

# 2N3771, 2N3772

2N3771 is a Preferred Device

## High Power NPN Silicon Power Transistors

These devices are designed for linear amplifiers, series pass regulators, and inductive switching applications.

### Features

- Forward Biased Second Breakdown Current Capability  
 $I_{S/b} = 3.75 \text{ Adc @ } V_{CE} = 40 \text{ Vdc} - 2N3771$   
 $= 2.5 \text{ Adc @ } V_{CE} = 60 \text{ Vdc} - 2N3772$
- Pb-Free Packages are Available\*

### MAXIMUM RATINGS (Note 1)

Rating	Symbol	2N3771	2N3772	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	60	Vdc
Collector-Emitter Voltage	$V_{CEX}$	50	80	Vdc
Collector-Base Voltage	$V_{CB}$	50	100	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0	7.0	Vdc
Collector Current – Continuous Peak	$I_C$	30 30	20 30	Adc
Base Current – Continuous Peak	$I_B$	7.5 15	5.0 15	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	150 0.855		W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$\theta_{JC}$	1.17	$^\circ\text{C/W}$

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.

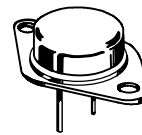
1. Indicates JEDEC registered data.



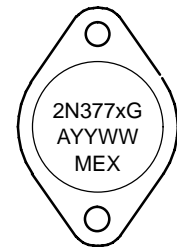
**ON Semiconductor®**

## 20 and 30 AMPERE POWER TRANSISTORS NPN SILICON 40 and 60 VOLTS, 150 WATTS

### MARKING DIAGRAM



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



2N377x = Device Code  
 x = 1 or 2  
 G = Pb-Free Package  
 A = Assembly Location  
 YY = Year  
 WW = Work Week  
 MEX = Country of Origin

### ORDERING INFORMATION

Device	Package	Shipping
2N3771	TO-204	100 Units / Tray
2N3771G	TO-204 (Pb-Free)	100 Units / Tray
2N3772	TO-204	100 Units / Tray
2N3772G	TO-204 (Pb-Free)	100 Units / Tray

**Preferred** devices are recommended choices for future use and best overall value.

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

## 2N3771, 2N3772

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

Characteristic		Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Sustaining Voltage (Note 2 and 3) ( $I_C = 0.2\text{ Adc}$ , $I_B = 0$ )	2N3771 2N3772	$V_{CEO(sus)}$	40 60	– –	Vdc
Collector–Emitter Sustaining Voltage ( $I_C = 0.2\text{ Adc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $R_{BE} = 100\ \Omega$ )	2N3771 2N3772	$V_{CEX(sus)}$	50 80	– –	Vdc
Collector–Emitter Sustaining Voltage ( $I_C = 0.2\text{ Adc}$ , $R_{BE} = 100\ \Omega$ )	2N3771 2N3772	$V_{CER(sus)}$	45 70	– –	Vdc
Collector Cutoff Current (Note 2) ( $V_{CE} = 30\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 50\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 25\text{ Vdc}$ , $I_B = 0$ )	2N3771 2N3772	$I_{CEO}$	– –	10 10	mAdc
Collector Cutoff Current (Note 2) ( $V_{CE} = 50\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 100\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 45\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 30\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ )  ( $V_{CE} = 45\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ )	2N3771 2N3772 2N6257 2N3771 2N3772	$I_{CEV}$	– – – – –	2.0 5.0 4.0 10 10	mAdc
Collector Cutoff Current (Note 2) ( $V_{CB} = 50\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ )	2N3771 2N3772	$I_{CBO}$	– –	2.0 5.0	mAdc
Emitter Cutoff Current (Note 2) ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ ) ( $V_{BE} = 7.0\text{ Vdc}$ , $I_C = 0$ )	2N3771 2N3772	$I_{EBO}$	– –	5.0 5.0	mAdc
<b>ON CHARACTERISTICS (Note 2)</b>					
DC Current Gain (Note 3) ( $I_C = 15\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 10\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 8.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 30\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 20\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )	2N3771 2N3772 2N3771 2N3772	$h_{FE}$	15 15 5.0 5.0	60 60 – –	–
Collector–Emitter Saturation Voltage ( $I_C = 15\text{ Adc}$ , $I_B = 1.5\text{ Adc}$ ) ( $I_C = 10\text{ Adc}$ , $I_B = 1.0\text{ Adc}$ ) ( $I_C = 30\text{ Adc}$ , $I_B = 6.0\text{ Adc}$ ) ( $I_C = 20\text{ Adc}$ , $I_B = 4.0\text{ Adc}$ )	2N3771 2N3772 2N3771 2N3772	$V_{CE(sat)}$	– – – –	2.0 1.4 4.0 4.0	Vdc
Base–Emitter On Voltage ( $I_C = 15\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 10\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 8.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )	2N3771 2N3772	$V_{BE(on)}$	– –	2.7 2.2	Vdc
<b>*DYNAMIC CHARACTERISTICS (Note 2)</b>					
Current–Gain — Bandwidth Product ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ , $f_{test} = 50\text{ kHz}$ )		$f_T$	0.2	–	MHz
Small–Signal Current Gain ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )		$h_{fe}$	40	–	–
<b>SECOND BREAKDOWN</b>					
Second Breakdown Energy with Base Forward Biased, $t = 1.0\text{ s}$ (non–repetitive) ( $V_{CE} = 40\text{ Vdc}$ ) ( $V_{CE} = 60\text{ Vdc}$ )	2N3771 2N3772	$I_{S/b}$	3.75 2.5	– –	Adc

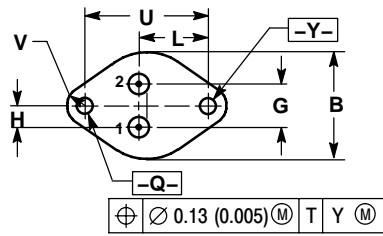
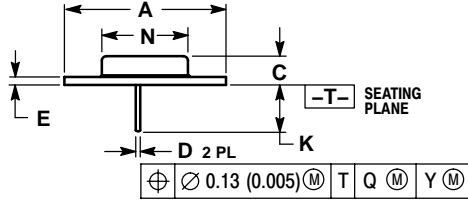
2. Indicates JEDEC registered data.

3. Pulse Test: 300  $\mu\text{s}$ , Rep. Rate 60 cps.

# 2N3771, 2N3772

## PACKAGE DIMENSIONS

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



- 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

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