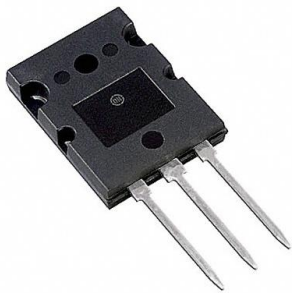


# MJL4302AG Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	MJL4302AG-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	MJL4302AG
Description	TRANS PNP 350V 15A TO264
Detailed Description	Bipolar (BJT) Transistor PNP 350 V 15 A 35MHz 230 W Through Hole TO-264



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

DiGi is a global authorized distributor of electronic components.

## Purchase and inquiry

Manufacturer Product Number:

MJL4302AG

Series:

-

Transistor Type:

PNP

Voltage - Collector Emitter Breakdown (Max):

350 V

Current - Collector Cutoff (Max):

100µA

Power - Max:

230 W

Operating Temperature:

-65°C ~ 150°C (TJ)

Package / Case:

TO-264-3, TO-264AA

Base Product Number:

MJL4302

Manufacturer:

onsemi

Product Status:

Active

Current - Collector (Ic) (Max):

15 A

Vce Saturation (Max) @ Ib, Ic:

1V @ 800mA, 8A

DC Current Gain (hFE) (Min) @ Ic, Vce:

80 @ 5A, 5V

Frequency - Transition:

35MHz

Mounting Type:

Through Hole

Supplier Device Package:

TO-264

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0075

Moisture Sensitivity Level (MSL):

Not Applicable

ECCN:

EAR99



# Complementary NPN-PNP Silicon Power Bipolar Transistors

## MJL4281A (NPN) MJL4302A (PNP)

The MJL4281A and MJL4302A are power transistors for high power audio.

### Features

- 350 V Collector–Emitter Sustaining Voltage
- Gain Complementary:
  - Gain Linearity from 100 mA to 5 A
  - High Gain – 80 to 240
  - $h_{FE} = 50$  (min) @  $I_C = 8$  A
- Low Harmonic Distortion
- High Safe Operation Area – 1.0 A/100 V @ 1 Second
- High  $f_T$
- Pb–Free Packages are Available\*

### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	350	Vdc
Collector–Base Voltage	$V_{CBO}$	350	Vdc
Emitter–Base Voltage	$V_{EBO}$	5.0	Vdc
Collector–Emitter Voltage – 1.5 V	$V_{CEX}$	350	Vdc
Collector Current – Continuous – Peak (Note 1)	$I_C$	15 30	Adc
Base Current – Continuous	$I_B$	1.5	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	230 1.84	W $^\circ\text{C}/\text{W}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	–65 to +150	$^\circ\text{C}$

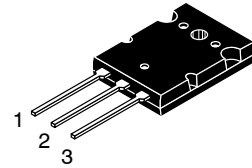
### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	0.54	$^\circ\text{C}/\text{W}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

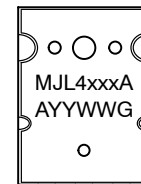
1. Pulse Test: Pulse Width = 5 ms, Duty Cycle < 10%.

**15 AMPERES  
COMPLEMENTARY SILICON  
POWER TRANSISTORS  
350 VOLTS, 230 WATTS**



TO–264  
CASE 340G  
STYLE 2

### MARKING DIAGRAM



1 BASE 3 EMITTER  
2 COLLECTOR

xxx = 281 or 302  
A = Assembly Location  
YY = Year  
WW = Work Week  
G = Pb–Free Package

### ORDERING INFORMATION

Device	Package	Shipping
MJL4281A	TO–264	25 Units/Rail
MJL4281AG	TO–264 (Pb–Free)	25 Units/Rail
MJL4302A	TO–264	25 Units/Rail
MJL4302AG	TO–264 (Pb–Free)	25 Units/Rail

\*For additional information on our Pb–Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

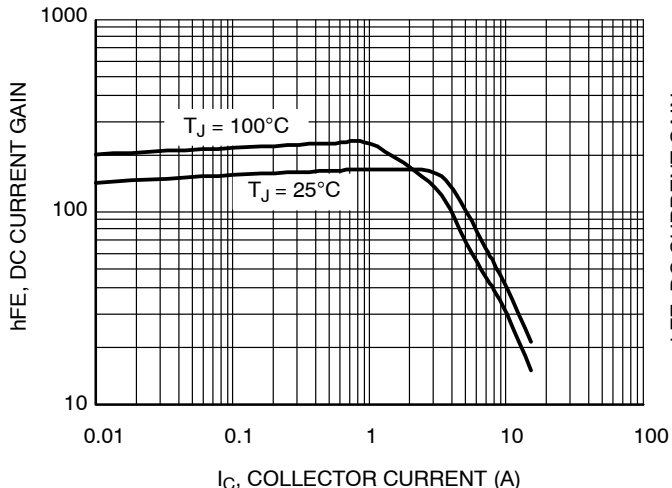
**MJL4281A (NPN) MJL4302A (PNP)****ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector Emitter Sustaining Voltage ( $I_C = 50\text{ mA}$ , $I_B = 0$ )	$V_{CE(sus)}$	350		Vdc
Collector Cut-off Current ( $V_{CE} = 200\text{ V}$ , $I_B = 0$ )	$I_{CEO}$		100	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CB} = 350\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	50	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	-	5.0	$\mu\text{Adc}$
<b>SECOND BREAKDOWN</b>				
Second Breakdown Collector with Base Forward Biased ( $V_{CE} = 50\text{ Vdc}$ , $t = 1.0\text{ s}$ (non-repetitive)) ( $V_{CE} = 100\text{ Vdc}$ , $t = 1.0\text{ s}$ (non-repetitive))	$I_{S/b}$	4.5 1.0	- -	Adc
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 3.0\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 5.0\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 8.0\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 15\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$h_{FE}$	80 80 80 80 50 10	250 250 250 250 - -	-
Collector-Emitter Saturation Voltage ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.8\text{ Adc}$ )	$V_{CE(sat)}$	-	1.0	Vdc
Emitter-Base Saturation Voltage ( $I_C = 8.0\text{ Adc}$ , $I_B = 0.8\text{ A}$ )	$V_{BE(sat)}$	-	1.4	Vdc
Base-Emitter ON Voltage ( $I_C = 8.0\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$V_{BE(on)}$	-	1.5	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current-Gain - Bandwidth Product ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f_{test} = 1.0\text{ MHz}$ )	$f_T$	35	-	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f_{test} = 1.0\text{ MHz}$ )	$C_{ob}$	-	600	pF

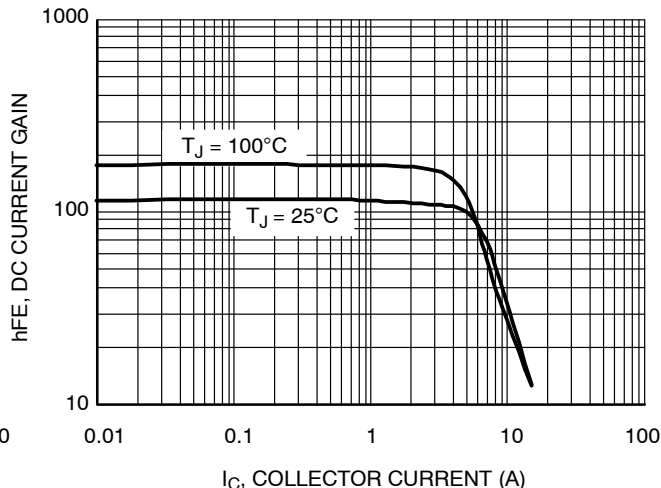
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

**MJL4281A (NPN) MJL4302A (PNP)**

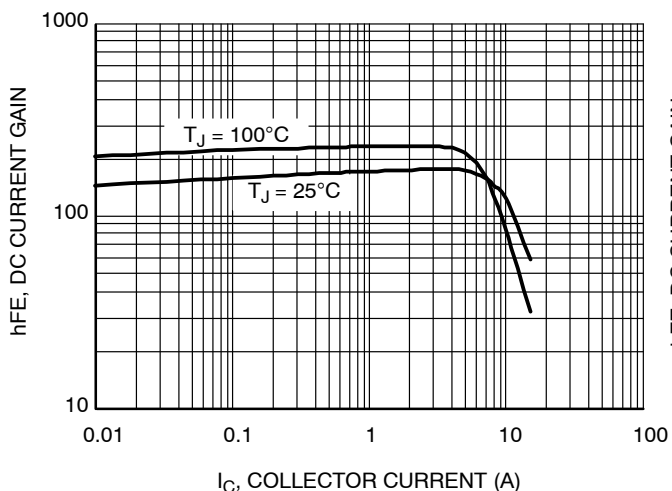
**TYPICAL CHARACTERISTICS**



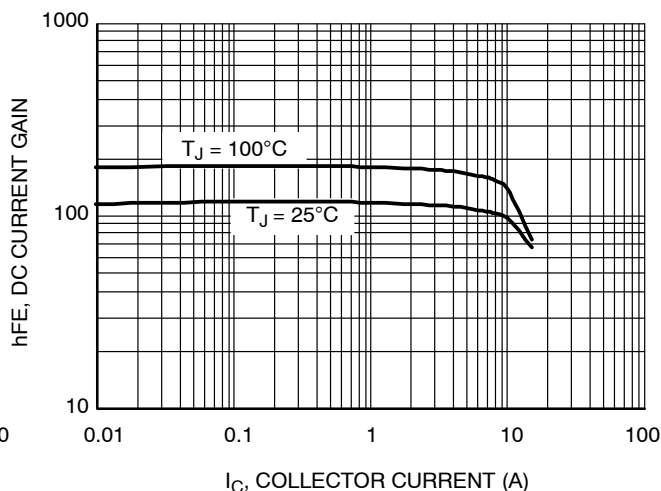
**Figure 1. DC Current Gain,  $V_{CE} = 5\text{ V}$ , NPN MJL4281A**



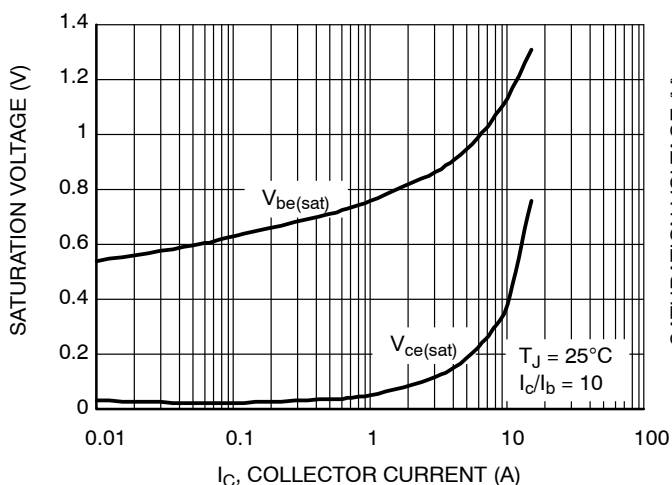
**Figure 2. DC Current Gain,  $V_{CE} = 5\text{ V}$ , PNP MJL4302A**



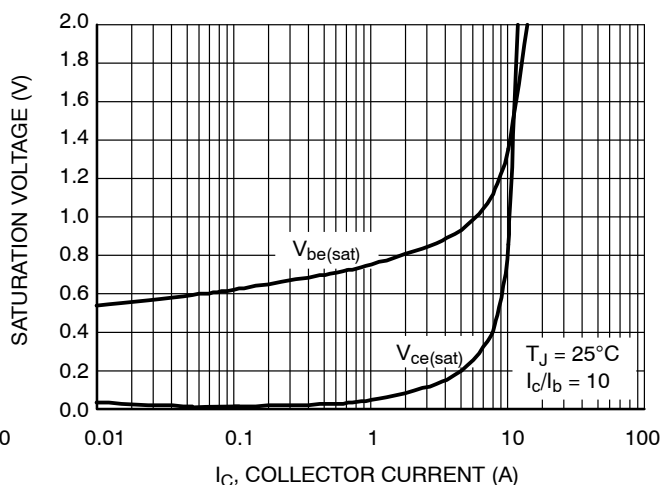
**Figure 3. DC Current Gain,  $V_{CE} = 20\text{ V}$ , NPN MJL4281A**



**Figure 4. DC Current Gain,  $V_{CE} = 20\text{ V}$ , PNP MJL4302A**



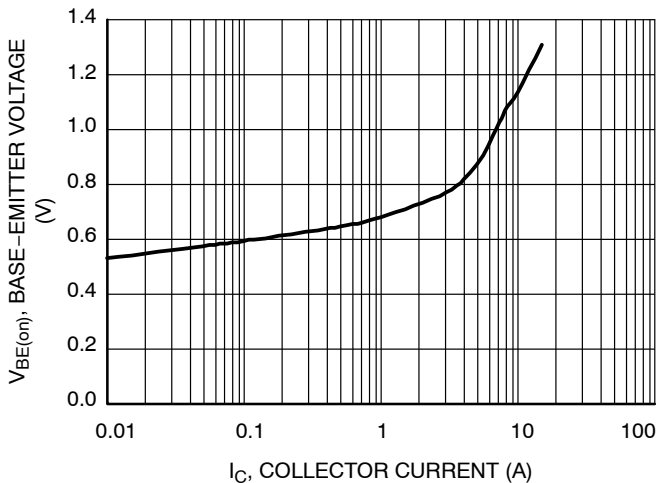
**Figure 5. Typical Saturation Voltage, NPN MJL4281A**



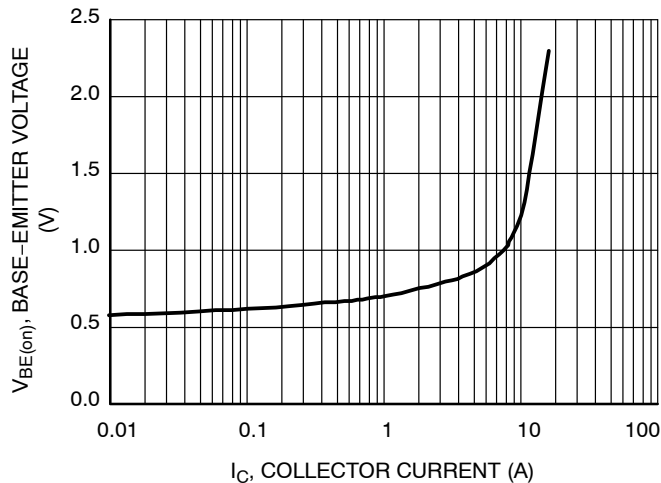
**Figure 6. Typical Saturation Voltage, PNP MJL4302A**

**MJL4281A (NPN) MJL4302A (PNP)**

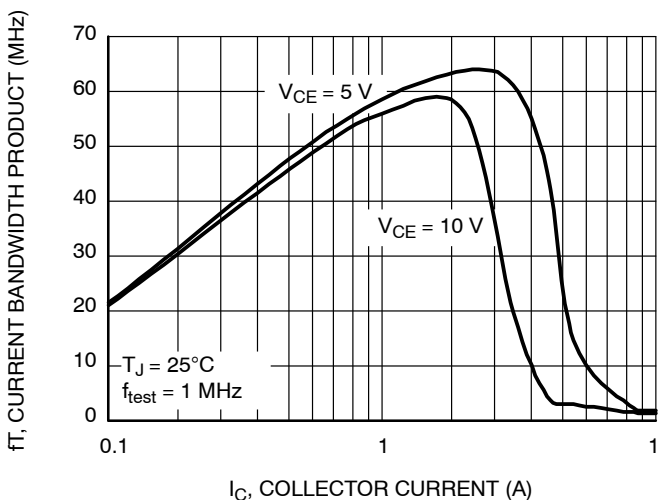
**TYPICAL CHARACTERISTICS**



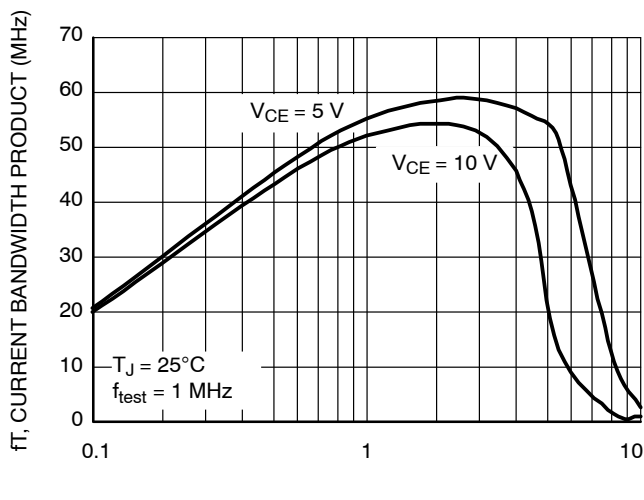
**Figure 7. Typical Base-Emitter Voltages, NPN MJL4281A**



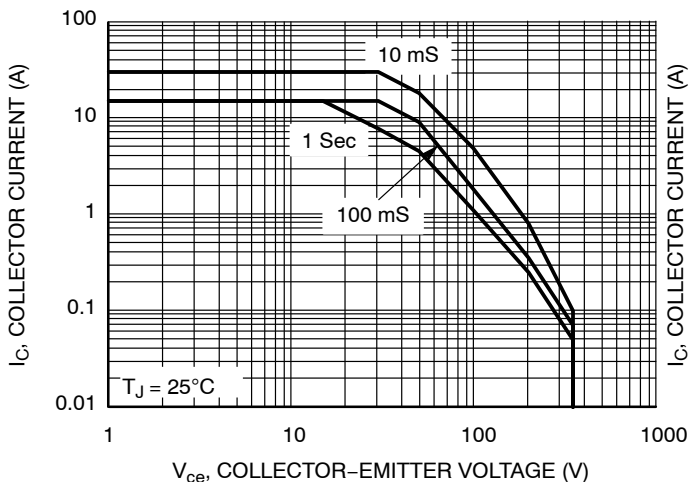
**Figure 8. Typical Base-Emitter Voltages, PNP MJL4302A**



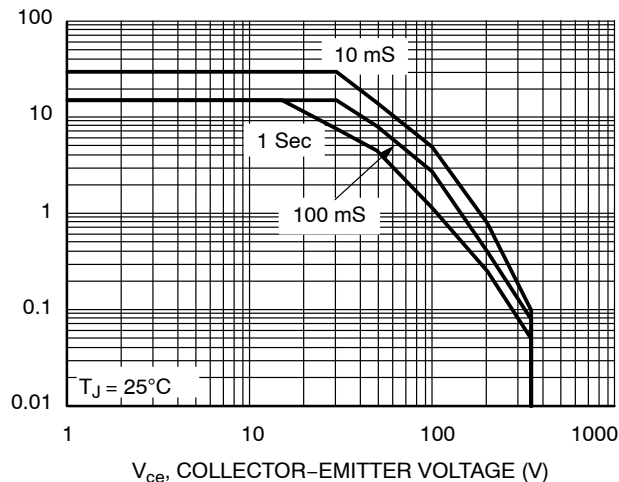
**Figure 9. Typical Current Gain Bandwidth Product, NPN MJL4281A**



**Figure 10. Typical Current Gain Bandwidth Product, PNP MJL4302A**



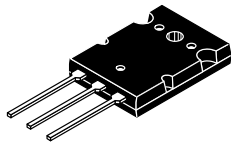
**Figure 11. Active Region Safe Operating Area, NPN MJL4281A**



**Figure 12. Active Region Safe Operating Area, PNP MJL4302A**



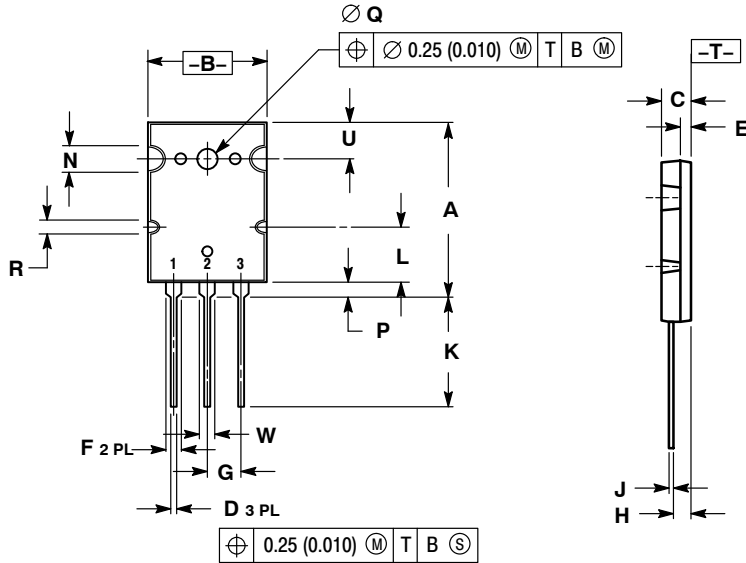
**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**



**TO-3BPL (TO-264)**  
CASE 340G-02  
ISSUE J

DATE 17 DEC 2004

SCALE 1:2

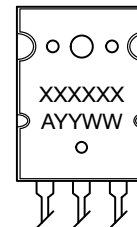


- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	28.0	29.0	1.102	1.142
B	19.3	20.3	0.760	0.800
C	4.7	5.3	0.185	0.209
D	0.93	1.48	0.037	0.058
E	1.9	2.1	0.075	0.083
F	2.2	2.4	0.087	0.102
G	5.45 BSC		0.215 BSC	
H	2.6	3.0	0.102	0.118
J	0.43	0.78	0.017	0.031
K	17.6	18.8	0.693	0.740
L	11.2 REF		0.411 REF	
N	4.35 REF		0.172 REF	
P	2.2	2.6	0.087	0.102
Q	3.1	3.5	0.122	0.137
R	2.25 REF		0.089 REF	
U	6.3 REF		0.248 REF	
W	2.8	3.2	0.110	0.125

**GENERIC  
MARKING DIAGRAM\***

- |  |   |  |  |   |
|--|---|--|--|---|
| STYLE 1:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE | STYLE 2:<br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER | STYLE 3:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN | STYLE 4:<br>PIN 1. DRAIN<br>2. SOURCE<br>3. GATE | STYLE 5:<br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER |
|--|---|--|--|---|



- XXXXXX = Specific Device Code  
A = Location Code  
YY = Year  
WW = Work Week

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

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<b>DESCRIPTION:</b>	<b>TO-3BPL (TO-264)</b>	<b>PAGE 1 OF 1</b>

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