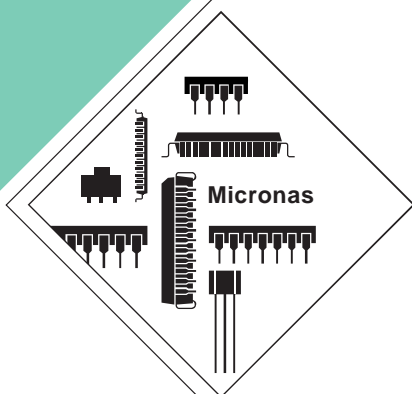


APPLICATION NOTE IC

# MSP 34xx Family Recommendations for Applications with Intercarrier IF-Signals



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## Recommendations for Applications with Inter-carrier IF-Signals

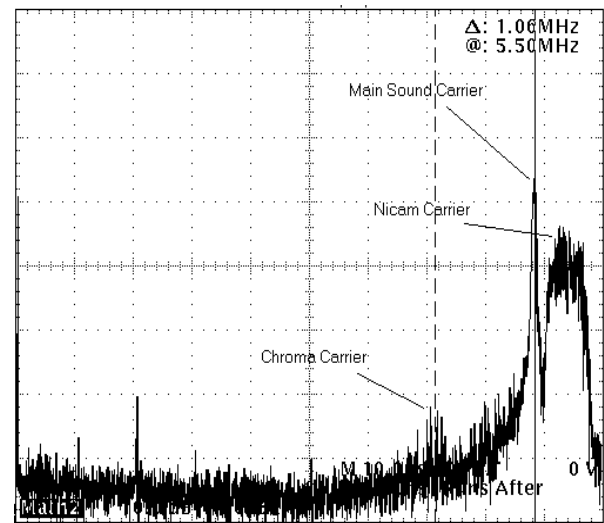
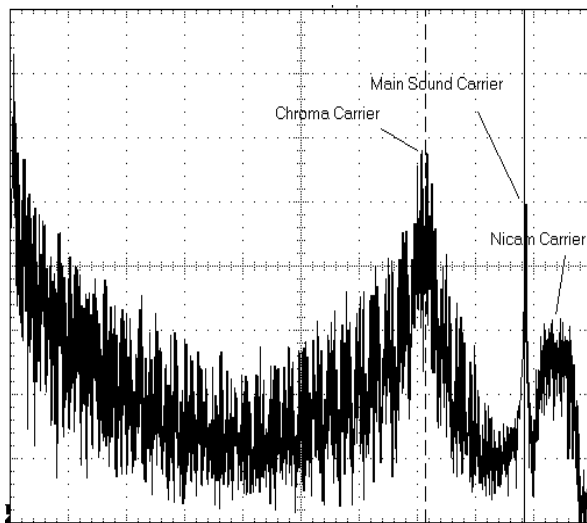
In order to avoid clipping effects at the IF-A/D converter of the MSP, the video, chroma, and sync signal components, which are included in the inter-carrier sound-IF-signal (see Fig. 1, left), should not exceed 300 mVpp at the ANA\_IN1/2+ MSP IF-input. Such clipping can cause a high NICAM error rate and loss of SNR performance with FM signals.

### Basic Recommendations

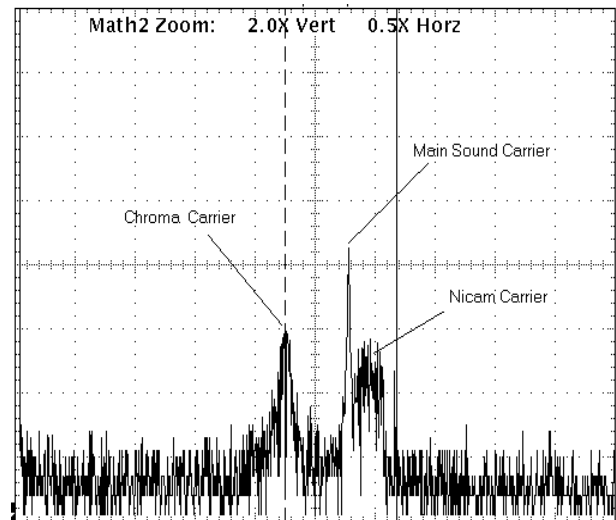
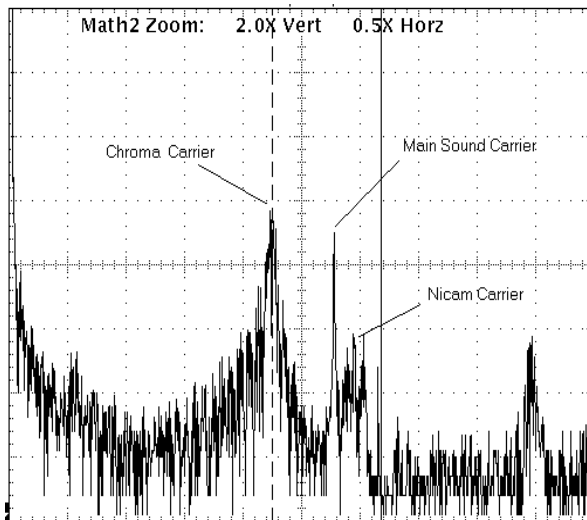
1. If an inter-carrier IF-input signal is used (see Fig. 1, left) for the IF-input of the MSP family, it is recommended to use a simple IF-amplifier and a band-pass- or highpass-filter in front of the MSP IF-input to attenuate the video, chroma, and sync signal components.
2. For the European market, a bandpass ranging from 5.3 MHz to 6.7 MHz should be used to eliminate the video and chroma signal components.
3. For the M-standards, a bandpass ranging from 4.3 MHz to 4.7 MHz is recommended. Instead of a bandpass filter, a highpass filter at 5.3 MHz (or at 4.3 MHz for standard M) can also be used.
4. Due to the filter loss and additional tolerances of the sound carrier (normally 100 mVpp with a 1 Vpp inter-carrier signal), an analog gain of about +9 dB or more is required as well. Tests have shown that the filter attenuation at the chroma carrier frequency should be about –12 dB or more relative to the main sound carrier.
5. The filtered IF-signal (sound carrier) at the MSP input should have a minimum level of 100 mVpp.
6. For standard NICAM-L, with a 6.5 MHz AM sound-carrier, a Quasi Split Sound (QSS) IF-Demodulator is recommended to avoid loss of AM-performance caused by the video and chroma signal components.

### Examples for Bandpass Filter Circuits

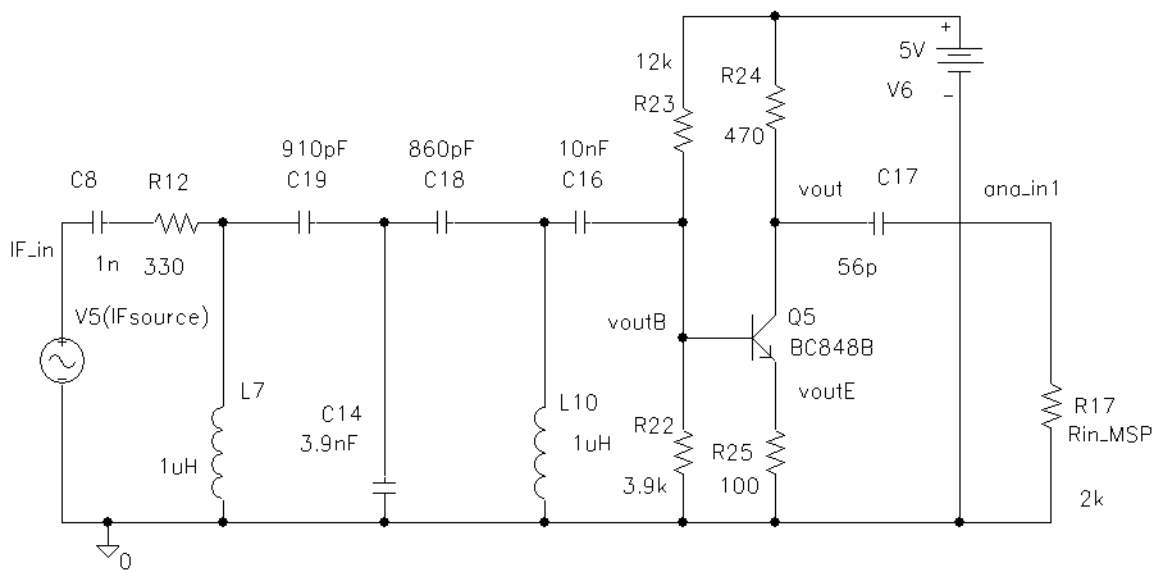
The diagrams on the following pages show examples for the IF-spectrum, for the circuit, and the frequency characteristic of such bandpass filters.



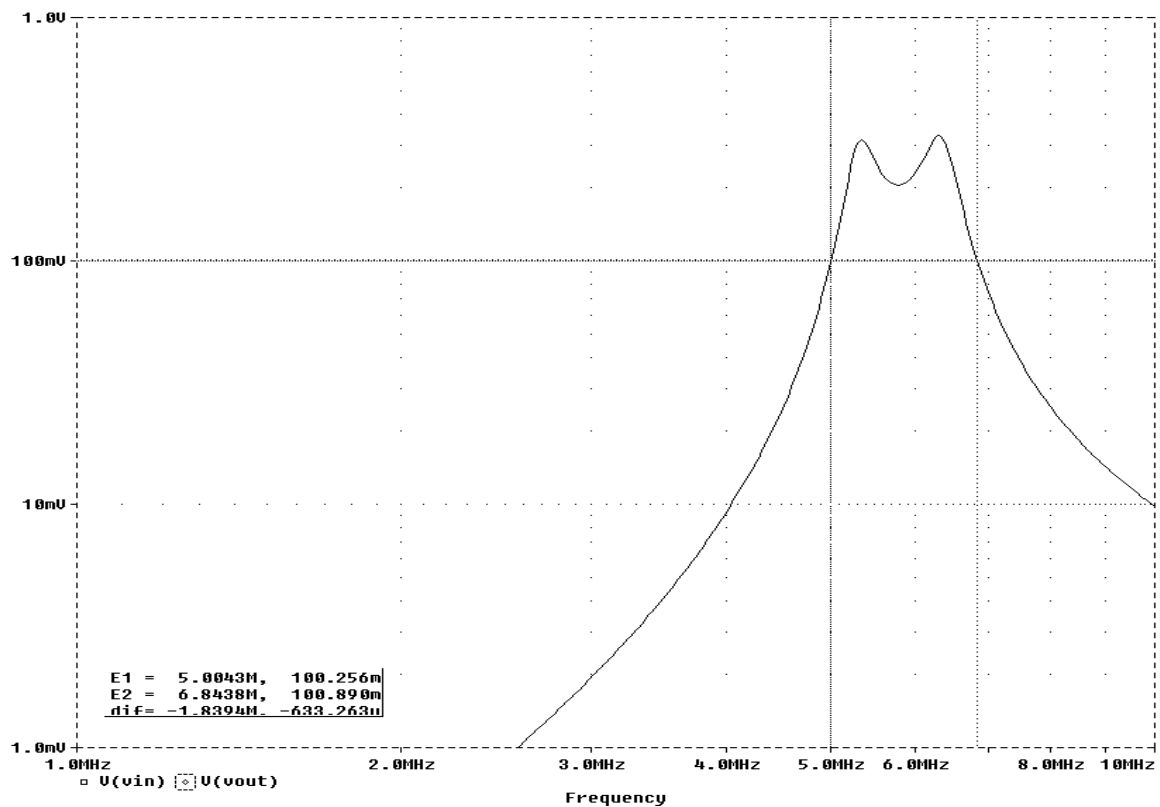
**Fig. 1:** Spectrum of typical intercarrier IF-signal (left) and Quasi Split Sound (QSS) IF (right) for PAL, NICAM B/G



**Fig. 2:** Measured input-spectrum (left) and output-spectrum (right) with the bandpass for the European Market (PAL, NICAM B/G)



**Fig. 3:** Bandpass filter circuit for the European Market



**Fig. 4:** Bandpass characteristic for the European Market

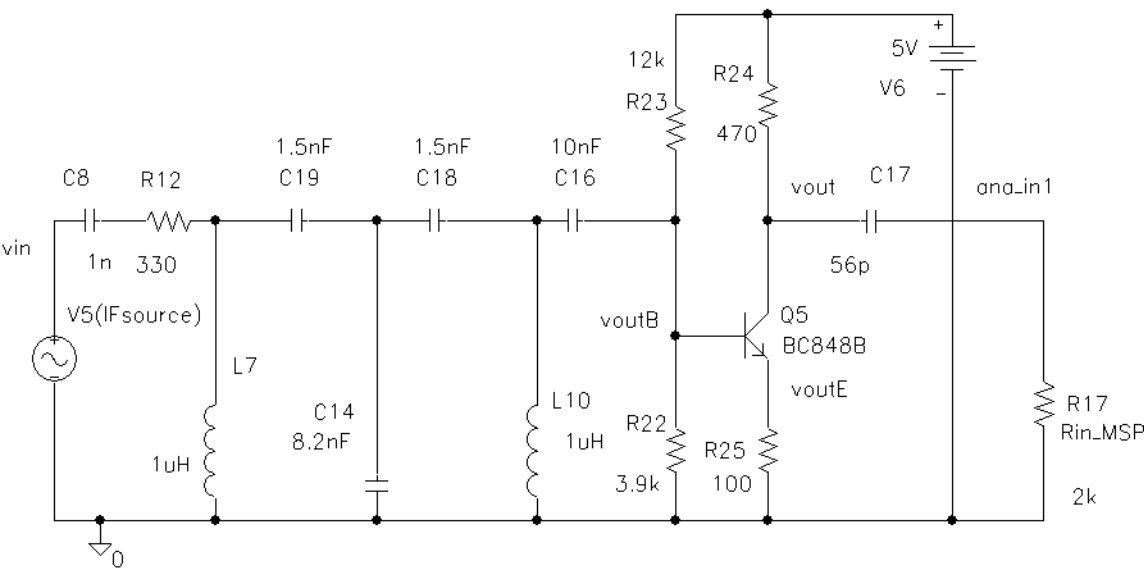


Fig. 5: Bandpass filter circuit for standard-M

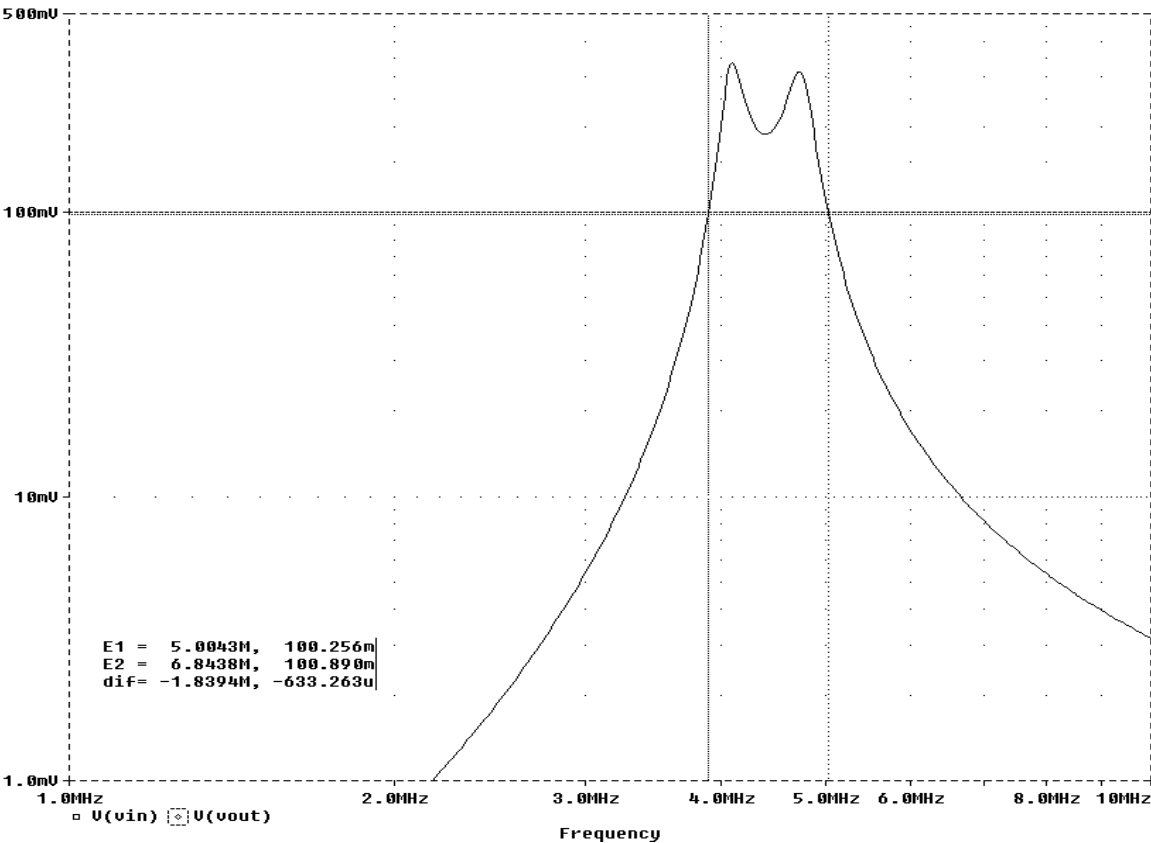


Fig. 6: Bandpass characteristic for standard-M



## 1. Application Note History

1. Application Note IC: "MSP 34xx Family Recommendations for Applications with Intercarrier IF-Signals", March 15, 2000, 6251-495-2AN. First release of the application note IC.

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