

Parmod VLT Inks for Membrane Switches

Parmod® VLT conductive inks and pastes enable the printing of membrane switch designs at high speed and low cost.

Parmod VLT is a mixture of metal powders with metallo organics formulated as an ink or paste for printing electronic interconnects.

Membrane Switches

are an enabling technology for miniaturization in many applications, such as:

- Mobile phones, cameras, PDAs and other hand-held consumer applications
- Control panels on consumer durables such as microwaves ovens and dishwashers
- Medical and industrial control instrumentation

The Benefits of Parmod VLT

Miniaturization

Due to the high conductivity of Parmod VLT, flex circuit designs with fine feature size are possible, enabling miniaturization of electronic devices.

Solderability

Membrane and flex circuits printed with Parmod VLT inks are solderable when applied to heat treated substrates or on PET with low temperature solders or conductive adhesives.

Lower Resistance Circuits

Typical membrane switches have closed loop resistances between 60 Ω - 150 Ω . With Parmod VLT silver ink, closed loop resistances of below 25 Ω can be achieved with the same circuit design.

Increased Life in Switch Applications

In momentary actuation switch testing, Parmod VLT silver ink has demonstrated up to five million actuations due to its greater impact resistance versus polymer thick film inks.

Lower Cost

Due to Parmod VLT's higher conductivity versus polymer thick film, less ink is required, thus lowering material cost.

No matter what the application, membrane switch performance is critical—it must be made from quality materials that offer both consistency and dependability.



How Do Membrane Switches Work?

A membrane switch is defined as a momentary switch device in which at least one contact is on, or made of, a flexible substrate. Conductive ink is printed onto a flexible substrate, such as polyester or polycarbonate, to form contacts. A dome, either pre-formed stainless steel or custom-formed on the substrate, is the working element in the switch. When force is applied, the top membrane or the dome deforms and closes the switch.

Membrane Switches and Parmod VLT Inks

When Parmod VLT images are heated to 135°C - 300°C, the ink consolidates into a “chemically welded” continuous phase. For membrane switches, Parmod VLT silver inks can be direct screen printed easily onto a variety of substrates such as print treated, heat stabilized polyester; polyethylene naphthalate or polyimide and thermally cured.

This means that components typically made by conventional “thick film” technology on ceramic substrates (which is based on metallurgical sintering at bright red heat) can now be made using Parmod VLT on polymeric substrates.

Parmod VLT
PRINTED ELECTRONICS

Parmod® VLT Inks for Membrane Switches

	Parmod® Silver	Parmod® Copper	Etched Copper	PTF	Thick Film
Process Type	Additive	Additive	Subtractive	Additive	Additive
Cure Temp. °C	125-200	260-320	N/A	125-140	>650
Resistivity, m-ohms/sq/mil	2	2.8	0.7	20-30	2
Substrate Solderability	Yes	Yes	Yes	No	Yes
Substrates	Polyester Modflex™ PEN Modflex™ PI	Modflex™ PI	Polyester Polyimide	Polyester	Alumina LTCC
Wet Processing Waste	No	No	Yes	No	No
Feature Size	4 mils	4 mils	3 mils	10 mils	3 mils

Parmod VLT inks and pastes out-perform the competition.

About Parelec

Parelec develops and markets Parmod® VLT inks and other innovative materials for the electronics industry. Parmod VLT can be printed onto paper or polyester substrates in high volume circuit applications with three to ten times greater performance than traditional polymer based metal inks. Parmod VLT inks provide solderable circuits when printed on high temperature substrates. Parmod VLT inks help create cost-effective, mass produced circuit components ranging from higher cost durable consumer devices, such as cellular phones, home electronics, appliances, automobiles and computers, to less expensive high volume disposable products, such as RFID smart labels, product identification tags, and intelligent packaging. Parelec's headquarters is in the high-tech corridor near Princeton, New Jersey. For more information visit www.parelec.com



5 Crescent Avenue • Building C • P.O. Box 236 • Rocky Hill, NJ 08553-0236
 P 609.279.0072 • F 609.252.1288 • www.parelec.com