



N Male Right Angle Low PIM Connector Solder Attachment for SPO-250, SPF-250, SPP-250-LLPL

RF Connectors Technical Data Sheet



TC-250-NM-RA-LP

Times Microwave Systems Connector Specification

Configuration

- N Male Connector
- 50 Ohms
- Right Angle Body Geometry
- Connector Interface Types: SPO-250, SPF-250, SPP-250-LLPL
- Low PIM Design

Features

- Max. Operating Frequency 6 GHz
- Good VSWR of 1.35:1
- PIM levels lower than -160 dBc
- Silver Plated Brass Contact
- 200 μ m contact plating

Applications

- General Purpose Test
- Custom Cable Assemblies
- Distributed Antenna Systems (DAS)
- Wireless Communications
- Low PIM Applications

Description

Times Microwave's TC-250-NM-RA-LP type N male right angle connector offered by Pasternack with solder/solder attachment for Times' SPO-250, SPF-250 and SPP-250-LLPL is part of our full line of RF components available for same-day shipping. Times Microwave's type N male connector operates up to a maximum frequency of 6 GHz and offers good VSWR of 1.35:1. The Times type N male connector also has low passive intermodulation of -160 dBc. Its right angle body geometry allows for easier connections in tight spaces.

Times Microwave's type N male right angle connector TC-250-NM-RA-LP datasheet specifications and drawing with dimensions are shown below in this PDF. Pasternack's broad catalog of RF, microwave and millimeter wave connectors allows designers to configure and customize their signal connections however they like. Whether the need is to provide an I/O for a board design, or simply create a custom cable assembly configuration, Pasternack has the right connector for the job. Pasternack can also expertly build your custom cable assemblies for you and ship same-day.

Electrical Specifications

| Description | Minimum | Typical | Maximum | Units |
|-------------------------|---------|---------|---------|-------|
| Frequency Range | DC | | 6 | GHz |
| VSWR | | | 1.35:1 | |
| Insertion Loss | | | 0.25 | dB |
| Passive Intermodulation | | | -160 | dBc |
| Operating Voltage (DC) | | | 2,500 | Vdc |
| Insulation Resistance | 5,000 | | | MOhms |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [N Male Right Angle Low PIM Connector Solder Attachment for SPO-250, SPF-250, SPP-250-LLPL TC-250-NM-RA-LP](#)



N Male Right Angle Low PIM Connector Solder Attachment for SPO-250, SPF-250, SPP-250-LLPL

RF Connectors Technical Data Sheet



TC-250-NM-RA-LP

Performance by Frequency

| Description | F1 | F2 | F3 | F4 | F5 | Units |
|-----------------|---------|--------|----|----|----|-------|
| Frequency Range | DC to 3 | 3 to 6 | | | | GHz |
| VSWR, Max | 1.1:1 | 1.35:1 | | | | |

Electrical Specification Notes:
Insertion Loss is $0.1 \cdot \sqrt{FGHz}$

Mechanical Specifications

Size

| | |
|---------------|------------------------|
| Length | 1.01 in [25.65 mm] |
| Width/Dia. | 0.94 in [23.88 mm] |
| Height | 1.53 in [38.86 mm] |
| Mating Torque | 15.05 in-lbs [1.70 Nm] |

Material Specifications

| Description | Material | Plating |
|--------------|----------|-------------------------|
| Contact | Brass | Silver 200 μ m |
| Insulation | PTFE | |
| Body | Brass | Tri-Metal 80 μ m |
| Coupling Nut | Brass | Tri-Metal 80 μ m |
| Gasket | Silicone | |

Environmental Specifications

Temperature

| | |
|-----------------|---------------------------------------|
| Operating Range | -55 to +125 deg C |
| Shock | MIL-STD 202G, Method 213, Condition I |
| Vibration | MIL-STD 202G, Method 204, Condition B |
| Thermal Shock | MIL-STD 202G, Method 107, Condition B |

Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

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N Male Right Angle Low PIM Connector Solder Attachment for SPO-250, SPF-250, SPP-250-LLPL

RF Connectors Technical Data Sheet



TC-250-NM-RA-LP

N Male Right Angle Low PIM Connector Solder Attachment for SPO-250, SPF-250, SPP-250-LLPL from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

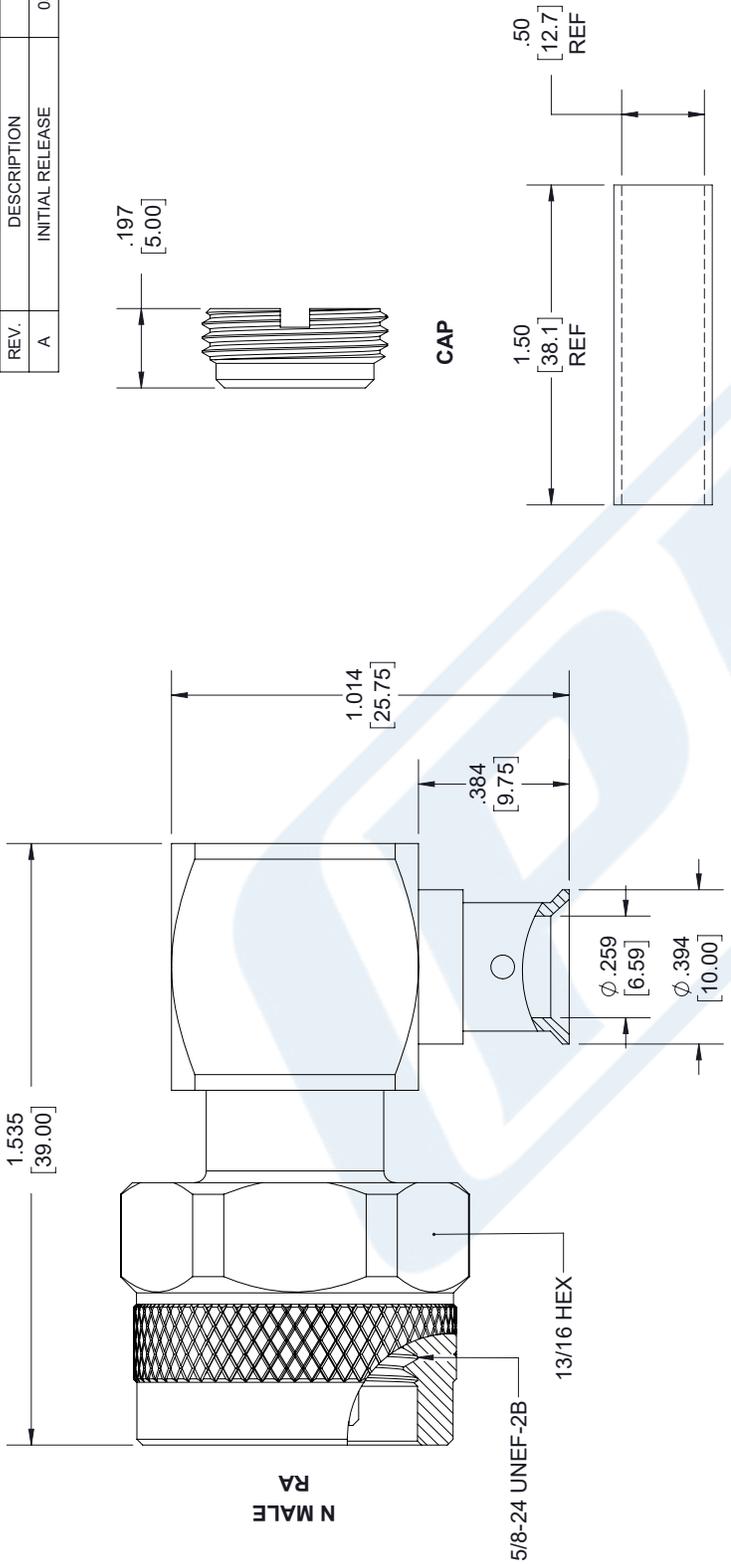
Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [N Male Right Angle Low PIM Connector Solder Attachment for SPO-250, SPF-250, SPP-250-LLPL TC-250-NM-RA-LP](https://www.pasternack.com/n-male-spo-250-spf-250-connector-tc-250-nm-ra-lp-p.aspx)

URL: <https://www.pasternack.com/n-male-spo-250-spf-250-connector-tc-250-nm-ra-lp-p.aspx>

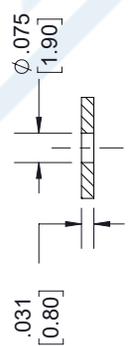
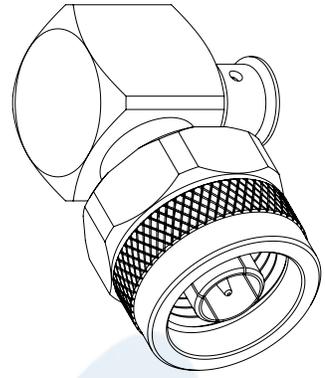
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TIMES MICROWAVE SYSTEMS **TC-250-NM-RA-LP CAD Drawing**
 N Male Right Angle Low PIM Connector Solder Attachment
 for SPO-250, SPF-250, SPP-250-LLPL

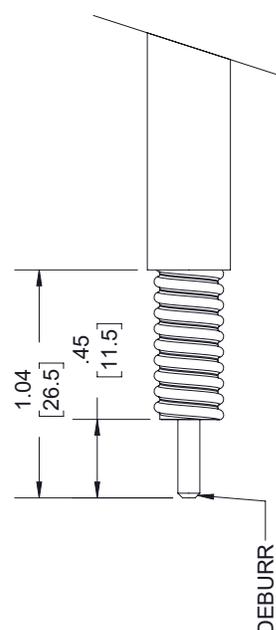
| REVISIONS | | | |
|-----------|-----------------|----------|-----------|
| REV. | DESCRIPTION | DATE | APPROVED |
| A | INITIAL RELEASE | 03/04/19 | S. SELLIS |



HEAT SHRINK TUBE



INSULATOR



STRIPPING DIMENSIONS

- NOTES:
- CABLE ATTACHMENT:
 - OUTER: SOLDER.
 - INNER: SOLDER.

UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES DIMENSIONS IN [] ARE MILLIMETERS

TOLERANCES:

.X = ±.2 [5.08] FRACTIONS ± 1/32
 .XX = ±.02 [.51] ANGLES ± 1°
 .XXX = ±.005 [.13]

CABLE LENGTH (L) TOLERANCES:
 L ≤ 12 [305] = +1 [25] / -0
 12 [305] < L ≤ 60 [1524] = +2 [51] / -0
 60 [1524] < L ≤ 120 [3048] = +4 [102] / -0
 120 [3048] < L ≤ 300 [7620] = +6 [152] / -0
 300 [7620] < L = +5% / -0

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

PE PASTERNAK
 an INFINIT brand

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 E-mail: sales@pasternack.com

THIRD-ANGLE PROJECTION

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SHEET 1 OF 1
 SCALE N/A

| | | | |
|------|-----------|----------|-----------------|
| SIZE | CAGE CODE | DRAWN BY | ITEM NO. |
| A | 53919 | K. DANG | TC-250-NM-RA-LP |
| REV | A | | |



N Male Low PIM Connector Solder Attachment for SPP-250-LLPL, SPO-250, SPF-250

RF Connectors Technical Data Sheet

Times Microwave Systems Connector Specification

Configuration

- N Male Connector
- 50 Ohms
- Straight Body Geometry
- Connector Interface Types: SPP-250-LLPL, SPO-250, SPF-250
- Low PIM Design

Features

- Max. Operating Frequency 6 GHz
- Good VSWR of 1.35:1
- PIM levels lower than -160 dBc
- Silver Plated Phosphor Bronze Contact
- 196 μ m contact plating

Applications

- General Purpose Test
- Custom Cable Assemblies
- Distributed Antenna Systems (DAS)
- Wireless Communications
- Low PIM Applications

Description

Times Microwave's TC-250-NM-LP type N male connector offered by Pasternack with solder/solder attachment for Times' SPP-250-LLPL, SPO-250 and SPF-250 is part of our full line of RF components available for same-day shipping. Times Microwave's type N male connector operates up to a maximum frequency of 6 GHz and offers good VSWR of 1.35:1. The Times type N male connector also has low passive intermodulation of -160 dBc.

Times Microwave's type N male connector TC-250-NM-LP datasheet specifications and drawing with dimensions are shown below in this PDF. Pasternack's broad catalog of RF, microwave and millimeter wave connectors allows designers to configure and customize their signal connections however they like. Whether the need is to provide an I/O for a board design, or simply create a custom cable assembly configuration, Pasternack has the right connector for the job. Pasternack can also expertly build your custom cable assemblies for you and ship same-day.

Electrical Specifications

| Description | Minimum | Typical | Maximum | Units |
|-------------------------------|---------|---------|---------|-------|
| Frequency Range | DC | | 6 | GHz |
| VSWR | | | 1.35:1 | |
| Insertion Loss | | | 0.25 | dB |
| Passive Intermodulation | | | -160 | dBc |
| Operating Voltage (DC) | | | 1,000 | Vdc |
| Inner Conductor DC Resistance | | | 1 | mOhms |
| Outer Conductor DC Resistance | | | 1.5 | mOhms |
| Insulation Resistance | 5,000 | | | MOhms |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [N Male Low PIM Connector Solder Attachment for SPP-250-LLPL, SPO-250, SPF-250 TC-250-NM-LP](#)



N Male Low PIM Connector Solder Attachment for SPP-250-LLPL, SPO-250, SPF-250

RF Connectors Technical Data Sheet



TC-250-NM-LP

Performance by Frequency

| Description | F1 | F2 | F3 | F4 | F5 | Units |
|-----------------|---------|--------|----|----|----|-------|
| Frequency Range | DC to 3 | 3 to 6 | | | | GHz |
| VSWR, Max | 1.25:1 | 1.35:1 | | | | |

Electrical Specification Notes:
Insertion Loss is $0.1 \cdot \sqrt{f(\text{GHz})}$

Mechanical Specifications

Size

| | |
|---------------|---------------------------------------|
| Length | 1.13 in [28.7 mm] |
| Width/Dia. | 0.94 in [23.88 mm] |
| Mating Torque | 7.08 to 9.74 in-lbs [0.80 to 1.10 Nm] |

Material Specifications

| Description | Material | Plating |
|--------------|-----------------|---------------------------|
| Contact | Phosphor Bronze | Silver 196 μ in |
| Insulation | PTFE | |
| Body | Brass | Tri-Metal 118 μ in |
| Coupling Nut | Brass | Tri-Metal 118 μ in |
| Gasket | Silicone Rubber | |

Environmental Specifications

Temperature

| | |
|-----------------|-------------------|
| Operating Range | -55 to +155 deg C |
| Humidity | IP67 |
| Shock | US MIL-STD 202G |
| Vibration | US MIL-STD 202G |
| Thermal Shock | US MIL-STD 202G |

Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [N Male Low PIM Connector Solder Attachment for SPP-250-LLPL, SPO-250, SPF-250 TC-250-NM-LP](#)



N Male Low PIM Connector Solder Attachment for SPP-250-LLPL, SPO-250, SPF-250

RF Connectors Technical Data Sheet



TC-250-NM-LP

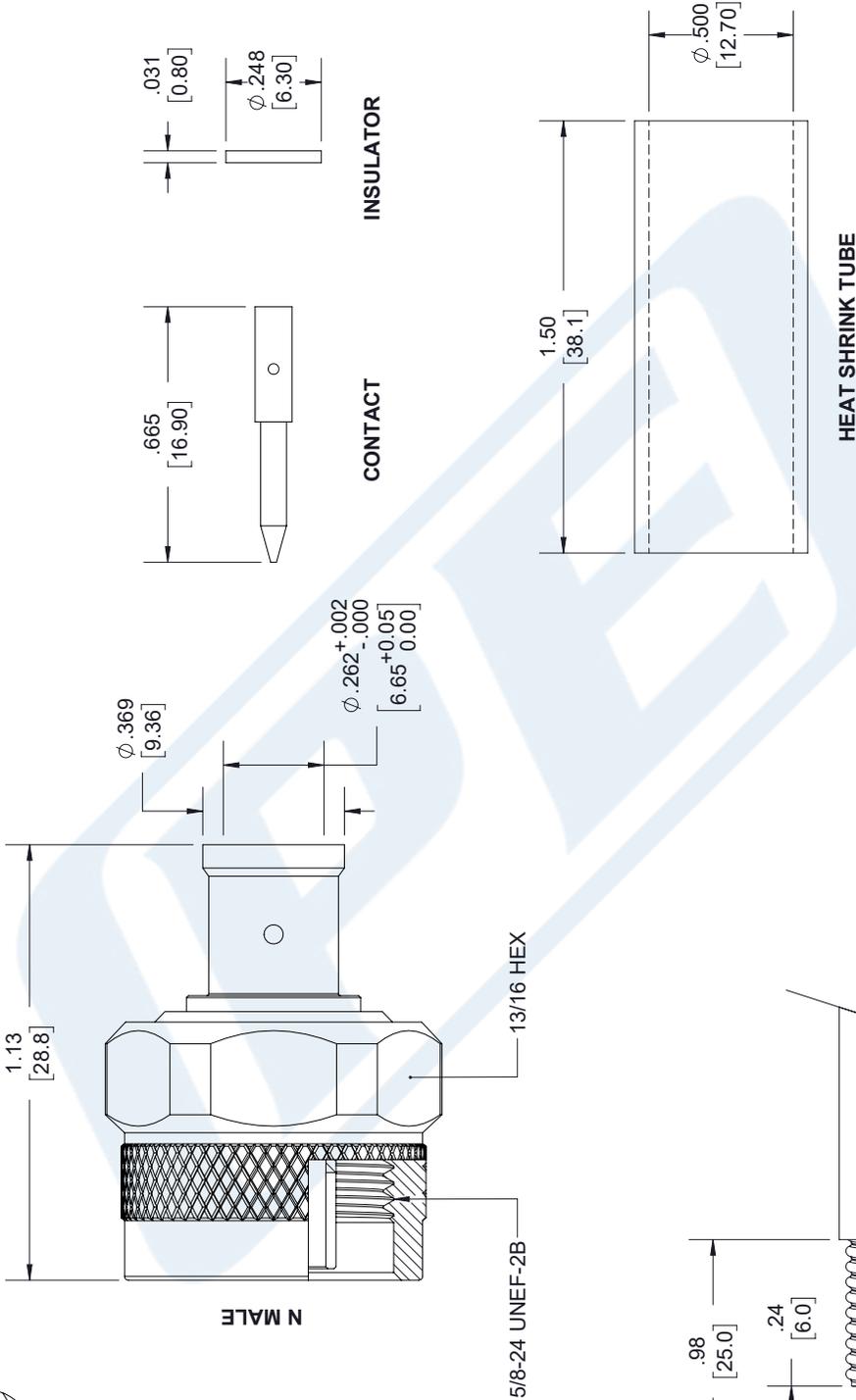
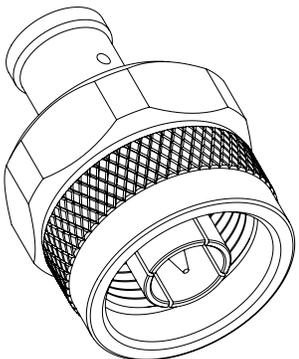
N Male Low PIM Connector Solder Attachment for SPP-250-LLPL, SPO-250, SPF-250 from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

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URL: <https://www.pasternack.com/n-male-spp-250-llpl-spo-250-connector-tc-250-nm-lp-p.aspx>

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| REVISIONS | | | |
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| REV. | DESCRIPTION | DATE | APPROVED |
| A | PCR TC-250-NM-LP | 5/29/2020 | S. ELLIS |



THIRD-ANGLE PROJECTION

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SHEET 1 OF 1
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 E-mail: sales@pasternack.com

UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES DIMENSIONS IN [] ARE MILLIMETERS

TOLERANCES:
 .X = ±.2 [5.08] FRACTIONS ± 1/32
 .XX = ±.02 [.51] ANGLES ± 1°
 .XXX = ±.005 [.13] CABLE LENGTH (L) TOLERANCES:
 L ≤ 12 [305] = +1 [25] / -0
 12 [305] < L ≤ 60 [1524] = +2 [51] / -0
 60 [1524] < L ≤ 120 [3048] = +4 [102] / -0
 120 [3048] < L ≤ 300 [7620] = +6 [152] / -0
 300 [7620] < L = +5% / L / -0

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

ITEM NO. TC-250-NM-LP
 DRAWN BY K. DANG
 CAGE CODE A 53919

STRIPPING DIMENSIONS

NOTES:

- CABLE ATTACHMENT:
 • OUTER: SOLDER.
 • INNER: SOLDER.

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Low Loss SPO-250 Rated Corrugated Coax Cable with Black PE Jacket Superflexible Outdoor Rated

RF Cables Technical Data Sheet

Times Microwave Systems Coax Cable Specification

Configuration

- Low Loss Corrugated Cable
- 1 Shield(s)

Features

- PIM < -160 dBc
- Lightweight and Super Flexible
- Low Loss Dielectric 83% VoP
- Shielding > 100 dB
- Durable Black Polyethylene Outer Jacket
- Outdoor Rated

Applications

- Distributed Antenna Systems (DAS)
- Antenna Installations
- Small Cell
- Outdoor Applications
- Commination Tower Install

Description

SPO-250 low loss outdoor rated coax cable by Times Microwave is part of our full line of RF components available for same-day shipping. The SPO-250 coaxial cable features a low loss dielectric with an 83% velocity of propagation (VoP), solid copper center conductor and a helically corrugated, copper outer conductor. These features combine to make the Times Microwave SPO-250 a super flexible, low PIM coax cable that is well suited for use as an antenna jumper cable, Distributed Antenna Systems (DAS), small cell, and other outdoor applications. The tough, black polyethylene jacket provides moisture and UV protection and is suitable for outdoor use.

Our datasheet specifications and drawing with dimensions for Times Microwave SPO-250 coax cable are shown below in this PDF. Whether the need is to provide a low PIM jumper connection, low PIM feeder cable or simply create a custom cable assembly configuration, Pasternack has the right SPO-250 cable assembly for the job. See our web site to find the right connector cable combination for your application.

Electrical Specifications

| Description | Minimum | Typical | Maximum | Units |
|-------------------------|---------|--------------|---------|--------------|
| Frequency Range | DC | | 5.8 | GHz |
| Impedance | | 50 | | Ohms |
| Velocity of Propagation | | 83 | | % |
| Passive Intermodulation | | | -160 | dBc |
| Nominal Capacitance | | 24 [78.74] | | pF/ft [pF/m] |
| Nominal Inductance | | 0.054 [0.18] | | uH/ft [uH/m] |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [Low Loss SPO-250 Rated Corrugated Coax Cable with Black PE Jacket Superflexible Outdoor Rated SPO-250](#)



Low Loss SPO-250 Rated Corrugated Coax Cable with Black PE Jacket Superflexible Outdoor Rated

RF Cables Technical Data Sheet

Performance by Frequency Band

| Description | F1 | F2 | F3 | F4 | F5 | Units |
|-----------------------|-------|-------|-------|-------|-------|----------|
| Frequency | 0.45 | 1.5 | 2 | 2.5 | 5.8 | GHz |
| Attenuation, Typ | 4.1 | 7.8 | 9.13 | 10.33 | 16.65 | dB/100ft |
| | 13.45 | 25.59 | 29.95 | 33.89 | 54.63 | dB/100m |
| Input Power (CW), Max | 1,110 | 580 | 500 | 440 | 280 | Watts |

Mechanical Specifications

| | |
|---------------------------------|--------------------------|
| Diameter | 0.303 in [7.7 mm] |
| Weight | 0.052 lbs/ft [0.08 Kg/m] |
| Min. Bend Radius (Installation) | 1.25 in [31.75 mm] |
| Bending Moment | 0.5 lbs-ft [0.68 N-m] |

Construction Specifications

| Description | Material and Plating | Diameter |
|-----------------|-----------------------|-------------------|
| Inner Conductor | Copper Clad Aluminum1 | 0.075 in 1.91 mm |
| Conductor Type | Solid | |
| Dielectric | Foam PE | 0.177 in 4.5 mm |
| Outer Conductor | Copper Corrugated | 0.252 in 6.4 mm |
| Jacket | PE, Black | 0.303 in [7.7 mm] |

Environmental Specifications

Temperature

| | |
|-----------------|------------------|
| Operating Range | -40 to +85 deg C |
|-----------------|------------------|

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [Low Loss SPO-250 Rated Corrugated Coax Cable with Black PE Jacket Superflexible Outdoor Rated SPO-250](#)



Low Loss SPO-250 Rated Corrugated Coax Cable with Black PE Jacket Superflexible Outdoor Rated

RF Cables Technical Data Sheet

Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

Low Loss SPO-250 Rated Corrugated Coax Cable with Black PE Jacket Superflexible Outdoor Rated from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

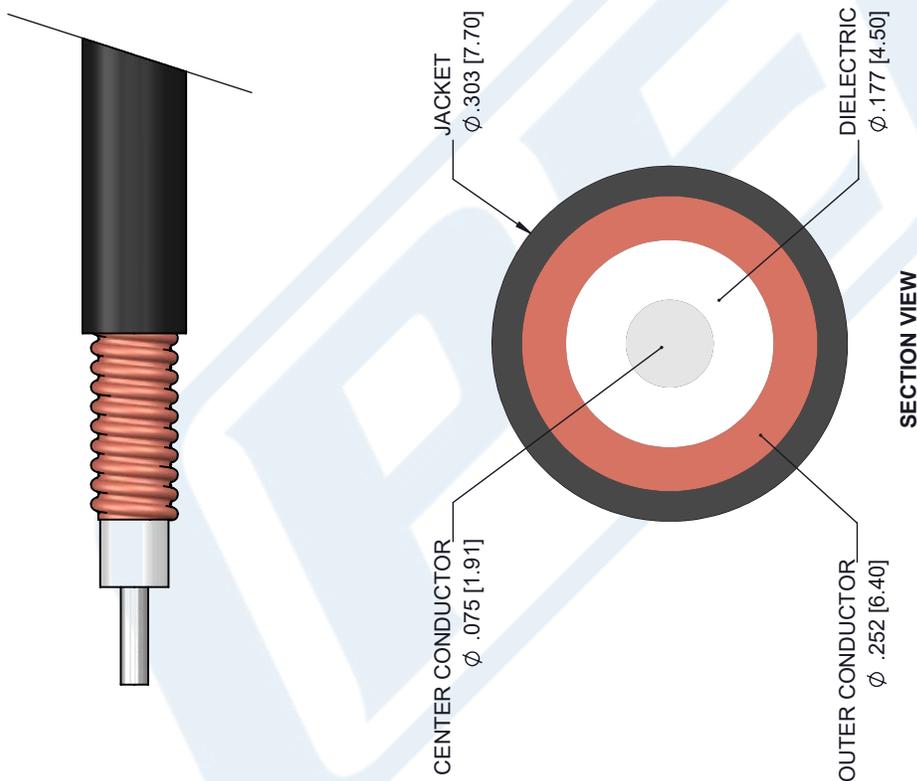
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URL: <https://www.pasternack.com/low-loss-corrugated-spo250-pe-jacket-spo-250-p.aspx>

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TIMES MICROWAVE SYSTEMS **SPO-250 CAD Drawing**
 Low Loss SPO-250 Rated Corrugated Coax Cable with
 Black PE Jacket Superflexible Outdoor Rated

| REVISIONS | | | |
|-----------|-----------------|----------|----------|
| REV. | DESCRIPTION | DATE | APPROVED |
| A | INITIAL RELEASE | 03/04/19 | S. ELLIS |



UNLESS OTHERWISE SPECIFIED
 LEADING DIMENSIONS ARE INCHES
 DIMENSIONS IN [] ARE MILLIMETERS

TOLERANCES:
 X±.2 [5.08] FRACTIONS
 XX±.01 [.25] +1/32
 XXX±.005 [1.13] ANGLES ± 1°

ALL DIMENSIONS SHOWN
 ARE FOR REFERENCE ONLY.

THIRD-ANGLE PROJECTION

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SHEET 1 OF 1
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CAGE NUMBER A 53919
 DRAWN BY K. DANG
 PART NUMBER SPO-250
 REV A

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