



CRYSTAL OSCILLATOR (Programmable)
OUTPUT: CMOS



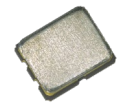
Product Number
SG-8201CJA: X1G005991xxxx16
SG-8201CGA: X1G006281xxxx16

SG-8201CJA/CGA

- Frequency range : 1.2 MHz to 170 MHz
- Supply voltage : 1.62 V to 3.63 V
- Function : Output enable (OE/ $\overline{\text{OE}}$) or Standby ($\overline{\text{ST}}$ /ST)
- Frequency tolerance, operating temperature:
 $\pm 15 \times 10^{-6}$ (-40 °C to +105 °C)
 $\pm 25 \times 10^{-6}$, $\pm 50 \times 10^{-6}$ (-40 °C to +125 °C)
- PLL technology to enable setting any output frequency
- AEC-Q100 compliant



SG-8201CJA
2.0 × 1.6 mm



SG-8201CGA
2.5 × 2.0 mm

Specifications (characteristics)

Item	Symbol	Specifications			Conditions/Remarks			
Supply voltage	V _{CC}	1.80 V Typ.	2.50 V Typ.	3.30 V Typ.				
		1.62 V to 1.98 V	2.25 V to 2.75 V	2.97 V to 3.63 V				
Output frequency range	f _o	1.2 MHz to 170 MHz						
Storage temperature	T _{stg}	-55 °C to +150 °C			Storage as single product.			
Operating temperature	T _{use}	H: -40 °C to +105 °C						
		J: -40 °C to +125 °C						
Frequency tolerance*1	f _{tol}	B: ±15 × 10 ⁻⁶			T _{use} = -40 °C to +105 °C			
		D: ±25 × 10 ⁻⁶			T _{use} = -40 °C to +125 °C			
		J: ±50 × 10 ⁻⁶			T _{use} = -40 °C to +125 °C			
Current consumption	I _{CC}	5.2 mA Typ.	5.4 mA Typ.	5.6 mA Typ.	1.2 MHz ≤ f _o ≤ 25 MHz	No load, Rise/Fall time: Default		
		7.0 mA Max.	7.2 mA Max.	7.5 mA Max.				
		5.4 mA Typ.	5.7 mA Typ.	6.1 mA Typ.	25 MHz < f _o ≤ 50 MHz			
		7.3 mA Max.	7.6 mA Max.	8.1 mA Max.				
		5.7 mA Typ.	6.3 mA Typ.	7.0 mA Typ.	50 MHz < f _o ≤ 75 MHz			
		7.7 mA Max.	8.2 mA Max.	9.1 mA Max.				
		6.2 mA Typ.	6.9 mA Typ.	7.9 mA Typ.	75 MHz < f _o ≤ 100 MHz			
		8.2 mA Max.	9.1 mA Max.	10.4 mA Max.				
		6.9 mA Typ.	7.9 mA Typ.	9.1 mA Typ.	100 MHz < f _o ≤ 125 MHz			
		9.4 mA Max.	10.7 mA Max.	12.4 mA Max.				
7.8 mA Typ.	9.2 mA Typ.	11.2 mA Typ.	125 MHz < f _o ≤ 170 MHz					
10.4 mA Max.	12.4 mA Max.	15.0 mA Max.						
Output disable current	I _{dis}	5.0 mA Typ.	5.0 mA Typ.	5.1 mA Typ.	OE = GND, OE = V _{CC}			
		7.2 mA Max.	7.3 mA Max.	7.4 mA Max.				
Standby current	I _{std}	0.3 μA Typ.	0.3 μA Typ.	0.5 μA Typ.	ST = GND, ST = V _{CC}			
		15.0 μA Max.	15.0 μA Max.	15.0 μA Max.				
Symmetry	SYM	45 % to 55 %			50 % V _{CC} Level, L _{CMOS} ≤ 15 pF			
Output voltage (DC characteristics)	V _{OH}	90 % V _{CC} Min.			Rise/Fall time		I _{OH}	I _{OL}
					Default 'A' Option*2	Other Options		
	V _{OL}	10 % V _{CC} Max.			fo > 125 MHz	B: Faster	-2.0 mA	2.0 mA
					75 MHz < fo ≤ 125 MHz	C: Fast	-1.0 mA	1.0 mA
					50 MHz < fo ≤ 75 MHz	D: Slow	-0.5 mA	0.5 mA
fo ≤ 50 MHz					E: Slower	-0.2 mA	0.2 mA	
Output load condition	L _{CMOS}	15 pF Max.						
Input voltage	V _{IH}	70 % V _{CC} Min.			Pin 1			
	V _{IL}	30 % V _{CC} Max.						
Rise/Fall time	tr/tf	-			Default 'A' Option*2	Other Options	20 % - 80 % V _{CC} , L _{CMOS} = 15 pF	
		2.0 ns Max.			fo > 125 MHz	B: Faster		
		2.5 ns Max.			75 MHz < fo ≤ 125 MHz	C: Fast		
		4.0 ns Max.			50 MHz < fo ≤ 75 MHz	D: Slow		
		6.0 ns Max.			fo ≤ 50 MHz	E: Slower		
Output disable time (OE)	tstp_oe	1 μs Max.			Measured from the time OE or ST pin crosses 30 % V _{CC} or measured from the time OE or ST pin crosses 70 % V _{CC}			
Output disable time (ST)	tstp_st							
Output enable time (OE)	tsta_oe	100 ns + 2 clock cycle Max.			Measured from the time OE pin crosses 70 % V _{CC} or measured from the time OE pin crosses 30 % V _{CC}			
Output enable time (ST)	tsta_st	3 ms Max.			Measured from the time ST pin crosses 70 % V _{CC} or measured from the time ST pin crosses 30 % V _{CC}			
Start-up time	t _{str}	3 ms Max.			Measured from the time V _{CC} reaches its rated minimum value, 1.62 V			
Phase Jitter	tpj	1.2 ps Typ.			fo = 25 MHz, Offset frequency: 12 kHz to 5 MHz			
		1.2 ps Typ.			fo = 50 MHz, Offset frequency: 12 kHz to 20 MHz			
		1.2 ps Typ.			fo = 75 MHz, Offset frequency: 12 kHz to 20 MHz			
		1.2 ps Typ.			fo = 100 MHz, Offset frequency: 12 kHz to 20 MHz			
		1.1 ps Typ.			fo = 125 MHz, Offset frequency: 12 kHz to 20 MHz			
		1.4 ps Typ.			fo = 150 MHz, Offset frequency: 12 kHz to 20 MHz			
Frequency aging	f _{age}	1.5 ps Typ.			fo = 170 MHz, Offset frequency: 12 kHz to 20 MHz			
Frequency aging	f _{age}	This is included in frequency tolerance specification.			+25 °C, first year			

^{*1} Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage variation, reflow drift, load drift and aging (+25 °C, 1 year).

^{*2} Default 'A' Rise/Fall time and I_{OH}/I_{OL} are dependent on programmed frequency.

Pin description

Pin	Name	I/O type	Function	
1	OE	Input	Output Enable	High ^{*1} or Open: Specified frequency output from OUT pin Low: OUT pin is low (pull down with 500 kΩ), only output driver is disabled.
	$\overline{\text{OE}}$	Input	Output Enable	Low ^{*2} or Open: Specified frequency output from OUT pin High: OUT pin is low (pull down with 500 kΩ), only output driver is disabled.
	$\overline{\text{ST}}$	Input	Standby	High ^{*1 *3} : Specified frequency output from OUT pin Low: OUT pin is low (pull down with 500 kΩ), Device goes to standby mode. Supply current reduces to the least as I _{std} .
	ST	Input	Standby	Low ^{*2 *3} : Specified frequency output from OUT pin High: OUT pin is low (pull down with 500 kΩ), Device goes to standby mode. Supply current reduces to the least as I _{std} .
2	GND	Power	Ground	
3	OUT	Output	Clock output	
4	V _{CC}	Power	Power supply	

*1 If fixing it at High, please connect to V_{CC} directly.

*2 If fixing it at Low, please connect to GND directly.

*3 If necessary to use Open, please select Output Enable function.

Product Name

SG-8201CJA 170.000000MHz T D J P A
a b c d e f g h

b: Package type

CJ	2.0 mm × 1.6 mm
CG	2.5 mm × 2.0 mm

e: Frequency tolerance / f: Operating temperature

BH	±15 × 10 ⁻⁶ / -40 °C to +105 °C
DJ	±25 × 10 ⁻⁶ / -40 °C to +125 °C
JJ	±50 × 10 ⁻⁶ / -40 °C to +125 °C

a: Model b: Package type

c: Frequency d: Supply voltage (T: 1.8 V to 3.3 V Typ.)

e: Frequency tolerance f: Operating temperature

g: Function h: Rise/Fall time

g: Function

P	Output Enable (OE)
Q	Output Enable ($\overline{\text{OE}}$)
S	Standby (ST)
T	Standby ($\overline{\text{ST}}$)

h: Rise/Fall time

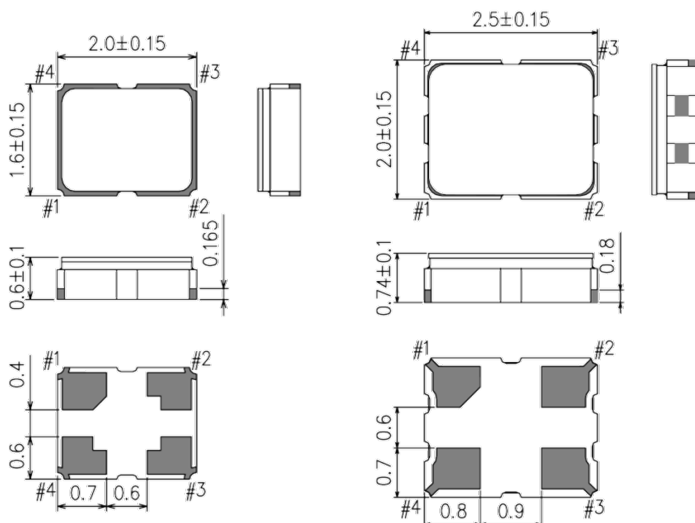
A	Default
B	Faster
C	Fast
D	Slow
E	Slower

External dimensions

(Unit: mm)

SG-8201CJA

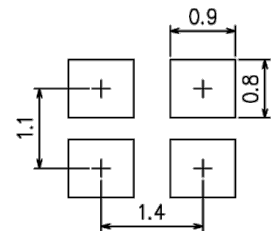
SG-8201CGA



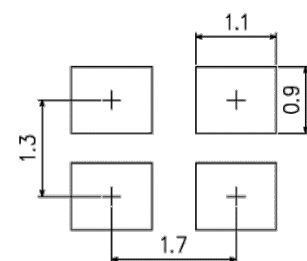
Footprint (Recommended)

(Unit: mm)

SG-8201CJA



SG-8201CGA



■ Notes:

In order to achieve optimum jitter performance, the 0.01 μF to 0.1 μF capacitor between V_{CC} and GND should be placed. It is also recommended that the capacitors are placed on the device side of the PCB, as close to the device as possible and connected together with short wiring pattern.

► Explanation of the mark that are using it for the catalog

	► Pb free.
	► Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	► Designed for automotive general equipment.
	► Designed for automotive applications related to driving and safety.

NOTICE : PLEASE READ CAREFULLY BELOW BEFORE THE USE OF THIS DOCUMENT

1. The content of this document is subject to change without notice. Before purchasing or using Epson products, please contact with sales representative of Seiko Epson Corporation ("Epson") for the latest information and be always sure to check the latest information published on Epson's official web sites and resources.
2. This document may not be copied, reproduced, or used for any other purposes, in whole or in part, without Epson's prior consent.
3. Information provided in this document including, but not limited to application circuits, programs and usage, is for reference purpose only. Epson makes no guarantees against any infringements or damages to any third parties' intellectual property rights or any other rights resulting from the information. This document does not grant you any licenses, any intellectual property rights or any other rights with respect to Epson products owned by Epson or any third parties.
4. Epson has prepared this document carefully to be accurate and dependable, but Epson does not guarantee that the information is always accurate and complete. Epson assumes no responsibility for any damages you incurred due to any misinformation in this document.
5. Epson products listed in this document and our associated technologies shall not be used in any equipment or systems that laws and regulations in Japan or any other countries prohibit to manufacture, use or sell. Furthermore, Epson products and our associated technologies shall not be used for the purposes of military weapons development (e.g. mass destruction weapons), military use, or any other military applications. If exporting Epson products or our associated technologies, please be sure to comply with the Foreign Exchange and Foreign Trade Control Act in Japan, Export Administration Regulations in the U.S.A (EAR) and other export-related laws and regulations in Japan and any other countries and to follow their required procedures.
6. Epson assumes no responsibility for any damages (whether direct or indirect) caused by or in relation with your non-compliance with the terms and conditions in this document or for any damages (whether direct or indirect) incurred by any third party that you give, transfer or assign Epson products.
7. For more details or other concerns about this document, please contact our sales representative.
8. Company names and product names listed in this document are trademarks or registered trademarks of their respective companies.

● Disclaimer

1. Epson products are designed for use in general electronic equipment applications that do not require extremely high reliability or safety.
2. Epson does not represent or warrant that its products will not cause a failure for any particular application, except for cases where the failure is a direct result caused by defects in materials and workmanship of this product.
If a product fails due to defects in materials and workmanship, to the maximum extent permitted by law, we will, at our sole discretion, refund or replace the affected product.
3. When products for used directly or indirectly in certain devices or applications (ex. Nuclear power, aerospace, infrastructure facilities, medical equipment, etc.) which are connected to or affect safety of human life or property, Customer is solely responsible for determining if the products and respective specifications are suitable for the intended use in particular customer applications.
Customer shall implement necessary and proper safety design and measures (including redundant design, malfunction prevention design, etc.) to ensure reliability and safety before using the products in/with customer's Equipment.
4. For the products designed for automotive applications, the products comply with AEC-Q100 or AEC-Q200.
Products do not comply with ISO 26262 (Products are not categorized to ASIL A, B, C and D).
5. No dismantling, analysis, reverse engineering, modification, alteration, adaptation, reproduction, etc., of Epson products is allowed.
Furthermore, any defects caused by this are not covered by the warranty.

©Seiko Epson Corporation 2025