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2N4402 & 2N4403
Silicon PNP Transistor
General Purpose
TO92 Type Package

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO} 40V
Collector–Base Voltage, V_{CBO} 40V
Emitter–Base Voltage, V_{EBO} 5V
Continuous Collector Current, I_C 600mA
Total Device Dissipation (T_A = +25°C), P_D 625mW
Derate Above 25°C . . . . . 5.0mW/°C
Total Device Dissipation (T_C = +25°C), P_D 1.5W
Derate Above 25°C . . . . . 12mW/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Junction to Case, R_{thJC} . . . . . 83.3°C/W
Thermal Resistance, Junction to Ambient, R_{thJA} . . . . . 200°C/W

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

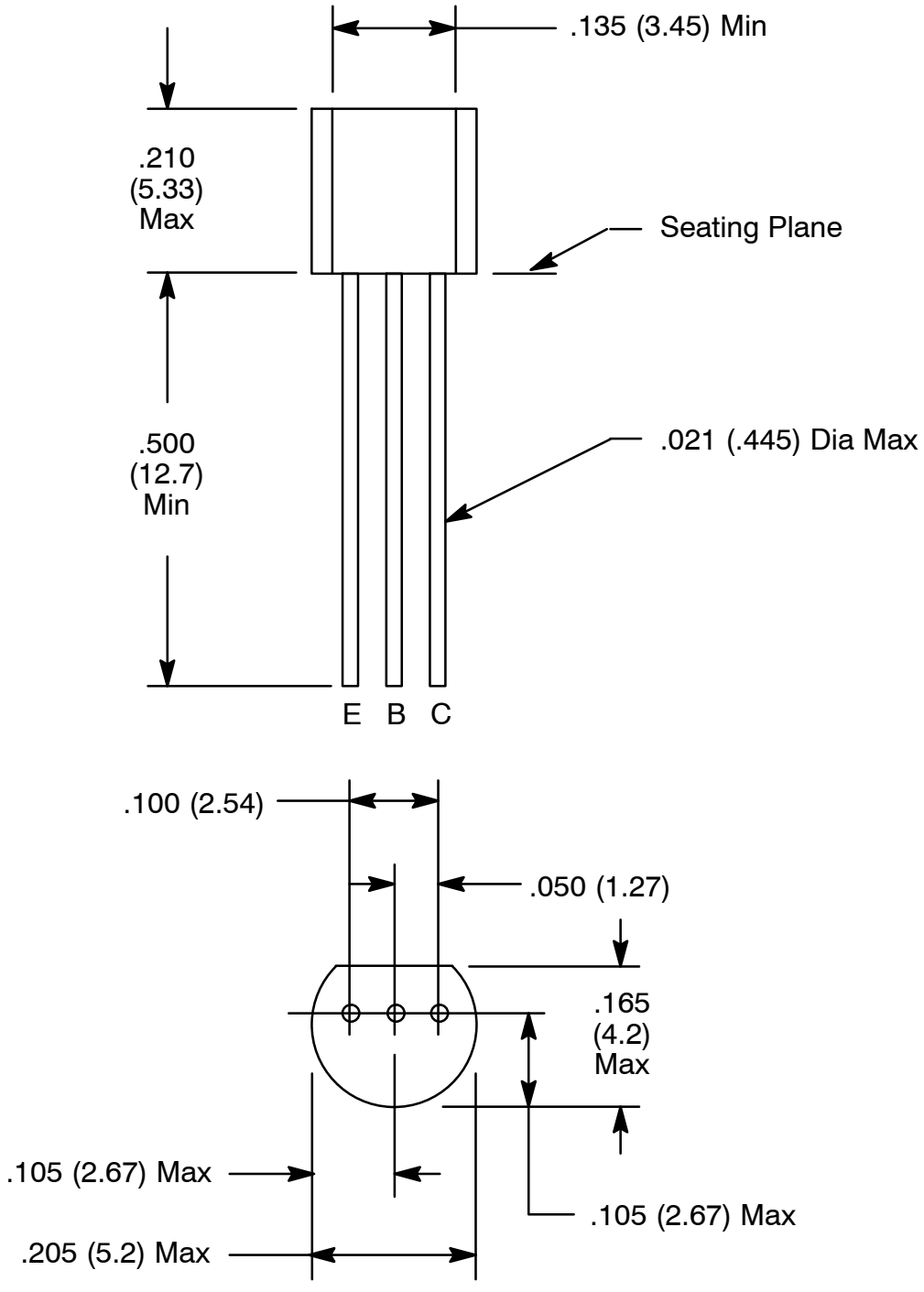
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA, I_B = 0, Note 1	40	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 0.1mA, I_E = 0	40	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 0.1mA, I_C = 0	5	–	–	V
Collector Cutoff Current	I_{CEX}	V_{CE} = 35V, V_{EB} = 0.4V	–	–	0.1	°A
Base Cutoff Current	I_{BEV}	V_{CE} = 35V, V_{EB} = 0.4V	–	–	0.1	°A
ON Characteristics (Note 1)						
DC Current Gain 2N4403	h_{FE}	V_{CE} = 1V, I_C = 0.1mA	30	–	–	
2N4402		V_{CE} = 1V, I_C = 1mA	30	–	–	
2N4403			60	–	–	
2N4402		V_{CE} = 1V, I_C = 10mA	50	–	–	
2N4403			100	–	–	
2N4402		V_{CE} = 2V, I_C = 150mA	50	–	150	
2N4403			100	–	300	
2N4402		V_{CE} = 2V, I_C = 500mA	20	–	–	
2N4403			20	–	–	

Note 1. Pulse Test: Pulse Width ≤ 300° s, Duty Cycle ≤ 2%.

Electrical Characteristics (Cont'd): (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Cont'd) (Note 1)						
Collector−Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	0.4	V
		I_C = 500mA, I_B = 50mA	–	–	0.75	V
Base−Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	0.75	–	0.95	V
		I_C = 500mA, I_B = 50mA	–	–	1.3	V
Small−Signal Characteristics						
Current Gain−Bandwidth Product 2N4402	f_T	I_C = 20mA, V_{CE} = 10V, f = 100MHz	150	–	–	MHz
2N4403			200	–	–	MHz
Collector−Base Capacitance	C_{cb}	V_{CB} = 10V, I_E = 0, f = 140kHz	–	–	8.5	pF
Emitter−Base Capacitance	C_{eb}	V_{BE} = 0.5V, I_C = 0, f = 140kHz	–	–	30	pF
Input Impedance 2N4402	h_{ie}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	750	–	7.5k	≤
2N4403			1.5k	–	15k	≤
Voltage Feedback Ratio	h_{re}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	0.1	–	8.0	x 10^{-4}
Small−Signal Current Gain 2N4402	h_{fe}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	30	–	250	
2N4403			60	–	500	
Output Admittance	h_{oe}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	1.0	–	100	°mhos
Switching Characteristics						
Delay Time	t_d	V_{CC} = 30V, V_{EB} = 2V, I_C = 150mA, I_{B1} = 15mA	–	–	15	ns
Rise Time	t_r		–	–	20	ns
Storage Time	t_s	V_{CC} = 30V, I_C = 150mA, I_{B1} = I_{B2} = 15mA	–	–	225	ns
Fall Time	t_f		–	–	30	ns

Note 1. Pulse Test: Pulse Width ≤ 300° s, Duty Cycle ≤ 2%.


.135 (3.45) Min
.210
(5.33)
Max
Seating Plane
.500
(12.7)
Min
.021 (.445) Dia Max
E B C
.100 (2.54)
.050 (1.27)
.165
(4.2)
Max
.105 (2.67) Max
.105 (2.67) Max
.205 (5.2) Max