

The current waveform of the current conducted transversely through the phone, when one side of the line breaks down, is as shown in Figure 2.7-3. This waveshape caused similar damage to the audio IC compared with field damaged ICs.

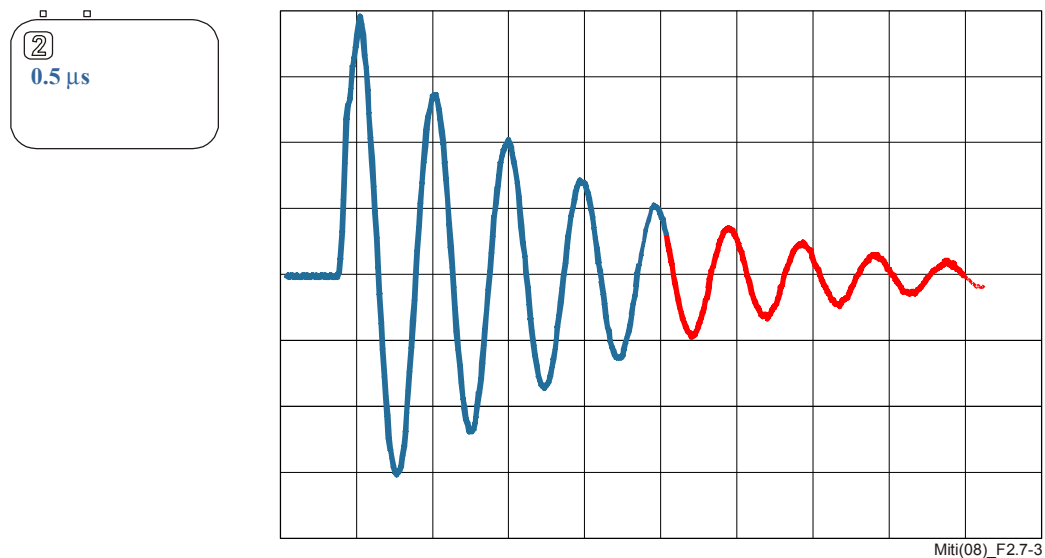


Figure 2.7-3 – Current waveshape entering the phone to replicate field damage

Increasing the resistibility of the phone

To "harden" the phone against damage, the current path from the line into the IC was identified from knowing the entry pins on the IC. The circuit was redesigned to minimize inductance of SPD lead lengths and components added to minimize the amount of current which could enter the IC. The inherent resistibility of the phone was increased fourfold from approximately 200 A to 800 A. Hardening the phone to this level eliminated damage to the phone, saving millions of dollars in maintenance per annum.

Unfortunately, while damage was no longer occurring, customers began complaining about stored number loss. Stored number loss was replicated by using the waveshape above but with a very high frequency oscillation added to the first half cycle.