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2N6338
Silicon NPN Transistor
Power Amp, Switch
TO–3 Type Package

Description:
The 2N6338 is a silicon NPN transistor in a TO–3 type package designed for use in industrial–military power amplifier and switching circuit applications.

Features:
- High Collector–Emitter Sustaining Voltage
- High DC Current Gain
- Low Collector–Emitter Saturation Voltage
- Fast Switching Times

Absolute Maximum Ratings: (Note 1)

Collector–Emitter Voltage, V_{CEO} 100V
Collector–Base Voltage, V_{CB} 120V
Emitter–Base Voltage, V_{EB} 6V
Collector Current, I_C
  Continuous 25A
  Peak 50A
Base Current, I_B 10A
Total Device Dissipation (T_C = +25°C), P_D 200W
  Derate Above 25°C . . . . . 1.14W/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Maximum Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 0.875°C/W

Note 1. 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.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	I_C = 50mA, I_B = 0, Note 2	100	–	–	V
Collector Cutoff Current	I_{CEX}	V_{CE} = 100V, $V_{EB(off)}$ = 1.5V	–	–	10	μA
		V_{CE} = 100V, $V_{EB(off)}$ = 1.5V, T_C = +150°C	–	–	1.0	mA
	I_{CEO}	V_{CE} = 50V, I_B = 0	–	–	50	μA
	I_{CBO}	V_{CB} = 100V, I_E = 0	–	–	10	μA
Emitter Cutoff Current	I_{EBO}	V_{BE} = 6V, I_C = 0	–	–	100	μA

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 2)						
DC Current Gain	h_{FE}	V_{CE} = 2V, I_C = 0.5A	50	–	–	
		V_{CE} = 2V, I_C = 10A	30	–	120	
		V_{CE} = 2V, I_C = 25A	12	–	–	
Collector−Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10A, I_B = 1.0A	–	–	1.0	V
		I_C = 25A, I_B = 2.5A	–	–	1.8	V
Base−Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 10A, I_B = 1.0A	–	–	1.8	V
		I_C = 25A, I_B = 2.5A	–	–	2.5	V
Base−Emitter ON Voltage	$V_{BE(on)}$	I_C = 10A, V_{CE} = 2V	–	–	1.8	V
Dynamic Characteristics						
Current Gain−Bandwidth Product	f_T	V_{CE} = 10V, I_C = 1A, f = 10MHz, Note 3	40	–	–	MHz
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 0.1MHz	–	–	300	pF
Switching Characteristics						
Rise Time	t_r	V_{CC} = 80V, I_C = 10A, I_{B1} = 1A, $V_{BE(off)}$ = 6V	–	–	0.3	μs
Storage Time	t_s	V_{CC} = 80V, I_C = 10A, I_{B1} = I_{B2} =1A	–	–	1.0	μs
Fall Time	t_f		–	–	0.25	μs

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

Note 3. $f_T = |h_{fe}| \bullet f_{test}$.