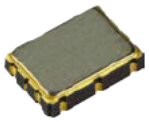
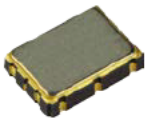
**Dual or Quad Selectable Programmable Crystal Oscillator**
**Output: LV-PECL**

# SG-8503CA / SG-8504CA

**Product Number**
**SG-8503CA : X1G005011xxxx00**
**SG-8504CA : X1G005021xxxx00**

- Dual frequency Selectable: SG-8503CA, 7.0 × 5.0 × 1.5 mm (6 pins)
- Quad frequency Selectable: SG-8504CA, 7.0 × 5.0 × 1.5 mm (8 pins)
- Frequency range: 50 MHz to 800 MHz
- Supply voltage: 2.5 V to 3.3 V

Features
- User-specified two (FSEL) or four (FSEL0, FSEL1) startup frequencies
- High frequency fundamental tone crystal, Low jitter PLL technology
- Available field oscillator programmer "SG-Writer II"

Application
- OTN, BTS, Test Instrument

## Specifications (characteristics)

| Item | Symbol | Specifications | Conditions / Remarks |
|---|---|---|---|
| Output frequency range | fo | 50 MHz to 800 MHz | - |
| Supply voltage | $V_{CC}$ | 2.5 V - 0.125 V to 3.3 V + 0.33 V | - |
| Storage temperature | T_stg | -55 ºC to +125 ºC | Store as bare product after packing |
| Operating temperature | T_use | -40 ºC to +85 ºC | - |
| Frequency tolerance *1 | f_tol | K : ±31.5 × $10^{-6}$ | Customized Product (Option) |
| | | L : ±50 × $10^{-6}$ | |
| Current consumption | $I_{CC}$ | 90 mA Max. | OE Active, L_ECL = 50 Ω |
| Disable current | I_dis | 40 mA Max. | OE Inactive, Output Standby: Hi-Z mode |
| | | 70 mA Max. | OE Inactive, Output Standby: Fix mode |
| Symmetry | SYM | 45 % to 55 % | At outputs crossing point |
| Output voltage | $V_{OH}$ | Vcc - 1.025 V Min. | DC characteristics |
| | $V_{OL}$ | Vcc - 1.62 V Max. | |
| Output load condition | L_ECL | 50 Ω | Termination to Vcc - 2.0 V |
| Input voltage | $V_{IH}$ | 70% Vcc Min. | SG-8503CA : OE, FSEL<br>SG-8504CA : OE, FSEL0, FSEL1 |
| | $V_{IL}$ | 30% Vcc Max. | |
| Rise time / Fall time | tr / tf | 400 ps Max. | Between 20% and 80% of ($V_{OH}$ - $V_{OL}$) |
| Start-up time | t_str | 10 ms Max. | Time at minimum supply voltage to be 0 s |
| Setting time for frequency change | $t_{SET1}$ | 1.5 ms Max. | SG-8503CA :<br>From setting FSEL pin to output new frequency<br>SG-8504CA :<br>From setting FSEL0 / FSEL1 pin to output new frequency |

*1 Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage change, reflow drift and 10 years aging at +25 ºC.

Product Name (Standard form)
SG-8503 ① CA ② 156MHz ③ 625MHz ④ A ⑤ P ⑥ R ⑦ L ⑧ Z ⑨

① Model, ② Package type,
③ Frequeny-0 (50 ~ 800 MHz), ④ Frequency-1 (50 ~ 800 MHz), ⑤ Internal crystal frequency, ⑥ Output enable pin Polarity,
⑦ Supply voltage/Output format, ⑧ Frequency tolerance/Operating temperature, ⑨ Output standby type

Product Name (Standard form)
SG-8504 ① CA ② 156.2MHz ③ nnnn ④ A ⑤ P ⑥ R ⑦ L ⑧ Z ⑨

① Model, ② Package type,
③ Frequeny-0 (50 ~ 800 MHz), ④ Parameter identifier, ⑤ Internal crystal frequency, ⑥ Output enable pin Polarity,
⑦ Supply voltage/Output format, ⑧ Frequency tolerance/Operating temperature, ⑨ Output standby type

| ⑤ Internal crystal frequency | |
|---|---|
| A | 114.1444 MHz |

| ⑥ Output enable pin Polarity | |
|---|---|
| P | Active High |
| Q | Active Low |

| ⑦ Supply voltage/ Output format | |
|---|---|
| R | 2.5 V ~ 3.3 V/LVPECL |

| ⑧ Frequency tolerance/ Operating temperature | |
|---|---|
| K | ±31.5 × $10^{-6}$/-40 to +85 °C |
| L | ±50 × $10^{-6}$/-40 to +85 °C |

| ⑨ Output standby type | |
|---|---|
| F | Fix (OUT="L", OUTN="H") |
| Z | High-Z |

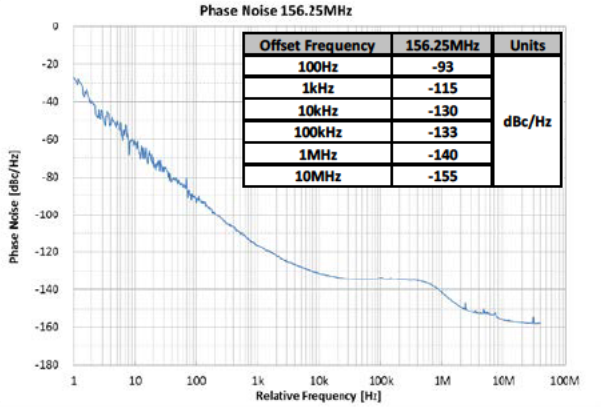
## Phase Jitter

| | Offset Frequency | 100.00 MHz | 125.00 MHz | 156.25 MHz | 250.00 MHz | 312.50 MHz | 500.00 MHz | 625.00 MHz |
|---|---|---|---|---|---|---|---|---|
| Phase jitter *2 Typ. | 12 kHz to 20 MHz | 0.31 ps | 0.30 ps | 0.26 ps | 0.26 ps | 0.29 ps | 0.28 ps | 0.29 ps |

*2 In order to achieve optimum jitter performance, it is recommended that the capacitor (0.1 µF + 10 µF) between $V_{CC}$ and GND pin should be placed as close to the $V_{CC}$ pin as possible.

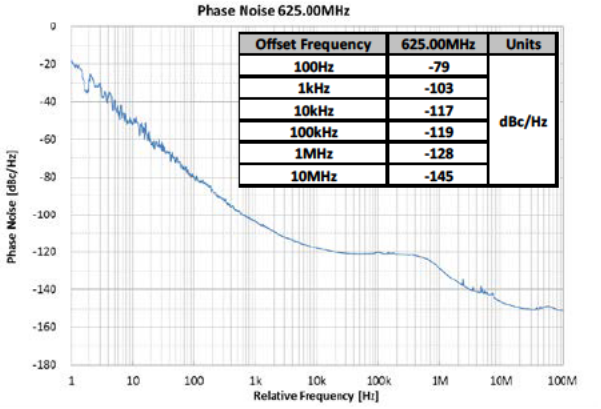
## Phase Noise

Phase Noise 156.25MHz




| Offset Frequency | 156.25MHz | Units |
|---|---|---|
| 100Hz | -93 | dBc/Hz |
| 1kHz | -115 | |
| 10kHz | -130 | |
| 100kHz | -133 | |
| 1MHz | -140 | |
| 10MHz | -155 | |

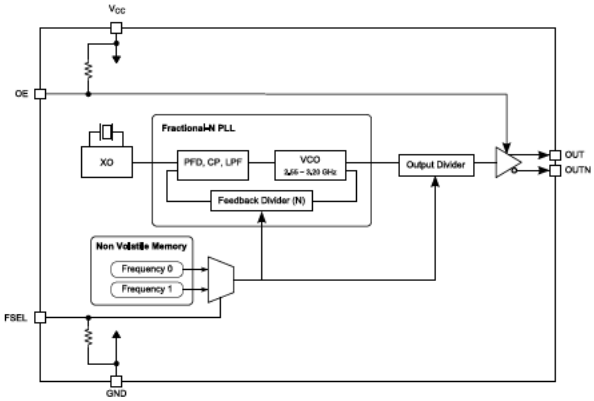
Phase Noise 625.00MHz



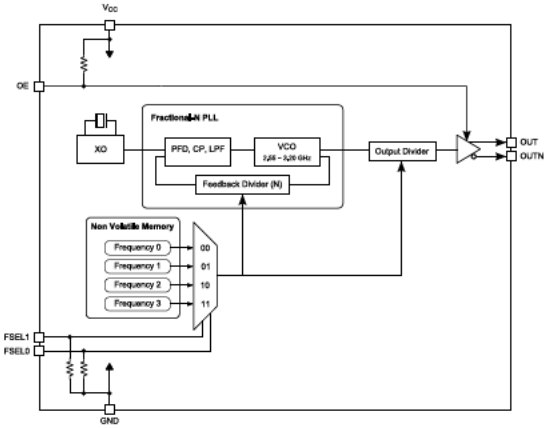

| Offset Frequency | 625.00MHz | Units |
|---|---|---|
| 100Hz | -79 | dBc/Hz |
| 1kHz | -103 | |
| 10kHz | -117 | |
| 100kHz | -119 | |
| 1MHz | -128 | |
| 10MHz | -145 | |

## Block diagram

SG-8503CA

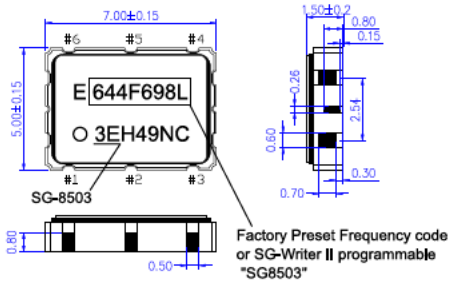



SG-8504CA

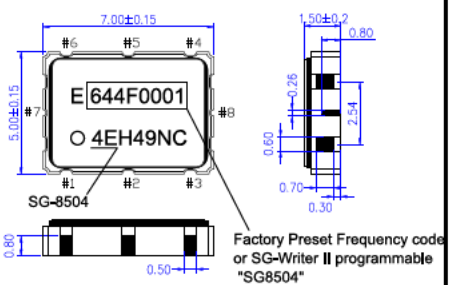


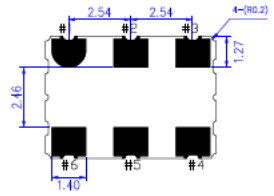

## External dimensions (Unit: mm)

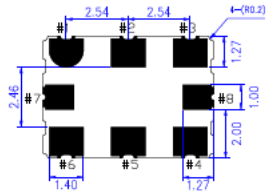
SG-8503CA




SG-8504CA





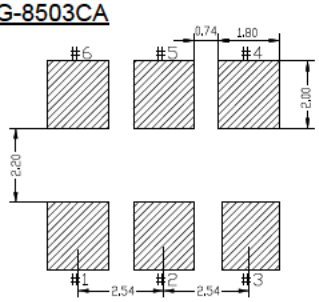
| Pin | Connection |
|---|---|
| 1 | OE |
| 2 | FSEL (L = Frequency-0, H = Frequency-1) |
| 3 | GND |
| 4 | OUT |
| 5 | OUTN |
| 6 | Vcc |

| Pin | Connection | Pin | Connection |
|---|---|---|---|
| 1 | NC | 5 | OUTN |
| 2 | OE | 6 | Vcc |
| 3 | GND | 7 | FSEL0 |
| 4 | OUT | 8 | FSEL1 |

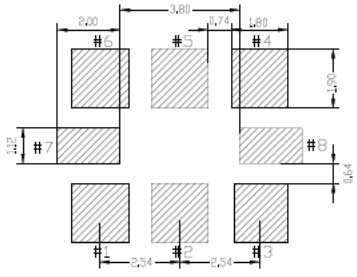
| FSEL1, FSEL0 | Output Frequency |
|---|---|
| LL | Frequency-0 |
| LH | Frequency-1 |
| HL | Frequency-2 |
| HH | Frequency-3 |

## Footprint (Recommended)(Unit: mm)

SG-8503CA



SG-8504CA



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