

Fig. 2. Acoustic emission signals collected with 1200 °C soldering temperature and 75% flux concentration: (a) real-time amplitude signals, (b) frequency spectrum.

sion signals set at 50 dB. Figure 2 shows a typical AE waveform and frequency spectrum for each dominant peak during soldering. The average amplitude of an AE dominant peak for hits in the heating period was from 55 to 65 dB. The acoustic activities in this period mainly resulted from the alternating frequency of the heating source, as well as electrical noise caused by the sudden onset of the induction current as the heating power switched on.

To reveal information about microfractures as well as deformation, indices such as maximum amplitude,

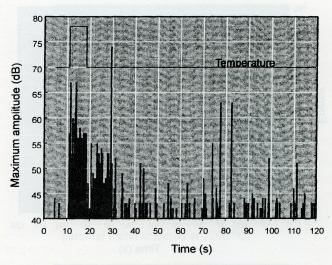


Fig. 3. Acoustic emission peak-amplitude signals for a 1200 °C group with pure powder flux during the soldering period.

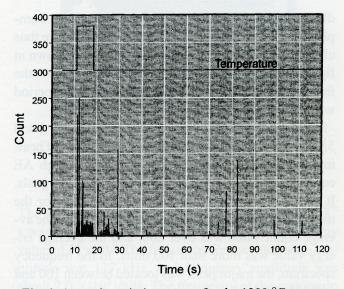


Fig. 4. Acoustic emission counts for the 1200 °C group with pure powder flux during the soldering period.

AE counts, and AE energy for hits during soldering with pure flux powder at 1200 C are shown in figures 3, 4, and 5. In this part of the experiment, the threshold for AE amplitude was set at 43 dB to accommodate a wide range of acoustic activities during the soldering procedure.

Before the heating period, the maximum AE amplitude of the background noise hits was about 43-45