



PNP Power Amplifier Silicon Transistor

Qualified per MIL-PRF-19500/580

Qualified Levels:
JAN, JANTX and
JANTXV

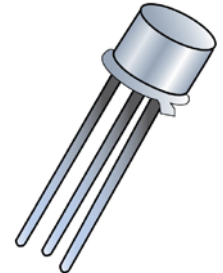
DESCRIPTION

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 °C unless otherwise noted

| Parameters / Test Conditions | Symbol | Value | Unit | |
|--|-----------------------------------|---|------|---|
| Junction & Storage Temperature | T _J , T _{stg} | -65 to +200 | °C | |
| Thermal Resistance Junction-to-Case | R _{θJC} | 29 | °C/W | |
| Thermal Resistance Junction-to-Ambient | R _{θJA} | 175 | °C/W | |
| Total Power Dissipation ⁽¹⁾ | P _T | @ T _A = 25 °C ⁽¹⁾ | 1.0 | W |
| | | @ T _C = 25 °C ⁽²⁾ | 6.0 | |
| Collector – Emitter Voltage | V _{CEO} | 2N4234 | -40 | V |
| | | 2N4235 | -60 | |
| | | 2N4236 | -80 | |
| Collector – Base Voltage | V _{CBO} | 2N4234 | -40 | V |
| | | 2N4235 | -60 | |
| | | 2N4236 | -80 | |
| 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/°C for T_A > +25 °C
2. Derated linearly by 34 mW/°C for T_C > +25 °C

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:
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 @ $T_A = +25\text{ }^\circ\text{C}$, unless otherwise noted

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

ON CHARACTERISTICS ⁽³⁾

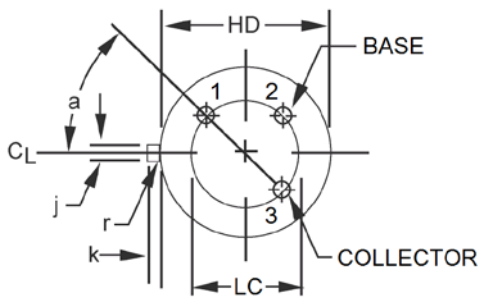
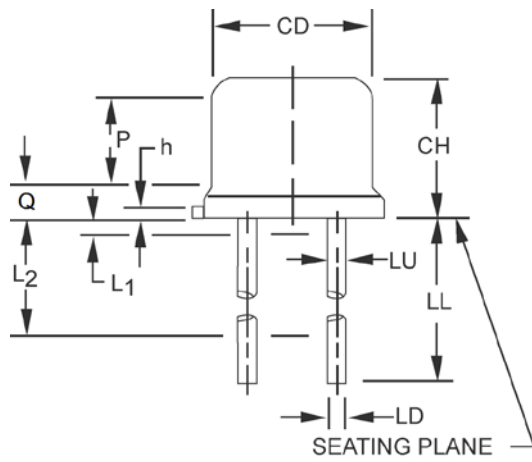
| | | | | | |
|--|--|---------------|----------------|--------------|---|
| Forward-Current Transfer Ratio $I_C = -100\text{ mA}, V_{CE} = -1.0\text{ V}$ $I_C = -250\text{ mA}, V_{CE} = -1.0\text{ V}$ $I_C = -500\text{ mA}, V_{CE} = -1.0\text{ V}$ | | h_{FE} | 40 30 20 | 150 | |
| Collector-Emitter Saturation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

DYNAMIC CHARACTERISTICS

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



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Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331