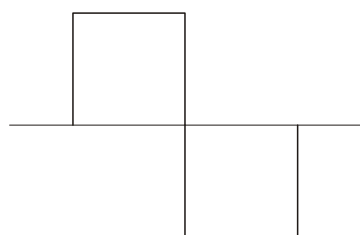


Introduction

In order to achieve maximum fidelity/performance in an audio system, the loudspeakers and the amplifiers must be able to accurately reproduce peaks in the order of 12dB above the expected RMS levels. Over the last few years, loudspeaker manufacturers have been developing products that meet these criteria. It is especially important in high power PA systems, where the number of boxes needs to be kept to a minimum.

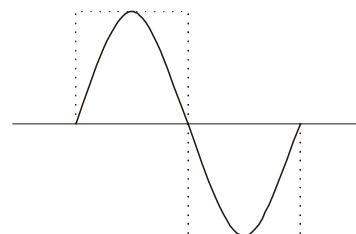
Defining Crest Factor

The Crest Factor of a waveform is defined as the ratio of the peak amplitude level divided by the RMS signal level. As such, it is a dimensionless value, but can be expressed in audio applications in decibels (dB).



The minimum possible Crest Factor has a value of 1, where the peak amplitude is the same as the RMS amplitude. This is the CF of a square wave (assuming this swings symmetrically about zero Volts).

A pure sine wave, also swinging symmetrically about zero of the same peak amplitude will have a CF of 1.414 as the RMS value is now $(\sqrt{2})/2$ so we have $CF = 1/((\sqrt{2})/2) = 1.414$.



Determining Power Requirements

MC² have developed the E-series of amplifiers to match the power requirements of these loudspeakers. They will deliver huge amounts of peak power, but automatically reduce (limit) the power if the CF of the signal goes too low.

This reduces the heat generated within the amplifier and keeps the mains power draw to an acceptable level. It also helps to protect the loudspeakers which could suffer serious damage for the same reason.

When specifying a system, it is important to not only know the dynamic performance and limits of the loudspeakers and the amplifiers, but also the expected signal type to be used. Please bear in mind that any signal source that has a lot of constant tones (CF between 3.0 and 1.5) will require twice as much available power than a typically 'heavy' dynamic music signal (CF between 3.0 and 5.0), and about ten times the power of a system mainly used for speech and 'light' music.

Written by Terry Clark 20/01/2012

Please also see associated technical notes:

Amplifier Power Measurement
Dynamic Amplifier Behaviour

available from our website at www.mc2-audio.co.uk