PCS3P8504A

General Purpose Peak EMI Reduction IC

Functional Description

PCS3P8504A is a versatile, 3.3 V Timing−Safe™ Peak EMI reduction IC. PCS3P8504A accepts an input clock either from a fundamental Crystal or from an external reference (AC or DC coupled to XIN/CLKIN) and locks on to it delivering a 1x modulated clock output. PCS3P8504A has a SSON pin for enabling and disabling Spread Spectrum function.

PCS3P8504A has an SSEXTR pin to select different deviations depending upon the value of an external resistor connected between SSEXTR and GND. Modulation Rate (MR) control selects one of the two different Modulation Rates.

PCS3P8504A operates from a 3.3 V supply, and is available in an 8−pin, WDFN(2 mm x 2 mm) package.

General Features

- 1x, LVCMOS Peak EMI Reduction
- Input frequency:
  - 15 MHz − 50 MHz
- Output frequency:
  - 15 MHz − 50 MHz
- Analog Deviation Selection
- ModRate selection option
- Spread Spectrum Enable/Disable
- Supply Voltage: 3.3 V ± 0.3 V
- 8−pin, WDFN 2 mm x 2 mm (TDFN) Package
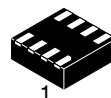- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Application

- PCS3P8504A is targeted for consumer electronics application like DPF, MFP.
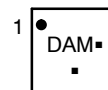
ON Semiconductor®

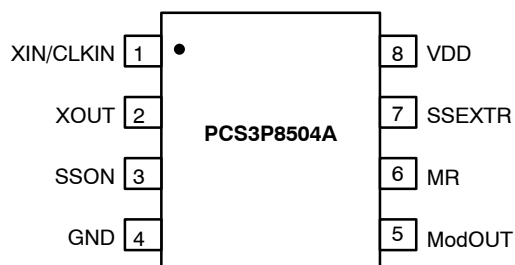**http://onsemi.com**

WDFN8
CASE 511AQ

MARKING DIAGRAMS

1 □ DAM■

DA = Specific Device Code
M = Date Code
■ = Pb−Free Device
(Note: Microdot may be in either location)

PIN CONFIGURATION

XIN/CLKIN	1	•	8	VDD
XOUT	2	**PCS3P8504A**	7	SSEXTR
SSON	3		6	MR
GND	4		5	ModOUT

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.
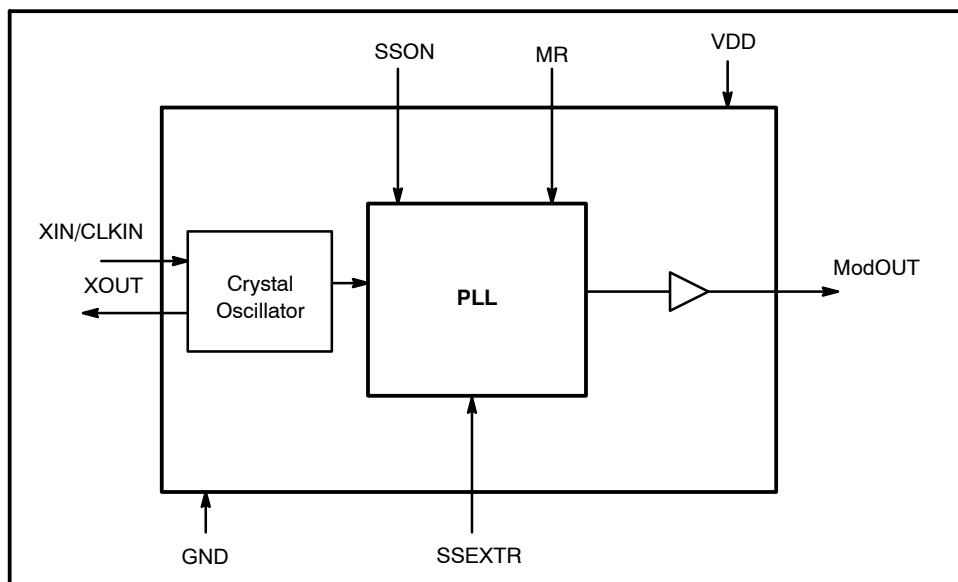
PCS3P8504A

Figure 1. Block Diagram

Table 1. PIN DESCRIPTION

Pin#	Pin Name	Type	Description
1	XIN / CLKIN	I	Crystal connection or External reference clock input.
2	XOUT	O	Crystal connection. If using an external reference, this pin should be left open.
3	SSON	I	Spread Spectrum ON/OFF. Spread Spectrum function enabled when HIGH, disabled when LOW. Has an internal pull–up resistor.
4	GND	P	Ground
5	ModOUT	O	Modulated clock output
6	MR	I	Modulation Rate Select. When LOW selects Low Modulation Rate. Selects High Modulation Rate when pulled HIGH. Has an internal pull–up resistor.
7	SSEXTR	I	Analog Deviation Selection through external resistor to GND.
8	V_{DD}	P	3.3 V supply Voltage.

Table 2. OPERATING CONDITIONS

Symbol	Parameter		Min	Max	Unit
V_{DD}	Supply Voltage		3	3.6	V
T_A	Operating Temperature	Commercial	0	70	°C
C_L	Load Capacitance			10	pF
C_{IN}	Input Capacitance			7	pF

Table 3. ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Rating	Unit
V_{DD}, V_{IN}	Voltage on any input 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

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.

PCS3P8504A

Table 3. ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Rating	Unit
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 4. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
VDD	Supply Voltage		3.0	3.3	3.6	V
V_{IL}	Input LOW Voltage				0.8	V
V_{IH}	Input HIGH Voltage		2.0			V
I_{IL}	Input LOW Current	V_{IN} = 0 V			25	μA
I_{IH}	Input HIGH Current	V_{IN} = V_{DD}			25	μA
V_{OL}	Output LOW Voltage	I_{OL} = 8 mA			0.4	V
V_{OH}	Output HIGH Voltage	I_{OH} = −8 mA	2.4			V
I_{CC}	Static Supply Current	XIN / CLKIN pulled low			50	μA
I_{DD}	Dynamic Supply Current	Unloaded Output			20	mA
Z_o	Output Impedance			30		Ω

Table 5. SWITCHING CHARACTERISTICS

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Frequency* / ModOUT		15		50	MHz
Duty Cycle (Notes 1 and 2)	Measured at V_{DD} / 2	45	50	55	%
Output Rise Time (Notes 1 and 2)	Measured between 20% to 80%			1.8	ns
Output Fall Time (Notes 1 and 2)	Measured between 80% to 20%			1.6	ns
Cycle–to–Cycle Jitter (Note 2)	Unloaded output with SSEXTR OPEN @ 27 MHz		± 150	± 250	ps
PLL Lock Time (Note 2)	Stable power supply, valid clock presented on XIN / CLKIN			3	ms

*Functionality with Crystal is guaranteed by design and characterization. Not tested in production.
1. All parameters are specified with10 pF loaded outputs.
2. Parameter is guaranteed by design and characterization. Not tested in production.

TYPICAL CRYSTAL SPECIFICATIONS

FUNDAMENTAL AT CUT PARALLEL RESONANT CRYSTAL

Nominal frequency	27 MHz
Frequency tolerance	$\pm$ 50 ppm or better at 25°C
Operating temperature range	−25°C to +85°C
Storage temperature	−40°C to +85°C
Load capacitance (C_P)	18 pF
Shunt capacitance	7 pF maximum
ESR	25 Ω

NOTE: C_L is the Load Capacitance and Rx is used to prevent oscillations at overtone frequency of the Fundamental frequency.
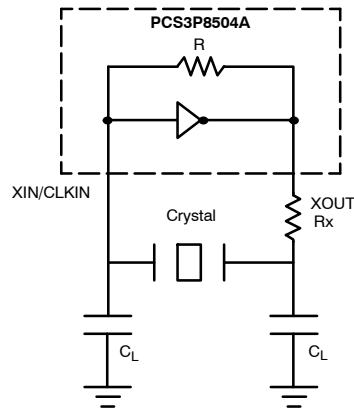
$C_L = 2 * (C_P − C_S)$,
Where C_P = Load capacitance of crystal from crystal vendor datasheet
C_S = Stray capacitance due to C_{IN}, PCB, Trace etc.

Figure 2. Typical Crystal Interface Circuit

SWITCHING WAVEFORMS
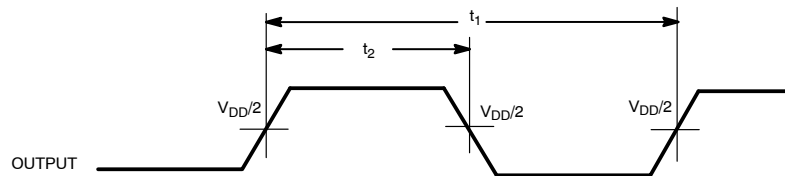
Figure 3. Duty Cycle Timing
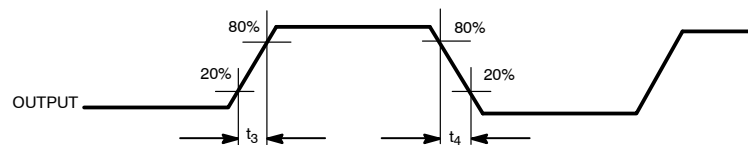
Figure 4. Output Rise/Fall Time
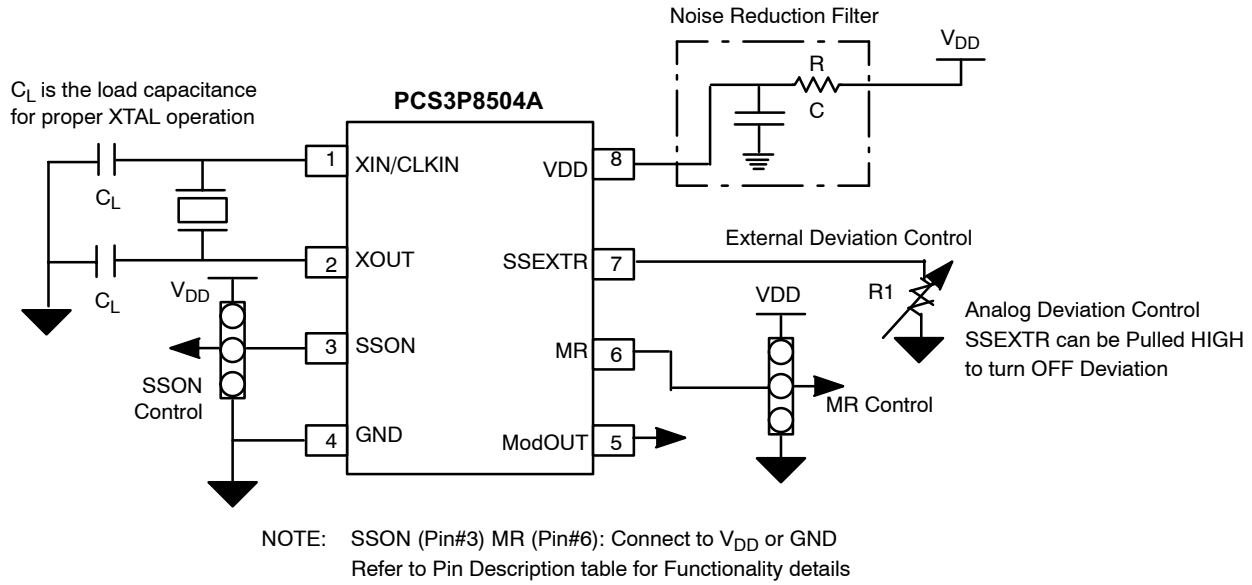
Figure 5. Application Schematic
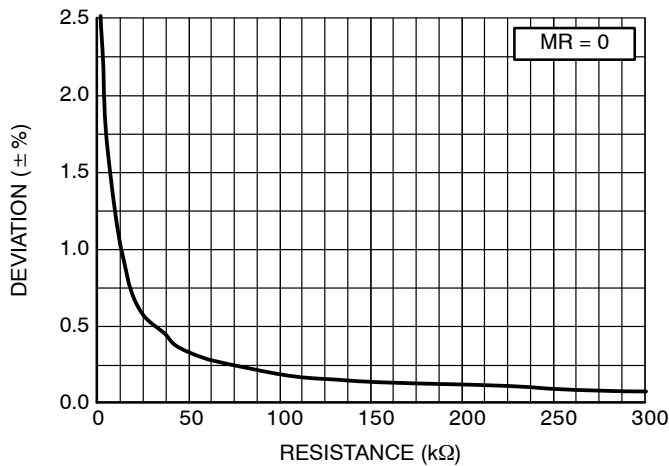
Figure 6. Deviation vs SSEXTR Resistance
Chart at 27 MHz
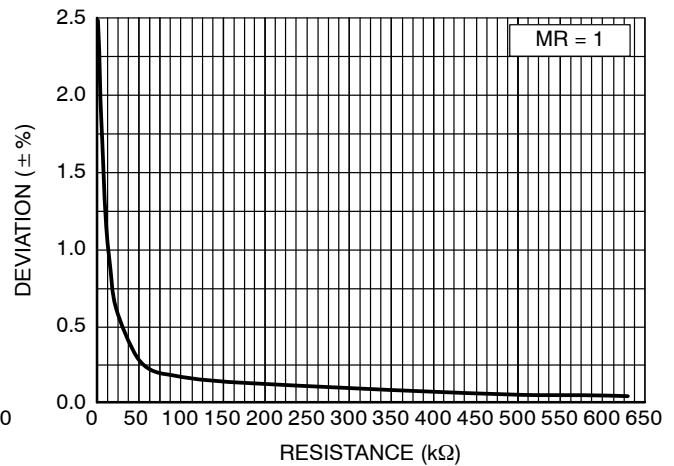
Figure 7. Deviation vs SSEXTR Resistance
Chart at 27 MHz

NOTE: Device to Device variation of Deviation is $\pm 10\%$ (Commercial Temperature Range) and $\pm 25\%$ (Industrial Temperature Range).

ORDERING INFORMATION

Part Number	Top Marking	Temperature	Package Type	Shipping[†]
PCS3P8504AG−08CR	DA	0°C to +70°C	8−Pin (2 mm x 2 mm) WDFN(TDFN) (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
  Specifications Brochure, BRD8011/D.
*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.

PACKAGE DIMENSIONS

WDFN8 2x2, 0.5P
CASE 511AQ
ISSUE A

TOP VIEW

PIN ONE REFERENCE
2X △ 0.10 C
2X △ 0.10 C
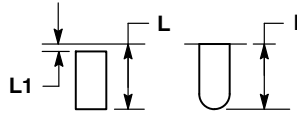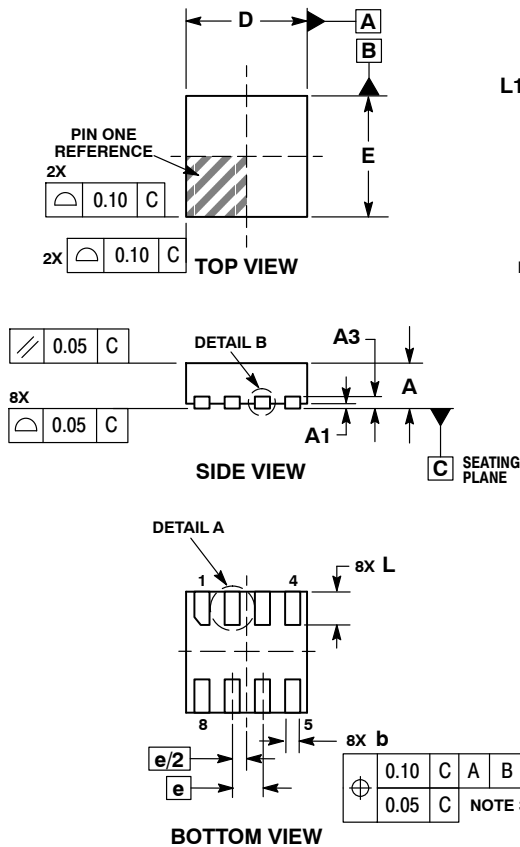
DETAIL A
OPTIONAL CONSTRUCTIONS

SIDE VIEW

// 0.05 C
DETAIL B
8X △ 0.05 C

C SEATING PLANE

EXPOSED Cu   MOLD CMPD
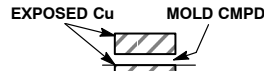
DETAIL B
OPTIONAL CONSTRUCTION

BOTTOM VIEW

DETAIL A
8X L
e/2
e
8X b
⊕ | 0.10 | C | A | B
0.05 | C | NOTE 3

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.

| DIM | MILLIMETERS | |
	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*

PACKAGE OUTLINE
7X 0.78
2.30
0.88
8X 0.35
1
0.50 PITCH

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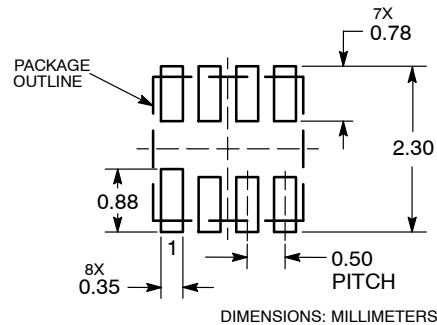
*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Timing–Safe is a trademark of Semiconductor Components Industries, LLC (SCILLC).

AMEYA360
Components Supply Platform

Authorized Distribution Brand :

ROHM	Sunlord	SSM SUSUMU	AVERLOGIC	NXP	Elprotronic
2Pai Semi	Ambarella	CanaanTek	Firstohm	GigaDevice	威臣半导体

Website :

Welcome to visit   www.ameya360.com

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