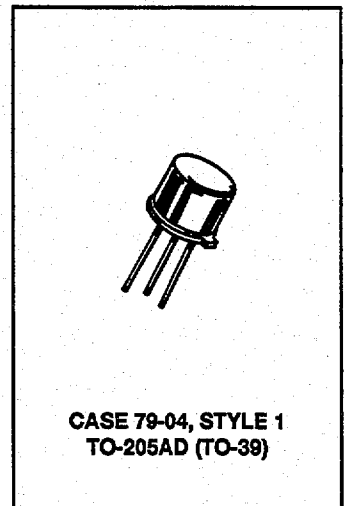


2N3439JAN, JTX, JTXV
2N3440JTX, JTXV
Processed per MIL-S-19500/368
NPN Silicon
Small-Signal Transistors



...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		Watts mW/ $^\circ\text{C}$ Watts W/ $^\circ\text{C}$
		4.57		
		5.0		
		28.5		
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 65 to 200		$^\circ\text{C}$



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)						
Characteristic	Symbol	Min	Max	Unit		
OFF CHARACTERISTICS						
Collector-Emitter Sustaining Voltage ($I_C = 50 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	350 250	— —	Vdc		
Collector Cutoff Current ($V_{CE} = 300 \text{ Vdc}, I_B = 0$) ($V_{CE} = 200 \text{ Vdc}, I_B = 0$)	I_{CEO}	— —	2.0 2.0	μAdc		
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CBO}, V_{BE} = -1.5 \text{ Vdc}$)	I_{CEX}	—	5.0	μAdc		
Collector Cutoff Current ($V_{CB} = 450 \text{ Vdc}$) ($V_{CB} = 360 \text{ Vdc}$) ($V_{CB} = 360 \text{ Vdc}, T_A = 150^\circ\text{C}$) ($V_{CB} = 300 \text{ Vdc}$) ($V_{CB} = 250 \text{ Vdc}$) ($V_{CB} = 250 \text{ Vdc}, T_A = 150^\circ\text{C}$)	I_{CBO}	2N3439	— —	5.0 2.0	μAdc	
		2N3440	— —	100 5.0		
	2N3439	— —	5.0 2.0	μAdc		
	2N3440	— —	100 2.0			
	Emitter Cutoff Current ($V_{BE} = 7.0 \text{ Vdc}$)	I_{EBO}	—	10	μAdc	

(continued)

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

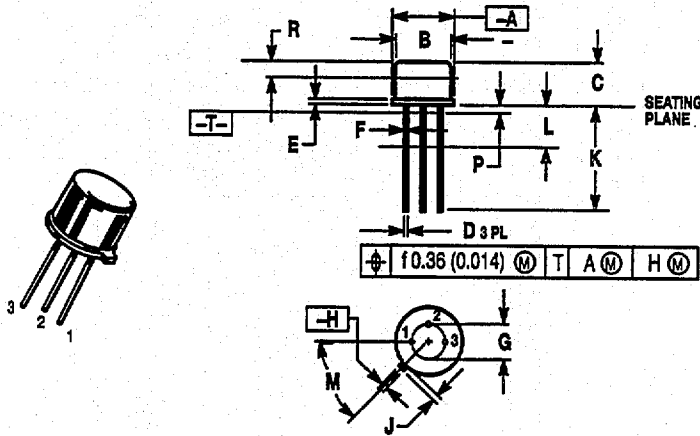
(1) Pulsed. Pulse Width 250 to 350 μs , Duty Cycle 1.0 to 2.0%.

ARCHIVE DOCUMENT - NOT FOR NEW DESIGN

This page intentionally left blank.

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)

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Literature Distribution Centers:

USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.

EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.

JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.

ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.

