



Generation  
**4.0**  
**FAKRA**  
**Connector Series**  
Fully Automated Solution

**Amphenol<sup>®</sup> RF**

[www.amphenolrf.com/automotive](http://www.amphenolrf.com/automotive)

# Overview

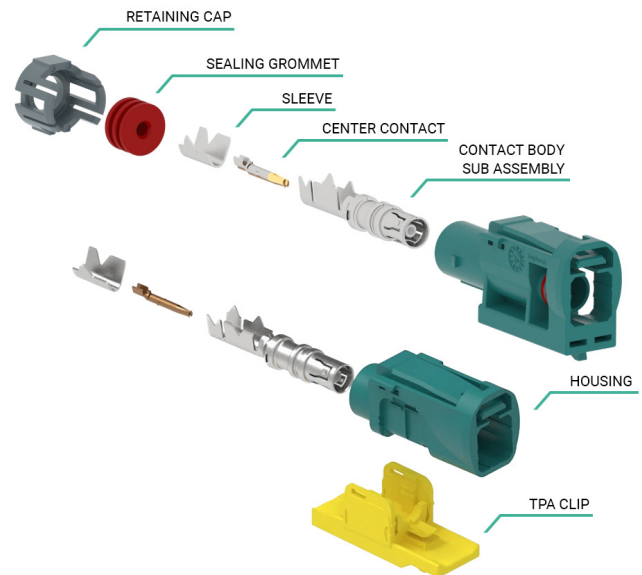
The latest generation of FAKRA connectors, generation 4.0, features an upgraded SMB connector design with stamped and formed construction for fully automated cable termination. The connectors feature removable connector housings for field replacement, if necessary, and are mechanically keyed and color-coded to prevent mismating on the production line. This generation of USCAR and FAKRA 2 compliant connectors is compatible with all previous FAKRA products.

Generation 4.0 FAKRA connectors meet the increasing demands of the automotive industry by offering low-cost, high-quality interconnect solutions. This generation of products is specifically intended for high volume users with factories which utilize high-speed automated cable assembly production. Traditional uses for FAKRA connectors include LVDS surround camera systems, infotainment, GPS navigation and satellite radio. This series of connectors also supports emerging applications such as blind spot monitoring, emergency vehicle warning systems and autonomous capabilities.

This updated line of FAKRA connectors is an integral part of the movement towards autonomous vehicles and supports the infrastructure necessary for cars and roadside applications where this technology is being implemented. These connectors are also being used increasingly in non-automotive markets within “smart” technology while remaining a staple in the automotive space.

## Features and Benefits

- Ruggedized housing with audible locking mechanism
- 14 different mechanical and visual key codes
- Minimum of 25 mating cycles
- Reliable electrical performance up to 6 GHz
- Available in a variety of PCB and cable-mount configurations
- Stamped & formed construction for fully automated cable termination
- FAKRA 2 compatible with enhanced TPA functionality
- Mechanical pull to 90N min.
- Chamber compatible per FAKRA 2 specification
- Connector housings are removable for field replacement



## Applications

- 360-degree surround view cameras
- Wireless remote controls
- Sensor connections
- Infotainment
- Vehicle controls
- Compute modules
- GPS
- Bluetooth
- Satellite radio and AM/FM radio





# FAKRA/USCAR Mechanical Coding

## FAKRA/USCAR MECHANICAL CODING

|          | JACK                                                                                | PLUG                                                                                | RAL  | COLOR                                                                                              | APPLICATION                     |
|----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------|---------------------------------|
| <b>A</b> |    |    | 9005 |  Jet Black        | DAB/AM-FM                       |
| <b>B</b> |    |    | 9001 |  Cream            | DAB with Power / AM-FM          |
| <b>C</b> |    |    | 5005 |  Signal Blue      | GPS                             |
| <b>D</b> |    |    | 4004 |  Claret Violet    | Cellular Phone                  |
| <b>E</b> |    |    | 6002 |  Leaf Green       | TV / SDARS Terrestrial          |
| <b>F</b> |   |   | 8011 |  Nut Brown       | TV / SDARS Terrestrial / Camera |
| <b>G</b> |  |  | 7031 |  Blue Grey      | SDARS Terrestrial               |
| <b>H</b> |  |  | 4003 |  Heather Violet | GPS Navigation                  |
| <b>I</b> |  |  | 1001 |  Beige          | Bluetooth / VPM                 |
| <b>K</b> |  |  | 1027 |  Curry          | SDARS Satellite AM-FM           |
| <b>L</b> |  |  | 3002 |  Carmine Red    | VPM                             |
| <b>M</b> |  |  | 2003 |  Pastel Orange  | RKE / TPMS                      |
| <b>N</b> |  |  | 6019 |  Pastel Green   | DSRC / VPM                      |
| <b>Z</b> |  |  | 5021 |  Water Blue     | Universal (Neutral) Code        |

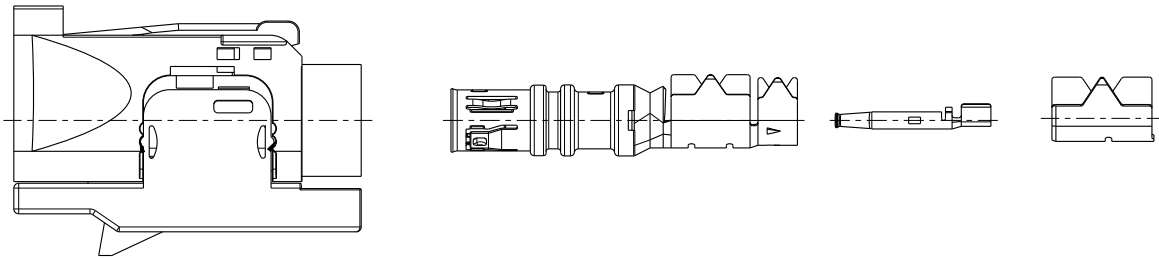
# FAKRA Generation Chart

|                                                                                     |                | Design Features                                                                  | Tooling                                     | Production  | Compliance                                                                   | Packaging                                                                               |
|-------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------|---------------------------------------------|-------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
|    | <b>GEN 4.0</b> | Stamped Body<br>Stamped Contact<br>Stamped Sleeve<br>Unassembled Housing         | Fully Automated Tooling                     | High Volume | USCAR-17<br>USCAR-18<br>DIN 72594-1<br>6Q0.90.961D<br>6Q0.90.961E<br>FAKRA 2 | Tray Pack for Housing<br><br>Other components sold on tape and reel<br><br>TPA included |
|    | <b>GEN 3.0</b> | Die Cast Body<br>Stamped Contact<br>Pre-Assembled Housing                        | Automated Tooling<br>Semi-Automated Tooling | High Volume | USCAR-17<br>USCAR-18<br>DIN 72594-1                                          | Tray Pack<br><br>Contacts sold separately on tape and reel                              |
|   | <b>GEN 2.5</b> | Die Cast Body<br>Stamped Contact<br>Pre-Assembled Housing                        | Automated Tooling<br>Semi-Automated Tooling | High Volume | USCAR-17<br>USCAR-18<br>DIN 72594-1                                          | Tray Pack<br><br>Contacts sold separately on tape and reel                              |
|  | <b>GEN 2.0</b> | Die Cast Body<br>Singulated Stamped or Machined Contact<br>Pre-Assembled Housing | Hand Tooling                                | Low Volume  | USCAR-17<br>USCAR-18<br>DIN 72594-1                                          | Tray Pack<br><br>Bulk Components                                                        |
|  | <b>GEN 1.0</b> | Machined Body<br>Machined Contact<br>Unassembled Housing                         | Hand Tooling                                | Low Volume  | USCAR-17<br>USCAR-18<br>DIN 72594-1                                          | Tray Pack<br><br>Bulk Components                                                        |

# FAKRA 4.0 Ordering Information

## FAKRA Generation 4.0 Connectors

FAKRA Generation 4.0 cable connectors consist of (4) components purchased separately; a housing with TPA clip(s), a contact body sub-assembly, contact pin and crimping sleeve. Components vary by cable type.



## Cable Groups

Amphenol RF's FAKRA Generation 4.0 series connectors support industry standard 50 ohm automotive cable types:

C01 – RG-174LL, DACAR462

C30 – TFC-302LL, DACAR 302, RTK031

| Item            | Description          | Cable Group | Image                                                                                 |
|-----------------|----------------------|-------------|---------------------------------------------------------------------------------------|
| 4FA1-NXSPAC01WS | Single Straight Plug | C01         |  |
| 4FA1-NXSJAC01W6 | Single Straight Jack | C01         |  |
| 4FA1-NXSPAC30WS | Single Straight Plug | C30         |  |
| 4FA1-NXSJAC30W6 | Single Straight Jack | C30         |  |

Note: Contact factory for component part numbers.

# FAKRA 4.0 Ordering Information

|                                                                                                                                                                     |            |          |          |          |          |          |          |          |            |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|----------|----------|----------|----------|----------|----------|------------|-----------|
|                                                                                                                                                                     | <b>4FA</b> | <b>1</b> | <b>—</b> | <b>N</b> | <b>X</b> | <b>S</b> | <b>J</b> | <b>A</b> | <b>C30</b> | <b>WS</b> |
| <b>Generation</b><br><b>4FA</b> = Gen 4.0                                                                                                                           |            |          |          |          |          |          |          |          |            |           |
| <b>Housing</b><br><b>1</b> = Single                                                                                                                                 |            |          |          |          |          |          |          |          |            |           |
| <b>Options</b><br><b>—</b> = (dash)<br><i>Other options available, please consult factory</i>                                                                       |            |          |          |          |          |          |          |          |            |           |
| <b>Tab Location</b><br><b>N</b> = North                                                                                                                             |            |          |          |          |          |          |          |          |            |           |
| <b>Key Code: See Key Code Chart</b>                                                                                                                                 |            |          |          |          |          |          |          |          |            |           |
| <b>Style</b><br><b>S</b> = Straight<br><b>R</b> = Right Angle                                                                                                       |            |          |          |          |          |          |          |          |            |           |
| <b>Gender</b><br><b>J</b> = Jack<br><b>P</b> = Plug                                                                                                                 |            |          |          |          |          |          |          |          |            |           |
| <b>Options</b><br><b>—</b> = (dash) PCB<br><b>A</b> = Fixed Character                                                                                               |            |          |          |          |          |          |          |          |            |           |
| <b>Termination</b><br>Cable Mount Connectors<br><b>C01</b> = RG-174/316, DACAR 462<br><b>C30</b> = TFC302, RTK031, DACAR 0302<br><b>PCB</b> = Printed Circuit Board |            |          |          |          |          |          |          |          |            |           |

## Options

- WS** = unsealed without clip slot
- W6** = unsealed with clip slot
- ES** = Sealed without clip slot (jack only)
- E1** = Sealed without clip slot (plug only)
- E6** = Sealed with clip slot

Note: All Gen 4.0 unsealed connectors have TPA's.  
Suffix may vary for PCB products, please consult factory.

# Technical Specifications

## Electrical

|                                 |                      |
|---------------------------------|----------------------|
| Impedance                       | 50Ω Nominal          |
| Frequency Range                 | DC - 6 GHz           |
| VSWR                            | 1.4 Max (DC - 2 GHz) |
|                                 | 1.5 Max (2 - 3 GHz)  |
| Insertion Loss                  | 0.3 dB Max           |
| Insulation Resistance           | 100 mΩ Min           |
| Center Contact Resistance       | 24 mΩ Max            |
| Outer Contact Resistance        | 5 mΩ Max             |
| Dielectric Withstanding Voltage | 800 Vrms Min         |

## Mechanical

|                            |                                 |
|----------------------------|---------------------------------|
| Durability (Mating Cycles) | 25 Min                          |
| Engage Force               | 45N Max                         |
| Disengagement Force        | 75N Max                         |
| Cable Retention Force      | 90N Min                         |
| Coding                     | 14 Mechanical and Colored Codes |
| Interface                  | USCAR-18, DIN                   |

## Environmental

|                   |               |
|-------------------|---------------|
| Temperature Range | -40 to +105°C |
| Thermal Shock     | USCAR-2       |
| Vibration         | USCAR-2       |
| Shock             | USCAR-2       |

## Materials

|                 |                     |
|-----------------|---------------------|
| Plastic Housing | PBT                 |
| Clip            | PBT                 |
| Center Contact  | Copper Nickel Alloy |
| Body            | Phosphor Bronze     |
| Sleeve          | Phosphor Bronze     |
| Insulator       | Nylon PA12          |

## Plating

|                |                                            |
|----------------|--------------------------------------------|
| Center Contact | Nickel with Selective Gold in Mating Areas |
| Body           | Tin                                        |
| Sleeve         | Nickel                                     |

Note: Technical specifications are typical and may vary by specific part number. Please see component drawing.

## Supported 50 Ohm Cable Types

| Amphenol Cable Type | Alternate Cables | Temp Range      | Jacket OD (mm) | Center Cond. OD (mm) | Dielectric |
|---------------------|------------------|-----------------|----------------|----------------------|------------|
| TFC-302             | Dacar 302-4      | -40°C to +105°C | 3.3 ± 0.1      | 0.76 (Stranded)      | Foam PP    |
| TFC-302, TFC-302LL  | RTK 031          | -40°C to +105°C | 3.30           | 0.81 (Stranded)      | Foam PP    |
| TFC RG-174LL        | Dacar 462        | -40°C to +105°C | 2.74           | 0.50 (Stranded)      | Solid PP   |

Note: Please check with cable manufacturer for latest specs.





# Amphenol® RF

[www.amphenolrf.com](http://www.amphenolrf.com)

## North America

### Amphenol RF Global HQ

4 Old Newtown Road  
Danbury, CT 06810  
Tel: (800) 627-7100 Toll Free  
Tel: (203) 743-9272 International  
Email: [sales@amphenolrf.com](mailto:sales@amphenolrf.com)

### Amphenol US Sales Office

4100 Guardian Street  
Suite 150  
Simi Valley, CA 93063

### Mexico

Boulevard Luis Donaldo  
Colosio 2280 C  
Nogales, Sonora, CP 84094

## Europe

### Amphenol RF Europe

Hoofdveste 19  
3992 DH Houten  
The Netherlands  
Tel: +31 (0)6 899 101 75  
Tel: +31 (0)6 152 128 17  
Email: [info@amphenol-nl.com](mailto:info@amphenol-nl.com)

## Asia

### China

Block DM2, TongWei Industrial  
District, TangWei Community  
Feng Huang Street  
Guang Ming New District  
Shenzhen, Guangdong  
Province, P.R. China 518132  
Tel: +86 755 27549918

### China

No. 55, Industry 2nd Road  
Aerospace Economic Technology  
Development Zone  
Xi'an, Shaanxi Province  
P.R. China

### India

Plot 3/4B & 5A  
CMDA's Industrial Area  
Maraimalai Nagar  
Kilkarana Village  
Chengleput Taluk, Kancheepuram  
Chennai, 603209



Learn more about our  
automotive capabilities!