

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 _{CB0} (V) Min	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	I _C (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
2N699	TO-39	120	60	5	60	60	40	120	150	10	5.0	1.3	150	20	50	50				12
2N1613	TO-5	75	35	7	60	60	20	500	10	10	1.5	1.3	150	25	60	50		12	1	12
2N1711	TO-5	75	35	7	60	60	40	300	10	10	1.5	1.3	150	25	70	50		8	1	12
2N2017	TO-39	60	60	8	30	30	20	200	10	10	2.0	200								12
2N2102	TO-39	120	65	7	60	60	10	0.1	0.1	10	0.5	1.1	150	15	60	50				12
2N2192	TO-39	60	40	5	30	30	15	0.1	0.1	10	0.35	1.3	150	10	50	50				12
2N2192A	TO-39	60	40	5	30	30	75	0.1	0.1	10	0.25	1.3	150	20	50	50				12
2N2193	TO-39	80	50	8	80	80	15	300	10	10	0.35	1.3	150	20	50	50				12

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

JPN 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	hFE Max	IC (mA) Max	VCE (V) Max	VBE(SAT) (V)		Cob (pF) Max	fT (MHz) Min	IC (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
											Min	Max							
2N2193A	TO-39	80	50	8	10	60	15	30	0.1	10	0.25	1.3	20	50	50				12
2N2195	TO-39	45	25	5	100	30	20	150	150	1	0.35	1.3	20	50	50				12
2N2195A	TO-39	45	25	5	100	30	20	150	150	1	0.25	1.3	20	50	50				12
2N2243	TO-39	120	80	7	10	60	15	30	0.1	10	0.35	1.3	15	50	50				12
2N2243A	TO-39	120	80	7	10	60	15	30	0.1	10	0.25	1.3	15	50	50				12
2N2270	TO-39	60	45	7	50	60	30	50	1	10	0.9	1.2	15	100	50				12
2N3019	TO-39	140	80	7	10	90	50	90	0.1	10	0.2	1.1	12	100	50				12
2N3020	TO-39	140	80	7	10	90	30	100	0.1	10	0.2	1.1	12	80	50				12
2N3053	TO-39	60	40	5	250	30	25	250	150	2.5	1.4	1.7	15	100	50				12
2N3107	TO-39	100	60	7	10	60	35	100	0.1	10	0.25	1.1	20	70	50	1000	7	5/6 (See page 1-27)	12
2N3108	TO-39	100	60	7	10	60	20	40	0.1	10	0.25	1.1	20	60	50	600	7	5/6 (See page 1-27)	12

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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 _{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	10*	35	300	0.1 10 150 10 500 10	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	120	0.1 10 150 10 500 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	50	30	120	10 10 150 10 500 10	0.5	1.2	150	12	60	50				12
2N3666	TO-39	120	80	10	50	25	300	10 10 150 10 500 10	1.2	1.8	500	12	60	50				12
2N3700	TO-18	140	80	7	10	50	10	1 10 10 10 300 10 500 10	1.2	1.8	500	12	100	200	5			12
2N3945	TO-39	70	50	8	40	25	250	10 10 150 10 500 10	0.5	1.2	150	12	60	50				12
2N4924	TO-39	100	100	5	100	20	500	10 10 150 10 500 10	1.8	1.8	500	10	10	500	20			12
2N4945	TO-92 (92)	80	60	5	50	25	10	1 10 30 10 150 10	0.25	1.1	150	10	60	900	50			12
40314	TO-39		40		250	70	350	50 4 100 1	1.4		150							12
MPSA05	TO-92 (92)		60	4	100	50	100	10 1 100 1	0.25		100		100	100				12
MPSA06	TO-92 (92)		80	4	100	50	100	10 1 100 1	0.25		100		100	100				12
PN3568	TO-92 (92)	80	60	5	50	40	120	30 1 150 1	0.25		150	20	60	600	50			12
TN1711	TO-237 (91)	75		7	10	20	0.01	10 10 10 10 150 10	1.5		150	25						12

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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	VBO (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.
							IC (mA) Max	VCE (V) Max										
TN2017	TO-237 (91)	60	60	8	10 μA	35	10	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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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 0.5	150 500	12	200	50				25
TN3253	TO-237 (91)	75	40	5	500	60	25 25 20	0.35	150	12		150				25
TN3444	TO-237 (91)	80	50	5	500	60	20 20	0.35	150	12	150	50				25
TN3724	TO-237 (91)	50	30	6	1.7 μA	40	15 30 40 35 25 30	0.25	10	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	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	70	30	200	15		3 (See page 1-27)	34

NPN Transistors

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NPN Transistors

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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 _{CB0} (mA) Max	I _{CB0} (mA) Max	h _{FE} @ I _C & V _{CE}		V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) @ I _C		C _{ob} (pF) Max	f _T (MHz)		t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
								Min	Max		Min	Max		Min	Max				
2N2891	TO-39	100	80	5	5	50 μA	60	50 300	10 10	0.5	1.2 1A	70	30 200	15				3	34
2N5148	TO-39		80			1 μA	60	20 90	5 5	0.46	1.2 100	70	60 200						34
2N5150	TO-39		80			1 μA	60	60 200	5 5	0.46	1.2 100	70	60 200						34
2N5336	TO-39		80			10 μA	80	30 120	2 2	0.7	1.2 2A		30 500	2200				7	34
2N5338	TO-39		100			10 μA	100	30 120	2 2	0.7	1.2 2A		30 500	2200				7	34
2N3440	TO-39		250			20 μA*	300	40 160	20 10	0.8									36
2N6591	TO-202 (55)	150	150	5	5	200	100	40 250	10 10	0.8									36
2N6592	TO-202 (55)	200	200	5	5	200	150	40 250	10 10	0.8									36
2N6593	TO-202 (55)	250	250	5	5	200	200	40 250	10 10	0.8									36
2N6720	TO-237 (91)	175	150	6	6	1 μA	150	25 50	10 10	0.5			30 300	50					36
2N6721	TO-237 (91)	225	200	6	6	1 μA	200	30 100	10 10	0.5			30 300	50					36
2N6722	TO-237 (91)	275	250	6	6	1 μA	250	30 100	10 10	0.5			30 300	50					36
2N6723	TO-237 (91)	325	300	6	6	1 μA	300	30 100	10 10	0.5			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} (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) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	I _C (mA) @ f _T 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 10 250 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	50 10 100 10 250 10 500 10	1.0		100	15	10	80					36
D40P3	TO-202 (55)		180		10 μA	250	20	2	50 10 100 10 250 10 500 10	1.0	1.5	100	15	10	80					36
D40P5	TO-202 (55)		225		10 μA	300	20	2	50 10 100 10 250 10 500 10	1.0	1.5	100	15	10	80					36
NSD36	TO-202 (55)	175	150	6	1 μA	150	25	300	50 10 100 10 250 10 500 10	0.5		100	15	10	50					36
NSD36A	TO-202 (55)	225	200	6	1 μA	200	25	300	50 10 100 10 250 10 500 10	0.5		100	15	10	50					36
NSD36B	TO-202 (55)	275	250	6	1 μA	250	25	300	50 10 100 10 250 10 500 10	0.5		100	15	10	50					36
NSD36C	TO-202 (55)	325	300	6	1 μA	300	25	300	50 10 100 10 250 10 500 10	0.5		100	15	10	50					36
NSD3439	TO-202 (55)		350		20 μA	300	30	160	2 10 20 10	0.5	1.3	50	20	15	10					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 Max	IC @ VCE (mA) Max	VCE(SAT) VBE(SAT) (V) & (V) Min Max		IC (mA) Max	Cob (pF) Max	ft (MHz) Min Max		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
									Max	Min			Min	Max				
NSD3440	TO-202 (55)		250		500 μA	200	30 40	2 10	1.3 50	0.5	10	20	15					36
TN3440	TO-237 (91)		250		20 μA	250	30 40	2 10	1.3 50	0.5	10		15					36
2N6714	TO-237 (91)	40	30	5	100	40	55 50	10 1A	100	0.5	50		50 500					37
92PU01	TO-237 (90)		30	5	100	40	55 60	10 100	1A	0.5	50	30	100					37
92PU01A	TO-237 (90)		40	5	100	50	55 60	10 100	1A	0.5	50	30	100					37
D42C1	TO-202 (56)		30		1 μA	30	25 10	200 1A	1A	0.5	1.3	30						37
D42C2	TO-202 (56)		30		1 μA	30	40 20	200 1A	1A	0.5	1.3	30						37
D42C3	TO-202 (56)		30		1 μA	30	40 20	200 2A	1A	0.5	1.3	30						37
D42C4	TO-202 (56)		45		1 μA	45	25 10	200 1A	1A	0.5	1.3	30						37
D42C5	TO-202 (56)		45		1 μA	45	40 20	200 1A	1A	0.5	1.3	30						37
D42C6	TO-202 (56)		45		1 μA	45	40 20	200 2A	1A	0.5	1.3	30						37
NSD102	TO-202 (55)	60	45	5	100	60	40 50	10 5	100	0.2	50	30	60					37
NSD103	TO-202 (55)	60	45	5	100	60	50 30	10 5	500	0.4	500							37
NSDU01	TO-202 (55)	40	30	5	100	30	55 60	10 100	1A	0.5	50	30	50					37
NSDU01A	TO-202 (55)	50	40	5	100	40	55 60	10 100	1A	0.5	50	30	50					37

MEDIUM POWER (Continued)



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Type No.	Case Style	VCBO (V) Min	VCER* VCE0 (V) Min	VEBO (V) Min	ICES* ICBO (mA) Max	VCB (V)	hFE		IC @ (mA)	VCE & VCE (V)	VCE(SAT) VBE(SAT) (V) & (V) Min Max		IC (mA)	Cob (pF) Max	fr (MHz)		IC (mA)	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max			Min	Max			Min	Max					
NSDU02	TO-202 (55)	60	40	5	100	40	60	50	10	10	0.4	1.3	150	20	50	20					37
NSE180	TO-202 (55)		40		100	60	50	250	100	1	0.3		500		50	100					37
2N5449	TO-92 (97)	50	30	5	100	20	100	300	50	2	0.6	1.5	1.5A		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	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	500	50	2	1.0		1A		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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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)								Max
BD137-6	TO-126	60	60	5	60	5	100	30	40	100	150	2	2	0.5	500	50				38
BD137-10	TO-126	60	60	5	60	5	100	30	25	160	150	2	2	0.5	500	50				38
BD345	TO-126	60	60	5	60	5	500	60	40	250	200	1	1	0.4	200	50				38
D40D1	TO-202 (55)		30		30		100*	45	50	150	100			0.5	500					38
D40D2	TO-202 (55)		30		30		100*	45	120	360	100			0.5	500					38
D40D3	TO-202 (55)		30		30		100*	45	290	100	100			1.5	500					38
D40D4	TO-202 (55)		46		46		100*	60	50	150	100			0.5	500					38
D40D5	TO-202 (55)		45		45		100*	60	120	360	100			0.5	500					38
D40D6	TO-202 (55)		45		45		100*	60	50	150	100			1.0	500					38
D40D7	TO-202 (55)		60		60		100*	60	50	150	100			1.0	500					38
D40D8	TO-202 (55)		60		60		100*	75	120	360	100	2	2	1.0	500					38
D40D10	TO-202 (55)		75		75		100*	90	50	150	100	2	2	1.0	500					38
D40D11	TO-202 (55)		75		75		100*	90	120	360	100	2	2	1.0	500					38
D40D13	TO-202 (55)		75		75		100*	90	50	150	100	2	2	1.0	500					38
D40D14	TO-202 (55)		75		75		100*	90	120	360	100	2	2	1.0	500					38
D40E1	TO-202 (55)		30		30		100*	40	50	100	100	2	2	1.0	1.3	1A				38
D40E5	TO-202 (55)		60		60		100*	70	50	100	100	2	2	1.0	1.3	1A				38
D40E7	TO-202 (55)		80		80		100*	90	50	100	100	2	2	1.0	1.3	1A				38
MJE721	TO-126 (58)		60		60				40	150	1	1	1	1.0	1.3	1.5A				38
									20	500	1	1	1	0.15	150					38
									8	1A	1	1	1	0.4	500					38

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6501130 NATL SEMICOND, (DISCRETE)

28C 35422 D



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) Min	h _{FE} Min	I _C (mA) Max	V _{CE} (V) Min	V _{BE(SAT)} (V) Min Max		I _C (mA) Max	C _{ob} (pF) Max	f _T (MHz) Min Max		t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
											V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) Min			f _T (MHz) Min	f _T (MHz) 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	0.9	1.5	1.5A		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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6501130 NATL SEMICOND, (DISCRETE)

28C 35423 D

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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	150	10	5	0.2	0.9	30	60	50				39
NSD105	TO-202 (55)	100	80	7	100	100	10	360	10	5	0.2	0.9	30	60	50				39
NSD106	TO-202 (55)	140	100	7	100	140	20	150	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	200	3	10	0.75	1.0	6	60	10				48
2N4926	TO-39	200	200	7	100	100	10	200	3	10	1.0	1.2	6	30	300	20			48
2N4927	TO-39	250	250	7	100	150	10	200	3	10			6	30	300	20			48
2N6711	TO-237 (90)	160	160	7	50	100	15	200	1	10				40	200	10			48
2N6712	TO-237 (90)	250	250	7	50	200	15	200	1	10				40	200	10			48
2N6713	TO-237 (90)	300	300	7	50	250	15	200	1	10				40	200	10			48
2N6719	TO-237 (91)	300	300	7	100	200	25	200	1	10				30	300	15			48
2N6733	TO-237 (91)	200	200	6	100	160	25	200	1	10	2.0			50	200	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 @ (mA)		VCE(SAT) (V) Max	VBE(SAT) (V) Min Max		IC (mA)	Cob (pF) Max	fT (MHz) Min Max	IC (mA) @	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
								Max	Min		Max	Min								
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			50		10					48

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NPN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

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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 _{CB0} (mA) Max	I _{CE0} (mA) Max	V _{CE} (V) & V _{CE} (V)	h _{FE} (Min) & h _{FE} (Max)	I _C (mA) & I _C (mA)	V _{BE(SAT)} (V) & V _{BE(SAT)} (V)	I _C (mA) & I _C (mA)	C _{ob} (pF) Max	f _T (MHz) Min & Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
MPSA43	TO-92 (92)	200	200	6	100	160	10	25	1	0.4	20	4	50				48
NSD131	TO-202 (55)	250	250	7	100	150	10	15	1	1.0	20	3					48
NSD132	TO-202 (55)	250	250	7	100	150	10	30	30	1.0	20	3					48
NSD133	TO-202 (55)	300	300	7	100	150	10	60	180	1.0	20	3					48
NSD134	TO-202 (55)	300	300	7	100	150	10	15	10	1.0	20	3					48
NSD135	TO-202 (55)	375	375	7	100	150	10	30	30	1.0	20	3					48
NSD457	TO-202 (55)	160	160	5	50	100	10	25	30	1.0	30						48
NSD458	TO-202 (55)	250	250	5	50	200	10	25	30	1.0	30						48
NSD459	TO-202 (55)	300	300	5	50	250	10	25	30	1.0	30						48
NSDU10	TO-202 (55)	300	300	8	200	200	15	25	1	1.5	20	3	60				48
NSE457	TO-202 (56)	160	160	5	50	100	10	40	30	1.0	30						48
NSE458	TO-202 (56)	250	250	5	50	200	10	40	30	1.0	30						48
NSE459	TO-202 (56)	300	300	5	50	250	10	25	30	1.0	30						48
PN7055	TO-92 (92)	220	220	7	100	150	20	20	1	1.0	20	3.5	50				48
SE7055	TO-39	220	220	7	100	150	20	40	30	1.0	20	3.5	50				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 (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	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	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		0.1					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	0.1	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	0.1	10				36
MJE340	TO-126		300		100	300	30	0.05 10 0.01 10	1.0	1.0		0.05					36
MJE341	TO-126		150		300	175	20	0.05 10 0.15 10	2.3	2.3	15	0.15					36
MJE344	TO-126		200		100	200	30	0.05 10	1.0	1.0	15	0.05					36

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NPN Transistors



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POWER (Continued)

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	0.05	10	15	0.01	36
MJE3440	TO-126		250		20	250	30 40	0.002 10	0.5	0.05	10	15	0.01	36
MJE180	TO-126		40		0.1	60	50 30 12	0.1 1 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 1 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 1 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) Max	Cob (pF) Max	fT (MHz) Min Max	IC (A) 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)} & 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	25 10	100	40	250 1.5 4	0.6	1.5				4E
MJE5191J	TO-126	60	60	25 10	100	60	250 1.5 4	0.6	1.5				4E
MJE5192J	TO-126	80	80	50 7	100	80	250 1.5 4	0.6	1.5				4E
2N6473	TO-220	100	100	15	100*	100	150 1.5 4	1.2	1.5	250			4F
2N6474	TO-220	120	120	15	100*	120	150 1.5 4	1.2	1.5	250			4F
MJE520	TO-220	30	30	25	100	30	1						4F
MJE521	TO-220	40	40	40	100	40	1						4F
TIP29	TO-220	40	40	40	200*	40	0.2 0.2 4	0.7	1		3	0.2	4F
TIP29A	TO-220	60	60	40	200*	60	0.2 0.2 4	0.7	1		3	0.2	4F
TIP29B	TO-220	80	80	40	200*	80	0.2 0.2 4	0.7	1		3	0.2	4F
TIP29C	TO-220	40	40	25 10	200*	40	1 1 4	0.7	1		3	0.2	4F
TIP31	TO-220	40	40	25 10	200*	40	3 3 4	1.2	3		3	0.5	4F
TIP31A	TO-220	60	60	25 10	200*	60	1 1 4	1.2	3		3	0.5	4F
TIP31B	TO-220	80	80	25 10	200*	80	3 3 4	1.2	3		3	0.5	4F
TIP31C	TO-220	100	100	25 10	200*	100	1 1 4	1.2	3		3	0.5	4F
TIP61	TO-220	40	40	40	200*	40	0.05 0.5 4	0.7	0.5		3	0.05	4F
TIP61A	TO-220	60	60	40	200*	60	0.05 0.5 4	0.7	0.5		3	0.05	4F
TIP61B	TO-220	80	80	40	200*	80	0.05 0.5 4	0.7	0.5		3	0.05	4F
TIP61C	TO-220	100	100	40	200*	100	0.05 0.5 4	0.7	0.5		3	0.05	4F
2N4921	TO-220	40	40	40 20 10	100	40	0.05 0.5 1	0.6	1.3 1	100	300	0.25	4H

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28C 35430 D

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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	0.6	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) 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)