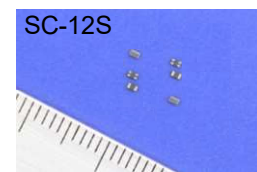
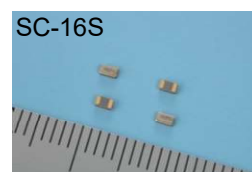
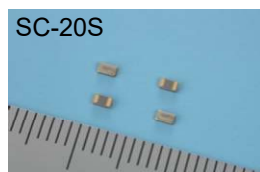
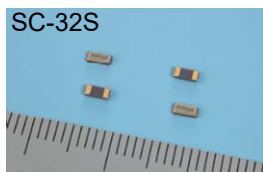
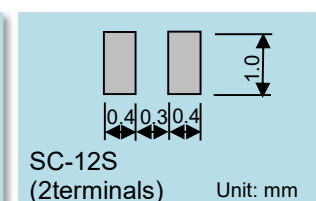
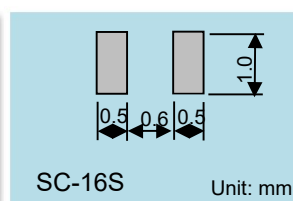
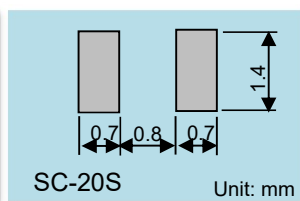
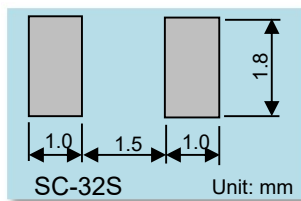


◆Specification for Quartz Crystal

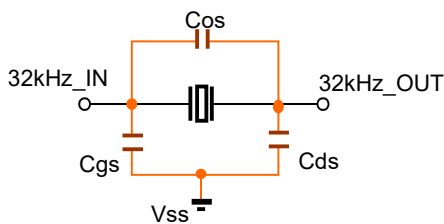
	SC-32S	SC-20S	SC-16S	SC-12S
Nominal Frequency	32.768kHz			
Frequency Tolerance	+/-20x10 ⁻⁶			
Load capacitance : CL	4pF~12.5pF ※Please contact us for inquiries regarding available CL.		6pF~12.5pF ※Please contact us for inquiries regarding available CL.	
Motional Resistance : R1	70kΩmax		90kΩmax	
Absolute Maximum Drive Level	1.0μW max		0.5μW max	0.3μW max
Dimensions(Thickness: Max.Value)	3.2×1.5×0.85mm	2.0×1.2×0.6mm	1.6×1.0×0.5mm	1.2×1.0×0.5mm



RECOMMENDED SOLDERING PATTERN



◆Approximate expression for Circuit load capacitance



$$CL = Cg \times Cd / (Cg + Cd) + Cs \text{ (pF)}$$

Cos : 32kHz_IN-32kHz_OUT Stray capacitance

Cgs : 32kHz_IN-Vss Stray capacitance

Cds : 32kHz_OUT-Vss Stray capacitance

◆Notes for the design of Circuit board

Please keep the wiring short and place Quartz Crystal, Condensor, and Resistance close as possible to Renesas 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).

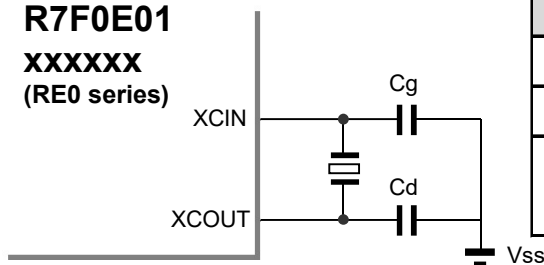
◆Circuit matching constant for Oscillation circuit



Product specifications				32kHz Quartz Crystal			External capacitors		Oscillation Characteristics			Supply
Product (series)	Register settings			Product	R1Max. (kΩ)	CL (pF)	Cg (pF)	Cd (pF)	RL (kΩ)	M (Times)	D.L (μW)	Vdd (V)
	SODRV	SODRV0	Target CL(pF)									
R7F0E01 xxxxxx (RE0)	1	0	4	SC-32S	70	4	3	3	-354	5.1	less than0.01	3.3
				SC-20S	70	4	3	2	-388	5.5	less than0.01	
	0	1	6	SC-32S	70	6	6	6	-351	5.0	0.01	
				SC-20S	70	6	7	6	-389	5.6	0.02	
	1	1	7	SC-32S	70	7	9	9	-491	7.0	0.01	
				SC-20S	70	7	9	9	-471	6.7	0.01	
				SC-16S	90	7	9	9	-519	5.8	0.01	
				SC-12S	90	6	7	7	-649	7.2	less than0.01	
	0	0	12.5	SC-12S	90	7	9	8	-483	5.4	less than0.01	
				SC-32S	70	12.5	22	18	-705	10.1	0.08	
				SC-20S	70	12.5	22	18	-591	8.4	0.07	
				SC-16S	90	12.5	22	22	-527	5.9	0.01	
				SC-12S	90	6	7	6	-859	9.5	less than0.01	
				SC-12S	90	7	9	8	-783	8.7	0.01	
	SC-12S	90	12.5	22	18	-683	7.6	0.02				

◆Qualification item for Oscillation circuit characteristics

**R7F0E01
XXXXXX
(RE0 series)**



No	Items	Symbol	Recommendation
1	Negative Resistance	RL	
2	Oscillation allowance	M	more than 5 times of R1Max.
3	Absolute Maximum Drive Level	D.L	SC-32S/SC-20S: 1μW SC-16S:0.5μW SC-12S:0.3μW

◆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.