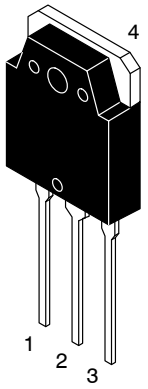
# Complementary NPN-PNP Power Bipolar Transistors

# NJW0281G (NPN), NJW0302G (PNP)

**15 AMPERES COMPLEMENTARY SILICON POWER TRANSISTORS 250 VOLTS, 150 WATTS**

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.




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

### Features

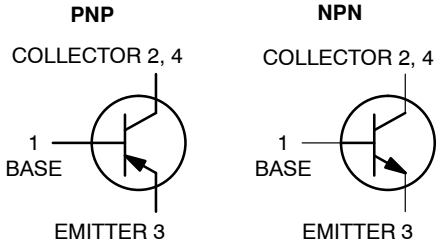
- Exceptional Safe Operating Area
- NPN/PNP Gain Matching within 10% from 50 mA to 3 A
- Excellent Gain Linearity
- High BVCEO
- High Frequency
- These Devices are Pb-Free and are RoHS Compliant

### Benefits

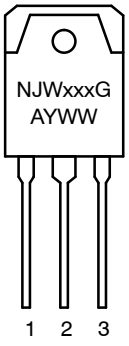
- Reliable Performance at Higher Powers
- Symmetrical Characteristics in Complementary Configurations
- Accurate Reproduction of Input Signal
- Greater Dynamic Range
- High Amplifier Bandwidth

### Applications

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




### MARKING DIAGRAM




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

### 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 °C | 150 | Watts |
| $T_J$, $T_{stg}$ | Operating and Storage Junction Temperature Range | − 65 to +150 | °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%.

### ORDERING INFORMATION

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

## THERMAL CHARACTERISTICS

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

## ELECTRICAL CHARACTERISTICS ($T_C$ = 25 °C unless otherwise noted)

| Symbol | Characteristic | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage ($I_C$ = 30 mA, $I_B$ = 0) | 250 | – | V |
| $I_{CBO}$ | Collector Cutoff Current ($V_{CB}$ = 250 V, $I_E$ = 0) | – | 10 | μA |
| $I_{EBO}$ | Emitter Cutoff Current ($V_{EB}$ = 5.0 V, $I_C$ = 0) | – | 5.0 | μA |
| **ON CHARACTERISTICS** | | | | |
| $h_{FE}$ | DC Current Gain<br>($I_C$ = 0.5 A, $V_{CE}$ = 5.0 V)<br>($I_C$ = 1.0 A, $V_{CE}$ = 5.0 V)<br>($I_C$ = 3.0 A, $V_{CE}$ = 5.0 V) | <br>75<br>75<br>75 | <br>150<br>150<br>150 | – |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage ($I_C$ = 5.0 A, $I_B$ = 0.5 A) | – | 1.0 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage ($I_C$ = 5.0 A, $V_{CE}$ = 5.0 V) | – | 1.2 | V |
| **DYNAMIC CHARACTERISTICS** | | | | |
| $f_T$ | Current-Gain - Bandwidth Product ($I_C$ = 1.0 A, $V_{CE}$ = 5.0 V, $f_{test}$ = 1.0 MHz) | 30 | – | MHz |
| $C_{ob}$ | Output Capacitance ($V_{CB}$ = 10 V, $I_E$ = 0, $f_{test}$ = 1.0 MHz) | – | 400 | pF |

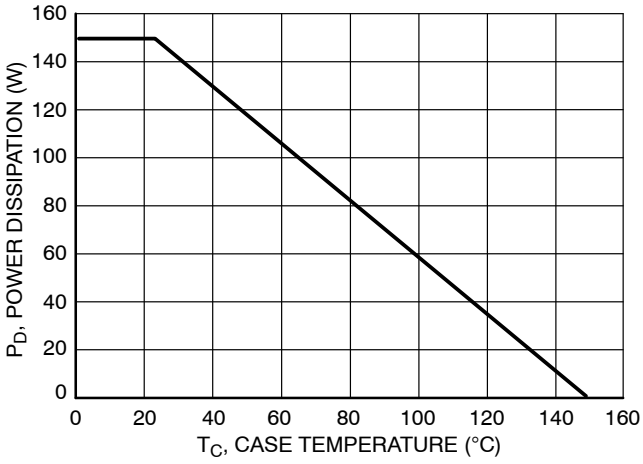



**Figure 1. Power Derating**

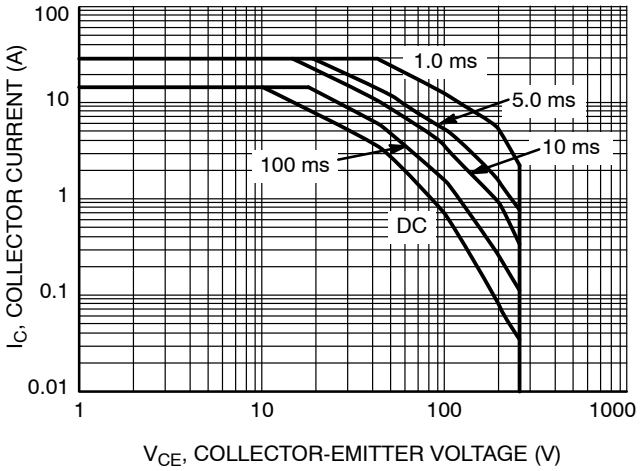



**Figure 2. Safe Operating Area**

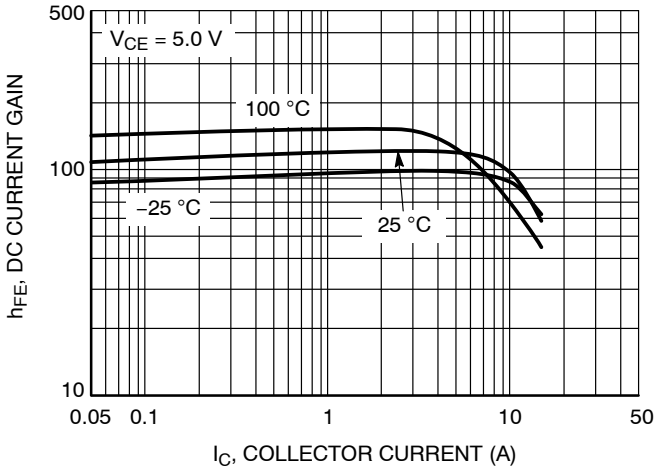



**Figure 3. NJW0281G DC Current Gain**

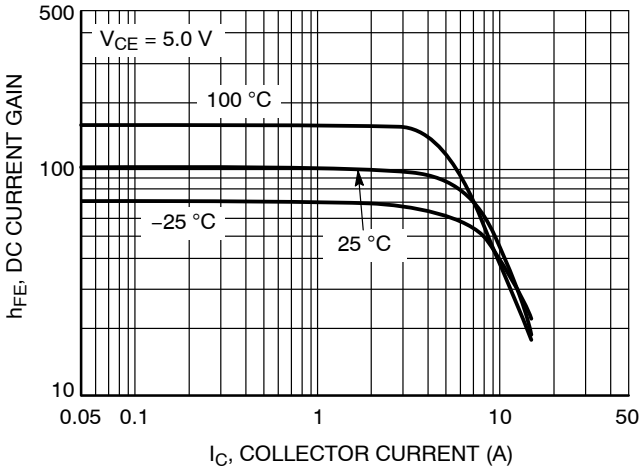



**Figure 4. NJW0302G DC Current Gain**

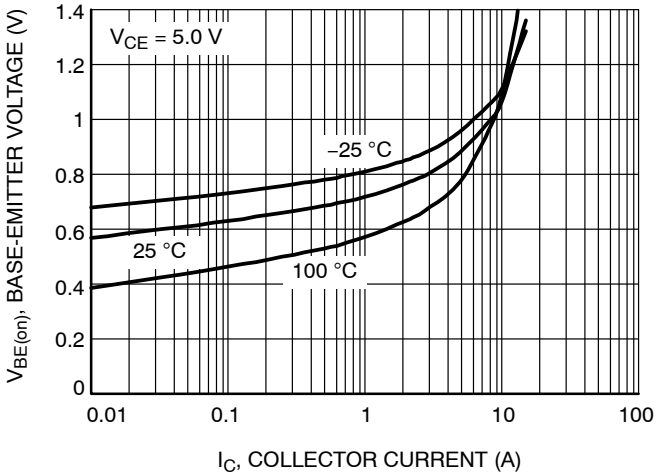



**Figure 5. NJW0281G Base-Emitter Voltage**

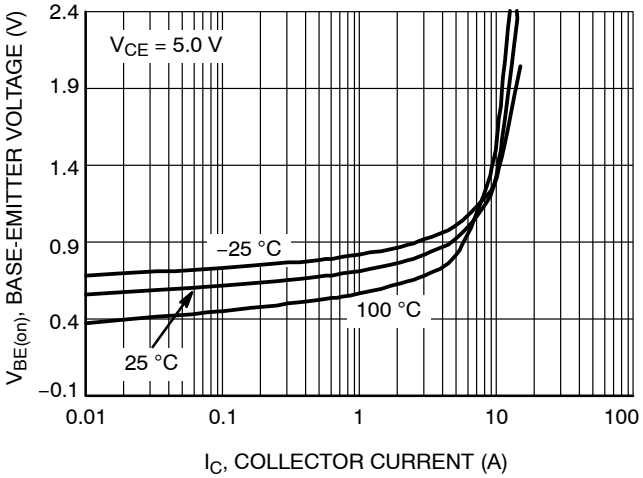



**Figure 6. NJW0302G Base-Emitter Voltage**

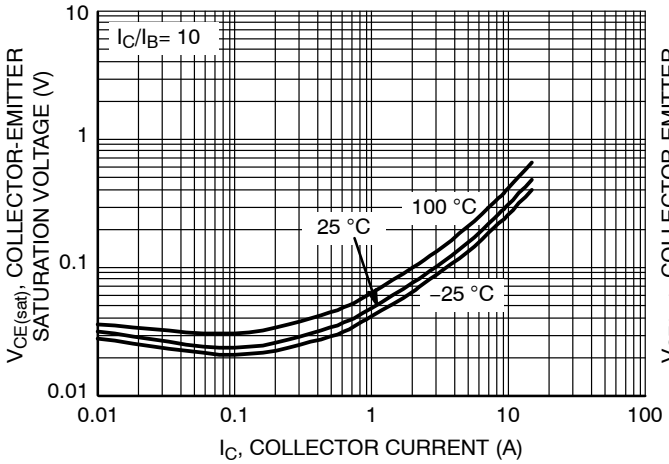



**Figure 7. NJW0281G Saturation Voltage**

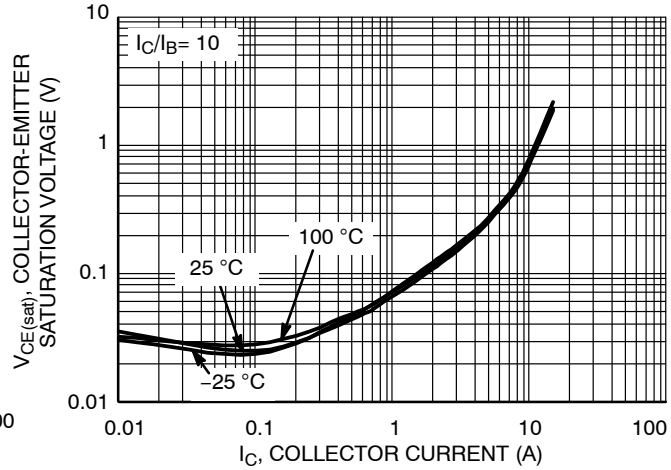



**Figure 8. NJW0302G Saturation Voltage**

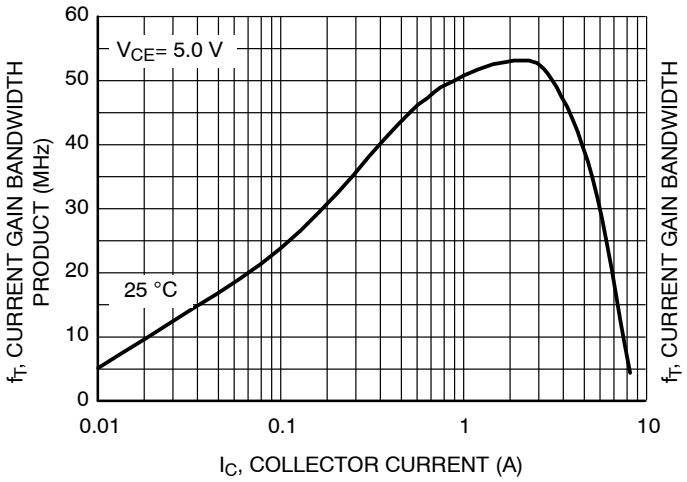



**Figure 9. NJW0281G Current Gain Bandwidth Product**

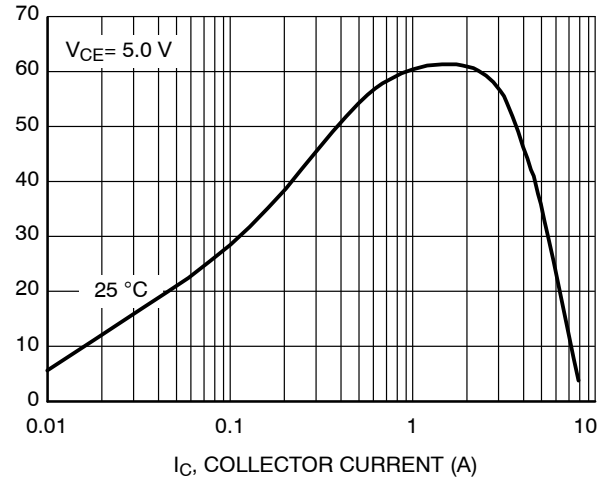



**Figure 10. NJW0302G Current Gain Bandwidth Product**

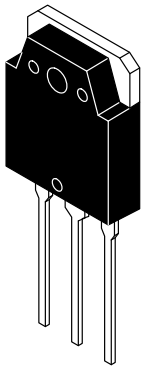
**REVISION HISTORY**

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

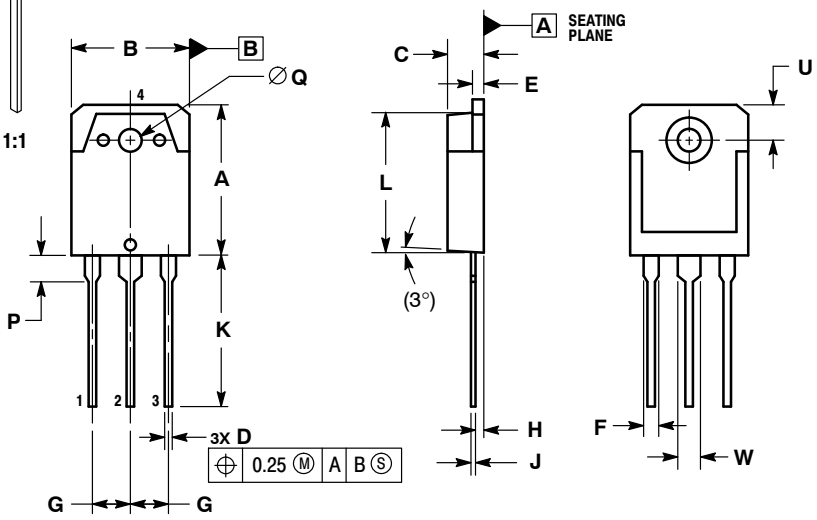
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

**TO−3P−3LD**
CASE 340AB
ISSUE A

DATE 30 OCT 2007



SCALE 1:1




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.

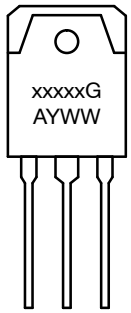
| | MILLIMETERS | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | 19.70 | 19.90 | 20.10 |
| B | 15.40 | 15.60 | 15.80 |
| C | 4.60 | 4.80 | 5.00 |
| D | 0.80 | 1.00 | 1.20 |
| E | 1.45 | 1.50 | 1.65 |
| F | 1.80 | 2.00 | 2.20 |
| G | 5.45 BSC | | |
| H | 1.20 | 1.40 | 1.60 |
| J | 0.55 | 0.60 | 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 |

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

STYLE 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.

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

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