

Application Note

Suitable circuit conditions for Murata's crystal Unit on STMicroelectronics ST21NFCA and ST21NFCB



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Purpose of this application note

For the customer who is trying to embed NFC function by ST21NFCA and ST21NFCB (released by STMicroelectronics), Murata will provide information of

1. Suitable crystal part number by Murata
2. Optimized circuit conditions for oscillation circuit
3. Oscillation characteristics

to save customer's time and resources for evaluation above.

* ST21NFCA has been released, and it is able to use 27.12MHz Xtal as reference clock. Oscillation characteristics in this document is confirmed by existed ST21NFCA, and those results are effective after update of the IC as oscillator portion in the IC is same.

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- 1. Murata's Crystal Unit for ST21NFCA**
- 2. Optimized circuit conditions**
- 3. Oscillation characteristics**

1. Crystal part number for ST21NFCA

XRCGB27M120F2P10R0

Spec. of muRata's crystal

Parameter	Spec. of Murata's crystal
Size [mm] (L x W x H)	2.0 x 1.6 x 0.7
Frequency tolerance [ppm]	+/-20
Frequency drift over temp [ppm] (-30 to 85deg.C)	+/-20
ESR [ohm] (*2)	80 max
Load cap [pF] (*3)	10
Drive level [uW] (*4)	300 max

(*2): Equivalent Series Resistance. Resistance of the crystal.

(*3): Specified capacitance for frequency sorting on crystal.

(*4): Withstand-ability for how high power the crystal can use by.

Refer oscillation characteristics data for actual power consumption on crystal.

Murata confirmed crystal above can be used with ST21NFCA and ST21NFCB.

2. Optimized circuit conditions

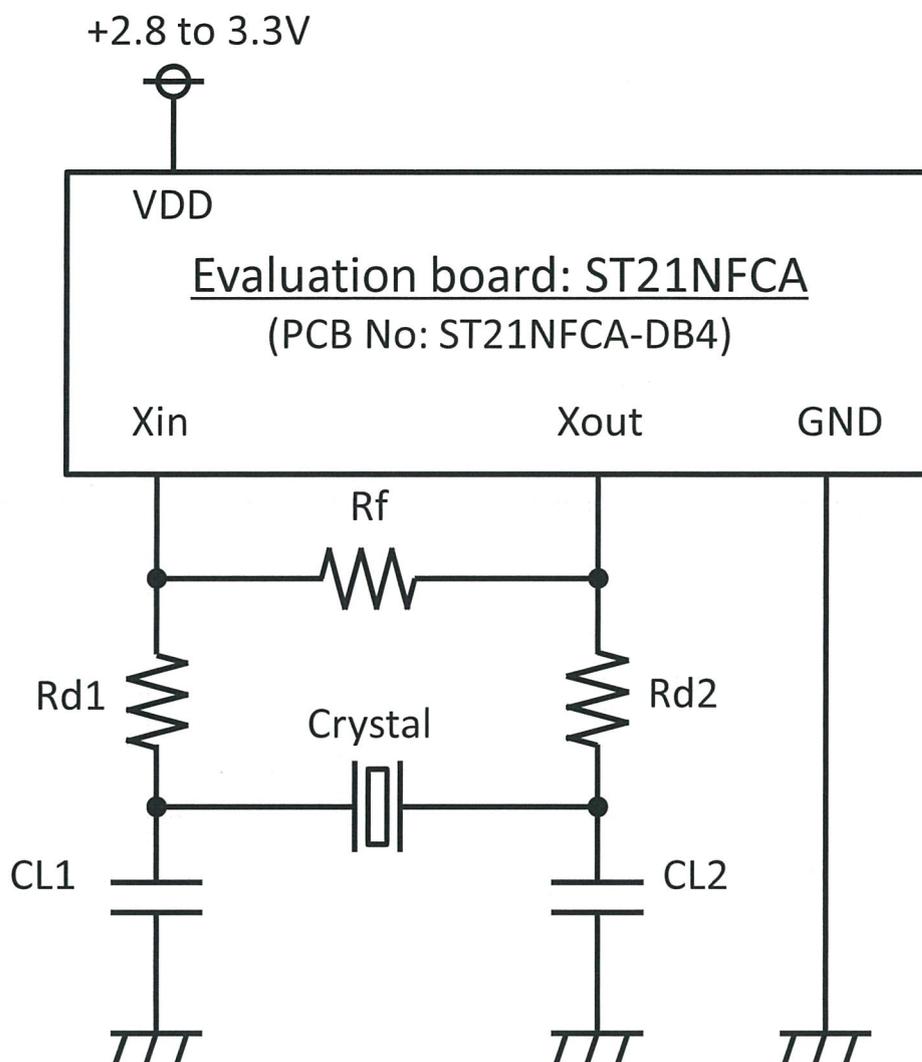


Figure of oscillation circuit

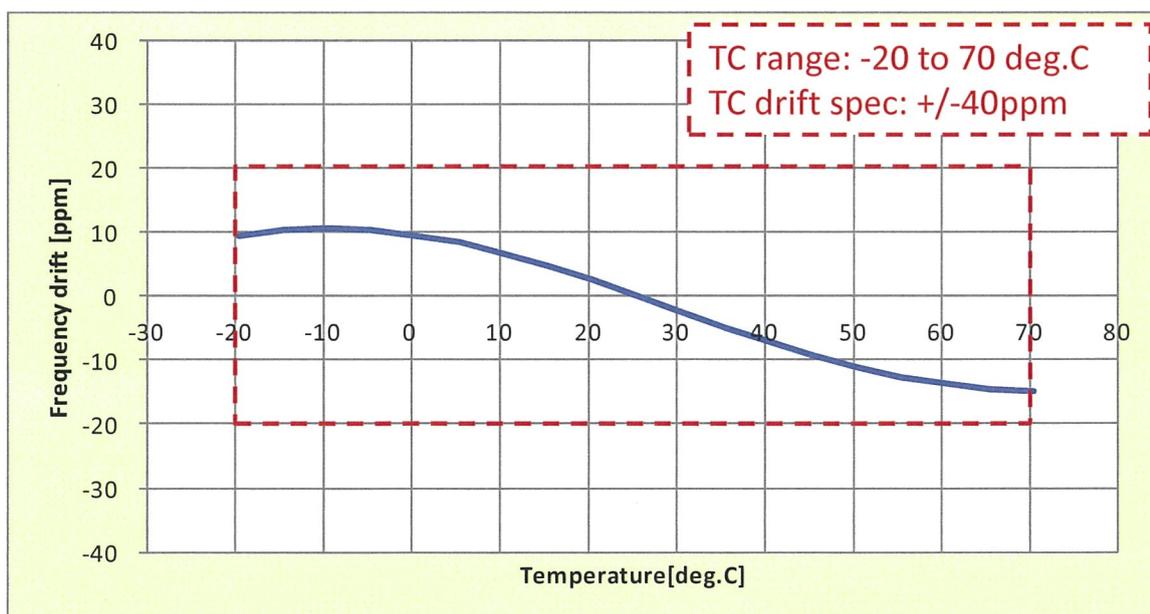
Symbol	Parameter	Optimized value
Rf	Feedback resistor [ohm]	No mount
Rd1	Damping resistor at Xin [ohm]	0
Rd2	Damping resistor at Xout [ohm]	0
CL1	External capacitance [pF]	10
CL2	External capacitance [pF]	10

3. Oscillation characteristics

Measured oscillation characteristics

Parameter	Measured results
Oscillation margin	5.1 [times]
Drive level	135 [μ W]
Actual load capacitance	10.2 [pF]
Nominal frequency shift (from 27.12MHz)	-1.2[ppm]
Frequency drift by temperature	See chart below

Measured frequency drift by temperature



All of above results have been measured on evaluation board of ST21NFCA (PCB: ST21NFCA-DB4) from STMicroelectronics, with optimized circuit conditions for XRCGB27M120F2P10R0.