

GENERAL ELECTRICAL PROPERTIES 電子特性

| | Cable Type | Impedance (ohms) | Capacitance (p/F/foot) | Velocity (%) | Dielectric Constant | Time Delay (nS/foot) | |
|------------------|--------------------|---------------------|---------------------------|-----------------|------------------------|-------------------------|------|
| 50 OHM | Solid Polyethylene | 50 | 30.8 | 65.9 | 2.30 | 1.54 | |
| | Foam PE | 50 | 24.5 | 83.0 | 1.45 | 1.22 | |
| | Foam PE | 50 | 24.2 | 84.0 | 1.42 | 1.21 | |
| | Foam PE | 50 | 23.9 | 85.0 | 1.38 | 1.20 | |
| | Foam PE | 50 | 23.6 | 86.0 | 1.35 | 1.18 | |
| | Foam PE | 50 | 23.3 | 87.0 | 1.32 | 1.17 | |
| | Foam PE | 50 | 23.1 | 88.0 | 1.29 | 1.16 | |
| | Solid PTFE | 50 | 29.2 | 69.5 | 2.07 | 1.46 | |
| | Tape PTFE | 50 | 28.6 | 71.0 | 1.98 | 1.43 | |
| | Low Density PTFE | 50 | 26.7 | 76.0 | 1.73 | 1.34 | |
| | Low Density PTFE | 50 | 25.4 | 80.0 | 1.56 | 1.27 | |
| | 75 OHM | Solid Polyethylene | 75 | 20.6 | 65.9 | 2.30 | 1.54 |
| Foam PE | | 75 | 16.3 | 83.0 | 1.45 | 1.22 | |
| Foam PE | | 75 | 16.1 | 84.0 | 1.42 | 1.21 | |
| Foam PE | | 75 | 15.9 | 85.0 | 1.38 | 1.20 | |
| Foam PE | | 75 | 15.8 | 86.0 | 1.35 | 1.18 | |
| Foam PE | | 75 | 15.6 | 87.0 | 1.32 | 1.17 | |
| Foam PE | | 75 | 15.4 | 88.0 | 1.29 | 1.16 | |
| Solid PTFE | | 75 | 19.5 | 69.5 | 2.07 | 1.46 | |
| Low Density PTFE | | 75 | 17.8 | 76.0 | 1.73 | 1.34 | |
| Low Density PTFE | | 75 | 16.9 | 80.0 | 1.56 | 1.27 | |
| MISC | | Solid Polyethylene | 95 | 16.2 | 65.9 | 2.30 | 1.54 |
| | | Foam PE | 95 | 12.6 | 85.0 | 1.38 | 1.20 |
| | Air Spaced PE | 95 | 12.6 | 85.0 | 1.38 | 1.20 | |
| | Solid PTFE | 95 | 15.4 | 69.5 | 2.07 | 1.46 | |
| | Air Spaced PE | 125 | 09.6 | 85.0 | 1.38 | 1.20 | |
| | Air Spaced PE | 185 | 06.5 | 85.0 | 1.38 | 1.20 | |

PROPERTIES OF WIRE AND CABLE INSULATING MATERIALS 材料特性

| Material | Dielectric Constant | Dissipation Factor | Volume- Resistivity (ohm-cm) | Operating Temperature (Range °C) |
|--------------------|------------------------|-----------------------|------------------------------------|--|
| PTFE | 2.07 | 0.0003 | 10 ¹⁹ th | -75 to +250 |
| Polyethylene | 2.3 | 0.0003 | 10 ¹⁶ th | -65 to +80 |
| Foam Polyethylene | 1.29 - 1.64 | 0.0001 | 10 ¹² th | -65 to +100 |
| Polyvinylchloride | 3.0 - 8.0 | 0.07 - 0.16 | 2 x 10 ¹² th | -50 to +105 |
| Polyamide | 3.5 - 4.6 | 0.03 - 0.4 | 4 x 10 ¹⁴ th | -60 to +120 |
| Silicone Rubber | 2.1 - 3.5 | 0.007 - 0.016 | 10 ¹³ th | -70 to +250 |
| Ethylene Propylene | 2.24 | 0.00046 | 10 ¹⁷ th | -40 to +105 |
| FEP | 2.1 | 0.0007 | 10 ¹⁸ th | -70 to +200 |
| Low Density PTFE | 1.38 - 1.73 | 0.00005 | 10 ¹⁹ th | -75 to +250 |
| Foam FEP | 1.45 | 0.0007 | 10 ¹⁸ th | -75 to +200 |
| Polyimide | 3.0 - 3.5 | 0.002 - 0.003 | 10 ¹³ th | -75 to +300 |
| PFA | 2.1 | 0.001 | 10 ¹⁶ th | -75 to +260 |
| ETFE | 2.6 | 0.005 | 10 ¹⁶ th | -75 to +150 |
| ECTFE | 2.5 | 0.0015 | 10 ¹⁶ th | -65 to +150 |
| PVDF | 7.8 | 0.02 | 10 ¹⁴ th | -75 to +125 |

MATERIALS ABBREVIATIONS LEGEND 材料名詞縮寫

CONDUCTORS & BRAID MATERIALS

| | |
|---------|---|
| AL | Aluminum |
| BC | Bare Copper |
| BeCu | Beryllium-Copper Alloy 172 |
| BCCAI | Bare Copper Clad Aluminum |
| CCS | Bare Copper Clad Steel |
| GS | Galvanized Steel |
| HR | High Resistance Wire |
| MW | Magnet Wire |
| NC | Nickel Covered Copper |
| SA | Silver Covered Alloy |
| SC | Silver Covered Copper |
| SCBeCu | Silver Covered Beryllium Copper |
| SCCadBr | Silver Covered Cadmium Bronze |
| SCCA1 | Silver Covered Copper Clad Aluminum |
| SCCS | Silver Covered Copper Clad Steel |
| SNCCS | Silver Covered Nickel Covered Copper Clad Steel |
| SCS | Silver Covered Copper Strip |
| TC | Tinned Copper |

DIELECTRIC MATERIALS

| | |
|---------|---|
| PE | Solid Low Density Polyethylene |
| PTFE | Solid Polytetrafluoroethylene |
| LDTFE | Low Density PTFE |
| Foam PE | Gas Injected Foam PE |
| FEP | Solid Fluorinated Ethylene Propylene |
| CPT | Conductive PTFE |
| CPE | Conductive Polyethylene (Type A-5 per MIL-C-17) |
| Rubber | per MIL-C-17 (obsolete) |

INTERLAYER MATERIALS

| | |
|------|----------------------------------|
| PE | Solid Polyethylene |
| PTFE | Solid Polytetrafluoroethylene |
| MY | Polyester |
| KP | Polyimide |
| ALMY | Aluminum-Polyester Laminate |
| ALKP | Aluminum-Polyimide Laminate |
| CPC | Copper-Polyester-Copper Laminate |

JACKET MATERIALS

| | |
|----------|--|
| E-CTFE | Ethylene Chlorotrifluoroethylene Type XI per MIL-C-17 |
| ETFE | Ethylene Tetrafluoroethylene Copolymer Type X per MIL-C-17 |
| FEP | Fluorinated Ethylene Propylene Type IX per MIN-C-17 |
| FG Braid | Fiberglass; Impregnated Type V per MIL-C-17 |
| PE | Clear Polyethylene Type III per MIL-C-17 |
| LS/LT | Low Smoke/Low Toxicity (XLPE) |
| PE | Polyethylene, black HMW Type IIIA per MIL-C-17 |
| PFA | Perfluoroalkoxy Type XIII per MIL-C-17 |
| PTFE | Polytetrafluoroethylene Type VIIA per MIL-C-17 |
| PUR | Polyurethane, black Type XII per MIL-C-17 |
| PVC-I | Polyvinyl Chloride, black (contaminating) Type 1 per MIL-C-17 |
| PVC-II | Polyvinyl Chloride, grey (non-contaminating) Type II per MIL-C-17 |
| PVC-IIA | Polyvinyl Chloride, black (non-contaminating) Type IIA per MIL-C-17 |
| Rubber | Per MIL-C-17 (obsolete) |
| SIL/DAC | Dacron Braid over Silicone Rubber Type VI per MIL-C-17 |
| TPE | Thermo Plastic Elastomer |
| XLPE | Crosslinked Polyolefin Type XIV per MIL-C-17 |

COAXIAL CABLE EQUATIONS LEGEND 代碼意義

| Symbol | Definition | Units |
|--------------|--|-------------|
| α | = Attenuation in dB/100 feet | dB/100 feet |
| ϵ | = Dielectric constant | |
| Γ | = Reflection coefficient | |
| ϕ | = Electrical length | degrees |
| C | = capacitance | pF/foot |
| L | = Inductance | uH/foot |
| Zo | = Impedance | ohms |
| Vp | = Velocity of propagation | % |
| df | = Dissipation factor | |
| Td | = Time delay | nS/foot |
| F | = Frequency | MHz |
| PTC | = Phase temperature coefficient | ppm/C |
| ΔT | = Change in temperature (t2 to t1) | C |
| LTH | = Length | feet |
| $\Delta\phi$ | = Change in electrical length (t1 to t2) | degrees |
| D | = dielectric diameter | inches |
| d | = center conductor diameter | inches |
| ds | = Braid wire size | inches |
| Fbd | = Braid factor | |

| Symbol | Definition | Units |
|----------------------|--|--------|
| Fco | = Cutoff frequency | GHz |
| C | = Braid carriers | |
| N | = Braid ends per carrier | |
| t | = Flat strip thickness | inches |
| w | = Flat strip width | inches |
| SRL | = Return loss | dB |
| VSWR | = Voltage standing wave ratio | |
| FWD | = Forward power | dB |
| RFL | = Reflected power | dB |
| MML | = Mismatch loss | dB |
| ME | = Match efficiency | % |
| k_s | = 1.0 for solid center conductor = 0.939 for 7 strand center conductor = 0.97 for 19 strand center conductor | |
| log | = logarithm to base 10 | |
| ln | = logarithm to base e | |
| k₁ | = resistive loss constant | |
| k₂ | = dielectric loss constant | |