

# MJW0281A (NPN) MJW0302A (PNP)

Preferred Devices

## Complementary NPN-PNP Power Bipolar Transistors

These complementary devices are lower power versions of the popular MJW3281A and MJW1302A 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 5 A
- Excellent Gain Linearity
- High BVCEO
- High Frequency

### 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                           | $V_{CEO}$      | 260             | Vdc              |
| Collector-Base Voltage                              | $V_{CBO}$      | 260             | Vdc              |
| Emitter-Base Voltage                                | $V_{EBO}$      | 5.0             | Vdc              |
| Collector-Emitter Voltage – 1.5 V                   | $V_{CEX}$      | 260             | Vdc              |
| Collector Current – Continuous<br>– Peak (Note 1)   | $I_C$          | 15<br>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<br>Temperature Range | $T_J, T_{stg}$ | - 65 to<br>+150 | $^\circ\text{C}$ |

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.

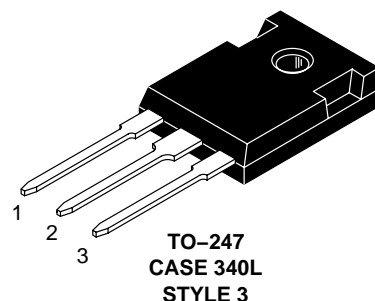
1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle < 10%.



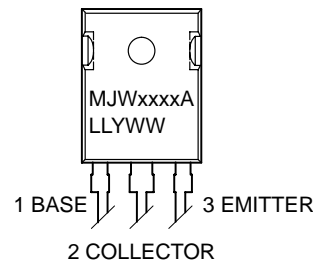
**ON Semiconductor®**

<http://onsemi.com>

**15 AMPERES  
COMPLEMENTARY  
SILICON POWER  
TRANSISTORS  
260 VOLTS  
150 WATTS**



### MARKING DIAGRAM



MJWxxxxA = Device Code  
 xxxx = 0281 OR 0302  
 LL = Location Code  
 Y = Year  
 WW = Work Week

### ORDERING INFORMATION

| Device   | Package | Shipping      |
|----------|---------|---------------|
| MJW0281A | TO-247  | 30 Units/Rail |
| MJW0302A | TO-247  | 30 Units/Rail |

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

# MJW0281A (NPN) MJW0302A (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<br>( $I_C = 30\text{ mA}$ , $I_B = 0$ ) | $V_{CEO(sus)}$ | 260 | –   | V       |
| Collector Cutoff Current<br>( $V_{CB} = 260\text{ V}$ , $I_E = 0$ )          | $I_{CBO}$      | –   | 10  | $\mu A$ |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )            | $I_{EBO}$      | –   | 5.0 | $\mu A$ |

### ON CHARACTERISTICS

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

### DYNAMIC CHARACTERISTICS

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

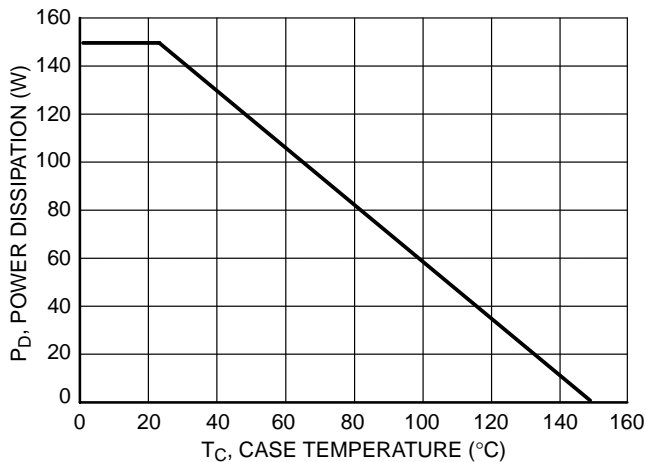


Figure 1. Power Derating

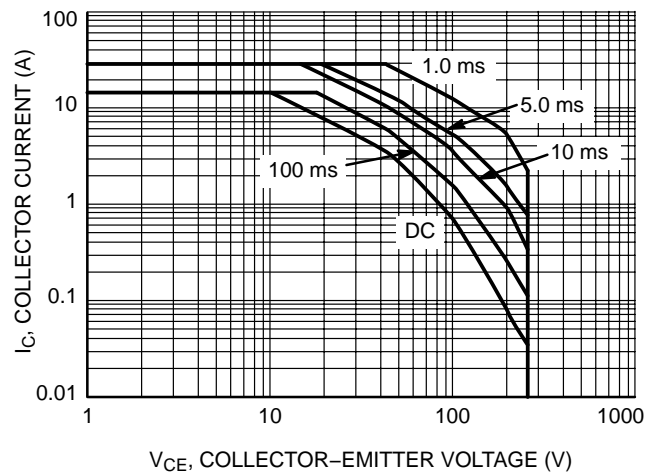


Figure 2. Safe Operating Area

# MJW0281A (NPN) MJW0302A (PNP)

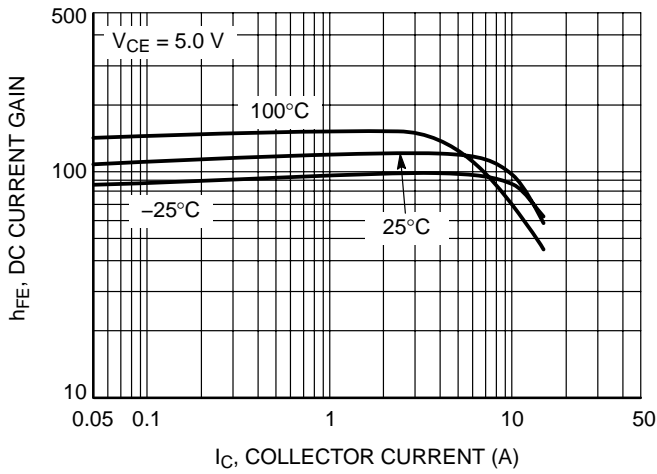


Figure 3. MJW0281A DC Current Gain

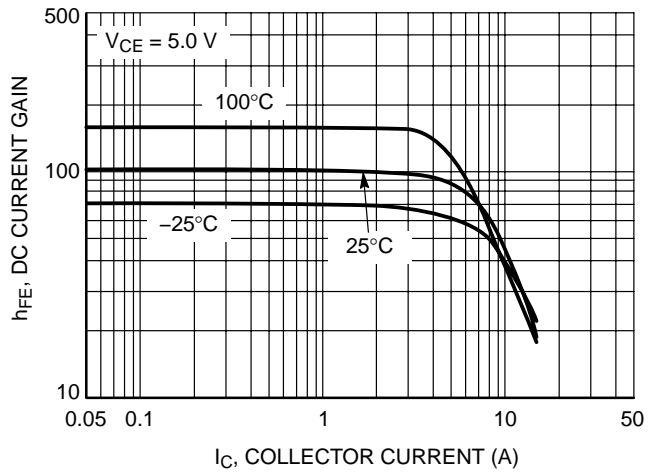


Figure 4. MJW0302A DC Current Gain

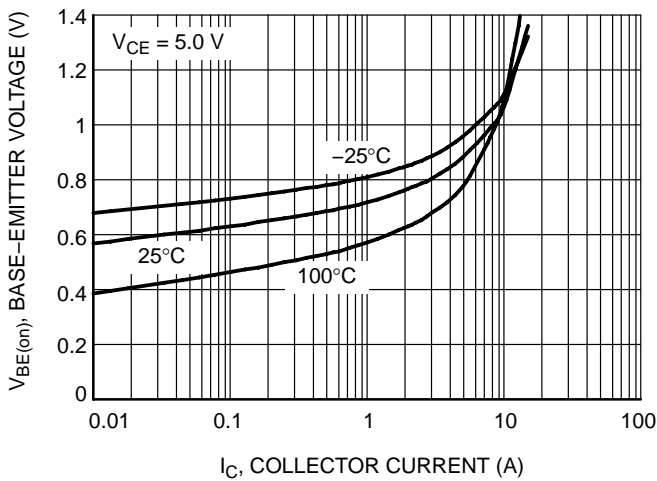


Figure 5. MJW0281A Base-Emitter Voltage

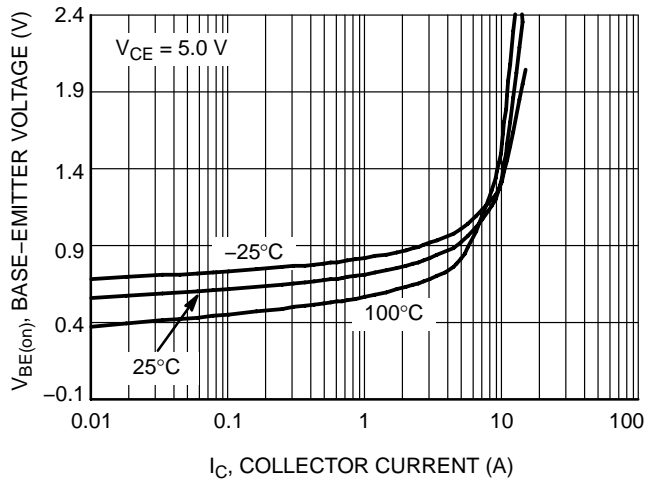


Figure 6. MJW0302A Base-Emitter Voltage

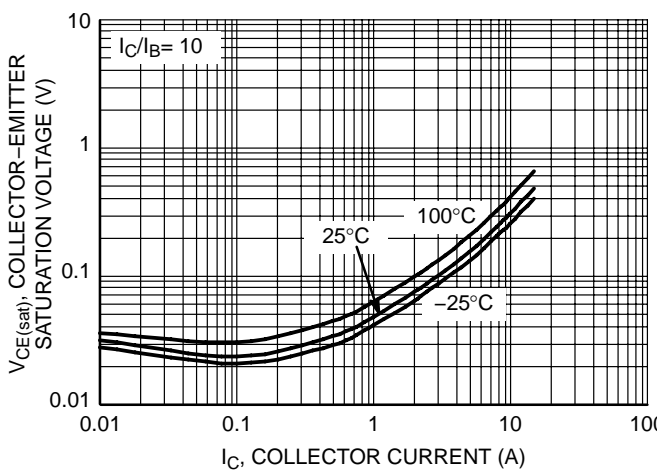


Figure 7. MJW0281A Saturation Voltage

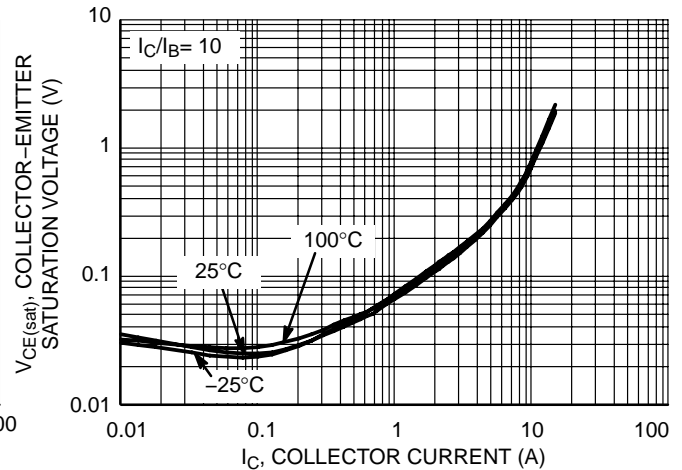
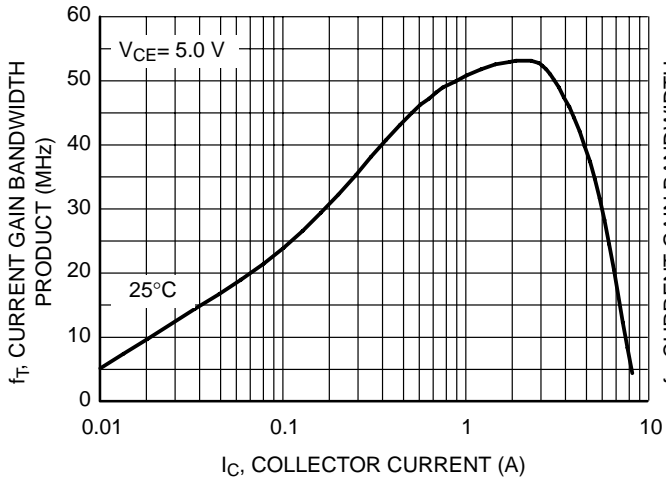
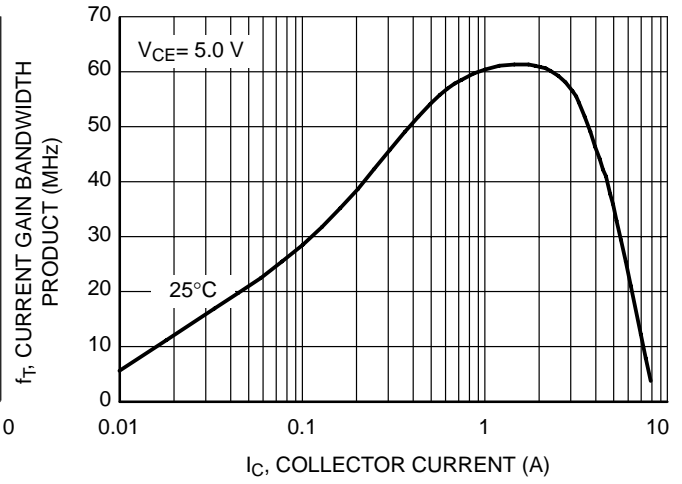


Figure 8. MJW0302A Saturation Voltage

# MJW0281A (NPN) MJW0302A (PNP)



**Figure 9. MJW0281A Current Gain Bandwidth Product**

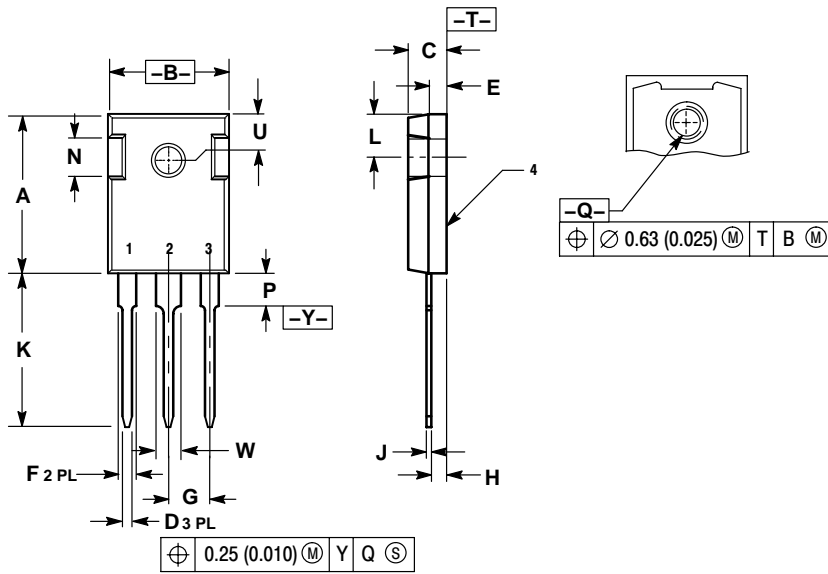


**Figure 10. MJW0302A Current Gain Bandwidth Product**

# MJW0281A (NPN) MJW0302A (PNP)

## PACKAGE DIMENSIONS

TO-247  
CASE 340L-02  
ISSUE D



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 20.32       | 21.08 | 0.800     | 0.830 |
| B   | 15.75       | 16.26 | 0.620     | 0.640 |
| C   | 4.70        | 5.30  | 0.185     | 0.209 |
| D   | 1.00        | 1.40  | 0.040     | 0.055 |
| E   | 2.20        | 2.60  | 0.087     | 0.102 |
| F   | 1.65        | 2.13  | 0.065     | 0.084 |
| G   | 5.45 BSC    |       | 0.215 BSC |       |
| H   | 1.50        | 2.49  | 0.059     | 0.098 |
| J   | 0.40        | 0.80  | 0.016     | 0.031 |
| K   | 20.06       | 20.83 | 0.790     | 0.820 |
| L   | 5.40        | 6.20  | 0.212     | 0.244 |
| N   | 4.32        | 5.49  | 0.170     | 0.216 |
| P   | ---         | 4.50  | ---       | 0.177 |
| Q   | 3.55        | 3.65  | 0.140     | 0.144 |
| U   | 6.15 BSC    |       | 0.242 BSC |       |
| W   | 2.87        | 3.12  | 0.113     | 0.123 |

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

# MJW0281A (NPN) MJW0302A (PNP)

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