MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

Discrete Military Products

DMO

NPN/PNP Complementary Power Transistors

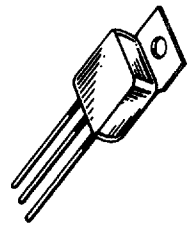
. . . designed for switching and wide amplifier applications

MJT5339
(NPN)
MJT6193
(PNP)

Suffixes:
HX, HXV

Processed per MIL-S-19500/560 & 561

TRANSISTORS NPN/PNP COMPLEMENTARY POWER



CASE 386-01
TO-257AA

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	100	Vdc
Collector-Base Voltage	V_{CBO}	100	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current — Continuous	I_C	5.0	Adc
Base Current	I_B	1.0	Adc
Device Dissipation @ T_C = 25°C MTJ5339 Derate above 25°C MTJ6193 Derate above 25°C	P_T	 6.0 34.3 10 57.1	 W mW/°C W mW/°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	−65 to 200	°C

THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Thermal Resistance — Junction to Case MJT5339 MTJ6193	$R_{\theta JC}$	 29.2 17.5	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage(1) (I_C = 50 mAdc, I_B = 0)	$V_{CEO(sus)}$	100	—	Vdc
Collector Cutoff Current (V_{CE} = 100 Vdc, I_B = 0)	I_{CEO}	—	100	μAdc
Collector Cutoff Current (V_{CE} = 90 Vdc, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = 90 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 150°C)	I_{CEX}	 — —	 10 1.0	 μAdc mAdc
Collector Cutoff Current (V_{CB} = 100 Vdc, I_E = 0)	I_{CBO}	—	10	μAdc
Emitter Cutoff Current (V_{BE} = 6.0 Vdc, I_C = 0)	I_{EBO}	—	100	μAdc

(1) Pulsed. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

(continued)

ELECTRICAL CHARACTERISTICS — continued (T_A = 25°C unless otherwise noted.)

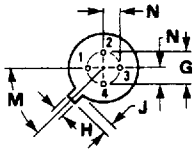
Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS(1)					
DC Current Gain		h_{FE}			—
(I_C = 0.5 Adc, V_{CE} = 2.0 Vdc)			60	—	
(I_C = 2.0 Adc, V_{CE} = 2.0 Vdc)			60	240	
(I_C = 5.0 Adc, V_{CE} = 2.0 Vdc)			40	—	
(I_C = 2.0 Adc, V_{CE} = 2.0 Vdc, T_A = −55°C)			12	—	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 2.0 Adc, I_B = 0.2 Adc)			—	0.7	
(I_C = 5.0 Adc, I_B = 0.5 Adc)			—	1.2	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
(I_C = 2.0 Adc, I_B = 0.2 Adc)			—	1.2	
(I_C = 5.0 Adc, I_B = 0.5 Adc)			—	1.8	
SMALL-SIGNAL CHARACTERISTICS					
Output Capacitance		C_{obo}			pF
(V_{CB} = 10 Vdc, I_E = 0, f = 0.1 to 1.0 MHz)	MJT5339		—	250	
	MJT6193		—	300	
Input Capacitance		C_{ibo}			pF
(V_{BE} = 2.0 Vdc, I_C = 0, f = 0.1 MHz)	MJT5339		—	1000	
	MJT6193		—	1250	
Current Transfer Ratio, Magnitude		$\|h_{fe}\|$	3.0	15	MHz
(I_C = 0.5 Adc, V_{CE} = 10 Vdc, f = 10 MHz)					
SWITCHING CHARACTERISTICS					
Delay Time		t_d	—	100	ns
(V_{CC} = 40 Vdc, I_C = 2.0 Adc, I_B = 0.2 Adc, $V_{BE(off)}$ = 3.0 Vdc)					
Rise Time		t_r	—	100	ns
(V_{CC} = 40 Vdc, I_C = 2.0 Adc, I_B = 0.2 Adc, $V_{BE(off)}$ = 3.0 Vdc)					
Storage Time		t_s	—	2.0	μs
(V_{CC} = 40 Vdc, I_C = 2.0 Adc, I_B = 0.2 Adc)					
Fall Time		t_f	—	200	ns
(V_{CC} = 40 Vdc, I_C = 2.0 Adc, I_B = 0.2 Adc)					

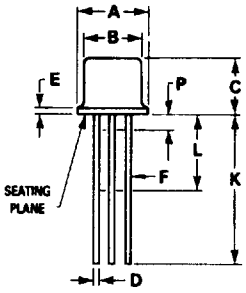
ASSURANCE TESTING (Pre/Post Burn-In)

Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V_{CB} = 100 Vdc)	I_{CBO}	—	10	μAdc
DC Current Gain(1) (I_C = 2.0 Adc, V_{CE} = 2.0 Vdc)	h_{FE}	60	240	

Delta from Pre-Burn-In Measured Values		Min	Max	
Delta Collector Cutoff Current	ΔI_{CBO}	—	±100 or ±1.0 whichever is greater	% of Initial Value μAdc
Delta DC Current Gain(1)	Δh_{FE}	—	±15	% of Initial Value

(1) Pulsed. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.



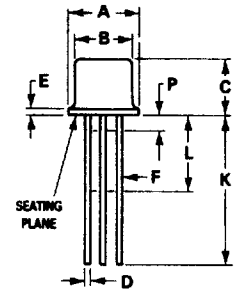


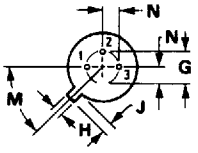
STYLE 10:
PIN 1. EMITTER
2. BASE
3. COLLECTOR
4 CASE

NOTE ALL RULES AND NOTES ASSOCIATED WITH TO-72 OUTLINE SHALL APPLY

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.32	5.33	0.170	0.210
D	0.41	0.53	0.016	0.021
E	—	0.76	—	0.030
F	0.41	0.48	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.91	1.17	0.036	0.046
J	0.71	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

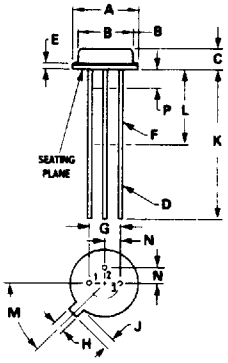
CASE 20-03
TO-206AF
(TO-72)





DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.32	5.33	0.170	0.210
D	0.406	0.533	0.016	0.021
E	—	0.762	—	0.030
F	0.406	0.483	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.914	1.17	0.036	0.046
J	0.711	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

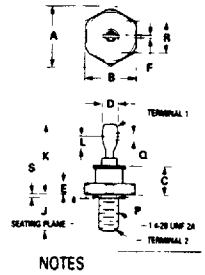
CASE 22-03
TO-206AA
(TO-18)

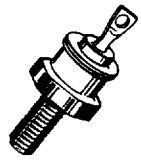


STYLE 1
PIN 1 EMITTER
2 BASE
3 COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	1.65	2.16	0.065	0.085
D	0.406	0.533	0.016	0.021
E	—	1.02	—	0.040
F	0.305	0.483	0.012	0.019
G	2.54 BSC		0.100 BSC	
H	0.914	1.17	0.036	0.046
J	0.711	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

CASE 26-03
TO-206AB
(TO-46)



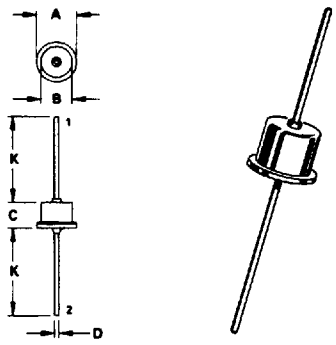


STYLE 1
TERM 1 CATHODE
2 ANODE

NOTES
1 CHAMFER OR UNDERCUT ON ONE OR BOTH ENDS OF HEXAGONAL BASE IS OPTIONAL
2 ANGULAR ORIENTATION AND CONTOUR OF TERMINAL ONE IS OPTIONAL
3. THREADS ARE PLATED
4 DIMENSIONING AND TOLERANCING PER ANSI Y14 5, 1973.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	—	20.07	—	0.790
B	16.94	17.45	0.669	0.687
C	—	11.43	—	0.450
D	—	9.53	—	0.375
E	2.92	5.08	0.115	0.200
F	—	2.03	—	0.080
J	10.72	11.51	0.422	0.453
K	19.05	25.40	0.750	1.00
L	3.96	—	0.156	—
P	5.59	6.32	0.220	0.249
Q	3.56	4.45	0.140	0.175
R	—	16.94	—	0.667
S	—	2.26	—	0.089

CASE 042A-01
DO-203AB

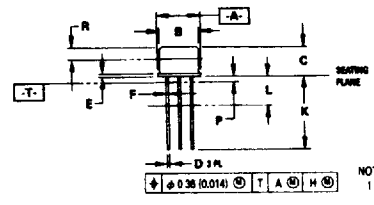


STYLE 1.
PIN 1 CATHODE
2 ANODE

NOTES:
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M, 1982
2 CONTROLLING DIMENSION INCH.

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	—	11.43	—	0.450
B	—	8.89	—	0.350
C	—	7.62	—	0.300
D	1.17	1.42	0.046	0.056
K	24.90	—	0.980	—

CASE 60-01
METAL



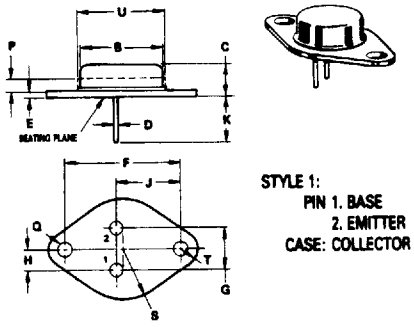
NOTES
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M 1982
2 CONTROLLING DIMENSION INCH
3 DIMENSION J MEASURED FROM DIMENSION A MAXIMUM
4 DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING
5 DIMENSION F APPLIES BETWEEN DIMENSION P AND L DIMENSION D 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 3:
PIN 1. CATHODE
2. GATE
3. ANODE

DIM	MILLIMETERS MIN	MAX	INCHES 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	—

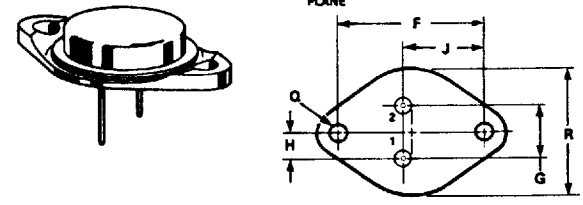
CASE 79-04
TO-205AD
(TO-39)



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

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
B	11.94	12.70	0.470	0.500
C	6.35	8.64	0.250	0.340
D	0.71	0.86	0.028	0.034
E	1.27	1.91	0.050	0.075
F	24.33	24.43	0.958	0.962
G	4.83	5.33	0.190	0.210
H	2.41	2.67	0.095	0.105
J	14.48	14.99	0.570	0.590
K	9.14	—	0.360	—
P	—	1.27	—	0.050
Q	3.61	3.86	0.142	0.152
S	—	8.89	—	0.350
T	—	3.68	—	0.145
U	—	15.75	—	0.620

CASE 80-02
TO-213AA
(TO-66)

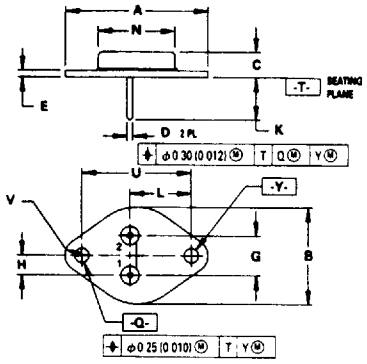


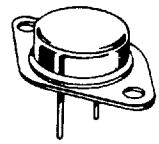
STYLE 1:
PIN 1. BASE
2. EMITTER
CASE. COLLECTOR

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	38.35	39.37	1.510	1.550
B	19.30	21.08	0.760	0.830
C	6.35	7.62	0.250	0.300
D	1.45	1.60	0.057	0.063
E	—	3.43	—	0.135
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.21	5.72	0.205	0.225
J	16.64	17.15	0.655	0.675
K	11.18	12.19	0.440	0.480
Q	3.84	4.19	0.151	0.165
R	24.89	26.67	0.980	1.050

CASE 197-01
TO-204AE
(TO-3)

PACKAGE OUTLINE DIMENSIONS (Continued)



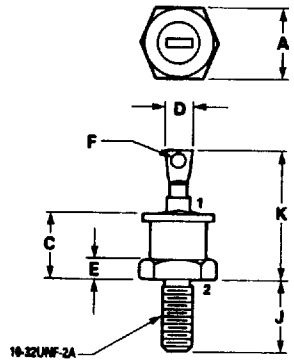


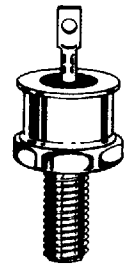
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	38.86 REF		1.530 REF	
B	25.15	26.67	0.990	1.050
C	6.35	8.25	0.250	0.325
D	1.45	1.60	0.057	0.063
E	1.53	1.77	0.060	0.070
G	10.92 BSC		0.430 BSC	
H	5.46 BSC		0.215 BSC	
K	11.18	12.19	0.440	0.480
L	16.89 BSC		0.665 BSC	
N	19.31	21.08	0.760	0.830
Q	3.84	4.19	0.151	0.165
U	30.15 BSC		1.187 BSC	
V	3.33	4.77	0.131	0.188

NOTES
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982
2. CONTROLLING DIMENSION INCH

STYLE 1
PIN 1. BASE
2. EMITTER
CASE. COLLECTOR

CASE 197A-02
TO-204AE
(TO-3)



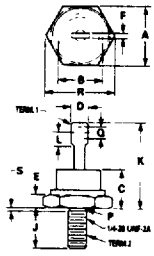


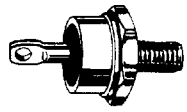
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION INCH.

STYLE 2:
PIN 1. ANODE
2. CATHODE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.75	11.12	0.423	0.438
C	—	10.28	—	0.405
D	4.07	4.69	0.160	0.185
E	1.91	4.44	0.075	0.175
F	2.29	2.41	0.090	0.095
J	10.72	11.50	0.422	0.453
K	18.80	20.32	0.740	0.800

CASE 245A-02
DO-203AA
(DO-4)





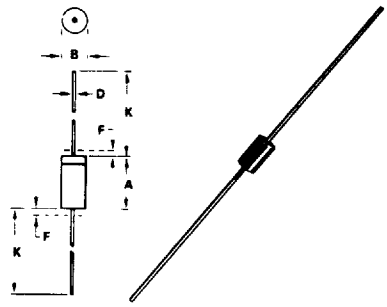
STYLE 1
TERM 1. CATHODE
2. ANODE (CASE)

STYLE 2
TERM 1. ANODE
2. CATHODE (CASE)

NOTES
1. DIM "P" IS DIA
2. CHAMFER OR UNDERCUT ON ONE OR BOTH ENDS OF HEXAGONAL BASE IS OPTIONAL
3. ANGULAR ORIENTATION AND CONTOUR OF TERMINAL ONE IS OPTIONAL
4. THREADS ARE PLATED
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	16.94	17.45	0.669	0.687
B	—	16.94	—	0.667
C	—	11.43	—	0.450
D	—	9.53	—	0.375
E	2.92	5.08	0.115	0.200
F	—	2.03	—	0.080
J	10.72	11.51	0.422	0.453
K	—	25.40	—	1.000
L	3.86	—	0.156	—
P	5.59	6.32	0.220	0.249
Q	3.56	4.45	0.140	0.175
R	—	20.16	—	0.794
S	—	2.26	—	0.089

CASE 257-01
DO-203AB
(DO-5)

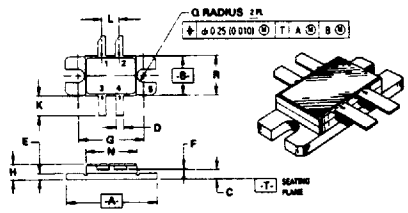


NOTES:
1. PACKAGE CONTOUR OPTIONAL WITHIN A AND B HEAT SLUGS, IF ANY, SHALL BE INCLUDED WITHIN THIS CYLINDER, BUT NOT SUBJECT TO THE MINIMUM LIMIT OF B
2. LEAD DIAMETER NOT CONTROLLED IN ZONE F TO ALLOW FOR FLASH, LEAD FINISH BUILDUP AND MINOR IRREGULARITIES OTHER THAN HEAT SLUGS.
3. POLARITY DENOTED BY CATHODE BAND
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	3.05	5.08	0.120	0.200
B	1.52	2.29	0.060	0.090
D	0.46	0.56	0.018	0.022
F	—	1.27	—	0.050
K	25.40	38.10	1.000	1.500

CASE 299-02
DO-204AH
(DO-35)

PACKAGE OUTLINE DIMENSIONS (Continued)

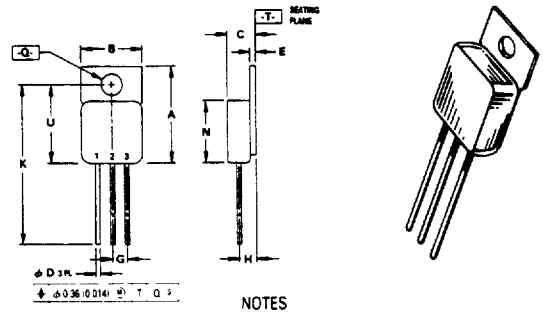


STYLE 1
PIN 1 COLLECTOR
2. COLLECTOR
3. BASE
4 BASE
5. EMITTER

NOTES
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M, 1982.
2 CONTROLLING DIMENSION INCH

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	22.61	23.11	0 890	0 910
B	9 40	10.16	0.370	0.400
C	2 67	3.42	0 105	0 135
D	1 66	2.15	0 065	0 085
E	1 40	1.65	0 055	0.065
F	0 08	0.15	0.003	0.006
G	16.51 BSC		0.650 BSC	
H	3.81	4 44	0.150	0.175
K	4.83	5 33	0.190	0 210
L	3.94	4 82	0.155	0.190
N	12.45	12.95	0.490	0.510
Q	1 53	1 77	0.060	0 070
R	9.91	10 41	0.390	0 410

CASE 382-01



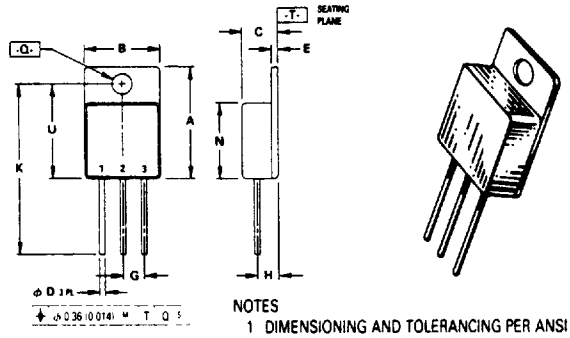
NOTES
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M, 1982
2 CONTROLLING DIMENSION INCH
3 GLASS MENISCUS INCLUDED IN DIMENSION A AND L.

STYLE 1
PIN 1 DRAIN
2. SOURCE
3. GATE
CASE NO CONNECTION

STYLE 2:
PIN 1 BASE
2. COLLECTOR
3. EMITTER
CASE. NO CONNECTION

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	16 39	16 89	0 645	0.665
B	10 42	10.66	0.410	0 420
C	4 83	5.08	0 190	0.200
D	0 64	0 88	0 025	0.035
E	0 89	1.14	0.035	0 045
G	2.54 BSC		0.100 BSC	
H	3.05 BSC		0 120 BSC	
K	26.22	28 75	1.032	1 132
N	10.42	10 92	0 410	0.420
Q	3.56	3 81	0 140	0 150
U	13 39	13 63	0 527	0 537

CASE 386-01
TO-257AA

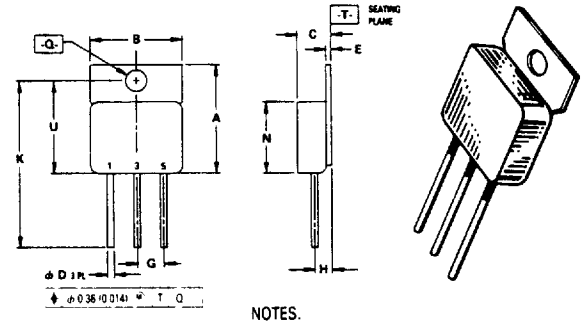


NOTES
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M, 1982
2. CONTROLLING DIMENSION INCH.
3 GLASS MENISCUS INCLUDED IN DIMENSION A AND L.

STYLE 1
PIN 1 DRAIN
2 SOURCE
3 GATE
CASE· NO CONNECTION

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	20.07	20 32	0 790	0 800
B	13 59	13.84	0.535	0.545
C	6 33	6.60	0.249	0.260
D	0.89	1 14	0 035	0.045
E	10.16	12 70	0.040	0 050
G	3.81 BSC		0.150 BSC	
H	3 81 BSC		0 150 BSC	
K	30 36	31 36	1.195	1 235
N	13 59	13.84	0 535	0 545
Q	3.54	3.78	0 139	0 149
U	16.90	17.39	0.665	0 685

CASE 387-01
TO-254AA



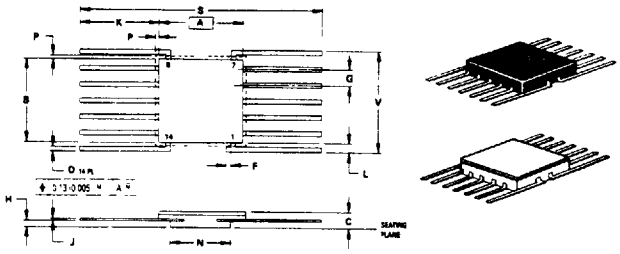
NOTES.
1 DIMENSIONING AND TOLERANCING PER ANSI Y14 5M, 1982
2 CONTROLLING DIMENSION INCH
3 GLASS MENISCUS INCLUDED IN DIMENSION A AND L

STYLE 1
PIN 1 DRAIN
3 SOURCE
5. GATE
CASE NO CONNECTION

STYLE 2·
PIN 1 BASE
3 COLLECTOR
5 EMITTER
CASE NO CONNECTION

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	20.71	21 20	0 815	0 835
B	17 40	17 65	0 685	0 695
C	6 10	6 85	0 240	0 270
D	1 40	1 65	0 055	0.065
E	0 89	1 14	0 035	0 045
G	5 08 BSC		0 200 BSC	
H	3.56 BSC		0 140 BSC	
K	30 54	33.07	1 202	1 302
N	13.47	13.97	0.530	0 550
Q	3.94	4.19	0 155	0 165
U	17 71	17.95	0 697	0 707

CASE 388A-02
TO-258AA



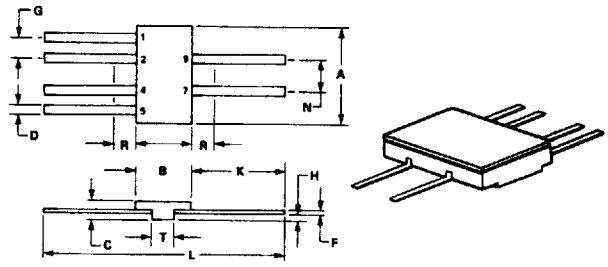
NOTES.
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982
2. CONTROLLING DIMENSION: INCH
3. DIMENSIONS P DETERMINE ZONE WITHIN WHICH ALL BODY AND LEAD IRREGULARITIES LIE

STYLE 2
- PIN 1 COLLECTOR (NPN)
- 2 BASE (NPN)
- 3 EMITTER (NPN)
- 4 NOT CONNECTED
- 5 EMITTER (PNP)
- 6 BASE (PNP)
- 7 COLLECTOR (PNP)
- 8 COLLECTOR (PNP)
- 9 BASE (PNP)
- 10 EMITTER (PNP)
- 11 NOT CONNECTED
- 12 EMITTER (NPN)
- 13 BASE (NPN)
- 14 COLLECTOR (NPN)

(Parenthetical Polarities are for Complementary Quads – MQ6002)

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	6.10	6.98	0.240	0.275
B	6.10	6.98	0.240	0.275
C	0.77	1.77	0.030	0.070
D	0.26	0.48	0.010	0.019
F	—	0.38	—	0.015
G	1.27 BSC		0.050 BSC	
H	0.13	0.88	0.005	0.035
J	0.08	0.015	0.003	0.006
K	6.35	—	0.250	—
L	0.26	—	0.010	—
N	4.45	4.95	0.175	0.195
P	—	0.38	—	0.015
S	18.80	—	0.740	—
V	7.62	8.38	0.300	0.330

CASE 607-04

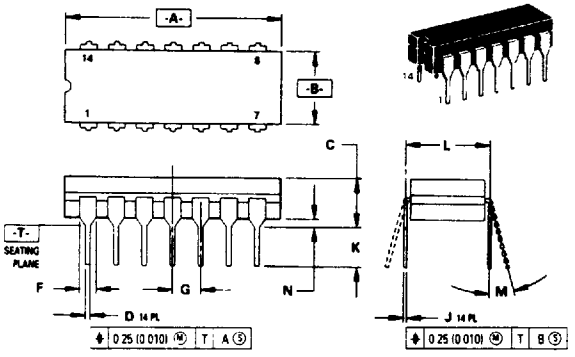


NOTES:
1. DIM "D," "G" & "N" TO BE MEASURED IN ZONE "R."
2. LEADS WITHIN 0.13 mm (0.005) TOTAL OF TRUE POSITION WITHIN "R" AT MAXIMUM MATERIAL CONDITION.

STYLE 1:
- PIN 1. BASE
- 2. EMITTER
- 4. EMITTER
- 5. BASE
- 7. COLLECTOR
- 9. COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	6.10	7.37	0.240	0.290
B	2.92	4.06	0.115	0.160
C	0.76	2.03	0.030	0.070
D	0.36	0.48	0.014	0.019
F	0.08	0.15	0.003	0.006
G	1.27 BSC		0.050 BSC	
H	0.13	0.89	0.005	0.035
K	3.81	—	0.150	—
L	10.54	—	0.415	—
N	2.54 BSC		0.100 BSC	
R	—	1.27	—	0.050
T	1.65	2.03	0.065	0.080

CASE 610A-04

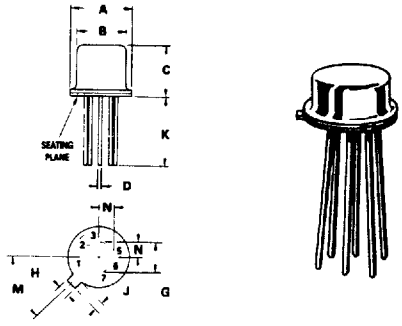


NOTES
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M 1982
2. CONTROLLING DIMENSION: INCH
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
4. DIM F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	19.05	19.94	0.750	0.785
B	6.23	7.11	0.245	0.280
C	3.94	5.08	0.155	0.200
D	0.39	0.50	0.015	0.020
F	1.40	1.65	0.055	0.065
G	2.54 BSC		0.100 BSC	
J	0.21	0.38	0.008	0.015
K	3.18	4.31	0.125	0.170
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	0.51	1.01	0.020	0.040

STYLE 1
- PIN 1 COLLECTOR
- 2 BASE
- 3 EMITTER
- 4 NO CONNECTION
- 5 EMITTER
- 6 BASE
- 7 COLLECTOR
- 8 COLLECTOR
- 9. BASE
- 10 EMITTER
- 11 NO CONNECTION
- 12 EMITTER
- 13 BASE
- 14. COLLECTOR

CASE 632-08
(TO-116)



STYLE 1:
- PIN 1. COLLECTOR
- 2. BASE
- 3. EMITTER
- 4. OMITTED
- 5. EMITTER
- 6. BASE
- 7. COLLECTOR
- 8. OMITTED

STYLE 5:
- SIDE 1 (NPN)
- PIN 1. COLLECTOR
- 2. BASE
- 3. EMITTER
- 4. OMITTED

SIDE 2 (PNP)
- 5. EMITTER
- 6. BASE
- 7. COLLECTOR
- 8. OMITTED

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	8.51	9.40	0.335	0.370
B	7.75	8.51	0.305	0.335
C	3.81	4.70	0.150	0.185
D	0.41	0.53	0.016	0.021
G	5.08 BSC		0.200 BSC	
H	0.71	0.86	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	—	0.500	—
M	45° BSC		45° BSC	
N	2.54 BSC		0.100 BSC	

CASE 654-07
(TO-78)