

Parmod VLT Inks for RFID Antennae

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

Parmod VLT's patented family of materials includes one or more metal powders and a reactive metallo organic medium. It is formulated as an ink, paste or toner for printing electrically functional components such as conductors, resistors, capacitors and inductors.

Smarter Technology, Simpler Manufacturing

Parmod VLT is ideally suited for printing tomorrow's RFID antennae — today. With emerging RFID transponder applications demanding printed antenna technology, Parmod VLT is uniquely designed to combine the high conductivity of bulk metal with the simplicity of printing.

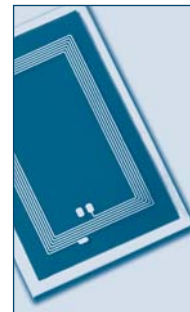
- Unique high conductivity makes other inks obsolete
- Formulated for high speed printing systems
- Compatible with chip attach, graphic printing
- Eliminates etching process, environmental wastes

Print It ... with Parmod VLT

Parmod VLT inks are printed with conventional graphics printing techniques such as web screen and roto-gravure, and are cured at low temperatures compatible with high volume, low cost printing environments. Parmod VLT is formulated for direct printing and high-speed drying onto low-cost polyester or paper substrates.

Parmod VLT silver inks are custom formulated and optimized for your specific application, substrate material and printing equipment requirements. Enabling roll-to-roll printing and curing of RFID antennae at today's high print speeds, Parmod VLT is ideally suited for the high volume, low cost manufacture of antennae for 13.56MHz, 915MHz and 2.45GHz applications.

No matter what the substrate, the antenna design is critical—it must be made from quality materials which offer both dependability and flawless readability.



Lowest Cost Path to RFID Implementation

Direct printing of RFID antennae with Parmod VLT enables you to define a continuous, fully integrated in-line dry chemistry manufacturing process to yield the inherently lowest cost RFID tag. High speed manufacturing allows you to print antennae and convert the RFID tags directly into labels, eliminating the added cost associated with constructing the tag on an interim substrate.

In a fully continuous production line, graphics can also be added as an in-line production step. High volume low cost printing and in-line processing deliver improved ROI for the printer and lower cost for the end user.

The Benefits of Parmod VLT

Lower Cost

Parmod VLT uses a totally dry process, eliminating the wastes and costs associated with subtractive etching. Due to its higher conductivity versus polymer thick film, less ink is required, lowering material costs.

Longer Read Distance

Due to its high conductivity, Parmod VLT produces RFID antennae with longer read distance than polymer thick film.

Lower Current Drain

Flex circuits and antennae printed with Parmod VLT inks are more conductive than polymer thick film inks, providing lower current drain and longer battery life in active circuit and label applications.

Parmod VLT
PRINTED ELECTRONICS

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Applications	Printing Process	Printing Speed	Print Thickness	Substrate	Cure Temperature	Cure Time	Resistivity, $\mu\Omega\text{-cm}$ (at 1 mil)	Attachment
Transponders - Smart labels and tickets	flat screen	40 FPM	0.2 - 1.2 mils	polyester	130C - 150C	2 - 5 minutes	5 - 15	conductive adhesive
				paper	150C - 180C	< 1 minute	10 - 15	conductive adhesive
	rotary screen	200 FPM	0.2 - 1.2 mils	polyester	130C - 150C	2 - 5 minutes	5 - 15	conductive adhesive
				paper	150C - 180C	< 1 minute	10 - 15	conductive adhesive
	gravure	400 FPM	0.1 - 1.2 mils	polyester	130C - 150C	< 1 minute	5 - 15	conductive adhesive
				paper	150C - 200C	< 1 minute	10 - 15	conductive adhesive
Transponders for Harsh Environments	flat screen	40 FPM	0.2 - 1.2 mils	Modflex™ polyimide	260C - 300C	5 minutes	3 - 5	reflow solder
Reader antennae	flat screen	40 FPM	0.2 - 1.2 mils	polyester	130C - 150C	2 - 5 minutes	5 - 15	conductive adhesive

Parmod VLT inks provide reliable, cost-effective solutions for RFID manufacturers.

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



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