

6501130 NATL SEMICOND, (DISCRETE)

28C 35412

D



MEDIUM POWER

Type No.	Case Style	V _{CEO} (V) Min	V _{CER} * V _{CEO} (V) Min	V _{BO} (V) Min	I _{CBO} * (nA) Max	V _{CB} (V) Min	h _{FE} @ I _C & V _{CE} (V)		V _{CE(SAT)} & V _{BE(SAT)} (V) @ I _C (mA)		C _{ob} (pF) Max	f _T (MHz)		t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max	Min	Max		Min	Max				
2N699	TO-39	120	60	5	2	60	40	120	150	10	20	50	50				12
2N1613	TO-5	75	35	7	10	60	20	500	150	10	25	60	50		12	1	12
2N1711	TO-5	75	35	7	10	60	20	500	150	10	25	70	50		8	1	12
2N2017	TO-39	60	60	8	10 μA	30	20	200	200	10							12
2N2102	TO-39	120	65	7	2	60	10	0.01	150	10	15	60	50				12
2N2192	TO-39	60	40	5	10	30	15	0.01	150	10	10	50	50				12
2N2192A	TO-39	60	40	5	10	30	15	0.01	150	10	20	50	50				12
2N2193	TO-39	80	50	8	10	80	15	0.01	150	10	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 = 15 mA. (4) I_C = 150 mA, V_{CC} = 30V, I_B¹ = I_B² = 50 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	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CB0} (nA) Max	I _{CE0} (nA) Max	V _{CB} (V) @ I _C & V _{CE}	h _{FE} Min	I _C (mA) @ I _C & V _{CE}	V _{CE(SAT)} (V) Max	V _{BE(SAT)} (V) & Min		I _C (mA) @ I _C & V _{CE}	C _{ob} (pF) Max	f _T (MHz) Min		I _C (mA) @ I _C & V _{CE}	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.	
											Max	Min			Max	Min						Max
2N2193A	TO-39	80	50	8	10	10	60	15	0.1	0.25	1.3	150	20	50	50	50	50					12
2N2195	TO-39	45	25	5	100	30	30	20	150	0.35	1.3	150	20	50	50	50	50					12
2N2195A	TO-39	45	25	5	100	30	30	20	150	0.25	1.3	150	20	50	50	50	50					12
2N2243	TO-39	120	80	7	10	10	60	15	0.1	0.35	1.3	150	15	50	50	50	50					12
2N2243A	TO-39	120	80	7	10	10	60	15	0.1	0.25	1.3	150	15	50	50	50	50					12
2N2270	TO-39	60	45	7	50	60	60	30	1	0.9	1.2	150	15	100	100	50	50					12
2N3019	TO-39	140	80	7	10	10	90	50	0.1	0.2	1.1	150	12	100	100	50	50					12
2N3020	TO-39	140	80	7	10	10	90	30	100	0.2	1.1	150	12	80	80	50	50					12
2N3053	TO-39	60	40	5	250	30	30	25	150	1.4	1.7	150	15	100	100	50	50					12
2N3107	TO-39	100	60	7	10	10	60	35	0.1	0.25	1.1	150	20	70	70	50	50	1000	7	5/6 (See page 1-27)		12
2N3108	TO-39	100	60	7	10	10	60	20	0.1	0.25	1.1	150	20	60	60	50	50	600	7	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 _{CER} * V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CB0} (mA) Max	V _{CE} & V _{CE} (V)	h _{FE} Min	I _C (mA) Max	V _{CE(SAT)} & V _{BE(SAT)} (V) Max	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*	10	35	0.1	0.25	150	25	70	50	1000	7	5/6 (See page 1-27)	12
2N3110	TO-39	80	40	7	10*	10	40	500	1.0	1A	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	10	30	10	0.5	150	12	60	50				12
2N3666	TO-39	120	80	10	50	10	70	10	0.5	150	12	60	50				12
2N3700	TO-18	140	80	7	10	10	50	500	1.2	500	12	100	5				12
2N3945	TO-39	70	50	8	40	10	25	10	0.5	150	12	60	50				12
2N4924	TO-39	100	100	5	100	10	40	500	1.8	500	10	10	20				12
2N4945	TO-92 (92)	80	60	5	50	1	40	150	0.4	150		60	50				12
40314	TO-39		40		250	4	70	350	1.4	150							12
MPSA05	TO-92 (92)		60	4	100	1	50	100	0.25	100		100	100				12
MPSA06	TO-92 (92)		80	4	100	1	50	100	0.25	100		100	100				12
PN3568	TO-92 (92)	80	60	5	50	1	40	150	0.25	150	20	60	50				12
TN1711	TO-237 (91)	75		7	10	10	20	0.01	1.5	150	25						12

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PNP Transistors

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6501130 NATL SEMICOND, (DISCRETE)

28C 35415 D

NPN Transistors

MEDIUM POWER (Continued)



Type No.	Case Style	VCBO (V) Min	V _{CE} * V _{CEO} (V) Min	V _{EB0} (V) Min	I _{CS} * I _{CB0} (mA) Max	V _{CB} (V) Max	hFE		I _C @ V _{CE} & V _{CE} (mA) & (V)	V _{CE(SAT)} & V _{BE(SAT)} (V) & (V)		I _C @ V _{CE} (mA)	C _{ob} (pF) Max	f _T (MHz)		I _C (mA)	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.	
							Min	Max		Max	Min			Max	Min						Max
TN2017	TO-237 (91)	60	60	8	10 μA	30	35	10	10	10										12	
TN2102	TO-237 (91)	120	65	7	10	60	20	0.01	10	0.5	1.1	150	15	60		50				12	
TN2270	TO-237 (91)	60	45	7	50	60	30	1	10	0.9	1.2	150	15	100		50				12	
TN3019	TO-237 (91)	140	80	7	10	90	50	1	10	0.2	1.1	150	12	100		50				12	
TN3020	TO-237 (91)	140	80	7	10	90	30	100	1	0.2	1.1	150	12	80		50				12	
TN3053	TO-237 (91)	60	40	5	250	30	25	150	2.5	1.4	1.7	150	15	100		50				12	
2N3566	TO-92 (92)	40	30	5	50	20	150	600	10	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	
2N3569	TO-92 (92)	80	40	5	50	40	100	300	150	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	50	15	1A	1	0.6	1.5	1A	100	1	100	100					14

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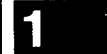
28C 35416 D

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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	V _{CB} (V)	h _{FE}		I _C & V _{CE}		V _{CE(SAT)} (V) & V _{BE(SAT)} (V) @ I _C (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				
MPS6560	TO-92 (92)	25	25	5	100	20	35	10	1	1	0.5	1.2*	30	60	10				14
MPS6561	TO-92 (92)	20	20	5	100	20	35	10	1	1	0.5	1.2*	30	60	10				14
NCBV14	TO-202 (55)	60	40	4	100	30	75	50	1	1	0.4		10	125	50				14
NSE871	TO-202 (51)	300			100	200	50	25	20					60	10				17
MPO3725	TO-39		40	6	500	40	35	200	1	1	0.45	0.8	10	250	50				25
TN3252	TO-237 (91)	60	30		500	40	30	90	1	1	0.3	1.0	12	200	50				25
TN3253	TO-237 (91)	75	40	5	500	60	25	150	1	1	0.35	1.0	12						25
TN3444	TO-237 (91)	80	50	5	500	60	20	60	1	1	0.35	1.0	12	150	50				25
TN3724	TO-237 (91)	50	30	6	1.7 μA	40	30	10	1	1	0.25	0.76	10	60		60		6 (See page 1-27)	25
TN3725	TO-237 (91)	80	50	6	1.7 μA	60	30	150	1	1	0.25	0.76	10	60		60		6 (See page 1-27)	25
2N2657	TO-39	80	50	8	100	60	15	5A	6	6	0.5	1.5	150	20	200	15		2 (See page 1-27)	34
2N2658	TO-39	100	80	8	100	60	15	5A	6	6	0.5	1.5	150	20	200	15		2 (See page 1-27)	34
2N2890	TO-39	100	80	5	50 μA	60	25	2A	5	5	0.5	1.2	70	30	200	15		3 (See page 1-27)	34

NPN Transistors



6501130 NATL SEMICOND, (DISCRETE)

28C 35417 D

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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 (nA) Max	VCB (V)	hFE		IC & VCE		VCE(SAT) & VBE(SAT) (V)		IC (mA)	Cob (pF) Max	fT (MHz)		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max	Min	Max	Min	Max			Min	Max				
2N2891	TO-39	100	80	5	50 μA	60	30 300	50 100	10	0.5	1.2	1A	200	70	30	200	15		3 (See page 1-27)	34
2N5148	TO-39		80		1 μA	60	20 30 15	50 100 200	5 5 5	0.46	1.2	100 200	70		60	200				34
2N5150	TO-39		80		1 μA	60	60 70 30 15	50 100 200 300	5 5 5 5	0.46	1.2	100 3A	70		60	200				34
2N5336	TO-39		80		10 μA	80	30 30 20	600 120 600	2 2 2	0.7	1.2	2A 5A			30	500	2200		7 (See page 1-27)	34
2N5338	TO-39		100		10 μA	100	30 20	600 120 600	2 2 2	0.7	1.2	2A 5A			30	500	2200		7 (See page 1-27)	34
2N3440	TO-39		250		20 μA*	300	40 40	160 250	10 10			200								36
2N6591	TO-202 (55)	150	150	5	200	100	40 40	200 200	10 10	0.8		200								36
2N6592	TO-202 (55)	200	200	5	200	150	30 40	250 200	10 10	0.8		200								36
2N6593	TO-202 (55)	250	250	5	200	200	30 30	250 200	10 10	0.8		200								36
2N6720	TO-237 (91)	175	150	6	1 μA	150	25 30 15	50 100 250	10 10 10	0.5		100			30	300 50				36
2N6721	TO-237 (91)	225	200	6	1 μA	200	25 30 15	50 100 250	10 10 10	0.5		100			30	300 50				36
2N6722	TO-237 (91)	275	250	6	1 μA	250	25 30 15	50 100 250	10 10 10	0.5		100			30	300 50				36
2N6723	TO-237 (91)	325	300	6	1 μA	300	25 30 15	50 100 250	10 10 10	0.5		100			30	300 50				36

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28C 35418 D

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MEDIUM POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (nA) Max	VCB @ (V) Max	hFE Min	IC @ (mA) Max	VCE (V) Max	VCE(SAT) & VBE(SAT) (V)		IC (mA) Max	Cob (pF) Max	fT (MHz) Min	IC (mA) Max	toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
										Max	Min								
92PU36	TO-237 (91)	175	150	6	1 μA	150	25	50	10	0.5		100							36
92PU36A	TO-237 (91)	225	200	6	1 μA	200	25	50	10	0.5		100							36
92PU36B	TO-237 (91)	275	250	6	1 μA	250	25	50	10	0.5		100							36
92PU36C	TO-237 (91)	325	300	6	1 μA	300	25	50	10	0.5		100							36
D40P1	TO-202 (55)		120		10 μA	200	20	2	10	1.0		100	15	10	80				36
D40P3	TO-202 (55)		180		10 μA	250	20	2	10	1.0	1.5	100	15	10	80				36
D40P5	TO-202 (55)		225		10 μA	300	20	2	10	1.0	1.5	100	15	10	80				36
NSD36	TO-202 (55)	175	150	6	1 μA	150	25	50	10	0.5		100	15	10	50				36
NSD36A	TO-202 (55)	225	200	6	1 μA	200	25	50	10	0.5		100	15	10	50				36
NSD36B	TO-202 (55)	275	250	6	1 μA	250	25	50	10	0.5		100	15	10	50				36
NSD36C	TO-202 (55)	325	300	6	1 μA	300	25	50	10	0.5		100	15	10	50				36
NSD3439	TO-202 (55)		350		20 μA	300	30	2	10	0.5	1.3	50	20	15	10				36

NPN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

28C 35419 D

T-29-01

NPN Transistors

MEDIUM POWER (Continued)



Type No.	Case Style	V _{CB0} (V) Min	V _{CER} * V _{CEO} (V) Min	V _{BE0} (V) Min	I _{CS} * I _{CB0} (mA) Max	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) @ V _{CE(SAT)} & V _{BE(SAT)}	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	I _C (mA) @ f _T	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
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	160	2	10	0.5	1.3	50		15		10				36
2N6714	TO-237 (91)	40	30	5	100	40	55	250	10	1	0.5		100		50	500	50				37
92PU01	TO-237 (90)		30	5	100	40	55	100	10	1	0.5		1A	30	100		50				37
92PU01A	TO-237 (90)		40	5	100	50	55	100	10	1	0.5		1A	30	100		50				37
D42C1	TO-202 (56)		30		1 μA	30	25	200	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	200	1	0.5	1.3	1A	30							37
D42C4	TO-202 (56)		45		1 μA	45	25	200	200	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	200	1	0.5	1.3	1A	30							37
NSD102	TO-202 (55)	60	45	5	100	60	40	150	10	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				50				37
NSDU01	TO-202 (55)	40	30	5	100	30	55	100	10	1	0.5	1.2	1A	30	50		50				37
NSDU01A	TO-202 (55)	50	40	5	100	40	55	100	10	1	0.5	1.2	1A	30	50		50				37

6501130 NATL SEMICOND, (DISCRETE)

28C 35420

D

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 @ (mA) & VCE (V)	VCE(SAT) (V) Max	VBE(SAT) (V) Min Max	IC @ (mA) Max	Cob (pF) Max	fT (MHz) Min Max	IC (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
NSDU02	TO-202 (55)	60	40	5	100	60 300 30	10 10 10 150 10 500 10	0.4	1.3	150	20	50	20				37
NSE180	TO-202 (55)		40		100	50 250 30	100 1 500 1 1A 1.5	0.3	1.5	500		50	100				37
2N5449	TO-92 (97)	50	30	5	100	100 300 12	50 2 1A 1.5	0.6	1.5	100		5	50				38
2N6551	TO-202 (55)	60	60	5	100	60 80 60 25	10 50 250 500 1	0.5		500							38
2N6552	TO-202 (55)	80	80	5	100	60 80 60 25	10 50 250 500 1	1.0		1A		75	250 100				38
2N6705	TO-237 (90)	60	45	5	100	40 40 25	50 2 250 500 2	0.5		500		50	400 200				38
2N6706	TO-237 (90)	80	60	5	100	40 40 25	50 2 250 500 2	0.5		500		50	400 200				38
2N6707	TO-237 (90)	100	80	5	100	40 40 25	50 2 250 500 2	0.5		500		50	400 200				38
2N6715	TO-237 (91)	50	40	5	100	55 60 50	10 1 100 1A 1	0.5		1A		50	400 50				38
2N6716	TO-237 (91)	60	60	5	100	80 50 20	50 1 250 500 1	0.35		250		50	500 50				38
92PE37A	TO-237 (90)		45		100	25 40 40	50 2 250 500 2	0.5		500	30	50	200				38
92PE37B	TO-237 (90)		60		100	25 40 40	50 2 250 500 2	0.5		500	30	50	200				38
92PE37C	TO-237 (90)		80		100	25 40 40	50 2 250 500 2	0.5		500	30	50	200				38

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NPN Transistors



NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

28C 35421 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		IC & VCE		VCE(SAT) & VBE(SAT) (V)		IC (mA)	Cob (pF) Max	fT (MHz)		toff (ns) Max	NF (dB) Max	Test Conditions	Process No.
							Min	Max	Min	Max	Min	Max			Min	Max				
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	63	160	150	2	0.5	500		50	50				38	
BD345	TO-126	60	60	5	500	60	60	40	250	1	0.4	200	15	50	50				38	
D40D1	TO-202 (55)		30		100*	45	50	150	100		0.5	1.5	500						38	
D40D2	TO-202 (55)		30		100*	45	120	360	100		0.5	1.5	500						38	
D40D3	TO-202 (55)		30		100*	45	290	100	1A			1.5	500						38	
D40D4	TO-202 (55)		46		100*	60	50	150	100		0.5	1.5	500						38	
D40D5	TO-202 (55)		45		100*	60	120	360	100		0.5	1.5	500						38	
D40D6	TO-202 (55)		45		100*	60	50	150	100		1.0	1.5	500						38	
D40D7	TO-202 (55)		60		100*	60	50	150	100		1.0	1.5	500						38	
D40D8	TO-202 (55)		60		100*	75	120	360	100	2	1.0	1.5	500						38	
D40D10	TO-202 (55)		75		100*	90	50	150	100	2	1.0	1.5	500						38	
D40D11	TO-202 (55)		75		100*	90	120	360	100	2	1.0	1.5	500						38	
D40D13	TO-202 (55)		75		100*	90	50	150	100	2	1.0	1.5	500						38	
D40D14	TO-202 (55)		75		100*	90	120	360	100	2	1.0	1.5	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								
							8	1A	1A	1	0.4	500								

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6501130 NATL SEMICOND, (DISCRETE)

28C 35422 D

MEDIUM POWER (Continued)

Type No.	Case Style	V _{CB0} (V) Min	V _{CER} [*] V _{CEO} (V) Min	V _{EBO} (V) Min	ICES [*] I _{CB0} (mA) Max	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) Max	C _{ob} (pF) Max	f _T (MHz) Min	f _T (MHz) Max	I _C (mA)	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
NSD6178	TO-202 (55)		75		500 μA	80	30	40	50	2	0.5	1.2	500								38
NSD6179	TO-202 (55)		50		500 μA	60	30	40	500	2	0.5	1.2	500								38
NSDU05	TO-202 (55)	60	60	4	100	60	80	50	50	1	0.35		250	30	50		200				38
NSE181	TO-202 (56)		60		100	80	50	250	500	1	0.3		500		50		100				38
2N6553	TO-202 (55)	100	100	5	100	80	60	80	10	1	1.0		1A		75	250	100				39
2N6717	TO-237 (91)	80	80	5	100	60	80	250	250	1	0.35		250		50	500	200				39
2N6718	TO-237 (91)	100	100	5	100	80	80	250	50	1	0.35		350		50	500	200				39
2N6731	TO-237 (91)	100	80	5	100	80	100	300	10	2	0.35		350		50	500	200				39
92PU05	TO-237 (90)		100		100	80	50	250	250	1	0.35		250	30	50		200				39
92PU06	TO-237 (90)		100		100	80	20	500	500	1	0.35		250	30	50		200				39
92PU07	TO-237 (91)		100		100	80	80	50	50	1	0.35		250	30	50		200				39
92PU100	TO-237 (91)	100	80		100	80	20	150	100	5	0.35		350	20	50		100				39
MJE722	TO-126 (58)		80				40	20	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	VCBO (V) Min	VCER* VCEO (V) Min	VEBO (V) Min	ICES* ICBO (mA) Max	VCE & VCB (V)	hFE Min	hFE Max	IC @ (mA)	VCE(SAT) & VBE(SAT) (V) Min Max	IC @ (mA) Min Max	Cob (pF) Max	fT (MHz) Min Max	IC (mA) Min Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
NSD104	TO-202 (55)	100	80	7	100	100	20	150	10	0.2	100	30	60	50				39
NSD105	TO-202 (55)	100	80	7	100	100	10	360	10	0.2	100	30	60	50				39
NSD106	TO-202 (55)	140	100	7	100	140	20	150	10	0.2	100	30	60	50				39
NSDU06	TO-202 (55)	80	80	4	100	80	80	50	50	0.35	250	30	50	200				39
NSDU07	TO-202 (55)	100	100	4	100	100	80	250	50	0.35	250	30	50	200				39
2N3742	TO-39	300	300	7	200	200	15	200	3	0.75	10	6	60	10				48
2N4926	TO-39	200	200	7	100	100	10	200	3	1.0	30	6	30	20				48
2N4927	TO-39	250	250	7	100	150	10	200	3			6	30	20				48
2N6711	TO-237 (90)	160	160	7	50	100	15	200	1				40	10				48
2N6712	TO-237 (90)	250	250	7	50	200	15	200	1				40	10				48
2N6713	TO-237 (90)	300	300	7	50	250	15	200	1				40	10				48
2N6719	TO-237 (91)	300	300	7	100	200	25	200	1				30	15				48
2N6733	TO-237 (91)	200	200	6	100	160	25	200	1	2.0	20		50	10				48

6501130 NATL SEMICOND, (DISCRETE)

28C 35424 D

MEDIUM POWER (Continued)



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

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NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

28C 35425 D

MEDIUM POWER (Continued)



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

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6501130 NATL SEMICOND, (DISCRETE)

28C 35426 D
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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	hFE @ IC & VCE Min Max	VCESAT (V) & VCE Max	VCESAT (V) & IC Min Max	Cob (pF) Max	ft (MHz) Min Max	IC (mA) Max	t _{off} (ns) Max	NF (dB) Max	Test Conditions	Process No.
SE7056	TO-39	300	300	7	100	20 40 40	1.0	0.85 20	3.5	50	15				48
SV7056	TO-202 (55)	300	300	7	100	20 40 40	1.0	0.85 20		50	15				48
TN3742	TO-237 (91)	300	300	7	200	10 15 20	0.75	1.0 10 1.2 30	6	30	10				48

POWER

Type No.	Case Style	VCBO (V) Min	VCEO (V) Min	VEBO (V) Min	ICEX* IC _{EB} † ICBO (μA) Max	hFE @ IC & VCE Min Max	VCESAT (V) & VCE Max	VCESAT (V) & IC Min Max	Cob (pF) Max	ft (MHz) Min Max	IC (A) Max	IC (A) Max	Process No.
2N5655	TO-126		250		10	25 30 15	1.0 10 2.5 10 10.0	1.0 0.1 2.5 10.0		0.1 0.25 0.5			36
2N5656	TO-126		300		10	25 30 15	1.0 10 2.5 10 10.0	1.0 0.1 2.5 10.0		0.1 0.25 0.5	25	0.05	36
2N5657	TO-126		350		10	25 30 15	1.0 10 2.5 10 10.0	1.0 0.1 2.5 10.0		0.1 0.25 0.5	25	0.05	36
MJE340	TO-126		300		100	20 25 20	1.0 10 2.3	1.0 0.05 15		15	0.05		36
MJE341	TO-126		150		300	20 20 30	1.0 10 1.0	1.0 0.05 15		15	0.05		36
MJE344	TO-126		200		100	20 20 30	1.0 10 1.0	1.0 0.05 15		15	0.05		36

NPN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

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POWER (Continued)



Type No.	Case Style	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{ES0} (V) Min	I _{CEX} [†] I _{CEB} [†] I _{CB0} (μA) Max	V _{CB} (V)	h _{FE} Min Max	I _C (A) @ V _{CE} (V)	V _{CE(SAT)} (V) Max & V _{BE(SAT)} (V) Min	I _C (A) @ V _{CE(SAT)} (V) Min	C _{ob} (pF) Max	f _T (MHz) Min Max	I _C (A) @ V _{CE(SAT)} (V) Min	Process No.
MJE3439	TO-126		360		20	360	30 40	0.002 0.02	0.5 1.3	0.05 0.05	10	15	0.01	36
MJE3440	TO-126		250		20	250	30 40	0.002 0.02	0.5 1.3	0.05 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 0.1	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	4 10	2.5	10				4A
2N6101	TO-220		70		2 mA	60	20 5	5 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 5	4 10	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	V _{CB0} (V) Min	V _{CE0} (V) Min	V _{EB0} (V) Min	I _{CEX} [†] I _{CB0} (μA) Max	V _{CB} (V) Max	I _{FE} Min I _{CE} & I _{VCE} (A) Max	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) Max	Process No.
2N5190	TO-126	40	40		100	40	25 10	0.6 1.4	1.5 4		2	1	4E
2N5191	TO-126	60	60		100	60	25	0.6 1.4	1.5 4		2	1	4E
2N5192	TO-126	80	80		100	80	20 7	0.6 1.4	1.5 4		2	1	4E
2N5294	TO-220	70	70		500 [†]	50 (100Ω)	30	1	0.5		2	0.2	4E
2N5296	TO-220	40	40		100	35	30	1.0	1		2	0.2	4E
2N5298	TO-220	60	60		500 [†]	50 (100Ω)	20	1.0	1.5		2	0.2	4E
2N5490	TO-220	40	40		5 mA*	55	20 5	2.0	0.5				4E
2N5492	TO-220	55	55		1 mA*	70	20	2.0	0.2				4E
2N5494	TO-220	40	40		1 mA*	55	20 5	2.0	0.5				4E
2N5496	TO-220	70	70		1 mA*	85	20	2.0	7				4E
2N6121	TO-220	45	45		100	45	25 10	0.6 1.4	1.5 4		2.5	1	4E
2N6122	TO-220	60	60		100	60	25	0.6 1.4	1.5 4		2.5	1	4E
2N6123	TO-220	80	80		100	80	20 7	0.6 1.4	1.5 4		2.5	1	4E
2N6129	TO-220	40	40		100	40	20	1.4	7				4E
2N6130	TO-220	60	60		100	60	20	1.4	7				4E
2N6131	TO-220	80	80		100	80	20	2.0	7				4E
2N6288	TO-220	30	30		100*	37.5	30	1.0 2.0	3 6.5	250	4	0.5	4E
2N6290	TO-220	50	50		100*	56	30	1.0 2.0	2.5 6.5	250	4	0.5	4E
2N6292	TO-220	70	70		100*	75	30 5	1.0 2.0	2 6.5	250	4	0.5	4E

NPN Transistors

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6501130 NATL SEMICOND, (DISCRETE)

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NPN Transistors



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) @	h _{FE} Min Max	I _C (A) & V _{CE} (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.
MJES190J	TO-126		40		100	40	25 10	1.5 4	0.6	1.5				4E
MJES191J	TO-126		60		100	60	25 10	1.5 4	0.6	1.5				4E
MJES192J	TO-126		80		100	80	50 7	1.5 4	0.6	1.5				4E
2N6473	TO-220		100		100*	100	15	1.5	1.2	1.5	250			4F
2N6474	TO-220		120		100*	120	15	1.5	1.2	1.5	250			4F
MJES20	TO-220		30		100	30	25	1						4F
MJES21	TO-220		40		100	40	40	1						4F
TIP29	TO-220		40		200*	40	40	0.2	0.7	1		3	0.2	4F
TIP29A	TO-220		60		200*	60	15	1	0.7	1		3	0.2	4F
TIP29B	TO-220		80		200*	80	15	1	0.7	1		3	0.2	4F
TIP29C	TO-220		40		200*	40	15	1	0.7	1		3	0.2	4F
TIP31	TO-220		40		200*	40	10	3	1.2	3		3	0.5	4F
TIP31A	TO-220		60		200*	60	10	3	1.2	3		3	0.5	4F
TIP31B	TO-220		80		200*	80	10	3	1.2	3		3	0.5	4F
TIP31C	TO-220		100		200*	100	10	3	1.2	3		3	0.5	4F
TIP61	TO-220		40		200*	40	40	0.05	0.7	0.5		3	0.05	4F
TIP61A	TO-220		60		200*	60	15	0.5	0.7	0.5		3	0.05	4F
TIP61B	TO-220		80		200*	80	40	0.05	0.7	0.5		3	0.05	4F
TIP61C	TO-220		100		200*	100	40	0.05	0.7	0.5		3	0.05	4F
2N4921	TO-220		40		100	40	40 20 10	0.05 0.5 1	0.6	1.3	100	300	0.25	4H

6501130 NATL SEMICOND, (DISCRETE)

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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	IC (A) & VCE (V)	VCE(SAT) (V) Max	VBE(SAT) (V) Min	IC (A) Max	Cob (pF) Max	fT (MHz) Min	IC (A) Max	Process No.
2N4922	TO-220		60		100	60	40 20 10	0.05 0.5 1	0.6	1.3	1	100	300	0.25	4H
2N4923	TO-220		80		100	80	40 20 10	0.05 0.5 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 10	0.5 2 5	0.3 0.75 1.8	0.5 2 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 0.6	0.5 1.0	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 2	50	50	0.1	4P

NPN Transistors



NPN Transistors

6501130 NATL SEMICOND, (DISCRETE)

28C 35431 D

T-33-01

POWER (Continued)

Type No.	Case Style	VCBO (V) Min	VCEO (V) Min	VEBO (V) Min	ICEX ⁺		VCB (V)	hFE		VCE(SAT) (V) Max	VBE(SAT) (V) Min	IC (A) @	C _{ob} (pF) Max	f _T (MHz) Min	IC (A) @	Process No.
					ICBO (μA) Max	IC (A) @		Min	Max							
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	0.8	0.5	50	40	100	4P
MJE242	TO-126		80		0.1	80	20	1	1	1	0.6	1	40	40	100	4P
MJE243	TO-126		100		0.1	100	25	20	0.2	1	2.5	0.5	50	40	100	4P
MJE244	TO-126		100		0.1	100	10	40	0.2	1	0.3	0.5	50	40	100	4P
D44H1	TO-220		30		10	30	35	20	2	1	1.0	1.5				4Q
D44H2	TO-220		30		10	30	60	40	2	1	1.0	1.5				4Q
D44H4	TO-220		45		10	45	35	20	2	1	1.0	1.5				4Q
D44H5	TO-220		45		10	45	60	40	2	1	1.0	1.5				4Q
D44H7	TO-220		60		10	60	35	20	2	1	1.0	1.5				4Q
D44H8	TO-220		60		10	60	60	40	2	1	1.0	1.5				4Q
D44H10	TO-220		80		10	80	35	20	2	1	1.0	1.5				4Q
D44H11	TO-220		80		10	80	60	40	2	1	1.0	1.5				4Q