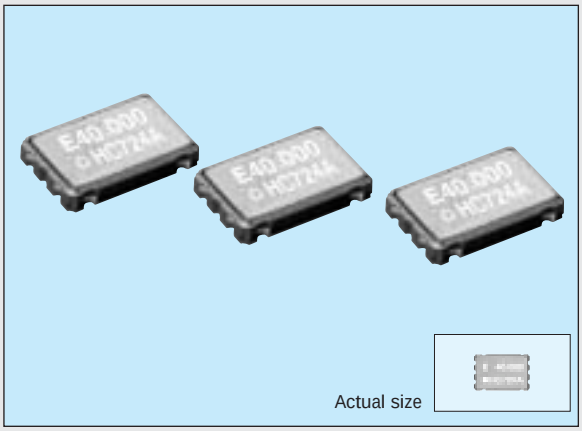
HIGH-FREQUENCY CRYSTAL OSCILLATOR

SG-710 series

Product number (please refer to page 1)

Q33710xxxxxxx00

- 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).

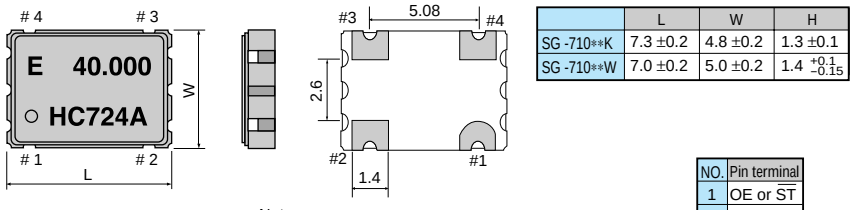


Specifications (characteristics)

Item		Symbol	Specifications SG-710PTK	SG-710PHK	SG-710ECK	Remarks
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	-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			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: ±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}	13 mA Max.	15 mA Max.	8 mA Max.	Fo ≤ 25 MHz, No load condition (ECK: Fo ≤ 32 MHz, No load condition)
			24 mA Max.	26 mA Max.	15 mA Max.	Fo ≤ 50 MHz, No load condition
			—	34 mA Max.	18 mA Max.	Fo ≤ 67 MHz, No load condition
			—	40 mA Max.	—	Fo ≤ 80 MHz, No load condition
Output disable current		I_{OE}	6 mA Max.	5 mA Max.	—	Fo ≤ 25 MHz, OE=GND(PTK, PHK)
			12 mA Max.	10 mA Max.	—	Fo ≤ 50 MHz, OE=GND(PTK, PHK)
			—	13 mA Max.	—	Fo ≤ 67 MHz, OE=GND(PTK, PHK)
			—	16 mA Max.	—	Fo ≤ 80 MHz, OE=GND(PTK, PHK)
Standby current		I_{ST}	—		10 µA 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.	IOH=-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.	IOL= 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) ST terminal(ECK)
		V_{IL}	0.8 V Max.	0.8 V Max.	0.3 x V_{DD} Max.	
Output rise time		t_{TLH}	—	5 ns Max.	6 ns Max.	CMOS load: 10 %→90 % V_{DD}
			5 ns Max.	—		TTL load: 0.4 V→2.4 V
Output fall time		t_{THL}	—	5 ns Max.	6 ns Max.	CMOS load: 90 %→10 % V_{DD}
			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, First year
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)



	L	W	H
SG -710**K	7.3 ±0.2	4.8 ±0.2	1.3 ±0.1
SG -710**W	7.0 ±0.2	5.0 ±0.2	1.4 $^{+0.1}_{-0.15}$

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

Note.

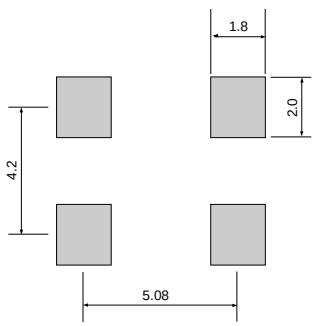
OE Pin (PTK, PHK, PTW, PHW, PCW)
OE pin - "H" or "open" : Specified frequency output.
OE pin - "L" : Output is high impedance.

ST pin (STW, SHW, SCW)
ST pin - "H" or "open" : Specified frequency output.
ST pin - "L" : Output is low level (weak pull-down), oscillation stops.

ST pin (ECK)
ST pin - "H" or "open" : Specified frequency output.
ST pin - "L" : Output is high impedance., oscillation stops.

Recommended soldering pattern

(Unit: mm)



Specifications (characteristics)

Item		Symbol	Specifications			Remarks
			SG-710PTW/STW	SG-710PHW/SHW	SG-710PCW/SCW	
Output frequency range		f_O	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	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			Stored as bare product after unpacking
	Operating temperature	T_{OPR}	-20 °C to +70 °C		-40 °C to +85 °C	Refer to page 31. "Frequency range"
Frequency stability		Δf/f0	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	tw/t	—	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,$\overline{ST}$
		V_{IL}	0.8 V Max.		20 % V_{DD} Max.	OE,$\overline{ST}$
Output rise time		t_{TLH}	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/s2 x 0.3 ms x 1/2 sine wave in 3 directions