Next generation
STRETCHABLE MULTISOLUTION
for safe driving

Forciot® GRIP - a game changing steering wheel HMI solution, which brings additional safety and more functionality.

GRIP combines several functionalities into one multisolution to bring advanced steering wheel grip detection, levels of force, and now also as new functionality heating, for enhanced safety and user experience.

FORCIOT® GRIP

Printed and stretchable electronics combined with advanced algorithms, GRIP revolutionizes steering wheel grip detecting providing accurate force data in all conditions with multiple sensing zones, allowing design freedom to easily integrate into any surface, size and shape, regardless of the surface material.

FORCIOT GRIP

PRESSURE SENSING
From sensitive soft touches to different grip force levels

STRETCHABLE HEATING ELEMENT
In one solution

FUNCTIONAL WITH GLOVES

SAFETY

GRIP DETECTION

Detecting grip force

Multiple sensing zones

Measuring gentle touches to firm grip force accurately

COMFORT

STRETCHABLE HEATING ELEMENT

Stretchable heater element

Seamless temperature control

Thin solution

COST REDUCTION

DESIGN & MANUNFACTURING

Light weight

Less layers

Less electronics

SIMPLICITY

ALL-IN-ONE MULTISOLUTION

Sensor

Heater element

Software & ECU interface

SUPPLEMENTING THE LEGAL REQUIREMENTS

Accurate and extensive data

COMMANDED STEERING FUNCTIONS (CSF)
UNECE R79

DRIVER PRESENCE MONITORING (DPR)
UNECE R157

DRIVER MONITORING SYSTEM (DMS)
EU General Safety Regulation

ADAS

FORCIOT® GRIP

NEXT GENERATION TECHNOLOGY

Accurate force measurement generates extensive data

		SAFETY	COST SAVING	UX	SUSTAIN-ABILITY
TECHNOLOGY	Accurate data under all conditions	•		•	
	Detects human hand (force sensing and SW dynamic result)	•		•	
	Supports Advanced Driver Assistance Systems (ADAS)	•		•	
	Unrestricted shapes and sizes of measurement zones	•		•	
	Sensor fusion compatible	•		•	
FUNCTIONALITY	Heater functionality		•	•	
	Self-calibrating algorithms to ensure functionality for product lifetime	•		•	•
	Distraction and Drowsiness Recognition from grip level (DMS)	•			
	Static poses and dynamic poses (DMS)	•			
	Warning the driver when distracted and not good grip (DMS)	•		•	
	Accurate data with several surface materials	•		•	
DESIGN	Intuitive design opportunity	•		•	
	Less layers and stretchable material enable any shape		•		
	Using same technology in car interiors in other solutions		•	•	
	Sensors are seamlessly merged		•	•	
MANUFACTURING	Supply chain simplicity		•		
	Additive manufacturing		•		•
	Less waste		•		•
	Less assembly work, one component		•		
	Lower capital expenditures than traditional electronics manufacturing		•		

OPTIONAL FEATURES

Mechanical switches and buttons in the steering wheel can be replaced with seamless reprogrammable HMI controllers.

HMI Controls by Force measurement

HMI Controls by Force distribution

√ Intuitive interaction   √ Aesthetic design   √ Advanced safety   √ Premium comfort

FORCIOT® GRIP

TECHNICAL SPECIFICATION

PRODUCT SOLUTION	MIN	MAX	UNIT
Thickness (depending on the configuration)	0,15	1,5	mm
Operating temperature	-40	105	°C
Pressure sensing areas	1	>10	-
Pressure range	0	300	kPa
Heating range	0	50	°C
ELECTRONICS			
Physical interface	I2C/SPI/UART/CAN/LIN		
Supply voltage	3-12 V		
Single configurable electronics board	YES		
Automotive Qualified (AEC-Q100)	YES		
SOFTWARE			
Data interface	Sensing area specific pressure data and/or threshold related decision		
Self-calibrating algorithms	Temperature, humidity and creep compensation		

FORCIOT®

SENSE AND EXCEED

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