

# NPN 2N3773\*, PNP 2N6609

Preferred Device

## Complementary Silicon Power Transistors

The 2N3773 and 2N6609 are PowerBase™ power transistors designed for high power audio, disk head positioners and other linear applications. These devices can also be used in power switching circuits such as relay or solenoid drivers, DC-DC converters or inverters.

### Features

- Pb-Free Packages are Available\*\*
- High Safe Operating Area (100% Tested) 150 W @ 100 V
- Completely Characterized for Linear Operation
- High DC Current Gain and Low Saturation Voltage  
 $h_{FE} = 15$  (Min) @ 8.0 A, 4.0 V  
 $V_{CE(sat)} = 1.4$  V (Max) @  $I_C = 8.0$  A,  $I_B = 0.8$  A
- For Low Distortion Complementary Designs

### MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	$V_{CEO}$	140	Vdc
Collector - Emitter Voltage	$V_{CEX}$	160	Vdc
Collector - Base Voltage	$V_{CBO}$	160	Vdc
Emitter - Base Voltage	$V_{EBO}$	7	Vdc
Collector Current - Continuous - Peak (Note 2)	$I_C$	16 30	Adc
Base Current - Continuous - Peak (Note 2)	$I_B$	4 15	Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ 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	$^\circ\text{C}$

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. Pulse Test: Pulse Width = 5 ms, Duty Cycle  $\leq 10\%$ .

### THERMAL CHARACTERISTICS

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

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

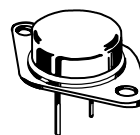


ON Semiconductor®

<http://onsemi.com>

## 16 A COMPLEMENTARY POWER TRANSISTORS 140 V, 150 W

### MARKING DIAGRAM



TO-204  
CASE 1-07



xxxx = 3773 or 6609  
A = Assembly Location  
YY = Year  
WW = Work Week

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

# NPN 2N3773\*, PNP 2N6609

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b> (Note 3)				
Collector–Emitter Breakdown Voltage (Note 4) (I <sub>C</sub> = 0.2 Adc, I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	140	–	Vdc
Collector–Emitter Sustaining Voltage (Note 4) (I <sub>C</sub> = 0.1 Adc, V <sub>BE(off)</sub> = 1.5 Vdc, R <sub>BE</sub> = 100 Ohms)	V <sub>CEX(sus)</sub>	160	–	Vdc
Collector–Emitter Sustaining Voltage (I <sub>C</sub> = 0.2 Adc, R <sub>BE</sub> = 100 Ohms)	V <sub>CER(sus)</sub>	150	–	Vdc
Collector Cutoff Current (Note 4) (V <sub>CE</sub> = 120 Vdc, I <sub>B</sub> = 0)	I <sub>CEO</sub>	–	10	mAdc
Collector Cutoff Current (Note 4) (V <sub>CE</sub> = 140 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc) (V <sub>CE</sub> = 140 Vdc, V <sub>BE(off)</sub> = 1.5 Vdc, T <sub>C</sub> = 150°C)	I <sub>CEX</sub>	– –	2 10	mAdc
Collector Cutoff Current (V <sub>CB</sub> = 140 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	–	2	mAdc
Emitter Cutoff Current (Note 4) (V <sub>BE</sub> = 7 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	–	5	mAdc

## ON CHARACTERISTICS (Note 3)

DC Current Gain (I <sub>C</sub> = 8 Adc, V <sub>CE</sub> = 4 Vdc) (Note 4) (I <sub>C</sub> = 16 Adc, V <sub>CE</sub> = 4 Vdc)	h <sub>FE</sub>	15 5	60 –	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 8 Adc, I <sub>B</sub> = 800 mAdc) (Note 4) (I <sub>C</sub> = 16 Adc, I <sub>B</sub> = 3.2 Adc)	V <sub>CE(sat)</sub>	– –	1.4 4	Vdc
Base–Emitter On Voltage (Note 4) (I <sub>C</sub> = 8 Adc, V <sub>CE</sub> = 4 Vdc)	V <sub>BE(on)</sub>	–	2.2	Vdc

## DYNAMIC CHARACTERISTICS

Magnitude of Common–Emitter Small–Signal, Short–Circuit, Forward Current Transfer Ratio (I <sub>C</sub> = 1 A, f = 50 kHz)	h <sub>fe</sub>	4	–	–
Small–Signal Current Gain (Note 4) (I <sub>C</sub> = 1 Adc, V <sub>CE</sub> = 4 Vdc, f = 1 kHz)	h <sub>fe</sub>	40	–	–

## SECOND BREAKDOWN CHARACTERISTICS

Second Breakdown Collector Current with Base Forward Biased t = 1 s (non–repetitive), V <sub>CE</sub> = 100 V, See Figure 12	I <sub>S/b</sub>	1.5	–	Adc
---	------------------	-----	---	-----

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2%.

4. Indicates JEDEC Registered Data.

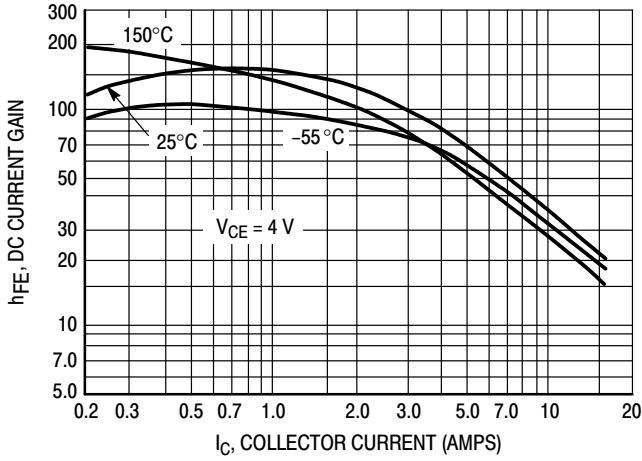
## ORDERING INFORMATION

Device	Package	Shipping†
2N3773	TO–204	100 Unit / Tray
2N3773G	TO–204 (Pb–Free)	100 Unit / Tray
2N6609	TO–204	100 Unit / Tray

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

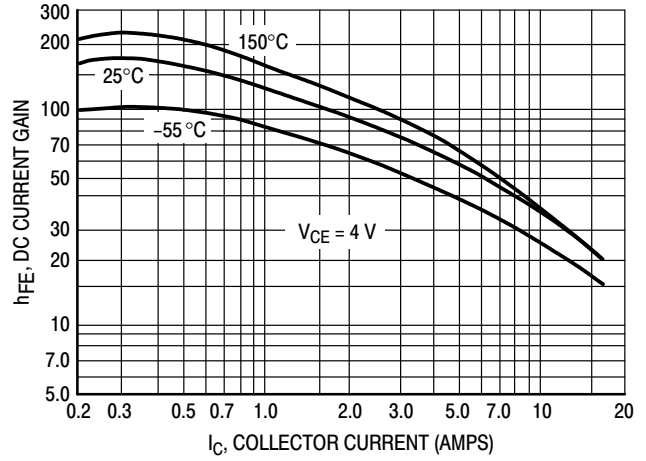
# NPN 2N3773\*, PNP 2N6609

## NPN

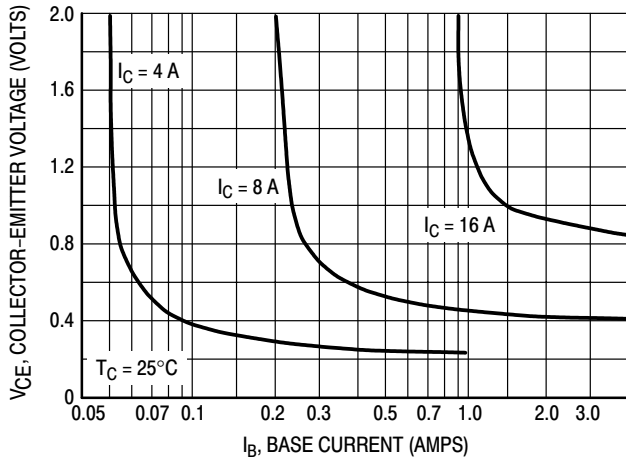


**Figure 1. DC Current Gain**

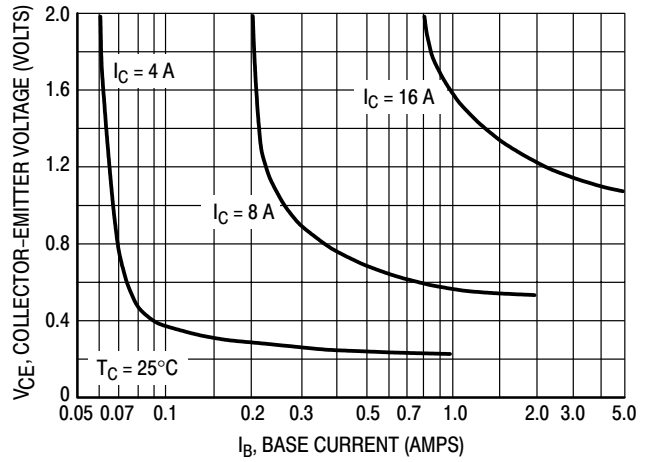
## PNP



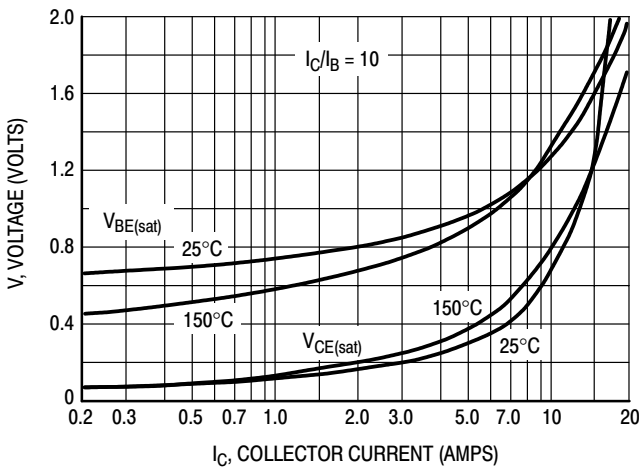
**Figure 2. DC Current Gain**



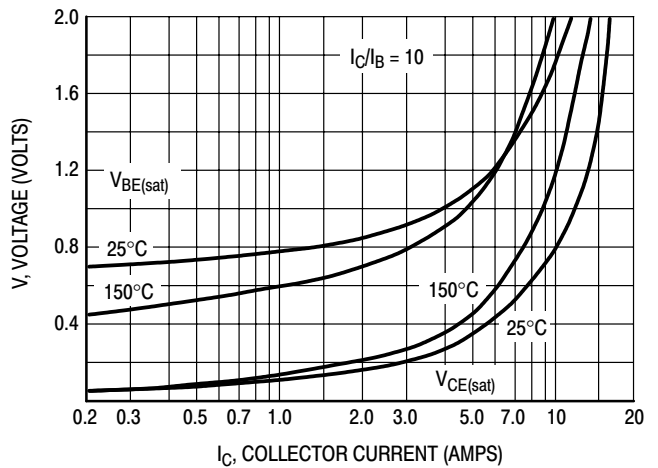
**Figure 3. Collector Saturation Region**



**Figure 4. Collector Saturation Region**

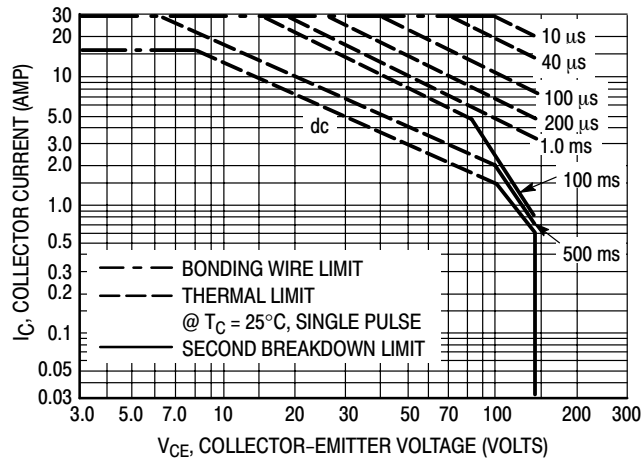


**Figure 5. "On" Voltage**



**Figure 6. "On" Voltage**

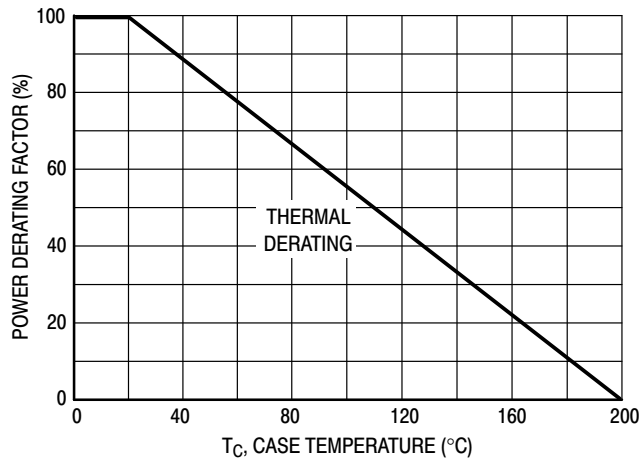
## NPN 2N3773\*, PNP 2N6609



**Figure 7. 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.

The data of Figure 7 is based on  $T_{J(pk)} = 200^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} < 200^\circ\text{C}$ . At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

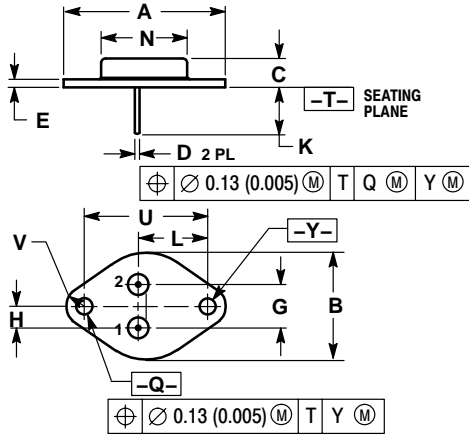


**Figure 8. Power Derating**

# NPN 2N3773\*, PNP 2N6609

## 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:

1. BASE
  2. EMITTER
- CASE: COLLECTOR

# NPN 2N3773\*, PNP 2N6609

PowerBase is a registered trademark of Semiconductor Components Industries, LLC (SCILLC).

**ON Semiconductor** and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA  
**Phone:** 480-829-7710 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 480-829-7709 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada

**Japan:** ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
**Phone:** 81-3-5773-3850

**ON Semiconductor Website:** <http://onsemi.com>

**Order Literature:** <http://www.onsemi.com/litorder>

For additional information, please contact your  
local Sales Representative.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: [org@lifeelectronics.ru](mailto:org@lifeelectronics.ru)