阅读申明

1. 本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
2. 本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
3. 本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描叙上的差异，建议读者做出适当判断。
4. 如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有"数据手册"字样。

Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.

2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.

3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.

4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets".

ASM3P2779A
# Peak EMI
Reducing Solution

ON Semiconductor®

Features

- Generates an EMI optimized clock signal at the output.
- Integrated loop filter components.
- Operates with a 3.3 / 2.5V Supply.
- Operating current less than 4mA.
- CMOS design.
- Input frequency range: 13MHz to 30MHz for 2.5V
  13MHz to 30MHz for 3.3V
- Generates a 1X low EMI spread spectrum clock of the input frequency.
- Frequency deviation: ±1% (Typ) @ 16MHz Input Frequency.
- Available in 6L-TSOP (6L-TSOT-23).

Product Description

The ASM3P2779A is a versatile spread spectrum frequency modulator designed specifically for a wide range of clock frequencies. The ASM3P2779A reduces electromagnetic interference (EMI) at the clock source, allowing system wide reduction of EMI of all clock dependent signals. The ASM3P2779A allows significant system cost savings by reducing the number of circuit board layers, ferrite beads and shielding that are traditionally required to pass EMI regulations.
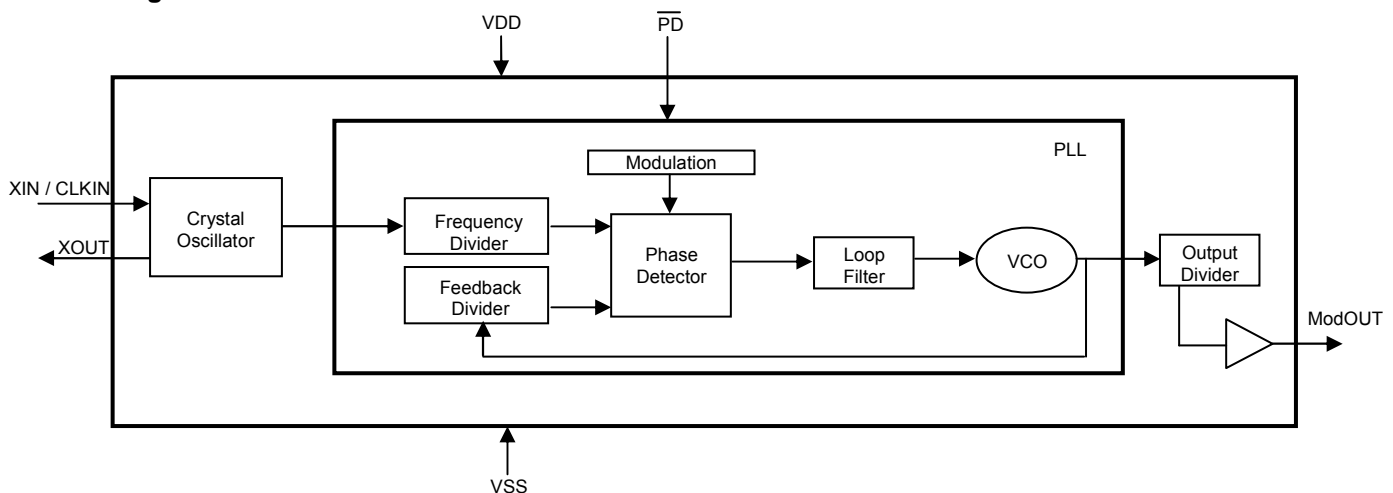
The ASM3P2779A uses the most efficient and optimized modulation profile approved by the FCC and is implemented by using a proprietary all digital method.

The ASM3P2779A 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 ASM3P2779A is targeted towards all portable devices like MP3 players and digital still cameras.

Key Specifications

Description	Specification
Supply voltages	V_{DD} = 3.3V / 2.5V
Cycle-to-Cycle Jitter	±200pS (Typ)
Output Duty Cycle	45/55%
Modulation Rate Equation	$F_{IN}/640$
Frequency Deviation	±1% (Typ) @ 16MHz

Block Diagram

ASM3P2779A

Pin Configuration (6L-TSOP Package)
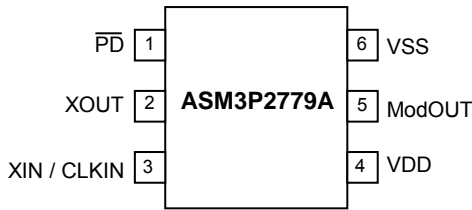
Pin Description

Pin#	Pin Name	Type	Description
1	$\overline{PD}$	I	Power-down control pin. Pull low to enable power-down mode. Connect to VDD if not used.
2	XOUT	O	Crystal connection. If using an external reference, this pin must be left unconnected.
3	XIN / CLKIN	I	Crystal connection or external reference frequency input. This pin has dual functions. It can be connected either to an external crystal or an external reference clock.
4	VDD	P	Power supply for the entire chip.
5	ModOUT	O	Spread spectrum clock output.
6	VSS	P	Ground connection.

Specifications

Description		Specification
Frequency Range	For 2.5V Supply	13MHz < CLKIN < 30MHz
	For 3.3V Supply	13MHz < CLKIN < 30MHz
Modulation Equation		$F_{IN}/640$
Frequency Deviation		±1% (Typ) @ 16MHz

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
VDD, V_{IN}	Voltage on any pin with respect to Ground	-0.5 to +4.6	V
T_{STG}	Storage temperature	-65 to +125	℃
T_A	Operating temperature	0 to +70	℃
T_s	Max. Soldering Temperature (10 sec)	260	℃
T_J	Junction Temperature	150	℃
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.

Operating Conditions

Parameter	Description	Min	Max	Unit
VDD	Supply Voltage	2.375	3.6	V
T_A	Operating Temperature (Ambient Temperature)	-40	+85	℃
C_L	Load Capacitance		15	pF
C_{IN}	Input Capacitance		7	pF

DC Electrical Characteristics for 2.5V Supply

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	VSS-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 (@ 0.5V, VDD = 2.5V)		3		mA
I_{XOH}	XOUT output high current (@ 1.8V, VDD = 2.5V)		3		mA
V_{OL}	Output low voltage (VDD = 2.5 V, I_{OL} = 8mA)			0.6	V
V_{OH}	Output high voltage (VDD = 2.5 V, I_{OH} = 8mA)	1.8			V
I_{DD}	Static supply current[1]			2.0	uA
I_{CC}	Dynamic supply current (2.5V, 16MHz and no load)		3.0		mA
VDD	Operating Voltage	2.375	2.5	2.625	V
t_{ON}	Power-up time (first locked cycle after power-up)[2]			5	mS
Z_{OUT}	Output impedance		50		Ω

Notes: 1. XIN / CLKIN pin and $\overline{PD}$ pin are pulled low.
      2. V_{DD} and XIN / CLKIN input are stable, $\overline{PD}$ pin is made high from low.

AC Electrical Characteristics for 2.5V Supply

Symbol	Parameter		Min	Typ	Max	Unit
CLKIN	Input frequency		13		30	MHz
ModOUT	Output frequency		13		30	MHz
f_d	Frequency Deviation	Input Frequency = 13MHz		±1.15		%
		Input Frequency = 30MHz		±0.6		
t_{LH}[1]	Output rise time (measured from 0.7V to 1.7V)		0.7	1.4	1.8	nS
t_{HL}[1]	Output fall time (measured from 1.7V to 0.7V)		0.4	0.9	1.1	nS
t_{JC}	Jitter (cycle-to-cycle)			±200		pS
t_D	Output duty cycle		45	50	55	%

Note: 1. t_{LH} and t_{HL} are measured into a capacitive load of 15pF.

DC Electrical Characteristics for 3.3V Supply

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	VSS-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 (@ 0.4V, VDD = 3.3V)		3		mA
I_{XOH}	XOUT output high current (@ 2.5V, VDD = 3.3V)		3		mA
V_{OL}	Output low voltage (VDD = 3.3 V, I_{OL} = 8mA)			0.4	V
V_{OH}	Output high voltage (VDD = 3.3 V, I_{OH} = 8mA)	2.5			V
I_{DD}	Static supply current[1]			2.0	uA
I_{CC}	Dynamic supply current (3.3V, 16MHz and no load)		3.5		mA
VDD	Operating Voltage	2.7	3.3	3.6	V
t_{ON}	Power-up time (first locked cycle after power-up)[2]			5	mS
Z_{OUT}	Output impedance		45		Ω

Notes: 1. XIN / CLKIN pin and PD pin are pulled low.
      2. V_{DD} and XIN / CLKIN input are stable, PD pin is made high from low.

AC Electrical Characteristics for 3.3V Supply

Symbol	Parameter		Min	Typ	Max	Unit
CLKIN	Input frequency		13		30	MHz
ModOUT	Output frequency		13	v	30	MHz
f_d	Frequency Deviation	Input Frequency = 13MHz		±1.15		%
		Input Frequency = 30MHz		±0.6		
t_{LH}[1]	Output rise time (measured from 0.8 to 2.0V)		0.5	1.1	1.3	nS
t_{HL}[1]	Output fall time (measured at 2.0V to 0.8V)		0.3	0.8	0.9	nS
t_{JC}	Jitter (cycle-to-cycle)			±200		pS
t_D	Output duty cycle		45	50	55	%

Note: 1. t_{LH} and t_{HL} are measured into a capacitive load of 15pF.

Modulation Profile
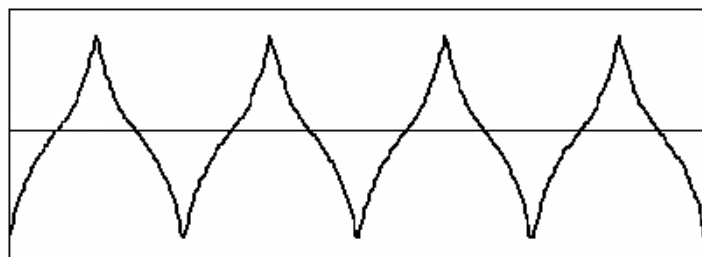
Typical Crystal Specifications

| Fundamental AT cut parallel resonant crystal	
Nominal frequency	16MHz
Frequency tolerance	± 50 ppm or better at 25℃
Operating temperature range	-25℃ to +85℃
Storage temperature	-40℃ to +85℃
Load capacitance(C_P)	18pF
Shunt capacitance	7pF maximum
ESR	25 Ω

Note: Note: C_L is Load Capacitance and Rx is used to prevent oscillations at overtone frequency of the Fundamental frequency.

Typical Crystal Interface Circuit
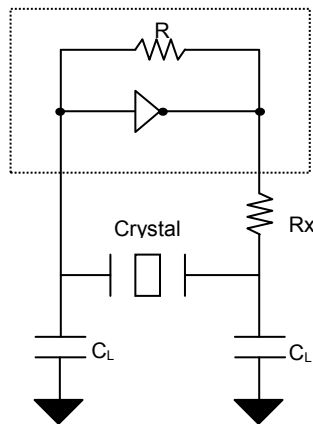
$C_L = 2*(C_P - C_S)$,
   Where C_P = Load capacitance of crystal
         C_S = Stray capacitance due to $C_{IN,}$ PCB, Trace etc.

Typical Application Schematic
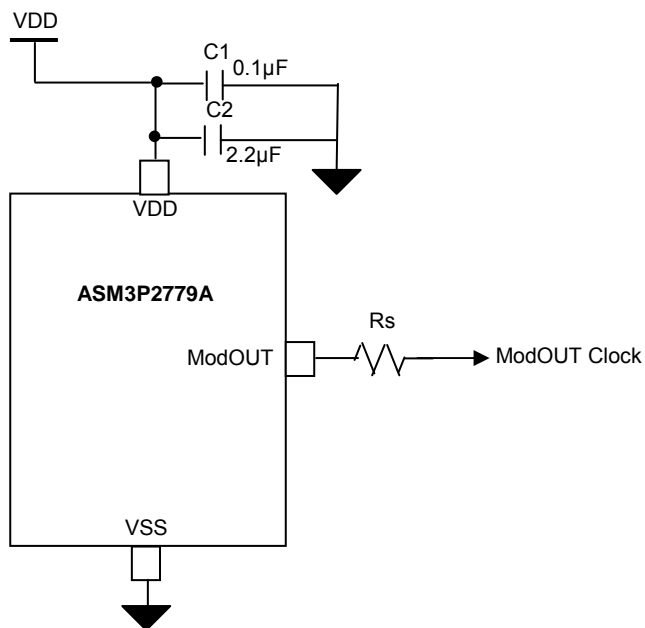
Package Information

6L-TSOP Package
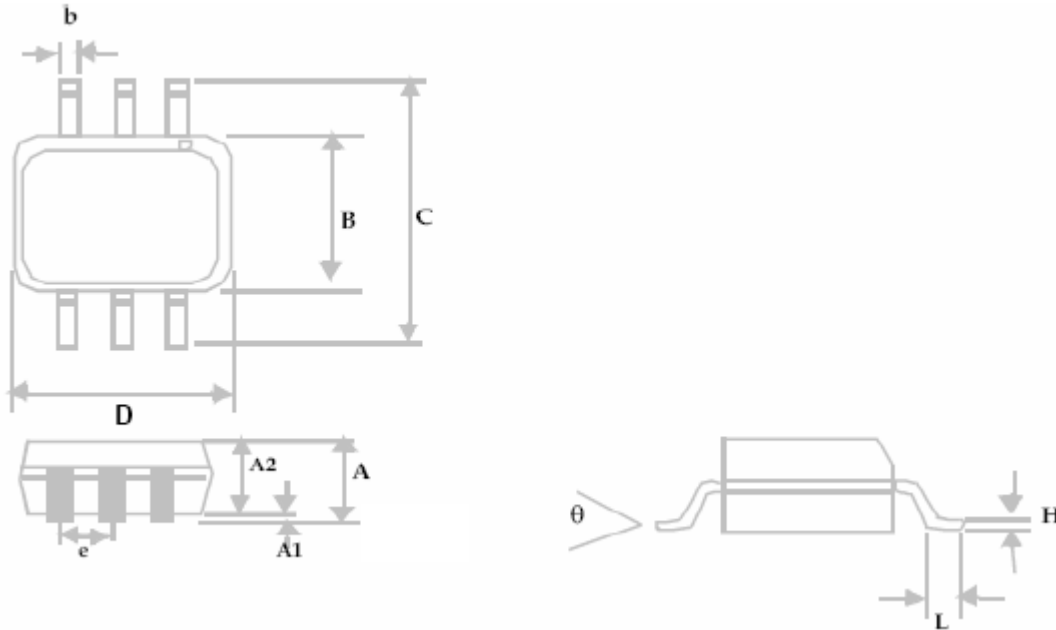
Symbol	Dimensions			
	Inches		**Millimeters**	
	Min	**Max**	**Min**	**Max**
A		0.04		1.00
A1	0.00	0.004	0.00	0.10
A2	0.033	0.036	0.84	0.90
b	0.012	0.02	0.30	0.50
H	0.005 BSC		0.127 BSC	
D	0.114 BSC		2.90 BSC	
B	0.06 BSC		1.60 BSC	
e	0.0374 BSC		0.950 BSC	
C	0.11 BSC		2.80 BSC	
L	0.0118	0.02	0.30	0.50
θ	0°	4°	0°	4°

Ordering Information

Part Number	Marking	Package Type	Temperature
ASM3P2779AF-06OR	A4L	6L-TSOP(6L-TSOT-23)., TAPE & REEL, Pb Free	0℃ to +70℃
ASM3I2779AF-06OR	A5L	6L-TSOP(6L-TSOT-23)., TAPE & REEL, Pb Free	-40℃ to +85℃

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.