



Features

- FCC approved method of EMI attenuation
- Generates a low EMI spread spectrum and a non-spread reference signal of the input clock frequency
- Optimized for input frequency range from 20 to 32 MHz
- Internal loop filter minimizes external components and board space
- Two selectable spread ranges
- Low inherent cycle-to-cycle jitter
- 3.3 V or 5 V operating voltage
- CMOS/TTL compatible inputs and outputs
- Ultra low power CMOS design: 5.50 mA @3.3 V
- Supports notebook VGA and other LCD timing controller applications
- SSON pin for Spread Spectrum On/Off and Standby Mode controls
- Available in 8-pin SOIC and TSSOP

Product Description

The P2560B is a versatile spread spectrum frequency modulator designed specifically for a wide range of clock frequencies. It reduces electromagnetic interference

(EMI) at the clock source allowing system-wide reduction of EMI of downstream clock and data dependent signals. It allows significant system cost savings by reducing the number of circuit board layers and shielding traditionally required to pass EMI regulations.

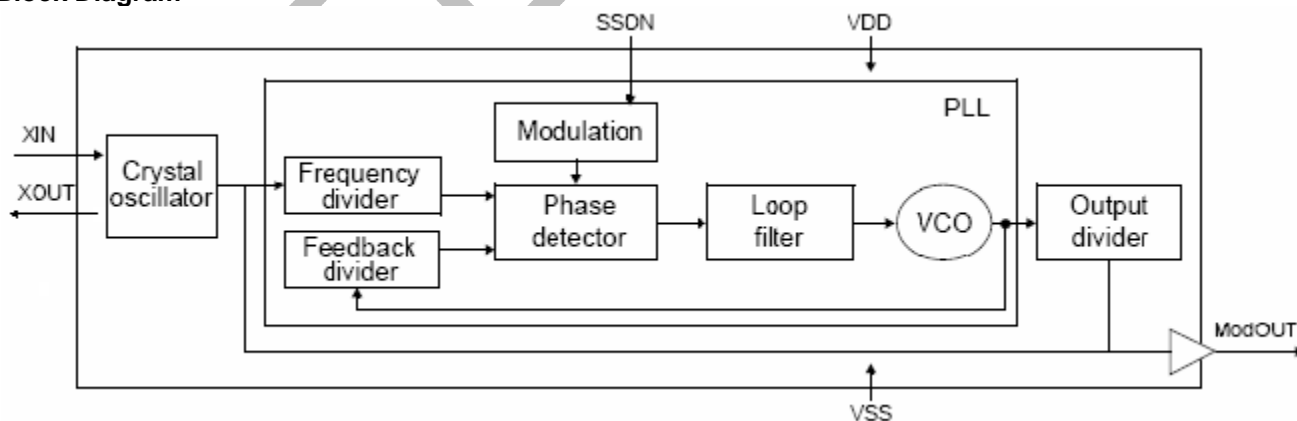
The P2560B modulates the output of a single PLL in order to spread the bandwidth of a synthesized clock, thereby decreasing the peak amplitudes of its harmonics. This results in significantly lower system EMI compared to the typical narrow band signal produced by oscillators and most clock generators. Lowering EMI by increasing a signal's bandwidth is called spread spectrum clock generation.

The P2560B uses the most efficient and optimized modulation profile approved by the FCC and is implemented by using a proprietary all-digital method.

Applications

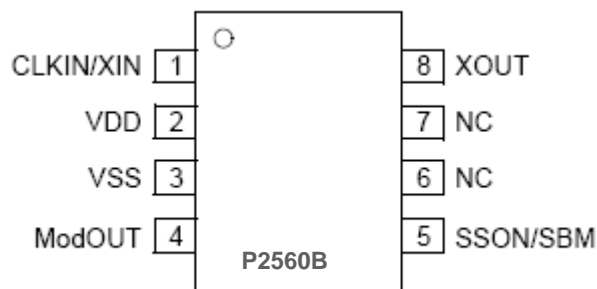
The P2560B is targeted toward the notebook VGA chip and other displays using an LVDS interface, PC peripheral devices, and embedded systems

Block Diagram





rev 1.0 Pin Configuration



Standby Mode Selection

CLKIN	SSON/SBM	Spread Spectrum	ModOUT	PLL	Mode
Disabled	0	N/A	Disabled	Disabled	Standby
Disabled	1	N/A	Disabled	Free running	Free running
Enabled	0	Off	Reference	Disabled	Buffer out
Enabled	1	On	Normal	Normal	Normal

Spread Range Selection, VDD = 3.3 V

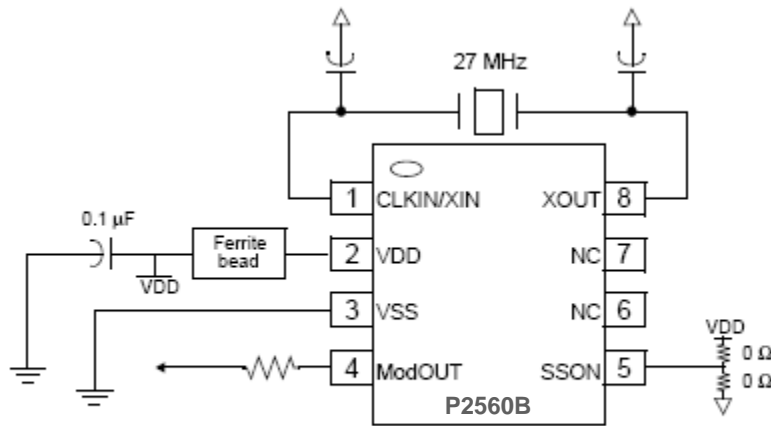
CLKIN frequency	Spreading range	Modulation rate
20 MHz	±1.16%	(CLKIN/10) * 20.83 kHz
25 MHz	±1.13%	
27 MHz	±1.11%	
30 MHz	±1.0%	
32 MHz	±1.0%	

Pin Description

Pin#	Pin Name	Type	Description
1	XIN/CLK	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	DIV2	I	Digital logic input used to select normal output mode or divide-by-2 output mode. When this pin is HIGH, the frequency of the output clock is the same as the input clock frequency. When it is tied LOW, the output frequency is half the input clock frequency. This pin has an internal pull-up resistor.
4	VSS	P	Ground to entire chip.
5	SR0	I	Digital logic input used to select Spreading Range (Refer Spread Deviation Table). This pin has an internal pull-up resistor.
6	SSON#	I	Digital logic input used to enable Spread Spectrum function (Active LOW). Spread Spectrum function enabled when LOW, disabled when HIGH. This pin has an internal pull-low resistor.
7	MODOUT	O	Spread spectrum low EMI output.
8	VDD	P	Power supply for the entire chip (5V).



Schematic for Notebook VGA Application



Use either pull-up or pull-down resistors with 0 Ω.

PRELIMINARY



rev 1.0

Absolute Maximum Ratings

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

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 (pull-up resistor on inputs SR0 and SSON/SBM)	–	–	-35	µA	
I_{IH}	Input high current	–	–	35	µA	
I_{XOL}	XOUT output low current	at 0.4 V, $V_{DD} = 3.3V$	–	3	–	mA
		at 0.4 V, $V_{DD} = 5.0 V$	–	20	–	mA
I_{XOH}	XOUT output high current	at 2.5 V, $V_{DD} = 3.3 V$	–	3	–	mA
		at 4.5 V, $V_{DD} = 5.0 V$	–	20	–	mA
V_{OL}	Output low voltage	$V_{DD} = 3.3 V, I_{OL} = 20 mA$	–	–	0.4	V
		$V_{DD} = 5.0 V, I_{OL} = 20 mA$	–	–	–	V
V_{OH}	Output high voltage	$V_{DD} = 3.3 V, I_{OL} = 20 mA$	2.5	–	–	V
		$V_{DD} = 5.0 V, I_{OL} = 20 mA$	4.5	–	–	V
I_{DD}	Static supply current standby mode	–	0.6	–	mA	
I_{CC}	Dynamic supply current	Normal mode:	fIN-min	fIN-typ	fIN-max	
		3.3 V and 10 pF loading	3.2	–	7.0	mA
		5.0 V and 10 pF loading	6.2	–	13.6	mA
V_{DD}	Operating voltage	2.7	3.3	5.5	V	
t_{ON}	Power-up time (first locked cycle after power up)	–	0.18	–	mS	
Z_{OUT}	Clock output impedance	–	50	–	Ω	

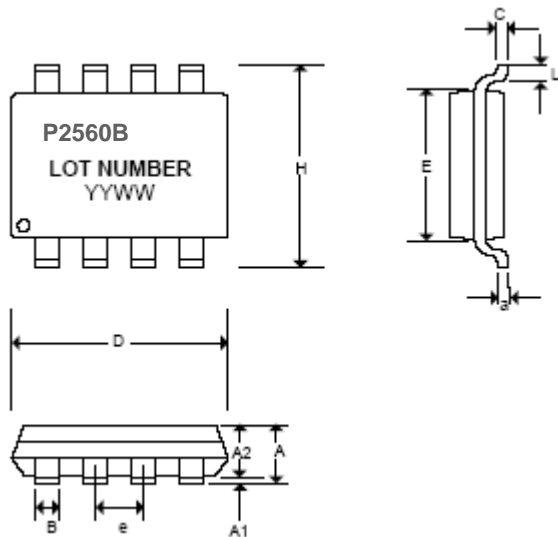
AC Electrical Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	
f_{IN}	Input frequency	20	–	32	MHz	
f_{OUT}	Output frequency	20	–	32	MHz	
$t_{LH} 1$	Output rise time	Measured at 0.8 V to 2.0 V	0.7	0.9	1.1	ns
		Measured at 1.2 V to 3.75 V	–	0.75	–	ns
$t_{HL} 1$	Output fall time	Measured at 2.0 V to 0.8 V	0.6	0.8	1.0	ns
		Measured at 1.2 V to 3.75 V	–	0.75	–	ns
t_{JC}	Jitter (cycle to cycle)	–	–	360	ps	
t_D	Output duty cycle	45	50	55	%	



Package Information

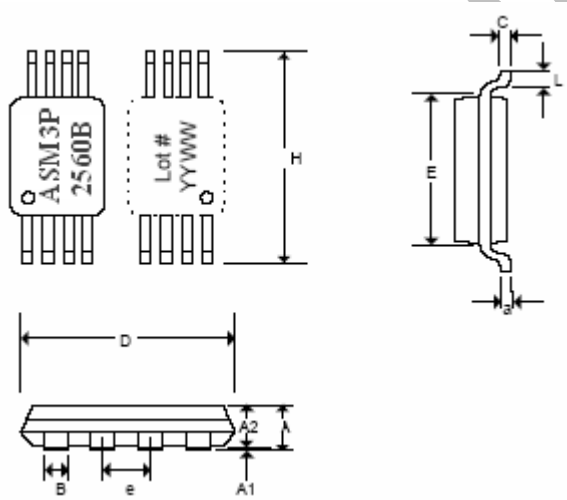
8-Pin SOIC



SYMBOL	INCHES			MILLIMETERS		
	MIN	NOR	MAX	MIN	NOR	MAX
A	0.057	0.064	0.071	1.45	1.63	1.80
A1	0.004	0.007	0.010	0.10	0.18	0.25
A2	0.053	0.061	0.069	1.35	1.55	1.75
B	0.012	0.016	0.020	0.31	0.41	0.51
C	0.004	0.006	0.010	0.10	0.15	0.25
D	0.186	0.194	0.202	4.72	4.92	5.12
E	0.148	0.156	0.164	3.75	3.95	4.15
e	0.050	BSC	1.27	BSC		
H	0.224	0.236	0.248	5.70	6.00	6.30
L	0.012	0.020	0.028	0.30	0.50	0.70
a	0°	5°	8°	0°	5°	8°

Note: Controlling dimensions are millimeters.
SOIC - 0.074 grams unit weight

8-Pin TSSOP



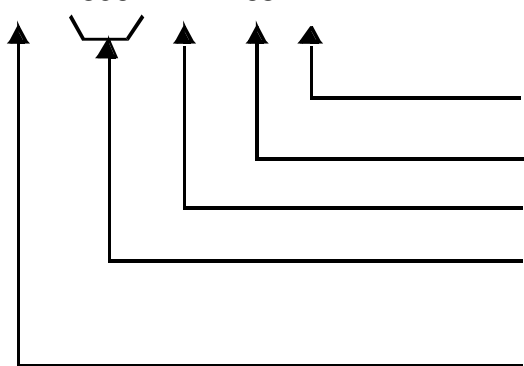
SYMBOL	INCHES			MILLIMETERS		
	MIN	NOR	MAX	MIN	NOR	MAX
A	-	-	0.047	-	-	1.10
A1	0.002	-	0.006	0.05	-	0.15
A2	0.031	0.039	0.041	0.80	1.00	1.05
B	0.007	-	0.012	0.19	-	0.30
C	0.004	-	0.008	0.09	-	0.20
D	0.114	0.118	0.122	2.90	3.00	3.10
E	0.169	0.173	0.177	4.30	4.40	4.50
e	0.026	BSC	0.65	BSC		
H	0.244	0.252	0.260	6.20	6.40	6.60
L	0.018	0.024	0.030	0.45	0.60	0.75
a	0°	-	8°	0°	-	8°

Note: Controlling dimensions are millimeters.
TSSOP - 0.034 grams unit weight



Ordering Information

X 2560B X - 08 XX



Package:
 ST: SOIC in TUBE
 SR: SOIC in TAPE & REEL
 TT: TSSOP in TUBE
 TR: TSSOP in TAPE & REEL

PIN COUNT

F = Pb FREE

PART NUMBER

Flow:
 P: Commercial temperature Range (0°C to 70°C)
 I: Industrial Temperature Range (-20°C to 85°C)

Examples

Ordering Code	Package Type	Operating Range
P2560B-08ST	8-pin 150mil SOIC	Commercial
I2560B-08SR	8-pin SOIC T&R	Industrial
P2560BF-08ST	8-pin TSSOP Tube	Commercial
I2560BF-08SR	8-pin TSSOP T&R	Industrial



Licensed under US patent number 5,488,627 and 5,631,920.



Alliance Semiconductor Corporation
2595, 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: P2560B
Document Version: v1.0

© 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.