HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-710 series

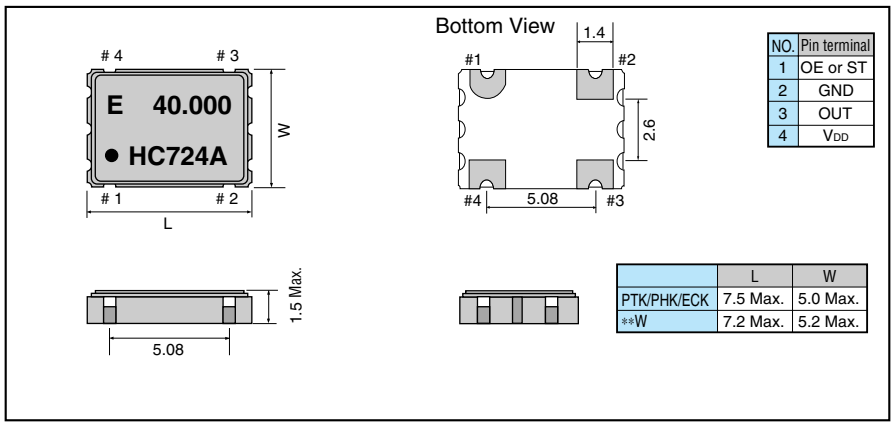
- Ceramic package with 1.5 mm thickness.
- Excellent shock resistance and environmental capability.
- Low current consumption due to use of C-MOS technology.
- Low current consumption by output enabled function (OE) or standby function (ST).

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		$\Delta f/f_0$	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		Iop	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) $\overline{ST}$ terminal(ECK)
		V_{IL}	0.8 V Max.	0.8 V Max.	0.3 x V_{DD} Max.	
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		fa		±5 x 10^{-6}/year Max.		Ta= +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/s² x 0.3 ms x 1/2sine wave in 3 directions

External dimensions

(Unit: mm)

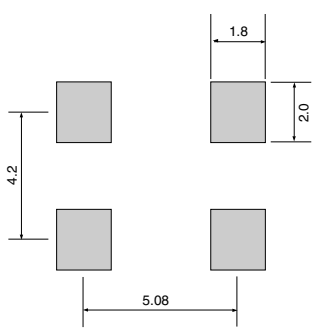


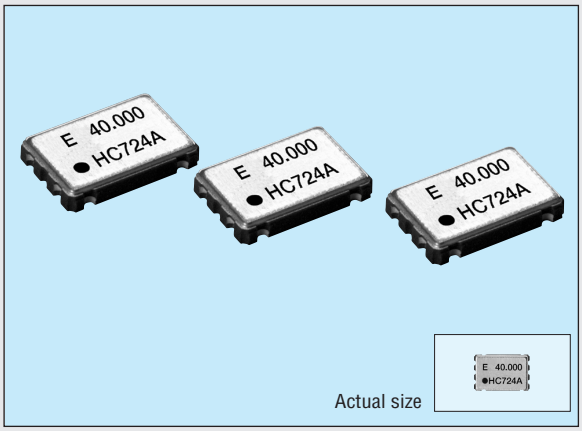
NO.	Pin terminal
1	OE or ST
2	GND
3	OUT
4	V_{DD}

	L	W
PTK/PHK/ECK	7.5 Max.	5.0 Max.
**W	7.2 Max.	5.2 Max.

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±0.5 V		3.3 V±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		$\Delta f/f_0$	B: ±50 x 10^{-6} C: ±100 x 10^{-6}			-20 °C to +70 °C
			M: ±100 x 10^{-6}			-40 °C to +85 °C
Current consumption		Iop	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 µA Max.			ST=GND(S*W)
Duty	C-MOS level	tw/t	—	40 % to 60 %		C-MOS load: 1/2V_{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_{TLH}	—	3 ns Max.	3 ns Max.	C-MOS load: 20 %→80 % V_{DD}
	TTL level		4 ns Max.	—	—	TTL load: 0.4 V→2.4 V
Output fall time	C-MOS level	t_{THL}	—	3 ns Max.	3 ns Max.	C-MOS load: 80 %→20 % V_{DD}
	TTL level		4 ns Max.	—	—	TTL load: 2.4 V→0.4 V
Oscillation start up time		t_{OSC}		10 ms Max.		Time at 4.5 V to be 0 s
Aging		fa		±5 x 10^{-6}/year Max.		Ta=+25 °C, V_{DD} =5 V
Shock resistance		S.R.		±20 x 10^{-6} Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s² 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±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±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	