

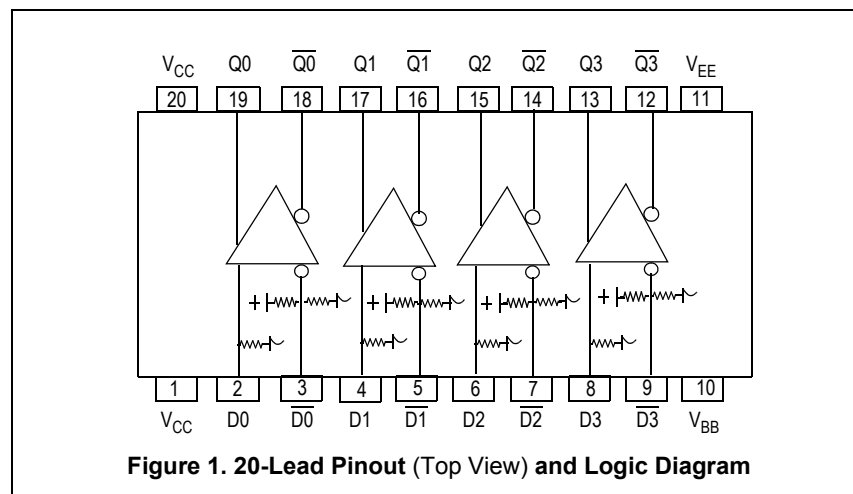
3.3 V ECL/PECL Quad Differential Receiver

The MC100ES6017 is a 3.3 V ECL/PECL quad differential receiver. Under open input conditions, the \bar{D} input will be biased at $V_{CC}/2$ and the D input will be pulled down to V_{EE} . This operation will force the Q output LOW and ensure stability.

For single-ended input conditions, the unused differential input is connected to V_{BB} as a switching reference voltage. V_{BB} may also rebias AC coupled inputs. When used, decouple V_{BB} and V_{CC} via a 0.01 μF capacitor and limit current sourcing or sinking to 0.5 mA. When not used, V_{BB} should be left open.

Features

- High bandwidth output transitions
- LVPECL operating range: $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$
- Internal input pulldown resistors on D inputs, pullup and pulldown resistors on \bar{D} inputs
- 20 lead SOIC package
- Ambient temperature range $-40^\circ\text{C to } +85^\circ\text{C}$
- 20-lead Pb-free package available



MC100ES6017

**ECL/PECL QUAD
 DIFFERENTIAL RECEIVER**



**DW SUFFIX
 20-LEAD SOIC PACKAGE
 CASE 751D-07**



**EG SUFFIX
 20-LEAD SOIC PACKAGE
 Pb-FREE PACKAGE
 CASE 751D-07**

ORDERING INFORMATION

Device	Package
MC100ES6017DW	SO-20
MC100ES6017DWR2	SO-20
MC100ES6017EG	SO-20 (Pb-Free)
MC100ES6017EGR2	SO-20 (Pb-Free)

PIN DESCRIPTION

Pin	Function
D_n, \bar{D}_n	ECL Differential Data Inputs
Q_n, \bar{Q}_n	ECL Differential Data Outputs
V_{BB}	Reference Voltage Output
V_{CC}	Positive Supply
V_{EE}	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	> 2000 V
	Machine Model	> 200 V
	Charged Device Model	> 1500 V
θ_{JA} Thermal Resistance (Junction to Ambient)	0 LFPM, 20 SOIC	90 °C/W
	500 LFPM, 20 SOIC	60 °C/W
Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test		

Table 2. Absolute Maximum Ratings⁽¹⁾

Symbol	Parameter	Conditions	Rating	Unit
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
			$V_{EE} - 0.3$	V
I_{OUT}	Output Current	Continuous Surge	50	mA
			100	mA
I_{BB}	V_{BB} Sink/Source		± 0.5	mA
TA	Operating Temp Range		-40 to +85	°C
T_{STG}	Storage Temp 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 ($V_{CC} = 3.0$ to 3.6 V; $V_{EE} = 0$ V or $V_{CC} = 0$ V; $V_{EE} = -3.6$ to -3.0 V)

Symbol	Characteristic	-40°C			0°C to 85°C			Unit
		Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current		20	31		28	35	mA
$V_{OH}^{(1)}$	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
V_{IH}	Input HIGH Voltage	$V_{CC} - 1165$		$V_{CC} - 880$	$V_{CC} - 1165$		$V_{CC} - 880$	mV
V_{IL}	Input LOW Voltage	$V_{CC} - 1810$		$V_{CC} - 1475$	$V_{CC} - 1810$		$V_{CC} - 1475$	mV
$V_{BB}^{(2)}$	Output Voltage Reference ($I_{BB} = 0.5$ mA)	$V_{CC} - 1440$		$V_{CC} - 1235$	$V_{CC} - 1440$		$V_{CC} - 1235$	mV
V_{PP}	Differential Input Voltage	0.12		1.3	0.12		1.3	V
V_{CMR}	Differential Cross Point Voltage	$V_{EE} + 1.3$		$V_{CC} - 0.9$	$V_{EE} + 1.3$		$V_{CC} - 0.9$	V
I_{IH}	Input HIGH Current			150			150	μ A
I_{IL}	Input LOW Current	$\frac{Dn}{Dn}$	0.5		0.5			μ A
			-300		-300			μ A

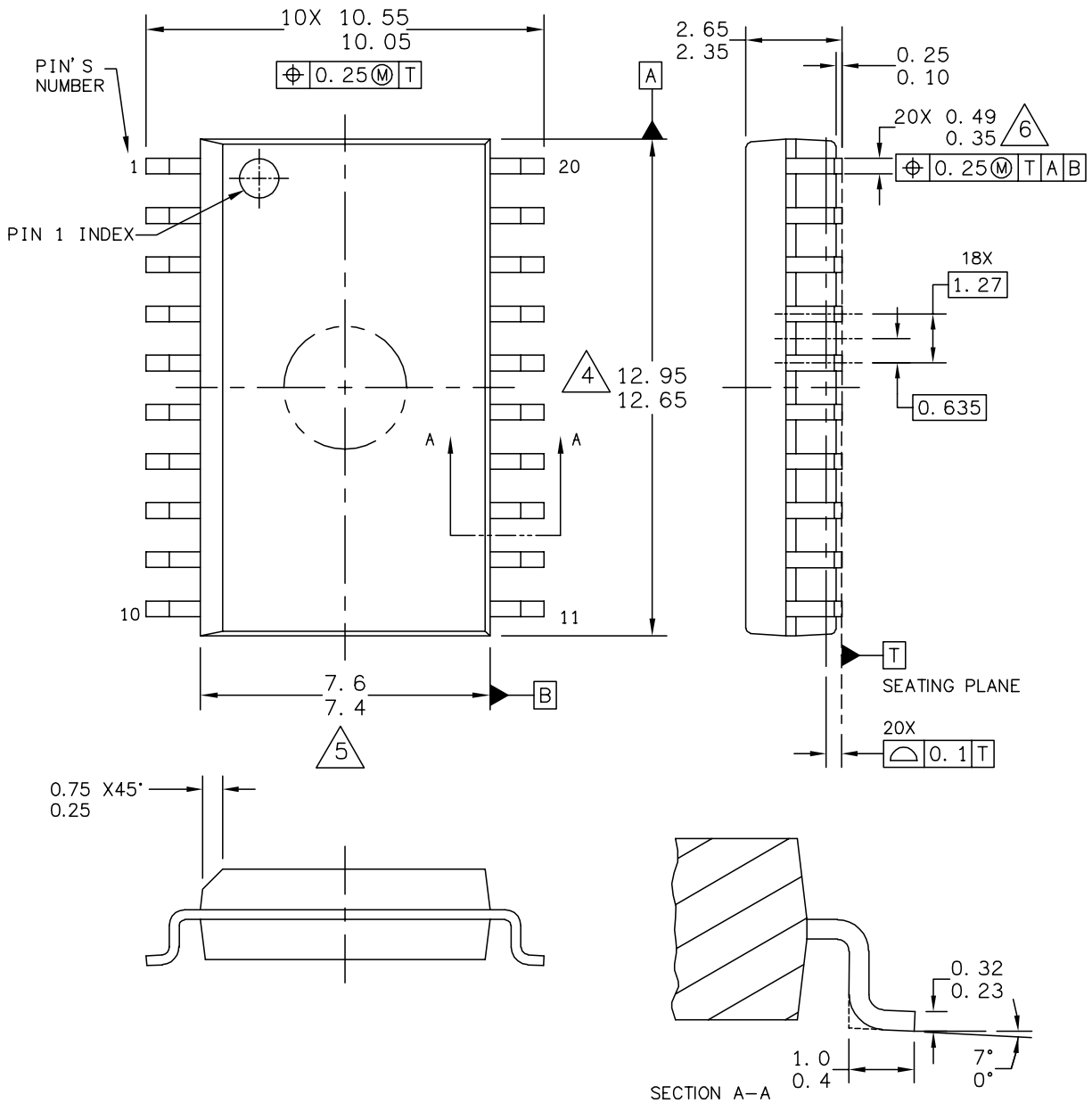
1. Outputs are terminated through a 50 Ω resistor to $V_{CC}-2$ volts.
2. Input swing is centered around V_{BB} .

Table 4. AC Characteristics ($V_{CC} = 3.0$ to 3.6 V; $V_{EE} = 0$ V or $V_{CC} = 0$ V; $V_{EE} = -3.6$ to -3.0 V)

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f_{max}	Maximum Toggle Frequency		1.75			1.75			1.75		GHz
t_{PLH} , t_{PHL}	Propagation Delay to Output Diff S.E. ⁽¹⁾	310 225		510 595	310 225		510 595	310 225		510 595	ps
t_{SKEW}	Data Path Skew ⁽²⁾ (differential) Part-to-Part Skew ⁽²⁾ (differential) Pulse Width Skew ⁽²⁾⁽³⁾ (differential)			50 200 50			50 200 50			50 200 50	ps
t_{JITTER}	Cycle to Cycle Jitter			1			1			1	ps
$V_{PP}^{(4)}$	Input Swing	150		1000	150		1000	150		1000	mV
t_r / t_f	Output Rise/Fall Times (20% - 80%)	50		250	50		250	50		250	ps

1. Single-ended input propagation delay requires t_r and $t_f \leq 350$ ps to meet specified propagation delay. Device will function with larger t_r and t_f values.
2. Skews are valid across specified voltage range, part-to-part skew is for a given temperature and frequency
3. Pulse width skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.
4. V_{PP} (min) is minimum input swing for which AC parameters guaranteed. The device has a DC gain of approximately 40.

PACKAGE DIMENSIONS



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TITLE: 20LD SOIC W/B, 1.27 PITCH CASE-OUTLINE	DOCUMENT NO: 98ASB42343B	REV: J
	CASE NUMBER: 751D-07	23 MAR 2005
	STANDARD: JEDEC MS-013AC	

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CASE 751D-07 ISSUE J 20-LEAD SOIC PACKAGE

PACKAGE DIMENSIONS

NOTES:

1. DIMENSIONS ARE IN MILLIMETERS.
 2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
 3. DATUMS A AND B TO BE DETERMINED AT THE PLANE WHERE THE BOTTOM OF THE LEADS EXIT THE PLASTIC BODY.
- ⚠ THIS DIMENSION DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS. MOLD FLASH, PROTRUSION OR GATE BURRS SHALL NOT EXCEED 0.15 MM PER SIDE. THIS DIMENSION IS DETERMINED AT THE PLANE WHERE THE BOTTOM OF THE LEADS EXIT THE PLASTIC BODY.
- ⚠ THIS DIMENSION DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSIONS SHALL NOT EXCEED 0.25 MM PER SIDE. THIS DIMENSION IS DETERMINED AT THE PLANE WHERE THE BOTTOM OF THE LEADS EXIT THE PLASTIC BODY.
- ⚠ THIS DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL NOT CAUSE THE LEAD WIDTH TO EXCEED 0.62 mm.

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MC100ES6017

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
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