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MAXIMUM RATINGS

| Rating | Symbol | BCX 78 | BCX 79 | Unit |
|---|-----------------------------------|-------------|--------|---------------|
| Collector-Emitter Voltage | V _{CEO} | 32 | 45 | Vdc |
| Collector-Base Voltage | V _{CBO} | 32 | 45 | Vdc |
| Emitter-Base Voltage | V _{EBO} | 5.0 | | Vdc |
| Collector Current - Continuous | I _C | 100 | | mAdc |
| Total Device Dissipation @ T _A = 25°C Derate above 25°C | P _D | 625 | 5.0 | mW mW/°C |
| Total Device Dissipation @ T _C = 25°C Derate above 25°C | P _D | 1.5 | 12 | Watt mW/°C |
| Operating and Storage Junction Temperature Range | T _J , T _{stg} | -55 to +150 | | °C |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|------------------|------|------|
| Thermal Resistance, Junction to Case | R _{θJC} | 83.3 | °C/W |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 200 | °C/W |

BCX78,-7,-8,-9,-10
BCX79,-7,-8,-9,-10

CASE 29-04, STYLE 17
TO-92 (TO-226AA)

AMPLIFIER TRANSISTORS

PNP SILICON

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|--|----------------------|--------------------------|--------------------------|--------------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector-Emitter Breakdown Voltage (I _C = 10 mAdc, I _B = 0) | BCX78 BCX79 | V _{(BR)CEO} | 32 45 | — — | Vdc |
| Emitter-Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0) | All | V _{(BR)EBO} | 5.0 | 6.8 | Vdc |
| Collector Cutoff Current (V _{CE} = 32 V) | BCX78 | I _{CES} | — | 10 | nAdc |
| (V _{CE} = 45 V) | BCX79 | I _{CES} | — | 10 | nAdc |
| (V _{CE} = 32 V, T _A = 100°C, V _{BE} = 0.2 V) | BCX78 | I _{CEX} | — | 20 | μAdc |
| (V _{CE} = 45 V, T _A = 100°C, V _{BE} = 0.2 V) | BCX79 | I _{CEX} | — | 20 | μAdc |
| (V _{CE} = 32 V, T _A = 125°C) | BCX78 | I _{CES} | — | 2.5 | nAdc |
| (V _{CE} = 45 V, T _A = 125°C) | BCX79 | I _{CES} | — | 2.5 | nAdc |
| Emitter-Cutoff Current (V _{EBO} = 4.0 V, I _C = 0) | | I _{EBO} | — | 20 | nAdc |
| ON CHARACTERISTICS | | | | | |
| DC Current Gain (I _C = 10 μAdc, V _{CE} = 5.0 Vdc) | BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10 | h _{FE} | 20 40 75 100 | 140 200 270 340 | — — — — |
| (I _C = 2.0 mAdc, V _{CE} = 5.0 Vdc) | BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10 | | 120 180 250 380 | 170 250 350 500 | 220 310 460 630 |
| (I _C = 10 mAdc, V _{CE} = 1.0 Vdc) | BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10 | | 80 120 160 240 | 180 260 360 500 | — 400 630 1000 |
| (I _C = 100 mAdc, V _{CE} = 2.0 Vdc) | BCX78-7, BCX79-7 BCX78-8, BCX79-8 BCX78-9, BCX79-9 BCX78-10, BCX79-10 | | 40 45 60 60 | — — — — | — — — — |
| Collector-Emitter Saturation Voltage (I _C = 100 mAdc, I _B = 5.0 mAdc) | | V _{CE(sat)} | — | — | 0.6 Vdc |
| Base-Emitter Saturation Voltage (I _C = 100 mA, I _B = 5.0 mAdc) | | V _{BE(sat)} | — | — | 1.0 Vdc |
| Base-Emitter On Voltage (I _C = 2.0 mAdc, V _{CE} = 5.0 Vdc) | | V _{BE(on)} | 0.55 | — | 0.7 Vdc |

6367254 MOTOROLA SC (XSTRS/R F)

96D 81726 D

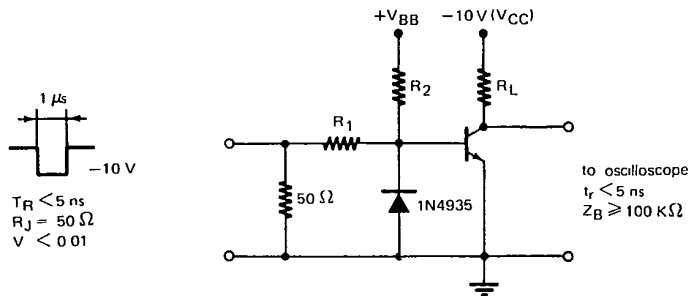
BCX78,-7,-8,-9,-10, BCX79,-7,-8,-9,-10

T-29-21

ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|-----------|--------------------------|--------------------------|--------------------------|------|
| SMALL-SIGNAL CHARACTERISTICS | | | | | |
| Current-Gain Bandwidth Product ($I_C = 10 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 100 \text{ MHz}$) | f_T | — | 200 | — | MHz |
| Output Capacitance ($V_{CE} = 10 \text{ Vdc}$, $I_C = 0$, $f = 1.0 \text{ MHz}$) | C_{ob} | — | 2.6 | 4.5 | pF |
| Input Capacitance ($V_{BE} = 0.5 \text{ V}$, $I_C = 0$, $f = 1.0 \text{ MHz}$) | C_{ib} | — | 8.5 | 15 | pF |
| Small-Signal Current Gain ($I_C = 2.0 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) | h_{fe} | 125 175 250 350 | 200 260 330 520 | 250 350 500 700 | — |
| Noise Figure ($I_C = 0.2 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$, $R_G = 2.0 \text{ kohms}$, $f = 1.0 \text{ kHz}$) | NF | — | 1.0 | 6.0 | dB |
| ($I_C = 10 \text{ mA}$, $I_{B1} = 1.0 \text{ mA}$, $I_{B2} = 1.0 \text{ mA}$) ($V_{BB} = 3.6 \text{ V}$, $R_1 = R_2 = 5.0 \text{ k}\Omega$) ($R_L = 999 \text{ ohms}$) *See test circuit | T_d | — | 17 | — | ns |
| | T_r | — | 27 | — | |
| | T_{on} | — | 44 | 150 | |
| | T_s | — | 400 | — | |
| | T_f | — | 60 | — | |
| ($I_C = 100 \text{ mA}$, $I_{B1} = 10 \text{ mA}$, $I_{B2} = 10 \text{ mA}$) ($V_{BB} = 5.0 \text{ V}$, $R_1 = 500 \Omega$, $R_2 = 700 \Omega$) ($R_L = 98 \text{ ohms}$) *See test circuit | t_d | — | 5.0 | — | ns |
| | t_r | — | 20 | — | |
| | t_{on} | — | 25 | 150 | |
| | t_s | — | 130 | — | |
| | t_f | — | 40 | — | |
| | t_{off} | — | 170 | 800 | |

TEST CIRCUIT



6367254 MOTOROLA SC (XSTRS/R F)

96D 81727 D

BCX78,-7,-8,-9,-10, BCX79,-7,-8,-9,-10

T-29-21

2

FIGURE 1 - NORMALIZED DC CURRENT GAIN

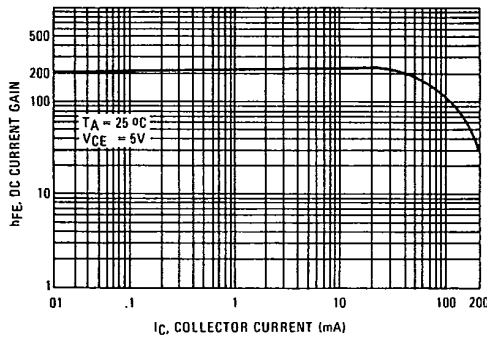


FIGURE 2 - "SATURATION" AND "ON" VOLTAGES

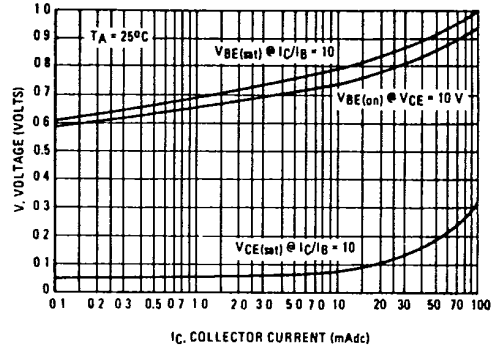


FIGURE 3 - COLLECTOR SATURATION REGION

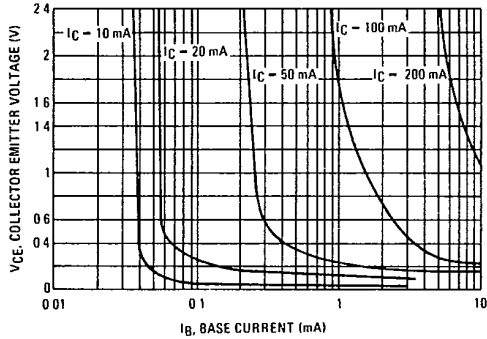


FIGURE 4 - BASE EMITTER TEMPERATURE COEFFICIENT

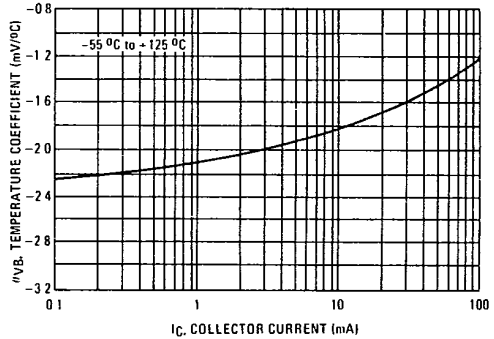


FIGURE 5 - CAPACITANCES

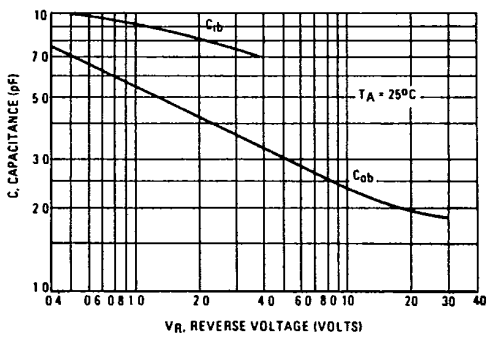


FIGURE 6 - CURRENT GAIN-BANDWIDTH PRODUCT

