

# 358-204

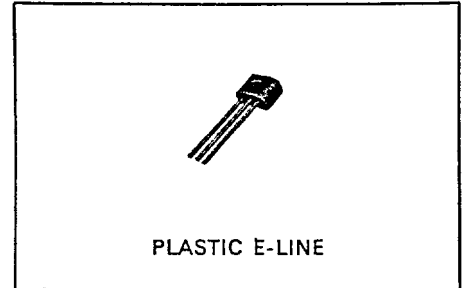
ZTX500 (BCW11)  
ZTX501 (BCW13)  
ZTX502 (BCW15)  
ZTX503 (BCW17)  
ZTX504 (BCW19)

## GENERAL DESCRIPTION

These plastic encapsulated transistors are designed for small and medium signal amplification from d.c. to radio frequencies. Typical application areas include: Audio Frequency Amplifiers, Drivers and Output Stages, Oscillators and General Purpose Switches.

These transistors are complementary to the ZTX300 series n-p-n transistors and electrically similar to the ZT180 series.

The ZTX500 series transistors have been APPROVED FOR USE IN MILITARY EQUIPMENT and are identified by the following numbers: BS.9365 F031-F035-Category P

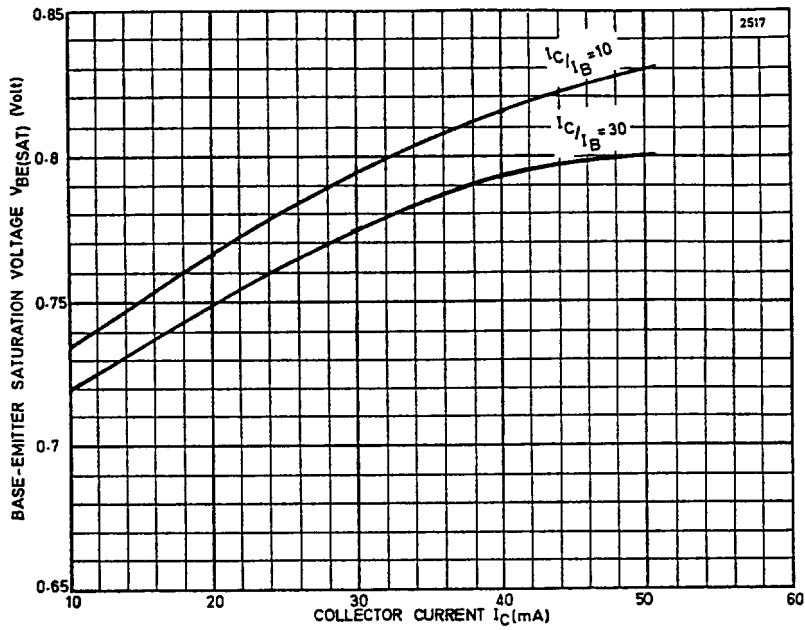


## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	ZTX500 (BCW11)	ZTX501 (BCW13)	ZTX502 (BCW15)	ZTX503 (BCW17)	ZTX504 (BCW19)	Units
Collector-Base Voltage	$V_{CBO}$	-25	-35	-35	-45	-70	Volts
Collector-Emitter Voltage	$V_{CEO}$	-25	-35	-35	-45	-70	Volts
Emitter-Base Voltage	$V_{EB}$	-5	-5	-5	-5	-5	Volts
Collector Current	$I_C$	-500	-500	-500	-500	-500	mA
Base Current	$I_B$	-100	-100	-100	-100	-100	mA
Power Dissipation at $T_{amb} = 25^\circ\text{C}$	$P_{tot}$	300	300	300	300	300	mW
Operating and Storage Temperature Range		-55 to +175					$^\circ\text{C}$

# ZTX500 Series

TYPICAL CHARACTERISTIC for the ZTX502



$$V_{BE(sat)}/I_C$$

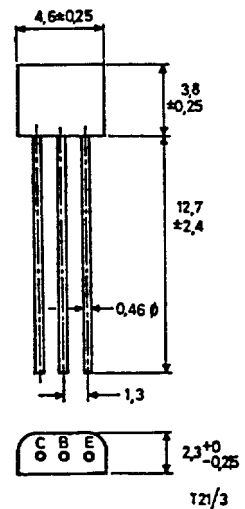
## LEAD CONNECTIONS

The device can be supplied to the following lead configurations by using the indicated suffix.

Lead Configuration	Suffix
TO- 5 (SO-95)	K
TO-18 (SO-96)	L
Flat mounting (SO-97)	M

## OUTLINE

BS.3934 .. .. . SO-94



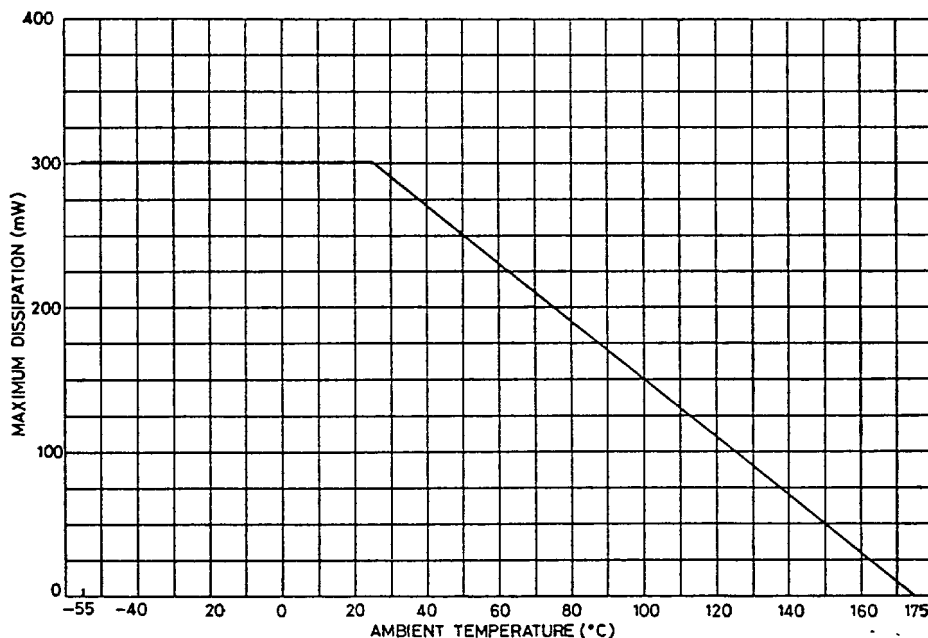
Dimensions in millimetres

# ZTX500 Series

CHARACTERISTICS (at 25°C ambient temperature unless otherwise specified).

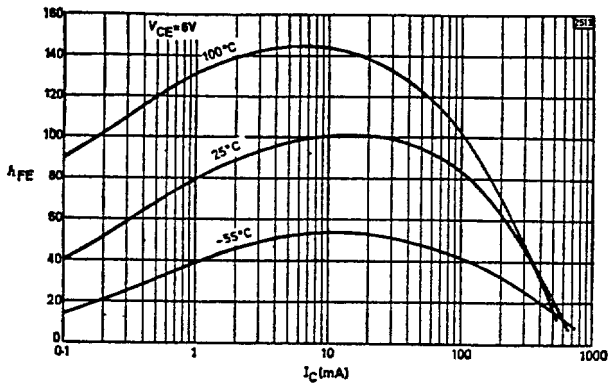
Parameter	Symbol	ZTX500 (BCW 11)	ZTX501 (BCW 13)	ZTX502 (BCW 15)	ZTX503 (BCW 17)	ZTX504 (BCW 19)	Units	Test Conditions
Max. Collector-base cut-off current	$I_{CBO}$	-0.2 — — —	— -0.2 — —	— -0.2 — —	— — -0.2 —	— — — -0.2	$\mu A$ $\mu A$ $\mu A$ $\mu A$	$V_{CB} = -25V$ $V_{CB} = -35V$ $V_{CB} = -45V$ $V_{CB} = -70V$
Maximum emitter-base cut-off current	$I_{EBO}$	-0.2	-0.2	-0.2	-0.2	-0.2	$\mu A$	$V_{EB} = -4V$
Minimum collector-emitter sustaining voltage	$V_{CEO(sus)}$	-25	-35	-35	-45	-70	V	$I_C = -5 mA$
Maximum collector-emitter saturation voltage	$V_{CE(sat)}$	-0.35	-0.25	-0.25	-0.35	-0.60	V	$I_C = -50 mA, I_B = -5 mA$
Base-emitter saturation voltage Minimum Maximum	$V_{BE(sat)}$	-0.65 -1.0	-0.65 -1.0	-0.65 -1.0	-0.65 -1.0	-0.65 -1.0	V V	} $I_C = -10 mA, I_B = -1 mA$
Static forward current transfer ratio Minimum Maximum Minimum Minimum	$h_{FE}$	50 300 — —	50 300 — —	100 300 20 50	50 300 — —	50 300 — —		
Minimum transition frequency	$f_T$	150	150	150	150	150	MHz	$I_C = -10 mA, V_{CE} = -6V$ $f = 100 MHz$
Maximum output capacitance	$C_{obo}$	6	6	6	6	6	pF	$V_{CB} = -6V, f = 1 MHz$
Typical noise figure	N	7	7	7	7	7	dB	$I_C = -100 \mu A, R_S = 1500 \Omega$ $f = 1 kHz$

Derating Curve

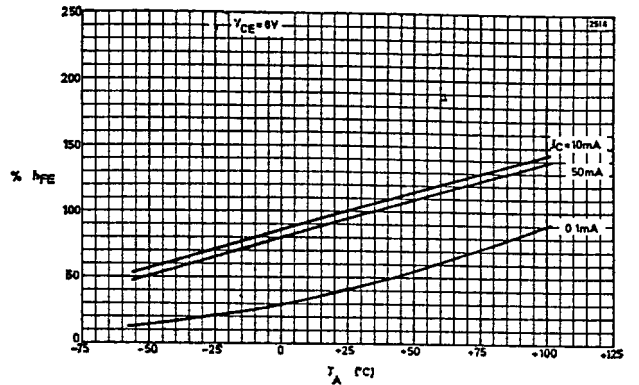


# ZTX500 Series

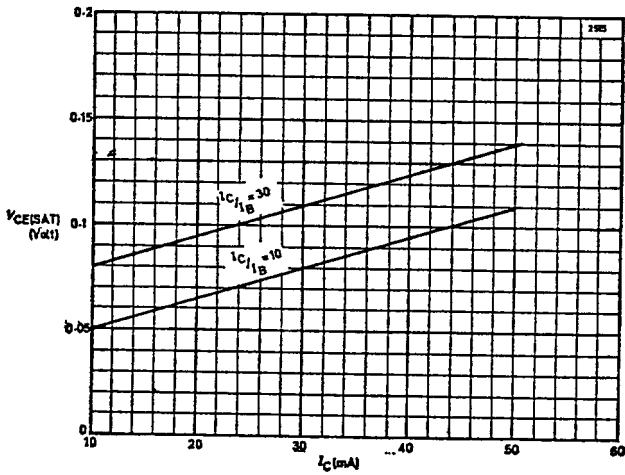
## TYPICAL CHARACTERISTICS for the ZTX502



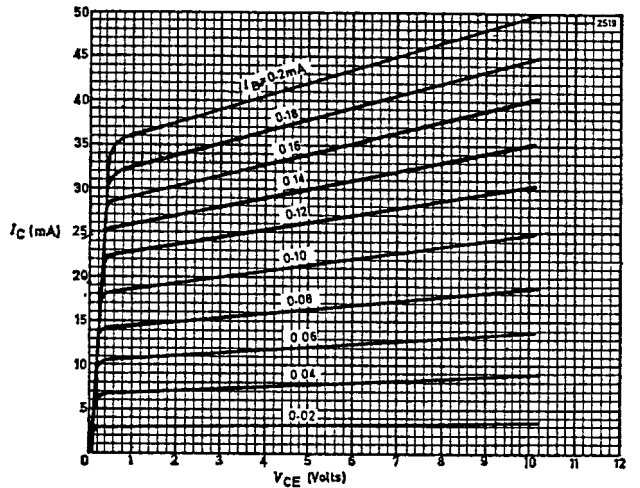
$h_{FE}/I_C$



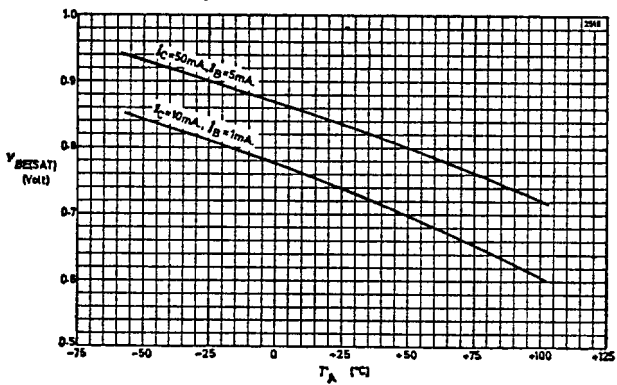
$h_{FE}/T_{ambient}$



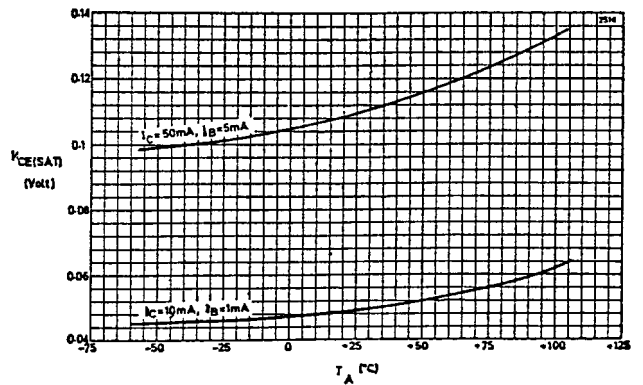
$V_{CE(sat)}/I_C$



$I_C/V_{CE}$



$V_{BE(sat)}/T_{ambient}$



$V_{CE(sat)}/T_{ambient}$

# TABLE 2 : PNP GENERAL PURPOSE

The devices shown in this table are general purpose transistors designed for small signal amplification from d.c. to radio frequencies. Typical application areas include: AUDIO FREQUENCY AMPLIFIERS, DRIVERS and OUTPUT STAGES, OSCILLATORS, AND GENERAL PURPOSE SWITCHES.

Element	Type	V <sub>CB0</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		
3P	BC556P	80	65	200	0.25	10	0.5	75	450	2	150*	10	500	BC546P
04	ZTX504	70	70	500	0.6	50	5	50	300	10	150	10	300	ZTX304
2P	ZTX212	60	50	200	0.25	10	0.5	60	400	2	200	10	500	ZTX107
12	BC212P	60	50	200	0.6	100	5	60	400	2	200	10	300	BC182P
7P	BC557P	50	45	200	0.25	10	0.5	75	450	2	150*	10	500	BC547P
7P	BC177P	50	45	200	0.2	10	0.5	120	460	2	130	10	300	BC107P
7P	BC307P	50	45	200	0.2	10	0.5	120	460	2	130*	10	300	BC237P
2	ZTX503	45	45	500	0.35	50	5	50	300	10	150	10	300	ZTX303
03	ZTX531	45	45	500	0.7	10	0.5	40	120	0.01	30	0.5	250	ZTX331
3	ZTX213	45	30	200	0.25	10	0.5	80	550	2	200	10	500	ZTX108
P	BC213P	45	30	200	0.6	100	5	80	600	2	200	10	300	BC183P
3	ZTX502	35	35	500	0.25	50	5	100	300	10	150	10	300	ZTX302
2	ZTX501	35	35	500	0.25	50	5	50	300	10	150	10	300	ZTX301
1	ZTX530	30	30	500	0.7	10	0.5	100	400	0.1	30	0.5	250	ZTX330
P	BC558P	30	30	200	0.25	10	0.5	75	800	2	150*	10	500	BC548P
P	BC178P	30	25	200	0.2	10	0.5	120	800	2	130	10	300	BC108P
P	BC308P	30	25	200	0.2	10	0.5	120	800	2	130*	10	300	BC238P
0	ZTX500	25	25	500	0.35	50	5	50	300	10	150	10	300	ZTX300

Typical