

Freescall Semiconductor Technical Data

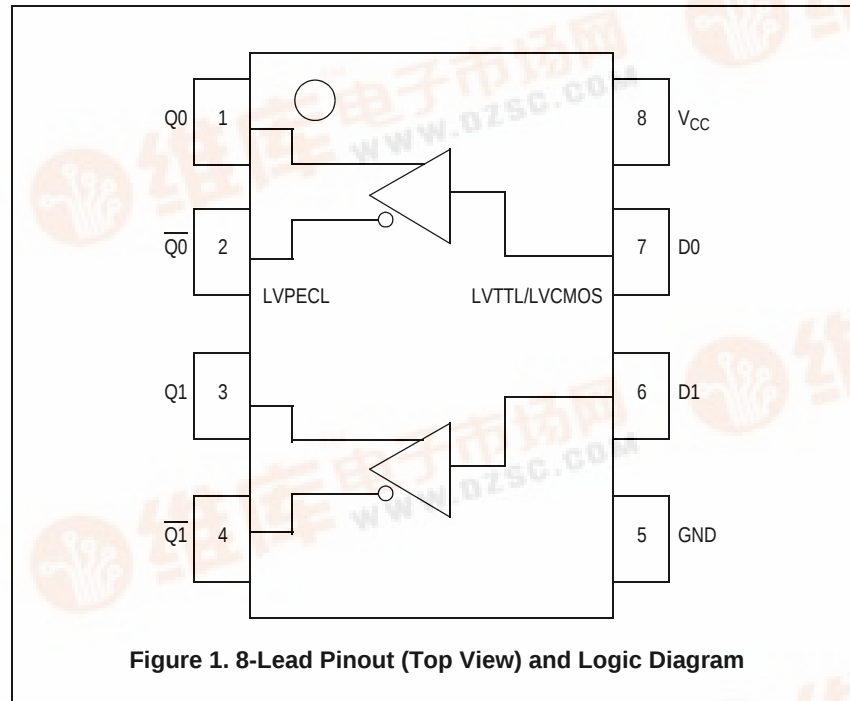
MC100ES60T22
Rev 2, 2/2005

3.3 V Dual LVTTTL/LVCMOS to Differential LVPECL Translator

The MC100ES60T22 is a low skew dual LVTTTL/LVCMOS to differential LVPECL translator. The low voltage PECL levels, small package, and dual gate design are ideal for clock translation applications.

Features

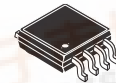
- 280 ps typical propagation delay
- 100 ps max output-to-output skew
- LVPECL operating range: $V_{CC} = 3.135\text{ V to }3.8\text{ V}$
- 8-lead SOIC and 8-lead TSSOP packages
- Ambient temperature range $-40^{\circ}\text{C to }+85^{\circ}\text{C}$



MC100ES60T22



D SUFFIX
8-LEAD SOIC PACKAGE
CASE 751-06



DT SUFFIX
8-LEAD TSSOP PACKAGE
CASE 1640-01

ORDERING INFORMATION

Device	Package
MC100ES60T22D	SOIC-8
MC100ES60T22DR2	SOIC-8
MC100ES60T22DT	TSSOP-8
MC100ES60T22DTR2	TSSOP-8

PIN DESCRIPTION

Pin	Function
D0, D1	LVTTTL/LVCMOS Inputs
$Q_n, \overline{Q}_n$	LVPECL Differential Outputs
V_{CC}	Positive Supply
GND	Negative Supply

Table 1. General Specifications

Characteristics		Value
Internal Input Pulldown Resistor		75 k Ω
Internal Input Pullup Resistor		75 k Ω
ESD Protection	Human Body Model Machine Model	> 2000 V > 200 V
θ_{JA} Thermal Resistance (Junction-to-Ambient)	0 LFPM, 8 SOIC 500 LFPM, 8 SOIC 0 LFPM, 8 TSSOP 500 LFPM, 8 TSSOP	190°C/W 130°C/W 185°C/W 140°C/W

Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test

Table 2. Absolute Maximum Ratings⁽¹⁾

Symbol	Rating	Conditions	Rating	Units
V_{SUPPLY}	Power Supply Voltage	Difference between V_{CC} & V_{EE}	3.9	V
V_{IN}	Input Voltage	$V_{CC} - V_{EE} \leq 3.6$ V	$V_{CC} + 0.3$ $V_{EE} - 0.3$	V V
I_{out}	Output Current	Continuous Surge	50 100	mA mA
T_A	Operating Temperature Range		-40 to +85	°C
T_{STG}	Storage Temperature Range		-65 to +150	°C

1. Absolute maximum continuous ratings are those maximum values beyond which damage to the device may occur. Exposure to these conditions or conditions beyond those indicated may adversely affect device reliability. Functional operation at absolute-maximum-rated conditions is not implied.

Table 3. DC Characteristics ($V_{CC} = 3.135$ V to 3.8 V; $V_{EE} = 0$ V)

Symbol	Characteristic	-40°C			0°C to 85°C			Unit
		Min	Typ	Max	Min	Typ	Max	
$V_{OH}^{(1)}$	Output HIGH Voltage	$V_{CC} - 1150$	$V_{CC} - 1020$	$V_{CC} - 800$	$V_{CC} - 1200$	$V_{CC} - 970$	$V_{CC} - 750$	mV
$V_{OL}^{(1)}$	Output LOW Voltage	$V_{CC} - 1950$	$V_{CC} - 1620$	$V_{CC} - 1250$	$V_{CC} - 2000$	$V_{CC} - 1680$	$V_{CC} - 1300$	mV

1. Outputs are terminated through a 50 Ω resistor to $V_{CC} - 2$ volts.

Table 4. LVTTTL / LVCMOS Input DC Characteristics ($V_{CC} = 3.135$ V to 3.8 V)

Symbol	Characteristic	Condition	-40°C			0°C to 85°C			Unit
			Min	Typ	Max	Min	Typ	Max	
I_{IN}	Input Current	$V_{IN} = V_{CC}$			± 150			± 150	μ A
V_{IK}	Input Clamp Voltage	$I_{IN} = -18$ mA			-1.2			-1.2	V
V_{IH}	Input HIGH Voltage		2.0		$V_{CC} + 0.3$	2.0		$V_{CC} + 0.3$	V
V_{IL}	Input LOW Voltage				0.8			0.8	V

Table 5. AC Characteristics ($V_{CC} = 3.134\text{ V}$ to 3.8 V ; $V_{EE} = 0\text{ V}$)

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{\max}$	Maximum Toggle Frequency			1			1			1	GHz
t_{PLH} , t_{PHL}	Propagation Delay	100	260	400	100	280	400	100	280	450	ps
t_{SKEW}	Skew part-to-part			300			300			350	ps
t_{JITTER}	Cycle-to-Cycle Jitter RMS (1σ)			1			1			1	ps
V_{outPP}	Output Peak-to-Peak Voltage	350	750		350	750		350	750		mV
t_r / t_f	Output Rise/Fall Times (20% – 80%)	50		400	50		400	50		400	ps

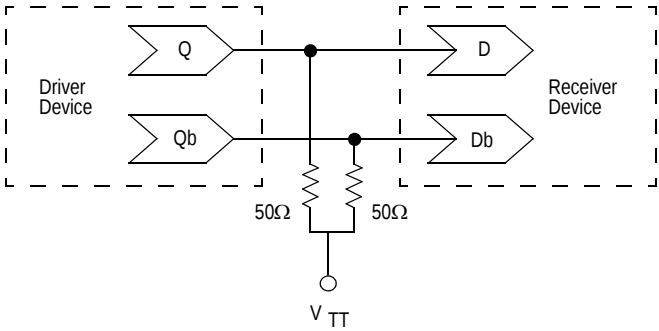
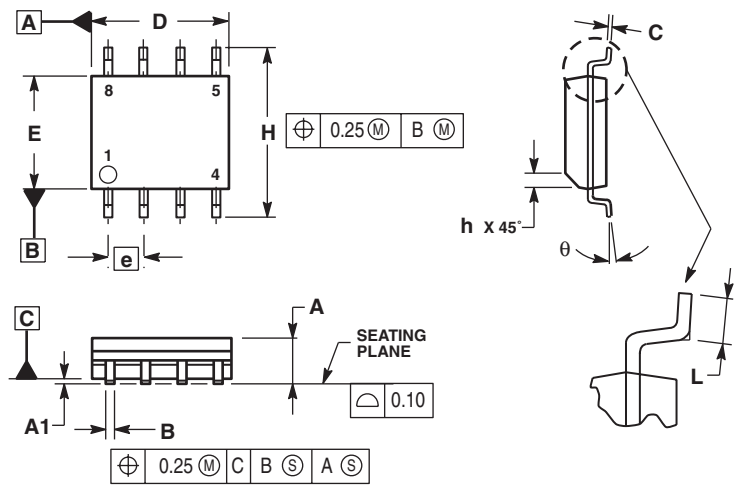


Figure 2. Typical Termination for Output Driver and Device Evaluation

PACKAGE DIMENSIONS

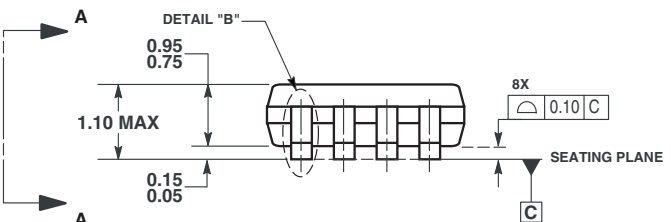


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. DIMENSIONS ARE IN MILLIMETER.
 3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
 4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
 5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

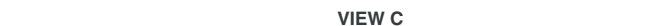
DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27	BSC
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°

SOIC-8
D SUFFIX
8-LEAD SOIC PACKAGE
CASE 751-06
ISSUE T

Downloaded from <http://ajph.org/> on November 10, 2015



SIDE VIEW



- TSSOP-8
DT SUFFIX
8-LEAD TSSOP PACKAGE
CASE 1640-01
ISSUE O**



NOTES



NOTES

NOTES

How to Reach Us:

Home Page:
www.freescale.com

E-mail:
support@freescale.com

USA/Europe or Locations Not Listed:
Freescale Semiconductor
Technical Information Center, CH370
1300 N. Alma School Road
Chandler, Arizona 85224
+1-800-521-6274 or +1-480-768-2130
support@freescale.com

Europe, Middle East, and Africa:
Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
support@freescale.com

Japan:
Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064
Japan
0120 191014 or +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:
Freescale Semiconductor Hong Kong Ltd.
Technical Information Center
2 Dai King Street
Tai Po Industrial Estate
Tai Po, N.T., Hong Kong
+800 2666 8080
support.asia@freescale.com

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
P.O. Box 5405
Denver, Colorado 80217
1-800-441-2447 or 303-675-2140
Fax: 303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor 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 consequential or incidental damages. "Typical" parameters that may be provided in Freescale Semiconductor 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. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor 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 Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor 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 Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners.

© Freescale Semiconductor, Inc. 2005. All rights reserved.