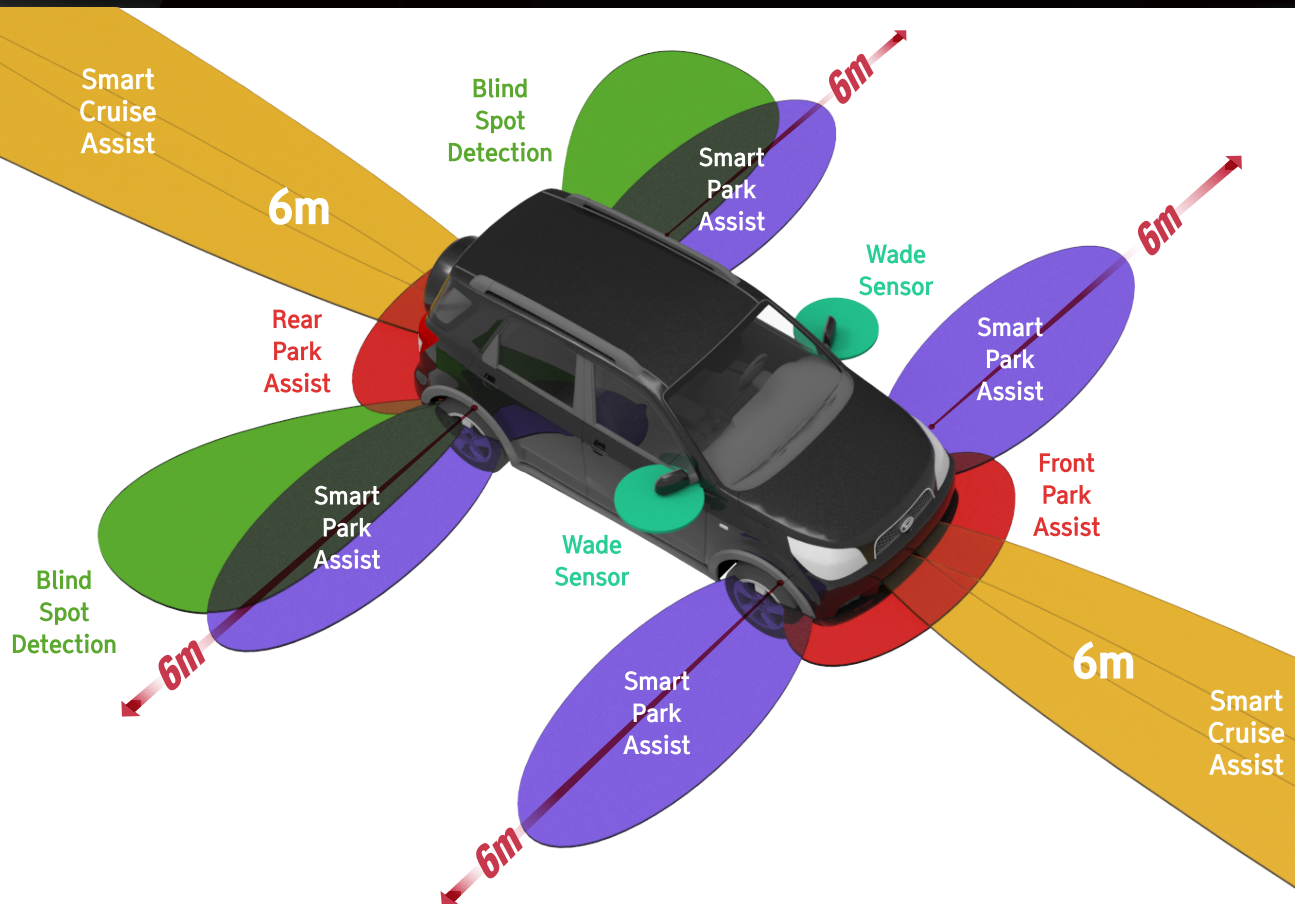


Long Range Ultrasonic Sensor

SENSORTEC is supplying various types of ultrasonic sensors from high-end to low-end level to complete vehicles' PDC function and even more as the leading Ultrasonic sensor provider.



■ Ultrasonic Sensor Transducer



Dimension	Ø15.5mm, 9mm
Type	Wire Type
Frequency	40 kHz
Detectable Range	0.3m ~ 6m
Directivity	Wide : 70°
	Narrow : 35°
Capacitance	1,500 pF
Operating Temp	- 40°C ~ 85°C

■ Ultrasonic Sensor Module

Distance	0.3m ~ 6m
Using Sensor	Ø15.5mm, 9mm / Wire Type
Operating Voltage	10V ~ 16V
Current Consumptio	10mA ~ 20mA
LIN Interface	LIN 2.1 / 19,200 bps
LIN Type	Slave
Connector	4Pin, Waterproof Type
Protection Class	IP6K7K, Sensor and connector

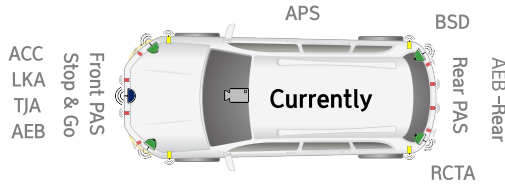


Low-Cost RADAR

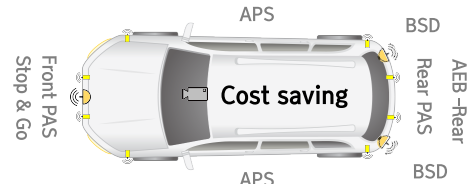
Ultrasonic(SRU)  Ultrasonic(LRU)  Radar(USRR)  Radar(SRR)  Radar(LRR)  Camera 

CMOS based Low-cost RADAR

New Solution

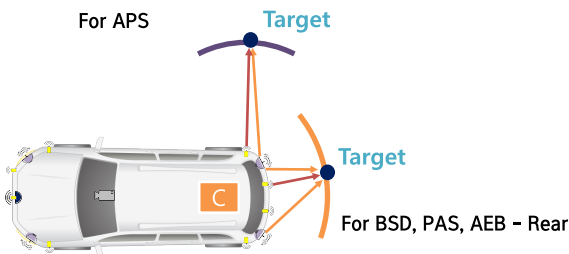


77GHz LRR, Camera[Vision] +
8ea Short Range Ultrasonic (\$6*8ea SRU)
4ea Long Range Ultrasonic (\$7*4ea LRU)
4ea 24GHz SRR [\$25*4ea SRR]



Using sensor fusion tech.
Except 77GHz LRR, Camera[Vision]
Total Cost reduction : Over USD \$90

Basic method for Location Recognition



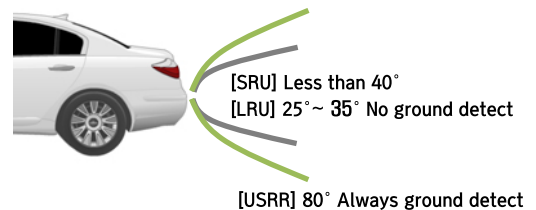
Using sensor fusion tech.

- Improved location recognition precision
- Ultrasonic Resolution[10mm under] + USRR Resolution [+/-50mm]

Vertical FOV Requirements

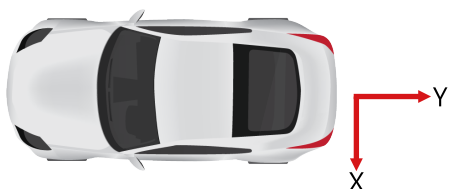
FOV[V] : [USRR] 80° Always ground detect
It can detect cliffs or pits.
[LRU] 35° No ground detect

Sensor fusion technology is available.



Specification & System Accuracy

Category	Description	Value
Detection	Range	< 10m
	Boot-up time	< 200ms
	Response time	< 50ms
	Velocity	< 15km/hr
	compliant with ISO 17386	
	Support angle of arrival	
	Test object	75mm plastic pole, 1m height
Operation condition	Sensor Operation Temp.	- 40 °C ~ 85 °C
	Operation voltage	6 ~ 36 V
	Activated by rear light signal (LIN based system is TBD)	
	Sensor height	30 ~ 65 cm
Warning mechanism	Support self-diagnostic function	
	Speaker is default (LED and display with embedded MCU is TBD)	
Feature	No bumper hole needed	
	Support LIN (TBD)	



Range	Accuracy(X direction)	Accuracy(Y direction)	Miss detection rate
0.1~1m	10cm	10cm	1%
1~2.5m	15cm	10cm	3%
2.5~5m	30cm	10cm	5%