

## Dual TTL-to-Differential PECL Translator

### Features

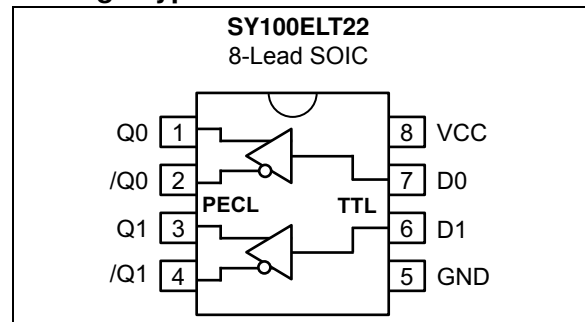
- 300 ps Typical Propagation Delay
- <100 ps Output-to-Output Skew
- Differential PECL Outputs
- PNP TTL Inputs for Minimal Loading
- Flow-Through Pinouts
- Available in 8-Lead SOIC Package

### General Description

The SY100ELT22 is a dual TTL-to-differential PECL translator. Because positive ECL (PECL) levels are used, only +5V and ground is required. The small outline 8-lead SOIC package and the low-skew, dual-gate design of the SY100ELT22 makes it ideal for applications that require the translation of a clock and a data signal.

The SY100ELT22 is compatible with positive ECL 100K logic levels.

### Package Type



# SY100ELT22

## 1.0 ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings †

Power Supply Voltage ( $V_{CC}$ )	-0.5V to +7.0V
TTL Input Voltage ( $V_I$ )	-0.5V to $V_{CC}$
PECL Output Current, Continuous ( $I_{OUT}$ )	50 mA
PECL Output Current, Surge ( $I_{OUT}$ )	100 mA

† **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: DC ELECTRICAL CHARACTERISTICS**

**Electrical Characteristics:**  $V_{CC} = 4.2V$  to  $5.5V$ ;  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless noted.

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Power Supply Current	$I_{CC}$	—	—	30	mA	—

**TABLE 1-2: TTL DC ELECTRICAL CHARACTERISTICS**

**Electrical Characteristics:**  $V_{CC} = 4.2V$  to  $5.5V$ ;  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless noted.

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Input High Voltage	$V_{IH}$	2.0	—	—	V	—
Input Low Voltage	$V_{IL}$	—	—	0.8	V	—
Input High Current	$I_{IH}$	—	—	20	$\mu A$	$V_{IN} = 2.7V$
		—	—	100		$V_{IN} = V_{CC}$
Input Low Current	$I_{IL}$	—	—	-0.2	mA	$V_{IN} = 0.5V$
Input Clamp Voltage	$V_{IK}$	—	—	-1.2	V	$I_{IN} = -18 mA$

**TABLE 1-3: PECL DC ELECTRICAL CHARACTERISTICS**

**Electrical Characteristics:**  $V_{CC} = 4.2V$  to  $5.5V$ ;  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless noted.

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Output High Voltage	$V_{OH}$	3915	—	4120	mV	$T_A = -40^{\circ}C$ ; Values for $V_{CC} = 5V$ ; Level specifications will vary 1:1 with $V_{CC}$ .
		3975	—	4120		$T_A = 0^{\circ}C$ to $+85^{\circ}C$ ; Values for $V_{CC} = 5V$ ; Level specifications will vary 1:1 with $V_{CC}$ .
Output Low Voltage	$V_{OL}$	3170	—	3445	mV	$T_A = -40^{\circ}C$ ; Values for $V_{CC} = 5V$ ; Level specifications will vary 1:1 with $V_{CC}$ .
		3190	—	3380		$T_A = 0^{\circ}C$ to $+85^{\circ}C$ ; Values for $V_{CC} = 5V$ ; Level specifications will vary 1:1 with $V_{CC}$ .

**TABLE 1-4: AC ELECTRICAL CHARACTERISTICS**

Electrical Characteristics:  $V_{CC} = 4.2V$  to  $5.5V$ ;  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless noted.

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Propagation Delay to Output D, ENECL/ENTTL	$t_{PD}$	100	—	600	ps	$50\Omega$ to $V_{CC} - 2.0V$
Output Rise/Fall Time, 20% to 80%	$t_r/t_f$	200	—	500	ps	$50\Omega$ to $V_{CC} - 2.0V$
Part-to-Part Skew, (Note 1)	$t_{skpp}$	—	—	500	ps	$50\Omega$ to $V_{CC} - 2.0V$
Within-Device Skew, (Note 1, Note 2)	$t_{skew}$	—	—	100	ps	$50\Omega$ to $V_{CC} - 2.0V$

**Note 1:** Guaranteed, but not tested.

**2:** Same transition at common  $V_{CC}$  levels.

## TEMPERATURE SPECIFICATIONS

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
<b>Temperature Ranges</b>						
Operating Temperature Range	$T_A$	-40	—	+85	$^{\circ}C$	—
Storage Temperature Range	$T_S$	-65	—	+150	$^{\circ}C$	—
Lead Temperature	$T_{LEAD}$	—	—	+260	$^{\circ}C$	Soldering, 20s

# SY100ELT22

---

## 2.0 PIN DESCRIPTIONS

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

**TABLE 2-1: SY100ELT22 PIN FUNCTION TABLE**

Pin Number	Pin Name	Description
1, 2	Q0, /Q0	Differential PECL Output 0
3, 4	Q1, /Q1	Differential PECL Output 1
5	GND	Ground
6	D1	TTL Input 1
7	D0	TTL Input 0
8	VCC	+5.0V Supply

**TABLE 2-2: TRUTH TABLE**

D	Q	$\bar{Q}$
High	High	Low
Low	Low	High
Open	High	Low

## 3.0 PACKAGING INFORMATION

### 3.1 Package Marking Information

8-Lead SOIC\*



Example



<b>Legend:</b>	XX...X	Product code or customer-specific information
	Y	Year code (last digit of calendar year)
	YY	Year code (last 2 digits of calendar year)
	WW	Week code (week of January 1 is week '01')
	NNN	Alphanumeric traceability code
	(e3)	Pb-free JEDEC® designator for Matte Tin (Sn)
	*	This package is Pb-free. The Pb-free JEDEC designator (e3) can be found on the outer packaging for this package.
	•, ▲, ▼	Pin one index is identified by a dot, delta up, or delta down (triangle mark).
<b>Note:</b>	In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information. Package may or may not include the corporate logo.	
	Underbar (̄) and/or Overbar (¯) symbol may not be to scale.	

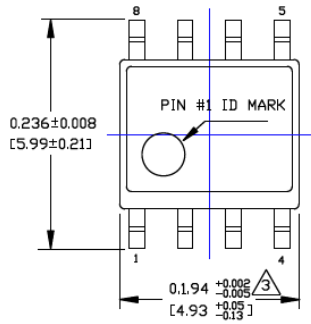
# SY100ELT22

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

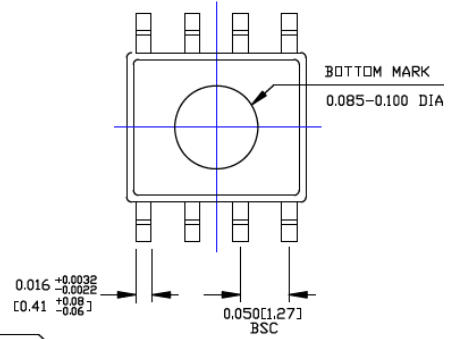
**TITLE**

8 LEAD SOICN PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

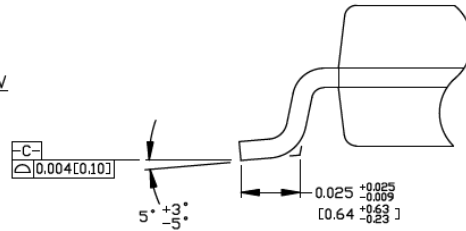
<b>DRAWING #</b>	SOICN-8LD-PL-1	<b>UNIT</b>	INCH [MM]
------------------	----------------	-------------	-----------



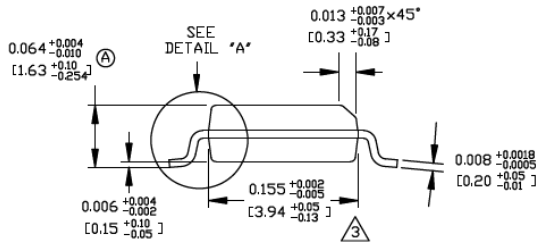
TOP VIEW



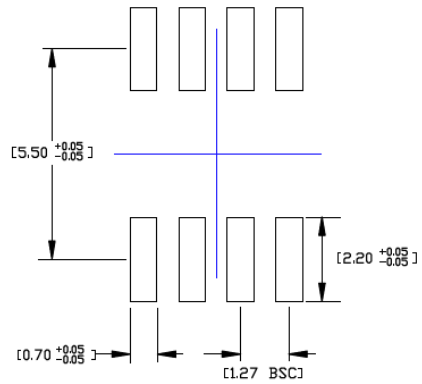
BOTTOM VIEW



DETAIL "A"



END VIEW



RECOMMENDED LAND PATTERN

**NOTES:**

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

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

## APPENDIX A: REVISION HISTORY

### Revision A (April 2018)

- Initial release of SY100ELT22 as Microchip data sheet DS20005996A.
- Removal of all instances of the SY10ELT22 part number. It has been discontinued.

# SY100ELT22

---

NOTES:



## PRODUCT IDENTIFICATION SYSTEM

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

Device	<u>X</u>	<u>X</u>	<u>-XX</u>
Part No.	Package	Operating Range	Media Type
<b>Device:</b>	SY100ELT22:	Dual TTL-to-Differential PECL Translator	
<b>Package:</b>	Z =	8-Lead SOIC	
<b>Operating Range:</b>	G =	Industrial	
<b>Media Type:</b>	<blank>=	95/Tube	
	TR =	1,000/Reel	

<b>Examples:</b>	
a) SY100ELT22ZG:	SY100ELT22, 8-Lead SOIC, Industrial Operating Range, 95/Tube
b) SY100ELT22ZG-TR:	SY100ELT22, 8-Lead SOIC, Industrial Operating Range, 1,000/Reel

<b>Note 1:</b>	
Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.	

# SY100ELT22

---

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, AVR, AVR logo, AVR Freaks, BeaconThings, BitCloud, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, Heldo, JukeBlox, KEELoC, KEELoC logo, Klear, LANCheck, LINK MD, maXStylus, maXTouch, MediaLB, megaAVR, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, Prochip Designer, QTouch, RightTouch, SAM-BA, SpyNIC, SST, SST Logo, SuperFlash, tinyAVR, UNI/O, and XMEGA 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.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BodyCom, chipKIT, chipKIT logo, CodeGuard, CryptoAuthentication, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, JitterBlocker, KlearNet, KlearNet logo, Mindi, MiWi, motorBench, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICKit, PICtail, PureSilicon, QMatrix, RightTouch logo, REAL ICE, Ripple Blocker, SAM-ICE, Serial Quad I/O, SMART-I.S., SQI, 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 trademark 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.

© 2018, Microchip Technology Incorporated, All Rights Reserved.  
ISBN: 978-1-5224-2880-0



# 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>  
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

#### 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  
Tel: 317-536-2380

#### Los Angeles

Mission Viejo, CA  
Tel: 949-462-9523  
Fax: 949-462-9608  
Tel: 951-273-7800

#### Raleigh, NC

Tel: 919-844-7510

#### New York, NY

Tel: 631-435-6000

#### San Jose, CA

Tel: 408-735-9110  
Tel: 408-436-4270

#### Canada - Toronto

Tel: 905-695-1980  
Fax: 905-695-2078

### ASIA/PACIFIC

**Australia - Sydney**  
Tel: 61-2-9868-6733

**China - Beijing**  
Tel: 86-10-8569-7000

**China - Chengdu**  
Tel: 86-28-8665-5511

**China - Chongqing**  
Tel: 86-23-8980-9588

**China - Dongguan**  
Tel: 86-769-8702-9880

**China - Guangzhou**  
Tel: 86-20-8755-8029

**China - Hangzhou**  
Tel: 86-571-8792-8115

**China - Hong Kong SAR**  
Tel: 852-2943-5100

**China - Nanjing**  
Tel: 86-25-8473-2460

**China - Qingdao**  
Tel: 86-532-8502-7355

**China - Shanghai**  
Tel: 86-21-3326-8000

**China - Shenyang**  
Tel: 86-24-2334-2829

**China - Shenzhen**  
Tel: 86-755-8864-2200

**China - Suzhou**  
Tel: 86-186-6233-1526

**China - Wuhan**  
Tel: 86-27-5980-5300

**China - Xian**  
Tel: 86-29-8833-7252

**China - Xiamen**  
Tel: 86-592-2388138

**China - Zhuhai**  
Tel: 86-756-3210040

### ASIA/PACIFIC

**India - Bangalore**  
Tel: 91-80-3090-4444

**India - New Delhi**  
Tel: 91-11-4160-8631

**India - Pune**  
Tel: 91-20-4121-0141

**Japan - Osaka**  
Tel: 81-6-6152-7160

**Japan - Tokyo**  
Tel: 81-3-6880-3770

**Korea - Daegu**  
Tel: 82-53-744-4301

**Korea - Seoul**  
Tel: 82-2-554-7200

**Malaysia - Kuala Lumpur**  
Tel: 60-3-7651-7906

**Malaysia - Penang**  
Tel: 60-4-227-8870

**Philippines - Manila**  
Tel: 63-2-634-9065

**Singapore**  
Tel: 65-6334-8870

**Taiwan - Hsin Chu**  
Tel: 886-3-577-8366

**Taiwan - Kaohsiung**  
Tel: 886-7-213-7830

**Taiwan - Taipei**  
Tel: 886-2-2508-8600

**Thailand - Bangkok**  
Tel: 66-2-694-1351

**Vietnam - Ho Chi Minh**  
Tel: 84-28-5448-2100

### EUROPE

**Austria - Wels**  
Tel: 43-7242-2244-39  
Fax: 43-7242-2244-393

**Denmark - Copenhagen**  
Tel: 45-4450-2828  
Fax: 45-4485-2829

**Finland - Espoo**  
Tel: 358-9-4520-820

**France - Paris**  
Tel: 33-1-69-53-63-20  
Fax: 33-1-69-30-90-79

**Germany - Garching**  
Tel: 49-8931-9700

**Germany - Haan**  
Tel: 49-2129-3766400

**Germany - Heilbronn**  
Tel: 49-7131-67-3636

**Germany - Karlsruhe**  
Tel: 49-721-625370

**Germany - Munich**  
Tel: 49-89-627-144-0  
Fax: 49-89-627-144-44

**Germany - Rosenheim**  
Tel: 49-8031-354-560

**Israel - Ra'anana**  
Tel: 972-9-744-7705

**Italy - Milan**  
Tel: 39-0331-742611  
Fax: 39-0331-466781

**Italy - Padova**  
Tel: 39-049-7625286

**Netherlands - Drunen**  
Tel: 31-416-690399  
Fax: 31-416-690340

**Norway - Trondheim**  
Tel: 47-7289-7561

**Poland - Warsaw**  
Tel: 48-22-3325737

**Romania - Bucharest**  
Tel: 40-21-407-87-50

**Spain - Madrid**  
Tel: 34-91-708-08-90  
Fax: 34-91-708-08-91

**Sweden - Gothenberg**  
Tel: 46-31-704-60-40

**Sweden - Stockholm**  
Tel: 46-8-5090-4654

**UK - Wokingham**  
Tel: 44-118-921-5800  
Fax: 44-118-921-5820