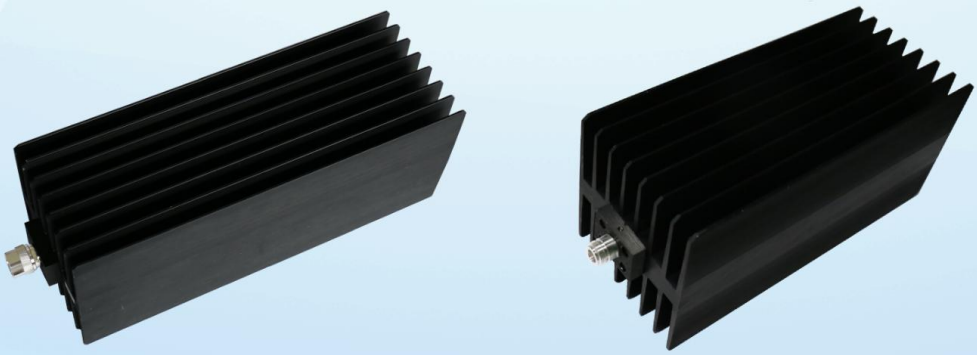
Fixed Attenuators



2019

Qualwave Inc.

About Qualwave Inc.

Qualwave Inc. is the top designer and manufacturer of microwave and millimeter wave products. We supply both active and passive components in a wide frequency range from DC to 110GHz all over the world. We provide a series of standard products to meet the needs of most customers. Mean while we customize products according to special requirements.

Like the name, quality is one of the key success factors. Our products are designed and manufactured with the latest tools and the best quality materials. Our engineers are keeping quality in mind through designing, manufacturing and testing. We are proud that many clients rated five stars in their feedback for product quality.

Our team comprised of professional microwave and millimeter wave engineers and specialized support staff. We take customer's needs as the first priority, as the success of our customers is also our success. We optimized design and manufacture processes by adding more flexibility, which helps to decrease lead time. Our management and service are customer oriented, ensuring to response to customer as soon as possible.

Products

ATTENUATORS	CABLE ASSEMBLIES	COAXIAL ADAPTERS	CIRCULATORS
DC-BLOCKS	DETECTORS	FILTERS	FREQUENCY SOURCES
PHASE SHIFTERS	POWER DIVIDERS/COMBINERS	SWITCHES	TERMINATIONS
COUPLERS	ISOLATORS		

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Table of Contents

QFA6701

DC~67GHz, 1W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~67GHz
Attenuation:	6, 10dB
Attenuation Accuracy:	±2dB
Impedance:	50Ω
VSWR:	2 max.
Average Power:	1W

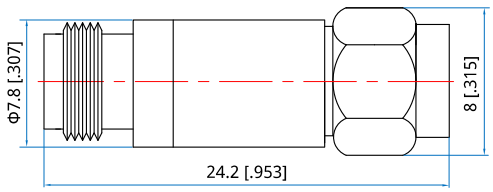
Mechanical

Length:	24.2mm
	0.953in
RF Connectors:	1.85mm

Environmental

Operating Temperature:	0~+50℃
Non-operating Temperature:	-20~+70℃

Outline Drawings



Unit: mm [in]
Tolerance: ±0.2mm [±0.008in]

How To Order

QFA6701-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
V - 1.85mm

Examples:
To order an attenuator, DC-67GHz, 1.85mm, 6dB attenuation, specify QFA6701-67-6-V.

QFA5002

DC~50GHz, 2W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~50GHz
Impedance:	50Ω
VSWR:	1.25 max.
Average Power[*1]:	2W@25°C max.
Attenuation Accuracy:	±0.6dB@0dB attenuation
	±0.8dB@1~30dB attenuation
	±1dB@40~60dB attenuation

[1] Derated linearly to 0.1W@120°C.

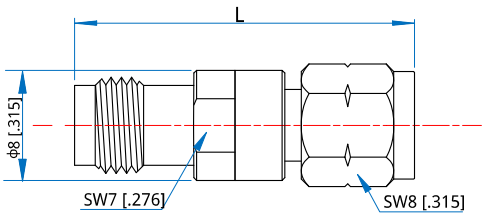
Mechanical

Size:	Φ8*L mm
	Φ0.315*L in
RF Connectors:	2.4mm Male
	2.4mm Female
Housing:	Passivated Stainless Steel
Center Conductor:	Gold Plated Beryllium Copper
Dielectric:	PEEK

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±0.2mm [±0.008in]
L: 24.64 [0.970] (attenuation: 0~30dB)
27.45 [1.081] (attenuation: 40~60dB)

How To Order

QFA5002-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Examples:
To order an attenuator, DC-50GHz, 2.4mm male to 2.4mm female, 3dB attenuation, specify QFA5002-50-3-2

Connector naming rules:
2 - 2.4mm

QFA4002

DC~40GHz, 2W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~40GHz
Attenuation:	1~30dB, 40dB
Impedance:	50Ω
Average Power[*1]:	2W@25℃ max.
Peak Power[*2]:	200W

[1] Derated linearly to 0.5W@125°C.
[2] Pulse width: 5us, duty cycle: 0.5%.

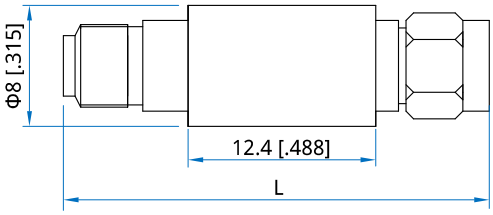
Mechanical

Size:	Φ8*L mm Φ0.315*L in
Weight:	5g
RF Connectors:	2.92mm Male 2.92mm Female
Housing:	Aluminum or Stainless steel
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85℃

Outline Drawings



Unit: mm [in]
Tolerance: ±0.2mm [±0.008in]
L: 31.4 [1.236] (attenuation: 1~20dB)
33 [1.299] (attenuation: 21~30dB)
47.6 [1.874] (attenuation: 40dB)

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~9	10~19	20~30	40	
DC~32	±0.8	±0.8	±1.0	±1.5	1.30
32~40	±1.0	±1.0	-1.0/+1.5	-1.0/+2.0	1.35, 1.40@40dB

How To Order

QFA4002-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Examples:
To order an attenuator, DC-32GHz, 2.92mm male to 2.92mm female, 3dB attenuation, specify QFA4002-32-3-K.

Connector naming rules:
K - 2.92mm

QFA4005

DC~40GHz, 5W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~40GHz
Attenuation:	1~10dB, 20dB, 30dB, 40dB
Impedance:	50Ω
Average Power*[1]:	5W@25℃ max.

[1] Derated linearly to 0.25W@120℃.

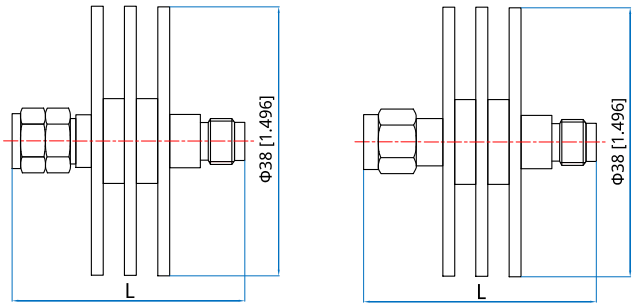
Mechanical

Size:	Φ38*L mm Φ1.496*L in
Weight:	25g typ.
RF Connectors:	2.4mm, 2.92mm
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85℃

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]
L: 31.4 [1.236] (attenuation: 1~20dB)
33 [1.299] (attenuation: 30dB)
47.6 [1.874] (attenuation: 40dB)

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~10	20	30	40	
DC~32	±1.0	±1.0	±1.4	±1.5	1.30
32~40	±1.0	±1.5	±1.5	-1.0/+2.0	1.35, 1.40@40dB

How To Order

QFA4005-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
2 - 2.4mm (Outline A)
K - 2.92mm (Outline B)

Examples:
To order an attenuator, DC-40GHz, 2.92mm male to 2.92mm female, 3dB attenuation, specify QFA4005-40-3-K.

QFA4010

DC~40GHz, 10W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~40GHz
Attenuation:	10dB, 20dB, 30dB, 40dB
Impedance:	50Ω
Average Power*[1]:	10W@25°C max.

[1] Derated linearly to 0.5W@120°C.

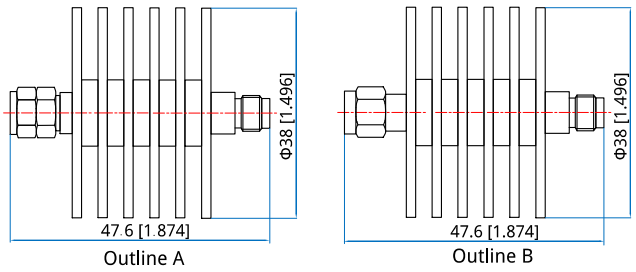
Mechanical

Size:	Φ38*47.6 mm Φ1.496*1.874 in
Weight:	40g typ.
RF Connectors:	2.4mm, 2.92mm
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	10	20	30	40	
DC~26.5	±1.0	±1.0	±1.0	±1.0	1.25
26.5~32	-1.0/+1.5	-1.0/+1.2	-1.0/+1.2	-1.0/+1.5	1.35
32~40	-1.0/+2.0	-1.0/+1.5	-1.0/+1.5	-1.0/+2.0	1.40

How To Order

QFA4010-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
2 - 2.4mm (Outline A)
K - 2.92mm (Outline B)

Examples:
To order an attenuator, DC-40GHz, 2.92mm male to 2.92mm female, 3dB attenuation, specify QFA4010-40-3-K.

QFA4020

DC~40GHz, 20W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~40GHz
Attenuation:	3dB, 10dB, 20dB, 30dB, 40dB
Impedance:	50Ω
Average Power*[1]:	20W@25°C max.

[1] Derated linearly to 1W@120°C.

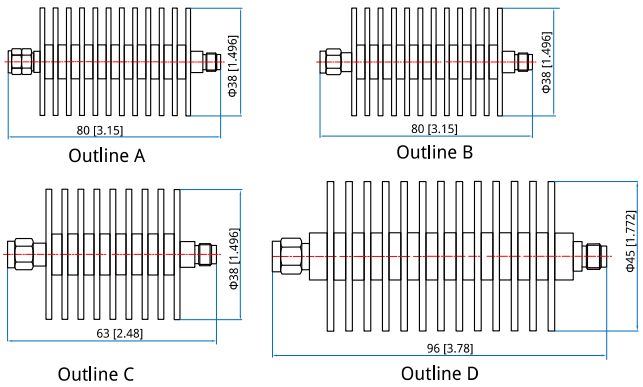
Mechanical

RF Connectors:	2.4mm, 2.92mm
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]
Outline B - Attenuation: 10, 20, 30dB
Outine C - Attenuation: 3dB
Outine D - Attenuation: 40dB

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)		VSWR (max.)
	3, 10	20, 30, 40	
DC~26.5	-1.0/+2.0	-1.0/+2.0	1.3
26.5~32	-1.0/+2.0	-1.0/+2.0	1.4
32~40	-1.5/+3.0	-1.0/+2.0	1.4

How To Order

QFA4020-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
2 - 2.4mm (Outline A)
K - 2.92mm (Outline B, C, D)

Examples:
To order an attenuator, DC-40GHz, 2.92mm male to 2.92mm female, 3dB attenuation, specify QFA4020-40-3-K.

QFA4030

DC~40GHz, 30W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~40GHz
Attenuation:	30dB, 40dB
Impedance:	50Ω
Average Power*[1]:	30W@25°C max.

[1] Derated linearly to 1.5W@120°C.

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)		VSWR (max.)
	30	40	
DC~26.5	-1.0/+1.5	-1.0/+1.5	1.3
26.5~32	-1.0/+2.0	-1.0/+2.0	1.4
32~40	-1.5/+2.0	-1.0/+2.5	1.5

Mechanical

RF Connectors:	2.92mm
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85°C

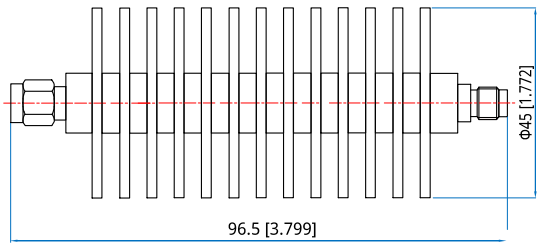
How To Order

QFA4030-X-Y-Z

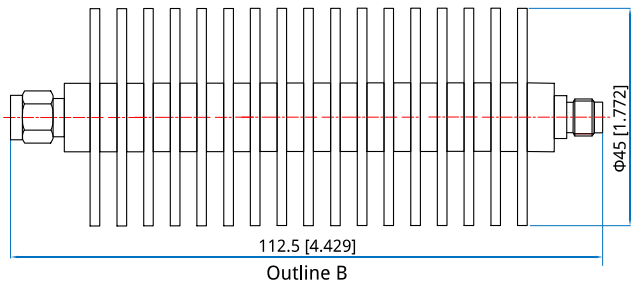
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Examples:
To order an attenuator, DC-40GHz, 2.92mm male to 2.92mm female, 30dB attenuation, specify QFA4030-40-30-K.

Outline Drawings



Outline A



Outline B

Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Outline A - Attenuation: 30dB
Outline B - Attenuation: 40dB

Connector naming rules:
K - 2.92mm

QFA4050

DC~40GHz, 50W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~40GHz
Attenuation:	30dB, 40dB
Attenuation Accuracy:	±3.0dB
VSWR:	1.6 max.
Impedance:	50Ω
Average Power[*1]:	50W@25°C max.

[1] Derated linearly to 2.5W@120°C.

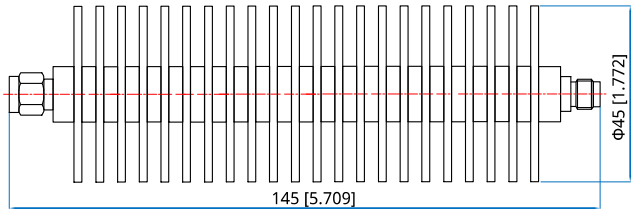
Mechanical

RF Connectors:	2.92mm
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

How To Order

QFA4050-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
K - 2.92mm

Examples:
To order an attenuator, DC-40GHz, 2.92mm male to 2.92mm female, 30dB attenuation, specify QFA4050-40-30-K.

QFA2602

DC~26.5GHz, 2W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~26.5GHz
Attenuation:	1~90dB
Impedance:	50Ω
Average Power*[1]:	2W@25℃ max.

[1] Derated linearly to 0.1W@120°C.

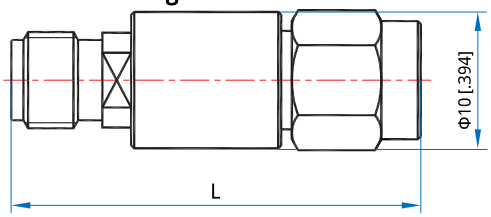
Mechanical

RF Connectors:	3.5mm, SMA
Housing:	Aluminum or Gold/Nickel plated brass
Outer Conductor:	Gold/Nickel plated brass
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85℃

Outline Drawings



Connector	Attenuation (dB)	L (mm [in])
SMA	1~40	24.2 [.953]
SMA	41~90	43 [1.693]
3.5mm	1~30	37 [1.457]
3.5mm	40	40.3 [1.587]
3.5mm	50~70	46 [1.811]

Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR (3.5mm)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	1~9	10~19	20~30	40	50	60~70	
DC~12.4	-0.3/+0.5	-0.3/+0.6	-0.3/+0.6	-0.3/+0.7	±1	±1	1.15
12.4~18	-0.3/+0.6	-0.3/+0.7	-0.3/+0.8	-0.5/+1	±1	±1	1.2
18~26.5	-0.3/+1	-0.3/+1	-0.3/+1	-1/+1.5	±1.5	±1	1.25

Attenuation Accuracy and VSWR (SMA)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)							VSWR (max.)
	1~9	10~40	50	60	70	80	90	
DC~4	±0.4	±0.3	±0.5	±0.8	±1	±1	±1.5	1.15
4~8	±0.5	±0.4	±0.6	±1	±1	±1	±1.5	1.2
8~12.4	±0.6	±0.5	±0.8	±1	±1.2	±1.2	±2	1.25
12.4~18	±0.8	±0.8	±1.5	±1.5	±1.5	±1.5	±2	1.3
18~26.5	±1	±1	±2	±2	±2	-	-	1.35

How To Order

QFA2602-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
3 - 3.5mm
S - SMA

Examples:
To order an attenuator, DC-26.5GHz, SMA male to SMA female, 3dB attenuation, specify QFA2602-26.5-3-S.

QFA2605

DC~26.5GHz, 5W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~26.5GHz
Attenuation:	1~80dB
Impedance:	50Ω
Average Power*[1]:	5W@25℃ max.

[1] Derated linearly to 0.25W@120℃.

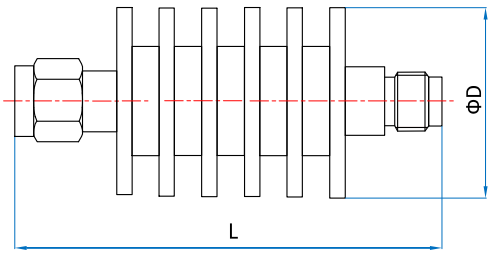
Mechanical

RF Connectors:	3.5mm, SMA
Housing:	Aluminum
Outer Conductor:	Gold/Nickel plated brass
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85℃

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Connector	Attenuation (dB)	ΦD (mm [in])	L (mm [in])
SMA	3~30	15.7 [.618]	33.7 [1.327]
SMA	40~50	16.5 [.65]	37 [1.457]
3.5mm	1~30	15.7 [.618]	37 [1.457]
3.5mm	40	16.5 [.65]	40.3 [1.587]
3.5mm	50~80	16.5 [.65]	46 [1.811]

Attenuation Accuracy and VSWR (3.5mm)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	1~10	11~30	40	50~60	70	80	
DC~12.4	±0.6	±0.5	-0.5/+0.7	±1	-1/+1.5	-1.2/+1.5	1.15
12.4~18	±0.8	±0.8	-0.5/+1	-1/+1.2	-1/+1.5	-1.2/+1.5	1.2
18~26.5	±1	-0.5/+1.2	-0.5/+1.2	-1/+1.5	-1/+1.5	-1.2/+1.5	1.25

Attenuation Accuracy and VSWR (SMA)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)					VSWR (max.)
	3, 6	10	20	30, 40	50	
DC~4	±0.3	±0.3	±0.3	±0.4	±0.5	1.15
4~8	±0.4	±0.4	±0.4	±0.5	±0.5	1.2
8~12.4	±0.5	±0.5	±0.5	±0.5	±0.5	1.25
12.4~18	-0.5/+0.8	±1	±1	±1	±1	1.3
18~26.5	±1	±1	-0.5/+1.5	-0.5/+1.5	-0.5/+1.5	1.35

How To Order

QFA2605-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
3 - 3.5mm
S - SMA

Examples:
To order an attenuator, DC-26.5GHz, SMA male to SMA female, 3dB attenuation, specify QFA2605-26.5-3-S.

QFA2610

DC~26.5GHz, 10W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~26.5GHz
Attenuation:	1~70dB
Impedance:	50Ω
Average Power*[1]:	10W@25°C max.

[1] Derated linearly to 0.5W@120°C.

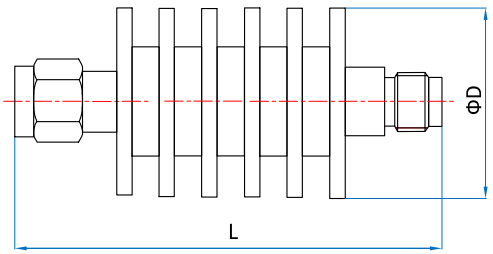
Mechanical

RF Connectors:	3.5mm, SMA
Housing:	Aluminum
Outer Conductor:	Gold/Nickel plated brass
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Connector	Attenuation (dB)	ΦD (mm [in])	L (mm [in])
SMA	3~40	16.5 [.65]	46.5 [1.831]
3.5mm	1~70	26 [1.024]	45.8 [1.803]

Attenuation Accuracy and VSWR (3.5mm)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	1~10	20, 30	40	50	60	70	
DC~12.4	±0.6	±0.5	-0.5/+0.7	±1	-1/+1.5	-1.2/+1.5	1.15
12.4~18	±0.8	±0.8	-0.5/+1	-1/+1.2	-1/+1.5	-1.2/+1.5	1.2
18~26.5	±1	-0.5/+1.2	-0.5/+1.2	-1/+1.5	-1/+1.5	-1.2/+1.8	1.25

Attenuation Accuracy and VSWR (SMA)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	3, 6	10	20	30, 40	
DC~4	±0.4	±0.4	±0.4	±0.4	1.15
4~8	±0.4	±0.5	±0.5	±0.5	1.2
8~12.4	±0.6	±0.6	±0.6	±0.6	1.25
12.4~18	±0.8	±1	±1	±1	1.3
18~26.5	-0.5/+1.0	-0.5/+1.5	-0.5/+1.2	±1.2	1.35

How To Order

QFA2610-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
3 - 3.5mm
S - SMA

Examples:
To order an attenuator, DC-26.5GHz, SMA male to SMA female, 3dB attenuation, specify QFA2610-26.5-3-S.

QFA2625

DC~26.5GHz, 25W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~26.5GHz
Attenuation:	3~70dB
Impedance:	50Ω
Average Power*[1]:	25W@25°C max.

[1] Derated linearly to 1.25W@120°C.

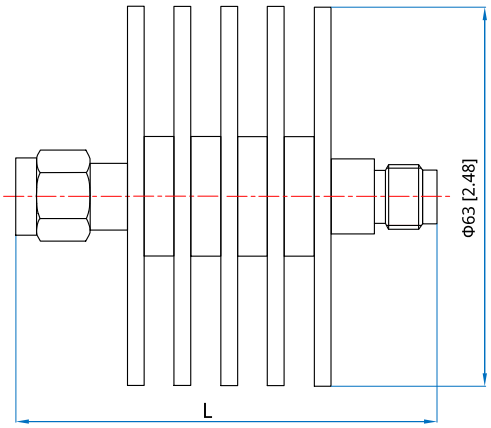
Mechanical

Size:	Φ63*L mm Φ2.48*L in
Weight:	115g typ.
RF Connectors:	3.5mm, SMA
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85℃

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Connector	Attenuation (dB)	L (mm [in])
3.5mm	3~70	50.3 [1.98]
SMA	10~40	47 [1.85]

Attenuation Accuracy and VSWR (3.5mm)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)								VSWR (max.)
	3	6, 10	20	30	40	50	60	70	
DC~12.4	±0.8	±1.0	±0.8	±0.8	±1.0	-1.0/+0.5	-1.0/+0.5	-0.6/+1.0	1.20
12.4~18	±0.8	±1.0	±0.8	-0.8/+1.0	-0.8/+1.0	-1.0/+0.75	-1.0/+0.75	-1.0/+0.5	1.25
18~26.5	-0.9/+0.8	±1.0	-0.9/+1.0	-0.8/+1.0	-0.8/+1.2	-1.0/+1.5	±1.0	-1.0/+1.2	1.30

Attenuation Accuracy and VSWR (SMA)

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	10	20	30	40	
DC~12.4	±0.5	±0.8	±0.8	±0.8	1.25
12.4~18	±1.0	±1.0	±1.0	±1.0	1.30
18~26.5	±1.2	±1.2	±1.2	±1.2	1.35

How To Order

QFA2625-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
3 - 3.5mm S - SMA

Examples:
To order an attenuator, DC-26.5GHz, SMA male to SMA female, 30dB attenuation, specify QFA2625-26.5-30-S.

QFA2650

DC~26.5GHz, 50W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~26.5GHz
Attenuation:	3~60dB
Impedance:	50Ω
Average Power*[1]:	50W@25°C max.

[1] Derated linearly to 2.5W@120°C.

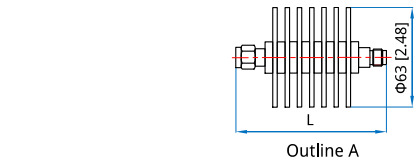
Mechanical

Weight:	120~200g typ.
RF Connectors:	3.5mm, SMA
Housing:	Aluminum
Outer Conductor:	Gold plated brass or Stainless steel
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

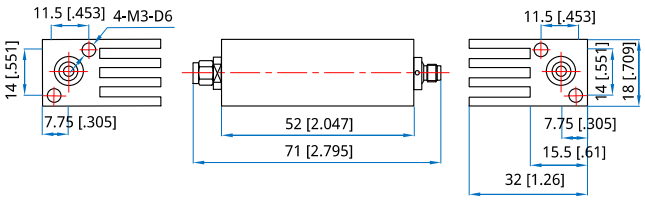
Environmental

Temperature:	-55~+85°C

Outline Drawings



Outline A



Outline B

Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Connector	Attenuation (dB)	L (mm [in])
3.5mm	3~60	74 [2.913]
SMA	10~60	71 [2.795]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	3	6	10	20~40	50	60	
DC~18	±0.8	±1.0	±1.0	±1.0	±1.0	-1.0/+0.75	1.25
18~26.5	-0.8/+1.0	-1.0/+1.7	-1.0/+2.5	-1.0/+1.5	±1.0	±1.0	1.30

How To Order

QFA2650-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Examples:
To order an attenuator, DC-26.5GHz, SMA male to SMA female, 30dB attenuation, Cuboid, specify QFA2650-26.5-30-S2.

Connector and shape naming rules:
31 - Cylinder, 3.5mm (Outline A)
32 - Cuboid, 3.5mm (Outline B)
S1 - Cylinder, SMA (Outline A)
S2 - Cuboid, SMA (Outline B)

QFA26K1

DC~26.5GHz, 100W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~26.5GHz
Attenuation:	3~50dB
Impedance:	50Ω
Average Power*[1]:	100W@25°C max.

[1] Derated linearly to 5W@120°C.

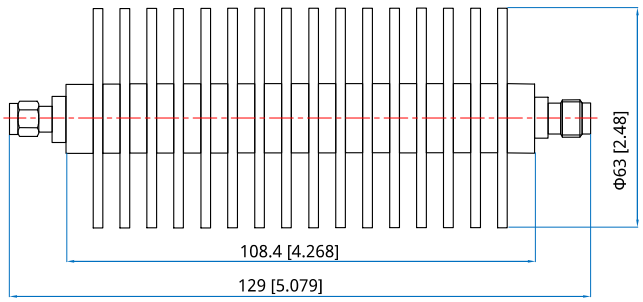
Mechanical

Weight:	390g
Connectors:	3.5mm, SMA
Housing:	Aluminum
Outer Conductor:	Gold plated brass
Male Inner Conductor:	Gold plated brass
Female Inner Conductor:	Gold plated beryllium copper

Environmental

Temperature:	-55~+85°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)					VSWR (max.)
	3	6	10	20	30~50	
DC~18	±1.0	±1.0	±1.0	-1.0/+1.5	±1.0	1.30
18~26.5	-1.0/+1.5	-1.0/+2.5	-1.0/+3.5	-1.0/+3.0	-1.0/+1.5	1.40

How To Order

QFA26K1-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
3 - 3.5mm
S - SMA

Examples:
To order an attenuator, DC-26.5GHz, SMA male to SMA female, 30dB attenuation,specify QFA26K1-26.5-30-S.

QFA1802

DC~18GHz, 2W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	1~30, 40, 50, 60dB
Impedance:	50Ω
Average Power*[1]:	2W@25℃ max.

[1] Derated linearly to 0.1W@120°C.

Mechanical

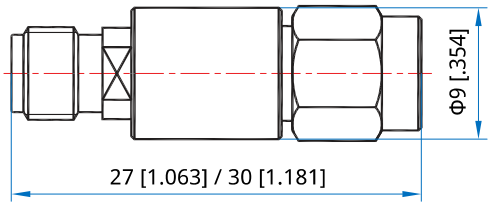
Size*[2]:	Φ9*27mm
	Φ0.354*1.063in
Size*[3]:	Φ9*30mm
	Φ0.354*1.181in
RF Connectors:	SMA Male, SMA Female

[2] Attenuation=1~30dB.
[3] Attenuation=40, 50, 60dB.

Environmental

Temperature:	-55~+125℃

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				
	1~10	11~20	21~30	40	50
DC~4	0.4	0.5	0.7	0.7	0.7
4~8	0.5	0.6	0.8	0.8	0.8
8~12.4	0.6	0.7	0.9	0.9	1.0
12.4~18	0.6	0.8	1.0	1.2	1.5

How To Order

QFA1802-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
S - SMA

Examples:
To order an attenuator, DC-18GHz, SMA male to SMA female, 30dB attenuation, specify QFA1802-18-30-S.

QFA1805

DC~18GHz, 5W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	1~40dB
Impedance:	50Ω
Average Power*1:	5W@25℃ max.

[1] Derated linearly to 0.25W@120°C.

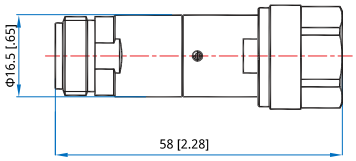
Mechanical

Size*1:	Φ16.5*58mm
	Φ0.65*2.28in
Size*2:	Φ19*27mm
	Φ0.75*1.06in
RF Connectors*1:	N Male, N Female
RF Connectors*2:	SMA Male, SMA Female

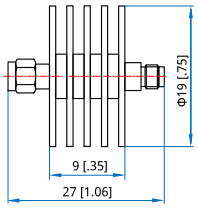
Environmental

Temperature:	-55~+125℃

Outline Drawings



Outline A



Outline B

Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR (N)

Frequency(GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~10	11~20	21~30	31~40	
DC~4	0.4	0.5	0.6	0.7	1.2
4~6	0.5	0.6	0.8	0.8	1.25
6~12.4	0.6	0.7	0.8	0.9	1.35
12.4~18	0.6	0.8	1.0	1.2	1.45

Attenuation Accuracy and VSWR (SMA)

Frequency(GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)			VSWR (max.)
	1~10	11~20	21~30	
DC~4	0.4	0.5	0.7	1.2
4~8	0.5	0.6	0.8	1.25
8~12.4	0.6	0.7	0.9	1.35
12.4~18	0.6	0.8	1.0	1.45

How To Order

QFA1805-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Examples:
To order an attenuator, DC-18GHz, N male to N female, 3dB attenuation, specify QFA1805-18-3-N.

Connector naming rules:
N - N (Outline A)
S - SMA (Outline B)

QFA1810

DC~18GHz, 10W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	1~40dB
Impedance:	50Ω
Average Power[*1]:	10W@25°C max.

[1] Derated linearly to 0.5W@120°C.

Mechanical

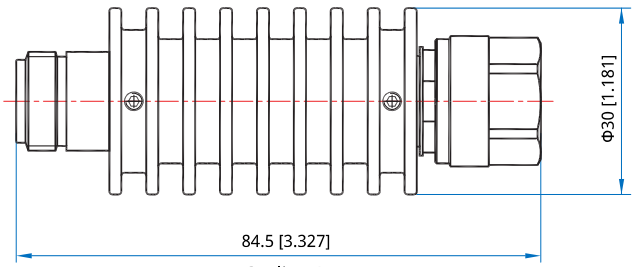
Size[*2]:	Φ30*84.5mm
	Φ1.181*3.327in
Size[*3]:	Φ15.8*47.5mm
	Φ0.622*1.87in
RF Connectors[*2]:	N Male, N Female
RF Connector[*3]:	SMA Male, SMA Female

[2] N connectors
[3] SMA connectors

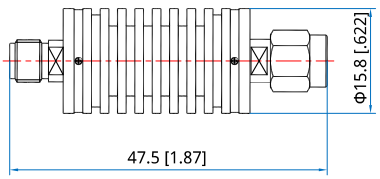
Environmental

Temperature:	-55~+125°C

Outline Drawings



Outline A



Outline B

Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~10	11~20	21~30	31~40	
DC~4	0.4	0.5	0.6	0.7	1.2
4~8	0.5	0.6	0.8	0.8	1.25
8~12.4	0.6	0.7	0.8	0.9	1.35
12.4~18	0.8	0.9	1.0	1.2	1.45

How To Order

QFA1810-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N (Outline A)
S - SMA (Outline B)

Examples:
To order an attenuator, DC-18GHz, N male to N female, 3dB attenuation, specify QFA1810-18-3-N.

QFA1820

DC~18GHz, 20W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	1~40dB
Impedance:	50Ω
Average Power[*1]:	20W@25°C max.

[1] Derated linearly to 1W@120°C.

Mechanical

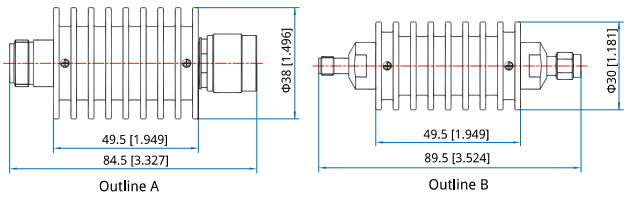
Size[*2]:	Φ38*84.5mm
	Φ1.496*3.327in
Size[*3]:	Φ30*89.5mm
	Φ1.181*3.524in
RF Connectors[*2]:	N Male, N Female
RF Connectors[*3]:	SMA Male, SMA Female

[2] N connectors.
[3] SMA connectors.

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~10	11~20	21~30	31~40	
DC~4	0.4	0.5	0.6	0.7	1.2
4~8	0.5	0.6	0.8	0.8	1.25
8~12.4	0.6	0.7	0.8	0.9	1.35
12.4~18	0.6	0.8	1.0	1.2	1.45

How To Order

QFA1820-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N (Outline A)
S - SMA (Outline B)

Examples:
To order an attenuator, DC-18GHz, N male to N female, 3dB attenuation, specify QFA1820-18-3-N.

QFA1825

DC~18GHz, 25W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	1~50dB
Impedance:	50Ω
Average Power[*1]:	25W@25℃

[1] Derated linearly to 1.25W@120°C.

Mechanical

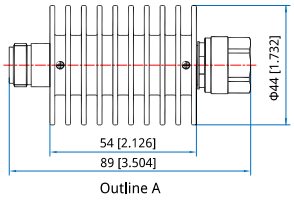
Size[*2]:	Φ44*89mm
	Φ1.732*3.504in
Size[*3]:	Φ44*94mm
	Φ1.732*3.701in
RF Connectors[*2]:	N Male, N Female
RF Connectors[*3]:	SMA Male, SMA Female

[2] N connectors.
[3] SMA connectors.

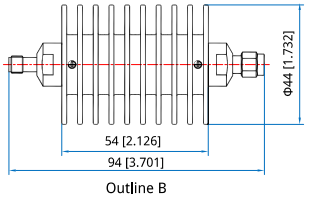
Environmental

Temperature:	-55~+125℃

Outline Drawings



Outline A



Outline B

Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~10	11~20	21~30	40~50	
DC~4	0.4	0.5	0.6	0.7	1.2
4~8	0.5	0.6	0.8	0.8	1.25
8~12.4	0.7	0.8	0.9	1.0~1.1	1.35
12.4~18	0.8	0.9	1.1	1.2~1.3	1.45

How To Order

QFA1825-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N (Outline A)
S - SMA (Outline B)

Examples:
To order an attenuator, DC-18GHz, N male to N female, 3dB attenuation, specify QFA1825-18-3-N.

QFA1850

DC~18GHz, 50W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	1~50dB
Impedance:	50Ω
Average Power*1:	50W@25°C max.

[1] Derated linearly to 2.5W@120°C.

Mechanical

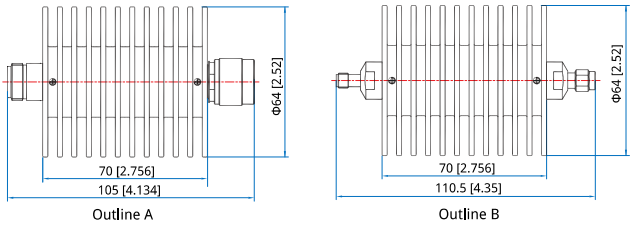
Size*2:	Φ64*105mm
	Φ2.52*4.134in
Size*3:	Φ64*110.5mm
	Φ2.52*4.35in
RF Connectors*2:	N Male, N Female
RF Connectors*3:	SMA Male, SMA Female

[2] N connectors.
[3] SMA connectors.

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	1~10	11~20	21~30	31~50	
DC~4	0.4	0.5	0.7	0.7	1.2
4~8	0.5	0.6	0.8	0.8	1.25
8~12.4	0.6	0.7	0.8	1.1	1.35
12.4~18	0.8	0.9	1.1	1.3	1.45

How To Order

QFA1850-X-Y-Z
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N (Outline A)
S - SMA (Outline B)

Examples:
To order an attenuator, DC-12.4GHz, N male to N female, 3dB attenuation, specify QFA1850-12.4-3-N.

QFA18K1

DC~18GHz, 100W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	6~60dB
Impedance:	50Ω
Average Power*1:	100W@25℃ max.

Mechanical

RF Connectors:	N, SMA, 7/16(DIN)

Environmental

Temperature:	-55~+125℃

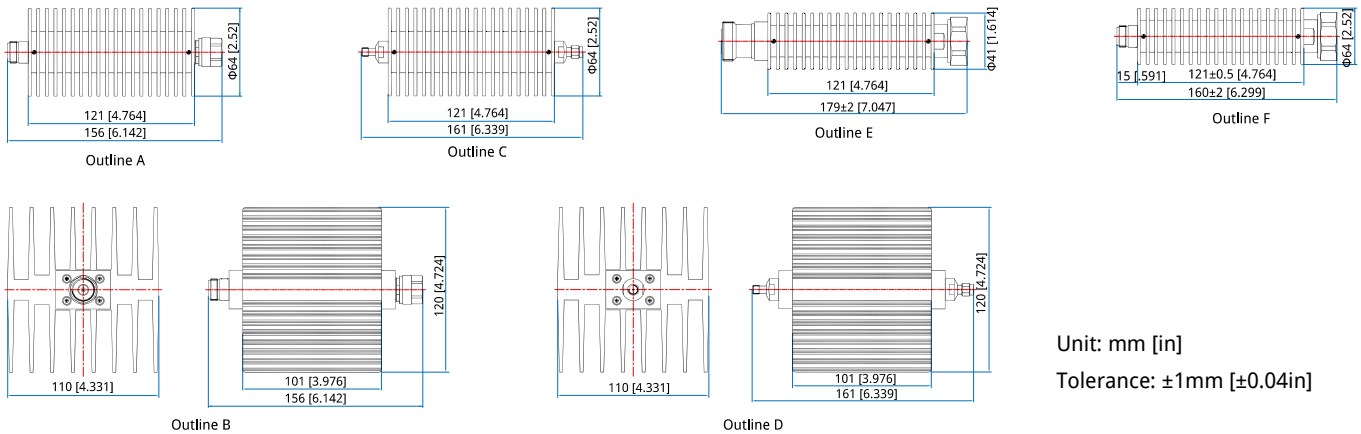
[1] Derated linearly to 5W@120°C.

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)					VSWR (max.)
	6~10	11~20	21~30	31~40	41~60	
DC~4	0.7	0.7	0.8	0.8	0.9-1.0	1.2
4~8*2	0.8	0.8	0.9	0.9	1.0	1.25
8~12.4*2	0.9	0.9	1.0	1.0	1.1	1.35
12.4~18	1.5	1.5	1.3	1.3	1.4	1.45

[2] Rated at 4~6GHz and 6~12.4GHz for 7/16(DIN) connectors.

Outline Drawings



Unit: mm [in]

Tolerance: ±1mm [±0.04in]

How To Order

QFA18K1-X-Y-Z

X: Frequency in GHz

Y: Attenuation in dB

Z: Connector type

Examples:

To order an attenuator, DC-12.4GHz, N male to N female, 9dB attenuation, Cuboid, specify QFA18K1-12.4-9-N2.

Connector and shape naming rules:

N1 - Cylinder, N (Outline A)

N2 - Cuboid, N (Outline B)

S1 - Cylinder, SMA (Outline C)

S2 - Cuboid, SMA (Outline D)

7 - 7/16(DIN) (Outline E)

7NF - In: 7/16(DIN) Male, Out: N Female (Outline F)

QFA18K15

DC~18GHz, 150W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	6~60dB
Impedance:	50Ω
Average Power[*1]:	150W@25°C max.

[1] Derated linearly to 7.5W@120°C.

Mechanical

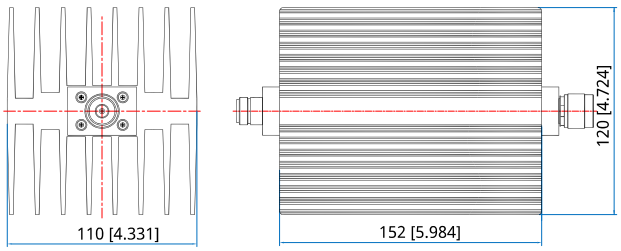
Size[*2]:	152*120*110mm
	5.984*4.724*4.331in
RF Connectors:	N Male, N Female

[2] Exclude connectors.

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	6~10	20	30	40	50	60	
DC~4	0.7	0.7	0.8	0.9	0.9	0.9	1.20
4~8	0.8	0.8	0.9	0.9	0.9	0.9	1.25
8~12.4	0.9	0.9	1.0	1.1	1.1	1.1	1.35
12.4~18	2.0	-	1.5	1.3	1.4	1.4	1.45

How To Order

QFA18K15-X-Y-Z

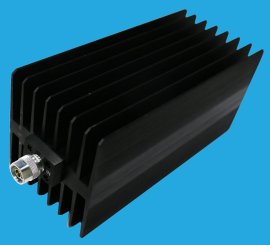
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N

Examples:
To order an attenuator, DC-18GHz, N male to N female, 30dB attenuation, specify QFA18K15-18-30-N.

QFA18K2

DC~18GHz, 200W



Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	10~60dB
Impedance:	50Ω
Average Power[*1]:	200W@25°C max.

[1] Derated linearly to 10W@120°C.

Mechanical

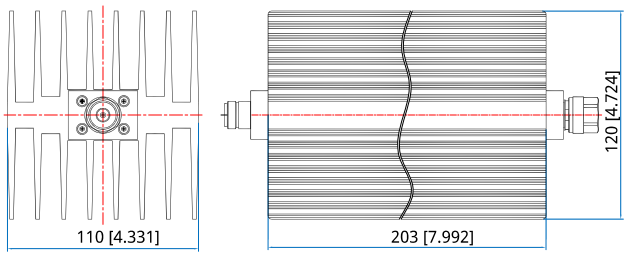
Size[*2]:	203*120*110mm
	7.992*4.724*4.331in
RF Connectors:	N Male, N Female

[2] Exclude connectors.

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	10	20	30	40	50	60	
DC~4	0.7	0.7	0.8	0.9	0.9	0.9	1.20
4~8	0.8	0.8	0.9	0.9	0.9	0.9	1.25
8~12.4	0.9	0.9	1.0	1.1	1.1	1.1	1.35
12.4~18	2.0	-	1.5	1.3	1.4	1.4	1.45

How To Order

QFA18K2-X-Y-Z

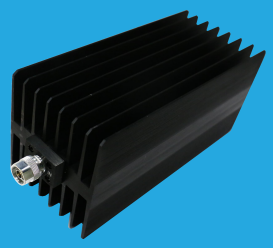
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N

Examples:
To order an attenuator, DC-18GHz, N male to N female, 30dB attenuation, specify QFA18K2-18-30-N.

QFA18K25

DC~18GHz, 250W



Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	10~60dB
Impedance:	50Ω
Average Power[*1]:	250W@25°C max.

[1] Derated linearly to 12.5W@120°C.

Mechanical

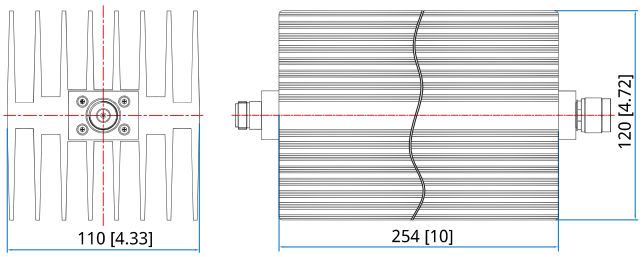
Size[*2]:	254*120*110mm
	10*4.72*4.33in
RF Connectors:	N Male, N Female

[2] Exclude connectors.

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)				VSWR (max.)
	10~20	21~30	31~40	41~60	
DC~4	0.7	0.8	0.9	0.9	1.2
4~8	0.8	0.9	0.9	0.9	1.25
8~12.4	0.9	1.0	1.1	1.1	1.35
12.4~18	2.0	1.5	1.3	1.4	1.45

How To Order

QFA18K25-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N

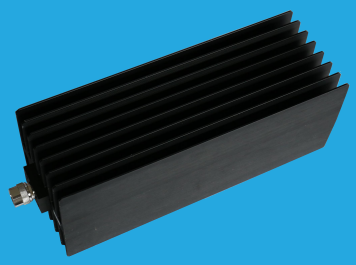
Examples:
To order an attenuator, DC-18GHz, N male to N female, 20dB attenuation, specify QFA18K25-18-20-N.

QFA18K3

DC~18GHz, 300W

Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar



Electrical

Frequency:	DC~18GHz
Attenuation:	10~60dB
Impedance:	50Ω
Average Power[*1]:	300W@25°C max.

[1] Derated linearly to 15W@120°C.

Mechanical

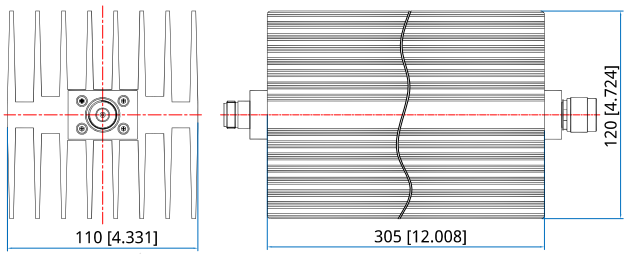
Size[*2]:	305*120*110mm
	12.008*4.724*4.331in
RF Connectors:	N Male, N Female

[2] Exclude connectors.

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	10	20	30	40	50	60	
DC~4	0.7	0.7	0.8	0.9	0.9	0.9	1.20
4~8	0.8	0.8	0.9	0.9	0.9	0.9	1.25
8~12.4	3.0	0.9	1.0	1.1	1.1	1.1	1.35
12.4~18	3.5	-	1.5	1.3	1.3	1.4	1.45

How To Order

QFA18K3-X-Y-Z

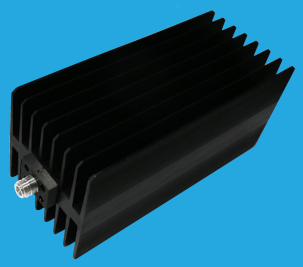
X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N

Examples:
To order an attenuator, DC-18GHz, N male to N female, 30dB attenuation, specify QFA18K3-18-30-N.

QFA18K5

DC~18GHz, 500W



Features:
* Low VSWR
* High Attenuation Flatness

Applications:
* Wireless
* Transmitter
* Laboratory Test
* Radar

Electrical

Frequency:	DC~18GHz
Attenuation:	10~60dB
Impedance:	50Ω
Average Power*[1]:	500W@25°C max.

[1] Derated linearly to 25W@120°C.

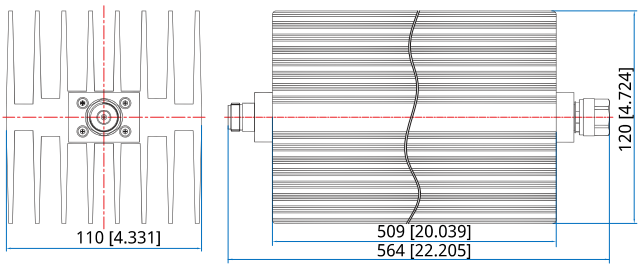
Mechanical

Size:	564*120*110mm
	22.205*4.724*4.331in
RF Connectors:	N Male, N Female

Environmental

Temperature:	-55~+125°C

Outline Drawings



Unit: mm [in]
Tolerance: ±2mm [±0.08in]

Attenuation Accuracy and VSWR

Frequency (GHz)	Attenuation Accuracy (±dB) vs. Attenuation (dB)						VSWR (max.)
	10	20	30	40	50	60	
DC~4	-0.6/+1.5	1.2	1.0	1.0	1.0	1.0	1.25
4~8	-0.5/+2.0	2.0	1.5	1.1	1.1	1.1	1.30
8~12.4	3.0	2.0	-1.5/+2.0	1.2	1.2	1.2	1.35
12.4~18	6.0	5.0	0/+6.0	1.5	1.5	1.5	1.5

How To Order

QFA18K5-X-Y-Z

X: Frequency in GHz
Y: Attenuation in dB
Z: Connector type

Connector naming rules:
N - N

Examples:
To order an attenuator, DC-18GHz, N male to N female, 30dB attenuation, specify QFA18K5-18-30-N.

Fixed Attenuators

QFAVW-X-Y-Z

V: Maximum Frequency (GHz)
W: Maximum Power (W)
X: Frequency (GHz)
Y: Attenuation (dB)
Z: Connector type

Examples:
To order a fixed attenuator, DC~18GHz, 100W, 30dB, N Male and Female, specify QFA18K1-18-30-N.

Manually Variable Attenuators

QUAV-W-X-Y-Z

U: Variable attenuator type.
S - Rotary Stepped Attenuators
C - Continuously Variable Attenuators
V: Series number
W: Frequency (GHz)
X: Maximum attenuation (dB)
Y: Power (W)
Z: Connector type

Examples:
To order a manually variable attenuator, rotary stepped, 06B series, DC-6GHz, 0~50dB, 2W, SMA female, specify QSA06B-6-50-2-S.

Digital Controlled Attenuators

QDA-W-X-Y-Z

W: Start frequency (GHz)
X: Stop frequency (GHz)
Y: Maximum attenuation (dB)
Z: Step (dB)

Examples:
To order a digital controlled attenuator, 0.5~18GHz, 0~62dB, 1 Bit step, SMA female, specify QDA-0.5-18-62-1

Connector Names

1	1.0mm (110GHz)	K	2.92mm (40GHz)
2	2.4mm (50GHz)	L	L27
3	3.5mm (33GHz)	M	MCX (6GHz)
4	4.3/10 (8GHz)	N	N (18GHz)
7	7/16 DIN (L29)	P	SMP (40GHz)
A	SSMA (40GHz)	Q	QMA
B	BNC (4GHz)	S	SMA (26.5GHz)
E	SC (11GHz in theory, Usually 6GHz)	T	TNC (18GHz)
G	Mini-SMP (mateable with GPPO & SSMP, 65GHz)	V	1.85mm (67GHz)
I	BMA (18GHz)	X	MMCX (40GHz)
J	APC-7 (7mm,18GHz)		

Gender

M: Male (Plug)
F: Female (Jack)

Multiple Connectors

Some parts have several connectors. Most parts have their default connector options. Abbreviation naming is applied for default connector options. In full naming, it is name-gender pairs. For example: “SM” stand for SMA Male connector, and “NF” means N Female connector.

Broad Band & High Power

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