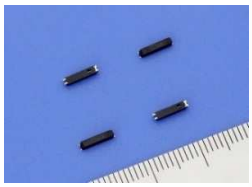
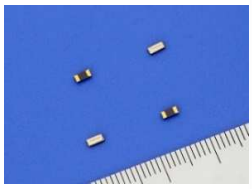
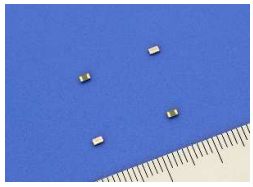
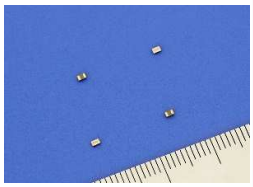
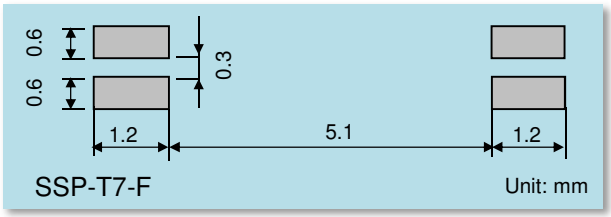
RX660 group 32kHz quartz crystal

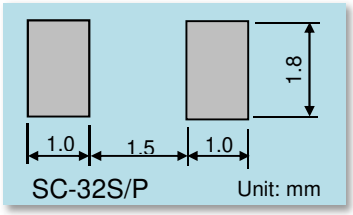
◆Specification for Quartz Crystal

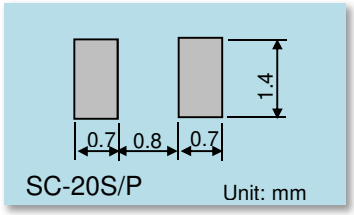
Size (mm)	Products		Load capacitance CL	Motional Resistance R1	Maximum Drive Level DL max.	Shunt Capacitance
7.0×1.5×1.4	**SSP-T7-F**		12.5pF 9pF 7pF	65KΩ max.	1.0μW max.	0.9pF typ.
3.2×1.5×0.85	**SC-32P**		12.5pF	50kΩ max.	1.0μW max.	1.0pF typ.
	SC-32S		9pF 7pF	70kΩ max.		
2.0×1.2×0.60	NEW **SC-20P**		12.5pF	50kΩ max.	1.0μW max.	1.3pF typ.
	SC-20S		9pF 7pF	70kΩ max.		
1.6×1.0×0.5	**SC-16S**		9pF 7pF	90kΩ max.	0.5μW max.	1.2pF typ.

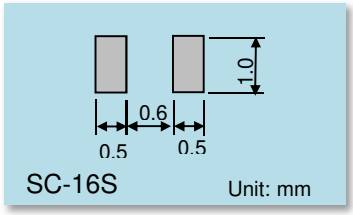
Matching data was acquired on the evaluation board with this crystal.
Please contact us for other CL and other products.

◆RECOMMENDED SOLDERING PATTERN









Seiko Instruments Inc.
Phone:+81-43-211-1207(Direct)

RX660 group Matching data

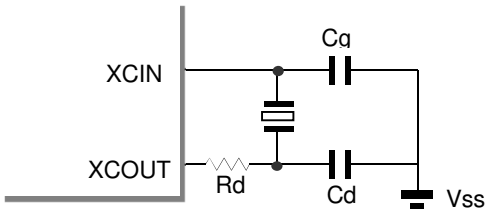
◆Circuit matching constant for Oscillation circuit

32.768kHz quartz crystals			Constants			V_{DD} (V)	Characteristics of Oscillation			
Size	Products	CL (pF)	Rd (kΩ)	Cg (pF)	Cd (pF)		RL (kΩ)	M (Times)	D.L (μW)	Ts (sec)
7.0 x 1.5	SSP-T7-F	12.5	0	18	18	2.7	-392	6.0	0.06	0.68
						3.3	-392	6.0	0.06	0.67
						5.0	-402	6.2	0.06	0.64
						5.7	-442	6.8	0.07	0.63
		9	0	15	15	2.7	-544	8.4	0.04	0.54
						3.3	-564	8.7	0.04	0.54
						5.0	-564	8.7	0.04	0.54
						5.7	-594	9.1	0.05	0.50
		7	0	9	9	2.7	-1,047	16.1	0.01	0.39
						3.3	-1,047	16.1	0.01	0.41
						5.0	-1,047	16.1	0.01	0.40
						5.7	-1,047	16.1	0.01	0.40
3.2 x 1.5	SC-32P	12.5	0	18	22	2.7	-325	6.5	0.07	0.42
						3.3	-325	6.5	0.07	0.42
						5.0	-345	6.9	0.08	0.39
						5.7	-365	7.3	0.08	0.37
	SC-32S	9	0	12	15	2.7	-638	9.1	0.04	0.34
						3.3	-638	9.1	0.04	0.34
						5.0	-658	9.4	0.05	0.35
						5.7	-688	9.8	0.05	0.35
		7	0	9	9	2.7	-1,061	15.2	0.01	0.23
						3.3	-1,061	15.2	0.01	0.23
						5.0	-1,061	15.2	0.01	0.23
						5.7	-1,061	15.2	0.01	0.24
2.0 x 1.2	NEW SC-20P	12.5	0	18	22	2.7	-311	6.2	0.05	0.26
						3.3	-311	6.2	0.05	0.26
						5.0	-321	6.4	0.06	0.26
						5.7	-351	7.0	0.06	0.26
	SC-20S	9	0	12	15	2.7	-626	8.9	0.05	0.16
						3.3	-626	8.9	0.05	0.16
						5.0	-646	9.2	0.06	0.16
						5.7	-686	9.8	0.06	0.15
		7	0	9	9	2.7	-1,071	15.3	0.03	0.12
						3.3	-1,071	15.3	0.03	0.12
						5.0	-1,071	15.3	0.03	0.12
						5.7	-1,071	15.3	0.04	0.12
1.6 x 1.0	SC-16S	9	0	15	15	2.7	-563	8.7	0.05	0.17
						3.3	-563	8.7	0.05	0.17
						5.0	-583	9.0	0.05	0.15
						5.7	-593	9.1	0.05	0.14
		7	0	10	10	2.7	-939	14.4	0.03	0.10
						3.3	-939	14.4	0.03	0.09
						5.0	-939	14.4	0.03	0.09
						5.7	-939	14.4	0.03	0.09

Seiko Instruments Inc.
Phone:+81-43-211-1207(Direct)

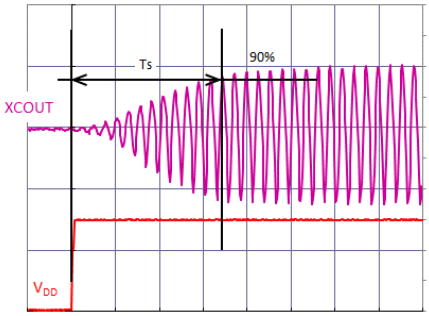
RX660 group Evaluation items and notes

◆Qualification item for Oscillation circuit characteristics



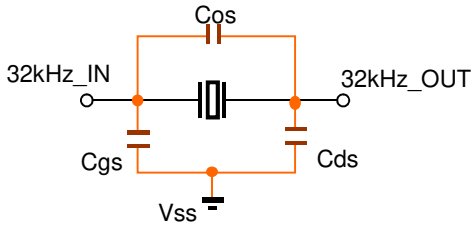
No	Item	Symbol	Recommended conditions
1	Negative Resistance	RL	
2	Oscillation allowance	M	more than 5 times of R1Max.
3	Drive Level	D.L	SSP-T7-F : 1μW SC-32S/P : 1μW SC-20S/P : 1μW SC-16S : 0.5μW
4	Oscillation Rising Time	Ts	-

Oscillation rising time (Ts) measurement conditions



Time from the application of VDD until the XCOU amplitude reaches 90%

◆**Approximate expression for Circuit load capacitance**



CL = Cg × Cd / (Cg + Cd) + Cs (pF)

Cos : 32kHz_IN-32kHz_OUT Stray capacitance
Cgs : 32kHz_IN-Vss Stray capacitance
Cds : 32kHz_OUT-Vss Stray capacitance

◆**Notes**

The above evaluation results are reference values evaluated in the specific sample, and the contents are not guaranteed.
Please note that in the actual circuit board, the value of the external element capacitance and the characteristics may change depending on the difference in stray capacitance and so on.

◆**Notes for the design of Circuit board**

Please keep the wiring short and place Quartz Crystal, Condensor, and Resistance close as possible to Microchip microcontroller. In order to prevent interference with other signal lines, do not provide other signal lines, please do not provide other signal lines on the crystal mounting part (bottom surface).

Seiko Instruments Inc.
Phone:+81-43-211-1207(Direct)