

2.5V/3.3V, 500 MHz Twelve 2-to-1 Differential LVPECL Clock Multiplexer

Features

- Pin-to-pin compatible to ICS85352I
- $F_{MAX} \leq 500$ MHz
- Propagation Delay < 4 ns
- Output-to-output skew < 100 ps
- 12 pairs of differential LVPECL outputs
- Selectable differential CLK and /CLK inputs
- CLK, /CLK pair accepts LVDS, LVPECL, LVHSTL, SSTL and HCSL input level
- Select input accept CMOS/LVTTL levels
- 2.5V/3.3V power supply
- Operating Temperature: -40°C to $+85^{\circ}\text{C}$
- Packaging (Pb-free & Green):
 - 48-pin TQFP (FA)

Description

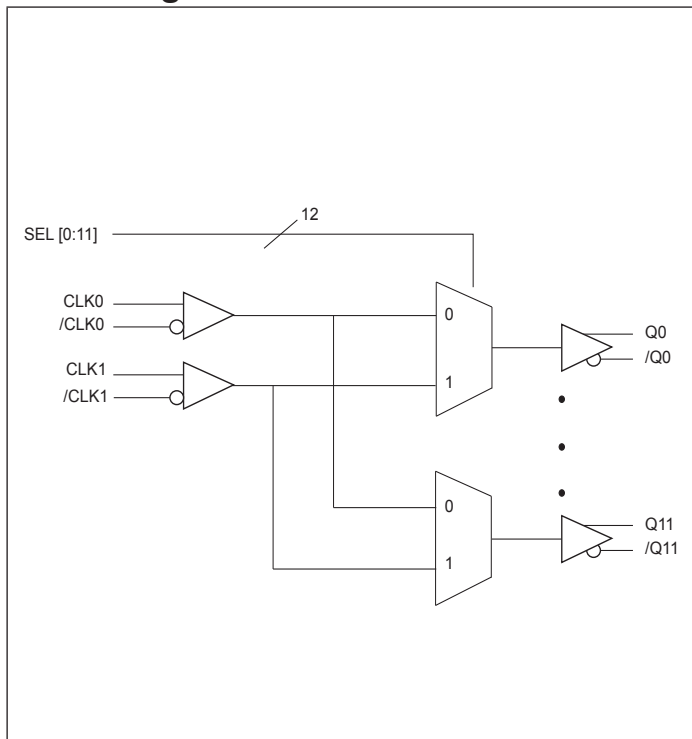
The PI6C485352 is a high-performance low-skew LVPECL fanout buffer. PI6C485352 features two selectable differential inputs and translates to twelve LVPECL output pairs. The inputs can also be configured to single-ended with external resistor bias circuit. The CLK input accepts LVPECL, LVDS, LVHSTL, SSTL or HCSL signals. The PI6C485352 is ideal for differential to LVPECL translations and/or LVPECL clock distribution.

Typical clock translation and distribution applications are data-communications and telecommunications.

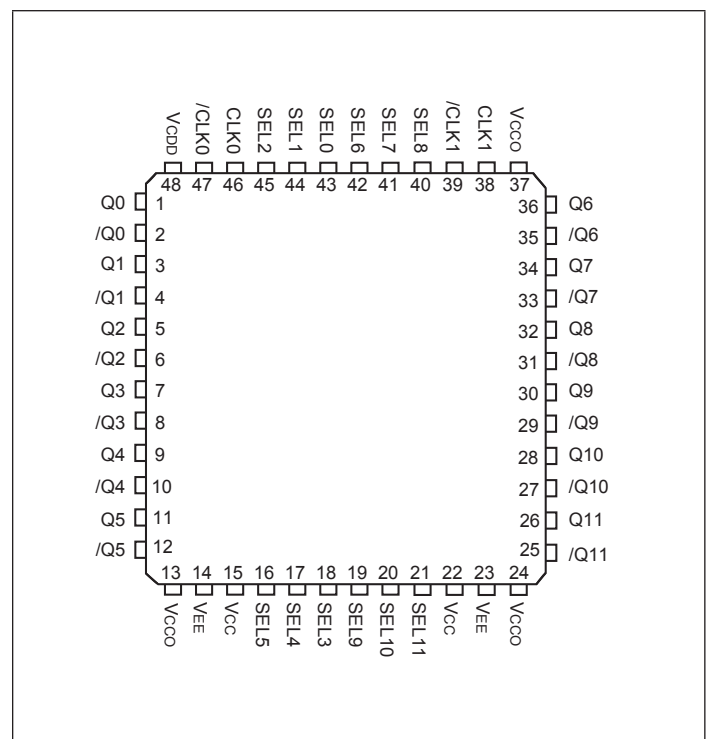
Applications

- Networking systems including switches and Routers
- High frequency backplane based computing and telecom platforms

Block Diagram



Pin Configuration (48-Pin TQFP)



Pinout Table

| Pin # | Pin Name | Type | Description |
|--------|------------------|-----------------|---|
| 1, 2 | Q0, /Q0 | Output | Differential LVPECL Output pairs. LVPECL interface levels |
| 3, 4 | Q1, /Q1 | | |
| 5, 6 | Q2, /Q2 | | |
| 7, 8 | Q3, /Q3 | | |
| 9, 10 | Q4, /Q4 | | |
| 11, 12 | Q5, /Q5 | | |
| 25, 26 | /Q11, Q11 | | |
| 27, 28 | /Q10, Q10 | | |
| 29, 30 | /Q9, Q9 | | |
| 31, 32 | /Q8, Q8 | | |
| 33, 34 | /Q7, Q7 | | |
| 35, 36 | /Q6, Q6 | | |
| 13, 24 | V _{CCO} | Power | Output supply pins |
| 37, 48 | | | Ground pins |
| 14, 23 | | | V _{EE} |
| 15, 22 | V _{CC} | | |
| 16, 17 | SEL5, SEL4, | Pulldown | Clock select inputs. LVCMOS/LVTTL interface levels |
| 18, 19 | SEL3, SEL9, | | |
| 20, 21 | SEL10, SEL11, | | |
| 40, 41 | SEL8, SEL7, | | |
| 42, 43 | SEL6, SEL0, | | |
| 44, 45 | SEL1, SEL2 | | |
| 38 | CLK1 | Pulldown | Non-inverting differential clock input |
| 39 | /CLK1 | Pullup/Pulldown | Inverting differential clock input |
| 46 | CLK0 | Pulldown | Non-inverting differential clock input |
| 47 | /CLK0 | Pullup/Pulldown | Inverting differential clock input |

Maximum Ratings (Above which the useful life may be impaired. For user guidelines, not tested)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|------------------|---------------------------|-------------------|------|------|---------------|-------|
| V_{CC}/V_{CC0} | Supply Voltage | Referenced to GND | | | 4.6 | V |
| V_{IN} | Input voltage | Referenced to GND | -0.5 | | $V_{CC}+0.5V$ | |
| Outputs, I_O | Surge current | | | | 100 | mA |
| TSTG | Storage temperature | | -65 | | 150 | °C |
| θ_{jA} | Package thermal impedance | | | | 73 | °C/W |

Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Pin Characteristics

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|----------------|---------------------------|----------------|------|------|------|------------|
| C_{IN} | Input Capacitance | | | | 4 | pF |
| R_{pullup} | Input Pullup Resistance | | | 50 | | k Ω |
| $R_{pulldown}$ | Input Pulldown Resistance | | | 50 | | k Ω |

Control Input Function Table

| SELX | Selected Clock Inputs |
|------|-----------------------|
| 0 | CLK0, /CLK0 |
| 1 | CLK1, /CLK1 |

Operating Conditions

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|------------------|-----------------------------|----------------|-------|------|------|-------|
| V _{CC} | Power Supply Voltage | | 3.0 | 3.3 | 3.6 | V |
| V _{CCO} | Output Power Supply Voltage | | 2.375 | | 3.6 | V |
| T _A | Ambient Temperature | | -40 | | 85 | °C |
| I _{EE} | Power Supply Current | | | | 200 | mA |

LVCMOS/LVTTL DC Characteristics (T_A = -40°C to +85°C, V_{CC} = 3.3V ±10%, V_{CCO} = 2.5V ±5% to 3.3V ±10%)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------|--------------------|------------|--|------|----------------------|-------|
| V _{IH} | Input High voltage | SEL0:SEL11 | 2 | | V _{CC} +0.3 | V |
| V _{IL} | Input Low voltage | SEL0:SEL11 | -0.3 | | 0.8 | |
| I _{IH} | Input High current | SEL0:SEL11 | V _{IN} = V _{CC} = 3.6V | | 150 | μA |
| I _{IL} | Input Low current | SEL0:SEL11 | V _{IN} = 0V, V _{CC} = 3.6V | | -5 | μA |

Differential DC Characteristics (T_A = -40°C to +85°C, V_{CC} = 3.3V ±10%, V_{CCO} = 2.5V ±5% to 3.3V ±10%)

| Parameter | Description | Conditions | Min. | Typ. | Max. | Units |
|------------------|--|---------------------------------|--|------|------------------------|-------|
| I _{IH} | Input High Current | CLK0, CLK1 | V _{IN} = V _{CC} = 3.6V | | 150 | μA |
| | | /CLK0, /CLK1 | V _{IN} = V _{CC} = 3.6V | | 150 | μA |
| I _{IL} | Input Low Current | CLK0, CLK1 | V _{CC} = 3.6V, V _{IN} = 0V | -5 | | μA |
| | | /CLK0, /CLK1 | V _{CC} = 3.6V, V _{IN} = 0V | -150 | | μA |
| V _{PP} | Peak-to-peak Voltage | | 0.15 | | 1.3 | V |
| V _{CMR} | Common Mode Input Voltage ⁽¹⁾ | | V _{EE} +0.5 | | V _{CC} -0.85V | V |
| V _{OH} | Output High Voltage ⁽²⁾ | V _{CCO} = 3.3V or 2.5V | V _{CCO} -1.4 | | V _{CCO} -0.9 | V |
| V _{OL} | Output Low Voltage ⁽²⁾ | V _{CCO} = 3.3V or 2.5V | V _{CCO} -2.0 | | V _{CCO} -1.7 | V |

Note:

1. Outputs terminated with 50Ω to V_{CCO} -2.0V

AC Characteristics (TA = -40°C to +85°C, VCC = 3.3V ±10%, VCCO = 2.5V ±5% to 3.3V ±10%)

| Parameter | Description | Conditions | Min. | Typ. | Max. | Units |
|-----------|--------------------------------------|------------|------|------|------|-------|
| fmax | Output Frequency | | | | 500 | MHz |
| tpd | Propagation Delay ⁽¹⁾ | | | | 4 | ns |
| Tsk | Output-to-output Skew ⁽²⁾ | | | | 100 | ps |
| Tskpp | Part-to-part Skew ⁽³⁾ | | | | 500 | ps |
| tr/tf | Output Rise/Fall time | 20% - 80% | 150 | | 700 | ps |
| odc | Output duty cycle | | 45 | | 55 | % |
| Tj | Buffer additive jitter RMS | | | 0.05 | | ps |

Note:

1. Measured from the differential input to the differential output crossing point
2. Defined as skew between outputs at the same supply voltage and with equal loads. Measured at the output differential crossing point.
3. Defined as skew between outputs on different parts operating at the same supply voltage and with equal loads. Measured at the outputs differential crossing point.

Applications Information

Wiring the differential input to accept single ended levels

Figure 1 shows how the differential input can be wired to accept single-ended levels. The reference voltage $V_{REF} = V_{CC}/2$ is generated by the bias resistors R1, R2 and C1. This bias circuit should be placed as close as possible to the input pin. The ratio of R1 and R2 should be adjusted to position the V_{REF} at the center of the input voltage swing. For example, if the input clock swing is 2.5V and $V_{CC} = 3.3V$, V_{REF} should be 1.25V and $R1/R2 = 0.609$.

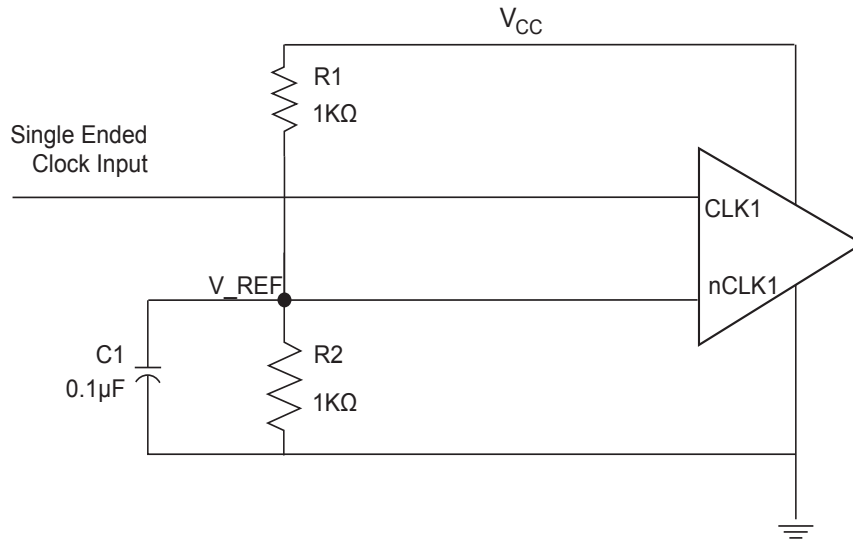
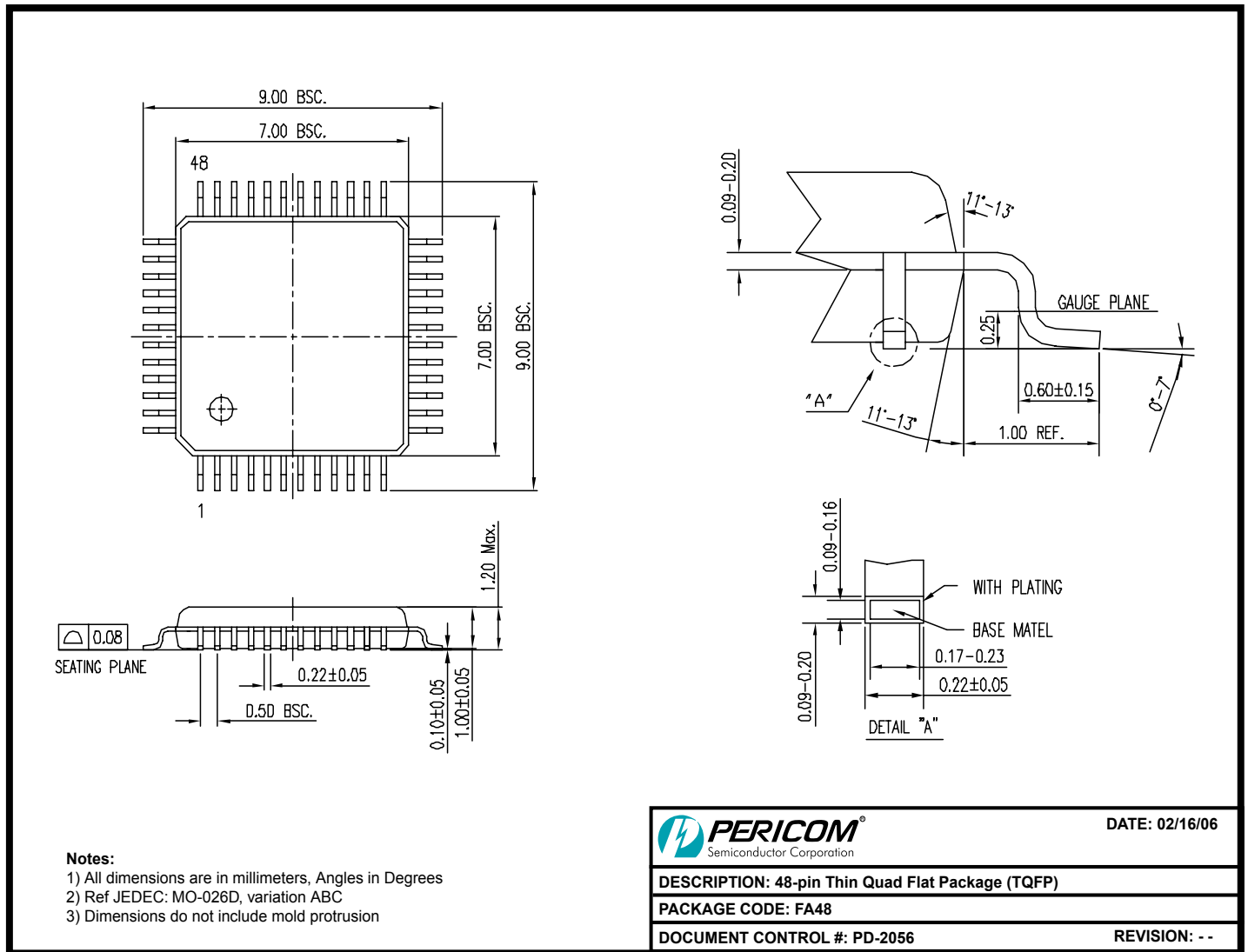


Figure 1: Single-ended Signal Driving Differential Input

Packaging Mechanical: 48-Pin TQFP (FA)



06-0182

Ordering Information

| Ordering Number | Package Code | Package Description |
|-----------------|--------------|--|
| PI6C485352FAE | FA | Pb-free & Green, 48-pin, 276-mil wide TQFP |

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- X suffix = Tape/Reel

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