

CSC Products For Mobile Phones

I. Films

- EMI Absorber Sheets
- Metal Sheets for Digitizer
- EMI Shielding Films
- MCC (Multilayer Coated Copper)
- MCG (Multilayer Coated Graphene)

II. Silver Pastes

- Touch Screen Electrodes

III. Clad Metals

- Lead Taps for Batteries



I .Films

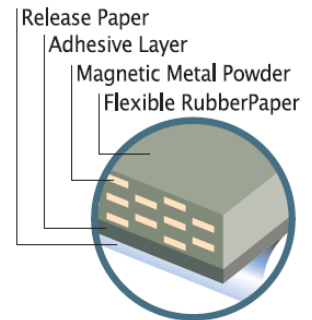
- EMI Absorber Sheets
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- EMI Shielding Films
- MCC (Multilayer Coated Copper)
- MCG (Multilayer Coated Graphene)

EMI Absorber Sheets

CSC's EMI materials are designed to help resolve a various of noise related issues that the IT industry is facing. These functional EMC materials are a good example of how creative technology can be used to come up with products that meet the demands of IT customers around the world.

Advantages

- Applicable frequency : 10MHz~6GHz
- Volume resistivity ($10^8\Omega$)
- Flexible in design, size, thickness (0.02mm to 2mm)

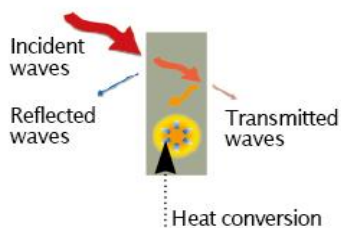


Specifications

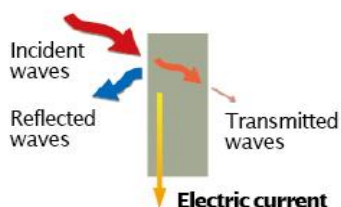
	Absorber Sheet					Absorber Film			Multi Function	RF - ID	
	NS - H	NS - L	NS - B	NS - K	NS - S	NS - F	NS - FA	NS - FK	TM - H/S	NS - R	
Permeability [at 3MHz]	30	45	70	100	150	20	20	50	10	40[at 13.56MHz]	
Applicable frequency	500MHz ~ 6GHz	300MHz ~ 6GHz	100MHz ~ 6GHz	10MHz ~ 6GHz		100MHz ~ 3GHz				13.56MHz	
Use temperature (°C)	-25 ~ 105					-25 ~ 85			-40 ~ 140	-25 ~ 85	
Standard thickness (mm)	0.1, 0.2, 0.3, 0.5, 1.0		0.1, 0.2, 0.3, 0.5			0.05, 0.1	0.05, 0.1	0.1	0.2~3.0	0.1, 0.2, 0.3, 0.5	
Standard size (mmxmm)	210mm x15M		210mm x 297mm			300mm x100M			210mm x 297mm	210mm x15M	
Surface resistance(Ω-cm)	1×10^8									1×10^{12}	1×10^8
Remarks	High Freq. ←————→ Low Freq.					Thin type for high frequency noise	Function of noise absorbing and shielding	Thin type of low frequency noise	Enhanced thermal conductivity up to 2w/mk	13.56MHz RF - ID	
	* Halogen Free available										

Principles

Microwave Absorbers



Shielding Materials



Applications

Mobile Phone



- Noise Suppression at FPC between LCD circuit and main board
- Radiated noise suppression at camera module (CCD)
- Attenuation SAR at antenna

Camcorder



- Radiated noise suppression from CCD
- Prevention of malfunction in PCB circuit

Computer

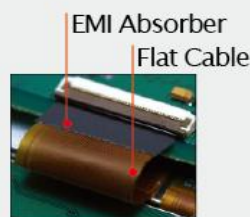


- Noise suppression at IC package
- Noise suppression at flat cable
- Noise suppression at CPUs

Display



- EMI attenuation for CISPR, FCC, etc., restriction
- Prevention of radiated noise in housing case

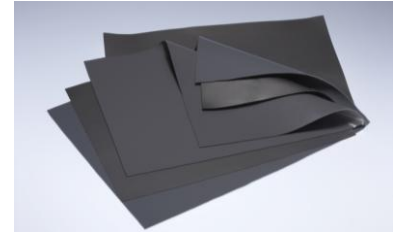


Metal Sheets for Digitizer

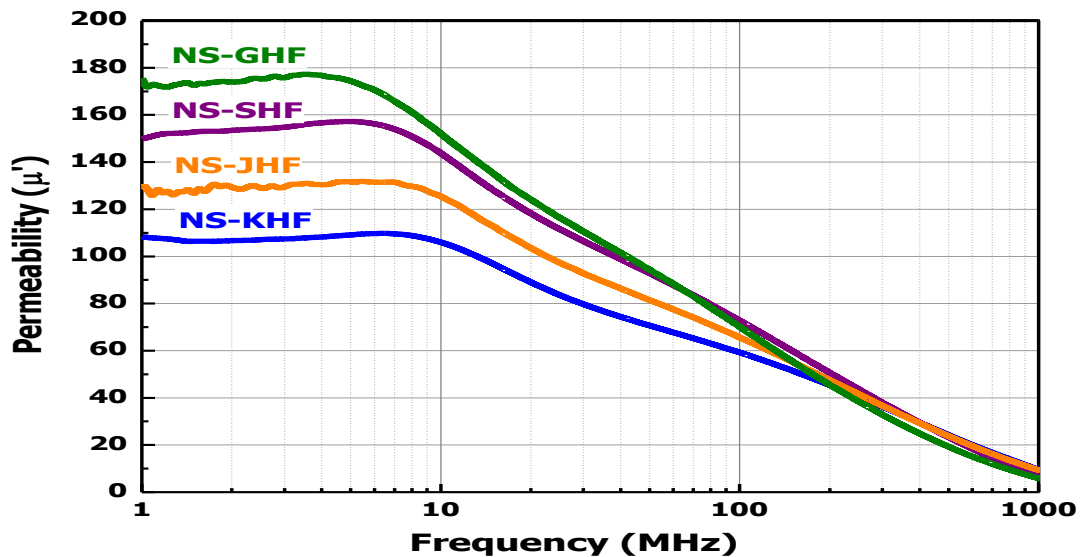
CSC's high permeability metal sheets for digitizers are attached to the back of the circuits, helping to smooth writing with pens on the screen and absorb EMI noise in the mobile phones.

■ Advantages

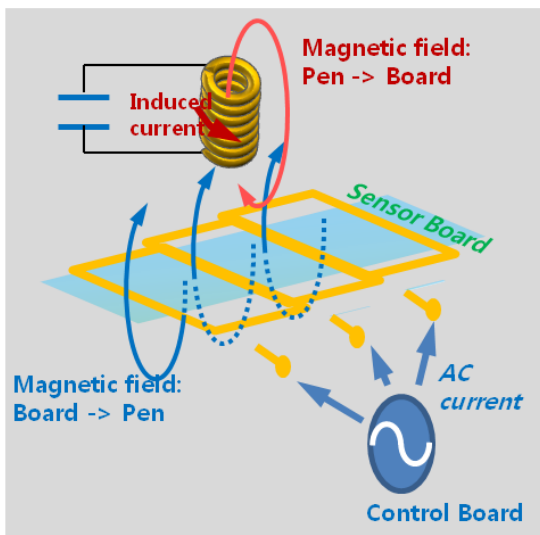
- Uniform thickness
- Excellent level of insulation resistance ($\geq 10^7 \Omega$)
- Good reliability



■ Specifications



■ Principles



■ Applications



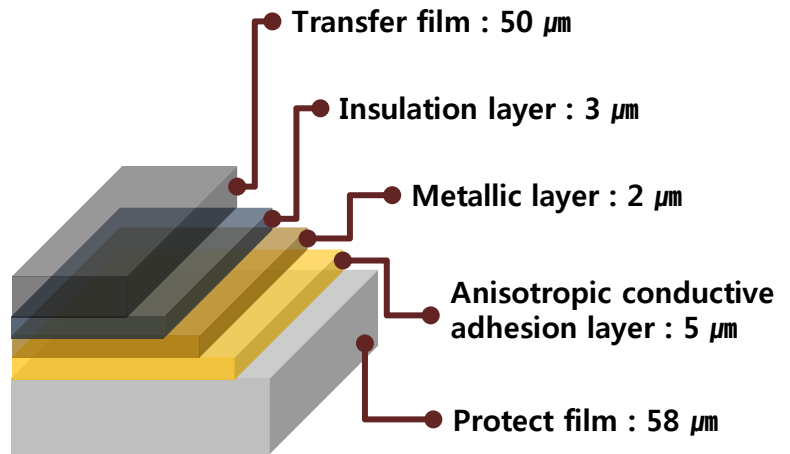
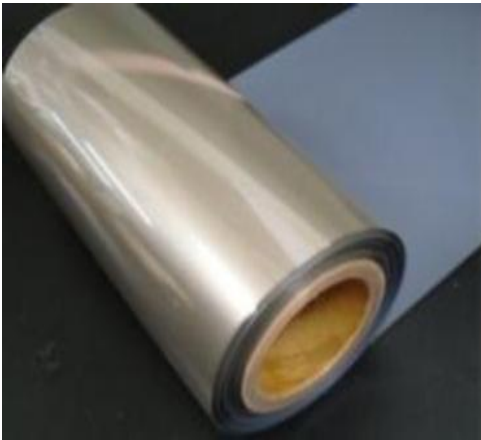
EMI Shielding Films

CSC's EMI Shielding Films optimize EMC compatibility and perfect impedance match in high speed signal transmission.

Advantages

- Flexibility
- Reliability(Heat resisting property)
- Chemically resistant

Structures

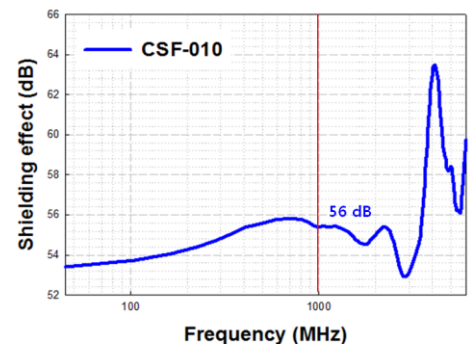


<CSF-010>

Specifications

Specifications	
EMI Shielding(dB@1GHz)	≥ 50
Anisotropic conductivity(Ω)	≤ 1.8
Insulation R(Ω)	$\geq 10^{10}$
Peel strength (Kgf/cm)	≥ 1.0

EMI Shielding effect (CSF-010)



Electro Matrics-2107A SE Test Fixture holder
(up to ~ 1.5 GHz)

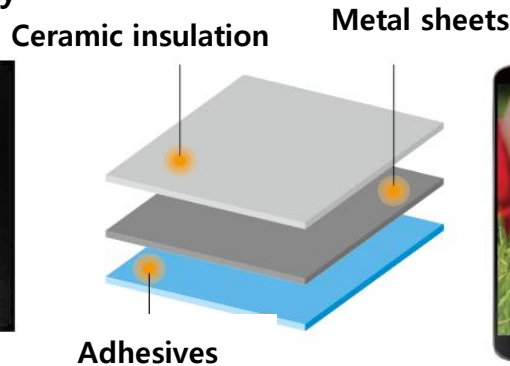
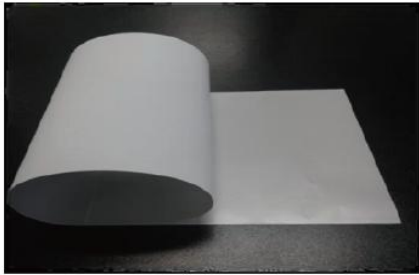
MCC Heat Spreading Sheets

CSC's MCC heat spreading sheets combine copper films and ceramic films to maximize Vertical thermal conductivity and horizontal thermal conductivity.

CSC's MCC heat spreading sheets are ideal solution instead of graphite.

■ Advantages

- Thermal Conductivity : In-plane = 1200W/mk / Through-plane = 5W/Mk
- High vertical electrical resistance
- Thickness available < 50 μ m
- Excellent Flexibility
- Excellent die-cut property



■ Specifications

Item		TS-C030A	TS-C050A	TS-C050B
Mechanical				
Base Polymer		Acryl	Acryl	Acryl
Thickness (μ m)		30	50	50
Standard Size (mm×mm)		250×650	250×650	250×650
Adhesion Strength (gf/cm)		> 1,000	> 1,000	> 1,000
Electrical				
Vertical Resistance (kV)		> 10 ⁹	> 10 ⁹	> 10 ¹
Thermal				
Thermal Conductivity (W/mK)	In-Plane	200	250	250
	Through-Plane	2.3	2.5	2.5
Adhesive		One side	One side	Both side (electro-conductive)

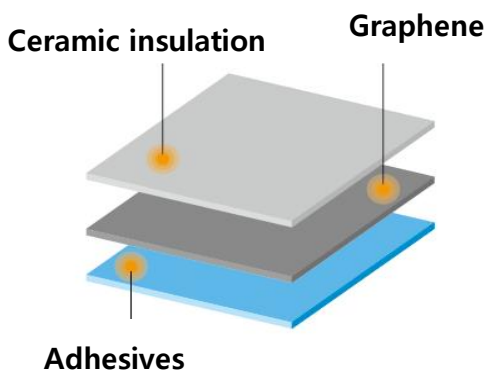
MCG Heat Spreading Sheets

CSC's MCG heat spreading sheets combines copper films and ceramic films to maximize Vertical thermal conductivity and horizontal thermal conductivity.

CSC's MCG heat spreading sheets are ideal solution instead of graphite.

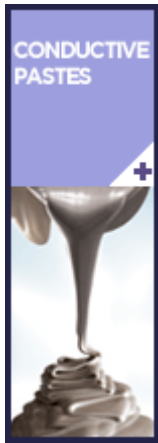
Advantages

- Thermal Conductivity : In-plane = 1200W/mk
- Through-plane = 5W/Mk
- High vertical electrical resistance
- Thickness available < 50 μ m
- Excellent Flexibility
- Excellent die-cut property



Specifications

Item		TS-G030A	TS-G050A	TS-G050B
Mechanical				
Base Polymer		Acryl	Acryl	Acryl
Thickness (μ m)		30	50	50
Standard Size (mm \times mm)		300 \times 300	300 \times 300	300 \times 300
Adhesion Strength (gf/cm)		> 1,000	> 1,000	> 1,000
Electrical				
Vertical Resistance (kV)		> 10 ⁹	> 10 ⁹	> 10 ⁻¹
Thermal				
Thermal Conductivity (W/mk)	In-Plane	1,000	1,200	1,200
	Through-Plane	3	5	5
Adhesive		One side	One side	Both side (electro-conductive)



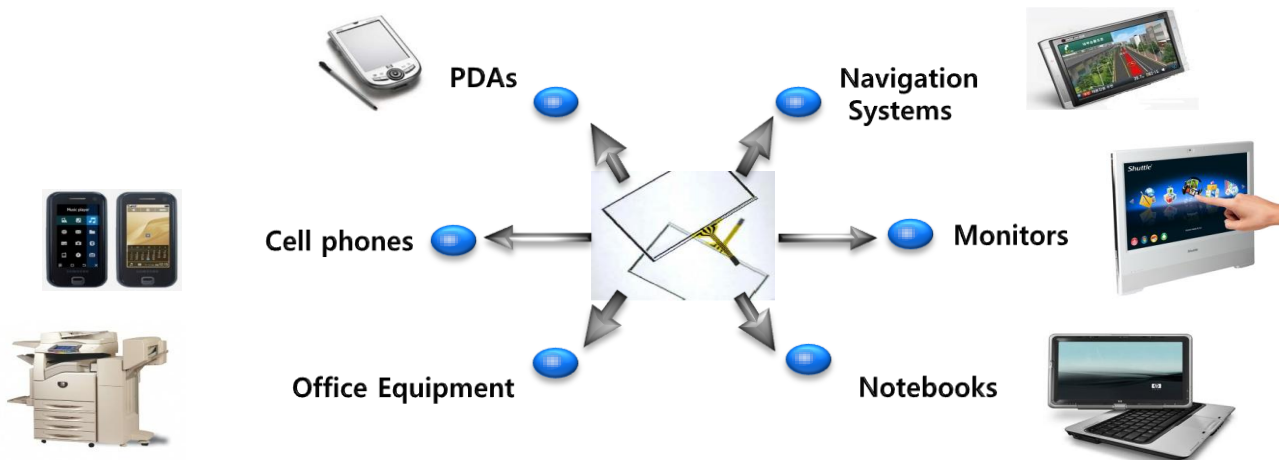
II. Silver pastes

- Touch Screen Electrodes

Touch Screen Electrodes

■ Advantages

- Good printing characteristics
- High level of conductivity
- Excellent adhesion to ITO Electrodes and PET films
- Fine line resolution, High level of surface hardness and wear-resistance
- Halogen free



■ Specifications

		Unit	Paron 810	Paron 810E	Paron 811	Paron 811A
Type of touch screen		-	Resistive type		Capacitive type	
Physical properties	Solid content	wt%	78 ± 2	70 ± 2	83 ± 2	80 ± 2
	F.O.G.	um	≤ 5	≤ 10	≤ 5	≤ 5
	Specific Gravity	-	2.7 ± 0.2	2.2 ± 0.2	3.1 ± 0.2	2.9 ± 0.2
	Viscosity *	Poise	250 ± 50	250 ± 50	1,000 ± 50	800 ± 50
Printing properties	Volume Resistivity	10 ⁻⁶ Ω·cm	≤ 80	≤ 200	≤ 80	≤ 80
	Pencil Hardness	H	2	2	2	2
	Adhesion Strength (PET & ITO electrode)	-	100/100	100/100	100/100	100/100
	Fine Line Resolution	um	100	200	50	70



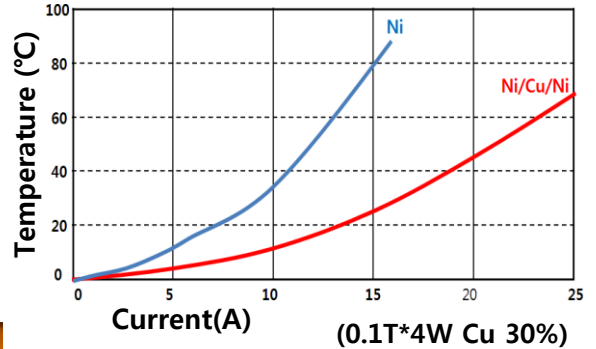
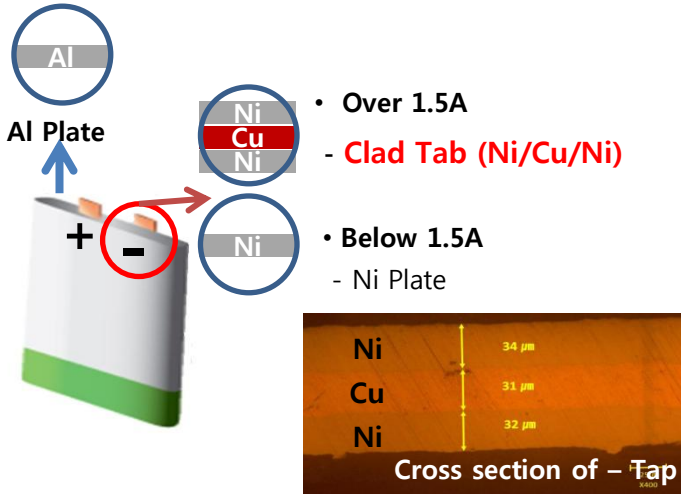
Ⅲ. Clad metals

- Lead Taps

Lead Taps for Batteries

■ Li-ion battery lead taps

Low resistance, Anti(Less)-oxidized Cu/Ni clad metals.



Items	Cu%	($\times 10^{-8} \Omega \cdot m$)
Ni	0%	6.8~7.2
Ni/Cu	70%	2.0-2.2
Ni/Cu/Ni	30%	2.8-3.2

■ Li-ion polymer safety tabs

Solder is cladding on the cathode taps to protect Li-polymer batteries when currents are exceeded.

