ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

2N2405
Silicon NPN Transistor
General Purpose, Medium Power
TO–39 Type Package

Description:

The 2N2405 is a silicon NPN transistor in a TO–39 type package designed for use in high current, fast switching applications and for power amplifiers.

Features:

- For Operation at Junction Temperature up to +200°C
- Planar Construction fo Low Noise and Low Leakage
- Low Output Capacitance

Absolute Maximum Ratings:

Collector–Base Voltage, V_{CBO} 120V
Collector–Emitter Voltage, V_{CEO} 90V
Emitter–Base Voltage, V_{EBO} 7V
Collector–Emitter Sustaining Voltage, V_{CER} 140V
Collector Current, I_C 1A
Total Power Dissipation, P_T
$T_C \le +25°C$ 5W
$T_A \le +25°C$ 1W
Operating Junction Temperature Range, T_J . . . . . –65° to +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 35°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 175°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	I_C = 30mA, I_B = 0	90	–	–	V
		I_C = 100mA, I_B = 0	90	–	–	V
	$V_{CER(sus)}$	I_C = 100mA, R_{BE} = 10Ω, Note 1	140	–	–	V
		I_C = 100mA, R_{BE} = 500Ω, Note 1	120	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 0.1mA, I_E = 0, Note 1	120	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_C = 0.1mA, I_C = 0, Note 1	7	–	–	V
Collector Cutoff Current	I_{CBO}	V_{CB} = 90V, I_E = 0	–	–	0.01	μA
		V_{CB} = 90V, I_E = 0, T_C = +150°C	–	–	10	μA
Emitter Cutoff Current	I_{EBO}	V_{BE} = –5V, I_C = 0	–	–	0.01	μA
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	0.5	V
		I_C = 50mA, I_B = 5mA,	–	–	0.2	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	1.1	V
		I_C = 50mA, I_B = 5mA	–	–	0.9	V

Note 1. Pulse Test: Pulse Duration = 300μs, Duty Cycle ≤ 2%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
DC Current Gain	h_{FE}	I_C = 10mA, V_{CE} = 10V, Note 1	35	–	–	
		I_C = 150mA, V_{CE} = 10V, Note 1	60	–	200	
		I_C = 10mA, V_{CE} = 10V, T_C = –55°C, Note 1	20	–	–	
Dynamic Characteristics						
Small–Signal Current Gain	h_{fe}	V_{CE} = 5V, I_C = 5mA, f = 1kHz	50	275	–	
		V_{CE} = 10V, I_C = 50mA, f = 20MHz	6	–	–	
	h_{ib}	V_{CB} = 5V, I_C = 1mA, f = 1KHz	24	34	–	Ω
		V_{CB} = 10V, I_C = 5mA, f = 1KHz	4	8	–	Ω
	h_{rb}	V_{CB} = 5V, I_C = 1mA, f = 1KHz	–	–	$3x10^4$	
		V_{CB} = 10V, I_C = 5mA, f = 1KHz	–	–	$3x10^4$	
	h_{ob}	V_{CB} = 5V, I_C = 1mA, f = 1KHz	–	–	0.5	μmho
		V_{CB} = 10V, I_C = 5mA, f = 1KHz	–	–	0.5	μmho
Output Capacitance	C_{obo}	V_{CB} = 10V, I_E = 0	–	–	15	pF
	C_{ib}	V_{BE} = –0.5V, I_C = 0	–	–	80	pF

Note 1. Pulse Test: Pulse Duration = 300μs, Duty Cycle ≤ 2%.