

Output	CMOS					Differential				
						LVDS / LVPECL (LVDS: V _{xN} / LVPECL: E _{xN})			HCSL	
f _{tol}	+/- 20 x 10 ⁻⁶	+/- 25 x 10 ⁻⁶	+/- 50 x 10 ⁻⁶		+/- 100 x 10 ⁻⁶	+/- 20 x 10 ⁻⁶	+/- 50 x 10 ⁻⁶		+/- 100 x 10 ⁻⁶	
Operating Temp. (Max.)	+105 °C	+125 °C	+105 °C		+125 °C	+105 °C	+105 °C	+85 °C	+105 °C	
Oscillation Type	AT-Cut+ PLL	AT Cut+ PLL	AT Cut + PLL	AT Cut + Fundamental	AT Cut + Fundamental	HFF Fundamental	HFF Fundamental	AT Cut+ PLL	HFF Fundamental	
Jitter	PLL Type: 65.000fs (10⁻¹⁵)		Fundamental 200fs			50 fs Typ. (at 156.25MHz)	50 fs Typ. (at 156.25MHz)	300 fs Typ.	85 fs Typ. (at 156.25MHz)	
Output Frequency	Any (to 170 MHz)	Any (to 170 MHz)	Any (to 170 MHz)	20 Standard Frequencies	20 Standard frequencies	25 MHz to 500 MHz	25 MHz to 500 MHz	73.5 MHz to 700 MHz	100 MHz to 325 MHz	
Package Size [mm]	7.0 x 5.0	SG-8101CA	-	SG-8018CA	SG7050CAN	-	-	SG7050VEN SG7050EEN	SG7050VAN SG7050EAN	-
	5.0 x 3.2	SG-8101CB	-	SG-8018CB	SG5032CAN	-	-	SG5032VEN SG5032EEN	SG5032VAN SG5032EAN	-
	3.2 x 2.5	SG-8101CE	-	SG-8018CE	SG3225CAN	-	-	SG3225VEN SG3225EEN	SG3225VAN SG3225EAN	SG3225HBN
	2.5 x 2.0	SG-8101CG	-	SG-8018CG	SG-210STF	-	-	SG2520VGN SG2520EGN	-	-
	2.0 x 1.6	SG-8201CJ 1200fs Jitter	MP Soon SG-8201CJ	-	SG2016CAN	-	-	-	-	-

New

New

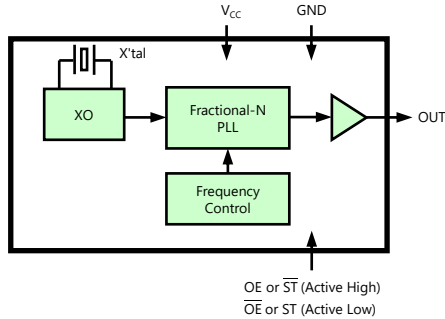
SG2520VHN
SG2520EHN
SG2520VGN
SG2520EGN

For small optical module

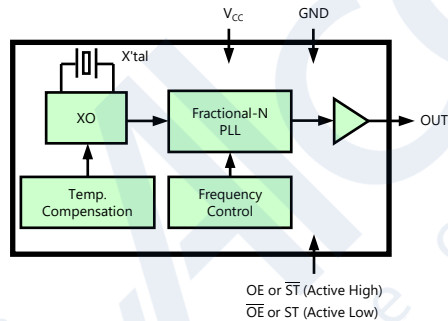
VXN X= IC-Generation A / B / E / H / G -

Programable Oscillator

SG8018xx/SG8200xx

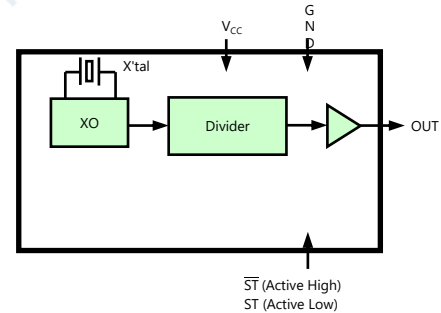


SG8101xx/ SG8201xx



Simple Packaged Crystal Oscillator (MHz)

SG2016CAN/SG-210STF etc



Feature introduction SG8201

Low Noise Programmable XOs – SG8200/01CJ

ES : NOW
MP : June 2023

■ Feature

- Low noise Fractional PLL technology support any frequency
 - between 1.2 MHz and 170 MHz **with quick turn-around time**
 - low jitter characteristics **1.1 ps Typ.** at fo = 125 MHz
- High temperature up to +125 ° C and high frequency stability with Temperature compensation function
- External dimension: 2.0 × 1.6 × 0.6 mm

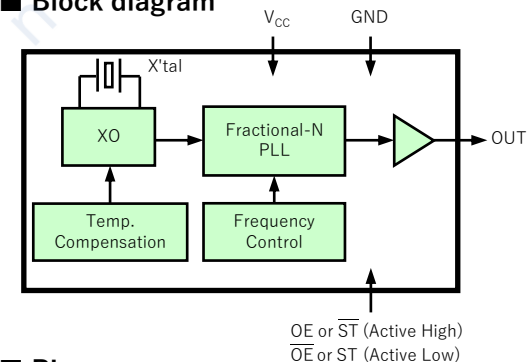
■ Applications

- Utility Smart Meters
- Smart Grid Solar Inverters
- Industrial Factory Automation Equipment
- Industrial Electric Motor Controllers
- Smart Lighting
- Network Equipment
- Vehicle Telematics
- Vehicle Navigation
- Robotics for Inventory

■ Specifications

Item	Specifications
Frequency (fo)	1.2 MHz to 170 MHz
Output	CMOS
Supply voltage (V _{CC})	1.62 V to 3.63 V
Frequency tolerance / Operating temperature	SG-8200CJ: ± 50 × 10 ⁻⁶ / -40 ° C to +125 ° C SG-8201CJ: ± 15 × 10 ⁻⁶ / -40 ° C to +105 ° C ± 25 × 10 ⁻⁶ / -40 ° C to +125 ° C <small>* Including includes Initial frequency tolerance, Frequency / temperature characteristics, Frequency / voltage coefficient, Frequency / load coefficient, and Aging (+25 ° C, First year)</small>
Current consumption	7.5 mA Max. (fo = 25 MHz) 12.4 mA Max. (fo = 125 MHz)
Symmetry	45 % to 55 %
Rise/Fall time	2.0 ns Max. (fo > 125 MHz) 2.5 ns Max. (75 MHz < fo ≤ 125 MHz) 4.0 ns Max. (50 MHz < fo ≤ 75 MHz) 6.0 ns Max. (fo ≤ 50 MHz)
Phase jitter (12 kHz to 20 MHz)	1.1 ps Typ. (fo = 125 MHz)
Function	Output enable or Stand-by

■ Block diagram



■ Pin map

#1	OE or \overline{ST} (Active High) ST or \overline{OE} (Active Low)
#2	GND
#3	OUT
#4	Vcc

Low Noise Programmable XOs – SG8200/01CG

ES : NOW
MP : H1 24

■ Feature

- Low noise Fractional PLL technology support any frequency
 - between 1.2 MHz and 170 MHz **with quick turn-around time**
 - low jitter characteristics **1.1 ps Typ.** at $f_o = 125$ MHz
- High temperature up to $+125^\circ\text{C}$ and high frequency stability with Temperature compensation function
- External dimension: $2.5 \times 2.0 \times 0.74$ mm

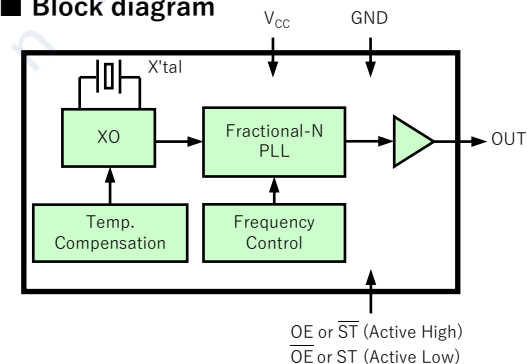
■ Applications

- Utility Smart Meters
- Smart Grid Solar Inverters
- Industrial Factory Automation Equipment
- Industrial Electric Motor Controllers
- Smart Lighting
- Network Equipment
- Vehicle Telematics
- Vehicle Navigation
- Robotics for Inventory

■ Specifications

Item	Specifications
Frequency (f_o)	1.2 MHz to 170 MHz
Output	CMOS
Supply voltage (V_{CC})	1.62 V to 3.63 V
Frequency tolerance / Operating temperature	SG-8200CG: $\pm 50 \times 10^{-6} / -40^\circ\text{C}$ to $+125^\circ\text{C}$ SG-8201CG: $\pm 15 \times 10^{-6} / -40^\circ\text{C}$ to $+105^\circ\text{C}$ $\pm 25 \times 10^{-6} / -40^\circ\text{C}$ to $+125^\circ\text{C}$
	<small>* Including includes Initial frequency tolerance, Frequency / temperature characteristics, Frequency / voltage coefficient, Frequency / load coefficient, and Aging ($+25^\circ\text{C}$, First year)</small>
Current consumption	7.5 mA Max. ($f_o = 25$ MHz) 12.4 mA Max. ($f_o = 125$ MHz)
Symmetry	45 % to 55 %
Rise/Fall time	2.0 ns Max. ($f_o > 125$ MHz) 2.5 ns Max. ($75\text{ MHz} < f_o \leq 125$ MHz) 4.0 ns Max. ($50\text{ MHz} < f_o \leq 75$ MHz) 6.0 ns Max. ($f_o \leq 50$ MHz)
Phase jitter (12 kHz to 20 MHz)	1.1 ps Typ. ($f_o = 125$ MHz)
Function	Output enable or Stand-by

■ Block diagram



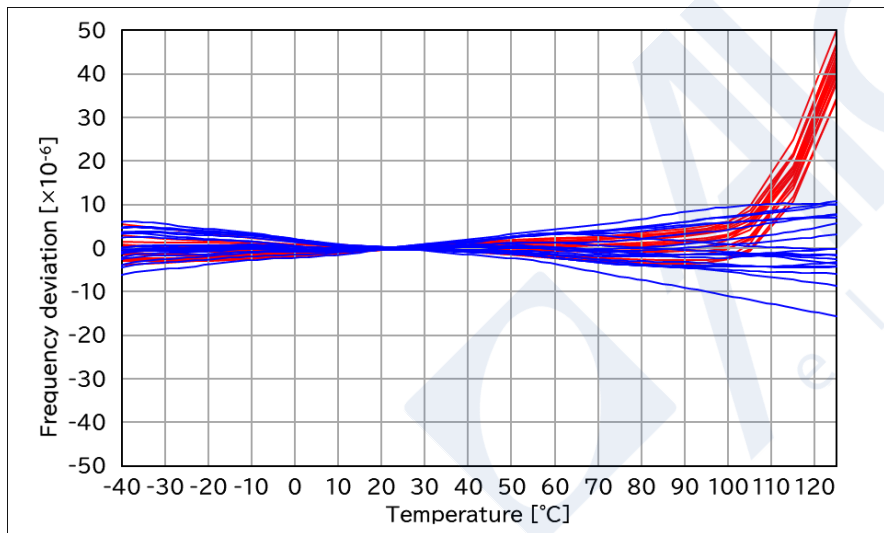
■ Pin map

#1	OE or $\overline{\text{ST}}$ (Active High) ST or $\overline{\text{OE}}$ (Active Low)
#2	GND
#3	OUT
#4	Vcc

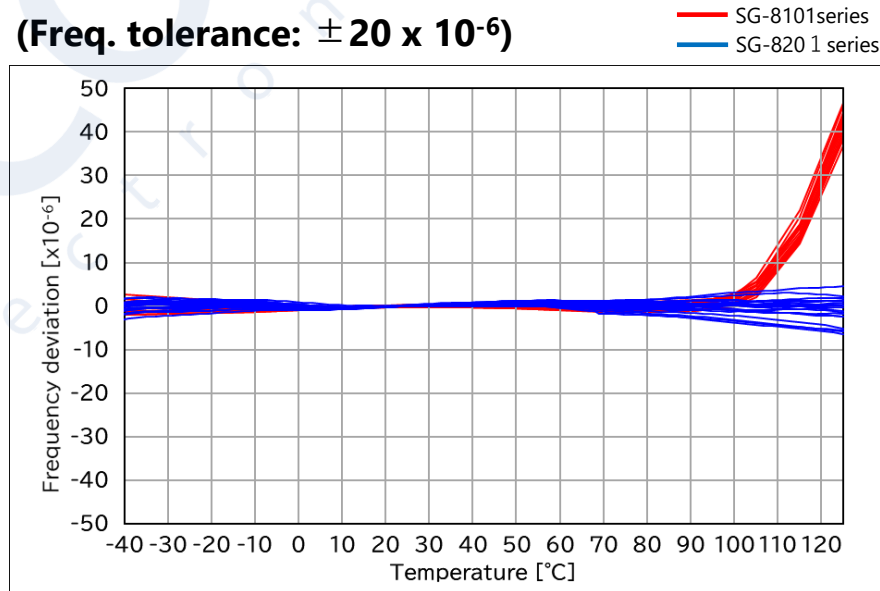
High Stability & Wide Temperature Range

Compared with existing programmable SPXO SG-8101series, this product can adjust the temperature variation up to +125 ° C and has high stability characteristics over a wide temperature range.

- SG-8200CJ vs SG-8101series
- (Freq. tolerance: $\pm 50 \times 10^{-6}$)



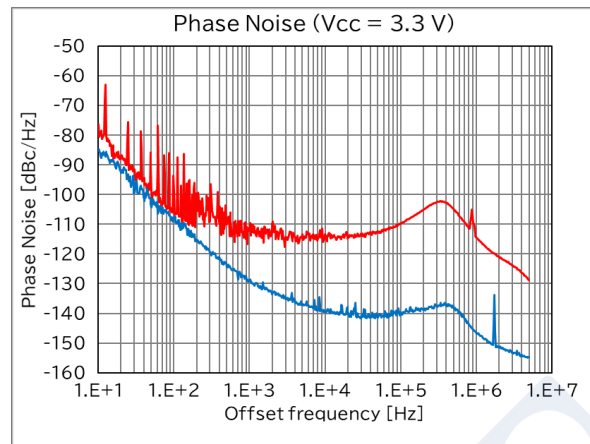
- SG-8201CJ vs SG-8101series
- (Freq. tolerance: $\pm 20 \times 10^{-6}$)



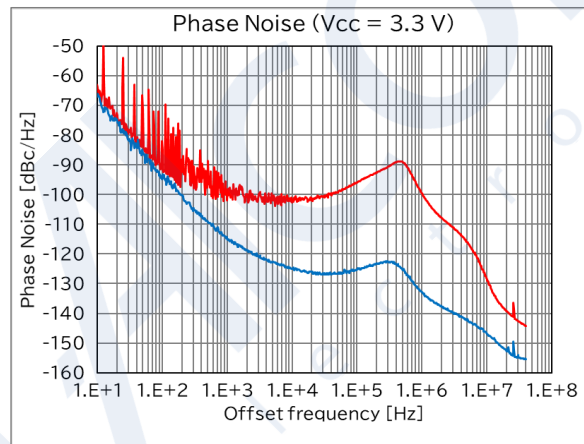
Low Phase Noise/Low Jitter Characteristics

Compared with existing programmable SPXO SG-8101series, phase noise is improved about 30 dBc/Hz at offset frequency from 100 kHz to 1 MHz, and phase jitter is reduced to about 1/40.

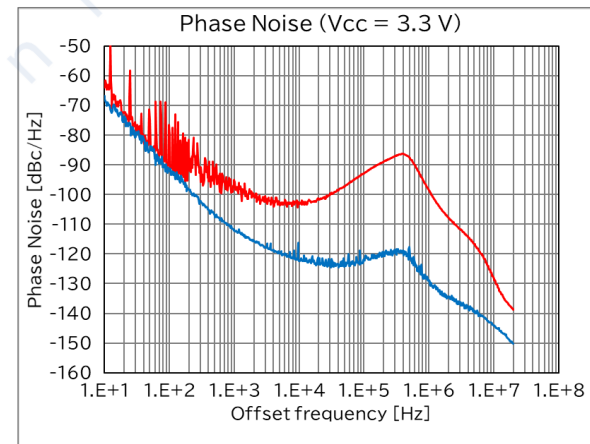
f_o = 25.0 MHz



f_o = 125.0 MHz



f_o = 170.0 MHz



— SG-8101series
— SG-8201series

	Phase jitter (12 kHz to 5 MHz)
SG-8101series	45.8 ps
SG-8201series	1.2 ps

	Phase jitter (12 kHz to 20 MHz)
SG-8101series	43.7 ps
SG-8201series	1.1 ps

	Phase jitter (12 kHz to 20 MHz)
SG-8101series	42.3 ps
SG-8201series	1.5 ps

Programmable SPXOs (PLL)

	SG-8002CA/CE	SG-8018	SG-8101	SG-82xx
Frequency Range (MHz)	1 to 125	0.67 to 170	0.67 to 170	1.2 to 170
Frequency Options	1 Frequency (Integer-N PLL)	1 Frequency (Fractional-N PLL)	1 Frequency (Fractional-N PLL)	1 Frequency (Fractional-N PLL)
Phase Jitter	>250ps RMS	<50ps RMS	<50ps RMS	1.1ps typ.
Supply Voltage	2.7V to 3.6V 4.5V to 5.5V	1.6V to 3.6V	1.6V to 3.6V	1.6V to 3.6V
Temperature Range	-20C to 70C -40C to 85C	-40C to 105C	-40C to 85C -40C to 105C	-40C to 105C -40C to 125C
Frequency Tolerance	50ppm 100ppm	50 ppm TTL inc. 10years aging	15/20/50 ppm	15/20/50 ppm TTL inc. 1year aging
Current Consumption	28m A to 45mA	2.7mA to 6.8mA	2.7mA to 6.8mA	7.5mA – 12.4mA
Output Type	CMOS/TTL	LVC MOS	LVC MOS	LVC MOS
Packages	CE/LB/CA/JF/ JC/JA/DC/DB	CG/CE/CB/CA	CG/CE/CB/CA	CG/CJ