

---

## High Speed Translator Buffer to LVCMOS

---

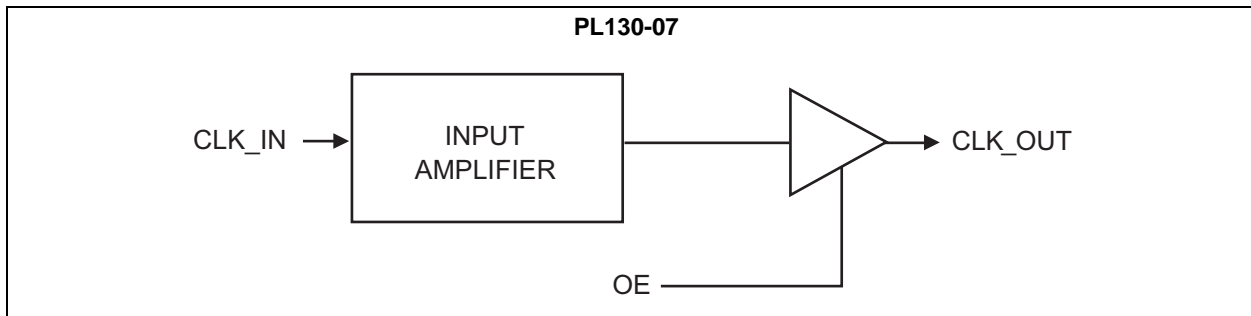
### Features

- LVCMOS Output
- Selectable Drive Capability
  - Drive 15 pF or 30 pF Output Load
- Single AC-Coupled Input (Min. 100 mV Swing)
- Accepts LVCMOS or Sine Wave Inputs
- Input Range from 10 MHz to 200 MHz
- OE High (PL130-07) or OE Low (PL130-07A) Enable
- 2.5V to 3.3V Operation
- Available in 8-Pin SOIC, 8-Pin TSSOP and 3 mm x 3 mm 16-Pin QFN

### General Description

The PL130-07 is a low cost, high performance, high speed, buffer that reproduces any input frequency from 10 MHz to 200 MHz. It provides an LVCMOS output with 15 pF output load drive capability. Any input signal with at least 100 mV swing can be used as reference signal. This chip is ideal for conversion from sine wave to LVCMOS.

### Block Diagram



# PL130-07

---

## 1.0 ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings †

Supply Voltage ( $V_{DD}$ ) .....	+4.6V
Input Voltage (DC).....	-0.5V to $V_{DD} + 0.5V$
Output Voltage (DC).....	-0.5V to $V_{DD} + 0.5V$
HBM ESD Rating.....	2 kV

† **Notice:** Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not intended. Exposure to maximum rating conditions for extended periods may affect device reliability.

**TABLE 1-1: AC ELECTRICAL CHARACTERISTICS**

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Input Frequency	—	10	—	200	MHz	—
Input Signal Swing	—	100	—	—	mV	CLK_IN Input
Output Frequency	—	10	—	200	MHz	—

**TABLE 1-2: CMOS OUTPUT ELECTRICAL CHARACTERISTICS**

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Output High Voltage	$V_{OH}$	2.4	—	—	V	$I_{OH} = 12\text{ mA}$
Output Low Voltage	$V_{OL}$	—	—	0.4	V	$I_{OL} = 12\text{ mA}$
Output High Voltage at CMOS Level	$V_{OHC}$	$V_{DD} - 0.4$	—	—	V	$I_{OH} = -4\text{ mA}$
Output Drive Current	—	36	51	—	mA	At TTL Level (High Drive, <a href="#">Note 1</a> )
		12	17	—	mA	At TTL Level (Standard Drive)
Quiescent Supply Current	$I_{DD}$	—	5.9	—	mA	No input signal, $V_{DD} = 2.5\text{V}$
		—	12.7	—	mA	No input signal, $V_{DD} = 3.3\text{V}$

**Note 1:** High Drive CMOS is selectable through DRIV\_SEL selector input on pin 8(SOIC) or 13(QFN).

**TABLE 1-3: CMOS SWITCHING CHARACTERISTICS**

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Output Clock Rise/Fall Time	$t_r/t_f$	—	1.15	—	ns	0.8V ~ 2.0V with 10 pF load
		—	3.7	—	ns	0.8V ~ 3.0V with 15 pF load
Output Clock Rise/Fall Time (High Drive, <a href="#">Note 1</a> )	$t_r/t_f$	—	0.5	—	ns	0.8V ~ 2.0V with 10 pF load
		—	1.5	—	ns	0.8V ~ 3.0V with 15 pF load

**Note 1:** High Drive CMOS is selectable through DRIV\_SEL selector input on pin 8(SOIC) or 13(QFN).

## TEMPERATURE SPECIFICATIONS (Note 1)

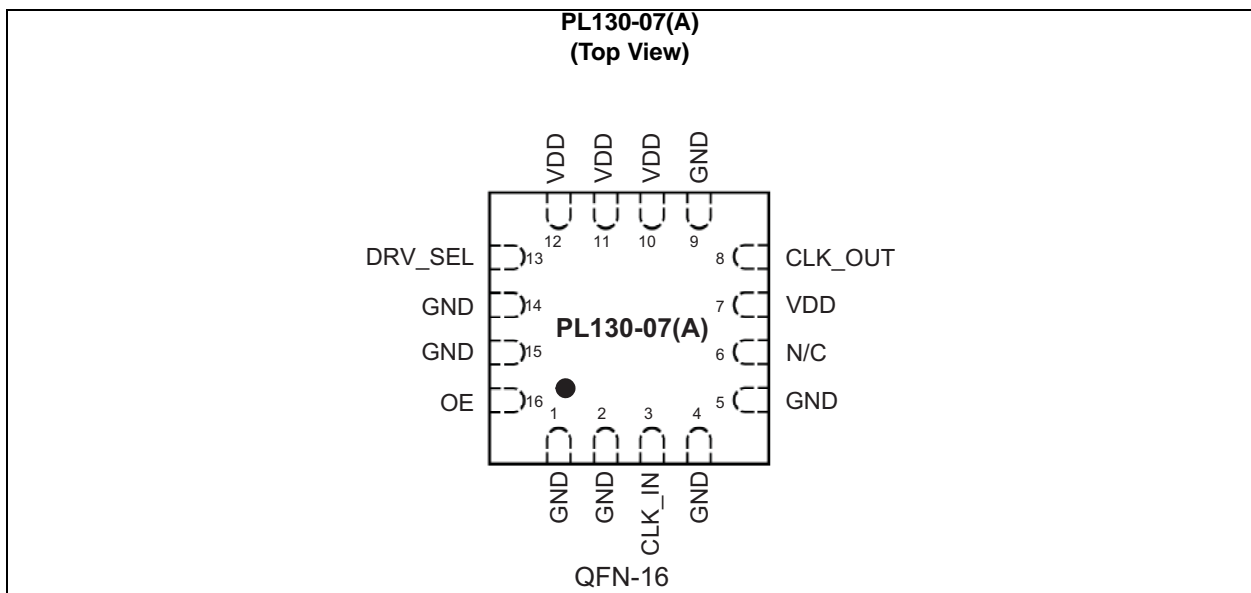
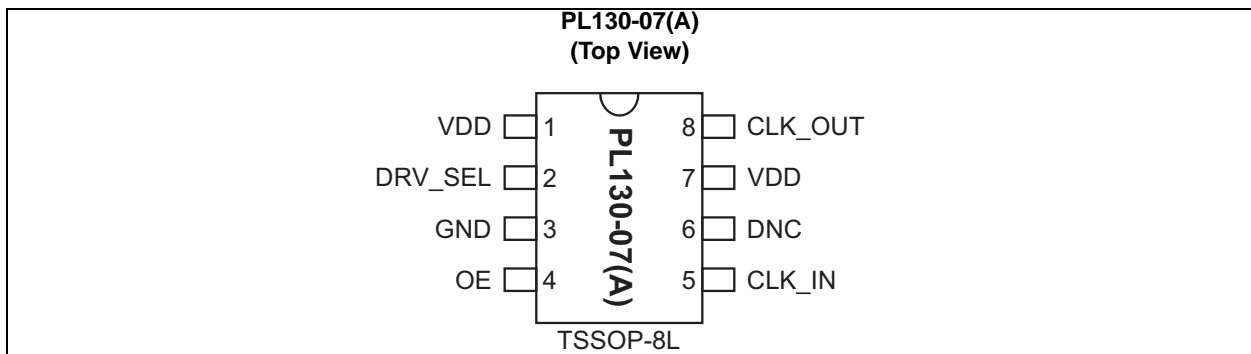
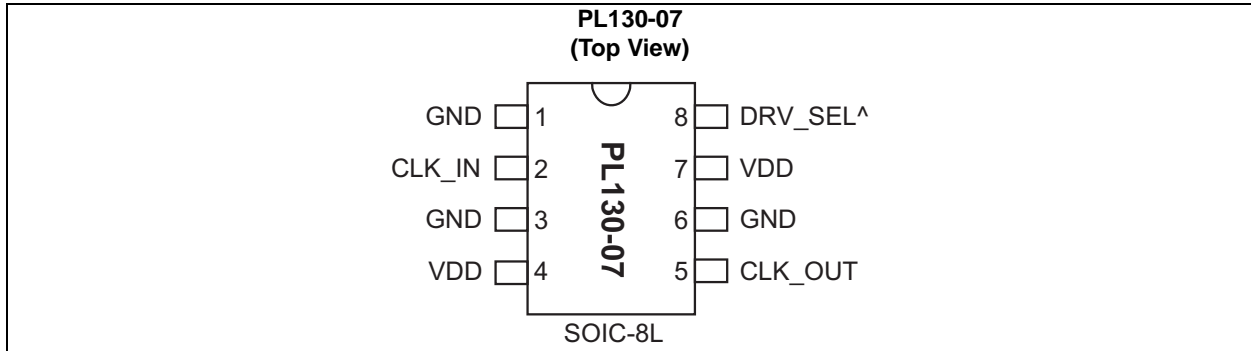
Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
<b>Temperature Ranges</b>						
Storage Temperature Range	T <sub>S</sub>	-65	—	+150	°C	—
Ambient Operating Temperature	T <sub>A</sub>	-40	—	+85	°C	Note 2
Junction Temperature	T <sub>J</sub>	—	—	+125	°C	—
Lead Temperature	—	—	—	+260	°C	Soldering, 10 seconds

- Note 1:** The maximum allowable power dissipation is a function of ambient temperature, the maximum allowable junction temperature and the thermal resistance from junction to air (i.e., T<sub>A</sub>, T<sub>J</sub>, θ<sub>JA</sub>). Exceeding the maximum allowable power dissipation will cause the device operating junction temperature to exceed the maximum +125°C rating. Sustained junction temperatures above +125°C can impact the device reliability.
- 2:** Operating Temperature is guaranteed by design for all parts (COMMERCIAL and INDUSTRIAL), but tested for COMMERCIAL grade only.

## 2.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in [Table 2-1](#).

### Pin Configurations



# PL130-07

**TABLE 2-1: PIN FUNCTION TABLE**

Pin Name	SOIC-8L	TSSOP-8L	QFN-16L	Type	Description
GND	1, 3, 6	3	1, 2, 4, 5, 9, 14, 15	P	Ground.
V <sub>DD</sub>	4, 7	1, 7	7, 10, 11, 12	P	Power supply.
DRV_SEL	8	2	13	I	Drive Select input: '1' for standard drive, '0' for high drive output. Internal pull-up (default is '1').
CLK_IN	2	5	3	I	Clock input signal. The frequency of this signal will be reproduced at the output (after translation to CMOS level).
CLK_OUT	5	8	8	O	CMOS clock output.
OE	N/A	4	16	I	Output Enable. See <a href="#">Table 2-2</a> .

**TABLE 2-2: OE LOGIC TABLE**

Part Number	OE State	Output Buffer State
PL130-07	0	Tri-State
	1 (default)	Active
PL130-07A	0 (default)	Active
	1	Tri-State

## 3.0 PACKAGING INFORMATION

### 8 Lead TSSOP Package Outline and Recommended Land Pattern

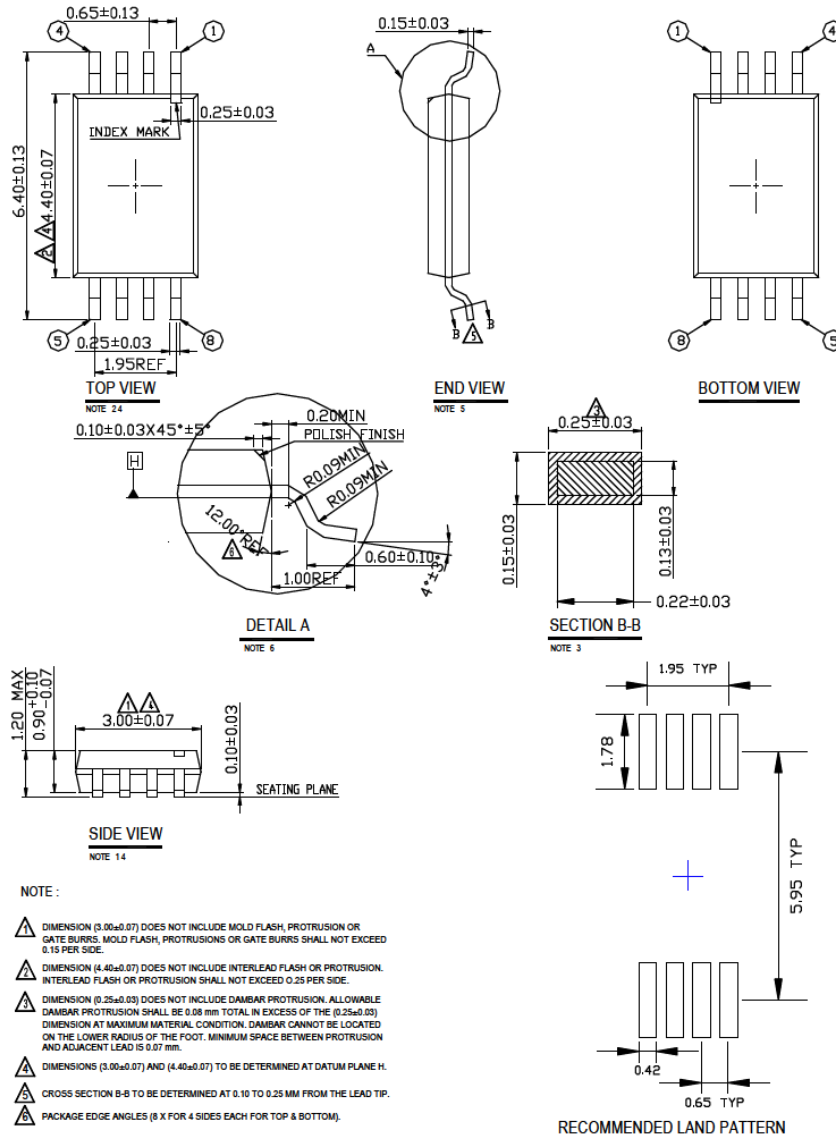
**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>

**TITLE**

8 LEAD TSSOP PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

**DRAWING #** TSSOP-8LD-PL-1

**UNIT** MM



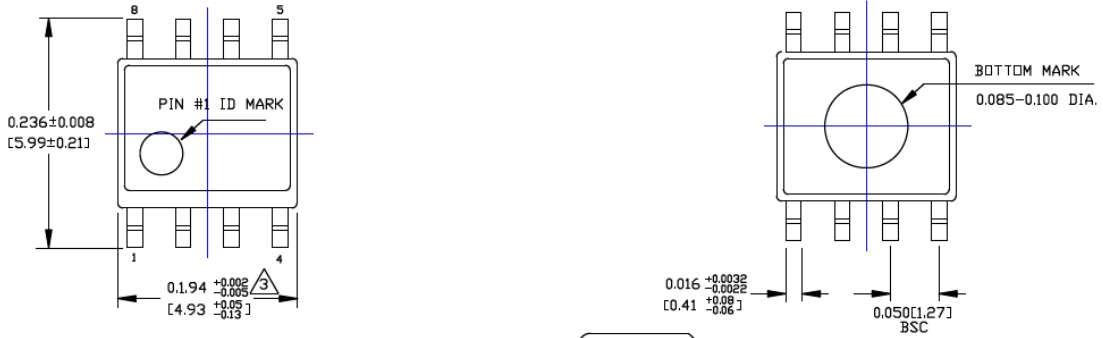
# PL130-07

## 8-Lead SOIC Package Outline and Recommended Land Pattern

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>

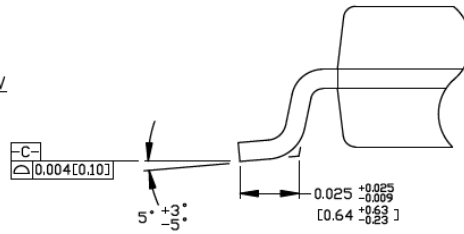
**TITLE**  
8 LEAD SOICN PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

DRAWING #	SOICN-8LD-PL-1	UNIT	INCH [MM]
-----------	----------------	------	-----------

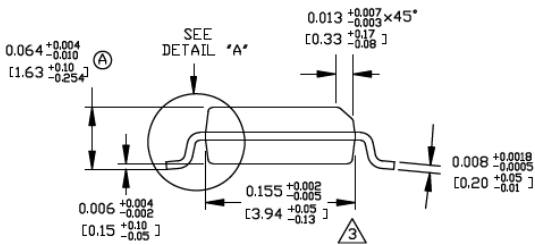


TOP VIEW

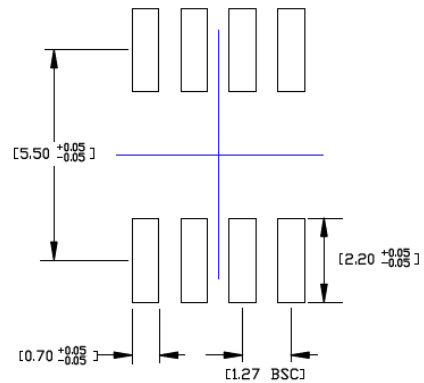
BOTTOM VIEW



DETAIL "A"



END VIEW



RECOMMENDED LAND PATTERN

**NOTES:**

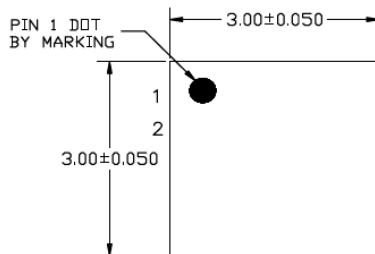
1. DIMENSIONS ARE IN INCHES[MM].
  2. CONTROLLING DIMENSION: INCHES.
- DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.010[0.25] PER SIDE.

## 16-Lead QFN 3 mm x 3 mm Package Outline and Recommended Land Pattern

**TITLE**

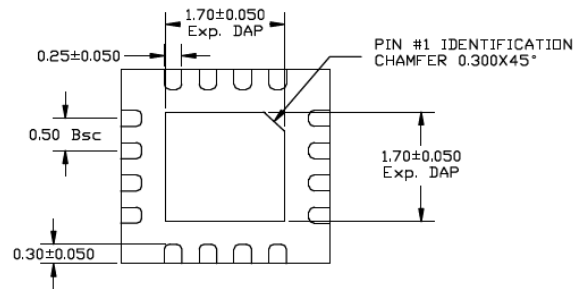
16 LEAD QFN 3x3mm PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

<b>DRAWING #</b>	QFN33-16LD-PL-3	<b>UNIT</b>	MM
<b>Lead Frame</b>	NiPdAu	<b>Lead Finish</b>	NiPdAu



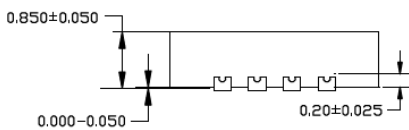
TOP VIEW

NOTE: 1, 2, 3



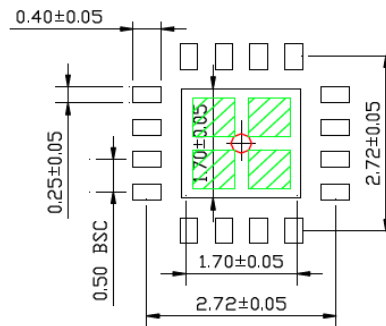
BOTTOM VIEW

NOTE: 1, 2, 3



SIDE VIEW

NOTE: 1, 2, 3



RECOMMENDED LAND PATTERN

NOTE: 4, 5

**NOTE:**

1. MAX PACKAGE WARPAGE IS 0.05mm.
2. MAX ALLOWABLE BURR IS 0.076mm IN ALL DIRECTIONS
3. PIN #1 IS ON TOP WILL BE LASER MARKED.
4. RED CIRCLE IN LAND PATTERN INDICATES THERMAL VIA. SIZE SHOULD BE 0.30-0.35mm IN DIAMETER AND SHOULD BE CONNECTED TO GND FOR MAX THERMAL PERFORMANCE.
5. GREEN RECTANGLES (SHADED AREA) indicate SOLDER STENCIL OPENING ON EXPOSED PAD AREA. SIZE SHOULD BE 0.60x0.60mm IN SIZE, 0.20mm SPACING.

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>.

NOTES:

## APPENDIX A: REVISION HISTORY

### Revision A (July 2016)

- Converted Micrel document PL130-07 to Microchip data sheet DS20005598A.
- Minor text changes throughout.



## PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, contact your local Microchip representative or sales office.

<u>PART NO.</u>	X	X	X	—	X
Device	OE State	Package Type	Temperature		Media Type
<b>Device:</b> PL130-07: High Speed Translator Buffer to LVCMOS  <b>OE State:</b> (blank) = High Enable A = Low Enable  <b>Package Type:</b> O = TSSOP-8L Q = QFN-16L S = SOIC-8L  <b>Temperature</b> C = Commercial Temperature Range I = Industrial Temperature Range  <b>Media Type</b> (blank) = Tube R = Tape & Reel	<b>Examples:</b> a) PL130-07OC: High Speed Translator Buffer to LVCMOS, High Enable, TSSOP-8L, Commercial Temp. Range, Tube b) PL130-07OC-R: High Speed Translator Buffer to LVCMOS, High Enable, TSSOP-8L, Commercial Temp. Range, Tape & Reel c) PL130-07AOI: High Speed Translator Buffer to LVCMOS, Low Enable, TSSOP-8L, Industrial Temp. Range, Tube d) PL130-07AQI-R: High Speed Translator Buffer to LVCMOS, Low Enable, QFN-16L, Industrial Temp. Range, Tape & Reel e) PL130-07SC: High Speed Translator Buffer to LVCMOS, High Enable, SOIC-8L, Commercial Temp. Range, Tube				

NOTES:

---

---

**Note the following details of the code protection feature on Microchip devices:**

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “unbreakable.”

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

---

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

*Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELoc® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.*

**QUALITY MANAGEMENT SYSTEM  
CERTIFIED BY DNV  
= ISO/TS 16949 =**

### Trademarks

The Microchip name and logo, the Microchip logo, AnyRate, dsPIC, FlashFlex, flexPWR, Heldo, JukeBlox, KeeLoq, KeeLoq logo, Klear, LANCheck, LINK MD, MediaLB, MOST, MOST logo, MPLAB, OptoLyzer, PIC, PICSTART, PIC32 logo, RightTouch, SpyNIC, SST, SST Logo, SuperFlash and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

ClockWorks, The Embedded Control Solutions Company, ETHERSYNCH, Hyper Speed Control, HyperLight Load, IntelliMOS, mTouch, Precision Edge, and QUIET-WIRE are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BodyCom, chipKIT, chipKIT logo, CodeGuard, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, JitterBlocker, KlearNet, KlearNet logo, MiWi, motorBench, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PureSilicon, RightTouch logo, REAL ICE, Ripple Blocker, Serial Quad I/O, SQL, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademarks of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2016, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

ISBN: 978-1-5224-0805-5



# MICROCHIP

## Worldwide Sales and Service

### AMERICAS

#### Corporate Office

2355 West Chandler Blvd.  
Chandler, AZ 85224-6199

Tel: 480-792-7200

Fax: 480-792-7277

Technical Support:

[http://www.microchip.com/  
support](http://www.microchip.com/support)

Web Address:

[www.microchip.com](http://www.microchip.com)

#### Atlanta

Duluth, GA

Tel: 678-957-9614

Fax: 678-957-1455

#### Austin, TX

Tel: 512-257-3370

#### Boston

Westborough, MA

Tel: 774-760-0087

Fax: 774-760-0088

#### Chicago

Itasca, IL

Tel: 630-285-0071

Fax: 630-285-0075

#### Cleveland

Independence, OH

Tel: 216-447-0464

Fax: 216-447-0643

#### Dallas

Addison, TX

Tel: 972-818-7423

Fax: 972-818-2924

#### Detroit

Novi, MI

Tel: 248-848-4000

#### Houston, TX

Tel: 281-894-5983

#### Indianapolis

Noblesville, IN

Tel: 317-773-8323

Fax: 317-773-5453

#### Los Angeles

Mission Viejo, CA

Tel: 949-462-9523

Fax: 949-462-9608

#### New York, NY

Tel: 631-435-6000

#### San Jose, CA

Tel: 408-735-9110

#### Canada - Toronto

Tel: 905-695-1980

Fax: 905-695-2078

### ASIA/PACIFIC

#### Asia Pacific Office

Suites 3707-14, 37th Floor  
Tower 6, The Gateway  
Harbour City, Kowloon

#### Hong Kong

Tel: 852-2943-5100

Fax: 852-2401-3431

#### Australia - Sydney

Tel: 61-2-9868-6733

Fax: 61-2-9868-6755

#### China - Beijing

Tel: 86-10-8569-7000

Fax: 86-10-8528-2104

#### China - Chengdu

Tel: 86-28-8665-5511

Fax: 86-28-8665-7889

#### China - Chongqing

Tel: 86-23-8980-9588

Fax: 86-23-8980-9500

#### China - Dongguan

Tel: 86-769-8702-9880

#### China - Guangzhou

Tel: 86-20-8755-8029

#### China - Hangzhou

Tel: 86-571-8792-8115

Fax: 86-571-8792-8116

#### China - Hong Kong SAR

Tel: 852-2943-5100

Fax: 852-2401-3431

#### China - Nanjing

Tel: 86-25-8473-2460

Fax: 86-25-8473-2470

#### China - Qingdao

Tel: 86-532-8502-7355

Fax: 86-532-8502-7205

#### China - Shanghai

Tel: 86-21-5407-5533

Fax: 86-21-5407-5066

#### China - Shenyang

Tel: 86-24-2334-2829

Fax: 86-24-2334-2393

#### China - Shenzhen

Tel: 86-755-8864-2200

Fax: 86-755-8203-1760

#### China - Wuhan

Tel: 86-27-5980-5300

Fax: 86-27-5980-5118

#### China - Xian

Tel: 86-29-8833-7252

Fax: 86-29-8833-7256

### ASIA/PACIFIC

#### China - Xiamen

Tel: 86-592-2388138

Fax: 86-592-2388130

#### China - Zhuhai

Tel: 86-756-3210040

Fax: 86-756-3210049

#### India - Bangalore

Tel: 91-80-3090-4444

Fax: 91-80-3090-4123

#### India - New Delhi

Tel: 91-11-4160-8631

Fax: 91-11-4160-8632

#### India - Pune

Tel: 91-20-3019-1500

#### Japan - Osaka

Tel: 81-6-6152-7160

Fax: 81-6-6152-9310

#### Japan - Tokyo

Tel: 81-3-6880-3770

Fax: 81-3-6880-3771

#### Korea - Daegu

Tel: 82-53-744-4301

Fax: 82-53-744-4302

#### Korea - Seoul

Tel: 82-2-554-7200

Fax: 82-2-558-5932 or

82-2-558-5934

#### Malaysia - Kuala Lumpur

Tel: 60-3-6201-9857

Fax: 60-3-6201-9859

#### Malaysia - Penang

Tel: 60-4-227-8870

Fax: 60-4-227-4068

#### Philippines - Manila

Tel: 63-2-634-9065

Fax: 63-2-634-9069

#### Singapore

Tel: 65-6334-8870

Fax: 65-6334-8850

#### Taiwan - Hsin Chu

Tel: 886-3-5778-366

Fax: 886-3-5770-955

#### Taiwan - Kaohsiung

Tel: 886-7-213-7828

#### Taiwan - Taipei

Tel: 886-2-2508-8600

Fax: 886-2-2508-0102

#### Thailand - Bangkok

Tel: 66-2-694-1351

Fax: 66-2-694-1350

### EUROPE

#### Austria - Wels

Tel: 43-7242-2244-39

Fax: 43-7242-2244-393

#### Denmark - Copenhagen

Tel: 45-4450-2828

Fax: 45-4485-2829

#### France - Paris

Tel: 33-1-69-53-63-20

Fax: 33-1-69-30-90-79

#### Germany - Dusseldorf

Tel: 49-2129-3766400

#### Germany - Karlsruhe

Tel: 49-721-625370

#### Germany - Munich

Tel: 49-89-627-144-0

Fax: 49-89-627-144-44

#### Italy - Milan

Tel: 39-0331-742611

Fax: 39-0331-466781

#### Italy - Venice

Tel: 39-049-7625286

#### Netherlands - Drunen

Tel: 31-416-690399

Fax: 31-416-690340

#### Poland - Warsaw

Tel: 48-22-3325737

#### Spain - Madrid

Tel: 34-91-708-08-90

Fax: 34-91-708-08-91

#### Sweden - Stockholm

Tel: 46-8-5090-4654

#### UK - Wokingham



Tel: 44-118-921-5800

Fax: 44-118-921-5820

06/23/16

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View PL130-07SC-R on WIN SOURCE](#)
-  [Microchip Technology](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management