

2N3442

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (I _C = 200 mA _{dc} , I _B = 0)	V _{CEO(sus)}	140	–	V _{dc}
Collector Cutoff Current (V _{CE} = 140 V _{dc} , I _B = 0)	I _{CEO}	–	200	mA _{dc}
Collector Cutoff Current (V _{CE} = 140 V _{dc} , V _{BE(off)} = 1.5 V _{dc}) (V _{CE} = 140 V _{dc} , V _{BE(off)} = 1.5 V _{dc} , T _C = 150°C)	I _{CEX}	–	5.0 30	mA _{dc}
Emitter Cutoff Current (V _{BE} = 7.0 V _{dc} , I _C = 0)	I _{EBO}	–	5.0	mA _{dc}

ON CHARACTERISTICS (Note 3)

DC Current Gain (I _C = 3.0 A _{dc} , V _{CE} = 4.0 V _{dc}) (I _C = 10 A _{dc} , V _{CE} = 4.0 V _{dc})	h _{FE}	20 7.5	70 –	–
Collector–Emitter Saturation Voltage (I _C = 10 A _{dc} , I _B = 2.0 A _{dc})	V _{CE(sat)}	–	5.0	V _{dc}
Base–Emitter On Voltage (I _C = 10 A _{dc} , V _{CE} = 4.0 V _{dc})	V _{BE(on)}	–	5.7	V _{dc}

DYNAMIC CHARACTERISTICS

Current–Gain – Bandwidth Product (Note 4) (I _C = 2.0 A _{dc} , V _{CE} = 4.0 V _{dc} , f _{test} = 40 kHz)	f _T	80	–	kHz
Small–Signal Current Gain (I _C = 2.0 A _{dc} , V _{CE} = 4.0 V _{dc} , f = 1.0 kHz)	h _{fe}	12	72	–

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

4. f_T = |h_{fe}| • f_{test}

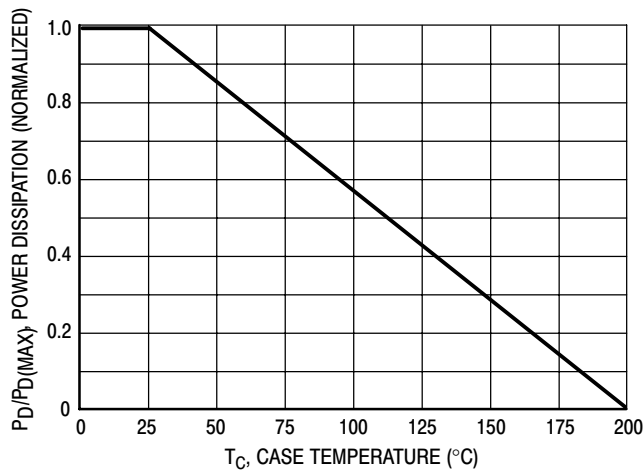


Figure 1. Power Derating

ACTIVE REGION SAFE OPERATING AREA INFORMATION

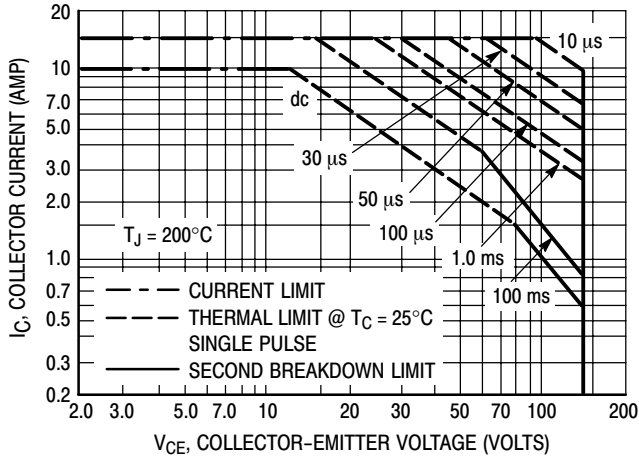


Figure 2. 2N3442

There are two limitations on the power-handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation, i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 2 is based on $T_{J(pk)} = 200^\circ\text{C}$; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

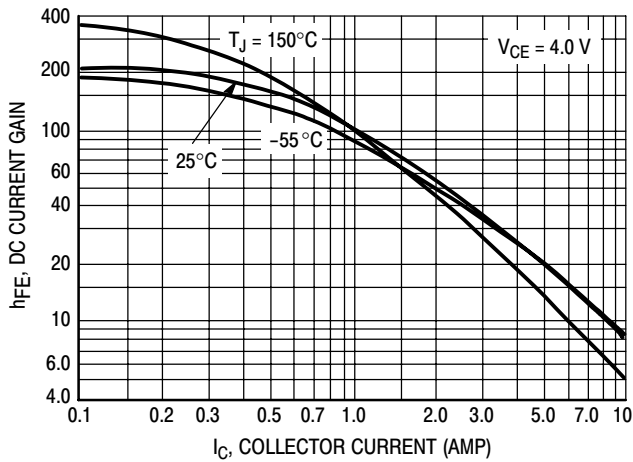


Figure 3. DC Current Gain

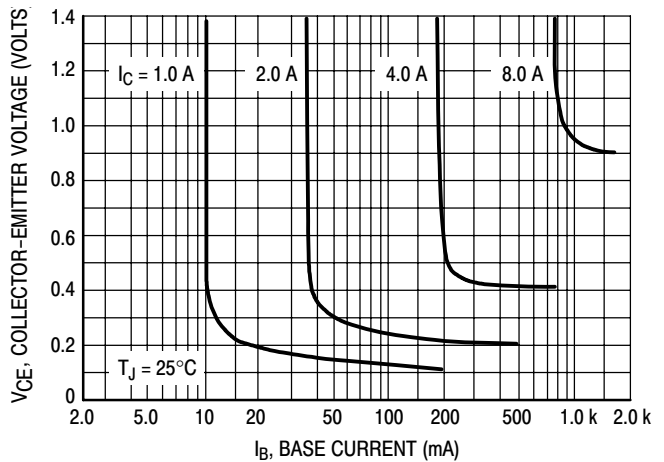


Figure 4. Collector-Saturation Region

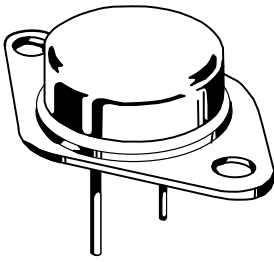
MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor

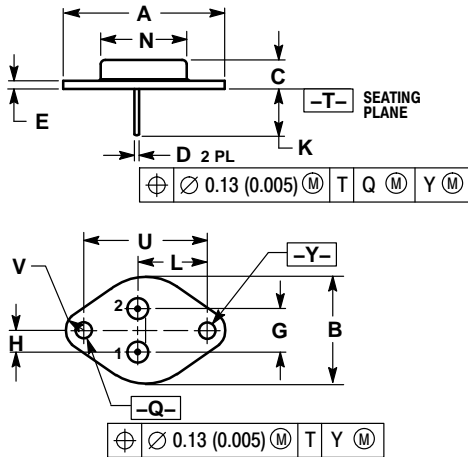


TO-204 (TO-3)
CASE 1-07
ISSUE Z

DATE 05/18/1988



SCALE 1:1



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.550 REF		39.37 REF	
B	---	1.050	---	26.67
C	0.250	0.335	6.35	8.51
D	0.038	0.043	0.97	1.09
E	0.055	0.070	1.40	1.77
G	0.430 BSC		10.92 BSC	
H	0.215 BSC		5.46 BSC	
K	0.440	0.480	11.18	12.19
L	0.665 BSC		16.89 BSC	
N	---	0.830	---	21.08
Q	0.151	0.165	3.84	4.19
U	1.187 BSC		30.15 BSC	
V	0.131	0.188	3.33	4.77

- | | | | | |
|--|--|---|---|---|
| <p>STYLE 1:
PIN 1. BASE
2. EMITTER
CASE: COLLECTOR</p> | <p>STYLE 2:
PIN 1. BASE
2. COLLECTOR
CASE: EMITTER</p> | <p>STYLE 3:
PIN 1. GATE
2. SOURCE
CASE: DRAIN</p> | <p>STYLE 4:
PIN 1. GROUND
2. INPUT
CASE: OUTPUT</p> | <p>STYLE 5:
PIN 1. CATHODE
2. EXTERNAL TRIP/DELAY
CASE: ANODE</p> |
| <p>STYLE 6:
PIN 1. GATE
2. EMITTER
CASE: COLLECTOR</p> | <p>STYLE 7:
PIN 1. ANODE
2. OPEN
CASE: CATHODE</p> | <p>STYLE 8:
PIN 1. CATHODE #1
2. CATHODE #2
CASE: ANODE</p> | <p>STYLE 9:
PIN 1. ANODE #1
2. ANODE #2
CASE: CATHODE</p> | |

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