

Peak EMI Reduction IC

SSDCP2501AF

■ DESCRIPTION

SSDCP2501AF is a clock generator for EMI (Electro Magnetic Interference) reduction. The peak of unnecessary (EM) can be attenuated by making the oscillation frequency slightly modulate periodically with the internal modulator. SSDCP2501AF accepts an external reference , and locks on to it delivering a 1x modulated clock output

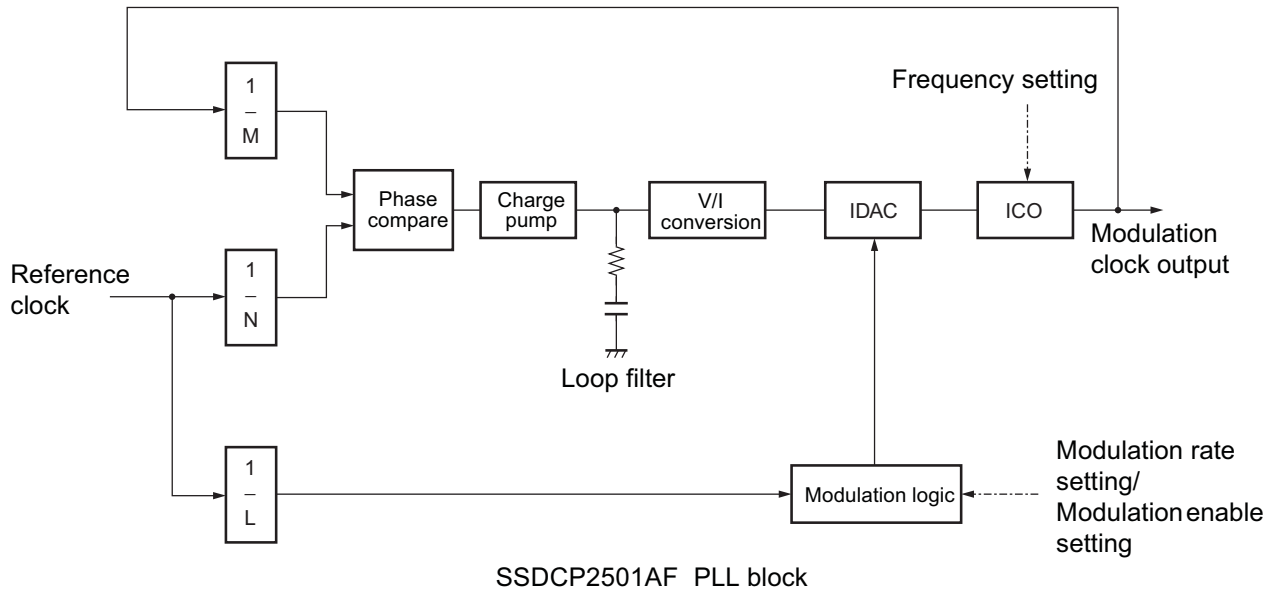
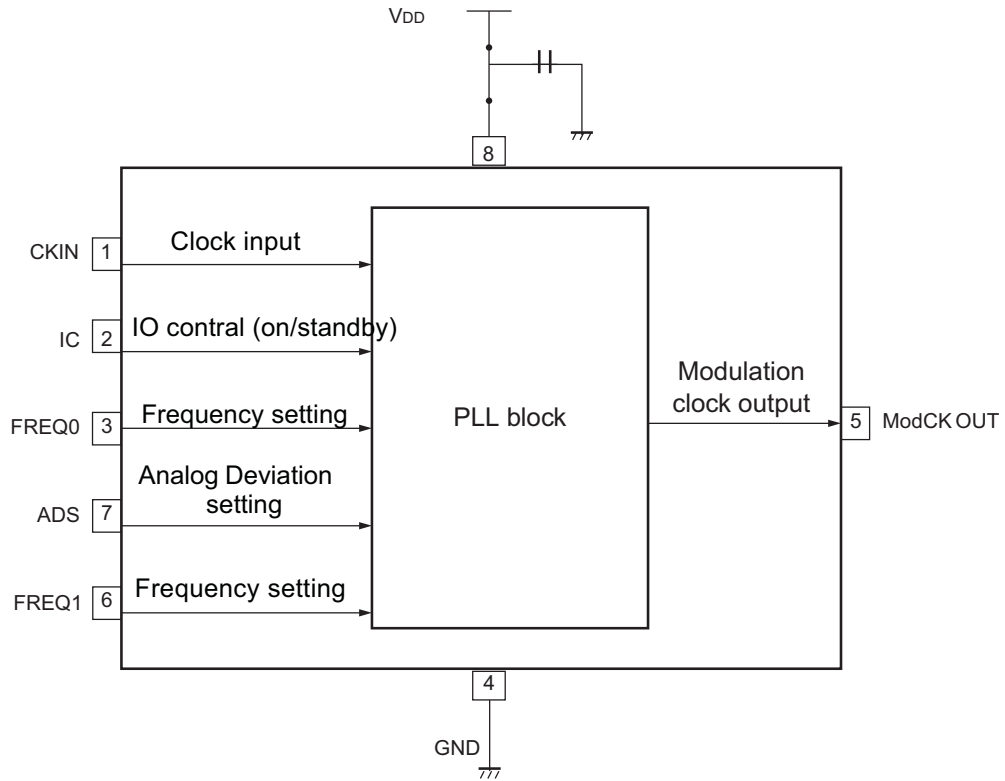
■ FEATURE

- Power down pin : 4 μ A (Typ-sample) consumption current at power down
- Input frequency : 14.0 MHz to 88.0 MHz
- Output frequency : 14.0 MHz to 88.0 MHz
- Analog Deviation Selection
- Modulation clock output Duty : 40% to 60%
- Power supply voltage : 2.5V--3.3 V
- Package : 8-pin TDFN
- Operating temperature:0°Cto+70 °C

■ Application

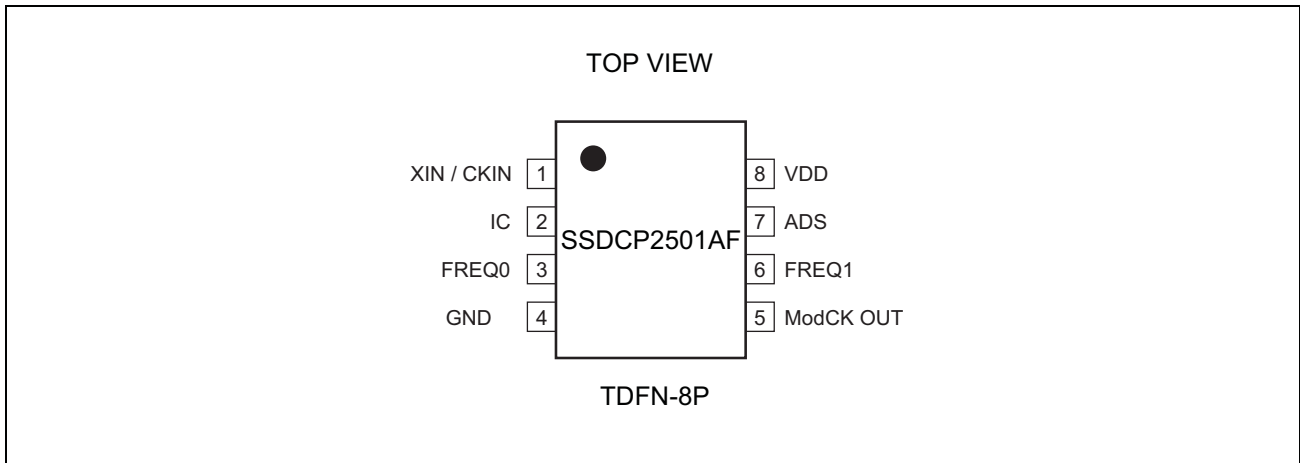
SSDCP2501AF is targeted for use in consumer electronic applications like mobile phones, Camera modules, MFP and DPF.

■ BLOCK DIAGRAM



A glitchless IDAC (current output D/A converter) provides precise modulation, thereby dramatically reducing EMI.

■ PIN ASSIGNMENT



■ PIN DESCRIPTION

Pin name	I/O	Pin no.	Description
XIN / CKIN	I	1	Clock input pin (or External reference clock input).
IC	I	2	Power Down. Outputs will be tri-stated when power down is standby Pull HIGH to disable power down and enable output.
FREQ0	I	3	Frequency setting pin
GND	---	4	GND pin
MODCK OUT	O	5	Modulation clock output
FREQ1	I	6	Frequency setting pin
ADS	I	7	Analog Deviation Selection through external resistor to GND.
VDD	---	8	Power supply voltage pin

■ **PIN SETTING**

When changing the pin setting, the stabilization wait time for the modulation clock required. The stabilization wait time for the modulation clock takes the maximum value of Lock-Up time in “■ ELECTRICAL CHARACTERISTICS • AC Characteristics”.

ADS modulation enable setting

Resistance(K ohm)	Deviation(+/-%)
0-1000K	3.0 - 0.25
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Note : Analog Deviation Selection through external resistor to GND.
Spectrum is spread (modulated) by centering on the input frequency.

FREQ0, FREQ1 frequency setting

FREQ0	FREQ1	Input frequency range
L	H	10 MHz to 36 MHz
L	L	20 MHz to 56 MHz
H	H	40 MHz to 68 MHz
H	L	57 MHz to 88 MHz

Note : It is set according to the frequency of the clock input to the device. Set FREQ0 pin to “H” for the pin opened because FREQ0 pin has pull-up resistor.

SSDCP2501AF

TABSOLUTE MAXIMUM RATING

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DD}	Supply Voltage		2.3	2.7	3.6	V
V_{IH}	Input HIGH Voltage		$0.65 * V_{DD}$			V
V_{IL}	Input LOW Voltage				$0.35 * V_{DD}$	V
I_{IH}	Input HIGH Current	$V_{IN} = V_{DD}$			10	μA
I_{IL}	Input LOW Current	$V_{IN} = 0$ V for MR pin			10	μA
V_{OH}	Output HIGH Voltage	$I_{OH} = -16$ mA	$0.75 * V_{DD}$			V
V_{OL}	Output LOW Voltage	$I_{OL} = 16$ mA			$0.25 * V_{DD}$	V
I_{CC}	Static Supply Current	PD#/OE pin pulled to GND			10	μA
Z_o	Output Impedance			13		Ω

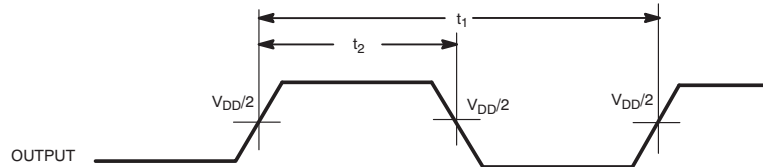
AC ELECTRICAL CHARACTERISTICS

Parameter	Test Conditions	Min	Typ	Max	Unit
Duty Cycle (Note 1 and 2)	Measured at $V_{DD} / 2$	40	50	60	%
Rise Time (Note 1 and 2)	Measured between 20% to 80%		0.8	1.2	ns
Fall Time (Note 1 and 2)	Measured between 80% to 20%		0.8	1.2	ns

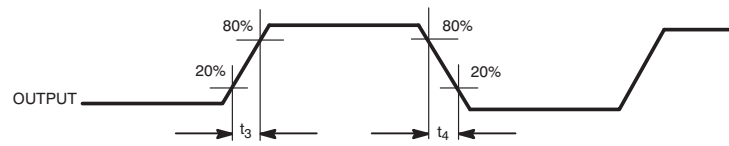
- All parameters are specified with 15 pF loaded output.
- Parameter is guaranteed by design and characterization. Not 100% tested in production.

SSDCP2501AF

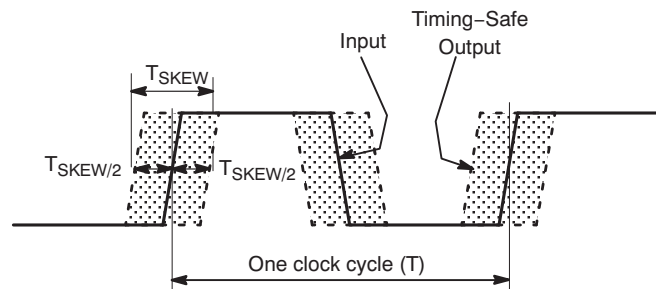
SWITCHING WAVEFORMS



Duty Cycle Timing

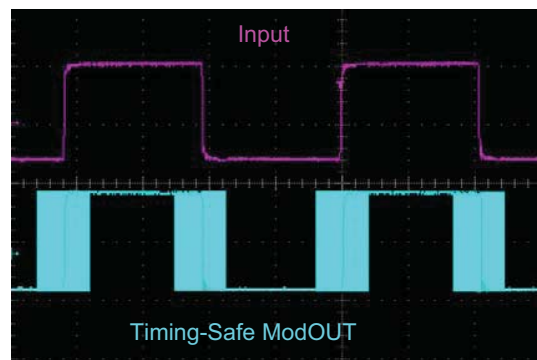
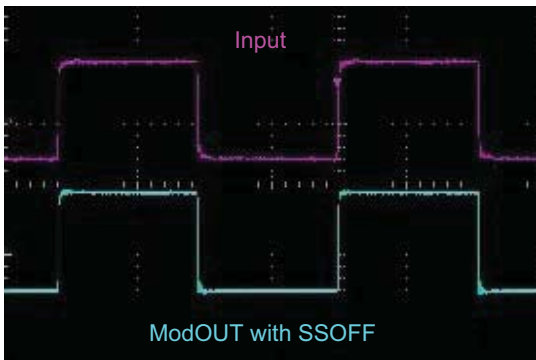


Output Rise/Fall T



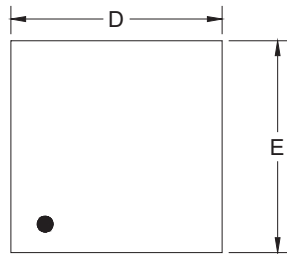
T_{SKEW} represents input-output skew when spread spectrum is on
For example, $T_{SKEW} / 2 = 0.20 * T$ for an Input clock of 24 MHz, translates in to $(1/24 \text{ MHz}) * 0.20 = 8.33 \text{ ns}$

Input-Output Skew

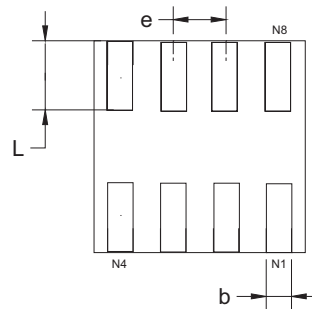


Typical Example of Timing-Safe Waveform

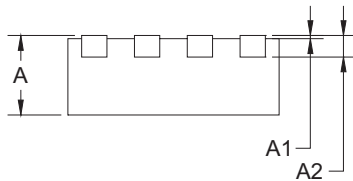
TDFN-2x2-8L



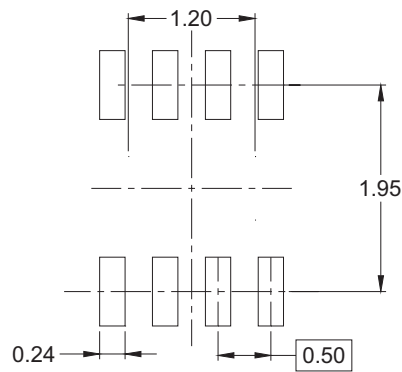
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
b	0.180	0.300	0.007	0.012
L	0.500	0.600	0.020	0.024
e	0.500 TYP		0.020 TYP	

ORDERING INFORMATION

Part Number	Temperature	Package Type	Shipping†
SSDCP2501AF -08 -CT	0°C to +70°C	8-Pin (2 mm x 2 mm) TDFN (Pb-Free)	3000 / Tape & Reel

Device Ordering Information

SSDCP 2501A F- 08 - CT

T = Tape & Reel, R = Tube or Tray																					
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