



industrial data rf cable series

SpaceWire ESCC 3902

ESCC 3902 SpaceWire High-Speed LVDS

ESA ESCC 3902/003 & /004 $100\ \Omega \pm 6\ \Omega$ 4×2×28/26 AWG ePTFE SpaceWire LVDS spacecraft cable



ESA ESCC 3902/003 & /004

 $100\ \Omega \pm 6\ \Omega \cdot <0.1\ \text{ns/m Skew}$

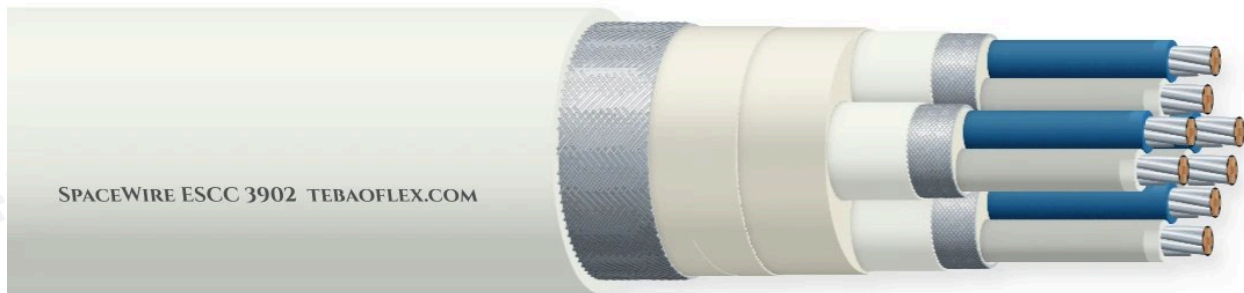
400 Mbps LVDS · -100 to +200 °C

Application

Radiation-hardened 100 Ω SpaceWire LVDS spacecraft harness cable per ESA ESCC 3902/003 and ECSS-E-ST-50-12C (400 Mbps) with four individually braided 26/28 AWG SPC-alloy pairs, microporous ePTFE dielectric (76 % VoP), overall SPC braid, and PFA jacket.

Typical uses: LEO / MEO / GEO Communications Satellites, Earth Observation Optical & SAR Payloads, Deep-Space & Planetary Science Probes, Launch Vehicle Avionics & Telemetry, Spacecraft Ground EGSE Test Racks

Construction



SPACEWIRE ESCC 3902 TEBAOFLEX.COM



Cross-section, not to scale

- 1 Silver-plated high-strength copper-alloy pairs
- 2 Microporous expanded PTFE (ePTFE) insulation
- 3 4 × individual silver-plated copper pair braids
- 4 Overall silver-plated copper wire braid screen
- 5 Radiation-resistant PFA fluoropolymer outer jacket

Technical data

Typical values

Differential impedance	100 Ω ± 6 Ω (measured by TDR, tr ≤ 200 ps)	Intra-pair & inter-pair skew	< 0.10 ns/m (intra-pair) · < 0.15 ns/m (Data-to-Strobe)
Velocity of propagation	80 % nominal (4.17 ns/m delay, ≈ 43 pF/m)	Attenuation @ 100 / 400 MHz	≤ 23 / ≤ 45 dB/100m (28 AWG) · ≤ 17 / ≤ 34 dB/100m (26 AWG)
Conductor DC resistance @ 20 °C	≤ 256 Ω/km (28 AWG 3902/003) · ≤ 160 Ω/km (26 AWG 3902/004)	Operating temperature range	-100 °C to +200 °C (thermal-vacuum orbital duty)
Max. operating voltage	250 V RMS · 1,000 V RMS dielectric test	Vacuum outgassing (ECSS)	TML < 1.0 % · RML < 1.0 % · CVCM < 0.10 %
Pair configuration	4 Individually Shielded Twisted Pairs (4 × STP) + Overall Braid	Overall diameter & mass	Ø 5.8–6.1 mm / 68 g/m (3902/003) · Ø 6.8–7.0 mm / 88 g/m (/004)
Min. bending radius	6 × OD (36 mm static) · 10 × OD dynamic	Radiation resistance	≥ 100 Mrad (1 MGy) total ionizing dose (PFA/ePTFE)
Atomic oxygen & UV	Fluoropolymer sheath resists LEO atomic oxygen & UV	Flammability	Non-flammable in vacuum and 30 % O2 crewed cabin atmosphere
Standards	ESCC 3902/003 (28 AWG) & ESCC 3902/004 (26 AWG)		

Sizes

8 standard constructions

Tick the sizes you need and send this page to info@tebaoflex.com or WhatsApp +86 185 9591 3361.

Order designation	Impedance / size	Conductor & dielectric	Wall ≈ mm	Outer Ø ≈ mm	Metal kg/km	Weight ≈ kg/km	Min. bend R fixed mm
Standard SpaceWire ESCC 3902 configurations 8 sizes							
☐ ESCC 3902/003-01 (28 AWG)	100 Ω · 4×2×28 AWG	19×40 SPC Alloy + ePTFE + 5×Braid	0.40	5.90	42.0	68.0	36
☐ ESCC 3902/003-02 Low-Mass	100 Ω · 4×2×28 AWG Foil/Braid	19×40 SPC + Pair Foil + Braid	0.35	5.20	34.0	52.0	31
☐ ESCC 3902/004-01 (26 AWG)	100 Ω · 4×2×26 AWG Low-Loss	19×38 SPC Alloy + ePTFE + 5×Braid	0.45	6.90	58.0	88.0	42
☐ ESCC 3902/004-02 Low-Mass	100 Ω · 4×2×26 AWG Foil/Braid	19×38 SPC + Pair Foil + Braid	0.40	6.10	46.0	71.0	37
☐ SpaceWire Micro 30 AWG	100 Ω · 4×2×30 AWG CubeSat	7×38 SPC Alloy + ePTFE	0.30	4.50	25.0	39.0	27
☐ SpaceWire Twin-Coax 28 AWG	100 Ω · 4×(2×50 Ω Coax)	Zero-Skew Matched Micro-Coax	0.42	6.00	45.0	70.0	36
☐ SpaceFibre ESCC 3902-6G	100 Ω · 6.25 Gbps Multi-GHz	Low-Skew Multi-Gigabit Twinax	0.45	6.40	48.0	76.0	38
☐ SpaceWire EGSE Ground Test	100 Ω · 4×2×26 AWG PUR	Flexible Ground Lab Harness	0.70	7.20	52.0	84.0	43

– Outer diameters and weights are nominal engineering values for SpaceWire ESCC 3902 subject to standard manufacturing tolerances per ESA ESCC 3902/003 & 3902/004 / ECSS-E-ST-50-12C (100 Ω SpaceWire LVDS).

RF & electrical data

8 sizes

Configuration	Max. DC R @ 20 °C Ω/km	Char. Z0 Ω	Velocity VoP / L (% or nH/m)	Dielectric test V AC rms
ESCC 3902/003-01 (28 AWG) (100 Ω · 4×2×28 AWG)	256.00	100.0	80.0	1,000
ESCC 3902/003-02 Low-Mass (100 Ω · 4×2×28 AWG Foil/Braid)	256.00	100.0	80.0	1,000
ESCC 3902/004-01 (26 AWG) (100 Ω · 4×2×26 AWG Low-Loss)	160.00	100.0	80.0	1,000
ESCC 3902/004-02 Low-Mass (100 Ω · 4×2×26 AWG Foil/Braid)	160.00	100.0	80.0	1,000
SpaceWire Micro 30 AWG (100 Ω · 4×2×30 AWG CubeSat)	380.00	100.0	79.0	800
SpaceWire Twin-Coax 28 AWG (100 Ω · 4×(2×50 Ω Coax))	256.00	100.0	82.0	1,000
SpaceFibre ESCC 3902-6G (100 Ω · 6.25 Gbps Multi-GHz)	160.00	100.0	82.0	1,000
SpaceWire EGSE Ground Test (100 Ω · 4×2×26 AWG PUR)	150.00	100.0	76.0	1,000

– Characteristic impedance, propagation velocity, DC resistance at +20 °C, and dielectric withstand voltages verified per ESA ESCC 3902/003 & 3902/004 / ECSS-E-ST-50-12C (100 Ω SpaceWire LVDS).

Standards and approvals

- ✓ ESA ESCC 3902/003 & 3902/004 / ECSS-E-ST-50-12C (100 Ω SpaceWire LVDS)
- ✓ CE (2014/35/EU) & RoHS 3 (2015/863/EU) Compliant
- ✓ REACH SVHC Compliance Verified

Certifications



Management systems: ISO 9001, ISO 14001, ISO 45001

Request a quotation

Send the size, length and destination. An application engineer replies within 2 business hours.

WhatsApp / phone

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Email

info@tebaoflex.com

Web

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Typical values for this cable type, based on ESA ESCC 3902/003 & 3902/004 / ECSS-E-ST-50-12C (100 Ω SpaceWire LVDS). Values for your order are confirmed in the quotation. Subject to change without notice. Jiangsu Tebaoflex Special Cable Co., Ltd., Taicang, Jiangsu, China.