General Purpose Peak EMI reduction IC

General Features

- 1x, LVCMOS Peak EMI Reduction
- Incorporates the latest Timing-Safe™ technology which allows the spread of analog video signal
- Input frequency:
  10MHz - 35MHz @ 2.5V
  10MHz - 40MHz @ 3.3V
- Output frequency :
  10MHz - 35MHz @ 2.5V
  10MHz - 40MHz @ 3.3V
- Analog Deviation Selection
- Spread Spectrum Enable/Disable
- Supply Voltage: 2.5V±0.2V
  3.3V±0.3V
- 8pin TDFN(2X2) COL Packages
- Commercial temperature range

Functional Description

SSDCP1108AF is a versatile, 3.3V/2.5V Peak EMI reduction IC. SSDCP1108AF accepts an input clock either from a fundamental Crystal or from an external reference (AC or DC coupled to XIN/CLKIN) and locks on to it delivering a 1x modulated clock output. SSDCP1108AF has a SSON pin for enabling and disabling Timing-Safe™ Spread Spectrum function.

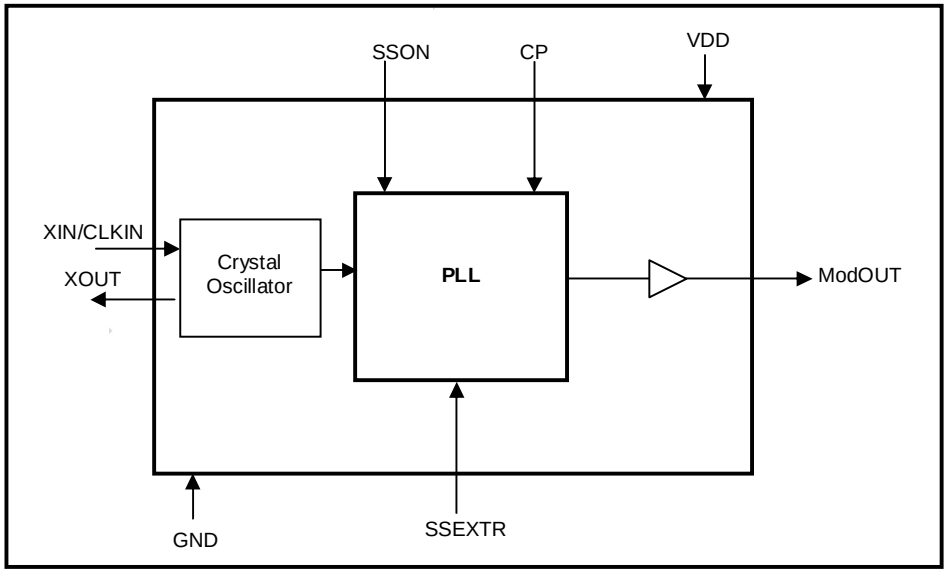
SSDCP1108AF has an SSEXTR pin to select different deviations depending upon the value of an external resistor connected between SSEXTR and GND. Charge Pump (CP) control selects one of the two different Charge Pump current settings.

SSDCP1108AF operates from a 3.3V/2.5V supply, and is available in an 8 pin TDFN(2X2) COL packages, over Commercial temperature range.

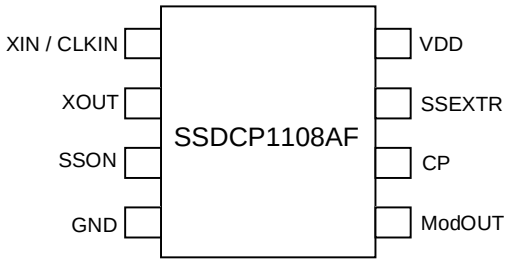
Application

- SSDCP1108AF is targeted for consumer electronics application such as MFP, STB, DSC, MID,HDMI,LCD panel Camcorder,and other timing sensitive analog video imaging applications
- Applications of HDMI, RJ45 port has good compatibility

Block Diagram



Pin Configuration



Pin Description

Pin #	Pin Name	Pin Type	Description
1	XIN / CLKIN	I	Crystal connection or External reference clock input.
2	XOUT	O	Crystal connection. If using an external reference, this pin should be left open.
3	SSON	I	Spread Spectrum ON/OFF. Spread Spectrum function enabled when HIGH, disabled when LOW. Has an internal pull-up resistor inside.
4	GND	P	Ground
5	ModOUT	O	Modulated clock output
6	CP	I	Charge Pump current Select. When LOW selects Low CP current. Selects High CP current when pulled HIGH. Has an internal pull-up resistor inside.
7	SSEXTR	I	Analog Deviation Selection through external resistor to GND.
8	VDD	P	2.5V / 3.3V supply Voltage.

Frequency Selection table

VDD (V)	Frequency (MHz)
2.5	15-35
3.3	15-40

Operating Conditions

Parameter	Description	Min	Max	Unit
VDD	Supply Voltage	2.3	3.6	V
T_A	Operating Temperature (Ambient Temperature)	0	+70	°C
C_L	Load Capacitance		10	pF
C_{IN}	Input Capacitance		7	pF

Absolute Maximum Rating

Symbol	Parameter	Rating	Unit
VDD, V_{IN}	Voltage on any input pin with respect to Ground	-0.5 to +4.6	V
T_{STG}	Storage temperature	-65 to +125	℃
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.

DC Electrical Characteristics for 2.5V

Parameter	Description	Test Conditions	Min	Typ	Max	Unit
VDD	Supply Voltage		2.3	2.5	2.7	V
V_{IL}	Input LOW Voltage				0.7	V
V_{IH}	Input HIGH Voltage		1.7			V
I_{IL}	Input LOW Current	V_{IN} = 0V			25	µA
I_{IH}	Input HIGH Current	V_{IN} = V_{DD}			25	µA
V_{OL}	Output LOW Voltage	I_{OL} = 8mA			0.6	V
V_{OH}	Output HIGH Voltage	I_{OH} = -8mA	1.8			V
I_{CC}	Static Supply Current	XIN / CLKIN pulled low			50	µA
I_{DD}	Dynamic Supply Current	Unloaded Output			12	mA
Z_o	Output Impedance			35		Ω

Switching Characteristics for 2.5V

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Frequency* / ModoUT		10		35	MHz
Duty Cycle [1, 2]	Measured at V_{DD} /2	45	50	55	%
Output Rise Time [1, 2]	Measured between 20% to 80%			2.2	nS
Output Fall Time [1,2]	Measured between 80% to 20%			2	nS
Cycle-to-Cycle Jitter [2]	Unloaded output with SSEXTR OPEN @ 27MHz		±175		pS
PLL Lock Time [2]	Stable power supply, valid clock presented on XIN / CLKIN			3	mS

Note: 1. All parameters are specified with 10pF loaded outputs.
2. Parameter is guaranteed by design and characterization. Not 100% tested in production
* Functionality with Crystal is guaranteed by design and characterization. Not 100% tested in production.

DC Electrical Characteristics for 3.3V

Parameter	Description	Test Conditions	Min	Typ	Max	Unit
VDD	Supply Voltage		3.0	3.3	3.6	V
V_{IL}	Input LOW Voltage				0.8	V
V_{IH}	Input HIGH Voltage		2.0			V
I_{IL}	Input LOW Current	V_{IN} = 0V			25	µA
I_{IH}	Input HIGH Current	V_{IN} = V_{DD}			25	µA
V_{OL}	Output LOW Voltage	I_{OL} = 8mA			0.4	V
V_{OH}	Output HIGH Voltage	I_{OH} = -8mA	2.4			V
I_{CC}	Static Supply Current	XIN / CLKIN pulled low			50	µA
I_{DD}	Dynamic Supply Current	Unloaded Output			16	mA
Z_o	Output Impedance			30		Ω

Switching Characteristics for 3.3V

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Frequency* / ModOUT		10		40	MHz
Duty Cycle [3, 4]	Measured at V_{DD} /2	45	50	55	%
Output Rise Time [3, 4]	Measured between 20% to 80%			1.8	nS
Output Fall Time [3, 4]	Measured between 80% to 20%			1.6	nS
Cycle-to-Cycle Jitter [4]	Unloaded output with SSEXTR OPEN @ 27MHz		±150		pS
PLL Lock Time [4]	Stable power supply, valid clock presented on XIN / CLKIN			3	mS

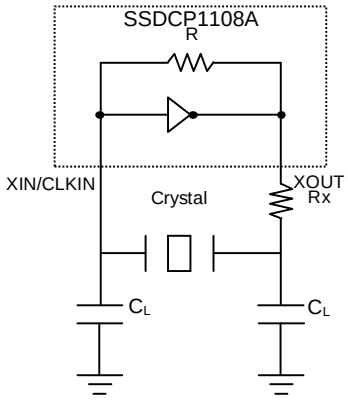
Note: 3. All parameters are specified with10pF loaded outputs.
4. Parameter is guaranteed by design and characterization. Not 100% tested in production.
* Functionality with Crystal is guaranteed by design and characterization. Not 100% tested in production.

Typical Crystal Specifications

Fundamental AT cut parallel resonant crystal	
Nominal frequency	27MHz
Frequency tolerance	± 50 ppm or better at 25℃
Operating temperature range	0°C to +70°C
Storage temperature	-40℃ to +85℃
Load capacitance(C_P)	18pF
Shunt capacitance	7pF maximum
ESR	25 Ω

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

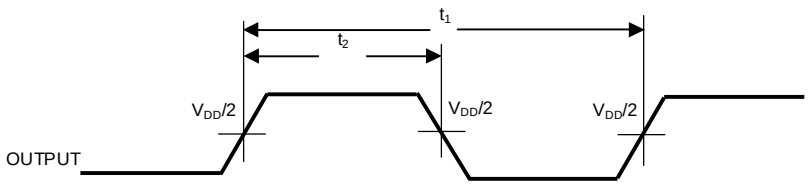
Typical Crystal Interface Circuit



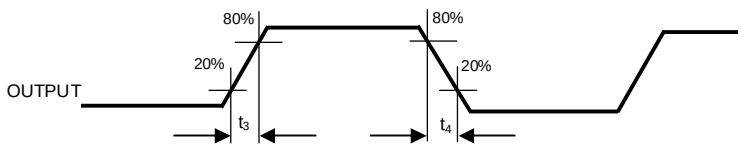
$C_L = 2*(C_P - C_S)$,
Where C_P = Load capacitance of crystal from crystal vendor datasheet
C_S = Stray capacitance due to $C_{IN,}$ PCB, Trace etc.

Switching Waveforms

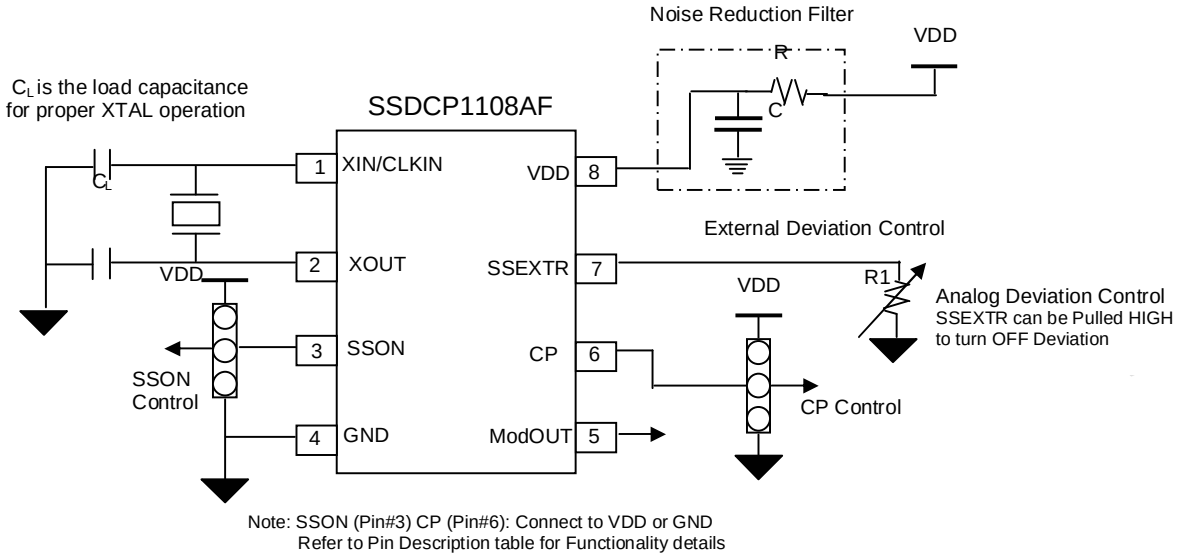
Duty Cycle Timing



Output Rise/Fall Time

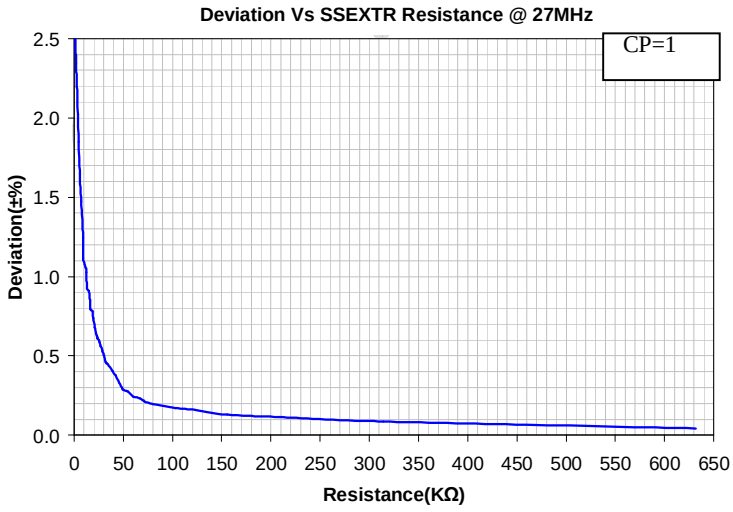


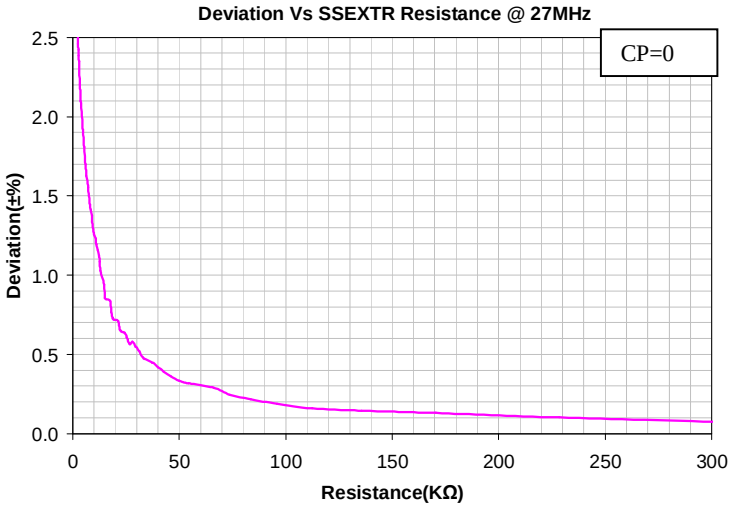
Application Schematic



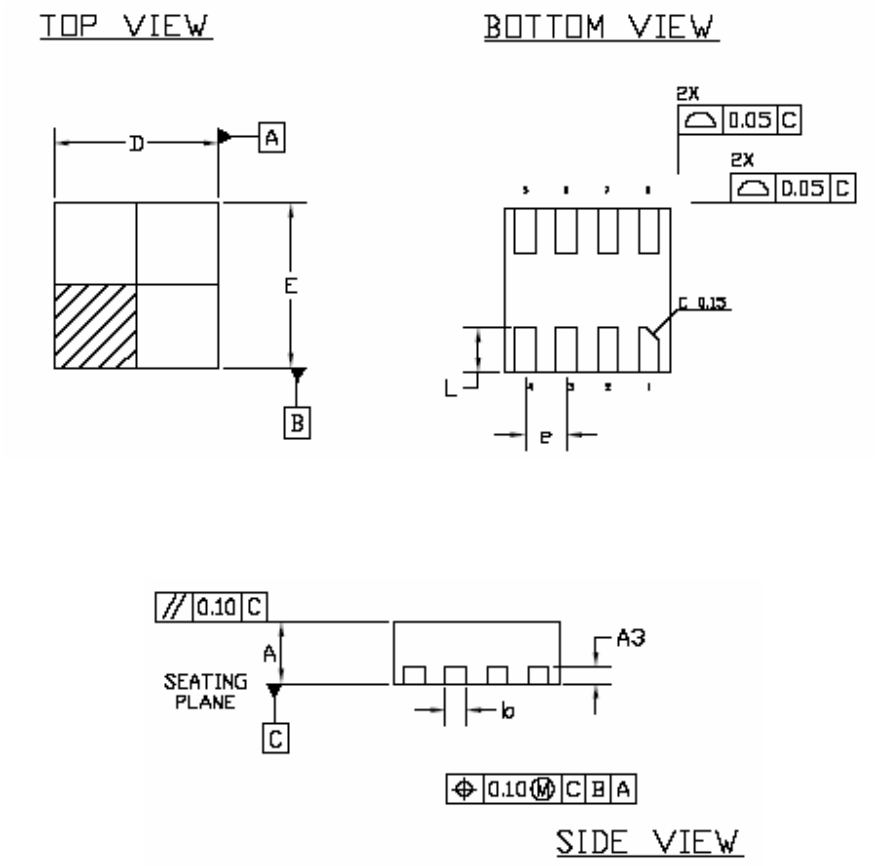
Note: For AC Coupled Interface refer to Application Brief: **CT100801**

Deviation Vs SSEXTR resistance Charts at 27MHz




Deviation Vs SSEXTR Resistance @ 27MHz
CP=0
Deviation(±%)
2.5
2.0
1.5
1.0
0.5
0.0
0
50
100
150
200
250
300
Resistance(KΩ)

TDFN COL 2x2 8L package Outline drawing

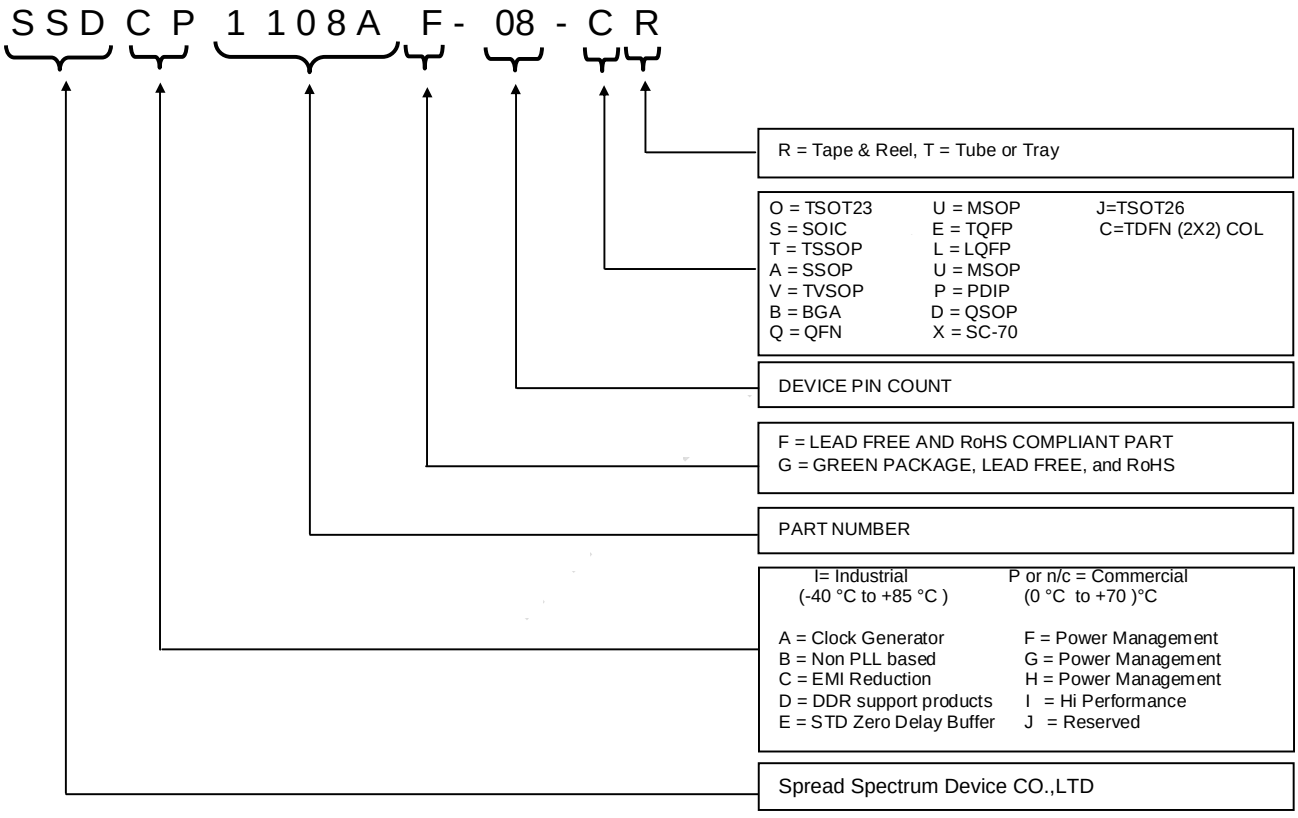


Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.027	0.0315	0.70	0.80
A3	0.008 BSC		0.203 BSC	
b	0.008	0.012	0.20	0.30
D	0.079 BSC		2.00 BSC	
E	0.078 BSC		2.00 BSC	
e	0.020 BSC		0.50 BSC	
L	0.020	0.024	0.50	0.60

Ordering Code

Part Number	Marking	Package	Temperature
SSDCP1108AF-08-CR	DA	8- pin 2-mm TDFN COL - TAPE & REEL, Green	0 °C to +70 °C

Device Ordering Information



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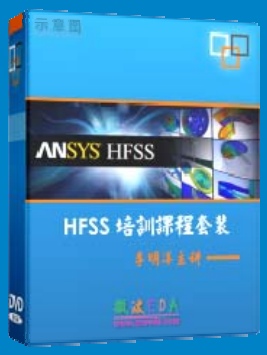

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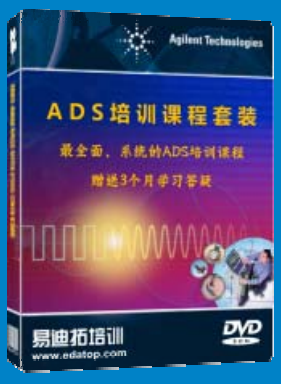

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