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FAKRA SMB connector series

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With recent advancements in communications technology and increased consumer demand for a diverse array of on-board telematic services, RF communications systems have become indispensable components of the modern automobile.

To keep RF interconnection costs low and ensure high levels of electrical and mechanical performance for telematic applications, the German and American automotive industries have standardized a high-performing, cost-effective RF connector based on the FAKRA and USCAR standards.

Utilizing a standard metal SMB connector embedded within a plastic housing that can be designed with multiple colored codes for easy identification, FAKRA connectors are designed to perform up to 4GHz and meet the particular mechanical and environmental requirements of the automobile industry.

Amphenol offers both its original FAKRA connectors, which incorporate machined components, as well as its FAKRA II connector series which utilizes die cast as well as stamped and formed components.



Product Links

Single Plugs

Key Code A	Key Code B	Key Code C	Key Code D
Key Code E	Key Code F	Key Code G	Key Code H
Key Code I	Key Code K	Key Code Z	

Straight Single Jacks

Key Code A	Key Code B	Key Code C	Key Code D
Key Code E	Key Code F	Key Code G	Key Code H
Key Code I	Key Code K	Key Code Z	

Right Angle Single Jacks

Key Code A	Key Code B	Key Code C	Key Code D
Key Code E	Key Code F	Key Code G	Key Code H
Key Code I	Key Code K	Key Code Z	

Dual Plugs

Key Code A	Key Code B	Key Code C	Key Code D
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[Key Code E](#)[Key Code F](#)[Key Code Z](#)*Dual Jacks*[Key Code A](#)[Key Code B](#)[Key Code C](#)[Key Code D](#)[Key Code E](#)[Key Code F](#)[Key Code Z](#)*Male PCB Connectors*[Key Code A](#)[Key Code B](#)[Key Code C](#)[Key Code D](#)[Key Code E](#)[Key Code F](#)[Key Code G](#)[Key Code H](#)[Key Code I](#)[Key Code K](#)[Key Code Z](#)*Combo Connectors*[Cable Connectors](#)[PCB Connectors](#)[Catalog Pages](#)

Features & Benefits

- 12 different mechanical and color codes
- Plastic housing with locking feature and audible clicking noise
- Minimum of 100 mating cycles
- Frequency range of DC - 4 GHz
- Usable on multiple coaxial cables such as RG-58, RF-174, RG-316, RG-178, and other micro-cables
- Available in numerous connector configurations such as straight and right angle for cable as well as edge-launch and PCB designs

Applications

- Global Positioning Satellite
- Remote Vehicle Diagnostics
- Satellite Radio
- Bluetooth
- Vehicular Internet Access

Part Numbering System Overview

Single Series- FA1													
F	A	1	-	N	X	S	P	-	C	*	*	-	#
Series				Tab Location	Keying Codes	Style	Gender		Attachment				Special
				North South East West		Straight Right Angle	P(Male) J(Female)		C	#	#		
									P	C	B		

Dual Series- FA2														
F	A	2	-	N	X	S	P	-	C	*	*	-	#	
Series			Tab Location		Keying Codes		Style		Gender		Attachment			Special
			North South East West				Straight Right Angle		P(Male) J(Female)					
											C	#	#	
											P	C	B	

Note: For 2nd generation product, the part # begins with 2FA... instead of just FA...

Cable Group

	Cable Group Codes
00	RG-58/RG-174 Combo Design
01	RG 174, 188, 316
04	RG 58, 141
09	Cables with .057 OD
10	RG-178, .071OD Cables
62	RG-62
08	0.8DV Cable for Hirose U.FL Connector

Special Codes (Female)

	Special Codes (Female)
0	Standard
3	360° Design (R/A only)
6	Clip provision 180°

Special Codes (Male)

	Special Codes (Male)
0	Standard Bracket
1	Standard (Single)
9	Standard (Dual)
X	Special Bracket

Special Codes (Male PCB)

	Special Codes (Male PCB)
0	Edge Card
1	Edge Card with Support Legs
2	Vertical Mount
6	R/A Extended Nose (Gold)
8	R/A Extended Nose (Tin)
9	R/A Extended Nose (Nickel)
M	Die Cast R/A
S	Stamped & Formed R/A
X	Straight SMT PCB

Note: For the -6, -8 and -9, add an "A" to the end for assembled part w/housing.

Tooling Information

Recommended Tooling (Daniel's Manufacturing)						
	RG-174, RG-316, Cables			RG-58		
	Center Pin	Ferrule(Single)	Ferrule(Dual)	Center Pin	Ferrule(Single)	Ferrule(Dual)
Hand Crimp Tool	AFM8	HX4	HX4	AFM8	HX4	HX4
Pneumatic Crimp Tool	WA22	HX23	HX23	WA22	HX23	HX23
Die Set (Positioner)	K727	Y119 or Y1831	Y1831	K1470	Y188 or Y1832	Y1832
Depth Setting	4 or 5*	-	-	6 or 7*	-	-

Please note: The dual ferrule die sets can be used on the single ferrule designs.

* Depth setting should be used at minimum setting which will yield wire minimum 5 lbs pull-off force.

* Depth setting requirements depend upon several factors including wire manufacturer + grade.

FAKRA SMB Specifications

Electrical																
Impedance	50 ©															
Frequency Range	DC - 4 GHz															
Performance Spec	SAE-USCAR-17, 18															
VSWR	<table border="0"> <thead> <tr> <th></th> <th>DC - 2 GHz</th> <th>2 GHz - 4 GHz</th> </tr> </thead> <tbody> <tr> <td>Spec requirement</td> <td>1.40 max</td> <td>1.50 max</td> </tr> <tr> <td>Straight SMB (cable group 1)</td> <td>1.15 max</td> <td>1.25 max</td> </tr> <tr> <td>Right angle SMB (cable group 1)</td> <td>1.20 max</td> <td>1.35 max</td> </tr> <tr> <td>Straight SMB (cable group 4)</td> <td>1.10 max</td> <td>1.15 max</td> </tr> </tbody> </table>		DC - 2 GHz	2 GHz - 4 GHz	Spec requirement	1.40 max	1.50 max	Straight SMB (cable group 1)	1.15 max	1.25 max	Right angle SMB (cable group 1)	1.20 max	1.35 max	Straight SMB (cable group 4)	1.10 max	1.15 max
	DC - 2 GHz	2 GHz - 4 GHz														
Spec requirement	1.40 max	1.50 max														
Straight SMB (cable group 1)	1.15 max	1.25 max														
Right angle SMB (cable group 1)	1.20 max	1.35 max														
Straight SMB (cable group 4)	1.10 max	1.15 max														
Insertion Loss	Spec requirement: < .3 dB max from DC - 3GHz Up to 1 GHz: < .1 dB Up to 2 GHz: < .2 dB Up to 4 GHz: < .3 dB															
Insulation Resistance	1000 M© minimum															
Center Contact Resistance	Center contact: < 20 m© Outer contact: < 10 m©															
Dielectric Withstanding Voltage	> 1,000 VRMS at sea level															
Mechanical																
Mating Durability	100 mating cycles minimum															
Plastic Housing Engagement Force	Engagement: = 20 N Disengagement: = 25 N															
Cable Retention Force	Cable group 1: = 110 N Cable group 4: = 180 N															
Coding	12 mechanical and color codings															
Material																
Plastic Housing	PBT with 15% Glass Fiber															
Secondary Locking Clip	PBT with 15% Glass Fiber															
Center Contact	Male: Brass Female: Beryllium copper															
Body	Brass															
Barrel	Brass															
Retainer Ring	Beryllium copper															
Ferrule	Copper															

Insulator	TFE or TPX
Plating	
Center Contact	Gold
Body	cable types Nickel solder types Nickel, Gold, Tin
Barrel	Nickel
Ferrule	Nickel

Note: These characteristics are typical but may not apply to all connectors.

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