smiths interconnect

SpaceNXT™ QT Series

Space Qualified Phase Stable Coaxial Cable Assemblies

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Specifically designed and tested for next generation commercial space applications.

Smiths Interconnect's SpaceNXT™ QT Series offers improved phase stability over a wide range of temperatures found in space environments whilst meeting all NASA/ESA outgassing specifications. It is equipped with ETFE radiation resistant jacket materials. This combination enables customers to enjoy the benefits of lower cost of ownership while improving system performance.

The SpaceNXT™ QT series is part of Smiths Interconnect's overarching initiative entailing the creation of a full range of higher reliability products for next generation space applications that are readily available on the market.

All products have passed design verification and are rigorously tested per customer and industry application requirements. SpaceNXT™ QT series assemblies are manufactured with low loss fluoropolymer dielectrics and constructed with materials which meet the outgassing requirements of NASA/ESA when tested per ASTM E595.

The outer jackets use ETFE material for increased radiation resistance. SpaceNXT™ 065QT, 100QT, and 160QT cables are specifically designed for space flight applications on LEO, MEO, and GEO satellite platforms and offered with standardized testing sequences, reducing delivery times and overall cost of ownership.

Features and Benefits

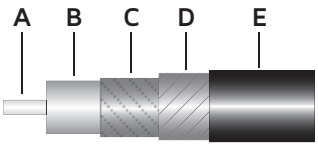
- Mode Free performance up to 50 GHz - for high frequency applications
- Stainless steel connectors or BeCu Connectors - rated >500 mating cycles where applicable
- Phase Stable Fluoropolymer dielectric – Minimized electrical length changes over a wide temperature range
- Low loss dielectric - reduced attenuation and power loss
- >-90dB shielding effectiveness - superior RF leakage performance and minimized cross talk
- ETFE Jackets - increased radiation resistance
- Compliant to NASA/ESA outgassing specifications
- Phase stable testing available on request including "tracking" cable pairs
- 100% flight test data available

Applications:

- Satellite Communication & Navigation
- Military, Commercial and Scientific Programs
- GEO/MEO/LEO and Small Satellites
- Manned Space Flight

Technical Characteristics

SpaceNXT™ QT Series		065QT	100QT	160QT
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	0.65, EFTE	0.100, EFTE	0.160, EFTE



SpaceNXT™ QT

SpaceNXT™ 065QT

SpaceNXT™ 100QT

SpaceNXT™ 160QT

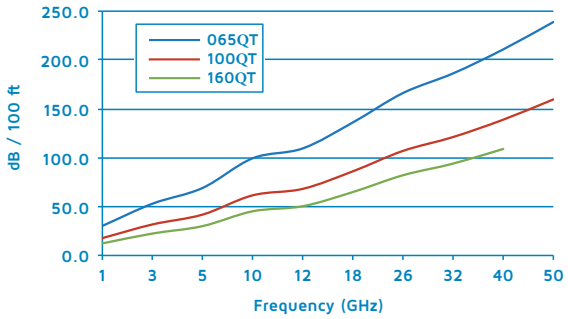
Technical Characteristics

Attenuation (dB/100ft)

GHz	065QT	100QT	160QT
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

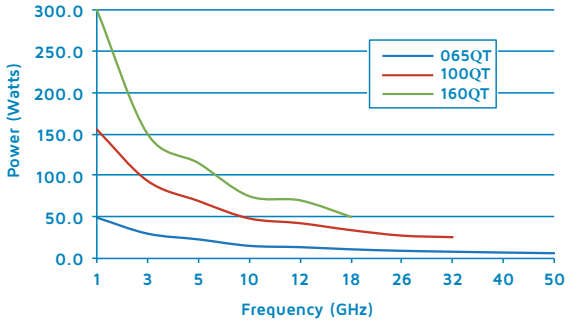


Average Power Rating (Watts)

GHz	065QT	100QT	160QT
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

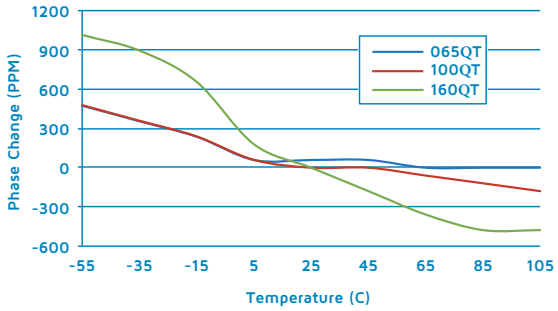


Phase vs. Temperature (PPM)

Temperature (°C)	065QT	100QT	160QT
-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)



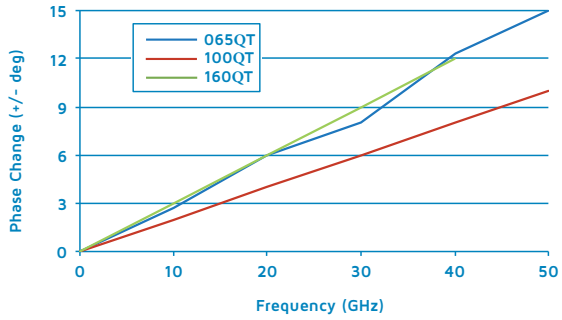
Technical Characteristics

Phase vs. Flexure

Frequency (GHz)	065QT (+/-deg)	100QT (+/-deg)	160QT (+/-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
065QT, 100QT, 160QT	SMS	SMA	Male	Straight	H	SS	P	0.01	18
065QT, 100QT, 160QT	KMS	2.92mm	Male	Straight	H	SS	P	0.01	40
065QT, 100QT	MMS	2.4mm	Male	Straight	H	SS	P	0.01	50
065QT, 100QT	SMPFS	SMP	Female	Straight	N/A	Be	G	0.02	40
065QT, 100QT	SMPFR	SMP	Female	Right Angle	N/A	Be	G	0.02	40
065QT, 100QT	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
Gender of connector is determined by center conductor

Cable Code	Option Code	Option Description	Option Details
065QT, 100QT, 160QT	+/-2.8 ps[4]	Phase Match	Standard Tolerance of +/-2.8ps

[4] for phase matched assemblies (+/-2.8ps) must be added at the end of the standard part number
example: SMS-160QT-24.0-SMS +/-2.8ps

Custom Options:
The above options represent the most used cable and connector types. Smiths Interconnect offers a wide range of cables and connectors. If you do not find the option you are looking for in the catalog, please consult our sales department or send an inquiry via our website.

Qualification Summary

Test Plan	Description	
TP-9229	Internal Test Procedure for Phase Over Temperature Requirements	
Products Tested	**QTY**	**Testing Sequence**
KMS-105Q-48.0-KMS +/-2.8ps	4	1,2
KMS-190Q-48.0-KMS +/-2.8ps	4	1,2
SMS-200Q-48.0-SMS +/-2.8ps	4	1,2
Testing Sequence 1	**Requirements**	**Results**
Phase Match Assemblies	+/-2.8ps	Pass
VSWR and Insertion Loss	Per Cable Specifications	Pass
Phase Over Temperature	Characterization Test	Recorded
VSWR and Insertion Loss	Per Cable Specifications	Pass
Testing Sequence 2	**Requirements**	**Results**
Phase Tracking Over Temperature	Measure and Record Results	Recorded
TP-9140	**Internal Test Qualification Procedure for Space Flight Cables**	
Products Tested	**QTY**	**Testing Sequence**
SMS-200Q-12.0-SMS	7	2
SMS-105Q-12.0-SMS	5	2
SSMS-060Q-12.0-SSMS	5	2
SMS-200Q-39.4-SMS	4	3
TMS-200Q-39.4-TMS	4	3
Cable 200Q	4 ft.	1
Cable 190Q	1 ft.	1
Testing Sequence 1	**Requirements**	**Results**
Group A Inspection Tests	Per MIL-DTL-17H	Pass
Group B Inspection Tests	Per MIL-DTL-17H	Pass
Testing Sequence 2	**Requirements**	**Results**
Insertion Loss (pre-Radiation)	Per Cable Specifications	Pass
Radiation Dosage	Cables Exposed to Various Levels of Radiation	Recorded
Insertion Loss (post-radiation)	Measure and Record Delta to Original Results	Recorded
Testing Sequence 3	**Requirements**	**Results**
DWV	Mil-STD-202 Method 301	Recorded
Radiation Dosage	Measure and Record Results	Recorded
Random and Sine Vibration	MIL-STD-202 Method 214A Conditions IIG, Swept Sine, 5-100Hz, 2 oct/min	Recorded
Thermal Cycles	100X Thermal Cycles	Recorded
Shielding Effectiveness	Measure and Record Results	Recorded
CW Power	Measure and Record Results	Recorded
Connector Retention	Measure and Record Results	Recorded
X-ray	MIL-STD 202 Method 209	Recorded
DPA	Verification of Mechanical Integrity	Recorded
VSWR and Insertion Loss	Recorded Between Each Step Above	Pass

Summary: Cable and connectors individually all passed industry requirements outlined in MIL standards for group A and B tests. Cable assemblies successfully passed testing sequences.

How To Order

1	_	2	_	3	_	4	5
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1 Connector #1

SMS	SMA Male Straight	SMPFS	SMP Female Straight	SMPFR	SMP Female Right Angle
KMS	2.9mm Male Straight	MMS	2.4mm Male Straight	SMPMFS	SMPM Female Straight

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2 Cable *(fixed)*

065	SpaceNXT™ 065QT	100	SpaceNXT™ 100QT	160	SpaceNXT™ 160QT

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3 Length *(inches)*

36.0 Example: 36 in.

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4 Connector #2

SMS	SMA Male Straight	KMS	2.9mm Male Straight	SMPFS	SMP Female Straight

5 Assembly Option

+/-2.8ps	+/-2.8ps Phase Matched Electrical Length	_	None

Worldwide Support

Connectors

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Technical Support
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