2N929, A (SILICON)
2N930, A

2N929 JAN AVAILABLE
2N930 JAN AVAILABLE

CASE 22
(TO-18)
Collector connected to case

NPN silicon annular transistors for low-level, low-noise amplifier applications.

MAXIMUM RATINGS

Rating	Symbol	2N929 2N930	2N929A 2N930A	Unit
Collector-Emitter Voltage	V_{CEO}	45	60	Vdc
Collector-Base Voltage	V_{CB}	45	60	Vdc
Emitter-Base Voltage	V_{EB}	5.0	6.0	Vdc
Collector Current	I_C	30		mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	0.5 3.33		W mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.8 12		Watt mW/°C
Operating Junction Temperature Range	T_J	-65to + 175		°C
Storage Temperature Range	T_{stg}	-65 to +200		°C

2N929, A, 2N930, A (continued)

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_B = 0)		BV_{CEO}	45	-	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	2N929A, 2N930A	BV_{CBO}	60	-	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	2N929, 2N930 2N929A, 2N930A	BV_{EBO}	5.0 6.0	- -	Vdc
Collector Cutoff Current (V_{CE} = 5.0 Vdc, I_B = 0)		I_{CEO}	-	2.0	nAdc
Collector Cutoff Current (V_{CE} = 45 Vdc, V_{BE} = 0)	2N929, 2N930 2N929A, 2N930A	I_{CES}	- -	10 2.0	nAdc
(V_{CE} = 45 Vdc, V_{BE} = 0, T_A = 170°C)	2N929, 2N930 2N929A, 2N930A		- -	10 2.0	μAdc
Collector Cutoff Current (V_{CB} = 45 Vdc, I_E = 0)	2N929, 2N930 2N929A, 2N930A	I_{CBO}	- -	10 2.0	nAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)	2N929, 2N930 2N929A, 2N930A	I_{EBO}	- -	10 2.0	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 μAdc, V_{CE} = 5.0 Vdc)	2N929A 2N930A	h_{FE}	25 60	- -	-
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N929, 2N929A 2N930, 2N930A		40 100	120 300	
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = -55°C)	2N929 2N929A 2N930 2N930A		10 15 20 30	- - - -	
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc)	2N929, 2N929A 2N930, 2N930A		60 150	- -	
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc) [1]	2N929, 2N929A 2N930, 2N930A		- -	350 600	
Collector-Emitter Saturation Voltage [1] (I_C = 10 mAdc, I_B = 0.5 mAdc)	2N929, 2N930 2N929A, 2N930A	$V_{CE(sat)}$	- -	1.0 0.5	Vdc
Base-Emitter Saturation Voltage [1] (I_C = 10 mAdc, I_B = 0.5 mAdc)	2N929, 2N930 2N929A, 2N930A	$V_{BE(sat)}$	0.6	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain—Bandwidth Product (I_C = 500 μAdc, V_{CE} = 5.0 Vdc, f = 30 MHz)	2N929, 2N930 2N929A, 2N930A	f_T	30 45	- -	MHz
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 1.0 MHz)	2N929, 2N930 2N929A, 2N930A	C_{ob}	- -	8.0 6.0	pF
Input Impedance (I_E = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		h_{ib}	25	32	ohms
Voltage Feedback Ratio (I_E = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		h_{rb}	-	600	X 10-6
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)	2N929, 2N929A 2N930, 2N930A	h_{fe}	60 150	350 600	-
Output Admittance (I_E = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		h_{ob}	-	1.0	μmho
Noise Figure (I_C = 10 μAdc, V_{CE} = 5.0 Vdc, R_S = 10 k ohms, f = 10 Hz to 15.7 kHz)	2N929, 2N929A 2N930, 2N930A	NF	- -	4.0 3.0	dB

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