DKT COMEGA

distribution passives signia series

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about dkt

DKT develops optical and coaxial products for professional broadband operators and solution providers.

The company was founded in 1977. Its headquarters are in Denmark and it has subsidiaries in Sweden, Finland and China. As a dynamic and innovative company, its ambition is to deliver the best and broadest selection of quality products and advice when it comes to optical, coaxial and HFC broadband networks.

With thirtyfive years of experience in coaxial broadband networks, DKT offers a comprehensive product portfolio, making it a strong partner for broadband operators. The solid experience gained by DKT is reflected in its products, these being characterized by high quality, top performance and easy installation.

DKT mission

DKT mission is to be a strong partner in network products for European broadband operators and solution providers. Based on know-how and natural enthusiasm, good ideas are developed into successful products. This is done together with the customer, who furthermore appreciates the broad product range, the attractive quality/price level and the unique customized products. DKT's flexibility and proactive attitude assists in optimizing broadband networks.

For further information please contact DKT at sales@dktcomega.com

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DKT COMEGA

product introduction

Introduction

The demand for improved signal quality in coaxial networks is increasing, especially as subscribers expect triple play in broadband services. With many years of experience, DKT has a proven track record in the development and production of high performance broadband passives. The sum of experience and know-how combined with close cooperation with top operators has resulted in a state-of-the-art series of passives, the Signia line with nickel-tin brass connectors.

With increased competition from fiber optical networks, it is nescessary to optimize the existing networks to be able to provide higher internetspeed, and increase competetiveness, and reduce cost of maintenance. These difficulties are not existing in optical networks for example because connectors do not loosen over time, therefore reducing OPEX in coaxial networks is crucial for staying competitive.

The Signia line approaches and solves these problems by reducing the need for service visits to retighten connectors every now and then. This is achieved by crafting the connectors in the same metal and with the same alloy as the connectors used in CATV networks. Additionally the new spring mechanism that clamps around the inner conductor securing the connection even after continuously having inserted large inner conductors the spring still holds a firm grib even around slim inner conductors, this allows for maximum flexibility service without having to replace the units, due to wear and tear.

So in short, what does this mean?

Better economy due to reduced maintance cost/OPEX

- No maintenance required on distrution passives
- No interference due to return loss
- No noise due to surge pulses
- No replacement due to corrosion
- Faster installation with all ports facing the same direction

Better economy due to reduced depreciation

- Long lifetime due to both mechanical and electrical design

Increased service level and higher level of customer satisfaction

- Stable services. Happy customers and reduced churn as a result

Increased revenue and ARPU

- Due to increased network performance more services can be delivered to end customers

World class electrical and mechanical performance!

All DKTCOMEGA's products comply with RoHS and WEEE directives.

For more information visit:
www.rohsguide.com

RoHS 2002/95/EC

WEEE

DKTCOMEGA follow the recommendations by CENELEC.

For more information visit:
www.cenelec.eu

CE approved

DKT COMEGA

Advantages

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feature introduction

Introduction

The Signia series has been designed from scratch exploiting the many years of experience and know-how which has been generated in our value chain, from subcontractors as well as operators/service providers. The purpose of the section below is to give conclusions regarding what all these measurements, and features means in running a cable TV network. All the details for how this information was obtained can be found in the back.

Electrical overview

By using the Signia series of distribution passives it is possible to operate the network with a lower signal level, ultimately this will mean longer distance between each amplifier and thus reducing the cost of establishing and running the network. This can only be achieved due to several new features introduced in the Signia series.

With the very high return loss, there is no need for preventive boosting of the signal level to suppress problems with noise and interference. The insertion loss following the attenuation curve of coaxial cable, the extremely flat tap loss, a very high isolation between outputs and excellent return loss levels, are all milestones.

Furthermore the AC block and the resistance to passive intermodulation, and sturdy construction if exposed to high surge pulses provides excellent resistance and makes the networks even stronger/ more reliable.

DKT are therefore proud to present a series of products which increases network performance & lifetime as well as makes network design & installation easier than ever.

Mechanical overview

The mechanical construction is extremely durable and is without comparisson the best DKT has ever designed, this will mean no impact on the mechanical performance from corrosion and the general environment, thus requiring no maintanance throughtout it's entire lifespan.

Normally distribution passives require:

- Annual tightening of connectors to ensure connection
- Replacement in case of flooded installation site
- Stable environment

The Signia series requires none of the above. This will eventually will lead to better options when choosing installation site, and lower cost of establishing as well as maintenance of the cable network.

Enviromental test overview

The Signia series of distribution passives can be mounted as any operator see fit, without considering how it will affect the network quality, not even in the long run. It is thus not absolutely necessary to use special cabinets to ward of salt, water and high temperatures.

After having tested Signia the conclusion is that not even the most hostile environments have any particular impact on either the mechanical or electrical performance of the unit.

The Signia series simply does not care about where it's mounted, it just works!

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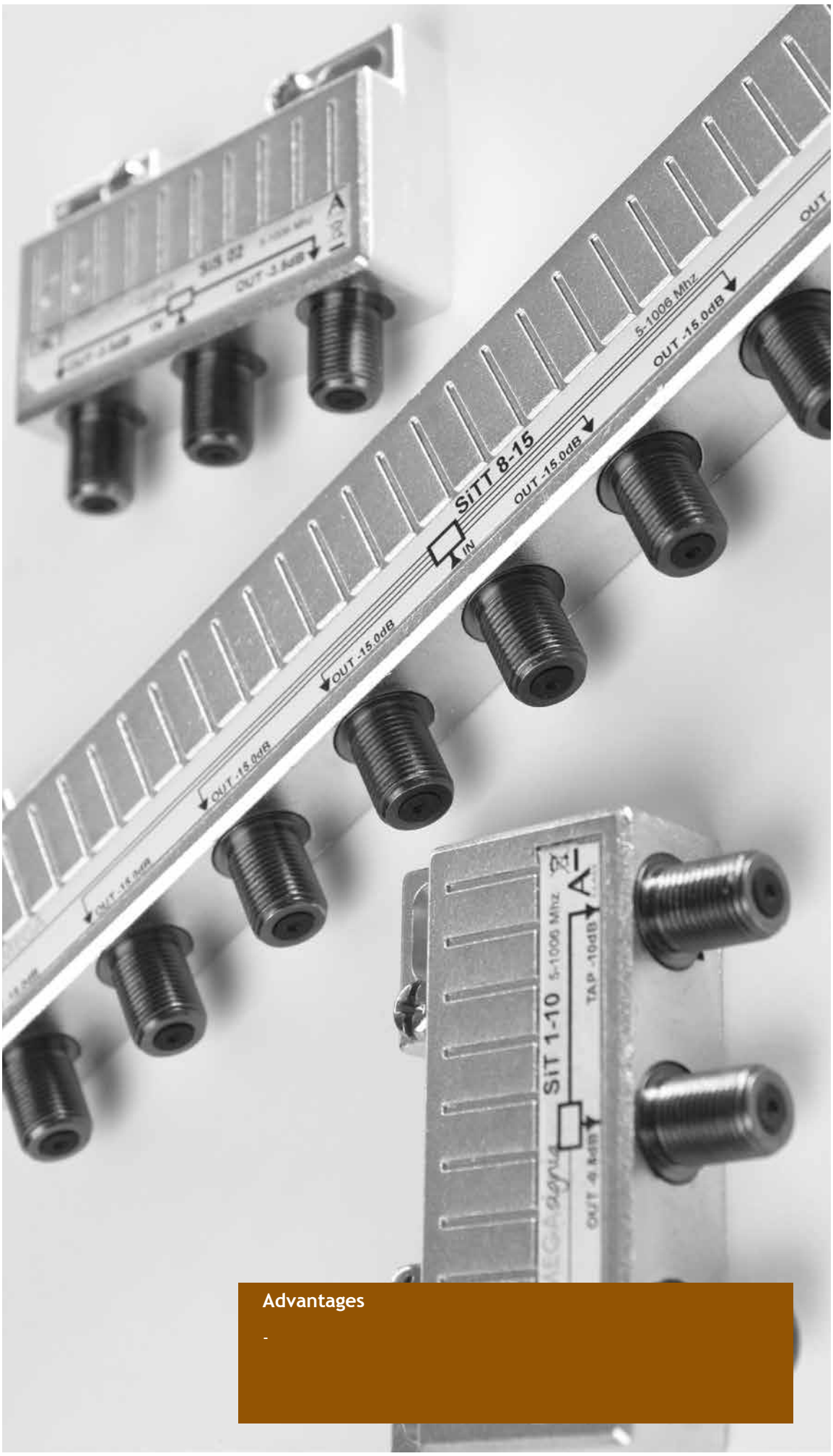

Advantages

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signia taps

Product information

The Signia tap series follows the tradition of the Master series. With reliable performance and superb specifications, this superior and comprehensive series includes 1-way through to 8-way taps with various attenuations. This optimizes network design options and efficiency.

A lightweight design allows easy handling. Mounting spacers that are easily snapped on and off provide a choice for spacing underneath the taps allowing a more flexible installation. There is easy access to F-connectors which are mounted on the side. A unique construction of the female F-connector ensures secure connection to the inner conductor of the male connector, and furthermore the alloy ensures minimum corrosion. This dramatically reduces the likelihood of signal dropout and the subsequent need for network troubleshooting.

The tap name, frequency range and all connectors are clearly marked with rugged labels.

Technical features

- ✓ Class A (page 16)
- ✓ AC Block (page 16)
- ✓ Resistant to passive intermodulation (page 16)
- ✓ Surge pulse protection (page 16)
- ✓ Protected against dust & humidity (page 17)
- ✓ Corrosion-free (page 17)

Model overview

Type	Product name	Tap loss 5-1006MHz	Through loss 5-1006MHz
1-way TAP 6 dB	SiT 1-6	6,5	2,2
1-way TAP 8 dB	SiT 1-8	8,5	1,6
1-way TAP 10 dB	SiT 1-10	10,0	0,8
1-way TAP 12 dB	SiT 1-12	12,0	0,7
1-way TAP 16 dB	SiT 1-16	16,0	0,5
1-way TAP 20 dB	SiT 1-20	20,0	0,5
1-way TAP 24 dB	SiT 1-24	24,0	0,5
1-way TAP 30 dB	SiT 1-30	30,0	0,5
2-way TAP 8 dB	SiT 2-8	8,5	3,3
2-way TAP 12 dB	SiT 2-12	12,3	1,3
2-way TAP 16 dB	SiT 2-16	16,0	1,1
2-way TAP 20 dB	SiT 2-20	20,0	0,9
2-way TAP 24 dB	SiT 2-24	24,0	0,9
3-way TAP 16 dB	SiT 3-16	16,0	2,1
3-way TAP 20 dB	SiT 3-20	20,0	1,4
4-way TAP 12 dB	SiT 4-12	12,3	3,6
4-way TAP 16 dB	SiT 4-16	16,0	2,3
4-way TAP 20 dB	SiT 4-20	20,0	1,6
4-way TAP 24 dB	SiT 4-20	24,0	1,2
4-way TAP terminated 12 dB*	SiTT 4-12	12,0	-
6-way TAP terminated 14 dB*	SiT 6-14	14,0	-
8-way TAP terminated 15 dB*	SiTT 8-15	15,0	-

* Internally terminated, no OUT port

Standardization of Signia Taps

The Signia tap series complies with a range of standards, below are some of the most relevant for cable TV networks.

Description	Name	Conformity
Dry Heat	EN60068-2-2	✓
Change of temperature	EN60068-2-14	✓
Return loss	EN60728-4	Grade 1+
Screening effectiveness	EN 50083-2	Class A
Isolation (TAP-TAP)	EN 60728-4	✓

Description	Name	Conformity
Protection against instrusion	IEC 60529	IP67
Damp Heat	EN60068-2-30	✓
Salt Mist	EN60068-2-11	✓
Vibration	EN60068-2-6	✓

+ 5-10 MHz: >20 dB

A CLASS

1-way taps

Type	Tap loss IN-TAP (dB) Frequency range (MHz)		Insertion loss IN-OUT (dB) Frequency range (MHz)				Isolation TAP-OUT (dB) Frequency range (MHz)				Item no.
	5-10	10-1006	5-10	10-470	470-862	862-1006	5-10	10-470	470-862	862-1006	
SiT 1-6	7.2 (± 0.4)	6.6 (± 0.4)	2.4	2.2	2.7	2.9	26	30	26	25	48106
SiT 1-8	8.7 (± 0.4)	8.4 (± 0.4)	2.1	1.7	2.0	2.3	34	35	33	30	48108
SiT 1-10	10.3 (± 0.4)	10.0 (± 0.3)	1.4	1.1	1.4	1.8	25	28	27	23	48110
SiT 1-12	12.2 (± 0.4)	12.0 (± 0.3)	1.1	0.9	1.1	1.4	38	48	27	22	48112
SiT 1-16	16.1 (± 0.4)	16.0 (± 0.3)	0.9	0.6	0.8	1.1	43	35	29	25	48116
SiT 1-20	20.0 (± 0.4)	20.0 (± 0.3)	0.9	0.6	0.8	1.1	45	41	34	29	48120
SiT 1-24	24.0 (± 0.4)	24.0 (± 0.3)	0.9	0.6	0.8	1.1	48	44	37	33	48124
SiT 1-30	30.1 (± 0.4)	30.1 (± 0.3)	0.9	0.6	0.8	1.1	54	51	50	43	48130

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 65 x 50 x 16 mm
Weight: 86 g

2-way taps

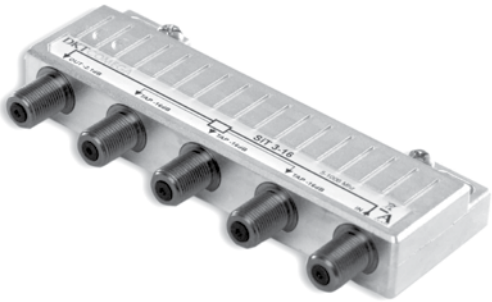
Type	Tap loss IN-TAP (dB) Frequency range (MHz)		Insertion loss IN-OUT (dB) Frequency range (MHz)				Isolation TAP-OUT (dB) Frequency range (MHz)				Isolation TAP-TAP (dB) Frequency range (MHz)				Item no.
	5-10	10-1006	5-10	10-470	470-862	862-1006	5-10	10-470	470-862	862-1006	5-10	10-470	470-862	862-1006	
SiT 2-8	8.6 (± 0.6)	8.3 (± 0.5)	4.7	4.2	4.7	5.6	30	32	28	31	41	42	38	33	48208
SiT 2-12	12.6 (± 0.4)	**12.3** (± 0.4)	1.7	1.1	1.6	1.9	33	37	30	24	46	45	36	33	48212
SiT 2-16	16.4 (± 0.4)	**16.3** (± 0.4)	1.5	1.0	1.4	1.8	40	44	31	27	52	59	44	38	48216
SiT 2-20	20.1 (± 0.4)	**20.0** (± 0.4)	1.5	1.0	1.4	1.8	41	43	32	28	60	70	50	43	48220
SiT 2-24	24.2 (± 0.4)	**24.1** (± 0.4)	1.5	1.0	1.4	1.8	44	47	34	29	67	71	59	50	48224

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 109 x 50 x 16 mm
Weight: 118 g

3-way taps

Type	Tap loss IN-TAP (dB) Frequency range (MHz)		Insertion loss IN-OUT (dB) Frequency range (MHz)				Isolation TAP-OUT (dB) Frequency range (MHz)				Isolation TAP-TAP (dB) Frequency range (MHz)				Item no.
	5-10	10-1006	5-10	10-470	470-862	862-1006	5-10	10-470	470-862	862-1006	5-10	10-470	470-862	862-1006	
SiT 3-16	16.4 (± 0.4)	16.1 (± 0.4)	2.8	2.0	2.1	2.4	33	38	34	27	49	56	46	40	48316
SiT 3-20	20.4 (± 0.4)	**19.9** (± 0.4)	1.8	1.2	1.6	1.9	40	41	32	30	60	58	45	42	48320

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 109 x 50 x 16 mm
Weight: 122 g



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A CLASS

4-way taps

Type	Tap loss IN-TAP (dB) *Frequency range (MHz)*		Insertion loss IN-OUT (dB) *Frequency range (MHz)*				Isolation TAP-OUT (dB) *Frequency range (MHz)*				Isolation TAP-TAP (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	
SiT 4-12	12.8 (± 0.4)	**12.4** (± 0.4)	4.3	3.6	4.3	5.0	33	38	30	29	41	48	40	40	48412
SiT 4-16	16.4 (± 0.4)	**16.0** (± 0.4)	3.6	2.8	2.8	3.0	36	38	32	26	48	54	44	38	48416
SiT 4-20	20.1 (± 0.4)	**20.0** (± 0.4)	2.2	1.5	1.8	2.3	40	37	30	27	57	56	46	44	48420
SiT 4-24	24.3 (± 0.4)	**24.2** (± 0.4)	2.1	1.6	1.7	2.1	43	44	34	33	66	68	55	52	48424
SiTT 4-12*	12.7 (± 0.5)	**12.2** (± 0.4)	-	-	-	-	-	-	-	-	40	47	42	42	48411

*Internally terminated, no OUT port

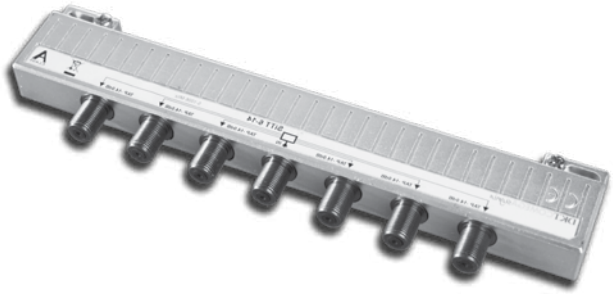
Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 196 x 50 x 16 mm
Weight: 199 g

6-way taps

Type	Tap loss IN-TAP (dB) *Frequency range (MHz)*		Insertion loss IN-OUT (dB) *Frequency range (MHz)*				Isolation TAP-OUT (dB) *Frequency range (MHz)*				Isolation TAP-TAP (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	
SiT 6-14*	xx (± 0.5)	xx (± 0.25)	-	-	-	-	-	-	-	-	xx	xx	xx	xx	48614

*Internally terminated, no OUT port

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 196 x 50 x 16 mm
Weight: 207 g



8-way taps

Type	Tap loss IN-TAP (dB) *Frequency range (MHz)*		Insertion loss IN-OUT (dB) *Frequency range (MHz)*				Isolation TAP-OUT (dB) *Frequency range (MHz)*				Isolation TAP-TAP (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*470-862*	*862-1006*	
SiT 8-15*	15.6 (± 0.5)	15.3 (± 0.5)	-	-	-	-	-	-	-	-	50	53	54	46	48815

*Internally terminated, no OUT port

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 196 x 50 x 16 mm
Weight: 214 g

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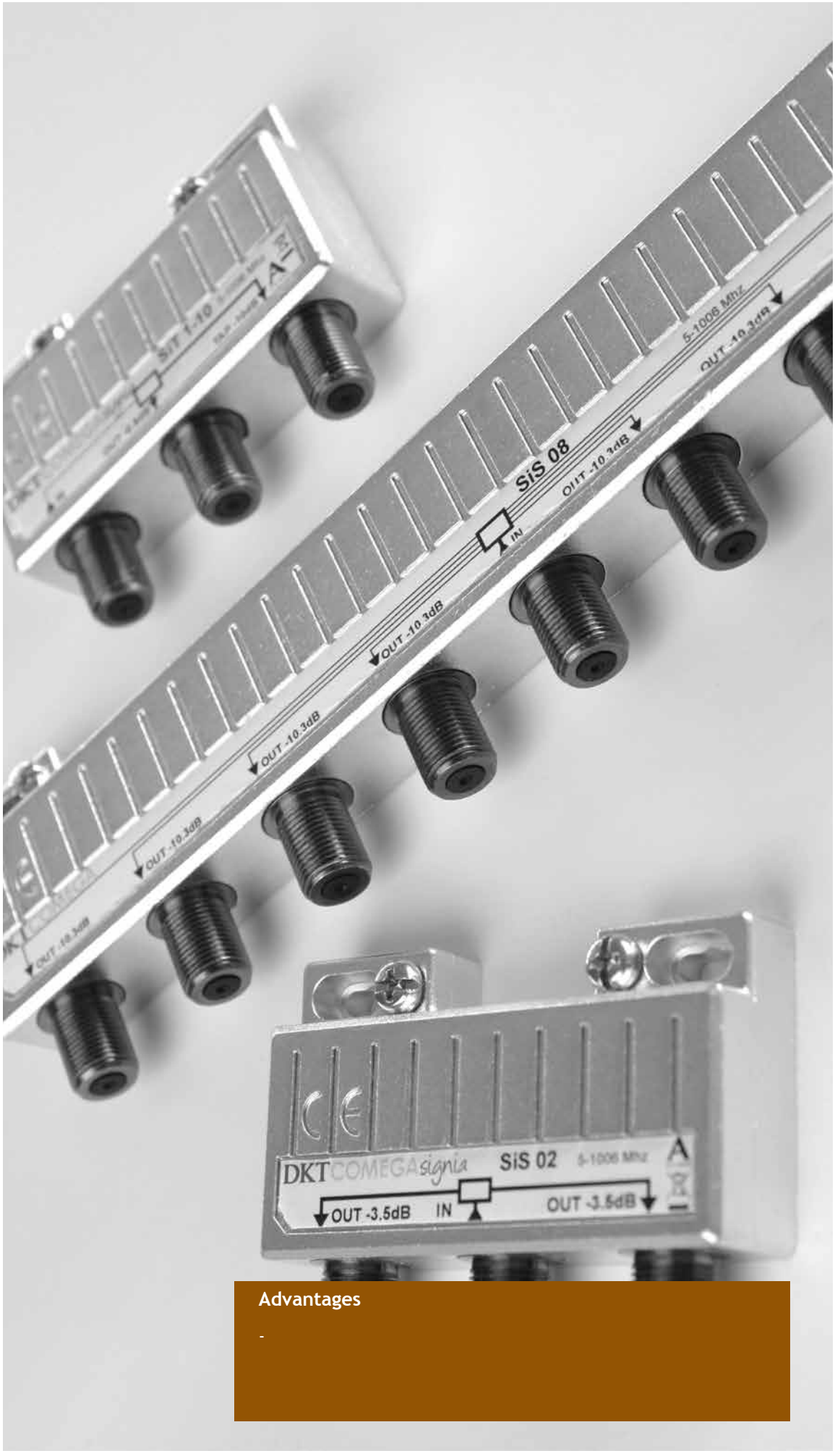

Advantages

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signia splitters

Product information

The Signia splitter series follows the tradition of the Master series. With reliable performance and superb specifications, this superior and comprehensive series includes 1-way through to 8-way splitters with various attenuations. This optimizes network design options and efficiency.

A lightweight design allows easy handling. Mounting spacers that are easily snapped on and off provide a choice for spacing underneath the taps allowing a more flexible installation. There is easy access to F-connectors which are mounted on the side. A unique construction of the female F-connector ensures secure connection to the inner conductor of the male connector, and furthermore the alloy ensures minimum corrosion. This dramatically reduces the likelihood of signal dropout and the subsequent need for network troubleshooting.

The tap name, frequency range and all connectors are clearly marked with rugged labels.

Technical features

- ✓ Class A (page 16)
- ✓ AC Block (page 16)
- ✓ Resistant to passive intermodulation (page 16)
- ✓ Surge pulse protection (page 16)
- ✓ Protected against dust & humidity (page 17)
- ✓ Corrosion-free (page 17)

Model overview

Type	Product name	Splitter loss 5-1006Mhz
2-way splitter	SiS 02	3,4
3-way splitter	SiS 03	5,4
3-way splitter asymmetric	SiS 03A	3,4 / 6,8
4-way splitter	SiS 04	6,8
6-way splitter	SiS 06	8,6
8-way splitter	SiS 08	10,3

Standardization of Signia Splitters

The Signia splitter series complies with a range of standards, below are some of the most relevant for cable TV networks.

Description	Name	Conformity
Dry Heat	EN60068-2-2	✓
Change of temperature	EN60068-2-14	✓
Return loss	EN60728-4	Grade 1*
Screening effectiveness	EN 50083-2	Class A
Isolation (TAP-TAP)	EN 60728-4	✓

Description	Name	Conformity
Protection against instrusion	IEC 60529	IP67
Damp Heat	EN60068-2-30	✓
Salt Mist	EN60068-2-11	✓
Vibration	EN60068-2-6	✓

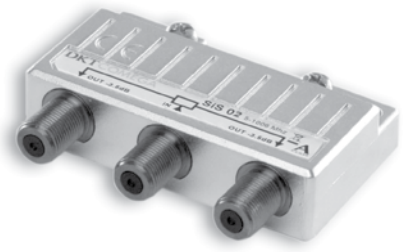
* 5-10 MHz: >20 dB

A CLASS

2-way splitters

Type	Insertion loss IN-OUT (dB ± 0.5) *Frequency range (MHz)*				Isolation OUT-OUT (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*600-862*	*862-1006*	
SiS 02	3.1	3.2	3.5	3.9	32	36	33	28	48002

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 65 x 50 x 16 mm
Weight: 86 g



3-way splitters

Type	Insertion loss IN-OUT (dB ± 0.5) *Frequency range (MHz)*				Isolation OUT-OUT (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*600-862*	*862-1006*	
SiS 03	5.0	5.1	5.5	6.1	28	36	26	28	48003
SiS 03A	3.2 6.3	3.2 6.4	3.5 6.5	3.8 7.0	34	34	40	30	48005

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 109 x 50 x 16 mm
Weight: 118 g

4-way splitters

Type	Insertion loss IN-OUT (dB ± 0.5) *Frequency range (MHz)*				Isolation OUT-OUT (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*600-862*	*862-1006*	
SiS 04	6.4	6.4	6.8	7.5	34	39	29	31	48004

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 109 x 50 x 16 mm
Weight: 122 g

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6-way splitters

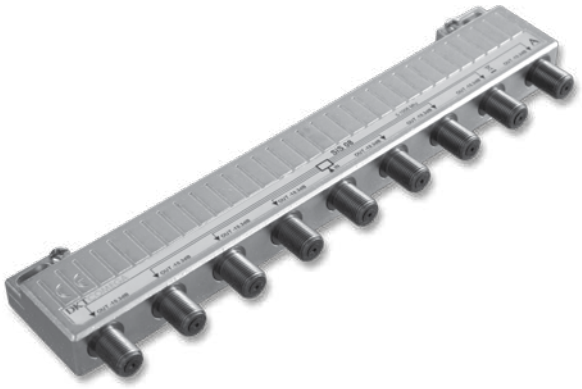
Type	Insertion loss IN-OUT (dB ± 0.5) *Frequency range (MHz)*				Isolation OUT-OUT (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*600-862*	*862-1006*	
SiS 06	8.6	8.8	9.5	10.5	36	36	31	30	48006

Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 196 x 50 x 16 mm
Weight: 207 g

8-way splitters

Type	Insertion loss IN-OUT (dB ± 0.5) *Frequency range (MHz)*				Isolation OUT-OUT (dB) *Frequency range (MHz)*				Item no.
	5-10	*10-470*	*470-862*	*862-1006*	*5-10*	*10-470*	*600-862*	*862-1006*	
SiS 08	9.8	9.9	10.1	11.2	38	46	32	31	48008

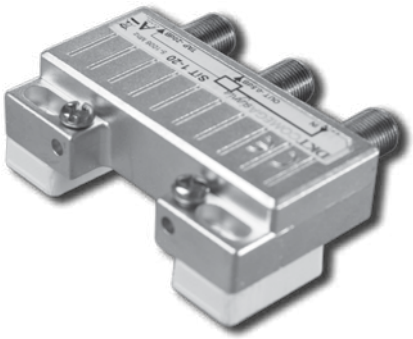
Return loss: Grade 1
5-10 MHz: > 20 dB
Connectors: F-Female
Dimensions: 196 x 50 x 16 mm
Weight: 214 g



accessories for signia taps and splitters

All Signia taps & splitters have included a set of spacers to allow easy installation of cables underneath the units, with a height of 7 mm it allows space for the most commonly used installation cables.

The spacers are easily snapped on if that extra space is desired when installing.



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electrical features

Frequency range

The Signia products are designed to operate within the frequency range specified in DOCSIS 3.0 (5-1006 MHz).

Insertion loss

Insertion loss indicates how much of the signal strength is lost by leading the signal from IN to OUT. Signia is designed to provide the least possible insertion loss. The curve is optimized to be as flat as possible, to allow for high consistency in the signal passing through.

The Signia series have been designed to simulate the attenuation of coaxial cable over the frequency range, there by making planning of the networks easier, and allows for easy calculating of equalizing in the amplifier.

Tap loss

Tap loss indicates how much of the signal strength is lost by leading the signal from IN to TAP. Some physical conditions makes it possible to further enhance tap loss in comparison to insertion loss. Which leads to a very flat curve for tap loss.

The Signia series are on the tap loss designed to be as flat as possible, with a very small margin variyng only ±0.25 dB over the entire frequency range.

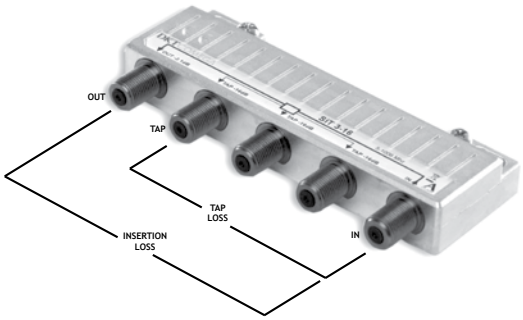
Isolation

Isolation is also an important factor, it indicates how effectively the unit negates interference from one output to another. There are 3 types of measurements, OUT-OUT, which is relevant for splitters, TAP-TAP and TAP-OUT which are relevant to taps.

A high isolation between TAP-TAP means that noise from TAP1 does not interfere with signals or TAP2, and services as well as maintenance is optimized.

The Signia TAP-TAP isolation is so high that it complies with EN 60728-4 requirements for isolation between two subscribers, without having to add any other equipment for additional isolation.

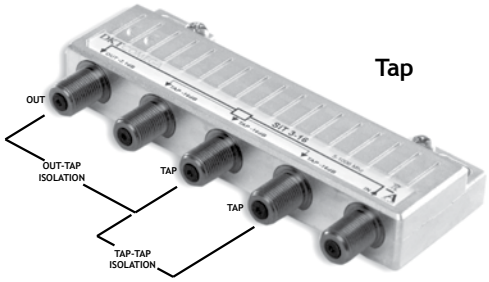
Loss measurement



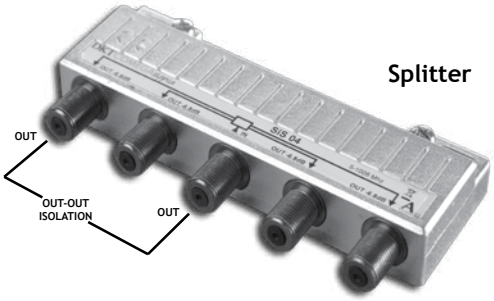
A signal is applied to the IN connector. For Tap Loss the output is measured on the other TAP connectors. For Insertion Loss the output is measured on the OUT connector.

Isolation measurement

Tap



Splitter



For isolation measurements a signal is applied to a connector and the output is measured on the other connectors.

Return loss

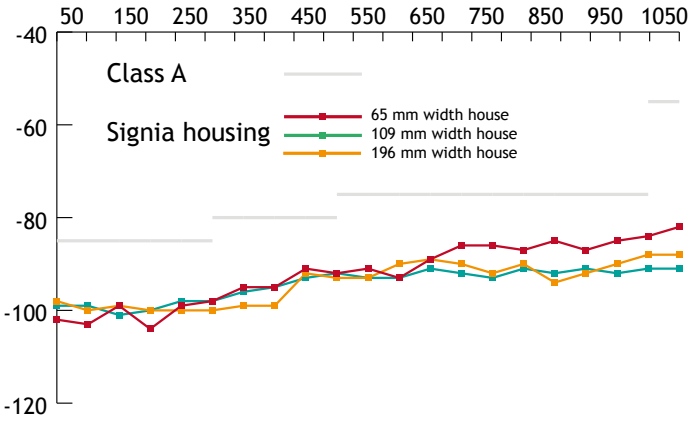
Return loss is the measurement of how much of the signal is being reflected backwards in the system. All reflections in the network are not desired and the return loss should thus be as high as possible, and in a perfect network the return loss is indefinately high.

A return loss of 3 dB means that 50% of the signal is reflected back to the source, and with a 20 dB return loss its only 1%.

The Signia line is designed for maximum return loss, following the standardization of EN60728-4, where we achieve more than 20 dB in the entire frequency range which fullfills the requirements for Grade 1 compliance. This provides a higher safety margin when projecting.

Screening effectiveness/efficiency/RFI

Screening effectiveness is the products ability to shield the internal print circuits from exterior electromagnetic interference and vice versa. The disturbance may interrupt, obstruct, or otherwise degrade or limit the effective performance of the circuit. These effects can range from a simple degradation of data to a total loss of data. The source may be any object, artificial or natural, that carries rapidly changing electrical currents, such as mobile broadband signals.



With an increasing amount of interfering signals in the surroundings, screening effectiveness is a more crucial matter than ever. With a screening effectiveness exceeding the requirements for Class A, the installation have a very high level of resistance to interference, which leads to less pixelation and signal outage. The graph shows the screening effectiveness measured according to EN50083-2 in all of the Signia housings. For example, in cases with LTE/4G signals there will be no problems if the Signia series is used.

High voltage blocking (AC)

Built in surge protection against AC power. This eliminates problems with TVs discharging currents or possibly current surges from the network into the installation with the possibility damaging sensitive equipment.

On all port a 1kV capacitor is installed; hence all devices are capable of withstanding up to 2kV between the inner conductors of any connection cables.

Passive intermodulation

Passive intermodulation can occur in passive components such as taps and splitters, if the ferrite cores are saturated by too high signal levels. In such a situation the ferrite core becomes permanently magnetized and thereby decline permanently in linearity.

The Signia series have been designed with ferrite cores with a very high saturation threshold, thereby providing resistance to passive intermodulation.

Surge pulse protection

Surge pulses are closely related to passive intermodulation, and is the measurement on the level of intermodulation after high pulses of signal level into the unit.

The surge pulses are measured with two carriers 120 dBµV at 50 and 55 MHz OUT-IN. The level of resulting intermodulation product at 105MHz is recorded. For the two way splitter, SiS 02 the following results are obtained:

No surge:	-6 dBµV at 105MHz -> PIM 126dB
Surge 10 pulses at 25V:	16 dBµV at 105MHz -> PIM 104dB
Surge 1 pulse at 1kV:	19 dBµV at 105MHz -> PIM 101dB

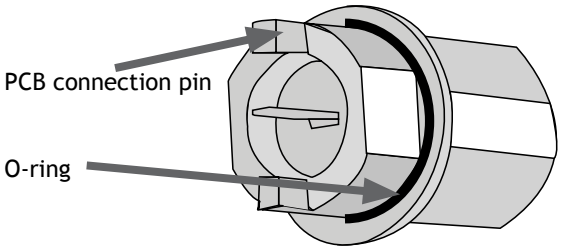
The recorded intermodulation signal at 105MHz after a sequence of 10 surge pulses at 25V and 1 surge pulse at 1kV. The level of the intermodulation signal is 18.65 dBµV.

The Signia series is constructed very sturdy when handling surge pulses, and it will take very large surges of signal before deteriorating the unit to a degree where the performance will decrease.

mechanical features

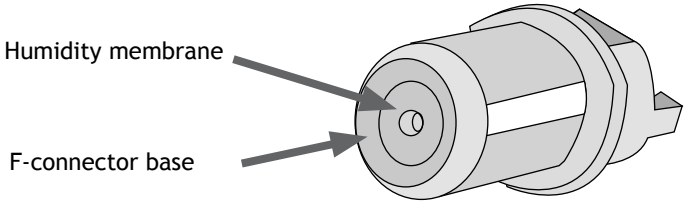
Enclosure

The Signia housing are cast in a zinc alloy, a backplate is sealed with a strong glue. The F-connector is fitted into DD hole in the housing and it is sealed with an O-ring. Finally the F-connector is designed with a rubber humidity membrane, which is perforated first when the product is installed. All these will make sure no water or dust will enter the housing.



To ensure potential corrosion over a long period of time have no effect on the electrical performance, the outershield of the F-connector is soldered directly onto the printed circiut board (PCB). Normally the outer shield of the F-connector is soldered to the housing and from there connected to the PCB, but as the housing can be more vulnerable to electrolytical corrosion as its made from zinc and not pure brass. If the housing was used as connection between the connected cables shield, and oxidises as part of the corrosion, it can act as a semiconductor, that will degrade the signal quality.

The Signia housing has been tested under 1m water for 30min, corresponding to the IPx7 requirements. No water penetrated into the housing with the glue sealing, so the sealing between the back plate and the housing, and the sealing between the F-connector and the housing is water tight to at least 1m.



Based on these results it is concluded that the Signia housing it-self is IP class 64 (dust and dripping water tight). With cables and/or terminators mounted on all ports it is concluded that the Signia housing is IP class 67.

F-connector

The Signia series F-connector follow the dimensions as standardized in ANSI/SCTE 01 2006, the connector is made of pure brass which is the same metal as professionel connectors. Brass is a very stable metal compared to zinc which is usually used for casting F-connectors. This is especially important for components that often have filters swapped.

Furthermore the connectors are plated with a nickel-tin alloy, ensuring a minimum corrosion over time, reducing the need to retighten connectors across the cabe network to near zero for the products lifespan. This is a common cause of errors in cable network and many hours per year can thus be saved.

Clamping force

The Clamp-claw inside the connector is made with a phosphor bronze alloy making it very flexible allowing insertion of small inner conductors even after large inner conductors have been fitted without loss of electrical performance, phosphor bronze have been chosen over beryllium copper because beryllium-containing alloys create an inhalation hazard during manufacturing due to their toxic properties. Furthermore the clamp-claw is plated with the same nickel-tin mixture as the F-connector.

After the insertion of an inner conductor with a diameter of 1.3mm 5 times the F-connector is capable of carrying an inner conductor with a diameter of 1.0mm and with a weight of 250g.

After the insertion of an inner conductor with a diameter of 1.2mm 3 times the F-connector is capable of carrying an inner conductor with a diameter of 0.64mm and with a weight of 34.5g.

Cable tightening torque

DKT have tested the Signia passives up to 11 Nm without observering any damage to the housing or connector. Outdoor female “F” ports shall be able to withstand a minimum tightening torque of 4.5Nm (40 in.-lb.), without damage when measured per IPS TP 253. This is achieved as a combination in the mechanical design in both the sturdiness of pure brass and DD shape of the connector insert.

DKT COMEGA

Advantages

- Environmentally friendly materials (RoHS & WEEE compliant)
- Protected against AC surges
- Seamlessly maintenance
- Superb screening effectiveness with negligible RFI

environmental tests

Introduction

Taken into consideration how much effort there's been put into designing the ultimate series of distribution passives, it has been nescessary to accompany the excellent specifications with environmental tests of the mechanical and eletrical features, to prove the durability of both the exterior and interior of the Signia. Below are the test results, and the conclusion is that Signia suffers no crucial deterioration.

Salt mist

The Signia housing was exposed to salt mist according to EN60068-2-11:

- Concentration 5%
- Temperature +35 °C
- Exposure time 16 hours
- Terminators are mounted on all F-connectors

No residuals from salt are observed inside the housing after this test. On the outside of the housing deposit of salt is observed, but not on the F-connectors.

In conclusion the electrical parameters are unaffected by the salt mist exposure.

Vibration

Some Signia samples were exposed to a sequence of Vibration Test according to EN60068-2-6:

- Frequency range 10-55 Hz
- Sweep rate 1 octave per minute
- Sweep cycles 10
- Displacement amplitude 0.75mm
- 3 Directions

For the insertion loss an increase of maximum 0.5dB is observed, only at the highest frequencies.

Also, the return loss and the isolation change after the test sequence, but in all cases the specifications are fulfilled.

Dry heat

Some Signia samples were exposed to a sequence of Dry Heat Test according to EN60068-2-2:

- Temperature +70°C
- Time 16 hours
- Relative humidity <30%

For the insertion loss an increase of maximum 0.5dB is observed, only at the highest frequencies. Return loss and the isolation change after the test sequence, but in all cases the specifications are fulfilled.

Change of temperature

Some Signia samples were exposed to Change of Temperature according to EN60068-2-14:

- Low temperature -15°C
- High temperature +55°C
- Rate of temperature change 1°C per minute
- Number of cycles 5
- Stable time at low and high temperature 3 hours

All of the electrical parameters are still within the specifications after the test.

Damp heat

Some Signia samples were exposed to Damp Heat according to EN60068-2-30:

- Low temperature +25°C
- High temperature +40°C
- Number of cycles 21
- Stable time at low and high temperature 12 hours
- Relative humidity >95%

All of the electrical parameters are still within the specifications after the test.

DKT COMEGA

Advantages

- Superior electrical and mechanical performance
- Best in class return on investment
- Surge pulse protection, e.g. from the return path
- Extremely long lifetime

useful terms and standards

DOCSIS

An international standard developed by major companies to define the communication and operation support interface requirements for data over cable systems. DOCSIS 1.0 was issued in March 1997, DOCSIS 2.0 in December 2001 and DOCSIS 3.0 in August 2006. With DOCSIS 3.0 the operating frequency range was expanded from 5-862 MHz to 5-1006 MHz, allowing even higher data rates to be transmitted.

Usually 5-15 MHz are not utilized for upstream transmissions, but are included in the standard, to allow buffering on the products so they are fully operational at 15 MHz, occasionally the 5-15 MHz band is used for measurement signals and other operator tools.

IP

As defined in international standard IEC 60529, IP Code classifies and rates the degrees of protection provided against the intrusion of solid objects (including body parts like hands and fingers), dust, accidental contact, and water in mechanical casings and with electrical enclosures.

The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.

Level	Object size protected against	Effective against
0	–	No protection against contact and ingress of objects
1	>50 mm	Any large surface of the body, such as the back of a hand, but no protection against deliberate contact with a body part
2	>12.5 mm	Fingers or similar objects
3	>2.5 mm	Tools, thick wires, etc.
4	>1 mm	Most wires, screws, etc.
5	Dust protected	Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satis-factory operation of the equipment; complete protection against contact
6	Dust tight	No ingress of dust; complete protection against contact

The second digit indicates protection of the equipment inside the enclosure against harmful ingress of water.

Level	Protected against	Testing for	Details
0	Not protected	–	–
1	Dripping water	Dripping water (vertically falling drops) shall have no harmful effect.	Test duration: 10 minutes Water equivalent to 1mm rainfall per minute
2	Dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.	Test duration: 10 minutes Water equivalent to 3mm rainfall per minute
3	Spraying water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.	Test duration: 5 minutes Water volume: 0.7 litres per minute Pressure: 80-100 kN/m²
4	Splashing water	Water splashing against the enclosure from any direction shall have no harmful effect.	Test duration: 5 minutes Water volume: 10 litres per minute Pressure: 80-100 kN/m²
5	Water jets	Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.	Test duration: at least 3 minutes Water volume: 12.5 litres per minute Pressure: 30 kN/m² at distance of 3m
6	Powerful water jets	Water projected in powerful jets (12.5mm nozzle) against the enclosure from any direction shall have no harmful effects.	Test duration: at least 3 minutes Water volume: 100 litres per minute Pressure: 100 kN/m² at distance of 3m
7	Immersion up to 1 m	Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).	Test duration: 30 minutes Immersion at depth of 1m

SHIELDED AGAINST

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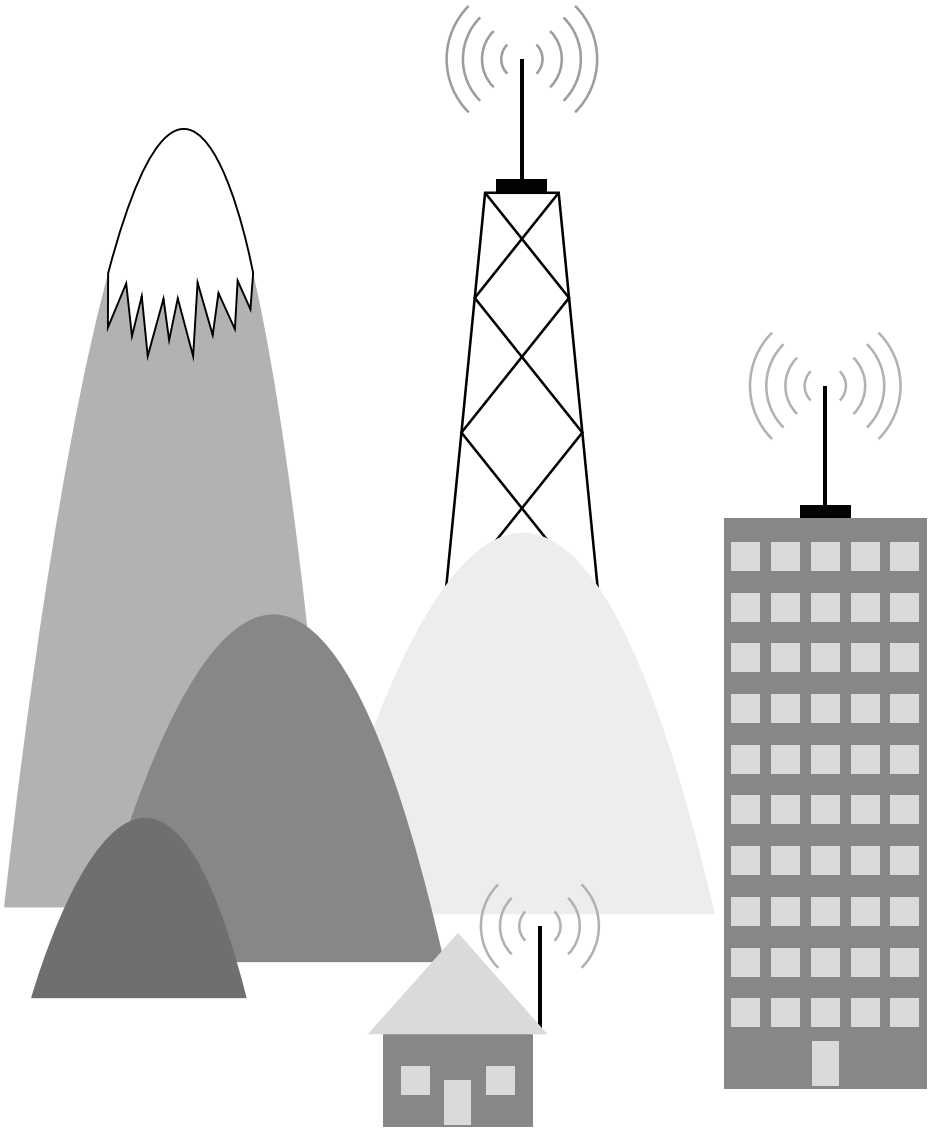
DKTCOMEGA



DKTCOMEGA

ANSI/SCTE 01 2006

A specification for F-type radio frequency connectors where the male pin or inner coaxial conductor may have a diameter from 0,51 to 1,63 mm.

EN 50083-2

A standard dealing with cabled distribution systems for television, sound and interactive multimedia signals using all applicable transmission media. Developed by CENELEC the European Committee for Electrotechnical Standardization.

Class A: 5-300 MHz ≥ 85 dB, 300-470 MHz ≥ 80 dB, 470-950 MHz ≥ 75 dB, 950-1006 MHz ≥ 55 dB

Class B: 5-470 MHz ≥ 75 dB, 470-950 MHz ≥ 65 dB, 950-1006 MHz ≥ 50 dB

EN60728-4

A standard covering Cable networks for television signals, sound signals and interactive services. Passive wideband equipment for coaxial cable networks. It supersedes EN50083-4. Among others it includes standardization of return loss.

Grade 1: 5-40 MHz ≥ 22 dB, 40-1006 MHz ≥ 22 dB ÷ 1.5 dB/oct. min. 14 dB

Grade 2: 5-40 MHz ≥ 18 dB, 40-1006 MHz ≥ 18 dB ÷ 1.5 dB/oct. min. 10 dB

Grade 3: 5-40 MHz ≥ 14 dB, 40-1006 MHz ≥ 14 dB ÷ 1.5 dB/oct. min. 10 dB

Triple Play

The transfer of voice, video and data over broadband networks.

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