



GENERAL DESCRIPTION



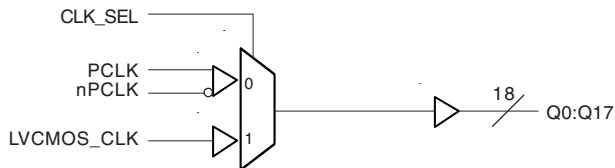
The ICS83940D is a low skew, 1-to-18 LVPECL-to-LVCMOS/LVTTTL Fanout Buffer and a member of the HiPerClockSTM family of High Performance Clock Solutions from ICS. The ICS83940D has two selectable clock inputs. The PCLK, nPCLK pair can accept LVPECL, CML, or SSTL input levels. The LVCMOS_CLK can accept LVCMOS or LVTTTL input levels. The low impedance LVCMOS/LVTTTL outputs are designed to drive 50Ω series or parallel terminated transmission lines.

The ICS83940D is characterized at full 3.3V and 2.5V or mixed 3.3V core, 2.5V output operating supply modes. Guaranteed output and part-to-part skew characteristics make the ICS83940D ideal for those clock distribution applications demanding well defined performance and repeatability.

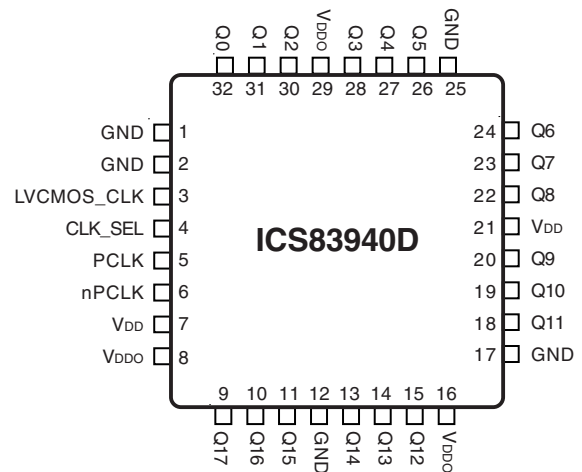
FEATURES

- 18 LVCMOS/LVTTTL outputs
- Selectable LVCMOS_CLK or LVPECL clock inputs
- PCLK, nPCLK supports the following input types: LVPECL, CML, SSTL
- LVCMOS_CLK accepts the following input levels: LVCMOS or LVTTTL
- Maximum output frequency: 250MHz
- Output skew: 150ps (maximum)
- Part to part skew: 750ps (maximum)
- Additive phase jitter, RMS: < 0.03ps (typical)
- Full 3.3V and 2.5V or mixed 3.3V core, 2.5V output supply modes
- 0°C to 70°C ambient operating temperature
- Lead-Free package available
- Pin compatible with the MPC940L

BLOCK DIAGRAM



PIN ASSIGNMENT



32-Lead LQFP

7mm x 7mm x 1.4mm package body

Y Package

Top View



TABLE 1. PIN DESCRIPTIONS

| Number | Name | Type | Description |
|---|--|--------------------------------|---|
| 1, 2, 12, 17, 25 | GND | Power | Power supply ground. |
| 3 | LVCMOS_CLK | Input Pull-down | Clock input. LVCMOS / LVTTTL interface levels. |
| 4 | CLK_SEL | Input Pull-down | Clock select input. Selects LVCMOS / LVTTTL clock input when HIGH. Selects PCLK, nPCLK inputs when LOW. LVCMOS / LVTTTL interface levels. |
| 5 | PCLK | Input Pull-down | Non-inverting differential LVPECL clock input. |
| 6 | nPCLK | Input Pull-up/ Pull-down | Inverting differential LVPECL clock input. $V_{DD}/2$ default when left floating. |
| 7, 21 | V_{DD} | Power | Core supply pins. |
| 8, 16, 29 | V_{DDO} | Power | Output supply pins. |
| 9, 10, 11, 13, 14, 15, 18, 19, 20, 22, 23, 24, 26, 27, 28, 30, 31, 32 | Q17, Q16, Q15, Q14, Q13, Q12, Q11, Q10, Q9, Q8, Q7, Q6, Q5, Q4, Q3, Q2, Q1, Q0 | Output | Clock outputs. LVCMOS / LVTTTL interface levels. |

NOTE: Pullup and Pull-down refers to internal input resistors. See Table 2, Pin Characteristics, for typical values.

TABLE 2. PIN CHARACTERISTICS

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|----------------|--|-----------------|---------|---------|---------|-----------|
| C_{IN} | Input Capacitance | | | 4 | | pF |
| C_{PD} | Power Dissipation Capacitance (per output) | | | 6 | | pF |
| R_{PULLUP} | Input Pullup Resistor | | | 51 | | $K\Omega$ |
| $R_{PULLDOWN}$ | Input Pulldown Resistor | | | 51 | | $K\Omega$ |
| R_{OUT} | Output Impedance | | 18 | | 28 | Ω |

TABLE 3A. CLOCK SELECT FUNCTION TABLE

| Control Input | Clock | |
|---------------|-------------|-------------|
| | CLK_SEL | LVCMOS_CLK |
| 0 | Selected | De-selected |
| 1 | De-selected | Selected |

TABLE 3B. CLOCK INPUT FUNCTION TABLE

| Inputs | | | | Outputs | Input to Output Mode | Polarity |
|---------|------------|----------------|-------------------|---------|------------------------------|---------------|
| CLK_SEL | LVCMOS_CLK | PCLK | nPCLK | Q0:Q17 | | |
| 0 | — | 0 | 1 | LOW | Differential to Single Ended | Non Inverting |
| 0 | — | 1 | 0 | HIGH | Differential to Single Ended | Non Inverting |
| 0 | — | 0 | Biased; NOTE 1 | LOW | Single Ended to Single Ended | Non Inverting |
| 0 | — | 1 | Biased; NOTE 1 | HIGH | Single Ended to Single Ended | Non Inverting |
| 0 | — | Biased; NOTE 1 | 0 | HIGH | Single Ended to Single Ended | Inverting |
| 0 | — | Biased; NOTE 1 | 1 | LOW | Single Ended to Single Ended | Inverting |
| 1 | 0 | — | — | LOW | Single Ended to Single Ended | Non Inverting |
| 1 | 1 | — | — | HIGH | Single Ended to Single Ended | Non Inverting |

NOTE 1: Please refer to the Application Information section, "Wiring the Differential Input to Accept Single Ended Levels".



ABSOLUTE MAXIMUM RATINGS

| | |
|--------------------------------|---------------------------|
| Supply Voltage, V_{DD} | 3.6V |
| Inputs, V_I | -0.3V to $V_{DD} + 0.3V$ |
| Outputs, V_O | -0.3V to $V_{DDO} + 0.3V$ |
| Input Current, I_{IN} | $\pm 20mA$ |
| Storage Temperature, T_{STG} | -40°C to 125°C |

NOTE: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These ratings are stress specifications only. Functional operation of product at these conditions or any conditions beyond those listed in the *DC Characteristics* or *AC Characteristics* is not implied. Exposure to absolute maximum rating conditions for extended periods may affect product reliability.



TABLE 4A. DC CHARACTERISTICS, $V_{DD} = V_{DDO} = 3.3V \pm 5\%$, $T_A = 0^\circ$ TO 70°

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|-----------|---|------------------|----------------|---------|----------------|---------|
| V_{IH} | Input High Voltage | LVCMOS_CLK | 2.4 | | V_{DD} | V |
| V_{IL} | Input Low Voltage | LVCMOS_CLK | | | 0.8 | V |
| V_{PP} | Peak-to-Peak Input Voltage | PCLK, nPCLK | 500 | | 1000 | mV |
| V_{CMR} | Input Common Mode Voltage; NOTE 1, 2 | PCLK, nPCLK | $V_{DD} - 1.4$ | | $V_{DD} - 0.6$ | V |
| I_{IN} | Input Current | | | | ± 200 | μA |
| V_{OH} | Output High Voltage | $I_{OH} = -20mA$ | 2.4 | | | V |
| V_{OL} | Output Low Voltage | $I_{OL} = 20mA$ | | | 0.5 | V |
| I_{DD} | Core Supply Current | | | | 25 | mA |

NOTE 1: For single ended applications, the maximum input voltage for PCLK, nPCLK is $V_{DD} + 0.3V$.

NOTE 2: Common mode voltage is defined as V_{IH} .

TABLE 5A. AC CHARACTERISTICS, $V_{DD} = V_{DDO} = 3.3V \pm 5\%$, $T_A = 0^\circ$ TO 70°

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|--------------|---|-----------------------------|--|---------|---------|-------|
| f_{MAX} | Output Frequency | | | | 250 | MHz |
| t_{pLH} | Propagation Delay | PCLK, nPCLK; NOTE 1, 5 | $f \leq 150MHz$ | 1.6 | 3.0 | ns |
| | | LVCMOS_CLK; NOTE 2, 5 | $f \leq 150MHz$ | 1.8 | 3.0 | ns |
| t_{pLH} | Propagation Delay | PCLK, nPCLK; NOTE 1, 5 | $f > 150MHz$ | 1.6 | 3.3 | ns |
| | | LVCMOS_CLK; NOTE 2, 5 | $f > 150MHz$ | 1.8 | 3.2 | ns |
| $t_{sk(o)}$ | Output Skew; NOTE 3, 5 | PCLK, nPCLK | Measured on rising edge @ $V_{DDO}/2$ | | 150 | ps |
| | | LVCMOS_CLK | | | 150 | ps |
| $t_{sk(pp)}$ | Part-to-Part Skew; NOTE 6 | PCLK, nPCLK | $f \leq 150MHz$ | | 1.4 | ns |
| | | LVCMOS_CLK | $f \leq 150MHz$ | | 1.2 | ns |
| $t_{sk(pp)}$ | Part-to-Part Skew; NOTE 6 | PCLK, nPCLK | $f > 150MHz$ | | 1.7 | ns |
| | | LVCMOS_CLK | $f > 150MHz$ | | 1.4 | ns |
| $t_{sk(pp)}$ | Part-to-Part Skew; NOTE 4, 5 | PCLK, nPCLK | Measured on rising edge @ $V_{DDO}/2$ | | 850 | ps |
| | | LVCMOS_CLK | | | 750 | ps |
| f_{jit} | Buffer Additive Phase Jitter, RMS; refer to Additive Phase Jitter section, NOTE 7 | | | 0.03 | | ps |
| t_R / t_F | Output Rise/Fall Time | 0.5 to 2.4V | 0.3 | | 1.1 | ns |
| odc | Output Duty Cycle | $f < 134MHz$ | 45 | 50 | 55 | % |
| | | $134MHz \leq f \leq 250MHz$ | 40 | 50 | 60 | % |

All parameters measured at 200MHz unless noted otherwise.

NOTE 1: Measured from the differential input crossing point to the output $V_{DDO}/2$.

NOTE 2: Measured from $V_{DD}/2$ to $V_{DDO}/2$.

NOTE 3: Defined as skew between outputs at the same supply voltage and with equal load conditions. Measured at $V_{DDO}/2$.

NOTE 4: Defined as skew between outputs on different devices operating at the same supply voltages, same temperature, and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at $V_{DDO}/2$.

NOTE 5: This parameter is defined in accordance with JEDEC Standard 65.

NOTE 6: Defined as skew between outputs on different devices, across temperature and voltage ranges, and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at $V_{DDO}/2$.

NOTE 7: Driving only one input clock.



TABLE 4B. DC CHARACTERISTICS, $V_{DD} = 3.3V \pm 5\%$, $V_{DDO} = 2.5V \pm 5\%$, $T_A = 0^\circ$ TO 70°

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|-----------|---|------------------|----------------|---------|----------------|---------|
| V_{IH} | Input High Voltage | LVC MOS_CLK | 2.4 | | V_{DD} | V |
| V_{IL} | Input Low Voltage | LVC MOS_CLK | | | 0.8 | V |
| V_{PP} | Peak-to-Peak Input Voltage | PCLK, nPCLK | 300 | | 1000 | mV |
| V_{CMR} | Input Common Mode Voltage; NOTE 1, 2 | PCLK, nPCLK | $V_{DD} - 1.4$ | | $V_{DD} - 0.6$ | V |
| I_{IN} | Input Current | | | | ± 200 | μA |
| V_{OH} | Output High Voltage | $I_{OH} = -20mA$ | 1.8 | | | V |
| V_{OL} | Output Low Voltage | $I_{OL} = 20mA$ | | | 0.5 | V |
| I_{DD} | Core Supply Current | | | | 25 | mA |

NOTE 1: For single ended applications, the maximum input voltage for PCLK, nPCLK is $V_{DD} + 0.3V$.

NOTE 2: Common mode voltage is defined as V_{IH} .

TABLE 5B. AC CHARACTERISTICS, $V_{DD} = 3.3V \pm 5\%$, $V_{DDO} = 2.5V \pm 5\%$, $T_A = 0^\circ$ TO 70°

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|-------------|---|---------------------------|--|---------|---------|-------|
| f_{MAX} | Output Frequency | | | | 250 | MHz |
| t_{PLH} | Propagation Delay | PCLK, nPCLK; NOTE 1, 5 | $f \leq 150MHz$ | 1.7 | 3.2 | ns |
| | | LVC MOS_CLK; NOTE 2, 5 | $f \leq 150MHz$ | 1.7 | 3.0 | ns |
| t_{PLH} | Propagation Delay | PCLK, nPCLK; NOTE 1, 5 | $f > 150MHz$ | 1.6 | 3.4 | ns |
| | | LVC MOS_CLK; NOTE 2, 5 | $f > 150MHz$ | 1.8 | 3.3 | ns |
| $tsk(o)$ | Output Skew; NOTE 3, 5 | PCLK, nPCLK | Measured on rising edge @ $V_{DDO}/2$ | | 150 | ps |
| | | LVC MOS_CLK | | | 150 | ps |
| $tsk(pp)$ | Part-to-Part Skew; NOTE 6 | PCLK, nPCLK | $f \leq 150MHz$ | | 1.5 | ns |
| | | LVC MOS_CLK | $f \leq 150MHz$ | | 1.3 | ns |
| $tsk(pp)$ | Part-to-Part Skew; NOTE 6 | PCLK, nPCLK | $f > 150MHz$ | | 1.8 | ns |
| | | LVC MOS_CLK | $f > 150MHz$ | | 1.5 | ns |
| $tsk(pp)$ | Part-to-Part Skew; NOTE 4, 5 | PCLK, nPCLK | Measured on rising edge @ $V_{DDO}/2$ | | 850 | ps |
| | | LVC MOS_CLK | | | 750 | ps |
| f_{jit} | Buffer Additive Phase Jitter, RMS; refer to Additive Phase Jitter section, NOTE 7 | | | 0.03 | | ps |
| t_R / t_F | Output Rise/Fall Time | 0.5 to 1.8V | 0.3 | | 1.2 | ns |
| odc | Output Duty Cycle | $f < 134MHz$ | 45 | 50 | 55 | % |

All parameters measured at 200MHz unless noted otherwise.

NOTE 1: Measured from the differential input crossing point to the output $V_{DDO}/2$.

NOTE 2: Measured from $V_{DD}/2$ to $V_{DDO}/2$.

NOTE 3: Defined as skew between outputs at the same supply voltage and with equal load conditions. Measured at $V_{DDO}/2$.

NOTE 4: Defined as skew between outputs on different devices operating at the same supply voltages, same temperature, and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at $V_{DDO}/2$.

NOTE 5: This parameter is defined in accordance with JEDEC Standard 65.

NOTE 6: Defined as skew between outputs on different devices, across temperature and voltage ranges, and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at $V_{DDO}/2$.

NOTE 7: Driving only one input clock.



TABLE 4C. DC CHARACTERISTICS, $V_{DD} = V_{DDO} = 2.5V \pm 5\%$, $T_A = 0^\circ$ TO 70°

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|-----------|--------------------------------------|------------------|----------------|---------|----------------|---------|
| V_{IH} | Input High Voltage | LVCMOS_CLK | 2 | | V_{DD} | V |
| V_{IL} | Input Low Voltage | LVCMOS_CLK | | | 0.8 | V |
| V_{PP} | Peak-to-Peak Input Voltage | PCLK, nPCLK | 300 | | 1000 | mV |
| V_{CMR} | Input Common Mode Voltage; NOTE 1, 2 | PCLK, nPCLK | $V_{DD} - 1.4$ | | $V_{DD} - 0.6$ | V |
| I_{IN} | Input Current | | | | ± 200 | μA |
| V_{OH} | Output High Voltage | $I_{OH} = -12mA$ | 1.8 | | | V |
| V_{OL} | Output Low Voltage | $I_{OL} = 12mA$ | | | 0.5 | V |
| I_{DD} | Core Supply Current | | | | 25 | mA |

NOTE 1: For single ended applications, the maximum input voltage for PCLK, nPCLK is $V_{DD} + 0.3V$.

NOTE 2: Common mode voltage is defined as V_{IH} .

TABLE 5C. AC CHARACTERISTICS, $V_{DD} = V_{DDO} = 2.5V \pm 5\%$, $T_A = 0^\circ$ TO 70°

| Symbol | Parameter | Test Conditions | Minimum | Typical | Maximum | Units |
|--------------|---|------------------------|---------------------------------------|---------|---------|-------|
| f_{MAX} | Output Frequency | | | | 200 | MHz |
| t_{PLH} | Propagation Delay; | PCLK, nPCLK; NOTE 1, 5 | $f \leq 150MHz$ | 1.2 | 3.8 | ns |
| | | LVCMOS_CLK; NOTE 2, 5 | $f \leq 150MHz$ | 1.5 | 3.2 | ns |
| t_{PLH} | Propagation Delay; | PCLK, nPCLK; NOTE 1, 5 | $f > 150MHz$ | 1.5 | 3.7 | ns |
| | | LVCMOS_CLK; NOTE 2, 5 | $f > 150MHz$ | 2 | 3.6 | ns |
| $t_{sk(o)}$ | Output Skew; NOTE 3, 5 | PCLK, nPCLK | Measured on rising edge @ $V_{DDO}/2$ | | 200 | ps |
| | | LVCMOS_CLK | | 200 | ps | |
| $t_{sk(pp)}$ | Part-to-Part Skew; NOTE 6 | PCLK, nPCLK | $f \leq 150MHz$ | | 2.6 | ns |
| | | LVCMOS_CLK | $f \leq 150MHz$ | | 1.7 | ns |
| $t_{sk(pp)}$ | Part-to-Part Skew; NOTE 6 | PCLK, nPCLK | $f > 150MHz$ | | 2.2 | ns |
| | | LVCMOS_CLK | $f > 150MHz$ | | 1.7 | ns |
| $t_{sk(pp)}$ | Part-to-Part Skew; NOTE 4, 5 | PCLK, nPCLK | Measured on rising edge @ $V_{DDO}/2$ | | 1.2 | ns |
| | | LVCMOS_CLK | | 1.0 | ns | |
| f_{jit} | Buffer Additive Phase Jitter, RMS; refer to Additive Phase Jitter section, NOTE 7 | | | 0.03 | | ps |
| t_R / t_F | Output Rise/Fall Time | 0.5 to 1.8V | 0.3 | | 1.2 | ns |
| odc | Output Duty Cycle | $f < 134MHz$ | 45 | | 55 | % |

All parameters measured at 200MHz unless noted otherwise.

NOTE 1: Measured from the differential input crossing point to the output $V_{DDO}/2$.

NOTE 2: Measured from $V_{DD}/2$ to $V_{DDO}/2$.

NOTE 3: Defined as skew between outputs at the same supply voltage and with equal load conditions. Measured at $V_{DDO}/2$.

NOTE 4: Defined as skew between outputs on different devices operating at the same supply voltages, same temperature, and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at $V_{DDO}/2$.

NOTE 5: This parameter is defined in accordance with JEDEC Standard 65.

NOTE 6: Defined as skew between outputs on different devices, across temperature and voltage ranges,

and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at $V_{DDO}/2$.

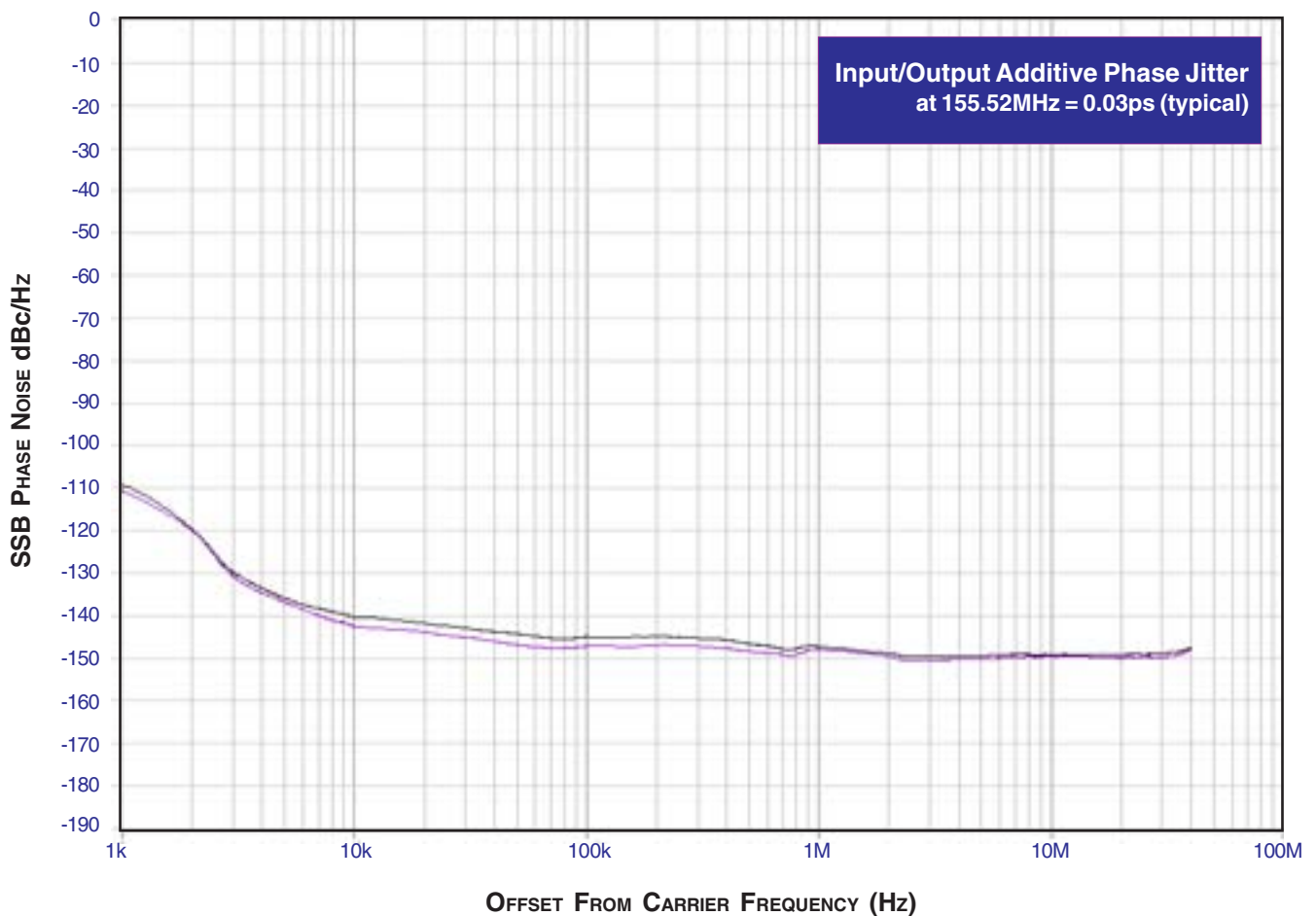
NOTE 7 Driving only one input clock.



ADDITIVE PHASE JITTER

The spectral purity in a band at a specific offset from the fundamental compared to the power of the fundamental is called the ***dBc Phase Noise***. This value is normally expressed using a Phase noise plot and is most often the specified plot in many applications. Phase noise is defined as the ratio of the noise power present in a 1Hz band at a specified offset from the fundamental frequency to the power value of the fundamental. This ratio is expressed in decibels (dBm) or a ratio of the power in

the 1Hz band to the power in the fundamental. When the required offset is specified, the phase noise is called a ***dBc*** value, which simply means dBm at a specified offset from the fundamental. By investigating jitter in the frequency domain, we get a better understanding of its effects on the desired application over the entire time record of the signal. It is mathematically possible to calculate an expected bit error rate given a phase noise plot.

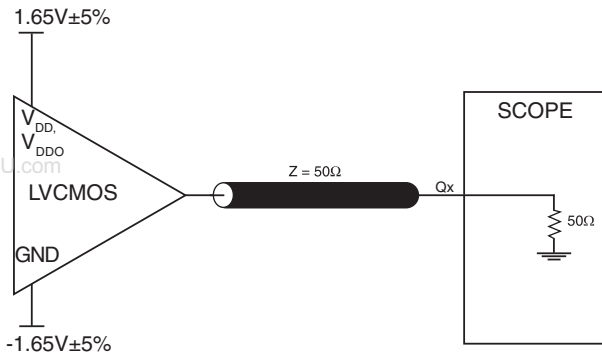


As with most timing specifications, phase noise measurements have issues. The primary issue relates to the limitations of the equipment. Often the noise floor of the equipment is higher than the noise floor of the device. This is illustrated above. The de-

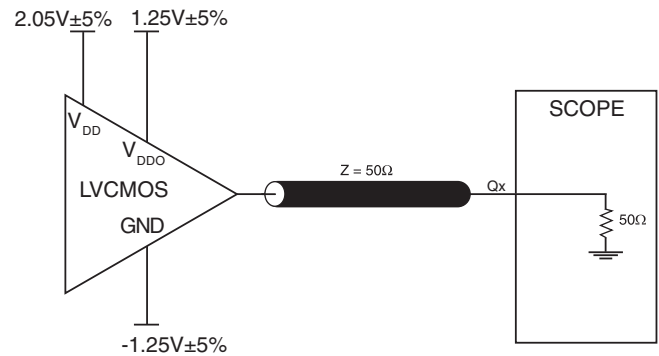
vice meets the noise floor of what is shown, but can actually be lower. The phase noise is dependant on the input source and measurement equipment.



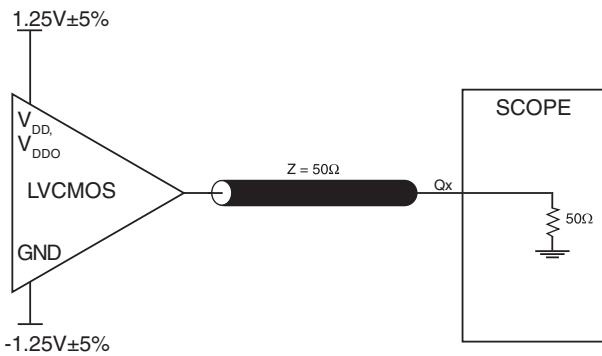
PARAMETER MEASUREMENT INFORMATION



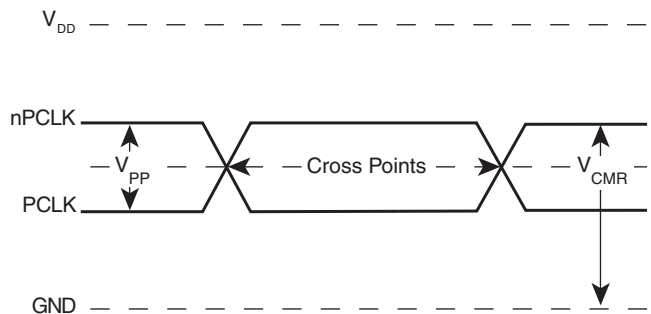
3.3V CORE/3.3V OUTPUT LOAD AC TEST CIRCUIT



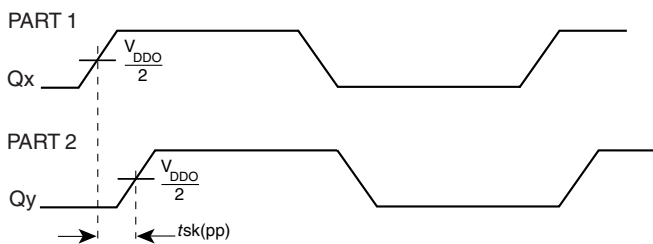
3.3V CORE/2.5V OUTPUT LOAD AC TEST CIRCUIT



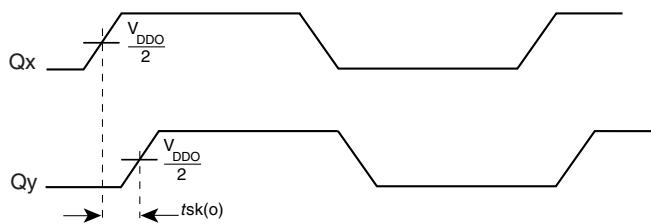
2.5V OUTPUT LOAD AC TEST CIRCUIT



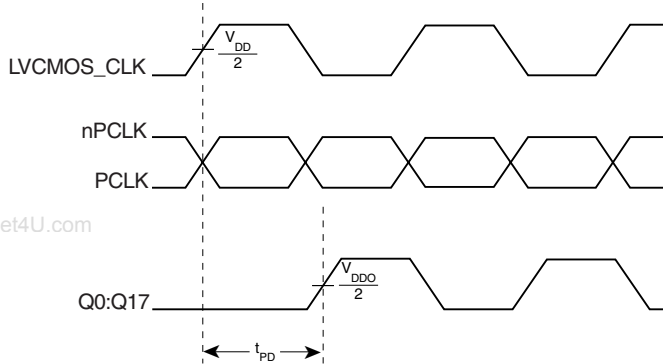
DIFFERENTIAL INPUT LEVEL



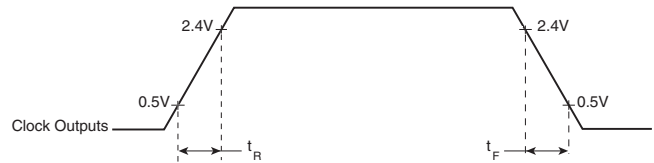
PART-TO-PART SKEW



OUTPUT SKEW

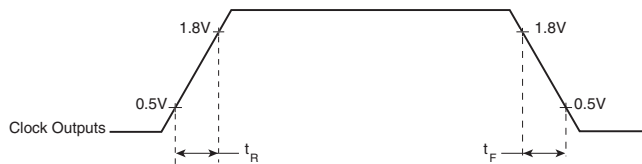


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PROPAGATION DELAY

3.3V OUTPUT RISE/FALL TIME



2.5V OUTPUT RISE/FALL TIME

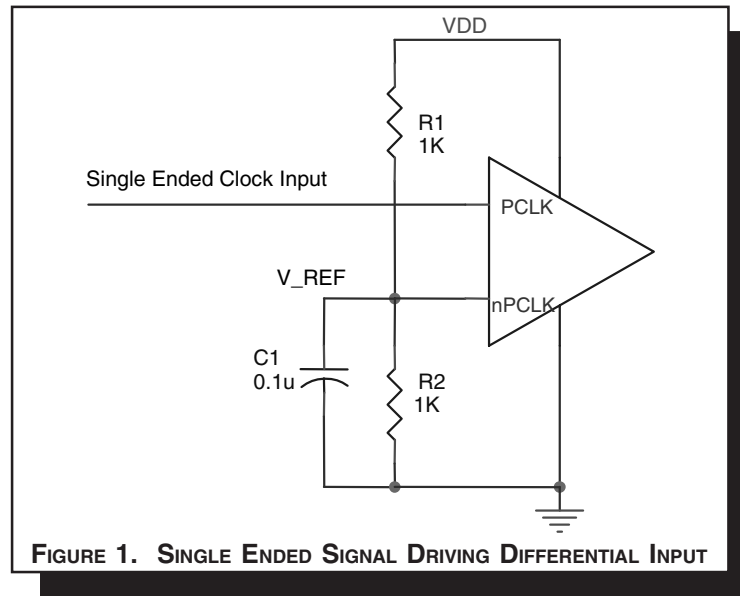


APPLICATION INFORMATION

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 $V_{REF} = V_{DD}/2$ is generated by the bias resistors R1, R2 and C1. This bias circuit should be located as close as possible to the input pin. The ratio

of R1 and R2 might need to be adjusted to position the V_{REF} in the center of the input voltage swing. For example, if the input clock swing is only 2.5V and $V_{DD} = 3.3V$, V_{REF} should be 1.25V and $R2/R1 = 0.609$.





LVPECL CLOCK INPUT INTERFACE

The PCLK /nPCLK accepts LVPECL, CML, SSTL and other differential signals. Both V_{SWING} and V_{OH} must meet the V_{PP} and V_{CMR} input requirements. Figures 2A to 2F show interface examples for the HiPerClockS PCLK/nPCLK input driven by the most common driver types. The input interfaces suggested

here are examples only. If the driver is from another vendor, use their termination recommendation. Please consult with the vendor of the driver component to confirm the driver termination requirements.

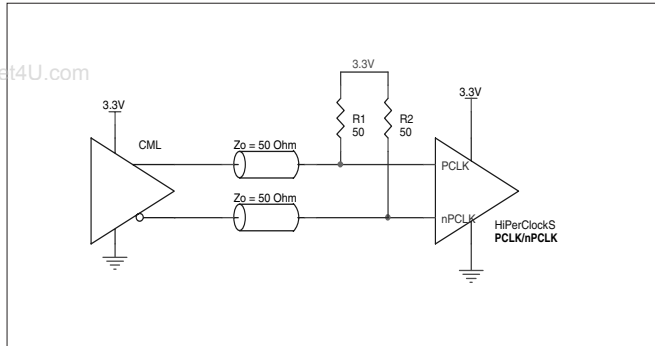


FIGURE 2A. HiPerClockS PCLK/nPCLK INPUT DRIVEN BY AN OPEN COLLECTOR CML DRIVER

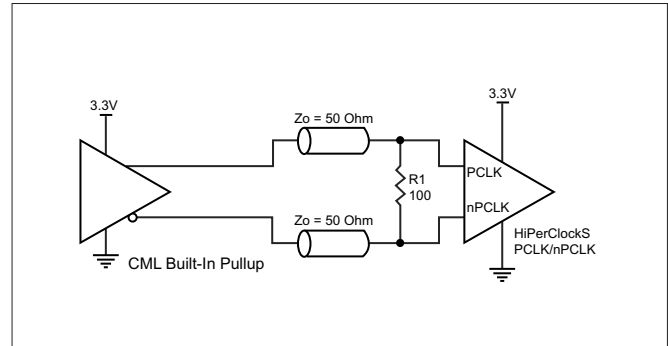


FIGURE 2B. HiPerClockS PCLK/nPCLK INPUT DRIVEN BY A BUILT-IN PULLUP CML DRIVER

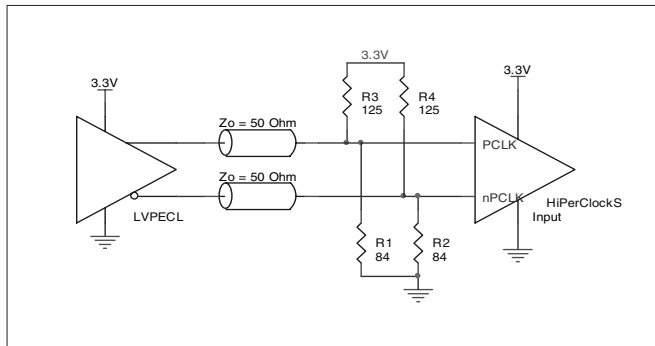


FIGURE 2C. HiPerClockS PCLK/nPCLK INPUT DRIVEN BY A 3.3V LVPECL DRIVER

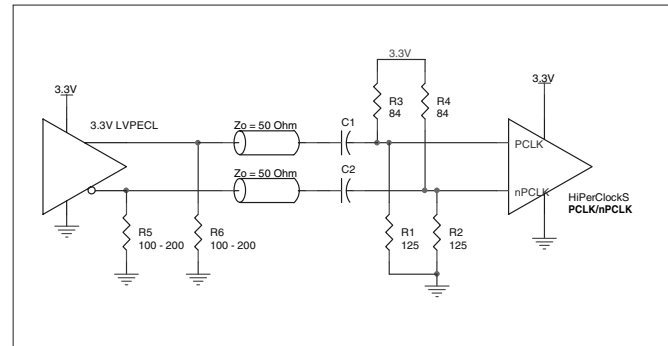


FIGURE 2D. HiPerClockS PCLK/nPCLK INPUT DRIVEN BY A 3.3V LVPECL DRIVER WITH AC COUPLE

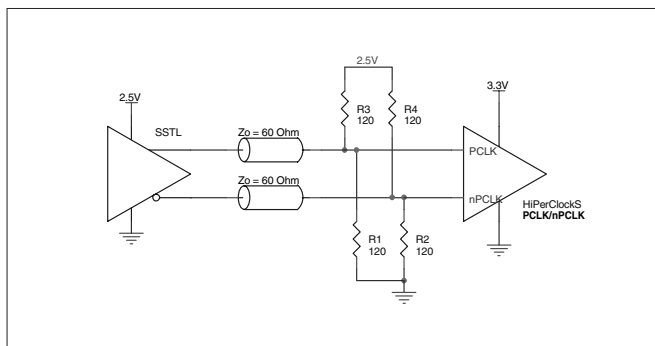


FIGURE 2E. HiPerClockS PCLK/nPCLK INPUT DRIVEN BY AN SSTL DRIVER

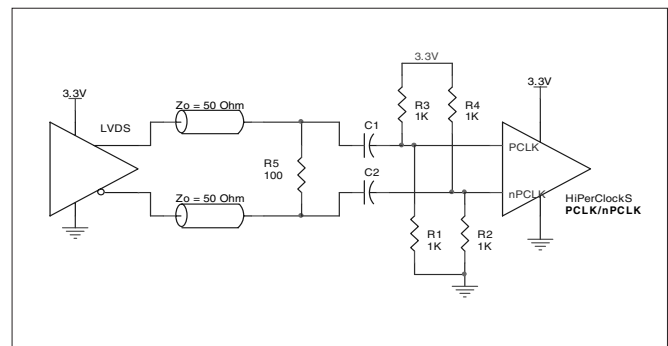


FIGURE 2F. HiPerClockS PCLK/nPCLK INPUT DRIVEN BY A 3.3V LVDS DRIVER



RELIABILITY INFORMATION

TABLE 6. θ_{JA} VS. AIR FLOW TABLE FOR 32 LEAD LQFP

| θ_{JA} by Velocity (Linear Feet per Minute) | | | |
|--|----------|----------|----------|
| | 0 | 200 | 500 |
| Single-Layer PCB, JEDEC Standard Test Boards | 67.8°C/W | 55.9°C/W | 50.1°C/W |
| Multi-Layer PCB, JEDEC Standard Test Boards | 47.9°C/W | 42.1°C/W | 39.4°C/W |

NOTE: Most modern PCB designs use multi-layered boards. The data in the second row pertains to most designs.

TRANSISTOR COUNT

The transistor count for ICS83940D is: 820



PACKAGE OUTLINE - Y SUFFIX FOR 32 LEAD LQFP

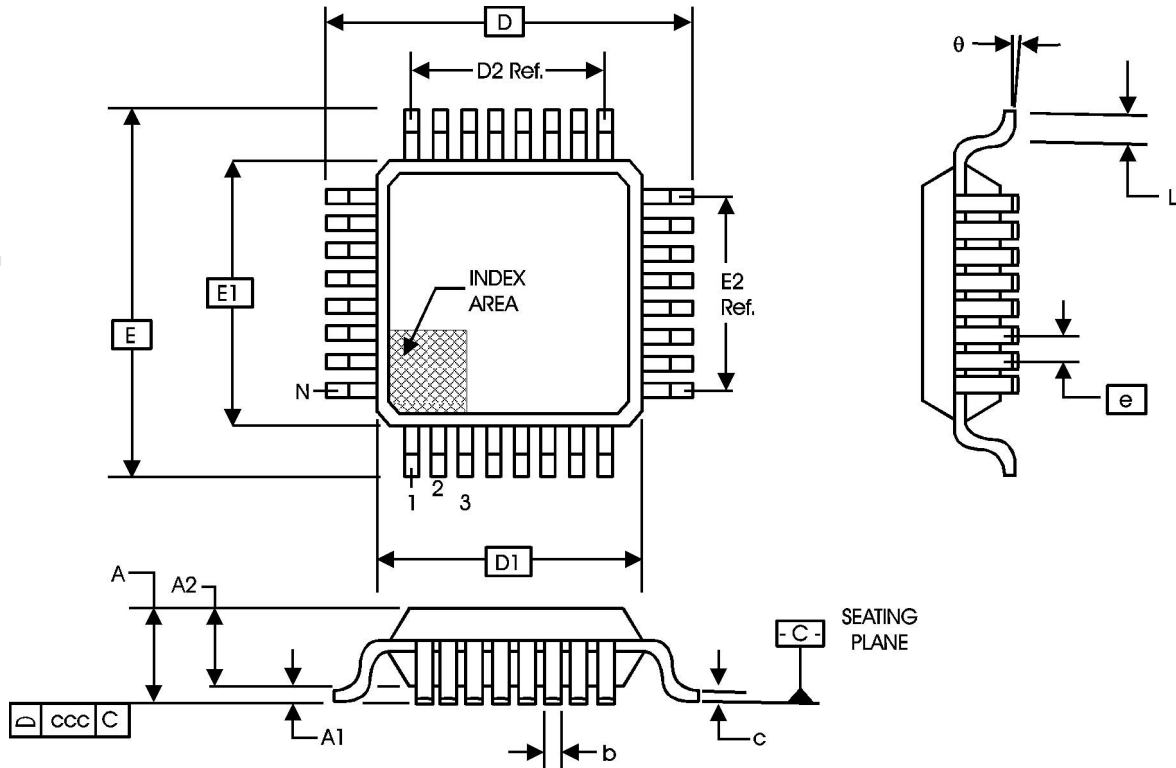


TABLE 7. PACKAGE DIMENSIONS

| JEDEC VARIATION ALL DIMENSIONS IN MILLIMETERS | | | |
|--|------------|---------|---------|
| SYMBOL | BBA | | |
| | MINIMUM | NOMINAL | MAXIMUM |
| N | 32 | | |
| A | -- | -- | 1.60 |
| A1 | 0.05 | -- | 0.15 |
| A2 | 1.35 | 1.40 | 1.45 |
| b | 0.30 | 0.37 | 0.45 |
| c | 0.09 | -- | 0.20 |
| D | 9.00 BASIC | | |
| D1 | 7.00 BASIC | | |
| D2 | 5.60 Ref. | | |
| E | 9.00 BASIC | | |
| E1 | 7.00 BASIC | | |
| E2 | 5.60 Ref. | | |
| e | 0.80 BASIC | | |
| L | 0.45 | 0.60 | 0.75 |
| theta | 0° | -- | 7° |
| ccc | -- | -- | 0.10 |

Reference Document: JEDEC Publication 95, MS-026



Integrated
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ICS83940D

LOW SKEW, 1-TO-18

LVPECL-TO-LVCMOS / LVTTTL FANOUT BUFFER

TABLE 8. ORDERING INFORMATION

| Part/Order Number | Marking | Package | Count | Temperature |
|-------------------|--------------|---|--------------|-------------|
| ICS83940DY | ICS83940DY | 32 Lead LQFP | 250 per tray | 0°C to 70°C |
| ICS83940DYT | ICS83940DY | 32 Lead LQFP on Tape and Reel | 1000 | 0°C to 70°C |
| ICS83940DYLF | ICS83940DYLF | 32 Lead "Lead Free" LQFP | 250 per tray | 0°C to 70°C |
| ICS83940DYLFT | ICS83940DYLF | 32 Lead "Lead Free" LQFP on Tape and Reel | 1000 | 0°C to 70°C |

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REVISION HISTORY SHEET

| Rev | Table | Page | Description of Change | Date |
|-----|-----------|--|---|----------|
| A | T5A | 4 | 3.3V AC Characteristics table - <ul style="list-style-type: none"> tsk(pp) Test Conditions, replaced "<" with "≤"; corrected Units to "ns" from "ps". odc - corrected Test Conditions to read "134MHz ≤ f ≤ 250MHz", from "f ≤ 250MHz". | 10/11/02 |
| | T5B | 5 | 3.3V/2.5V AC Characteristics table - tsk(pp) Test Conditions, replaced "<" with "≤"; corrected Units to read "ns" from "ps". | |
| | T5C | 6 | 2.5V AC Characteristics table - tsk(pp) Test Conditions, replaced "<" with "≤"; corrected Units to "ns" from "ps". | |
| A | T2 | 2 | Pin Characteristics table - changed R _{OUT} 25Ω maximum to 28Ω maximum. Delete R _{PULLUP} row. | 12/12/02 |
| | | 7 | 3.3V Output Load AC Test Circuit diagram - corrected GND equation to read -1.65V... from -1.165V... Added LVTTTL to title. Updated format. | |
| B | T1 | 2 | Pin Description Table - added <i>Pullup</i> and <i>Pulldown</i> to Pin 6, nPCLK. | 10/9/03 |
| | T2 | 2 | Pin Characteristics Table - added R _{PULLUP} row. | |
| | T5A | 4 | Added tjit row. | |
| | T5B T5C | 5 | Added tjit row. | |
| | | 6 | Added tjit row. | |
| | | 7 | Added <i>Additive Phase Jitter</i> section. | |
| | 10 | Updated <i>Single Ended Signal Driving Differential Input</i> diagram. | | |
| | 11 | Added <i>LVPECL Clock Interface</i> section. | | |
| B | T5A - T5C | 1 | Added "Lead-Free" bullet to Features section. | 6/15/04 |
| | | 4 - 6 | Added NOTE 7. | |
| | | 11 | Updated LVPECL Clock Input Interface section. | |
| | | 14 | Ordering Information table - added "Lead-Free" part number. | |