rev 0.2

Multi-Output Custom Clock Generator

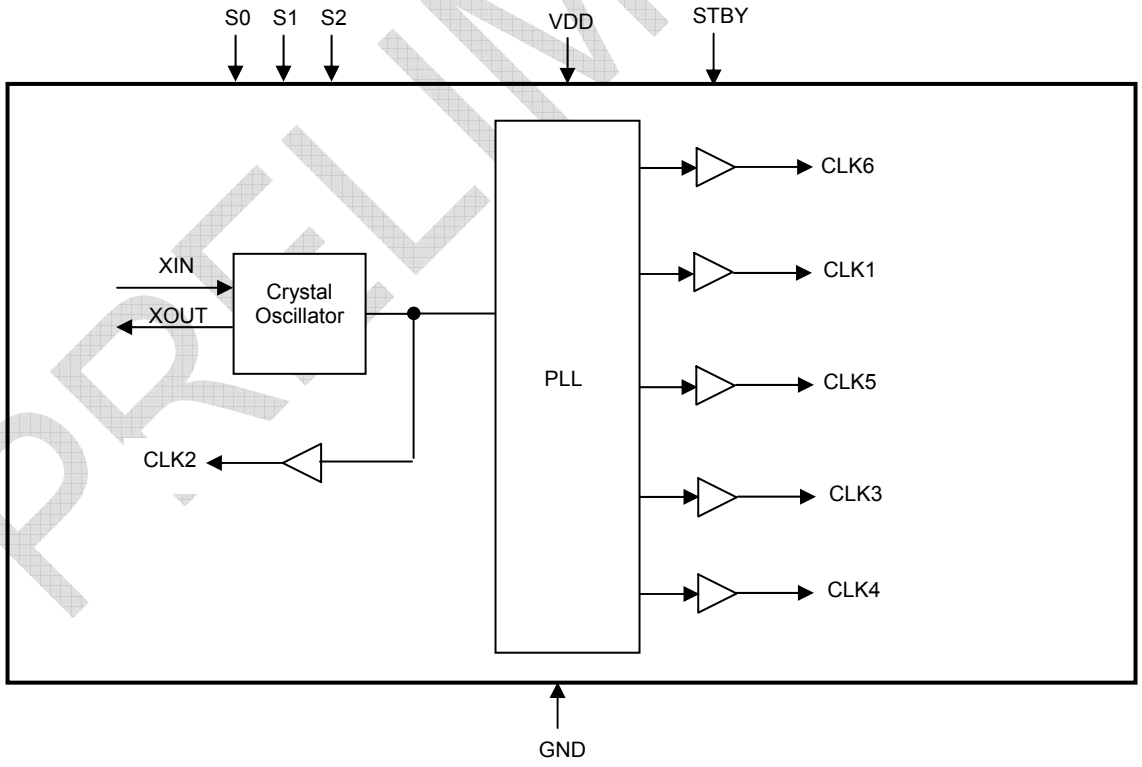
Features

- Generates five clock outputs from an inexpensive 20MHz crystal or external reference clock.
- Output Frequencies are selectable through select bits
- Generates an EMI optimized clock signal at the output.
- ±1.5% (Typ) Centre Spread for Spread Spectrum Clock Outputs
- Operates with a 3.3V ± 0.3V Supply Voltage
- Output Clocks disable feature using STBY pin
- Available in 20-pin TSSOP.

Product Description

The ASM3P4201A is a versatile multi output custom clock generator. The five high frequency Clock outputs are generated using an inexpensive 20MHz Crystal or external reference clock. The accuracy of the 20MHz Input Clock should be within ±50ppm. The output clocks consist of a low EMI spread spectrum clock and other non-spread clocks. Three Select bits choose the combination of Output Clock Frequency. Refer to the Output Frequency Selection Table for the values. Output clocks can be disabled using the STBY pin. The device operates from a Supply Voltage of 3.3V±0.3V with a tolerable ripple voltage of 50mV . The device is available in a 20 pin TSSOP JEDEC package.

Block Diagram



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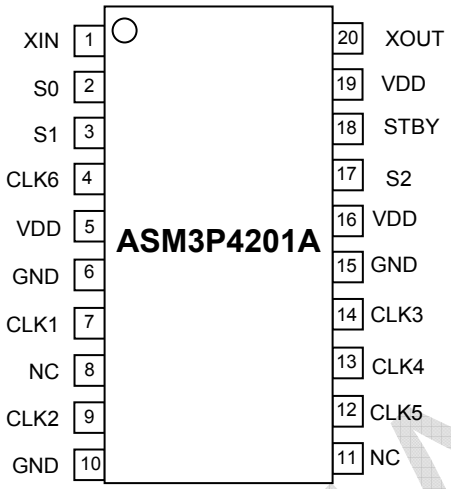
Pin Assignment



20 pin TSSOP

Pin Description

Pin #	Pin Name	Pin Type	Pin Description
1	XIN	Input	Crystal connection or external reference frequency input. It can be connected to a 20MHz Fundamental mode crystal or to an external reference clock.
2	S0	Input	Select Bit for Desired Output Frequency at different output pins. Refer to the Output Frequency Selection Table for details. Has an internal pull down resistor
3	S1	Input	Select Bit for Desired Output Frequency at different output pins. Refer to the Output Frequency Selection Table for details. Has an internal pull down resistor
4	CLK6	Output	Clock Output. Refer to the Output Frequency Selection Table for details.
5	VDD	Power	Connect to +3.3V.
6	GND	Power	Connect to ground.
7	CLK1	Output	Clock Output. Refer to the Output Frequency Selection Table for details.
8	NC	-	No connect
9	CLK2	Output	Clock Output. Refer to the Output Frequency Selection Table for details.
10	GND	Power	Connect to ground.
11	NC	-	No connect
12	CLK5	Output	Clock Output. Refer to the Output Frequency Selection Table for details.
13	CLK4	Output	Spread Spectrum Clock Output. Refer to the Output Frequency Selection Table for details.
14	CLK3	Output	Spread Spectrum Clock Output. Refer to the Output Frequency Selection Table for details.
15	GND	Power	Connect to ground.
16	VDD	Power	Connect to +3.3V.
17	S2	Input	Select Bit for Desired Output Frequency at different output pins. Refer to the Output Frequency Selection Table for details. Has an internal pull down resistor
18	STBY	Input	When this pin is made is HIGH, all the output clocks are enabled.
19	VDD	Power	Connect to +3.3V.
20	XOUT	Output	Crystal connection. If an external reference clock is used, this pin must be left unconnected.

Output Frequency Selection Table

Selection Bits			CLK1 (MHz)	CLK2 (MHz)	CLK3* (MHz)	CLK4* (MHz)	CLK5 (MHz)	CLK6 (MHz)
S2	S1	S0						
0	0	0	39.5	20	65	20	84	36.6
0	0	1	39.5	20	60	20	84	36.6
0	1	0	39.5	20	50	20	36	36.6
0	1	1	39.5	20	75	20	84	36.6

* CLK3 and CLK4 are Spread Spectrum Clocks

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
VDD	Power Supply Voltage relative to Ground	-0.5 to +4.6	V
V_{IN}	Input Voltage relative to Ground (Input Pins)	-0.5 to VDD+0.3	
T_{STG}	Storage temperature	-65 to +150	°C
T_A	Operating temperature	-20 to +85	°C
T_s	Max. Soldering Temperature (10 sec)	260	°C
T_J	Junction Temperature	125	°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} =12mA)	-	-	0.4	V
V_{OH}	Output high voltage (VDD = 3.3V, I_{OH} =12mA)	2.5	-	-	V
I_{DD}	Static supply current*	-	TBD	-	mA
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	-	17	-	Ω

* XIN and STBY Pins are pulled low
** VDD and XIN input are stable,

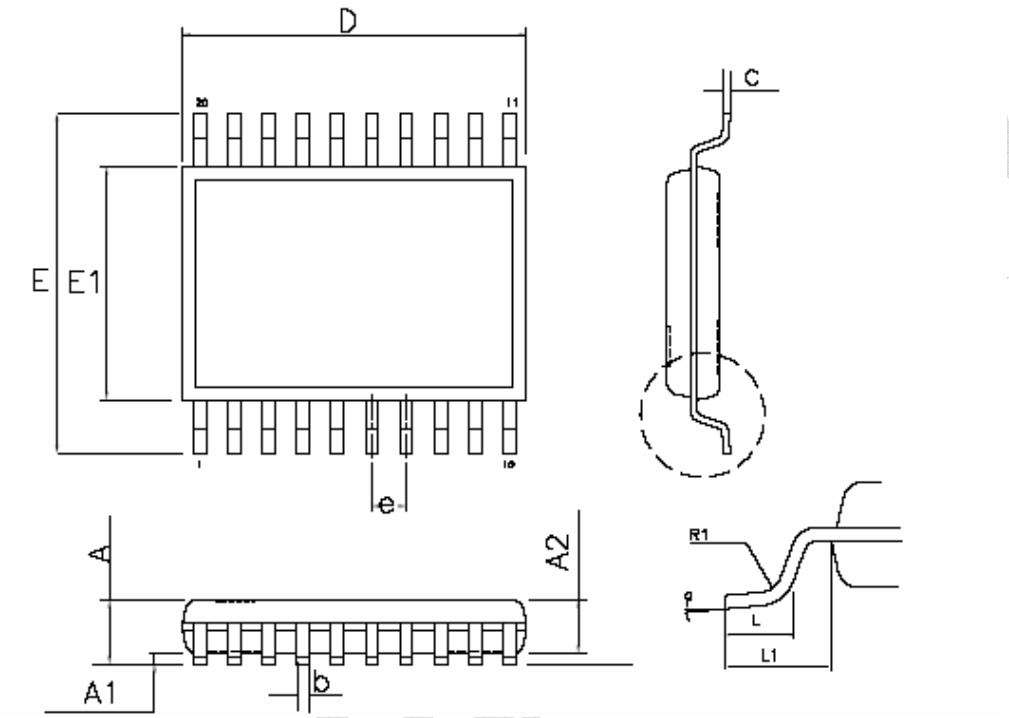
AC Electrical Characteristics

Symbol	Parameter		Min	Typ	Max	Unit
CLKIN	Input frequency		-	20	-	MHz
f_d	Spread Percentage	Output Frequency =20MHz (Pin 13)	-	±1.5	-	%
		Output Frequency = 50MHz				
		Output Frequency = 60MHz				
		Output Frequency = 65MHz				
		Output Frequency = 75MHz				
t_{LH}*	Output rise time (Measured from 0.8V to 2.0V)		-	-	1	nS
t_{HL}*	Output fall time (Measured from 2.0V to 0.8V)		-	-	1	nS
t_{JC}	Jitter (Cycle to cycle)		-	±250	-	pS
t_p	Jitter(Period)		-	±150	-	pS
t_D	Output duty cycle		45	50	55	%

*t_{LH} and t_{HL} are measured into a capacitive load of 30pF

Package Information

20-lead Thin Shrunk Small Outline Package (4.40-MM Body) – JEDEC Standard

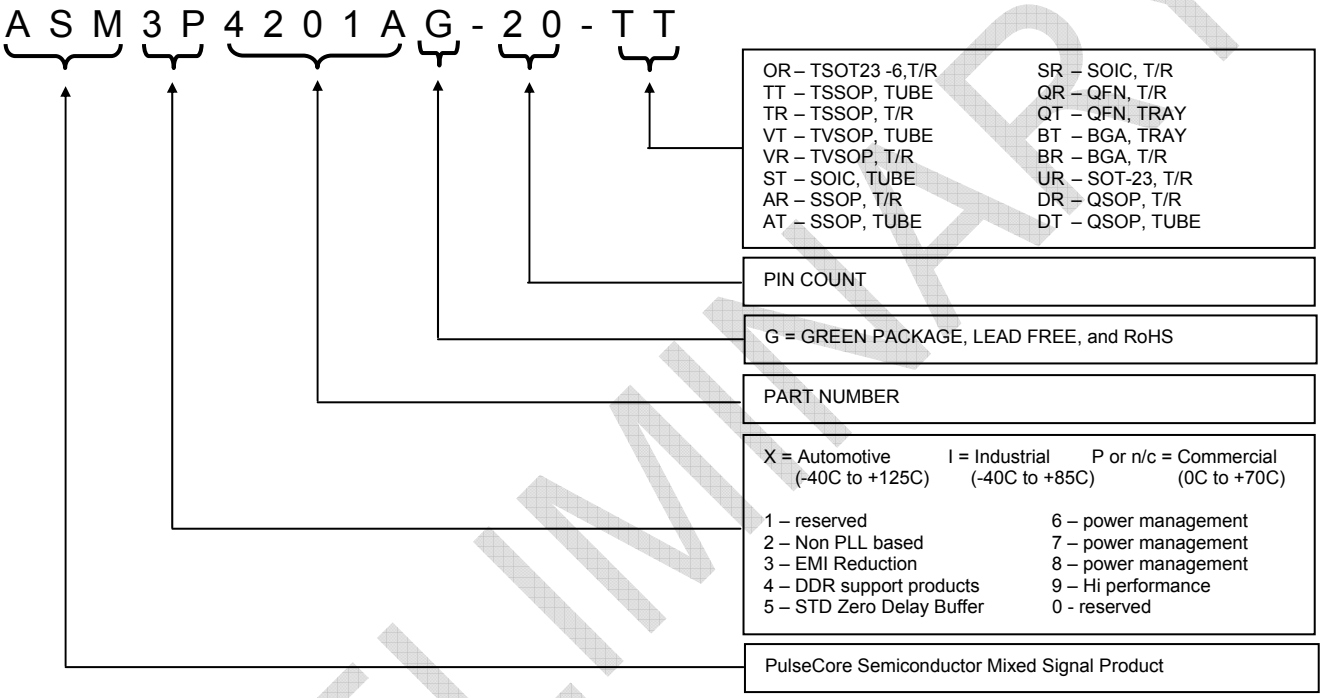


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	….	0.043	…	1.2
A1	0.0020	0.0059	0.05	0.15
A2	0.031	0.041	0.80	1.05
D	0.252	0.26	6.40	6.60
L	0.020	0.030	0.50	0.75
E	0.252 BSC		6.40 BSC	
E1	0.169	0.177	4.30	4.50
R1	0.004	….	0.09	…..
b	0.007	0.012	0.19	0.30
c	0.004	0.008	0.09	0.20
L1	0.039 REF		1.0 REF	
e	0.026 BSC		0.65 BSC	
a	0°	8°	0°	8°

Ordering Information

Part Number	Marking	Package	Temperature
ASM3P4201AG-28-TT	3P4201AG	20-Pin TSSOP, Tube, Green	Commercial
ASM3P4201AG-28-TR	3P4201AG	20-Pin TSSOP, Tape and Reel, Green	Commercial

Device Ordering Information



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