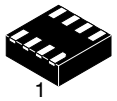
PCS3P2537A

Product Preview

Peak EMI Reduction IC

ON Semiconductor®

http://onsemi.com



WDFN8 2x2, 0.5P
CASE 511AQ

Product Description

PCS3P2537A is a 1x spread spectrum frequency modulator designed to reduce electromagnetic interference (EMI) at the clock source, allowing system wide reduction of EMI of down stream clock and data dependent signals. The device allows significant system cost savings by reducing the number of circuit board layers, ferrite beads and shielding and other passive components that are traditionally required to pass EMI regulations.

PCS3P2537A modulates the output of a single PLL in order to "spread" the bandwidth of a synthesized clock, and more importantly, decreases the peak amplitudes of its harmonics. This result in significantly lower system EMI compared to the typical narrow band signal produced by oscillators and most frequency generators. Lowering EMI by increasing a signal's bandwidth is called 'spread spectrum clock generation'.

PCS3P2537A has a frequency range of 18 MHz – 36 MHz, and accepts input clock either from a Crystal or from an external reference and locks on to it delivering a 1x spread spectrum clock output. It has an SSON control for enabling and disabling Spread Spectrum function.

PCS3P2537A operates with a supply voltage of 3.3 V, and is available in 8 L−WDFN package.

Application

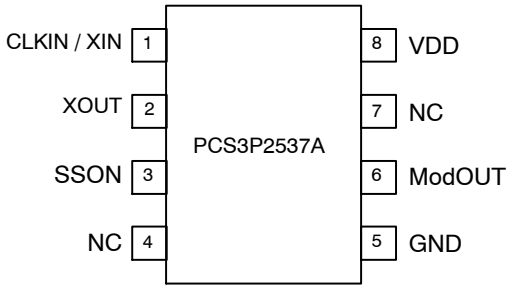
PCS3P2537A is targeted towards PC peripheral devices and embedded systems.

General Features

- 1x Peak EMI Reduction IC
- Input Frequency: 18 MHz – 36 MHz
- Output Frequency: 18 MHz – 36 MHz
- Frequency Deviation @ 27 MHz: −0.25%
- Modulation Rate @ 27 MHz: 30.1 KHz
- Supply Voltage: 3.3 V ± 0.3 V
- Operating Current less than 8 mA @ 27 MHz
- Spread Spectrum Enable Control
- CMOS Design
- 8L−WDFN (8L−TDFN) Package
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

PIN CONFIGURATION



(8L−WDFN Package)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

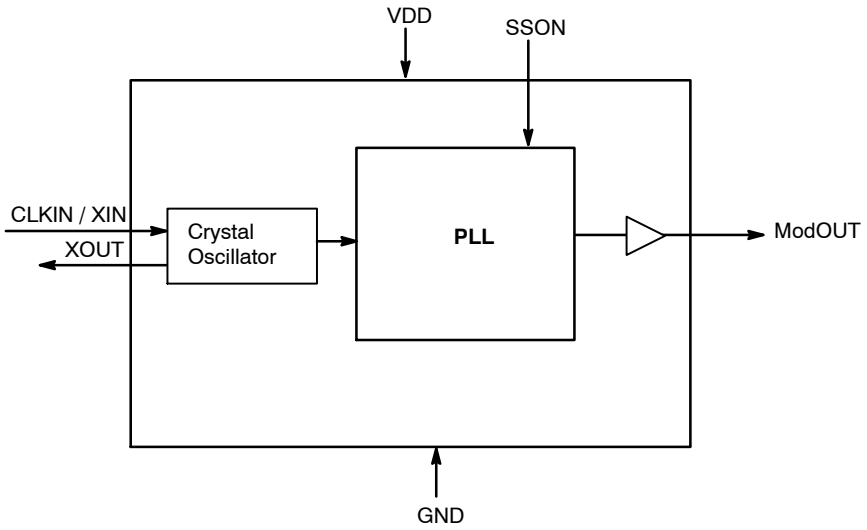


Figure 1. Block Diagram

Table 1. PIN DESCRIPTION

Pin #	Pin Name	Type	Description
1	CLKIN / XIN	Input	External reference Clock input or Crystal connection. This pin has dual functions. It can be connected either to an external crystal or an external reference clock.
2	XOUT	Output	Crystal connection. If using an external reference, this pin must be left unconnected.
3	SSON	Input	When SSON is HIGH, the spread spectrum is enabled and when LOW, it turns off the spread spectrum.
4	NC		No Connect.
5	GND	Power	Ground Connection.
6	ModOUT	Output	Spread Spectrum Clock Output.
7	NC		No Connect.
8	VDD	Power	Power supply for the entire chip.

Table 2. ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Unit
VDD, V_{IN}	Voltage with 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	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 3. OPERATING CONDITIONS

Parameter	Description	Min	Max	Unit
VDD	Supply Voltage	3.0	3.6	V
T_A	Operating Temperature (Ambient Temperature)	0	70	°C
C_L	Load Capacitance		15	pF
C_{IN}	Input Capacitance		7	pF

Table 4. DC ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY

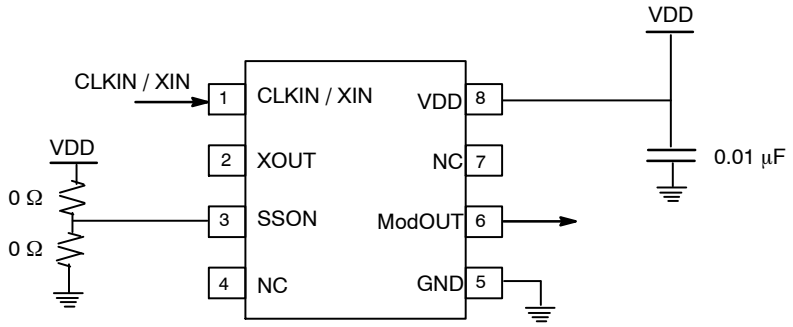
Symbol	Parameter	Min	Typ	Max	Units
V_{IL}	Input low voltage	VSS − 0.3		0.8	V
V_{IH}	Input high voltage	2.0		VDD + 0.3	V
I_{IL}	Input low current			−35	μA
I_{IH}	Input high current			35	μA
V_{OL}	Output low voltage (VDD = 3.3 V, I_{OL} = 8 mA)			0.4	V
V_{OH}	Output high voltage (VDD = 3.3 V, I_{OH} = 8 mA)	2.5			V
I_{DD}	Static supply current (Note 1)			2.5	mA
I_{CC}	Dynamic supply current (3.3 V, 27 MHz and no load)		5	8	mA
VDD	Operating Voltage	3	3.3	3.6	Ω
t_{ON}	Power−up time (first locked cycle after power−up)			5	mS
Z_{OUT}	Output impedance		36		Ω

1. CLKIN is pulled to GND.

Table 5. AC ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY

Symbol	Parameter	Min	Typ	Max	Units
CLKIN	Input frequency	18	27	36	MHz
ModOUT	Output frequency	18	27	36	MHz
f_d	Frequency Deviation @ 27 MHz	−0.2	−0.25	−0.3	%
MR	Modulation Rate @ 27 MHz	30		33	KHz
t_{LH} (Note 2)	Output rise time (measured from 20% to 80%)			2	nS
t_{HL} (Note 2)	Output fall time (measured at 80% to 20%)			1.5	nS
t_{JC}	Cycle−to−Cycle Jitter at 27 MHz		±200	±300	pS
t_D	Output duty cycle	45	50	55	%

2. t_{LH} and t_{HL} are measured into a capacitive load of 15 pF.



Note: Refer to Pin Description table for Functionality Details.

Figure 2. Typical Application Schematic

PCB Layout Recommendation

For optimum device performance, the following guidelines are recommended.

- Dedicated VDD and GND planes.
- The device must be isolated from system power supply noise. A 0.01 μF decoupling capacitor should be mounted on the component side of the board as close to the VDD pin as possible. No vias should be used between the decoupling capacitor and VDD pin. The PCB trace to VDD pin and the ground via should be kept as short as possible. All the VDD pins should have decoupling capacitors.
- In an optimum layout all components are on the same side of the board, minimizing vias through other signal layers.

A typical layout is shown in the Figure 3.

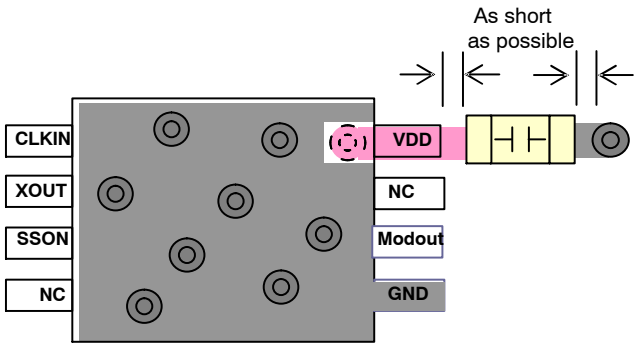
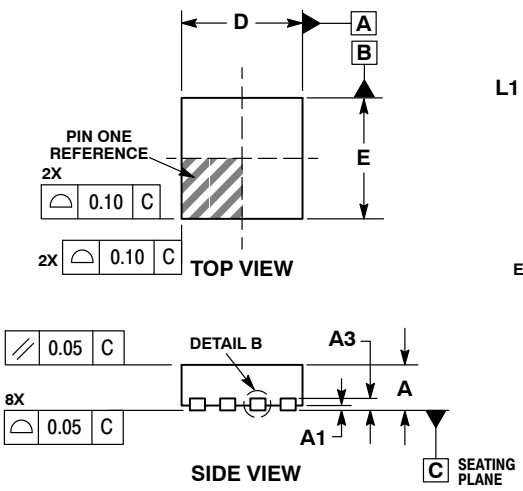
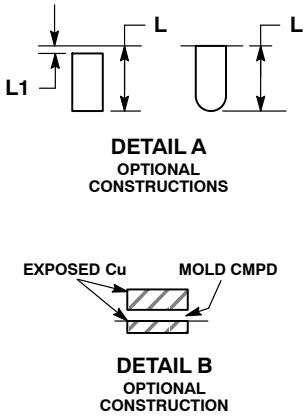


Figure 3. Typical Layout

PACKAGE DIMENSIONS

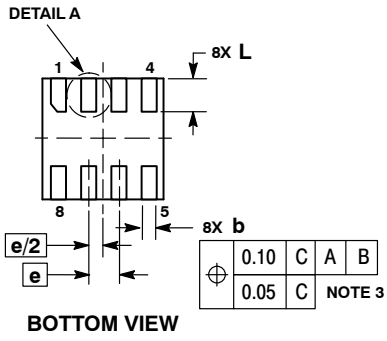
WDFN8 2x2, 0.5P
CASE 511AQ
ISSUE A



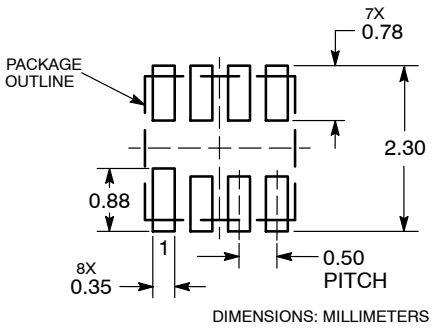


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM TERMINAL.

	MILLIMETERS	
DIM	MIN	MAX
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.20	0.30
D	2.00 BSC	
E	2.00 BSC	
e	0.50 BSC	
L	0.50	0.60
L1	---	0.15



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.

Table 6. ORDERING INFORMATION

Part Number	Top Marking	Package Type	Temperature
PCS3P2537AG−08CR	AM	8L−WDFN (8L−TDFN) − TAPE & REEL, Green	0°C to +70°C

NOTE: A “microdot” placed at the end of last row of marking or just below the last row toward the center of package indicates Pb−free

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: 81−3−5817−1050

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

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

For additional information, please contact your local Sales Representative

PCS3P2537A/D