2N4401

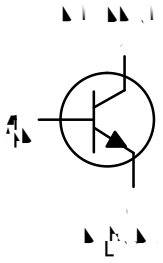
General Purpose Transistors

NPN Silicon

http://onsemi.com

Features

- Pb−Free Packages are Available*



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CEO}	40	Vdc
Collector − Base Voltage	V_{CBO}	60	Vdc
Emitter − Base Voltage	V_{EBO}	6.0	Vdc
Collector Current − Continuous	I_C	600	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 625 5.0	 mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	 1.5 12	 W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

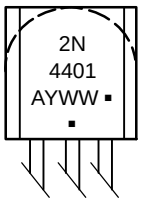
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	83.3	°C/W

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MARKING DIAGRAM



2N4401 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Breakdown Voltage (Note 1)	(I_C = 1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	40	−	Vdc
Collector−Base Breakdown Voltage	(I_C = 0.1 mAdc, I_E = 0)	$V_{(BR)CBO}$	60	−	Vdc
Emitter−Base Breakdown Voltage	(I_E = 0.1 mAdc, I_C = 0)	$V_{(BR)EBO}$	6.0	−	Vdc
Base Cutoff Current	(V_{CE} = 35 Vdc, V_{EB} = 0.4 Vdc)	I_{BEV}	−	0.1	μAdc
Collector Cutoff Current	(V_{CE} = 35 Vdc, V_{EB} = 0.4 Vdc)	I_{CEX}	−	0.1	μAdc
ON CHARACTERISTICS (Note 1)					
DC Current Gain		h_{FE}			−
	(I_C = 0.1 mAdc, V_{CE} = 1.0 Vdc)		20	−	
	(I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc)		40	−	
	(I_C = 10 mAdc, V_{CE} = 1.0 Vdc)		80	−	
	(I_C = 150 mAdc, V_{CE} = 1.0 Vdc)		100	300	
	(I_C = 500 mAdc, V_{CE} = 2.0 Vdc)		40	−	
Collector−Emitter Saturation Voltage	(I_C = 150 mAdc, I_B = 15 mAdc)	$V_{CE(sat)}$	−	0.4	Vdc
	(I_C = 500 mAdc, I_B = 50 mAdc)		−	0.75	
Base−Emitter Saturation Voltage	(I_C = 150 mAdc, I_B = 15 mAdc)	$V_{BE(sat)}$	0.75	0.95	Vdc
	(I_C = 500 mAdc, I_B = 50 mAdc)		−	1.2	
SMALL−SIGNAL CHARACTERISTICS					
Current−Gain − Bandwidth Product	(I_C = 20 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	f_T	250	−	MHz
Collector−Base Capacitance	(V_{CB} = 5.0 Vdc, I_E = 0, f = 1.0 MHz)	C_{cb}	−	6.5	pF
Emitter−					

Figure 1. Turn−On Time

Figure 2. Turn−

h PARAMETERS

V_{CE} = 10 Vdc, f = 1.0 kHz, T_A = 25°C

TO−92 (TO−226)
CASE 29−11
ISSUE AM

DATE 09 MAR 2007

Y 1: . 806-46A
N 1.
2. BA
3.

Y 2:
N 1. BA
2.
3.

Y 3:
N 1. AN
2. AN
3. A

Y 6:
N 1. A
2. U & UB A
3. A N

Y 7:
N 1. U
2. A N
3. A

Y 8:
N 1. A N
2. A
3. U & UB A

Y 11:
N 1. AN
2. A & AN
3. A

Y 12:
N 1. A N NA 1
2. A
3. A N NA 2

Y 13:
N 1. AN 1
2. A
3. A 2

Y 16:
N 1. AN
2. A
3. A

Y 17:
N 1.
2. BA
3.

Y 18:
N 1. AN
2. A
3. N NN

Y 21:
N 1.
2.
3. BA

Y 22:
N 1. U
2. A
3. A N

Y 23:
N 1. A
2. U
3. A N

Y 26:
N 1.
2. UN 2
3. U U

Y 27:
N 1.
2. UB A
3.

Y 28:
N 1. A
N 1. A N Y 8:
2. 3. A N

Y 31:
N 1. A
2. A N
3. U

Y 32:
N 1. BA
2. Y
3.

2. A