

July 2005



ASM3P2107A

rev 0.3

## Peak EMI Reducing Solution

### Features

- FCC approved method of EMI attenuation.
- Generates a 1X low EMI spread spectrum clock of the input frequency.
- Input frequency range: 12MHz to 22MHz.
- Internal loop filter minimizes external components and board space.
- Frequency deviation: - 0.8%( Typ) @20MHz.
- Low cycle-to-cycle jitter.
- 5.0V  $\pm$  5% operating voltage range.
- TTL or CMOS compatible outputs.
- Available in 8-pin SOIC and TSSOP Packages.

### Product Description

The ASM3P2107A is a versatile spread spectrum frequency modulator designed specifically for input clock frequencies from 12MHz to 22MHz. The ASM3P2107A can generate an EMI reduced clock from crystal, ceramic resonator, or system clock.

The ASM3P2107A reduces electromagnetic interference (EMI) at the clock source, allowing system wide reduction of EMI of down stream clock and data dependent signals. The ASM3P2107A 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.

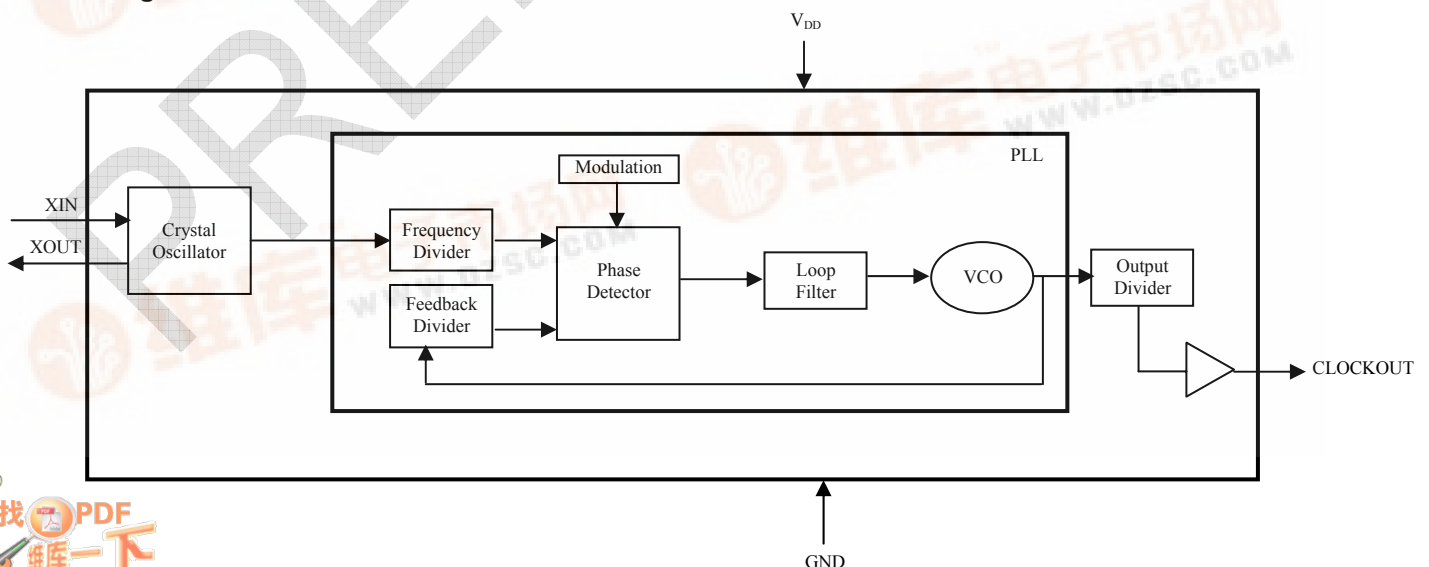
The ASM3P2107A uses the most efficient and optimized modulation profile approved by the FCC and is implemented in a proprietary all digital method.

The ASM3P2107A 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 results 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'.

### Applications

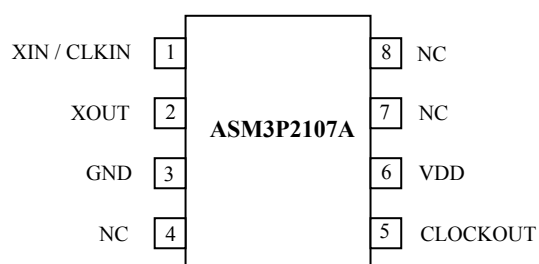
The ASM3P2107A is targeted towards EMI management for high speed digital applications such as PC peripheral devices, consumer electronics and embedded controller systems.

### Block Diagram





## Pin Configuration



## Pin Description

Pin#	Pin Name	Type	Description
1	XIN/CLKIN	I	Crystal connection or external reference frequency input. This pin has dual functions. It can be connected to either an external crystal or an external reference clock.
2	XOUT	O	Crystal connection. If using an external reference, this pin must be left unconnected.
3	GND	P	Ground to entire chip.
4	NC	-	No connect.
5	CLOCKOUT	O	Spread spectrum low EMI output.
6	VDD	P	Power supply for the entire chip (5V).
7	NC	-	No connect.
8	NC	-	No connect.

July 2005



ASM3P2107A

rev 0.3

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Unit
$V_{DD}, V_{IN}$	Voltage on any pin with respect to Ground	-0.5 to +7.0	V
$T_{STG}$	Storage temperature	-65 to +125	°C
$T_A$	Operating temperature	0 to 70	°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

Note: These are stress ratings only and are not implied for functional use. Exposure to absolute maximum ratings for prolonged periods of time may affect device reliability.

**DC Electrical Characteristics**

Symbol	Parameter	Min	Typ	Max	Unit
$V_{IL}$	Input low voltage	GND – 0.3	-	0.8	V
$V_{IH}$	Input high voltage	2.0	-	$V_{DD} + 0.3$	V
$I_{IL}$	Input low current	-	44	-	μA
$I_{IH}$	Input high current	-	66	-	μA
$I_{XOL}$	$X_{OUT}$ output low current (@ 0.4, $V_{DD} = 5V$ )	-	3	-	mA
$I_{XOH}$	$X_{OUT}$ output high current (@2.5V, $V_{DD} = 5V$ )	-	3	-	mA
$V_{OL}$	Output low voltage ( $V_{DD} = 5V$ , $I_{OL} = 20mA$ )	-	-	0.4	V
$V_{OH}$	Output high voltage ( $V_{DD} = 5V$ , $I_{OH} = 20mA$ )	2.5	-	-	V
$I_{CC}$	Dynamic supply current normal mode (5V, 18MHz and 15pF loading)	-	40	-	mA
$I_{DD}$	Static supply current standby mode	-	40	-	μA
$V_{DD}$	Operating voltage	4.75	5.0	5.25	V
$t_{ON}$	Power up time (first locked clock cycle after power up)	-	0.18	-	mS
$Z_{OUT}$	Clock out impedance	-	50	-	Ω

**AC Electrical Characteristics**

Symbol	Parameter	Min	Typ	Max	Unit
$f_{IN}$	Input frequency	12	-	22	MHz
MODOUT	Output frequency	12	-	22	MHz
$f_d$	Frequency Deviation	Input Frequency =12MHz	-2.13	-	%
		Input Frequency =22MHz	-0.62	-	
$t_{LH}^*$	Output rise time (measured at 0.8V to 2.0V)	-	440	-	pS
$t_{HL}^*$	Output fall time (measured at 2.0V to 0.8V)	-	300	-	pS
$t_{JC}$	Jitter (cycle to cycle)	-	-	360	pS
$t_D$	Output duty cycle	45	50	55	%

\*  $V_{DD} = +5V$ , Input Frequency = 18MHz,  $t_{LH}$  and  $t_{HL}$  are measured into a capacitive load of 15pF

July 2005

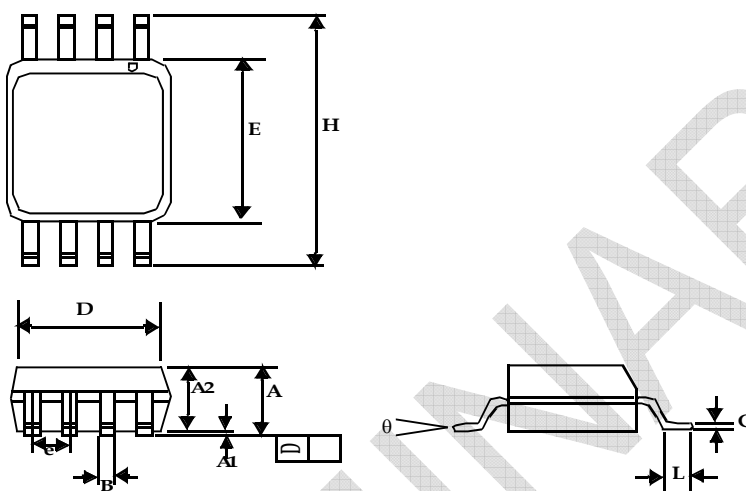


ASM3P2107A

rev 0.3

## Package Information

### 8-Pin SOIC Package



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A1	0.004	0.010	0.10	0.25
A	0.053	0.069	1.35	1.75
A2	0.049	0.059	1.25	1.50
B	0.012	0.020	0.31	0.51
C	0.007	0.010	0.18	0.25
D	0.193 BSC		4.90 BSC	
E	0.154 BSC		3.91 BSC	
e	0.050 BSC		1.27 BSC	
H	0.236 BSC		6.00 BSC	
L	0.016	0.050	0.41	1.27
θ	0°	8°	0°	8°

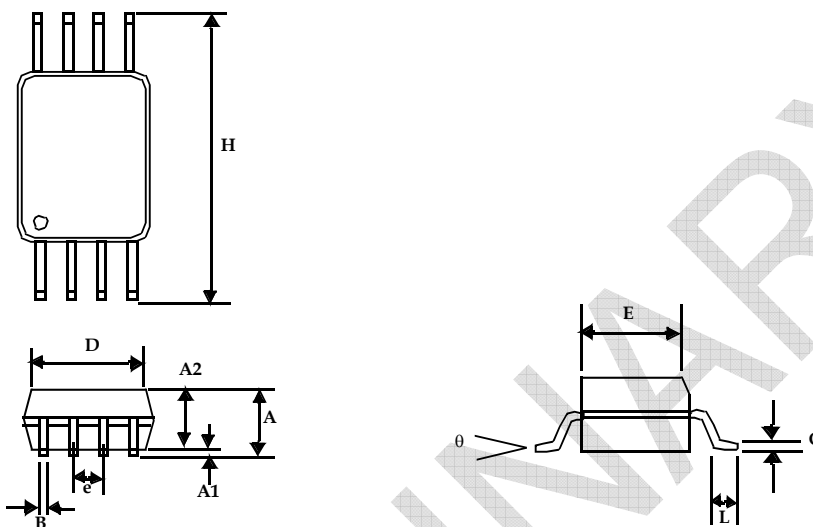
July 2005



ASM3P2107A

rev 0.3

# 8-Pin TSSOP Package



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A		0.043		1.10
A1	0.002	0.006	0.05	0.15
A2	0.033	0.037	0.85	0.95
B	0.008	0.012	0.19	0.30
c	0.004	0.008	0.09	0.20
D	0.114	0.122	2.90	3.10
E	0.169	0.177	4.30	4.50
e	0.026 BSC		0.65 BSC	
H	0.252 BSC		6.40 BSC	
L	0.020	0.028	0.50	0.70
θ	0°	8°	0°	8°

July 2005



ASM3P2107A

rev 0.3

## Ordering Codes

Part Number	Marking	Package	Temperature
ASM3P2107AF-08-SR	3P2107AF	8-PIN SOIC, TAPE AND REEL, Pb Free	Commercial
ASM3P2107AF-08-ST	3P2107AF	8-PIN SOIC, TUBE, Pb Free	Commercial
ASM3P2107AF-08-TR	3P2107AF	8-PIN TSSOP, TAPE AND REEL, Pb Free	Commercial
ASM3P2107AF-08-TT	3P2107AF	8-PIN TSSOP, TUBE, Pb Free	Commercial
ASM3P2107AG-08-SR	3P2107AG	8-PIN SOIC, TAPE AND REEL, Green	Commercial
ASM3P2107AG-08-ST	3P2107AG	8-PIN SOIC, TUBE, Green	Commercial
ASM3P2107AG-08-TR	3P2107AG	8-PIN TSSOP, TAPE AND REEL, Green	Commercial
ASM3P2107AG-08-TT	3P2107AG	8-PIN TSSOP, TUBE, Green	Commercial
ASM3P2107A-08-SR	3P2107A	8-PIN SOIC, TAPE AND REEL	Commercial
ASM3P2107A-08-ST	3P2107A	8-PIN SOIC, TUBE	Commercial
ASM3P2107A-08-TR	3P2107A	8-PIN TSSOP, TAPE AND REEL	Commercial
ASM3P2107A-08-TT	3P2107A	8-PIN TSSOP, TUBE	Commercial

## Device Ordering Information

A S M 3 P 2 1 0 7 A G - 0 8 - S T

R = Tape & reel, T = Tube or Tray

O = SOT  
S = SOIC  
T = TSSOP  
A = SSOP  
V = TVSOP  
B = BGA  
Q = QFN

U = MSOP  
E = TQFP  
L = LQFP  
U = MSOP  
P = PDIP  
D = QSOP  
X = SC-70

DEVICE PIN COUNT

F = LEAD FREE AND RoHS COMPLIANT PART  
G = GREEN PACKAGE

PART NUMBER

X = Automotive (-40C to +125C) I = Industrial (-40C to +85C) P or n/c = Commercial (0C to +70C)

1 = Reserved  
2 = Non PLL based  
3 = EMI Reduction  
4 = DDR support products  
5 = STD Zero Delay Buffer

6 = Power Management  
7 = Power Management  
8 = Power Management  
9 = Hi Performance  
0 = Reserved

ALLIANCE SEMICONDUCTOR MIXED SIGNAL PRODUCT

July 2005



ASM3P2107A

rev 0.3



Alliance Semiconductor Corporation  
2575 Augustine Drive,  
Santa Clara, CA 95054  
Tel# 408-855-4900  
Fax: 408-855-4999  
www.alsc.com

Copyright © Alliance Semiconductor  
All Rights Reserved  
Preliminary Information  
Part Number: ASM3P2107A  
Document Version: v0.3

Note: This product utilizes US Patent # 6,646,463 Impedance Emulator Patent issued to Alliance Semiconductor, dated 11-11-2003

© Copyright 2003 Alliance Semiconductor Corporation. All rights reserved. Our three-point logo, our name and Intelliwatt are trademarks or registered trademarks of Alliance. All other brand and product names may be the trademarks of their respective companies. Alliance reserves the right to make changes to this document and its products at any time without notice. Alliance assumes no responsibility for any errors that may appear in this document. The data contained herein represents Alliance's best data and/or estimates at the time of issuance. Alliance reserves the right to change or correct this data at any time, without notice. If the product described herein is under development, significant changes to these specifications are possible. The information in this product data sheet is intended to be general descriptive information for potential customers and users, and is not intended to operate as, or provide, any guarantee or warranty to any user or customer. Alliance does not assume any responsibility or liability arising out of the application or use of any product described herein, and disclaims any express or implied warranties related to the sale and/or use of Alliance products including liability or warranties related to fitness for a particular purpose, merchantability, or infringement of any intellectual property rights, except as express agreed to in Alliance's Terms and Conditions of Sale (which are available from Alliance). All sales of Alliance products are made exclusively according to Alliance's Terms and Conditions of Sale. The purchase of products from Alliance does not convey a license under any patent rights, copyrights; mask works rights, trademarks, or any other intellectual property rights of Alliance or third parties. Alliance does not authorize its products for use as critical components in life-supporting systems where a malfunction or failure may reasonably be expected to result in significant injury to the user, and the inclusion of Alliance products in such life-supporting systems implies that the manufacturer assumes all risk of such use and agrees to indemnify Alliance against all claims arising from such use.