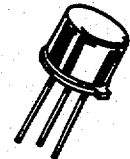


2N3439JAN, JTX, JTXV
2N3440JTX, JTXV
Processed per MIL-S-19500/368
NPN Silicon
Small-Signal Transistors

...designed for high-voltage amplifier applications.



MAXIMUM RATINGS				
Rating	Symbol	2N3439	2N3440	Unit
Collector-Emitter Voltage	V_{CEO}	350	250	Vdc
Collector-Base Voltage	V_{CBO}	450	300	Vdc
Collector-Base Voltage @ 100,000 Ft. Altitude	V_{CB}	300		Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector Current — Continuous	I_C	1.0		Adc
Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C @ $T_C = 100^\circ\text{C}$ Derate above 100°C	P_D	0.8 4.57 5.0 28.5		Watts mW/ $^\circ\text{C}$ Watts W/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-65 to 200		$^\circ\text{C}$



CASE 79-04, STYLE 1
TO-205AD (TO-39)

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted.)					
Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (I _C = 50 mA _{dc} , I _B = 0)	2N3439 2N3440	V _{(BR)CEO}	350 250	— —	V _{dc}
Collector Cutoff Current (V _{CE} = 300 V _{dc} , I _B = 0) (V _{CE} = 200 V _{dc} , I _B = 0)	2N3439 2N3440	I _{CEO}	— —	2.0 2.0	μA _{dc}
Collector Cutoff Current (V _{CE} = Rated V _{CBO} , V _{BE} = -1.5 V _{dc})		I _{CEX}	—	5.0	μA _{dc}
Collector Cutoff Current (V _{CB} = 450 V _{dc}) (V _{CB} = 360 V _{dc}) (V _{CB} = 360 V _{dc} , T _A = 150°C) (V _{CB} = 300 V _{dc}) (V _{CB} = 250 V _{dc}) (V _{CB} = 250 V _{dc} , T _A = 150°C)	2N3439 2N3440	I _{CBO}	— — — — — —	5.0 2.0 100 5.0 2.0 100	μA _{dc} μA _{dc}
Emitter Cutoff Current (V _{BE} = 7.0 V _{dc})		I _{EBO}	—	10	μA _{dc}

(continued)

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MOTOROLA

2N3439 SERIES and 2N3440JTX, JTXV

ELECTRICAL CHARACTERISTICS — continued ($T_A = 25^\circ\text{C}$ unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS(1)				
DC Current Gain ($I_C = 0.2 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 2.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 20 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 20 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $T_A = -55^\circ\text{C}$)	h_{FE}	10 30 40 15	— — 160 —	—
Collector-Emitter Saturation Voltage ($I_C = 50 \text{ mAdc}$, $I_B = 4.0 \text{ mAdc}$)	$V_{CE(sat)}$	—	0.5	Vdc
Base-Emitter Saturation Voltage ($I_C = 50 \text{ mAdc}$, $I_B = 4.0 \text{ mAdc}$)	$V_{BE(sat)}$	—	1.3	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $f = 0.1$ to 1.0 MHz)	C_{obo}	—	10	pF
Input Capacitance ($V_{BE} = 5.0 \text{ Vdc}$, $f = 0.1$ to 1.0 MHz)	C_{ibo}	—	75	pF
Current Gain ($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	h_{fe}	25	—	—
Small-Signal Current Transfer Ratio, Magnitude ($I_C = 10 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 5.0 \text{ MHz}$)	$ h_{fe} $	3.0	15	—
Real-Time Part of Input Impedance ($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)	$RE(hie)$	—	300	ohms
SWITCHING CHARACTERISTICS (See Section 4, Figure 7) ($I_{B1} = 0.6 \text{ Adc}$, $I_{B2} = 1.5 \text{ Adc}$)				
Turn-On Time	t_{on}	—	1.0	μs
Turn-Off Time	t_{off}	—	10	μs

ASSURANCE TESTING (Pre/Post Burn-In)				
Burn-In Conditions: $T_A = 25 \pm 3^\circ\text{C}$, $V_{CB} = 200 \text{ Vdc}$, $P_D = 600 \text{ mW}$				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current ($V_{CE} = 300 \text{ Vdc}$) ($V_{CE} = 200 \text{ Vdc}$)	I_{CEO}	— —	20 20	μAdc
DC Current Gain(1) ($I_C = 20 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)	h_{FE}	40	160	—

Delta from Pre-Burn-In Measured Values		Min	Max	
Delta Collector Cutoff Current	ΔI_{CBO}	—	± 100 or ± 0.5 whichever is greater	% of Initial Value μAdc
Delta DC Current Gain(1)	Δh_{FE}	—	± 20	% of Initial Value

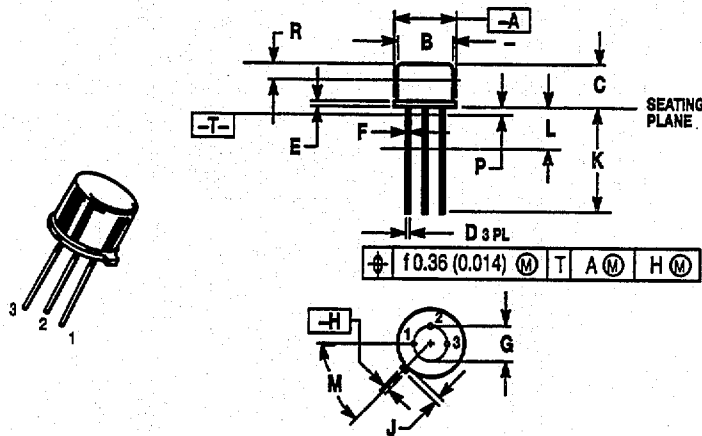
(1) Pulsed. Pulse Width 250 to 350 μs , Duty Cycle 1.0 to 2.0%.

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2N3439 SERIES and 2N3440JTX, JTXV

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
4. DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

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

STYLE 2:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 3:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 4:
PIN 1. MAIN TERM. 1
2. GATE
3. MAIN TERM. 2

STYLE 5:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

STYLE 6:
PIN 1. SOURCE
2. GATE
3. DRAIN (CASE)

STYLE 7:
PIN 1. DRAIN
2. GATE
3. SOURCE

STYLE 8:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 9:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 10:
PIN 1. COLLECTOR
2. EMITTER
3. BASE

STYLE 11:
PIN 1. ANODE
2. OPEN
3. CATHODE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.51	9.39	0.335	0.370
B	7.75	8.50	0.305	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	1.04	0.009	0.041
F	0.41	0.48	0.016	0.019
G	5.08 BSC		0.200 BSC	
H	0.72	0.86	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	19.05	0.500	0.750
L	6.35	-	0.250	-
M	45° BSC		45° BSC	
P	-	1.27	-	0.050
R	2.54	-	0.100	-

CASE 79-04
TO-205AD
(TO-39)

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