

**TO-39 NPN METAL TRANSISTORS**  
**AMPLIFIER AND SWITCH**

Device Type	Polarity	V <sub>CEO</sub> V <sub>CER</sub> <sup>+</sup> (V <sub>dc</sub> )	I <sub>C</sub> max. (mA)	H <sub>FE</sub> min. @ I <sub>C</sub>		V <sub>CE</sub> (V <sub>dc</sub> )
				—	(mA)	
2N696S	NPN	40+	—	20	150	10
2N697S	NPN	40+	—	40	150	10
2N1613S	NPN	50+	500	40	150	10
2N1711S	NPN	50+	—	100	150	10
2N2218S	NPN	30	800	40	150	10
2N2218AS	NPN	40	900	100	150	10
2N2219S	NPN	30	800	40	150	10
2N2219AS	NPN	40	800	100	150	10

**MEDIUM CURRENT AMPLIFIER AND SWITCH**

BFY50	NPN	35	1000	30	150	6
BFY51	NPN	30	1000	40	150	6
BFY52	NPN	20	1000	60	150	6
BSX45	NPN	40	1000	40	100	1
BSX46	NPN	60	1000	40	100	1
BSX47	NPN	80	1000	40	150	1
2N1893S	NPN	80	500	40	150	10
2N2405S	NPN	90	1000	60	150	10
2N3019S	NPN	80	1000	100	150	10
2N3020S	NPN	80	1000	40	150	10
2N3053S	NPN	80	700	50	150	10

**VIDEO OUTPUT**

Device Type	Polarity	V <sub>CEO</sub> (Volts)	I <sub>C</sub> max. (mA)	H <sub>FE</sub> min. @ I <sub>C</sub>		V <sub>CE</sub> (Volts)
				—	(mA)	
BF257	NPN	160	100	25	30	10
BF258	NPN	250	100	25	30	10
BF259	NPN	300	100	25	30	10

**AUDIO DRIVERS**

Device Type	Polarity	V <sub>CEO</sub> (V <sub>dc</sub> )	I <sub>C</sub> max. (mA)	H <sub>FE</sub> @		V <sub>CE</sub> (V <sub>dc</sub> )
				—	I <sub>C</sub> (mA)	
BC140	NPN	40	1000	40	100	1
BC141	NPN	60	1000	40	100	1

**TO-39 PNP METAL TRANSISTORS**  
**GENERAL PURPOSE AMPLIFIER AND SWITCH**

Device Type	Polarity	V <sub>CEO</sub> (Volts)	I <sub>C</sub> max. (mA)	H <sub>FE</sub> min. @		V <sub>CE</sub> (Volts)
				—	I <sub>C</sub> (mA)	
2N2904S	PNP	40	600	40	150	10
2N2904AS	PNP	60	600	40	150	10
2N2905S	PNP	40	600	100	150	10
2N2905AS	PNP	60	600	100	150	10

**MEDIUM CURRENT AMPLIFIER AND SWITCH**

BFX38	PNP	55	1000	85	100	5
BFX39	PNP	55	1000	40	100	5
BFX40	PNP	75	1000	85	100	5
BFX41	PNP	75	1000	40	100	5
2N4404	PNP	80	1000	40	150	1
2N4405	PNP	80	1000	40	150	1
2N4406	PNP	80	2000	25	150	1
2N4407	PNP	80	2000	75	150	1
2N4890S	PNP	40	700	50	150	10

V <sub>CE</sub> (sat) @ max. (Vdc) (mA) (Volts)			F <sub>T</sub> min. @ I <sub>C</sub> (MHz) (mA)		Compl. Type	Comments
1.5	150	15	40	50		
1.5	150	15	50	50		
1.5	150	15	60	50		
1.5	150	15	70	50		
0.4	150	15	250	20	2N2904S	
0.3	150	15	250	20	2N2904AS	
0.4	150	15	250	20	2N2905S	
0.3	150	15	250	20	2N2905AS	

0.2	150	15	60	50		
0.35	150	15	50	50		
0.35	150	15	50	50		
1.0	1000	100	50	50		
1.0	1000	100	50	50		
0.9	500	25	50	50		
5.0	150	15	50	50		
0.5	150	15	—	—		
0.2	150	15	100	50		
0.2	150	15	80	50		
1.4	150	15	100	50	2N4890S	Exists A Version

Exist in -6, -10, -16 H<sub>FE</sub> groups  
Exist in -6, -10, -16 H<sub>FE</sub> groups  
Exist in -6, -10 H<sub>FE</sub> groups

V <sub>CE</sub> (sat) @ I <sub>C</sub> (Volts) (mA)	I <sub>B</sub> (mA)	F <sub>T</sub> Type @ I <sub>C</sub> (MHz) (mA)	C <sub>OB</sub> max. (pF)	Comments		
1	30	6	110	30	5.5	
1	30	6	110	30	5.5	
1	30	6	110	30	5.5	

V <sub>CE</sub> (sat) @ max. (Vdc)	I <sub>C</sub> (mA)	V <sub>CE</sub> (Volts)	F <sub>T</sub> min. @ I <sub>C</sub> (MHz) (mA)	Compl. Type	Comments	
1	1000	100	50	50	BC160	
1	1000	100	50	50	BC161	— Exists in -6, -10, -16 H <sub>FE</sub> Groups

V <sub>CE</sub> (sat) @ (Vdc)	I <sub>C</sub> (mA)	V <sub>CE</sub> (Volts)	F <sub>T</sub> min. @ I <sub>C</sub> (MHz) (mA)	Complementary	
0.4	150	15	200	50	2N2218S
0.4	150	15	200	50	2N2218AS
0.4	150	15	200	50	2N2219S
0.4	150	15	200	50	2N2219AS

0.15	150	15	100	50		
0.15	150	15	100	50		
0.15	150	15	100	50		
0.15	150	15	100	50		
0.2	150	15	200	50		
0.2	150	15	200	50		
0.2	150	15	150	50		
0.2	150	15	150	50		
0.4	150	15	100	50		

BFY56A

2N3053S