

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	2N3439	2N3440	Unit
Collector-emitter voltage	V_{CEO}	350	250	Vdc
Collector-base voltage	V_{CBO}	450	300	Vdc
Emitter-base voltage	V_{EBO}	7.0		Vdc
Collector current	I_C	1.0		Adc
Total power dissipation @ $T_A = 25^\circ\text{C}^{(1)}$ @ $T_C = 25^\circ\text{C}^{(2)}$	P_T	0.8		W
		5.0		W/ $^\circ\text{C}$
Operating and storage temperature range	T_{opr}, T_{stg}	-55 to +200		$^\circ\text{C}$

Note 1: Derate linearly 4.57mW/ $^\circ\text{C}$ for $T_A > 25^\circ\text{C}$.

Note 2: Derate linearly 28.5mW/ $^\circ\text{C}$ for $T_C > 25^\circ\text{C}$.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector-emitter breakdown voltage $I_C = 50\text{mAdc}$	2N3439	$V_{(BR)CEO}$	350	-	Vdc
	2N3440		250	-	
Collector-emitter cutoff current $V_{CE} = 300\text{Vdc}$ $V_{CE} = 200\text{Vdc}$	2N3439	I_{CEO}	-	2.0	μAdc
	2N3440		-	2.0	
Emitter-base cutoff current $V_{EB} = 7.0\text{Vdc}$		I_{EBO}	-	10	μAdc
Collector-emitter cutoff current $V_{CE} = 450\text{Vdc}, V_{BE} = -1.5\text{Vdc}$ $V_{CE} = 300\text{Vdc}, V_{BE} = -1.5\text{Vdc}$	2N3439	I_{CEX}	-	5.0	μAdc
	2N3440		-	5.0	
Collector-base cutoff current $V_{CB} = 360\text{Vdc}$ $V_{CB} = 250\text{Vdc}$ $V_{CB} = 450\text{Vdc}$ $V_{CB} = 300\text{Vdc}$	2N3439	I_{CBO}	-	2.0	μAdc
	2N3440		-	2.0	
	2N3439		-	5.0	
	2N3440		-	5.0	
ON CHARACTERISTICS⁽³⁾					
Forward-current transfer ratio $I_C = 20\text{mAdc}, V_{CE} = 10\text{Vdc}$ $I_C = 2.0\text{mAdc}, V_{CE} = 10\text{Vdc}$ $I_C = 0.2\text{mAdc}, V_{CE} = 10\text{Vdc}$		h_{FE}	40	160	
			30	-	
			10	-	
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

2N3439(L)-2N3440(L)

NPN SILICON LOW POWER TRANSISTORS

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit
DYNAMIC CHARACTERISTICS				
Magnitude of common emitter small-signal short circuit forward current transfer ratio $I_C = 10\text{mA}$, $V_{CE} = 10\text{V}$, $f = 5.0\text{MHz}$	$ h_{fe} $	3.0	15	
Forward current transfer ratio $I_C = 5.0\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1.0\text{kHz}$	h_{fe}	25	-	
Output capacitance $V_{CB} = 10\text{V}$, $I_E = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{obo}	-	10	pF
Input capacitance $V_{EB} = 5.0\text{V}$, $I_C = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{ibo}	-	75	pF
SWITCHING CHARACTERISTICS				
Turn-on time $V_{CC} = 200\text{V}$, $I_C = 20\text{mA}$, $I_{B1} = 2.0\text{mA}$	t_{on}	-	1.0	μs
Turn-off time $V_{CC} = 200\text{V}$, $I_C = 20\text{mA}$, $I_{B1} = -I_{B2} = 2.0\text{mA}$	t_{off}	-	10	μs
SAFE OPERATING AREA				
DC tests $T_C = 25^\circ\text{C}$, 1 cycle, $t = 1.0\text{s}$				
Test 1	Both types			
$V_{CE} = 5.0\text{V}$, $I_C = 1.0\text{A}$				
Test 2	2N3439			
$V_{CE} = 350\text{V}$, $I_C = 14\text{mA}$				
Test 3	2N3440			
$V_{CE} = 250\text{V}$, $I_C = 20\text{mA}$				

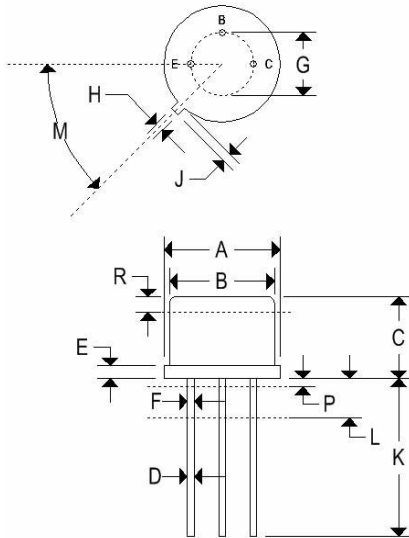
Note 3: Pulse test: Pulse width = $300\mu\text{s}$, duty cycle $\leq 2.0\%$.

2N3439(L)-2N3440(L)

NPN SILICON LOW POWER TRANSISTORS

MECHANICAL CHARACTERISTICS

Case	TO-39 (2N3439, 2N3440)
Marking	Alpha-numeric
Polarity	See below



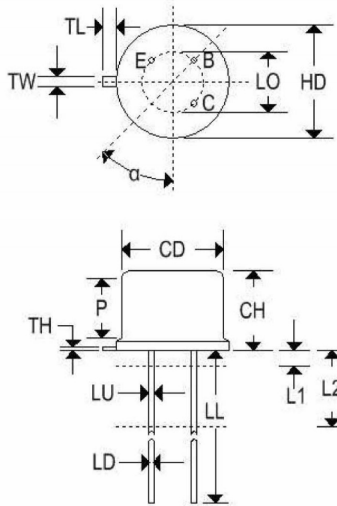
	TO-39			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.350	0.370	8.890	9.400
B	0.315	0.335	8.000	8.510
C	0.240	0.260	6.10	6.60
D	0.016	0.021	0.406	0.533
E	0.009	0.125	0.2269	3.180
F	0.016	0.019	0.406	0.533
G	0.190	0.210	4.830	5.33
H	0.028	0.034	0.711	0.864
J	0.029	0.040	0.737	1.020
K	0.500	-	12.700	-
L	0.250	-	6.350	-
M	45° NOM		45° NOM	
P	-	0.050	-	1.270
Q	90° NOM		90° NOM	
R	0.100	-	2.540	-

2N3439(L)-2N3440(L)

NPN SILICON LOW POWER TRANSISTORS

MECHANICAL CHARACTERISTICS

Case	TO-5 (2N3439L, 2N3440L)
Marking	Alpha-numeric
Polarity	See below



Dim	TO-5			
	Inches		Millimeters	
	Min	Max	Min	Max
HD	0.335	0.370	8.510	9.400
CD	0.305	0.335	7.750	8.510
CH	0.240	0.260	6.100	6.600
LL	1.500	-	38.100	-
LD	0.016	0.021	0.410	0.530
LU	0.016	0.019	0.410	0.480
P	0.100	-	2.540	-
TL	0.029	0.045	0.740	1.140
TW	0.028	0.034	0.710	0.860
TH	0.009	0.125	0.230	3.180
LO	0.141 NOM		3.590 NOM	
α	45°TP		45°TP	