



PNP Power Amplifier Silicon Transistor

Qualified per MIL-PRF-19500/580

Qualified Levels:
JAN, JANTX and
JANTXV

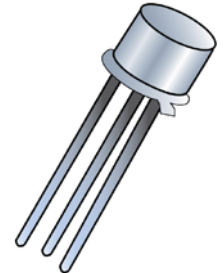
DESCRIPTION

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

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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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