



***SEGER Sound of Safety<sup>®</sup> ...***

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## **What is the meaning of AVAS?**

AVAS is a system to warn pedestrians by generating an artificial sound in electric vehicles.

## **In which vehicles are AVAS used?**

AVAS is used in hybrid (HEVs), plug-in hybrid (PHEVs), and full battery electric vehicles (BEVs).

## **Is it mandatory to use AVAS?**

Yes, the use of AVAS has become mandatory in electric vehicles with the ECE-R138 regulation coming into force in 2018.



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## ACTIVE AVAS (WITH ECU)



- **POWERFUL SOUND**

Meets Regulation ECE-R138 at 1 meter\*

\*official test standard according to the regulation

- **MORE DURABLE**

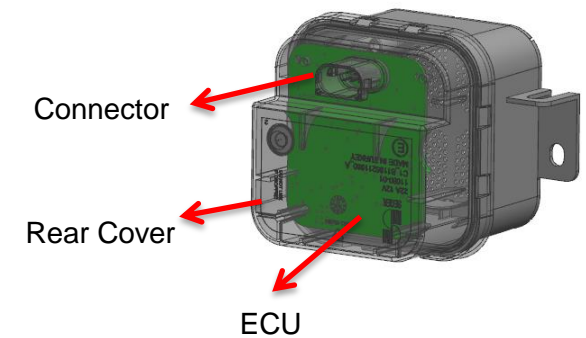
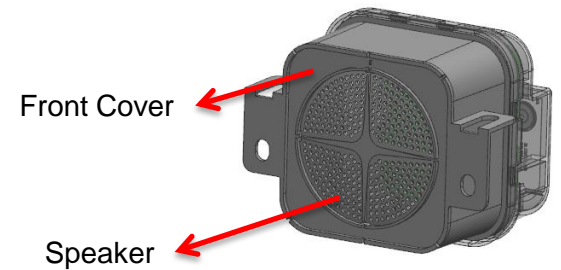
At High Temperature Tests

- **STABLE**

Sound Pattern for Frequency & Acoustical

- **ECU CONTROLLED**

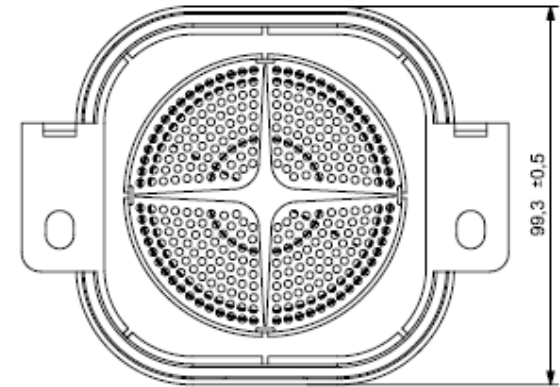
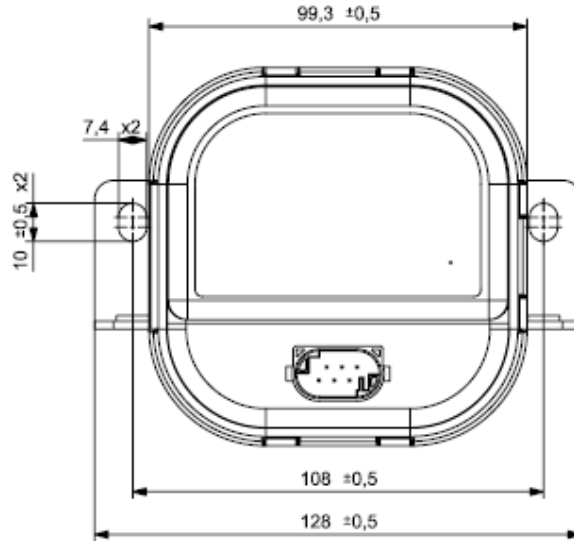
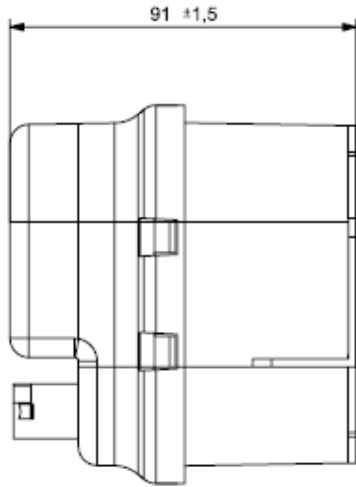
HW & SW & Sound are placed in the product and driven by Product Side



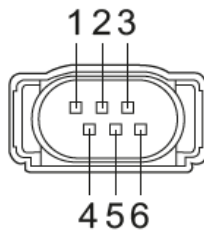
## MAIN TECHNICAL SPECIFICATIONS (Product Type : 22A)

Nominal Voltage	12	Vdc
Operating Voltage Range	9 - 16	Vdc
Current Consumption	Max.0,5	A
Sound Pressure Level (Overall)	min.65 dB(A) at 1 meters Suitable For ECE-R138	-
Frequency	160 - 5000	Hz
Operating & Storage Temperature	-40° to 85°	°C
Operating relative humidity	30 to 95	%
Speaker Durability (Pink Noise)	> 200	hours
Thermal Overload Protection	Available	
AEC Q Standards	Available	
Communication	CAN	
Operating Vehicle Speed	0 to 20 & 32	Km/h
Full Digital Amp	8/16/32	Bits resolution
Speaker	4	Ω
Speaker Power	5	Watt
Vibration ( 8 h, 3 axis)	3	G
Water Protection	IP67	15 min.15 cm
UDS & Bootloader Implementation	can be developed	-
Functional Safety ( ISO 26262:2018 )	can be implemented for ASIL A	-
Cybersecurity	can be developed	-
Weight	420	Gr

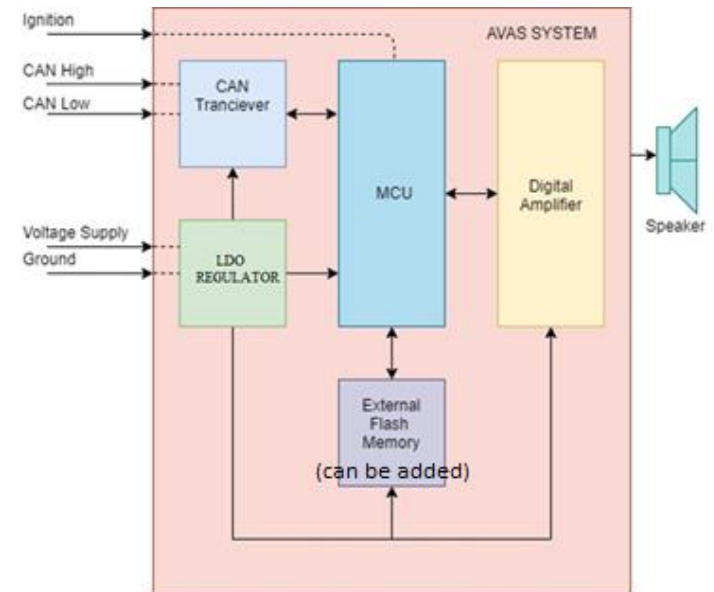




Harness Connector Number: TE 1-967616-1



- 1 V\_BAT
- 2 IGN
- 3 CAN\_bus\_L
- 4 N.A
- 5 GND
- 6 CAN\_bus\_H



## Active AVAS System Qualifications

- Operating on limited supply voltage (9 - 16V for 12V system)
- Processing via Gear Position, Vehicle Speed, Vehicle Status and/or Gas Pedal Position by getting from Vehicle CAN System
- Fade In / Fade out effects at sound
- Supports external Flash Memory.(acc.to Customer Expectations)
- Digital Amplifier is used (supports FuSa ASIL A)
- Sound is processing with I<sup>2</sup>S protocol which process high quality sound
- Compatible with 8bit, 16 bit and 32bit sounds
- Compatible with 44.1kHz, 48kHz and 96 kHz sample rates.

**\*\*Sound files are provided by vehicle producer**



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**PASSIVE AVAS (WITHOUT ECU)**



- **POWERFUL SOUND**

Meets Regulation ECE-R138 at 1 meter\*

\* official test standard according to the regulation

- **MORE DURABLE**

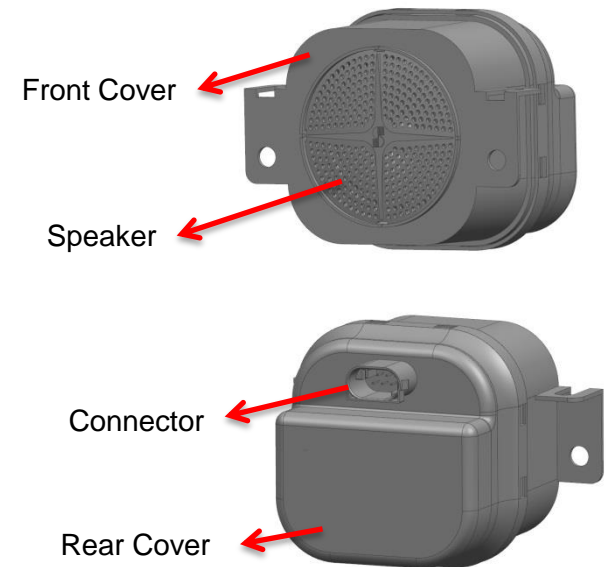
at High Temperature Tests

- **STABLE**

Sound Pattern for Frequency & Acoustical

- **CONTROLLED BY CUSTOMER**

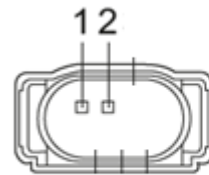
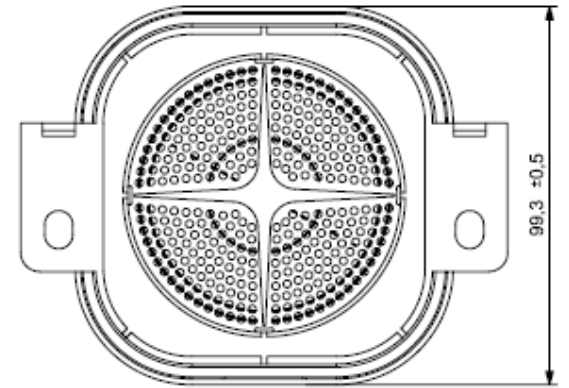
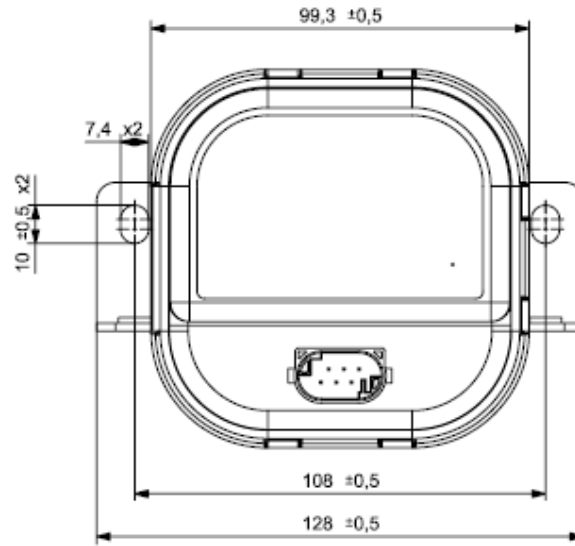
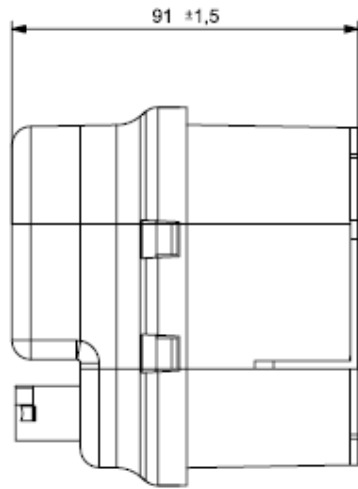
HW & SW & Sound are supplied and driven by Customer Vehicle Side



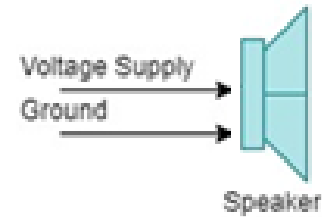
## MAIN TECHNICAL SPECIFICATIONS (Product Type : 22P)

Nominal Voltage	12	Vdc
Operating Voltage Range	9 - 16	Vdc
Current Consumption	Max.0,5	A
Sound Pressure Level (Overall)	min.65 dB(A) at 1 meter Suitable For ECE-R138	-
Frequency	160 - 5000	Hz
Operating & Storage Temperature	-40° to 85°	°C
Operating relative humidity	30 to 95	%
Speaker Durability (Pink Noise)	> 200	hours
Operating Vehicle Speed	0 to 20 & 32	Km/h
Speaker	4	Ω
Speaker Power	5	Watt
Vibration ( 8 h, 3 axis)	3	G
Water Protection	IP67	15 min.15 cm
Weight	400	Gr





- 1 V\_BAT
- 2 GND



## Passive AVAS System Qualifications

- Operating on limited supply voltage (9 - 16V for 12V system or 16 - 32V for 24V system)

\*\*Sound is played by the vehicle producer via Passive Avas Speaker



THANKS...