

P3P816711A

Spread Spectrum Peak EMI Reduction Device

Description

P3P816711A generates a 1x LVCMOS low EMI Spread Spectrum clock of the input. The device accepts an AC or DC coupled external clock input at CLKIN. It reduces electromagnetic interference (EMI) at the clock source, allowing system wide reduction of EMI of down stream clock and data dependent signals. It allows significant system cost savings by reducing the number of circuit board layers, ferrite beads, shielding, and other passive components that are traditionally required to pass EMI regulations.

P3P816711A use the most efficient and optimized modulation profile approved by the FCC and is implemented in a proprietary all-digital method.

P3P816711A operates over a V_{DD} range of $3.3\text{ V} \pm 10\%$ and is available in TSOP-6 package over a temperature range of 0°C to $+70^{\circ}\text{C}$. P3I816711A operates over a temperature range of -40°C to $+85^{\circ}\text{C}$.

Application

The P3P816711A is targeted towards EMI management in consumer electronics applications including Set Top Box.

Features

- 1x Low EMI Spread Spectrum Clock of the Input
- External Reference Input Clock: 30 MHz
- Output Clock: $30\text{ MHz} \pm 0.3\%$ (typ)
- Low Inherent Cycle-to-Cycle Jitter
- Supply Voltage: $3.3\text{ V} \pm 10\%$
- LVCMOS Input and Output
- Available in TSOP-6 (6 Lead TSOT-23)
- Operating Temperature Range: -40°C to $+85^{\circ}\text{C}$
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant



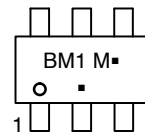
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TSOP-6
CASE 318G

MARKING DIAGRAM



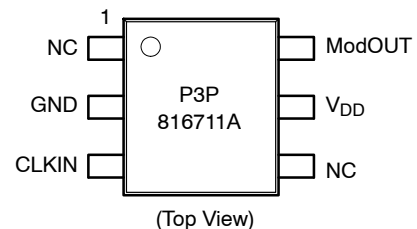
BM1 = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(Note: Microdot may be in either location)

PIN CONFIGURATION



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

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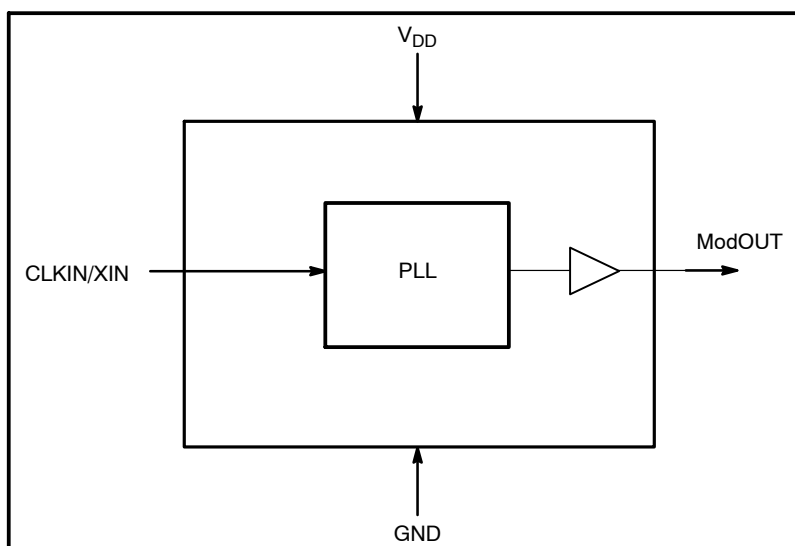


Figure 1. Block Diagram

Table 1. PIN DESCRIPTION

| Pin# | Pin Name | Type | Description |
|------|-----------------|--------|---------------------------------|
| 1 | NC | | No Connect |
| 2 | GND | Power | Ground to entire chip. |
| 3 | CLKIN | Input | External Reference Clock Input. |
| 4 | NC | | No Connect |
| 5 | V _{DD} | Power | Power Supply to entire chip. |
| 6 | ModOUT | Output | Spread Spectrum Clock Output. |

Table 2. OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit |
|-----------------|--|--------------------------|-----------------|------|
| V _{DD} | Voltage on any pin with respect to V _{SS} | 2.97 | 3.63 | V |
| T _A | Operating Temperature | Commercial Industrial | 0 +70 +85 | °C |
| C _L | Load Capacitance | | 15 | pF |
| C _{IN} | Input Capacitance | | 7 | pF |

Table 3. ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Rating | Unit |
|-----------------------------------|--|--------------|------|
| V _{DD} , V _{IN} | Voltage on any pin with respect to Ground | -0.5 to +4.6 | V |
| T _{STG} | Storage Temperature | -65 to +125 | °C |
| T _s | Max. Soldering Temperature (10 sec) | 260 | °C |
| T _J | Junction Temperature | 150 | °C |
| T _{DV} | Static Discharge Voltage (As per JEDEC STD22-A114-B) | 2.0 | kV |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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Table 4. DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Min | Typ | Max | Unit |
|----------|---|--------------------------|-----|----------------------|------|
| V_{DD} | Operating voltage | 2.97 | 3.3 | 3.63 | V |
| V_{IL} | Input low voltage | 0 | | $0.13 \times V_{DD}$ | V |
| V_{IH} | Input high voltage | $0.85 \times V_{DD}$ | | V_{DD} | V |
| V_{OL} | Output low voltage (ModOUT Output) | $I_{OL} = 4 \text{ mA}$ | | 0.4 | V |
| V_{OH} | Output high voltage (ModOUT Output) | $I_{OH} = -4 \text{ mA}$ | 2.4 | | V |
| I_{DD} | Dynamic supply current (Unloaded Output) | | | 10 | mA |
| I_{CC} | Static supply current (CLKIN pulled to GND) | | | 0.5 | mA |

Table 5. AC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Min | Typ | Max | Unit |
|--------------------------|---|-----|-----------|-----|------|
| f_{IN} | Input Clock frequency | | 30 | | MHz |
| f_{OUT} | ModOUT Clock frequency | | 30 | | MHz |
| t_{LH} (Notes 1, 2) | ModOUT Rise time (Measured from 20% to 80%) | | | 5.0 | ns |
| t_{HL} (Notes 1, 2) | ModOUT Fall time (Measured from 80% to 20%) | | | 4.5 | ns |
| T_{DCOUT} (Notes 1, 2) | Output Clock Duty Cycle (ModOUT) (Measured at 50%) | 45 | 50 | 55 | % |
| T_{JC} (Note 2) | Cycle-to-Cycle Jitter (ModOUT with Spread ON) | | ± 200 | | ps |
| t_{ON} | PLL Lock Time (Stable power supply, valid input clock to valid clock on ModOUT) | | | 3.0 | ms |

- Parameters are specified with 15 pF loaded outputs.
- Parameter is guaranteed by design and characterization. Not 100% tested in production.

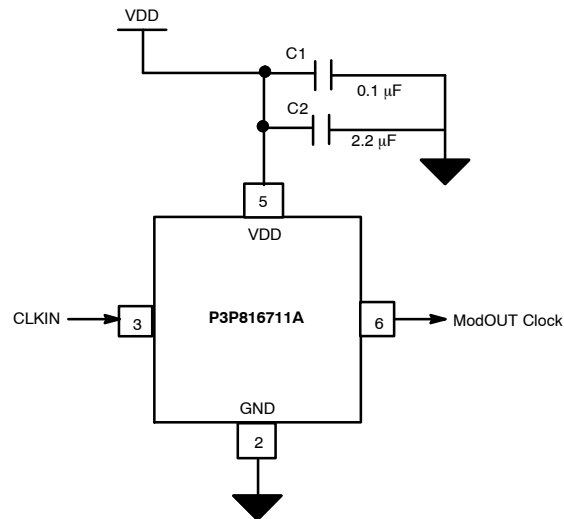


Figure 2. Application Schematic

Table 6. ORDERING INFORMATION

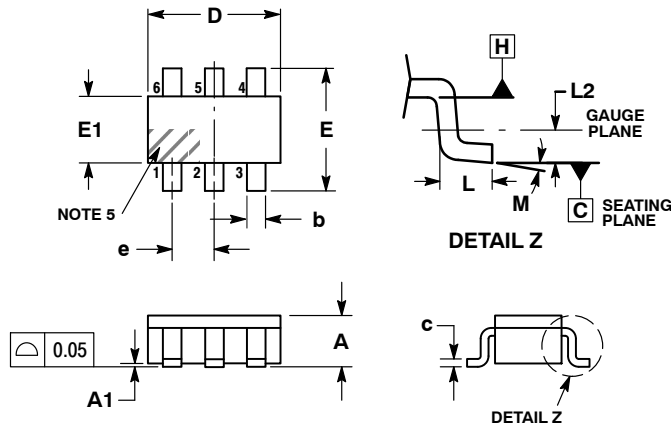
| Part Number | Marking | Temperature | Package Type | Shipping [†] |
|-----------------|---------|--------------|------------------------------|-----------------------|
| P3P816711A-06OR | BM1 | 0°C to +70°C | TSOP-6, Commercial (Pb-Free) | 3000 / Tape & Reel |

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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PACKAGE DIMENSIONS

TSOP-6
CASE 318G-02
ISSUE U

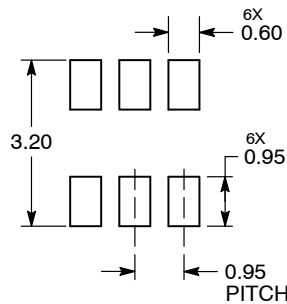


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE. DIMENSIONS D AND E1 ARE DETERMINED AT DATUM H.
5. PIN ONE INDICATOR MUST BE LOCATED IN THE INDICATED ZONE.

| DIM | MILLIMETERS | | |
|-----|-------------|------|------|
| | MIN | NOM | MAX |
| A | 0.90 | 1.00 | 1.10 |
| A1 | 0.01 | 0.06 | 0.10 |
| b | 0.25 | 0.38 | 0.50 |
| c | 0.10 | 0.18 | 0.26 |
| D | 2.90 | 3.00 | 3.10 |
| E | 2.50 | 2.75 | 3.00 |
| E1 | 1.30 | 1.50 | 1.70 |
| e | 0.85 | 0.95 | 1.05 |
| L | 0.20 | 0.40 | 0.60 |
| L2 | 0.25 BSC | | |
| M | 0° | - | 10° |

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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