

# TABLE 7 : NPN/PNP MEDIUM POWER

The transistors shown in this table have been designed to operate and provide useful gain at current levels up to 1 amp with power dissipation capabilities of 1000mW at 25°C ambient temperature. Typical application areas include: Audio Frequency Drivers and Output Stages, Relay Switching, etc.

Type	V <sub>CBO</sub> V	V <sub>CEO</sub> V	Max I <sub>c</sub> mA	Max V <sub>CE(sat)</sub> at			h <sub>FE</sub> at			Min f <sub>T</sub> at		P <sub>tot</sub> at T <sub>amb</sub> = 25°C mW	Complement
				V	I <sub>c</sub> mA	I <sub>B</sub> mA	Min	Max	I <sub>c</sub> mA	MHz	I <sub>c</sub> mA		
<b>NPN</b>													
ZTX455§	160	140	1000	0.7	150	15	100	300	150	100	50	1000	ZTX555
ZTX454	140	120	1000	0.7	150	15	100	300	150	100	50	1000	ZTX554
ZTX453§	120	100	1000	0.7	150	15	40	200	150	150	50	1000	ZTX553
ZTX452	100	80	1000	0.7	150	15	40	150	150	150	50	1000	ZTX552
MPSA06	80	80	500	0.25	100	10	50	—	100	100	10	750	MPSA56
ZTX451§	80	60	1000	0.35	150	15	50	150	150	150	50	1000	ZTX551
BFS61	80	60	1000	0.35	150	15	40	160	150	150	50	500	BFS98
MPSA05	60	60	500	0.25	100	10	50	—	100	100	10	750	MPSA55
ZTX450§	60	45	1000	0.25	150	15	100	300	150	50	50	1000	ZTX550
BFS60	60	40	1000	0.25	150	15	100	300	150	150	50	500	BFS97
BFS59	60	30	1000	0.35	150	15	40	300	150	150	50	500	BFS96
ZTX337	50	45	800	0.7	500	50	100	630	100	200*	10	750	ZTX537
BC337P	50	45	800	0.7	500	50	100	630	100	100	10	625	BC327P
ZTX449§	50	30	1000	0.5	1000	100	100	300	500	150	50	1000	ZTX549
ZTX338	30	25	800	0.7	500	50	100	630	100	200*	10	750	ZTX538
BC338P	30	25	800	0.7	500	50	100	630	100	100	10	625	BC328P
<b>PNP</b>													
ZTX557§	300	300	500	0.3	50	5	50	300	50	75	50	1000	—
ZTX556	200	200	500	0.3	50	5	50	300	50	75	50	1000	—
ZTX555§	160	150	1000	0.3	100	10	50	300	300	100	50	1000	ZTX455
ZTX554	140	125	1000	0.3	100	10	50	300	300	100	50	1000	ZTX454
ZTX553§	120	100	1000	0.7	150	15	40	200	150	150	50	1000	ZTX453
ZTX552	100	80	1000	0.7	150	15	40	150	150	150	50	1000	ZTX452
MPSA56	80	80	500	0.25	100	10	50	—	100	100	10	750	MPSA06
ZTX551§	80	60	1000	0.35	150	15	50	150	150	150	50	1000	ZTX451
BFS98	80	60	1000	0.35	150	15	40	160	150	150	50	500	BFS61
MPSA55	60	60	500	0.25	100	10	50	—	100	100	10	750	MPSA05
ZTX550§	60	45	1000	0.25	150	15	100	300	150	150	50	1000	ZTX450
BFS97	60	40	1000	0.265	150	15	100	300	150	150	50	500	BFS61
BFS96	60	30	1000	0.35	150	165	40	300	150	150	50	500	BFS59
ZTX537	50	45	800	0.7	500	50	100	630	100	200*	10	750	ZTX337
BC327P	50	45	800	0.7	500	50	100	630	100	100	10	625	BC337P
ZTX549§	35	25	1000	0.5	1000	100	100	300	500	100	100	1000	ZTX449
ZTX538	30	25	800	0.7	500	50	100	630	100	200*	10	750	ZTX338
BC328P	30	25	800	0.7	500	50	100	630	100	100	10	625	BC338P

\* Typical.

§ Also available with centre collector lead form option. See centre collector section for details.

# TABLE 13 : NPN/PNP HIGH VOLTAGE TRANSISTORS

The transistors shown in this table are designed for driving numerical indicator tubes, neon lamps and other applications requiring high voltage capability.

Type	V <sub>CBO</sub> V	V <sub>CEO</sub> V	Max I <sub>c</sub> mA	Max V <sub>CE(sat)</sub> at			h <sub>FE</sub> at			Max I <sub>CBO</sub> at		P <sub>tot</sub> at T <sub>amb</sub> = 25°C mW	Comple- ment
				V	I <sub>c</sub> mA	I <sub>B</sub> mA	Min	Max	I <sub>c</sub> mA	μA	V <sub>CB</sub> V		
<b>NPN</b>													
ZTX658	400	400	500	0.5	100	10	50	—	100	0.1	300	1000	ZTX758
ZTX458	400	400	500	0.5	50	6	100	300	50	0.1	320	1000	ZTX558
ZTX657§	300	300	500	0.5	100	10	50	—	100	0.1	200	1000	ZTX757
MPSA42§	300	300	500	0.5	20	2.0	40	—	10	0.1	200	680	MPSA92
BF393	300	300	500	2.0	20	2.0	40	—	10	0.1	200	625	BF493
BF392	250	250	500	2.0	20	2.0	40	—	10	0.1	200	625	BF492
ZTX656	200	200	500	0.5	100	10	50	—	100	0.1	160	1000	ZTX756
MPSA43	200	200	500	0.4	20	2.0	40	—	10	0.1	160	680	MPSA93
BF391	200	200	500	2.0	20	2.0	40	—	10	0.1	160	625	BF491
2N5551	180	160	600	0.2	50	5	80	250	10	0.05	120	350	2N5401
ZTX655§	150	150	1000	0.5	1000	200	50	—	500	0.1	125	1000	ZTX755
ZTX455§	160	140	1000	0.7	150	15	100	300	150	0.1	140	1000	ZTX555
2N5550	160	140	600	0.25	50	5	60	250	10	0.1	100	350	2N5400
ZTX654	125	125	1000	0.5	1000	200	50	—	500	0.1	100	1000	ZTX754
ZTX454	140	120	1000	0.7	150	15	100	300	150	0.1	120	1000	ZTX554
ZTX342	120	120	100	0.5	2	0.1	30	—	2	0.5	100	300	ZTX542
ZTX341	100	100	100	0.5	2	0.1	30	—	2	0.5	80	300	ZTX541
<b>PNP</b>													
ZTX758	400	400	500	0.5	100	10	50	—	100	0.1	300	1000	ZTX658
ZTX558	400	400	500	0.5	50	6	100	300	50	0.1	320	1000	ZTX458
BF493SP	350	350	500	2.0	20	2.0	40	—	10	0.005	250	625	—
ZTX757§	300	300	500	0.5	100	10	50	—	100	0.1	200	1000	ZTX657
ZTX557§	300	300	500	0.3	50	5	50	300	50	0.1	200	1000	—
MPSA92§	300	300	500	0.5	20	2.0	40	—	10	0.1	200	680	MPSA42
BF493	300	300	500	2.0	20	2.0	40	—	10	0.1	200	625	BF393
BF492	250	250	500	2.0	20	2.0	40	—	10	0.1	200	625	BF392
ZTX776	200	200	1000	0.5	1000	200	50	—	500	0.1	160	1000	—
ZTX576	200	200	1000	0.3	100	10	50	300	300	0.1	160	1000	—
ZTX756	200	200	500	0.5	100	10	50	—	100	0.1	160	1000	ZTX656
ZTX556	200	200	500	0.3	50	5	50	300	50	0.1	160	1000	—
MPSA93	200	200	500	0.4	20	2.0	40	—	10	0.1	160	680	MPSA43
BF491	200	200	500	2.0	20	2.0	40	—	10	0.1	160	625	BF391
2N5401	160	150	600	0.5	50	5	60	240	10	0.05	120	350	2N5551
ZTX755§	150	150	1000	0.5	1000	200	50	—	500	0.1	125	1000	ZTX655
ZTX555§	160	150	1000	0.3	100	10	50	300	300	0.1	140	1000	ZTX455
ZTX754	125	125	1000	0.5	1000	200	50	—	500	0.1	100	1000	ZTX654
ZTX554	140	125	1000	0.3	100	10	50	300	300	0.1	120	1000	ZTX454
2N5400	130	120	600	0.5	50	5	40	180	10	0.1	100	350	2N5550
ZTX542	120	120	100	0.5	2	0.1	30	—	2	0.5	100	300	ZTX342
ZTX541	100	100	100	0.5	2	0.1	30	—	2	0.5	80	300	ZTX341

§Current in second breakdown. See centre collector section for details.

# SEMICONDUCTOR DICE

## NPN HIGH VOLTAGE

Dice type	V <sub>CB0</sub>	V <sub>CE0</sub>	I <sub>CB0</sub>		h <sub>FE</sub>			V <sub>CE(sat)</sub>		Max.	f <sub>T</sub>	C <sub>OBO</sub>	Chip geometry	
	Min.	Min.	Max. at V <sub>CB</sub>		at	I <sub>C</sub>	V <sub>CE</sub>	at	I <sub>C</sub>	I <sub>B</sub>	Min.	Max.		
	Volts	Volts	nA	Volts	Min.	Max.	mA	Volts	Volts	mA	mA	MHz	pF	
ZTX657	300	300	100	200	50	—	100	5	0.5	100	10	30	20	G10
MPSA42	300	300	100	200	40	—	30	10	0.5	20	2	50	6	G13
ZTX656	200	200	100	160	50	—	100	5	0.5	100	10	30	20	G10
MPSA43	200	200	100	160	50	200	30	10	0.4	20	2	50	6	G13
ZTX655	150	150	100	125	50	—	500	5	0.5	500	50	30	20	G12
ZTX455	160	140	100	140	100	300	150	10	0.7	150	15	100	15	G9
ZTX454	140	120	100	120	100	300	150	10	0.7	150	15	100	15	G9
ZTX654	125	125	100	100	50	—	500	5	0.5	500	50	30	20	G12
ZTX342	120	120	500	100	30	—	2	1	0.5	2	0.1	80	10	G14
ZTX341	100	100	500	80	30	—	2	1	0.5	2	0.1	80	10	G14

## PNP HIGH VOLTAGE

Dice type	V <sub>CB0</sub>	V <sub>CE0</sub>	I <sub>CB0</sub>		h <sub>FE</sub>			V <sub>CE(sat)</sub>		Max.	f <sub>T</sub>	C <sub>OBO</sub>	Chip geometry	
	Min.	Min.	Max. at V <sub>CB</sub>		at	I <sub>C</sub>	V <sub>CE</sub>	at	I <sub>C</sub>	I <sub>B</sub>	Min.	Max.		
	Volts	Volts	nA	Volts	Min.	Max.	mA	Volts	Volts	mA	mA	MHz	pF	
ZTX757	300	300	100	200	50	—	100	5	0.5	100	10	30	20	G12
ZTX557	300	300	100	200	50	300	50	10	0.3	50	5	75	10	G11
MPSA92	300	300	250	200	25	—	30	10	0.5	20	2	50	6	G13
ZTX756	200	200	100	160	50	—	100	5	0.5	100	10	30	20	G12
ZTX556	200	200	100	160	50	300	50	10	0.3	50	5	75	10	G11
MPSA93	200	200	250	160	30	150	30	10	0.4	20	2	50	8	G13
ZTX555	160	150	100	140	50	300	300	10	0.3	100	10	100	10	G11
ZTX755	150	150	100	125	50	—	500	5	0.5	500	50	30	20	G12
ZTX554	140	125	100	120	50	300	300	10	0.3	100	10	100	10	G11
ZTX754	125	125	100	100	50	—	500	5	0.5	500	50	30	20	G12
ZTX542	120	120	500	100	30	—	2	1	0.5	2	0.1	80	10	G2
ZTX541	100	100	500	80	30	—	2	1	0.5	2	0.1	80	10	G2

## NPN DARLINGTON

Dice type	V <sub>CB0</sub>	V <sub>CE0</sub>	I <sub>CB0</sub>		h <sub>FE</sub>			V <sub>CE(sat)</sub>		Max.	f <sub>T</sub>	C <sub>OBO</sub>	Chip geometry	
	Min.	Min.	Max. at V <sub>CB</sub>		at	I <sub>C</sub>	V <sub>CE</sub>	at	I <sub>C</sub>	I <sub>B</sub>	Min.	Max.		
	Volts	Volts	nA	Volts	Min.	Max.	mA	Volts	Volts	mA	mA	MHz	pF	
ZTX601	180	160	100	160	2k	100k	500	10	1.1	500	5.0	150	15	G15
ZTX600	160	140	100	140	2k	100k	500	10	1.1	500	5.0	150	15	G15
ZTX605	140	120	100	120	2k	100k	1000	5	1.5	1000	1.0	150	—	G15
ZTX604	120	100	100	100	2k	100k	1000	5	1.5	1000	1.0	150	—	G15
ZTX603	100	80	100	80	2k	100k	1000	5	1.0	1000	1.0	150	—	G15
ZTX602	80	60	100	60	2k	100k	1000	5	1.0	1000	1.0	150	—	G15
BCX38A	80	60	100	60	1k	—	500	5	1.25	800	8.0	—	—	G16
BCX38B	80	60	100	60	4k	—	500	5	1.25	800	8.0	—	—	G16
BCX38C	80	60	100	60	10k	—	500	5	1.25	800	8.0	—	—	G16
MPSA14	30†	30	100	30	20k	—	100	5	1.5	100	0.1	—	—	G16
MPSA13	30†	30	100	30	10k	—	100	5	1.5	100	0.1	—	—	G16
MPSA12	20†	—	100	15	20k	—	10	5	1.0	10	0.01	—	—	G16

†V<sub>CES</sub>