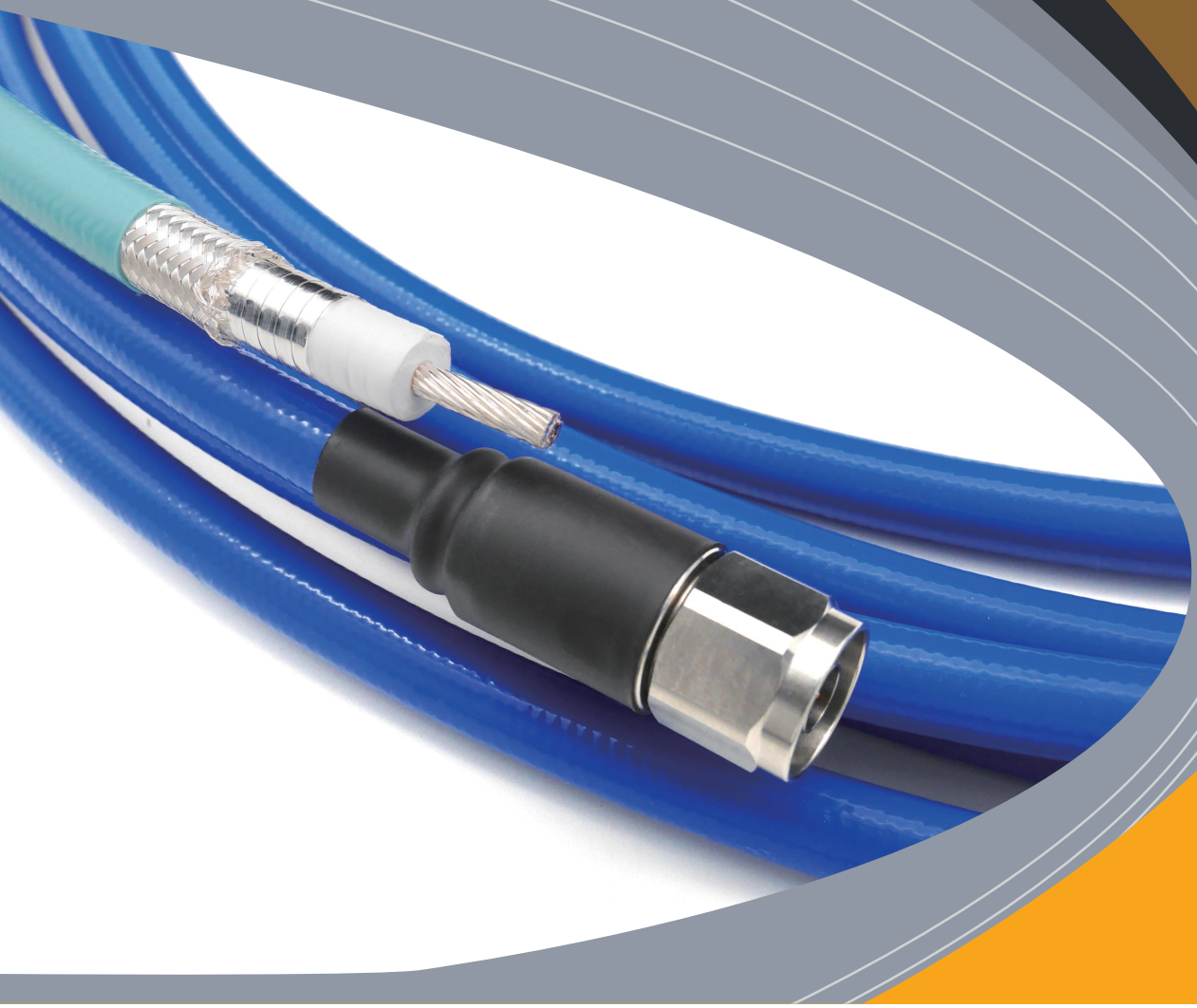
昕讯微波
Xinxun Microwave



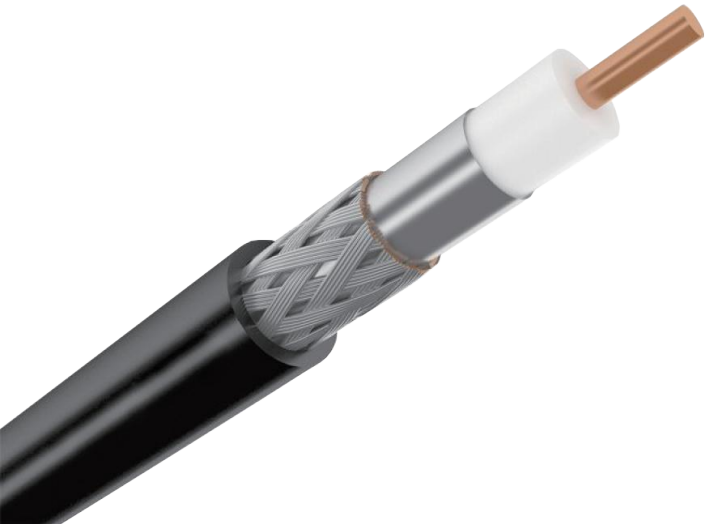
# 高性能
# 同轴射频电缆

HIGH PERFORMANCE
COAXIAL RF CABLE

# 射频电缆命名方法

| | |
|---|---|
| X | 代表昕讯公司名称的缩写 |
| 绝缘 | F—氟塑料　Y—PE　T—特殊材料 |
| 电缆特性与外导体结构 | WP— 发泡低损稳相（发泡介质+铜带绕包+圆线编织）<br>XP— 发泡低损稳相（整体发泡介质+铜带绕包+圆线编织）<br>HP— 大功率系列<br>BP— 发泡低损（扁线编织+圆线编织）<br>X — 普通绝缘低损（铜带绕包+圆线编织）<br>BX— 普通绝缘低损（扁线编织+圆线编织）<br>S — 束丝外导体（圆线或扁线束丝）<br>M — 常规结构（铝箔+圆线编织或圆线编织） |
| 电缆阻抗 | 50—50Ω（可省略）如有特殊阻抗需标注 |
| 电缆直径 | 英寸×1000 |
| 护套 | F—F46　FA—PFA　J—聚氨酯　L—低烟无卤聚烯烃<br>V—PVC　Y—PE　G—硅橡胶 |
| 颜色 | 可省略（按我司标准色） 如有特殊需求需要标注<br>B—黑色　BL—蓝色　BR—棕色<br>G—灰　GR—绿　R—红色　Y—黄色 |
| 特殊备注 | Q—轻型　D—多芯内导体<br>R—超柔等级　L—经济型 |

注：例如：1.低损稳相电缆国外类似型号：UFB-311,我司命名方法为：XFWP-311
2. 普通绝缘低损电缆国外类似型号：T-flex 402 ,我司命名方法为：XFX-141
3.半钢电缆国外类似型号：UT-142,我司命名方法为：XFT-142
注：普通常规电缆按国家标准命名：如：SFCJ-50-3；SFX-50-3；SFF-12.5-0.6；SFT-50-3等



# Naming method

| | |
|---|---|
| X | Abbreviation for the company |
| Insulating material | F—Fluoroplastics Y—PE T—Special materials |
| Cable characteristics and outer conductor structure | WP — Foaming low loss stable phase<br>(foaming medium +copper tape wrapping + round wire weaving)<br>XP — Foaming low loss stable phase<br>(integral foaming medium + copper tape wrapping + round wire weaving)<br>HP — High power series<br>BP — Foaming and low loss (flat knitting + round knitting)<br>X — Low loss of common insulation (copper tape wrapping + round wire braiding)<br>BX — Low loss of common insulation (flat wire braiding + round wire braiding)<br>S — Bundle wire outer conductor (round wire or flat bundle wire)<br>M — Conventional construction (aluminum foil + round or round) |
| Cable impedance | 50—50Ω（Can be omitte) If any special impedance, it should be noted |
| Cable diameter | Inch×1000 |
| Sheath | F — F46 FA — PFA J — polyurethane<br>L — Low smoke halogen free polyolefin<br>V — PVC Y — PE G — silicon rubber |
| Colour | It can be omitted (according to our standard color) if there is special needs to be marked<br>B—black BL—blue BR—brown<br>G—gray GR—green R—red Y—yellow |
| Remarks | Q—light D—Multicore inner conductor<br>R—Ultra soft L—Economic type |

P.S：For example：1.Similar type of low loss stable phase cable abroad：UFB-311，
Our naming method is：XFWP-311
2. Similar models of ordinary insulated low loss cables abroad：
T-flex 402 ,Our naming method is：XFX-141
3.Similar model of semi steel cable：UT-142,Our naming method is：XFT-142
P.S：Common cables are named according to national standards：as：SFCJ-50-3；
SFX-50-3；SFF-12.5-0.6；SFT-50-3etc.

# 产品型号对比
# Comparison table of product models

| 我司型号 Cable type of our products | 可替代产品 厂家及型号 Exchangeable type | 阻抗（Ω） Impedance | 工作频率（GHz） Working frequency | 插损(dB/m) Insertion loss | | |
|---|---|---|---|---|---|---|
| | | | | 1GHz | 10GHz | 18GHz |
| XFWP-90 | GORE CXN3506 | 50 | 67 | 0.63 | 2.07 | 2.84 |
| XFWP-142 | GORE CXN3507 | 50 | 40 | 0.36 | 1.10 | 1.58 |
| XFWP-190 | GORE CXN3449 | 50 | 26.5 | 0.26 | 0.81 | 1.08 |
| XFWP-205 | MICRO-COAX UFB-205A | 50 | 26.5 | 0.24 | 0.77 | 1.05 |
| XFWP-290 | GORE-CXN3450 | 50 | 18 | 0.21 | 0.52 | 0.71 |
| XFWP-311 | MICRO-COAX UFB-311A | 50 | 18 | 0.17 | 0.50 | 0.67 |
| XFWP-320 | GORE-CXN3508 | 50 | 18 | 0.14 | 0.46 | 0.63 |
| XFX-086 | TIMES T-flex 405 | 50 | 40 | 0.77 | 2.67 | 3.74 |
| XFX-141 | TIMES T-flex 402 | 50 | 40 | 0.44 | 1.63 | 2.35 |
| XFXP-150 | CARLISLE 1130A | 50 | 40 | 0.34 | 1.18 | 1.64 |
| XFXP-155B | H+S SF102E | 50 | 40 | 0.38 | 1.28 | 1.78 |
| XFXP-216 | H+S SF104E | 50 | 26.5 | 0.22 | 0.70 | 1.13 |
| SFCJ-50-3 | 中电科23所同款 | 50 | 18 | 0.45 | 1.43 | 2.02 |
| SFCJ-50-5 | 中电科23所同款 | 50 | 18 | 0.34 | 1.05 | 1.58 |
| SFCJ-50-7 | 中电科23所同款 | 50 | 15 | 0.18 | 0.72 | - |
| SFCJ-50-9 | 中电科23所同款 | 50 | 10 | 0.14 | 0.57 | - |

# 产品型号对比
# Comparison table of product models

| 电缆外径（mm）<br>Outer diameter | 温度范围（℃）<br>Operating temperature range | 温度相位稳定性（PPM）（-40℃~+85℃）<br>Phase stability vs temperature |
|---|---|---|
| 2.30 | -65~+165 | ≤800PPM（-55℃~+85℃） |
| 3.60 | -65~+165 | ≤750PPM（-55℃~+85℃） |
| 4.80 | -65~+165 | ≤750PPM（-55℃~+85℃） |
| 5.21 | -65~+165 | ≤750PPM（-55℃~+85℃） |
| 7.50 | -65~+165 | ≤750PPM（-55℃~+85℃） |
| 7.90 | -65~+165 | ≤750PPM（-55℃~+85℃） |
| 8.10 | -65~+165 | ≤750PPM（-55℃~+85℃） |
| 2.64 | -65~+165 | |
| 4.17 | -65~+165 | |
| 3.80 | -65~+165 | |
| 4.20 | -65~+90 | |
| 5.50 | -65~+165 | |
| 5.00 | -55~+85 | |
| 7.30 | -55~+85 | |
| 10.50 | -55~+85 | |
| 13.30 | -55~+85 | |

# 型号目录
# CONTENT

- *XFWP*
- *XFXP*
- *XFX*
- *SPECIAL XFWP*


## 结构说明 Construction

1.内导体：采用单芯镀银线。
2.绝缘：采用微孔低密度PTFE，介电常数1.45左右，多层绕包结构能使电缆外径和绝缘介电常数稳定，保障了信号的稳定传输。
3.屏蔽层：采用双屏蔽层结构，内屏蔽层采用镀银铜带绕包，外屏蔽层采用镀银铜线编织。
4.护套：采用了环境适应性能优越的FEP或PFA等原材料，使电缆具有较高的环境适应性。

1.Centre conductor:Single core silver plated wire.
2.Insulator:Adopt microporous low density PTFE, dielectric constant 1.45, multilayer wrapped structure can make the cable diameter and insulating dielectric constant stability, safeguard the stability of the signal transmission.
3.Shield:With double shielding layer structure, the shielding layer using silver plating copper strap bag, the shielding layer using silver plated copper wire braided.
4.Jacket:Raw materials such as FEP or PFA with superior environmental adaptability are used, cable has high environmental adaptability.

# XFWP series
# 高性能柔性低损耗同轴射频电缆

XFWP系列高性能柔性低损耗同轴射频电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标。
XFWP series High performance flexible low loss Radio Frequency Coaxial Cable adopt the special structure design and advanced production technology, make cable in the whole frequency range has excellent electrical and mechanical performance index.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFWP-060 | XFWP-90 | XFWP-125 | XFWP-142 | XFWP-143A | XFWP-190 |
|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.32 | 0.51 | 0.72 | 0.91 | 1.02 | 1.40 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.88 | 1.40 | 2.00 | 2.50 | 2.79 | 3.85 |
| 屏蔽外径（mm） Shields Diameter | 1.30 | 1.90 | 2.60 | 3.10 | 3.30 | 4.40 |
| 总外径(mm) Jacket Diameter | ≤1.60 | ≤2.30 | ≤3.20 | ≤3.60 | ≤3.75 | ≤4.85 |
| 最小弯曲半径(mm) Min.bending radius | 8 | 11 | 16 | 18 | 18 | 26 |

## 电气与环境性能 Electrical and Environmental Performance

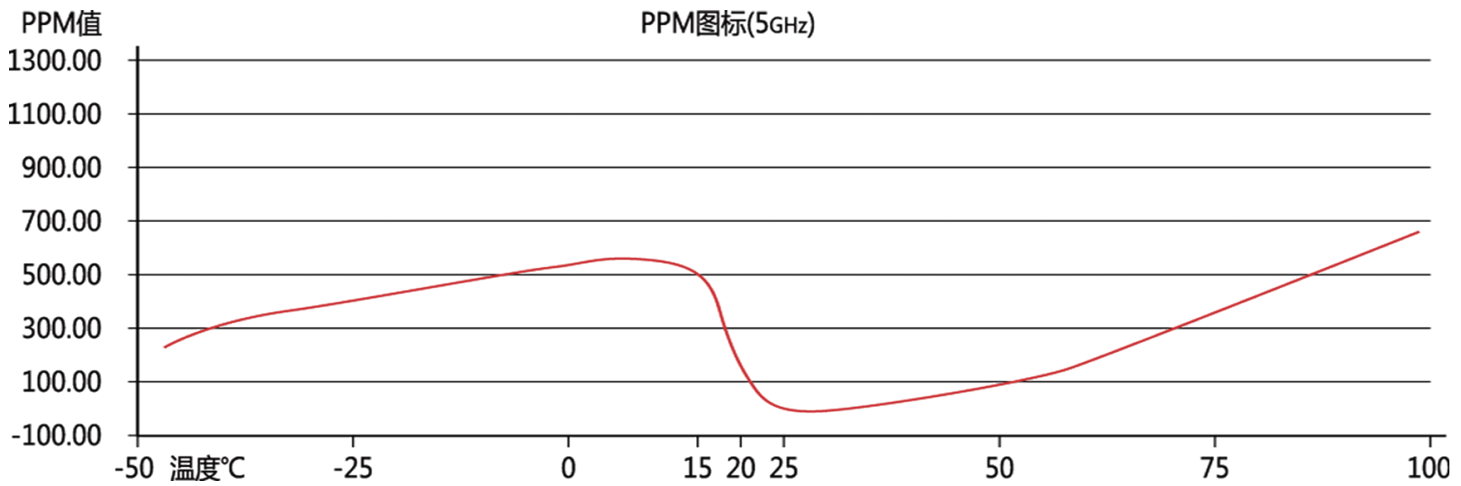
| 型号 TYPE | XFWP-060 | | XFWP-90 | | XFWP-125 | | XFWP-142 | | XFWP-143A | | XFWP-190 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | | 50 | | 50 | | 50 | | 50 | | 50 | |
| 电容(pf/m) Capacitance | 88 | | 85 | | 83 | | 83 | | 83 | | 83 | |
| 工作频率(GHz) Frequency Range | DC-110 | | DC-67 | | DC-50 | | DC-40 | | DC-40 | | DC-26.5 | |
| 传输速率 Velocity of Propagation | 79% | | 81% | | 82% | | 82% | | 82% | | 83% | |
| 最大工作电压（kV) Max.Operating Voltage | 0.4 | | 0.8 | | 1.0 | | 1.2 | | 1.2 | | 1.3 | |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | | ≥90 | | ≥90 | | ≥90 | | ≥90 | | ≥90 | |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | | | | | | | |
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 0.5GHz | 0.71 | 0.071 | 0.44 | 0.136 | 0.31 | 0.581 | 0.26 | 0.708 | 0.22 | 0.959 | 0.19 | 1.316 |
| 1GHz | 1.02 | 0.050 | 0.63 | 0.096 | 0.44 | 0.408 | 0.36 | 0.499 | 0.32 | 0.675 | 0.26 | 0.925 |
| 3GHz | 1.81 | 0.028 | 1.10 | 0.055 | 0.78 | 0.232 | 0.61 | 0.285 | 0.55 | 0.386 | 0.44 | 0.526 |
| 4GHz | 2.11 | 0.024 | 1.28 | 0.047 | 0.91 | 0.198 | 0.70 | 0.246 | 0.64 | 0.333 | 0.51 | 0.453 |
| 6GHz | 2.62 | 0.020 | 1.58 | 0.038 | 1.13 | 0.161 | 0.86 | 0.200 | 0.79 | 0.270 | 0.63 | 0.367 |
| 8GHz | 3.06 | 0.017 | 1.84 | 0.033 | 1.32 | 0.138 | 0.99 | 0.172 | 0.92 | 0.232 | 0.73 | 0.315 |
| 10GHz | 3.46 | 0.015 | 2.07 | 0.029 | 1.48 | 0.123 | 1.10 | 0.154 | 1.04 | 0.207 | 0.81 | 0.280 |
| 12GHz | 3.83 | 0.014 | 2.28 | 0.027 | 1.64 | 0.112 | 1.24 | 0.140 | 1.14 | 0.188 | 0.88 | 0.254 |
| 15GHz | 4.33 | 0.012 | 2.57 | 0.024 | 1.85 | 0.099 | 1.36 | 0.124 | 1.28 | 0.167 | 0.99 | 0.226 |
| 18GHz | 4.80 | 0.011 | 2.84 | 0.022 | 2.05 | 0.090 | 1.58 | 0.113 | 1.41 | 0.152 | 1.08 | 0.204 |
| 26.5GHz | 5.98 | 0.008 | 3.50 | 0.018 | 2.54 | 0.072 | 2.09 | 0.092 | 1.74 | 0.124 | 1.35 | 0.166 |
| 40GHz | 7.61 | 0.007 | 4.39 | 0.014 | 3.21 | 0.058 | 2.64 | 0.074 | 2.18 | 0.099 | - | - |
| 50GHz | 8.69 | 0.006 | 4.97 | 0.012 | 3.66 | 0.051 | - | - | - | - | - | - |
| 67GHz | 10.37 | 0.005 | 5.87 | 0.011 | - | - | - | - | - | - | - | - |
| 90GHz | 12.45 | 0.004 | - | - | - | - | - | - | - | - | - | - |
| 110GHz | 14.13 | 0.003 | - | - | - | - | - | - | - | - | - | - |
| 机械相位稳定性（18GHz） Phase Stability vs Flexure （最小弯曲半径缠绕一圈） | ±0.3°/GHz | | ±0.3°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | |
| 相位温度稳定性（ppm） -55℃~+85℃ Phase Change vs Temperature | ≤850ppm | | ≤800ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | |
| 使用温度范围（℃） Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | |

## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | XFWP-205 | XFWP-220 | XFWP-290 | XFWP-311 | XFWP-320 | XFWP-400 | XFWP-480 |
|---|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 1.45 | 1.60 | 2.10 | 2.30 | 2.40 | 3.00 | 3.80 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 3.90 | 4.40 | 5.80 | 6.30 | 6.60 | 8.10 | 10.10 |
| 屏蔽外径（mm） Shields Diameter | 4.59 | 5.10 | 6.65 | 7.10 | 7.50 | 9.10 | 11.10 |
| 总外径(mm) Jacket Diameter | ≤5.20 | ≤5.80 | ≤7.50 | ≤7.90 | ≤8.10 | ≤10.20 | ≤12.20 |
| 最小弯曲半径(mm) Min.bending radius | 26 | 30 | 37 | 40 | 40 | 50 | 60 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFWP-205 | XFWP-220 | XFWP-290 | XFWP-311 | XFWP-320 | XFWP-400 | XFWP-480 |
|---|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 88 | 83 | 83 | 83 | 83 | 83 | 83 |
| 工作频率(GHz) Frequency Range | DC-110 | DC-18 | DC-18 | DC-18 | DC-18 | DC-12 | DC-8 |
| 传输速率 Velocity of Propagation | 83% | 83% | 83% | 83% | 83% | 83% | 84% |
| 最大工作电压（kV) Max.Operating Voltage | 0.4 | 2.0 | 3.0 | 3.0 | 3.0 | 4.0 | 5.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 |



## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFWP-205 | | XFWP-220 | | XFWP-290 | | XFWP-311 | | XFWP-320 | | XFWP-400 | | XFWP-480 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 0.5GHz | 0.18 | 1.390 | 0.14 | 1.589 | 0.16 | 2.487 | 0.12 | 2.577 | 0.11 | 2.712 | 0.09 | 3.047 | 0.07 | 3.313 |
| 1GHz | 0.24 | 0.977 | 0.20 | 1.116 | 0.21 | 1.750 | 0.17 | 1.812 | 0.14 | 1.906 | 0.13 | 2.132 | 0.10 | 2.324 |
| 3GHz | 0.42 | 0.556 | 0.36 | 0.634 | 0.32 | 1.000 | 0.28 | 1.033 | 0.25 | 1.084 | 0.22 | 1.200 | 0.18 | 1.317 |
| 4GHz | 0.48 | 0.479 | 0.41 | 0.546 | 0.36 | 0.863 | 0.33 | 0.890 | 0.28 | 0.934 | 0.26 | 1.030 | 0.21 | 1.132 |
| 6GHz | 0.59 | 0.388 | 0.51 | 0.442 | 0.40 | 0.700 | 0.38 | 0.721 | 0.35 | 0.756 | 0.32 | 0.828 | 0.27 | 0.914 |
| 8GHz | 0.68 | 0.333 | 0.60 | 0.379 | 0.46 | 0.603 | 0.44 | 0.621 | 0.41 | 0.649 | 0.37 | 0.708 | 0.31 | 0.784 |
| 10GHz | 0.77 | 0.296 | 0.68 | 0.337 | 0.52 | 0.537 | 0.50 | 0.552 | 0.46 | 0.577 | 0.42 | 0.627 | - | - |
| 12GHz | 0.84 | 0.269 | 0.75 | 0.306 | 0.57 | 0.488 | 0.55 | 0.501 | 0.50 | 0.524 | 0.47 | 0.566 | - | - |
| 15GHz | 0.95 | 0.239 | 0.84 | 0.271 | 0.65 | 0.434 | 0.62 | 0.445 | 0.57 | 0.465 | - | - | - | - |
| 18GHz | 1.05 | 0.216 | 0.93 | 0.246 | 0.71 | 0.394 | 0.67 | 0.404 | 0.63 | 0.421 | - | - | - | - |
| 26.5GHz | 1.29 | 0.175 | - | - | - | - | - | - | - | - | - | - | - | - |
| 机械相位稳定性（18GHz）Phase Stability vs Flexure（最小弯曲半径缠绕一圈） | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.5°/GHz | | ±0.5°/GHz | |
| 相位温度稳定性（ppm）-55℃~+85℃ Phase Change vs Temperature | ≤750ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | |
| 使用温度范围（℃）Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）<br>Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | | | | | | | | | |

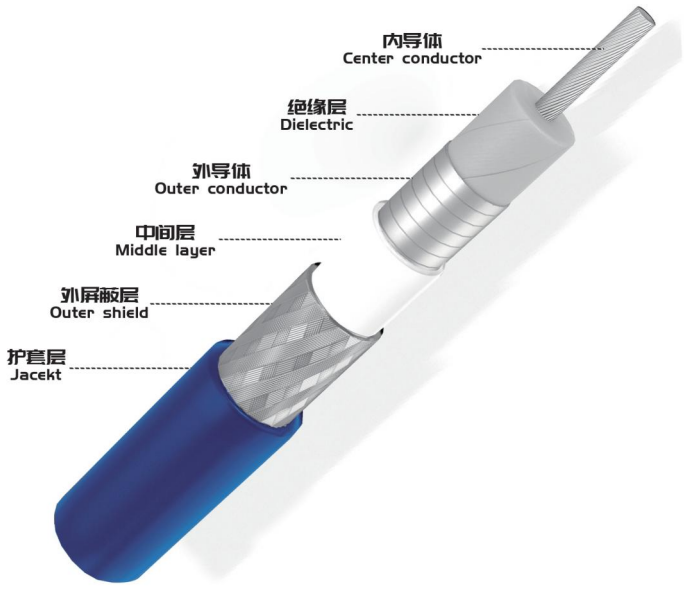
备注：

1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。

The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation

2.机械相位稳定性与测试方法密切相关，如用其他方法测试，数值可能发生变化。

Is closely related to the phase stability and mechanical testing methods, such as test with other methods, numerical might change.




## 结构说明 Construction

1.内导体：采用单芯或绞合镀银线。
2.绝缘：采用微孔低密度PTFE，介电常数1.45左右，多层绕包结构能使电缆外径和绝缘介电常数稳定，保障了信号的稳定传输。
3.屏蔽层：采用双屏蔽层+中间层结构，内屏蔽与外屏蔽之间采用氟塑料中间层。
4.护套：采用了环境适应性能优越的FEP或PFA等原材料，使电缆具有较高的环境适应性。

1.Centre conductor: Utilizes solid or stranded silver-plated wire.
2.Insulation: Employs microporous low-density PTFE with a dielectric constant of approximately 1.45. The multi-layer spiral-wrapped structure ensures consistent cable outer diameter and stable insulation dielectric constant, enabling reliable signal transmission.
3.Shielding: Features a dual-shield + interstitial layer construction. A fluoropolymer interstitial layer is applied between the inner and outer shields.
4.Jacket: Constructed from environmentally superior materials such as FEP or PFA, offering enhanced environmental adaptability.

# XFWP series
# 特种高性能柔性低损耗同轴射频电缆

XFWP系列特种低损耗同轴射频电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标。

XFWP series special low loss Radio Frequency Coaxial Cable adopt the special structure design and advanced production technology, make cable in the whole frequency range has excellent electrical and mechanical performance index.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFWP-060W | XFWP-90W | XFWP-125W | XFWP-142W | XFWP-143AW | XFWP-190W |
|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.32 | 0.51 | 0.72 | 0.91 | 1.02 | 1.40 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.88 | 1.40 | 2.00 | 2.50 | 2.79 | 3.85 |
| 屏蔽外径（mm） Shields Diameter | 1.50 | 2.10 | 2.80 | 3.30 | 3.55 | 4.65 |
| 总外径(mm) Jacket Diameter | ≤1.80 | ≤2.50 | ≤3.40 | ≤3.80 | ≤4.00 | ≤5.10 |
| 最小弯曲半径(mm) Min.bending radius | 9 | 12 | 17 | 19 | 20 | 26 |

## 电气与环境性能 Electrical and Environmental Performance

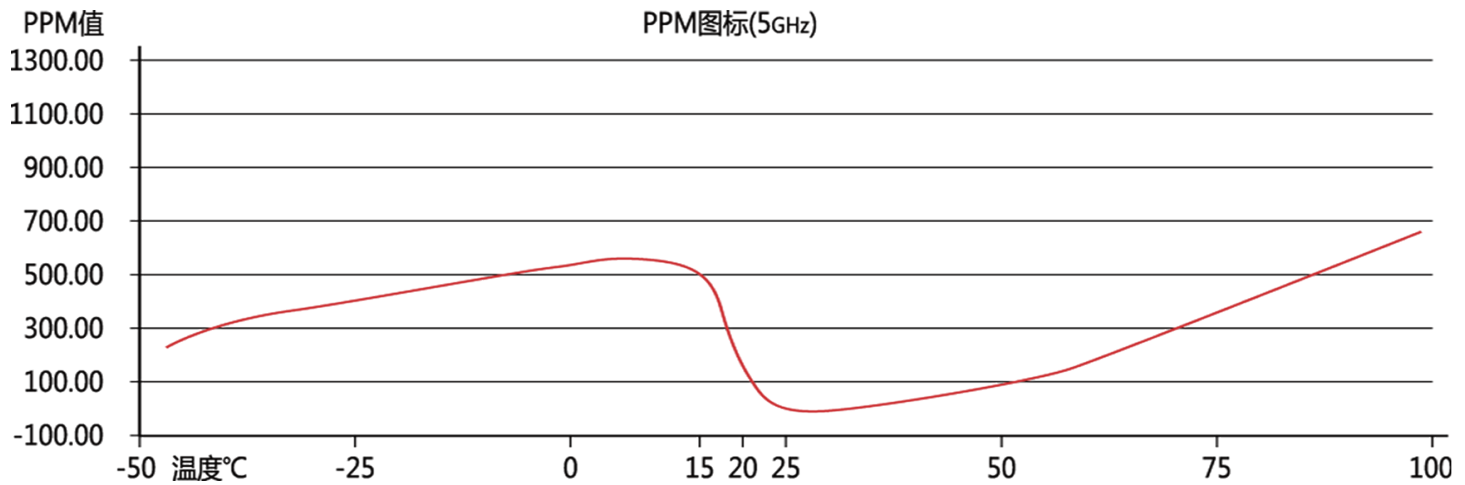
| 型号 TYPE | XFWP-060W | | XFWP-90W | | XFWP-125W | | XFWP-142W | | XFWP-143AW | | XFWP-190W | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | | 50 | | 50 | | 50 | | 50 | | 50 | |
| 电容(pf/m) Capacitance | 88 | | 85 | | 83 | | 83 | | 83 | | 83 | |
| 工作频率(GHz) Frequency Range | DC-110 | | DC-67 | | DC-50 | | DC-40 | | DC-40 | | DC-26.5 | |
| 传输速率 Velocity of Propagation | 79% | | 81% | | 82% | | 82% | | 82% | | 83% | |
| 最大工作电压（kV) Max.Operating Voltage | 0.4 | | 0.8 | | 1.0 | | 1.2 | | 1.2 | | 1.3 | |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | | ≥90 | | ≥90 | | ≥90 | | ≥90 | | ≥90 | |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | | | | | | | |
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 0.5GHz | 0.71 | 0.071 | 0.44 | 0.136 | 0.31 | 0.581 | 0.26 | 0.708 | 0.22 | 0.959 | 0.19 | 1.316 |
| 1GHz | 1.02 | 0.050 | 0.63 | 0.096 | 0.44 | 0.408 | 0.36 | 0.499 | 0.32 | 0.675 | 0.26 | 0.925 |
| 3GHz | 1.81 | 0.028 | 1.10 | 0.055 | 0.78 | 0.232 | 0.61 | 0.285 | 0.55 | 0.386 | 0.44 | 0.526 |
| 4GHz | 2.11 | 0.024 | 1.28 | 0.047 | 0.91 | 0.198 | 0.70 | 0.246 | 0.64 | 0.333 | 0.51 | 0.453 |
| 6GHz | 2.62 | 0.020 | 1.58 | 0.038 | 1.13 | 0.161 | 0.86 | 0.200 | 0.79 | 0.270 | 0.63 | 0.367 |
| 8GHz | 3.06 | 0.017 | 1.84 | 0.033 | 1.32 | 0.138 | 0.99 | 0.172 | 0.92 | 0.232 | 0.73 | 0.315 |
| 10GHz | 3.46 | 0.015 | 2.07 | 0.029 | 1.48 | 0.123 | 1.10 | 0.154 | 1.04 | 0.207 | 0.81 | 0.280 |
| 12GHz | 3.83 | 0.014 | 2.28 | 0.027 | 1.64 | 0.112 | 1.24 | 0.140 | 1.14 | 0.188 | 0.88 | 0.254 |
| 15GHz | 4.33 | 0.012 | 2.57 | 0.024 | 1.85 | 0.099 | 1.36 | 0.124 | 1.28 | 0.167 | 0.99 | 0.226 |
| 18GHz | 4.80 | 0.011 | 2.84 | 0.022 | 2.05 | 0.090 | 1.58 | 0.113 | 1.41 | 0.152 | 1.08 | 0.204 |
| 26.5GHz | 5.98 | 0.008 | 3.50 | 0.018 | 2.54 | 0.072 | 2.09 | 0.092 | 1.74 | 0.124 | 1.35 | 0.166 |
| 40GHz | 7.61 | 0.007 | 4.39 | 0.014 | 3.21 | 0.058 | 2.64 | 0.074 | 2.18 | 0.099 | - | - |
| 50GHz | 8.69 | 0.006 | 4.97 | 0.012 | 3.66 | 0.051 | - | - | - | - | - | - |
| 67GHz | 10.37 | 0.005 | 5.87 | 0.011 | - | - | - | - | - | - | - | - |
| 90GHz | 12.45 | 0.004 | - | - | - | - | - | - | - | - | - | - |
| 110GHz | 14.13 | 0.003 | - | - | - | - | - | - | - | - | - | - |
| 机械相位稳定性（18GHz） Phase Stability vs Flexure （最小弯曲半径缠绕一圈） | ±0.3°/GHz | | ±0.3°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | |
| 相位温度稳定性（ppm） -55℃~+85℃ Phase Change vs Temperature | ≤850ppm | | ≤800ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | |
| 使用温度范围（℃） Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | |

## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | XFWP-142D | XFWP-190D | XFWP-220D | XFWP-311D | XFWP-400D | XFWP-480D |
|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.90 | 1.45 | 1.65 | 2.35 | 4.00 | 3.80 |
| 导体形式 Center Conductor Type | 多股 Stranded | 多股 Stranded | 多股 Stranded | 多股 Stranded | 多股 Stranded | 多股 Stranded |
| 绝缘外径（mm） Insulation Diameter | 2.40 | 3.85 | 4.40 | 6.30 | 7.80 | 9.80 |
| 屏蔽外径（mm） Shields Diameter | 3.20 | 4.60 | 5.35 | 7.50 | 9.10 | 10.70 |
| 总外径(mm) Jacket Diameter | ≤3.60 | ≤5.00 | ≤5.90 | ≤8.10 | ≤10.20 | ≤12.20 |
| 最小弯曲半径(mm) Min.bending radius | 18 | 26 | 30 | 40 | 50 | 60 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFWP-142D | XFWP-190D | XFWP-220D | XFWP-311D | XFWP-400D | XFWP-480D |
|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 83 | 83 | 83 | 83 | 83 | 83 |
| 工作频率(GHz) Frequency Range | DC-40 | DC-18 | DC-18 | DC-18 | DC-12 | DC-8 |
| 传输速率 Velocity of Propagation | 82% | 83% | 83% | 83% | 83% | 84% |
| 最大工作电压（kV) Max.Operating Voltage | 1.2 | 1.3 | 2.0 | 3.0 | 4.0 | 5.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 |



## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFWP-142D | | XFWP-190D | | XFWP-220D | | XFWP-311D | | XFWP-400D | | XFWP-480D | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 0.5GHz | 0.35 | 0.587 | 0.24 | 1.104 | 0.21 | 1.324 | 0.16 | 2.111 | 0.12 | 2.539 | 0.10 | 2.761 |
| 1GHz | 0.55 | 0.415 | 0.34 | 0.777 | 0.30 | 0.930 | 0.21 | 1.486 | 0.17 | 1.777 | 0.15 | 1.937 |
| 3GHz | 0.96 | 0.238 | 0.60 | 0.443 | 0.53 | 0.528 | 0.38 | 0.848 | 0.30 | 1.000 | 0.26 | 1.098 |
| 4GHz | 1.11 | 0.206 | 0.69 | 0.382 | 0.62 | 0.455 | 0.44 | 0.731 | 0.35 | 0.858 | 0.31 | 0.943 |
| 6GHz | 1.37 | 0.167 | 0.86 | 0.309 | 0.77 | 0.368 | 0.54 | 0.592 | 0.44 | 0.690 | 0.38 | 0.762 |
| 8GHz | 1.59 | 0.144 | 1.00 | 0.266 | 0.89 | 0.316 | 0.63 | 0.510 | 0.51 | 0.590 | 0.44 | 0.653 |
| 10GHz | 1.78 | 0.129 | 1.12 | 0.237 | 1.00 | 0.281 | 0.71 | 0.454 | 0.57 | 0.523 | - | - |
| 12GHz | 1.96 | 0.117 | 1.24 | 0.215 | 1.11 | 0.255 | 0.78 | 0.412 | 0.63 | 0.472 | - | - |
| 15GHz | 2.20 | 0.105 | 1.39 | 0.191 | 1.25 | 0.226 | 0.88 | 0.366 | - | - | - | - |
| 18GHz | 2.42 | 0.095 | 1.54 | 0.173 | 1.38 | 0.205 | 0.97 | 0.332 | - | - | - | - |
| 26.5GHz | 2.97 | 0.077 | 1.90 | 0.138 | - | - | - | - | - | - | - | - |
| 40GHz | 3.71 | 0.062 | - | - | - | - | - | - | - | - | - | - |
| 机械相位稳定性（18GHz）Phase Stability vs Flexure（最小弯曲半径缠绕一圈） | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.5°/GHz | | ±0.5°/GHz | |
| 相位温度稳定性（ppm）-55℃~+85℃ Phase Change vs Temperature | ≤850ppm | | ≤850ppm | | ≤850ppm | | ≤850ppm | | ≤750ppm | | ≤750ppm | |
| 使用温度范围（℃）Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | | | | | | | |

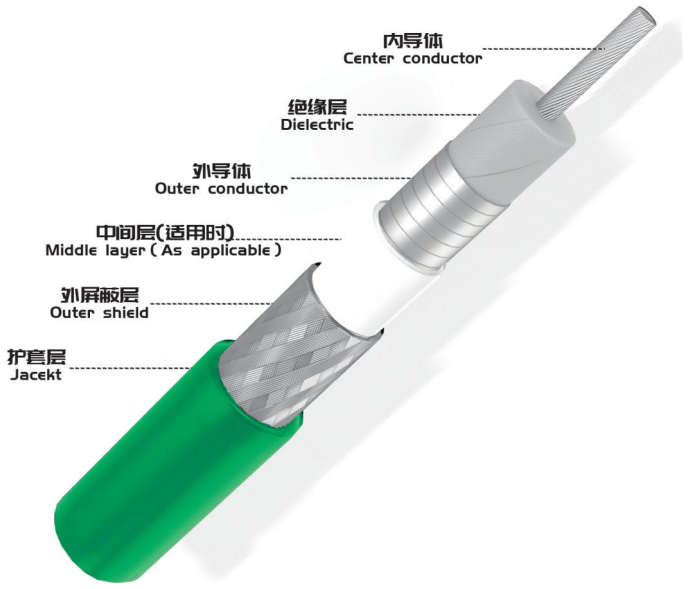
备注：

1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。

The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation

2.机械相位稳定性与测试方法密切相关，如用其他方法测试，数值可能发生变化。

Is closely related to the phase stability and mechanical testing methods, such as test with other methods, numerical might change.




## 结构说明 Construction

1.内导体：采用单芯或绞合镀银线。
2.绝缘：采用整体低密度PTFE，介电常数1.65左右，整体绝缘结构能使电缆外径和绝缘介电常数稳定，保障了信号的稳定传输。
3.屏蔽层：采用双屏蔽层+中间层（多芯内导体）结构，内屏蔽与外屏蔽之间采用氟塑料中间层。
4.护套：护套：采用了环境适应性能优越的FEP或PFA等原材料，是电缆具有较高的环境适应性。

1.Centre conductor: Utilizes solid or stranded silver-plated wire.
2.Insulation: Employs solid-extruded low-density PTFE with a dielectric constant of approximately 1.65. The solid insulation structure ensures uniform cable outer diameter and stable insulation dielectric constant, enabling reliable signal transmission.
3.Shielding: Features a dual-shield + interstitial layer structure (with multi-stranded inner conductor). A fluoropolymer interstitial layer is applied between the inner and outer shields.
4.Jacket: Constructed from environmentally superior materials such as FEP or PFA, providing enhanced environmental adaptability.

# XFXP series
# 柔性低损耗同轴射频电缆

XFXP系列柔性低损耗同轴射频电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标，并具有很高的性价比。
XFXP series Flexible low loss cable adopts the structure of special design and advanced production technology, make the cable in the range of frequencies has excellent electric and mechanical performance, and has a high cost performance.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFXP-061 | XFXP-072 | XFXP-091 | XFXP-130 |
|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.28 | 0.35 | 0.51 | 0.72 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.80 | 1.00 | 1.45 | 2.05 |
| 外导体外径（mm） Shields Diameter | 1.20 | 1.40 | 1.98 | 2.70 |
| 总外径(mm) Jacket Diameter | ≤1.50 | ≤1.80 | ≤2.35 | ≤3.20 |
| 最小弯曲半径(mm) Min.bending radius | 8 | 9 | 15 | 16 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFXP-061 | XFXP-072 | XFXP-091 | XFXP-130 |
|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 88 | 88 | 88 | 87 |
| 工作频率(GHz) Frequency Range | DC-110 | DC-110 | DC-67 | DC-50 |
| 传输速率 Velocity of Propagation | 76% | 76% | 77% | 77% |
| 最大工作电压（kV) Max.Operating Voltage | 0.4 | 0.4 | 0.8 | 1.2 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ⩾90 | ⩾90 | ⩾90 | ⩾90 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|
| 0.5GHz | 0.81 | 0.062 | 0.65 | 0.078 | 0.44 | 0.141 | 0.32 | 0.569 |
| 1GHz | 1.15 | 0.043 | 0.93 | 0.055 | 0.63 | 0.099 | 0.45 | 0.400 |
| 3GHz | 2.04 | 0.025 | 1.66 | 0.031 | 1.11 | 0.057 | 0.80 | 0.227 |
| 4GHz | 2.37 | 0.021 | 1.93 | 0.027 | 1.29 | 0.049 | 0.93 | 0.195 |
| 6GHz | 2.95 | 0.017 | 2.41 | 0.021 | 1.59 | 0.040 | 1.15 | 0.158 |
| 8GHz | 3.45 | 0.015 | 2.82 | 0.018 | 1.85 | 0.034 | 1.34 | 0.136 |
| 10GHz | 3.89 | 0.013 | 3.19 | 0.016 | 2.09 | 0.030 | 1.51 | 0.120 |
| 12GHz | 4.30 | 0.012 | 3.53 | 0.015 | 2.30 | 0.027 | 1.67 | 0.109 |
| 15GHz | 4.87 | 0.010 | 4.00 | 0.013 | 2.59 | 0.024 | 1.89 | 0.097 |
| 18GHz | 5.39 | 0.009 | 4.44 | 0.012 | 2.86 | 0.022 | 2.09 | 0.088 |
| 26.5GHz | 6.72 | 0.007 | 5.55 | 0.009 | 3.53 | 0.018 | 2.59 | 0.071 |
| 40GHz | 8.53 | 0.006 | 7.08 | 0.007 | 4.43 | 0.014 | 3.28 | 0.056 |
| 50GHz | 9.73 | 0.005 | 8.10 | 0.006 | 5.02 | 0.012 | 3.74 | 0.048 |
| 67GHz | 11.61 | 0.004 | 9.69 | 0.005 | 5.93 | 0.010 | - | - |
| 90GHz | 13.91 | 0.003 | 11.66 | 0.004 | - | - | - | - |
| 110GHz | 15.78 | 0.003 | 13.26 | 0.004 | - | - | - | - |

| | | | | |
|---|---|---|---|---|
| 机械相位稳定性（18GHz） Phase Stability vs Flexure （最小弯曲半径缠绕一圈） | ±0.3°/GHz | ±0.3°/GHz | ±0.4°/GHz | ±0.4°/GHz |
| 相位温度稳定性（ppm） -55℃~+85℃ Phase Change vs Temperature | ⩽1300ppm | ⩽1300ppm | ⩽1300ppm | ⩽1300ppm |
| 使用温度范围（℃） Temperature Range | -65~+165 | -65~+165 | -65~+165 | -65~+165 |

## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | XFXP-150 | XFXP-150D | XFXP-155B | XFXP-216 | XFXP-216D |
|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.93 | 0.90 | 0.84 | 1.45 | 1.50 |
| 导体形式 Center Conductor Type | 单芯 Solid | 多股 Stranded | 单芯 Solid | 单芯 Solid | 多股 Stranded |
| 绝缘外径（mm） Insulation Diameter | 2.70 | 2.50 | 2.50 | 4.30 | 4.30 |
| 屏蔽外径（mm） Shields Diameter | 3.35 | 3.30 | 3.35 | 4.90 | 4.90 |
| 总外径(mm) Jacket Diameter | ≤3.80 | ≤3.80 | ≤4.20 | ≤5.50 | ≤5.50 |
| 最小弯曲半径(mm) Min.bending radius | 19 | 19 | 21 | 28 | 28 |
| 结构说明 Construction | - | D-外导体含中间层 outer conductor contains an intermediate layer | B-聚氨酯护套 Polyurethanesheath （外导体含中间层 outer conductor contains an intermediate layer） | - | D-外导体含中间层 outer conductor contains an intermediate layer |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFXP-150 | XFXP-150D | XFXP-155B | XFXP-216 | XFXP-216D |
|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 88 | 88 | 88 | 88 | 88 |
| 工作频率(GHz) Frequency Range | DC-40 | DC-40 | DC-50 | DC-26.5 | DC-26.5 |
| 传输速率 Velocity of Propagation | 77% | 77% | 77% | 77% | 77% |
| 最大工作电压（kV) Max.Operating Voltage | 1.2 | 1.2 | 1.2 | 2.0 | 2.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFXP-150 | | XFXP-150D | | XFXP-155B | | XFXP-216 | | XFXP-216D | |
|---|---|---|---|---|---|---|---|---|---|---|
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 0.5GHz | 0.24 | 0.603 | 0.35 | 0.503 | 0.26 | 0.766 | 0.16 | 1.132 | 0.23 | 0.943 |
| 1GHz | 0.34 | 0.425 | 0.51 | 0.354 | 0.38 | 0.539 | 0.22 | 0.794 | 0.33 | 0.662 |
| 3GHz | 0.61 | 0.243 | 0.89 | 0.203 | 0.67 | 0.306 | 0.41 | 0.448 | 0.59 | 0.373 |
| 4GHz | 0.71 | 0.210 | 1.04 | 0.175 | 0.78 | 0.264 | 0.48 | 0.385 | 0.69 | 0.321 |
| 6GHz | 0.89 | 0.170 | 1.29 | 0.142 | 0.97 | 0.214 | 0.60 | 0.310 | 0.86 | 0.258 |
| 8GHz | 1.04 | 0.147 | 1.51 | 0.123 | 1.13 | 0.184 | 0.70 | 0.266 | 1.02 | 0.222 |
| 10GHz | 1.18 | 0.131 | 1.70 | 0.109 | 1.28 | 0.163 | 0.80 | 0.235 | 1.15 | 0.196 |
| 12GHz | 1.30 | 0.119 | 1.88 | 0.099 | 1.42 | 0.148 | 0.89 | 0.213 | 1.28 | 0.178 |
| 15GHz | 1.48 | 0.106 | 2.13 | 0.088 | 1.60 | 0.131 | 1.01 | 0.188 | 1.46 | 0.157 |
| 18GHz | 1.64 | 0.096 | 2.36 | 0.080 | 1.78 | 0.119 | 1.13 | 0.170 | 1.63 | 0.142 |
| 26.5GHz | 2.05 | 0.078 | 2.93 | 0.065 | 2.22 | 0.096 | 1.43 | 0.137 | 2.05 | 0.114 |
| 40GHz | 2.61 | 0.063 | 3.72 | 0.053 | 2.82 | 0.077 | - | - | - | - |
| 机械相位稳定性（18GHz）Phase Stability vs Flexure（最小弯曲半径缠绕一圈） | ±0.4°/GHz | | ±0.5°/GHz | | ±0.5°/GHz | | ±0.6°/GHz | | ±0.6°/GHz | |
| 相位温度稳定性（ppm）-55℃~+85℃ Phase Change vs Temperature | ≤850ppm | | ≤1300ppm | | ≤1300ppm | | ≤1300ppm | | ≤1300ppm | |
| 使用温度范围（℃）Temperature Range | -65~+165 | | -65~+165 | | -65~+85 | | -65~+165 | | -65~+165 | |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.
2.机械相位稳定性与测试方法密切相关，如用其他方法测试，数值可能发生变化。
Is closely related to the phase stability and mechanical testing methods, such as test with other methods, numerical might change.


## 结构说明 Construction

1.内导体：采用单芯镀银线。
2.绝缘：采用PTFE，传输速率70%
3.屏蔽层：采用双屏蔽层结构，内屏蔽层采用镀银铜带绕包，此类结构有损耗低，屏蔽高，外屏蔽层采用镀银铜线编织，保证了电缆的抗拉强度。
4.护套：采用了FEP护套，使电缆具有较高的环境适用性。

1.Centre conductor:single silver plated copper wire.
2.Insulation: Adopt PTFE, transmission rate of 70% .
3.Shield: Adopt double shield layer structure, the inner shielding layer is wrapped with silver plated copper tape, this structure has low loss, high block, the outer shielding layer is braided by silver-plated copper wire, ensure that the cable's tensile strength.
4.Jacket: used the FEP sheath, the cable has high environmental suitability.

# XFX series
# 柔性低损耗同轴射频电缆

XFX系列电缆采用了双层屏蔽镀银铜带绕包加圆线编织的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标，并具有很高的性价比。
XFX series with a double-layer cable shielding copper with silver plated round bag with round wire weaving production process, make the cable in the range of frequencies has excellent electric and mechanical performance.

## 结构参数与机械性能
## Mechanical Characteristics

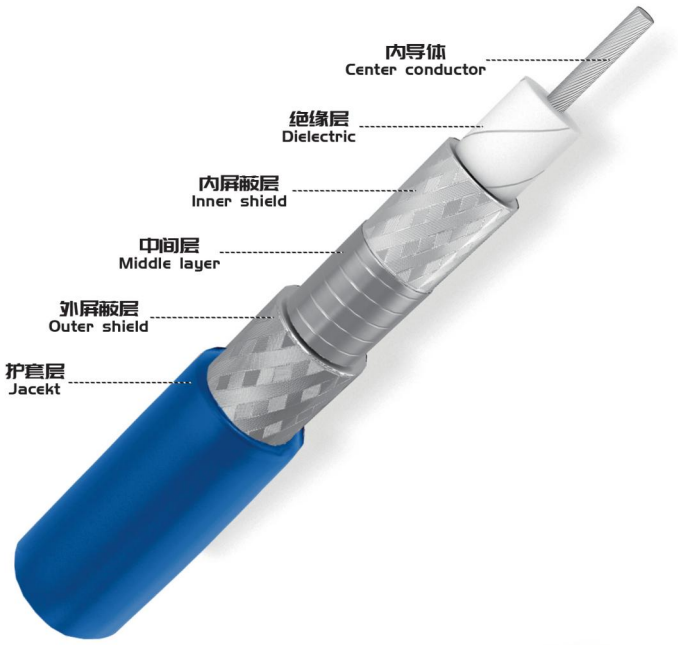
| 型号 TYPE | XFX-060 | XFX-086 | XFX-141 |
|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.28 | 0.53 | 0.92 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.87 | 1.65 | 2.98 |
| 外导体外径（mm） Shields Diameter | 1.25 | 2.16 | 3.65 |
| 总外径(mm) Jacket Diameter | ≤1.50 | ≤2.64 | ≤4.17 |
| 最小弯曲半径(mm) Min.bending radius | 6 | 13 | 21 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFX-060 | | XFX-086 | | XFX-141 | |
|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | | 50 | | 50 | |
| 电容(pf/m) Capacitance | 96.1 | | 96.1 | | 96.1 | |
| 工作频率(GHz) Frequency Range | DC-110 | | DC-40 | | DC-40 | |
| 传输速率 Velocity of Propagation | 70% | | 70% | | 70% | |
| 最大工作电压（kV) Max.Operating Voltage | 0.4 | | 0.8 | | 1.2 | |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ⩾90 | | ⩾90 | | ⩾90 | |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | |
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW |
| 0.5GHz | 1.00 | 0.054 | 0.54 | 0.159 | 0.30 | 0.375 |
| 1GHz | 1.43 | 0.038 | 0.77 | 0.111 | 0.44 | 0.260 |
| 3GHz | 2.52 | 0.022 | 1.38 | 0.062 | 0.81 | 0.143 |
| 4GHz | 2.93 | 0.019 | 1.61 | 0.053 | 0.95 | 0.121 |
| 6GHz | 3.62 | 0.015 | 2.01 | 0.043 | 1.20 | 0.096 |
| 8GHz | 4.22 | 0.013 | 2.35 | 0.037 | 1.43 | 0.088 |
| 10GHz | 4.76 | 0.012 | 2.67 | 0.032 | 1.63 | 0.071 |
| 12GHz | 5.25 | 0.010 | 2.96 | 0.029 | 1.82 | 0.064 |
| 15GHz | 5.92 | 0.009 | 3.36 | 0.026 | 2.09 | 0.056 |
| 18GHz | 6.54 | 0.008 | 3.74 | 0.023 | 2.35 | 0.050 |
| 26.5GHz | 8.10 | 0.007 | 4.70 | 0.019 | 3.01 | 0.039 |
| 40GHz | 10.20 | 0.006 | 6.03 | 0.015 | 3.95 | 0.030 |
| 50GHz | 11.59 | 0.005 | - | - | - | - |
| 67GHz | 13.73 | 0.004 | - | - | - | - |
| 90GHz | 16.34 | 0.003 | - | - | - | - |
| 110GHz | 18.43 | 0.003 | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.

- *XFBP*
- *SFCJ*
- *XYMR*
- *XFLL*




## 结构说明 Construction

1.内导体：采用单芯或绞合镀银线。
2.绝缘：采用微孔低密度PTFE和整体低密度PTFE。
3.屏蔽层：采用三屏蔽层结构，内屏蔽层采用镀银铜带编织，中间采用聚酰亚胺薄膜绕包，外屏蔽层采用镀银铜线编织。
4.护套：采用了环境适应性能优越的FEP或PFA。

1.Centre conductor: Single-core or stranded silver-plated wire.
2.Insulation: Microporous low-density PTFE combined with solid low-density PTFE.
3.Triple-layer shielding structure comprising:
Inner layer: Silver-plated copper tape braiding.
Middle layer: Polyimide film wrapping.
Outer layer: Silver-plated copper wire braiding.
4.Jacket: FEP or PFA material with superior environmental adaptability.

# XFBP series
# 低损耗稳相同轴射频电缆

XFBP系列电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标，是低损耗首选的低成本方案。
XFWP series cable of the special structure design and advanced production technology, making the cable in the whole frequency range has excellent electrical and mechanical performance, and the high ratio of performance to price is low loss preferred low cost solution.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFBP-142 | XFBP-205 | XFBP-304 | XFBP-310 | XFBP-480（J） | XFBP-530（J） |
|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 1.02 | 1.29 | 1.57 | 2.00 | 3.35 | 3.66 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 多股 Stranded | 多股 Stranded |
| 绝缘外径（mm） Insulation Diameter | 2.95 | 3.80 | 4.70 | 5.85 | 9.05 | 10.30 |
| 屏蔽外径（mm） Shields Diameter | 3.70 | 4.50 | 5.70 | 7.00 | 10.30 | 11.00 |
| 总外径(mm) Jacket Diameter | ≦4.30 | ≦5.20 | ≦6.20 | ≦7.70 | ≦11.45（FEP） ≦12.30（TPU） | ≦12.30（FEP） ≦13.50（TPU） |
| 最小弯曲半径(mm) Min.bending radius | 22 | 26 | 30 | 39 | 64 | 69 |

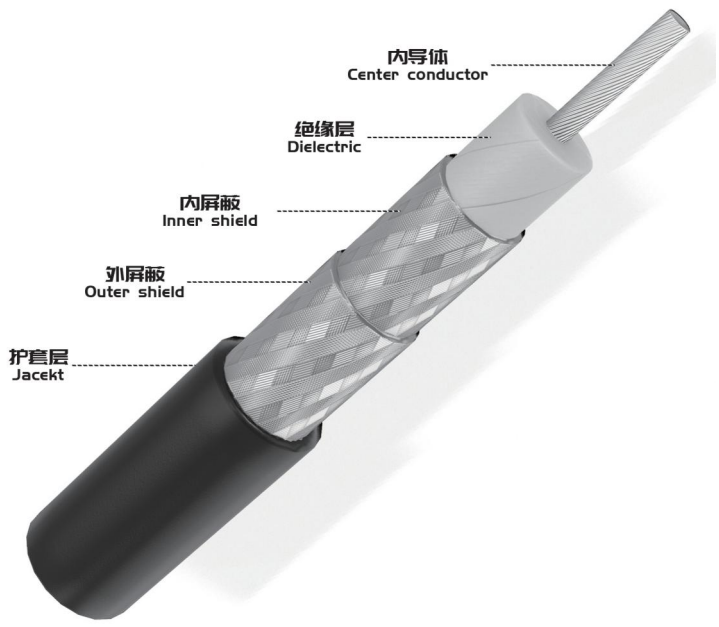
## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFBP-142 | XFBP-205 | XFBP-304 | XFBP-310 | XFBP-480（J） | XFBP-530（J） |
|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 88 | 88 | 88 | 88 | 85 | 85 |
| 工作频率(GHz) Frequency Range | DC-18 | DC-18 | DC-18 | DC-18 | DC-12 | DC-10 |
| 传输速率 Velocity of Propagation | 76% | 76% | 76% | 76% | 80% | 80% |
| 最大工作电压（kV) Max.Operating Voltage | 1.0 | 1.0 | 2.0 | 3.0 | 5 | 5 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | | dB/m | kW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | FEP | TPU | | FEP | TPU |
| 0.5GHz | 0.25 | 0.432 | 0.20 | 0.618 | 0.50 | 0.841 | 0.11 | 1.230 | 0.10 | 2.570 | 0.912 | 0.08 | 2.805 | 1.003 |
| 1GHz | 0.36 | 0.303 | 0.28 | 0.431 | 0.20 | 0.586 | 0.17 | 0.853 | 0.15 | 1.778 | 0.630 | 0.12 | 1.928 | 0.687 |
| 3GHz | 0.62 | 0.171 | 0.49 | 0.241 | 0.36 | 0.326 | 0.30 | 0.471 | 0.27 | 0.975 | 0.344 | 0.22 | 1.040 | 0.368 |
| 4GHz | 0.72 | 0.147 | 0.57 | 0.207 | 0.44 | 0.279 | 0.36 | 0.401 | - | - | - | - | - | - |
| 6GHz | 0.89 | 0.118 | 0.70 | 0.166 | 0.55 | 0.223 | 0.45 | 0.319 | 0.37 | 0.657 | 0.231 | 0.33 | 0.691 | 0.244 |
| 8GHz | 1.03 | 0.101 | 0.82 | 0.141 | 0.69 | 0.189 | 0.53 | 0.270 | - | - | - | - | - | - |
| 10GHz | 1.16 | 0.090 | 0.92 | 0.125 | 0.72 | 0.167 | 0.61 | 0.237 | 0.50 | 0.486 | 0.170 | 0.45 | 0.505 | 0.177 |
| 12GHz | 1.28 | 0.081 | 1.01 | 0.112 | 0.76 | 0.150 | 0.68 | 0.213 | 0.55 | 0.436 | 0.152 | - | - | - |
| 15GHz | 1.44 | 0.072 | 1.14 | 0.099 | 0.85 | 0.132 | 0.78 | 0.186 | - | - | - | - | - | - |
| 18GHz | 1.59 | 0.065 | 1.26 | 0.089 | 1.07 | 0.118 | 0.88 | 0.166 | - | - | - | - | - | - |
| 机械相位稳定性（18GHz） Phase Stability vs Flexure （最小弯曲半径缠绕一圈） | ±0.4°/GHz | | ±0.5°/GHz | | ±0.5°/GHz | | ±0.5°/GHz | | - | | | - | | |
| 相位温度稳定性（ppm） -55℃~+85℃ Phase Change vs Temperature | ≤1300ppm | | ≤1300ppm | | ≤1300ppm | | ≤1300ppm | | - | | | - | | |
| 使用温度范围（℃） Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | | FEP:-65~+165 TPU:-65~+85 | | | FEP:-65~+165 TPU:-65~+85 | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.
2.机械相位稳定性与测试方法密切相关，如用其他方法测试，数值可能发生变化。
Is closely related to the phase stability and mechanical testing methods, such as test with other methods, numerical might change.




## 结构说明 Construction

1.内导体：采用绞合镀银线。
2.绝缘：采用微孔低密度PTFE，多层绕包结构能使电缆外径和绝缘介电常数稳定，保障了信号的稳定传输。
3.屏蔽层：采用二屏蔽层结构，内外屏蔽层采用镀银铜带编织，此类结构有损耗低，屏蔽高，并有较强的抗扭能力。
4.护套：采用了TPU护套，使电缆柔软且耐磨。

1.Centre conductor: the twisted plating silver thread. Stranded conductor is relatively soft, have better bending resistance and bending fatigue life.
2. Insulation: Adopt microporous low density PTFE, multilayer wrapped structure can make the cable diameter and insulating dielectric constant stability, safeguard the stability of the signal transmission.
3. Shield: the two shielding layer structure, internal and external shielding layer using silver plating copper strip weaving, this kind of structure has low loss and high shielding, and have strong torsional capacity.
4. Jacket: using the TPU sheath, make cable soft and wear-resisting.

# SFCJ series
# 柔性低损耗同轴射频电缆

SFCJ系列电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标，并具有很高的性价比。
SFCJ series cable of the special structure design and advanced production technology, making the cable in the whole frequency range has excellent electrical and mechanical performance, and the high ratio of performance to price is low loss low cost solution one option.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | SFCJ-50-3 | SFCJ-50-5 | SFCJ-50-7 | SFCJ-50-9 |
|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 1.14 | 1.82 | 2.65 | 3.35 |
| 导体形式 Center Conductor Type | 多股 Stranded | 多股 Stranded | 多股 Stranded | 多股 Stranded |
| 绝缘外径（mm） Insulation Diameter | 2.95 | 4.95 | 6.95 | 9.00 |
| 外导体外径（mm） Shields Diameter | 3.60 | 5.55 | 7.60 | 9.80 |
| 总外径(mm) Jacket Diameter | ≦5.30 | ≦7.50 | ≦10.50 | ≦13.30 |
| 最小弯曲半径(mm) Min.bending radius | 50 | 73 | 105 | 130 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | SFCJ-50-3 | | SFCJ-50-5 | | SFCJ-50-7 | | SFCJ-50-9 | |
|---|---|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | | 50 | | 50 | | 50 | |
| 电容(pf/m) Capacitance | 87 | | 87 | | 83 | | 83 | |
| 工作频率(GHz) Frequency Range | DC-18 | | DC-18 | | DC-15 | | DC-10 | |
| 传输速率 Velocity of Propagation | 81% | | 81% | | 81% | | 81% | |
| 最大工作电压（kV) Max.Operating Voltage | 1.0 | | 1.5 | | 2.5 | | 3.0 | |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥80 | | ≥80 | | ≥80 | | ≥80 | |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | | | |
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 1GHz | 0.45 | 0.131 | 0.34 | 0.267 | 0.18 | 0.470 | 0.14 | 0.664 |
| 3GHz | 0.74 | 0.075 | 0.55 | 0.152 | 0.34 | 0.267 | 0.27 | 0.375 |
| 6GHz | 1.08 | 0.052 | 0.80 | 0.106 | 0.51 | 0.187 | 0.41 | 0.260 |
| 8GHz | 1.25 | 0.045 | 0.87 | 0.091 | 0.58 | 0.160 | 0.47 | 0.223 |
| 10GHz | 1.43 | 0.040 | 1.05 | 0.081 | 0.72 | 0.143 | 0.57 | 0.198 |
| 12GHz | 1.57 | 0.037 | 1.17 | 0.074 | 0.79 | 0.129 | - | - |
| 15GHz | 1.80 | 0.033 | 1.39 | 0.066 | 0.94 | 0.115 | - | - |
| 18GHz | 2.02 | 0.029 | 1.58 | 0.060 | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -55~+85 | | -55~+85 | | -55~+85 | | -55~+85 | |

备注：

1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。

The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.


## 结构说明 Construction

1.内导体：采用单芯裸铜线或单芯铜包铝线，在相同外径的情况下单芯内导体有更低的损耗。
2.绝缘：采用发泡PE或PE，信号传输速率达83%（PE为66%）。
3.屏蔽层：采用铝箔+镀锡铜线编织屏蔽。
4.护套：采用了环境适应性能优良的交联PE材料。

1.Centre conductor: Single core,bare copper and copper clad aluminium wire on the outside diameter of the same order core inner conductor have lower loss.
2. Insulation: Adopt foam PE or PE, signal transmission rate up to 83%（PE for 66%）.
3. Shield: the shielding layer with aluminum foil + tinned round copper wire braided shield.
4. Jacket: the environment to adapt to the good performance of the crosslinked PE material.

# XYMR series
# 经济型低损耗同轴射频电缆

XYMR系列电缆采用了发泡PE或PE为绝缘，铝箔+镀锡圆铜线编织屏蔽，交联PE为护套，具有很高的性价比，是XFWP和SFCJ的替代方案的选择之一。
XYMR series cable adopts the foaming PE insulation or PE insulation, aluminum foil + tinned round copper wire braided shield, crosslinked PE jacket, has the very high cost performance, are XFWP and SFCJ one of the cost alternative choice.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XYMR-100 | XYMR-195 | XYMR-200 | XYMR-240 |
|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.46 | 0.94 | 1.12 | 1.42 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 1.52 | 2.79 | 2.95 | 3.81 |
| 外导体外径（mm） Shields Diameter | 2.11 | 3.53 | 3.66 | 4.52 |
| 总外径(mm) Jacket Diameter | ≤2.79 | ≤4.95 | ≤4.95 | ≤6.10 |
| 最小弯曲半径(mm) Min.bending radius | 14 | 26 | 26 | 35 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XYMR-100 | XYMR-195 | XYMR-200 | XYMR-240 |
|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 101 | 80.4 | 80.4 | 80.4 |
| 工作频率(GHz) Frequency Range | DC-5.8 | DC-5.8 | DC-5.8 | DC-5.8 |
| 传输速率 Velocity of Propagation | 66% | 80% | 83% | 85% |
| 最大工作电压（kV) Max.Operating Voltage | 0.8 | 1.2 | 1.2 | 1.5 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|
| 30MHz | 0.12 | 0.23 | 0.06 | 0.89 | 0.05 | 1.02 | 0.04 | 1.49 |
| 50MHz | 0.16 | 0.18 | 0.08 | 0.68 | 0.07 | 0.79 | 0.05 | 1.15 |
| 150MHz | 0.29 | 0.10 | 0.14 | 0.39 | 0.13 | 0.45 | 0.10 | 0.66 |
| 220MHz | 0.35 | 0.08 | 0.17 | 0.32 | 0.15 | 0.37 | 0.12 | 0.54 |
| 450MHz | 0.51 | 0.06 | 0.25 | 0.22 | 0.22 | 0.26 | 0.17 | 0.38 |
| 900MHz | 0.74 | 0.05 | 0.36 | 0.15 | 0.32 | 0.18 | 0.24 | 0.26 |
| 1500MHz | 0.98 | 0.04 | 0.47 | 0.12 | 0.42 | 0.14 | 0.32 | 0.20 |
| 1800MHz | 1.10 | 0.03 | 0.52 | 0.11 | 0.46 | 0.13 | 0.35 | 0.18 |
| 2000MHz | 1.16 | 0.02 | 0.55 | 0.10 | 0.49 | 0.12 | 0.37 | 0.17 |
| 2500MHz | 1.31 | 0.01 | 0.62 | 0.09 | 0.55 | 0.10 | 0.42 | 0.15 |
| 5800MHz | 2.17 | 0.01 | 0.93 | 0.06 | 0.86 | 0.07 | 0.66 | 0.10 |
| 使用温度范围（℃） Temperature Range | -22~+185 | | -22~+185 | | -22~+185 | | -22~+185 | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.

## 结构参数与机械性能Mechanical Characteristics

| 型号 TYPE | XYMR-300 | XYMR-400 | XYMR-500 | XYMR-600 |
|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 1.78 | 2.74 | 3.61 | 4.47 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 4.83 | 7.24 | 9.40 | 11.56 |
| 外导体外径（mm） Shields Diameter | 5.72 | 8.13 | 10.29 | 12.50 |
| 总外径(mm) Jacket Diameter | ≤7.62 | ≤10.29 | ≤12.70 | ≤14.99 |
| 最小弯曲半径(mm) Min.bending radius | 41 | 55 | 65 | 80 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XYMR-300 | XYMR-400 | XYMR-500 | XYMR-600 |
|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 80.4 | 78.4 | 76.8 | 76.8 |
| 工作频率(GHz) Frequency Range | DC-5.8 | DC-5.8 | DC-5.8 | DC-5.8 |
| 传输速率 Velocity of Propagation | 85% | 85% | 86% | 85% |
| 最大工作电压（kV) Max.Operating Voltage | 2.0 | 3.0 | 3.0 | 5.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | |

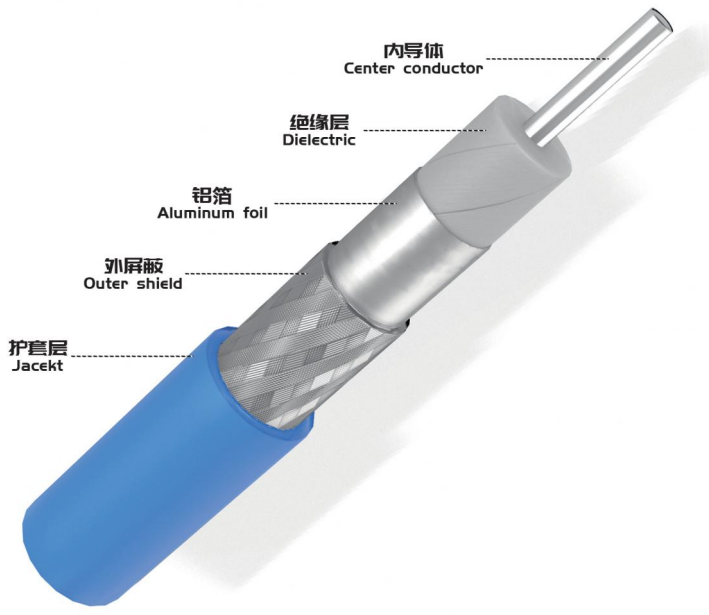
## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XYMR-300 | | XYMR-400 | | XYMR-500 | | XYMR-600 | |
|---|---|---|---|---|---|---|---|---|
| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
| 30MHz | 0.03 | 2.10 | 0.02 | 3.30 | 0.018 | 4.40 | 0.01 | 5.51 |
| 50MHz | 0.04 | 1.60 | 0.03 | 2.60 | 0.02 | 3.40 | 0.02 | 4.24 |
| 150MHz | 0.08 | 0.92 | 0.05 | 1.50 | 0.04 | 1.90 | 0.03 | 2.41 |
| 220MHz | 0.09 | 0.76 | 0.06 | 1.20 | 0.05 | 1.60 | 0.04 | 1.97 |
| 450MHz | 0.13 | 0.52 | 0.09 | 0.83 | 0.07 | 1.09 | 0.06 | 1.35 |
| 900MHz | 0.20 | 0.36 | 0.13 | 0.58 | 0.10 | 0.75 | 0.08 | 0.93 |
| 1500MHz | 0.26 | 0.28 | 0.17 | 0.44 | 0.13 | 0.57 | 0.11 | 0.70 |
| 1800MHz | 0.28 | 0.25 | 0.19 | 0.40 | 0.15 | 0.52 | 0.12 | 0.63 |
| 2000MHz | 0.30 | 0.24 | 0.20 | 0.37 | 0.16 | 0.49 | 0.13 | 0.59 |
| 2500MHz | 0.34 | 0.21 | 0.22 | 0.33 | 0.18 | 0.43 | 0.15 | 0.52 |
| 5800MHz | 0.54 | 0.13 | 0.35 | 0.21 | 0.29 | 0.26 | 0.24 | 0.32 |
| 使用温度范围（℃） Temperature Range | -22~+185 | | -22~+185 | | -22~+185 | | -22~+185 | |

备注：

1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。

The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.




## 结构说明 Construction

1.内导体：采用单芯。在相同外径的情况下单芯内导体有更低的损耗，在弯曲情况下有更好的机械相位稳定性；绞合导体较为柔软，有更好的弯曲性和弯曲疲劳使用寿命。
2.绝缘：采用PTFE或整体低密度PTFE，信号传输速率达70%或77%，整体绝缘结构能使电缆外径和绝缘介电常数稳定，保障了信号的稳定传输。
3.屏蔽层：采用纵包铝箔加镀银铜线编织的结构。纵包铝箔使屏蔽效率增加，高密度编织层是电缆的抗拉强度增加。
4.护套：采用了环境适应性能优越的FEP或PFA。

1.Centre conductor: The single core. In the same order of outer diameter core inner conductor has lower loss,in bending cases have better mechanical phase stability; Stranded conductor is relatively soft, have better bending resistance and bending fatigue life.
2. Insulation: Adopt PTFE or overall low density PTFE, the signal transmission rate of 70% or 77%,the overall insulating structure can make the cable diameter and insulating dielectric constant stability,guarantee the stability of the signal transmission.
3. Shielding layer: Longitudinal aluminum foil plus silver-plated copper wire woven structure. The Longitudinal wrapped aluminum foil increases the shielding efficiency, and the high density braided layer increases the tensile strength of the cable.

# XFLL series
# 经济型柔软低损耗同轴射频电缆

XFLL系列电缆采用了特殊的结构设计和生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标，并具有很高的性价比。

XFLL series cable adopts Special Structure Design and production technology, which makes the cable have excellent electrical and mechanical performance in the whole frequency range, and have high performance-price ratio.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFLL-091 | XFLL-130 | XFLL-150 | XFLL-216 | XFLL-250 | XFLL-315 | XFLL-480 |
|---|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.52 | 0.72 | 0.93 | 1.45 | 1.78 | 2.30 | 3.80 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 1.68 | 2.00 | 2.75 | 4.20 | 5.20 | 6.80 | 10.30 |
| 外导体外径（mm） Shields Diameter | 2.10 | 2.53 | 3.30 | 4.78 | 5.75 | 7.40 | 11.10 |
| 总外径(mm) Jacket Diameter | ≤2.65 | ≤3.20 | ≤3.80 | ≤5.30 | ≤6.40 | ≤8.10 | ≤12.20 |
| 最小弯曲半径(mm) Min.bending radius | 6.5 | 16 | 18 | 26 | 32 | 40 | 60 |

## 电气与环境性能 Electrical and Environmental Performance

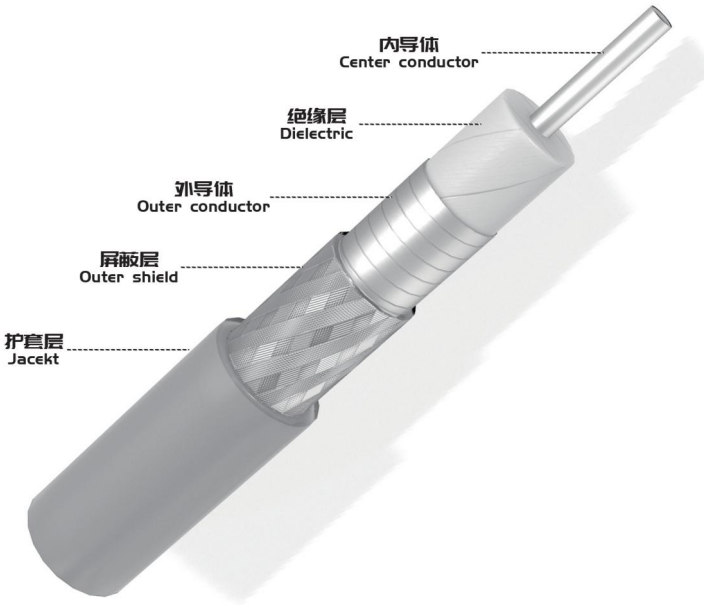
| 型号 TYPE | XFLL-086 | XFLL-141 | XFLL-150 | XFLL-216 | XFLL-250 | XFLL-315 | XFLL-480 |
|---|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 96.2 | 88 | 88 | 88 | 88 | 88 | 88 |
| 工作频率(GHz) Frequency Range | DC-40 | DC-40 | DC-40 | DC-18 | DC-18 | DC-15 | DC-15 |
| 传输速率 Velocity of Propagation | 70% | 76% | 76% | 76% | 76% | 76% | 76% |
| 最大工作电压（kV) Max.Operating Voltage | 0.8 | 1.0 | 1.2 | 1.5 | 1.5 | 2.0 | 2.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 | ≥90 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.5GHz | 0.49 | 0.154 | 0.36 | 0.266 | 0.29 | 0.366 | 0.17 | 1.098 | 0.15 | 1.453 | 0.10 | 2.409 | 0.07 | 4.374 |
| 1GHz | 0.66 | 0.108 | 0.51 | 0.186 | 0.37 | 0.256 | 0.20 | 0.766 | 0.22 | 0.990 | 0.15 | 1.674 | 0.10 | 3.048 |
| 3GHz | 1.20 | 0.060 | 0.88 | 0.104 | 0.65 | 0.145 | 0.43 | 0.428 | 0.38 | 0.574 | 0.27 | 0.926 | 0.18 | 1.698 |
| 4GHz | 1.41 | 0.052 | 1.00 | 0.090 | 0.78 | 0.124 | 0.50 | 0.366 | 0.44 | 0.496 | 0.32 | 0.790 | 0.21 | 1.477 |
| 6GHz | 1.75 | 0.041 | 1.23 | 0.072 | 0.96 | 0.100 | 0.62 | 0.293 | 0.55 | 0.396 | 0.40 | 0.629 | 0.27 | 1.161 |
| 8GHz | 2.08 | 0.035 | 1.42 | 0.062 | 1.13 | 0.086 | 0.73 | 0.250 | 0.64 | 0.340 | 0.47 | 0.534 | 0.32 | 0.988 |
| 10GHz | 2.37 | 0.031 | 1.60 | 0.054 | 1.28 | 0.076 | 0.83 | 0.220 | 0.72 | 0.302 | 0.54 | 0.469 | 0.36 | 0.870 |
| 12GHz | 2.62 | 0.028 | 1.76 | 0.049 | 1.39 | 0.069 | 0.93 | 0.199 | 0.79 | 0.275 | 0.60 | 0.421 | - | - |
| 15GHz | 3.00 | 0.025 | 1.97 | 0.043 | 1.58 | 0.061 | 1.04 | 0.174 | 0.90 | 0.242 | 0.70 | 0.360 | - | - |
| 18GHz | 3.35 | 0.022 | 2.17 | 0.039 | 1.78 | 0.055 | 1.16 | 0.157 | 0.99 | 0.220 | - | - | - | - |
| 26.5GHz | 4.32 | 0.018 | 2.66 | 0.032 | 2.35 | 0.044 | - | - | - | - | - | - | - | - |
| 40GHz | 6.01 | 0.014 | 3.31 | 0.025 | - | - | - | - | - | - | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -65~+165 | | | | | | | | | | | | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.

# XFWQ




## 结构说明 Construction

1.内导体：单根镀银金属复合材料线。
2.绝缘：采用微孔低密度PTFE，传输速率83%。
3.屏蔽层：采用双屏蔽层结构，内屏蔽层采用镀银铜带绕包，外屏蔽采用镀银金属复合材料线编织。
4.护套：采用了ETFE护套。

1.Centre conductor:Single silver plated metal composite wire.
2. Insulation: Adopt microporous low density PTFE, transmission rate of 83%.
3. The shield: With double shielding layer structure, the shielding layer using silver plating copper strap bag, the outer shield is braided by silver - plated metal composite wire.
4. Sheath: adopted ETFE sheath.

# XFWQ series
# 航空航天用超轻柔性低损耗同轴射频电缆

XFWQ 系列电缆是专为航空航天设计的一款轻型低损耗同轴射频电缆，具有重量轻，耐辐射性能优良，电气性能稳定等特点。

XFWQ series cable is a lightweight low loss coaxial RF cable designed for aerospace, with light weight, good radiation resistance, stable electrical performance, etc.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFWQ-88 | XFWQ-142 | XFWQ-190 | XFWPQ-311 |
|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.51 | 0.91 | 1.40 | 2.30 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 1.40 | 2.50 | 3.85 | 6.30 |
| 外导体外径（mm） Shields Diameter | 1.80 | 3.05 | 4.40 | 7.10 |
| 总外径(mm) Jacket Diameter | ≤2.15 | ≤3.55 | ≤4.80 | ≤7.80 |
| 最小弯曲半径(mm) Min.bending radius | 11 | 18 | 26 | 40 |
| 重量 Weight（g/m | 11 | 23 | 42 | 85 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFWQ-88 | XFWQ-142 | XFWQ-190 | XFWPQ-311 |
|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 85 | 83 | 83 | 83 |
| 工作频率(GHz) Frequency Range | DC-67 | DC-40 | DC-26.5 | DC-18 |
| 传输速率 Velocity of Propagation | 80% | 82% | 83% | 83% |
| 最大工作电压（kV) Max.Operating Voltage | 0.8 | 1.2 | 1.3 | 3.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥90 | ≥90 | ≥90 | ≥90 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|
| 0.5GHz | 0.44 | 0.131 | 0.26 | 0.703 | 0.19 | 1.310 | 0.12 | 2.564 |
| 1GHz | 0.63 | 0.092 | 0.36 | 0.495 | 0.26 | 0.921 | 0.17 | 1.804 |
| 3GHz | 1.10 | 0.053 | 0.61 | 0.283 | 0.44 | 0.524 | 0.28 | 1.028 |
| 4GHz | 1.28 | 0.045 | 0.70 | 0.244 | 0.51 | 0.451 | 0.33 | 0.886 |
| 6GHz | 1.58 | 0.037 | 0.86 | 0.199 | 0.63 | 0.365 | 0.38 | 0.718 |
| 8GHz | 1.84 | 0.032 | 0.99 | 0.171 | 0.73 | 0.314 | 0.44 | 0.618 |
| 10GHz | 2.07 | 0.028 | 1.10 | 0.152 | 0.81 | 0.279 | 0.50 | 0.549 |
| 12GHz | 2.28 | 0.026 | 1.24 | 0.139 | 0.88 | 0.253 | 0.55 | 0.499 |
| 15GHz | 2.57 | 0.023 | 1.36 | 0.123 | 0.99 | 0.225 | 0.62 | 0.443 |
| 18GHz | 2.84 | 0.021 | 1.58 | 0.112 | 1.08 | 0.204 | 0.67 | 0.402 |
| 26.5GHz | 3.50 | 0.017 | 2.09 | 0.091 | 1.35 | 0.165 | - | - |
| 40GHz | 4.39 | 0.013 | 2.64 | 0.073 | - | - | - | - |
| 50GHz | 4.97 | 0.012 | - | - | - | - | - | - |
| 67GHz | 5.87 | 0.010 | - | - | - | - | - | - |
| 机械相位稳定性（18GHz） Phase Stability vs Flexure （最小弯曲半径缠绕一圈） | ±0.3°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | | ±0.4°/GHz | |
| 相位温度稳定性（ppm） -55℃~+85℃ Phase Change vs Temperature | ≤800ppm | | ≤750ppm | | ≤750ppm | | ≤750ppm | |
| 耐辐射性能（kGy） Radiation | 100 | | 100 | | 100 | | 100 | |
| 使用温度范围（℃） Temperature Range | -65~+150 | | -65~+150 | | -65~+150 | | -65~+150 | |

备注：

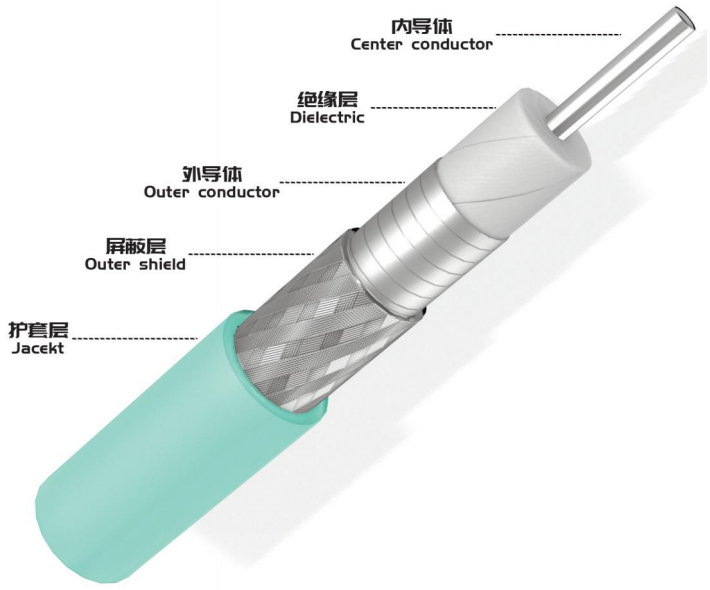
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。

The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation

2.机械相位稳定性与测试方法密切相关，如用其他方法测试，数值可能发生变化。

Is closely related to the phase stability and mechanical testing methods, such as test with other methods, numerical might change.

- ***XFWP HIGH POWER***
- ***XFMP HIGH POWER***




## 结构说明 Construction

1.内导体：采用多股镀银圆铜线，在弯曲情况下有更好的机械稳定性和弯曲寿命，并使电缆具有更好的柔性。
2.绝缘：采用微孔低密度PTFE，介电常数1.45左右。
3.屏蔽层：采用双屏蔽层结构，内屏蔽层采用镀银铜扁带绕包，外屏蔽层采用镀银圆铜线编织。
4.护套：采用了环境适应性能优越的FEP或PFA等原材料，使电缆具有较高的环境适应性。

1.Centre conductor: Multi-stranded silver-plated round copper wire, providing enhanced mechanical stability and flex life during bending, while improving overall cable flexibility.
2.Insulation: Microporous low-density PTFE (Polytetrafluoroethylene), with a dielectric constant of approximately 1.45.
3.Shielding: Dual-layer shield structure. Inner shield: Helically wrapped silver-plated copper tape. Outer shield: Braided silver-plated round copper wire.
4.Jacket: Constructed from environmentally superior materials such as FEP (Fluorinated Ethylene Propylene) or PFA (Perfluoroalkoxy), ensuring high environmental adaptability of the cable.

# XFWP series
# 大功率低损耗稳相射频电缆

XFWP系列高性能柔性大功率低损耗同轴射频电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标。

XYMR series cable adopts the foaming PE insulation or PE insulation, aluminum foil + tinned round copper wire braided shield, crosslinked PE jacket, has the very high cost performance, are XFWP and SFCJ one of the cost alternative choice.

## 结构参数与机械性能
## Mechanical Characteristics

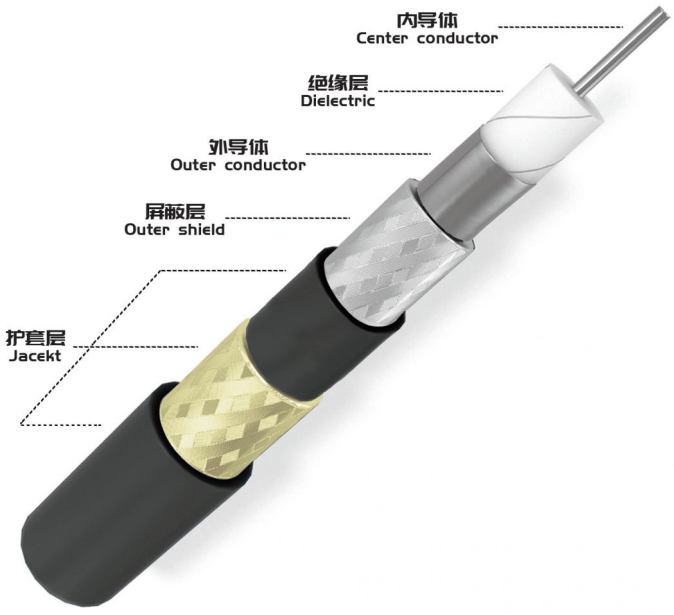
| 型号 TYPE | XFWP-480H | XFWP-580H | XFWP-700H | XFWP-790H |
|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 3.80 | 4.70 | 5.60 | 6.30 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 10.15 | 12.30 | 15.00 | 17.00 |
| 外导体外径（mm） Shields Diameter | 10.40 | 12.60 | 15.25 | 17.30 |
| 总外径(mm) Jacket Diameter | ≤12.20 | ≤14.70 | ≤17.80 | ≤20.00 |
| 最小弯曲半径(mm) Min.bending radius | 静态 static：60<br>动态 dynamic：120 | 静态 static：75<br>动态 dynamic：150 | 静态 static：90<br>动态 dynamic：180 | 静态 static：100<br>动态 dynamic：200 |
| 最大重量（g/m） Max. weight | 280 | 410 | 575 | 700 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFWP-480H | XFWP-580H | XFWP-700H | XFWP-790H |
|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 84 | 84 | 84 | 84 |
| 工作频率(MHz) Frequency Range | DC-8000 | DC-8000 | DC-6000 | DC-5000 |
| 传输速率 Velocity of Propagation | 83% | 83% | 83% | 83% |
| 最大工作电压（kV) Max.Operating Voltage | 5.0 | 5.0 | 6.0 | 7.0 |
| 时延（ns/m） Time delay | 4.01 | 4.01 | 4.01 | 4.01 |
| 电压驻波比 VSWR | 1.30 | 1.30 | 1.30 | 1.30 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/100m | kW | dB/100m | kW | dB/100m | kW | dB/100m | kW |
|---|---|---|---|---|---|---|---|---|
| 100MHz | 4.27 | 11.10 | 3.33 | 14.60 | 2.73 | 18.04 | 2.41 | 20.86 |
| 300MHz | 7.25 | 6.37 | 5.83 | 8.37 | 4.78 | 10.31 | 4.23 | 11.90 |
| 500MHz | 9.41 | 4.91 | 7.57 | 6.45 | 6.22 | 7.93 | 5.50 | 9.15 |
| 1000MHz | 13.44 | 3.44 | 10.84 | 4.52 | 8.92 | 5.54 | 7.91 | 6.38 |
| 2000MHz | 19.26 | 2.40 | 15.58 | 3.16 | 12.86 | 3.85 | 11.43 | 4.42 |
| 3000MHz | 23.83 | 1.94 | 19.31 | 2.56 | 15.99 | 3.10 | 14.24 | 3.56 |
| 5000MHz | - | - | - | - | - | - | 18.86 | 2.69 |
| 6000MHz | 24.46 | 1.34 | 28.06 | 1.77 | 23.36 | 2.13 | - | - |
| 8000MHz | 40.26 | 1.15 | 32.86 | 1.52 | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -65~+165 | | -65~+165 | | -65~+165 | | -65~+165 | |




## 结构说明 Construction

1.内导体：采用多股镀银圆铜线，在弯曲情况下有更好的机械稳定性和弯曲寿命，并使电缆具有更好的柔性。
2.绝缘：采用微孔低密度PTFE，介电常数1.45左右。
3.屏蔽层：采用双屏蔽层结构，内屏蔽层采用镀银铜扁带绕包，外屏蔽层采用镀银圆铜线编织。
4.护套：采用了环境适应性能优越的FEP或PFA等原材料，使电缆具有较高的环境适应性。

1.Centre conductor: Multi-stranded silver-plated round copper wire, providing enhanced mechanical stability and flex life during bending, while improving overall cable flexibility.
2.Insulation: Microporous low-density PTFE (Polytetrafluoroethylene), with a dielectric constant of approximately 1.45.
3.Shielding: Dual-layer shield structure. Inner shield: Helically wrapped silver-plated copper tape. Outer shield: Braided silver-plated round copper wire.
4.Jacket: Constructed from environmentally superior materials such as FEP (Fluorinated Ethylene Propylene) or PFA (Perfluoroalkoxy), ensuring high environmental adaptability of the cable.

# XFMP series
# 大功率低损耗稳相射频电缆

XFWP系列高性能柔性大功率低损耗同轴射频电缆采用了特殊的结构设计与先进的生产工艺，使得电缆在全频段范围内有着优良的电气与机械性能指标。

XYMR series cable adopts the foaming PE insulation or PE insulation, aluminum foil + tinned round copper wire braided shield，crosslinked PE jacket，has the very high cost performance, are XFWP and SFCJ one of the cost alternative choice.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | XFMP-2500 | XFMP-2700 | XFMP-2900 |
|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 7.50 | 8.25 | 9.00 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 19.80 | 21.80 | 23.80 |
| 外导体外径（mm） Shields Diameter | 20.00 | 22.00 | 24.00 |
| 总外径(mm) Jacket Diameter | ≤25.00 | ≤27.00 | ≤29.50 |
| 最小弯曲半径(mm) Min.bending radius | 静态 static：125<br>动态 dynamic：250 | 静态 static：135<br>动态 dynamic：270 | 静态 static：150<br>动态 dynamic：300 |
| 最大重量（g/m） Max. weight | 865 | 1063 | 1266 |

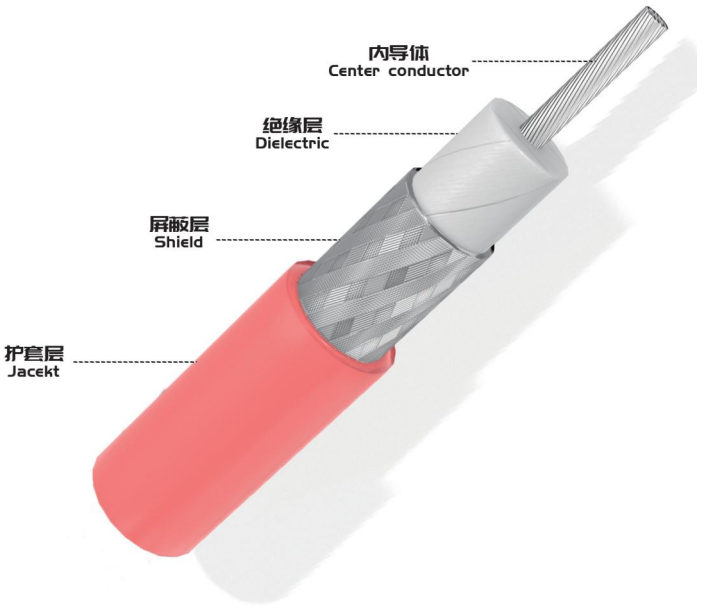
## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | XFMP-2500 | XFMP-2700 | XFMP-2900 |
|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 83 | 83 | 83 |
| 工作频率(MHz) Frequency Range | DC-4000 | DC-3000 | DC-2000 |
| 传输速率 Velocity of Propagation | 84% | 84% | 84% |
| 最大工作电压（kV) Max.Operating Voltage | 8.0 | 9.0 | 10.0 |
| 时延（ns/m） Time delay | 4.01 | 4.01 | 4.01 |
| 电压驻波比 VSWR | 1.30 | 1.30 | 1.30 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/100m | kW | dB/100m | kW | dB/100m | kW |
|---|---|---|---|---|---|---|
| 30MHz | 1.23 | 37.31 | 1.12 | 41.97 | 1.03 | 46.30 |
| 100MHz | 2.26 | 20.26 | 2.06 | 22.77 | 1.89 | 25.12 |
| 300MHz | - | - | - | - | 3.34 | 14.29 |
| 500MHz | 5.19 | 8.85 | 4.74 | 9.92 | 4.37 | 10.96 |
| 800MHz | - | - | 6.08 | 7.75 | 5.60 | 8.56 |
| 1000MHz | 7.48 | 6.15 | 6.84 | 6.89 | 6.31 | 7.61 |
| 2000MHz | 10.86 | 4.25 | 9.95 | 4.74 | 9.20 | 5.25 |
| 3000MHz | 13.55 | 3.41 | 12.45 | 3.80 | - | - |
| 4000MHz | 15.90 | 2.91 | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -65~+135 | | -65~+135 | | -65~+135 | |

- *RG*
- *SFX*
- *SFT*
- *SFT-LP*
- *SFT-LPS*




## 结构说明 Construction

1.内导体：镀银、锡铜线或镀银铜包钢线。
2.绝缘：采用实心PTFE或PE，传输速率：70%（PE为66%）左右。
3.屏蔽层：采用高密度镀银、镀锡圆铜线编织结构。屏蔽层95%的覆盖率使得电缆有很好的屏蔽性能，同时也降低了电缆的外导体损耗，使得较高的使用频段和在全频段内较好的电性能指标。
4.护套：根据客户要求定制。

1.Centre conductor:conductor:silver or tin plated copper wire or silver plated copper clad steel wire.
2. Insulation: Adopt solid PTFE or PE, transmission rate: 70%（PE is 66%）.
3.The outer conductor: using high density silver or tin round copper wire braid. Shielding close to 95% coverage makes cable has good shielding performance, also reduce the loss of the outer conductor of cable at the same time, makes the use of high frequency and good electric performance indicators within the full frequency.
4.Jacket： According to customer requirements customization.

# RG series
# 柔软同轴射频电缆

RG系列属于柔性电缆，其外导体采用高密度镀银、镀锡圆铜线编织结构。由于屏蔽层接近95%的覆盖率，使其具有较高的使用频段和良好的电性能指标。
RG series belongs to a flexible cable, its outer conductor USES high density silver or tin round copper wire braid. Due to the shielding close to 95% coverage, make its have high use frequency and good electric performance indicators.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | | RG178 (SFF-50-1) | RG179 (SFF-75-1.5) | RG316 (SFF-50-1.5) | RG316 (SFF-50-1.5) | RG-400 (SFF-50-3) | RG-304 (SFF-50-5) | RG-393 (SFF-50-7) |
|---|---|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | | 7/0.10 | 7/0.10 | 7/0.18 | 0.93 | 19/0.20 | 1.50 | 7/0.80 |
| 导体形式 Center Conductor Type | | 多芯 Stranded | 多芯 Stranded | 多芯 Stranded | 单芯 Solid | 多芯 Stranded | 单芯 Solid | 多芯 Stranded |
| 绝缘外径（mm） Insulation Diameter | | 0.86 | 1.50 | 1.50 | 2.95 | 2.95 | 4.70 | 7.25 |
| 外导体外径（mm） Shields diameter | 单层编织 Single layer | 1.30 | 1.95 | 1.95 | 3.40 | 3.40 | 5.15 | 7.88 |
| | 双层编织 Double Braid | 1.75 | 2.40 | 2.40 | 3.95 | 3.95 | 5.70 | 8.51 |
| 护套外径 (mm) Jacket diameter | 单层编织 Single layer | 1.85 | 2.55 | 2.55 | 4.50 | 4.50 | 6.40 | 9.20 |
| | 双层编织 Double Braid | 2.50 | 3.20 | 3.20 | 4.95 | 4.95 | 7.11 | 9.91 |
| 最小弯曲半径(mm) Min.bending radius | | 12 | 15 | 15 | 25 | 25 | 30 | 51 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | RG178 （SFF-50-1） | RG179 （SFF-75-1.5） | RG316 （SFF-50-1.5） | RG316 （SFF-50-1.5） | RG-400 （SFF-50-3） | RG-304 （SFF-50-5） | RG-393 （SFF-50-7） |
|---|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 75 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 100 | 68 | 100 | 100 | 100 | 100 | 100 |
| 工作频率(GHz) Frequency Range | DC-3 | DC-3 | DC-3 | DC-3 | DC-3 | DC-3 | DC-3 |
| 传输速率 Velocity of Propagation | 70% | 70% | 70% | 70% | 70% | 70% | 70% |
| 最大工作电压（kV) Max.Operating Voltage | 1.0 | 1.2 | 1.2 | 1.9 | 1.9 | 3.0 | 5.0 |
| 时延（ns/m） Time delay | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 | 4.7 |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | | | |
| 频率Frequency | dB/m | dB/m | dB/m | dB/m | dB/m | dB/m | dB/m |
| 30MHz | - | 0.206 | 0.192 | 0.086 | 0.103 | 0.072 | 0.072 |
| 200MHz | - | 0.508 | 0.505 | 0.232 | 0.278 | 0.130 | - |
| 400MHz | 1.094 | 0.706 | 0.705 | 0.324 | 0.389 | 0.180 | 0.140 |
| 1GHz | 1.752 | 1.158 | 1.154 | 0.527 | 0.632 | 0.360 | 0.240 |
| 1.5GHz | - | 1.558 | 1.555 | 0.636 | 0.763 | 0.480 | - |
| 2GHz | - | 1.759 | 1.756 | 0.758 | 0.910 | 0.590 | - |
| 3GHz | 3.086 | 2.004 | 2.001 | 0.957 | 1.148 | 0.670 | 0.480 |
| 使用温度范围（℃） Temperature Range | -65~+165（FEP） -30~+90（LSZH） | | | | | | |

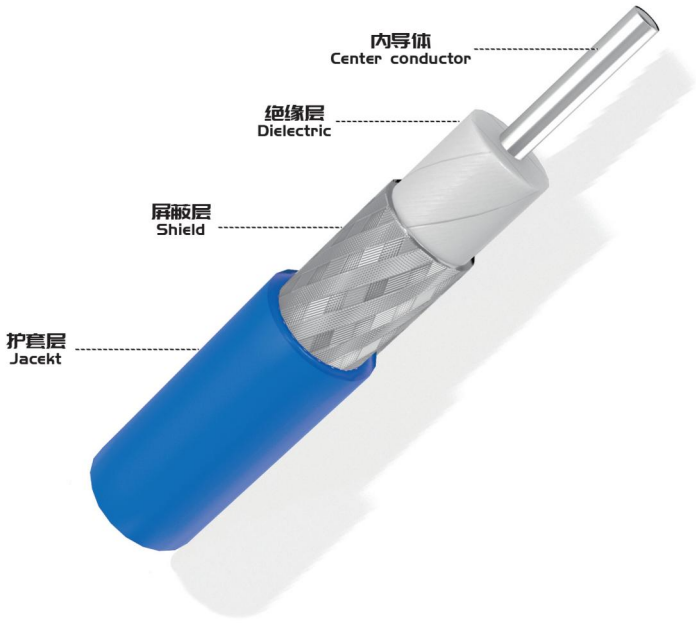
## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | RG58 | RG174 | RG213 | RG214 | RG-223 |
|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 19/0.18 | 7/0.16 | 7/0.75 | 7/0.75 | 0.90 |
| 导体形式 Center Conductor Type | 多芯 Stranded | 多芯 Stranded | 多芯 Stranded | 多芯 Stranded | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 2.95 | 1.52 | 7.25 | 7.25 | 2.95 |
| 屏蔽外径（mm） Shields Diameter | 3.45 | 2.05 | 7.85 | 8.40 | 3.95 |
| 总外径(mm) Jacket Diameter | 4.95 | 2.60 | 10.30 | 10.80 | 5.30 |
| 最小弯曲半径(mm) Min.bending radius | 25 | 13 | 52 | 54 | 26 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | RG58 | RG174 | RG213 | RG214 | RG-223 |
|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 101 | 101 | 101 | 101 | 100 |
| 工作频率(GHz) Frequency Range | DC-1 | DC-1 | DC-1 | DC-1 | DC-1 |
| 传输速率 Velocity of Propagation | 66% | 66% | 66% | 66% | 66% |
| 最大工作电压（kV) Max.Operating Voltage | 1.9 | 1.5 | 5.0 | 5.0 | 1.9 |
| 时延（ns/m） Time delay | 5.1 | 5.1 | 5.1 | 5.1 | 5.1 |
| 损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值） Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level） | | | | | |
| 频率Frequency | dB/m | dB/m | dB/m | dB/m | dB/m |
| 10MHz | 0.151 | 0.276 | 0.066 | 0.066 | 0.131 |
| 400MHz | 0.308 | 0.558 | 0.141 | 0.141 | 0.269 |
| 1GHz | 0.502 | 0.899 | 0.240 | 0.240 | 0.440 |
| 使用温度范围（℃） Temperature Range | -40~+80（PVC） -30~+90（LSZH） | | | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.




## 结构说明 Construction

1.内导体：单根镀银铜线或单根镀银铜包钢线。
2.绝缘层：采用实心PTFE，传输速率：70%左右。
3.外导体：采用高密度圆线编织镀锡结构。屏蔽层镀锡后100%的覆盖率使得电缆有很好的屏蔽性能，同时也降低了电缆的外导体损耗，使得较高的使用频段和在全频段内较好的电性能指标。
4.护套：根据客户要求定制。

1.Centre conductor: Single silver plated copper wire or single silver plated copper clad steel wire.
2. Insulation: Adopt solid PTFE. , transmission rate: 70%.
4.The outer conductor: using high density round wire woven structure of tin plating. Shielding layer of tin plating after 100% coverage makes cable has good shielding performance, also reduce the loss of the outer conductor of cable at the same time, makes the use of high frequency and good electric performance indicators within the full frequency.
4. Jacket: According to customer requirements customization.

# SFX series
# 半柔同轴射频电缆

SFX系列属于半柔性电缆，其外导体采用高密度圆线编织镀锡结构。由于屏蔽层镀锡后接近100%的覆盖率,使其具有较高的使用频段和良好的电性能指标。

SFX series belongs to a semi-flexible cable, its outer conductor USES high density round wire woven structure of tin plating. Due to the shielding layer of tin plating after close to 100% coverage, cable has good shielding performance.

## 结构参数与机械性能
## Mechanical Characteristics

| 型号 TYPE | | SFX-50-1 | SFX-50-2 (RG405) | SFX-50-3 (RG402) | SFX-50-5.3 (RG401) t |
|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | | 0.29 | 0.51 | 0.92 | 1.65 |
| 导体形式 Center Conductor Type | | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | | 0.94 | 1.68 | 2.98 | 5.25 |
| 外导体外径（mm） Shields Diameter | | 1.19 | 2.17 | 3.55 | 6.30 |
| 总外径(mm) Jacket Diameter | FEP | ≤1.44 | ≤2.60 | ≤4.10 | ≤6.85 |
| | LSZH | ≤1.74 | ≤2.65 | ≤4.55 | ≤6.95 |
| 最小弯曲半径(mm) Min.bending radius | | 4.2 | 6 | 8 | 30 |

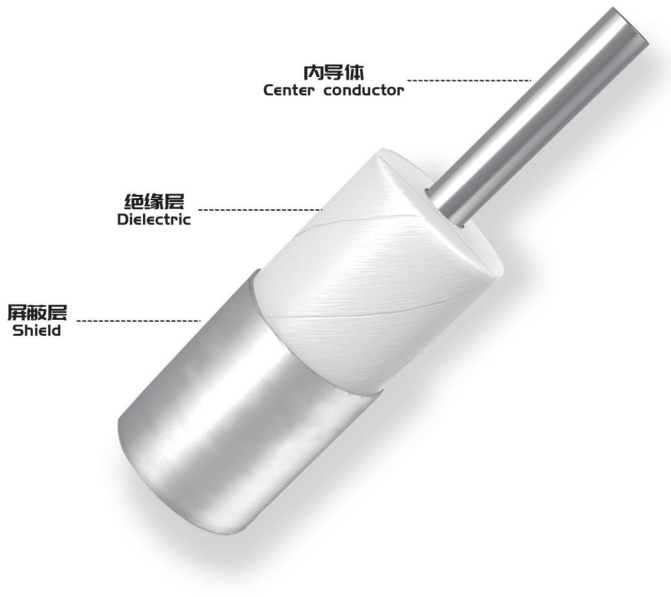
## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | SFX-50-1 | SFX-50-2 （RG405） | SFX-50-3 （RG402） | SFX-50-5.3 （RG401） |
|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 98 | 98 | 98 | 98 |
| 工作频率(GHz) Frequency Range | DC-18 | DC-18 | DC-18 | DC-18 |
| 传输速率 Velocity of Propagation | 70% | 70% | 70% | 70% |
| 最大工作电压（kV) Max.Operating Voltage | 0.75 | 1.5 | 1.9 | 3.5 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ⩾100 | ⩾100 | ⩾100 | ⩾100 |
| 时延（ns/m） Time delay | 4.7 | 4.7 | 4.7 | 4.7 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|
| 0.5GHz | 0.83 | 0.046 | 0.49 | 0.338 | 0.27 | 0.790 | 0.16 | 1.831 |
| 1GHz | 1.24 | 0.031 | 0.72 | 0.219 | 0.41 | 0.526 | 0.24 | 1.188 |
| 2GHz | 1.78 | 0.022 | 1.07 | 0.142 | 0.62 | 0.351 | 0.37 | 0.771 |
| 3GHz | 2.21 | 0.018 | 1.34 | 0.110 | 0.78 | 0.277 | 0.48 | 0.598 |
| 5GHz | 2.96 | 0.013 | 1.80 | 0.080 | 1.05 | 0.205 | 0.65 | 0.435 |
| 8GHz | 3.83 | 0.010 | 2.36 | 0.060 | 1.39 | 0.156 | 0.87 | 0.324 |
| 10GHz | 4.31 | 0.009 | 2.67 | 0.052 | 1.58 | 0.137 | 0.99 | 0.282 |
| 15GHz | 5.43 | 0.007 | 3.37 | 0.040 | 2.00 | 0.108 | 1.27 | 0.219 |
| 18GHz | 6.03 | 0.006 | 3.73 | 0.036 | 2.22 | 0.097 | 1.42 | 0.196 |
| 使用温度范围（℃） Temperature Range | -65~+165（FEP） -30~+90（LSZH） | | | | | | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.




## 结构说明 Construction

1、内导体：单根镀银铜线或单根镀银铜包钢线。
2、绝缘层：采用实心PTFE，传输速率：70%左右；
3、外导体：采用无缝紫铜管或三元合金管结构。全封闭的屏蔽层结构，使得电缆具有最优的屏蔽性能和最小的外导体损耗，较高的使用频段范围和在全频段内较好的电性能指标。

1.Centre conductor: Single copper wire or silver plated single silver plated copper clad steel wire.
2. Insulation: Adopt solid PTFE, transmission rate: 70%.
3.The outer conductor: using seamless copper tube or ternary alloy tube structure. Totally enclosed shielding layer structure, make the cable with the best shielding performance and minimal outer conductor loss of the use of high frequency range and good electric performance indicators within the full frequency.

# SFT series
# 半刚同轴射频电缆

SFT系列为半钢电缆，其外导体为无缝紫铜管或三元合金管结构。由于屏蔽层为全封闭结构，所以电缆具有最优的屏蔽性能和最小的外导体损耗。

The SFT series of steel cables, the outer conductor is seamless copper tube or ternary alloy tube structure. Due to the shield .Is fully enclosed structure, so the cable has a optimal shielding performance and minimal outer conductor loss.

## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | SFT-50-0.6 | SFT-50-1 | SFT-50-2 | SFT-50-3 | SFT-50-5.2 |
|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.20 | 0.29 | 0.53 | 0.92 | 1.63 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.66 | 0.94 | 1.68 | 2.98 | 5.25 |
| 屏蔽外径（mm） Shields Diameter | 0.86 | 1.19 | 2.20 | 3.58 | 6.35 |
| 最小弯曲半径(mm) Min.bending radius | 4 | 5 | 10 | 15 | 30 |

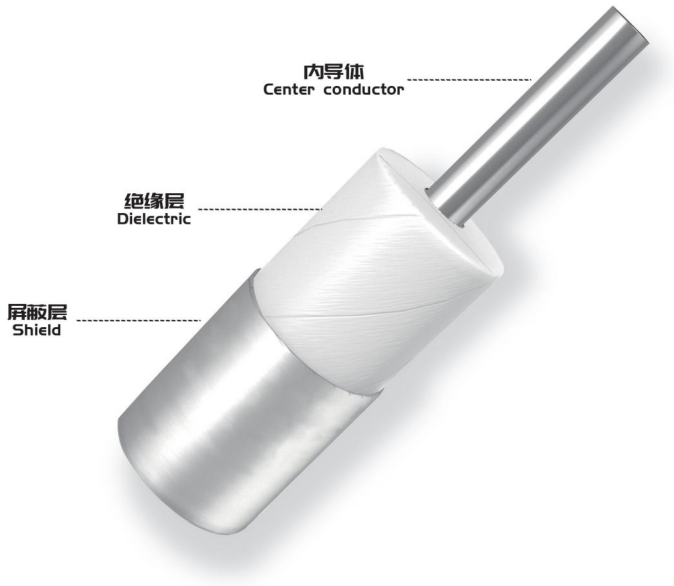
## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | SFT-50-0.6 | SFT-50-1 | SFT-50-2 | SFT-50-3 | SFT-50-5.2 |
|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 98 | 98 | 98 | 98 | 98 |
| 工作频率(GHz) Frequency Range | DC-20 | DC-20 | DC-20 | DC-20 | DC-10 |
| 传输速率 Velocity of Propagation | 70% | 70% | 70% | 70% | 70% |
| 最大工作电压（kV) Max.Operating Voltage | 1.0 | 2.0 | 2.5 | 3.0 | 6 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥100 | ≥100 | ≥100 | ≥100 | ≥100 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.5GHz | 1.12 | 0.045 | 0.79 | 0.067 | 0.45 | 0.190 | 0.26 | 0.483 | 0.16 | 1.061 |
| 1GHz | 1.59 | 0.032 | 1.13 | 0.047 | 0.64 | 0.133 | 0.38 | 0.336 | 0.23 | 0.728 |
| 5GHz | 3.62 | 0.012 | 2.59 | 0.020 | 1.51 | 0.057 | 0.91 | 0.140 | 0.58 | 0.290 |
| 10GHz | 5.20 | 0.008 | 3.74 | 0.014 | 2.22 | 0.039 | 1.37 | 0.094 | 0.89 | 0.189 |
| 20GHz | 7.52 | 0.006 | 5.44 | 0.010 | 3.29 | 0.026 | 2.09 | 0.062 | - | - |
| 使用温度范围（℃） Temperature Range | -55~+125 | | | | | | | | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.




## 结构说明 Construction

1、内导体：单根镀银铜线或单根镀银铜包钢线。
2、绝缘层：采用整体低密度PTFE，传输速率：77%左右；
3、外导体：采用无缝紫铜管或三元合金管结构。全封闭的屏蔽层结构，使得电缆具有最优的屏蔽性能和最小的外导体损耗，较高的使用频段范围和在全频段内较好的电性能指标。

1.Centre conductor: Single copper wire or silver plated single silver plated copper clad steel wire.
2. Insulation: Adopt overall low density insulation , Velocity of propagation: 77%.
3.The outer conductor: using seamless copper tube and aluminum tube structure. Totally enclosed shielding layer structure, make the cable with the best shielding performance and minimal outer conductor loss of the use of high frequency range and good electric performance indicators within the full frequency.

# SFT-LP series
# 半刚同轴射频电缆

SFT-LP系列为低损耗半钢电缆，其外导体为无缝紫铜管或三元合金管结构。由于屏蔽层为全封闭结构，所以电缆具有最优的屏蔽性能和最小的外导体损耗。
The SFT series of low losssteel cables, the outer conductor is seamless copper tube or ternary alloy tube structure. Due to the shield ,Is fully enclosed structure, so the cable has a optimal shielding performance and minimal outer conductor loss.

## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | SFT-034-LP | SFT-047-LP | SFT-086-LP | SFT-120-LP | SFT-141-LP | SFT-250-LP |
|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.22 | 0.32 | 0.57 | 0.915 | 1.03 | 1.78 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.66 | 0.94 | 1.68 | 2.70 | 2.98 | 5.25 |
| 屏蔽外径（mm） Shields Diameter | 0.86 | 1.19 | 2.20 | 3.05 | 3.60 | 6.35 |
| 最小弯曲半径(mm) Min.bending radius | 4 | 5 | 10 | 15 | 18 | 30 |

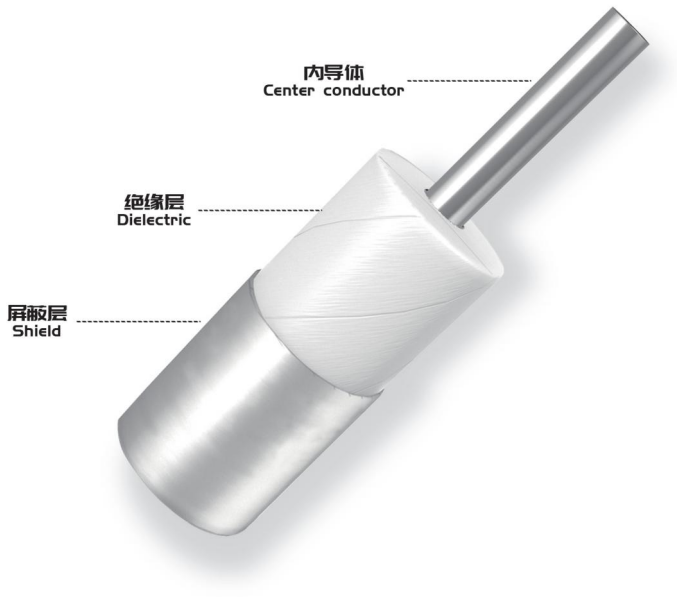
## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | SFT-034-LP | SFT-047-LP | SFT-086-LP | SFT-120-LP | SFT-141-LP | SFT-250-LP |
|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 88 | 88 | 88 | 88 | 88 | 88 |
| 工作频率(GHz) Frequency Range | DC-67 | DC-67 | DC-50 | DC-40 | DC-26.5 | DC-18 |
| 传输速率 Velocity of Propagation | 77% | 77% | 77% | 77% | 77% | 77% |
| 最大工作电压（kV) Max.Operating Voltage | 1.0 | 1.0 | 1.0 | 1.2 | 1.5 | 2.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥100 | ≥100 | ≥100 | ≥100 | ≥100 | ≥100 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1GHz | 1.43 | 0.012 | 1.01 | 0.024 | 0.57 | 0.072 | 0.36 | 0.148 | 0.33 | 0.189 | 0.19 | 0.473 |
| 5GHz | 3.23 | 0.005 | 2.30 | 0.011 | 1.31 | 0.031 | 0.84 | 0.064 | 0.77 | 0.081 | 0.47 | 0.196 |
| 10GHz | 4.61 | 0.004 | 3.29 | 0.007 | 1.90 | 0.022 | 1.23 | 0.044 | 1.13 | 0.056 | 0.70 | 0.132 |
| 18GHz | 6.24 | 0.003 | 4.47 | 0.005 | 2.61 | 0.016 | 1.71 | 0.032 | 1.58 | 0.040 | 1.00 | 0.093 |
| 26.5GHz | 7.64 | 0.002 | 5.49 | 0.004 | 3.23 | 0.013 | 2.14 | 0.025 | 1.98 | 0.032 | - | - |
| 40GHz | 9.48 | 0.002 | 6.84 | 0.004 | 4.06 | 0.010 | 2.73 | 0.020 | - | - | - | - |
| 50GHz | 10.67 | 0.002 | 7.72 | 0.003 | 4.61 | 0.009 | - | - | - | - | - | - |
| 67GHz | 12.48 | 0.001 | 9.06 | 0.002 | - | - | - | - | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -55~+125 | | | | | | | | | | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.




## 结构说明 Construction

1、内导体：单根镀银铜线或单根镀银铜包钢线。
2、绝缘层：采用微孔低密度PTFE，传输速率：83%左右；
3、外导体：采用无缝紫铜管或三元合金管结构。全封闭的屏蔽层结构，使得电缆具有最优的屏蔽性能和最小的外导体损耗，较高的使用频段范围和在全频段内较好的电性能指标。

1.Centre conductor: Single copper wire or silver plated single silver plated copper clad steel wire.
2. Insulation: Adopt microporous low density PTFE , Velocity of propagation: 77%.
3.The outer conductor: using seamless copper tube and aluminum tube structure. Totally enclosed shielding layer structure, make the cable with the best shielding performance and minimal outer conductor loss of the use of high frequency range and good electric performance indicators within the full frequency.

# SFT-LPS series
# 半刚同轴射频电缆

SFT-LPS系列为低损耗稳相半钢电缆，其外导体为无缝紫铜管或三元合金管结构。由于屏蔽层为全封闭结构，所以电缆具有最优的屏蔽性能和最小的外导体损耗。

The SFT series of low loss phase stabilizationl cables, the outer conductor is seamless copper tube or ternary alloy tube structure. Due to the shield .Is fully enclosed structure, so the cable has a optimal shielding performance and minimal outer conductor loss.

## 结构参数与机械性能 Mechanical Characteristics

| 型号 TYPE | SFT-034-LPS | SFT-047-LPS | SFT-086-LPS | SFT-120-LPS | SFT-141-LPS | SFT-250-LPS |
|---|---|---|---|---|---|---|
| 内导体外径（mm） Center Conductor Diameter | 0.23 | 0.33 | 0.60 | 0.98 | 1.08 | 1.91 |
| 导体形式 Center Conductor Type | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid | 单芯 Solid |
| 绝缘外径（mm） Insulation Diameter | 0.66 | 0.94 | 1.68 | 2.70 | 2.98 | 5.25 |
| 屏蔽外径（mm） Shields Diameter | 0.86 | 1.19 | 2.20 | 3.05 | 3.60 | 6.35 |
| 最小弯曲半径(mm) Min.bending radius | 4 | 5 | 10 | 15 | 18 | 30 |

## 电气与环境性能 Electrical and Environmental Performance

| 型号 TYPE | SFT-034-LPS | SFT-047-LPS | SFT-086-LPS | SFT-120-LPS | SFT-141-LPS | SFT-250-LPS |
|---|---|---|---|---|---|---|
| 特性阻抗(ohms) Impedance | 50 | 50 | 50 | 50 | 50 | 50 |
| 电容(pf/m) Capacitance | 85 | 85 | 83 | 83 | 83 | 83 |
| 工作频率(GHz) Frequency Range | DC-67 | DC-67 | DC-50 | DC-40 | DC-26.5 | DC-18 |
| 传输速率 Velocity of Propagation | 80% | 80% | 81% | 83% | 83% | 83% |
| 最大工作电压（kV) Max.Operating Voltage | 1.0 | 1.0 | 1.0 | 1.2 | 1.5 | 2.0 |
| 屏蔽效率（dB@1GHz) Shielding Effectiveness | ≥100 | ≥100 | ≥100 | ≥100 | ≥100 | ≥100 |

损耗（+25℃室温时的典型值)和传输功率（+40℃室温，海平面时的典型值）
Insertion Loss（Typical value at +25℃Ambient temperature）and Transmission power（Typical value at +40℃Ambient Temperature，Sea Level）

| 频率Frequency | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW | dB/m | kW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1GHz | 1.39 | 0.012 | 0.98 | 0.025 | 0.55 | 0.076 | 0.34 | 0.162 | 0.30 | 0.202 | 0.17 | 0.539 |
| 5GHz | 3.16 | 0.005 | 2.24 | 0.011 | 1.26 | 0.033 | 0.77 | 0.071 | 0.70 | 0.089 | 0.40 | 0.236 |
| 10GHz | 4.50 | 0.004 | 3.20 | 0.008 | 1.83 | 0.023 | 1.10 | 0.050 | 1.00 | 0.062 | 0.57 | 0.164 |
| 18GHz | 6.10 | 0.003 | 4.36 | 0.006 | 2.51 | 0.017 | 1.50 | 0.036 | 1.37 | 0.045 | 0.78 | 0.120 |
| 26.5GHz | 7.46 | 0.002 | 5.35 | 0.005 | 3.10 | 0.014 | 1.85 | 0.030 | 1.69 | 0.037 | - | - |
| 40GHz | 9.26 | 0.002 | 6.67 | 0.004 | 3.91 | 0.011 | 2.32 | 0.024 | - | - | - | - |
| 50GHz | 10.42 | 0.002 | 7.52 | 0.003 | 4.44 | 0.010 | - | - | - | - | - | - |
| 67GHz | 12.19 | 0.001 | 8.83 | 0.003 | - | - | - | - | - | - | - | - |
| 使用温度范围（℃） Temperature Range | -55~+125 | | | | | | | | | | | |

备注：
1.上表所列损耗值为未含连接器标称值，连接器按2×0.03√f(GHz)计算。
The loss shown does not include the connector，the connector according to 2×0.03√f(GHz) calculation.


# ■ 技术支持
# ■ *TECHNICAL SUPPORT*

## 公式 Formula

| | | | |
|---|---|---|---|
| 特性阻抗<br>(ohms)Impedance | $Z_c = \frac{60}{\sqrt{\varepsilon}} \ln\frac{D}{d} = \frac{138}{\sqrt{\varepsilon}} \lg\frac{D}{d}$ （Ω） | 延时与长度<br>And the length of delay | $T = 3.33\sqrt{\varepsilon}$ （ns/m）<br>$L = \frac{0.3T}{\sqrt{\varepsilon}}$ （m） |
| 衰减<br>Attenuation | $\partial_{总} = \partial_R + \partial_G$ （dB/km）<br>$\partial_R = \frac{2.61\times10^{-3}\sqrt{f\varepsilon}}{\lg\frac{D}{d}}(\frac{1}{d}+\frac{1}{D})$<br>$\alpha_G = 9.1\times10^{-5} f\sqrt{\varepsilon}\cdot \mathrm{tg}\delta$ | 速率<br>Rate | $V_p = \frac{1}{\sqrt{\varepsilon}}\times100$ （%） |
| 电容（pf/m）<br>Capacitance | $C = \frac{24.12\varepsilon}{\lg\frac{D}{d}}$ （pF/m） | 截止频率<br>Cut-off frequency | $F_\infty = \frac{1.91\times10^5}{\sqrt{\varepsilon}(D+d)}$ （MHz） |

## 回波损耗与驻波比对照表 Return Loss and VSWR table

| 反射系数（ρ）<br>Reflection coefficient | 回波损耗（RL）<br>Return Loss | 驻波比（SWR）<br>VSWR |
|---|---|---|
| 1.00 | 0.00 | ∞ |
| 0.90 | 0.92 | 19.00 |
| 0.80 | 0.94 | 9.00 |
| 0.70 | 3.10 | 5.67 |
| 0.60 | 4.44 | 4.00 |
| 0.50 | 6.02 | 3.00 |
| 0.40 | 7.96 | 2.33 |
| 0.30 | 10.46 | 1.86 |
| 0.20 | 13.98 | 1.50 |
| 0.10 | 20.00 | 1.22 |
| 0.09 | 20.92 | 1.20 |
| 0.08 | 21.94 | 1.17 |
| 0.07 | 23.10 | 1.15 |
| 0.06 | 24.44 | 1.13 |
| 0.05 | 26.02 | 1.11 |
| 0.04 | 27.96 | 1.08 |
| 0.03 | 30.46 | 1.06 |
| 0.02 | 33.98 | 1.04 |
| 0.01 | 40.00 | 1.02 |
| 0.00 | ∞ | 1.00 |

ρ =（SWR-1）/（SWR+1） RL= — 20lg（ρ） SWR =（1+ρ）/（1-ρ）

复反射系数：Γ=（ZL-Z0）/（ZL+Z0）= ρ（sinθ+jcosθ）

## A．1 温度相位稳定性

### A.1.1 概述

电缆由于环境温度的变化引起机械长度及介电常数的变化，从而产生相位变化。电缆的温度相位变化是温度的函数，温度相位稳定性可以用相位温度变化系数 $\eta_T$ 表示与最大相位变化系数 $|\Delta\eta|_{max}$ 评定。

相位温度变化系数 $\eta_t$ 为在规定的频率下，各规定温度点电缆相位值相对室温 $t_0$（通常为25 ℃）相位值的变量（=-）与室温相位之比值，并以 $1\times10^{-6}$ 为 1 个单位：

$$\eta_t=(\Delta\Phi_t/\Phi_{t_0})\times10^6\ |\Delta\eta| \quad \text{---------- (A.1)}$$

最大相位变化系数 $|\Delta\eta|_{max}$ 为在试验温度范围内，“$\eta_T$ —T”曲线图中最大值 $\eta_{max}$ 和最小值 $\eta_{min}$ 的绝对差值：

$$|\Delta\eta| = |\eta_{max}-\eta_{min}| \quad \text{---------- (A.2)}$$

### A.1.2 试验设备

试验设备包括矢量网络分析仪、温度试验箱。

### A.1.3 试验步骤

试验步骤如下：

1）试样长度为 6 m ～ 10 m，两端应配接适配的连接器；

2）测试电缆试样在常温（25 ℃）下，规定频率点的相位；

3）为了 $\eta_T$ —T 曲线可重复性稳定，试样需做多个温度循环；

4）电缆试样置温度试验箱内温度均一区域，连接器两端伸出箱体段长不大于 0.3 米。在试验温度范围内，从最低温开始升温至最高温，每次升温不大于 5 ℃，并记录每次升温温度稳定后的电缆相位；

5）按公式 A.1 计算 $\eta_T$ ，并作出 $\eta_T$ —T 曲线图（见 A.1 示例图）；

6）确定曲线图中的最大值 $\eta_{max}$ 和最小值 $\eta_{min}$，并按公式 A.2 计算电缆在该温度范围内的最大相位变化系数 $|\Delta\eta|_{max}$。

### A.1.4 试验报告

试验报告应包含以下内容：

—试样长度；

—测试频率；

—试验温度范围；

—循环次数；

— $\eta_T$ —T 曲线图；

—最大相位变化系数 $|\Delta\eta|_{max}$。

## A. 1 temperature phase stability

### A. 1.1 Overview

Cable due to environmental temperature changes cause changes in the mechanical length and the dielectric constant, resulting in phase change. Phase change temperature of the cable is a function of temperature, the temperature of the phase of phase stability can $\eta_T$ represents the temperature coefficient of the maximum phase variation coefficient $|\Delta\eta|_{max}$ Assessment.

Temperature coefficient of $\eta_t$ phase at a predetermined frequency for each point of a predetermined temperature value of the relative phase of the cable temperature $t_0$ (typically 25 ℃ ) variable phase value (= -) ratio of the phase of a room temperature, and $1\times10^{-6}$ to one unit:

$$\eta_t=(\Delta\Phi_t/\Phi_{t_0})\times10^6\ |\Delta\eta| \quad \text{---------- (A.1)}$$

The maximum phase variation coefficient $|\Delta\eta|_{max}$ To be within the test temperature range, "$\eta_T$ -T" $\eta_{max}$ maximum graph and the $\eta_{min}$ imum absolute difference $\eta_{min}$:

$$|\Delta\eta| = |\eta_{max}-\eta_{min}| \quad \text{---------- (A.2)}$$

### A.1.2 Test Equipment

Test equipment including vector network analyzers, temperature chambers.

### A.1.3 Test procedure

The test procedure is as follows:

1)The sample length is 6 m ~ 10 m, the ends should be connected with the adapter connector;

2) Test cable specimens at room temperature(25℃ ), the phase of a predetermined frequency points;

3) In order to stabilize the reproducibility $\eta_T$ -T curve, the samples to be done to a plurality of temperature cycles;

4) Cable sample set temperature test chamber temperature uniformity region, extending both ends of the connector box segment grow to 0.3 meters. Within the test temperature range from low temperature to warm up to the maximum temperature, each temperature of not more than 5℃ , and records the phase of each cable stable temperature after heating;

5) Calculated according to the formula A.1 $\eta_T$, and make $\eta_T$ -T graph (see the example in Figure A.1);

6) Determine the maximum $\eta_{max}$ graph and minimum $\eta_{min}$, then the formula A.2 cable maximum phase variation coefficient calculated within the temperature range $|\Delta\eta|_{max}$.

### A.1.4 Test Report

The test report shall contain the following:

—Sample length;

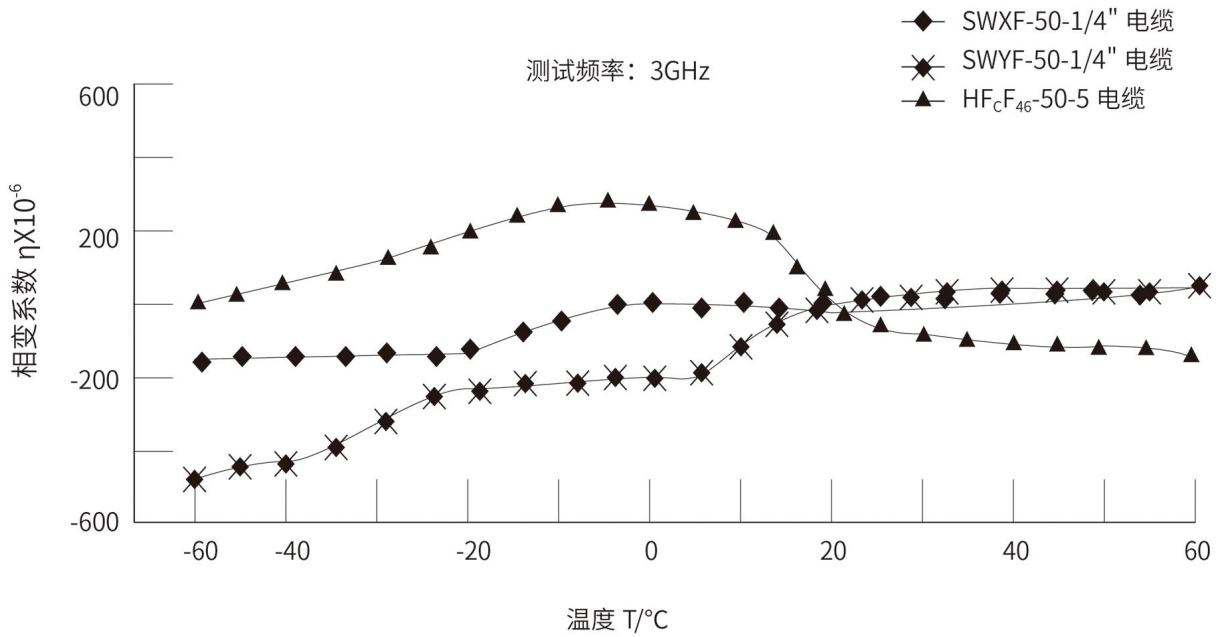
—Test frequency;

—Test temperature range;

—Cycles;

—$\eta_T$ -T graph;

—Maximum phase variation coefficient max.




## A．2 弯曲相位稳定性

A.2.1 概述

弯曲相位稳定性为在规定的频率下，电缆弯曲时产生的相位变化。其数值大小表示电缆结构机械稳定性，试验值与试验频率、弯曲圆盘直径、弯曲角（弯曲圈数）、试样长度等试验条件密切相关。

A.2.2 试验设备

试验设备包括矢量网络分析仪、弯曲圆盘。

A.2.3 试验步骤

试验步骤如下：

1) 试样长度大于 3 m，两端应配接适配的连接器；
2) 测试电缆试样在常温（25 °C）下，规定频率点的相位并校准为“零”；
3) 电缆按详细规范规定的直径和弯曲角进行弯曲，如图 A.2 所示；
4) 记录各弯曲状态时相位变化量$|\Delta\Phi_t|$;
5) 弯曲时，电缆非弯曲部位应处于静止状态，尤其是与矢量网络分析仪接口部位。

## A. 2 bending phase stability

A.2.1 Overview

Bending phase stability at a predetermined frequency to produce a phase change of the cable bend. Its value indicates the size of the cable structure mechanical stability test with the test frequency, bending disc diameter, bend angle (bending laps), is closely related to the sample length test conditions.

A.2.2 Test Equipment

Test equipment including vector network analyzer, bend the disc.

A.2.3 Test procedure

The test procedure is as follows:

1) The sample length is greater than 3 m, the ends should be connected with the adapter connector;
2) Test cable samples at room temperature (25°C), the provisions of frequency and phase calibration for "zero";
3) Press the detailed specification cable diameter and bending angle bend, as shown in Figure A.2;
4) The amount of the phase change recording bent state $|\Delta\Phi|$;
5) When bending, bending parts of the cable should be in the non-stationary state, especially with the vector network analyzer interface site.

A.2.4 试验报告

试验报告应包含以下内容：

—试样长度；

—测试频率；

—试验弯曲圆盘直径；

—弯曲角；

—各弯曲状态时弯曲相位变化量$|\Delta\Phi_t|$。

A.2.4 Test Report

The test report shall contain the following:

—Sample length;

—Test frequency;

—Bending test disc diameter;

—Bending angle;

—Bending phase change amount each bent state$|\Delta\Phi_t|$.

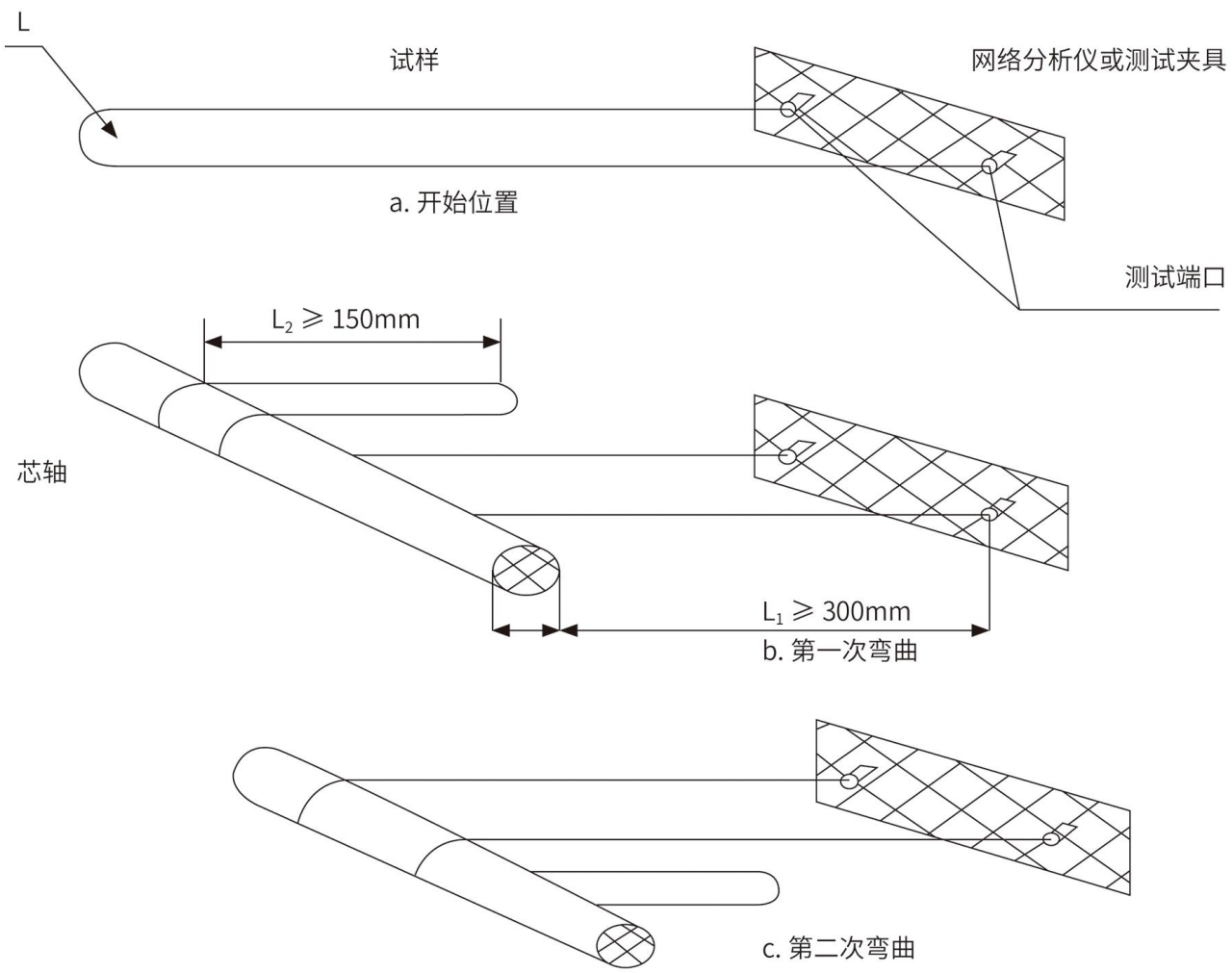



图 A.2 弯曲相位稳定性试验示意图

## 衰减震动稳定性 Attenuate Vibration Stability

1. 试样的制备

测试样品选用电缆长度 L=2000±20mm，两段装接符合 GJB681A-2002 及相关详细规范要求的 SMA-50J 连接器插头。

2. 试验设备

振动台：最小振动频率 1Hz, 振动位移幅值≥ 0.5mm。如果无专业振动台，可按试验要求手工或台具进行模拟振动。

矢量网络分析仪：足够精度、准确度和频率范围的矢量网络分析仪。

3. 试验环境

试验环境温度变化范围应保持在 ±2°C以内。

4. 试验系统的组装

试验前，电缆应无支撑的成圈，成圈直径不小于 200mm，将电缆组件安装在指定夹具上置于振动台上，通过测试线连接到矢量网络分析仪上，网络分析仪扫描频点 801 点，避免测试线和连接部位受到振动影响。

5. 测量振动前衰减

按 3.5.7 方法测试组件衰减，按要求频率点测试衰减 值。

6. 测量振动时变化最大的衰减值：振动频率 2Hz，振动位移幅值≤ 20mm，振动时间 30s，监测振动过程中规定频率的衰减最大值。

7. 计算衰减振动稳定值：$|\Delta\partial| = |\partial_{max} - \partial_0|$

1. Specimen preparation

Test samples were selected cable length L = 2000 ± 20mm, two attachment meets GJB681A-2002 and the related detailed specification requirements SMA-50J connector plug.

2. Test Equipment

Vibration table: minimum vibration frequency 1Hz, vibration displacement amplitude ≥ 0.5mm. If there is no professional shaking table, according to test requirements with manual or Taiwan to simulate vibration.

Vector Network Analyzer: sufficient precision, accuracy and frequency range of vector network analyzer.

3. Test environment

Test the ambient temperature changes should be maintained within ± 2 °C .

4. Assembly 4 test system

Before the test, the cable should be no support of a circle, a circle diameter of not less than 200mm, the cable assembly is mounted on the vibration table designated fixture placed, connected to a vector network analyzer through the test line, network analyzers scanning frequency 801 points, avoid testing line and connecting parts affected by vibration.

5.Measuring vibration damping ago 3.5.7 The method according to test components decay, according to the requirements of the test frequency attenuation value.

6.Measuring vibration changes the maximum attenuation values: vibration frequency 2Hz, vibration displacement amplitude ≤ 20mm, vibration time 30s, the process of monitoring the vibration attenuation specified maximum frequency.

7.Calculate the stable value of attenuated vibration:

$|\Delta\partial| = |\partial_{max} - \partial_0|$

## 同轴电缆额定平均功率 Rated average power of coaxial cable

同轴电缆的允许传输额定平均功率代表电缆可以长期安全运行而不发生热损坏所能承受的平均输入功率值，其主要受到以下因素限制：

a.电缆的自身产生发热的热流源－衰减；

b.绝缘介质的耐高温能力；

c.电缆的自身散热能力－热阻；

d.敷设条件、环境温度等。

The allowable transmission average power of coaxial cable represents the average input power that the cable can operate safely for a long time without thermal damage. It is mainly limited by the following factors:

a. The heat source of the cable which produces heat itself - attenuation;

b. The high temperature resistance of insulating medium;

c. The thermal resistance of the cable;

d. Laying conditions, ambient temperature, etc.

## 电缆的发热 Heating of cable

电缆传输一定的功率时，其内部有三个热源组成：

内导体发热Wd=I2Rd=2Pad

外导体发热WD=I2RD=2PaD

介质发热WG=U2G=2PaG

式中ad=Rd/2ZC－内导体电阻引起的衰减

aD=RD/2ZC－外导体电阻引起的衰减

aG=1/2GZC－介质衰减

Rd、RD－分别为内、外导体的电阻

P－平均功率

Wd、WD、WG－分别为上述衰减分量所引起的热流分量。

When the cable transmits a certain power, there are three heat sources in it:

Heating of inner conductor

Wd=I2Rd=2Pad

Heating of outer conductor

WD=I2RD=2PaD

Medium heating

WG=U2G=2PaG

In ad=Rd/2ZC－Attenuation caused by resistance of inner conductor

aD=RD/2ZC－Attenuation caused by resistance of outer conductor

aG=1/2GZC－Dielectric attenuation

Rd、RD－The resistance of inner and outer conductor respectively

P－Average power

Wd、WD、WG－They are the heat flux component caused by the attenuation component.

## 电缆的散热 Cable heat dissipation

电缆的散热能力可以用所谓“热阻”来表示，热阻表示电缆散热时受到的阻碍，如图所示，当电缆内导体向周围环境散热时，热流要经过绝缘的热阻Sd，护套的热阻Sc以及护套表面向周围环境散热的热阻S0，当然热流还会遇到内、外导体金属的热阻，由于金属是良好的导热体，其热阻可忽略不计。

The heat dissipation capacity of the cable can be expressed as the so-called "thermal resistance". The thermal resistance indicates the resistance of the cable when it is cooled. As shown in the figure, when the inner conductor of the cable is radiating to the surrounding environment, the heat flow shall pass through the insulation thermal resistance SD, the thermal resistance SC of the sheath and the thermal resistance S0 of the sheath surface to the surrounding environment. Of course, the heat flow will encounter the thermal resistance of the inner and outer conductor metal, Because metal is a good heat conducting body, its thermal resistance can be ignored.

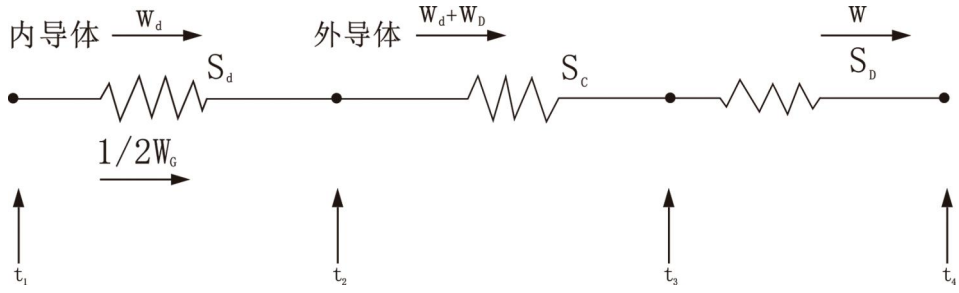



图1 同轴电缆的等效热路图

绝缘和护套的热阻Sd、Sc可按下式计算：

$$S_d=\frac{G_d}{2\pi}\ln\frac{D}{K_{1d}}=0.3665G_d\lg\frac{D}{K_{1d}}\text{热欧厘米}$$

$$S_c=\frac{G_c}{2\pi}\ln\frac{D_0}{D_1}=0.3665G_c\lg\frac{D_0}{D_1}\text{热欧厘米}$$

式中D、d为绝缘层的外、内径（毫米）

$D_0$、$D_1$为护套层的外、内径（毫米）

$K_1$为绞线内导体的等效直径系数（见表1）

$G_d$、$G_c$分别为绝缘介质和护套材料的热阻率（热偶厘米），可由表2选取。

对于埋地敷设：

$$S_0=\frac{G_g}{2\pi}\ln\frac{4L}{D_0}=0.3665G_g\lg\frac{4L}{D_0}\text{热欧厘米}$$

式中：$G_g$为土壤的热阻率，L为电缆的埋地深度，$D_0$为电缆的外径。

对于架空敷设：

$$S_0=\frac{1}{\pi D_0K_h\theta_0^{\frac{1}{4}}}\text{热欧厘米}$$

式中$\theta_0=t_3-t_0$表示电缆表面与周围环境的温差（℃）

$K_h$ - 电缆表面的散热系数（瓦/厘米2·℃）

$D_0$ - 电缆外径（应该用厘米代入）

The thermal resistance SD and SC of insulation and sheath can be calculated as follows:

$$S_d=\frac{G_d}{2\pi}\ln\frac{D}{K_{1d}}=0.3665G_d\lg\frac{D}{K_{1d}}$$

$$S_c=\frac{G_c}{2\pi}\ln\frac{D_0}{D_1}=0.3665G_c\lg\frac{D_0}{D_1}$$

In the above formula,

D、d is the outer and inner diameter of the insulating layer (mm).

$D_0$、$D_1$ is the outer and inner diameter of sheath (mm).

$K_1$ Is the equivalent diameter coefficient of conductor in stranded wire (see Table 1).

$G_d$、$G_c$ They are the thermal resistances (thermocouple cm) of insulating medium and sheath material respectively, which can be selected from table 2.

For buried laying:

$$S_0=\frac{G_g}{2\pi}\ln\frac{4L}{D_0}=0.3665G_g\lg\frac{4L}{D_0}$$

In the above formula,Gg is the thermal resistance of the soil,L is the buried depth of the cable,and D0 is the outer diameter of the cable.

For overhead laying:

$$S_0=\frac{1}{\pi D_0K_h\theta_0^{\frac{1}{4}}}$$

In the above formula,$\theta_0=t_3-t_0$ indicates the temperature difference between the cable surface and the surrounding environment (℃)

$K_h$ - heat dissipation coefficient of cable surface (watt / cm2 ·℃)

$D_0$ - cable outer diameter (should be replaced in cm)

表1 绞线内导体的有效直径系数 Table 1 effective diameter coefficient of inner conductor of stranded wire

| 绞线内导体的导线根数N<br>Number of conductors in stranded conductor(N) | 1 | 3 | 7 | 12 | 19 | 27 |
|---|---|---|---|---|---|---|
| 有效直径系数K1<br>Effective diameter coefficient ($K_1$) | 1.000 | 0.871 | 0.939 | 0.957 | 0.970 | 0.976 |
| 绞线内导体的导线根数N<br>Number of conductors in stranded conductor(N) | 37 | 50 | 70 | 90 | - | - |
| 有效直径系数K1<br>Effective diameter coefficient ($K_1$) | 0.980 | 0.983 | 0.986 | 0.988 | - | - |

表2 常规材料的热阻率　Table 2 thermal resistance of conventional materials

| 材料 Material | 热阻率（热欧厘米）Thermal resistance |
|---|---|
| 聚乙烯 polyethylene | 350-450 |
| 聚氯乙烯 polyvinyl chloride | 700 |
| 聚四氟乙烯 pteflon | 500 |
| 微孔聚四氟乙烯 Microporous polytetrafluoroethylene | 900 |
| 泡沫聚乙烯 Foamed polyethylene | 900 |
| 聚苯乙烯 polystyrene | 750 |
| 氯丁橡胶 Chloroprene rubber | 500 |
| 涂沥青的棉麻 Pitch coated cotton and hemp | 500 |
| 土壤 soil | 120 |
| 干燥电缆纸 Drying cable paper | 1000 |
| 静止空气 Still air | 4100 |

由图1可见额定功率的计算公式

$t_1-t_2=(W_d+1/2W_G)S_d=(\alpha_d+1/2\alpha_G)2PS_d$

$t_2-t_3=WS_c=2P\alpha S_c$

$t_3-t_0=WS_0=2P\alpha S_0$

相加之后可得：

$t_1-t_0=2PS_d(\alpha_d+1/2\alpha_G)+2P\alpha(S_c+S_0)$

因此$P=\dfrac{t_1-t_0}{(2\alpha_d+\alpha_G)S_d+2\alpha(S_c+S_0)}$

式中$t_1-t_0$表示允许的内导体最高温度$t_1$与环境温度$t_0$之差，通常是预先规定的耐温等级。

在使用上式时，如果是架空敷设，则热阻$S_0$中包含着未知数$\theta_0$，而电缆内导体与护套表面之间温差为：

$\theta'=t_1-t_3$　它与总热流W之间有如下线性关系：

$$\theta'=S_dW_{绝}+S_cW\left(\frac{\alpha_d+\frac{1}{2}\alpha_G}{\alpha}S_d+S_c\right)W$$

将温升曲线$\theta_0$和$\theta'$相互迭加即可确定允许的热流值$W_{允}$（迭加的方法见图3），则额定功率即可求出如下：

$$P=\frac{W_{允}}{2\alpha}$$

式中α应该用电缆在工作温度下的衰减值代入。

The calculation formula of rated power can be seen from Figure 1:

$t_1-t_2=(W_d+1/2W_G)S_d=(\alpha_d+1/2\alpha_G)2PS_d$

$t_2-t_3=WS_c=2P\alpha S_c$

$t_3-t_0=WS_0=2P\alpha S_0$

After adding, we can get:

$t_1-t_0=2PS_d(\alpha_d+1/2\alpha_G)+2P\alpha(S_c+S_0)$

So $P=\dfrac{t_1-t_0}{(2\alpha_d+\alpha_G)S_d+2\alpha(S_c+S_0)}$

$t_1-t_0$ refers to the difference between the maximum allowable temperature T1 of the inner conductor and the ambient temperature T0, which is usually the pre-determined temperature resistance level.

When using the above formula, if it is overhead laying, the thermal resistance S0 contains unknowns θ 0, and the temperature difference between the inner conductor and the sheath surface is:

θ’ = The linear relationship between T1-T3 and total heat flux W is as follows

Temperature rise curve $\theta_0$ and$\theta'$ The allowable heat flow value W is determined by superposition (see Fig. 3 for the superposition method), then the rated power can be calculated as follows:

$$P=\frac{W_{允}}{2\alpha}$$

α should be replaced by the attenuation value of the cable at the working temperature.

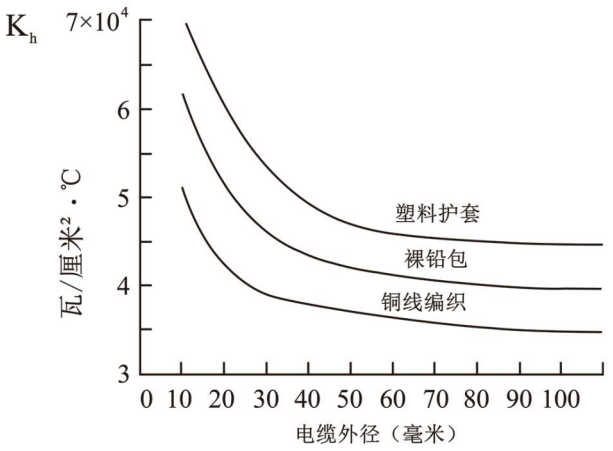



图2 电缆的表面散热系数

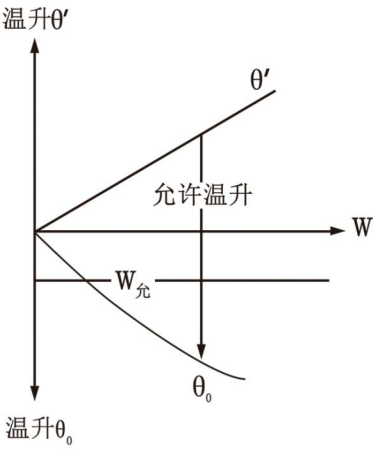



图2 图解法求得允许热流

## 改善网络分析仪的插入损耗测量精度
## Improve the accuracy of insertion loss measurement for network analyzers

在用网络分析仪测量无源器件(尤其是低损耗的器件如电缆组件，空气线等)的插入损耗时，在通路上插入固定衰减器可以提高测量精度。

在测试通路中插入两个6dB(或10dB)衰减器，在通路中校准时，将这两个衰减器作为测试电缆的一部分进行校准，使测试通路的插入损耗归一化到0dB，然后接入DUT进行测试。从图1的测试结果可以发现，当不加衰减器时，DUT的插入损耗曲线存在波动；而加入衰减器后(图2)，曲线变得平滑。是因为由于衰减器的存在改善了测试通路的失配损耗。

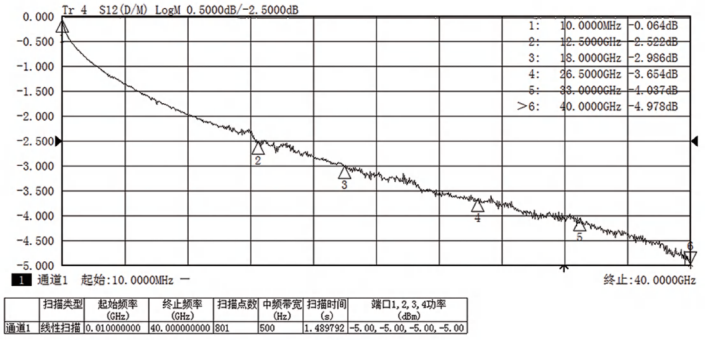



图1 不加衰减器时的插入损耗测试结果

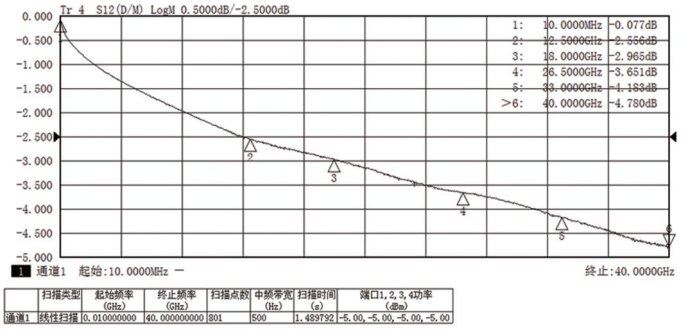



图2 加衰减器时的插入损耗测试结果

用于上述用途的衰减器，并不需要十分平坦的衰减量频率相应，因为在通路校准时，这些频响误差都被校准了，但衰减器的VSWR则越低越好。

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