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2N6387 & 2N6388
Silicon NPN Transistors
Darlington Power Amplifier
TO–220 Type Package

Description:

The 2N6387 and 2N6388 are silicon NPN Darlington power transistors in a TO–220 type package designed for general purpose amplifier and low–speed switching applications.

Features:

- High DC Current Gain: h_{FE} = 2500 Typ
- Collector–Emitter Sustaining Voltage (@ 100mA):
  2N6387: $V_{CEO(sus)}$ = 60V Min
  2N6387: $V_{CEO(sus)}$ = 80V Min
- Low Collector–Emitter Saturation Voltage:
  $V_{CE(sat)}$ = 2V Max @ I_C = 5A
- Monolithic Construction with Built–In Base–Emitter Shunt Resistor

Absolute Maximum Ratings: (Note 1)

Collector–Emitter Voltage, V_{CEO}
- 2N6387 . . . . . 60V
- 2N6388 . . . . . 80V

Collector–Base Voltage, V_{CB}
- 2N6387 . . . . . 60V
- 2N6388 . . . . . 80V

Emitter–Base Voltage, V_{EB} 5V

Collector Current, I_C
- Continuous 10A
- Peak 15A

Base Current, I_B 250mA

Total Power Dissipation (T_C = +25°C), P_D 65W
- Derate Above 25°C . . . . . 0.52W/°C

Total Power Dissipation (T_A = +25°C), P_D 2W
- Derate Above 25°C . . . . . 0.016W/°C

Operating Junction Temperature range, T_J . . . . . –65° to +150°C

Storage Temperature range, T_{stg} . . . . . –65° to +150°C

Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.92°C/W

Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 62.5°C/W

Note 1. Stresses exceeding those listed in the Absolute Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Electrical Characteristics: (T_C = +25°C, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage 2N6387	$V_{CEO(sus)}$	I_C = 200mA, I_B = 0, Note 3	60	–	–	V
2N6388			80	–	–	V
Collector Cutoff Current	I_{CEO}	V_{CE} = Rated Voltage, I_B = 0	–	–	1.0	mA
	I_{CEX}	V_{CE} = Rated Voltage, $V_{EB(off)}$ = 1.5V	–	–	300	μA
		T_C = +125°C	–	–	3	mA
Emitter Cutoff Current	I_{EBO}	V_{BE} = 5V, I_C = 0	–	–	5	mA
ON Characteristics (Note 3)						
DC Current Gain	h_{FE}	I_C = 5A, V_{CE} = 3V	1000	–	20000	
		I_C = 10A, V_{CE} = 3V	100	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 5A, I_B = 0.01A	–	–	2	V
		I_C = 10A, I_B = 0.1A	–	–	3	V
Base–Emitter ON Voltage	$V_{BE(on)}$	I_C = 5A, V_{CE} = 3V	–	–	2.8	V
		I_C = 10A, V_{CE} = 3V	–	–	4.5	V
Dynamic Characteristics						
Small–Signal Current Gain	$\|h_{fe}\|$	I_C = 1A, V_{CE} = 5V, f_{test} = 1MHz	20	–	–	
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	–	–	200	pF
Small–Signal Current Gain	h_{fe}	I_C = 1A, V_{CE} = 5V, f = 1kHz	1000	–	–	

Note 2. Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise specified. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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