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Freescale Semiconductor
 Technical Data

Document Number: MC100ES6017
 Rev 2, 09/2005

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

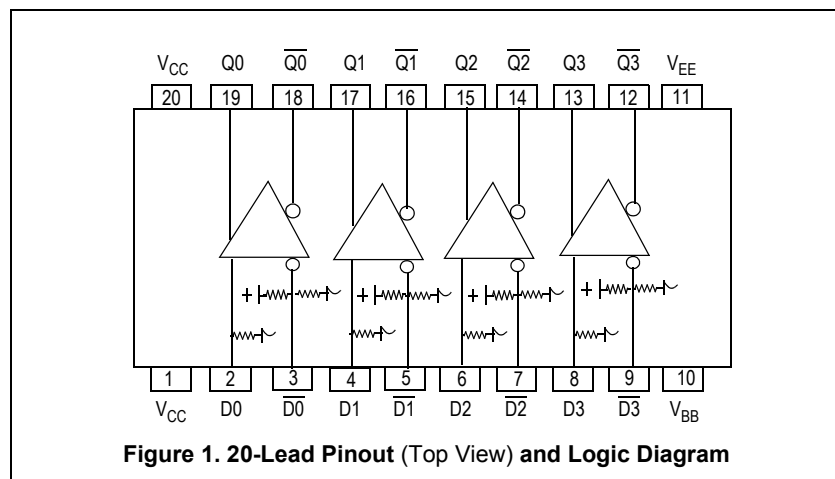
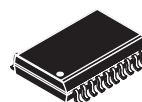


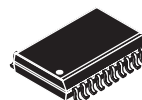
Figure 1. 20-Lead Pinout (Top View) and Logic Diagram

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 kΩ
Internal Input Pullup Resistor		75 kΩ
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} ≤ 3.6 V	V _{CC} + 0.3 V _{EE} - 0.3	V V
I _{OUT}	Output Current	Continuous Surge	50 100	mA 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	μA
I _{IL}	Input LOW Current	D _n	0.5		0.5			μA
		D _n	-300		-300			μA

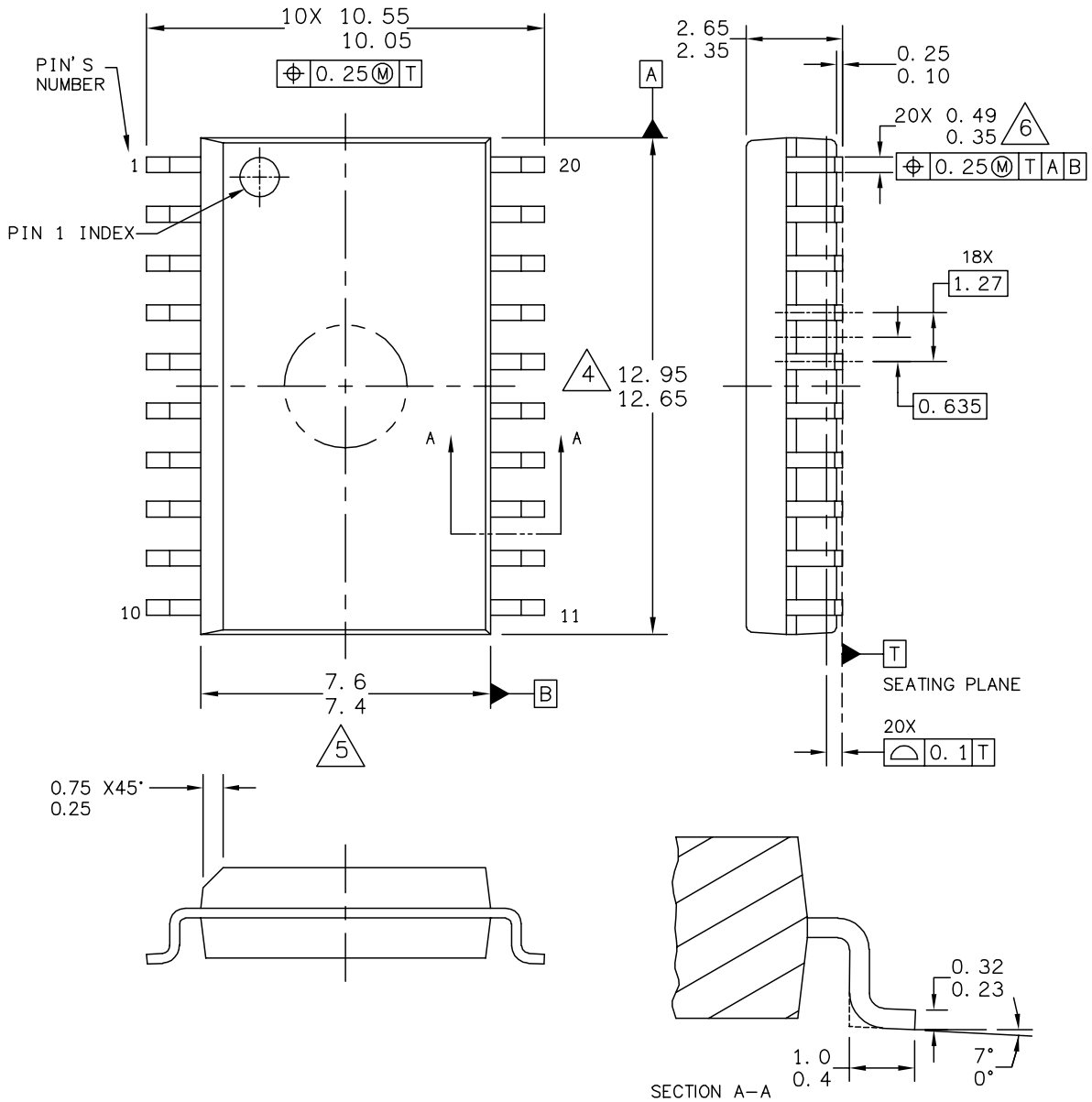
1. Outputs are terminated through a 50Ω resistor to V_{CC}-2 volts.
2. Input swing is centered around V_{BB}.

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	

**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.
4. 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.
5. 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.
6. 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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**CASE 751D-07
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MC100ES6017

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