ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted) (Note 3)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage (Note 4) (I_C = 200 mAdc, I_B = 0)		$V_{CEO(sus)}$	90	−	Vdc
Collector Cutoff Current (V_{CE} = 140 Vdc, $V_{BE(off)}$ = 1.5 V) (V_{CE} = 100 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 150°C)		I_{CEX}	− −	50 10	mAdc
Emitter Cutoff Current (V_{EB} = 5 Vdc, I_C = 0) (V_{EB} = 7 Vdc, I_C = 0)		I_{EBO}	− −	5 50	mAdc
ON CHARACTERISTICS (Note 4)					
DC Current Gain (I_C = 12 Adc, V_{CE} = 5 Vdc)		h_{FE}	20	100	−
Collector−Emitter Saturation Voltage (I_C = 20 Adc, I_B = 5 Adc)		$V_{CE(sat)}$	−	2.5	Vdc
Base−Emitter Saturation Voltage (I_C = 20 Adc, I_B = 5 Adc)		$V_{BE(sat)}$	−	3.3	Vdc
DYNAMIC CHARACTERISTICS					
Magnitude of Common−Emitter Small−Signal Short−Circuit Forward Current Transfer Ratio (I_C = 2 Adc, V_{CE} = 10 Vdc, f = 5 MHz)		$\|h_{fe}\|$	12	−	−
SWITCHING CHARACTERISTICS					
RESISTIVE LOAD					
Rise Time	(V_{CC} = 30 Vdc)	t_r	−	0.5	μs
Storage Time	(I_C = 12 Adc, I_{B1} = I_{B2} = 1.2 Adc)	t_s	−	1.5	μs

3. Indicates JEDEC Registered Data.
4. Pulse Test: Pulse Width ≤ 300, μs, Duty Cycle ≤ 2%.

ORDERING INFORMATION

Device	Package	Shipping
2N5038	TO−204	100 Units / Tray
2N5038G	TO−204 (Pb−Free)	

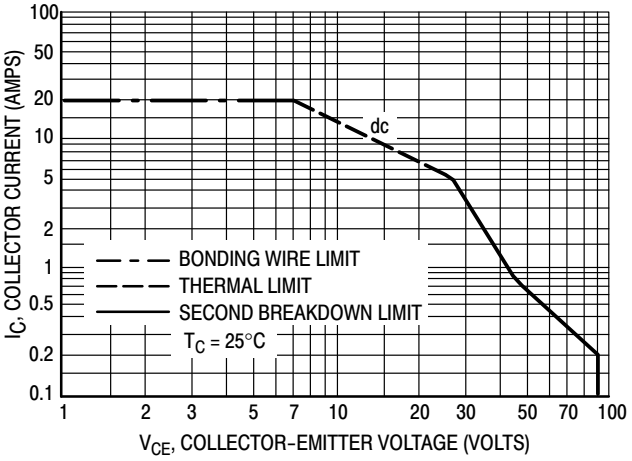
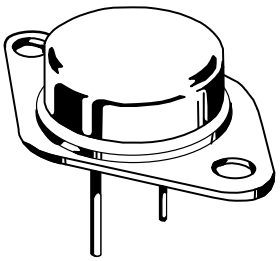


Figure 2. Forward Bias Safe Operating Area

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.

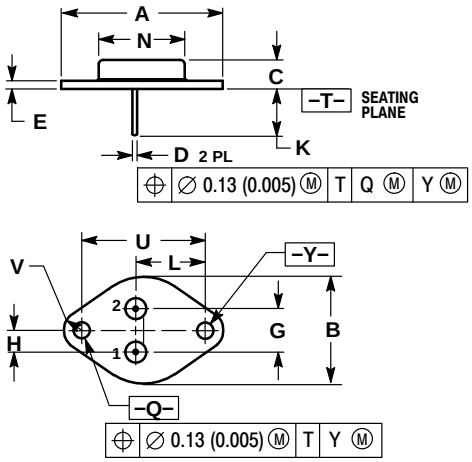
Second breakdown pulse limits are valid for duty cycles to 10%. At high case temperatures, thermal limitations may reduce the power that can be handled to values less than the limitations imposed by second breakdown.



SCALE 1:1

TO−204 (TO−3)
CASE 1−07
ISSUE Z

DATE 05/18/1988



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.

	INCHES		MILLIMETERS	
DIM	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

STYLE 1:
PIN 1. BASE
2. EMITTER
CASE: COLLECTOR

STYLE 2:
PIN 1. BASE
2. COLLECTOR
CASE: EMITTER

STYLE 3:
PIN 1. GATE
2. SOURCE
CASE: DRAIN

STYLE 4:
PIN 1. GROUND
2. INPUT
CASE: OUTPUT

STYLE 5:
PIN 1. CATHODE
2. EXTERNAL TRIP/DELAY
CASE: ANODE

STYLE 6:
PIN 1. GATE
2. EMITTER
CASE: COLLECTOR

STYLE 7:
PIN 1. ANODE
2. OPEN
CASE: CATHODE

STYLE 8:
PIN 1. CATHODE #1
2. CATHODE #2
CASE: ANODE

STYLE 9:
PIN 1. ANODE #1
2. ANODE #2
CASE: CATHODE

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