smiths interconnect
bringing technology to life

# Lab-Flex® T Series

## Phase Tested Coaxial Cable Assemblies



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Smiths Interconnect's Lab-Flex T product portfolio provides customers with a solution for applications requiring critical signal timing. The combination of repeatable, consistent performance and high reliability products translates to lower cost of ownership while improving system performance. The benefits enable customers to be more competitive with support of an established technology partner.

The Lab-Flex T Series is a unique design specifically tailored to minimize phase change when subjected to a wide range of temperatures. It also has a very stable nature around room temperature. As such, Radar, Test & Measurement applications are ideal for this product line.

All products have gone through extensive qualification testing in order to validate today's rigorous application requirements per customer and industry. The T series assemblies are made with a special Foam Fluoropolymer insulation to minimize phase deviation over a wide temperature range while all but eliminating the "Knee" at room temperature. The attenuation characteristics are similar to low loss PTFE due to the foam insulator design. The 065T, 100T, and 160T products represent the most common sizes needed for today's applications. Test reports are available on request.

**Lab-Flex® T Series, specifically designed for Radar and Test applications requiring precise phase stability over temperature.**

## Features and Benefits

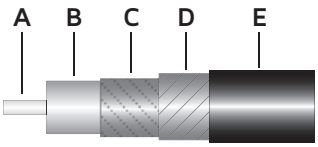
- Up to 50 GHz
- Phase vs. Temp testing available on request including "tracking" cable pairs
- Temperature stable foam dielectric for minimum phase change
- Phased Matched Pairs and Sets available (standard tolerance is +/- one degree per GHz or +/-2.8 picoseconds)

## Applications

- Radar, Tx, Rx, links of same electrical length over temperature
- Commercial and Military markets
- Test & Measurement
- Space, GEO/MEO/LEO and Small Satellites

# Technical Characteristics

| Lab-Flex T Series | | 065T | 100T | 160T |
|---|---|---|---|---|
| **Electrical** | | | | |
| Frequency, Max (GHz) | | 50 | 50 | 40 |
| Impedance, nominal (Ω) | | 50 | 50 | 50 |
| Velocity of Propagation (%) | | 79 | 80 | 80 |
| Shielding Effectiveness, 18 GHz (dB/ft) | | >100 | >100 | >100 |
| Capacitance (pF/ft) | | 26 | 25.4 | 23.3 |
| Delay (ns/ft), (ns/meter) | | 1.29, 4.24 | 1.27, 4.17 | 1.27, 4.17 |
| Attenuation k1 (db/100ft) @ 23 deg C | | 0.934 | 0.534 | 0.341 |
| Attenuation k2 (db/100ft) @ 23 deg C | | 0.000602 | 0.000803 | 0.000891 |
| Attenuation (Typical) at any Frequency = k1 x SqRt (FMHz) + k2 x (FMHz) | | | | |
| **Mechanical & Environmental** | | | | |
| Weight (lbs/100ft), (Kg/100m) | | 0.412, 0.614 | 1.10, 1.64 | 2.47, 3.68 |
| Temperature Range (˚C) | | -65 to +165 | -65 to +165 | -65 to +165 |
| Minimum Bend Radius (inch), (mm) | | 0.250, 6.35 | 0.350, 8.90 | 0.500, 12.70 |
| **Construction** | | | | |
| Inner Conductor | A | Solid SPC | Solid SPC | Solid SPC |
| Dielectric | B | Foam Fluoropolymer | Foam Fluoropolymer | Foam Fluoropolymer |
| First Outer Shield | C | SPC Spiral | SPC Spiral | SPC Spiral |
| Second Outer Shield | D | SPC Round | SPC Round | SPC Round |
| Jacket (inch O.D.) | E | 0.065, FEP | 0.100, FEP | 0.160, FEP |



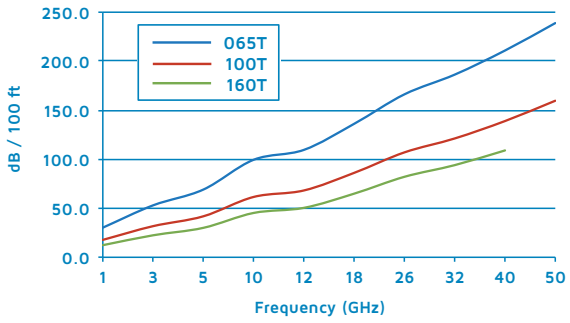
Lab-Flex® T

## Attenuation (dB/100ft)

| GHz | 065T | 100T | 160T |
|---|---|---|---|
| 1 | 30.1 | 17.7 | 12.3 |
| 3 | 52.9 | 31.7 | 22.4 |
| 5 | 69.0 | 41.8 | 30.0 |
| 10 | 99.4 | 61.5 | 45.2 |
| 12 | 109.5 | 68.1 | 50.4 |
| 18 | 136.1 | 86.1 | 64.9 |
| 26 | 166.2 | 107.0 | 82.1 |
| 32 | 186.3 | 121.2 | 94.0 |
| 40 | 210.9 | 139.0 | 109.0 |
| 50 | 238.9 | 159.7 | |

Typical Cable Loss at +25° C & Sea Level

## Attenuation vs Frequency

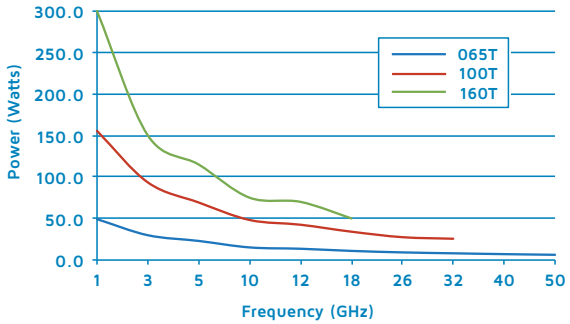



## Average Power Rating (Watts)

| GHz | 065T | 100T | 160T |
|---|---|---|---|
| 1 | 49.3 | 155.7 | 300 |
| 3 | 29.9 | 93.5 | 150 |
| 5 | 23.0 | 69.3 | 115 |
| 10 | 15.2 | 48.2 | 75 |
| 12 | 13.6 | 42.5 | 70 |
| 18 | 11.0 | 34.1 | 50 |
| 26 | 9.2 | 27.5 | |
| 32 | 8.1 | 25.6 | |
| 40 | 7.1 | 21.9 | |
| 50 | 6.3 | 19.3 | |

Power Rating at +25° C & Sea Level

## Average Power Rating



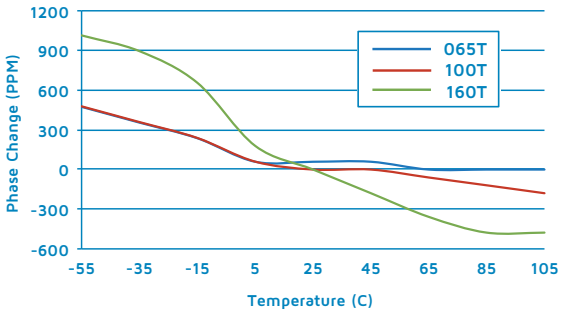
# Technical Characteristics

## Phase vs. Temperature (PPM)

| Temperature (°C) | 065T | 100T | 160T |
|---|---|---|---|
| -55 | 474 | 478 | 1014 |
| -35 | 355 | 359 | 895 |
| -15 | 237 | 239 | 656 |
| 5 | 59 | 60 | 179 |
| 25 | 59 | 0 | 0 |
| 45 | 59 | 0 | -179 |
| 65 | 0 | -60 | -358 |
| 85 | 0 | -119 | -477 |
| 105 | 0 | -179 | -477 |

Typical Values

## Phase vs. Temperature (°C)

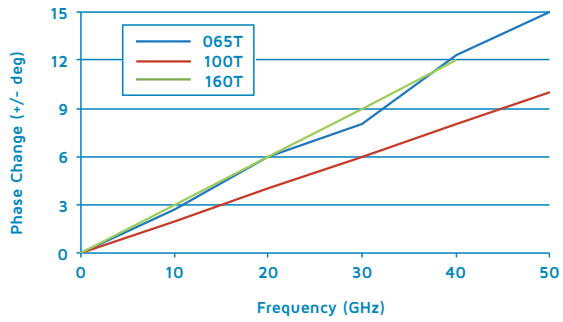



## Phase vs. Flexure

| Frequency (GHz) | 065T (+/-deg) | 100T (+/-deg) | 160T (+/-deg) |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 10 | 2.7 | 2 | 3 |
| 20 | 6 | 4 | 6 |
| 30 | 8 | 6 | 9 |
| 40 | 12.3 | 8 | 12 |
| 50 | 15 | 10 | |

Typical Values +25° C

## Phase vs. Flexure




| Cable Code | Connector Code | Series | Gender | Type | C-Nut Style[1] | Body Material[2] | Body Finish[3] | Loss per GHz | Frequency Max GHz |
|---|---|---|---|---|---|---|---|---|---|
| 065T, 100T, 160T | SMS | SMA | Male | Straight | H | SS | P | 0.01 | 18 |
| 065T, 100T, 160T | KMS | 2.92mm | Male | Straight | H | SS | P | 0.01 | 40 |
| 065T, 100T | MMS | 2.4mm | Male | Straight | H | SS | P | 0.01 | 50 |
| 065T, 100T | SMPFS | SMP | Female | Straight | N/A | Be | G | 0.02 | 40 |
| 065T, 100T | SMPFR | SMP | Female | Right Angle | N/A | Be | G | 0.02 | 40 |
| 065T, 100T | SMPMFS | SMPM | Female | Straight | N/A | Be | G | 0.02 | 50 |

[1] C-Nut Style: H=Hex, K-Knurled, HK=Hex Nut & Knurled
[2] Body Materials: B=Brass, SS=Stainless, Be=Beryllium Copper
[3] Body Finish: N=Nickel, S=Silver, G=Gold, P=Passivated
Sex of connector is determined by center conductor

| Cable Code | Option Code | Option Description | Option Details |
|---|---|---|---|
| 065T, 100T, 160T | +/-2.8 ps[4] | Phase Match | Standard Tolerance of +/-2.8ps |
| 065T, 100T, 160T | RoHS[5] | RoHS Compliant | Per EU Directive 2002/95/EC |

[4]for phase matched assemblies (+/-2.8ps) is required to be added to the end of standard part number
example: SMS-160T-24.0-SMS +/-2.8ps

[5]for RoHS assemblies (RoHS) is required to be added to the end of standard part number
example: SMS-160T-24.0-SMS-RoHS

**Custom Options:**
The above connectors and options represent the most common types used. Smiths Interconnect offers a wide range of cables, connectors and options. If you do not see an option you require please consult the sales department.

# How To Order

| | | | | |
|---|---|---|---|---|
| _ _ _ _ _ _ - | _ _ _ T - | _ _ . _ - | _ _ _ - | _ _ _ _ |
| 1 | 2 | 3 | 4 | 5 |

## 1 Connector #1

| | | | | | |
|---|---|---|---|---|---|
| SMS | SMA Male Straight | MMS | 2.4mm Male Straight | SMPFR | SMP Female Right Angle |
| KMS | 2.92mm Male Straight | SMPFS | SMP Female Straight | SMPMFS | SMPM Female Straight |

## 2 Cable *(fixed)*

| | | | | | |
|---|---|---|---|---|---|
| 065 | Lab-Flex 065T | 100 | Lab-Flex 100T | 160 | Lab-Flex 160T |

## 3 Length *(inches)*

| | |
|---|---|
| 36.0 | Example: 36 in. |

## 4 Connector #2

| | | | | | |
|---|---|---|---|---|---|
| SMS | SMA Male Straight | KMS | 2.9mm Male Straight | MMS | 2.4mm Male Straight |

## 5 Assembly Option

| | | | |
|---|---|---|---|
| +/-2.8ps | +/-2.8ps Phase Matched Electrical Length | RoHS | RoHS Compliant Per EU Directive 2002/95/EC |

# Global
## Support




RFMW is a globally franchised distributor for Smiths Interconnect.
A list of local offices is available at www.rfmw.com/contact/29

more > smithsinterconnect.com

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