

SEMICONDUCTOR TECHNICAL DATA

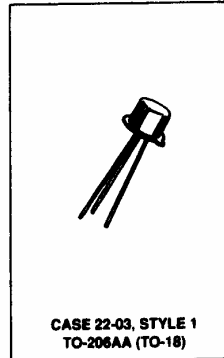
2N930.

NPN Silicon Small-Signal Transistor

... designed for low power amplifier applications.

CRYSTALONCS
2805 Veterans Highway
Suite 14
Ronkonkoma, N.Y. 11779

MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	45	V _{dc}
Collector-Base Voltage	V _{CBO}	60	V _{dc}
Emitter-Base Voltage	V _{EBO}	6.0	V _{dc}
Collector Current — Continuous	I _C	30	mAdc
Total Device Dissipation	P _T	300	mW
@ T _A = 25°C		2.0	mW/°C
Derate above 25°C		600	mW
@ T _C = 25°C		4.0	mW/°C
Derate above 25°C			
Operating Junction	T _J	175	°C
Storage Temperature Range	T _{stg}	-65 to 200	°C



ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ⁽¹⁾ (I _C = 10 mAdc, I _E = 0)	V _{(BR)CEO}	45	—	V _{dc}
Collector-Base Breakdown Voltage (I _C = 10 μAdc, I _E = 0)	V _{(BR)CBO}	60	—	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0)	V _{(BR)EBO}	6.0	—	V _{dc}
Collector Cutoff Current (V _{CE} = 5.0 V _{dc} , V _{BE} = 0)	I _{CEO}	—	0.2	nAdc
Collector Cutoff Current (V _{CE} = 45 V _{dc} , V _{BE} = 0)	I _{CES}	—	0.2	nAdc
Collector Cutoff Current (V _{CE} = 45 V _{dc} , V _{BE} = 0, T _A = 170°C)		—	10	μAdc
Collector Cutoff Current (V _{CB} = 45 V _{dc} , V _{BE} = 0)	I _{CBO}	—	0.1	nAdc
Emitter Cutoff Current (V _{EB} = 5.0 V _{dc} , I _C = 0)	I _{EBO}	—	0.5	nAdc

(1) Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1:0 to 2:0%.

(continued)

2N930JAN SERIES

ELECTRICAL CHARACTERISTICS — continued (T _A = 25 °C unless otherwise noted)				
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain (I _C = 10 μAdc, V _{CE} = 5.0 Vdc) (I _C = 500 μAdc, V _{CE} = 5.0 Vdc) (I _C = 10 mAdc, V _{CE} = 5.0 Vdc) ⁽¹⁾ (I _C = 10 μAdc, V _{CE} = 5.0 Vdc, T _A = -55 °C)	h _{FE}	100 150 — 20	300 — 600 —	—
Collector-Emitter Saturation Voltage (I _C = 10 mAdc, I _B = 0.5 mAdc)	V _{CE(sat)}	—	1.0	Vdc
Base-Emitter Saturation Voltage ⁽¹⁾ (I _C = 10 mAdc, I _B = 0.5 mAdc)	V _{BE(sat)}	0.6	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance (V _{CB} = 5.0 Vdc, I _E = 0, f = 0.1 to 1.0 MHz)	C _{obo}	—	8.0	pF
Current Gain (I _E = 1.0 mAdc, V _{CB} = 5.0 Vdc, f = 1.0 kHz)	h _{ie}	150	600	—
Small-Signal Current Transfer Ratio, Magnitude (I _C = 0.5 mAdc, V _{CE} = 5.0 Vdc, f = 30 MHz)	h _{ie} '	1.5	6.0	—
Input Impedance (I _E = 1.0 mAdc, V _{CB} = 5.0 Vdc, f = 1.0 kHz)	h _{ib}	25	32	ohms
Output Admittance (I _E = 1.0 mAdc, V _{CB} = 5.0 Vdc, f = 1.0 kHz)	h _{ob}	—	1.0	μmho
Voltage Feedback Ratio (I _E = 1.0 mAdc, V _{CB} = 5.0 Vdc, f = 1.0 kHz)	h _{rb}	—	6.0	X 10 ⁻⁴
Noise Figure (I _C = 10 μAdc, V _{CE} = 5.0 Vdc, R _G = 10 kohm) (f = 100 Hz) (f = 1.0 kHz) (f = 10 kHz)	NF	— — —	5.0 3.0 3.0	dB

ASSURANCE TESTING (Pre/Post Burn-In)				
Burn-In Conditions: T _A = 25 ± 3 °C, V _{CB} = 30 Vdc				
P _T = 300 mW				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V _{CB} = 45 Vdc)	I _{CBO}	—	10	nAdc
DC Current Gain (I _C = 10 μAdc, V _{CE} = 5.0 Vdc)	h _{FE}	100	300	—

Delta from Pre-Burn-In Measured Values				
Delta Collector Cutoff Current	ΔI _{CBO}	Min	Max	% of Initial Value nAdc
		—	±100 or ±5.0 whichever is greater	
Delta DC Current Gain	Δh _{FE}	—	±25	% of Initial Value

(1) Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1.0 to 2.0%.