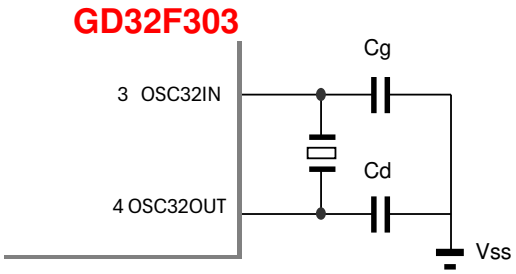
Giga Device semiconductor GD32F303 Series Matching Data Details

◆Evaluation items and evaluation data of oscillation circuit characteristics

・Circuit Diagram



Evaluation item

No	Item	Symbol	Recommended conditions
1	Frequency	⊿f/f	reference data
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	Must be within product specifications.

To ensure safe use by our customers,

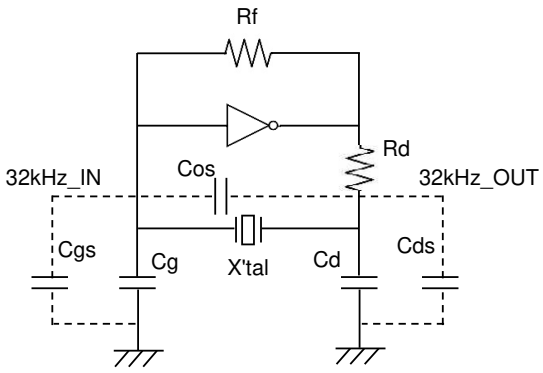
We recommend an oscillation margin of 5 times or more.

・Product and recommended circuit constants

IC Type	Mode	32kHz Crystal Unit			external element		Oscillation characteristics			
		Product name	R1Max. (kΩ)	CL (pF)	Cg (pF)	Cd (pF)	⊿f/f (ppm)	RL (kΩ)	M (times)	DL (μW)
GD32F303	Idle	SSP-T7-F	65	12.5	18	18	-1.16	-764	11.8	0.09
	Sleep			12.5	18	18	-1.16	-764	11.8	0.09
	Deep-sleep			12.5	18	18	-1.16	-764	11.8	0.09
	Standby			12.5	18	18	-1.16	-764	11.8	0.09
	Idle	SC-32S	70	12.5	18	18	1.89	-780	11.1	0.10
	Sleep			12.5	18	18	1.89	-780	11.1	0.10
	Deep-sleep			12.5	18	18	1.89	-780	11.1	0.10
	Standby			12.5	18	18	1.89	-780	11.1	0.10
	Idle	SC-20S	70	12.5	20	20	-0.24	-663	9.5	0.09
	Sleep			12.5	20	20	-0.24	-663	9.5	0.09
	Deep-sleep			12.5	20	20	-0.24	-663	9.5	0.09
	Standby			12.5	20	20	-0.24	-663	9.5	0.09
	Idle	SC-16S	90	12.5	20	22	2.47	-607	6.7	0.09
	Sleep			12.5	20	22	2.47	-607	6.7	0.09
	Deep-sleep			12.5	20	22	2.47	-607	6.7	0.09
	Standby			12.5	20	22	2.47	-607	6.7	0.09

Please contact us for other products not listed above.

◆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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