

## Small-signal Transistors and Diodes

## Selection guide

## HIGH-SPEED, SWITCHING AND GENERAL-PURPOSE DIODES

TYPE NUMBER	PACKAGE	RATINGS				CHARACTERISTICS				DOUBLE DIODE
		V <sub>R</sub> max.	I <sub>F</sub> max.	I <sub>FRM</sub> max.	I <sub>FSM</sub> max.	V <sub>F</sub> @ I <sub>F</sub> max.		C <sub>d</sub> max.	t <sub>rr</sub> max.	
		(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)	
Leaded types										
1N914	SOD27 (DO-35)	75	75	225	4	1	10	4	4	no
1N4148		75	200	450	4	1	10	4	4	no
1N4150		50	300	600	4	1	200	2.5	6	no
1N4151		50	200	450	4	1	50	2	4	no
1N4448		75	200	450	4	1	100	4	4	no
BAV10		60	300	600	9	1	200	2.5	6	no
BAV20		150	250	625	9	1	100	5	50	no
BAV21		200	250	625	9	1	100	5	50	no
BAW62		75	200	450	4	1	100	2	4	no
BAX12 <sup>(1)</sup>		90	400	800	55	1	200	35	50	no
BAX18		75	500	2000	55	1	300	35	50	no
1N4531	SOD68 (DO-34)	75	200	450	4	1	10	4	4	no
1N4532		75	200	450	4	1	10	2	2	no
Surface-mount types										
BAL74	SOT23	50	215	500	4	1	50	2	4	no
BAL99		70	215	500	4	1	50	1.5	4	no
BAS16		75	215	500	4	1	50	1.5	4	no
BAS19		100	200	625	9	1	100	5	50	no
BAS20		150	200	625	9	1	100	5	50	no
BAS21		200	200	625	9	1	100	5	50	no
BAS29 <sup>(1)</sup>		90	250	500	10	1	200	35	50	no
BAS31 <sup>(1)</sup>		90	250	500	10	1	200	35	50	yes <sup>(4)</sup>
BAS35 <sup>(1)</sup>		90	250	500	10	1	200	35	50	yes <sup>(2)</sup>
BAV23S		200	225	625	9	1	100	5	50	yes <sup>(4)</sup>
BAV70		70	215	450	4	1	50	1.5	4	yes <sup>(3)</sup>
BAV74		50	215	450	4	1	100	1.5	4	yes <sup>(3)</sup>
BAV99		75	215	450	4	1	50	1.5	4	yes <sup>(4)</sup>
BAW56		75	215	450	4	1	50	2	4	yes <sup>(2)</sup>
PMBD914		70	215	500	4	1	50	1.5	4	no
PMBD6050		70	215	500	4	1	50	1.5	4	no
PMBD6100		70	215	450	4	1	50	1.5	4	yes <sup>(3)</sup>
PMBD7000	100	215	450	4	1	50	1.5	4	yes <sup>(4)</sup>	

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TYPE NUMBER	PACKAGE	RATINGS				CHARACTERISTICS				DOUBLE DIODE
		V <sub>R</sub>	I <sub>F</sub>	I <sub>FRM</sub>	I <sub>FSM</sub>	V <sub>F</sub> @ I <sub>F</sub>		C <sub>d</sub>	t <sub>rr</sub>	
		max.	max.	max.	max.	max.		max.	max.	
		(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)	
BAS28	SOT143	75	215	500	4	1	50	1.5	4	yes
BAS56		60	200	600	9	1	200	2.5	6	yes
BAV23		200	225	625	9	1	100	5	50	yes
BAL74W	SOT323 (SC-70)	75	175	500	4	1	50	1.5	4	no
BAL99W		75	150	500	4	1	50	1.5	4	no
BAS16W		75	175	500	4	1	50	1.5	4	no
BAV70W		70	175	500	4	1	50	1.5	4	yes <sup>(3)</sup>
BAV99W		75	150	500	4	1	50	1.5	4	yes <sup>(4)</sup>
BAW56W		75	150	500	4	1	50	2	4	yes <sup>(2)</sup>
1PS300		80	200	500	4	1	50	2	4	yes <sup>(2)</sup>
1PS301		80	250	500	4	1	50	1.5	4	yes <sup>(3)</sup>
1PS302		80	200	500	4	1	50	1.5	4	yes <sup>(4)</sup>
1PS181	SOT346 (SC-59)	80	215	500	4	1	50	2	4	yes <sup>(2)</sup>
1PS184		80	215	500	4	1	50	1.5	4	yes <sup>(3)</sup>
1PS193		80	215	500	4	1	50	1.5	4	no
1PS226		80	215	500	4	1	50	1.5	4	yes <sup>(4)</sup>
BAS16T	SOT416 (SC-75)	75	155	500	4	1	50	1.5	4	no
BAV70T		75	150	500	4	1	50	1.5	4	yes <sup>(3)</sup>
BAW56T		75	150	500	4	1	50	2	4	yes <sup>(2)</sup>
1PS89SS04	SOT490 (SC-89)	80	200	500	4	1	50	1.5	4	yes <sup>(4)</sup>
1PS89SS05		80	200	500	4	1	50	1.5	4	yes <sup>(3)</sup>
1PS89SS06		80	200	500	4	1	50	2	4	yes <sup>(2)</sup>
BAS32L	SOD80C	75	200	450	4	0.93	100	2	4	no
BAV100		50	250	625	9	1	100	5	50	no
BAV101		100	250	625	9	1	100	5	50	no
BAV102		150	250	625	9	1	100	5	50	no
BAV103		200	250	625	9	1	100	5	50	no
BAV105		60	300	600	9	1	200	2.5	6	no
PMLL4148		75	200	450	4	1	10	4	4	no
PMLL4150		50	300	450	4	1	200	2.5	6	no
PMLL4151		50	200	450	4	1	50	2	4	no
PMLL4153		50	200	450	4	0.88	50	2	4	no
PMLL4448		75	200	450	4	1	100	4	4	no

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TYPE NUMBER	PACKAGE	RATINGS				CHARACTERISTICS				DOUBLE DIODE
		$V_R$ max.	$I_F$ max.	$I_{FRM}$ max.	$I_{FSM}$ max.	$V_F @ I_F$ max.		$C_d$ max.	$t_{rr}$ max.	
		(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)	
BAS216	SOD110	75	250	500	4	1	50	1.5	4	no
BAS221	SOD110	200	300	1000	20	1.4	300	2	50	no
BAS316	SOD323 (SC-76)	75	250	500	4	1	50	1.5	4	no
BAS516	SOD523 (SC-79)	75	250	500	4	1	50	1	4	no

**Notes**

1. Controlled avalanche diode;  $I_{RRM} = 600$  mA.
2. Common anode.
3. Common cathode.
4. Series connected.

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## SMALL-SIGNAL SCHOTTKY-BARRIER DIODES

TYPE NUMBER	PACKAGE	RATINGS		CHARACTERISTICS				DOUBLE DIODE	PAGE
		V <sub>R</sub>	I <sub>F</sub>	V <sub>F</sub> @ I <sub>F</sub>		C <sub>d</sub> @ V <sub>R</sub>			
		max.	max.	max.		max.			
		(V)	(mA)	(mV)	(mA)	(pF)	(V)		
Leaded types									
BAT81	SOD68 (DO-34)	40	30	410	1	1.6	1	no	421
BAT82		50	30	410	1	1.6	1	no	421
BAT83		60	30	410	1	1.6	1	no	421
BAT85		30	200	320	1	10	1	no	424
BAT86		50	200	380	1	8	1	no	424
Surface-mount types									
BAS40	SOT23	40	120	380	1	5	0	no	334
BAS40-04		40	120	380	1	5	0	yes <sup>(1)</sup>	334
BAS40-05		40	120	380	1	5	0	yes <sup>(2)</sup>	334
BAS40-06		40	120	380	1	5	0	yes <sup>(3)</sup>	334
BAS70		70	70	410	1	2	0	no	354
BAS70-04		70	70	410	1	2	0	yes <sup>(1)</sup>	354
BAS70-05		70	70	410	1	2	0	yes <sup>(2)</sup>	354
BAS70-06		70	70	410	1	2	0	yes <sup>(3)</sup>	354
BAT17		4	30	450	1	1	0	no	402
BAT54		30	200	320	1	10	1	no	405
BAT54A		30	200	320	1	10	1	yes <sup>(3)</sup>	405
BAT54C		30	200	320	1	10	1	yes <sup>(2)</sup>	405
BAT54S		30	200	320	1	10	1	yes <sup>(1)</sup>	405
BAT720		40	500	550	500	90	0	no	445
BAT721		40	200	300	10	50	0	yes	448
BAT721A		40	200	300	10	50	0	yes <sup>(3)</sup>	448
BAT721C		40	200	300	10	50	0	yes <sup>(2)</sup>	448
BAT721S		40	200	300	10	50	0	yes <sup>(1)</sup>	448
PMBD353		4	30	450	1	1	0	yes <sup>(1)</sup>	657
BAS70-07	SOT143	70	70	410	1	2	0	yes	354
BAT74		30	200	320	1	10	1	yes	411
BAS40-07		40	120	380	1	5	0	yes	334

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TYPE NUMBER	PACKAGE	RATINGS		CHARACTERISTICS				DOUBLE DIODE	PAGE
		V <sub>R</sub>	I <sub>F</sub>	V <sub>F</sub> @ I <sub>F</sub>		C <sub>d</sub> @ V <sub>R</sub>			
		max.	max.	max.		max.			
		(V)	(mA)	(mV)	(mA)	(pF)	(V)		
BAS40W	SOT323 (SC-70)	40	120	380	1	5	0	no	337
BAS40-04W		40	120	380	1	5	0	yes <sup>(1)</sup>	337
BAS40-05W		40	120	380	1	5	0	yes <sup>(2)</sup>	337
BAS40-06W		40	120	380	1	5	0	yes <sup>(3)</sup>	337
BAS70W		70	70	410	1	2	0	no	360
BAS70-04W		70	70	410	1	2	0	yes <sup>(1)</sup>	360
BAS70-05W		70	70	410	1	2	0	yes <sup>(2)</sup>	360
BAS70-06W		70	70	410	1	2	0	yes <sup>(3)</sup>	360
BAT54W		30	200	320	1	10	1	no	408
BAT54AW		30	200	320	1	10	1	yes <sup>(3)</sup>	408
BAT54CW		30	200	320	1	10	1	yes <sup>(2)</sup>	408
BAT54SW		30	200	320	1	10	1	yes <sup>(1)</sup>	408
1PS70SB10		30	200	320	1	10	1	yes	201
1PS70SB14		30	200	320	1	10	1	yes <sup>(1)</sup>	201
1PS70SB15		30	200	320	1	10	1	yes <sup>(2)</sup>	201
1PS70SB16		30	200	320	1	10	1	yes <sup>(3)</sup>	201
1PS70SB40		40	120	380	1	5	0	no	204
1PS70SB44		40	120	380	1	5	0	yes <sup>(1)</sup>	204
1PS70SB45		40	120	380	1	5	0	yes <sup>(2)</sup>	204
1PS70SB46		40	120	380	1	5	0	yes <sup>(3)</sup>	204
1PS59SB10	SOT346 (SC-59)	30	200	320	1	10	1	no	192
1PS59SB14		30	200	320	1	10	1	yes <sup>(1)</sup>	192
1PS59SB15		30	200	320	1	10	1	yes <sup>(2)</sup>	192
1PS59SB16		30	200	320	1	10	1	yes <sup>(3)</sup>	192
1PS59SB20		40	500	550	500	90	0	no	195
1PS59SB21		40	200	300	10	50	0	no	198
1PS88SB48	SOT363 (SC-88)	40	120	380	1	5	0	yes <sup>(4)</sup>	236
BAS70-07S		70	70	410	1	2	0	yes <sup>(5)</sup>	357
BAT74S		30	200	320	1	10	1	yes <sup>(5)</sup>	416
1PS75SB45	SOT416 (SC75)	40	120	380	1	5	0	yes <sup>(2)</sup>	210
1PS74SB23	SOT457 (SC74)	25	1000	300	100	100	4	no	207
1PS89SB14	SOT490 (SC-89)	30	200	320	1	10	1	yes <sup>(1)</sup>	239
1PS89SB15		30	200	320	1	10	1	yes <sup>(2)</sup>	239
1PS89SB16		30	200	320	1	10	1	yes <sup>(3)</sup>	239

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TYPE NUMBER	PACKAGE	RATINGS		CHARACTERISTICS				DOUBLE DIODE	PAGE
		V <sub>R</sub> max.	I <sub>F</sub> max.	V <sub>F</sub> @ I <sub>F</sub> max.		C <sub>d</sub> @ V <sub>R</sub> max.			
		(V)	(mA)	(mV)	(mA)	(pF)	(V)		
BAS81	SOD80C	40	30	410	1	1.6	1	no	363
BAS82		50	30	410	1	1.6	1	no	363
BAS83		60	30	410	1	1.6	1	no	363
BAS85		30	200	320	1	10	1	no	366
BAS86		50	200	380	1	8	1	no	369
BAT254	SOD110	30	200	320	1	10	1	no	441
1PS76SB10	SOD323 (SC-76)	30	200	320	1	10	1	no	213
1PS76SB17		4	30	450	1	1	0	no	216
1PS76SB21		40	200	550	200	50	0	no	218
1PS76SB40		40	120	380	1	5	0	no	221
1PS76SB70		70	70	410	1	2	0	no	224
1PS79SB10	SOD523 (SC-79)	30	200	320	1	10	1	no	227
1PS79SB40		40	120	380	1	5	0	no	230
1PS79SB70		70	70	410	1	2	0	no	233

**Notes**

1. Series connected.
2. Common cathode.
3. Common anode.
4. Dual diodes with common cathode.
5. Separate diodes.

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## MEDIUM-POWER SCHOTTKY-BARRIER DIODES

TYPE NUMBER	PACKAGE	RATINGS				CHARACTERISTICS				DOUBLE DIODE	PAGE
		V <sub>RRM</sub> max.	V <sub>R</sub> max.	I <sub>F(AV)</sub> max.	I <sub>FSM</sub> max.	C <sub>d</sub> @ V <sub>R</sub> max.		V <sub>F</sub> @ I <sub>F</sub> max.			
		(V)	(V)	(A)	(A)	(pF)	(V)	(mV)	(A)		
Leaded types											
1N5817	SOD81	20	20	1	25	80 <sup>(1)</sup>	4	450	1	no	185
1N5818		30	30	1	25	50 <sup>(1)</sup>	4	550	1	no	185
1N5819		40	40	1	25	50 <sup>(1)</sup>	4	600	1	no	185
BYV10-20		20	–	1	–	220 <sup>(1)</sup>	0	550	1	no	574
BYV10-30		30	–	1	–	220 <sup>(1)</sup>	0	550	1	no	574
BYV10-40		40	–	1	–	220 <sup>(1)</sup>	0	550	1	no	574
Surface-mount types											
PRLL5817	SOD87	20	20	1	25	70 <sup>(1)</sup>	4	450	1	no	697
PRLL5818		30	30	1	25	50 <sup>(1)</sup>	4	550	1	no	697
PRLL5819		40	40	1	25	50 <sup>(1)</sup>	4	600	1	no	697
BAT120A	SOT223	25	25	1	10	100	4	450	1	yes <sup>(3)</sup>	432
BAT120C		25	25	1	10	100	4	450	1	yes <sup>(2)</sup>	432
BAT120S		25	25	1	10	100	4	450	1	yes <sup>(4)</sup>	432
BAT140A		40	40	1	10	80	4	500	1	yes <sup>(3)</sup>	435
BAT140C		40	40	1	10	80	4	500	1	yes <sup>(2)</sup>	435
BAT140S		40	40	1	10	80	4	500	1	yes <sup>(4)</sup>	435
BAT160A		60	60	1	10	60	4	650	1	yes <sup>(3)</sup>	438
BAT160C		60	60	1	10	60	4	650	1	yes <sup>(2)</sup>	438
BAT160S		60	60	1	10	60	4	650	1	yes <sup>(4)</sup>	438
PBYR2100CT		100	100	1	10	100	4	790	1	yes <sup>(2)</sup>	637
PBYR2150CT		150	150	1	10	100	4	850	1	yes <sup>(2)</sup>	640

**Notes**

1. Typical values.
2. Common cathode.
3. Common anode.
4. Series connected.

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## MEDIUM-POWER TRANSISTOR/SCHOTTKY-DIODE MODULES

## Transistor section

TYPE NUMBER	PACKAGE	RATINGS		CHARACTERISTICS					NPN OR PNP MODULE	PAGE
		V <sub>CES</sub> max.	I <sub>C</sub> max.	h <sub>FE</sub> @ I <sub>C</sub> min.		f <sub>T</sub> min.	t <sub>on</sub> /t <sub>off</sub> @ I <sub>C</sub> max.			
		(V)	(mA)		(mA)	(MHz)	(ns)	(mA)		
PZTM1101	SOT223	40	200	100	10	300	36/410	50	NPN	715
PZTM1102		−40	−200	100	−10	250	30/460	50	PNP	719

## Schottky-barrier diode section

TYPE NUMBER	RATINGS		CHARACTERISTICS				PAGE
	V <sub>R</sub> max.	I <sub>F(AV)</sub> max.	C <sub>d</sub> @ V <sub>R</sub> max.		V <sub>F</sub> @ I <sub>F</sub> max.		
	(V)	(A)	(pF)	(V)	(mV)	(A)	
PZTM1101	40	1	250	0	560	1	715
PZTM1102	40	1	250	0	560	1	719

## LOW-LEAKAGE CURRENT DIODES

TYPE NUMBER	PACKAGE	RATINGS				CHARACTERISTICS						DOUBLE DIODE	PAGE
		V <sub>R</sub> max.	I <sub>F</sub> max.	I <sub>FRM</sub> max.	I <sub>FSM</sub> max.	V <sub>F</sub> @ I <sub>F</sub> max.		I <sub>R</sub> @ V <sub>R</sub> max.		C <sub>d</sub> max.	t <sub>rr</sub> max.		
		(V)	(mA)	(mA)	(A)	(V)	(mA)	(nA)	(V)	(pF)	(μs)		
Leaded types													
BAS45A	SOD68 (DO-34)	125	250	625	4	1	100	1	125	4	1.5 <sup>(1)</sup>	no	340
Surface-mount types													
BAS45AL	SOD80C	125	250	625	4	1	100	1	125	4	1.5 <sup>(1)</sup>	no	344
BAS116	SOT23	75	215	500	4	1	10	5	75	2 <sup>(1)</sup>	3	no	373
BAV170		75	215	500	4	1	10	5	75	2 <sup>(1)</sup>	3	yes <sup>(2)</sup>	517
BAV199		75	160	500	4	1	10	5	75	2 <sup>(1)</sup>	3	yes <sup>(3)</sup>	521
BAW156		75	160	500	4	1	10	5	75	3 <sup>(1)</sup>	3	yes <sup>(4)</sup>	559
BAV199W	SOT323 (SC-70)	75	135	500	4	1	10	5	75	2 <sup>(1)</sup>	3	yes <sup>(3)</sup>	525

## Notes

1. Typical value.
2. Common cathode.
3. Series connected.
4. Common anode.



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## ZENER DIODES

TYPE NUMBER	PACKAGE	RATINGS						CHARACTERISTICS		DOUBLE DIODE	PAGE
		I <sub>F</sub> max.	P <sub>tot</sub> @ T <sub>tp</sub> /T <sub>amb</sub> max.	P <sub>ZSM</sub> @ T <sub>j</sub> and t <sub>p</sub> max.			V <sub>Z</sub> nom.				
							E24 range	tol.			
				(mA)	(mW)	(°C)	(W)	(°C)	(ms)		
Leaded types											
BZX79 series	SOD27 (DO-35)	250	500	50	40	25	0.1	2.4 to 75	1, 2, appr. 5	no	606
PLVA400A ser.		250	400	55	30	150	0.1	5 to 6.8	±0.2 V	no	647
1N4728A to 49A	SOD66 (DO-41)	500	1000	50	–	–	–	3.3 to 24	5	no	181
BZV85 series		500	1300	55	60	25	0.1	3.6 to 75	5	no	
BZV37	SOD68 (DO-34)	50	400	25	40	25	0.1	6.5	5	yes <sup>(1)</sup>	579
Surface-mount types											
BZV55 series	SOD80C	250	500	50	40	25	0.1	2.4 to 75	2, appr. 5	no	587
BZX284 series	SOD110	250	400	25	–	–	–	2.4 to 75	2, appr. 5	no	625
BZX84 series	SOT23	200	250	25	40	25	0.1	2.4 to 75	1, 2, appr. 5	no	614
BZX99 series		300	300	25	–	–	–	2.4 to 15	5	no	621
PLVA600A ser.		250	250	25	30	150	0.1	5 to 6.8	±0.2 V	no	650
PLVA2600A ser.		250	250	25	30	150	0.1	5 to 6.8	±0.2 V	yes <sup>(2)</sup>	653
PMBZ5226B to PMBZ5257B		250	250	25	10	55	8.3	3.3 to 33	appr. 5	no	680
BZV49 series	SOT89	250	1000	25	40	25	0.1	2.4 to 75	appr. 5	no	581
BZV90 series	SOT223	400	1500	25	40	25	0.1	2.4 to 75	appr. 5	no	601
PDZ-B series	SOD323 (SC-76)	200	400	25	–	–	–	2.4 to 36 <sup>(3)</sup>	appr. 2	no	643
BZX399 series		250	300	25	–	–	–	1.8 to 43	5	no	631
PZM-N series	SOT346 (SC-59)	250	300	25	–	–	–	2.4 to 75 <sup>(3)</sup>	appr. 3	no	704
PZM-NA series		200	220	25	–	–	–	2.4 to 15 <sup>(3)</sup>	5	yes <sup>(2)</sup>	710

## Notes

1. Bidirectional Zener diode.
2. Common anode.
3. Japanese range.

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## VOLTAGE REFERENCE DIODES

TYPE NUMBER	PACKAGE	RATINGS	CHARACTERISTICS				PAGE
		I <sub>Z</sub> max.	V <sub>ref</sub> nom.	S <sub>Z</sub>   max.	r <sub>dif</sub> @ I <sub>Z</sub> max.		
		(mA)	(V)	(%/K)	(Ω)	(mA)	
Leaded types							
1N821/1N821A	SOD68 (DO-34)	50	6.2	0.01	15/10	7.5	158
1N823/1N823A		50	6.2	0.005	15/10	7.5	158
1N825/1N825A		50	6.2	0.002	15/10	7.5	158
1N827/1N827A		50	6.2	0.001	15/10	7.5	158
1N829/1N829A		50	6.2	0.0005	15/10	7.5	158
BZV10		50	6.2	0.01	50	2	576
BZV11		50	6.2	0.005	50	2	576
BZV12		50	6.2	0.002	50	2	576
BZV13		50	6.2	0.001	50	2	576
BZV14		50	6.2	0.0005	50	2	576

## LOW-VOLTAGE STABISTORS

TYPE NUMBER	PACKAGE	RATINGS		CHARACTERISTICS							PAGE
		V <sub>R</sub>	I <sub>F</sub>	V <sub>F</sub> @ I <sub>F</sub> = 5 mA		S <sub>F</sub> @ I <sub>F</sub>		r <sub>dir</sub> @ I <sub>F</sub> and f = 1 kHz		C <sub>d</sub>	
		max.	max.	min.	max.	typ.		max.		max.	
		(V)	(mA)	(mV)	(mV)	(mV/K)	(mA)	(mV/K)	(mA)	(pF)	
Leaded types											
BZV86-1V4	SOD27 (DO-35)	10	200	1300	1500	−3.8	5	10	10	25	598
BZV86-2V0		10	150	1850	2150	−6	5	15	10	25	598
BZV86-2V6		10	125	2350	2800	−8.5	5	17.5	10	25	598
BZV86-3V2		10	100	2850	3450	−11.5	5	20	10	25	598
Surface-mount types											
BAS17	SOT23	5	200	725	805	−1.8	1	80 <sup>(1)</sup>	2	140	311

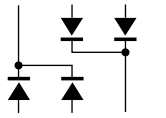
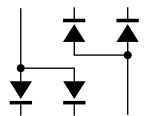
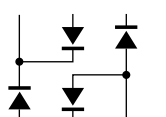
**Note**

1. Typical value.

## Small-signal Transistors and Diodes

## Selection guide

## HIGH-SPEED SWITCHING DIODE ARRAYS

TYPE NUMBER	PACKAGE	RATINGS				CHARACTERISTICS				CONFIGURATION	PAGE
		V <sub>R</sub> max.	I <sub>F</sub> max.	I <sub>FRM</sub> max.	I <sub>FSM</sub> max.	V <sub>F</sub> @ I <sub>F</sub> max.		C <sub>d</sub> max.	t <sub>rr</sub> max.		
		(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)		
Surface-mount types											
BAV70S	SOT363 (SC-88)	75	250	450	4	1	50	1.5	4		1608
BAW56S	SOT363 (SC-88)	75	250	450	4	1	50	2	4		1618
BAV756S	SOT363 (SC-88)	75	250	450	4	1	50	2	4		1613

## ZENER DIODE ARRAYS

TYPE NUMBER	PACKAGE	RATINGS					CHARACTERISTICS				NUMBER OF DIODES	PAGE
		I <sub>F</sub> max.	I <sub>FSM</sub> max.	I <sub>ZSM</sub> max.	P <sub>ZSM</sub> @ t <sub>p</sub> max.		V <sub>Z</sub> nom.	r <sub>dif</sub> max.	S <sub>Z</sub> @ I <sub>Z</sub> typ.			
		(mA)	(A)	(A)	(W)	(ms)	(V)	(Ω)	(mV/K)	(mA)		
Surface-mount types												
BZA100	SO20	200	4	2.5	27.5	1	6.8	8	3	5	18	1648
BZA109		100	4.5	2.5	25	1	6.8	100	3	5	18	1651
BZA109TS	SSOP20	100	4.5	2.5	25	1	6.8	100	3	5	18	1657
BZA408B	SOT457 (SC-74)	—	—	2	20	1	±5	—	—	—	8	1663
BZA420A		100	3.75	0.7	19.6	1	20	125	16.2	5	4	1668
BZA456A		100	3.75	3	24	1	5.6	400	1.2	5	4	1674
BZA462A		100	3.75	2.66	24	1	6.2	300	1.2	5	4	1680

## Small-signal Transistors and Diodes

## Selection guide

## SURFACE-MOUNT DEVICES

## NPN LOW-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BCV27	SOT23	30	500	250	20000	>20000	220 typ.	BCV26	903
BCV47	SOT23	60	500	250	10000	>10000	220 typ.	BCV46	903
PMBTA13	SOT23	30	500	250	5000	>5000	125	–	1487
PMBTA14	SOT23	30	500	250	10000	>10000	125	PMBTA64	1487

## PNP LOW-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BCV26	SOT23	30	500	250	20000	>20000	220 typ.	BCV27	900
BCV46	SOT23	60	500	250	10000	>10000	220 typ.	BCV47	900
PMBTA64	SOT23	30	500	250	10000	>10000	125	PMBTA14	1493

## NPN MEDIUM-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BCV29	SOT89	30	500	1300	20000	>20000	220 typ.	–	BCV28	909
BCV49	SOT89	60	500	1300	10000	>10000	220 typ.	–	BCV48	909
BSP50	SOT223	45	1000	1250	2000	>2000	200 typ.	1300 typ.	BSP60	1092
BSP51	SOT223	60	1000	1250	2000	>2000	200 typ.	1300 typ.	BSP61	1092
BSP52	SOT223	80	1000	1250	2000	>2000	200 typ.	1300 typ.	BSP62	1092
BST50	SOT89	45	500	1300	2000	>2000	200 typ.	1500 typ.	BST60	1138
BST51	SOT89	60	500	1300	2000	>2000	200 typ.	1500 typ.	BST61	1138
BST52	SOT89	80	500	1300	2000	>2000	200 typ.	1500 typ.	BST62	1138
PXTA14	SOT89	30	500	1300	20000	>20000	125	–	–	1573
PZTA14	SOT223	30	500	1250	10000	>10000	125	–	–	1598

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## PNP MEDIUM-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	NPN COMPL.	PAGE
BCV28	SOT89	30	500	1300	20000	>20000	220 typ.	–	BCV29	906
BCV48	SOT89	60	500	1300	10000	>10000	220 typ.	–	BCV49	906
BSP60	SOT223	45	500	1250	2000	>2000	200 typ.	1500 typ.	BSP50	1095
BSP61	SOT223	60	500	1250	2000	>2000	200 typ.	1500 typ.	BSP51	1095
BSP62	SOT223	80	500	1250	2000	>2000	200 typ.	1500 typ.	BSP52	1095
BST60	SOT89	45	500	1300	2000	>2000	200 typ.	700 typ.	BST50	1142
BST61	SOT89	60	500	1300	2000	>2000	200 typ.	700 typ.	BST51	1142
BST62	SOT89	80	500	1300	2000	>2000	200 typ.	700 typ.	BST52	1142

## NPN GENERAL PURPOSE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
2PC4081Q	SC-70/SOT323	40	100	200	120	270	100	2PA1576Q	762
2PC4081R	SC-70/SOT323	40	100	200	180	390	100	2PA1576R	762
2PC4081S	SC-70/SOT323	40	100	200	270	560	100	2PA1576S	762
2PC4617Q	SC-75/SOT416	50	100	150	120	270	100	2PA1774Q	764
2PC4617QJ	SC-89/SOT490	50	100	250	120	270	100	2PA1774QJ	764
2PC4617R	SC-75/SOT416	50	100	150	180	390	100	2PA1774R	764
2PC4617RJ	SC-89/SOT490	50	100	250	180	390	100	2PA1774RJ	764
2PC4617S	SC-75/SOT416	50	100	150	270	560	100	2PA1774S	764
2PC4617SJ	SC-89/SOT490	50	100	250	270	560	100	2PA1774SJ	764
2PD601AQ	SC-59/SOT346	50	100	250	160	260	100	2PB709AQ	768
2PD601AR	SC-59/SOT346	50	100	250	210	340	120	2PB709AR	768
2PD601AS	SC-59/SOT346	50	100	250	290	460	140	2PB709AS	768
2PD602AQ	SC-59/SOT346	50	500	250	85	170	140	2PB710AQ	770
2PD602AR	SC-59/SOT346	50	500	250	120	240	160	2PB710AR	770
2PD602AS	SC-59/SOT346	50	500	250	170	340	180	2PB710AS	770
2PD1820AQ	SC-70/SOT323	50	500	200	85	170	150	2PB1219AQ	772
2PD1820AR	SC-70/SOT323	50	500	200	120	240	150	2PB1219AR	772
2PD1820AS	SC-70/SOT323	50	500	200	170	340	150	2PB1219AS	772
BC817	SOT23	45	500	250	100	600	100	BC807	822
BC817W	SC-70/SOT323	45	500	200	100	600	100	BC807W	826
BC817-16	SOT23	45	500	250	100	250	100	BC807-16	822

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TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BC817-16W	SC-70/SOT323	45	500	200	100	250	100	BC807-16W	826
BC817-25	SOT23	45	500	250	160	400	100	BC807-25	822
BC817-25W	SC-70/SOT323	45	500	200	160	400	100	BC807-25W	826
BC817-40	SOT23	45	500	250	250	600	100	BC807-40	822
BC817-40W	SC-70/SOT323	45	500	200	250	600	100	BC807-40W	826
BC846	SOT23	65	100	250	110	450	100	BC856	830
BC846A	SOT23	65	100	250	110	220	100	BC856A	830
BC846AT	SC-75/SOT416	65	100	150	110	220	100	BC856AT	840
BC846AW	SC-70/SOT323	65	100	200	110	220	100	BC856AW	846
BC846B	SOT23	65	100	250	200	450	100	BC856B	830
BC846BT	SC-75/SOT416	65	100	150	200	450	100	BC856BT	840
BC846BW	SC-70/SOT323	65	100	200	200	450	100	BC856BW	846
BC846W	SC-70/SOT323	65	100	200	110	450	100	BC856W	844
BC847	SOT23	45	100	250	110	800	100	BC857	830
BC847A	SOT23	45	100	250	110	220	100	BC857A	830
BC847AF	SC-89/SOT490	45	100	250	110	220	100	BC857AF	834
BC847AT	SC-75/SOT416	45	100	150	110	220	100	BC857AT	840
BC847AW	SC-70/SOT323	45	100	200	110	220	100	BC857AW	830
BC847B	SOT23	45	100	250	200	450	100	BC857B	830
BC847BF	SC-89/SOT490	45	100	250	200	450	100	BC857BF	834
BC847BT	SC-75/SOT416	45	100	150	200	450	100	BC857BT	830
BC847BW	SC-70/SOT323	45	100	200	200	450	100	BC857BW	830
BC847C	SOT23	45	100	250	420	800	100	BC857C	830
BC847CF	SC-89/SOT490	45	100	250	420	800	100	BC857CF	830
BC847CT	SC-75/SOT416	45	100	150	420	800	100	BC857CT	830
BC847CW	SC-70/SOT323	45	100	200	420	800	100	BC857CW	830
BC847W	SC-70/SOT323	45	100	200	110	800	100	BC857W	846
BC849B	SOT23	30	100	250	200	450	100	BC859B	848
BC849BW	SC-70/SOT323	30	100	200	200	450	100	BC859BW	851
BC849C	SOT23	30	100	250	420	800	100	BC859C	848
BC849CW	SC-70/SOT323	30	100	200	420	800	100	BC859CW	851
BC850B	SOT23	45	100	250	200	450	100	BC860B	848
BC850BW	SC-70/SOT323	45	100	200	200	450	100	BC860BW	851
BC850C	SOT23	45	100	250	420	800	100	BC860C	848
BC850CW	SC-70/SOT323	45	100	200	420	800	100	BC860CW	851
BCF32	SOT23	32	100	250	200	450	100	–	887
BCV71	SOT23	60	100	250	110	220	100	–	887
BCV72	SOT23	60	100	250	200	450	100	–	912
BCW31	SOT23	32	100	250	110	220	100	BCW29	916

## Small-signal Transistors and Diodes

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TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BCW32	SOT23	32	100	250	200	450	100	BCW30	916
BCW33	SOT23	32	100	250	420	800	100	—	916
BCW60B	SOT23	32	100	250	180	310	100	BCW61B	918
BCW60C	SOT23	32	100	250	250	460	100	BCW61C	918
BCW60D	SOT23	32	100	250	380	630	100	BCW61D	918
BCW71	SOT23	45	100	250	110	220	100	BCW69	924
BCW72	SOT23	45	100	250	200	450	100	BCW70	924
BCX19	SOT23	45	500	250	100	600	100	BCX17	930
BCX70G	SOT23	45	100	250	120	220	100	BCX71G	938
BCX70H	SOT23	45	100	250	180	310	100	BCX71H	938
BCX70J	SOT23	45	100	250	250	460	100	BCX71J	938
BCX70K	SOT23	45	100	250	380	630	100	BCX71K	938
PMBS3904	SOT23	40	100	250	100	300	180	PMBS3906	1445
PMBT5088	SOT23	30	100	250	350	>350	—	—	1472
PMBT6428	SOT23	50	100	250	250	650	100	—	1483
PMBT6429	SOT23	45	100	250	500	1250	100	—	1483
PMBTA06	SOT23	80	500	250	50	>50	100	PMBTA56	1485
PMMT491A	SOT23	40	1000	250	300	900	150	PMMT591A	1497
PMST5088	SC-70/SOT323	30	100	200	350	>350	100	—	1528
PMST5089	SC-70/SOT323	25	100	200	450	>450	100	—	1528
PMST6428	SC-70/SOT323	50	100	200	250	650	100	—	1536
PMST6429	SC-70/SOT323	45	100	200	500	1250	100	—	1536
PMSTA05	SC-70/SOT323	60	500	200	50	>50	100	PMSTA55	1538
PMSTA06	SC-70/SOT323	80	500	200	50	>50	100	PMSTA56	1538

## Small-signal Transistors and Diodes

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## PNP GENERAL PURPOSE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
2PA1576Q	SC-70/SOT323	40	100	200	120	270	100	2PC4081Q	744
2PA1576R	SC-70/SOT323	40	100	200	180	390	100	2PC4081R	744
2PA1576S	SC-70/SOT323	40	100	200	270	560	100	2PC4081S	744
2PA1774Q	SC-75/SOT416	40	100	150	120	270	100	2PC4617Q	746
2PA1774QJ	SC-89/SOT490	50	100	250	120	270	100	2PC4617QJ	750
2PA1774R	SC-75/SOT416	40	100	150	180	390	100	2PC4617R	746
2PA1774RJ	SC-89/SOT490	50	100	250	180	390	100	2PC4617RJ	750
2PA1774S	SC-75/SOT416	40	100	150	270	560	100	2PC4617S	746
2PA1774SJ	SC-89/SOT490	50	100	250	270	560	100	2PC4617SJ	750
2PB709AQ	SC-59/SOT346	45	100	250	160	260	60	2PB601AQ	754
2PB709AR	SC-59/SOT346	45	100	250	210	340	70	2PB601AR	754
2PB709AS	SC-59/SOT346	45	100	250	290	460	80	2PB601AS	754
2PB710AQ	SC-59/SOT346	50	500	250	85	170	100	2PD602AQ	756
2PB710AR	SC-59/SOT346	50	500	250	120	240	120	2PD602AR	756
2PB710AS	SC-59/SOT346	50	500	250	170	340	140	2PD602AS	756
2PB1219AQ	SC-70/SOT323	50	500	200	85	170	100	2PD1820AQ	752
2PB1219AR	SC-70/SOT323	50	500	200	120	240	120	2PD1820AR	752
2PB1219AS	SC-70/SOT323	50	500	200	170	340	140	2PD1820AS	752
BC807	SOT23	45	500	250	100	600	80	BC817	814
BC807W	SC-70/SOT323	45	500	200	100	600	80	BC817W	818
BC807-16	SOT23	45	500	250	100	250	80	BC817-16	814
BC807-16W	SC-70/SOT323	45	500	200	100	250	80	BC817-16W	818
BC807-25	SOT23	45	500	250	160	400	80	BC817-25	814
BC807-25W	SC-70/SOT323	45	500	200	160	400	80	BC817-25W	818
BC807-40	SOT23	45	500	250	250	600	80	BC817-40	814
BC807-40W	SC-70/SOT323	45	500	200	250	600	80	BC817-40W	818
BC856	SOT23	65	100	250	125	475	100	BC846	854
BC856A	SOT23	65	100	250	125	250	100	BC846A	854
BC856AT	SC-75/SOT416	65	100	150	125	250	100	BC846AT	861
BC856AW	SC-70/SOT323	65	100	200	125	250	100	BC846AW	865
BC856B	SOT23	65	100	250	220	475	100	BC846B	854
BC856BT	SC-75/SOT416	65	100	150	220	475	100	BC846BT	861
BC856BW	SC-70/SOT323	65	100	200	220	475	100	BC846BW	865
BC856W	SC-70/SOT323	65	100	200	125	475	100	BC846W	865
BC857	SOT23	45	100	250	125	800	100	BC847	854
BC857A	SOT23	45	100	250	125	250	100	BC847AF	854
BC857AF	SC-89/SOT490	45	100	250	125	250	100	BC847A	858
BC857AT	SC-75/SOT416	45	100	150	125	250	100	BC847AT	861



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TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BC857AW	SC-70/SOT323	45	100	200	125	250	100	BC847AW	865
BC857B	SOT23	45	100	250	220	475	100	BC847B	854
BC857BF	SC-89/SOT490	45	100	250	200	475	100	BC847BF	858
BC857BT	SC-75/SOT416	45	100	150	220	475	100	BC847BT	861
BC857BW	SC-70/SOT323	45	100	200	220	475	100	BC847BW	865
BC857C	SOT23	45	100	250	420	800	100	BC847C	854
BC857CF	SOT23	45	100	250	420	800	100	BC847CF	858
BC857CT	SC-75/SOT416	45	100	150	420	800	100	BC847CT	861
BC857CW	SC-70/SOT323	45	100	200	420	800	100	BC847CW	865
BC857W	SC-70/SOT323	45	100	200	125	800	100	BC847W	865
BC859B	SOT23	30	100	250	220	475	100	BC849B	870
BC859BW	SC-70/SOT323	30	100	200	220	475	100	BC849BW	873
BC859C	SOT23	30	100	250	420	800	100	BC849C	870
BC859CW	SC-70/SOT323	30	100	200	420	800	100	BC849CW	873
BC859W	SC-70/SOT323	30	100	200	125	800	100	—	873
BC860B	SOT23	45	100	250	220	475	100	BC850B	870
BC860BW	SC-70/SOT323	45	100	200	220	475	100	BC850BW	873
BC860C	SOT23	45	100	250	420	800	100	BC850C	870
BC860CW	SC-70/SOT323	45	100	200	420	800	100	BC850CW	873
BC860W	SC-70/SOT323	45	100	200	125	800	100	—	873
BCW29	SOT23	32	100	250	120	260	100	BCW31	914
BCW30	SOT23	32	100	250	215	500	100	BCW32	914
BCW61B	SOT23	32	100	250	180	310	100	BCW60B	920
BCW61C	SOT23	32	100	250	250	460	100	BCW60C	920
BCW61D	SOT23	32	100	250	380	630	100	BCW60D	920
BCW69	SOT23	45	100	250	120	260	100	BCW71	922
BCW70	SOT23	45	100	250	215	500	100	BCW72	922
BCW89	SOT23	60	100	250	120	260	100	—	926
BCX17	SOT23	45	500	250	100	600	80	BCX19	928
BCX18	SOT23	25	500	250	100	600	80	—	928
BCX71G	SOT23	45	100	250	120	220	100	BCX70G	940
BCX71H	SOT23	45	100	250	180	310	100	BCX70H	940
BCX71J	SOT23	45	100	250	250	460	100	BCX70J	940
BCX71K	SOT23	45	100	250	380	630	100	BCX70K	940
PMBS3906	SOT23	40	100	250	100	300	150	PMBS3904	1448
PMBTA56	SOT23	80	500	250	100	>100	50	PMBTA06	1491
PMMT591A	SOT23	40	1000	250	300	900	150	PMMT491A	1499
PMSTA55	SC-70/SOT323	60	500	200	50	>50	50	PMSTA05	1542
PMSTA56	SC-70/SOT323	80	500	200	50	>50	50	PMSTA06	1542

## Small-signal Transistors and Diodes

## Selection guide

## NPN GENERAL PURPOSE TRANSISTOR ARRAYS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL. / REMARKS	PAGE
BC847BS	SC-88/SOT363	45	100	200	200	450	100	BC857BS; matched pair	1626
BCV61	SOT143B	30	100	250	100	>100	100	BCV62; matched pair	1632
BCV61A	SOT143B	30	100	250	110	220	100	BCV62A; matched pair	1632
BCV61B	SOT143B	30	100	250	200	450	100	BCV62B; matched pair	1632
BCV61C	SOT143B	30	100	250	420	800	100	BCV62C; matched pair	1632
BCV63	SOT143B	30	100	250	110	800	100	—	1640
BCV63B	SOT143B	30	100	250	200	450	100	BCV64B	1640
PUMX1	SC-88/SOT363	40	100	200	120	>120	100	PUMT1	1737

## PNP GENERAL PURPOSE TRANSISTOR ARRAYS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL./ REMARKS	PAGE
BC857BS	SC-88/SOT363	45	100	200	200	450	100	BC847BS; matched pair	1629
BCV62	SOT143B	30	100	250	100	>100	100	BCV61; matched pair	1636
BCV62A	SOT143B	30	100	250	125	250	100	BCV61A; matched pair	1636
BCV62B	SOT143B	30	100	250	220	475	100	BCV61B; matched pair	1636
BCV62C	SOT143B	30	100	250	420	800	100	BCV61C; matched pair	1636
BCV64B	SOT143B	30	100	250	220	475	100	BCV63B	1643
PUMT1	SC-88/SOT363	40	100	200	120	>120	100	PUMX1	1735

## NPN/PNP GENERAL PURPOSE TRANSISTOR ARRAYS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	REMARKS	PAGE
BC847BPN	SC-88/SOT363	45	100	200	200	450	100	matched pair	1623
BCV65	SOT143B	30	100	250	75	800	—	matched pair	1646
PUMZ1	SC-88/SOT363	40	100	200	120	>120	100	—	1739

## Small-signal Transistors and Diodes

## Selection guide

## NPN GENERAL PURPOSE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BC868	SOT89	20	1000	1350	85	375	40	–	BC869	876
BC868-25	SOT89	20	1000	1350	160	>250	40	–	BC869-25	876
BCP54	SOT223	45	1000	1330	40	250	130 typ.	–	BCP51	892
BCP54-16	SOT223	45	1000	1330	100	250	130 typ.	–	BCP51-16	892
BCP55	SOT223	60	1000	1330	40	250	130 typ.	–	–	892
BCP55-10	SOT223	60	1000	1330	63	160	130 typ.	–	–	892
BCP55-16	SOT223	60	1000	1330	100	250	130 typ.	–	BCP52-16	892
BCP56	SOT223	80	1000	1330	40	250	130 typ.	–	BCP53	892
BCP56-10	SOT223	80	1000	1330	63	160	130 typ.	–	BCP53-10	892
BCP56-16	SOT223	80	1000	1330	100	250	130 typ.	–	BCP53-16	892
BCP68	SOT223	20	1000	1370	85	375	40	–	BCP69	894
BCP68-25	SOT223	20	1000	1370	160	>160	40	–	BCP69-25	894
BCX54	SOT89	45	1000	1300	40	250	130 typ.	–	BCX51	932
BCX54-10	SOT89	45	1000	1300	63	160	130 typ.	–	BCX51-10	932
BCX54-16	SOT89	45	1000	1300	100	250	130 typ.	–	BCX51-16	932
BCX55	SOT89	60	1000	1300	40	250	130 typ.	–	BCX52	932
BCX55-10	SOT89	60	1000	1300	63	160	130 typ.	–	BCX52-10	932
BCX55-16	SOT89	60	1000	1300	100	250	130 typ.	–	BCX52-16	932
BCX56	SOT89	80	1000	1300	40	250	130 typ.	–	BCX53	932
BCX56-10	SOT89	80	1000	1300	63	160	130 typ.	–	BCX53-10	932
BCX56-16	SOT89	80	1000	1300	100	250	130 typ.	–	BCX53-16	932
BDL31	SOT223	10	5000	1350	200	>200	100	–	BDL32	972
BDP31	SOT223	45	3000	1350	40	>40	60	–	BDP32	977
BSP41	SOT223	60	1000	1300	100	300	100	–	BSP31	1090
BSP43	SOT223	80	1000	1300	100	300	100	–	BSP33	1090
BSR40	SOT89	60	1000	1350	40	120	100	1000	BSR30	1122
BSR41	SOT89	60	1000	1350	100	300	100	1000	BSR31	1122
BSR42	SOT89	80	1000	1350	40	120	100	1000	–	1122
BSR43	SOT89	80	1000	1350	100	300	100	1000	BSR33	1122

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## PNP GENERAL PURPOSE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	NPN COMPL.	PAGE
BC869	SOT89	20	1000	1350	100	375	40	–	BC868	879
BC869-16	SOT89	20	1000	1350	100	250	40	–	–	879
BC869-25	SOT89	20	1000	1350	160	>160	40	–	BC868-25	879
BCP51	SOT223	45	1000	1300	40	250	115 typ.	–	BCP54	889
BCP51-16	SOT223	45	1000	1300	100	250	115 typ.	–	BCP54-16	889
BCP52-16	SOT223	60	1000	1300	100	250	115 typ.	–	BCP55-16	889
BCP53	SOT223	80	1000	1300	40	250	115 typ.	–	BCP56	889
BCP53-10	SOT223	80	1000	1300	63	160	115 typ.	–	BCP56-10	889
BCP53-16	SOT223	80	1000	1300	100	250	115 typ.	–	BCP56-16	889
BCP69	SOT223	20	1000	1350	85	375	40	–	BCP68	897
BCP69-16	SOT223	20	1000	1350	100	250	40	–	–	897
BCP69-25	SOT223	20	1000	1350	160	>160	40	–	BCP68-25	897
BCX51	SOT89	45	1000	1300	40	250	50 typ.	–	BCX54	932
BCX51-10	SOT89	45	1000	1300	63	160	50 typ.	–	BCX54-10	932
BCX51-16	SOT89	45	1000	1300	100	250	50 typ.	–	BCX54-16	932
BCX52	SOT89	60	1000	1300	40	250	50 typ.	–	BCX55	932
BCX52-10	SOT89	60	1000	1300	63	160	50 typ.	–	BCX55-10	932
BCX52-16	SOT89	60	1000	1300	100	250	50 typ.	–	BCX55-16	932
BCX53	SOT89	80	1000	1300	40	250	50 typ.	–	BCX56	932
BCX53-10	SOT89	80	1000	1300	63	160	50 typ.	–	BCX56-10	932
BCX53-16	SOT89	80	1000	1300	100	250	50 typ.	–	BCX56-16	932
BDL32	SOT223	10	5000	1350	180	>180	100	–	BDL31	972
BDP32	SOT223	45	3000	1350	40	>40	60	–	BDP31	977
BSP31	SOT223	60	1000	1300	100	300	100	650	BSP41	1088
BSP32	SOT223	80	1000	1300	40	120	100	650	–	1088
BSP33	SOT223	80	1000	1300	100	300	100	650	BSP43	1088
BSR30	SOT89	60	1000	1350	40	120	100	–	BSR40	1120
BSR31	SOT89	60	1000	1350	100	300	100	–	BSR41	1120
BSR33	SOT89	80	1000	1350	100	300	100	–	BSR43	1120

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## NPN HIGH-VOLTAGE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BF820	SOT23	300	50	250	50	>50	60	BF821	1039
BF820W	SC-70/SOT323	300	50	200	50	>50	60	–	1041
BF822	SOT23	250	50	250	50	>50	60	BF823	1039
BF822W	SC-70/SOT323	250	50	200	50	>50	60	–	1041
BSR19	SOT23	140	300	250	60	>60	100	BSR20	1112
BSR19A	SOT23	160	300	250	80	>80	100	BSR20A	1112
BSS64	SOT23	80	100	250	20	80	60	BSS63	1132
PMBT5550	SOT23	140	300	250	60	250	100	PMBT5401	1477
PMBT5551	SOT23	160	300	250	80	250	100	PMBT5401	1480
PMBTA42	SOT23	300	100	250	40	>40	50	PMBTA92	1489
PMST5550	SC-70/SOT323	140	300	200	60	250	100	PMST5401	1533
PMST5551	SC-70/SOT323	160	300	200	80	250	100	PMST5401	1533
PMSTA42	SC-70/SOT323	300	500	200	40	>40	50	PMSTA92	1541
PMSTA43	SC-70/SOT323	200	500	200	40	>40	50	PMSTA93	1540

## PNP HIGH-VOLTAGE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BF821	SOT23	300	50	250	50	>50	60	BF820	1043
BF823	SOT23	250	50	250	50	>50	60	BF822	1043
BSR20	SOT23	120	300	250	40	180	100	BSR19	1116
BSR20A	SOT23	150	300	250	60	240	100	BSR19A	1116
BSS63	SOT23	100	100	250	30	>30	85 typ.	BSS64	1130
PMBT5401	SOT23	150	300	250	60	240	100	PMBT5550	1474
PMBTA92	SOT23	300	100	250	40	>40	50	PMBTA42	1495
PMST5401	SC-70/SOT323	150	300	200	60	240	100	PMST5550 PMST5551	1530
PMSTA92	SC-70/SOT323	300	500	200	40	>40	50	PMSTA42	1544
PMSTA93	SC-70/SOT323	200	500	200	40	>40	50	PMSTA43	1544

## Small-signal Transistors and Diodes

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## NPN HIGH-VOLTAGE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BF620	SOT89	300	50	1250	50	>50	60	BF621	1029
BF622	SOT89	250	50	1250	50	>50	60	BF623	1029
BF720	SOT223	300	50	1200	50	>50	60	–	1033
BF722	SOT223	250	50	1200	50	>50	60	BF723	1033
BSP19	SOT223	350	50	1200	40	>40	70	–	1086
BSP20	SOT223	250	50	1200	40	>40	70	BSP16	1086
BST39	SOT89	350	100	1300	40	>40	70	BST15	1136
BST40	SOT89	250	100	1300	40	>40	70	BST16	1136
PXTA42	SOT89	300	100	1300	40	>40	50	PXTA92	1576
PZTA42	SOT223	300	100	1200	40	>40	50	PZTA92	1601
PZTA44	SOT223	400	300	1350	40	>40	20	–	1603

## PNP HIGH-VOLTAGE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BF621	SOT89	300	50	1250	50	>50	60	BF620	1031
BF623	SOT89	250	50	1250	50	>50	60	BF622	1031
BF723	SOT223	250	50	1200	50	>50	60	BF722	1035
BSP16	SOT223	300	50	1280	30	120	15	BSP20	1084
BST15	SOT89	200	200	1300	30	150	15	BST39	1134
BST16	SOT89	300	200	1300	30	120	15	BST40	1134
PXTA92	SOT89	300	100	1300	40	>40	50	PXTA42	1578
PZTA92	SOT223	300	100	1200	40	>40	50	PZTA42	1605

## NPN MEDIUM-FREQUENCY TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PAGE
BF570	SOT23	15	100	250	40	>40	490	1023
BF840	SOT23	40	25	250	76	222	380 typ.	1049
BFS19	SOT23	20	30	250	65	225	260 typ.	1057
BFS20	SOT23	20	25	250	40	>85	450 typ.	1059
BFS20W	SC-70/SOT323	20	25	250	40	>85	450 typ.	1061

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## PNP MEDIUM-FREQUENCY TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PAGE
BF550	SOT23	40	25	250	50	>50	325 typ.	1021
BF824	SOT23	30	25	250	25	>50	450 typ.	1045
BF824W	SC-70/SOT323	30	25	200	25	>25	400	1047

## PROGRAMMABLE UNIJUNCTION TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>GA</sub> max. (V)	I <sub>A</sub> max. (mA)	I <sub>ARM</sub> max. (mA)	P <sub>tot</sub> max. (mW)	dl <sub>A</sub> /dt max. (A/μs)	I <sub>P</sub> max. (μA)	I <sub>V</sub> min. (μA)	t <sub>r</sub> max. (ns)	PAGE
BRY61	SOT23	70	175	2500	250	20	0.2	2	80	1074

## SILICON CONTROLLED SWITCHES

TYPE NUMBER	PACKAGE	V <sub>CBO</sub> max. (V)	I <sub>E</sub> max. (mA)	I <sub>ERM</sub> max. (mA)	P <sub>tot</sub> max. (mW)	V <sub>AK</sub> max. (V)	I <sub>H</sub> max. (mA)	t <sub>on</sub> max. (μs)	t <sub>off</sub> max. (μs)	PAGE
BRY62	SOT143B	70	175	2500	250	1.4	1	0.25	15	1078

## Small-signal Transistors and Diodes

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## NPN RESISTOR-EQUIPPED TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>O</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	INPUT RES. (K $\Omega$ )	RES. RATIO	PNP COMPL.	PAGE
PDTC114EE	SC-75/SOT416	50	100	150	30	>30	10	1	PDTA114EE	1309
PDTC114EEF	SC-89/SOT490	50	100	250	30	–	10	1	PDTA114EEF	1312
PDTC114EK	SC-59/SOT346	50	100	250	30	>30	10	1	PDTA114EK	1315
PDTC114ET	SOT23	50	100	250	30	>30	10	1	PDTA114ET	1321
PDTC114EU	SC70/SOT323	50	100	200	30	>30	10	1	PDTA114EU	1324
PDTC114TE	SC-75/SOT416	50	100	150	100	600	10	–	–	1327
PDTC114TK	SC-59/SOT346	50	100	250	100	600	10	–	PDTA114TK	1330
PDTC114TT	SOT23	50	100	250	100	600	10	–	PDTA114TT	1336
PDTC114TU	SC70/SOT323	50	100	200	100	600	10	–	PDTA114TU	1338
PDTC114YE	SC-75/SOT416	50	100	150	100	–	10	4.7	–	1340
PDTC114YT	SOT23	50	100	250	100	–	10	4.7	PDTA114YT	1343
PDTC114YU	SC70/SOT323	50	100	200	100	–	10	4.7	–	1346
PDTC123ET	SOT23	50	100	250	30	–	2.2	1	PDTA123ET	1349
PDTC123JE	SC-75/SOT416	50	100	150	100	–	2.2	21	PDTA123JE	1352
PDTC123JEF	SC-89/SOT490	50	100	250	100	–	2.2	21	PDTA123JEF	1355
PDTC123JT	SOT23	50	100	250	100	–	2.2	21	PDTA123JT	1358
PDTC124EE	SC-75/SOT416	50	100	150	56	>56	22	1	PDTA124EE	1361
PDTC124EK	SC-59/SOT346	50	100	250	56	>56	22	1	PDTA124EK	1364
PDTC124ET	SOT23	50	100	250	56	>56	22	1	PDTA124ET	1370
PDTC124EU	SC70/SOT323	50	100	200	56	>56	22	1	PDTA124EU	1373
PDTC124XE	SC-75/SOT416	50	100	150	80	–	22	2.1	PDTA124XE	1376
PDTC124XEF	SC-89/SOT490	50	100	250	80	–	22	2.1	PDTA124XEF	1379
PDTC143EE	SC-75/SOT416	50	100	150	20	>20	4.7	1	PDTA143EE	1382
PDTC143EK	SC-59/SOT346	50	100	250	20	>20	4.7	1	PDTA143EK	1385
PDTC143ET	SOT23	50	100	250	20	>20	4.7	1	PDTA143ET	1391
PDTC143EU	SC70/SOT323	50	100	200	20	>20	4.7	1	PDTA143EU	1394
PDTC143TT	SOT23	50	100	250	100	600	4.7	–	–	1397
PDTC143XE	SC-75/SOT416	50	100	150	50	–	4.7	2.1	PDTA143XE	1400
PDTC143XT	SOT23	50	100	250	50	–	4.7	2.1	PDTA143XT	1403
PDTC143ZK	SC-59/SOT346	50	100	250	100	–	4.7	10	PDTA143ZK	1406
PDTC143ZT	SOT23	50	100	250	100	–	4.7	10	PDTA143ZT	1409
PDTC144EE	SC-75/SOT416	50	100	150	68	>68	47	1	PDTA144EE	1412
PDTC144EEF	SC-89/SOT490	50	100	250	80	–	47	1	PDTA144EEF	1415
PDTC144EK	SC-59/SOT346	50	100	250	68	>68	47	1	PDTA144EK	1418
PDTC144ET	SOT23	50	100	250	68	>68	47	1	PDTA144ET	1424
PDTC144EU	SC70/SOT323	50	100	200	68	>68	47	1	PDTA144EU	1427
PDTC144WT	SOT23	50	100	250	60	–	47	0.47	–	1430
PDTC144WU	SC70/SOT323	50	100	200	60	–	47	0.47	PDTA144WU	1433



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## PNP RESISTOR-EQUIPPED TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	INPUT RES. (K $\Omega$ )	RES. RATIO	NPN COMPL.	PAGE
PDTA114EE	SC-75/SOT416	50	100	150	30	>30	10	1	PDTC114EE	1200
PDTA114EEF	SC-89/SOT490	50	100	250	30	–	10	1	PDTC114EEF	1203
PDTA114EK	SC-59/SOT346	50	100	250	30	>30	10	1	PDTC114EK	1206
PDTA114ET	SOT23	50	100	250	30	>30	10	1	PDTC114ET	1212
PDTA114EU	SC70/SOT323	50	100	200	30	>30	10	1	PDTC114EU	1215
PDTA114TK	SC-59/SOT346	50	100	250	100	600	10	–	PDTC114TK	1218
PDTA114TT	SOT23	50	100	250	100	600	10	–	PDTC114TT	1224
PDTA114TU	SC70/SOT323	50	100	200	100	600	10	–	PDTC114TU	1226
PDTA114YT	SOT23	50	100	250	100	–	10	4.7	PDTC114YT	1228
PDTA123ET	SOT23	50	100	250	30	–	2.2	2.2	PDTC123ET	1231
PDTA123JE	SC-75/SOT416	50	100	150	100	–	2.2	21	PDTC123JE	1234
PDTA123JEF	SC-89/SOT490	50	100	250	100	–	2.2	21	PDTC123JEF	1234
PDTA123JT	SOT23	50	100	250	100	–	2.2	21	PDTC123JT	1237
PDTA124EE	SC-75/SOT416	50	100	150	56	>56	22	1	PDTC124EE	1240
PDTA124EK	SC-59/SOT346	50	100	250	56	>56	22	1	PDTC124EK	1243
PDTA124ET	SOT23	50	100	250	56	>56	22	1	PDTC124ET	1249
PDTA124EU	SC70/SOT323	50	100	200	56	>56	22	1	PDTC124EU	1252
PDTA124XE	SC-75/SOT416	50	100	150	80	–	22	2.1	PDTC124XE	1255
PDTA124XEF	SC-89/SOT490	50	100	250	80	–	22	2.1	PDTC124XEF	1258
PDTA143EE	SC-75/SOT416	50	100	150	20	>20	4.7	1	PDTC143EE	1261
PDTA143EK	SC-59/SOT346	50	100	250	20	>20	4.7	1	PDTC143EK	1264
PDTA143ET	SOT23	50	100	250	20	>20	4.7	1	PDTC143ET	1270
PDTA143EU	SC70/SOT323	50	100	200	20	>20	4.7	1	PDTC143EU	1273
PDTA143XE	SC-75/SOT416	50	100	150	50	–	4.7	2.1	PDTC143XE	1276
PDTA143XT	SOT23	50	100	250	50	–	4.7	2.1	PDTC143XT	1279
PDTA143ZK	SC-59/SOT346	50	100	250	100	–	4.7	10	PDTC143ZK	1282
PDTA143ZT	SOT23	50	100	250	100	–	4.7	10	PDTC143ZT	1285
PDTA144EE	SC-75/SOT416	50	100	150	68	>68	47	1	PDTC144EE	1288
PDTA144EEF	SC-89/SOT490	50	100	250	80	–	47	1	PDTC144EEF	1291
PDTA144EK	SC-59/SOT346	50	100	250	68	>68	47	1	PDTC144EK	1294
PDTA144ET	SOT23	50	100	250	68	>68	47	1	PDTC144ET	1300
PDTA144EU	SC70/SOT323	50	100	200	68	>68	47	1	PDTC144EU	1303
PDTA144WU	SC70/SOT323	50	100	200	60	–	47	0.47	PDTC144WU	1306

## Small-signal Transistors and Diodes

## Selection guide

## NPN, PNP AND NPN/PNP RESISTOR-EQUIPPED TRANSISTOR ARRAYS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	INPUT RES. (KΩ)	RES. RATIO	POLARITY	PAGE
PUMB4	SC-88/SOT363	50	100	200	100	600	10	–	2 x PNP	1686
PUMD2	SC-88/SOT363	50	100	200	56	>56	22	1	NPN/PNP	1689
PUMD3	SC-88/SOT363	50	100	200	30	>30	10	1	NPN/PNP	1694
PUMD6	SC-88/SOT363	50	100	200	100	600	4.7	–	NPN/PNP	1699
PUMD9	SC-88/SOT363	50	100	200	100	–	10	4.7	NPN/PNP	1703
PUMD10	SC-88/SOT363	50	100	200	100	–	2.2	21	NPN/PNP	1708
PUMD12	SC-88/SOT363	50	100	200	80	–	47	1	NPN/PNP	1713
PUMD48	SC-88/SOT363	50	100	200	80/100	–	47/2.2	1/21	NPN/PNP	1717
PUMH1	SC-88/SOT363	50	100	200	60	–	22	1	n double	1722
PUMH4	SC-88/SOT363	50	100	200	200	–	10	–	n double	1726
PUMH7	SC-88/SOT363	50	100	200	100	600	4.7	–	n double	1729
PUMH11	SC-88/SOT363	50	100	200	30	>30	10	1	2 x NPN	1733

## NPN LOW-POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BSR13	SOT23	30	800	250	30	>30	250	250	BSR15	1098
BSR14	SOT23	40	800	250	40	>40	300	250	BSR16	1098
BSR17A	SOT23	40	100	250	100	300	300	240	BSR18A	1104
BSV52	SOT23	12	100	250	40	120	500 typ.	30	–	1146
PMBT2222	SOT23	30	600	250	100	300	250	250	PMBT2907	1451
PMBT2222A	SOT23	40	600	250	100	300	300	250	PMBS2907A	1451
PMBT2369	SOT23	15	200	250	40	120	500	30	–	1454
PMBT3904	SOT23	40	100	250	100	300	300	240	PMBT3906	1460
PMBT4401	SOT23	40	600	250	100	300	250	250	PMBT4403	1466
PMSS3904	SC70/SOT323	40	100	200	100	300	180	1200	PMSS3906	1501
PMST2222	SC70/SOT323	30	600	200	100	300	250	250	–	1507
PMST2222A	SC70/SOT323	40	600	200	100	300	300	250	PMST2907A	1507
PMST2369	SC70/SOT323	15	200	200	40	120	500	30	–	1510
PMST3904	SC70/SOT323	40	200	200	100	300	300	240	PMST3906	1516
PMST4401	SC70/SOT323	40	600	200	100	300	250	285	PMST4403	1522

## Small-signal Transistors and Diodes

## Selection guide

## PNP LOW-POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	NPN COMPL.	PAGE
BSR15	SOT23	40	600	250	30	>30	200	365	BSR13	1098
BSR16	SOT23	60	600	250	50	>50	200	365	BSR14	1101
BSR18A	SOT23	40	100	250	100	300	250	300	BSR17A	1108
PMBT2907	SOT23	40	600	250	100	300	200	365	PMBT2222	1457
PMBT2907A	SOT23	60	600	250	100	300	200	365	PMBT2222A	1457
PMBT3906	SOT23	40	100	250	100	300	250	300	PMBT3904	1463
PMBT4403	SOT23	40	600	250	100	300	200	350	PMBT4401	1469
PMSS3906	SC70/SOT323	40	100	200	100	300	150	700	PMSS3904	1504
PMST2907A	SC70/SOT323	60	200	200	50	>50	200	300	PMST2222A	1513
PMST3906	SC70/SOT323	40	100	200	100	300	250	300	PMST3904	1519
PMST4403	SC70/SOT323	40	600	200	100	300	200	350	PMST4401	1525

## NPN MEDIUM-POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
PXT2222A	SOT89	40	600	1250	100	300	300	250	PXT2907A	1555
PXT3904	SOT89	40	100	1200	100	300	300	240	PXT3906	1561
PXT4401	SOT89	40	600	1250	100	300	250	250	PXT4403	1567
PZT2222A	SOT223	40	600	1150	100	300	300	250	PZT2907A	1580
PZT3904	SOT223	40	200	1050	100	300	300	240	PZT3906	1586
PZT4401	SOT223	40	600	1150	100	300	250	250	PZT4403	1592

## PNP MEDIUM-POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	NPN COMPL.	PAGE
PXT2907A	SOT89	60	600	1250	100	300	200	365	PXT2222A	1558
PXT3906	SOT89	40	100	1150	100	300	250	300	PXT3904	1564
PXT4403	SOT89	40	600	1250	100	300	200	350	PXT4401	1570
PZT2907A	SOT223	60	600	1150	100	300	200	365	PZT2222A	1583
PZT3906	SOT223	40	100	1050	100	300	250	300	PZT3904	1589
PZT4403	SOT223	40	600	1150	100	300	200	350	PZT4401	1595

## Small-signal Transistors and Diodes

## Selection guide

## LEADED DEVICES

## NPN HIGH-VOLTAGE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
2N5550	TO-92	140	300	630	60	>60	100	–	739
2N5551	TO-92	160	300	630	80	>80	100	2N5401	739
BF422L	TO-92	250	50	625	50	>50	60	BF423L	1007
MPSA42	TO-92	300	100	500	40	>40	50	MPSA92	1190
MPSA43	TO-92	200	100	500	40	>40	50	–	1190
MPSA44	TO-92	400	300	625	40	>40	20	–	1192

## PNP HIGH-VOLTAGE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
2N5401	TO-92	150	300	630	60	>60	100	2N5551	736
BF421L	TO-92	300	50	625	50	>50	60	–	1005
BF423L	TO-92	250	50	625	50	>50	60	BF422L	1005
MPSA92	TO-92	300	500	625	25	>25	50	MPSA42	1198

## NPN HIGH-VOLTAGE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BF420	TO-92	300	50	830	50	>50	60	BF421	1001
BF422	TO-92	250	50	830	50	>50	60	BF423	1001
BF483	TO-92	250	50	830	50	>50	70	BF488	1017
BF485	TO-92	300	50	830	50	>50	70	BF488	1017
BF487	TO-92	350	50	830	50	>50	70	BF488	1017
BFV420	TO-92	100	100	830	150	>150	150	BFV421	1064

## PNP HIGH-VOLTAGE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BF421	TO-92	300	50	830	50	>50	60	BF420	1003
BF423	TO-92	250	50	830	50	>50	60	BF422	1003
BF488	TO-92	350	50	830	50	>50	70	BF487	1019
BFV421	TO-92	100	100	830	150	>150	150	BFV420	1066

## Small-signal Transistors and Diodes

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## NPN HIGH-VOLTAGE POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BF419	TO-126	250	300	6000	45 typ.	>45	90	–	999
BF458	TO-126	250	100	6000	26	>26	90 typ.	–	1011
BF459	TO-126	300	100	6000	26	>26	90 typ.	–	1011
BF469	TO-126	250	50	1800	50	>50	60	BF470	1013
BF471	TO-126	300	50	1800	50	>50	60	BF472	1013
BF585	TO-202	300	50	1600	50	>50	70	BF588	1017
BF587	TO-202	350	50	1600	50	>50	70	BF588	1025
BF819	TO-202	250	100	1200	45 typ.	>45	90 typ.	–	1037
BF859	TO-202	300	100	2000	26	>26	90	–	1051
BF869	TO-202	250	50	1600	50	>50	60	BF872	1053
BF871	TO-202	300	50	1600	50	>50	60	BF872	1053
BFV469	TO-126	100	100	2000	150	>150	150	–	1068

## PNP HIGH-VOLTAGE POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BF470	TO-126	250	50	1800	50	>50	60	BF469	1015
BF472	TO-126	300	50	1800	50	>50	60	BF471	1015
BF588	TO-202	300	50	1600	50	>50	70	BF587	1027
BF872	TO-202	300	50	1600	50	>50	60	BF871	1055

## NPN LOW-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BC517	TO-92	30	500	500	30000	>30000	220 typ.	–	BC516	790
BC618	TO-92	55	800	500	2000	>2000	155	–	–	806
MPSA14	TO-92	30	500	500	10000	>10000	125	–	MPSA64	1185
MPSA26	TO-92	50	500	500	10000	>10000	125	–	–	1187
MPSA27	TO-92	60	500	500	10000	>10000	125	–	–	1187

## PNP LOW-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BC516	TO-92	30	500	500	30000	>30000	220 typ.	BC517	788
MPSA64	TO-92	30	500	500	10000	>10000	125	MPSA14	1196

## Small-signal Transistors and Diodes

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## NPN LOW-POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
2N3904	TO-92	40	200	500	100	300	300	240	2N3906	724
2N4401	TO-92	40	600	630	150	300	250	250	2N4403	730
MPS3904	TO-92	40	100	500	100	300	180	990	MPS3906	1177
PH2222A	TO-92	40	600	500	75	>75	300	250	PH2907A	1436
PH2369	TO-92	15	200	500	40	120	500	30	—	1439
PN2222A	TO-92	40	600	500	100	300	300	250	PN2907A	1546
PN2369	TO-92	15	200	500	40	120	500	30	—	1549
PN2369A	TO-92	15	600	500	40	120	500	30	—	1549

## PNP LOW-POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	NPN COMPL.	PAGE
2N3906	TO-92	40	200	500	100	300	250	300	2N3904	727
2N4403	TO-92	40	600	630	100	300	200	350	2N4401	733
MPS3906	TO-92	40	100	500	100	300	150	690	MPS3904	1180
PH2907A	TO-92	60	600	500	100	300	200	365	PH2222A	1442
PN2907A	TO-92	60	600	500	100	300	200	365	PN2222A	1552

## NPN GENERAL PURPOSE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
2N5088	TO-92	30	100	500	350	>350	50	—	
2PC945P	TO-92	50	100	500	200	400	150	2PA733P	758
2PC1815	TO-92	50	150	500	120	700	80	—	760
2PC1815BL	TO-92	50	150	500	350	700	80	—	760
2PC1815GR	TO-92	50	150	500	200	400	80	2PA1015GR	760
2PC1815Y	TO-92	50	150	500	120	240	80	2PA1015Y	760
BC337	TO-92	45	500	625	100	600	100	BC327	778
BC337-16	TO-92	45	500	625	100	250	100	BC327-16	778
BC337-25	TO-92	45	500	625	160	400	100	BC327-25	778
BC337-40	TO-92	45	500	625	250	600	100	BC327-40	778
BC546	TO-92	65	100	500	110	450	100	BC556	792
BC546A	TO-92	65	100	500	110	220	100	BC556A	792
BC546B	TO-92	65	100	500	200	450	100	BC556B	792
BC547	TO-92	45	100	500	110	800	100	BC557	792
BC547B	TO-92	45	100	500	200	450	100	BC557B	792
BC547C	TO-92	45	100	500	420	800	100	BC557C	792

## Small-signal Transistors and Diodes

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TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BC549C	TO-92	30	100	500	420	800	100	BC559C	796
BC550C	TO-92	45	100	500	420	800	100	–	796
ED1402B	TO-92	20	200	500	150	225	100 max.	–	1149
ED1402C	TO-92	20	200	500	202	318	100 max.	ED1602C	1149
ED1402D	TO-92	20	200	500	290	450	100 max.	ED1602D	1149
ED1402E	TO-92	20	200	500	410	810	100 max.	ED1602E	1149
ED1502B	TO-92	20	25	500	48	75	825 max.	–	1151
ED1502C	TO-92	20	25	500	66	100	825 max.	–	1151
ED1502D	TO-92	20	25	500	84	127	825 max.	–	1151
ED1502E	TO-92	20	25	500	105	210	825 max.	–	1151
ED1702L	TO-92	25	500	625	132	189	80	ED1802L	1155
ED1702M	TO-92	25	500	625	170	233	80	ED1802M	1155
ED1702N	TO-92	25	500	625	213	300	80	ED1802N	1155
ED1702O	TO-92	25	500	625	263	370	80	ED1802O	1155
ED1702P	TO-92	25	500	625	333	476	80	ED1802P	1155
JC337-25	TO-92	60	500	625	160	400	100	JC327-25	1164
JC501P	TO-92	45	100	500	135	270	130 typ.	JA101P	1166
JC501Q	TO-92	45	100	500	200	400	130 typ.	JA101Q	1166
JC501R	TO-92	45	100	500	300	600	130 typ.	JA101R	1166
JC546B	TO-92	65	100	500	200	290	100	JC556B	1168
JC547A	TO-92	45	100	500	110	220	100	–	1168
JC547B	TO-92	45	100	500	200	450	100	JC557B	1168
JC548B	TO-92	30	100	500	200	450	100	JC558B	1168
MPSA06	TO-92	80	500	625	100	>100	100	MPSA56	1183

## Small-signal Transistors and Diodes

## Selection guide

## PNP GENERAL PURPOSE LOW-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
2PA733	TO-92	50	100	500	135	600	100	–	750
2PA733P	TO-92	50	100	500	200	400	100	2PC945P	750
2PA1015GR	TO-92	50	150	500	200	400	80	2PC1815GR	742
2PA1015Y	TO-92	50	150	500	120	240	80	2PC1815Y	742
BC327	TO-92	45	500	625	100	600	80	BC337	774
BC327-16	TO-92	45	500	625	100	250	80	BC337-16	774
BC327-25	TO-92	45	500	625	160	400	80	BC337-25	774
BC327-40	TO-92	45	500	625	250	600	80	BC337-40	774
BC556	TO-92	65	100	500	125	475	100	BC546	799
BC556A	TO-92	65	100	500	125	250	100	BC546A	799
BC556B	TO-92	65	100	500	200	475	100	BC546B	799
BC557	TO-92	45	100	500	125	800	100	BC547	799
BC557B	TO-92	45	100	500	220	475	100	BC547B	799
BC557C	TO-92	45	100	500	420	800	100	BC547C	799
BC559C	TO-92	30	100	500	420	800	100	BC549C	803
ED1602C	TO-92	20	100	500	125	190	100	ED1402C	1153
ED1602D	TO-92	20	100	500	170	260	100	ED1402D	1153
ED1602E	TO-92	20	100	500	223	475	100	ED1402E	1153
ED1802K	TO-92	25	500	625	106	150	80	–	1157
ED1802L	TO-92	25	500	625	132	189	80	ED1702L	1157
ED1802M	TO-92	25	500	625	170	233	80	ED1702M	1157
ED1802N	TO-92	25	500	625	213	300	80	ED1702N	1157
ED1802P	TO-92	25	500	625	333	476	80	ED1702P	1157
JA101P	TO-92	45	100	500	135	270	100	JC501P	1159
JA101Q	TO-92	45	100	500	200	400	100	JC501Q	1159
JA101R	TO-92	45	100	500	300	600	100	JC501R	1159
JC327-25	TO-92	45	500	625	160	400	80	JC337-25	1162
JC556B	TO-92	65	100	500	220	475	100	JC546B	1171
JC557B	TO-92	45	100	500	220	475	100	JC547B	1171
JC558B	TO-92	30	100	500	220	475	100	JC548B	1171
JC559	TO-92	30	100	500	125	800	100	–	1174
MPSA56	TO-92	80	500	625	100	>100	50	MPSA06	1194



## Small-signal Transistors and Diodes

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## NPN MEDIUM-FREQUENCY TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PAGE
BF199	TO-92	25	25	500	38	>38	550 typ.	991
BF240	TO-92	40	25	300	67	220	150	993
BF370	TO-92	15	100	500	40	>40	490	997

## PNP MEDIUM-FREQUENCY TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PAGE
BF324	TO-92	30	25	300	25	>25	450 typ.	995
BF450	TO-92	40	25	300	50	>50	350	1009

## NPN MEDIUM-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BC875	TO-92	45	1000	830	1000	>1000	200 typ.	1300	BC878	882
BC879	TO-92	80	1000	830	1000	>1000	200 typ.	1300	BC878	882
BSR52	TO-92	80	1000	830	2000	>2000	200 typ.	1300	BSR62	1124

## PNP MEDIUM-POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BC878	TO-92	60	1000	830	1000	>1000	200 typ.	700	BC879	885
BSR62	TO-92	80	1000	830	2000	>2000	200 typ.	—	BSR52	1127

## NPN GENERAL PURPOSE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BC368	TO-92	20	1000	830	85	375	40	—	BC369	782
BC635	TO-92	45	1000	830	40	250	100	—	BC636	808
BC635-16	TO-92	45	1000	830	100	250	100	—	BC636-16	808
BC637	TO-92	60	1000	830	40	250	100	—	BC638	808
BC637-16	TO-92	60	1000	830	100	250	100	—	BC638-16	808
BC639	TO-92	80	1000	830	40	250	100	—	BC640	808
BC639-10	TO-92	80	1000	830	63	160	100	—	—	808
BC639-16	TO-92	80	1000	830	100	250	100	—	BC640-16	808

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## PNP GENERAL PURPOSE MEDIUM-POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BC369	TO-92	20	1000	830	85	375	40	BC368	785
BC369-16	TO-92	20	1000	830	100	250	40	BC368	785
BC369-25	TO-92	20	1000	830	160	>160	40	BC368	785
BC636	TO-92	45	1000	830	40	250	100	BC635	811
BC636-10	TO-92	45	1000	830	63	160	100	—	811
BC636-16	TO-92	45	1000	830	100	250	100	BC635-16	811
BC638	TO-92	60	1000	830	40	250	100	BC637	811
BC638-16	TO-92	60	1000	830	100	250	100	BC637-16	811
BC640	TO-92	80	1000	830	40	250	100	BC639	811
BC640-16	TO-92	80	1000	830	100	250	100	BC639-16	811

## NPN POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BDX42	TO-126	45	1000	1250	2000	>2000	200 typ.	—	BDX45	983
BDX43	TO-126	60	1000	1250	2000	>2000	200 typ.	—	—	983
BDX44	TO-126	80	1000	1250	2000	>2000	200 typ.	—	BDX47	983

## PNP POWER DARLINGTON TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CES</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	NPN COMPL.	PAGE
BDX45	TO-126	45	1000	1250	2000	>2000	200 typ.	—	BDX42	987
BDX47	TO-126	80	1000	1250	2000	>2000	200 typ.	—	BDX44	987

## NPN POWER SWITCHING TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	t <sub>off</sub> max. (ns)	PNP COMPL.	PAGE
BDX35	TO-126	60	5000	1250	45	450	350 typ.	500	—	980
BDX36	TO-126	60	5000	1250	45	450	350 typ.	500	—	980
BDX37	TO-126	80	5000	1250	45	450	350 typ.	500	—	980

## Small-signal Transistors and Diodes

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## NPN GENERAL PURPOSE POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	PNP COMPL.	PAGE
BD131	TO-126	45	3000	15000	40	>40	60	BD132	942
BD135	TO-126	45	1500	8000	40	250	190 typ.	BD136	948
BD135-10	TO-126	45	1500	8000	63	160	190 typ.	BD136-10	948
BD135-16	TO-126	45	1500	8000	100	250	190 typ.	BD136-16	948
BD137	TO-126	60	1500	8000	40	250	190 typ.	BD138	948
BD137-10	TO-126	60	1500	8000	63	160	190 typ.	BD138-10	948
BD137-16	TO-126	60	1500	8000	100	250	190 typ.	BD138-16	948
BD139	TO-126	80	1500	8000	40	250	190 typ.	BD140	948
BD139-10	TO-126	80	1500	8000	63	160	190 typ.	BD140-10	948
BD139-16	TO-126	80	1500	8000	100	250	190 typ.	BD140-16	948
BD230	TO-126	80	1500	12500	40	250	125 typ.	BD231	954
BD329	TO-126	20	3000	15000	85	375	130 typ.	BD330	960
BD825	TO-202	45	1000	2000	40	250	250 typ.	–	965
BD825-16	TO-202	45	1000	2000	100	250	250 typ.	–	965
BD829	TO-202	80	1000	2000	40	250	250 typ.	BD830	965

## PNP GENERAL PURPOSE POWER TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	f <sub>T</sub> min. (MHz)	NPN COMPL.	PAGE
BD132	TO-126	45	3000	15000	40	>40	60	BD131	945
BD136	TO-126	45	1500	8000	40	250	160 typ.	BD135	951
BD136-10	TO-126	45	1500	8000	63	160	160 typ.	BD135-10	951
BD136-16	TO-126	45	1500	8000	100	250	160 typ.	BD135-16	951
BD138	TO-126	60	1500	8000	40	250	160 typ.	BD137	951
BD138-10	TO-126	60	1500	8000	63	160	160 typ.	BD137-10	951
BD138-16	TO-126	60	1500	8000	100	250	160 typ.	BD137-16	951
BD140	TO-126	80	1500	8000	40	250	160 typ.	BD139	951
BD140-10	TO-126	80	1500	8000	63	160	160 typ.	BD139-10	951
BD140-16	TO-126	80	1500	8000	100	250	160 typ.	BD139-16	951
BD231	TO-126	80	1500	12500	40	250	50 typ.	BD230	957
BD330	TO-126	20	3000	15000	85	375	100 typ.	BD329	963
BD830	TO-202	80	1000	2000	40	250	75 typ.	BD829	968

## PROGRAMMABLE UNIJUNCTION TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>GA</sub> max. (V)	I <sub>A</sub> max. (mA)	I <sub>ARM</sub> max. (mA)	P <sub>tot</sub> max. (mW)	dl <sub>A</sub> /dt max. (A/μs)	I <sub>P</sub> max. (μA)	I <sub>V</sub> min. (μA)	t <sub>r</sub> max. (ns)	PAGE
BRY56A	TO-92	70	175	2500	300	20	0.2	2	80	1070

## Small-signal Transistors and Diodes

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## NPN RESISTOR-EQUIPPED TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>O</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	INPUT RES. (KΩ)	RES. RATIO	PNP COMPL.	PAGE
PDTC114ES	TO-92	50	100	500	30	>30	10	1	PDTA114ES	1318
PDTC114TS	TO-92	50	100	500	100	600	10	—	PDTA114TS	1333
PDTC124ES	TO-92	50	100	500	56	>56	22	1	PDTA124ES	1367
PDTC143ES	TO-92	50	100	500	20	>20	4.7	1	PDTA143ES	1388
PDTC144ES	TO-92	50	100	500	68	>68	47	1	PDTA144ES	1421

## PNP RESISTOR-EQUIPPED TRANSISTORS

TYPE NUMBER	PACKAGE	V <sub>CEO</sub> max. (V)	I <sub>C</sub> max. (mA)	P <sub>tot</sub> max. (mW)	h <sub>FE</sub> min.	h <sub>FE</sub> max.	INPUT RES. (KΩ)	RES. RATIO	PNP COMPL.	PAGE
PDTA114ES	TO-92	50	100	500	30	>30	10	1	PDTC114ES	1209
PDTA114TS	TO-92	50	100	500	100	600	10	—	PDTC114TS	1221
PDTA124ES	TO-92	50	100	500	56	>56	22	1	PDTC124ES	1246
PDTA143ES	TO-92	50	100	500	20	>20	4.7	1	PDTC143ES	1267
PDTA144ES	TO-92	50	100	500	68	>68	47	1	PDTC144ES	1297