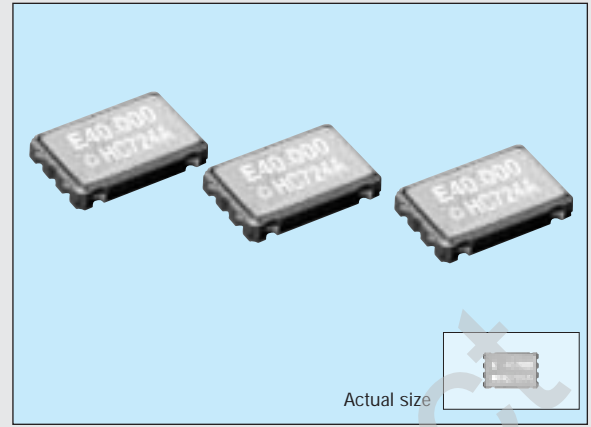


HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-710 series

Product number (please refer to page 1)
Q33710xxxxxx00

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



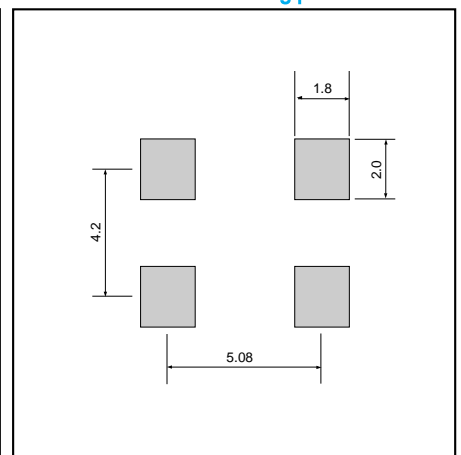
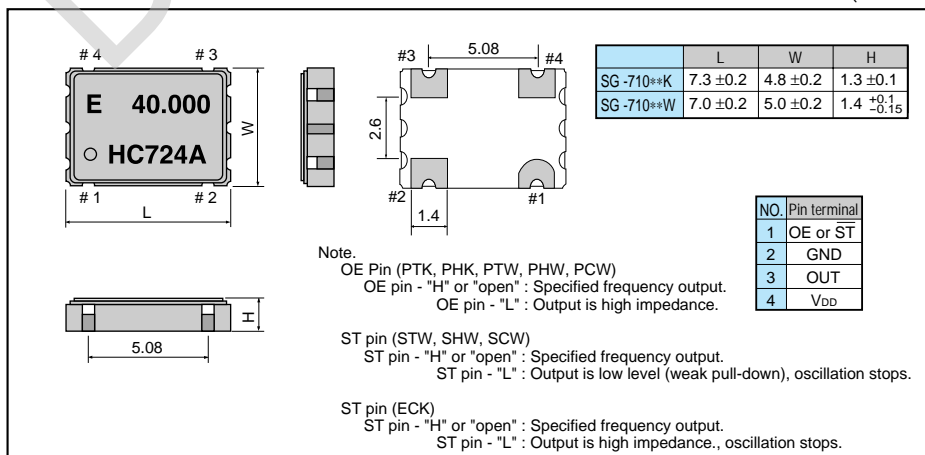
Specifications (characteristics)

Item	Symbol	Specifications			Remarks
		SG-710PTK	SG-710PHK	SG-710ECK	
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	Refer to page 31. "Frequency range"
Power source voltage	Max. supply voltage	V_{DD-GND}			
	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			Stored as bare product after unpacking
	Operating temperature	T_{OPR} -10 °C to +70 °C (-40 °C to +85 °C)			Refer to page 31. "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:-10 °C to +70 °C, M:-40 °C to +85 °C
Current consumption	I_{OP}	13 mA Max.	15 mA Max.	8 mA Max.	$F_0 \leq 25$ MHz, No load condition (ECK: $F_0 \leq 32$ MHz, No load condition)
		24 mA Max.	26 mA Max.	15 mA Max.	$F_0 \leq 50$ MHz, No load condition
		—	34 mA Max.	18 mA Max.	$F_0 \leq 67$ MHz, No load condition
		—	40 mA Max.	—	$F_0 \leq 80$ MHz, No load condition
Output disable current	I_{OE}	6 mA Max.	5 mA Max.	—	$F_0 \leq 25$ MHz, OE=GND(PTK, PHK)
		12 mA Max.	10 mA Max.	—	$F_0 \leq 50$ MHz, OE=GND(PTK, PHK)
		—	13 mA Max.	—	$F_0 \leq 67$ MHz, OE=GND(PTK, PHK)
		—	16 mA Max.	—	$F_0 \leq 80$ MHz, 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 %	CMOS 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.	—
	CMOS	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	t_{rHL}	—	5 ns Max.	6 ns Max.	CMOS load: 10 % \rightarrow 90 % V_{DD}
		5 ns Max.	—	—	TTL load: 0.4 V \rightarrow 2.4 V
Output fall time	t_{fHL}	—	5 ns Max.	6 ns Max.	CMOS load: 90 % \rightarrow 10 % V_{DD}
		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, First year
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	Specifications			Remarks	
		SG-710PTW/STW	SG-710PHW/SHW	SG-710PCW/SCW		
Output frequency range	fo	80.0001 MHz to 135.0000 MHz		67.0001 MHz to 135.0000 MHz	Refer to page 31. "Frequency range"	
Power source voltage	Max. supply voltage	-0.5 V to +7.0 V				
	Operating voltage	5.0 V ±0.5 V		3.3 V ±0.3 V		
Temperature range	Storage temperature	-55 °C to +125 °C			Stored as bare product after unpacking	
	Operating temperature	-20 °C to +70 °C		-40 °C to +85 °C	Refer to page 31. "Frequency range"	
Frequency stability	Δf/fo	B : ±50 x 10 ⁻⁶ C : ±100 x 10 ⁻⁶			-20 °C to +70 °C	
		M : ±100 x 10 ⁻⁶			-40 °C to +80 °C	
Current consumption	I _{OP}	45 mA Max.		28 mA Max.	No load condition (fo = Max.)	
Output disable current	I _{OE}	30 mA Max.		16 mA Max.	OE=GND(P*W)	
Standby current	I _{ST}	50 μA Max.			ST=GND(S*W)	
Duty	CMOS level	—			40 % to 60 %	CMOS 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)	CL	15 pF	—		fo ≤ 135 MHz	
		5 TTL + 15 pF	—		fo ≤ 90 MHz	
		—	15 pF	15 pF	fo ≤ 135 MHz	
		—	25 pF	—	fo ≤ 125 MHz	
Output enable disable input voltage	V _{IH}	2.0 V Min.		70 % V _{DD} Min.	OE, ST	
	V _{IL}	0.8 V Max.		20 % V _{DD} Max.	OE, ST	
Output rise time	t _{RLH}	2.0 ns Max.	—		TTL load: 0.8 V→2.0 V, CL = Max.	
		4.0 ns Max.	—		TTL load: 0.4 V→2.4 V, CL = Max.	
		—	3.0 ns Max.	3.0 ns Max.	CMOS load: 20 % V _{DD} →80 % V _{DD} , CL = Max.	
Output fall time	t _{THL}	2.0 ns Max.	—		TTL load: 2.0 V→0.8 V, CL = Max.	
		4.0 ns Max.	—		TTL load: 2.4 V→0.4 V, CL = Max.	
		—	3.0 ns Max.	3.0 ns Max.	CMOS load: 80 % V _{DD} →20 % V _{DD} , CL = Max.	
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 / 3.0 V, First year	
Shock resistance	S.R.	±20 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 1/2 sine wave in 3 directions	