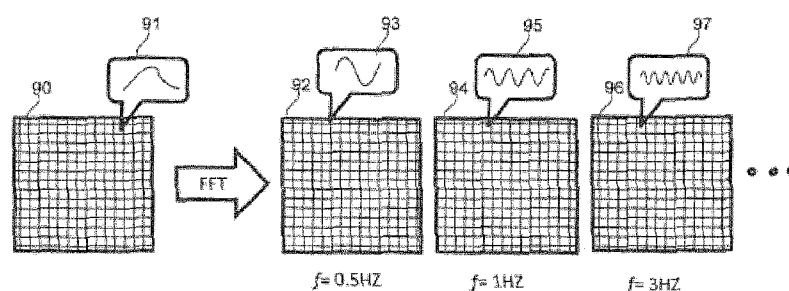




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(54) **Title:** LOCK-IN THERMOGRAPHY METHOD AND SYSTEM FOR HOT SPOT LOCALIZATION



**Fig. 9**

(57) **Abstract:** A method for localizing a hot spot (27) in a sample (12), in particular an encapsulated device under test (DUT), by using lock-in thermography (LIT), where at least one heat source (23) of an electrical circuit is buried within the sample (12) and generated the hot spot (27) upon flow of current therein, comprises applying a non-harmonic excitation wave test signal at a lock-in frequency to the electrical circuit of the sample (12) to activate the heat source (23) for generating the hot spot (27); imaging the sample (12) using an infrared sensor (16) to obtain IR images of the sample (12) while the non-harmonic test signal is applied to the electrical circuit; and detecting a thermal response signal obtained from the imaging, the thermal response signal being in correlation to the thermal heat propagation within the sample (12). The invention is characterized in that applying the non-harmonic test signal comprises applying a non-harmonic signal at a single selected frequency; that the thermal response signal is subjected to a Fourier transformation (FT) to break down the thermal response signal into a frequency spectrum containing harmonics signals of a base and higher harmonic signals to thereby obtain a plurality of frequency-specific response signals at multiple specific frequencies; that the phase shifts of each of the frequency-specific response signals is determined; that a frequency vs. phase shift curve is obtained from the phase shifts of the frequency-specific response signals; and that a plurality of images, each corresponding to one of the specific frequencies are displayed.