PulseCore®

Alliance Semiconductor®

PRELIMINARY Specification

AS80M2182

LCD Panel EMI Reduction IC

FEATURES

- FCC approved method of EMI attenuation
- Provides up to 15 dB EMI reduction
- Generates a **1X** low EMI spread spectrum clock from the input frequency
- Optimized for frequency range:
  AS80M2182: 25 MHz to 210 MHz
- Internal loop filter minimizes external components and board space
- Center Spread
- Low inherent cycle-to-cycle jitter
- 4 spread % selections: +/- 0.25% to +/- 1.875%
- 3.3V operating voltage
- CMOS/TTL compatible inputs and outputs
- Low power CMOS design
- Supports notebook VGA and other LCD timing controller applications
- Products are available for industrial temperature range.
- Available in 8 pin SOIC and TSSOP

PRODUCT DESCRIPTION

The AS80M2182 is a versatile spread spectrum frequency modulator designed specifically for a wide range of input clock frequencies from 25 to 210 MHz (see Table 1). The AS80M2182 can generate an EMI reduced clock from an OSC or a system generated clock. The AS80M2182 offer a Center Spread clock and with a percentage deviation from +/- 0.25% to +/- 1.875%.

The AS80M2182 reduces electromagnetic interference (EMI) at the clock source, allowing a system wide EMI reduction for all the down stream clocks and data dependent signals. The AS80M2182 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 AS80M2182 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 AS80M2182 uses the most efficient and optimized modulation profile approved by the FCC and is implemented by using a proprietary all-digital method.

APPLICATIONS

The AS80M2182 is targeted towards EMI management for memory and LVDS interfaces in mobile graphic chipsets and high-speed digital applications such as PC peripheral devices, consumer electronics, and embedded controller systems.

Figure 1 – AS80M2182 Pin Diagrams

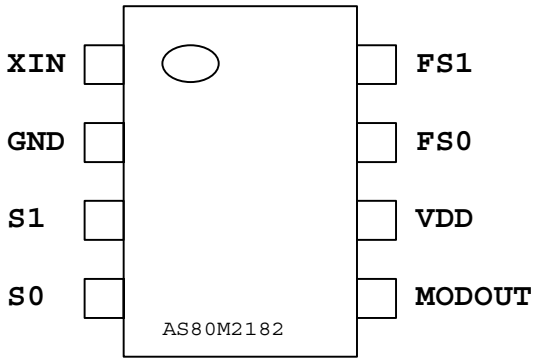
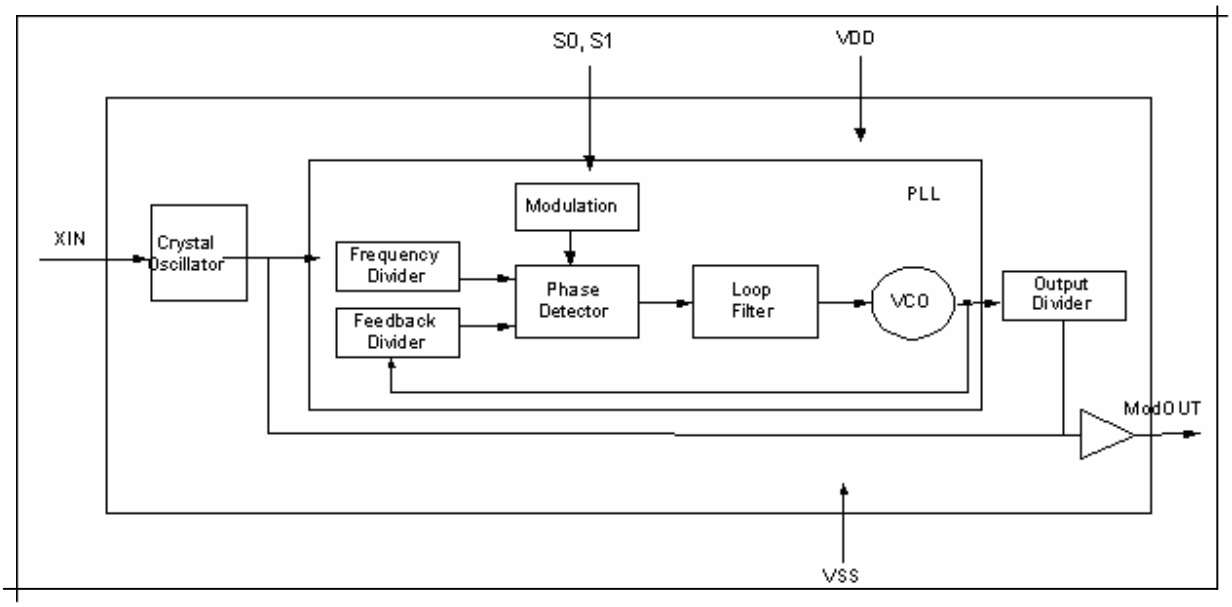


Figure 2 – AS80M2182 Block Diagram



AS80M2182 Block Diagram

Table 1- Input Frequency and Modulation Rate

Part Number	FS1 (pin 8)	FS0 (pin 7)	Frequency Range
AS80M2182	0	0	25 MHz to 50 MHz
	0	1	50 MHz to 103 MHz
	1	0	75 MHz to 150 MHz
	1	1	160 MHz to 210 MHz

Table 2 - Spread Deviation Selections

Part Number	S1 (pin 3)	S0 (pin 4)	Spread Deviation
AS80M2182	0	0	+-0.25%
	0	1	+/- 0.625%
	1	0	+/- 1.00%
	1	1	+/- 1.875%

PIN DESCRIPTION

PIN #	Name	Type	Description
1	XIN	I	Connect to externally generated clock signal.
2	GND	P	Ground.
3	S1	I	Spread Range Select. Digital logic input used to select frequency deviation (see Table 2). This pin has an internal pull-up resistor.
4	S0	I	Spread Range Select. Digital logic input used to select frequency deviation (see Table 2). This pin has an internal pull-up resistor.
5	ModOut	O	Spread Spectrum low EMI output
6	VDD	P	Connect to +3.3V.
7	FS0	I	Frequency range select. Digital Logic input used to select frequency range (see Table 1). This pin has an internal pull-up resistor.
8	FS1	I	Frequency range select. Digital Logic input used to select frequency range (see Table 1). This pin has an internal pull-up resistor.

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	ºC
T_A	Operating Temperature	0 to +70	ºC

DC ELECTRICAL CHARACTERISTICS

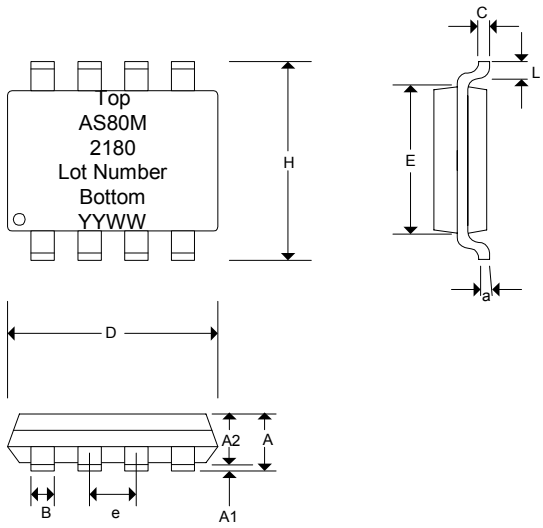
Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input Low Voltage	GND – 0.3	-	0.8	V
V_{IH}	Input High Voltage	2.0	-	VDD+0.3	V
I_{IL}	Input Low Current	-	-	-35	µA
I_{IH}	Input High Current	-	-	35	µA
I_{XOL}	XOUT Output Low Current (@ 0.4V, V_{DD} = 3.3V)	-	TBD	-	mA
I_{XOH}	XOUT Output High Current (@ 2.5V, V_{DD} = 3.3V)	-	TBD	-	mA
V_{OL}	Output Low Voltage (V_{DD}=3.3V, I_{OL} = 20 mA)	-	-	0.4	V
V_{OH}	Output High Voltage (V_{DD}=3.3V, I_{OH} = 20 mA)	2.5	-	-	V
I_{DD}	Static Supply Current Standby Mode	-	0.6	-	mA
I_{CC}	Dynamic Supply Current Normal Mode (3.3V and 10 pF loading)	8.46	12	17.78	mA
V_{DD}	Operating Voltage	2.7	3.3	3.7	V
t_{ON}	Power Up Time (First locked clock 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	25	-	210	MHz
f_{OUT}	Output Frequency	25	-	210	MHz
t_{LH} Note 1	Output Rise Time (measured at 0.8V to 2.0V)	0.7	0.9	1.1	ns
t_{HL} Note 1	Output Fall Time (measured at 2.0V to 0.8V)	0.6	0.8	1.0	ns
t_{JC}	Jitter (cycle to cycle)	-	-	360	ps
t_D	Output Duty Cycle	45	50	55	%

Note1: t_{LH} and t_{HL} are measured into a capacitive load of 15pF

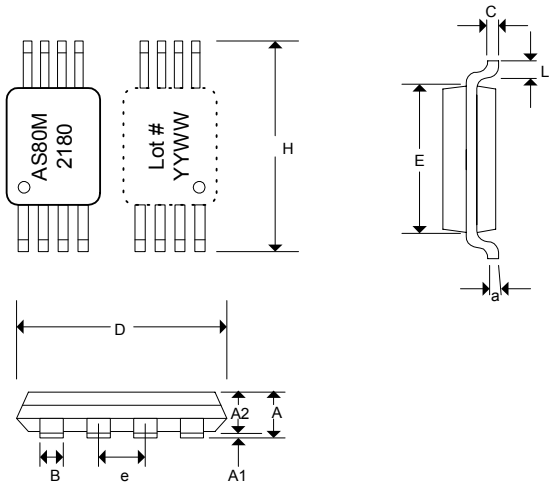
Figure 3 - Mechanical Package Outline (8 Pin SOIC)



	INCHES			MILLIMETERS		
SYMBOL	**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	0.001	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

Figure 4 - Mechanical Package Outline (8 Pin TSSOP)



	INCHES			MILLIMETERS		
SYMBOL	**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