

NJW0281G (NPN) NJW0302G (PNP)

Complementary NPN-PNP Power Bipolar Transistors

These complementary devices are lower power versions of the popular NJW3281G and NJW1302G audio output transistors. With superior gain linearity and safe operating area performance, these transistors are ideal for high fidelity audio amplifier output stages and other linear applications.

Features

- Exceptional Safe Operating Area
- NPN/PNP Gain Matching within 10% from 50 mA to 3 A
- Excellent Gain Linearity
- High BVCEO
- High Frequency
- These Devices are Pb-Free and are RoHS Compliant

Benefits

- Reliable Performance at Higher Powers
- Symmetrical Characteristics in Complementary Configurations
- Accurate Reproduction of Input Signal
- Greater Dynamic Range
- High Amplifier Bandwidth

Applications

- High-End Consumer Audio Products
 - ◆ Home Amplifiers
 - ◆ Home Receivers
- Professional Audio Amplifiers
 - ◆ Theater and Stadium Sound Systems
 - ◆ Public Address Systems (PAs)

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|--------------|------------------|
| Collector-Emitter Voltage | V_{CEO} | 250 | Vdc |
| Collector-Base Voltage | V_{CBO} | 250 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 5.0 | Vdc |
| Collector-Emitter Voltage - 1.5 V | V_{CEX} | 250 | Vdc |
| Collector Current - Continuous | I_C | 15 | Adc |
| Collector Current - Peak (Note 1) | I_{CM} | 30 | Adc |
| Base Current - Continuous | I_B | 1.5 | Adc |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ | P_D | 150 | Watts |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | - 65 to +150 | $^\circ\text{C}$ |

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.

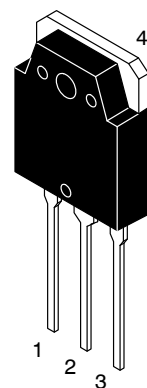
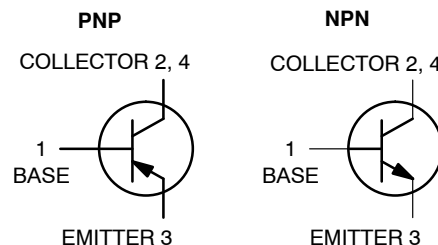
1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle < 10%.



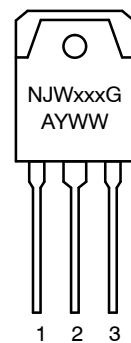
ON Semiconductor®

<http://onsemi.com>

15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 250 VOLTS, 150 WATTS



MARKING DIAGRAM



**TO-3P
CASE 340AB
STYLES 1,2,3**

xxxx = 0281 or 0302
G = Pb-Free Package
A = Assembly Location
Y = Year
WW = Work Week

ORDERING INFORMATION

| Device | Package | Shipping |
|----------|--------------------|---------------|
| NJW0281G | TO-3P (Pb-Free) | 30 Units/Rail |
| NJW0302G | TO-3P (Pb-Free) | 30 Units/Rail |

NJW0281G (NPN) NJW0302G (PNP)

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--------------------------------------|-----------------|-------|---------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 0.83 | $^{\circ}C/W$ |

Electrical Characteristics ($T_C = 25^{\circ}C$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | |
|--|---------------|-----|-----|---------|
| Collector-Emitter Sustaining Voltage ($I_C = 30\text{ mA}$, $I_B = 0$) | $V_{CE(sus)}$ | 250 | – | V |
| Collector Cutoff Current ($V_{CB} = 250\text{ V}$, $I_E = 0$) | I_{CBO} | – | 10 | μA |
| Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$) | I_{EBO} | – | 5.0 | μA |

ON CHARACTERISTICS

| | | | | |
|---|---------------|----------------|-------------------|---|
| DC Current Gain ($I_C = 0.5\text{ A}$, $V_{CE} = 5.0\text{ V}$) ($I_C = 1.0\text{ A}$, $V_{CE} = 5.0\text{ V}$) ($I_C = 3.0\text{ A}$, $V_{CE} = 5.0\text{ V}$) | h_{FE} | 75 75 75 | 150 150 150 | – |
| Collector-Emitter Saturation Voltage ($I_C = 5.0\text{ A}$, $I_B = 0.5\text{ A}$) | $V_{CE(sat)}$ | – | 1.0 | V |
| Base-Emitter On Voltage ($I_C = 5.0\text{ A}$, $V_{CE} = 5.0\text{ V}$) | $V_{BE(on)}$ | – | 1.2 | V |

DYNAMIC CHARACTERISTICS

| | | | | |
|--|----------|----|-----|-----|
| Current-Gain – Bandwidth Product ($I_C = 1.0\text{ A}$, $V_{CE} = 5.0\text{ V}$, $f_{test} = 1.0\text{ MHz}$) | f_T | 30 | – | MHz |
| Output Capacitance ($V_{CB} = 10\text{ V}$, $I_E = 0$, $f_{test} = 1.0\text{ MHz}$) | C_{ob} | – | 400 | pF |

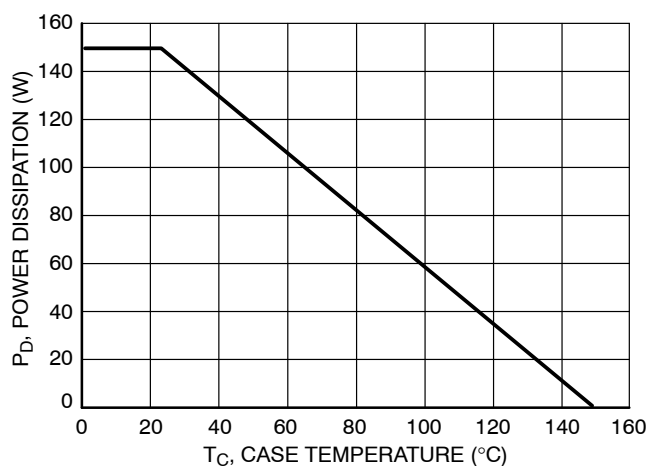


Figure 1. Power Derating

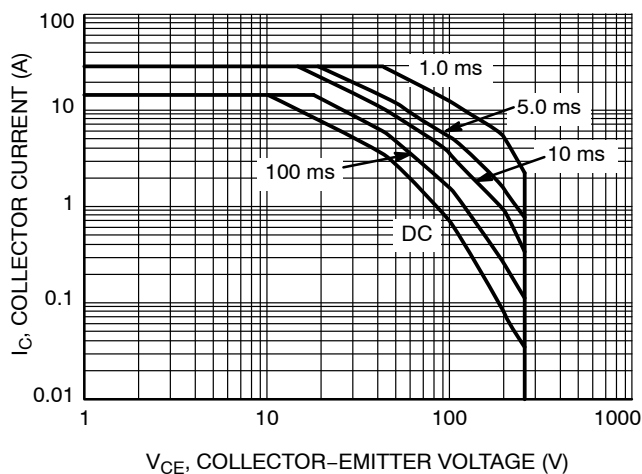


Figure 2. Safe Operating Area

NJW0281G (NPN) NJW0302G (PNP)



Figure 3. NJW0281G DC Current Gain



Figure 4. NJW0302G DC Current Gain



Figure 5. NJW0281G Base-Emitter Voltage



Figure 6. NJW0302G Base-Emitter Voltage

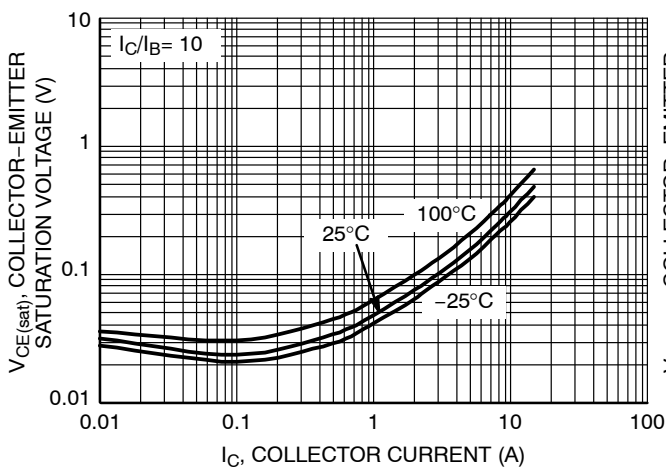


Figure 7. NJW0281G Saturation Voltage

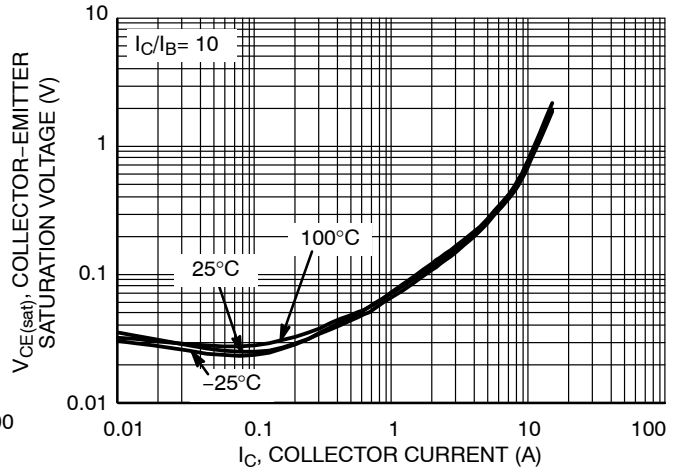


Figure 8. NJW0302G Saturation Voltage

NJW0281G (NPN) NJW0302G (PNP)

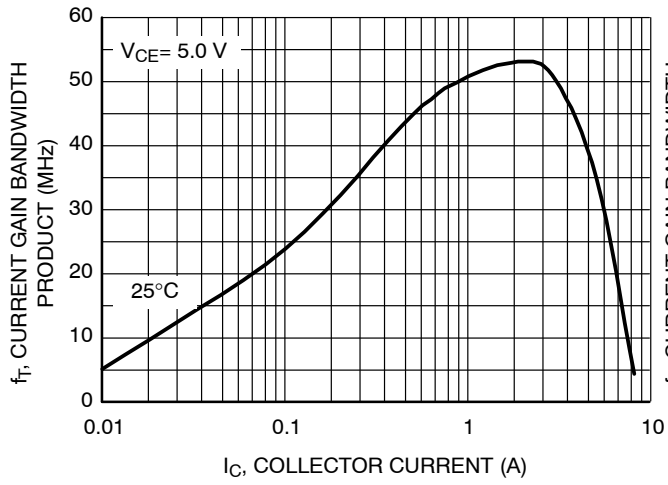


Figure 9. NJW0281G Current Gain Bandwidth Product

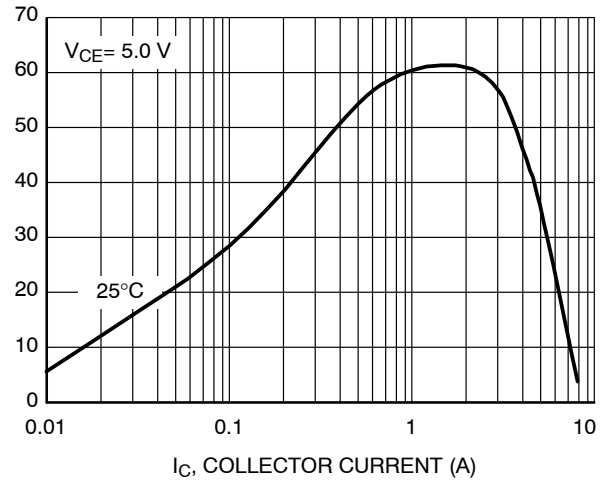
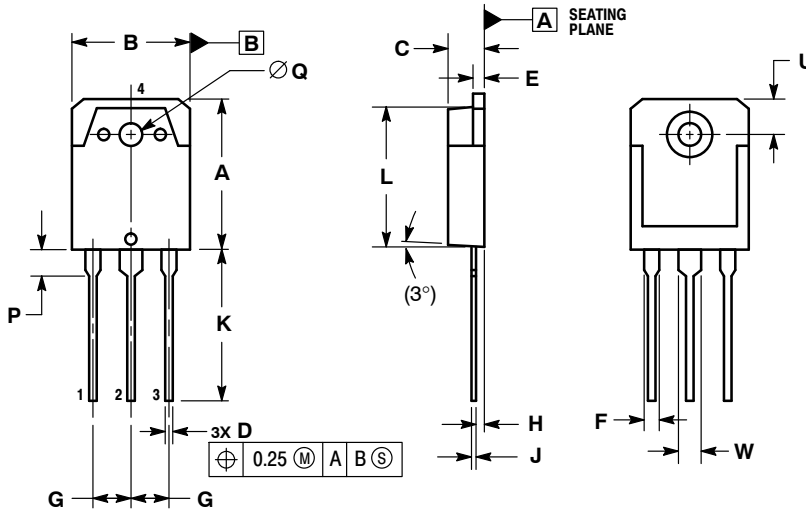


Figure 10. NJW0302G Current Gain Bandwidth Product

NJW0281G (NPN) NJW0302G (PNP)

PACKAGE DIMENSIONS

TO-3P-3LD
CASE 340AB-01
ISSUE A



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM THE TERMINAL TIP.
4. DIMENSION A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| DIM | MILLIMETERS | | |
|-----|-------------|-------|-------|
| | MIN | NOM | MAX |
| A | 19.70 | 19.90 | 20.10 |
| B | 15.40 | 15.60 | 15.80 |
| C | 4.60 | 4.80 | 5.00 |
| D | 0.80 | 1.00 | 1.20 |
| E | 1.45 | 1.50 | 1.65 |
| F | 1.80 | 2.00 | 2.20 |
| G | 5.45 BSC | | |
| H | 1.20 | 1.40 | 1.60 |
| J | 0.55 | 0.60 | 0.75 |
| K | 19.80 | 20.00 | 20.20 |
| L | 18.50 | 18.70 | 18.90 |
| P | 3.30 | 3.50 | 3.70 |
| Q | 3.10 | 3.20 | 3.50 |
| U | 5.00 REF | | |
| W | 2.80 | 3.00 | 3.20 |

STYLE 1:

- PIN 1. BASE
- COLLECTOR
- EMITTER
- COLLECTOR

STYLE 2:

- PIN 1. ANODE
- CATHODE
- ANODE
- CATHODE

STYLE 3:

- PIN 1. GATE
- DRAIN
- SOURCE
- DRAIN

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. 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 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative