



## PNP Power Amplifier Silicon Transistor

**Qualified per MIL-PRF-19500/580**

Qualified Levels:  
JAN, JANTX and  
JANTXV

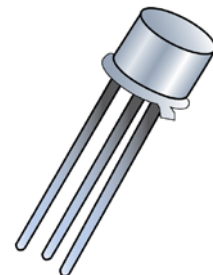
### DESCRIPTION

This family of 2N4234, 2N4235, and 2N4236 silicon transistors are military qualified up to the JANTXV level for high-reliability applications.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- JEDEC registered 2N4234 and 2N4236 number
- JAN, JANTX, and JANTXV qualifications available per MIL-PRF-19500/580
- RoHS compliant version available



**TO-205AD**  
(formerly TO-39)  
**Package**

### APPLICATIONS / BENEFITS

- Short leaded TO-205AD package
- Lightweight package
- Military and other high-reliability applications

### MAXIMUM RATINGS @ $T_A = +25^\circ\text{C}$ unless otherwise noted

| Parameters / Test Conditions                                                                                                     | Symbol          | Value             | Unit               |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|--------------------|
| Junction & Storage Temperature                                                                                                   | $T_J, T_{stg}$  | -65 to +200       | $^\circ\text{C}$   |
| Thermal Resistance Junction-to-Case                                                                                              | $R_{\theta JC}$ | 29                | $^\circ\text{C/W}$ |
| Thermal Resistance Junction-to-Ambient                                                                                           | $R_{\theta JA}$ | 175               | $^\circ\text{C/W}$ |
| Total Power Dissipation <sup>(1)</sup><br>@ $T_A = 25^\circ\text{C}$ <sup>(1)</sup><br>@ $T_C = 25^\circ\text{C}$ <sup>(2)</sup> | $P_T$           | 1.0<br>6.0        | W                  |
| Collector – Emitter Voltage<br>2N4234<br>2N4235<br>2N4236                                                                        | $V_{CEO}$       | -40<br>-60<br>-80 | V                  |
| Collector – Base Voltage<br>2N4234<br>2N4235<br>2N4236                                                                           | $V_{CBO}$       | -40<br>-60<br>-80 | V                  |
| Emitter - Base Voltage                                                                                                           | $V_{EBO}$       | -7.0              | V                  |
| Base Current                                                                                                                     | $I_B$           | -0.5              | A                  |
| Collector Current                                                                                                                | $I_C$           | -1.0              | A                  |

**Notes:** 1. Derated linearly by 5.7 mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$   
2. Derated linearly by 34 mW/ $^\circ\text{C}$  for  $T_C > +25^\circ\text{C}$

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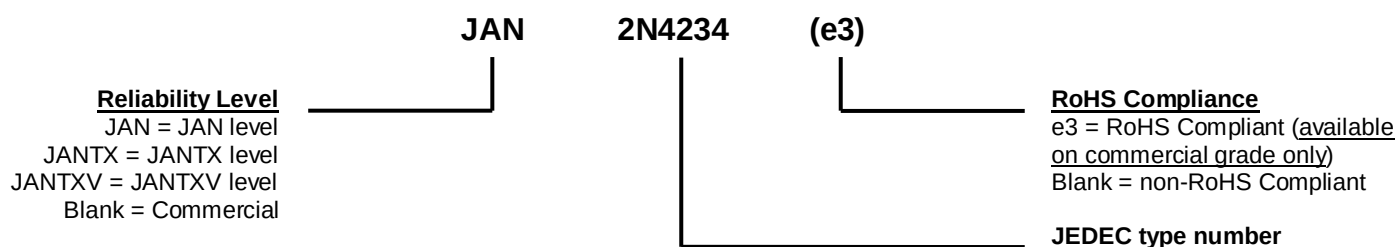
#### **Website:**

[www.microsemi.com](http://www.microsemi.com)

### MECHANICAL and PACKAGING

- CASE: Hermetically sealed, steel base, nickel cap
- TERMINALS: Steel Leads, nickel plated, then solder dipped or RoHS compliant matte-tin available on commercial grade only
- MARKING: Part number, date code, manufacturer's ID and serial number
- POLARITY: PNP
- WEIGHT: Approximately 1.064 grams
- See [Package Dimensions](#) on last page.

### PART NOMENCLATURE



### SYMBOLS & DEFINITIONS

| Symbol    | Definition                                                                                                                                  |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------|
| $I_B$     | Base current: The value of the dc current into the base terminal.                                                                           |
| $I_C$     | Collector current: The value of the dc current into the collector terminal.                                                                 |
| $I_E$     | Emitter current: The value of the dc current into the emitter terminal.                                                                     |
| $T_C$     | Case temperature: The temperature measured at a specified location on the case of a device.                                                 |
| $V_{CB}$  | Collector-base voltage: The dc voltage between the collector and the base.                                                                  |
| $V_{CBO}$ | Collector-base voltage, base open: The voltage between the collector and base terminals when the emitter terminal is open-circuited.        |
| $V_{CC}$  | Collector-supply voltage: The supply voltage applied to a circuit connected to the collector.                                               |
| $V_{CE}$  | Collector-emitter voltage: The dc voltage between the collector and the emitter.                                                            |
| $V_{CEO}$ | Collector-emitter voltage, base open: The voltage between the collector and the emitter terminals when the base terminal is open-circuited. |
| $V_{EB}$  | Emitter-base voltage: The dc voltage between the emitter and the base                                                                       |
| $V_{EBO}$ | Emitter-base voltage, collector open: The voltage between the emitter and base terminals with the collector terminal open-circuited.        |

**ELECTRICAL CHARACTERISTICS @  $T_A = +25^\circ\text{C}$ , unless otherwise noted**

| Characteristics | Symbol | Min | Max | Unit |
|-----------------|--------|-----|-----|------|
|-----------------|--------|-----|-----|------|

**OFF CHARACTERISTICS**

|                                                                                                                                                                                           |                            |               |                          |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|--------------------------|----|
| Collector-Emitter Breakdown Voltage<br>$I_C = -100\text{ mA}$                                                                                                                             | 2N4234<br>2N4235<br>2N4236 | $V_{(BR)CEO}$ | -40<br>-60<br>-80        | V  |
| Collector-Emitter Cutoff Current<br>$V_{CB} = -30\text{ V}$<br>$V_{CB} = -40\text{ V}$<br>$V_{CB} = -60\text{ V}$                                                                         | 2N4234<br>2N4235<br>2N4236 | $I_{CEO}$     | <br>-1.0<br>-1.0<br>-1.0 | mA |
| Collector-Emitter Cutoff Current<br>$V_{CB} = -40\text{ V}, V_{BE} = -1.5\text{ V}$<br>$V_{CB} = -60\text{ V}, V_{BE} = -1.5\text{ V}$<br>$V_{CB} = -80\text{ V}, V_{BE} = -1.5\text{ V}$ | 2N4234<br>2N4235<br>2N4236 | $I_{CEX}$     | <br>-100<br>-100<br>-100 | nA |
| Collector-Base Cutoff Current<br>$V_{CB} = -40\text{ V}$<br>$V_{CB} = -60\text{ V}$<br>$V_{CB} = -80\text{ V}$                                                                            | 2N4234<br>2N4235<br>2N4236 | $I_{CBO}$     | <br>-100<br>-100<br>-100 | nA |
| Emitter-Base Cutoff Current<br>$V_{BE} = -7.0\text{ V}$                                                                                                                                   |                            | $I_{EBO}$     | -0.5                     | mA |

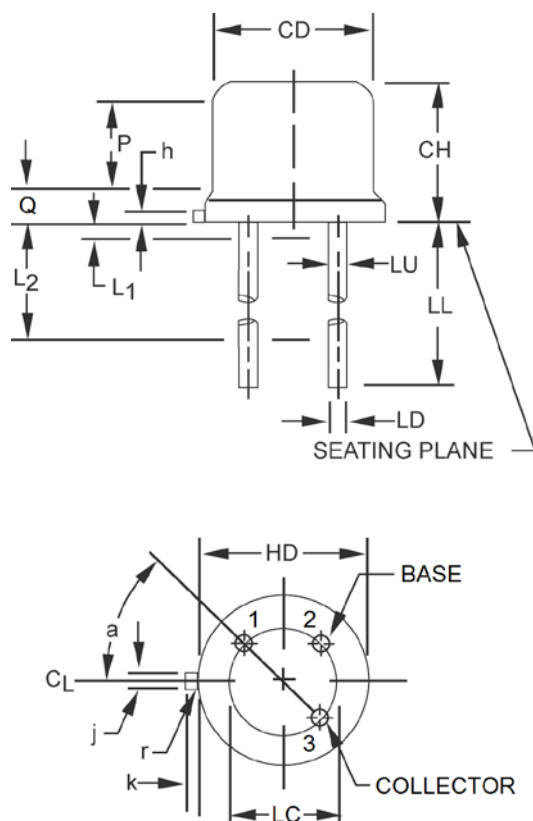
**ON CHARACTERISTICS <sup>(3)</sup>**

|                                                                                                                                                                                      |               |                |              |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|--------------|---|
| Forward-Current Transfer Ratio<br>$I_C = -100\text{ mA}, V_{CE} = -1.0\text{ V}$<br>$I_C = -250\text{ mA}, V_{CE} = -1.0\text{ V}$<br>$I_C = -500\text{ mA}, V_{CE} = -1.0\text{ V}$ | $h_{FE}$      | 40<br>30<br>20 | 150          |   |
| Collector-Emitter Saturation Voltage<br>$I_C = -1.0\text{ A}, I_B = -100\text{ mA}$<br>$I_C = -500\text{ mA}, I_B = -50\text{ mA}$                                                   | $V_{CE(sat)}$ |                | -0.6<br>-0.4 | V |
| Base-Emitter Saturation Voltage<br>$I_C = -500\text{ mA}, I_B = -50\text{ mA}$<br>$I_C = -1.0\text{ A}, I_B = -100\text{ mA}$                                                        | $V_{BE(sat)}$ |                | -1.1<br>-1.5 | V |

**DYNAMIC CHARACTERISTICS**

|                                                                                                                                                          |            |     |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio<br>$I_C = -100\text{ mA}, V_{CE} = -10\text{ V}, f = 1\text{ MHz}$ | $ h_{FE} $ | 3.0 |     |    |
| Output Capacitance<br>$V_{CB} = -10\text{ V}, I_E = 0, f = 100\text{ MHz}$                                                                               | $C_{obo}$  |     | 100 | pF |

**ELECTRICAL CHARACTERISTICS @  $T_A = +25\text{ }^{\circ}\text{C}$ , unless otherwise noted (continued)****SAFE OPERATING AREA****DC Tests** $T_C = +25\text{ }^{\circ}\text{C}$ , 1 cycle,  $t \geq 0.5\text{ s}$ **Test 1** $V_{CE} = -6.0\text{ V}$ ,  $I_C = -1.0\text{ A}$ **Test 2** $V_{CE} = -12\text{ V}$ ,  $I_C = -500\text{ mA}$ **Test 3** $V_{CE} = -30\text{ V}$ ,  $I_C = -166\text{ mA}$  (2N4234) $V_{CE} = -50\text{ V}$ ,  $I_C = -100\text{ mA}$  (2N4235) $V_{CE} = -70\text{ V}$ ,  $I_C = -71\text{ mA}$  (2N4236)(3) Pulse Test: Pulse Width =  $300\text{ }\mu\text{s}$ , duty cycle  $\leq 2.0\%$

**PACKAGE DIMENSIONS**


| Ltr | Dimensions |       |             |       | Notes |
|-----|------------|-------|-------------|-------|-------|
|     | Inch       |       | Millimeters |       |       |
|     | Min        | Max   | Min         | Max   |       |
| CD  | 0.305      | 0.335 | 7.75        | 8.51  |       |
| CH  | 0.240      | 0.260 | 6.10        | 6.60  |       |
| HD  | 0.335      | 0.370 | 8.51        | 9.40  |       |
| h   | 0.009      | 0.041 | 0.23        | 1.04  |       |
| j   | 0.028      | 0.034 | 0.71        | 0.86  | 3     |
| k   | 0.029      | 0.045 | 0.74        | 1.14  | 3, 4  |
| LD  | 0.016      | 0.021 | 0.41        | 0.53  | 8, 9  |
| LL  | 0.500      | 0.750 | 12.7        | 19.05 |       |
| LC  | 0.200 TP   |       | 5.08 TP     |       | 7     |
| LU  | 0.016      | 0.019 | 0.41        | 0.48  | 8, 9  |
| L1  | -          | 0.050 | -           | 1.27  | 8, 9  |
| L2  | 0.250      | -     | 6.35        | -     | 8, 9  |
| P   | 0.100      | -     | 2.54        | -     | 7     |
| Q   | -          | 0.050 | -           | 1.27  | 5     |
| r   | -          | 0.010 | -           | 0.25  | 10    |
| α   | 45° TP     |       | 45° TP      |       | 7     |

**NOTES:**

- Dimensions are in inches.
- Millimeters are given for information only.
- Beyond r (radius) maximum, TL shall be held for a minimum length of 0.011 inch (0.28 mm).
- Dimension TL measured from maximum HD.
- Body contour optional within zone defined by HD, CD, and Q.
- CD shall not vary more than .010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
- Leads at gauge plane 0.054 +0.001 -0.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within 0.007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
- Dimension LU applies between L1 and L2. Dimension LD applies between L2 and LL minimum. Diameter is uncontrolled in L1 and beyond LL minimum.
- All three leads.
- The collector shall be internally connected to the case.
- Dimension r (radius) applies to both inside corners of tab.
- In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.
- Lead 1 = emitter, lead 2 = base, lead 3 = collector.

## Данный компонент на территории Российской Федерации

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Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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