



TO-18



TO-39



SOT-223



SOT-23

## NPN GENERAL PURPOSE TRANSISTORS - TO-18

V <sub>CEO</sub> V <sub>CER</sub> *	h <sub>FE</sub> @ I <sub>c</sub>		Type	V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>		f <sub>T</sub>	t <sub>s</sub>	P <sub>tot</sub>	Also available
	(V)	min/max		(mA)	max (V)	(mA)	min (MHz)	(ns)	
55	50/-	50	BSX33	0.3	150 / 15	60	800	500	
30	100/300	150	2N2222	1.6	500 / 50	250	225	500	
40	100/300	150	2N2222A	1	500 / 50	250	225	500	
80	40/-	150	2N720A	5	150 / 15	50	-	500	
80	100/300	150	2N3700	0.5	500 / 50	100 typ.	-	500	

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	(V)	min/max		(mA)	max (V)	(mA)	min (MHz)	max (ns)	
60	40/250	100	BC141	0.35 typ.	500/50	50	850*	800	h <sub>FE</sub> groups -6, -10, -16
30	40/-	150	BFY51	0.35	150/15	50	300 typ.	800	BFY52
30	100/300	150	2N2219	1.6	500/50	250	225	800	
35	30/-	150	BFY50	0.2	150/15	60	300 typ.	800	
40	100/300	150	2N2219A	1	500/50	300	225	800	
50*	40/120	150	2N1613	1.5	150/15	60	-	800	
50*	100/300	150	2N1711	1.5	150/15	70	-	800	
65	40/120	150	2N 2102	0.5	150/15	60	30*	1000	
80	40/120	150	2N 1893	1.5	150/15	50	-	800	
80	100/300	150	2N 3019	0.5	500/50	100	-	800	
50	40/250	500	2N5321	0.8	500/50	50	800*	1000	
60	40/250	500	BC441	1	1000/100	50	-	1000	
75	30/130	500	2N5320	0.5	500/50	50	800*	1000	

## PNP GENERAL PURPOSE TRANSISTORS - TO-18

V <sub>CEO</sub> (V)	h <sub>FE</sub> @ I <sub>c</sub>		Type	V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>		f <sub>T</sub> min (MHz)	t <sub>s</sub> t <sub>off</sub> * max (ns)	P <sub>tot</sub> (mW)	Also available
	min/max	(mA)		max (V)	(mA)				
40	100/300	150	2N2907	0.4	150/15	200	80	400	
60	100/300	150	2N2907A	0.4	150/15	200	80	400	

## PNP GENERAL PURPOSE TRANSISTORS - TO-39

V <sub>CEO</sub> (V)	h <sub>FE</sub> @ I <sub>c</sub>		Type	V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>		f <sub>T</sub> min (MHz)	t <sub>s</sub> t <sub>off</sub> * max (ns)	P <sub>tot</sub> (mW)	Also available
	min/max	(mA)		max (V)	(mA)				
80	100/300	100	2N4033	0.5	500/50	150	350	800	
40	100/230	150	2N2905	0.4	150/15	200	80	600	
60	100/300	150	2N2905A	0.4	150/15	200	80	600	
50	40/250	500	2N5323	1.2	500/50	50	–	1000	
60	40/250	500	BC461	1	1000/100	50	–	1000	
75	30/130	500	2N5322	0.7	500/50	50	1000*	1000	
60	40/250	100	BC161	0.35 typ.	500/50	50	600*	650	–10, –16

## NPN TRANSISTORS FOR LOW LEVEL, LOW NOISE APPLICATIONS - TO-18

V <sub>CEO</sub> (V)	h <sub>FE</sub> @ I <sub>c</sub>		Type	V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>		f <sub>T</sub> min (MHz)	NF max (db)	P <sub>tot</sub> (mW)	Also available
	min/max	(mA)		max (V)	(mA)				
20	110/800	2	BC108	0.6	100/5	100	10	300	B, C
32	120/630	2	BCY58	0.7	100/2.5	200 typ.	6	390	
45	110/450	2	BC107	0.6	100/5	100	10	300	A, B
45	120/630	2	BCY59	0.7	100/2.5	100	6	360	

**PNP TRANSISTORS FOR LOW LEVEL, LOW NOISE APPLICATIONS - TO-18**

$V_{CE0}$ (V)	$h_{FE} @ I_c$		Type	$V_{CE(sat)} @ I_c / I_B$		$f_T$ min (MHz)	NF max (db)	$P_{tot}$ (mW)	Also available
	min/max	(mA)		max (V)	(mA)				
45	120/460	2	BCY79	0.8	100/2.5	180 typ.	6	390	A, B
45	125/500 <sup>(1)</sup>	2	BC177	0.25	10/0.5	200 typ.	10	300	

(1)  $h_{FE} @ 1\text{KHz}$ .**HIGH VOLTAGE TRANSISTORS**

Polarity	$V_{CE0}$ (V)	$h_{FE} @ I_c$		Type	$V_{CE(sat)} @ I_c / I_B$		$f_T$ min (MHz)	$P_{tot}$ (mW)	Package
		min/max	(mA)		max (V)	(mA)			
PNP	150	40/-	10	BFW43	0.5	10/1	60	400	TO-18
NPN	180	30/-	10	BC394	0.3	10/1	50	400	TO-18
PNP	180	50/-	10	BC393	0.3	10/1	50	400	TO-18
NPN	160	25/-	30	BF257	1	30/6	90 typ.	1000	TO-39
PNP	200	30/150	10	2N5415S	2.5	50/5	15	1000	TO-39
NPN	300	25/-	30	BF259	1	30/6	90 typ.	1000	TO-39
NPN	250	25/-	30	BF258	1	30/6	90 typ.	1000	TO-39

**NPN TRANSISTORS FOR FAST AND ULTRA FAST SWITCHING**

$V_{CE0}$ (V)	$h_{FE} @ I_c$		Type	$V_{CE(sat)} @ I_c / I_B$		$f_T$ min (MHz)	$t_s$ $t_{off}^*$ (ns)	$P_{tot}$ (mW)	Package
	min/max	(mA)		max (V)	(mA)				
15	40/120	10	BSX20	0.6	100/10	450	13	360	TO-18
15	40/120	10	2N2369	0.25	10/1	500	13	360	TO-18
15	40/120	10	2N2369A	0.2	10/1	500	13	360	TO-18
50	60/150	100	2N4014	0.52	500/50	300	60*	360	TO-18
40	60/150	100	BSX32	0.5	500/50	300	60*	800	TO-39
50	60/150	100	2N3725	0.52	500/50	300	60*	800	TO-39

## NPN GENERAL PURPOSE TRANSISTORS - SOT-23

V <sub>CBO</sub> V <sub>CEs</sub> *	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	h <sub>FE</sub> @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> max min *
					min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
50 *	45	500	350	BC817-25	160/400	100	1	700	500	50	100 *
50 *	45	200	310	BCX19	100/600	100	1	620	500	50	200
50	45	100	200	BCW72	200/450	2	5	250	10	0.5	300
50	50	100	310	BC847B	200/450	2	5	600	100	5	300
75 *	45	800	360	BCW66F	100/250	100	1	700	500	50	100 *
75 *	45	800	360	BCW66G	160/400	100	1	700	500	50	100 *
75 *	45	800	360	BCW66H	250/600	100	1	700	500	50	100 *
80	80	500	350	SOA06	50/-	100	1	250	100	10	100 *

## PNP GENERAL PURPOSE TRANSISTORS - SOT-23

V <sub>CBO</sub> V <sub>CEs</sub> *	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	h <sub>FE</sub> @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> max min *
					min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
30	20	100	200	BCW30	215/600	2	5	300	10	0.5	150
30	30	100	310	BC858A	110/220	2	5	650	50	5	150
30	30	100	310	BC858B	200/450	2	5	650	50	5	150
50 *	45	500	350	BC807-25	160/400	100	1	700	500	50	100 *
50	45	100	200	BCW69	120/260	2	5	300	10	0.5	150
50	45	100	200	BCW70	215/500	2	5	300	10	0.5	150
50 *	45	100	310	BCX17	100/600	100	1	620	500	50	100
50	50	100	310	BC857A	110/220	2	5	650	50	5	150
50	50	100	310	BC857B	200/450	2	5	650	50	5	150
60 *	45	800	360	BCW68G	160/400	100	1	700	500	50	100 *
80	80	500	350	SOA56	50/-	100	1	250	100	10	50
110	100	100	200	BSS63	30/—	25	1	900	75	7.5	50

## NPN SWITCHING TRANSISTORS - SOT-23

V <sub>CBO</sub>	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	h <sub>FE</sub> @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> min
					min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
20	12	200	200	BSV52	40/120	10	1	400	50	5	400
40	15	200	200	SO2369	40/120	10	1	250	30	3	400
40	15	200	200	SO2369A	40/120	10	0.35	500	100	10	500

**NPN HIGH VOLTAGE TRANSISTORS - SOT-23**

V <sub>CBO</sub>	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub>
					min/max	(mA)	(V)	max	(mA)	(mA)	
(V)	(V)	(mA)	(mW)					(mV)			(MHz)
300	300	100	310	SO642	40/-	30	20	500	10	2	50

**PNP HIGH VOLTAGE TRANSISTORS - SOT-23**

V <sub>CBO</sub>	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub>
					min/max	(mA)	(V)	max	(mA)	(mA)	
(V)	(V)	(mA)	(mW)					(mV)			(MHz)
160	150	600	200	SO5401	60/240	10	5	500	50	5	100
300	300	100	310	SO692	40/-	10	10	500	20	2	50

**NPN MEDIUM CURRENT SWITCHING TRANSISTORS - SOT-23**

V <sub>CBO</sub>	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub>
					min/max	(mA)	(V)	max	(mA)	(mA)	
(V)	(V)	(mA)	(mW)					(mV)			(MHz)
60	30	800	310	SO2222	100/300	150	10	400	150	15	250
75	40	800	310	SO2222A	100/300	150	10	300	150	15	250

**PNP MEDIUM CURRENT SWITCHING TRANSISTORS - SOT-23**

V <sub>CBO</sub>	V <sub>CEO</sub>	I <sub>c</sub>	P <sub>tot</sub>	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub>
					min/max	(mA)	(V)	max	(mA)	(mA)	
(V)	(V)	(mA)	(mW)					(mV)			(MHz)
60	60	800	310	SO2907	40/120	150	10	400	150	15	200
60	60	800	310	SO2907A	100/300	150	10	400	150	15	200

## NPN TRANSISTORS - SOT-223

V <sub>CEO</sub> (V)	I <sub>c</sub> (mA)	P <sub>tot</sub> • (mW)	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> typ min * (MHz)
				min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
30	800	1500	STZT2222	100/300	150	10	1600	500	50	250 *
40	800	1500	STZT2222A	100/300	150	10	1000	500	50	300 *
60	1500	2000	BCP55	40/250	150	2	500	500	50	130
60	1000	2000	BSP40	40/120	100	5	500	500	50	100 *
60	1000	2000	BSP41	100/300	100	5	500	500	50	100 *
80	1500	2000	BCP56	40/250	150	2	500	500	50	130
80	1000	2000	BSP42	40/120	100	5	500	500	50	100 *
80	1000	2000	BSP43	100/300	100	5	500	500	50	100 *

## PNP TRANSISTORS - SOT-223

V <sub>CEO</sub> (V)	I <sub>c</sub> (mA)	P <sub>tot</sub> • (mW)	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> typ min * (MHz)
				min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
40	600	1500	STZT2907	100/300	150	10	400	150	15	250 *
60	600	1500	STZT2907A	40/250	150	10	400	150	15	130
60	1500	2000	BCP52	40/250	150	2	500	500	50	130
60	1000	2000	BSP30	40/120	100	5	500	500	50	100 *
60	1000	2000	BSP31	100/300	100	5	500	500	50	100 *
80	1500	2000	BCP53	40/250	150	2	500	500	50	130
80	1000	2000	BSP32	40/120	100	5	500	500	50	100 *
80	1000	2000	BSP33	100/300	100	5	500	500	50	100 *

## NPN HIGH VOLTAGE AND VIDEO AMPLIFIER TRANSISTORS - SOT-223

V <sub>CEO</sub> V <sub>CER</sub> * (V)	I <sub>c</sub> (mA)	P <sub>tot</sub> • (mW)	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> min (MHz)
				min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
300	500	2000	STZTA42	40/-	10	10	500	20	2	50

## PNP HIGH VOLTAGE AND VIDEO AMPLIFIER TRANSISTORS - SOT-223

V <sub>CEO</sub> V <sub>CER</sub> * (V)	I <sub>c</sub> (mA)	P <sub>tot</sub> • (mW)	Type	hFE @ I <sub>c</sub> / V <sub>CE</sub>			V <sub>CE(sat)</sub> @ I <sub>c</sub> / I <sub>B</sub>			f <sub>T</sub> min (MHz)
				min/max	(mA)	(V)	max (mV)	(mA)	(mA)	
150	600		STZT5401	60/240	10	5	500	50	5	100
300	500		STZTA92	40/-	10	10	500	20	2	50

• Mounted on a ceramic substrate area of 35 x 35 x 0.7 mm