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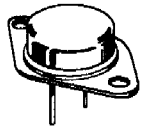
High-Voltage - High Power Transistors

. . . designed for use in high power audio amplifier applications and high voltage switching regulator circuits.

- High Collector Emitter Sustaining Voltage –
  $V_{CEO(sus)}$ = 140 Vdc
- High DC Current Gain – @ I_C = 8.0 Adc
  h_{FE} = 15 (Min)
- Low Collector–Emitter Saturation Voltage –
  $V_{CE(sat)}$ = 1.0 Vdc (Max) @ I_C = 10 Adc

NPN
2N5631
PNP
2N6031

16 AMPERE
POWER TRANSISTORS
COMPLEMENTARY
SILICON
140 VOLTS
200 WATTS



(TO–3)

MAXIMUM RATINGS (1)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	140	Vdc
Collector–Base Voltage	V_{CB}	140	Vdc
Emitter–Base Voltage	V_{EB}	7.0	Vdc
Collector Current – Continuous Peak	I_C	16 20	Adc
Base Current – Continuous	I_B	5.0	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	200 1.14	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +200	°C

THERMAL CHARACTERISTICS (1)

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	0.875	°C/W

(1) Indicates JEDEC Registered Data.

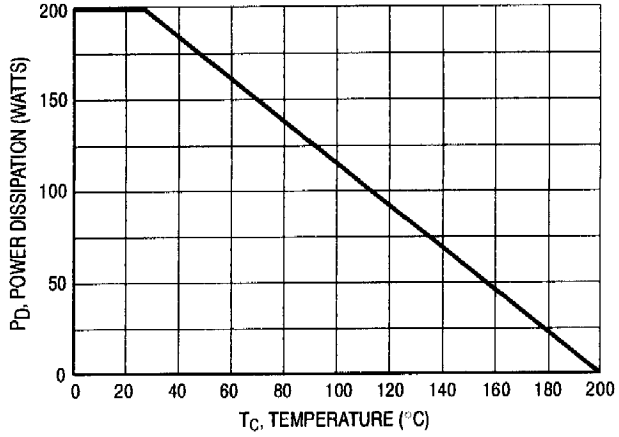


Figure 1. Power Derating

Safe Area Curves are indicated by Figure 5. All Limits are applicable and must be observed.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (2) (I_C = 200 mAdc, I_B = 0)	$V_{CEO(sus)}$	140	–	Vdc
Collector–Emitter Cutoff Current (V_{CE} = 70 Vdc, I_B = 0)	I_{CEO}	–	2.0	mAdc
Collector–Emitter Cutoff Current (V_{CE} = Rated V_{CB}, $V_{EB(off)}$ = 1.5 Vdc) (V_{CE} = Rated V_{CB}, $V_{EB(off)}$ = 1.5 Vdc, T_C = 150°C)	I_{CEX}	– –	2.0 7.0	mAdc
Collector–Base Cutoff Current (V_{CB} = Rated V_{CB}, I_E = 0)	I_{CBO}	–	2.0	mAdc
Emitter–Base Cutoff Current (V_{BE} = 7.0 Vdc, I_C = 0)	I_{EBO}	–	5.0	mAdc
ON CHARACTERISTICS (2)				
DC Current Gain (I_C = 8 Adc, V_{CE} = 2.0 Vdc) (I_C = 16 Adc, V_{CE} = 2.0 Vdc)	h_{FE}	15 4.0	60 –	–
Collector–Emitter Saturation Voltage (I_C = 10 Adc, I_B = 1.0 Adc) (I_C = 16 Adc, I_B = 4.0 Adc)	$V_{CE(sat)}$	– –	1.0 2.0	Vdc
Base–Emitter Saturation Voltage (I_C = 10 Adc, I_B = 1.0 Adc)	$V_{BE(sat)}$	–	1.8	Vdc
Base–Emitter On Voltage (I_C = 8.0 Adc, V_{CE} = 2.0 Vdc)	$V_{BE(on)}$	–	1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain – Bandwidth Product (3) (I_C = 1.0 Adc, V_{CE} = 20 Vdc, f_{test} = 0.5 MHz)	f_T	1.0	–	MHz
Output Capacitance 2N5631 (V_{CB} = 10 Vdc, I_E = 0, f = 0.1 MHz) 2N6031	C_{ob}	– –	500 1000	pF
Small–Signal Current Gain (I_C = 4.0 Adc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{fe}	15	–	–

*Indicates JEDEC Registered Data.

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≥ 2.0%.

(2) $f_T = |h_{fe}| \bullet f_{test}$