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 V ± 10% and is available in TSOP−6 package over a temperature range of 0°C to +70°C. P3I816711A operates over a temperature range of −40°C to +85°C.

Application

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

Features

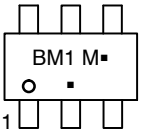
- 1x Low EMI Spread Spectrum Clock of the Input
- External Reference Input Clock: 30 MHz
- Output Clock: 30 MHz ± 0.3%(typ)
- Low Inherent Cycle-to-Cycle Jitter
- Supply Voltage: 3.3 V ± 10%
- LVCMOS Input and Output
- Available in TSOP−6 (6 Lead TSOT−23)
- Operating Temperature Range: −40°C to +85°C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

ON Semiconductor®

http://onsemi.com

MARKING DIAGRAM

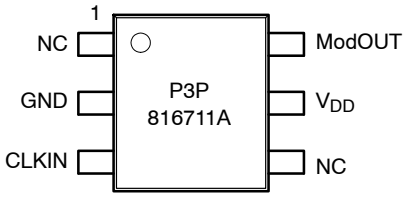
TSOP−6
CASE 318G



BM1 = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

PIN CONFIGURATION



(Top View)

ORDERING INFORMATION

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

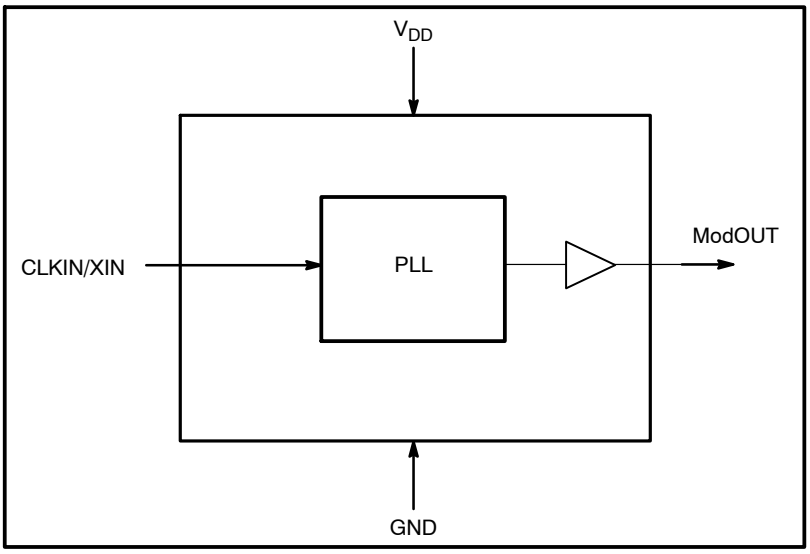


Figure 1. Block Diagram

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 −40	+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.

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		$0.13xV_{DD}$	V
V_{IH}	Input high voltage		$0.85xV_{DD}$		V_{DD}	V
V_{OL}	Output low voltage (ModOUT Output)	I_{OL} = 4 mA			0.4	V
V_{OH}	Output high voltage (ModOUT Output)	I_{OH} = −4 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

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

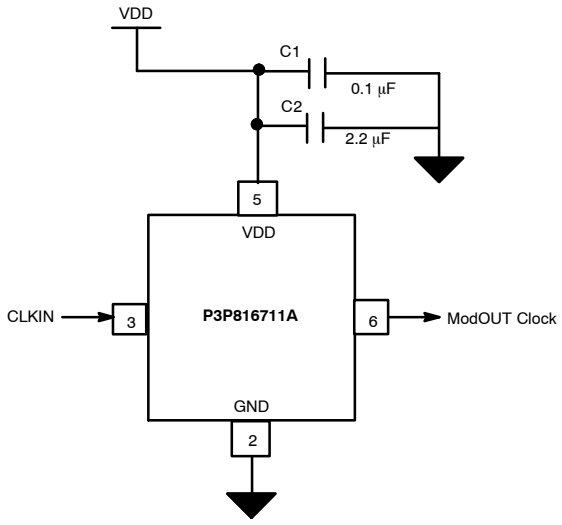


Figure 2. Application Schematic

Table 6. ORDERING INFORMATION

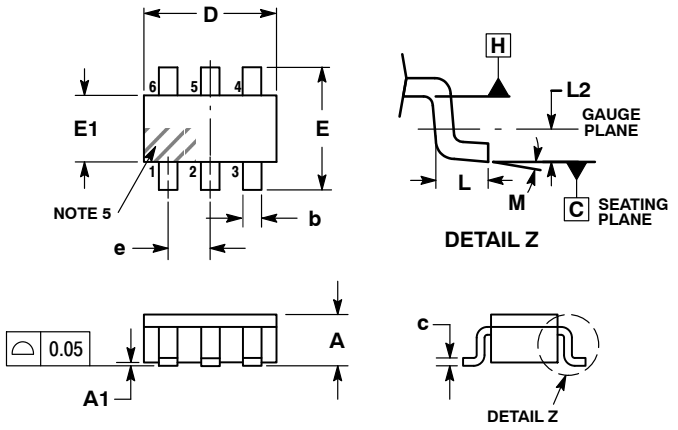
Part Number	Marking	Temperature	Package Type	Shipping†
P3P816711A−06OR	BM1	0°C to +70°C	TSOP−6, Commerical (Pb−Free)	3000 / Tape & Reel

†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.

P3P816711A

PACKAGE DIMENSIONS

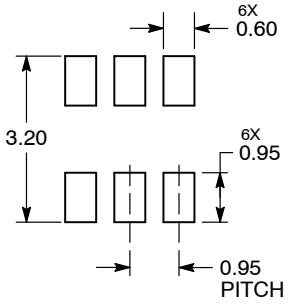
TSOP−6
CASE 318G−02
ISSUE U



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.

	MILLIMETERS		
DIM	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.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5773−3850

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative