

## Automotive Touch Film Sensor Product Specification



### 1. Product Overview

- The VMANX Automotive Touch Film Sensor utilizes "Precision Electronic Printing Technology" .
- Employing high-stability PET film as the substrate, combined with a multi-layer screen-printed structure of silver conductive circuits, protective carbon layers, and transparent conductive ink (PEDOT:PSS), topped with a high-performance Optically Clear Adhesive (OCA).
- This product innovatively integrates custom-printed patterns with transparent capacitive sensing electrodes, achieving a balance of functionality and aesthetics. Designed for demanding automotive electronic environments, it meets automotive-grade reliability and eco-compliance standards.



### 2. Core Technical Features

#### Integrated Visual & Touch Design

- ▶ Custom patterns/logos (e.g., backlit icons, brand logos) can be directly printed on PET film, Simultaneously, the highly transparent PEDOT:PSS layer (transmittance ≥85%) enables precise capacitive touch sensing .

#### Automotive-Grade Materials & Processes

- ▶ Substrate : High-strength, temperature-resistant PET film (standard thickness: 125μm; options: 100μm/188μm).
- ▶ Circuit Structure : Precision-printed silver conductive traces + protective carbon layer, ensuring superior conductivity, oxidation resistance, and mechanical durability.
- ▶ Transparent Electrode : Screen-printed PEDOT:PSS conductive ink, offering high transparency and stable conductivity.
- ▶ Optical Lamination : High-transmittance, low-haze OCA with vacuum lamination for bubble/wrinkle-free performance.

#### Exceptional Environmental Resilience

- ▶ Wide Operating Temperature : -40°C to +85°C (extendable to +105°C upon request) .
- ▶ High Humidity Resistance : Stable operation at 95% RH.
- ▶ Weather Resistance : Passes UV aging, damp heat, thermal shock tests—no yellowing, cracking, or performance degradation.
- ▶ Chemical Resistance : Withstands automotive cleaners, sweat, oils, etc.
- ▶ Longevity : >10-year lifespan (per typical automotive use); validated via vibration, shock, and bend tests.

#### Environmental Compliance

- ▶ Meets VOC emission standards (e.g., GB/T 27630, VDA 270, ISO 12219) for cabin air quality.
- ▶ Complies with RoHS, REACH, and other international regulations.

3. Key Performance Parameters		
Property	Specification	Test Standard/Condition
<b>Structural</b>		
Substrate	PET (125µm std.; 100µm/188µm optional)	--
Total Thickness (incl. OCA)	~200–350µm (customizable)	--
Minimum Bending Radius	R5mm (dynamic), R3mm (static)	Bending Test
Pencil Hardness	≥ 3H	ASTM D3363
Adhesion	5B	ASTM D3359 (Cross-cut)
<b>Optical</b>		
Transmittance (Active Area)	≥ 85%	ASTM D1003
Haze	≤ 2%	ASTM D1003
<b>Electrical</b>		
Sheet Resistance (PEDOT)	300–1000 Ω/□ (customizable)	4-point probe
Line Resistance (Ag)	<100 mΩ/cm (width/thickness customizable)	--
Insulation Resistance	≥ 100 MΩ	IPC-TM-650 2.6.3
Touch Sensitivity	Finger touch detectable (adjustable)	Client system definition
Response Time	< 10ms	
<b>Environmental</b>		
Operating Temperature	-40°C to +85°C (std.); -40°C to +105°C (custom)	--
Storage Temperature	-40°C ~ +105°C	--
Damp Heat Cycling	95% RH, -40°C ↔ +85°C, >500 cycles	IEC 60068-2-30
High Temp/Humidity Storage	85°C/85% RH, >1000 hours	IEC 60068-2-78
Thermal Cycling	-40°C ↔ +85°C, >500 cycles	IEC 60068-2-14
UV Aging	>500 kJ/m <sup>2</sup> (no yellowing/cracking)	ISO 4892-3
Salt Spray	5% NaCl, 35°C, >96 hours (no corrosion)	ISO 9227
<b>Chemical Resistance</b>		
Ethanol (15%)	>200 wipes (no damage)	GMW 3286
Artificial Perspiration	>48 hours (no damage)	ISO 105-E04
<b>Mechanical Reliability</b>		
Vibration	20–2000Hz, 50m/s <sup>2</sup> , XYZ axes >24 hours	IEC 60068-2-64
Shock	50g, 11ms, XYZ axes 3x	IEC 60068-2-27
Bending Lifespan	>100,000 (R=5mm, 180°)	Client-defined
<b>VOC/Odor</b>		
VOC Emissions	Complies with automotive standards (e.g., <X µgC/g)	VDA 278, ISO 12219
Odor Level	≤3.0 (target)	VDA 270

#### 4. Compliance with Standards & Certifications

##### Material & Performance Standards

- ▶ Compliant with relevant requirements of Technical Specifications for Paint Films in Automotive Electrical Equipment (e.g., LV 312-1).
- ▶ Compliant with Technical Specifications for Interior Lighting Fixtures in Automobiles (e.g., optical performance, durability).
- ▶ Compliant with Volatile Organic Compounds (VOC) Emission Requirements for Passenger Vehicles (e.g., GB/T 27630, VDA 270, ISO 12219).

##### Quality Management System

- ▶ Certified under IATF 16949:2016 (Automotive Quality Management System), ensuring full compliance with the highest automotive industry standards throughout the entire process—from design and production to delivery.

#### 5. Application Scenarios

- ▶ Center console touch panels (AC/audio controls)
- ▶ Steering wheel multi-function touch buttons
- ▶ Door armrest/window control zones
- ▶ Overhead panels (reading lights, sunroof controls)
- ▶ Rear-seat entertainment systems
- ▶ Other interior touch interfaces with backlit icons

#### 6. Customised Services

- ▶ Patterns/Logos : Custom designs, icons, or text .
- ▶ Shape/Size : Tailored to client specifications.
- ▶ Circuit Design : Supports single/multi-touch, sliders, buttons.
- ▶ Interfaces : FPC tail with ZIF/ACF options (pin definitions customizable).
- ▶ OCA Option : Varied thicknesses/viscosities for lamination needs .
- ▶ Extreme Environments : Enhanced designs for harsh conditions.

#### 7. Packaging & Storage

- ▶ Packaging : Anti-static bags + rigid trays/reels to prevent bending/ESD.
- ▶ Storage : 10°C–30°C, 40%–70% RH, dark, corrosive-free.
- ▶ Shelf Life : 12 months (under specified conditions).

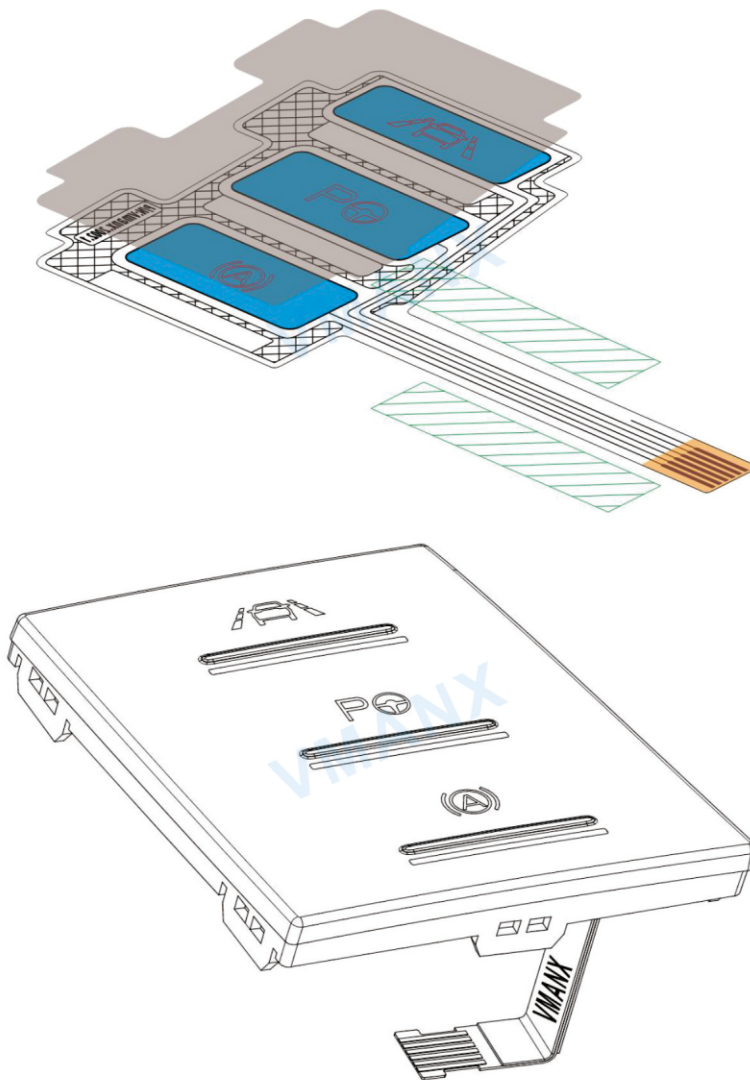
**8. Quality Assurance**

- ▶ VmanX commits that every automotive touch film sensor supplied undergoes stringent production process control and 100% critical performance testing (e.g., appearance, circuit continuity, insulation, functional testing).
- ▶ Key performance test reports and Certificates of Conformity (COC) can be provided with the shipment. We are committed to "zero defect" delivery .

**9. About VMANX**

- ▶ VMANX is an innovator and manufacturer specializing in high-performance automotive electronic film devices.
- ▶ With advanced precision printing technology, a strict automotive-grade quality control system (IATF 16949), and a deep understanding of European and American market standards, we provide highly reliable and cost-effective solutions for leading global automotive Tier 1 suppliers.
- ▶ Our core values lie in technological innovation, supreme quality, and customer orientation .

**10. Product Diagram**



**RoHS  
COMPLIANT**



**REACH**

