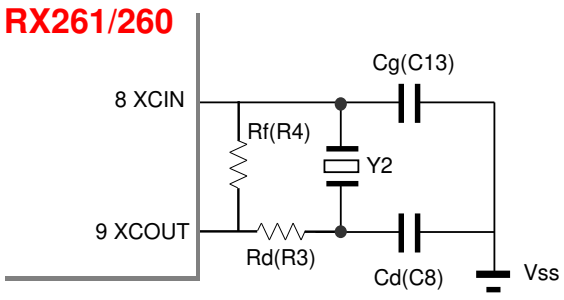
Renesas Electronics RX261/260 Group Matching Data Details

◆Evaluation items and evaluation data of oscillation circuit characteristics

・Circuit Diagram



Evaluation item

No	Item	Symbol	Recommended condition
1	Frequency	⊿f/f	Reference
2	Negative resistance	RL	The value shall be at least 5 times the product R1 specification value.
3	Oscillation margin	M	
4	Drive Level	D.L	Within product specifications.
5	Oscillation start-up time	Ts	Reference
6	Oscillation start voltage	Vstart	Reference
7	Oscillation stop voltage	Vstop	Reference

To ensure safe use by our customers,
We recommend an oscillation margin of 5 times or more.

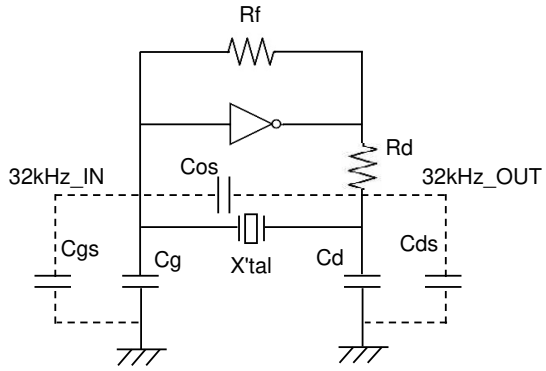
・Product and recommended circuit constants　　S.V.:Supply Voltage

Ocs. mode	32kHz Crystal unit			External element				S.V. (V)	Oscillation characteristics						
	Product Name	R1Max. (kΩ)	CL (pF)	Rf (kΩ)	Rd (kΩ)	Cg (pF)	Cd (pF)		⊿f (ppm)	RL (kΩ)	M (×)	D.L (μW)	Ts (sec)	Vstart (V)	Vstop (V)
STD.CL	SSP-T7-F	65	12.5	--	--	20	20	1.8	0.27	-504	7.8	0.020	0.75	1.51	1.49
								3.3	0.31	-504	7.8	0.020	0.75		
								5.0	0.34	-504	7.8	0.020	0.75		
	SC-32S	70	12.5	--	--	22	18	1.8	5.19	-451	6.4	0.003	0.62	1.51	1.49
								3.3	5.43	-451	6.4	0.003	0.62		
								5.0	5.49	-451	6.4	0.003	0.62		
	SC-20S	70	12.5	--	--	22	22	1.8	-3.05	-441	6.3	0.080	0.20	1.51	1.49
								3.3	-3.05	-441	6.3	0.080	0.20		
								5.0	-2.81	-441	6.3	0.080	0.22		
	SC-16S	90	9	--	--	15	18	1.8	-1.53	-581	6.5	0.020	0.18	1.51	1.49
								3.3	-1.53	-581	6.5	0.020	0.18		
								5.0	-1.83	-581	6.5	0.020	0.19		
	SC-12S	90	7	--	--	9	10	1.8	-4.27	-1,379	15.3	0.010	0.11	1.51	1.49
								3.3	-3.81	-1,379	15.3	0.010	0.11		
								5.0	-3.36	-1,379	15.3	0.010	0.11		

Ocs. mode	32kHz Crystal unit			External element				S.V. (V)	Oscillation characteristics						
	Product Name	R1Max. (kΩ)	CL (pF)	Rf (kΩ)	Rd (kΩ)	Cg (pF)	Cd (pF)		⊿f (ppm)	RL (kΩ)	M (×)	D.L (μW)	Ts (sec)	Vstart (V)	Vstop (V)
Low CL1	SSP-T7-F	65	7	--	--	9	9	1.8	0.58	-749	11.5	0.005	0.57	1.51	1.49
								3.3	0.61	-749	11.5	0.005	0.57		
								5.0	0.76	-749	11.5	0.005	0.57		
	SC-32S	70	7	--	--	9	9	1.8	1.22	-711	10.2	0.006	0.20	1.52	1.50
								3.3	1.53	-711	10.2	0.006	0.20		
								5.0	1.83	-711	10.2	0.006	0.20		
	SC-20S	70	7	--	--	9	10	1.8	-3.20	-721	10.3	0.010	0.18	1.52	1.50
								3.3	-2.66	-721	10.3	0.010	0.18		
								5.0	-2.29	-721	10.3	0.010	0.18		
	SC-16S	90	7	--	--	9	10	1.8	4.58	-491	5.5	0.010	0.20	1.52	1.50
								3.3	4.58	-491	5.5	0.010	0.20		
								5.0	4.58	-491	5.5	0.010	0.20		
	SC-12S	90	6	--	--	7	8	1.8	1.50	-899	10.0	0.007	0.13	1.51	1.49
								3.3	2.08	-899	10.0	0.007	0.13		
								5.0	2.84	-899	10.0	0.007	0.13		
Low CL2	SSP-T7-F	65	6	--	--	7	7	1.8	0.98	-411	6.3	0.002	1.13	1.51	1.49
								3.3	1.22	-411	6.3	0.002	1.13		
								5.0	1.37	-411	6.3	0.002	1.13		
	SC-32S	70	6	--	--	7	6	1.8	5.19	-444	6.3	0.002	0.25	1.52	1.50
								3.3	5.80	-444	6.3	0.002	0.25		
								5.0	6.41	-444	6.3	0.002	0.25		
	SC-20S	70	6	--	--	7	7	1.8	-5.71	-434	6.2	0.010	0.31	1.52	1.50
								3.3	-4.88	-434	6.2	0.010	0.31		
								5.0	-4.24	-434	6.2	0.010	0.31		
Low CL3	SSP-T7-F	65	3.7	--	--	3	2	1.8	3.54	-380	5.8	0.001	1.09	1.51	1.49
								3.3	4.21	-380	5.8	0.001	1.16		
								5.0	4.67	-380	5.8	0.001	1.20		
	SC-32S	70	4	--	--	3	3	1.8	-6.41	-368	5.3	0.001	0.45	1.52	1.50
								3.3	-4.88	-368	5.3	0.001	0.45		
								5.0	-4.58	-368	5.3	0.001	0.45		
	SC-20S	70	4	--	--	3	3	1.8	-3.11	-368	5.3	0.010	0.51	1.52	1.50
								3.3	-1.68	-368	5.3	0.010	0.51		
								5.0	-0.52	-368	5.3	0.010	0.51		

For other products, please contact us.

◆About circuit load capacitance



The oscillation circuit has stray capacitance.
The CL value is set considering stray capacitance.
CL = Cg×Cd / (Cg + Cd) + Cs (pF)

Cs≒Circuit stray capacitance
What is floating capacity?
Cos : 32kHz_IN-32kHz_OUT Stray capacitance
Cgs : 32kHz_IN-Vss Stray capacitance
Cds : 32kHz_OUT-Vss Stray capacitance

◆Circuit board design considerations

Place the crystal unit, capacitors, and resistors as close to the Chip as possible to shorten the wiring.
To prevent interference with other signal lines, do not place other signal lines in the area where the crystal unit is mounted (underside).
The oscillation circuit design is described on our website.
In addition, please use our circuit matching service. For details, please contact our sales representatives or visit our website.

◆Caution

The above evaluation results are reference values evaluated on specific samples and "IC manufacturer's evaluation board",
They are subject to change depending on the customer's board design.
Please note that the capacitance values and characteristics of external elements may vary depending on differences in stray capacitance and other factors in actual circuit boards.

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