2N3798
2N3799

CASE 22-03, STYLE 1
TO-18 (TO-206AA)

AMPLIFIER TRANSISTOR

PNP SILICON

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MAXIMUM RATINGS

Rating	Symbol	2N3798 2N3799	2N3798A 2N3799A	Unit
Collector-Emitter Voltage	V_{CEO}	60	90	Vdc
Collector-Base Voltage	V_{CBO}	60	90	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current — Continuous	I_C	50		mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	0.36 2.06		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.2 6.86		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance,-Junction to Case	$R_{\theta JC}$	0.15	°C/mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	0.49	°C/mW

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)	2N3798, 2N3799	$V_{(BR)CEO}$	60	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	2N3798, 2N3799	$V_{(BR)CBO}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0) (V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)		I_{CBO}	— —	— —	0.01 10	μAdc
Emitter Cutoff Current (V_{BE} = 4.0 Vdc, I_C = 0)		I_{EBO}	—	—	20	nAdc
ON CHARACTERISTICS						
DC Current Gain(1) (I_C = 1.0 μAdc, V_{CE} = 5.0 Vdc)	2N3799	h_{FE}	75	—	—	—
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N3798 2N3799		100 225	— —	— —	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3798 2N3799		150 300	— —	— —	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)	2N3798 2N3799		75 150	— —	— —	
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc)	2N3798 2N3799		150 300	— —	450 900	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N3798 2N3799		150 300	— —	— —	
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	2N3798 2N3799		125 250	— —	— —	
Collector-Emitter Saturation Voltage(1) (I_C = 100 μAdc, I_B = 10 μAdc) (I_C = 1.0 mAdc, I_B = 100 μAdc)		$V_{CE(sat)}$	— —	— —	0.2 0.25	Vdc
Base-Emitter Saturation Voltage(1) (I_C = 100 μAdc, I_B = 10 μAdc) (I_C = 1.0 mAdc, I_B = 100 μAdc)		$V_{BE(sat)}$	— —	— —	0.7 0.8	Vdc
Base-Emitter On Voltage (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)		$V_{BE(on)}$	—	—	0.7	Vdc

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

Characteristic		Symbol	Min	Typ	Max	Unit
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product(2) (I_C = 500 μAdc, V_{CE} = 5.0 Vdc, f = 30 MHz) (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 100 MHz)		f_T	 30 100	 — —	 — 500	MHz
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	—	4.0	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz)		C_{ibo}	—	—	8.0	pF
Input Impedance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3798 2N3799	h_{ie}	 3.0 10	 — —	 15 40	k ohms
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{re}	—	—	25	X 10^{-4}
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3798 2N3799	h_{fe}	 150 300	 — —	 600 900	—
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{oe}	5.0	—	60	μmhos
Noise Figure (I_C = 100 μAdc, V_{CE} = 10 Vdc, R_G = 3.0 k ohms), f = 100 Hz, B.W. = 20 Hz	2N3798 2N3799	NF	 —	 4.0 2.5	 7.0 4.0	dB
Spot Noise f = 1.0 kHz, B.W. = 200 Hz	2N3798 2N3799		 —	 1.5 0.8	 3.0 1.5	
f = 10 kHz, B.W. = 2.0 kHz	2N3798 2N3799		 —	 1.0 0.8	 2.5 1.5	
Broadband Noise-Bandwidth 10 Hz to 15.7 kHz	2N3798 2N3799		 —	 2.5 1.5	 3.5 2.5	

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(2) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

SPOT NOISE FIGURE
(V_{CE} = 10 Vdc, T_A = 25°C)

FIGURE 1 — SOURCE RESISTANCE EFFECTS, f = 1.0 kHz

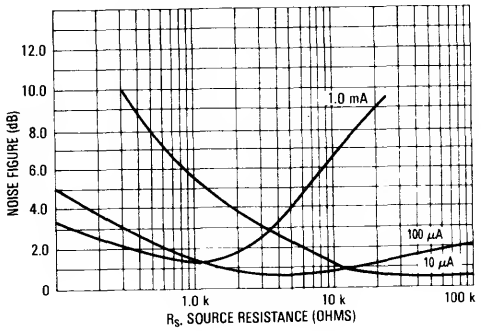

FIGURE 2 — SOURCE RESISTANCE EFFECTS, f = 10 Hz

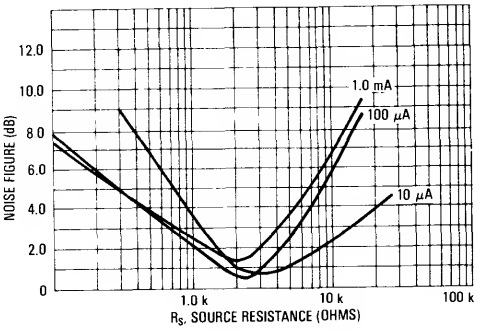

FIGURE 3 — FREQUENCY EFFECTS

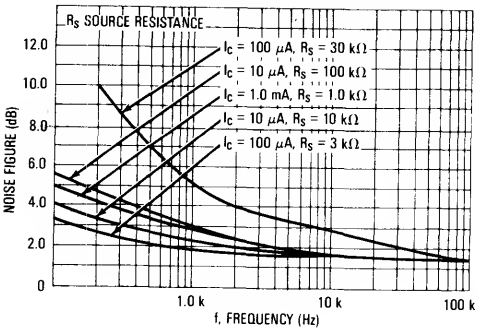

FIGURE 4a — TYPICAL CURRENT GAIN CHARACTERISTICS—2N3798

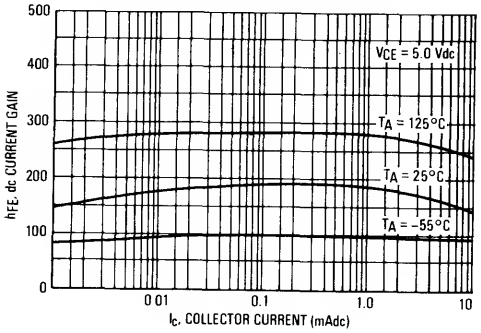

FIGURE 4b — TYPICAL CURRENT GAIN CHARACTERISTICS — 2N3799