

KOLEKTOR

ABSORBER SHEETS
for solving EMC and EMI problems

FLEXIBLE ELECTROMAGNETIC NOISE SUPPRESSION MATERIALS

Trends in the electronics and telecommunications industry are continuous increase of operating frequencies well into microwave region, interconnectivity, and increasing density of wireless systems. Consequently, the density of background electromagnetic waves in the electronic devices and surrounding is becoming a serious problem.

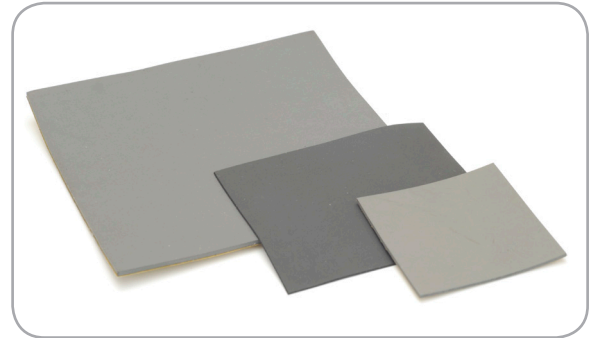
This brings additional challenges in the field of electromagnetic compatibility, electro-magnetic interference and health safety that demand new solutions - noise suppression sheets and absorber composites: passive components that interact with the electromagnetic waves and absorb high frequency EM noise.

Advantages:

- Miniaturization
- Multifunctionality
- Higher data transfer rate
- Wireless

Characteristics:

- Higher components density
- Higher operating frequency
- Higher background EM noise



KOLFLEX AND KOLTAG, EMC AND EMI PROBLEMS SOLUTION

For solving high frequency EMC and EMI problems, Kolektor offers a range of noise suppression materials KOLFLEX and KOLTAG. These materials are composites of flexible matrix and magnetic fillers that exhibit significant magnetic losses in a wide frequency range. They are especially suited for solving electromagnetic compatibility and electro-magnetic interferences problems in frequency range above 100MHz and operate by suppression of electromagnetic noise radiation, absorption of electromagnetic fields and suppression of conducted high frequency electromagnetic noise. In addition, sheet geometry, small thickness and flexibility enable easy application on diverse systems.

FEATURES

- Operating at frequencies above 100MHz
- Wide frequency range
- High electrical resistance
- Environmental resistance
- Light, thin and flexible
- Allows retrofitting



MATERIALS

	KOLFLEX				KOLTAG	
material name	FM1	FM3	FM8	FM9	FT1	
type	standard	insulating	high frequency	low frequency	RFID on metal	
application frequency range	100 MHz - 6 GHz	200 MHz - 10 GHz	300 MHz - 30 GHz	50 MHz - 5 GHz	125 kHz / 13,56 MHz	
surface resistivity (Ω)	$4 \cdot 10^5$	$1 \cdot 10^9$	$35 \cdot 10^6$	$1 \cdot 10^5$		
operating temperature	-40 °C to 120 °C				-40 °C to 120 °C	
thermal conductivity (W/mK)	0,3	0,3	0,5	0,6		
sheet dimensions (mm)	standard	100 x 100	100 x 100	100 x 100	100 x 100	sheets / pre-cut reel
	maximum	300 x 200	300 x 200	300 x 200	300 x 200	
standard sheet thickness (mm)	0,2 to 2	0,2 to 2	0,2 to 2	0,2 to 2	0,1 to 2	
density (g/cm ³)	3,1	3	4,2	4,5	3,5	
RoHS compliant	yes	yes	yes	yes	yes	

Product specification

FA FXX yyy/yyy 0ww 0x
 XX - material name
 yyy/yyy - dimensions in mm
 0ww - thickness (02 to 20)
 0x - with (01) or without (00) self-adhesive tape

Example

FA FM1 100/100 010-01
 FM1 material, dimension 100x100mm, 1mm thickness, self-adhesive tape

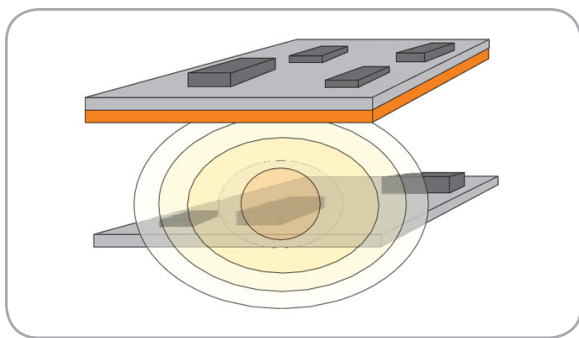
MODES OF OPERATION

- Absorption of electromagnetic field (increased dispersion of transmission lines, damping of Q factor)
- Change of characteristic impedance of elements and lines (reduced radiation properties of elements and lines, common-mode choke)
- Damping of currents due to magnetic field/absorber foil interaction
- Concentration of magnetic field and impedance buffer (RFID on metal)

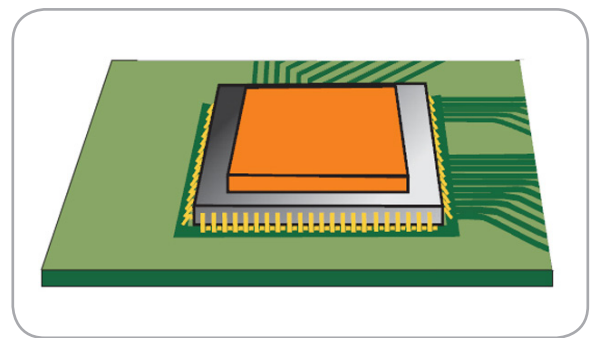
APPLICATIONS

- Reduction of crosstalk on or between printed circuit boards
- Reduction of coupling of transmission lines to incoming EM radiation
- Improvement of general EMC
- Attenuation of radiated noise in metal casing
- Suppression of parasitic currents in metal parts (casing, shields)
- Suppression of conducted electromagnetic noise on transmission lines
- Suppression of noise sources inside device
- enhancement of coupling between RFID elements near metal

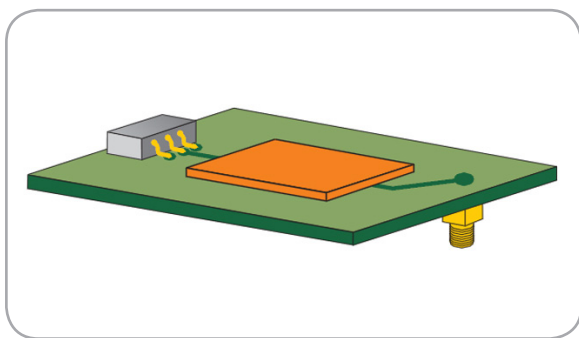
EXAMPLES OF APPLICATION



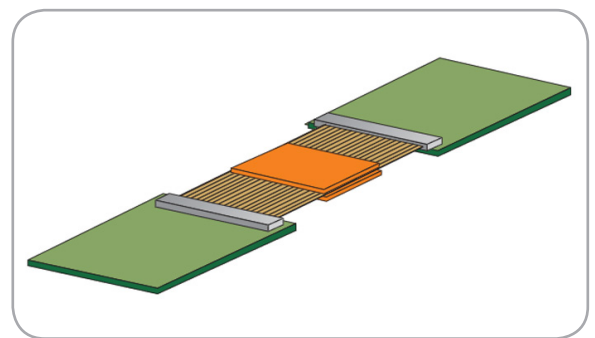
Between printed circuit boards



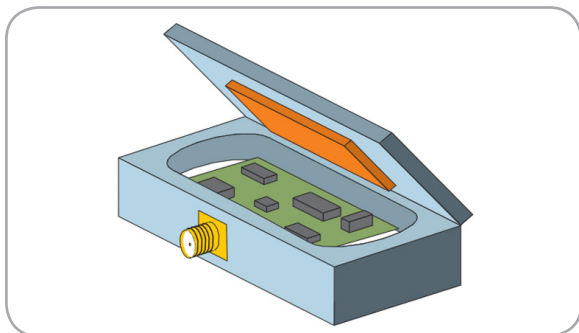
Application directly on source elements or susceptible elements



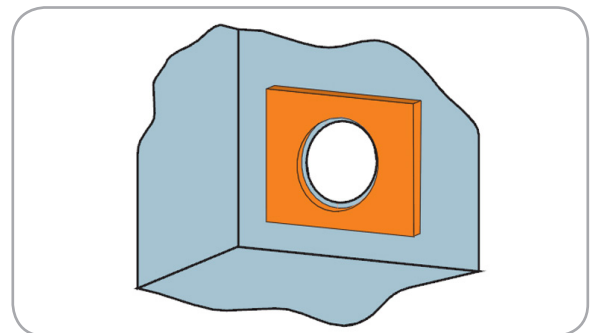
Application on high-frequency transmission lines



Application on flat cables

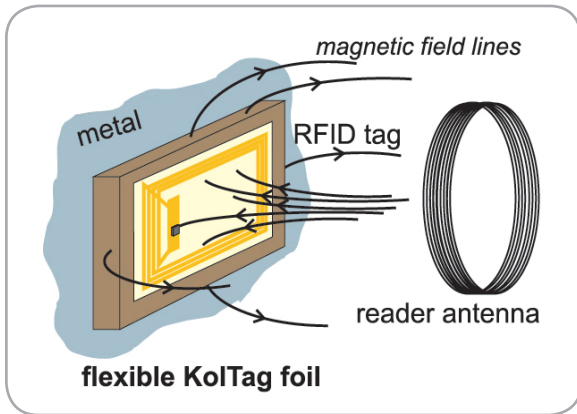


Application on inner wall of metal enclosure

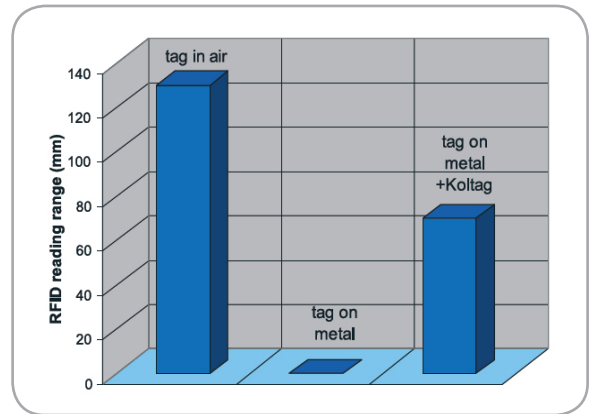


Application on metal surfaces and near openings

RFID SYSTEMS NEAR METAL



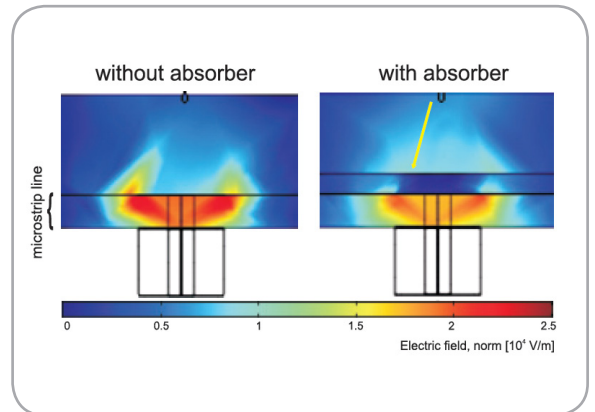
Application of KoltTag foil between RFID tag and metal object significantly improves performance.



Between printed circuit boards

NUMERICAL ANALYSIS AND OPTIMIZATION

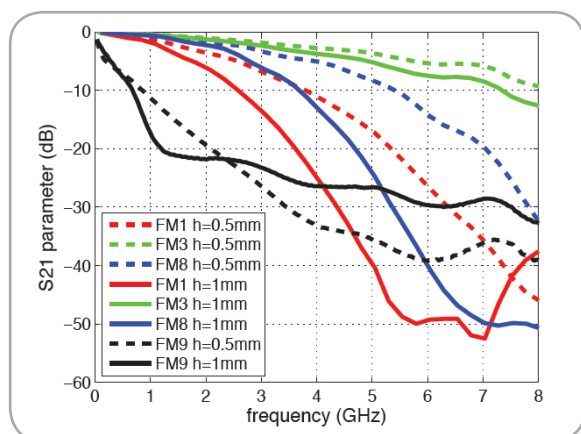
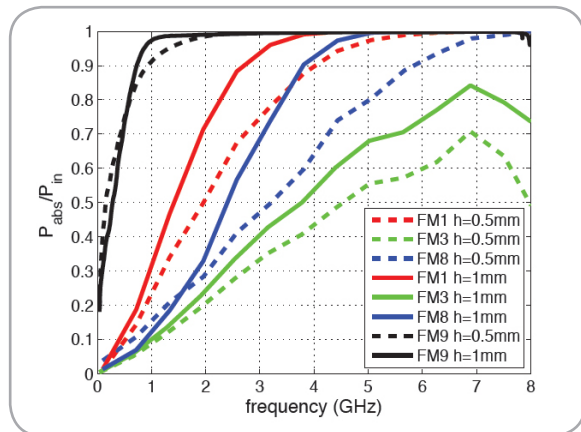
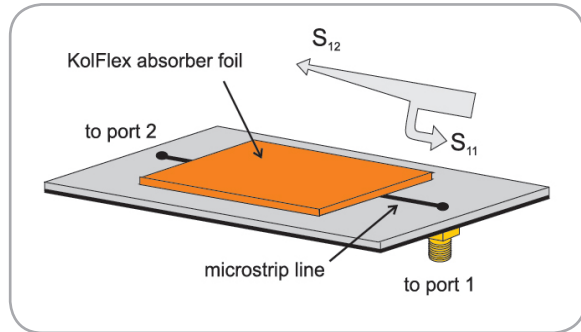
Numerical calculations show the interaction of an electromagnetic field and noise suppression materials. This allows better understanding of the effect in different applications and optimization of the materials for best performance. Figures on the left show interaction of the electric field with an absorbing material on a microstrip line.



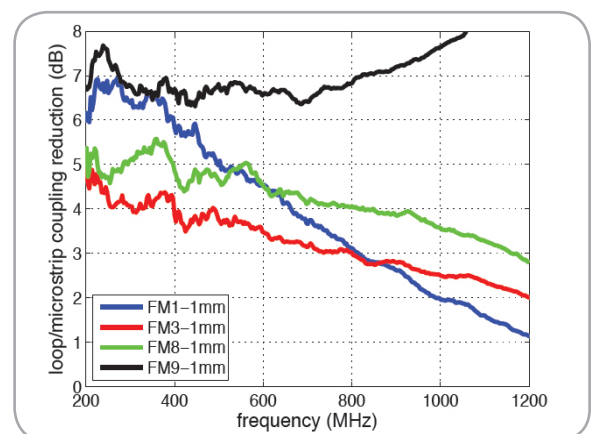
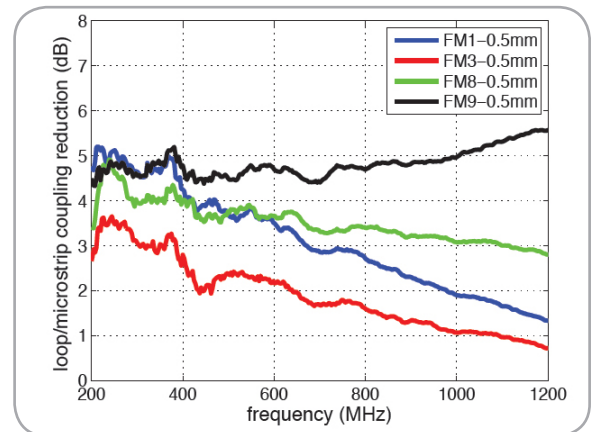
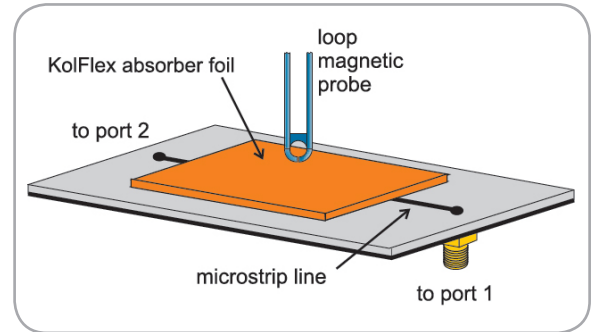
Application of KoltTag foil between RFID tag and metal object significantly improves performance.

MEASUREMENTS

- Measurement of the effect of KolFlex materials on conducted noise propagation



- Measurement of the effect of KolFlex materials on radiated noise coupling



The results of in-house measurements are shown for presentation only and are not guaranteed. Data may not coincide with performance in other systems. All specifications in this catalog and production status of products are subject to change without notice. Please contact Kolektor Magma for newest product data.