



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# TCA0372, TCA0372B, NCV0372B



ON Semiconductor®

<http://onsemi.com>

## 1.0 A Output Current, Dual Power Operational Amplifiers

The TCA0372 is a monolithic circuit intended for use as a power operational amplifier in a wide range of applications, including servo amplifiers and power supplies. No deadband crossover distortion provides better performance for driving coils.

### Features

- Output Current to 1.0 A
- Slew Rate of 1.3 V/ $\mu$ s
- Wide Bandwidth of 1.1 MHz
- Internal Thermal Shutdown
- Single or Split Supply Operation
- Excellent Gain and Phase Margins
- Common Mode Input Includes Ground
- Zero Deadband Crossover Distortion
- NCV devices are AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

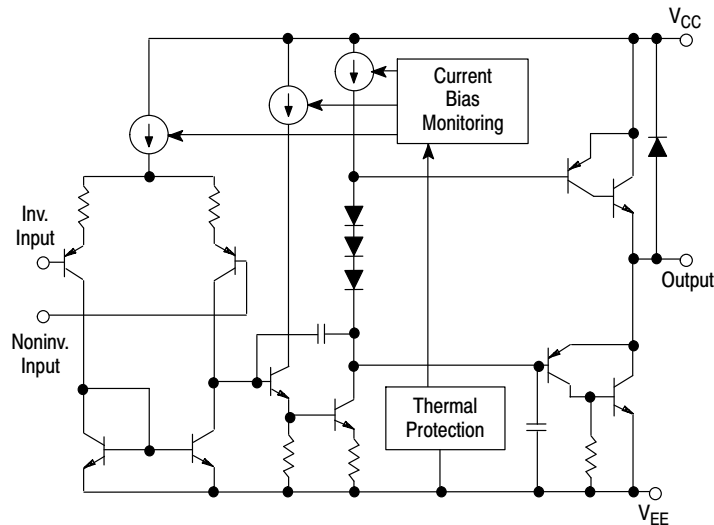
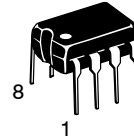
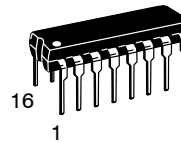


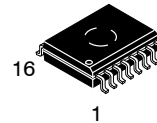
Figure 1. Representative Block Diagram



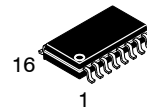
PDIP-8  
DP1 SUFFIX  
CASE 626



PDIP-16  
DP2 SUFFIX  
CASE 648



SOIC-16W  
DW SUFFIX  
CASE 751G



SOEIAJ-16  
DM2 SUFFIX  
CASE 966

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

### DEVICE MARKING INFORMATION

See general marking information in the device marking section on page 6 of this data sheet.

# TCA0372, TCA0372B, NCV0372B

## MAXIMUM RATINGS

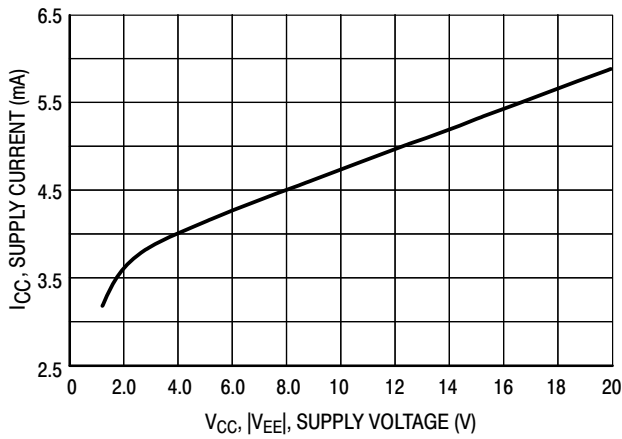
Rating	Symbol	Value	Unit
Supply Voltage (from $V_{CC}$ to $V_{EE}$ )	$V_S$	40	V
Input Differential Voltage Range	$V_{IDR}$	Note 1	V
Input Voltage Range	$V_{IR}$	Note 1	V
Junction Temperature (Note 2)	$T_J$	+150	°C
Operating Temperature Range	$T_A$	-40 to +125	°C
Storage Temperature Range	$T_{stg}$	-55 to +150	°C
DC Output Current	$I_O$	1.0	A
Peak Output Current (Nonrepetitive)	$I_{(max)}$	1.5	A
Thermal Resistance, Junction-to-Air Case 626 Case 648 Case 751G	$R_{\theta JA}$	137 72 80	°C/W
Thermal Resistance, Junction-to-Case Case 626 Case 648 Case 751G	$R_{\theta JC}$	23 10 12	°C/W

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

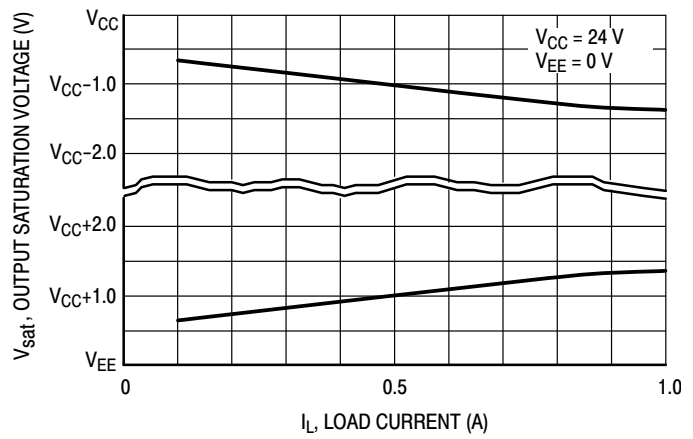
1. Either or both input voltages should not exceed the magnitude of  $V_{CC}$  or  $V_{EE}$ .
2. Power dissipation must be considered to ensure maximum junction temperature ( $T_J$ ) is not exceeded.



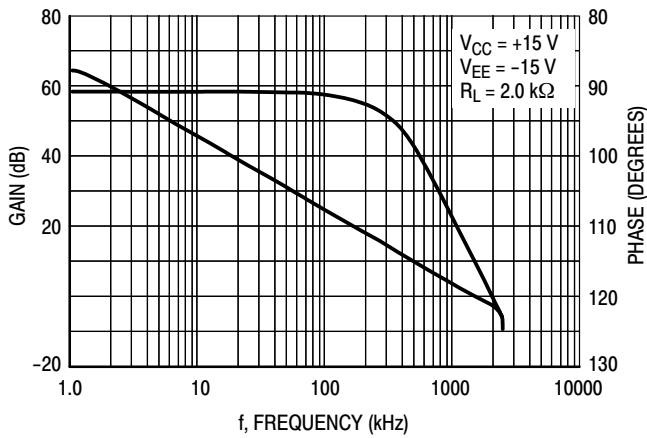
# TCA0372, TCA0372B, NCV0372B



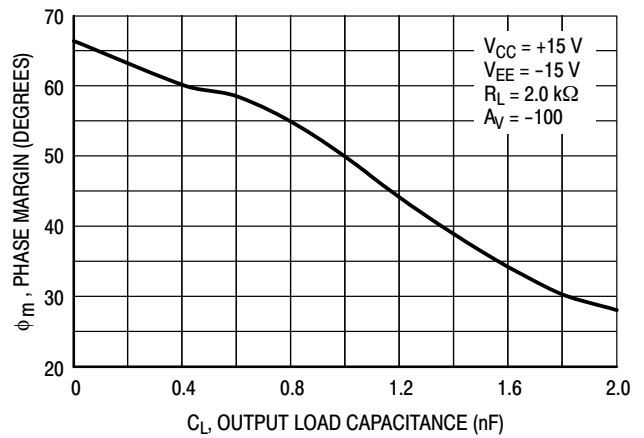
**Figure 2. Supply Current versus Supply Voltage with No Load**



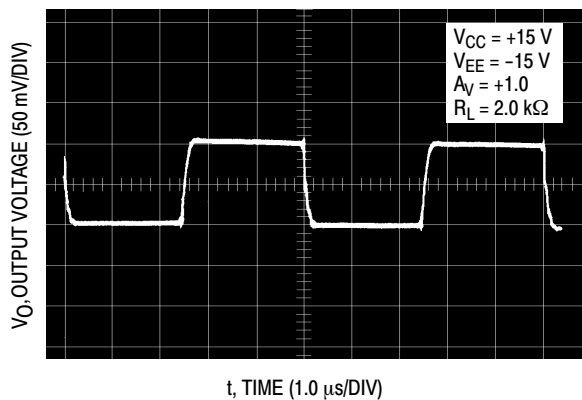
**Figure 3. Output Saturation Voltage versus Load Current**



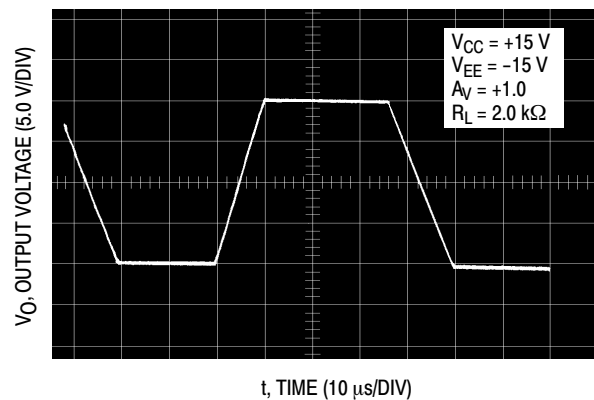
**Figure 4. Voltage Gain and Phase versus Frequency**



**Figure 5. Phase Margin versus Output Load Capacitance**

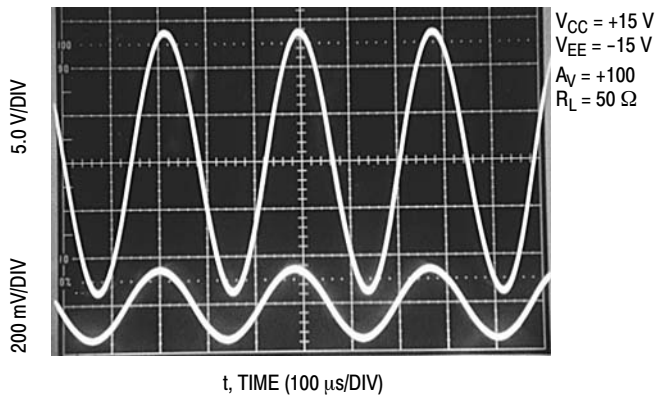


**Figure 6. Small Signal Transient Response**

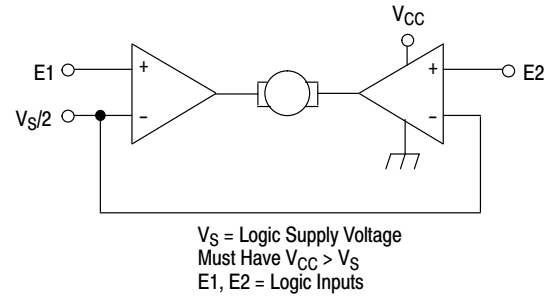


**Figure 7. Large Signal Transient Response**

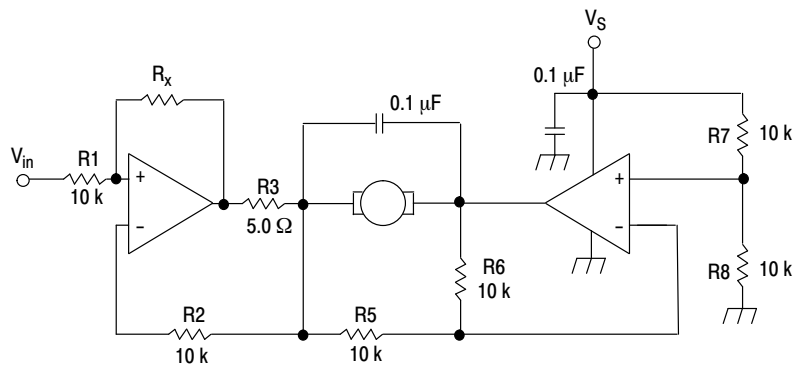
# TCA0372, TCA0372B, NCV0372B



**Figure 8. Sine Wave Response**



**Figure 9. Bidirectional DC Motor Control with Microprocessor-Compatible Inputs**



For circuit stability, ensure that  $R_x > \frac{2R_3 \cdot R_1}{R_M}$  where,  $R_M$  = internal resistance of motor.  
 The voltage available at the terminals of the motor is:  $V_M = 2(V_1 - \frac{V_S}{2}) + |R_{O1}| \cdot I_M$   
 where,  $|R_{O1}| = \frac{2R_3 \cdot R_1}{R_x}$  and  $I_M$  is the motor current.

**Figure 10. Bidirectional Speed Control of DC Motors**

# TCA0372, TCA0372B, NCV0372B

## ORDERING INFORMATION

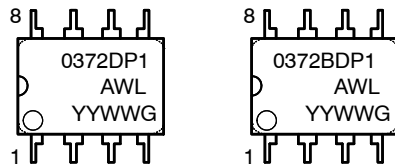
Device	Package	Shipping†
TCA0372DWG	SOIC-16W (Pb-Free)	47 Units / Rail
TCA0372DWR2G	SOIC-16W (Pb-Free)	1000 / Tape & Reel
TCA0372BDWR2G	SOIC-16W (Pb-Free)	1000 / Tape & Reel
NCV0372BDWR2G*	SOIC-16W (Pb-Free)	1000 / Tape & Reel
TCA0372DP1G	PDIP-8 (Pb-Free)	50 Units / Rail
TCA0372BDP1G	PDIP-8 (Pb-Free)	50 Units / Rail
TCA0372DP2G	PDIP-16 (Pb-Free)	25 Units / Rail
TCA0372DM2ELG	SOEIAJ-16 (Pb-Free)	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*AEC-Q100 Qualified and PPAP Capable

## MARKING DIAGRAMS

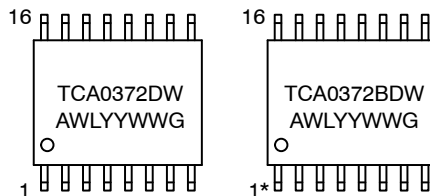
**PDIP-8**  
**DP1 SUFFIX**  
**CASE 626**



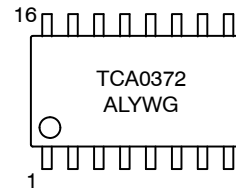
**PDIP-16**  
**DP2 SUFFIX**  
**CASE 648**



**SOIC-16W**  
**DW SUFFIX**  
**CASE 751G**



**SOEIAJ-16**  
**DM2 SUFFIX**  
**CASE 966**

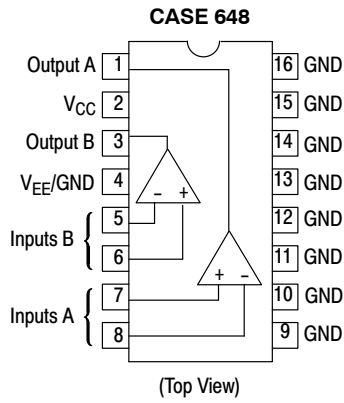


\*Also applies to NCV0372BDWR2G.

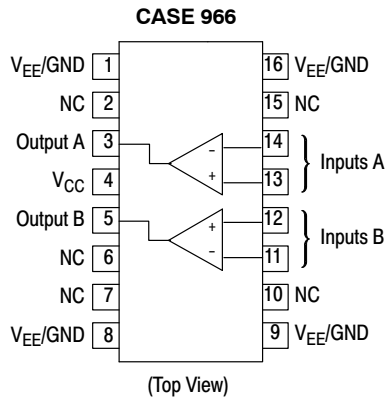
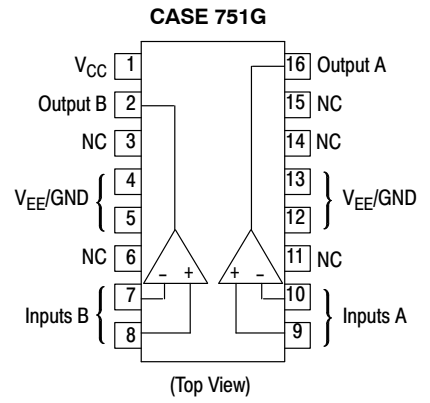
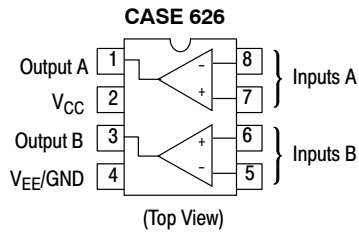
A = Assembly Location  
 WL, L = Wafer Lot  
 YY, Y = Year  
 WW, W = Work Week  
 G = Pb-Free Package

# TCA0372, TCA0372B, NCV0372B

## PIN CONNECTIONS



\*Pins 4 and 9 to 16 are internally connected.

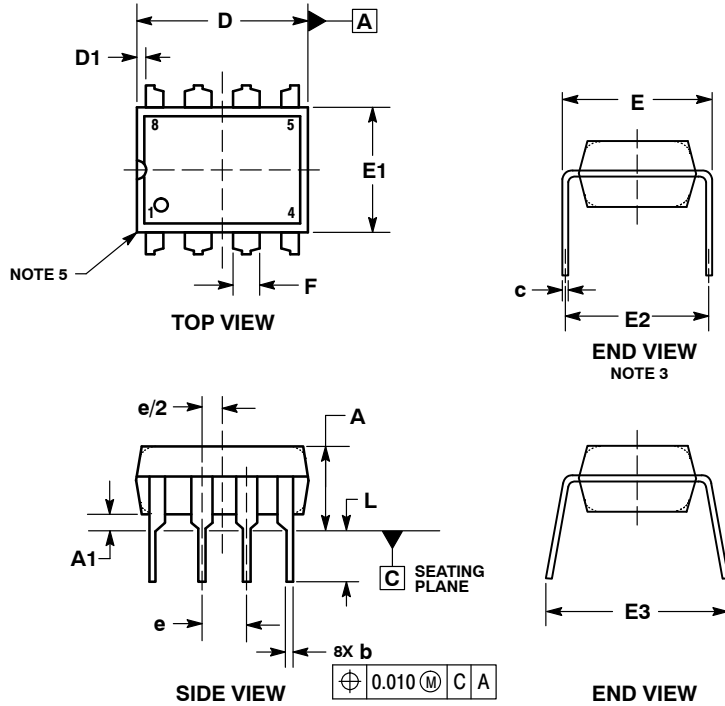




# TCA0372, TCA0372B, NCV0372B

## PACKAGE DIMENSIONS

### PDIP-8 DP1 SUFFIX CASE 626-05 ISSUE M

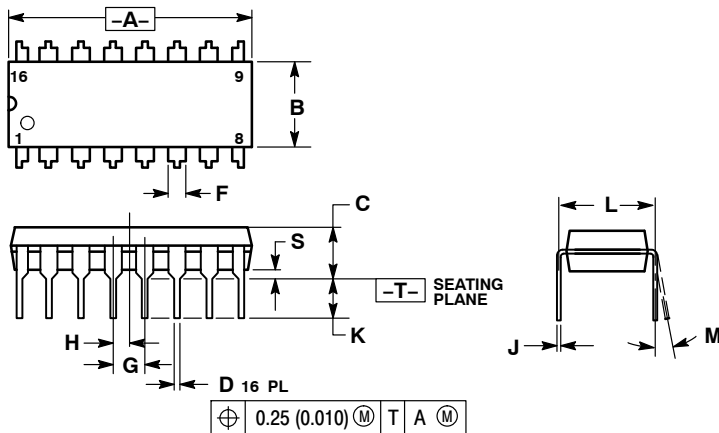


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION E IS MEASURED WITH THE LEADS RESTRAINED PARALLEL AT WIDTH E2.
4. DIMENSION E1 DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	----	----	0.210	----	----	5.33
A1	0.015	----	----	0.38	----	----
b	0.014	0.018	0.022	0.35	0.46	0.56
C	0.008	0.010	0.014	0.20	0.25	0.36
D	0.355	0.365	0.400	9.02	9.27	10.02
D1	0.005	----	----	0.13	----	----
E	0.300	0.310	0.325	7.62	7.87	8.26
E1	0.240	0.250	0.280	6.10	6.35	7.11
E2	0.300 BSC			7.62 BSC		
E3	----	----	0.430	----	----	10.92
e	0.100 BSC			2.54 BSC		
L	0.115	0.130	0.150	2.92	3.30	3.81

### PDIP-16 DP2 SUFFIX CASE 648-08 ISSUE T



NOTES:

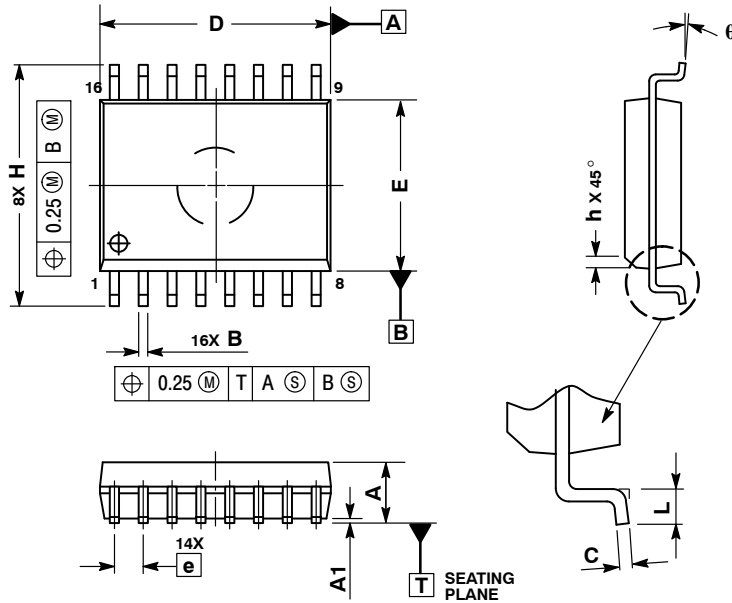
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0°	10°	0°	10°
S	0.020	0.040	0.51	1.01

# TCA0372, TCA0372B, NCV0372B

## PACKAGE DIMENSIONS

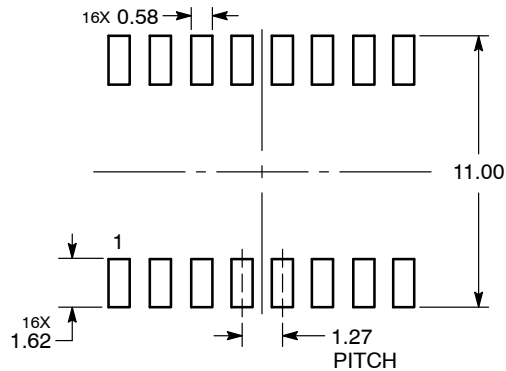
SOIC-16 WB  
CASE 751G-03  
ISSUE D



- NOTES:
1. DIMENSIONS ARE IN MILLIMETERS.
  2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
  3. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
  5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS	
	MIN	MAX
A	2.35	2.65
A1	0.10	0.25
B	0.35	0.49
C	0.23	0.32
D	10.15	10.45
E	7.40	7.60
e	1.27 BSC	
H	10.05	10.55
h	0.25	0.75
L	0.50	0.90
q	0°	7°

### SOLDERING FOOTPRINT\*

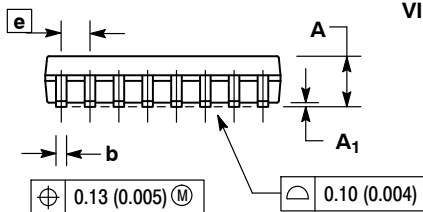
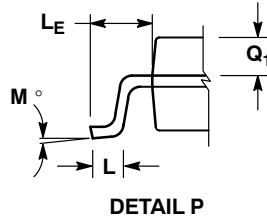
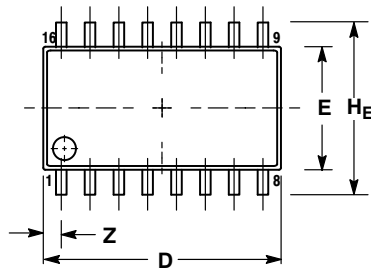


DIMENSIONS: MILLIMETERS

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

# TCA0372, TCA0372B, NCV0372B

SOEIAJ-16  
DM2 SUFFIX  
CASE 966  
ISSUE A



**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS AND ARE MEASURED AT THE PARTING LINE. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
5. THE LEAD WIDTH DIMENSION (b) DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE LEAD WIDTH DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSIONS AND ADJACENT LEAD TO BE 0.46 (0.018).

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	---	2.05	---	0.081
A <sub>1</sub>	0.05	0.20	0.002	0.008
b	0.35	0.50	0.014	0.020
c	0.10	0.20	0.007	0.011
D	9.90	10.50	0.390	0.413
E	5.10	5.45	0.201	0.215
e	1.27 BSC		0.050 BSC	
H <sub>E</sub>	7.40	8.20	0.291	0.323
L	0.50	0.85	0.020	0.033
L <sub>E</sub>	1.10	1.50	0.043	0.059
M	0°	10°	0°	10°
Q <sub>1</sub>	0.70	0.90	0.028	0.035
Z	---	0.78	---	0.031

**ON Semiconductor** and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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 special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC 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 SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

**PUBLICATION ORDERING INFORMATION**

**LITERATURE FULFILLMENT:**  
Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local Sales Representative