

HIGH-FREQUENCY CRYSTAL OSCILLATOR

# SG-710 series

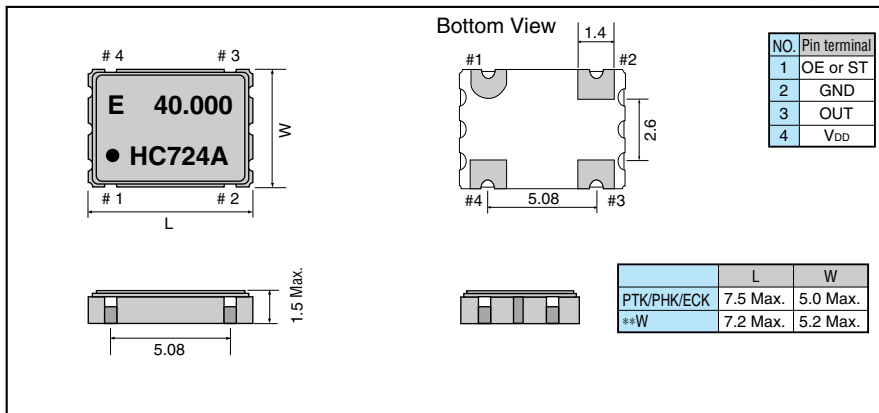
- Ceramic package with 1.5 mm thickness.
- Excellent shock resistance and environmental capability.
- Low current consumption due to use of C-MOS technology.
- Low current consumption by output enabled function (OE) or standby function (ST).

■ Specifications (characteristics)

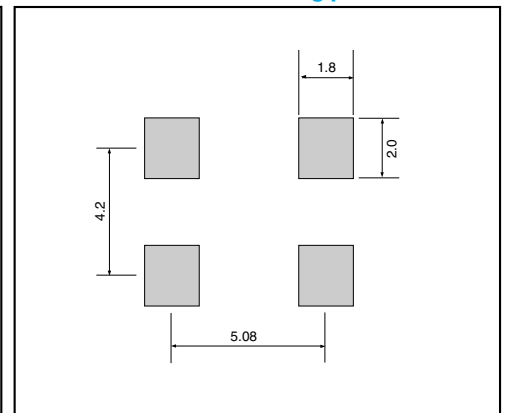
Item	Symbol	SG-710PTK	SG-710PHK	SG-710ECK	Remarks	
		Specifications				
Output frequency range	$f_0$	1.8000 MHz to 50.0000 MHz	1.8000 MHz to 80.0000 MHz	1.8000 MHz to 67.0000 MHz		
Power source voltage	Max. supply voltage	$V_{DD-GND}$ -0.5 V to +7.0 V				
	Operating voltage	$V_{DD}$	5.0 V $\pm$ 0.5 V	3.3 V $\pm$ 0.3 V		
Temperature range	Storage temperature	$T_{STG}$ -55 °C to +125 °C				
	Operating temperature	$T_{OPR}$ -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	$\Delta f/f_0$	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$ M: $\pm 100 \times 10^{-6}$			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 $\mu$ A 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.	—		
	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	$t_{rLH}$	—	5 ns Max.	6 ns Max.	C-MOS load: 10 % $\rightarrow$ 90 % $V_{DD}$
	TTL level		5 ns Max.	—	—	TTL load: 0.4 V $\rightarrow$ 2.4 V
Output fall time	C-MOS level	$t_{rHL}$	—	5 ns Max.	6 ns Max.	C-MOS load: 90 % $\rightarrow$ 10 % $V_{DD}$
	TTL level		5 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(ECK)	
Shock resistance	S.R.	$\pm 10 \times 10^{-6}$ Max.			Three drops on a hard board from 750 mm or excitation test with 29400 m/s <sup>2</sup> x 0.3 ms x 1/2sine wave in 3 directions	

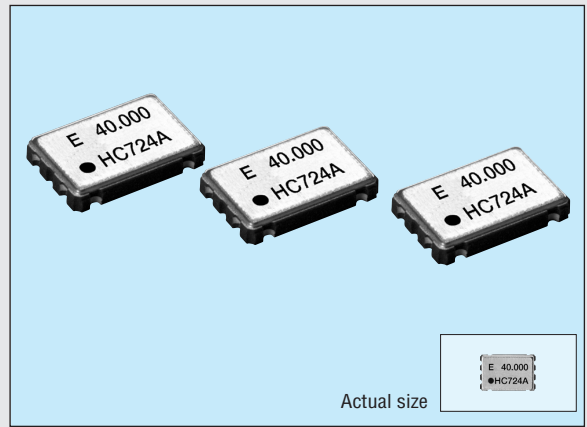
■ External dimensions

(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 $\mu$ A Max.			ST=GND(S*W)
Duty	C-MOS level	—		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	—		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	—		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 <sup>2</sup> 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
		SG-710PTK		SG-710PHK	SG-710PTW/STW/PHW/SHW
	Frequency stability:M (-40 to +85 °C)	1.8	50	80	
		SG-710PTK		SG-710PHK	
3.3 V $\pm$ 0.3 V	Frequency stability:B (-20 to +70 °C)	1.8	26	67	135
		SG-710ECK		SG-710PCW/SCW	
	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	