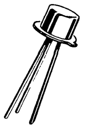
2N3798, 2N3798A (SILICON)
2N3799, 2N3799A

PNP SILICON ANNULAR TRANSISTORS

. . . designed for low-level, low-noise amplifier applications.

- High Collector-Emitter Breakdown Voltages –
  BV_{CEO} = 60 Vdc (Min) – 2N3798, 2N3799
  90 Vdc (Min) – 2N3798A, 2N3799A
- DC Current Gain – @ I_C = 500 μAdc
  h_{FE} = 150-450 – 2N3798, 2N3798A
  300-900 – 2N3799, 2N3799A
- Low Noise Figure –
  NF = 1.5 dB (Max) @ 1.0 kHz and 10 kHz

PNP SILICON AMPLIFIER TRANSISTORS



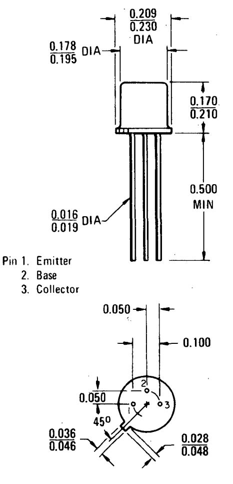
*MAXIMUM RATINGS

Rating	Symbol	2N3798 2N3799	2N3798A 2N3799A	Unit
Collector-Emitter Voltage	V_{CEO}	60	90	Vdc
Collector-Base Voltage	V_{CB}	60	90	Vdc
Emitter-Base Voltage	V_{EB}	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 W/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.2 6.9		Watts W/°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	θ_{JC}	0.15	°C/mW
Thermal Resistance, Junction to Ambient	θ_{JA}	0.49	°C/mW

*Indicates JEDEC Registered Data.



Collector Connected to Case
CASE 22 (1)
(TO-18)

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage		BV_{CEO}				Vdc
(I_C = 10 mAdc, I_B = 0)	2N3798,2N3799		60	–	–	
	2N3798A,2N3799A		90	–	–	
Collector-Base Breakdown Voltage		BV_{CBO}				Vdc
(I_C = 10 μAdc, I_E = 0)	2N3798,2N3799		60	–	–	
	2N3798A,2N3799A		90	–	–	
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		BV_{EBO}	5.0	–	–	Vdc
Collector Cutoff Current		I_{CBO}				μAdc
(V_{CB} = 50 Vdc, I_E = 0)			–	–	0.01	
(V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)			–	–	10	
Emitter Cutoff Current (V_{BE} = 4.0 Vdc, I_C = 0)		I_{EBO}	–	–	20	nAdc
ON CHARACTERISTICS						
DC Current Gain(1)		h_{FE}				–
(I_C = 1.0 μAdc, V_{CE} = 5.0 Vdc)	2N3799,2N3799A		75	–	–	
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N3798,2N3798A		100	–	–	
	2N3799,2N3799A		225	–	–	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3798,2N3798A		150	–	–	
	2N3799,2N3799A		300	–	–	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)	2N3798,2N3798A		75	–	–	
	2N3799,2N3799A		150	–	–	
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc)	2N3798,2N3798A		150	–	450	
	2N3799,2N3799A		300	–	900	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N3798,2N3798A		150	–	–	
	2N3799,2N3799A		300	–	–	
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	2N3798,2N3798A		125	–	–	
	2N3799,2N3799A		250	–	–	
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$				Vdc
(I_C = 100 μAdc, I_B = 10 μAdc)			–	–	0.2	
(I_C = 1.0 mAdc, I_B = 100 μAdc)			–	–	0.25	
Base-Emitter Saturation Voltage(1)		$V_{BE(sat)}$				Vdc
(I_C = 100 μAdc, I_B = 10 μAdc)			–	–	0.7	
(I_C = 1.0 mAdc, I_B = 100 μAdc)			–	–	0.8	
Base-Emitter On Voltage (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)		$V_{BE(on)}$	–	–	0.7	Vdc
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain—Bandwidth Product(2)		f_T				MHz
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc, f = 30 MHz)			30	–	–	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 100 MHz)			100	–	500	
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 100 kHz)		C_{ob}	–	–	4.0	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz)		C_{ib}	–	–	8.0	pF
Input Impedance		h_{ie}				k ohms
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3798,2N3798A		3.0	–	15	
	2N3799,2N3799A		10	–	40	
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{re}	–	–	25	$\times 10^{-4}$
Small-Signal Current Gain		h_{fe}				–
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3798,2N3798A		150	–	600	
	2N3799,2N3799A		300	–	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),		NF				dB
Spot Noise: f = 100 Hz, B.W. = 20 Hz	2N3798,2N3798A		–	4.0	7.0	
	2N3799,2N3799A		–	2.5	4.0	
Spot Noise: f = 1.0 kHz, B.W. = 200 Hz	2N3798,2N3798A		–	1.5	3.0	
	2N3799,2N3799A		–	0.8	1.5	
Spot Noise: f = 10 kHz, B.W. = 2.0 kHz	2N3798,2N3798A		–	1.0	2.5	
	2N3799,2N3799A		–	0.8	1.5	
Broadband Noise-Bandwidth 10 Hz to 15.7 kHz	2N3798,2N3798A		–	2.5	3.5	
	2N3799,2N3799A		–	1.5	2.5	

*Indicates JEDEC Registered Data.
(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

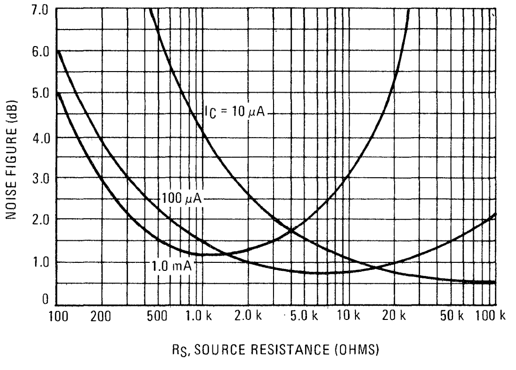


FIGURE 2 – SOURCE RESISTANCE EFFECTS, f = 10 Hz

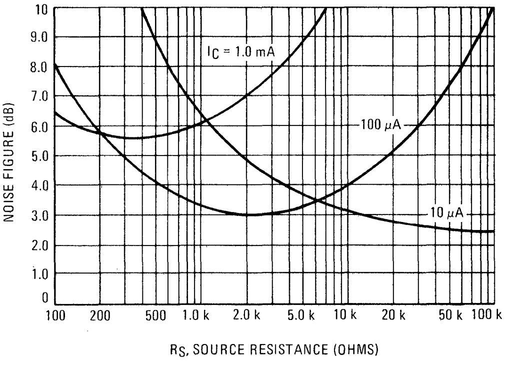


FIGURE 3 – FREQUENCY EFFECTS

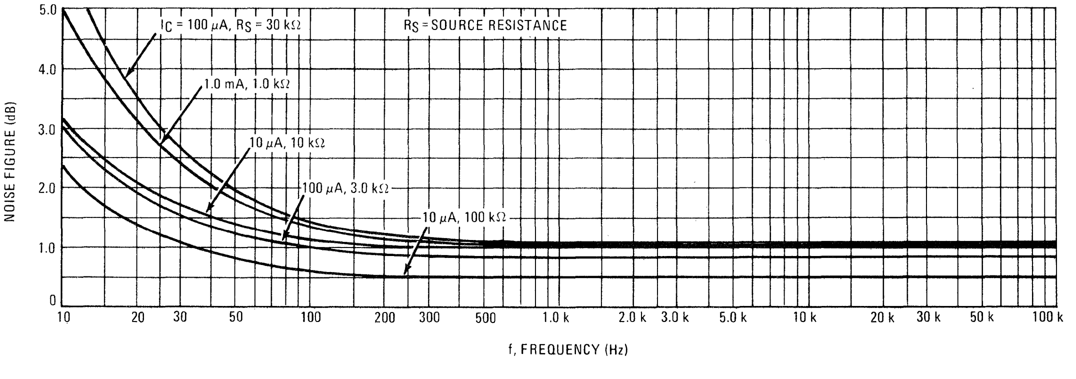


FIGURE 4 – TYPICAL CURRENT GAIN CHARACTERISTICS