

PROGRAMMABLE HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-8002DB/ DC series

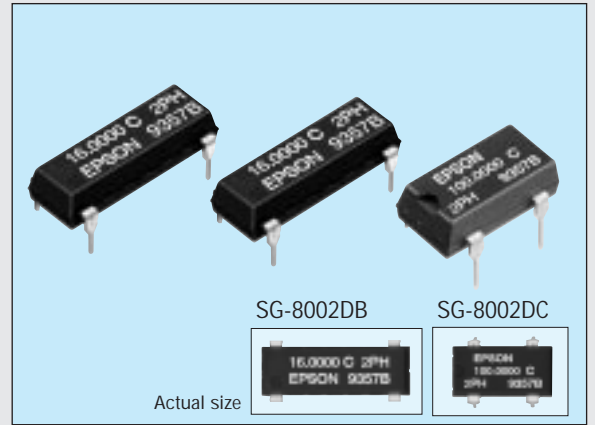
Products number

Q3203DBxxxxxx00

Q3204DCxxxxxx00

- 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.
- Pin compatible with full size and half size.

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			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(PT, PH, PC)
Standby current	I_{ST}	50 μ A Max.			ST=GND(ST, SH, SC)
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.	
Output enable/disable input voltage	V_{IH}	2.0 V Min.		0.7 x V_{DD} Min.	\overline{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

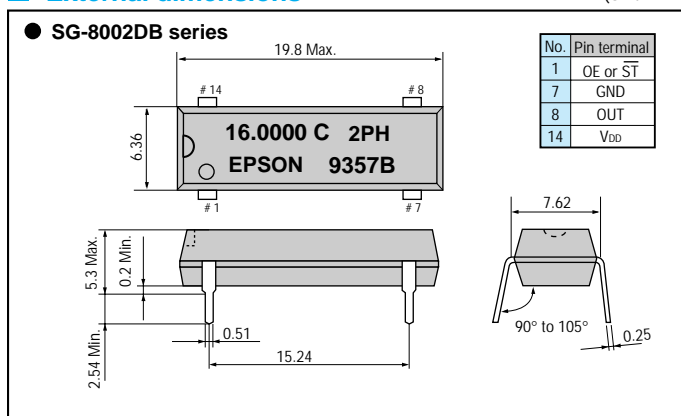
Note: • Please contact us for inquiries about operating temperature(-40 °C to +85 °C), the available frequency, duty and output load conditions.
Checking possible by the Frequency Checking Program.

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

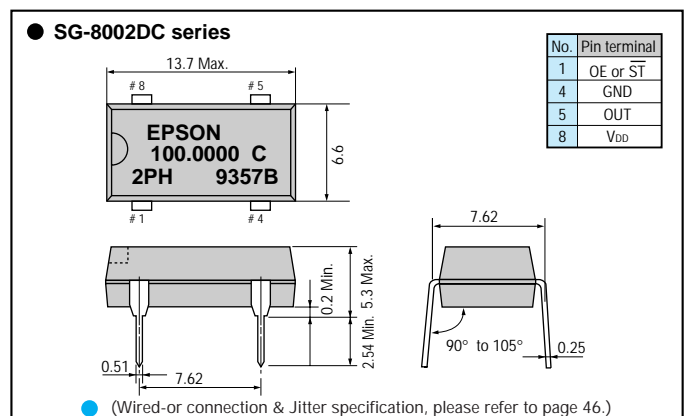
*PLL - PLL connection & Jitter specification, please refer to page 46.

External dimensions

(Unit: mm)



(Unit: mm)



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

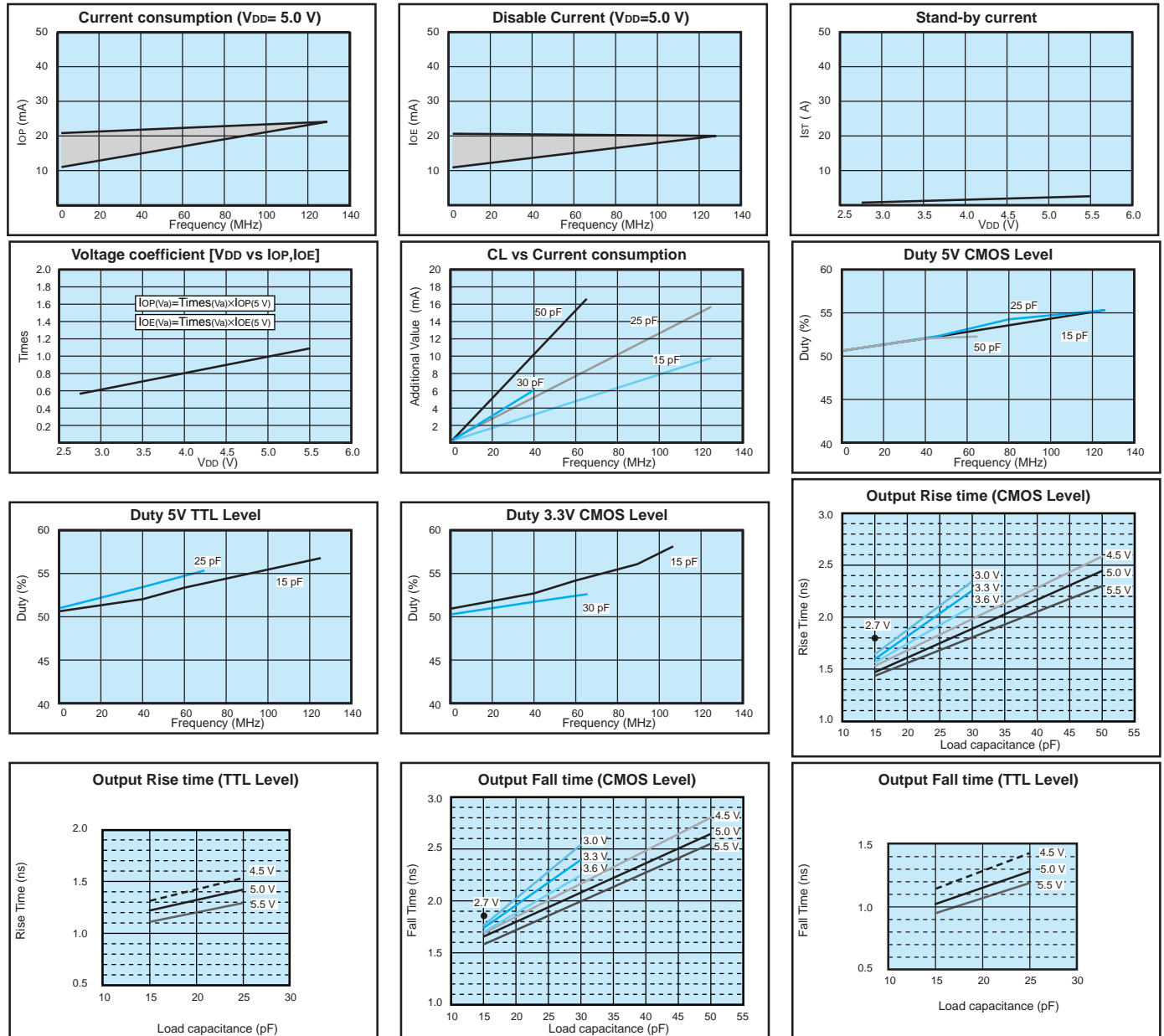
■ PLL-PLL connection

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 Stability	B : ±50x10 ⁻⁶ (-20 °C to +70 °C)	PTB	PHB	PCB	STB	SHB	SCB
	C : ±100x10 ⁻⁶ (-20 °C to +70 °C)	PTC	PHC	PCC	STC	SHC	SCC
	M : ±100x10 ⁻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 Stability	AV : ±20x10 ⁻⁶ (-20 °C to +70 °C)	PTAV	PHAV	PCAV	STAV	SHAV	SCAV
	BV : ±25x10 ⁻⁶ (-20 °C to +70 °C)	PTBV	PHBV	PCBV	STBV	SHBV	SCBV
	CX : ±30x10 ⁻⁶ (-40 °C to +85 °C)	PTCX	PHCX	PCCX	STCX	SHCX	SCCX