

Complementary NPN-PNP Power Bipolar Transistors

NJW0281G (NPN), NJW0302G (PNP)

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)

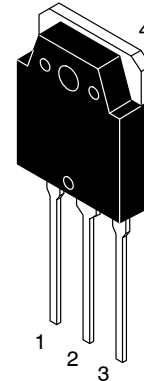
MAXIMUM RATINGS

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

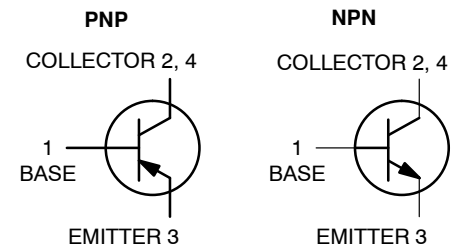
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

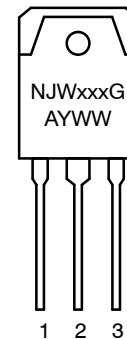
15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 250 VOLTS, 150 WATTS



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



MARKING DIAGRAM



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

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

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

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

OFF CHARACTERISTICS

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

ON CHARACTERISTICS

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

DYNAMIC CHARACTERISTICS

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

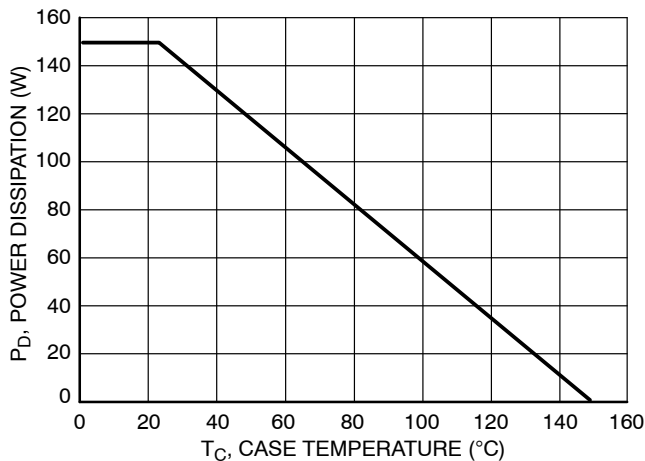


Figure 1. Power Derating

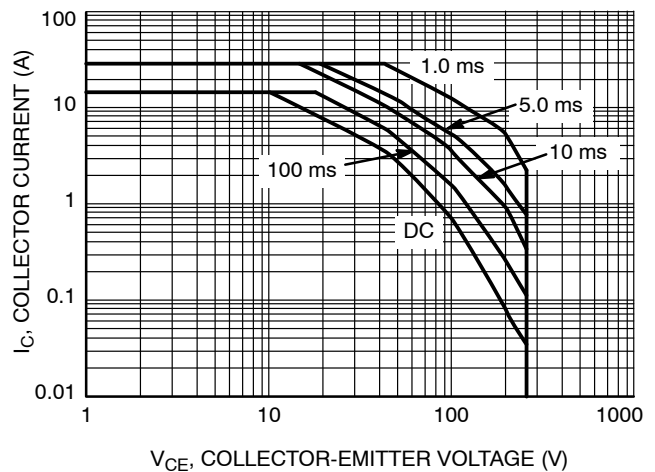


Figure 2. Safe Operating Area

NJW0281G (NPN), NJW0302G (PNP)

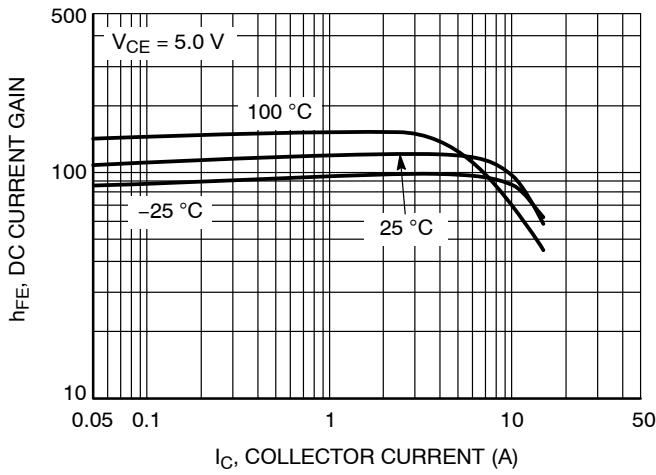


Figure 3. NJW0281G DC Current Gain

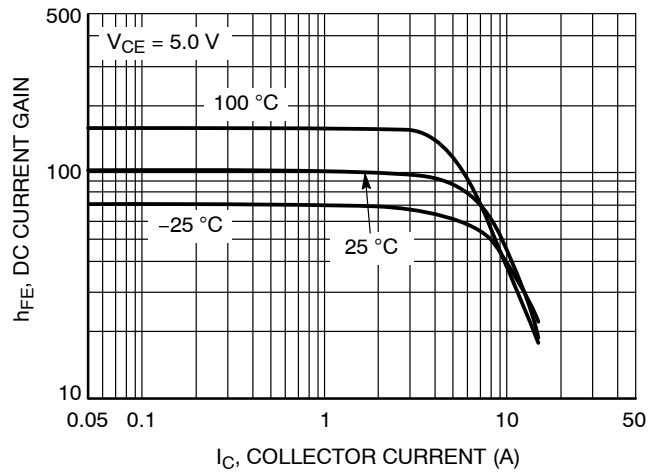


Figure 4. NJW0302G DC Current Gain

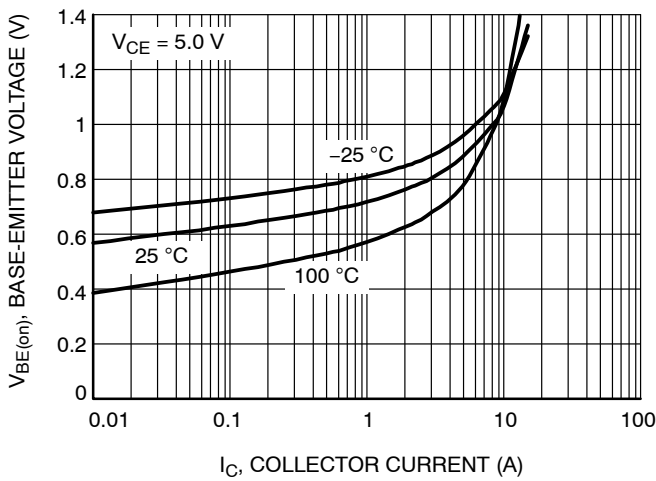


Figure 5. NJW0281G Base-Emitter Voltage

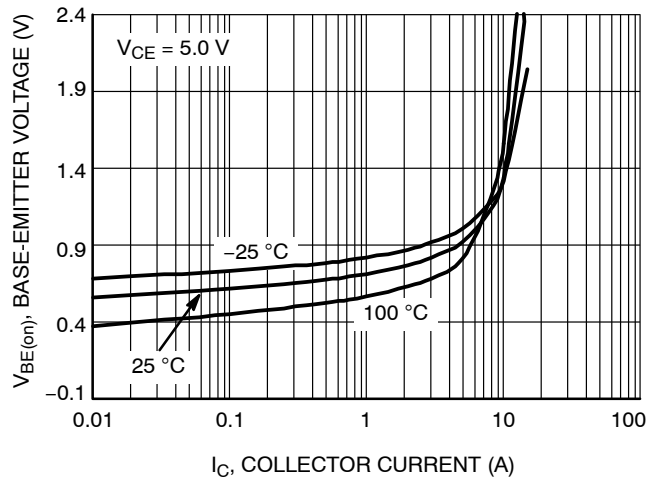


Figure 6. NJW0302G Base-Emitter Voltage

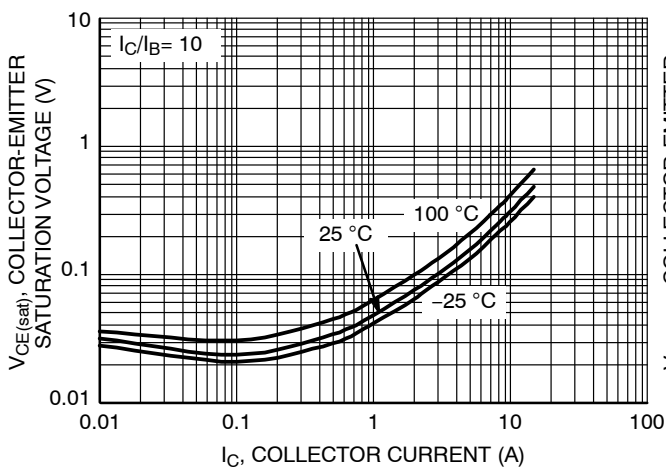


Figure 7. NJW0281G Saturation Voltage

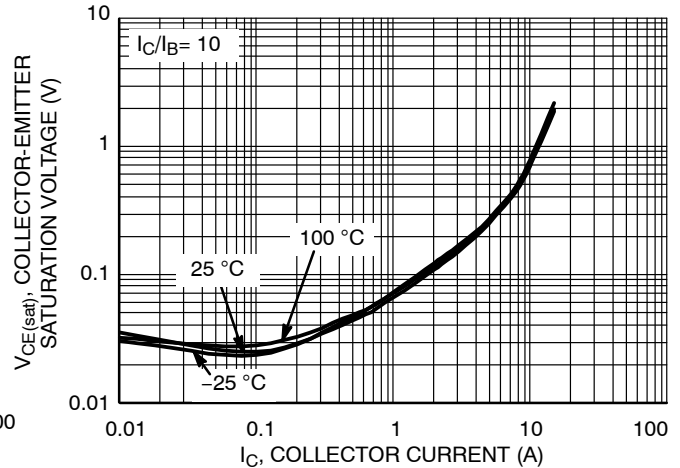


Figure 8. NJW0302G Saturation Voltage

NJW0281G (NPN), NJW0302G (PNP)

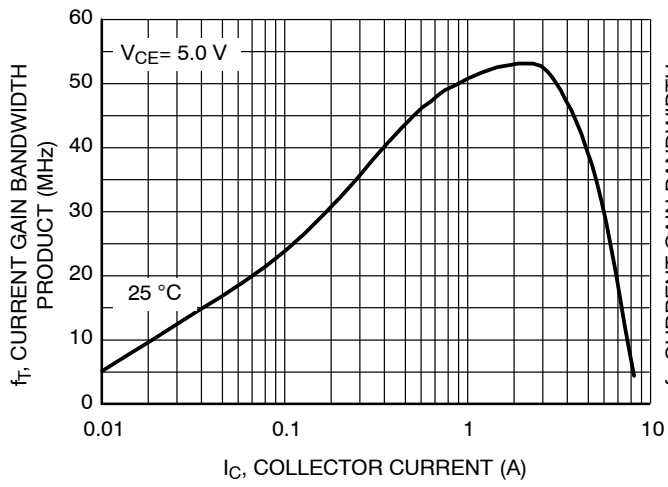


Figure 9. NJW0281G Current Gain Bandwidth Product

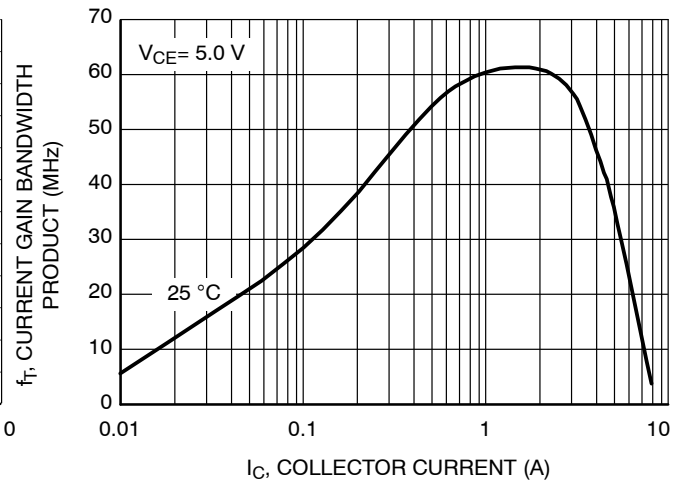


Figure 10. NJW0302G Current Gain Bandwidth Product

NJW0281G (NPN), NJW0302G (PNP)

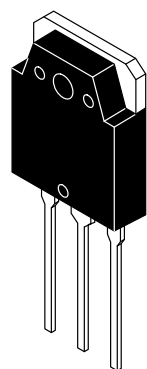
REVISION HISTORY

| Revision | Description of Changes | Date |
|----------|---|-----------|
| 2 | Rebranded the Data Sheet to onsemi format. | 6/26/2025 |

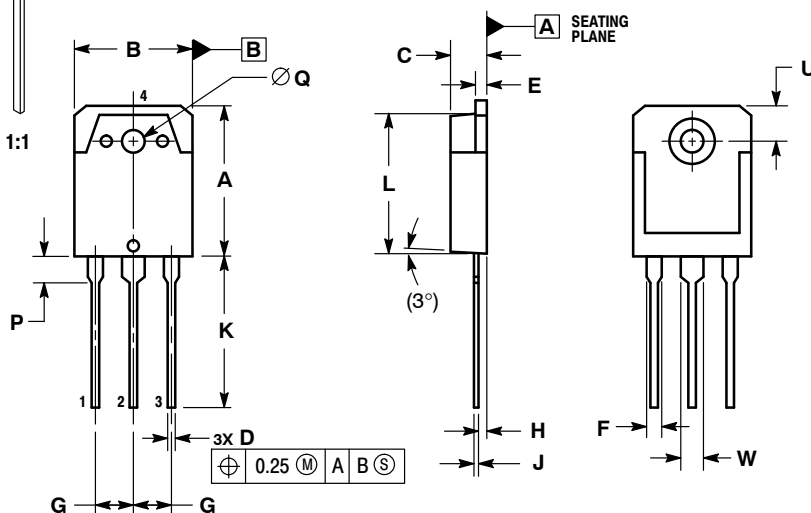
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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

DATE 30 OCT 2007



SCALE 1:1



STYLE 1:

PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

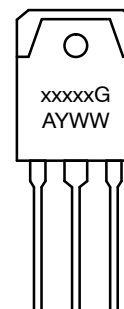
STYLE 2:

TYPE 2:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 3:

PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

GENERIC MARKING DIAGRAM*



xxxxx = Specific Device Code
G = Pb-Free Package
A = Assembly Location
Y = Year
WW = Work Week

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present.

| | MILLIMETERS | | |
|-----|-------------|-------|-------|
| DIM | 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 |

| | | |
|-------------------------|--------------------|---|
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| DESCRIPTION: | TO-3P-3LD | PAGE 1 OF 1 |

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