

HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-710 series

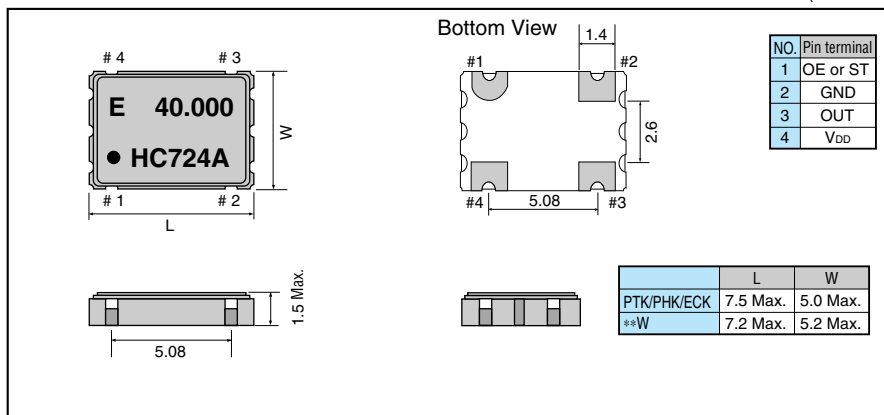
- Ceramic package with 1.5 mm thickness.
- Excellent shock resistance and environmental capability.
- Low current consumption due to use of C-MOS technology.
- Low current consumption by output enabled function (OE) or standby function (ST).

■ Specifications (characteristics)

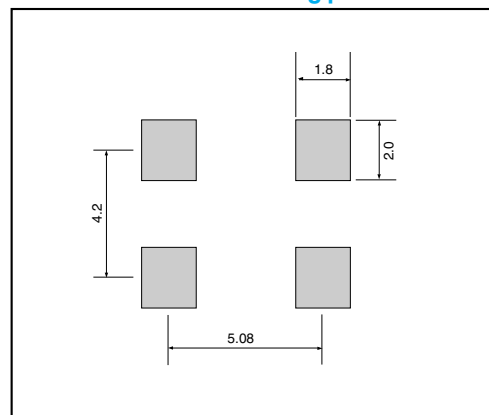
Item		Symbol	SG-710PTK	SG-710PHK	SG-710ECK	Remarks
			Specifications			
Output frequency range		f ₀	1.8000 MHz to 50.0000 MHz	1.8000 MHz to 80.0000 MHz	1.8000 MHz to 67.0000 MHz	
Power source voltage	Max. supply voltage	V _{DD} -GND		-0.5 V to +7.0 V		
	Operating voltage	V _{DD}	5.0 V ±0.5 V		3.3 V ±0.3 V	
Temperature range	Storage temperature	T _{STG}	-55 °C to +125 °C			
	Operating temperature	T _{OPR}	-10 °C to +70 °C (-40 °C to +85 °C)			Please contact us on availability of -40 °C to +85 °C
Soldering condition		T _{SOL}	Twice at under +260 °C within 10 s			
Frequency stability		Δf/f ₀	B: ±50 x 10 ⁻⁶ C: ±100 x 10 ⁻⁶ M: ±100 x 10 ⁻⁶			B,C:-10 °C to +70 °C, M:-40 °C to +85 C°
Current consumption		I _{OP}	24 mA Max.	40 mA Max.	18 mA Max.	No load condition
Output disable current		I _{OE}	12 mA Max.	16 mA Max.	—	OE=GND(PTK, PHK)
Standby current		I _{ST}	—		10 μA Max.	ST=GND(ECK)
Duty	t _w /t		—	45 % to 55 %	40 % to 60 %	C-MOS load: 1/2 V _{DD} level
			45 % to 55 %	40 % to 60 %	—	TTL load: 1.4 V level
High output voltage		V _{OH}	2.4 V Min.	V _{DD} -0.5 V Min.	0.9 x V _{DD} Min.	I _{OH} = -16 mA(PTK,PHK), -2 mA(ECK)
Low output voltage		V _{OL}	0.4 V Max.	0.5 V Max.	0.1 x V _{DD} Max.	I _{OL} = 16 mA(PTK,PHK), 2 mA(ECK)
Output load condition (fan out)	TTL	N	10 TTL Max.	10 TTL Max.	—	
	C-MOS	C _L (15 pF Max.)		50 pF Max.	15 pF Max.	
Output enable/disable input voltage		V _{IH}	2.0 V Min.	2.0 V Min.	0.7 x V _{DD} Min.	OE terminal(PTK,PHK)
		V _{IL}	0.8 V Max.	0.8 V Max.	0.3 x V _{DD} Max.	ST terminal(ECK)
Output rise time	C-MOS level	t _{TLH}	—	5 ns Max.	6 ns Max.	C-MOS load: 10 %→90 % V _{DD}
	TTL level		5 ns Max.	—	TTL load: 0.4 V→2.4 V	
Output fall time	C-MOS level	t _{THL}	—	5 ns Max.	6 ns Max.	C-MOS load: 90 %→10 % V _{DD}
	TTL level		5 ns Max.	—	TTL load: 2.4 V→0.4 V	
Oscillation start up time		t _{OSC}		10 ms Max.		Time at minimum operating voltage to be 0 s
Aging		f _a		±5 x 10 ⁻⁶ /year Max.		T _a = +25 °C, V _{DD} = 5.0 V/3.3 V(ECK)
Shock resistance		S.R.		±10 x 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

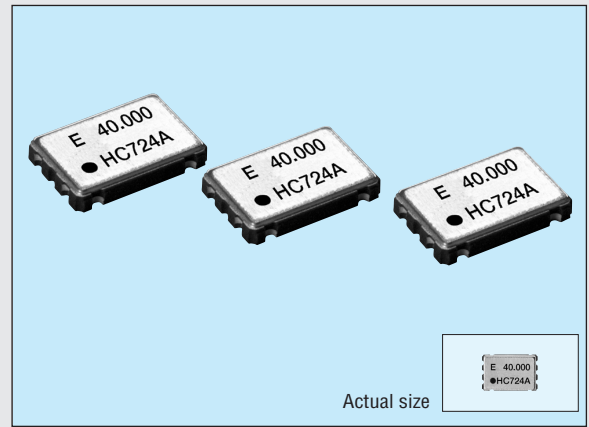
■ External dimensions

(Unit: mm)



■ Recommended soldering pattern (Unit: mm)





Specifications (characteristics)

Item		Symbol	SG-710PTW/STW	SG-710PHW/SHW	SG-710PCW/SCW	Remarks
Specifications						
Output frequency range		f_o	80.0001 MHz to 135.0000 MHz		66.6667 MHz to 135.0000 MHz	
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 V $\pm$ 0.3 V	
Temperature range	Storage temperature	T_{STG}	-55 °C to +125 °C			
	Operating temperature	T_{OPR}	-20 °C to +70 °C		-40 °C to +85 °C	
Soldering condition (lead part)		T_{SOL}	Twice at under 260 °C within 10 s or under 230 °C within 3 min.			
Frequency stability		$\Delta f/f_o$	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$			-20 °C to +70 °C
			M: $\pm 100 \times 10^{-6}$			-40 °C to +85 °C
Current consumption		I_{OP}	45 mA Max.		28 mA Max.	No load condition
Output disable current		I_{OE}	30 mA Max.		16 mA Max.	OE=GND(P*W)
Output disable current		I_{ST}	50 μ A Max.			ST=GND(S*W)
Duty	C-MOS level	t_w/t	—		40 % to 60 %	C-MOS load: 1/2 V_{DD}
	TTL level		40 % to 60 %		—	TTL load: 1.4 V
Output voltage		V_{OH}	V_{DD} -0.4 V Min.			I_{OH} = -16 mA (*TW/HW)/-8 mA(*CW)
		V_{OL}	0.4 V Max.			I_{OL} = -16 mA (*TW/HW)/8 mA(*CW)
Output load condition (fan out)		C_L	15 pF Max.			
Output enable/disable input voltage		V_{IH}	2.0 V Min.		0.7 V_{DD} Min.	OE,ST
		V_{IL}	0.8 V Max.		0.2 V_{DD} Max.	OE,ST
Output rise time	C-MOS level	t_{RLH}	—		3 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_{FHL}	—		3 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 4.5 V to be 0 s
Aging		f_a	$\pm 5 \times 10^{-6}$ /year Max.			T_a =+25 °C, V_{DD} =5 V
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 1/2 sine wave in 3 directions

Operating condition and Frequency band

Operating condition		1 MHz	50 MHz	100 MHz	150 MHz
5 V $\pm$ 0.5 V	Frequency stability:B (-20 to +70 °C)	1.8	50	80	135
		SG-710PTK SG-710PHK SG-710PTW/STW/PHW/SHW			
	Frequency stability:C (-20 to +70 °C)	1.8	50	80	135
3.3 V $\pm$ 0.3 V	Frequency stability:M (-40 to +85 °C)	1.8	50	80	
		SG-710PTK SG-710PHK			
	Frequency stability:B (-20 to +70 °C)	1.8	26	67	135
3.3 V $\pm$ 0.3 V	Frequency stability:C (-20 to +70 °C)	1.8	26	67	135
		SG-710ECK SG-710PCW/SCW			
	Frequency stability:M (-40 to +85 °C)	1.8	26	67	135
		SG-710ECK SG-710PCW/SCW			