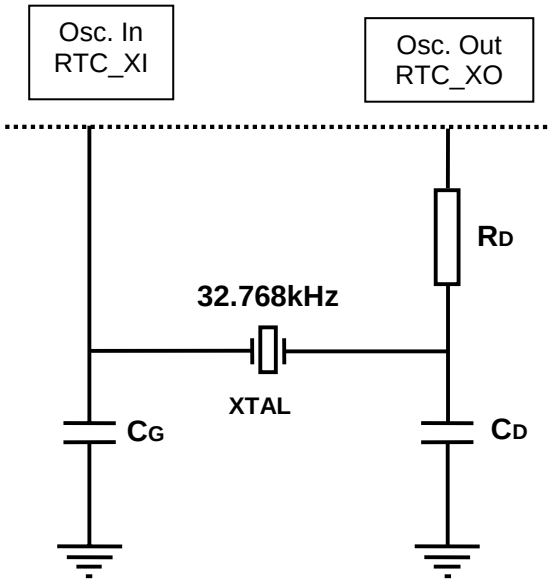
MICRO CRYSTAL SWITZERLAND

Pierce Oscillator

Design and Crystal Recommendation

SiRF GSC3f-Family

SiRF GSC3f



Results Oscillator Design check		Units
RTC Supply Voltage V_{DDRTC}	*1.5*	*[Volt]*
Load capacitor (each)	*27 / 22*	*[pF]*
Serial Resistor R_D	*47*	*[kOhm]*
Effective load-capacitance	**12.48**	**[pF]**
Oscillation allowance	**380**	**[kOhm]**
Oscillator Output voltage	**274**	**[mVrms]**
Drive level	**0.110**	**[microW]**
Start-up time	**600**	**[ms]**
R_D resistor for safe overtone-supppression	**47**	**[kOhm]**

Design - Crystal recommendation		Units
Crystal XTAL	**CC7V-T1A**	
Frequency	**32.768**	**[kHz]**
C_L	**12.5**	**[pF]**
Tolerance	**+/-20**	**[ppm]**
R_D	**47**	**[kOhm]**
C_D	**27**	**[pF]**
C_G	**22**	**[pF]**

Remarks:

This is a self-limiting Pierce Oscillator.
The R_D serial-resistor of 47kOhm is needed in order to safely suppress the crystal's overtone-mode.
A R_F feedback-resistor of 5MOhm is integrated into the chipset.
Placing two load-capacitors, C_D 27pF and C_G 22pF on each side of the crystal will result in an "effective load-capacitance" of 12.48pF (incl. the board's stray-capacitance). This is a perfect match for a crystal specified for CL: 12.5pF.
The recommended oscillator-circuitry provides an "oscillation allowance" of 380kOhm which allows the safe use of small quartz-crystals with ESR up to 75kOhm typical.

- All crystal constraints are based on reasonable pad-layout and trace-length.

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