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2N5400 & 2N5401 Silicon NPN Transistor General Purpose Amplifier TO92 Type Package

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	
2N5400	120V
2N5401	150V
Collector-Base Voltage, V_{CBO}	
2N5400	130V
2N5401	160V
Emitter-Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	600mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	625mW
Derate Above 25°C	5.0mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.5W
Derate Above 25°C	12.0mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction to Case, R_{thJC}	83.3 $^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient, R_{thJA}	200 $^\circ\text{C/W}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage 2N5400	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$, Note 1	120	–	–	V
2N5401			150	–	–	V
Collector-Base Breakdown Voltage 2N5400	$V_{(BR)CBO}$	$I_C = 100^\circ\text{A}$, $I_E = 0$	130	–	–	V
2N5401			160	–	–	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10^\circ\text{A}$, $I_C = 0$	5	–	–	V
Collector Cutoff Current 2N5400	I_{CBO}	$V_{CB} = 100\text{V}$, $I_E = 0$	–	–	100	nA
2N5401		$V_{CB} = 120\text{V}$, $I_E = 0$	–	–	50	nA
2N5400		$V_{CB} = 100\text{V}$, $I_E = 0$, $T_A = +100^\circ\text{C}$	–	–	100	nA
2N5401		$V_{CB} = 120\text{V}$, $I_E = 0$, $T_A = +100^\circ\text{C}$	–	–	50	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 3\text{V}$, $I_C = 0$	–	–	50	nA

Note 1. Pulse Test: Pulse Width = 300 $^\circ\text{s}$, Duty Cycle = 2%.

Electrical Characteristics (Cont'd): ($T_A = +25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 1)						
DC Current Gain 2N5400	h _{FE}	V _{CE} = 5V, I _C = 1mA	30	–	–	
2N5401			50	–	–	
2N5400		V _{CE} = 5V, I _C = 10mA	40	–	180	
2N5401			60	–	240	
2N5400		V _{CE} = 5V, I _C = 50mA	40	–	–	
2N5401			50	–	–	
Collector–Emitter Saturation Voltage	V _{CE(sat)}	I _C = 10mA, I _B = 1mA	–	–	0.2	V
		I _C = 50mA, I _B = 5mA	–	–	0.5	V
Base–Emitter Saturation Voltage	V _{BE(sat)}	I _C = 10mA, I _B = 1mA	–	–	1.0	V
		I _C = 50mA, I _B = 5mA	–	–	1.0	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product 2N5400	f _T	I _C = 10mA, V _{CE} = 10V, f = 100MHz	100	–	400	MHz
2N5401			100	–	300	MHz
Output Capacitance	C _{obo}	V _{CB} = 10V, I _E = 0, f = 1MHz	–	–	6.0	pF
Small–Signal Current Gain 2N5400	h _{fe}	I _C = 1mA, V _{CE} = 10V, f = 1kHz	30	–	200	
2N5401			40	–	200	
Noise Figure	NF	I _C = 250° A, V _{CE} = 5V, R _S = 1k≤, f = 10Hz to 15.7kHz	–	–	8.0	db

Note 1. Pulse Test: Pulse Width $\leq 300^{\circ}s$, Duty Cycle $\leq 2\%$.

