

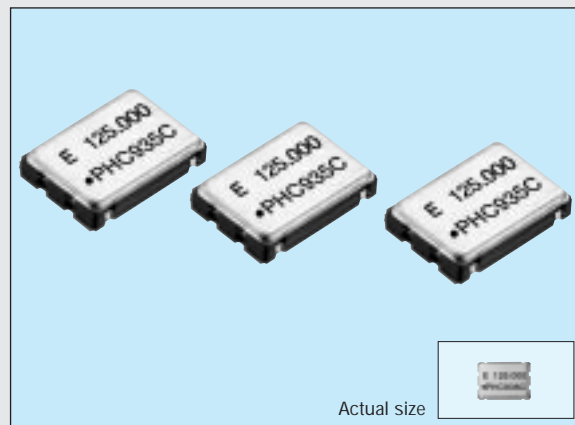
PROGRAMMABLE HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-8002CA series

Products number
Q3309CAxxxxxx00

- Wide frequency output by PLL technology.
- Quick delivery of samples and short lead mass production time.
- Excellent environmental capability.
- Output enable function (OE) and stand-by function (ST) can be used for low current consumption applications.

8002 PROM Writer available to purchase.(Type:PRW-8000A3-M01)
 Please contact EPSON or local sales representative.



Specifications (characteristics)

Item	Symbol	PT/ST	PH/SH		PC/SC	Remarks
			Specifications *			
Output frequency range	f_0		1.0000 MHz to 125.0000 MHz ¹			Refer to page 12. "Frequency range"
Power source voltage	Max. supply voltage	V_{DD_GND}	-0.5 V to +7.0 V			
	Operating voltage	V_{DD}	5.0 V \pm 0.5 V		3.3 \pm 0.3 V	3.0 V \pm 0.3 V: $f_0 \leq 66.7$ MHz(PC/SC)
Temperature range	Storage temperature	T_{STG}	-55 °C to +125 °C			Stored as bare product after unpacking
	Operating temperature	T_{OPR}	-20 °C to +70 °C (-40 °C to +85 °C)		-40 °C to +85 °C	Refer to page 12."Frequency range"
Frequency stability	$\Delta f/f_0$		B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$ M: $\pm 100 \times 10^{-6}$			B,C: -20 °C to +70 °C, M: -40 °C to +85 °C
Current consumption	I_{OP}		45 mA Max.		28 mA Max.	No load condition, Max. frequency range
Output disable current	I_{OE}		30 mA Max.		16 mA Max.	OE=GND
Standby current	I_{ST}		50 μ A Max.			ST=GND
Duty	t_w/t		40 % to 60 %			C-MOS load: 1/2 V_{DD} level
		40 % to 60 %				TTL load: 1.4 V level
High output voltage	V_{OH}		$V_{DD} - 0.4$ V Min.			$I_{OH} = -16$ mA(PT/ST,PH/SH), -8 mA(PC/SC)
Low output voltage	V_{OL}		0.4 V Max.			$I_{OL} = 16$ mA(PT/ST,PH/SH), 8 mA(PC/SC)
Output load condition (fan out)	TTL	N	5 TTL Max.			Max. frequency and Max. operating voltage range
	C-MOS	C_L	15 pF Max.		25 pF Max. 15 pF Max.	
Output enable/disable input voltage	V_{IH}		2.0 V Min.		0.7 x V_{DD} Min.	ST, OE terminal
	V_{IL}		0.8 V Max.		0.2 x V_{DD} Max.	
Output rise time	C-MOS level	t_{TLH}			4 ns Max.	C-MOS load: 20 % \rightarrow 80 % V_{DD}
	TTL level		4 ns Max.			TTL load: 0.4 V \rightarrow 2.4 V
Output fall time	C-MOS level	t_{THL}			4 ns Max.	C-MOS load: 80 % \rightarrow 20 % V_{DD}
	TTL level		4 ns Max.			TTL load: 2.4 V \rightarrow 0.4 V
Oscillation start up time	t_{OSC}		10 ms Max.			Time at minimum operating voltage to be 0 s
Aging	f_a		$\pm 5 \times 10^{-6}$ /year Max.			$T_a = +25$ °C, $V_{DD} = 5.0$ V/3.3 V(PC/SC)
Shock resistance	S.R.		$\pm 20 \times 10^{-6}$ Max.			Three drops on a hard board from 750 mm or excitation test with 29400 m/s ² x 0.3 ms x 1/2sine wave in 3 directions

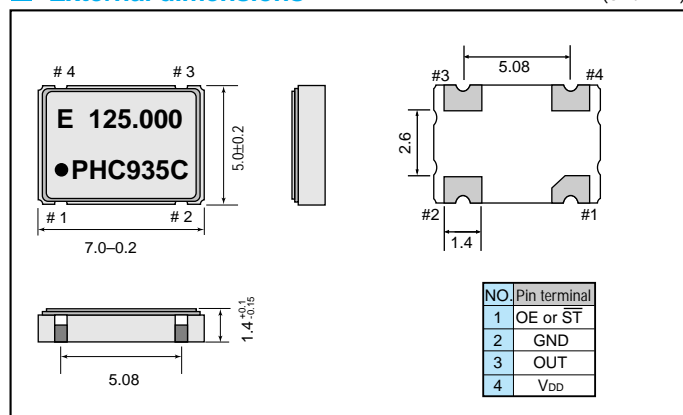
Note: • Please contact us for inquiries about operating temperature(-40 °C to +85 °C), the available frequency, duty and output load conditions. Checking possible by the Frequency Checking Program.

<http://www.epson.co.jp/device/>

*PLL - PLL connection & Jitter specification, please refer to page 46.

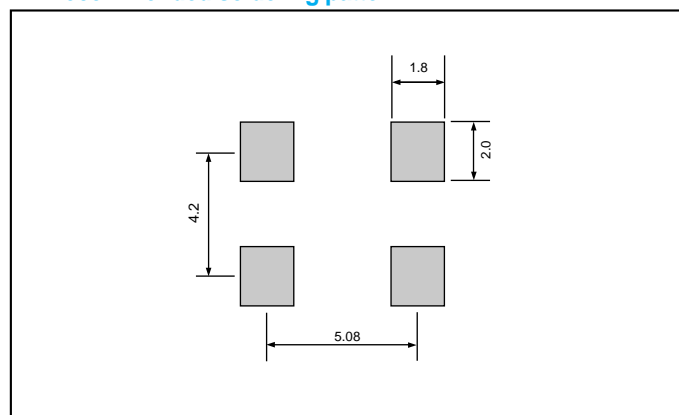
External dimensions

(Unit: mm)



Recommended soldering pattern

(Unit: mm)



PLL oscillator (SG-8002 series and HG-8002 series)

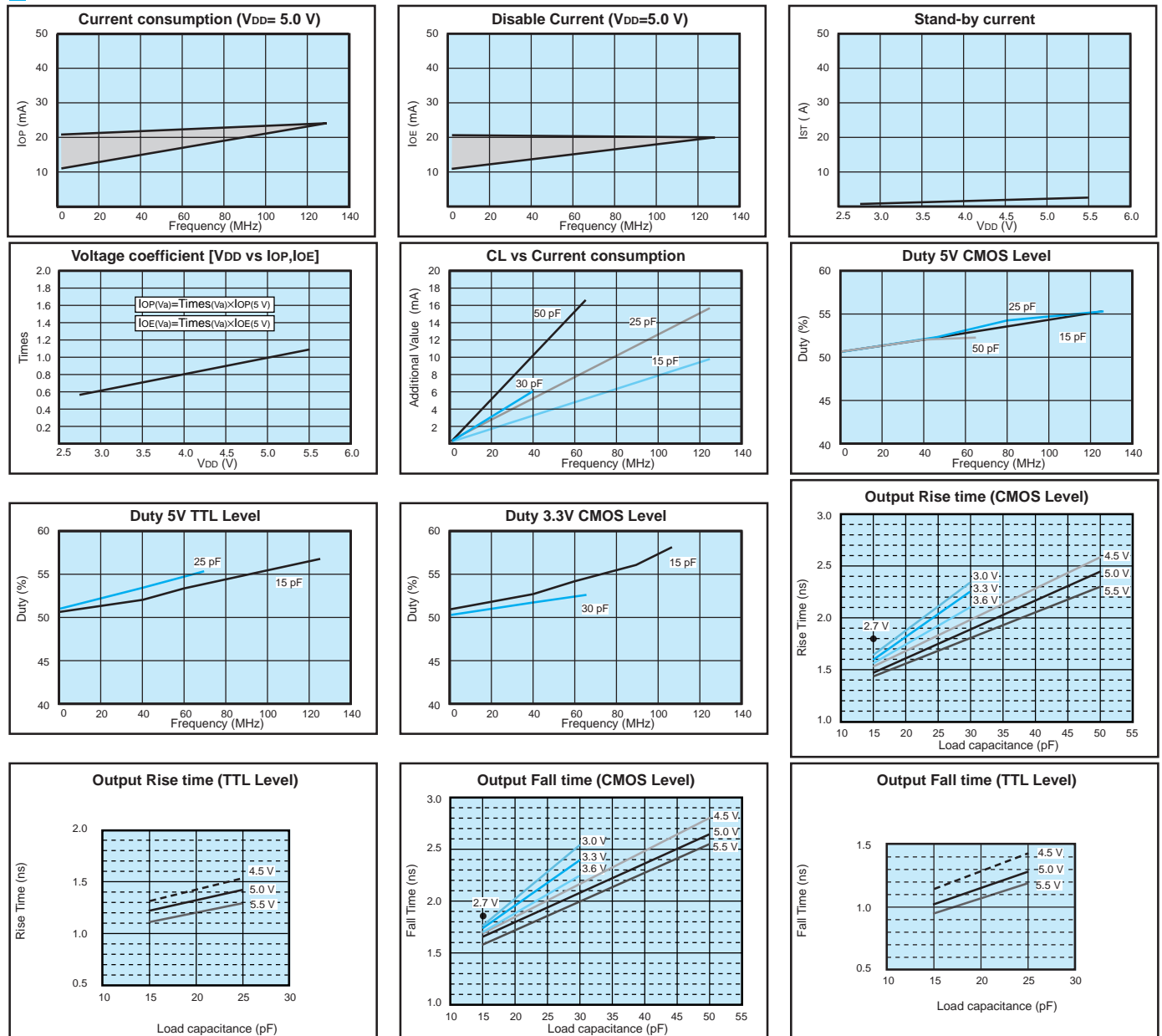
■ PLL-PLL connection

The 8002 series uses PLL technology. There are some cases where jitter will increase when connected to other PLL type devices. For application assistance, please contact Epson.

■ Jitter Specifications

Model	Operating Voltage	Jitter Item	Specifications	Remarks
PT/PH ST/SH	5 V±0.5 V	Cycle to cycle	150 ps Max.	33 MHz≤f _o ≤125 MHz, C _L =15 pF
			200 ps Max.	1.0 MHz≤f _o <33 MHz, C _L =15 pF
		Peak to peak	200 ps Max.	33 MHz≤f _o ≤125 MHz, C _L =15 pF
			250 ps Max.	1.0 MHz≤f _o <33 MHz, C _L =15 pF
SC/PC	3.3 V±0.3 V	Cycle to cycle	200 ps Max.	1.0 MHz≤f _o ≤125 MHz, C _L =15 pF
		Peak to peak	250 ps Max.	1.0 MHz≤f _o ≤125 MHz, C _L =15 pF

■ SG-8002 series Characteristics chart



■ SG-8002Series

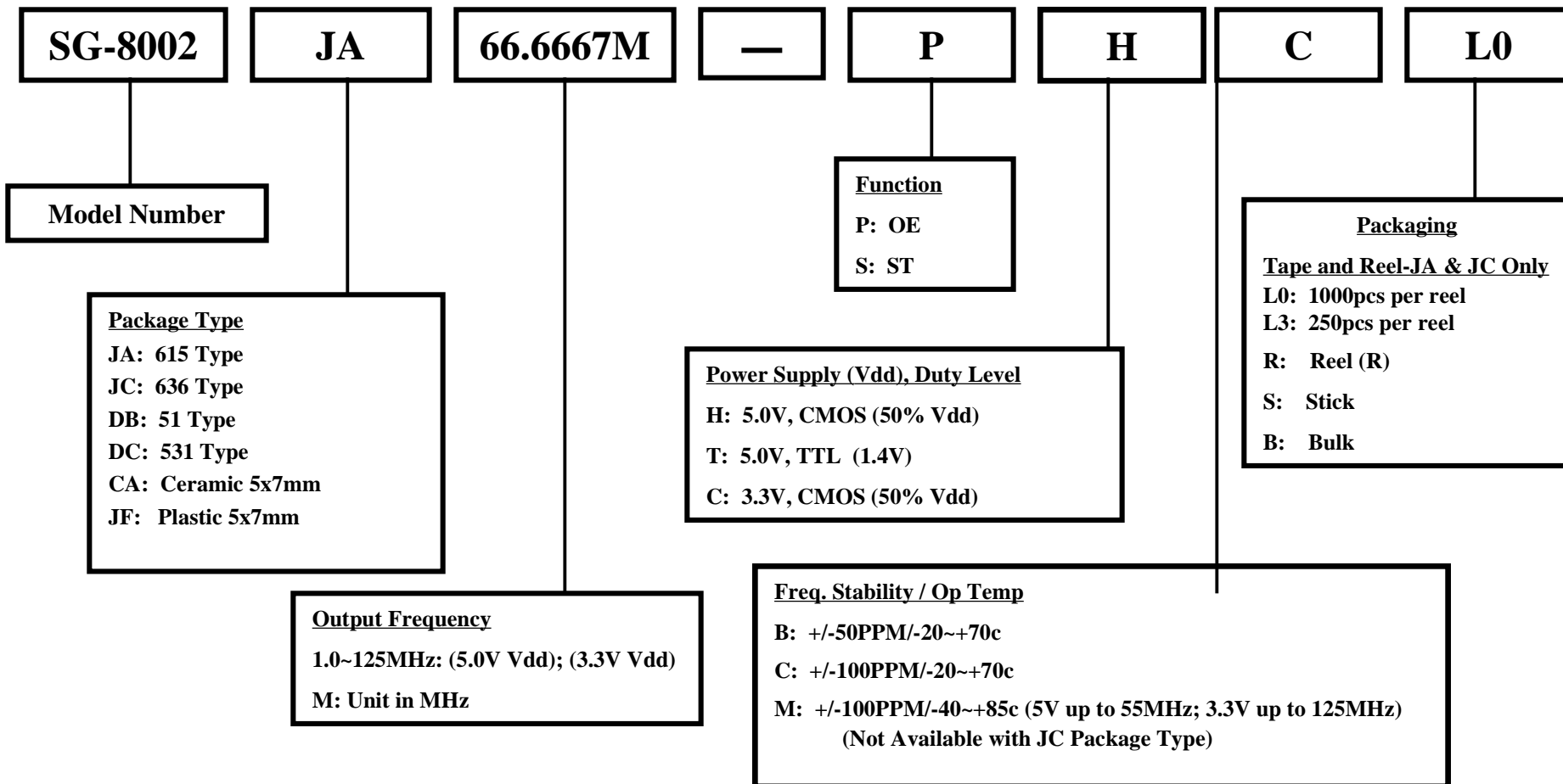
Function	P : Output enable			S : Standby			
	Operating voltage	5.0 V ±0.5 V	3.3 V ±0.3 V	5.0 V ±0.5 V	3.3 V ±0.3 V	3.3 V ±0.3 V	
Output load condition	T : TTL	H : C-MOS	C : C-MOS	T : TTL	H : C-MOS	C : C-MOS	
Frequency	B : ±50x 10 ⁻⁶ (-20 °C to +70 °C)	PTB	PHB	PCB	STB	SHB	SCB
Stability	C : ±100x 10 ⁻⁶ (-20 °C to +70 °C)	PTC	PHC	PCC	STC	SHC	SCC
	M : ±100x 10 ⁻⁶ (-40 °C to +85 °C)	PTM	PHM	PCM	STM	SHM	SCM

■ HG-8002Series

Function	P : Output enable			S : Standby			
	Operating voltage	5.0 V ±0.5 V	3.3 V ±0.3 V	5.0 V ±0.5 V	3.3 V ±0.3 V	3.3 V ±0.3 V	
Output load condition	T : TTL	H : C-MOS	C : C-MOS	T : TTL	H : C-MOS	C : C-MOS	
Frequency	AV : ±20x 10 ⁻⁶ (-20 °C to +70 °C)	PTAV	PHAV	PCAV	STAV	SHAV	SCAV
Stability	BV : ±25x 10 ⁻⁶ (-20 °C to +70 °C)	PTBV	PHBV	PCBV	STBV	SHBV	SCBV
	CX : ±30x 10 ⁻⁶ (-40 °C to +85 °C)	PTCX	PHCX	PCCX	STCX	SHCX	SCCX

Part Numbering System

Programmable Series Oscillators



SG8002 Series Part Number Selection Guide

OPERATING VOLTAGE

PART NUMBER SUFFIX

SERIES	OP VOLT	1MHz	125MHz
DB DC JA CA JF	5.0v	PHC PTC SHC STC PHB PTB SHB STB	
	3.3v	PCC SCC PCB SCB PCM SCM	
	5.0V	PHM SHM PTM STM	
		1MHz	55MHz

FREQUENCY RANGE

SERIES	OP VOLT	1MHz	125MHz
JC	5.0V	PHC PTC SHC STC PHB PTB SHB STB	
	3.3V	PCC SCC PCB SCB	125MHz

KEY:

X	X	X
FUNCTION	LOAD	STABILITY
P=OUTPUT ENABLE S= STANDBY	H=CMOS/5V T= TTL/5V C=CMOS/3V	C = +/-100PPM (-20 to 70c) B = +/-50PPM (-20 to 70c) M = +/-100PPM (-40 to 85c)

SG8002 Series Part Number Selection Guide

OPERATING TEMP

PART NUMBER SUFFIX

SERIES	TEMP	1MHz	125MHz
DB DC JA CA JF	-20 TO 70C	PHC PTC SHC STC PCC SCC PHB PTB SHB STB PCB SCB	
	-40 TO 85C	1MHz PCM SCM PHM SHM PTM STM	55MHz

FREQUENCY RANGE

SERIES	TEMP	1MHz	125MHz
JC	-20 TO 70C	PHC PTC SHC STC PCC SCC PHB PTB SHB STB PCB SCB	55MHz
	-40 TO 85C	Not Available	

KEY:

FUNCTION	LOAD	STABILITY
P=OUTPUT ENABLE S= STANDBY	H=CMOS/5V T= TTL/5V C=CMOS/3V	C = +/-100PPM (-20 to 70c) B = +/-50PPM (-20 to 70c) M = +/-100PPM (-40 to 85c)