

Document: **User Manual**

Product: **BSRF-V1RWHIGH.0**

Date: 2020-10-26

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1. Abstract

1.1 Change History

Version	Date	Changed By	Description
1.0	2020-10-19	Kelvin Fongang	First issue
1.1	2020-10-26	Kelvin Fongang	Updated Wi-Fi channel bandwidth specification
1.2	2021-01-14	Kelvin Fongang	Added max continuous current
1.3	2020-02-09	Kelvin Fongang	VoLTE not supported
1.4	2021-03-11	Kelvin Fongang	Updated operating temperature range
1.5	2021-03-22	Kelvin Fongang	Updated HW/SW versions
1.6	2021-04-16	Kelvin Fongang	Updated antenna gains
1.7	2021-04-22	Kelvin Fongang	Added user manual statements
1.8	2021-05-11	Kelvin Fongang	Added Wi-Fi 5150 – 5250 MHz restrictions Update AM, FM, DAB frequency ranges
1.9	2021-06-22	Kelvin Fongang	Updated ROW Infos, minor improvements
2.0	2021-10-27	Kelvin Fongang	Updated user manual statements

1.2 List of Abbreviations

Abbreviation	Description
AGC	Automatic Gain Control
AP	Access Point
BSRF	Boitier Supervision Radio Fréquence
Beidou	China's Beidou Navigation Satellite System
BUB	Backup Battery
CAN	Controller Area Network
CW	Continuous Wave
DAB	Digital Audio Broadcasting

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DIM	Driver Information Module
DTC	Diagnostic Trouble Code
DUT	Device under Test
EMC	Electromagnetic Compatibility
Galileo	European union's Navigation Satellite System
GLONASS	Russia's Navigation Satellite System
GNSS	Global Navigation Satellite System
GPS	United States' Global Positioning System
GSM	Global System for Mobile Communications
GTW	Gateway
HW	Hardware
HU	Head Unit
IVI	In-vehicle infotainment
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MFF2	Embedded Form Factor (embedded SIM)
MMI	Man Machine Interface
MNO	Mobile Network Operator
NAD	Network Access Device
PCB	Printed Circuit Board
PWM	Pulse Width Modulation
RED	Radio Equipment Directive
RF	Radio Frequency
ROW	Rest of World
SIM	Subscriber Identity Module
STA	Station
SVT	Stolen Vehicle Tracking
SW	Software
TCU	Telematic Control Unit
UMTS	Universal Mobile Telecommunications System
WCDMA	Wideband Code Division Multiple Access
PWM	Pulse Width Modulation
VSM	Vehicle Security Module (Body Control Module)

1.3 Scope of Document

The aim of this document is to provide a system, functional and general product description of the BSRF intelligent antenna module.

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2. *Manufacturer Information*

Manufacturer and Applicant

Continental Automotive GmbH
Siemensstrasse 12
93055 Regensburg
Germany

Brand/Trademark

Continental

Factory/Manufacturing Location

Continental Automotive Systems S.R.L.
Strada Salzburg 8
550018 Sibiu
Romania

Country of Origin

Romania

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3. Product and System Description

The BSRF is an Intelligent Antenna Module (IAM) for telematic and connectivity purposes to be factory fitted to passenger vehicles by the car manufacturer. It is designed and produced by Continental Automotive for the PSA Group.

The BSRF is designed for roof mounting with integrated antennas protected by a shark fin cover situated above the roof and internal PCB antennas below the roof surface.

The BSRF does not provide a direct user interface. Instead it provides the below mentioned radio features to be used by other control units and interfaces e.g. the Head Unit (HU) in the vehicle via the vehicle electrical bus. The only exception to this is the Emergency and Assistance Call functionalities which can operate autonomously in the vehicle or via a push button. The BSRF uses factory mounted embedded SIM (MFF2).

A built-in backup antenna provides cellular network access in case the main integrated antennas covered by the shark fin get damaged. E.g. during a roll-over crash scenario.

The BSRF is connected to the car power supply via a 4-pin battery connector, and to the vehicle interfaces via a 20-pin and a BroadR-Reach connector.

The radio features are:

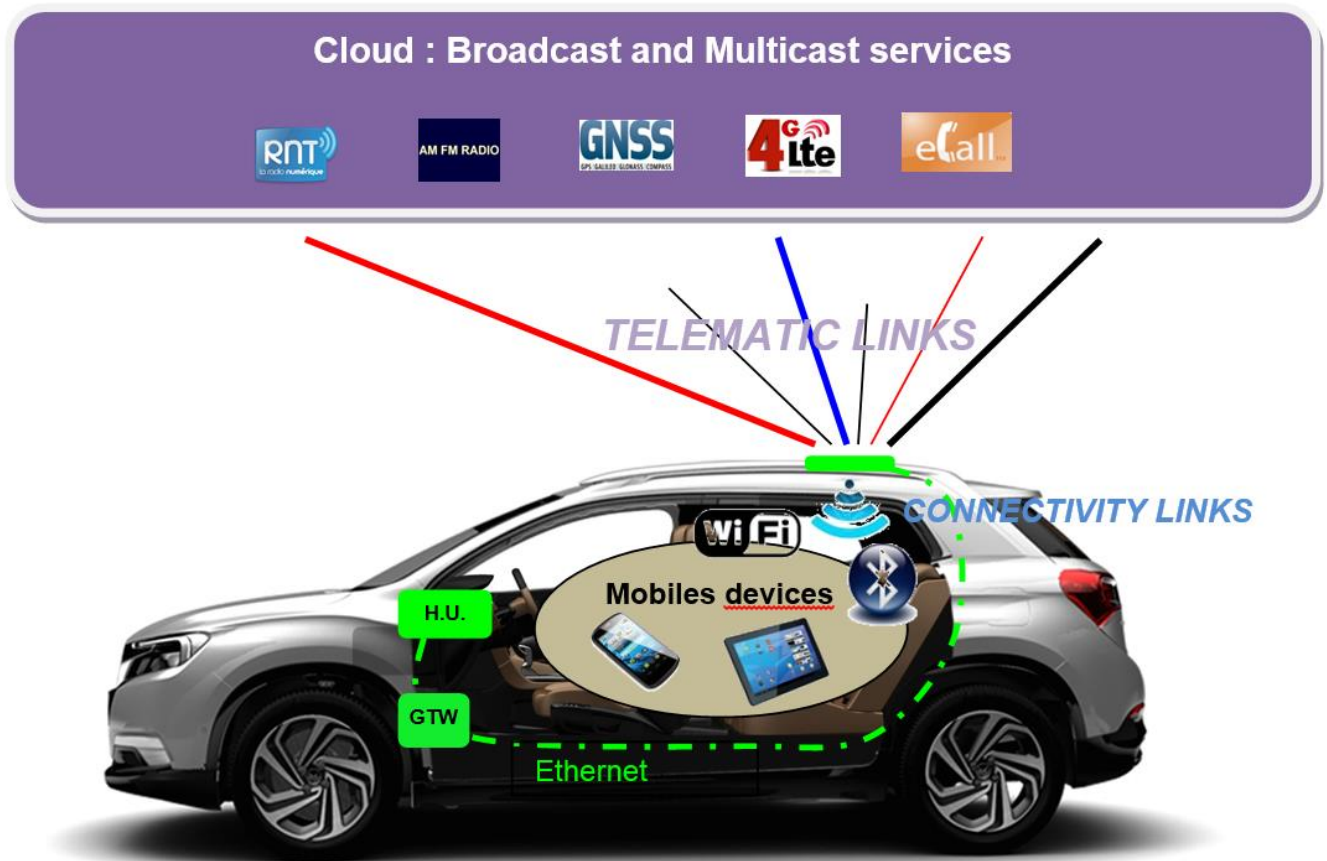
- › Radio broadcast reception services: AM, FM, DAB
- › FM antenna input for FM phase diversity (2nd FM antenna external)
- › Telematics and data connection via mobile networks (2G, 3G, 4G)
- › Wi-Fi hotspot
- › Emergency and Assistance Call Management
- › GNSS Position (GPS, GLONASS, Galileo, Beidou)

The non-radio features are:

- › SW Update (via mobile networks)
- › Cyber security
- › Vehicle data storage

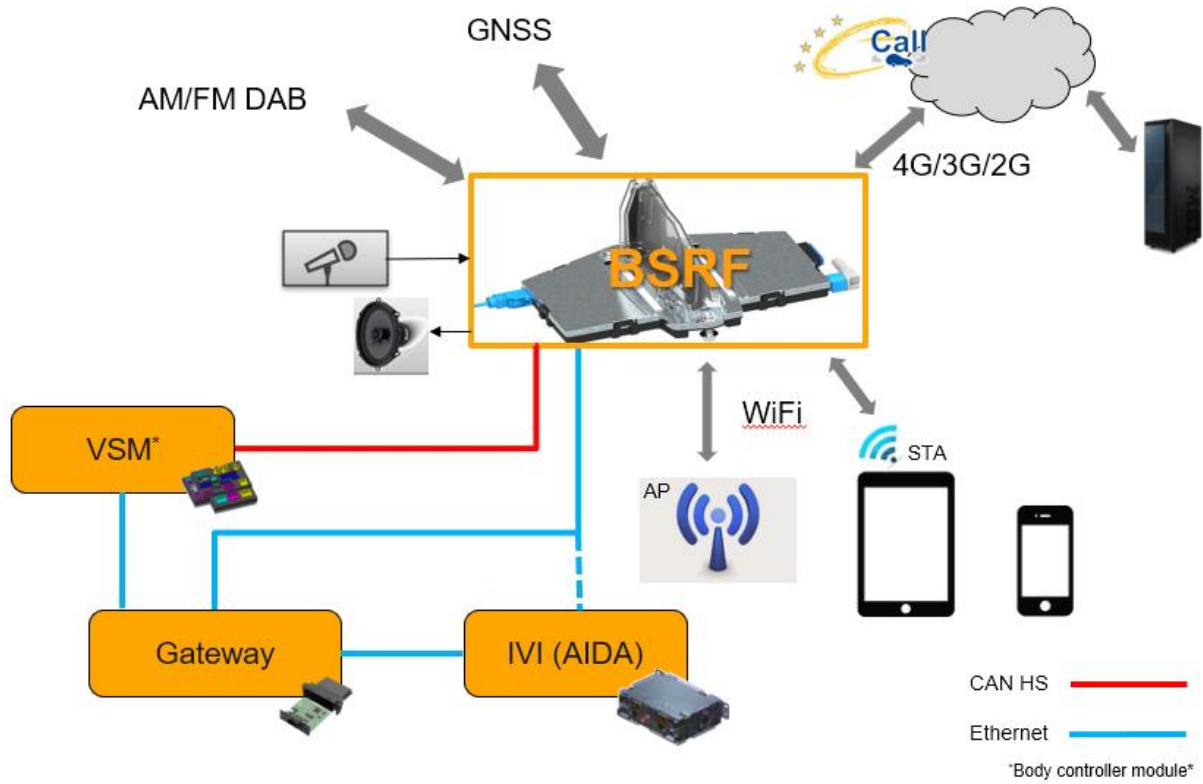
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Overview of the main functions of the BSRF in the vehicle



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BSRF System Architecture










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4. Product Variants

4.1 Model Names

Variant	Description	Hardware Version	Software Version
BSRF-V1EUHIGH.0	Europe HIGH	D5.1	V15_1.15.1.21.10.30
BSRF-V1EUMID.0	Europe MID	D5.1	V15_1.15.1.21.10.30
BSRF-V1RUHIGH.0	Russia HIGH	D5.1	
BSRF-V1TRHIGH.0	Turkey HIGH	D5.1	
BSRF-V1CNHIGH.0	China HIGH	D5.1	V13_1.13.0.20.33.70
BSRF-V1JPHIGH.0	Japan HIGH	D5	V15_1.15.1.21.10.30
BSRF-V1RWHIGH.0	Rest of World HIGH	D5	V15_1.15.1.21.10.30

BSRF Diversity Variants – NEA 2020 & AEE 2010

<p>High Europe</p>  <p>NAD : BL28EU-RD1 (New NAD) MNO: ORANGE eCall: PE112 4 tuners (2 chips) => DAB on FM range: 88-108 MHz SVT full</p>	<p>Mid Europe</p>  <p>NAD : BL28EU-RD1 (New NAD) MNO: ORANGE eCall: PE112 4 tuners (2 chips) => DAB on FM range: 88-108 MHz SVT Light – No Accelerometer</p>	<p>High Russia</p>  <p>NAD : BL28EU-RD1 (New NAD) MNO: ORANGE + GLONASS eCall: PE112 + GLONASS (with Roll over detection) 4 tuners (2 chips) => DAB on FM range: 88-108 MHz SVT full</p>	<p>High Turkey</p>  <p>NAD : BL28EU-RD1 (New NAD) MNO: Turkish MNO eCall: PE112 4 tuners (2 chips) => DAB on FM range: 88-108 MHz SVT full</p>
<p>High China</p>  <p>BL28CN-RD1 (New NAD) MNO: CN UNICOM eCall: N.A 2 tuners (1 chip) => DAB off FM range: 88-108 MHz SVT full</p>	<p>High Japan</p>  <p>BL28JP-001(Std) MNO: ORANGE eCall: N.A 2 tuners (1 chip) => DAB off FM range: 76-108 MHz SVT full</p>	<p>High Rest Of The World</p>  <p>BL28RW-001 (Std) MNO: ORANGE eCall: PE112 4 tuners (2 chips) => DAB on FM range: 76 -108 MHz SVT full</p>	

The listed variants Europe HIGH and Europe MID use the same:

- PCB
- Housing
- External connectors
- Shark fin antennas & internal antennas

The only difference is that the Europe MID variant doesn't have an accelerometer

The only differences between the other variants are:

- NAD module (different band configurations)
- Country specific MFF2 SIM card profile or even specific SIM
- China, ROW and Japan variants without DAB
- Number of broadcast tuners

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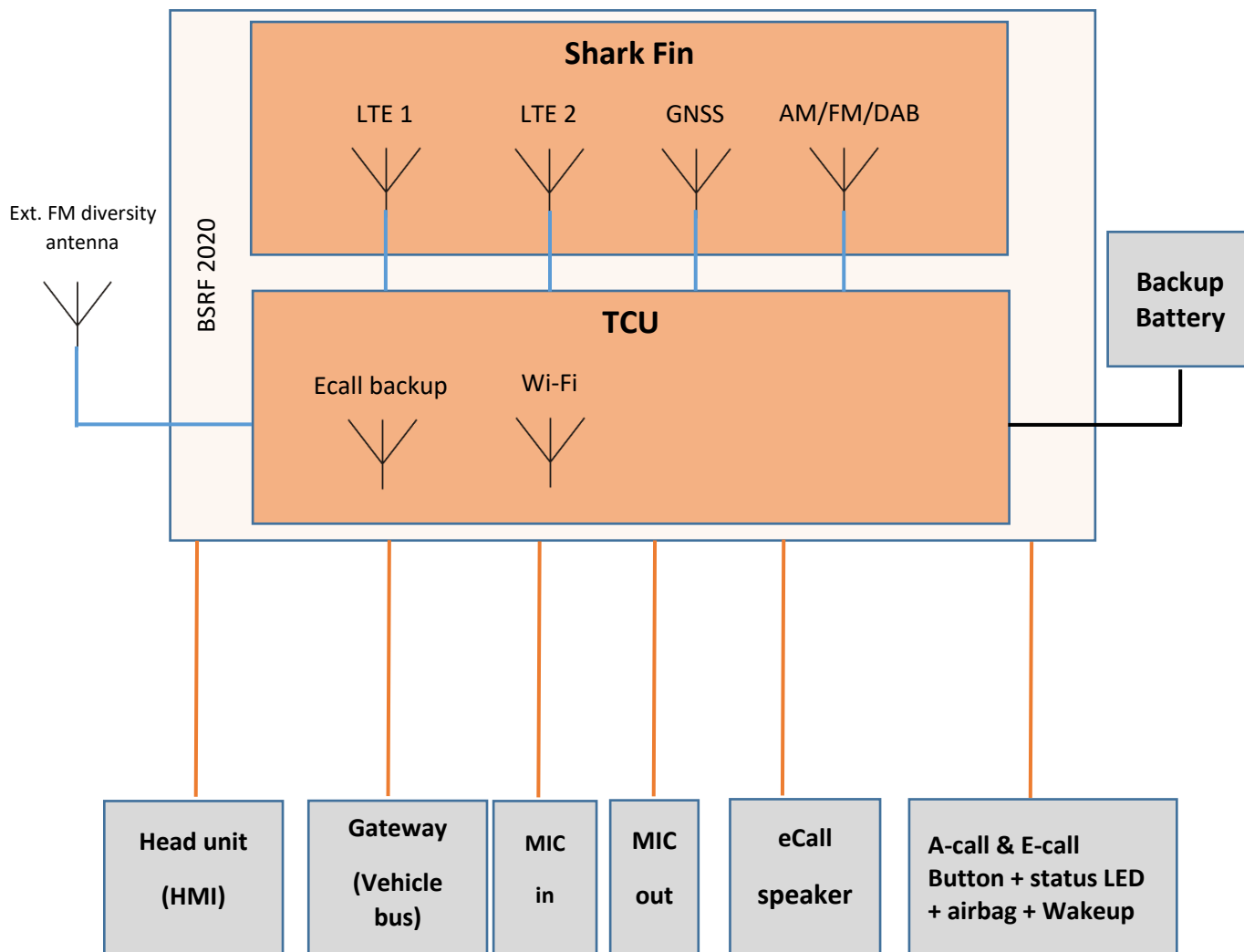
4.2 Variants and Features Table

Product Variant		MID EU	HIGH EU	HIGH Russia	HIGH CN	HIGH ROW	HIGH JAPAN (without TV)	Turkey
Geographical Zone	Mechanical impac	DEUR - DMOA	DEUR - DMOA	DRUC	DPCA	DAML	DINP	
EE Diversity								
NAD NDM 9628	cooling plate	BL28EU-RD1	BL28EU-RD1	BL28EU-RD1	BL28CN-RD1	BL28RW-001	BL28JP-001	BL28EU-RD1
eUICC - SIM card (MNO profile at Continental plant)	-	x (ORANGE)	x (ORANGE)	x (ORANGE + ERAGLONASS)	x (CHINA UNICOM FOR DPCA)	x (ORANGE TBC by PSA)	x (ORANGE)	Turkish MNO to be defined by PSA
FM/AM/DAB Antenna supply (External Antenna for phase diversity)	FAKRA	x	x	x	x	x	x	x
STA710 IC	?	2	2	2	1	2	1	2
FM / AM amplifier	-	x (no AGC)	x (no AGC)	x (no AGC)	x (no AGC)	x (no AGC)	x (no AGC)	x (no AGC)
DAB ampli (without AGC)	-	x	x	x	-	X	-	x
Japan Broadcast bands	-	-	-	-	-	No HW specificity (eg: Brazil)	No HW specificity	-
Wifi (+ Wifi Antenna) / BT (Combo)	-	x	x	x	x	x	x	x
Electronic component related to BT ⁽⁹⁾	-	-	-	-	-	-	-	-
Internal back-up antenna (used for eCall)	-	x	x	x	x	x	x	x
Ethernet BroadReach ⁽²⁾ (NXP)	H-MTD	x	x	x	x	x	x	x
Accelerometer	-	-	x	x	x	x	x	x
NAND (512MB) ⁽³⁾	-	-	-	-	-	-	-	-
eMMC (8GB) ⁽³⁾	-	x	x	x	x	x	x	x
SDARS module	Chassis	-	-	-	-	-	-	-
Stacked patch (for GNSS and SDARS) (externe antenna for US)	Chassis	-	-	-	-	-	-	-
HD Radio	?	-	-	-	-	-	-	-
Specific main PCB for Active antenna variants	Chassis, Protection Cap,	-	-	-	-	-	-	-
Specific main PCB for Entry Mid High EU CN ROW variants	-	x	x	x	x	x	x	x
Specific PCB for SDARS	?	-	-	-	-	-	-	-
Antenna PCBs		1 : EU antenna PC : EU antenna PC : EU antenna PC : EU antenna PC : EU antenna PC1 : EU antenna PCB1 : EU antenna PCB						
Button / Led interface (for Xcall) (Pin 1 & 2 & 4 & 5 of the 20 pins connector)	20 pin connector	x	x	x	x	x	x	x
Power Amp (for loudspeaker -> Pin 7 & 8 of the 20 pins connector)	20 pin connector	x	x	x	x	x	x	x
AirBag interface (Wire: Pin 10 of the 20 pins connector)	20 pin connector	x	x	x	x	x	x	x
MicroPhone Interface (Pins 12 & 13 & 14 & 15 of the 20 pins connector)	20 pin connector	x	x	x	x	x	x	x
Digital TV		-	-	-	-	-	-	-
No EE Diversity								
Rayleigh MAC58R 533Mhz	-	x	x	x	x	x	x	x
FM/AM/DAB Internal Antenna	-	x	x	x	x	x	x	x
LTE Antenna	-	2	2	2	2	2	2	2
CAN HS	-	x	x	x	x	x	x	x
GNSS	-	x	x	x	x	x	x	x
RAM DDR 128MB	-	x	x	x	x	x	x	x
Wakeup interface (Wire: Pin 11 of the 20 pins connector) ⁽⁴⁾	20 pin connector	x	x	x	x	x	x	x
Blower / Fan		x	x	x	x	x	x	x

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5. Hardware Description

5.1 Block Diagram



— Analog / digital signal

— RF – signal

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5.2 Main Features

The BSRF is a combination of an Intelligent Antenna Module and a Telematics Control Unit (TCU). It:

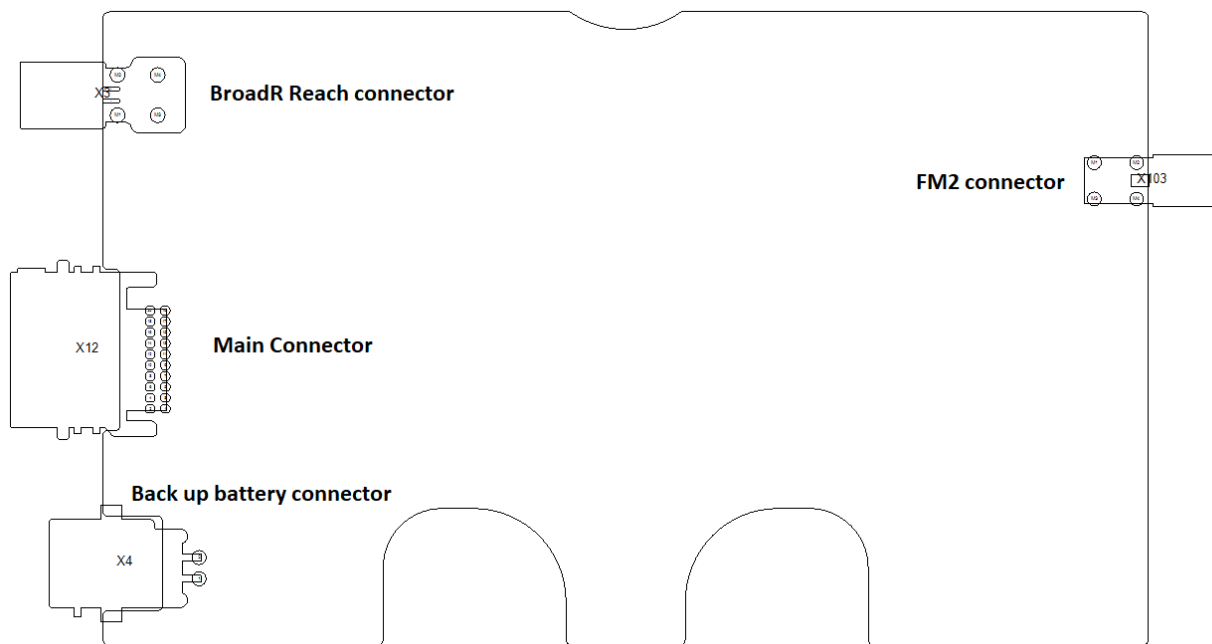
- offers possibilities for AM/FM and DAB reception with corresponding tuner processing
- embeds a 2G/3G/4G modem which features one internal GSM/WCDMA/LTE1 antenna and one internal LTE2 (Rx only) antenna
- has a backup cellular antenna: 2G, 3G, 4G
- supports Emergency Call (eCall and ERA-GLONASS)
- does not support VoLTE
- has a Backup Battery (BUB) in order to support eCall if the main vehicle battery is disconnected
- supports SVT (Stolen Vehicle Tracking)
- supports GNSS (GPS/GLONASS/Galileo/Beidou) via an internal antenna
- supports Wi-Fi IEEE802.11 a/b/g/n/ac
- features one High Speed CAN driver for interoperating with the vehicle
- communicates with Multimedia control unit through Ethernet BroadR-Reach bus
- communicates with eCall MMI via wired signals

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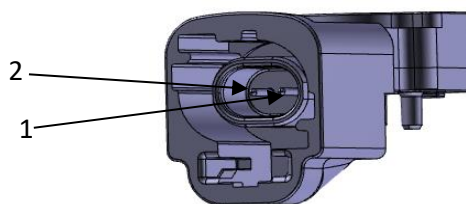
5.3 Wired Interfaces

The external interface of the BSRF consists of:

- 1) Radio antenna connector (FM2)
- 2) BroadR-Reach connector (type HSD)
- 3) Main 20 pin connector (Tyco)
- 4) Backup Battery Connector



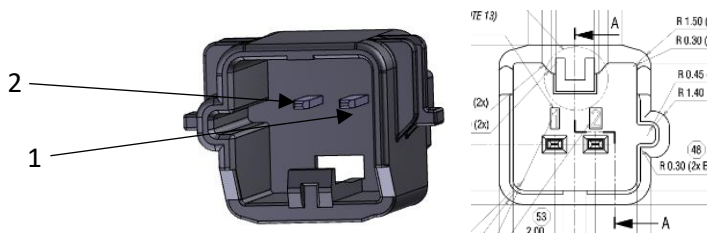
5.3.1 X3 HSD BroadR Reach Connector



Pin	Signal Name	Test point	Type	Comments
1	BROADRR_P1	-	I/O	
2	BROADRR_M1		I/O	

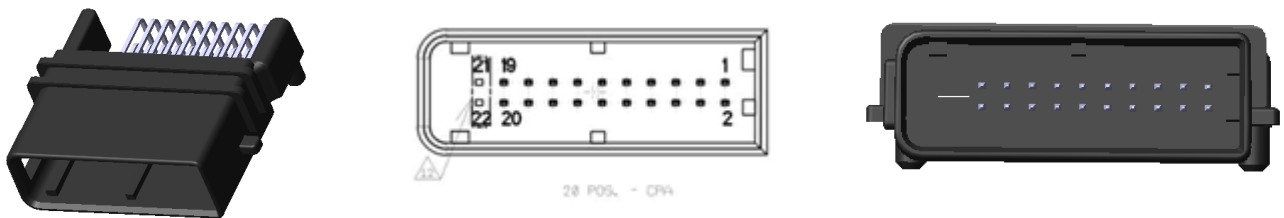
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5.3.2 X4 Backup Battery Connector



Pin	Signal Name	Test point	Type	Comments
1	VBUB	-	I	
2	GND	-	-	

5.3.3 X12 Main Connector (Nano MQS 20 pin)

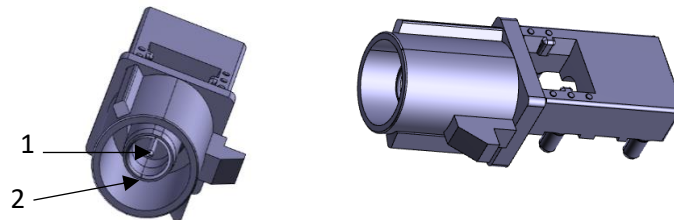


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Nano MSQ connector

Pin	Signal	I/O	Description	Current requirements	Electrical characteristics
1	CAN_H	I/O	CAN High data signal	I max. = 200 mA	High Speed CAN Bus
2	BUB_Supplier_Coding	I	Battery supplier coding		
3	Free	NC			
4	CAN_L	I/O	CAN Low data signal	I max. = 200 mA	High Speed CAN Bus
5	Microphone Out -	O	External microphone - line	I max. = 20 mA	Microphone -_recopy
6	BUB_NTC_ADC		Battery temperature sense		
7	Microphone In -	I	External microphone - line	I max. = 20 mA	
8	Microphone Out +	O	External microphone + line	I max. = 20 mA	Microphone +_recopy
9	Wakeup	I/O	Wakeup Signal	I max. = 10 mA	
10	Microphone In +	I	External microphone + line	I max. = 20 mA	
11	Power_GND	I	General supply ground	I max. = 2,5 A	
12	Airbag signal	I	Airbag Signal Input	I max. = 10 mA	
13	SPK-	O	Loud Speaker	I max. = 1,4 A (8W)	
14	SPK+	O	Loud Speaker	I max. = 1,4 A (8W)	
15	Red_Led	O	Red LED	I max. = 20 mA	
16	+VBAT	I	General power supply	I max. = 2,5 A	
17	Power_GND	I	General supply ground	I max. = 2,5 A	
18	Bcall_Button	I	Breakdown Call	I max. = 10 mA	
19	Ecall_Button	I	Emergency Call	I max. = 10 mA	
20	Green_Led	O	Green LED	I max. = 20 mA	
21	Not Available				
22	Not Available				

5.3.4 X103 FM2 Antenna Connector



FM Antenna Pinning Configuration

Pin	Signal Name	Test point	Type	Comments
1	FM_ANT			12V _{DC} output (Phantom Supply); 100mA RF input
2	GND	-	-	

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5.4 Operating Temperature Range

Operating temperature range: -40°C to +80°C.

NAD operating temperature range which complies with 3GPP specification: -10°C to +55°C.

5.5 Supply Voltage

Nominal Supply Voltage: 12 V DC.

Supply Voltage Range: 8 V – 16 V DC.

5.6 Power Consumption

Typical current consumption is around 700mA (Tuner, NAD, Wi-Fi, GNSS on).

Max continuous current estimated: 2A at 13V

5.7 Maximum Humidity

40 °C, 93 % to be tested for 504 hours.

5.8 SIM Card

The BSRF uses a factory fitted embedded SIM Card (MFF2 with a carrier specific profile).

5.9 Backup Battery (BUB)



The BSRF features a Lithium Ion BUB including a 3-terminals fuse, a thermal sensor with capacitor and an active overvoltage protection. In case there is a loss of power supply from the car battery, the BSRF is be able to run on the BUB when in Emergency or SVT power states. The BUB is externally connected to the BSRF unit.

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6. Wireless Services

6.1 NAD Module

The Continental NAD module is based on the MDM9628 SOC from Qualcomm that features a Cortex A7 core application processor and a modem offering the possibility to connect on 2G, 3G or 4G/LTE cellular networks.

The NAD embeds a GNSS receiver and provides control of WLAN through dedicated interfaces. LTE antennas, the GNSS and Wi-Fi antennas are connected directly to the NAD.

The NAD provides the following features:

Audio Call: Incoming, outgoing for telematics services (eCall and Assistance Call)

SMS: Data only for telematics services (eCall and Assistance Call)

Packet Data: Data via 2G, 3G and LTE for telematics services (eCall and Assistance Call)

eCall: Europe, Russia, UAE.

The variants are realised via different component values according the different bands:

NAD Model name	Region / Carrier	FDD / TDD LTE Band	UMTS Band	GSM Band
BL28EU-RD1	EU / Orange	1, 3, 7, 8, 20, 28a	1, 3, 8	3, 8
BL28RW-001	ROW / Orange	1, 2, 3, 4, 5, 7, 8, 28a, 28b	1, 2, 3, 4, 5, 6, 8	2, 3, 5, 8
BL28CN-RD1	China / CN Unicom	1, 3, 8, 34, 38, 39, 40, 41	1, 3, 8	3, 8
BL28JP-001	Japan / Orange	1, 3, 8, 19, 21, 28b	1, 5, 6, 8, 19	-

The NAD module variants are assigned to the BSRF according to the following table:

NAD Model name				
BL28EU-RD1	EU Mid	EU High	Russia High	Turkey High
BL28RW-001	ROW High			
BL28CN-RD1	CN High			
BL28JP-001	JP High			

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6.2 Cellular Services BL28RW-001 NAD

6.2.1 2G/GSM

Wireless Service	2G/GSM
Frequency Bands / Range	Band 2 (GSM1900) Band 3 (GSM1800) Band 5 (GSM850) Band 8 (GSM900)
Output Power (Conducted)	Low Band: + 32.5 dBm High Band: + 29.5 dBm
Modulation	0.3 GMSK/8PSK
Channel Bandwidth	≤ 200kHz

6.2.2 3G/UMTS

Wireless Service	3G/UMTS
Frequency Bands / Range	FDD Band I (B1: 2100 UMTS) FDD Band II (B2: 1900 UMTS) FDD Band III (B3: 1800 UMTS) FDD Band IV (B4: 1700 UMTS) FDD Band V (B5: 850 UMTS) FDD Band VI (B6: 800 UMTS) FDD Band VIII (B8: 900 UMTS)
Output Power (Conducted)	+23.5 dBm
Modulation	BPSK
Channel Bandwidth	≤ 5 MHz

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6.2.3 4G/LTE

Wireless Service	4G/LTE
Frequency Bands / Range	FDD Band 1 (2100 LTE) FDD Band 2 (1900 LTE) FDD Band 3 (1800 LTE) FDD Band 4 (1700 LTE) FDD Band 5 (850 LTE) FDD Band 7 (2600 LTE) FDD Band 8 (900 LTE) FDD Band 28a (700 LTE) FDD Band 28b (700 LTE)
Output Power (Conducted)	+23.0 dBm
Modulation	QPSK/16QAM
Channel Bandwidth	LTE-TDD: ≤ 20MHz LTE FDD: ≤ 15MHz

6.3 GNSS Receiver

GNSS receiver is included in the NAD. It is a multi-constellation compatible receiver implementing GPS, GLONASS, Galileo and Beidou positioning systems.

Positioning data is used for telematics services (eCall and Assistance Call).

Positioning data is also provided to other control units and applications in the vehicle.

Wireless Service	GNSS Receiver
Frequency Range	GPS L1 band: 1575.42 MHz Galileo E1 band: 1575.42 MHz Glonass band L1: 1602 MHz BeiDou L1 band: 1561 MHz
Max. Output Power (EIRP)	N/A
Modulation	CDMA, FDMA

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6.4 WLAN

The BSRF uses the Qualcomm Wi-Fi chipset QCA6564AU-3.

AU stands for automotive grade

-3 stands for SDIO 3.0 interface for WLAN part control.

6.4.1 WLAN RF Parameters

Wireless Service	WLAN: a, b, g, n, ac (SISO)
Frequency Range	2.4 – 2.4835 GHz 5.150 – 5.250 GHz 5.725 – 5.850 GHz
Output Power (Conducted)	
Max. Output Power (E.I.R.P.)	2.4 – 2.4835 GHz: ≤ 20 dBm 5.150 – 5.250 GHz: ≤ 14 dBm 5.725 – 5.850 GHz: ≤ 14 dBm
Modulation	DBPSK/DQPSK/CCK, BPSK/QPSK/16QAM/64QAM/256QAM
Number of Channels	
Channel Bandwidth	2.4GHz 802.11b/g/n: 20 MHz 5GHz 802.11a: 20MHz 802.11n: 20/40MHz 802.11ac: 20/40/80MHz

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6.4.2 WLAN Supported Bands per Variants

WIFI 2.4 GHz (2400 – 2483,5 MHz)			
Variants	Channel	[MHz]	Supported
EU	CH1 – CH13	2400 – 2483,5	
RU	CH1 – CH13	2400 – 2483,5	
CN	CH1 – CH13	2400 – 2483,5	
RW	CH1 – CH13	2400 – 2483,5	
JP	CH1 – CH13	2400 – 2483,5	

WIFI 5 GHz						
	5150 – 5250 MHz (UNII-1)		5250 – 5350 MHz (UNII-2)	5470 – 5725 MHz (UNII-2) Extended	5725 – 5850 MHz (UNII-3)	
Variants	[MHz]		Not Supported		[MHz]	
EU	5150 – 5250	In the EU (restricted to indoor and vehicle usage)			5725 – 5850	Supported
RU	Indoor restriction Not Supported				5725 – 5875	
CN					5725 – 5850	
RW	5150 – 5250	In the EU (restricted to indoor and vehicle usage)			5725 – 5850	Supported
JP	Indoor restriction Not Supported				Not allowed	Not Supported

6.5 Radio Broadcast Receiver

Radio reception will be used by other control units in the vehicle e.g. the Head Unit. The Broadcast RF signals are demodulated inside the BSRF and the content (audio/data) is provided in digital format to the vehicle gateway.

6.5.1 Frequency Range for Europe:

AM (LW/MW): 148.5 kHz – 283.5 kHz / 526.5 kHz – 1 606.5 kHz

FM: 87,5 MHz – 108 MHz

DAB Band-III: 174 MHz – 240 MHz

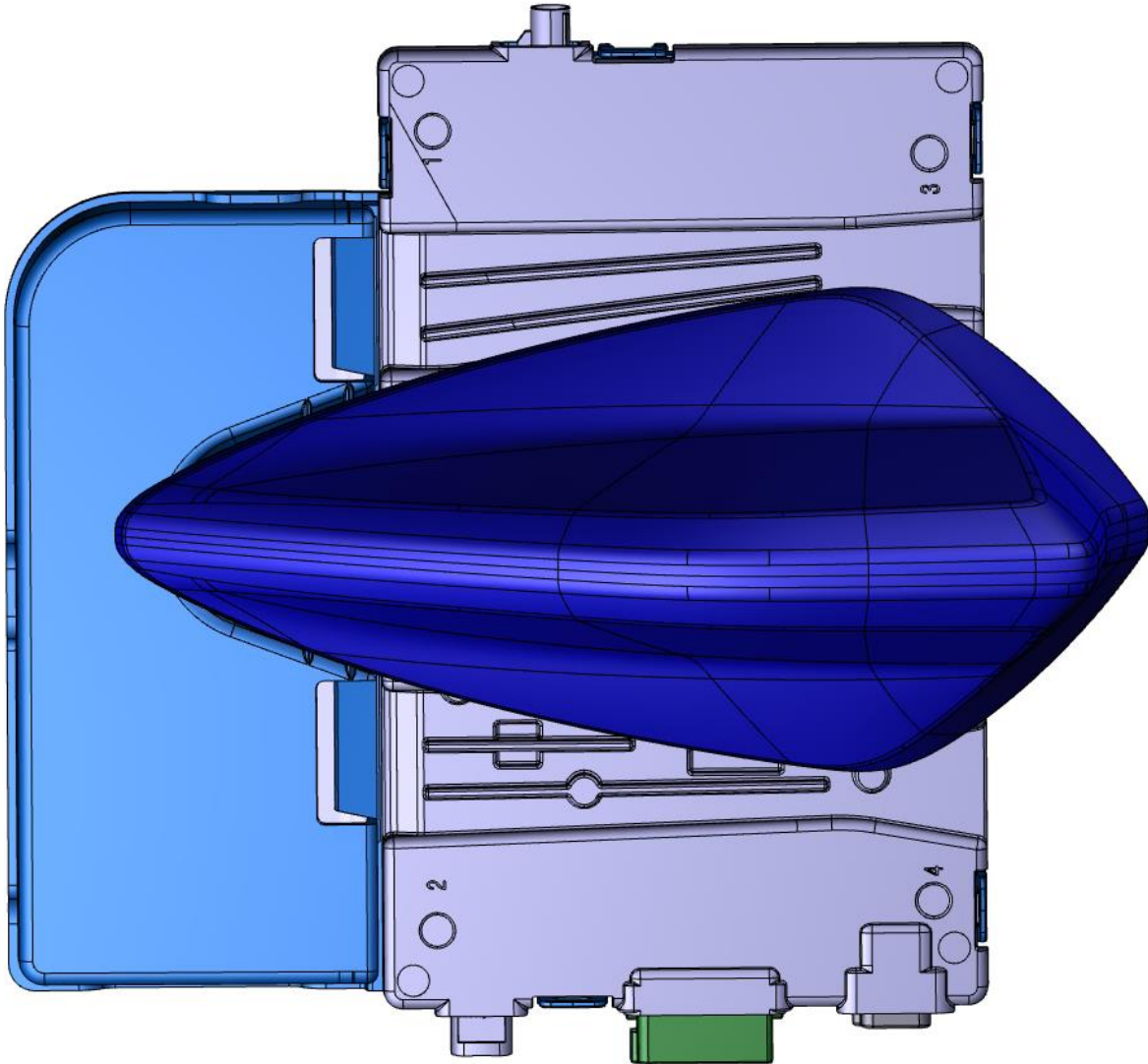
Via telecoding, the OEM will set the correct frequencies of operation in every other country.

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7. Mechanical Design

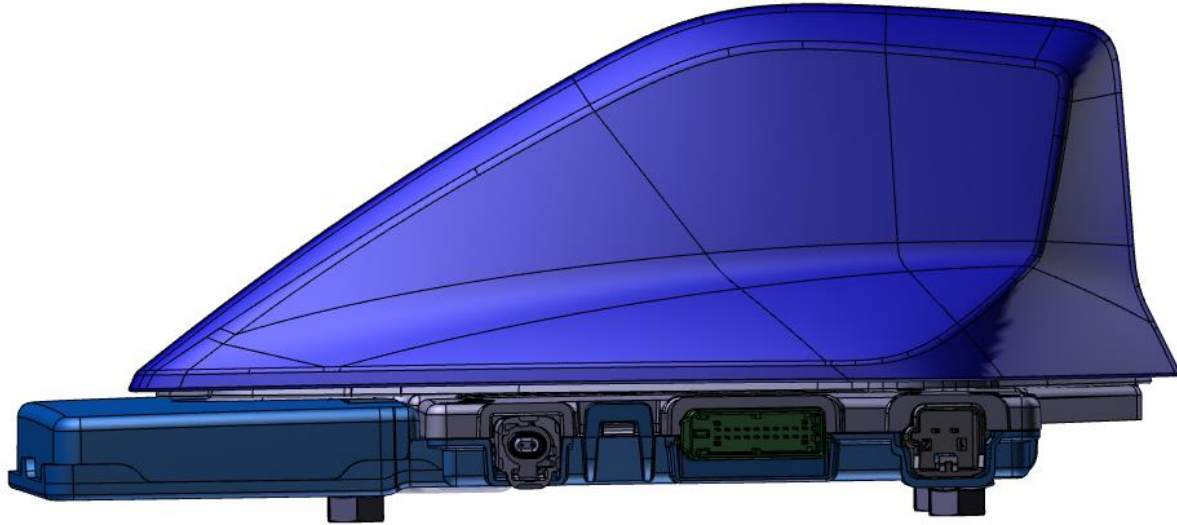
7.1 Product Picture

Top view

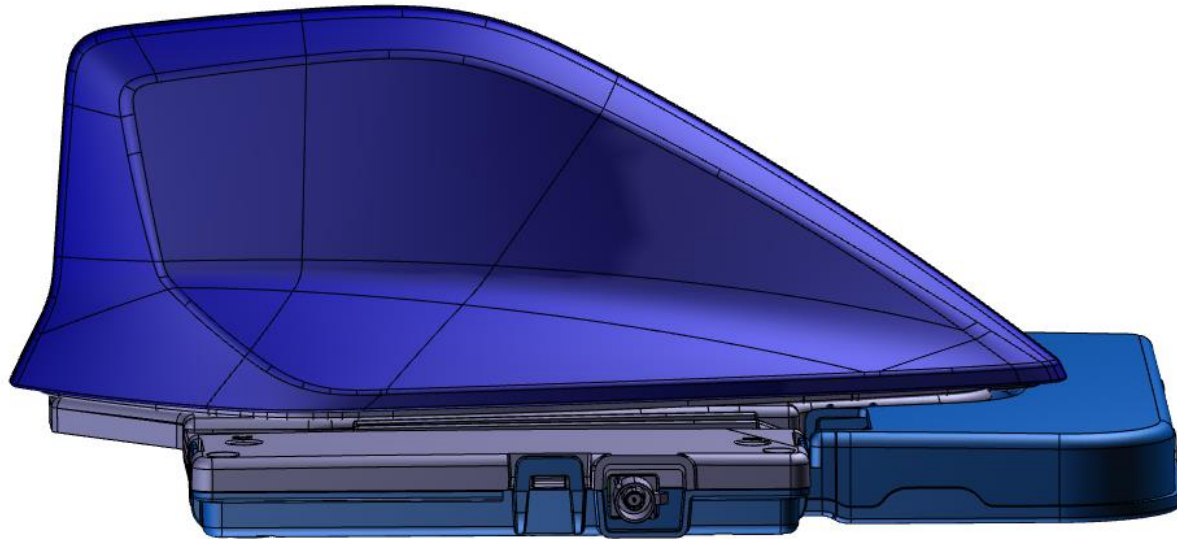


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Right side view

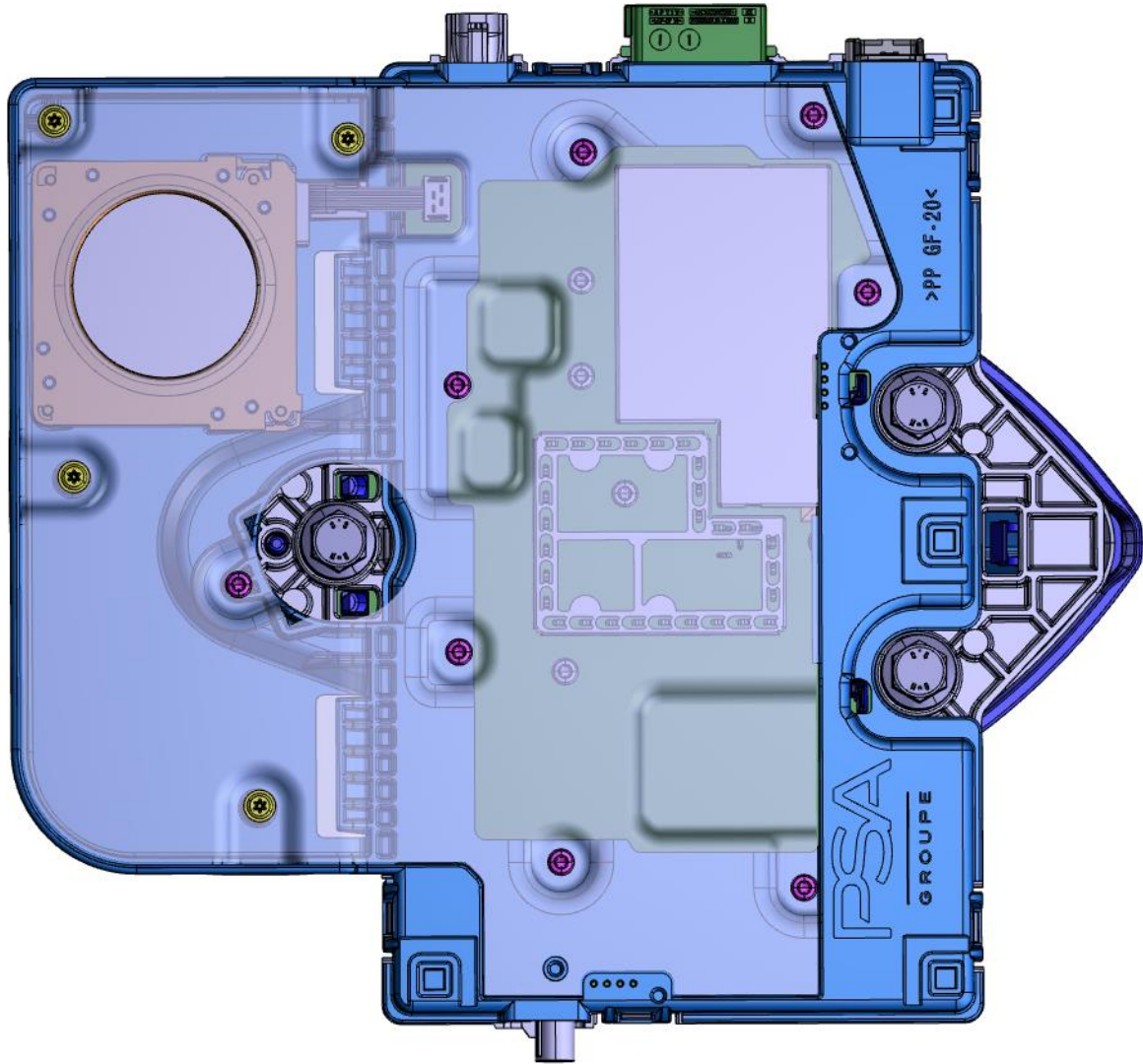


Left side view



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Bottom view



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7.2 Product Dimension

207,6 x 200,25 x 83,7mm

7.3 Product Weight

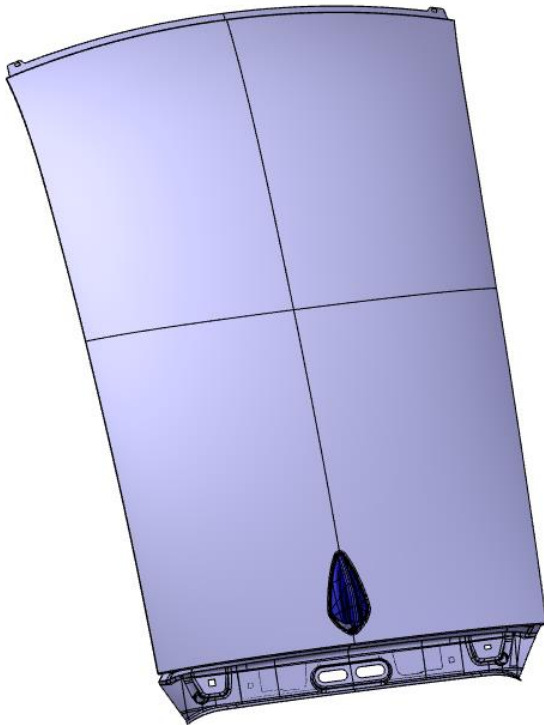
Approximately 0.62 kg

7.4 Mechanical Mounting Concept

7.4.1 Mounting Position

The BSRF will be mounted on the back of the roof. The head of the passenger can be less than 20cm to the internal antennas on the main PCB (Wi-Fi and backup antennas for eCall). All the other antennas are above the roof line.

Position of the BSRF on the vehicle roof (top view):



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Position of the BSRF on the vehicle roof (side view):

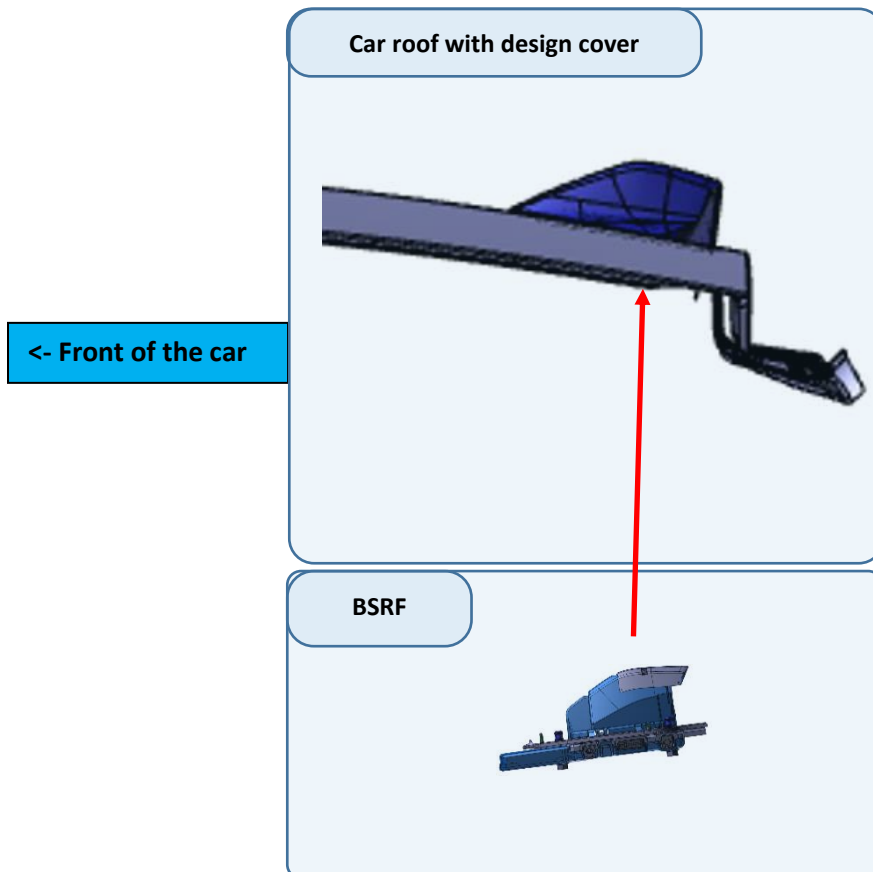


← Front of the vehicle roof

Back of the vehicle roof →

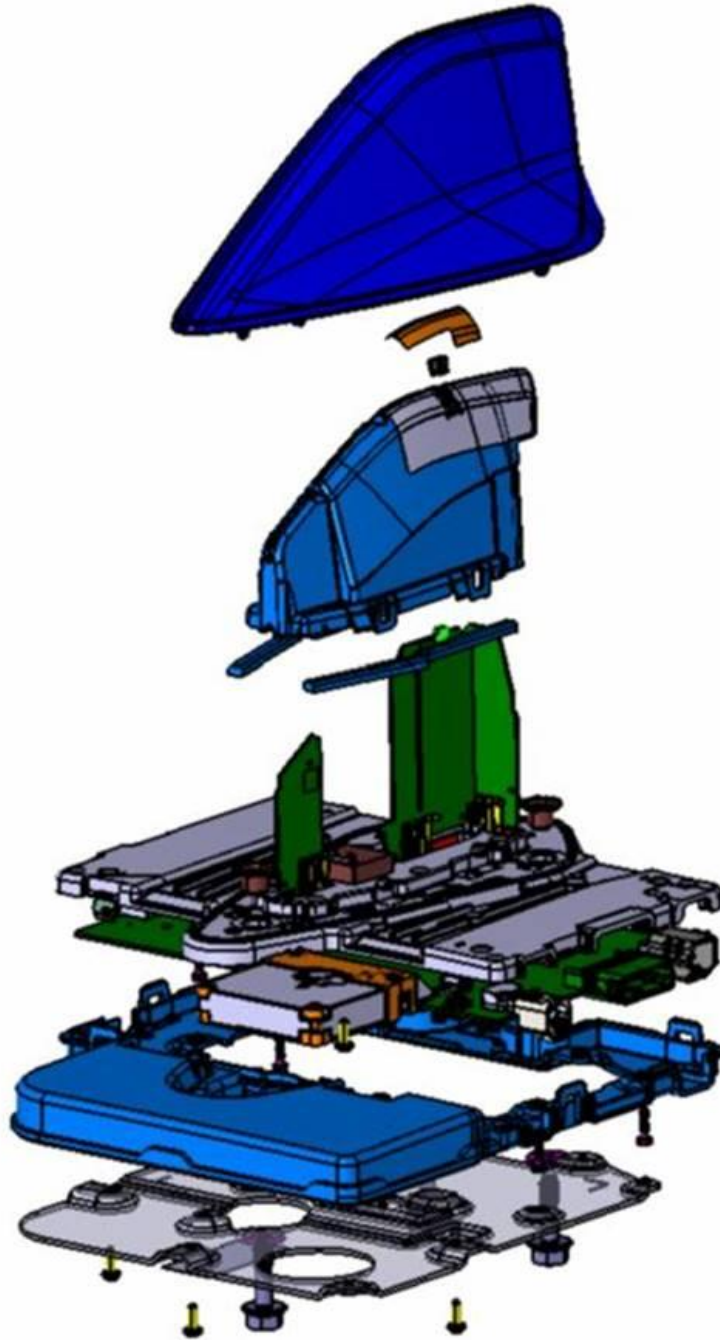
The BSRF will be mounted under the car roof and screwed to the design cover.

The integrated antennas are above the car roof and are protected by the design cover.



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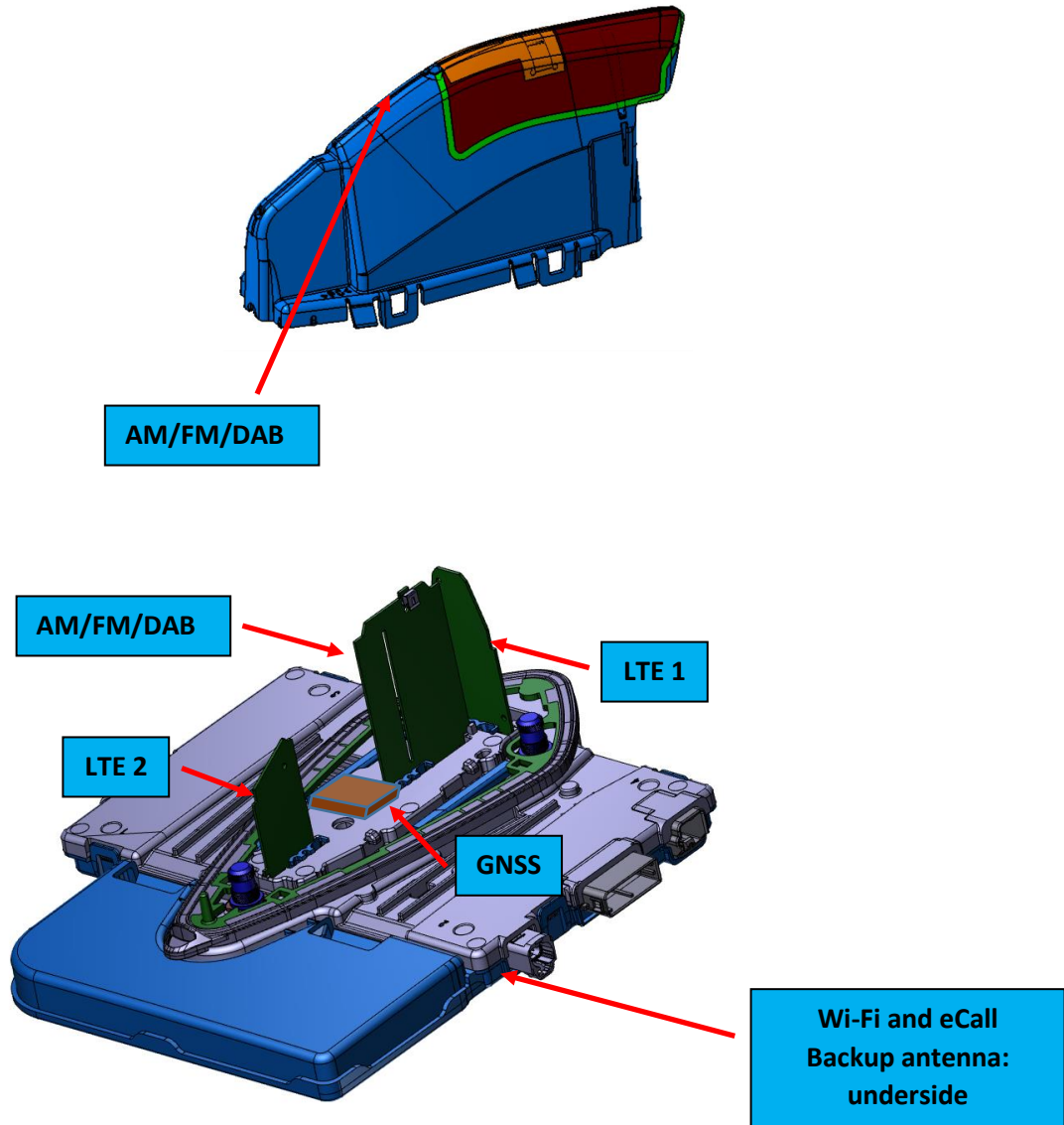
7.4.2 Product Assembly



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7.5 Antenna Concept

Antenna concept (shown with protection cover assembled)



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8. User Manual and Packaging Statements - Europe

	BE	BG	CZ	DK	DE	EE	IE	EL
	ES	FR	HR	IT	CY	LV	LT	LU
	HU	MT	NL	AT	PL	PT	RO	SI
	SK	FI	SE	UK				

8.1 Specific Absorption Rate (SAR) and RF exposure evaluation (MPE)

Max. Simultaneous Transmission SAR_{10g} = **XX** W/kg

The SAR_{10g} limit (2.0 W/kg for Body) general population/uncontrolled exposure is specified in Council Recommendation 1999/519/EC Annex II.

A minimum separation distance of 10mm between the user or bystander and the internal antennas (which are located on the bottom part of the BSRF inside the passenger compartment of the car) shall be ensured during normal operation.

A minimum separation distance of 20cm between the user or bystander and the external antennas (which are located on the top of the BSRF outside of the car) shall be ensured during normal operation.

8.2 Wi-Fi 5150 – 5250 MHz Restriction

The band 5150 - 5250 MHz is restricted to indoor or vehicle usage in Europe.

8.3 Safety Relevant Statements



All connected wiring shall be adequate according to the equipment's ratings and flammability requirements of standard EN 62368-1.

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9. User Manual Statements - USA

FCC ID: KR5-BSRFV1RW0

Interference statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Wireless notice

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. The antenna should be installed and operated with minimum distance of 15mm between the radiator and your body.

FCC Class B digital device notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modification statement

Continental Automotive GmbH has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

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