

LM392

Low Power Operational Amplifier and Comparator

The LM392 contains two functions: an op amp and a comparator. Both devices can operate on single-supply power and both have a common-mode range down to ground. Operation from split power supplies is also possible. Low power-supply current is independent of the supply voltage level. The output of the comparator interfaces directly with either TTL or CMOS logic. Low quiescent current makes the LM392 ideal for portable equipment.

Features

- Wide Power-Supply Range: 3 V to 32 V
- Low Input Offset Voltage: 2 mV
- Low Quiescent Current: 600 μ A
- Input CMV Range includes GND
- Op Amp is Unity Gain Stable
- These Devices are Pb-Free and are RoHS Compliant

Typical Applications

- Level Detectors
- Voltage Controlled Oscillators
- Transducer Amplifiers

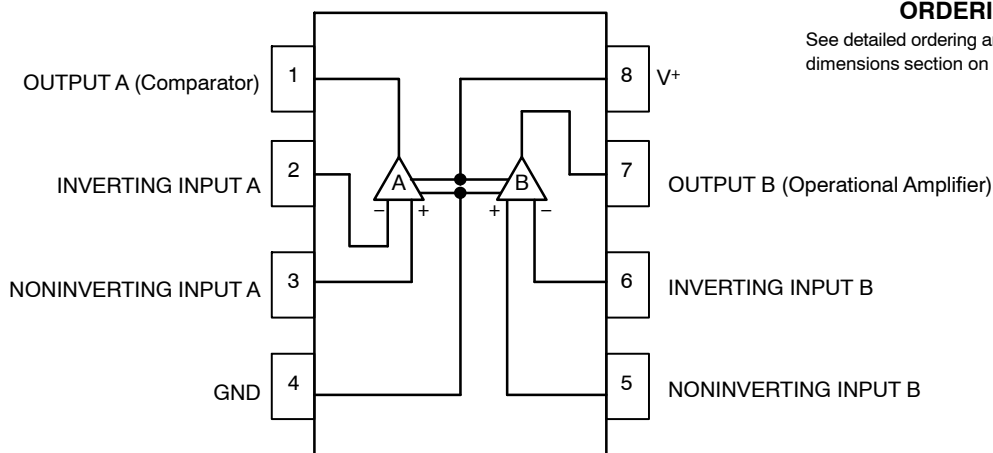


Figure 1. Logic Diagram and Pinout



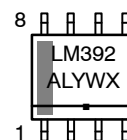
ON Semiconductor®

<http://onsemi.com>



SOIC-8 NB
CASE 751

MARKING DIAGRAM



XXXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb-Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

LM392

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage	V_S	32 or ± 16	V
Differential Input Voltage	V_{IDR}	32	V
Input Voltage	V_I	0.3 to 32	V
Output Short – Circuit to Ground	t_{SO}	Continuous	
Thermal Impedance	θ_{JA}	160	$^{\circ}\text{C}/\text{W}$
Storage Temperature Range	T_{stg}	-65 to 150	$^{\circ}\text{C}$
Lead Temperature (Soldering, 10 Seconds)		260	$^{\circ}\text{C}$

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.

LM392

ELECTRICAL CHARACTERISTICS (Both Amplifiers) ($V^+ = 5\text{ V}$, $T_A = 25^\circ\text{C}$ unless otherwise stated)

Parameter	Conditions	T_A	LM392			Unit	
			Min	Typ	Max		
Input Offset Voltage	At output switch point, $V_O = 1.4\text{ V}$, $R_S = 0\ \Omega$, $V^+ = 5\text{ V}$ to 30 V , $V_{CM} = 0$ to ($V^+ - 1.5\text{ V}$)	25°C		± 2	± 5	mV	
		0°C to 70°C			± 7		
Input Bias Current	IN(+) or IN(-), $V_{CM} = 0\text{ V}$	25°C		50	205	nA	
	IN(+) or IN(-)	0°C to 70°C			400		
Input Offset Current	IN(+) or IN(-)	25°C		± 5	± 50	nA	
		0°C to 70°C			± 150		
Input Common-Mode Voltage Range	$V^+ = 30\text{ V}$ (Note 1)	25°C	0		$V^+ - 1.5$	V	
		0°C to 70°C	0		$V^+ - 2$		
Supply Current	No Load	0°C to 70°C		$V^+ = 30\text{ V}$	1	2	mA
				$V^+ = 5\text{ V}$	0.5	1	
Amplifier-to-Amplifier Coupling	$f = 1\text{ kHz}$ to 20 kHz , Input Referred	25°C		-78		dB	
Differential Input Voltage	All $V_{IN} \geq V$ (or V^- , If Used)	0°C to 70°C			32	V	

ELECTRICAL CHARACTERISTICS ($V^+ = 5\text{ V}$, $T_A = 25^\circ\text{C}$ unless otherwise stated)

Parameter	Conditions	T_A	LM392			Unit
			Min	Typ	Max	
OP AMP ONLY						
Large Signal Voltage Gain	$V^+ = 15\text{ V}$, V_O Swing = 1 V to 11 V , $R_L = 2\text{ k}\Omega$	25°C	25	100		V/mV
Output Voltage Swing, High (V_{OH})	$R_L = 2\text{ k}\Omega$	25°C	$V^+ - 1.7$			V
Output Voltage Swing, Low (V_{OL})	$R_L = 2\text{ k}\Omega$	25°C			20	mV
Common-Mode Rejection Ratio	$V_{CM} = 0$ to $V^+ - 1.5\text{ V}$	25°C	65	70		dB
Power Supply Rejection Ratio		25°C	65	100		dB
Output Current Source	$V_{IN(+)} = 1\text{ V}$, $V_{IN(-)} = 0\text{ V}$, $V^+ = 15\text{ V}$, $V_O = 2\text{ V}$	25°C	20	40		mA
Output Current Sink	$V_{IN(-)} = 1\text{ V}$, $V_{IN(+)} = 0\text{ V}$, $V^+ = 15\text{ V}$, $V_O = 2\text{ V}$	25°C	10	20		mA
	$V_{IN(-)} = 1\text{ V}$, $V_{IN(+)} = 0\text{ V}$, $V^+ = 15\text{ V}$, $V_O = 200\text{ mV}$	25°C	12	50		μA
Input Offset Voltage Drift	$R_S = 0\ \Omega$ (0°C to 70°C)	0°C to 70°C		7		$\mu\text{V}/^\circ\text{C}$
Input Offset Current Drift	$R_S = 0\ \Omega$ (0°C to 70°C)	0°C to 70°C		10		$\text{pA}/^\circ\text{C}$
COMPARATOR ONLY						
Voltage Gain	$R_L \geq 15\text{ k}\Omega$, $V^+ = 15\text{ V}$	25°C	50	200		V/mV
Large Signal Response Time	$V_{IN} = \text{TTL Logic Swing}$, $V_{REF} = 1.4\text{ V}$, $V_{RL} = 5\text{ V}$, $R_L = 5.1\text{ k}\Omega$	25°C		200		ns
Response Time	$V_{RL} = 5\text{ V}$, $R_L = 5.1\text{ k}\Omega$	25°C		600		ns
Output Sink Current	$V_{IN(-)} = 1\text{ V}$, $V_{IN(+)} = 0\text{ V}$, $V_O \geq 1.5\text{ V}$	25°C	6	16		mA
Saturation Voltage	$V_{IN(-)} \geq 1\text{ V}$, $V_{IN(+)} = 0$, $I_{SINK} \leq 4\text{ mA}$	25°C		250	400	mV
	$V_{IN(-)} \geq 1\text{ V}$, $V_{IN(+)} = 0$, $I_{SINK} \leq 4\text{ mA}$	0°C to 70°C			700	mV
Output Leakage Current	$V_{IN(-)} = 0$, $V_{IN(+)} \geq 1\text{ V}$, $V_O = 5\text{ V}$	25°C		0.1		nA
	$V_{IN(-)} = 0$, $V_{IN(+)} \geq 1\text{ V}$, $V_O = 30\text{ V}$	25°C			1.0	μA

- The input common-mode voltage or either input signal voltage should not be allowed to go negative by more than 0.3 V . The upper end of the common-mode voltage range is $V^+ - 1.5\text{ V}$, but either or both inputs can go to 32 V without damage.

LM392

ORDERING INFORMATION

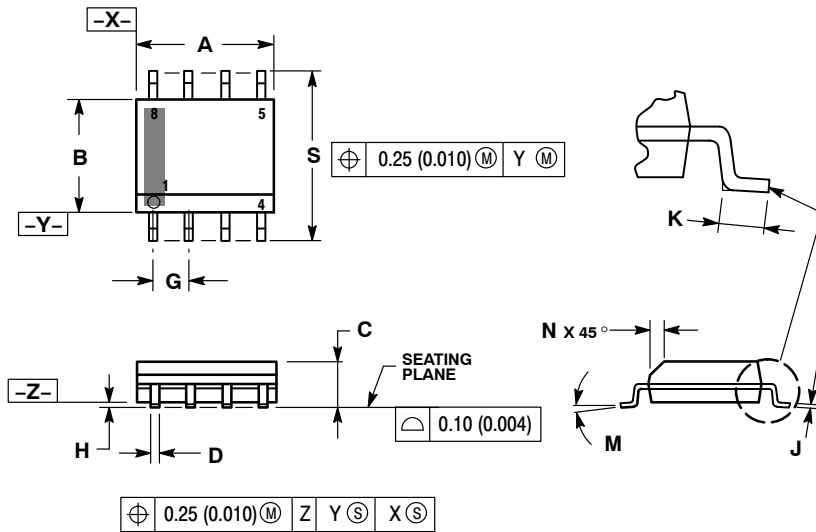
Device	Operating Temperature Range	Package	Shipping [†]
LM392DR2G	0°C to +70°C	SOIC-8 (Pb-Free)	2500 / Tape & Reel

[†]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.

LM392

PACKAGE DIMENSIONS

SOIC-8 NB
CASE 751-07
ISSUE AJ

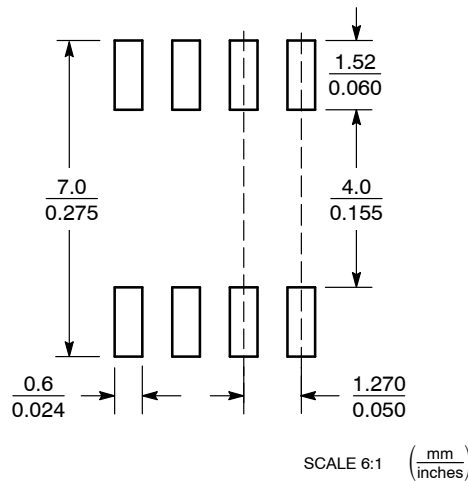


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

SOLDERING FOOTPRINT*



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

ON Semiconductor and registered trademarks of Semiconductor Components Industries, LLC (SCILLC). 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

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: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.