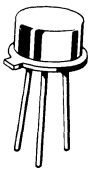
2N5865 (SILICON)

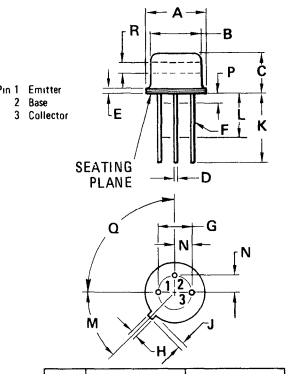
PNP SILICON ANNULAR TRANSISTOR

. . . designed where high-current, high-voltage conditions are requirements for general-purpose switching and amplifier applications.

- Collector-Emitter Breakdown Voltage –
  BV_{CEO} = 50 Vdc (Min) @ I_C = 10 mAdc
- DC Current Gain Specified – 1.0 mA to 500 mA
- Turn-On Time –
  t_{on} = 120 ns (Max) @ I_C = 500 mAdc

PNP SILICON
GENERAL-PURPOSE
TRANSISTOR





*MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	50	Vdc
Collector-Base Voltage	V_{CB}	70	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current – Continuous	I_C	1.0	Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.25 7.15	Watts mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	7.0 40	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J,T_{stg}	-65 to +200	°C

*Indicates JEDEC Registered Data.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	6.10	6.60	0.240	0.260
D	0.406	0.533	0.016	0.021
E	0.229	3.18	0.009	0.125
F	0.406	0.483	0.016	0.019
G	4.83	5.33	0.190	0.210
H	0.711	0.864	0.028	0.034
J	0.737	1.02	0.029	0.040
K	12.70	–	0.500	–
L	6.35	–	0.250	–
M	45° NOM		45° NOM	
P	–	1.27	–	0.050
Q	90° NOM		90° NOM	
R	2.54	–	0.100	–

All JEDEC dimensions and notes apply.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (2) (I_C = 10 mAdc, I_B = 0)	BV_{CEO}	50	–	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	BV_{CBO}	70	–	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	BV_{EBO}	5.0	–	Vdc
Collector Cutoff Current (V_{CB} = 35 Vdc, I_E = 0)	I_{CBO}	–	200	nAdc
Emitter Cutoff Current (V_{BE} = 3.0 Vdc, I_C = 0)	I_{EBO}	–	200	nAdc
ON CHARACTERISTICS (2)				
DC Current Gain	h_{FE}			–
(I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc)		40	–	
(I_C = 150 mAdc, V_{CE} = 1.0 Vdc)		40	200	
(I_C = 500 mAdc, V_{CE} = 2.0 Vdc)		20	–	
Collector-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{CE(sat)}$	–	1.25	Vdc
Base-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc)	$V_{BE(sat)}$	–	1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain–Bandwidth Product(1) (I_C = 50 mAdc, V_{CE} = 20 Vdc, f = 20 MHz)	f_T	100	–	MHz
Collector-Base Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{cb}	–	20	pF
Emitter-Base Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz)	C_{eb}	–	150	pF
SWITCHING CHARACTERISTICS				
Delay Time	(V_{CC} = 10 Vdc, I_C = 500 mAdc, I_{B1} = 50 mAdc)	t_d	–	30	ns
Rise Time		t_r	–	90	ns
Storage Time	(V_{CC} = 10 Vdc, I_C = 500 mAdc, I_{B1} = I_{B2} = 50 mAdc)	t_s	–	350	ns
Fall Time		t_f	–	150	ns

*Indicates JEDEC Registered Data.

(1) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates itself to unity.

(2) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

FIGURE 1 – SWITCHING TIME TEST CIRCUIT