	fT (MHz) Min	fT (MHz) Max	IC (mA) Max	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N6734	TO-237 (91)	250	250	6	100	200	25	1	10	2.0		50		50	200	10				48
2N6735	TO-237 (91)	300	300	6	100	260	40	1	10			50		50	200	10				48
40321	TO-39		300		100	150	25	200	10			30	6	30	300	20				48
92PE487	TO-237 (90)	160	160	7	50	100	15	1	10	1.0		30	3							48
92PE488	TO-237 (90)	250	250	7	50	100	15	10	10	1.0		30	3							48
92PE489	TO-237 (90)	300	300	7	50	200	15	10	10	1.0		30	3							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	2.0	20	2.5	50	10					48
92PU392	TO-237 (91)	250	250	6	100	200	25	1	10	2.0	2.0	20	2.5	50	10					48
92PU393	TO-237 (91)	300	300	6	100	260	25	1	10	2.0	2.0	20	2.5	50	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	4	10					50	20					48
D40N3	TO-202 (55)		300		10 μA	300	30	90	10					50	20					48
D40N4	TO-202 (55)		300		10 μA	300	20	40	10					50	20					48
MPSA42	TO-92 (92)	300	300	6	100	200	25	1	10	0.5	0.9	20	3	50	10					48

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NPN Transistors

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NPN Transistors

MEDIUM POWER (Continued)



Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CS} [*] (mA) Max	V _{CB} (V) @ I _C	h _{FE} Min Max	I _C (mA) @ V _{CE}	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min	I _C (mA) @ V _{BE(SAT)}	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPSA43	TO-92 (92)	200	200	6	100	160	25 40 50	1 10 30	0.4	0.9	20	4	50	10				48
NSD131	TO-202 (55)	250	250	7	100	150	15 30	1 10 30	1.0	0.85	20	3						48
NSD132	TO-202 (55)	250	250	7	100	150	15 30 60	1 10 30	1.0	0.85	20	3						48
NSD133	TO-202 (55)	300	300	7	100	150	15 30	1 10 30	1.0	0.85	20	3						48
NSD134	TO-202 (55)	300	300	7	100	150	15 30 60	1 10 30	1.0	0.85	20	3						48
NSD135	TO-202 (55)	375	375	7	100	150	15 30	1 10 30	1.0	0.85	20	3						48
NSD457	TO-202 (55)	160	160	5	50	100	25	30	1.0		30							48
NSD458	TO-202 (55)	250	250	5	50	200	25	30	1.0		30							48
NSD459	TO-202 (55)	300	300	5	50	250	25	30	1.0		30							48
NSDU10	TO-202 (55)	300	300	8	200	200	25 40 40	1 10 30	1.5	0.8	20	3	60					48
NSE457	TO-202 (56)	160	160	5	50	100	25	30	1.0		30							48
NSE458	TO-202 (56)	250	250	5	50	200	25	30	1.0		30							48
NSE459	TO-202 (56)	300	300	5	50	250	25	30	1.0		30							48
PN7055	TO-92 (92)	220	220	7	100	150	20 40	1 10 30	1.0	0.85	20	3.5	50	15				48
SE7055	TO-39	220	220	7	100	150	20 40	1 10 30	1.0	0.85	20	3.5	50	15				48

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6501130 NATL SEMICOND, (DISCRETE)

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 @ I _C		t _{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 @ I _C		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		0.1	0.25	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	0.05	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	0.05	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	0.05	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	0.05	36

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NPN Transistors



NPN Transistors

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Type No.	Case Style	VCBO (V) Min	VCEO (V) Min	VEBO (V) Min	ICEX* ICB* 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 10	0.5	1.3	10	15	0.01	36
MJE3440	TO-126		250		20	250	30 40	0.002 10	0.5	1.3	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	1.5 2.0	30	50	0.05 0.1	37
MJE720	TO-126		40		100*	40	40 20 8	0.15 0.5 1	0.15 0.4 1.0	1.3				37
MJE181	TO-126		60		0.1	80	50 30 12	0.1 0.5 1.5	0.3 0.9 1.7	1.5 2.0	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	2.0	30	50	0.1	39
2N6099	TO-220		60		2 mA	50	20 5	4 10	2.5					4A
2N6101	TO-220		70		2 mA	60	20 5	4 10	2.5					4A
2N6103	TO-220		40		2 mA	40	15 5	8 16	2.5					4A
2N6486	TO-220		40		100	35	20	5	1.3			5	1	4A
2N6487	TO-220		60		100	55	20	5	1.3			5	1	4A
2N6488	TO-220		80		100	75	20	5	1.3			5	1	4A
MJE2801T	TO-220		60		1 mA	70	25	3	1.1					4A
MJE3055T	TO-220		60		1 mA	70	20 5	4 10	8					4A
TIP41	TO-220		40		400*	40	30 15	0.3 3	1.5					4A
TIP41A	TO-220		60		400*	60	30 15	0.3 3	1.5					4A
TIP41B	TO-220		80		400*	80	30 15	0.3 3	1.5					4A
TIP41C	TO-220		100		400*	100	30 15	0.3 3	1.5					4A

POWER (Continued)



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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	fr (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

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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	I _C & V _{CE} (V) @ I _C	V _{CE(SAT)} (V) Max V _{BE(SAT)} (V) Min	I _C (A) @ V _{CE(SAT)} & V _{BE(SAT)}	C _{ob} (pF) Max	f _T (MHz) Min f _T Max	I _C (A) @ f _T Max	Process No.
MJE5190J	TO-126	40	40	100	100	40	25 10	1.5 4	0.6	1.5				4E
MJE5191J	TO-126	60	60	100	100	60	25 10	1.5 4	0.6	1.5				4E
MJE5192J	TO-126	80	80	100	100	80	50 7	1.5 4	0.6	1.5				4E
2N6473	TO-220	100	100	100*	100*	100	15	1.5	1.2	1.5	250			4F
2N6474	TO-220	120	120	100*	100*	120	15	1.5	1.2	1.5	250			4F
MJE520	TO-220	30	30	100	100	30	25	1						4F
MJE521	TO-220	40	40	100	100	40	40	1						4F
TIP29	TO-220	40	40	200*	200*	40	40	0.2	0.7	1		3	0.2	4F
TIP29A	TO-220	60	60	200*	200*	60	40	0.2	0.7	1		3	0.2	4F
TIP29B	TO-220	80	80	200*	200*	80	40	0.2	0.7	1		3	0.2	4F
TIP29C	TO-220	40	40	200*	200*	40	25	1	0.7	1		3	0.2	4F
TIP31	TO-220	40	40	200*	200*	40	25	3	1.2	3		3	0.5	4F
TIP31A	TO-220	60	60	200*	200*	60	25	1	1.2	3		3	0.5	4F
TIP31B	TO-220	80	80	200*	200*	80	25	1	1.2	3		3	0.5	4F
TIP31C	TO-220	100	100	200*	200*	100	25	1	1.2	3		3	0.5	4F
TIP61	TO-220	40	40	200*	200*	40	40	0.05	0.7	0.5		3	0.05	4F
TIP61A	TO-220	60	60	200*	200*	60	40	0.05	0.7	0.5		3	0.05	4F
TIP61B	TO-220	80	80	200*	200*	80	40	0.05	0.7	0.5		3	0.05	4F
TIP61C	TO-220	100	100	200*	200*	100	40	0.05	0.7	0.5		3	0.05	4F
2N4921	TO-220	40	40	100	100	40	40	0.05	0.6	1	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		100	60	40	100	0.05 1	0.6	1.3	1	100	300		0.25	4H
2N4923	TO-220		80		100	80	40	100	0.05 1	0.6	1.3	1	100	300		0.25	4H
D44C1	TO-220		30		10*	40	25	10	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C2	TO-220		30		10*	40	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C3	TO-220		30		10*	40	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C4	TO-220		45		10*	55	25	10	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C5	TO-220		45		100	55	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C6	TO-220		45		10*	55	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C7	TO-220		60		100	75	25	10	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C8	TO-220		60		100	70	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C9	TO-220		60		10*	70	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C10	TO-220		80		100	90	25	10	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C11	TO-220		80		10*	90	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
D44C12	TO-220		80		10*	90	40	20	0.2 1	0.5	1.3	1	100	3		0.02	4P
MJE200	TO-220		25		0.1	40	70	45	0.5 1	0.3	0.5	0.5	80	65		0.1	4P
MJE220	TO-220		100		0.1	60	40	20	0.2 1	0.3	0.5	0.5	80	50		0.1	4P
MJE221	TO-220		40		0.1	60	40	20	0.2 1	0.3	0.5	0.5	50	50		0.1	4P
MJE222	TO-220		40		0.1	60	25	10	0.2 1	0.3	1.8	0.5	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) Max	h _{FE} Min Max	I _C & V _{CE} (A) (V)	V _{CE(SAT)} (V) Max V _{BE(SAT)} (V) Min	I _C @ (A)	C _{ob} (pF) Max	f _T (MHz) Min, Max	I _C @ (A)	Process No.
MJE223	TO-220		60		0.1	80	40 20	0.2 2	0.3 0.8	0.5 2	50	50	0.1	4P
MJE224	TO-220		60		0.1	80	40 20	0.2 1	0.3 0.6	0.5 1	50	50	0.1	4P
MJE225	TO-220		60		0.1	80	25 10	0.2 1	0.3	0.5	50	50	0.1	4P
MJE240	TO-220		80		0.1	80	40 15	0.2 2	0.3 0.8	0.5 2	50	40	0.1	4P
MJE241	TO-126		80		0.1	80	40	0.2	0.3	0.5	50	40	100	4P
MJE242	TO-126		80		0.1	80	20	1	0.6	1				
MJE243	TO-126		100		0.1	100	25	0.2	0.3	0.5	50	40	100	4P
MJE244	TO-126		100		0.1	100	10	1	2.5	2				
D44H1	TO-220		30		10	30	35 20	2 4	1.0 2.5	1.5 4				4Q
D44H2	TO-220		30		10	30	60 40	2 4	1.0	1.5				4Q
D44H4	TO-220		45		10	45	35 20	2 4	1.0	1.5				4Q
D44H5	TO-220		45		10	45	60 40	2 4	1.0	1.5				4Q
D44H7	TO-220		60		10	60	35 20	2 4	1.0	1.5				4Q
D44H8	TO-220		60		10	60	60 40	2 4	1.0	1.5				4Q
D44H10	TO-220		80		10	80	35 20	2 4	1.0	1.5				4Q
D44H11	TO-220		80		10	80	60 40	2 4	1.0	1.5				4Q

POWER (Continued)