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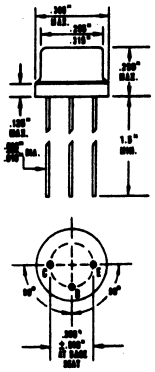
2N439 – 2N439A

NPN HIGH FREQUENCY COMPUTER TRANSISTORS

CBS-Hytron types 2N439 and 2N439A are NPN alloy-junction germanium transistors. Their basic NPN nature (high mobility electron flow) renders these transistors capable of very fast response under transient pulse operation. Their design is ideal for switching and flip-flop circuits. They are contained in a welded package equipped with flexible plated leads designed for connection by soldering, welding or socketing. This package has the mechanical dimensions of JETEC outline TO-9. The 2N439A has the base connected to the case internally to provide greater dissipation.

MECHANICAL DATA

JETEC outline	TO-9
JETEC base	E3-51
Case material	Metal
Maximum case length	0.250 inch
Maximum case diameter	0.360 inch
Minimum lead length	1.5 inches
Lead diameter	0.017 inch



ELECTRICAL DATA

RATINGS, ABSOLUTE MAXIMUM AT 25°C	2N439	2N439A
Collector to base voltage, V_{CB}	30	30 Vdc
Emitter to base voltage, V_{EB}	25	25 Vdc
Collector to emitter voltage, V_{CE}	20	20 Vdc
Total dissipation, P	100	150 mW
Derating per °C increase in ambient temperature	1.7	2.5 mW
Operating and storage temperature, T_j		-55 to +85°C

Quality Semi-Conductors

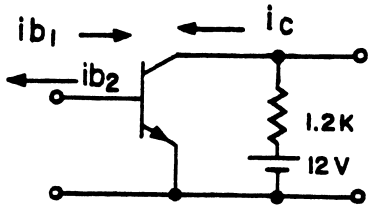
ELECTRICAL DATA

	Min.	Mode	Max.	Units
STATIC AND LARGE SIGNAL PARAMETERS				
Collector cutoff current, I_{CBO}				
V_{CB} = 25 V		2	10	μAdc
Collector cutoff current, I_{CBO}				
V_{CB} = 6 V, TA = 75°C			150	μAdc
Emitter cutoff current, I_{EBO}				
V_{EB} = 25 V		2	10	μAdc
Emitter cutoff current, I_{EBO}				
V_{EB} = 6 V, TA = 75°C			150	μAdc
Collector-base breakdown voltage, BV_{CBO}				
I_C = 100 μA	30			Vdc
Collector-emitter breakdown voltage, BV_{CEO}				
I_C = 300 μA	20			Vdc
Current gain, h_{FE}				
I_C = 50 mA, V_{CE} = 1.0 V	30	45		
Input voltage, V_{EB}				
I_C = 50 mA, V_{CE} = 1.0 V		.32	.7	Vdc
Saturation resistance, R_S				
I_C = 50 mA		3	5	ohms
TYPICAL SWITCHING CHARACTERISTICS (Note 3)				
Rise time, t_r		.5		μs
Fall time, t_f		.3		μs
Storage time, t_s		.7		μs
LOW FREQUENCY, SMALL SIGNAL PARAMETERS (Note 1)				
Current gain, h_{fe}		35		
Input resistance, h_{ib}		27		ohms
Input resistance, h_{ie}		1500		ohms
HIGH FREQUENCY, SMALL SIGNAL PARAMETERS (Note 2)				
Cutoff frequency, $f_{\alpha b}$	5.0			mc
Collector capacitance, C_c		9	20	μμf
Collector base time constant, $rb'C_c$		2300		μμs
Extrinsic base resistance, rb'		220		ohms

ENVIRONMENTAL

Hermetic seal - detergent and water at 60 psi for 1/2 hour.
Drop - 30 inches to maple block, 3 drops.
Shock - 500 g, 7 ms.
Vibration - 10 g, 100 - 1000 cps.
Lead bend - 3-180 degree bends on leads.

Note 1: V_{CB} = 6.0 Vdc, I_E = 1.0 mA, f = 270 cps
Note 2: V_{CB} = 6.0 Vdc, I_E = 1.0 mA, f = 455 kc
Note 3:



turn-on current ib_1 = 1 mA
turn-off current ib_2 = 1 mA
collector current i_c = 10 mA