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2N5089
Silicon NPN Transistor
High Gain, Low Noise Amp

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO} 25V

Collector–Base Voltage, V_{CBO} 30V

Emitter–Base Voltage, V_{EBO} 3.0V

Continuous Collector Current, I_C 50mA

Total Device Dissipation (T_A = +25°C), P_D 625mW
Derate above 25°C . . . . . 5mW/°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 (Note 1), R_{thJA} . . . . . 200°C/W

Note 1 R_{thJA} is measured with the device soldered into a typical printed circuit board.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0, Note 2	25	–	–	V
Colletor–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100μA, I_E = 0	30	–	–	V
Emitter Cutoff Current	I_{CBO}	$V_{EB(off)}$ = 4.5V_{dc}, I_C = 0	–	–	100	nA
Collector Cutoff Current	I_{CBO}	V_{CB} = 30V, I_E = 0	–	1.0	50	nA
ON Characteristics						
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 100μA	400	1200	–	
		V_{CE} = 5V, I_C = 1mA	450	–	–	
		V_{CE} = 5V, I_C = 10mA	400	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 0.5mA	–	–	0.5	V
Base–Emitter ON Voltage (Note 2)	$V_{BE(on)}$	V_{CE} = 5V, I_C = 10mA	–	–	0.8	V

Note 2 Pulse test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Small−Signal Characteristics						
Current Gain−Bandwidth Product	f_T	V_{CE} = 5V, I_C = 500μA, f = 20MHz	50	–	–	MHz
Collector−Base Capacitance	C_{obo}	V_{CB} = 5V, I_E = 0, f = 1MHz	–	–	4.0	pF
Emitter−Base Capacitance	C_{eb}	V_{CB} = 5V, I_E = 0, f = 1MHz	–	–	10	pF
Small Signal Current Gain	h_{fe}	V_{CE} = 5V, I_C = 1mA, f = 1kHz	450	–	1800	–
Noise Figure	NF	V_{CE} = 5V, I_C = 100μA, R_S = 1kΩ, f = 1kHz	–	–	2.0	dB