

FAKRA SMB RF Connector Supplement

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SAE/USCAR-18
December 2011

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ISBN: 978-0-7680-7500-7

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1. SCOPE

This document is a supplement to SAE/USCAR 17 and is intended to give recommended usages for one and two way RF connectors and dimensional requirements for 2-way RF connectors and hybrid (RF & DC power) connectors which are not currently specified elsewhere. The radio frequency (RF) connector interface specified herein is suited for unsealed automobile applications up to 3 GHz and is intended for in-line, board mount, device mount, straight or angled applications. Dimensional requirements are specified in this document to ensure interchangeability. Performance requirements are specified in SAE/USCAR-2, and in SAE/USCAR-17.

2. REFERENCES

DIN 72594-1, - Road vehicles – Radio frequency interface – Dimensions and electrical requirements.

SAE/USCAR-2 Performance Specification for Automotive Electrical Connector Systems

SAE/USCAR-17 Performance Specification for Automotive RF Connector Systems

The SAE performance specs can be obtained from the following location:

SAE
400 Commonwealth Dr
Warrendale, PA 15096-0001
USA
www.sae.org

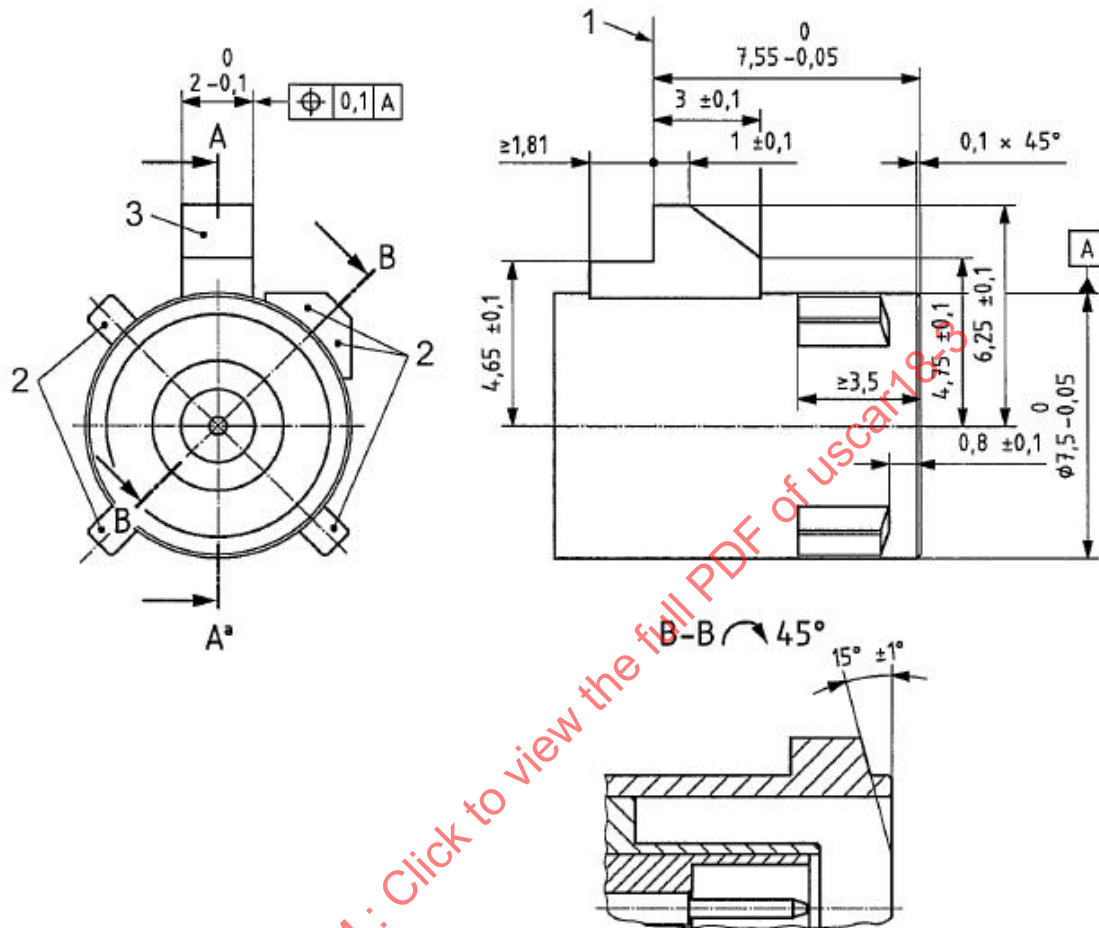
RAL RAL color charts are available from:

RAL
Sieburger Strasse 39
D-53757 Sankt Augustin
Telefon 49 22 41 - 16 05-0
Telefax 490 22 41 - 16 05-16
www.ral.de

Dorn Color, Inc.
11555 Berea Rd.
Cleveland, OH 44102
Phone: 216-634-2252
Fax: 216-634-2822
www.dorncolor.com

3. SINGLE CONTACT

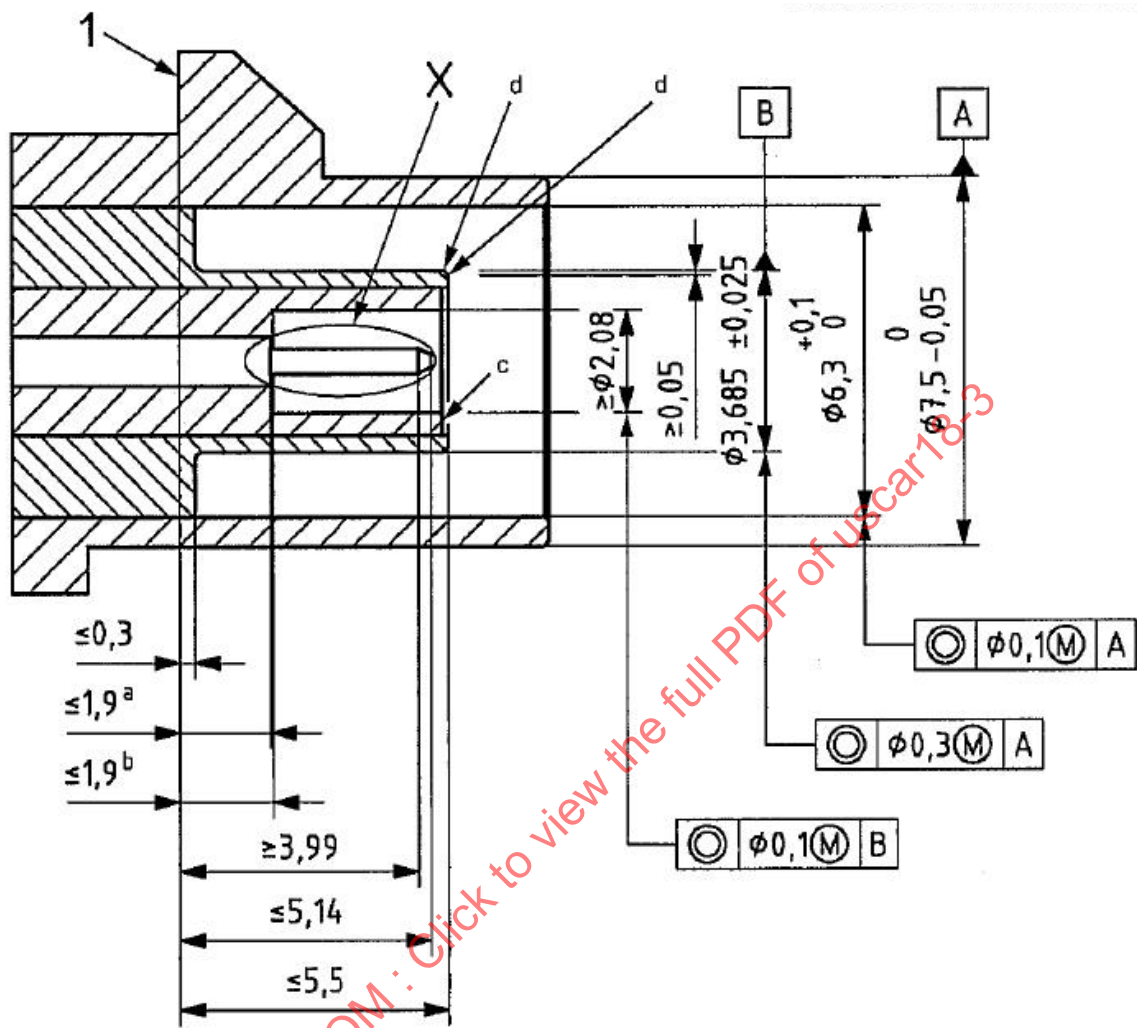
3.1 Male Connector Dimensions



KEY:

- 1 Reference Plane
- 2 Polarization Ribs (dimensions per Figure 5)
- 3 Locking Feature

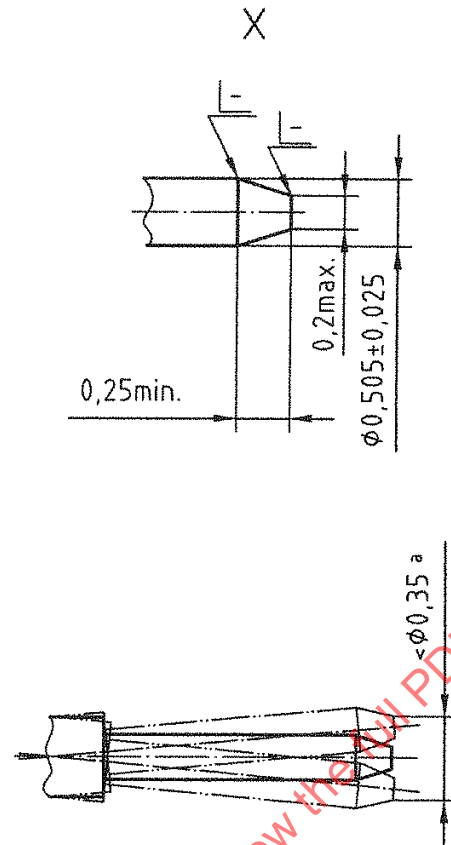
FIGURE 1: Male Connector Dimensions



KEY:

- 1 Reference Plane
- a Center Contact (See Detail X)
- b Dielectric Minimum Dimension
- c Dielectric must not extend past the front plane of the outer contact
- d No sharp burrs or edges

FIGURE 2: Male Cross Section



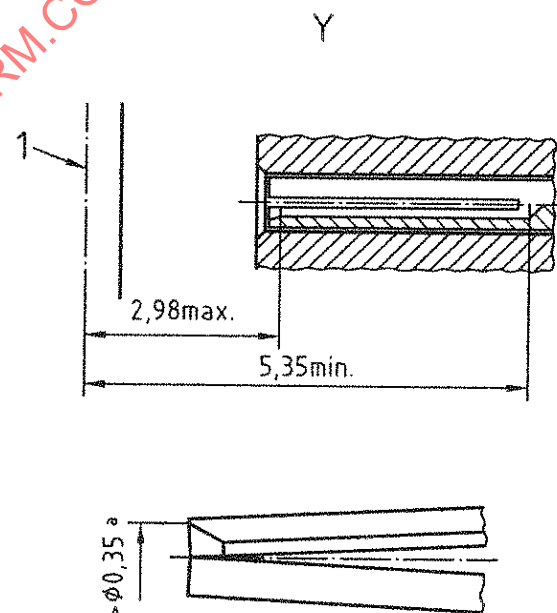
Detail X: Pin Dimensions

Technical drawing showing a cross-section of a mechanical assembly. The drawing includes the following dimensions and labels:

- Top horizontal dimensions: $\geq 7,7$, $\geq 3,5$, $\geq 3,25$.
- Left vertical dimensions: $\leq 1,7$, $\geq \phi 7,6$, $\leq \phi 6,2$, $\leq \phi 2,06$.
- Bottom horizontal dimensions: $\geq 0,42$, $\geq 2,05$, $\geq 2,05$, $\geq 5,65$, $\geq 5,65$.
- Label 'Y' points to a specific feature in the assembly.
- A small square box labeled 'D' is located on the left side.

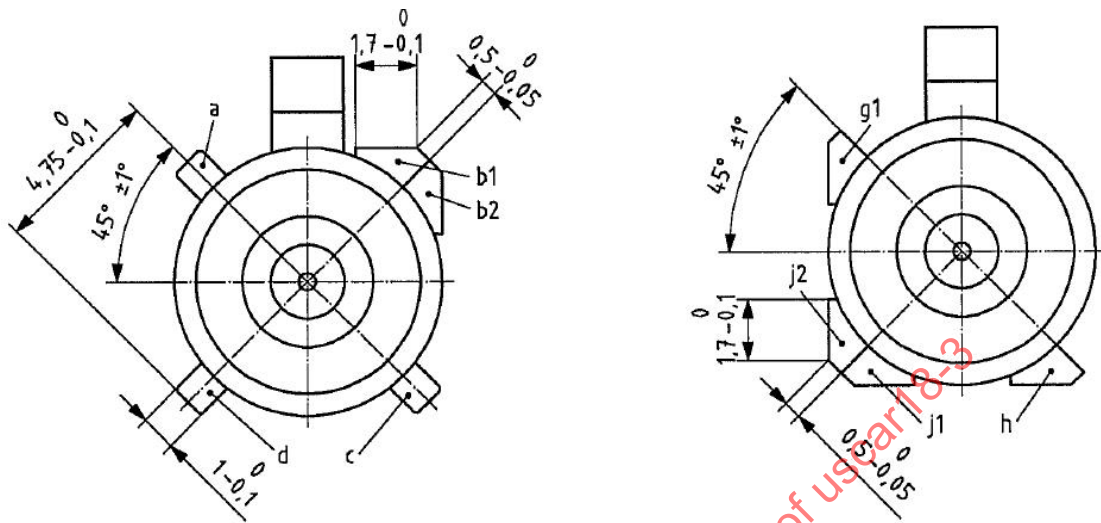
1 Reference Plane

FIGURE 3: Female Connector Dimensions



Detail Y: Female Contact

3.3 Polarizing Ribs



a) Ribs a, b1, b2, c, and d) Ribs g1, h, j1, and j2

FIGURE 5: Polarizing Rib Dimensions

3.4 Color Coding and Applications

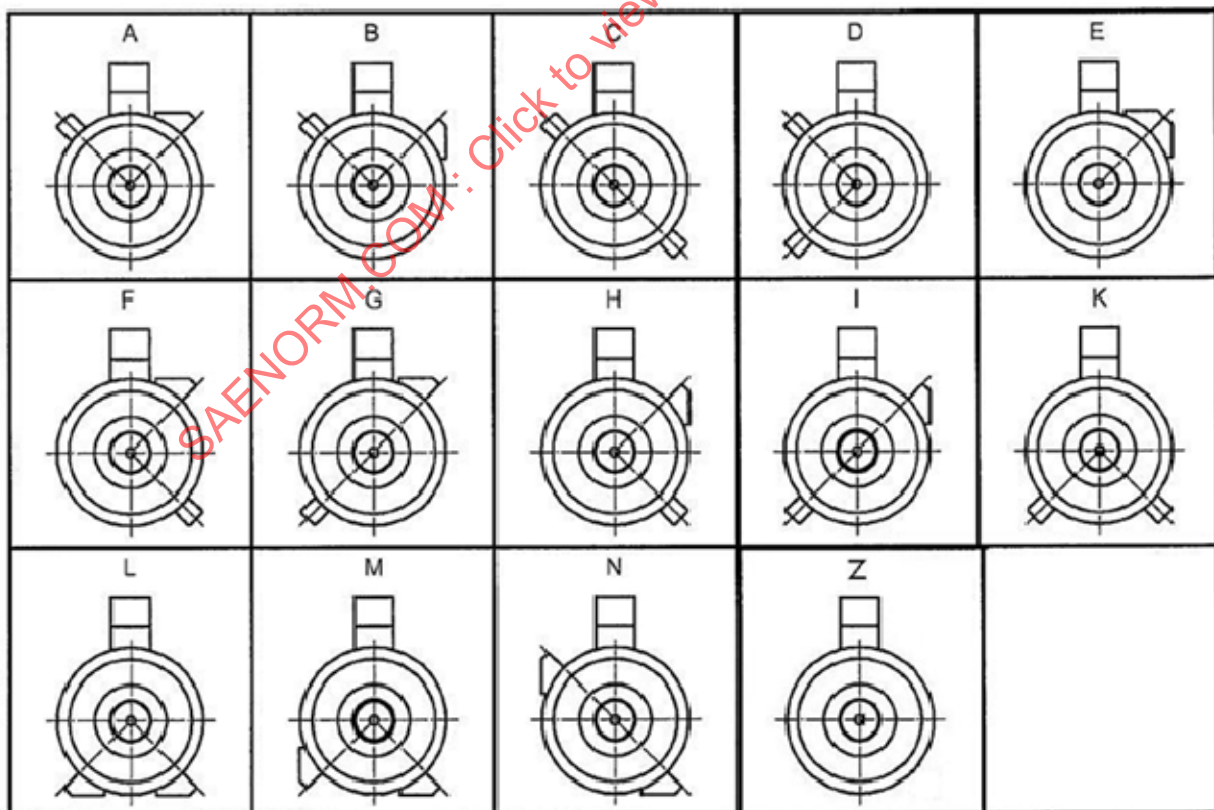


FIGURE 6: Mechanical Key Codes for Single Connectors

Coding	Rib Combination	Color	RAL No.	Usage
A	a – b1	Jet Black	9005	DAB
B	a – b2	Cream White	9001	DAB w/Power
C	a - c	Signal Blue	5005	GPS
D	a - d	Claret Violet	4004	Cellular Phone
E	b1 – b2	Leaf Green	6002	TV ¹ /SDARS Terrestrial ²
F	b1 – c	Nut Brown	8011	TV ³ /SDARS Terrestrial ⁴
G	b1 – d	Blue Gray	7031	SDARS Terrestrial ⁵
H	b2 – c	Heather Violet	4003	GPS Navigation
I	b2 – d	Beige	1001	Bluetooth
K	c – d	Curry	1027	SDARS Satellite
L	h – j1	Carmine Red	3002	Not Defined
M	h – j2	Pastel Orange	2003	RKE/TPMS ⁶
N	h – g1	Pastel Green	6019	Not Defined
Z	No Ribs	Water Blue	5021	Universal (Neutral) Code

TABLE 1: Color, Polarization, and Usage – Single Contact

¹ UHF where defined by receiver

² XM Radio

³ VHF where defined by receiver

⁴ Sirius Radio

⁵ Interoperable

⁶ Remote keyless entry/tire pressure monitoring system

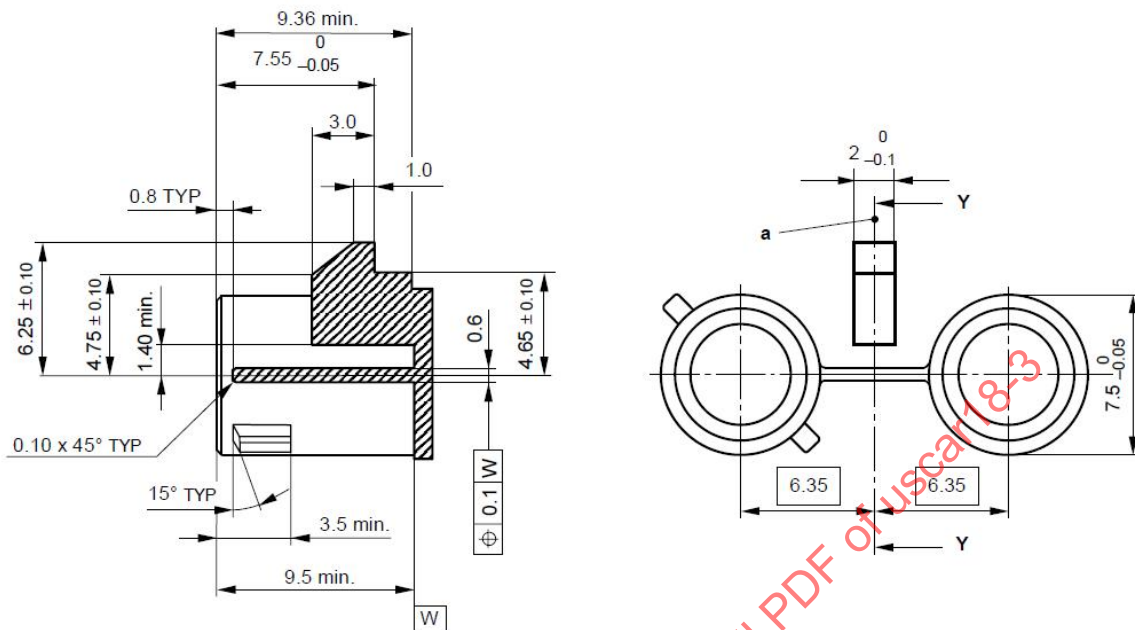
4. 2 WAY CONTACTS

4.1 Coding

Two-way connector coding uses the following scheme:

The left side of the device male connector (pin contact) viewed from the mating face uses identical coding to those shown in Section 3 for one-way connectors. The right side male connector viewed from the same position uses a neutral coding in all cases. An example is shown in paragraph 4.2. The center rib prevents one-way connectors from inadvertently being plugged to two-way receptacles.

4.2 Dimensions of the Device Side Interface



Section Y-Y

FIGURE 7: Two-Way Contacts, 12.7mm Centers

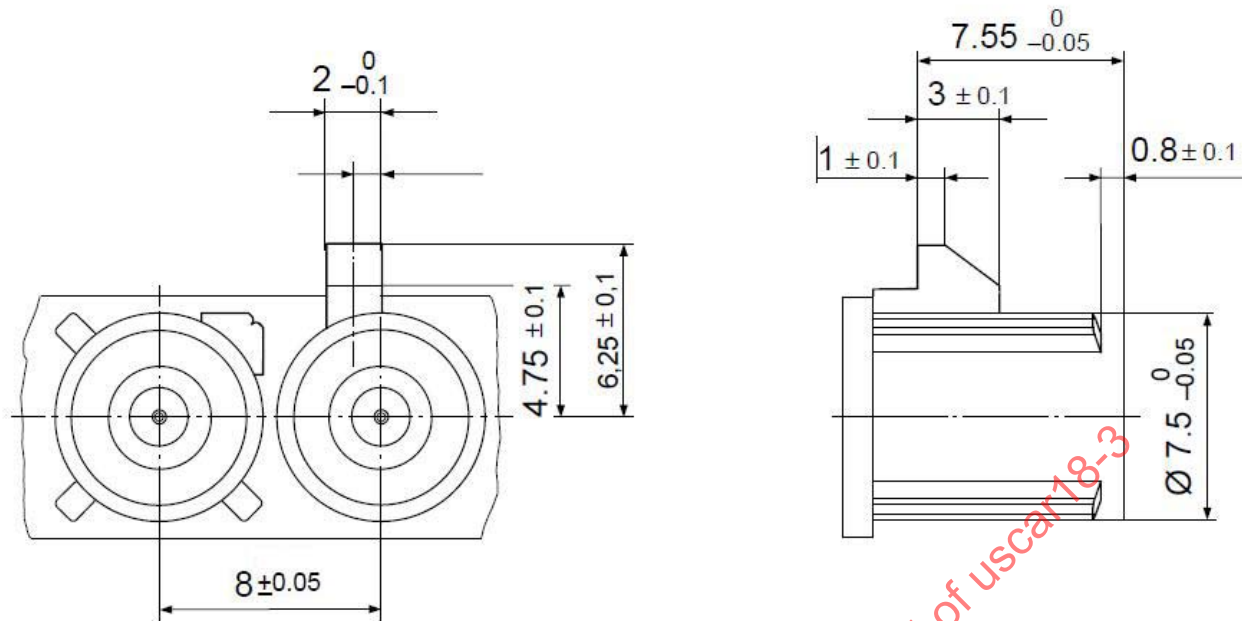


FIGURE 8: Two-Way Contacts, 8.0mm Centers – In-line and Board Mount

4.3 Colors and Applications

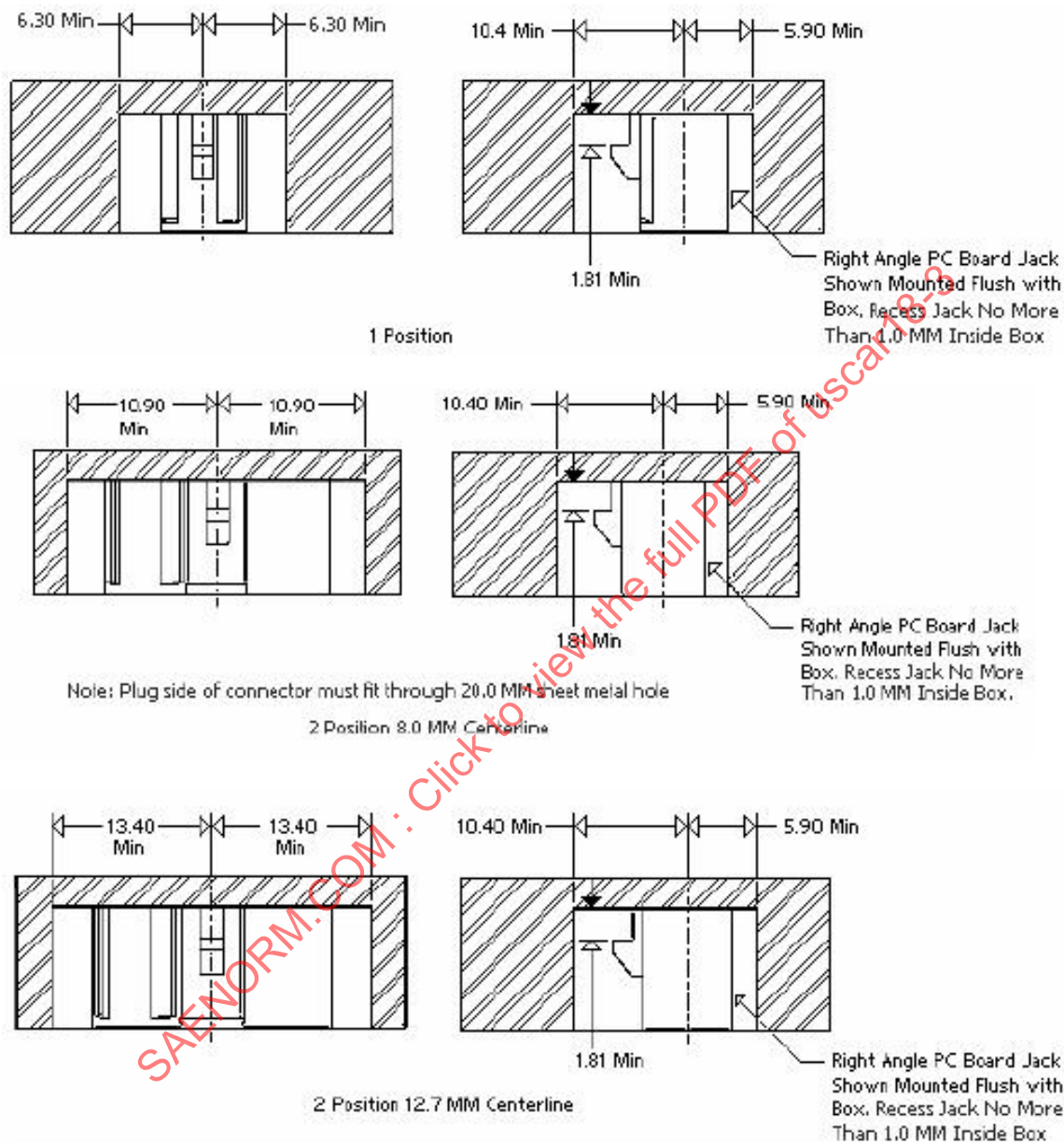
Coding	Color	RAL Number	Usage – Cavity 1 (Keying per FAKRA one way)	Usage – Cavity 2 (Neutral)
A2	Jet Black	9005	Not Defined	Not Defined
B2	Cream White	9001	Not Defined	Not Defined
C2	Signal Blue	5005	GPS	Cellular Phone
D2	Claret Violet	4004	Not Defined	Not Defined
E2	Leaf Green	6002	TV ¹	TV ²
F2	Nut Brown	8011	TV ³	TV ²
G2	Blue Gray	7031	SDARS Satellite	SDARS Terrestrial

TABLE 2: Color, Polarization, and Usage – Two Contact

¹ UHF where defined by receiver
² Frequency not defined
³ VHF where defined by receiver

5. PACKAGING INFORMATION

These dimensions represent the minimum clearance required for the mating cable plug.



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EWCAP (ELECTRICAL WIRING COMPONENT APPLICATION PARTNERSHIP)

It is recommended that non-plastic (i.e. die cast) housings provide a provision for adding the color code in some way. Device manufacturers that incorporate recessed PCB male designs are also requested to include 12 sq. mm minimum of RAL color on the panel near to the mating face of the connector to assist in assembly operations.

APPENDIX A DEFINITIONS

For this document, the following terms and definitions apply:

Male Contact

Pin contact

Contact intended to make electrical engagement on its outer surface and which will enter a female contact (socket)

Female Contact

Socket contact

Contact intended to make electrical engagement on its inner surface and which will accept entry of a male contact (pin)

Male Connector

Pin connector

Connector containing a male center contact

Female Connector

Socket connector

Connector containing a female center contact

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APPENDIX B
HYBRID (RF and DC) TYPE 1 STYLE DUAL CONNECTOR INTERFACE

