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RoHS
Available on commercial versions

PNP Power Amplifier Silicon Transistor

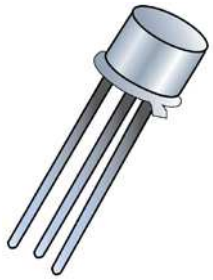
Qualified per MIL-PRF-19500/580

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.



TO-205AD
(formerly TO-39)
Package

FEATURES

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

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		$R_{\Theta JC}$	29	ºC/W
Thermal Resistance Junction-to-Ambient		$R_{\Theta JA}$	175	ºC/W
Total Power Dissipation (1)	@ T_A = 25 ºC (1) @ T_C = 25 ºC (2)	P_T	1.0 6.0	W
Collector – Emitter Voltage	2N4234 2N4235 2N4236	V_{CEO}	-40 -60 -80	V
Collector – Base Voltage	2N4234 2N4235 2N4236	V_{CBO}	-40 -60 -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/°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 °C, unless otherwise noted

Characteristics		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage					
I_C = -100 mA	2N4234	$V_{(BR)CEO}$	-40		V
	2N4235		-60		
	2N4236		-80		
Collector-Emitter Cutoff Current					
V_{CB} = -30 V	2N4234	I_{CEO}		-1.0	mA
V_{CB} = -40 V	2N4235			-1.0	
V_{CB} = -60 V	2N4236			-1.0	
Collector-Emitter Cutoff Current					
V_{CB} = -40 V, V_{BE} = -1.5 V	2N4234	I_{CEX}		-100	nA
V_{CB} = -60 V, V_{BE} = -1.5 V	2N4235			-100	
V_{CB} = -80 V, V_{BE} = -1.5 V	2N4236			-100	
Collector-Base Cutoff Current					
V_{CB} = -40 V	2N4234	I_{CBO}		-100	nA
V_{CB} = -60 V	2N4235			-100	
V_{CB} = -80 V	2N4236			-100	
Emitter-Base Cutoff Current					
V_{BE} = -7.0 V		I_{EBO}		-0.5	mA
ON CHARACTERISTICS (3)					
Forward-Current Transfer Ratio					
I_C = -100 mA, V_{CE} = -1.0 V		h_{FE}	40		
I_C = -250 mA, V_{CE} = -1.0 V			30	150	
I_C = -500 mA, V_{CE} = -1.0 V			20		
Collector-Emitter Saturation Voltage					
I_C = -1.0 A, I_B = -100 mA		$V_{CE(sat)}$		-0.6	V
I_C = -500 mA, I_B = -50 mA				-0.4	
Base-Emitter Saturation Voltage					
I_C = -500 mA, I_B = -50 mA		$V_{BE(sat)}$		-1.1	V
I_C = -1.0 A, I_B = -100 mA				-1.5	
DYNAMIC CHARACTERISTICS					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio					
I_C = -100 mA, V_{CE} = -10 V, f = 1 MHz		$\|h_{FE}\|$	3.0		
Output Capacitance					
V_{CB} = -10 V, I_E = 0, f = 100 MHz		C_{obo}		100	pF

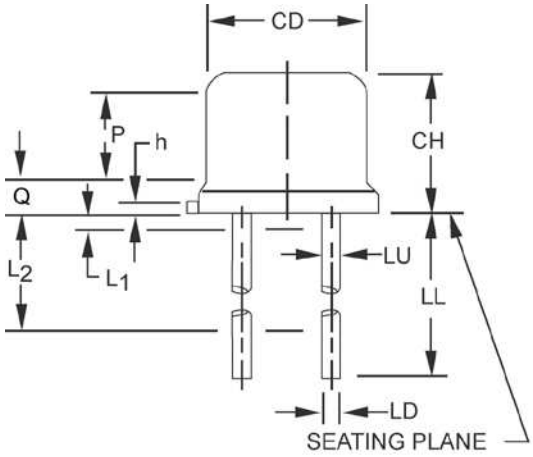
ELECTRICAL CHARACTERISTICS @ T_A = +25 °C, unless otherwise noted (continued)

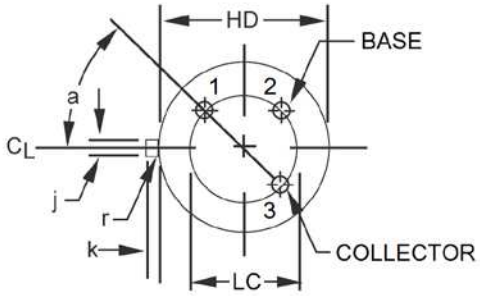
SAFE OPERATING AREA

DC Tests		
T_C = +25 °C, 1 cycle, t ≥ 0.5 s		
Test 1		
V_{CE} = -6.0 V, I_C = -1.0 A		
Test 2		
V_{CE} = -12 V, I_C = -500 mA		
Test 3		
V_{CE} = -30 V, I_C = -166 mA	(2N4234)	
V_{CE} = -50 V, I_C = -100 mA	(2N4235)	
V_{CE} = -70 V, I_C = -71 mA	(2N4236)	

(3) Pulse Test: Pulse Width = 300 μs, duty cycle ≤ 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:

1. Dimensions are in inches.
2. Millimeters are given for information only.
3. Beyond r (radius) maximum, TL shall be held for a minimum length of 0.011 inch (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. CD shall not vary more than .010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
7. 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.
8. Dimension LU applies between L1 and L2. Dimension LD applies between L2 and LL minimum. Diameter is uncontrolled in L1 and beyond LL minimum.
9. All three leads.
10. The collector shall be internally connected to the case.
11. Dimension r (radius) applies to both inside corners of tab.
12. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.
13. Lead 1 = emitter, lead 2 = base, lead 3 = collector.