

HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-710 series

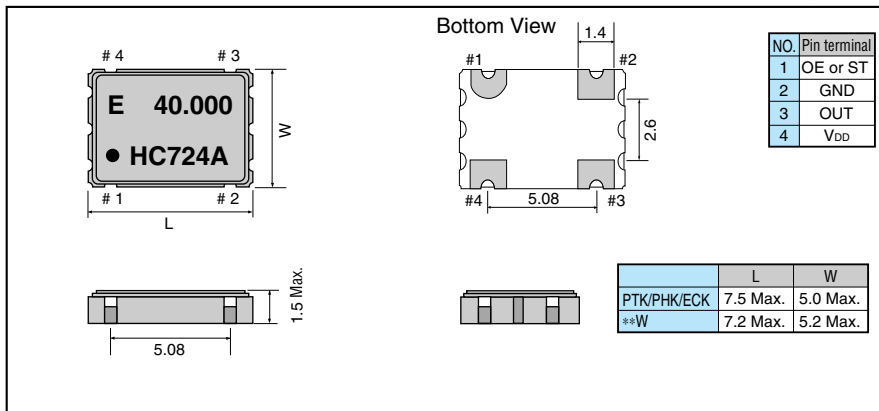
- Ceramic package with 1.5 mm thickness.
- Excellent shock resistance and environmental capability.
- Low current consumption due to use of C-MOS technology.
- Low current consumption by output enabled function (OE) or standby function (ST).

■ Specifications (characteristics)

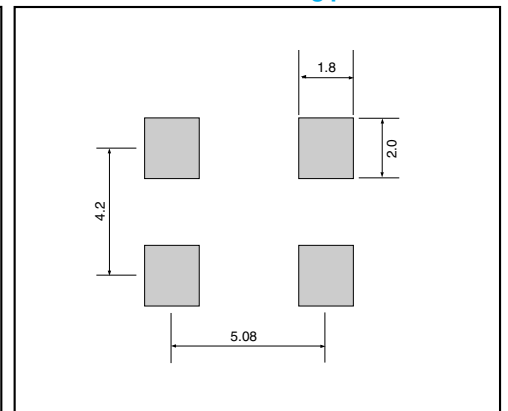
Item	Symbol	SG-710PTK	SG-710PHK	SG-710ECK	Remarks	
		Specifications				
Output frequency range	f_0	1.8000 MHz to 50.0000 MHz	1.8000 MHz to 80.0000 MHz	1.8000 MHz to 67.0000 MHz		
Power source voltage	Max. supply voltage	V_{DD-GND} -0.5 V to +7.0 V				
	Operating voltage	V_{DD}	5.0 V \pm 0.5 V	3.3 V \pm 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 μ 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_{LH}	—	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_{HL}	—	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 ² x 0.3 ms x 1/2sine wave in 3 directions	

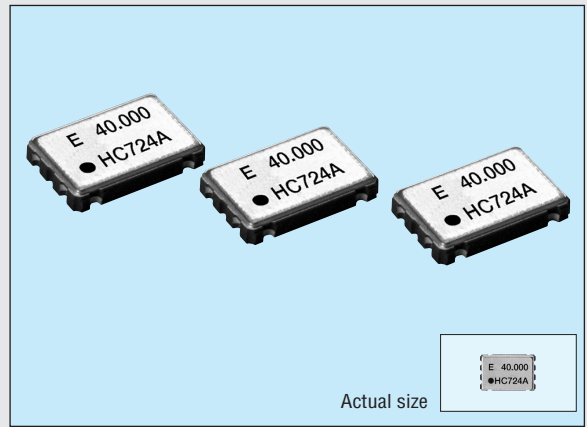
■ External dimensions

(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_0	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
Soldering condition (lead part)	T_{SOL}	Twice at under 260 °C within 10 s or under 230 °C within 3 min.			
Frequency stability	$\Delta f/f_0$	B: $\pm 50 \times 10^{-6}$ C: $\pm 100 \times 10^{-6}$		M: $\pm 100 \times 10^{-6}$	-20 °C to +70 °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	—		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 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
	Frequency stability:C (-20 to +70 °C)	1.8	50	80	135
	Frequency stability:M (-40 to +85 °C)	1.8	50	80	
3.3 V \pm 0.3 V	Frequency stability:B (-20 to +70 °C)	1.8	26	67	135
	Frequency stability:C (-20 to +70 °C)	1.8	26	67	135
	Frequency stability:M (-40 to +85 °C)	1.8	26	67	135