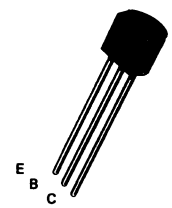
BF 368
BF 369

NPN SILICON ANNULAR* TRANSISTORS

. . . designed for RF, I.F. low-level amplifier, and oscillator applications.

- High f_T
- One-Piece, Injection-Molded Plastic Unibloc† Package for High Reliability

NPN SILICON AMPLIFIER TRANSISTORS

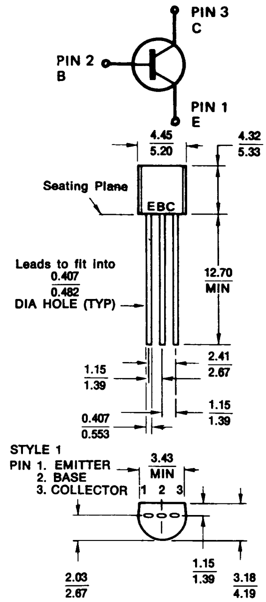


MAXIMUM RATINGS

Rating	Symbol	BF 368	BF 369	Unit
Collector-Emitter Voltage	V_{CEO}	15	20	Vdc
Collector-Base Voltage	V_{CB}	25	30	Vdc
Emitter-Base Voltage	V_{EB}	4.0	4.0	Vdc
Collector Current	I_C	50		mA
Total Device Dissipation @ T_A = 25° C Derate above 25° C	P_D	350 2.81		mW 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 Ambient	θ_{JA}	357	°C/W



CASE 29-02 (1)
(TO92)
PLASTIC

Dimensions in millimeters

*Annular Semiconductors Patented by Motorola Inc.
†Trademark of Motorola Inc.

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage* (I_C = 3.0 mAdc, I_B = 0)	BF 368 BF 369	BV_{CEO}*	15 20	– –	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BF 368 BF 369	BV_{CBO}	25 30	– –	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	BF 368 BF 369	BV_{EBO}	4.0 4.0	– –	Vdc
Collector Cutoff Current (V_{CB} = 15 Vdc, I_E = 0)	BF 368 BF 369	I_{CBO}	– –	100 100	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 mAdc, V_{CE} = 10.0 Vdc)	BF 368 BF 369	h_{FE}	35 70	125 220	–
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)	BF 368 BF 369	$V_{CE(sat)}$	–	0.4	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1 mAdc)	BF 368 BF 369	$V_{BE(sat)}$	–	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain—Bandwidth Product (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	BF 368 BF 369	f_T	250 400	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	BF 368 BF 369	C_{ob}	– – –	1.7 1.7	pF
Feedback Capitance (V_{CE} = 10 Vdc, I_C = 1 mA, f = 1 MHz)		C_{re}	–	.95 (typ)	pF
Noise Figure (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, Rs = 800 Ω, f = 1.0 MHz)		NF	–	2 (typ)	dB
Noise Figure (I_C = 1.0 mAdc, V_{CE} = 10 Vdc R_S = 100 ohms, f = 100 MHz)		NF	–	4 (typ)	dB

COMMON EMITTER Y PARAMETERS

V_{CE} = 10.0 Vdc, f = 100 MHz, T_A = 25° C

FIGURE 1 — INPUT ADMITTANCE versus COLLECTOR CURRENT

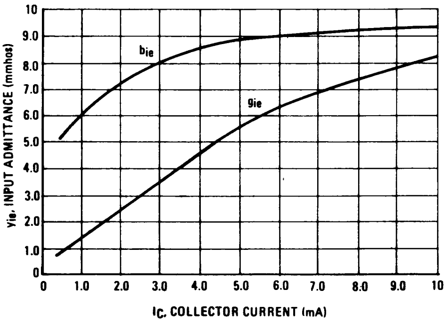


FIGURE 2 — REVERSE TRANSFER ADMITTANCE versus COLLECTOR CURRENT

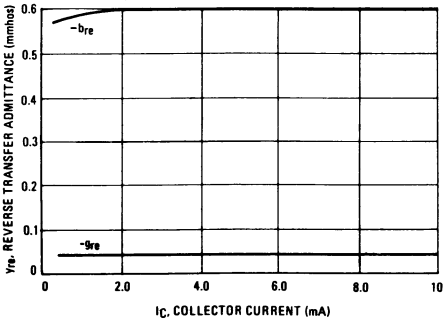


FIGURE 3 — FORWARD TRANSFER ADMITTANCE versus COLLECTOR CURRENT

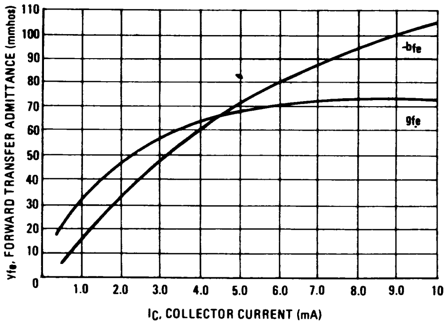
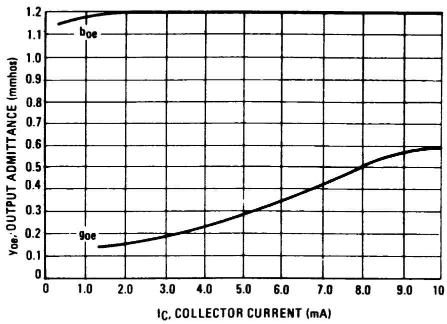


FIGURE 4 — OUTPUT ADMITTANCE versus COLLECTOR CURRENT



COMMON EMITTER Y PARAMETERS versus FREQUENCY

V_{CE} = 10Vdc, I_C = 3 mAdc, T_A = 25° C

FIGURE 5 — y_{ie}, INPUT ADMITTANCE versus FREQUENCY

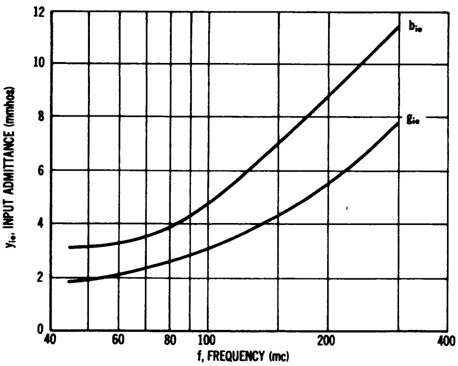


FIGURE 6 — y_{re}, REVERSE TRANSFER ADMITTANCE versus FREQUENCY

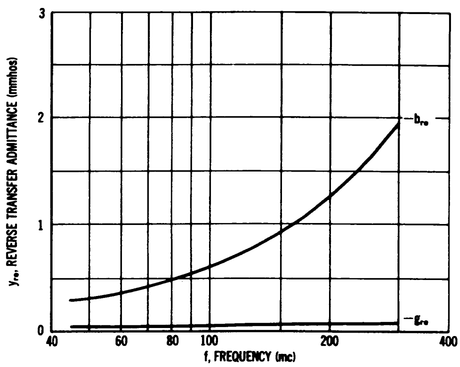


FIGURE 7 — y_{fe}, FORWARD TRANSFER ADMITTANCE versus FREQUENCY

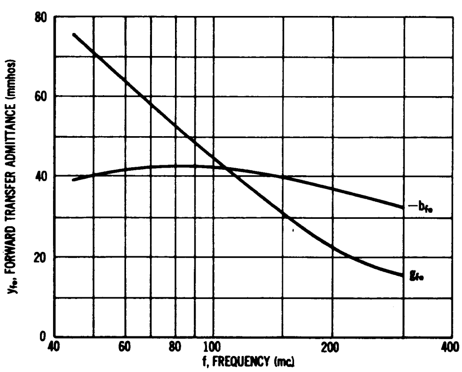
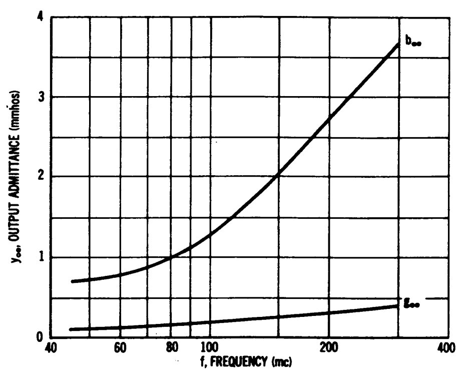


FIGURE 8 — y_{oe}, OUTPUT ADMITTANCE versus FREQUENCY



COMMON-BASE Y PARAMETERS

V_{CB} = 10 Vdc, I_C = 4.0 mAdc, T_A = 25°C

FIGURE 9 — INPUT ADMITTANCE versus FREQUENCY

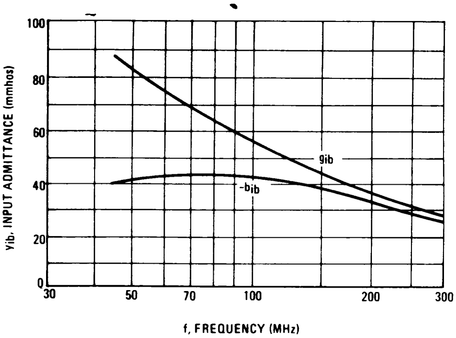


FIGURE 10 — REVERSE TRANSFER ADMITTANCE versus FREQUENCY

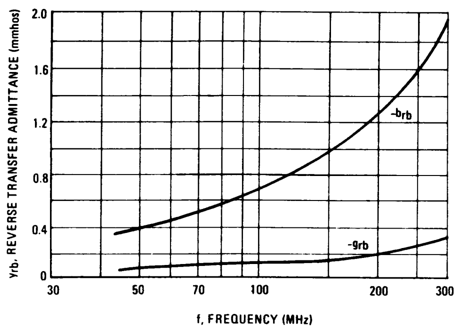


FIGURE 11 — FORWARD TRANSFER ADMITTANCE versus FREQUENCY

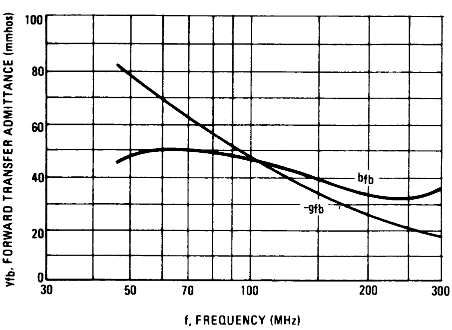


FIGURE 12 — OUTPUT ADMITTANCE versus FREQUENCY

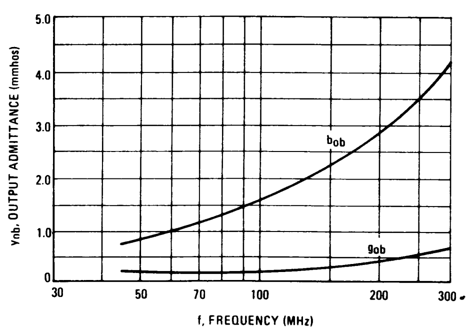
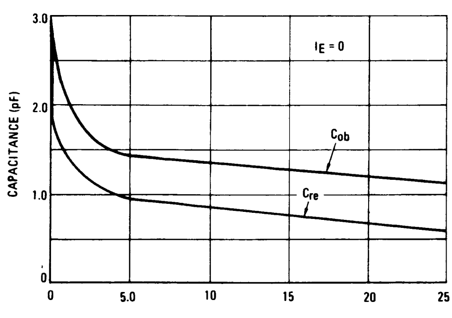


FIGURE 13 — CAPACITANCE



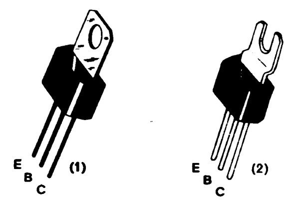
BF380
BF381
BF382

NPN SILICON HIGH VOLTAGE AMPLIFIER TRANSISTORS

NPN SILICON ANNULAR* TRANSISTORS

. . . designed for high-voltage video and luminance output stages in TV receivers.

- High Collector-Emitter Breakdown Voltage — BV_{CEO} = 300, 250, and 180 Vdc @ I_C = 10 mAdc
- Low Collector-Emitter Saturation Voltage — $V_{CE(sat)}$ = 0.75 Vdc (Max) @ I_C = 30 mAdc
- Low Collector-Base Capacitance — C_{cb} = 3.0 pF (Max) @ V_{CB} = 30 Vdc



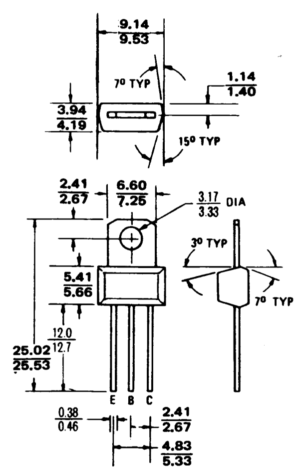
(1) Standard package: BF380
(2) Tab formed for flat mounting: BF380-1
Also available with leads formed to TO-5 configuration: BF380-5.

MAXIMUM RATINGS

Rating	Symbol	BF 380	BF 381	BF 382	Unit
Collector-Emitter Voltage	V_{CEO}	180	250	300	Vdc
Collector-Base Voltage	V_{CB}	180	250	300	Vdc
Emitter-Base Voltage	V_{EB}	—	5	—	Vdc
Collector Current—Continuous	I_C	—	500	—	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D		1.0 8.0		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D		10 80		Watts 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	θ_{JC}	12.5	°C/W
Thermal Resistance, Junction to Ambient	θ_{JA}	125	°C/W



Collector connected to tab

CASE 152
Dimensions in millimeters

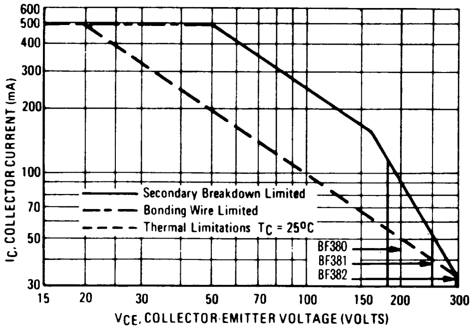
* Annular Semiconductors Patented by Motorola Inc.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (1) (I_C = 10 mAdc, I_B = 0)	BF 380	BV_{CEO}	180	—	—	Vdc
	BF 381		250	—	—	
	BF 382		300	—	—	
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BF 380	BV_{CBO}	180	—	—	Vdc
	BF 381		250	—	—	
	BF 382		300	—	—	
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		BV_{EBO}	5.0	—	—	Vdc
Collector Cutoff Current (V_{CB} = 100 Vdc, I_E = 0)	BF 380	I_{CBO}	—	—	50	nAdc
(V_{CB} = 200 Vdc, I_E = 0)	BF 381		—	—	50	
(V_{CB} = 250 Vdc, I_E = 0)	BF 382		—	—	50	
ON CHARACTERISTICS						
DC Current Gain (I_C = 30 mAdc, V_{CE} = 10 Vdc)		h_{FE}	25	—	—	—
Collector-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 6.0 mAdc)		$V_{CE(sat)}$	—	0.3	0.75	Vdc
Collector-Emitter Knee Voltage (T_J = 150°C) (I_C = 30 mAdc) (2)		V_{CEK}	—	11	—	Vdc
DYNAMIC CHARACTERISTICS						
Current-Gain—Bandwidth Product (I_C = 15 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)		f_T	—	90	—	MHz
Collector-Base Capacitance (V_{CB} = 30 Vdc, I_E = 0, f = 1.0 MHz)		C_{CB}	—	2.2	3.0	Pf

(1) Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2%.
(2) Value of V_{CE} at which h_{FE} is 80% of its value at V_{CE} = 50 Vdc, I_C = 30 mAdc.

FIGURE 1—DC SAFE OPERATING AREA



The Safe Operating Area Curves indicate I_C—V_{CE} limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J, power-temperature derating must be observed for both steady state and pulse power conditions.

FIGURE 2—DC CURRENT GAIN

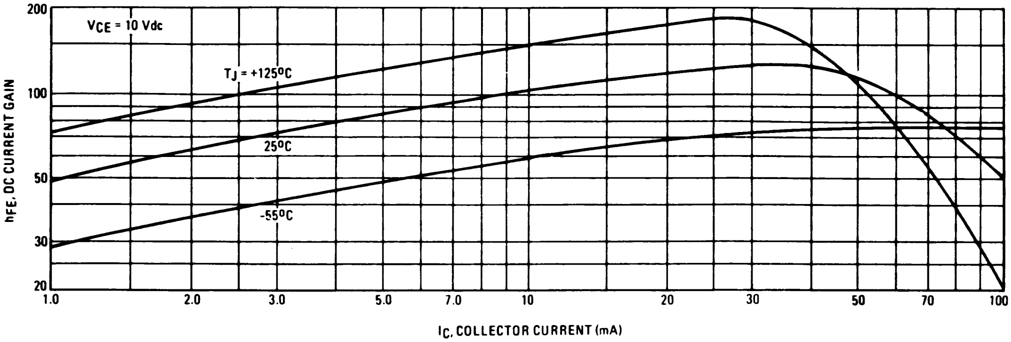


FIGURE 3—CAPACITANCES

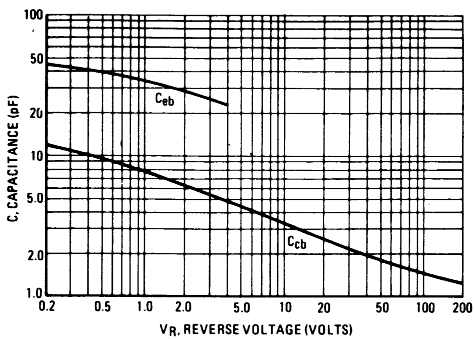


FIGURE 4—CURRENT-GAIN BANDWIDTH PRODUCT

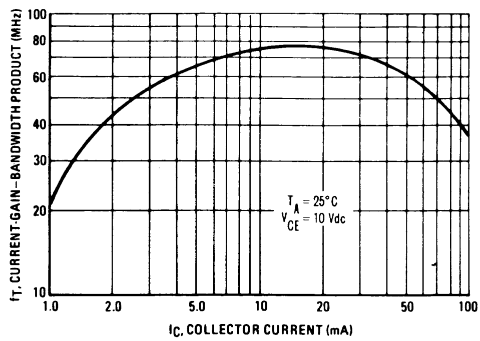
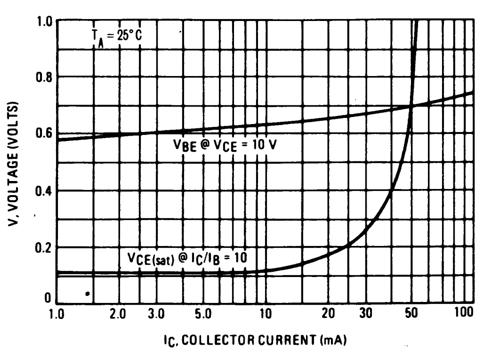


FIGURE 5—"ON" VOLTAGES



APPLICATIONS INFORMATION

The BF 382 is primarily designed for use in the R, G, and B output stages of color television receivers and with a high BV_{CEO}, it can supply the video amplitude requirements of any known system. The low feedback capacitance provides good video bandwidth with modest drive current requirements. Typical drive is from an emitter-follower with a 4.7 k emitter-resistor operated from a 20-Volt supply. It will, therefore, be operable directly from a number of available chroma demodulators. The low output capacitance of this device adds little to the total load capacitance, allowing improved bandwidth for a given collector load resistor. Two typical applications for the BF 382 are shown in Figures 6 and 7.

Device dissipation will reach approximately 1.6 Watts under worst-case signal conditions and some heat sinking is required. At an operating ambient temperature of 65°C, a thermal resistance θ_{JA} = 150-65/1.6 = 53°C/W will be required. The junction-to-case thermal resistance, θ_{JC}, of the device is 12.5°C/W, thus a heat dissipator of 40.5°C/W, or lower, will be required. A black anodized 0.5 mm thick aluminum plate measuring 25 x 51 mm can be folded into a channel shape and formed with «feet» to snap into a printed circuit panel for support. This will provide the safety factor.

Used as a color difference output, where drive and bandwidth requirements are less severe, the BF 382 can be operated with 27 k ohm load resistors (worst-case dissipation would then be only 0.6 Watts). The device can, therefore, be operated as a color-difference output without any heat radiator in ambient temperatures to 150-0.6 (125) = 75°C.

In addition the safe operating area of the BF 382 will fill the requirements of the luminance output function with a total equivalent load of 5.0 kilohms. Worst-case dissipation can reach 3 Watts, this requires a total θ_{JA} of 150-65/3 = 28.4°C/W. This 28.4°C/W means a heat dissipator of 15.9°C/W, (approximately 51 x 76 mm aluminum plate) will be required.

FIGURE 6—BF 382 AS RGB OUTPUT, MATRIXING COLOR DIFFERENCE AND LUMINANCE INPUTS

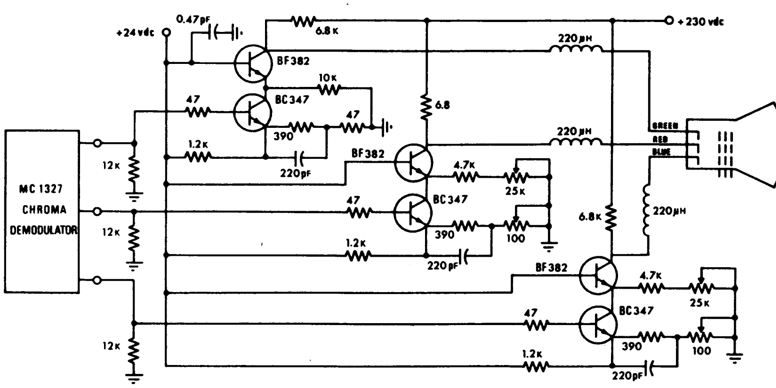
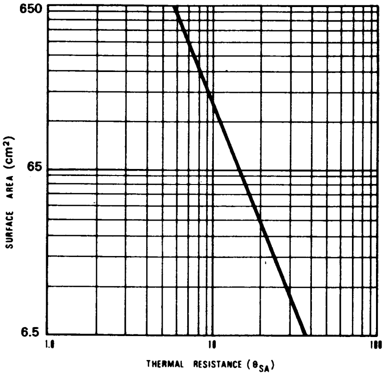


FIGURE 7—HEAT SINK VERSUS SURFACE AREA

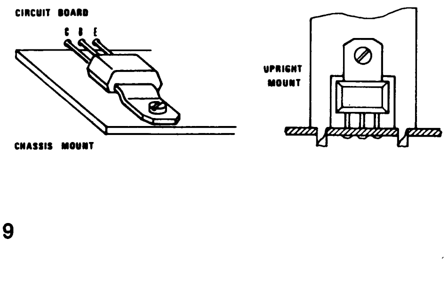


BRIGHT ALUMINUM 3.17 mm THICK

FIGURE 8—TYPICAL THERMAL RESISTANCE DATA—TAB TO SINK

CONDITION	θ_{CS} in °C/W	MOUNTING SCREW TORQUE (mkg)
NO GREASE	4.25	0.058
WITH DOW-340	2.1	0,023
'THERMAL COMPOUND	1.7	0.058
WITH DOW-340 AND 2 MIL	4.7	0.023
MICA WASHER	4.3	0.058

FIGURE 9—TYPICAL MOUNTING METHODS



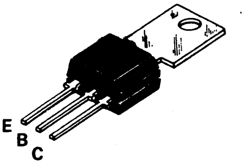
BF460
BF461
BF462

NPN SILICON ANNULAR◆ HIGH VOLTAGE AMPLIFIER TRANSISTORS

. . . designed for high-voltage TV video and chroma output circuits, high-voltage linear amplifiers, and high-voltage transistor regulators.

- High Collector-Emitter Breakdown Voltage —
  BV_{CEO} = 350 Vdc (Min) @ I_C = 1.0 mAdc — BF462
- Low Collector-Emitter Saturation Voltage —
  $V_{CE(sat)}$ = 0.6 Vdc (Max) @ I_C = 30 mAdc
- Low Collector-Base Capacitance —
  C_{cb} = 3.0 pF (Max) @ V_{CB} = 20 Vdc
- Duowatt Package —
  2 Watts Free Air Dissipation @ T_A = 25°C
- Complements to PNP BF463/464/465

NPN SILICON AMPLIFIER TRANSISTORS

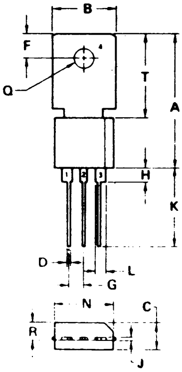


MAXIMUM RATINGS

Rating	Symbol	BF460	BF461	BF462	Unit
Collector-Emitter Voltage	V_{CEO}	250	300	350	Vdc
Collector-Base Voltage	V_{CBO}	250	300	350	Vdc
Emitter-Base Voltage	V_{EBO}	← 6.0 →			Vdc
Collector Current — Continuous Peak	I_C	← 0.5 → ← 0.7 →			Adc
Base Current	I_B	← 250 →			mAdc
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	← 2.0 → ← 16 →			Watts mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	← 10 → ← 80 →			Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -55 to +150 →			°C
Solder Temperature, 1/16" from Case for 10 Seconds	—	← 260 →			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	°C/W



STYLE 1
PIN 1 EMITTER
2 BASE
3 COLLECTOR
4 COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	21.84	22.35	0.860	0.880
B	9.91	10.41	0.390	0.410
C	4.39	4.65	0.173	0.183
D	0.58	0.74	0.023	0.029
F	3.56	4.06	0.140	0.160
G	2.41	2.67	0.095	0.105
H	1.70	1.96	0.067	0.077
J	0.48	0.66	0.019	0.026
K	12.19	12.95	0.480	0.510
L	1.65	2.03	0.065	0.080
N	9.91	10.16	0.390	0.400
Q	3.56	3.81	0.140	0.150
R	1.07	1.75	0.042	0.069
T	7.87	9.14	0.310	0.360

CASE 306-04

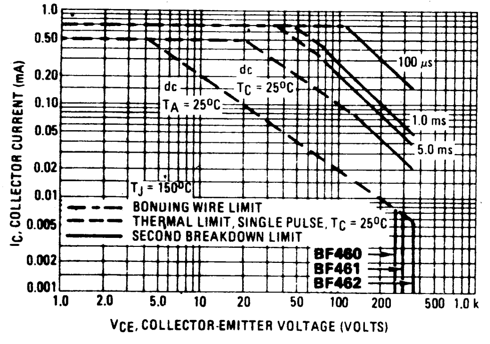
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BF460 BF461 BF462	BV_{CEO}	250 300 350	– – –	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BF460 BF461 BF462	BV_{CBO}	250 300 350	– – –	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)		BV_{EBO}	6.0	–	Vdc
Collector Cutoff Current (V_{CB} = 150 Vdc, I_E = 0) (V_{CB} = 200 Vdc, I_E = 0) (V_{CB} = 250 Vdc, I_E = 0)	BF460 BF461 BF462	I_{CBO}	– – –	0.2 0.2 0.2	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	–	0.1	μAdc
ON CHARACTERISTICS(1)					
DC Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) (I_C = 30 mAdc, V_{CE} = 10 Vdc)		h_{FE}	25 40	– 180	–
Collector-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 3.0 mAdc) (I_C = 50 mAdc, I_B = 5 mAdc)		$V_{CE(sat)}$	– –	0.6 1.5	Vdc
Base-Emitter On Voltage (I_C = 30 mAdc, V_{CE} = 10 Vdc)		$V_{BE(on)}$	–	1.0	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain – Bandwidth Product (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 20 MHz)		f_T	45	200	MHz
Common-Emitter Reverse Transfer Capacitance (V_{CB} = 20 Vdc, I_E = 0, f = 1.0 MHz)		Cre	–	3.0	pF

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

FIGURE 1 – ACTIVE-REGION SAFE OPERATING AREA



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 6. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415A).

TYPICAL CHARACTERISTICS (continued)

FIGURE 2 – DC CURRENT GAIN

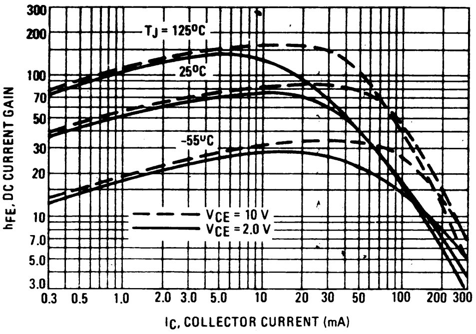


FIGURE 3 – "ON" VOLTAGES

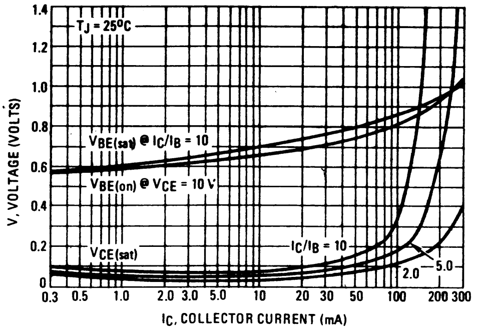


FIGURE 4 – COLLECTOR SATURATION REGION

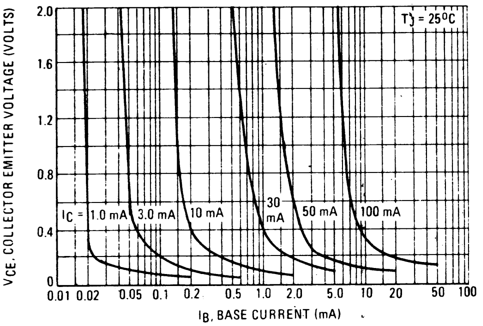


FIGURE 5 – TEMPERATURE COEFFICIENTS

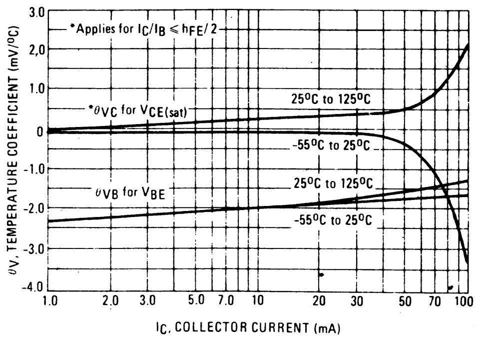
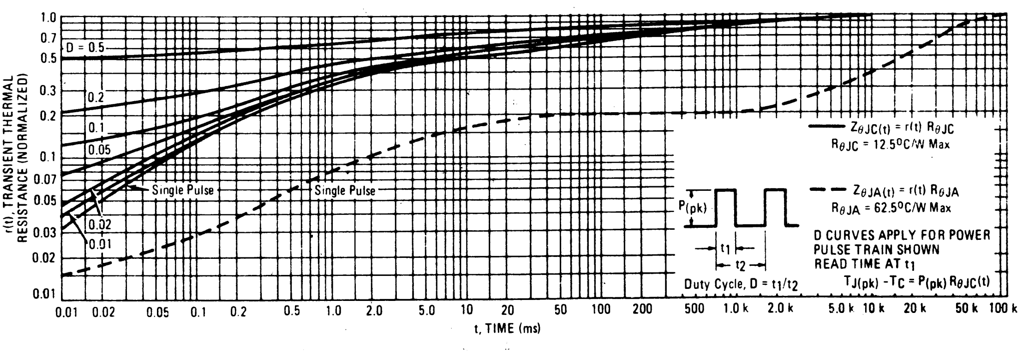


FIGURE 6 – THERMAL RESPONSE



TYPICAL CHARACTERISTICS (continued)

FIGURE 7 – CAPACITANCE

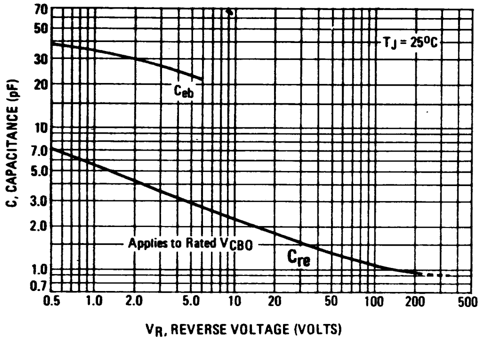
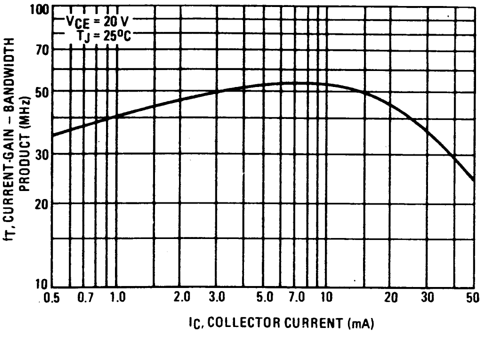


FIGURE 8 – CURRENT-GAIN – BANDWIDTH PRODUCT



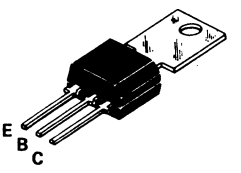
BF463
BF464
BF465

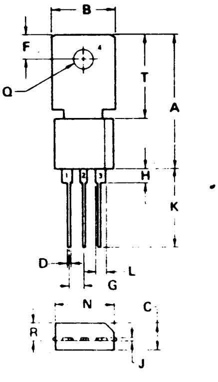
PNP SILICON ANNULAR♦ HIGH VOLTAGE AMPLIFIER TRANSISTORS

. . . designed for high-voltage TV video and chroma output circuits, high-voltage linear amplifiers, and high-voltage transistor regulators.

- High Collector-Emitter Breakdown Voltage – BV_{CEO} = 350 Vdc (Min) @ I_C = 1.0 mAdc – BF465
- Low Collector-Emitter Saturation Voltage – $V_{CE(sat)}$ = 0.75V (Max) @ I_C = 30 mAdc
- Low Collector-Base Capacitance – C_{re} = 3.0 pF (Max) @ V_{CB} = 60 Vdc
- Duowatt Package – 2 Watts Free Air Dissipation @ T_A = 25°C
- **Complementary to NPN BF460/BF461/BF462**

PNP SILICON AMPLIFIER TRANSISTORS





STYLE 1
PIN 1. EMITTER
2. BASE
3. COLLECTOR
4. COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	21.84	22.35	0.860	0.880
B	9.91	10.41	0.390	0.410
C	4.39	4.65	0.173	0.183
D	0.58	0.74	0.023	0.029
F	3.56	4.06	0.140	0.160
G	2.41	2.67	0.095	0.105
H	1.70	1.96	0.067	0.077
J	0.48	0.66	0.019	0.026
K	12.19	12.95	0.480	0.510
L	1.65	2.03	0.065	0.080
N	9.91	10.16	0.390	0.400
Q	3.56	3.81	0.140	0.150
R	1.07	1.75	0.042	0.069
T	7.87	9.14	0.310	0.360

CASE 306-04

MAXIMUM RATINGS

Rating	Symbol	BF463	BF464	BF465	Unit
Collector-Emitter Voltage	V_{CEO}	250	300	350	Vdc
Collector-Base Voltage	V_{CBO}	250	300	350	Vdc
Emitter-Base Voltage	V_{EBO}	← 5 V →			Vdc
Collector Current – Continuous Peak	I_C	← 0.5 → ← 0.7 →			Adc
Base Current	I_B	← 250 →			mAdc
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	← 2.0 → ← 16 →			Watts mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	← 10 → ← 80 →			Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -55 to +150 →			°C
Solder Temperature, 1/16" from Case for 10 Seconds	–	← 260 →			°C

THERMAL CHARACTERISTICS

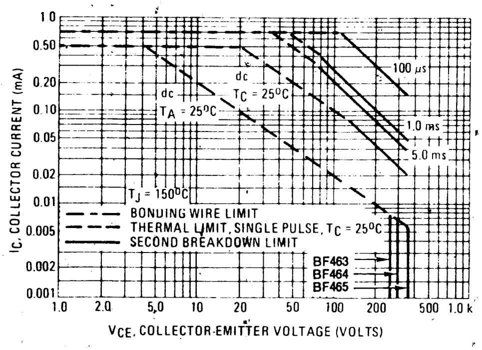
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	°C/W

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BF463	BV_{CEO}	250	–	Vdc
	BF464		300	–	
	BF465		350	–	
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BF463	BV_{CBO}	250	–	Vdc
	BF464		300	–	
	BF465		350	–	
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)		BV_{EBO}	5	–	Vdc
Collector Cutoff Current (V_{CB} = 150 Vdc, I_E = 0)	BF463	I_{CBO}	–	0.2	μAdc
(V_{CB} = 200 Vdc, I_E = 0)	BF464		–	0.2	
(V_{CB} = 250 Vdc, I_E = 0)	BF465		–	0.2	
Emitter Cutoff Current (V_{BE} = 3 Vdc, I_C = 0)		I_{EBO}	–	0.1	μAdc
ON CHARACTERISTICS(1)					
DC Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc)		h_{FE}	25	–	–
(I_C = 30 mAdc, V_{CE} = 10 Vdc)			40	180	
Collector-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 3.0 mAdc)		$V_{CE(sat)}$	–	0.75	Vdc
Base-Emitter On Voltage (I_C = 30 mAdc, V_{CE} = 10 Vdc)		$V_{BE(on)}$	–	0.85	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain – Bandwidth Product (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 20 MHz)		f_T	45	200	MHz
Common Emitter Reverse Transfer Capacitance (V_{CB} = 60 Vdc, I_E = 0, f = 1.0 MHz)		Cre	–	3.0	pF

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. $T_{J(pk)}$ may be calculated from the data in Figure 6. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415A).

FIGURE 1 – ACTIVE-REGION SAFE-OPERATING AREA

TYPICAL CHARACTERISTICS (continued)

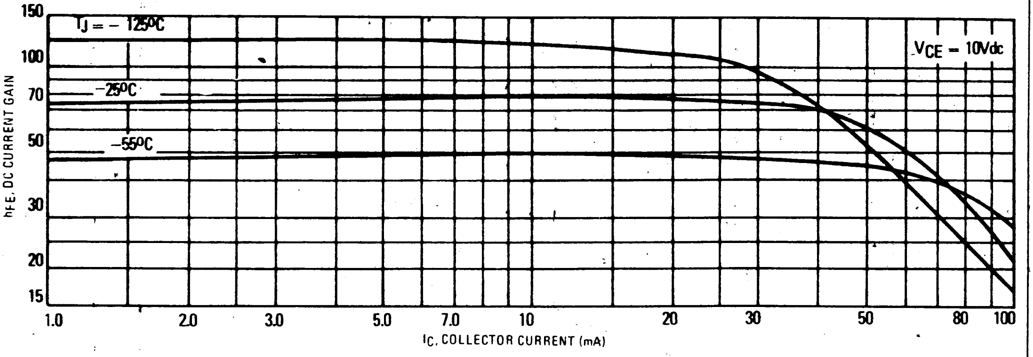


FIGURE 2 – DC CURRENT GAIN

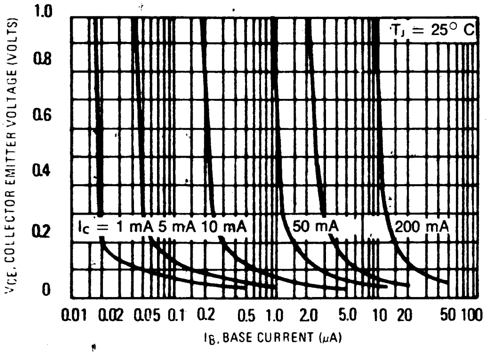


FIGURE 3 – COLLECTOR SATURATION REGION

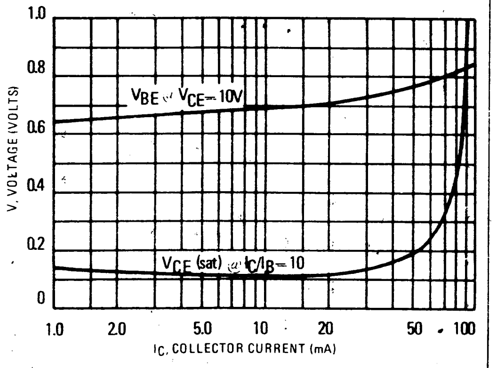


FIGURE 4 – "ON" VOLTAGES

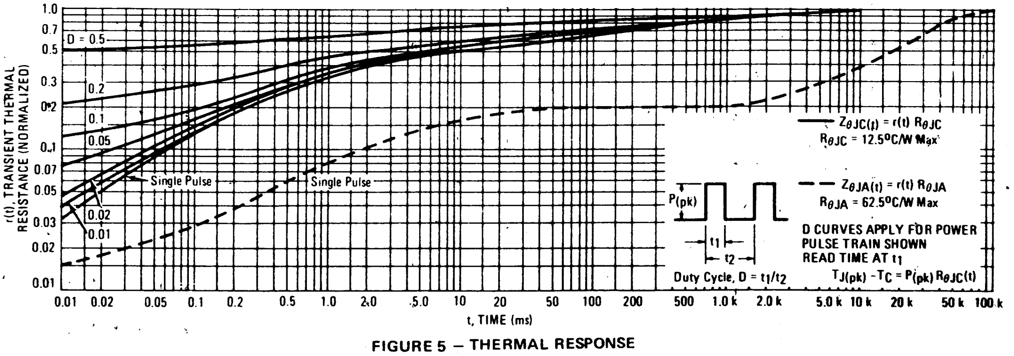


FIGURE 5 – THERMAL RESPONSE

TYPICAL CHARACTERISTICS (continued)

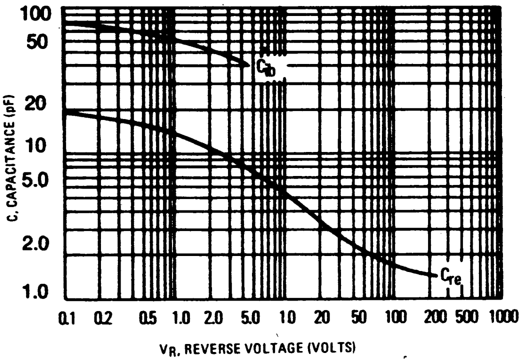


FIGURE 6 – CAPACITANCE

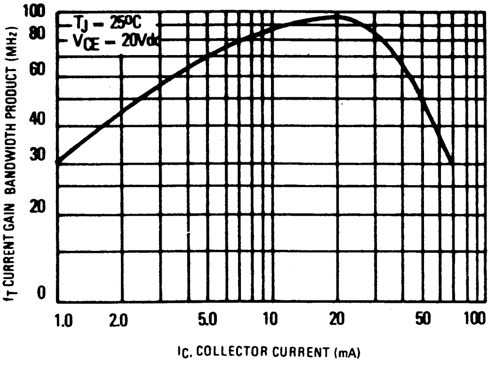


FIGURE 7 – CURRENT-GAIN – BANDWIDTH PRODUCT

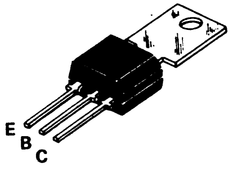
BF466
BF467
BF468

NPN SILICON ANNULAR ♦
HIGH VOLTAGE AMPLIFER TRANSISTORS

... designed for horizontal driver applications in television receivers.

- High Collector-Emitter Breakdown Voltage — BV_{CEO} = 250 Vdc (min) @ I_C = 1.0 mAdc – BF468
- Low Collector-Emitter Saturation Voltage — $V_{CE(sat)}$ = 1.5 Vdc (max) @ I_C = 200 mAdc
- Duowatt Package — 2 Watts Free Air Dissipation @ T_A = 25 °C

NPN SILICON
AMPLIFIER TRANSISTORS

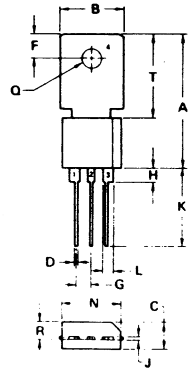


MAXIMUM RATINGS

Rating	Symbol	BF466	BF467	BF468	Unit
Collector-Emitter Voltage	V_{CEO}	150	200	250	Vdc
Collector-Base Voltage	V_{CBO}	150	200	250	Vdc
Emitter-Base Voltage	V_{EBO}	← 5 →			Vdc
Collector Current — Continuous Peak	I_C	← 1 → ← 2 →			Adc
Base Current	I_B	← 300 →			mAdc
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	← 2.0 → ← 16 →			Watts mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	← 10 → ← 80 →			Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	← 55 to +150 →			°C
Solder Temperature, 1/16" from Case for 10 Seconds	–	← 260 →			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	°C/W



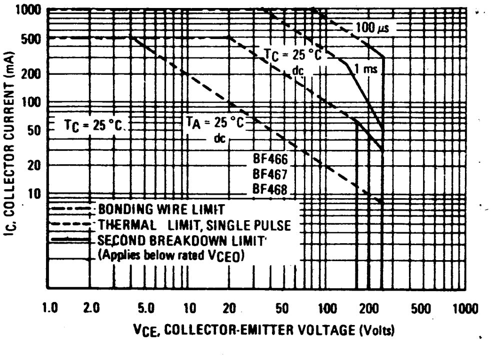
STYLE 1
PIN 1 EMITTER
2 BASE
3 COLLECTOR
4 COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	21.84	22.35	0.860	0.880
B	9.91	10.41	0.390	0.410
C	4.39	4.65	0.173	0.183
D	0.58	0.74	0.023	0.029
F	3.56	4.06	0.140	0.160
G	2.41	2.67	0.095	0.105
H	1.70	1.96	0.067	0.077
J	0.48	0.66	0.019	0.026
K	12.19	12.95	0.480	0.510
L	1.65	2.03	0.065	0.080
N	9.91	10.16	0.390	0.400
Q	3.56	3.81	0.140	0.150
R	1.07	1.75	0.042	0.069
T	7.87	9.14	0.310	0.360

CASE 306-04

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BF466 BF467 BF468	BV_{CEO}	150 200 250	– – –	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BF466 BF467 BF468	BV_{CBO}	150 200 250	– – –	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)		BV_{EBO}	5	–	Vdc
Collector Cutoff Current (V_{CB} – 100, Vdc, I_E – 0) (V_{CB} – 150, Vdc, I_E – 0) (V_{CB} – 200, Vdc, I_E – 0)	BF466 BF467 BF468	I_{CBO}	– – –	0.1 0.1 0.1	μAdc
Emitter Cutoff Current (V_{BE} = 4 Vdc, I_C = 0)		I_{EBO}	–	0.1	μAdc
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 10 mA, V_{CE} = 10 Vdc) (I_C = 100 mA, V_{CE} = 10 Vdc)		h_{FE}	40 40	–	–
Collector-Emitter Saturation Voltage (I_C = 200 mAdc, I_B = 20 mAdc)		$V_{CE(sat)}$	–	1.5	Vdc
Base-Emitter On Voltage (I_C = 200 mA, V_{CE} = 1 Vdc)		$V_{BE(on)}$		1	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain – Bandwidth Product (I_C = 50 mA, V_{CE} = 20 Vdc, f = 20 MHz)		f_T	100		MHz
Collector output capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 0.1 MHz)		C_{ob}	–	12	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 0.1 MHz)		C_{ib}	–	110	pF



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 6. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415A).

FIGURE 1 – ACTIVE-REGION SAFE OPERATING AREA

TYPICAL CHARACTERISTICS

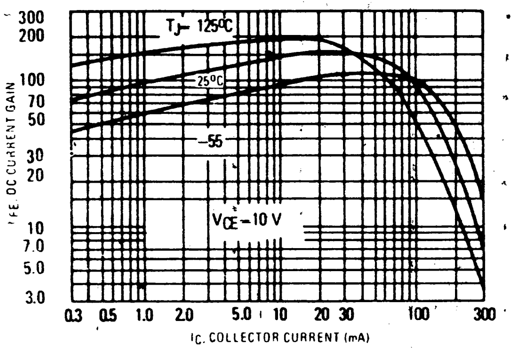


FIGURE 2 – DC CURRENT GAIN

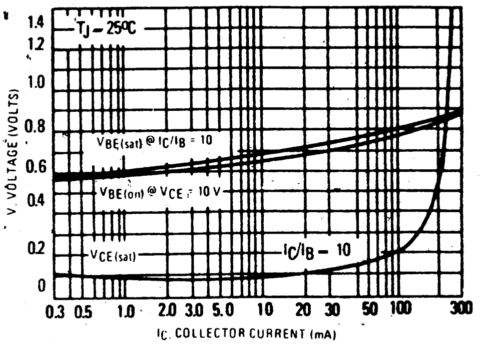


FIGURE 3 – "ON" VOLTAGES

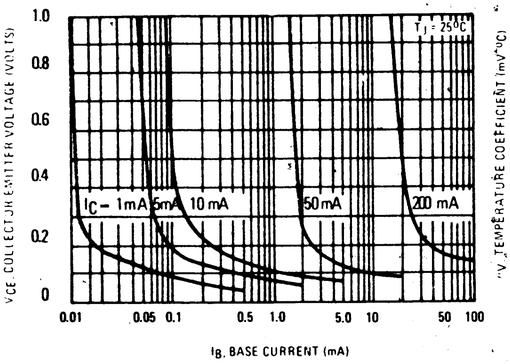


FIGURE 4 – COLLECTOR SATURATION REGION

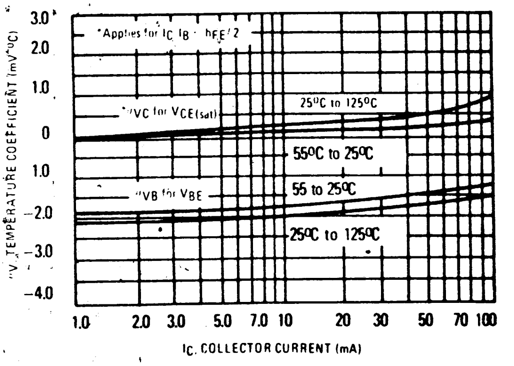


FIGURE 5 – TEMPERATURE COEFFICIENTS

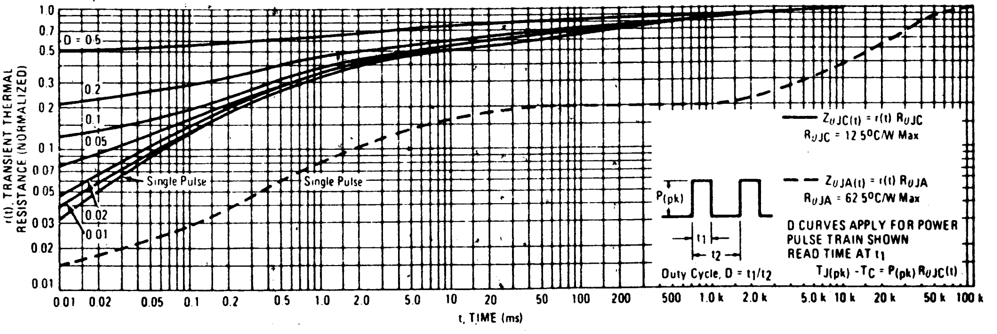


FIGURE 6 – THERMAL RESPONSE

TYPICAL CHARACTERISTICS (continued)

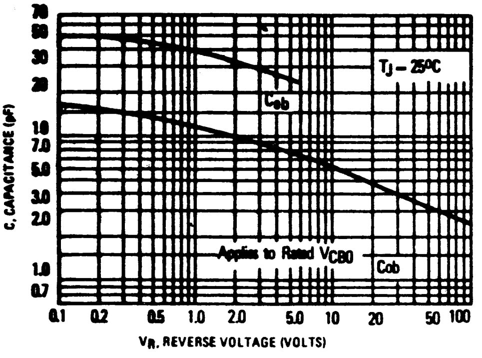


FIGURE 7 – CAPACITANCE

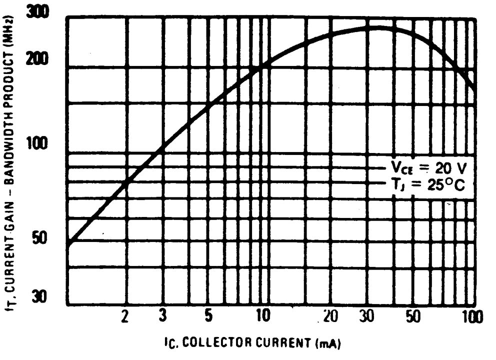


FIGURE 8 – CURRENT-GAIN – BANDWIDTH PRODUCT

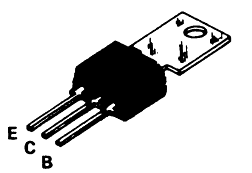
BF757
BF758
BF759

NPN SILICON ANNULAR
HIGH VOLTAGE AMPLIFER TRANSISTORS

. . . designed for high-voltage TV video and chroma output circuits, high-voltage linear amplifiers, and high-voltage transistor regulators.

- High Collector-Emitter Breakdown Voltage –
  BV_{CEO} = 350 Vdc (Min) @ I_C = 1.0 mAdc – BF759
- Low Collector-Emitter Saturation Voltage –
  $V_{CE(sat)}$ = 0.6 Vdc (Max) @ I_C = 30 mAdc
- Low Collector-Base Capacitance –
  C_{re} = 3.0 pF (Max) @ V_{CB} = 20 Vdc
- Duowatt Package –
  2 Watts Free Air Dissipation @ T_A = 25°C
- **Complements to NPN BF760/BF761/BF762**

NPN SILICON
AMPLIFIER TRANSISTORS

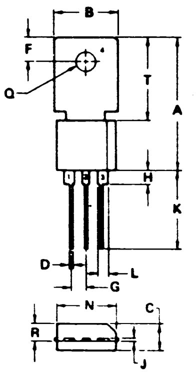


MAXIMUM RATINGS

Rating	Symbol	BF757	BF758	BF759	Unit
*Collector-Emitter Voltage	V_{CEO}	250	300	350	Vdc
*Collector-Base Voltage	V_{CBO}	250	300	350	Vdc
*Emitter-Base Voltage	V_{EBO}	← 6.0 →			Vdc
*Collector Current – Continuous Peak	I_C	← 0.5 → ← 0.7 →			Adc
*Base Current	I_B	← 250 →			mAdc
*Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	← 2.0 → ← 16 →			Watts mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	← 10 → ← 80 →			Watts mW/°C
*Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -55 to +150 →			°C
*Solder Temperature, 1/16" from Case for 10 Seconds	–	← 260 →			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	°C/W



STYLE 2
PIN 1. EMITTER
2. COLLECTOR
3. BASE
4. COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	21.84	22.35	0.860	0.880
B	9.91	10.41	0.390	0.410
C	4.39	4.65	0.173	0.183
D	0.58	0.74	0.023	0.029
F	3.56	4.06	0.140	0.160
G	2.41	2.67	0.095	0.105
H	1.70	1.96	0.067	0.077
J	0.48	0.66	0.019	0.026
K	12.19	12.95	0.480	0.510
L	1.65	2.03	0.065	0.080
N	9.91	10.16	0.390	0.400
Q	3.56	3.81	0.140	0.150
R	1.07	1.75	0.042	0.069
T	7.87	9.14	0.310	0.360

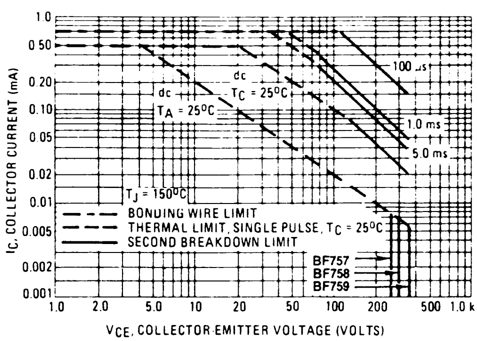
CASE 306-04

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BF757 BF758 BF759	BV_{CEO}	250 300 350	– – –	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BF757 BF758 BF759	BV_{CBO}	250 300 350	– – –	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)		BV_{EBO}	6.0	–	Vdc
Collector Cutoff Current (V_{CB} = 150 Vdc, I_E = 0) (V_{CB} = 200 Vdc, I_E = 0) (V_{CB} = 250 Vdc, I_E = 0)	BF757 BF758 BF759	I_{CBO}	– – –	0.2 0.2 0.2	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	–	0.1	μAdc
ON CHARACTERISTICS(1)					
DC Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) (I_C = 30 mAdc, V_{CE} = 10 Vdc)		h_{FE}	 25 40	 – 180	–
Collector-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 3.0 mAdc) (I_C = 50 mAdc, I_B = 5 mAdc)		$V_{CE(sat)}$	 – –	 0.6 1.5	Vdc
Base-Emitter On Voltage (I_C = 30 mAdc, V_{CE} = 10 Vdc)		$V_{BE(on)}$	–	1.0	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain – Bandwidth Product (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 20 MHz)		f_T	45	200	MHz
Common Emitter Reverse Transfer Capacitance (V_{CB} = 20 Vdc, I_E = 0, f = 1.0 MHz)		Cre	–	3.0	pF

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

TYPICAL CHARACTERISTICS



There are two limitations on the power handling ability of a transistor average junction temperature and second breakdown. Safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 6. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415A).

FIGURE 1 – ACTIVE-REGION SAFE-OPERATING AREA

TYPICAL CHARACTERISTICS (continued)

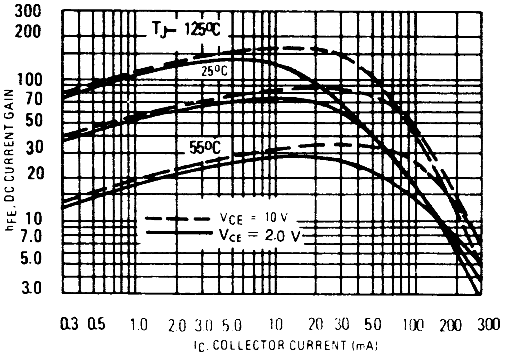


FIGURE 2 – DC CURRENT GAIN

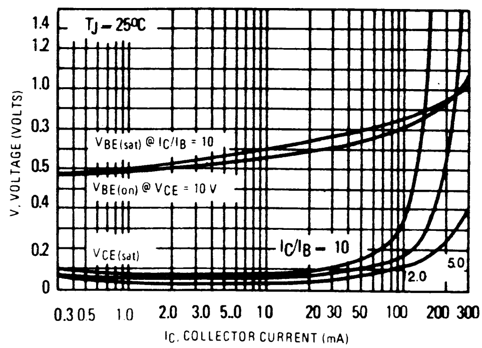


FIGURE 3 – "ON" VOLTAGES

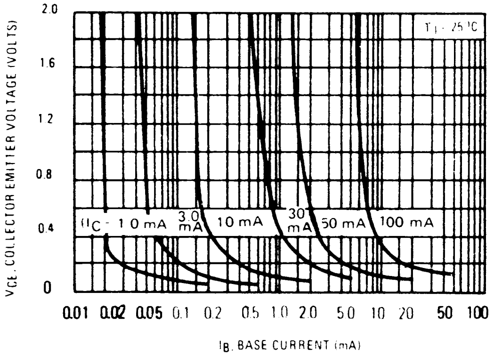


FIGURE 4 – COLLECTOR SATURATION REGION

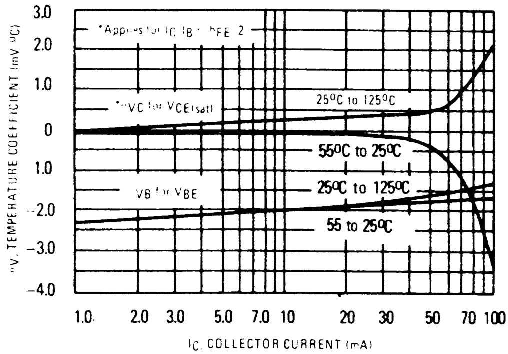


FIGURE 5 – TEMPERATURE COEFFICIENTS

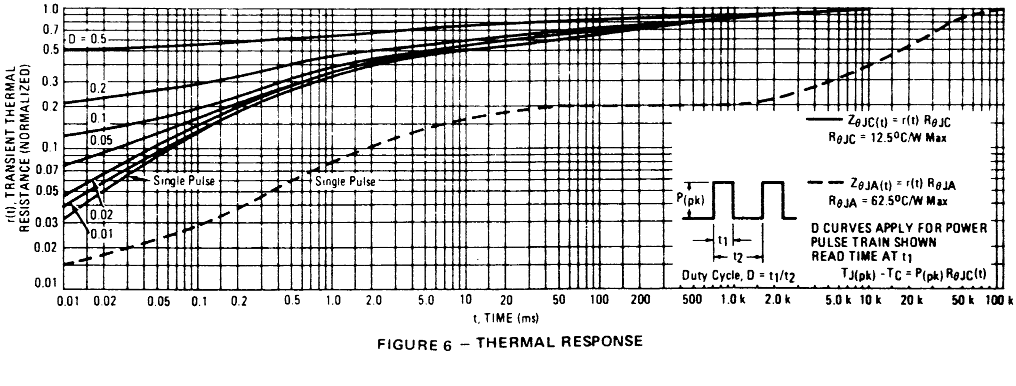


FIGURE 6 – THERMAL RESPONSE

TYPICAL CHARACTERISTICS (continued)

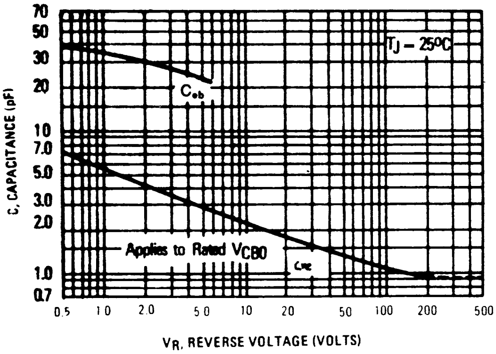


FIGURE 7 – CAPACITANCE

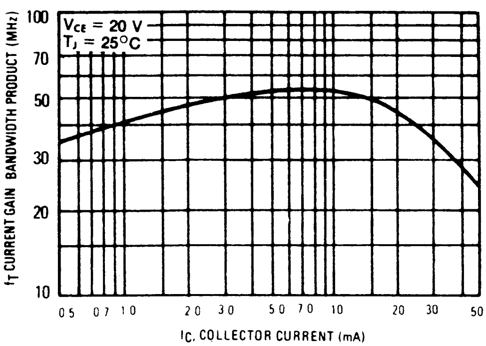


FIGURE 8 – CURRENT-GAIN – BANDWIDTH PRODUCT

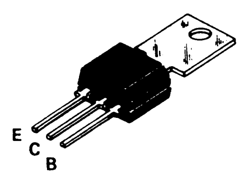
BF760
BF761
BF762

PNP SILICON ANNULAR◆ HIGH VOLTAGE AMPLIFIER TRANSISTORS

. . . designed for high-voltage TV video and chroma output circuits, high-voltage linear amplifiers, and high-voltage transistor regulators.

- High Collector-Emitter Breakdown Voltage — BV_{CEO} = 350 Vdc (Min) @ I_C = 1.0 mAdc — BF762
- Low Collector-Emitter Saturation Voltage — $V_{CE(sat)}$ = 0.75V (Max) @ I_C = 30 mAdc
- Low Collector-Base Capacitance — C_{re} = 3.0 pF (Max) @ V_{CB} = 60 Vdc
- Duowatt Package — 2 Watts Free Air Dissipation @ T_A = 25°C
- Complementary to NPN BF757/BF758/BF759

PNP SILICON AMPLIFIER TRANSISTORS

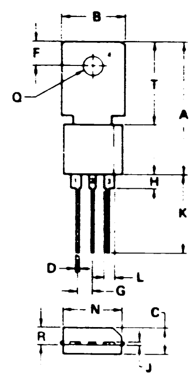


MAXIMUM RATINGS

Rating	Symbol	BF760	BF761	BF762	Unit
*Collector-Emitter Voltage	V_{CEO}	250	300	350	Vdc
*Collector-Base Voltage	V_{CBO}	250	300	350	Vdc
*Emitter-Base Voltage	V_{EBO}	← 5 →			Vdc
*Collector Current — Continuous Peak	I_C	← 0.5 → ← 0.7 →			Adc
*Base Current	I_B	← 250 →			mAdc
*Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	← 2.0 → ← 16 →			Watts mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	← 10 → ← 80 →			Watts mW/°C
*Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -55 to +150 →			°C
*Solder Temperature, 1/16" from Case for 10 Seconds	—	← 260 →			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	°C/W



STYLE 2
PIN 1. EMITTER
2. COLLECTOR
3. BASE
4. COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	21.84	22.35	0.860	0.880
B	9.91	10.41	0.390	0.410
C	4.39	4.65	0.173	0.183
D	0.58	0.74	0.023	0.029
F	3.56	4.06	0.140	0.160
G	2.41	2.67	0.095	0.105
H	1.70	1.96	0.067	0.077
J	0.48	0.66	0.019	0.026
K	12.19	12.95	0.480	0.510
L	1.65	2.03	0.065	0.080
N	9.91	10.16	0.390	0.400
Q	3.56	3.81	0.140	0.150
R	1.07	1.75	0.042	0.069
T	7.87	9.14	0.310	0.360

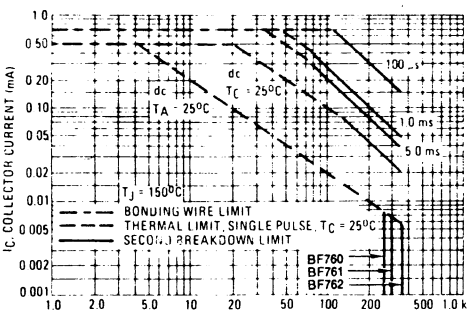
CASE 306-04

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0) BF760	BV_{CEO}	250	–	Vdc
BF761		300	–	
BF762		350	–	
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0) BF760	BV_{CBO}	250	–	Vdc
BF761		300	–	
BF762		350	–	
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BV_{EBO}	5	–	Vdc
Collector Cutoff Current	I_{CBO}			μAdc
(V_{CB} = 150 Vdc, I_E = 0) BF760		–	0.2	
(V_{CB} = 200 Vdc, I_E = 0) BF761		–	0.2	
(V_{CB} = 250 Vdc, I_E = 0) BF762		–	0.2	
Emitter Cutoff Current (V_{BE} = 3 Vdc, I_C = 0)	I_{EBO}	–	0.1	μAdc
ON CHARACTERISTICS(1)				
DC Current Gain	h_{FE}			–
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)		25	–	
(I_C = 30 mAdc, V_{CE} = 10 Vdc)		40	180	
Collector-Emitter Saturation Voltage (I_C = 30 mAdc, I_B = 3.0 mAdc)	$V_{CE(sat)}$	– –	0.75	Vdc
Base-Emitter On Voltage (I_C = 30 mAdc, V_{CE} = 10 Vdc)	$V_{BE(on)}$	–	0.85	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain – Bandwidth Product (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 20 MHz)	f_T	45	200	MHz
Common Emitter Reverse Transfer Capacitance (V_{CB} = 60 Vdc, I_E = 0, f = 1.0 MHz)	Cre	–	3	pF

(1) Pulse Test. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

TYPICAL CHARACTERISTICS



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation, i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)}$ = 150°C. T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. $T_{J(pk)}$ may be calculated from the data in Figure 6. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415A).

FIGURE 1 — ACTIVE-REGION SAFE-OPERATING AREA

TYPICAL CHARACTERISTICS (continued)

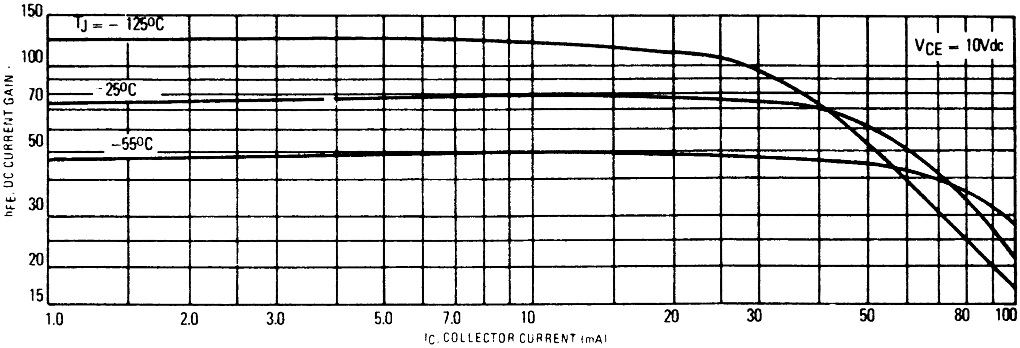


FIGURE 2 – DC CURRENT GAIN

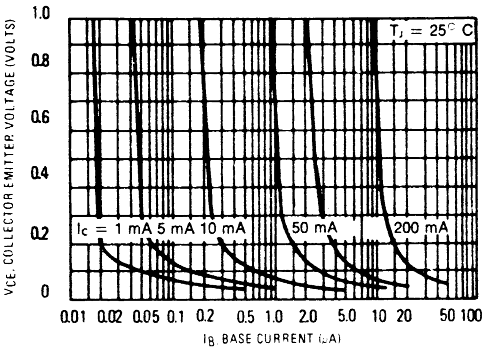


FIGURE 3 – COLLECTOR SATURATION REGION

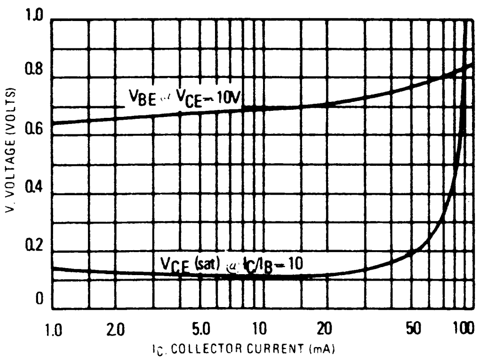


FIGURE 4 – "ON" VOLTAGES

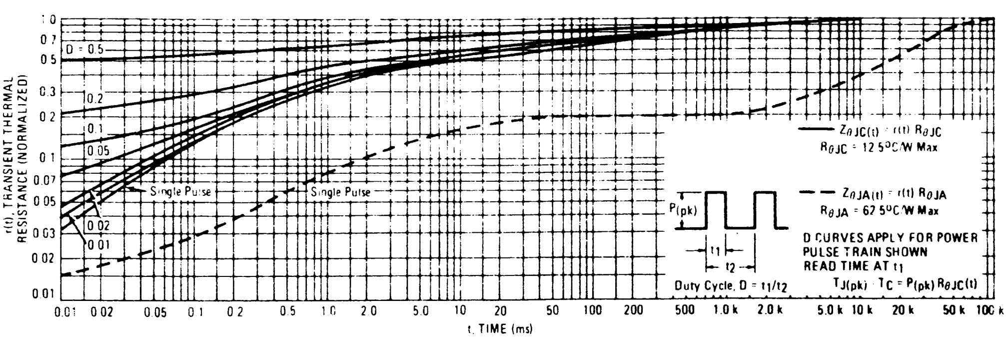


FIGURE 5 – THERMAL RESPONSE

TYPICAL CHARACTERISTICS (continued)

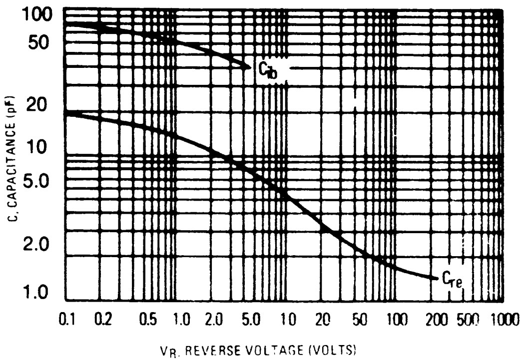


FIGURE 6 – CAPACITANCE

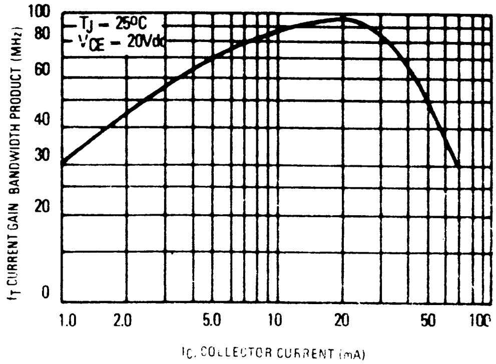


FIGURE 7 – CURRENT-GAIN – BANDWIDTH PRODUCT

BF787/788/789

PNP

BF790/791/792

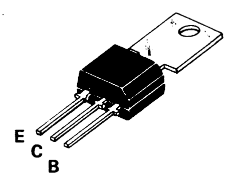
SILICON ANNULAR♦
HIGH VOLTAGE AMPLIFIER TRANSISTORS
LOW CRE

... electrically Low CRE identical in Duowatt package to BF469/470, and BF471/472 Case 77.

Designed for high-voltage TV video and chroma output circuits, high-voltage linear amplifiers, and high-voltage transistor regulators.

- High Collector-Emitter Breakdown Voltage — BV_{CEO} = 350 Vdc (Min) @ I_C = 1.0 mAdc — BF789/792.
- Low Collector-Emitter Saturation Voltage — $V_{CE(sat)}$ = 1.0 V (Max) @ I_C = 10 mAdc.
- Low Collector Base Capacitance — C_{re} = 1.8 pF (Max) @ V_{CB} = 30 Vdc.
- Duowatt Package — 2 Watts Free Air Dissipation @ T_A = 25 °C.

COMPLEMENTARY SILICON AMPLIFIER TRANSISTORS

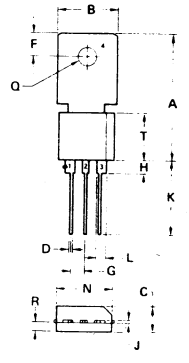


MAXIMUM RATINGS

Ratings	Symbol	BF787 BF790	BF788 BF791	BF789 BF792	Unit
Collector-Emitter Voltage	V_{CEO}	250	300	350	Vdc
Collector-Base Voltage	V_{CBO}	250	300	350	Vdc
Collector Current — Continuous Peak	I_C		0.1 0.2		Adc
Total Power Dissipation @ T_A = 25 °C Derate above 25 °C	P_D		2.0 16		Watts mW/°C
Total Power Dissipation @ T_C = 25 °C Derate above 25 °C	P_D		10 40		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}		−55 to +150		°C
Solder Temperature, 1/16" from Case for 10 Seconds	—		260		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	25	°C/W



STYLE 2
PIN 1. EMITTER
2. COLLECTOR
3. BASE
4. COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	21.84	22.35	0.860	0.880
B	9.91	10.41	0.390	0.410
C	4.39	4.65	0.173	0.183
D	0.58	0.74	0.023	0.029
F	3.56	4.06	0.140	0.160
G	2.41	2.67	0.095	0.105
H	1.70	1.96	0.067	0.077
J	0.48	0.66	0.019	0.026
K	12.19	12.95	0.480	0.510
L	1.65	2.03	0.065	0.080
N	9.91	10.16	0.390	0.400
Q	3.56	3.81	0.140	0.150
R	1.07	1.75	0.041	0.069
T	7.87	9.14	0.310	0.360

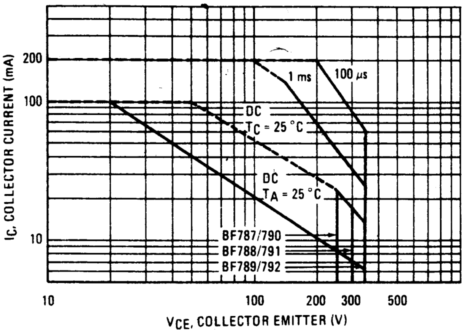
CASE 306-04

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

Characteristic		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Voltage (I_C = 1.0 mAdc, I_B = 0)	BF787/790 BF788/791 BF789/792	BV_{CEO}	250 300 350		Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	BF787/790 BF788/791 BF789/792	BV_{CBO}	250 300 350		Bdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		BV_{EBO}	5		Vdc
Collector-Cutoff Current (V_{CB} = 150 Vdc, I_E = 0) (V_{CB} = 200 Vdc, I_E = 0) (V_{CB} = 250 Vdc, I_E = 0)	BF787/790 BF788/791 BF789/792	I_{CBO}		0.2 0.2 0.2	μAdc
Emitter-Cutoff Current (V_{BE} = 5 Vdc, I_C = 0)		I_{EBO}		10	μAdc
Collector-cutoff Current (V_{CE} = 150 Vdc, V_{BE} = 0) (V_{CE} = 200 Vdc, V_{BE} = 0) (V_{CE} = 250 Vdc, V_{BE} = 0)	BF787/790 BF788/791 BF789/792	I_{CES}		10 10 10	μAdc
ON CHARACTERISTICS[1]					
DC Current Gain (I_C = 25 mAdc, V_{CE} = 20 Vdc)		h_{FE}	50		
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)		$V_{CE(sat)}$		1	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain — Gandwidth Product (I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 20 MHz)		f_T	60		MHz
Common-Emitter Reverse Transfer Capacitance (V_{CB} = 30 Vdc, I_E = 0, f = 1.0 MHz)		C_{re}		1.8	pF
Collector-Saturation RF Voltage (I_C = 25 mA)		$V_{CE(sat)\,hf}$	Typical 20		V

[1] Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

FIGURE 1 – ACTIVE-REGION SAFE-OPERATING AREA



TYPICAL CHARACTERISTICS

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FIGURE 2 – DC CURRENT GAIN

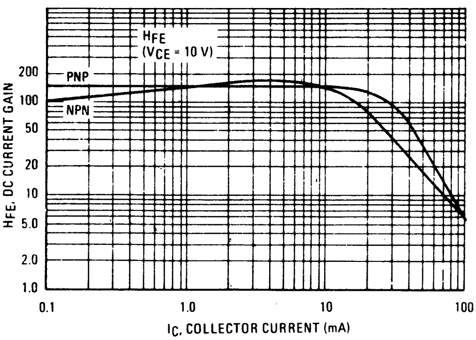

FIGURE 3 – SATURATION VOLTAGE

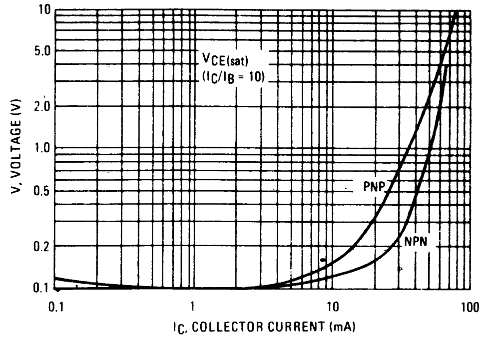

FIGURE 4 – CAPACITANCE