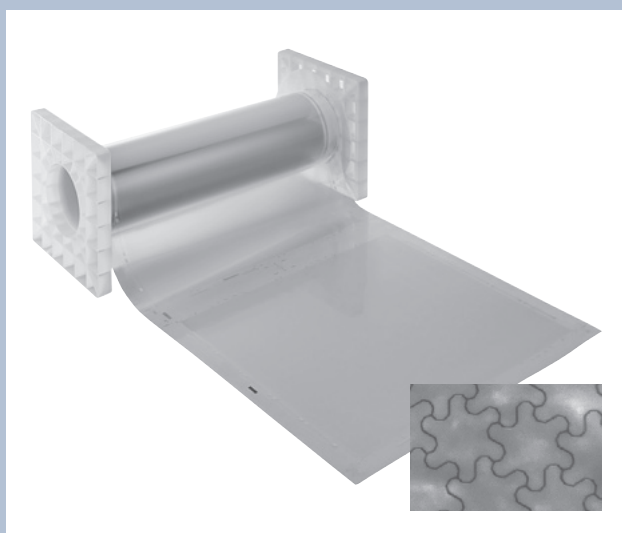


Roll type (with OCA)

Advanced EMC Solutions in Transparent Applications. Enabling efficient noise suppression with reduced component count and simplified integration



FEATURES

- High Transparency with Outstanding EMI Shielding Effective across a broad frequency range
- Ultra-Fine Copper Mesh Patterning Achieved with our proprietary microfabrication technology
- Pre-Applied OCA (Optical Clear Adhesive) Ensures convenient and clean installation
- Thin, Lightweight, and Flexible Film Format Maximizes design freedom and integration flexibility

MAIN APPLICATION

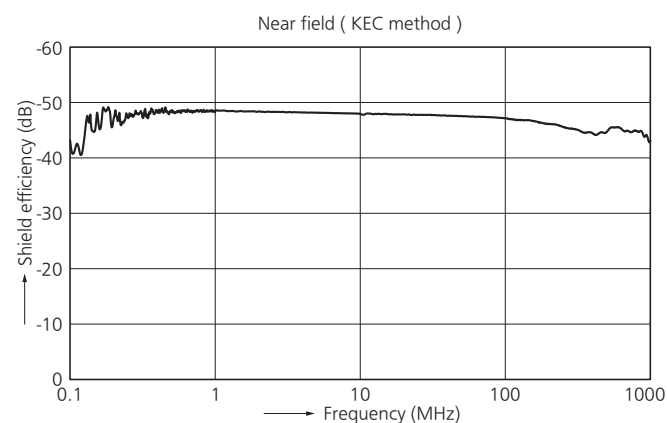
- Noise Shielding
 - Display / Monitor
 - Industrial Machinery, etc.
- Radio wave environment setup
 - RFID (restriction of radio wave area)
 - Wi-Fi (anti-interference) , etc.

DETAILED FEATURES

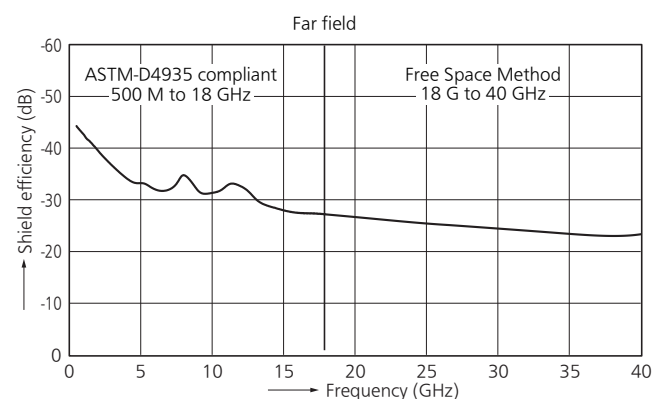
■ High Transparency Meets Broad-Spectrum EMI Shielding

Achieves both exceptional optical clarity and high electromagnetic shielding across wide frequency bands.

1. KEC method (100 k to 1 GHz) *



2. Coaxial tube method ASTM-D4935 compliant (500 M to 18 GHz) / Free space method (18 G to 40 GHz) *



*Data are for reference only and are not guaranteed.

Transparent conductive film Transparent Electromagnetic Wave Shielding

Proprietary Ultra-Fine Copper Mesh Technology

- Provides stable EMI shielding over a broad frequency range by
 - Copper lines: 2.4 μm width, 85 μm pitch on average*¹
 - Delivers low sheet resistance: Max. 2.6 $\Omega/\text{sq.}$ *²

*1: Typical values.

*2: Measured using 4-point probe method.

- Reduced Optical diffraction
By employing a unique mesh pattern, our design minimizes visual scatter and moiré, addressing a common drawback of conventional grid-type metal meshes.

PART NUMBER

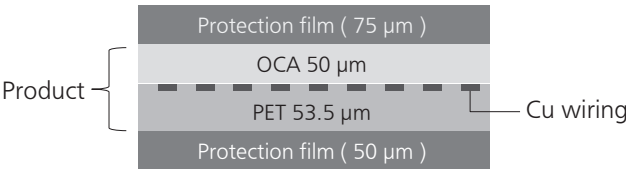
1	2	3	4	5	6	7	8	9	10	11	12
E	M	A	0	6	0	0	0	0	3	B	0

SPECIFICATIONS

This product is a transparent conductive film for Transparent electromagnetic wave shielding.

Stack up

Please remove the protective film on both sides before use.



Performance

Item		Details	
Film substrate		PET (Polyethylene Terephthalate)	
Dimensions (1 sheet)	External shape	558.9 mm: MD (Machine Direction) 620.0 mm: TD (Transverse Direction) *	
	Pattern area	477.3 mm: MD (Machine Direction) 531.5 mm: TD (Transverse Direction) *	
Thickness (Dimensions)		103.5 μm (excluding protection film) *	
Wiring	Material	Copper	
	Wiring Width	2.4 μm (Representative value) *	
	Average inter-wire pitch	85 μm (Representative value) *	
Mass (weight)		92.5 g (External 1 sheet, Protective film is not included) *	
Characteristics	Total light transmission	Min. 80 %	Light source irradiated from OCA side (ISO13468-1)
	Sheet resistance	Max. 2.6 $\Omega/\text{sq.}$	
Recommended Operating Conditions	Electromagnetic Wave Frequency Range	100 kHz to 40 GHz Near Field: 100 k to 1 GHz Far Field: 500 M to 40 GHz	
	Operating Temperature Range*	−20 to +35 °C (Normal humidity, normal pressure, and no condensation)	
Quantity/Carton		128 Sheets (approx. 72 m) / 1 Roll	

* These are not standard or guaranteed values.

Notes) 1: The unit of order must be the number of packaging boxes.

If you would like to cut the film or order less than the number of packaging boxes, please contact our sales representative.

2: Before using the product, please refer to "Precautions for Use of Transparent Electromagnetic Wave Shield " and " Orders and Precautions for Use. "

3: When using the product at temperatures and humidity other than the operating conditions, please check and evaluate the conditions of use for your company products.

4: The standard temperature and humidity for each characteristic measurement are normal temperature and normal humidity (Temperature +5 to +35 °C, humidity 45 to 85 % RH) .

However, if the measurement result is questionable or if reproducibility is required, the test should be conducted in an environment where the product is left at +23 ±5 °C and 65 ±10 % RH for at least 24 hours.

5: Each warranty item shall be individually agreed upon. In the absence of such agreement, no warranty shall be deemed applicable.

DIMENSIONS (Unit: mm)

Core (6 inch Inner Diameter, 625 mm Length)

Leader film

Protection film (75 μm)

OCA (50 μm)

Transparent Electromagnetic wave shield: This product (53.5 μm)

Protection film (50 μm)

Wiring

Diagram illustrating the layout of a product section, showing the sequence of components from the inner end to the outer end:

- Core
- Leader film (inner end) - Min. 0.53 m
- Dummy film
- Product pattern Area
- Connecting tape (Joint between dummy film)
- Product pattern Area
- Connecting tape (Joint between products)
- Trailer film (outer end) - None

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Transparent conductive film Transparent Electromagnetic Wave Shielding

REFERENCE DATA

Reference data. This is not a guaranteed value.

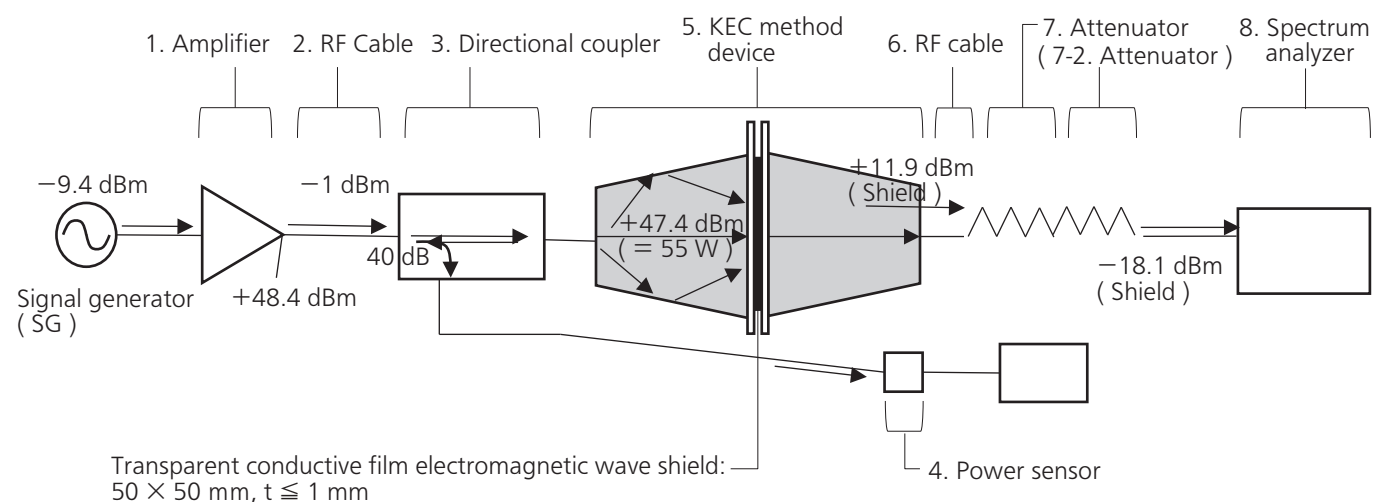
■ OCA characteristics

	Adhesion surface	Adhered duration	Measurement result [N/25 mm]	Test setup and measurement method
Adhesive force [N/25 mm]	Glass	1 minute	12.3	• Test sample stack up is OCA with PET#25 as substrate. • Test condition is referring to JIS Z 1528 • Adhered by rolling once with 2 Kg Rubber roller • Adhered to Glass and PET material • 180° peel/peel off speed: 300 mm/min • Bonding temperature: +23 °C 50 %RH • Measurement temperature: +23 °C 50 %RH
		24 hour	14.6	
	PET	1 minute	11.3	
		24 hour	12.7	

■ Power resistance evaluation

● Evaluation equipment setup

Purpose: Measuring power resistance by electromagnetic wave irradiation under ideal environment



1. Amplifier [NA1GF6G200]

Gain: +56.0 dB (min.)
Pout: 200 W (typ.),
150 W (min.) @P3dB/CW
100 W (min.) @P1dB/CW
Pin Resistance: +3.0 dBm (max.)
Pout Resistance: When the output reflected power exceeds 60 W, protection is applied.

2. RF Cable

SUCOFLEX_106 (3 m)
Loss value Approx. 1 dB (Spec: 0.328 dB/1 m @4 GHz)

3. Directional coupler [C10761R-727]

1000 to 6000 MHz 600 W 40 dB
Connector Shape
RF_IN: 7/16 (m) *
RF_OUT: 7/16 (f) *
FWD,REV: N (f)
*N conversion is used

4. Power sensor [NRP6A]

Average power sen
8 k to 6 GHz
100 pW to 200 mW
(-70 dBm to +23 dBm)

5. KEC method device

6. RF cable

SUCOFLEX_106 (3 m or 5 m product)
Spec: 0.328 dB/1 m @4 GHz

7. Attenuator: 20 dB, 100 W

7-2. Attenuator: 10 dB, 10 W

8. Spectrum analyzer [ESCI]

Pin Resistance: 30 dBm

● Evaluation conditions

- Evaluation device: KEC method device
- Electromagnetic wave frequency: 2.5 GHz
- Irradiation power: 55 W
- Irradiation time: 1 hour

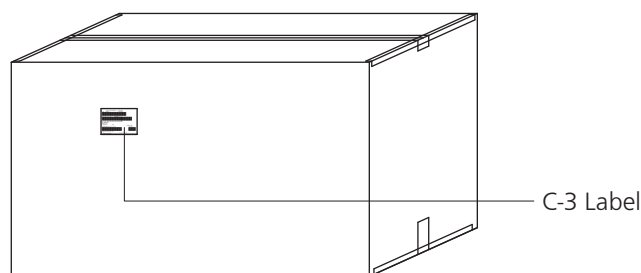
● Evaluation results

	Sheet resistance value (Ω /sq.)	Effect on fine wiring
Irradiation from substrate side	1.0	No effect
Irradiation from OCA side	1.0	No effect

Resistance value and fine wiring are not affected.

PACKAGING SPECIFICATIONS

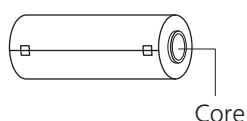
■ Exterior packaging Box



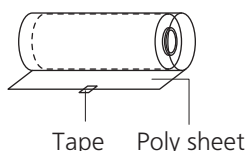
Note) For details on labels, please refer to "Label Specifications."

■ Inner Roll Packaging

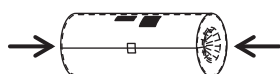
1) Fixing sheet with tape



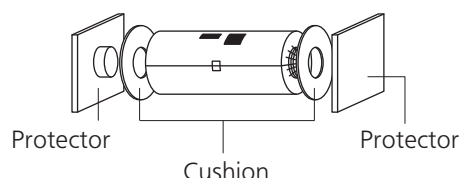
2) Covering entire roll with poly sheet and fixing it with tape.



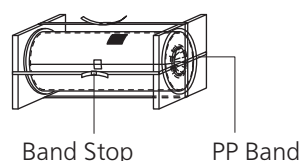
3) Folding both end of the wound poly sheet into the core.
Affixing labels onto the poly sheet.



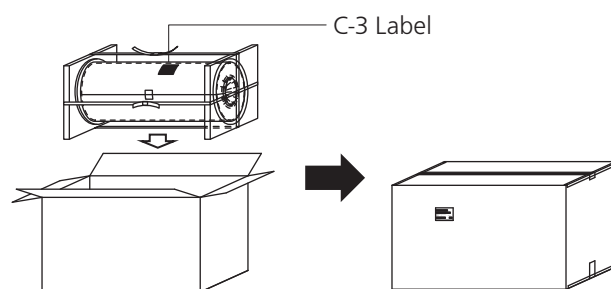
4) Placing cushions in between both ends of the roll and protector.



5) Tying up the roll with two pieces of PP band and fixing with band stop.



6) Store the roll in the packaging box and seal it.



Notes) 1: After opening the package, please repack and store it in accordance with the specifications.
2: To enhance the reliability of the product for actual use, please check the quality of the product in actual use.
3: Please be care not to scratch the product with a blade.
4: Do not place the product or roll directly on the floor or table etc.
5: For details on labels, please refer to "Label Specifications."

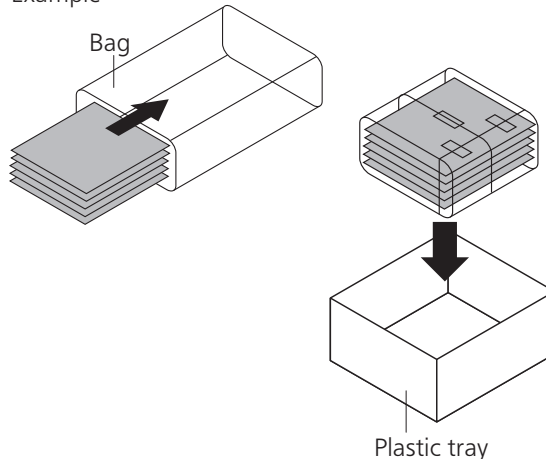
■ Individual Packaging for sheet condition products.

When you package this product individually, please check its performance before using.
Please store the product away from humidity, sulfide gas, external load, in order to maintain the product quality.

● Recommendation for packing material.

- Please use a bag such as PE. If the product is directly packed in cardboard, corrosion might occur due to sulfate from the cartonboard.
- Please use a plastic tray to protect the sheet from bending.

Example

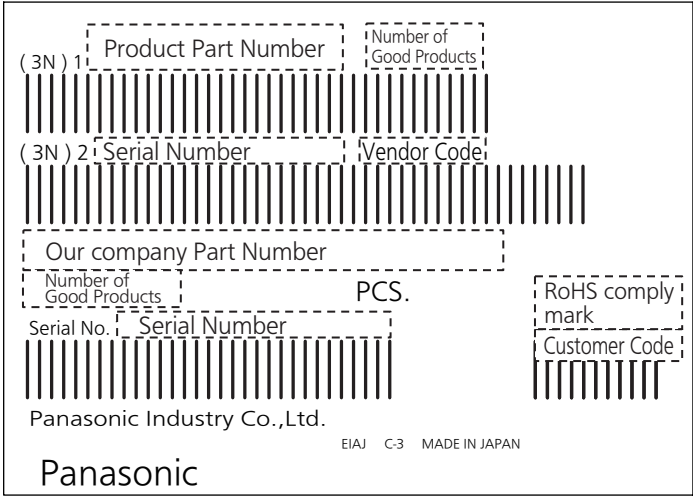


Transparent conductive film Transparent Electromagnetic Wave Shielding

Label specifications

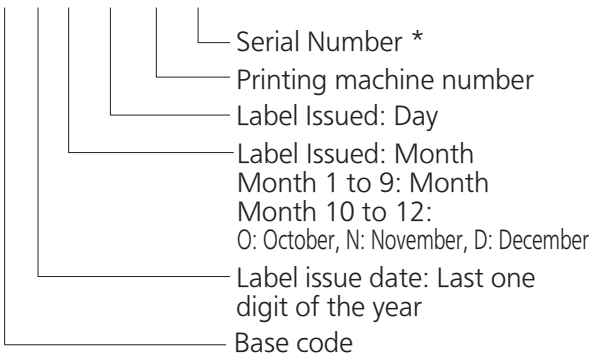
C-3 Label

Affixing to the exterior (packaging box) and interior (roll packaging) 1 piece each. Please refer to the " Packaging Specifications " for the affixed areas.



Example) Serial Number
Label Issued date: August 1, 2025

T 5 8 0 1 E 0 0 0 0 1



Note) Please refer to " Precautions for Use of Transparent Electromagnetic Wave Shield " for identifying NG products.

* The serial number differs between the exterior package (outer box) and interior package (roll packaging) .

PRECAUTIONS

Before using the product, please refer to " Precautions for Use of Transparent Electromagnetic Wave Shield " and " Requests to customers. "