## General Description

SSF104 is a small 8pin DFN packaged customized ASIC with configurable parameters. It supports frequency division and in-phase output function.

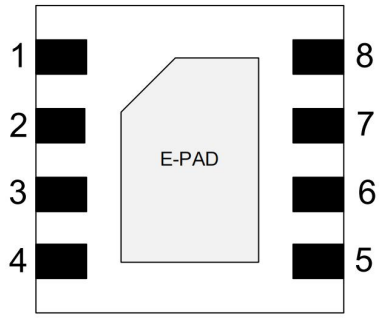
## Features

- Power supply input: 2.3V~5.5V
- OUT1, 1x Push Pull Digital Output, 12.288Mhz output
- OUT2, 1x Push Pull Digital Output, 6.144Mhz output
- GND Power Ground
- OUT3, 1x Push Pull Digital Output 96Khz output
- NC Not Connected, Internal pull-down 1M
- IN Digital input with Schmitt, Internal pull-down 1M，12.288Mhz input
- DFN - 8 Package

## Applications

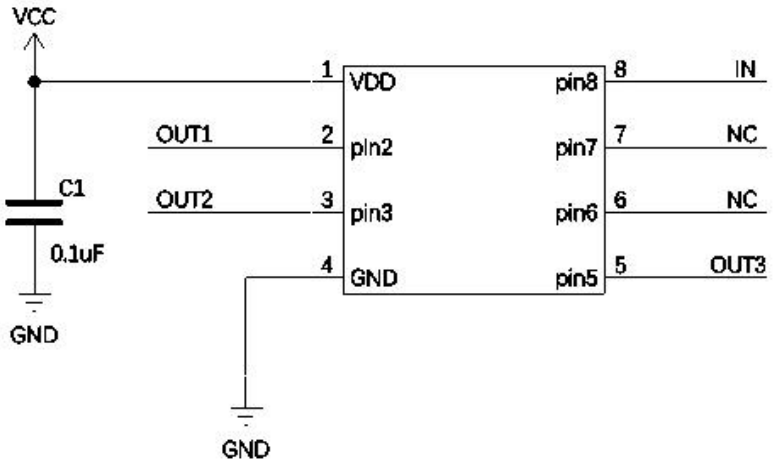
- Ultra low power consumption
- Pb - Free and RoHS Compliant and Halogen - Free

## Pin Configurations




**2.0mm x 2.0mm 8 Pin DFN**
**Top View**

## Block Diagram




Note:

1. Voltage on any pin must be with in GND to VDD.

2. ESD protect is must be considered on all Pins which connected to external interface.

## Pin name

| Pin | Pin | TYPE | Function |
|---|---|---|---|
| 1 | VDD | Power | Power supply input, 2.3V~5.5V |
| 2 | OUT1 | 1x Push Pull Digital Output | 12.288Mhz output. |
| 3 | OUT2 | 1x Push Pull Digital Output | 6.144Mhz output. |
| 4 | GND | Power | Ground |
| 5 | OUT3 | 1x Push Pull Digital Output | 96Khz output. |
| 6 | NC | Not Connected | Internal pull-down 1M |
| 7 | NC | Not Connected | Internal pull-down 1M |
| 8 | IN | Digital input with Schmitt | Internal pull-down 1M, 12.288Mhz input. |

## Absolute Maximum Ratings

| Parameter | Min. | Max. | Unit |
|---|---|---|---|
| Supply Voltage on VDD to GND | -0.3 | 7 | V |
| Maximum Voltage Input to Pins | -0.3 | 7 | V |
| VDD to GND Maximum DC Current | -- | 90 | mA |
| Input Leakage Current | -- | 1000 | nA |
| Storage Temperature Range | -65 | 150 | °C |
| Junction Temperature | -- | 150 | °C |
| ESD Protection (HBM) | 2000 | -- | V |
| ESD Protection (CDM) | 500 | -- | V |
| Moisture Sensitivity Level (MSL) | 1 | | |

## Customize Electrical Characteristics

VDD =3.3V±10%, Temp=25°C

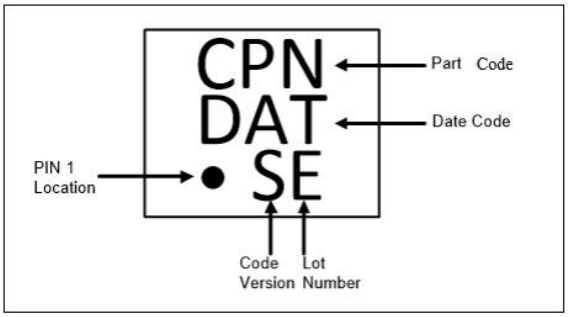
| Symbol | Parameter | Condition/Note | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_Q$ | Quiescent Current | Static inputs and floating outputs | | 0.1 | | μA |

## Electrical Characteristics

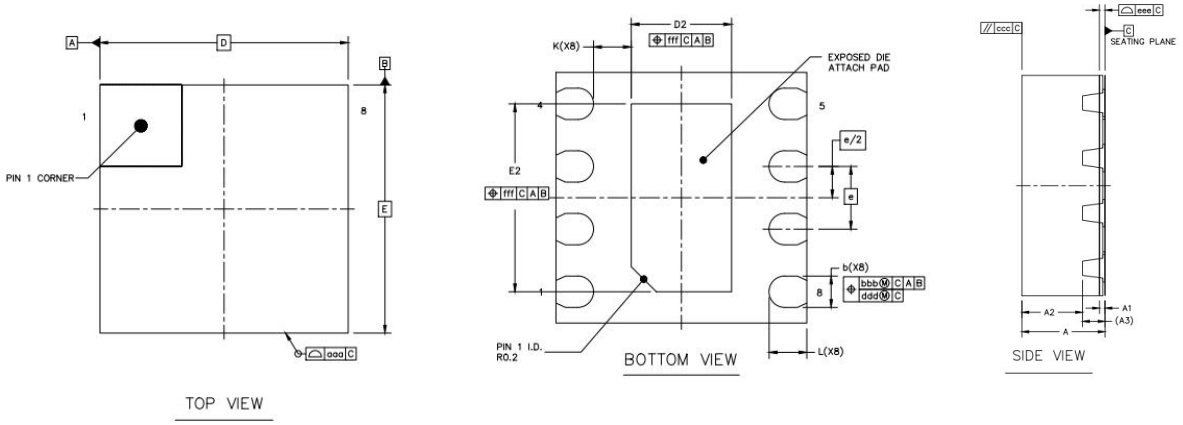
VDD =3.3V±10%, Temp: -40~85°C

| Symbol | Parameter | Condition/Note | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{DD}$ | Supply Voltage | | 1.71 | 3.3 | 5.5 | V |
| $T_A$ | Operating Temperature | | -40 | 25 | 85 | °C |
| $C_{VDD}$ | Capacitor Value at VDD | | -- | 0.1 | -- | µF |
| $I_{IH}$ | HIGH-Level Input Current | Logic Input PINs; $V_{IN}$ = VDD | -1.0 | -- | 1.0 | µA |
| $I_{IL}$ | LOW-Level Input Current | Logic Input PINs; $V_{IN}$ = 0V | -1.0 | -- | 1.0 | µA |
| **POR** | | | | | | |
| $PON_{THR}$ | Power On Threshold | VDD Level Required to Start Up | 1.67 | 1.80 | 1.92 | V |
| $POFF_{THR}$ | Power Off Threshold | VDD Level Required to Switch Off | 0.95 | 1.25 | 1.54 | V |
| $T_{SU}$ | Startup Time | From VDD rising past $PON_{THR}$ | -- | 1.2 | 1.6 | mS |
| $I_{stand\_by}$ | | T=+25℃ | -- | 97 | -- | nA |
| **IO PIN** | | | | | | |
| $V_{IH}$ | HIGH-Level Input Voltage | Logic Input | 1.90 | -- | -- | V |
| | | Logic Input with Schmitt Trigger | 2.11 | -- | -- | V |
| | | Low-Level Logic Input | 0.92 | -- | -- | V |
| $V_{IL}$ | LOW-Level Input Voltage | Logic Input | -- | -- | 1.30 | V |
| | | Logic Input with Schmitt Trigger | -- | -- | 1.16 | V |
| | | Low-Level Logic Input | -- | -- | 0.77 | V |
| $V_{HYS}$ | SchmittTrigger Hysteresis Voltage | Logic Input with Schmitt Trigger | -- | 0.45 | -- | V |
| $I_{LKG}$ | Input leakage (Absolute Value) | | -- | 1 | 1000 | nA |
| $V_{OH}$ | HIGH-Level Outpu Voltage | Push-Pull, $I_{OH}$ = 3 mA, 1X Drive | 2.60 | -- | -- | V |
| | | Push-Pull, $I_{OH}$ = 3 mA, 2X Drive | 2.80 | -- | -- | V |
| $V_{OL}$ | LOW-Level Output Voltage | Push-Pull, $I_{OL}$= 3 mA, 1X Drive | -- | -- | 0.25 | V |
| | | Push-Pull, $I_{OL}$ = 3 mA, 2X Drive | -- | -- | 0.22 | V |
| | | Open Drain, $I_{OL}$ = 3 mA, 1X Drive | -- | -- | 0.12 | V |
| | | Open Drain, $I_{OL}$ = 3 mA, 2X Drive | -- | -- | 0.089 | V |
| $I_{OH}$ | HIGH-Level Output Pulse Current (see Note) | Push-Pull, $V_{OH}$ = 2.4 V , 1X Drive | 5 | -- | -- | mA |
| | | Push-Pull, $V_{OH}$ = 2.4 V, 2X Drive | 10 | -- | -- | mA |
| $I_{OL}$ | LOW-Level Output Pulse Current (see Note) | Push-Pull, $V_{OL}$ = 0.4 V, 1X Drive | 5 | -- | -- | mA |
| | | Push-Pull, $V_{OL}$ = 0.4 V, 2X Drive | 10 | -- | -- | mA |
| | | Open Drain, $V_{OL}$ = 0.4 V, 1X Drive | 15 | -- | -- | mA |
| | | Open Drain, $V_{OL}$ = 0.4 V, 2X Drive | 30 | -- | -- | mA |
| Note: DC or average current through any pin should not exceed value given in Absolute Maximum Conditions. | | | | | | |

## Package Top Marking



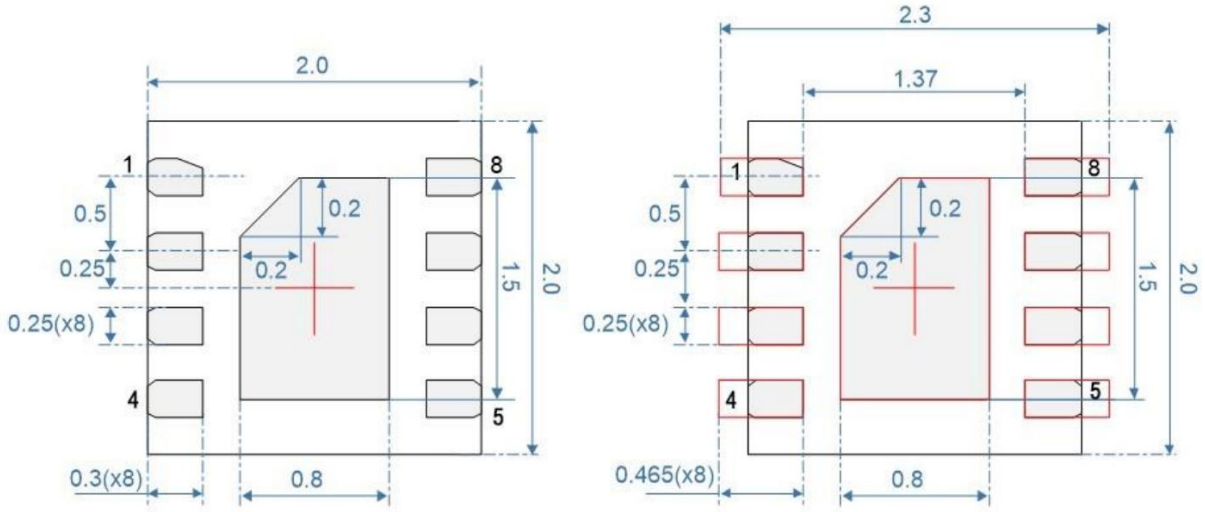

## Package Drawing and Dimensions




| | | SYMBOL | MIN | NOM | MAX |
|---|---|---|---|---|---|
| TOTAL THICKNESS | | A | 0.7 | 0.75 | 0.8 |
| STAND OFF | | A1 | 0 | 0.02 | 0.05 |
| MOLD THICKNESS | | A2 | --- | 0.55 | --- |
| L/F THICKNESS | | A3 | | 0.203 REF | |
| LEAD WIDTH | | b | 0.2 | 0.25 | 0.3 |
| BODY SIZE | X | D | | 2 BSC | |
| | Y | E | | 2 BSC | |
| LEAD PITCH | | e | | 0.5 BSC | |
| EP SIZE | X | D2 | 0.7 | 0.8 | 0.9 |
| | Y | E2 | 1.4 | 1.5 | 1.6 |
| LEAD LENGTH | | L | 0.2 | 0.3 | 0.4 |
| LEAD TIP TO EXPOSED PAD EDGE | | K | | 0.3 REF | |
| PACKAGE EDGE TOLERANCE | | aaa | | 0.1 | |
| MOLD FLATNESS | | ccc | | 0.1 | |
| COPLANARITY | | eee | | 0.05 | |
| LEAD OFFSET | | bbb | | 0.1 | |
| | | ddd | | 0.05 | |
| EXPOSED PAD OFFSET | | fff | | 0.1 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## Recommended Land Patter

Unit: mm



## Disclaimer

The content specified herein is for the purpose of introducing SET's products (hereinafter "Products"). The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

SET does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of the Products or technical information described in this document.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). SET shall bear no responsibility in any way for use of any of the Products for the above special purposes.

Although SET endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a SET product.

The content specified herein is subject to change for improvement without notice. When using a SET product, be sure to obtain the latest specifications.