

Description

The invention relates to an electric circuit assembly comprising a network of printed conductors on a wiring board and circuit components which are interconnected through the printed conductors.

It is known to provide printed circuits or conductors on printed circuit boards, to insert circuit components into holes in the boards, and to connect the various parts of the circuit at the connection places, for example by soldering, in particular by immersing in a solder bath. The material of the printed circuit boards is usually a glass fibre-reinforced polyester resin which satisfies the imposed requirements as regards thickness and rigidity.

It has been found that the properties of the electric circuits built up in the above-described manner can vary when the moisture content of the ambient air varies. This relates in particular to variations in the oscillator frequency of oscillator circuits, for example, those present in, for example, U.H.F. tuners. The most critical point proves to be the top of the oscillator resonant circuit. It has been found that the stray capacitance of the printed circuit board at this point varies under the influence of moisture and causes variations in the oscillator frequency.

The invention provides a particularly simple and effective solution to reduce this problem.

For that purpose, an electric circuit assembly of the type described in the opening paragraph is characterized in that the wiring board has an opening in which an apertured member of an electrically insulating and moisture impermeable material is fitted, and that a number of the circuit components are electrically interconnected by their connection leads disposed together in the aperture of the member.

Providing an apertured member (for example a small ring) of a moisture impermeable material (synthetic resins, for example polytetrafluoroethylene, are very suitable for this purpose) in printed wiring boards and inserting into the aperture and soldering together the connections of certain circuit components has for its result that the stray capacitance in that place in the circuit varies considerably less under the influence of varying moisture contents of the ambience. In the case of an oscillator circuit the oscillation frequency thus varies much less, in a given case 70% less.

An embodiment of the device according to the invention will be described in greater detail with reference to the drawing, in which:

Figure 1 is a plan view of a printed circuit assembly comprising a printed wiring board;

Figure 2 is a cross-sectional view through the printed wiring board of Figure 1 taken on the line II—II, and

Figure 3 shows a circuit diagram of an oscillator circuit.

A supporting plate 1 (printed wiring board) of electrically insulating material has an opening 2.

A body 3 of a moisture impermeable material which can withstand the soldering temperature, for example polytetrafluoroethylene, is pressed into said opening 2. Member 3, the shape of which is not critical—it may, for example, be square—but which for practical reasons is shown as a ring in the drawing, has an aperture 4. Supporting plate 1 has a network of conductors 5, for example, of (etched out) copper. A number of circuit components, *inter alia* a transistor 6, a varicap diode 7 and two inductors 8, 9, are interconnected through network of conductors 5. The components 6, 7, 8, 9 have connections extending in the aperture 4 of the member 3 and are electrically interconnected there. The variations of the oscillation frequency of the oscillator circuit of which these components form part (see Figure 3) prove to be considerably less in a test, in a given case 70% less, than the variations of the oscillator frequency of the same circuit but provided on a supporting plate without an opening, in which at the location of the member 3 a portion of the network of conductors was present to which the connections of the components 6, 7, 8, 9 were soldered.

Providing a moisture impermeable member into a printed wiring board presents advantages not only in oscillator circuits but also in non-oscillator circuits which have a moisture-sensitive place. An advantage not yet mentioned is that by providing such a member in a critical place in the printed wiring board the supporting plate may without any objections be manufactured from a material which does not satisfy the requirement of moisture impermeability, for example, a paper-based laminate. Without the invention it would be necessary to manufacture the complete supporting plate from a moisture impermeable material in order to obtain a comparable effect, which has a cost price-increasing effect.

Claims

1. An electric circuit assembly comprising a network of printed conductors on a wiring board and circuit components which are interconnected through the printed conductors, characterized in that the wiring board has an opening in which an apertured member of an electrically insulating and moisture impermeable material is fitted, and that a number of the circuit components are electrically interconnected by their connection leads disposed together in the aperture of the member.

2. An assembly as claimed in Claim 1, characterized in that the member is formed from a minimum moisture-absorbing, solder-resistant synthetic resin.

3. An assembly as claimed in Claim 2, characterized in that the synthetic resin is polytetrafluoroethylene.

4. An assembly as claimed in Claim 1, 2 or 3, characterized in that the electric circuit is an oscillator circuit.

5. An assembly as claimed in Claim 4, charac-

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terized in that the oscillator circuit comprises a transistor, a varicap diode and two inductors, the collector connection lead of the transistor and the connection leads of the varicap diode and of the inductors extending in the aperture of the member and being electrically interconnected.

6. A printed wiring board having an opening in which an apertured moisture impermeable member is fitted for an assembly as claimed in any of the Claims 1 to 5.

Patentansprüche

1. Elektrische Schaltungsanordnung mit einem Netzwerk aus gedruckten Leitern auf einer Leiterplatte und mit Schaltungselementen, die durch die gedruckten Leiter miteinander verbunden sind, dadurch gekennzeichnet, dass die Leiterplatte mit einer Oeffnung versehen ist, in der ein mit einer Bohrung versehener Körper aus elektrisch isolierendem und feuchtigkeitsbeständigem Material angeordnet ist und dass eine Anzahl der Schaltungselemente durch ihre Verbindungsdrähte, die in der Oeffnung des Körpers liegen, elektrisch miteinander verbunden sind.

2. Schaltungsanordnung nach Anspruch 1, dadurch gekennzeichnet, dass der Körper aus einem minimal feuchtaufnehmenden, lötbeständigen Kunststoff gebildet ist.

3. Schaltungsanordnung nach Anspruch 2, dadurch gekennzeichnet, dass der Kunststoff Polytetrafluoräthylen ist.

4. Schaltungsanordnung nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, dass die elektrische Schaltungsanordnung eine Oszillatorschaltung ist.

5. Schaltungsanordnung nach Anspruch 4, dadurch gekennzeichnet, dass die Oszillatorschaltung einen Transistor, eine Varikapdiode und zwei Induktivitäten aufweist, wobei der Kollektoranschluss des Transistors und die Anschlüsse der Varikapdiode und der Induk-

tivitäten sich in der Oeffnung des Körpers befinden und elektrisch miteinander verbunden sind.

6. Leiterplatte mit einer Oeffnung, in der ein mit einer Bohrung versehener, feuchtigkeitsbeständiger Körper befestigt ist für eine Schaltungsanordnung nach einem der Ansprüche 1 bis 5.

Revendications

1. Agencement de circuit électrique comprenant un réseau de conducteurs imprimés sur un panneau à câblage et des composants de circuit, qui sont interconnectés par les conducteurs imprimés, caractérisé en ce que le panneau de câblage présente une ouverture dans laquelle est fixé un corps perforé en matériau électro-isolant imperméable à l'humidité, et que plusieurs composants de circuit sont interconnectés par leurs conducteurs insérés ensemble dans l'ouverture de l'organe.

2. Arrangement selon la revendication 1, caractérisé en ce que le corps est formé en matière synthétique, résistant au soudage et absorbant l'humidité de façon minimale.

3. Arrangement selon la revendication 2, caractérisé en ce que la matière synthétique est polytétrafluoroéthylène.

4. Arrangement selon la revendication 1, 2 ou 3, caractérisé en ce que le circuit électrique est un circuit oscillateur.

5. Arrangement selon la revendication 4, caractérisé en ce que le circuit oscillateur comporte un transistor, une diode varicap et deux inducteurs, le conducteur de connexion de collecteur du transistor et les conducteurs de connexion de la diode varicap et des inducteurs s'étendant de l'ouverture du corps étant interconnectés.

6. Panneau à câblage imprimé présentant une ouverture dans laquelle est fixé un organe imperméable à l'humidité perforé pour un arrangement selon l'une des revendications 1 à 5.

