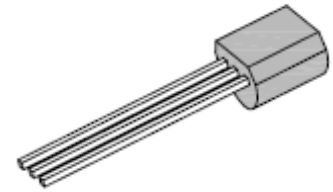


Small Signal General Purpose Transistors (NPN)

Features

- NPN Silicon Epitaxial Transistor for Switching and Amplifier Applications
- RoHS Compliance



TO-92



Mechanical Data

Case:	TO-92, Plastic Package
Terminals:	Solderable per MIL-STD-202G, Method 208
Weight:	0.18 gram

Maximum Ratings *(T_{Ambient}=25°C unless noted otherwise)*

Symbol	Description	2N4400	2N4401	Unit
	Marking Code	2N4400	2N4401	
V_{CEO}	Collector-Emitter Voltage	40		V
V_{CBO}	Collector-Base Voltage	60		V
V_{EBO}	Emitter-Base Voltage	6.0		V
I_C	Collector Current Continuous	600		mA
P_D	Power Dissipation at T _A =25°C	625		mW
	Derate above 25°C	5.0		mW/°C
P_D	Power Dissipation at T _C =25°C	1.5		W
	Derate above 25°C	12		mW/°C
R_{θJA}	Thermal Resistance Junction to Ambient Air	200		°C/W
R_{θJC}	Thermal Resistance Junction to Case	83.3		°C/W
T_J, T_{STG}	Operation and Storage Junction Temperature Range	-55 to +150		°C

Small Signal General Purpose Transistors (NPN)

2N4400/2N4401

Electrical Characteristics ($T_{Ambient}=25^{\circ}C$ unless noted otherwise)

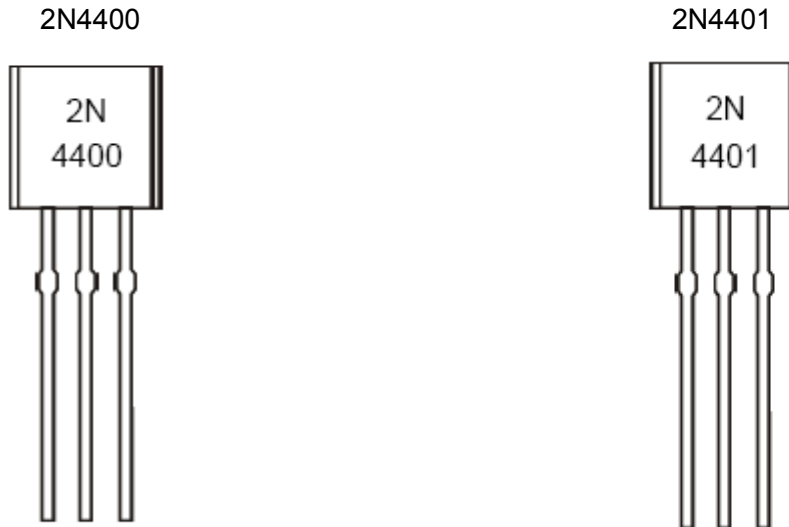
Symbol	Description	2N4400		2N4401		Unit	Conditions
		Min.	Max.	Min.	Max.		
V_{(BR)CBO}	Collector-Base Breakdown Voltage	60	-	60	-	V	I _C =100μA, I _E =0
V_{(BR)CEO}*	Collector-Emitter Breakdown Voltage	40	-	40	-	V	I _C =1mA, I _B =0
V_{(BR)EBO}	Emitter-Base Breakdown Voltage	6.0	-	6.0	-	V	I _E =100μA, I _C =0
V_{CE(sat)}*	Collector Emitter Saturation Voltage	-	0.40	-	0.40	V	I _C =150mA, I _B =15mA
		-	0.75	-	0.75		I _C =500mA, I _B =50mA
V_{BE(sat)}*	Base Emitter Saturation Voltage	0.75	0.95	0.75	0.95	V	I _C =150mA, I _B =15mA
		-	1.20	-	1.20		I _C =500mA, I _B =50mA
I_{CEV}	Collector Cut-Off Current	-	100	-	100	nA	V _{EB} =0.4V, V _{CE} =35V
I_{BEV}	Base Cut-Off Current	-	100	-	100	nA	V _{EB} =0.4V, V _{CE} =35V
h_{FE}*	D.C. Current Gain	-	-	20	-		V _{CE} =1V, I _C =0.1mA
		20	-	40	-		V _{CE} =1V, I _C =1mA
		40	-	80	-		V _{CE} =1V, I _C =10mA
		50	150	100	300		V _{CE} =1V, I _C =150mA
		20	-	40	-		V _{CE} =2V, I _C =500mA
h_{ie}	Input Impedance	0.5	7.5	1.0	15	kΩ	V _{CE} =10V, I _C =1mA f=1KHz,
h_{re}	Voltage Feedback Ratio	0.1	8.0	0.1	8.0	x10 ⁻⁴	V _{CE} =10V, I _C =1mA f=1KHz,
f_T	Current Gain-Bandwidth Product	200	-	250	-	MHz	V _{CE} =10V, I _C =20mA, f=100MHz
C_{CBO}	Collector-Base Capacitance	-	6.5	-	6.5	pF	V _{CB} =5V, I _E =0 f=100KHz,
C_{EBO}	Emitter-Base Capacitance	-	30	-	30	pF	V _{EB} =0.5V, I _C =0 f=100KHz,
h_{fe}	Small Signal Current Gain	20	250	40	500		V _{CE} =10V, I _C =1mA f=1KHz,
h_{oe}	Output Admittance	1.0	30	1.0	30	μS	V _{CE} =10V, I _C =1mA f=1KHz,
t_d	Delay Time	-	15	-	15	nS	V _{CC} =30V, V _{EB} =2V I _C =150mA, I _{B1} =15mA
t_r	Rise Time	-	20	-	20	nS	
t_s	Storage Time	-	225	-	225	nS	V _{CC} =30V, I _C =150mA I _{B1} =I _{B2} =15mA
t_f	Fall Time	-	30	-	30	nS	

*Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

Small Signal General Purpose Transistors (NPN)

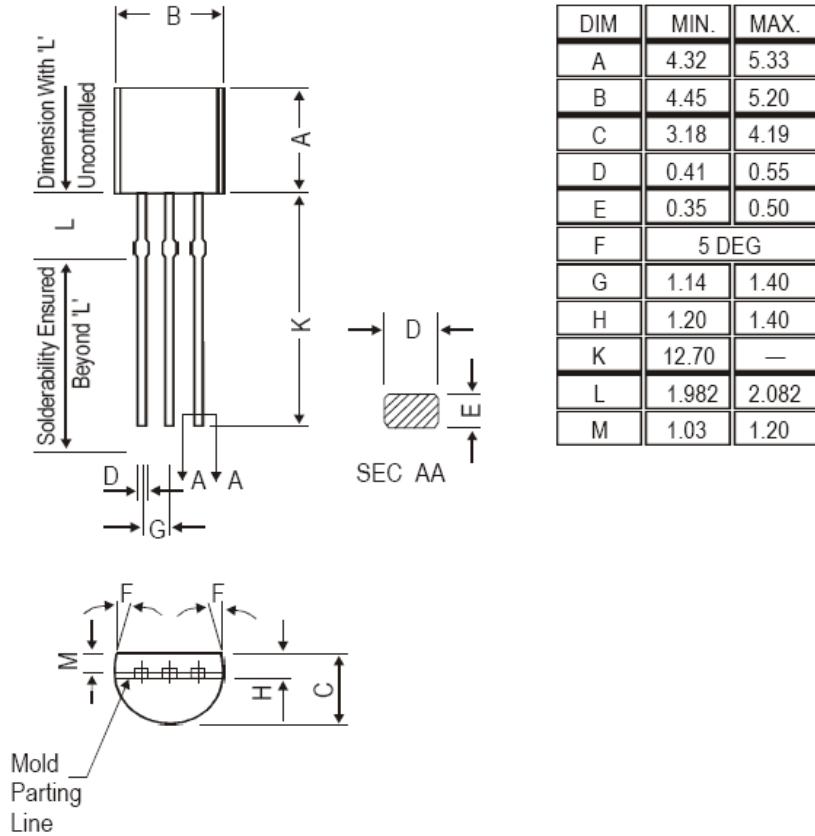
2N4400/2N4401

Marking Information:



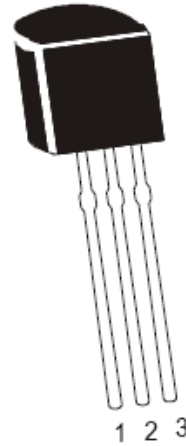
Dimensions in mm

TO-92



Small Signal General Purpose Transistors (NPN)

2N4400/2N4401



PIN CONFIGURATION

1. EMITTER
2. BASE
3. COLLECTOR

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