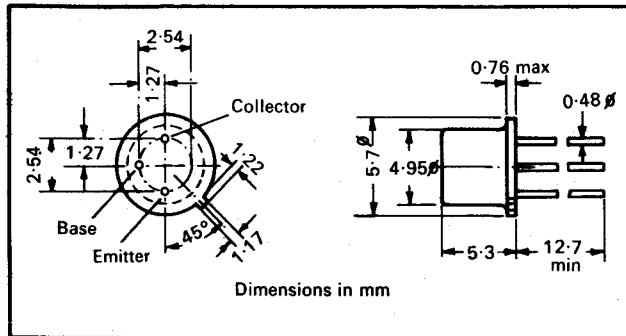
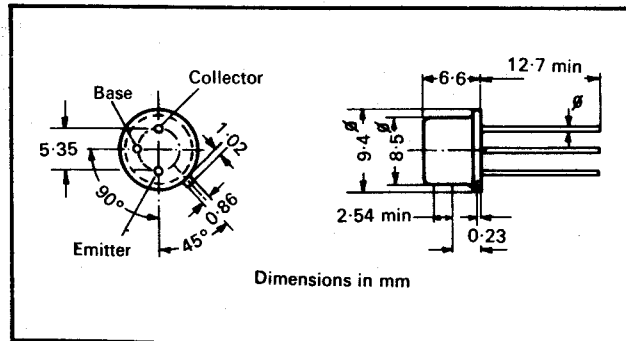


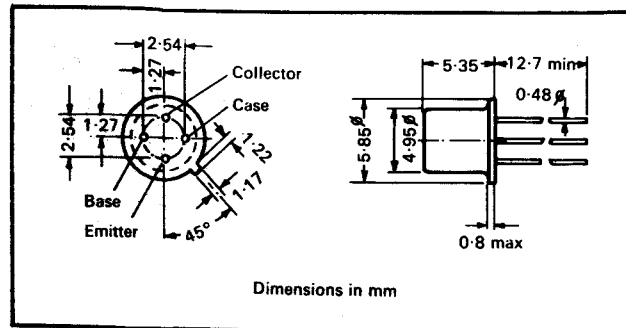
Case Outlines



TO-18



TO-39



TO-72

High Frequency Transistors

Device Type	Polarity	Case	Maximum ratings				hFE1 *			NF max.		ft min.	VCE(sat)		Notes
			BV CBO	BV CEO	BV EBO	ICM									
2N3570	NPN	TO72	30	15	3	50	5	20	150	1000	7	1500	—	—	Oscillator power output typically 60mW at 1GHz
2N3571	NPN	TO72	25	15	3	50	5	20	200	450	4	1200	—	—	
2N3572	NPN	TO72	25	13	3	50	5	20	300	450	6	1000	—	—	
2N918	NPN	TO72	30	15	3	50	3	20	—	60	6	600	10	0.4	Oscillator power output 50mW at 500 MHz
2N4252	NPN	TO72	30	18	4	50	2	50	—	100	2.5*	600	—	—	*Typical
2N4253	NPN	TO72	30	18	4	50	2	30	150	100	2.5*	600	—	—	

High Current PNP Amplifiers

Type	Polarity	Case	Maximum ratings				hFE1			hFE2			ft min.	VCE(sat)		Available in TO18	Notes
			BV CBO	BV CEO	BV EBO	ICM											
BFT79	PNP	TO39	90	80	5	1000	100	50	250	1000	20	—	100	1.0	1.6	BFT69	hFE 25 min at 1mA
BFT80	PNP	TO39	70	60	5	1000	100	75	250	1000	25	—	100	1.0	1.0	BFT70	hFE 45 min at 1mA
BFT81	PNP	TO39	60	50	5	1000	100	100	300	1000	25	—	100	1.0	1.0	BFT71	hFE 45 min at 1mA
BFT60	PNP	TO39	80	35	6	1000	150	30	—	1000	15	—	60	1.0	2.0	BFT20	hFE 20 min at 10mA
BFT61	PNP	TO39	60	30	6	1000	150	40	—	1000	15	—	50	1.0	2.0	BFT21	hFE 30 min at 10mA
BFT62	PNP	TO39	40	20	6	1000	150	60	—	1000	15	—	50	1.0	2.0	BFT22	hFE 30 min at 10mA
BC143	PNP	TO39	60	60	5	800	200	20	—	—	—	—	40	0.2	0.6	hFE 20 min at 100μA Available in 3 hFE Bands at Ic=150mA	Typically ton=110nS toff=265nS Typically ton=150nS toff=240nS
BC303	PNP	TO39	85	60	7	1000	150	40	240	500	20	—	120	0.15	0.65		
BC304	PNP	TO39	60	45	7	1000	150	40	240	500	20	—	120	0.15	0.65		
2N1131	PNP	TO39	50	35	5	600	150	20	45	5	15	—	—	0.15	1.5	Typically ton=110nS toff=265nS Typically ton=150nS toff=240nS	Typically ton=110nS toff=265nS Typically ton=150nS toff=240nS
2N1132	PNP	TO39	50	35	5	600	150	30	90	5	25	—	—	0.15	1.5		

Medium Current Amplifiers and Switches

Device Type	Polarity	Case	Maximum ratings				hFE1			hFE2			ft min.	VCE(sat)		Max. ton ns	Max. ts ns	Max. toff ns	Notes
			BV CBO	BV CEO	BV EBO	ICM													
2N2218A	NPN	TO39	75	40	6	800	150	40	120	500	25	—	250	150	0.3	35	—	280	hFE 20 min at 100μA
2N2221A	NPN	TO18	75	40	6	800	150	100	300	500	40	—	300	150	0.3	35	—	280	hFE 35 min at 100μA
2N2219A	NPN	TO39	75	40	6	800	150	100	300	500	40	—	300	150	0.3	35	—	280	hFE 35 min at 100μA
2N2222A	NPN	TO18	75	40	6	800	150	100	300	500	40	—	300	150	0.3	35	—	280	hFE 35 min at 100μA
2N2904A	PNP	TO39	60	60	5	600	150	40	120	500	40	—	200	150	0.4	45	—	100	hFE 40 min at 100μA
2N2906A	PNP	TO18	60	60	5	600	150	100	300	500	50	—	200	150	0.4	45	—	100	hFE 75 min at 100μA
2N2905A	PNP	TO39	60	60	5	600	150	100	300	500	50	—	200	150	0.4	45	—	100	hFE 75 min at 100μA
2N2907A	PNP	TO18	60	60	5	600	150	100	300	500	50	—	200	150	0.4	45	—	100	hFE 75 min at 100μA

Core Drivers

Device Type	Polarity	Case	Maximum ratings				hFE1			hFE2			f _T min. MHz	VCE(sat)		Max. ton ns	Max. ts ns	Max. toff ns	Notes
			BV CBO	BV CEO	BV EBO	ICM								IC	V				
			V	V	V	mA	mA	min.	max.	mA	min.	max.		mA	mA				
2N3724A	NPN	TO39	50	30	6	1200	100	60	150	1500	25	—	300	100	0.20	35	50	60	} Guaranteed switching time at 1 amp
2N3725A	NPN	TO39	80	50	6	1200	100	60	150	1500	20	—	300	100	0.26	35	50	60	
2N3244	PNP	TO39	40	40	5	1000	500	50	150	750	25	—	175	150	0.3	—	140	—	

Very High Voltage Amplifiers

Device Type	Polarity	Case	Maximum ratings				hFE1			hFE2			ft typ MHz	VCE(sat)		Notes
			BV CBO	BV CEO	BV EBO	ICM								IC	V	
			V	V	V	mA	mA	min.	max.	mA	min.	max.		mA	max	
BF257	NPN	TO5	160	160	5	200	30	25	—				110	30	1.0	} Designed as high voltage video amplifiers
BF258	NPN	TO6	250	250	5	200	30	25	—				110	30	1.0	
BF259	NPN	TO5	300	300	5	200	30	25	—				110	30	1.0	
BF336	NPN	TO5	185	180	5	100	30	20	—				80	30		} Intended for Video Applications
BF337	NPN	TO5	250	200	5	100	30	20	—				80			
BF338	NPN	TO5	300	225	5	100	30	20	—				80			
BF177	NPN	TO5	115	60	5	100	15	20	—	20	20	—	120			
BF178	NPN	TO5	160	115	5	100	20	20	—	30	20	—	120			
BF179	NPN	TO5	250	115	5	100	20	20	—	—	—	—	120			
BFT57	NPN	TO18	160	160	5	200	30	25	—	—	—	—	110	30	1.0	
BFT58	NPN	TO18	250	250	5	200	30	25	—	—	—	—	110	30	1.0	
BFT59	NPN	TO18	300	300	5	200	30	25	—	—	—	—	110	30	1.0	
BC312	NPN	TO5	100	100	5	150	1	40	—	30	50	200	100	50	2.0	} Designed as High Current Line Drivers
BD150A	NPN	TO5	300	220	6	500	40	20	—	80	20	—		80	1.0	
BD150B	NPN	TO5	250	150	6	500	40	20	—	80	20	—		80	1.0	
BD150C	NPN	TO5	200	150	6	500	40	20	—	80	20	—		80	1.0	} For High Current Applications
2N3440	NPN	TO5	300	250	7	1000	20	40	160	—	—	—	15*	50	0.5	
2N3439	NPN	TO5	450	350	7	1000	20	40	160	—	—	—	15*	50	0.5	
BFQ35	PNP	TO5	160	160	5	200	10	50	400	50	10	—	80	20	0.5	} BF257/8/9 Complementary Types
BFQ36	PNP	TO5	250	250	5	200	10	40	350	50	10	—	80	20	0.5	
BFQ37	PNP	TO5	300	300	5	200	10	30	300	50	10	—	80	20	0.5	

Complementary Pairs

Medium Current Amplifiers & Switches

NPN	TO5	PNP
2N2218		2N2904
2N2218A		2N2904A
2N2219		2N2905
2N2219A		2N2905A

Low level G.P. Amplifiers

NPN	TO18	PNP
BC107		BC177
BC108		BC178
BC109		BC179

High Current Amplifiers

NPN	TO5	PNP
BFT39		BFT79
BFT40		BFT80
BFT41		BFT81
BFY50		BFT60
BFY51		BFT61
BFY52		BFT62

NPN	TO18	PNP
2N2221		2N2906
2N2221A		2N2906A
2N2222		2N2907
2N2222A		2N2907A

NPN	TO18	PNP
BC325		2N2483
BC326		2N2484
BCW34		BCW35

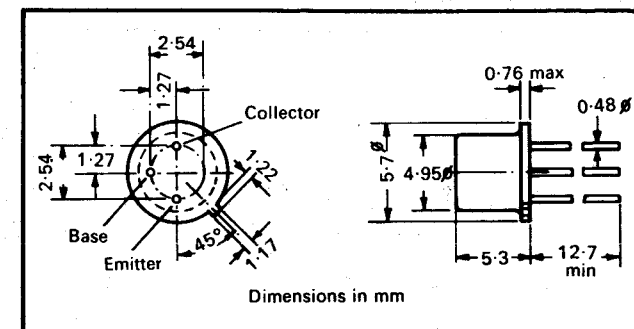
NPN	TO5	PNP
BC142		BC143
BC301		BC303
BC302		BC304
BFT32		BFT35
BFT33		BFT36
BFT34		BFT37

Small Signal Transistors

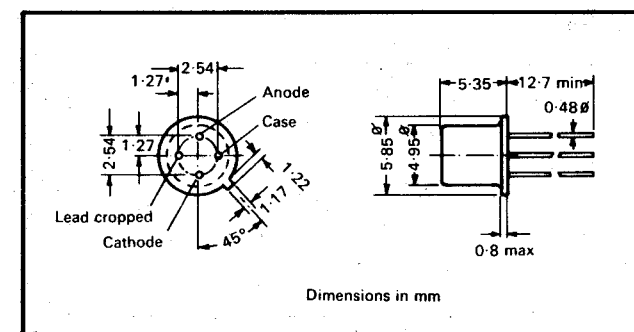
BS Type Number	Commercial Equivalent	Case Outline	Polarity	Absolute Maximum Rating			hFE at Collector Current			Min. ft MHz	Comments
				V _{CB} V	V _{CE} V	V _{EB} V	hFE min.	hFE max.	IC mA		
BS9300 C328 BS9300 C371 BS9300 C372 BS9300 C404	2S104 2N2221A* 2N2222A* 2N1893	TO18 TO18 TO18 TO5	NPN NPN NPN NPN	60 60 60 120	45 45 45 80	6 6 6 7	80 35 75 40	200 85 170 120	5 10 10 150	80 150 150 60	ton 140 ns toff 500 ns ton 140 ns toff 500 ns High Voltage hFE 35-100 α IC-1mA
BS9300 C460 BS9300 C461 BS9300 C462 BS9300 C463 BS9300 C478 BS9300 C492 BS9300 C493 BS9300 C495 BS9300 C496 BS9300 C580 BS9300 C581	2N1613 2S103 2N2411 2N2412 2N918 2N929 2N930 2N696 2N697 2N1131 2N1132	TO5 TO18 TO18 TO18 TO12 TO18 TO18 TO5 TO5 TO5 TO5	NPN NPN PNP PNP NPN NPN NPN NPN NPN PNP PNP	75 60 25 25 30 45 45 60 60 50 50	50 45 20 20 15 45 45 40 40 35 35	6 7 5 5 3 5 5 5 5 5 5	40 40 20 40 30 40 100 20 40 20 30	120 100 60 120 — 120 300 60 120 45 90	150 5 10 10 3 0.01 0.01 150 150 150 150	60 60 150 150 100 30 30 50 50 50 60	High Gain General Purpose Amplifier SRDE. Low Level Amplifier High Frequency Amplifier and Fast Switch Low Level Low Noise High Gain Amplifiers Medium Power High Gain General Purpose Amplifier Complementary to CV7580 & CV7581 Complementary to CV7495 & CV7496
BS9300 C588 BS9300 C596 BS9300 C630 BS9300 C631 BS9300 C633	2S104 2S103 2N2696 2N2927 2N1893	TO18 TO18 TO18 TO5 TO5	NPN NPN PNP PNP NPN	60 60 25 25 120	45 45 25 25 100	6 6 4 4 6	80 40 30 30 65	200 100 130 130 200	5 5 50 50 200	100 80 100 100 60	NPN General Purpose Amplifiers PNP High Frequency Amplifiers and Saturated Switches High Voltage General Purpose Amplifier
BS9300 C637 BS9300 C638 BS9300 C644 BS9300 C669 BS9300 C670 BS9300 C671 BS9300 C672 BS9300 C673 BS9300 C674 BS9300 C675 BS9300 C676	2N2905* 2N2905A* BC107A* 2N2904 2N2905 2N2904A 2N2905A 2N2906 2N2907 2N2906A 2N2907A	TO5 TO5 TO18 TO5 TO5 TO5 TO5 TO18 TO18 TO18 TO18	PNP PNP NPN PNP PNP PNP PNP PNP PNP PNP PNP	32 60 65 60 60 60 60 60 60 60 60	32 60 65 40 40 60 60 40 40 60 60	5 5 5 5 5 5 5 5 5 5 5	80 60 50 40 100 40 100 100 100 40 100	160 120 200 120 300 120 300 300 300 120 120	1.0 1.0 10 150 150 150 150 150 150 150 150	40 40 50 200 200 200 200 200 200 200 200	General Purpose PNP Amplifiers High Speed Medium Power Switching and General Purpose Amplifiers High Speed Switching and General Purpose Medium Power Amplifiers
BS9300 C722 BS9300 C723 BS9300 C724	8FY50 8FY51 8FY52	TO5 TO5 TO5	NPN NPN NPN	80 60 40	35 30 20	6 6 6	30 40 60	100 120 200	150 150 150	50 50 50	General purpose Amplifier
BS9300 C725 BS9300 C726 BS9300 C727 BS9300 C735 BS9300 C738	8FY50 8FY51 8FY52 2N1711 2N2484	TO5 TO5 TO5 TO5 TO18	NPN NPN NPN NPN NPN	80 60 40 75 60	35 30 20 50 60	6 6 6 7 6	30 35 50 100 100	— — — 300 500	150 150 150 150 0.01	50 50 50 70 60	General Purpose Amplifier and Saturated Switches 1 Amp hFE Minimum 10 High Gain Medium Power Amplifier Very High Gain Low Noise Low Level Amplifier
BS9300 C748 BS9300 C749 BS9300 C750 BS9300 C751 BS9300 C752 BS9300 C753 BS9300 C754 BS9300 C755 BS9300 C756 BS9300 C764 BS9300 C765 BS9300 C766	2N2221* 2N2906* 2N2221A* 2N2906A* 2N2222A* 2N2907A* 2N2222* 2N2907* 2N2218 2N2219 2N2218A 2N2219A	TO18 TO18 TO18 TO18 TO18 TO18 TO18 TO18 TO5 TO5 TO5 TO5	NPN PNP NPN PNP NPN PNP NPN PNP NPN NPN NPN NPN	25 25 45 45 45 45 25 25 60 25 75 75	25 25 35 35 35 35 25 25 30 30 40 40	4 4 4 4 4 4 4 4 5 5 6 6	38 38 38 38 75 75 75 75 40 100 40 100	162 162 162 162 250 250 250 250 120 300 120 300	10 10 10 10 10 10 10 10 150 150 150 150	120 120 120 120 120 120 120 120 250 250 250 250	High Frequency, Low Power Switching and Amplifier Applications. Fully Complementary High Frequency, Medium Power NPN Amplifier High Current Switches
BS9300 C767 BS9300 C768 BS9300 C769 BS9300 C770 BS9300 C774 BS9300 C775	2N2221 2N2222 2N2221A 2N2222A 2N2194 2N2243A	TO18 TO18 TO18 TO18 TO5 TO5	NPN NPN NPN NPN NPN NPN	60 60 75 75 60 120	30 30 40 40 40 80	5 5 6 6 5 7	40 100 40 100 20 40	120 300 120 300 60 120	150 150 150 150 150 50	250 250 250 250 50 50	TO18 Version of CV7763-66 General Purpose Amplifier High Voltage Amplifier

*Near Equivalent

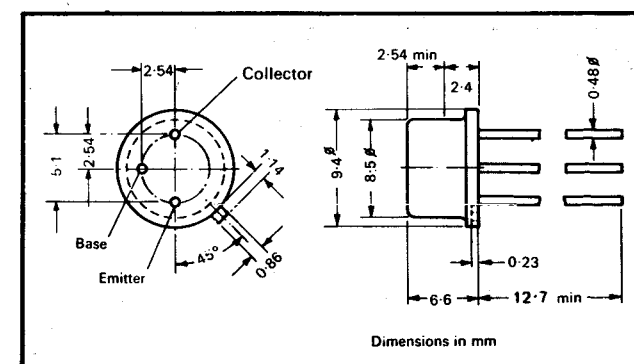
Case Outlines



TO-18



TO-72



TO-5