Preliminary

Programmable Spread-Spectrum XO : SG-9101

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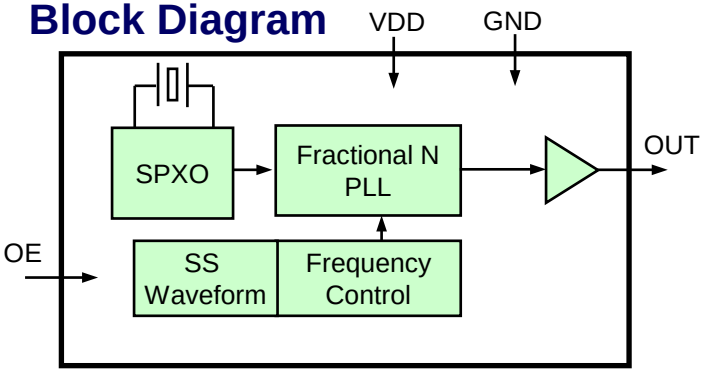
Features

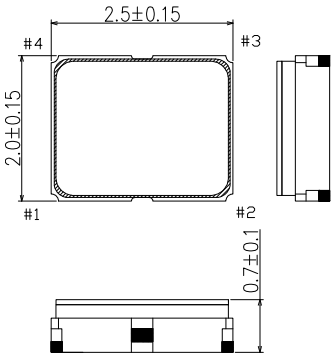
- Easy to make sample with SG-Writer II
  - Programmable Output Frequency from 0.67M to 170MHz
  - Programmable Frequency Resolution 1ppm
  - Programmable Spreading percentage
  - Selectable Spread spectrum profile
- Wide operating temperature range from -40 to +105 °C
- LVCMOS output

Block Diagram

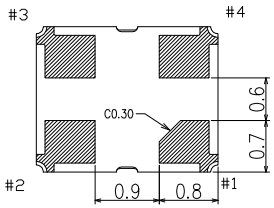


Item	Symbol	Specification
Output Frequency range	f_OUT	0.67M to 170MHz
Supply voltage	Vcc	1.62V ～ 3.63V
Operating Temperature	T_use	-40 to 105 °C
Spreading Percentage	f_ss	+/- 0.25% to +/- 2.0%
Spreading Profile	—	Triangle, Hershey-kiss, Sine
Function of PIN No.1	Func_PIN1	OE（ST Option）
Internal Crystal Frequency (f_out Initial Accuracy)	f_REF	26MHz Photo AT (Maximum variation is +/- 1 ppm)
Program Frequency setting resolution	f_reso	1ppm
Power Consumption (no load)	IDD	3.6mA Max (f_out=20MHz) 7.8mA Max (f_out=170MHz) 3.7mA Max (Output disable)
Package Lineup	PKG	7050, 5032, 3225, 2520, 2016

Package and Pin Assignments



ex.2.5 x 2.0 Package



Pin map

Pin	Connection
1	OE or $\overline{ST}$
2	GND
3	OUT
4	Vcc

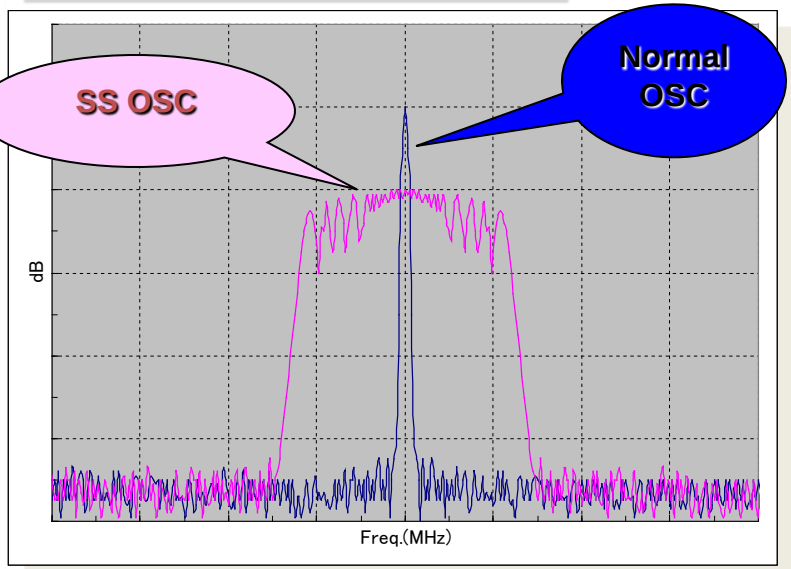
Schedule

Size 7050～3225 ES Jun.'16 MP Jul.'16
Size 2520 ES Jun.'16 MP Jun.'16
Size 2016 TBD('16)

What is Spread Spectrum(SS)?

Change the clock frequency dynamically, to reduce the power of radiation.
Technic for EMI.

Comparison of spectrum: Normal OSC vs SS OSC



SS-OSC Output Spectrum

SS-OSC
SG-9101 series

Reduce power radiation of products

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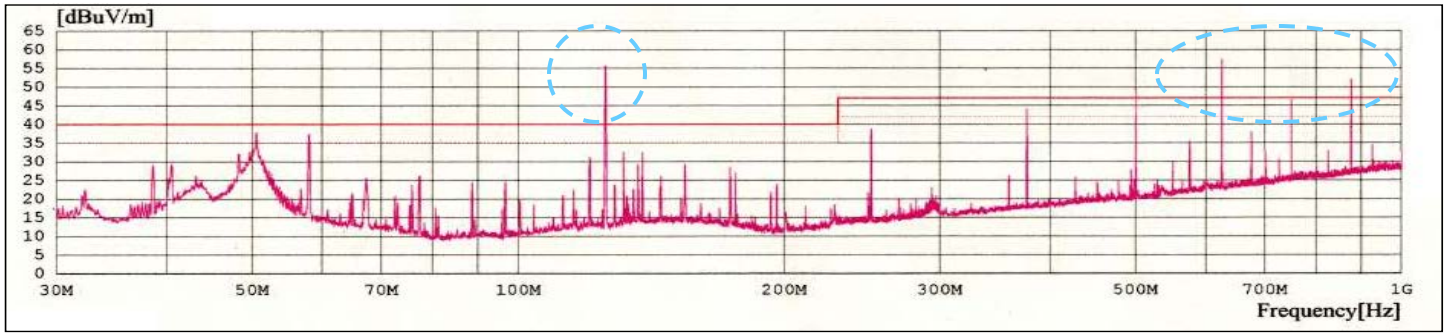
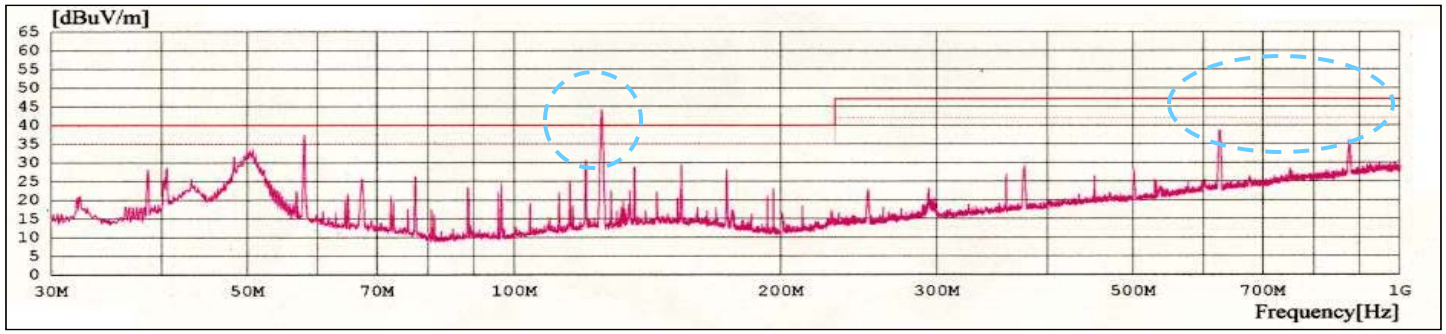
Reduce EMI ～Effect of high frequency～

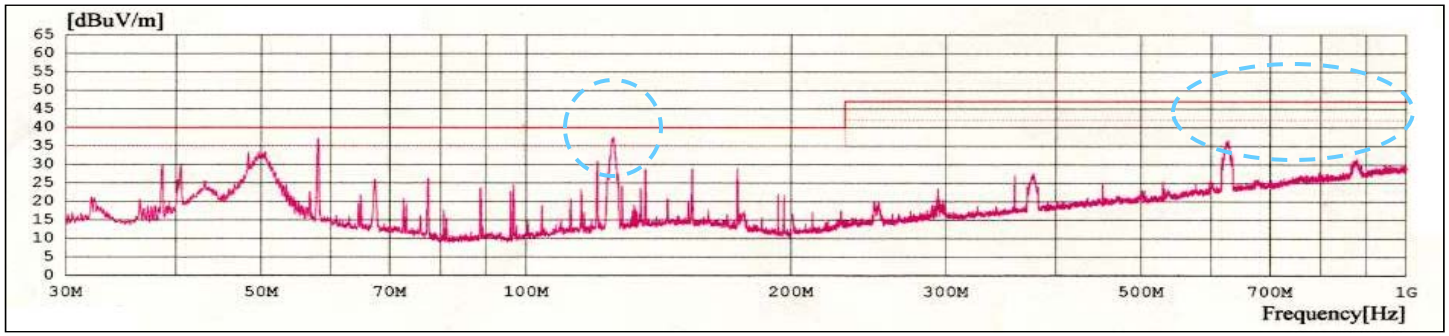
Spread OFF



Spread 0.5%



Spread 1.5%



Feature of SG-9101

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User selectable configuration

Item	Spec	Comment
SS Direction	Center Spread / Down Spread	
SS Width	±0.25%～±2.0%(Center Spread) - 0.5%～ - 4.0%(Down Spread)	6 step
SS Period	6.3kHz～25.4kHz	4 step
SS Profile	Hershey-Kiss / Sine-Wave / Triangle	
Output Drive Level	2.5ns / 5.5ns / 10ns(max)	tr/tf@Cload=15pF

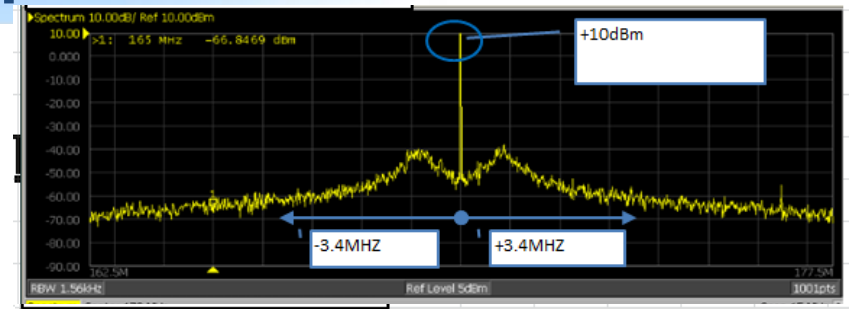
Flexible selection of SS configuration for each case

For example

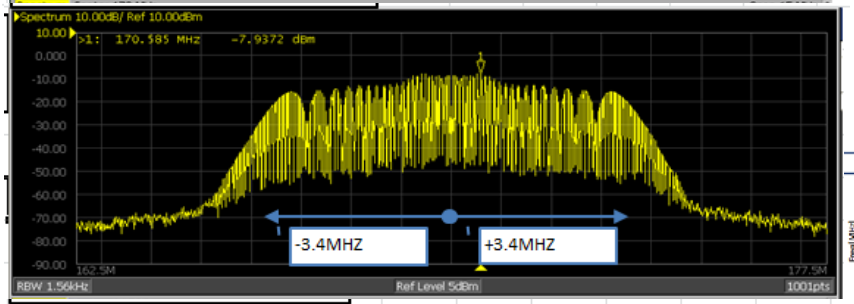
- Use for PLL reference clock ・・・slow SS Period and Sine-Wave Profile

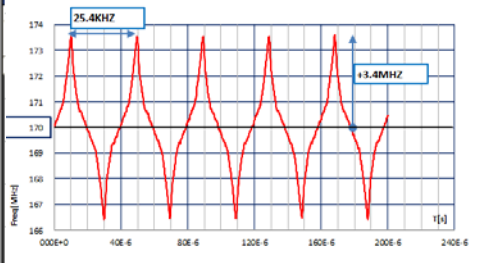
Waveform Comparison

No spread spectrum

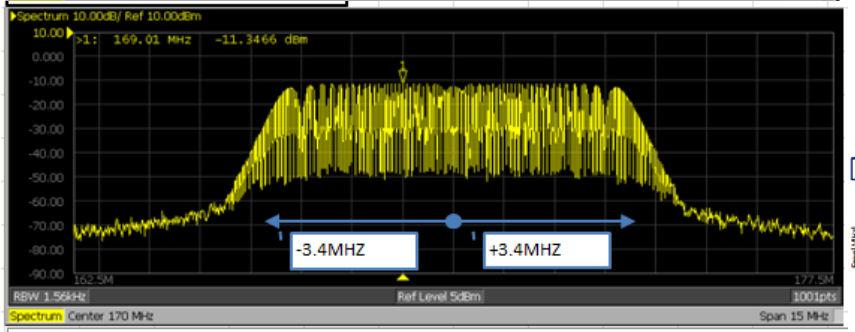


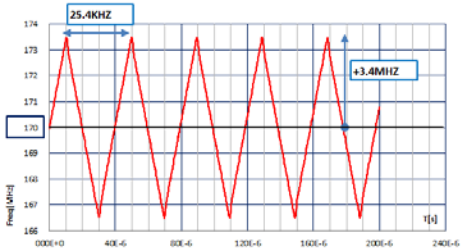
Hershey-kiss: -20 dB



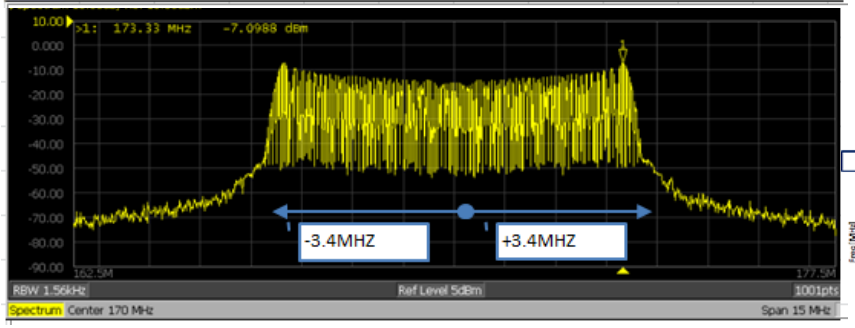


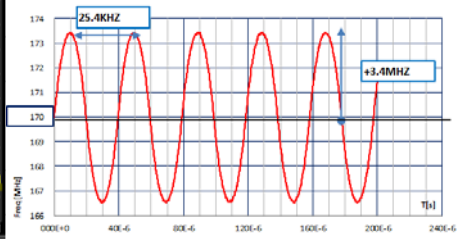
Triangle: -21 dB





Sine: -17 dB





Deviation Comparison (Triangle)

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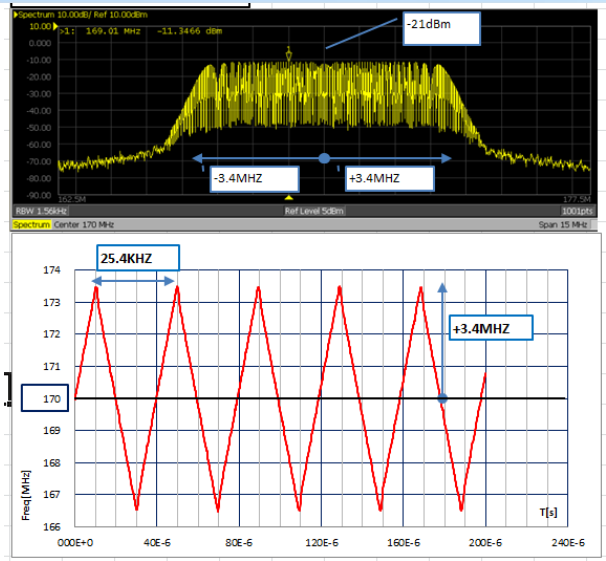
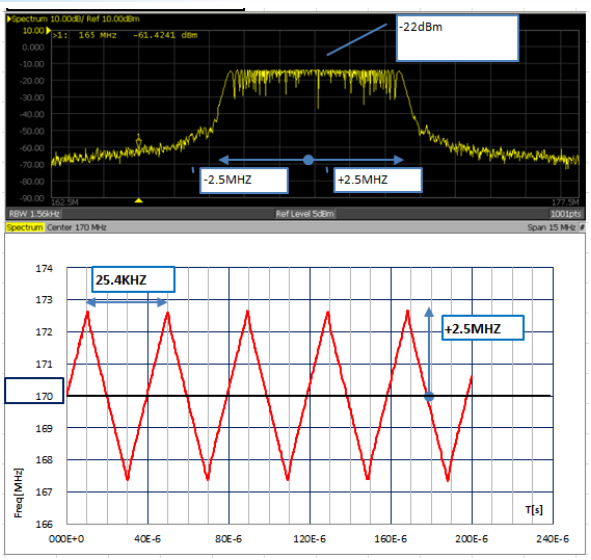
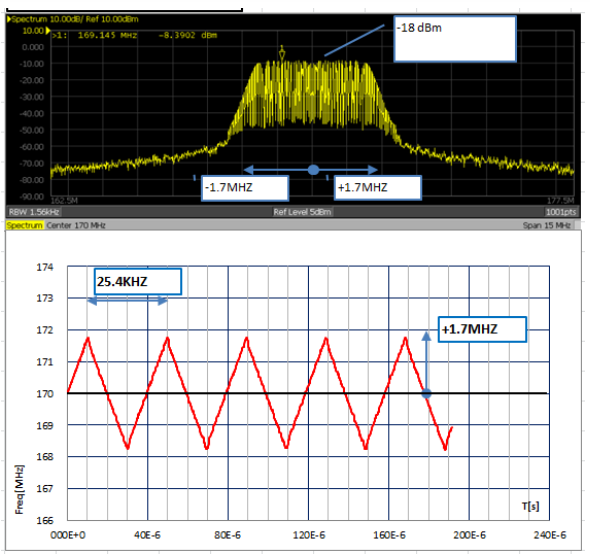


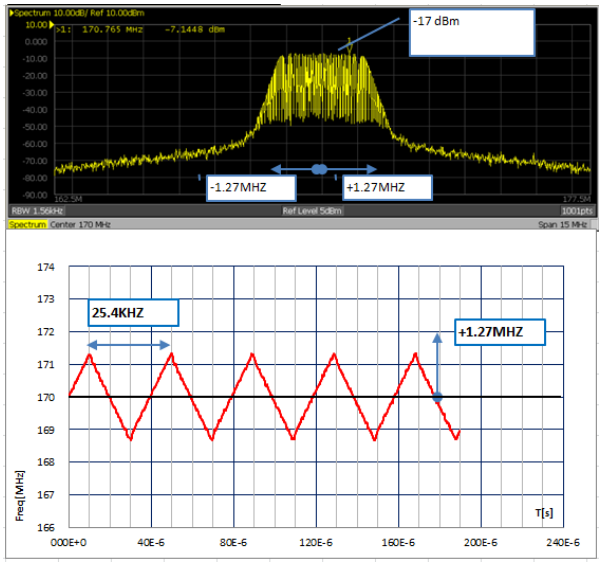
±2%: -21 dB



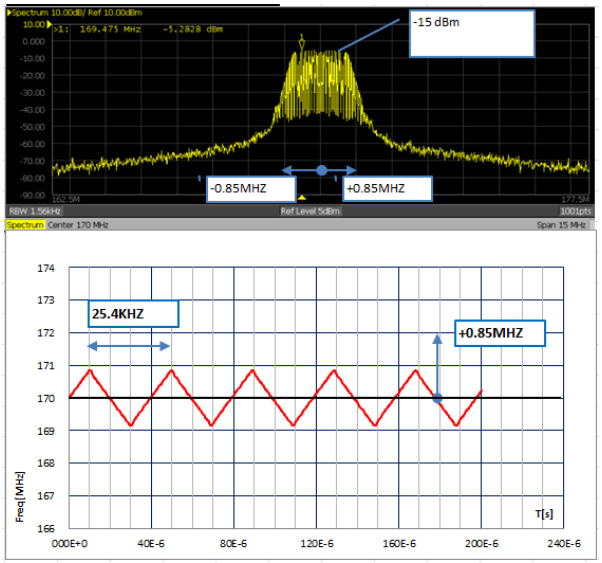
±1.5%: -22 dB



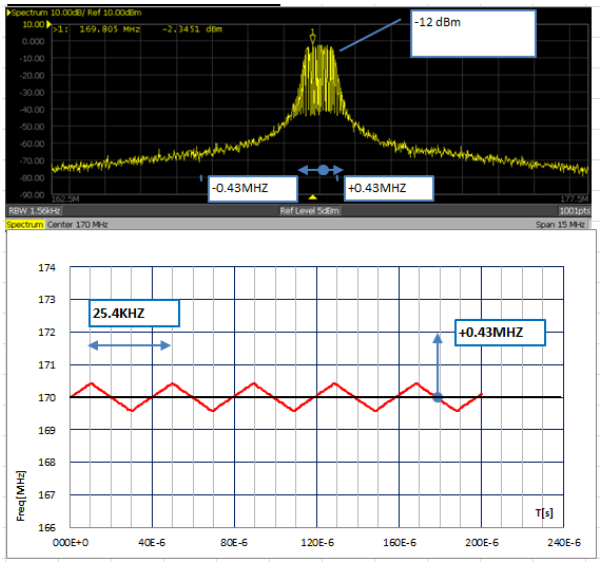
±1%: -18 dB



±0.75%: -17 dB



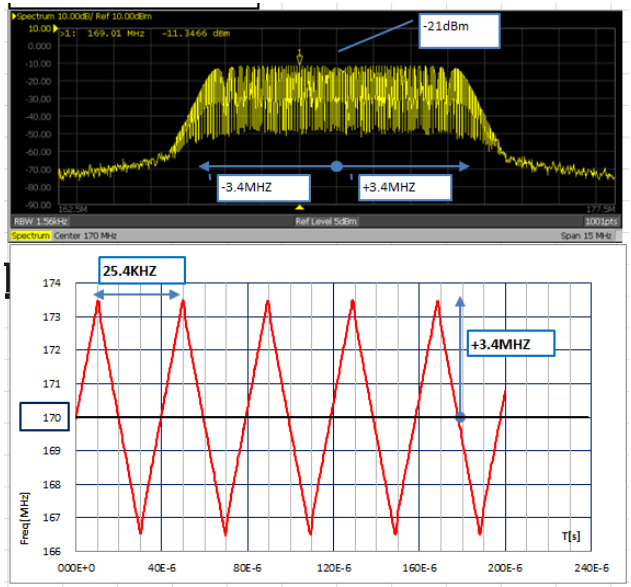
±0.5%: -15 dB



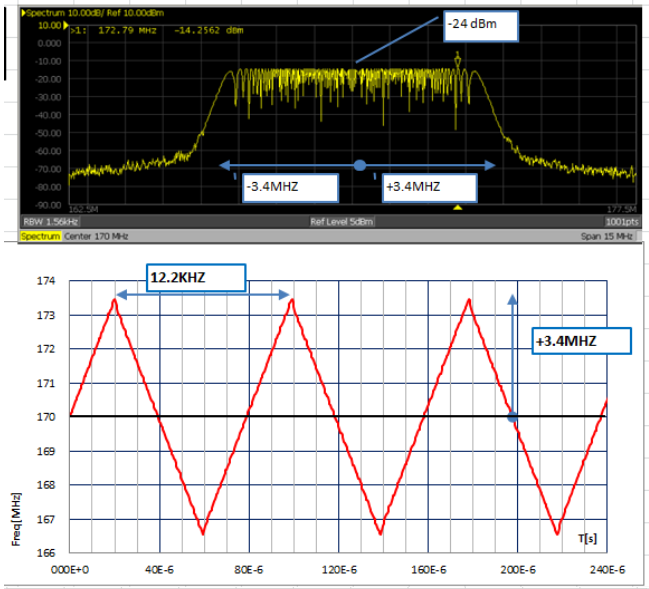
±0.25%: -12 dB

Rate Comparison (Triangle)

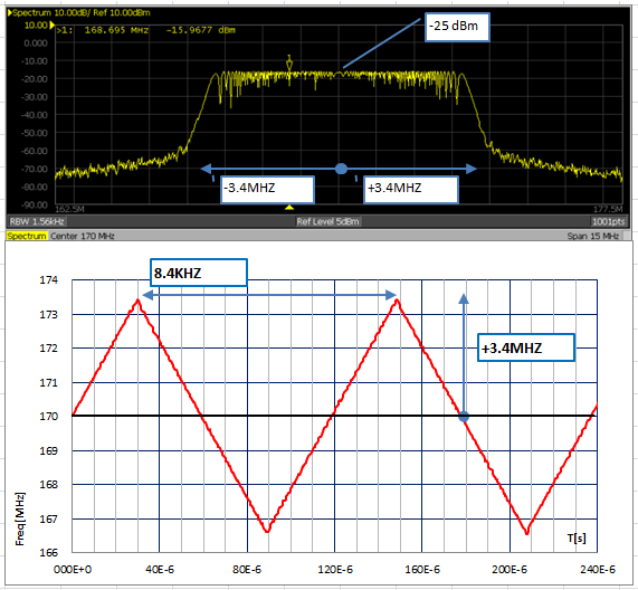
25.4 kHz:
-21 dB



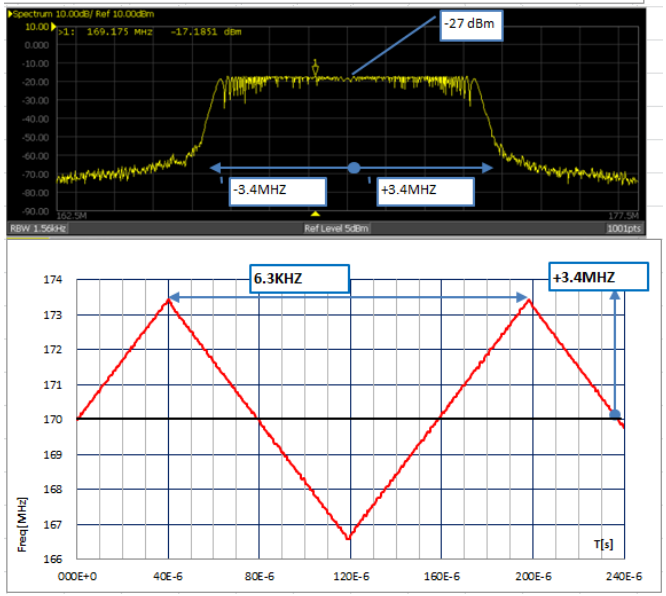
12.2 kHz:
-24 dB



8.4 kHz:
-25 dB



6.3 kHz:
-27 dB



SG-8503/4/6 Selectable / I²C Programmable PLL SPXO

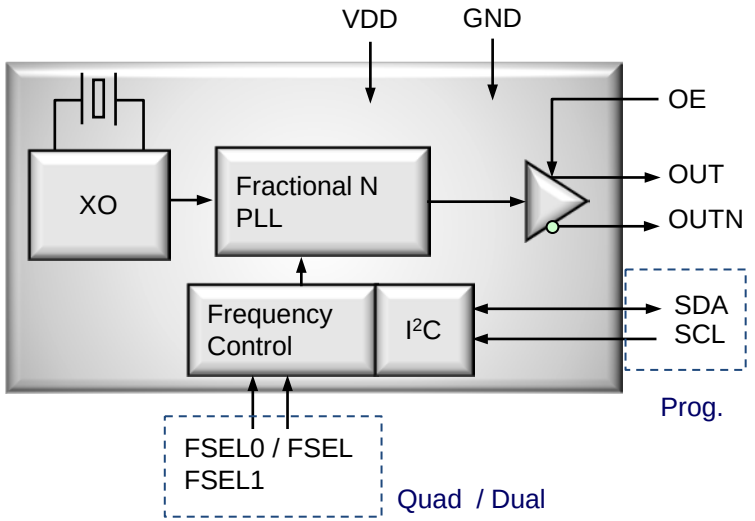
Features

- Programmable Frequency from 50 to 800 MHz
- 2.5 V ~ 3.3 V, 90 mA Max.
- RMS jitter 0.3 ps Typ. (12 kHz ~ 20 MHz)
- Total tolerance +/-50 ppm
- Frequency pin select / I²C Interface
- Output Control (OE)
- Output Type:
  LVPECL
- Output standby type: Hi-Z or Fixed

Technology

- Fundamental tone crystal oscillator (HFF)
- Low jitter fractional N PLL technology

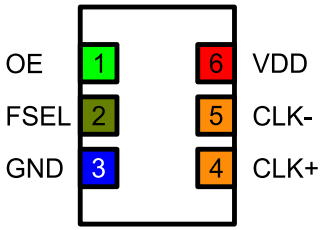
Block Diagram



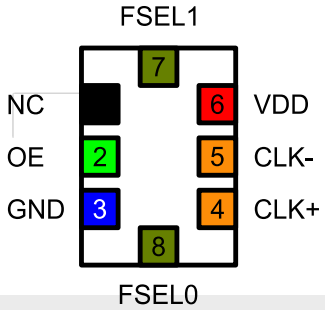
Package and Pin Assignments

- Small SMT Package 7.0 mm x 5.0 mm x 1.5 mm

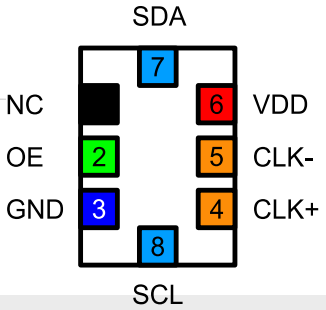
SG-8503CA
Dual Selectable



SG-8504CA
Quad Selectable



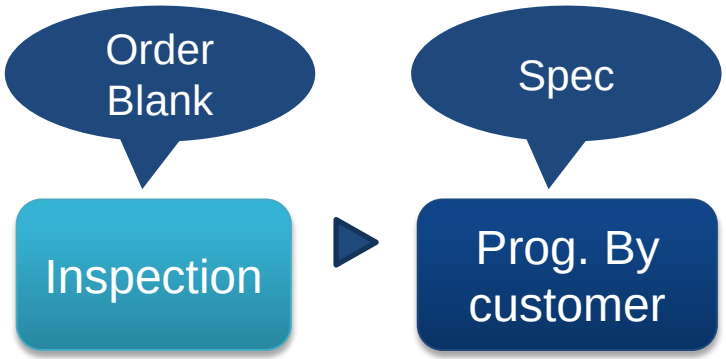
SG-8506CA
I2C programmable



Feature of SG-8101/9101 : Quick Sample Delivery

- Easy and quick samples ： Our oscillator programmer (SG-Writer Ⅱ) can program blank of SG-8101/9101 into any setting, profile, period, etc.
- Anyone can make sample by SG-Writer Ⅱ

FROM ORDER TO DELIVERY



SG-Writer Ⅱ