



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# 2N3442

## High-Power Industrial Transistors

NPN silicon power transistor designed for applications in industrial and commercial equipment including high fidelity audio amplifiers, series and shunt regulators and power switches.

### Features

- Collector–Emitter Sustaining Voltage –  $V_{CEO(sus)} = 140$  Vdc (Min)
- Excellent Second Breakdown Capability
- Pb–Free Package is Available\*

### MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	140	Vdc
Collector–Base Voltage	$V_{CB}$	160	Vdc
Emitter–Base Voltage	$V_{EB}$	7.0	Vdc
Collector Current – Continuous – Peak	$I_C$	10 15	Adc
Base Current – Continuous – Peak	$I_B$	7.0 –	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ (Note 2)	$P_D$	117 0.67	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	–65 to +200	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	1.17	$^\circ\text{C/W}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

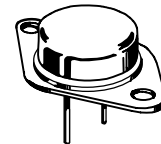
1. Indicates JEDEC Registered Data.
2. This data guaranteed in addition to JEDEC registered data.



ON Semiconductor®

<http://onsemi.com>

**10 AMPERE  
POWER TRANSISTOR  
NPN SILICON  
140 VOLTS – 117 WATTS**



TO-204AA (TO-3)  
CASE 1-07  
STYLE 1

### MARKING DIAGRAM



2N3442 = Device Code  
G = Pb–Free Package  
A = Assembly Location  
Y = Year  
WW = Work Week  
MEX = Country of Origin

### ORDERING INFORMATION

Device	Package	Shipping
2N3442	TO-204	100 Units / Tray
2N3442G	TO-204 (Pb–Free)	100 Units / Tray

\*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# 2N3442

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage ( $I_C = 200\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	140	–	Vdc
Collector Cutoff Current ( $V_{CE} = 140\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	–	200	mA
Collector Cutoff Current ( $V_{CE} = 140\text{ Vdc}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 140\text{ Vdc}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ )	$I_{CEX}$	–	5.0 30	mA
Emitter Cutoff Current ( $V_{BE} = 7.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	5.0	mA

## ON CHARACTERISTICS (Note 3)

DC Current Gain ( $I_C = 3.0\text{ A}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 10\text{ A}$ , $V_{CE} = 4.0\text{ Vdc}$ )	$h_{FE}$	20 7.5	70 –	–
Collector–Emitter Saturation Voltage ( $I_C = 10\text{ A}$ , $I_B = 2.0\text{ A}$ )	$V_{CE(sat)}$	–	5.0	Vdc
Base–Emitter On Voltage ( $I_C = 10\text{ A}$ , $V_{CE} = 4.0\text{ Vdc}$ )	$V_{BE(on)}$	–	5.7	Vdc

## DYNAMIC CHARACTERISTICS

Current–Gain – Bandwidth Product (Note 4) ( $I_C = 2.0\text{ A}$ , $V_{CE} = 4.0\text{ Vdc}$ , $f_{test} = 40\text{ kHz}$ )	$f_T$	80	–	kHz
Small–Signal Current Gain ( $I_C = 2.0\text{ A}$ , $V_{CE} = 4.0\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	12	72	–

3. Pulse Test: Pulse Width =  $300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

4.  $f_T = |h_{fe}| \cdot f_{test}$

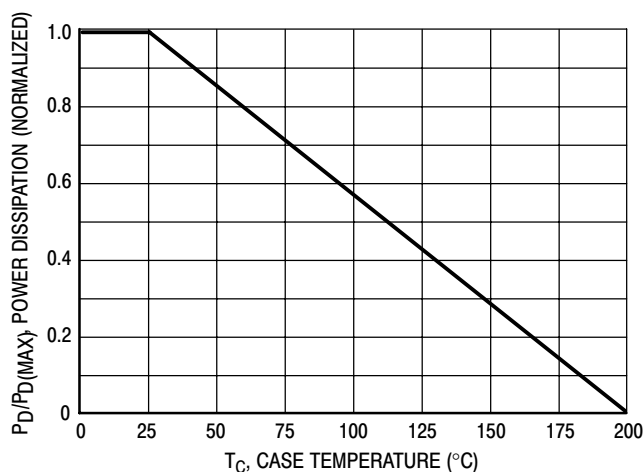


Figure 1. Power Derating

ACTIVE REGION SAFE OPERATING AREA INFORMATION

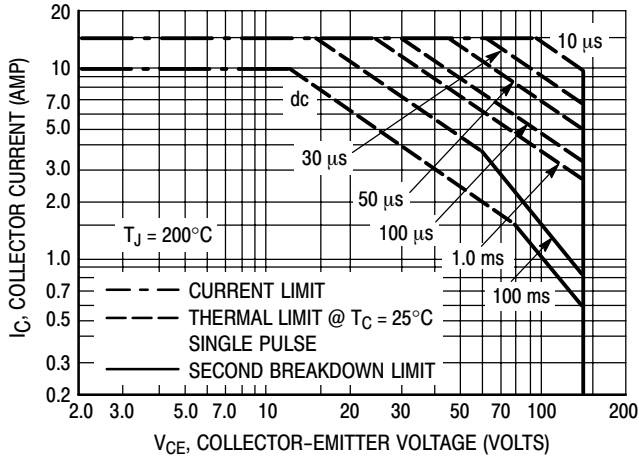


Figure 2. 2N3442

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.

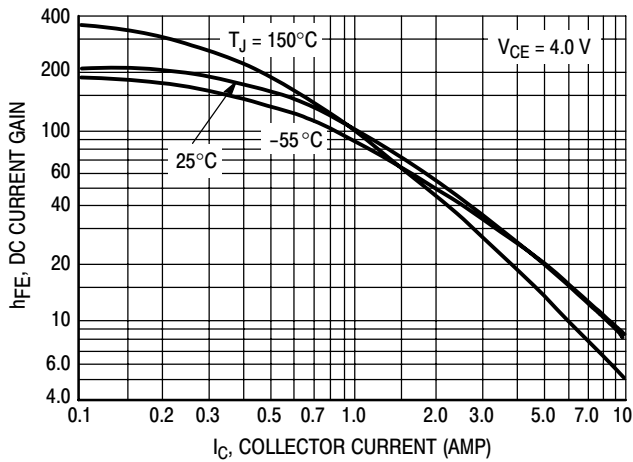


Figure 3. DC Current Gain

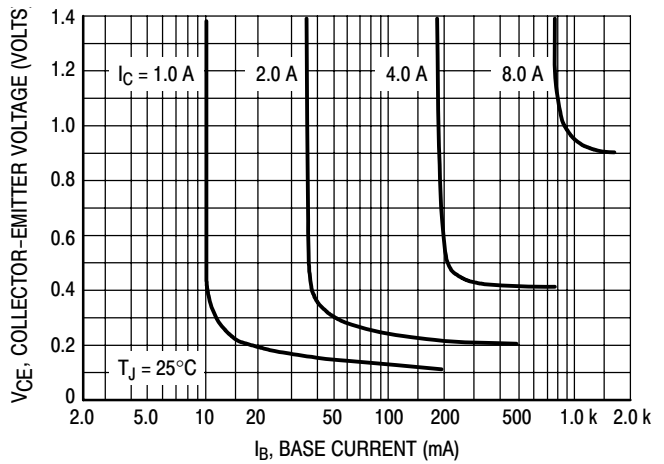


Figure 4. Collector-Saturation Region

