ASM3P2856A
ASM3P2856B

Custom Clock generator for LCD Projector

Features

- Custom Clock Generator for LCD Projector
- Generates EMI optimized clock signals for LCD Projector system
- Uses an inexpensive 14.7456 MHz crystal for generating the required Outputs
- Frequency outputs:
  - CLK1 : 27.002MHz (± 20 ppm)
  - CLK2 : 14.7456MHz (Zero ppm)
  - CLK3 : 65MHz (± 15 ppm)
  - CLK4,CLK5 : 65MHz (±15 ppm) Spread Spectrum Clock
  - ASM3P2856A: +/- 1% centre spread ASM3P2856B: selectable +/-1.0% & +/-1.5% Centre Spread option
- Supply voltage range 3.3V ± 0.3V.
- Available in 16 Pin TSSOP
- Available in Commercial Temperature range

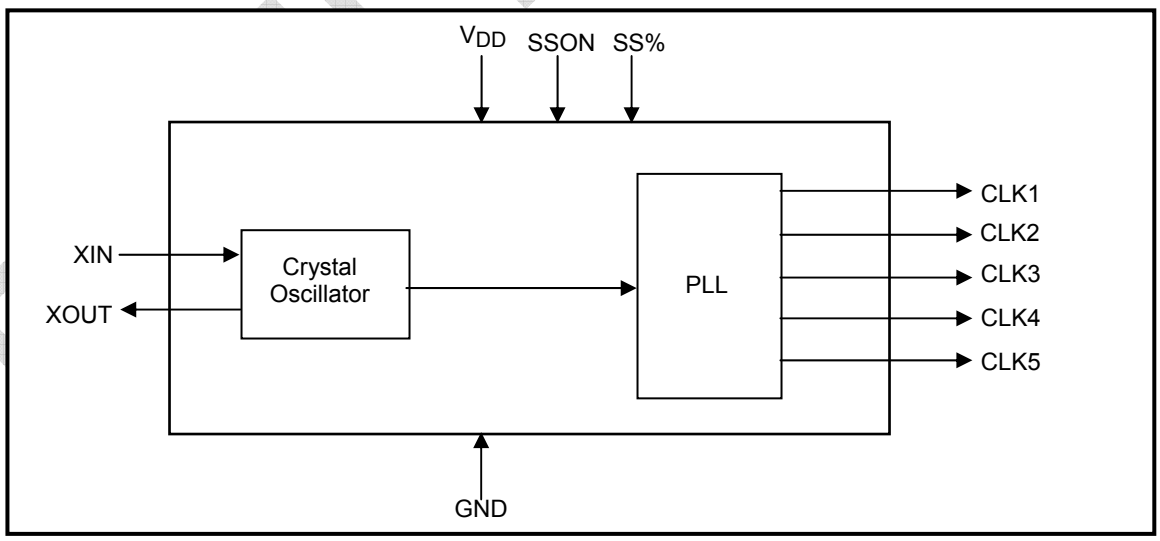
Product Description

ASM3P2856A/B generate the required four custom clock frequencies for the LCD Projector. An inexpensive 14.7456MHz crystal is used to generate a 14.7456MHz used by the microcomputer, a 27MHz used by Video, a non-spread 65MHz, and a centre spread 65MHz clock used by the LCD projector system. The spread spectrum clock has +/- 0.5% or +/- 1% spread options. The spread spectrum clock of ASM3P2856A/B reduces electromagnetic interference (EMI) at the clock source. This allows significant system cost savings by reducing the number of circuit board layers and shielding that are required to pass EMI regulations.

Applications

ASM3P2856A/B is targeted for use in LCD Projectors.

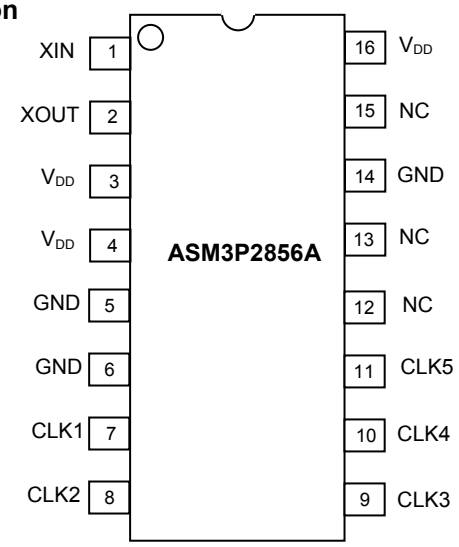
Block Diagram

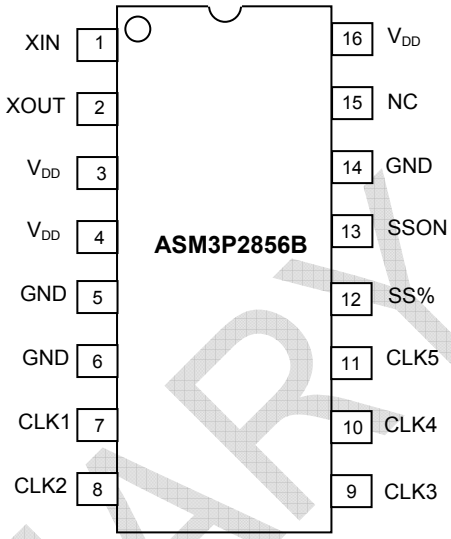


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Pin Configuration





Pin Description

Pin#	Pin Name	Type	Description
1	XIN	I	Connection to crystal or external reference frequency input. This pin has dual functions. It can be connected either to an external crystal or an external reference clock.
2	XOUT	O	Connection to crystal. If using an external reference clock, this pin must be left unconnected.
3	V_{DD}	P	Power supply for the entire Chip
4	V_{DD}	P	Power supply for the entire Chip
5	GND	P	Ground to entire chip
6	GND	P	Ground to entire chip
7	CLK1	O	27.002 MHz Clock output. Refer to Input & Output Frequency Table for details.
8	CLK2	O	Reference Clock Output. Refer to Input & Output Frequency Table for details.
9	CLK3	O	65 MHz non-spread Clock output. Refer to Input & Output Frequency Table for details.
10	CLK4	O	65 MHz Spread Spectrum Clock Output. Refer to Input & Output Frequency Table for details.
11	CLK5	O	65 MHz Spread Spectrum Clock Output. Refer to Input & Output Frequency Table for details.
12	NC	-	No Connection for ASM3P2856A
	SS%	I	Spread percentage selection pin for ASM3P2856B. Refer to Spread Selection Table for details. Has an internal pull down resistor
13	NC	-	No Connection for ASM3P2856A
	SSON	I	Spread spectrum selection. When SSON is HIGH, spread spectrum is enabled and when LOW, it turns off the spread spectrum. Connect the pin to ground When Spread Spectrum feature is not required. Has an internal pull up resistor.
14	GND	P	Ground to entire chip
15	NC	-	No Connection
16	V_{DD}	P	Power supply for the entire Chip

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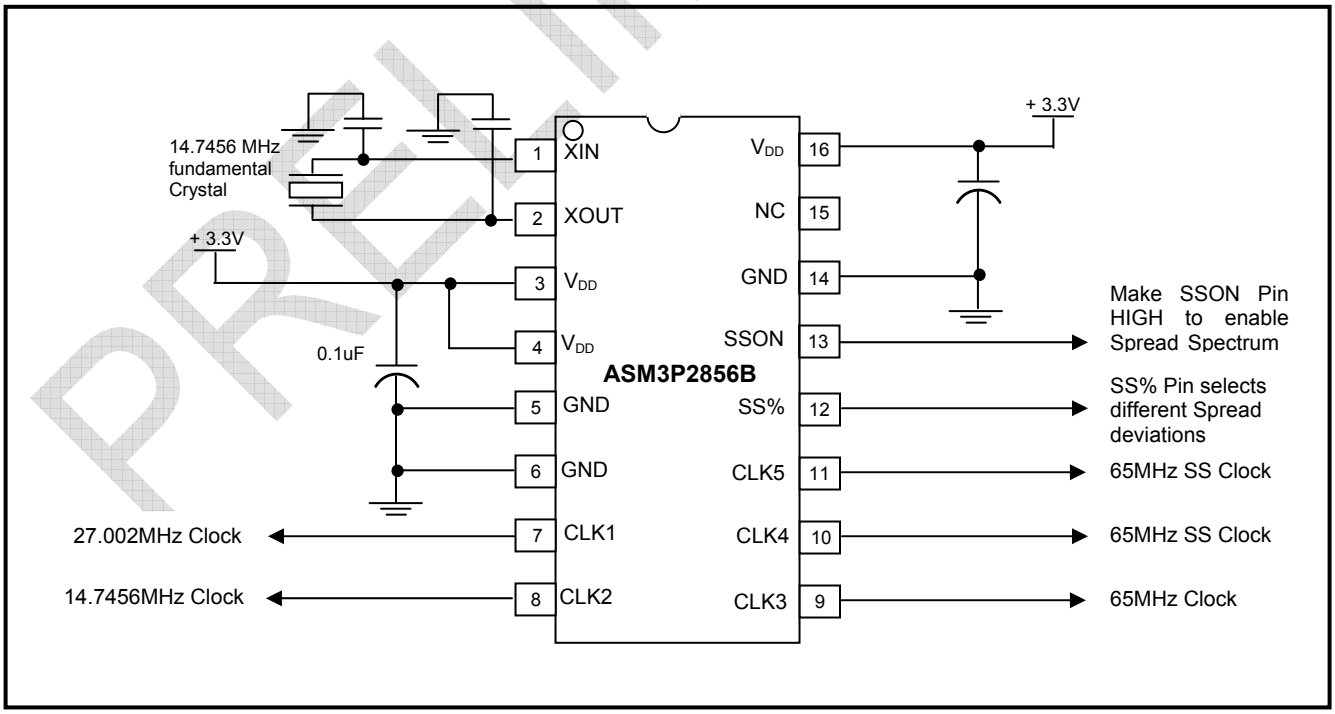
Input & Output Clock Frequency Table

Input Frequency	Output Frequencies		Frequency Accuracy of synthesized clocks
14.7456 MHz	CLK1	27.002 MHz	±20 ppm
	CLK2	14.7456 MHz	Zero ppm
	CLK3	65 MHz Non- Spread clock	±15 ppm
	CLK4	65 MHz Spread Spectrum Clock (+/-0.5 or +/- 1%)	±15 ppm
	CLK5	65 MHz Spread Spectrum Clock (+/-0.5 or +/-1%)	±15 ppm

Spread Selection Table

SS%	Spread Percentage
0	± 1.0%
1	± 1.5%

Typical Application Schematic for LCD Projector



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Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
VDD	Power Supply Voltage relative to GND	-0.5 to +4.6	V
V_{IN}	Input Voltage relative to GND (Input Pins)	-0.5 to VDD+0.5	
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

(Test condition: All parameters are measured at room temperature (+ 25°C) unless otherwise stated)

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	GND - 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
I_{XOL}	XOUT output low current (V_{XOL}@0.4V, VDD=3.3V)	-	3	-	mA
I_{XOH}	XOUT output high current (V_{XOH}@2.5V, VDD=3.3V)	-	3	-	mA
V_{OL}	Output low voltage (VDD = 3.3V, I_{OL} = 10mA)	-	-	0.4	V
V_{OH}	Output high voltage (VDD = 3.3V, I_{OH} = 10mA)	2.5	-	-	V
I_{DD}	Static supply current*	-	TBD	-	µA
I_{CC}	Dynamic supply current (VDD =3.3V)	-	TBD	-	mA
VDD	Operating Voltage	3.0	3.3	3.6	V
t_{ON}	Power-up time (first locked cycle after power-up)	-	-	5	mS
Z_{OUT}	Output impedance	-	TBD	-	Ω

* XIN is pulled low

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AC Electrical Characteristics

Symbol	Parameter		Min	Typ	Max	Unit
XIN	Input frequency		-	14.7456	-	MHz
F_{OUT}	Output frequency	CLK1	-	27.002	-	MHz
		CLK2	-	14.7456	-	
		CLK3	-	65	-	
		CLK4 (SS Clock)		65		
		CLK5 (SS Clock)		65		
f_d	Frequency Deviation (CLK4, CLK5)	For SS% = 0	-	± 1.0	-	%
		For SS% = 1		± 1.5		
t_{LH}*	Output rise time (measured from 0.8 to 2.0V)		-	1.4	-	nS
t_{HL} *	Output fall time (measured at 2.0V to 0.8V)		-	1.2	-	nS
t_{JC}	Jitter (Cycle to cycle)		-	TBD	-	pS
t_D	Output duty cycle		40	50	60	%

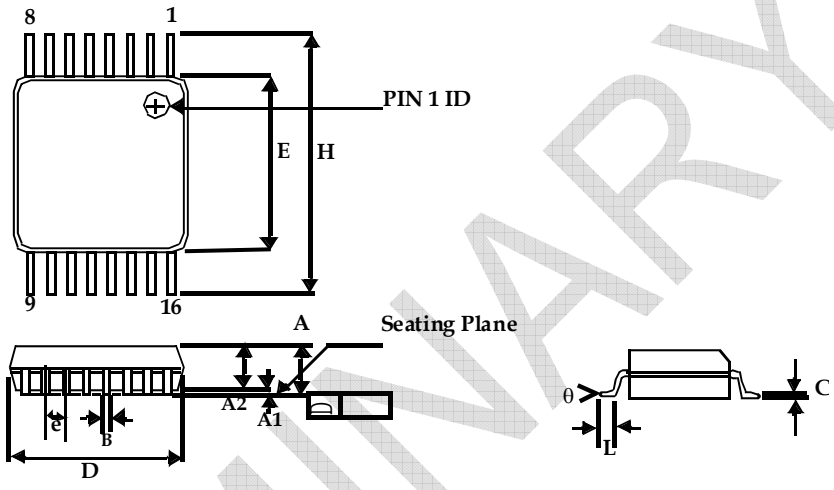
* t_{LH} and t_{HL} are measured into a capacitive load of 15pF

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Package Information

16-lead Thin Shrunk Small Outline Package (4.40-MM Body)



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A		0.043		1.20
A1	0.002	0.006	0.05	0.15
A2	0.031	0.041	0.80	1.05
B	0.007	0.012	0.19	0.30
C	0.004	0.008	0.09	0.20
D	0.193	0.201	4.90	5.10
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	0.030	0.50	0.75
θ	0°	8°	0°	8°

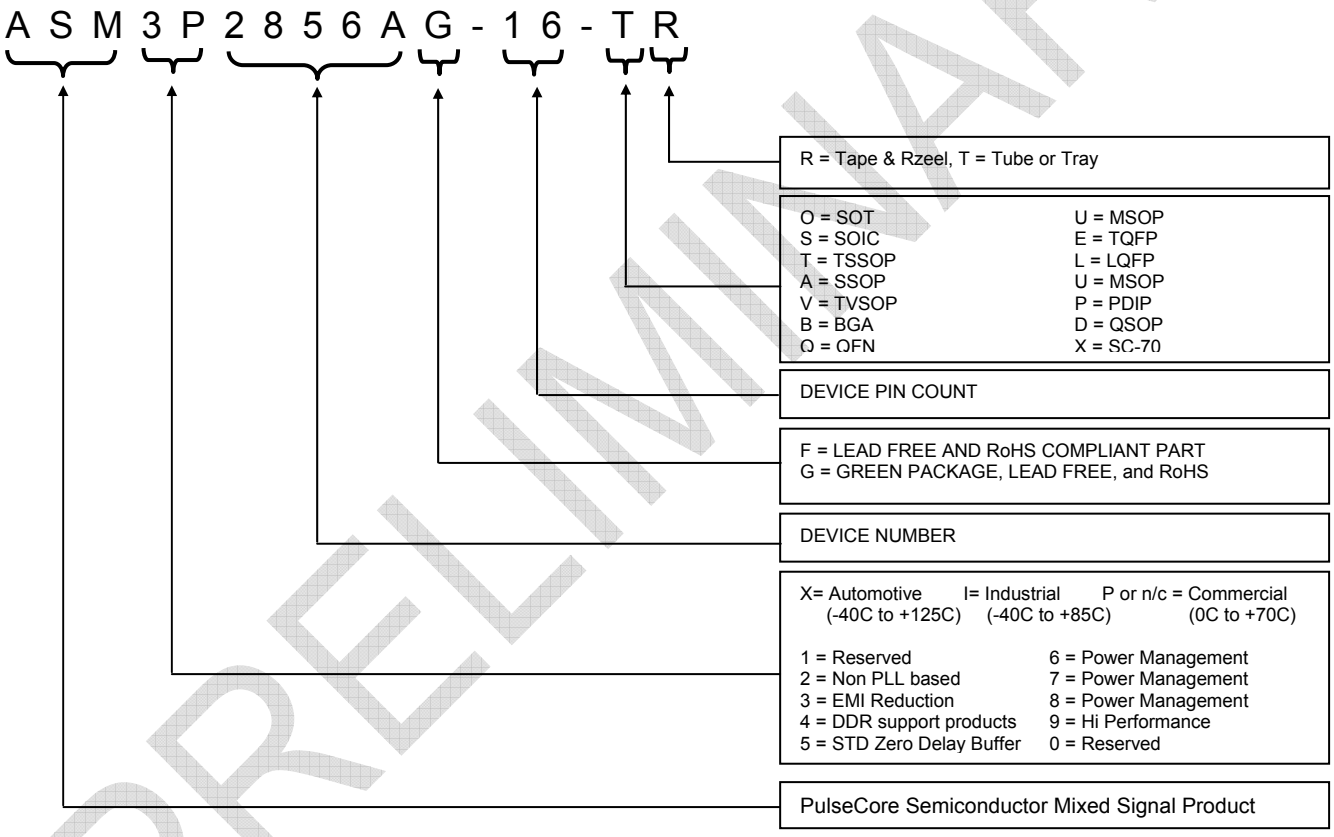
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Ordering Codes

Ordering Code	Marking	Package Type	Operating Range
ASM3P2856AG-16-TT	3P2856AG	16-pin 4.4-mm TSSOP - TUBE, Green	Commercial
ASM3P2856AG-16-TR	3P2856AG	16-pin 4.4-mm TSSOP - TAPE & REEL,Green	Commercial
ASM3P2856BG-16-TT	3P2856BG	16-pin 4.4-mm TSSOP - TUBE, Green	Commercial
ASM3P2856BG-16-TR	3P2856BG	16-pin 4.4-mm TSSOP - TAPE & REEL,Green	Commercial

Device Ordering Information



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Licensed under U.S Patent Nos 5,488,627 and 5,631,921

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ASM3P2856B
Document Version: v0.1

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

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