Application Hint 31

Ceramic Resonators for the MICRF001

by Tom Yestresbsky

Ceramic Resonators and Series Resistance

An on-board oscillator within the MICRF001, together with an externally connected resonator or clock signal, establishes the operating frequency of the MICRF001. When using a resonator (ceramic resonator or crystal), its series resistance should be minimized to the extent possible, to ensure oscillation. In case where the resonator series resistance is too great, the oscillator may oscillate at a diminished peak-to-peak level, or may fail to oscillate entirely. Micrel recommends that series resistances for ceramic resonators and crystals not exceed 50Ω and 100Ω, respectively.

Ceramic Resonators Availability

A family of ceramic resonators, manufactured by Murata Electronics, and providing low series resistance, has been characterized with the MICRF001 in SWP mode. These standard values (shown in the table below) provide a convenient solution for many common frequencies worldwide. Sample quantities of these standard values are stocked by Murata Electronics for rapid-protyping purposes (www.murata.com). Murata can also provide resonators for custom frequencies and high-volume applications.

Murata Part Number (Leaded Package)	Ref. Freq. f_T	TX Freq. f_{TX}
CSA2.44MG05051	2.44MHz	315MHz
CSA3.00MG05051	3.00MHz	387MHz
CSA3.02MG05051	3.02MHz	390MHz
CSA3.07MG05051	3.07MHz	396MHz
CSA3.21MG05051	3.21MHz	414MHz
CSA3.24MG05051	3.24MHz	418MHz
CSA3.31MG05051	3.31MHz	427MHz
CSA3.36MG05051	3.36MHz	433.9MHz

Murata Part Number (Surface-Mount Package)	Ref. Freq. f_T	TX Freq. f_{TX}
CSAC2.44MGC05051-TC	2.44MHz	315MHz
CSAC3.00MGC05051-TC	3.00MHz	387MHz
CSAC3.02MGC05051-TC	3.02MHz	390MHz
CSAC3.07MGC05051-TC	3.07MHz	396MHz
CSAC3.21MGC05051-TC	3.21MHz	414MHz
CSAC3.24MGC05051-TC	3.24MHz	418MHz
CSAC3.31MGC05051-TC	3.31MHz	427MHz
CSAC3.36MGC05051-TC	3.36MHz	433.9MHz

MICREL INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA

TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB http://www.micrel.com