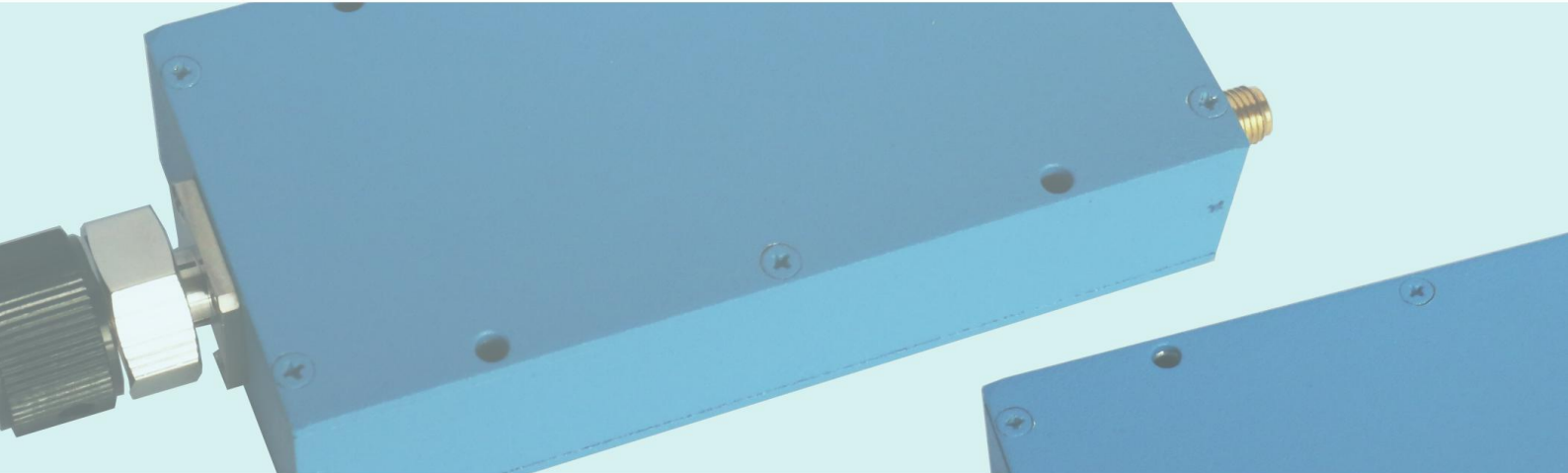


Manual Phase Shifters



2019



Qualwave Inc.

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QMPS20

20°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

Frequency: DC~18GHz
 Impedance: 50Ω
 Average Power: 50W
 Peak Power*1: 5KW

[1] Pulse width: 5us, duty cycle: 1%.

Frequency (GHz)	VSWR (max.)	Insertion Loss (dB, max.)	Phase Adjustment*2 (°)
DC~2	1.25	0.35	0~40
DC~3	1.3	0.5	0~60
DC~6	1.4	0.75	0~120
DC~9	1.5	1	0~180
DC~12	1.6	1.25	0~240
DC~18	1.6	1.5	0~360

[2] Phase shift varies linearly corresponding to the frequency. For example, if the maximum phase shift is 360°@18GHz, the maximum phase shift is 180°@9GHz.

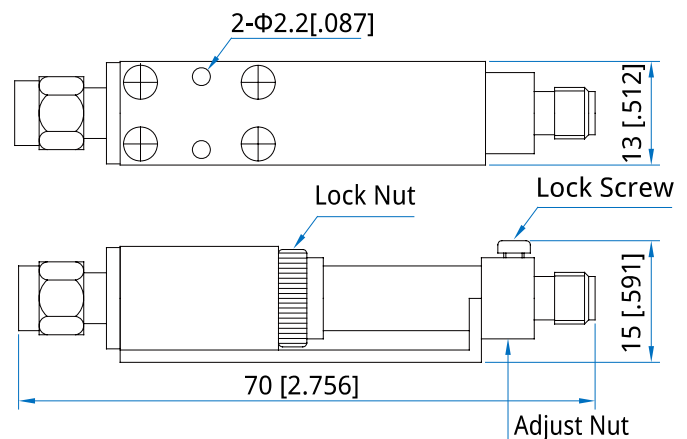
Mechanical

Size: 70*13*15mm
 2.756*0.512*0.591in
 Weight: 50g
 RF Connectors: SMA
 Outer Conductor: Gold plated brass
 Male Inner Conductor: Gold plated brass
 Female Inner Conductor: Gold plated beryllium copper

Environmental

Operating Temperature: -10~+50°C
 Non-operating Temperature: -40~+70°C

Outline Drawings



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

Usage

1. Tighten the lock screw and lock nut.
2. Connect both ends to cables.
3. Release the lock screw and lock nut.
4. Turn the adjust nut to adjust phase.
5. Tighten the lock screw and lock nut.

How To Order

QMPS20-X-Y

X: Frequency in GHz
 Y: Connector type

Connector naming rules:
 S - SMA

Examples:
 To order a phase shifter, DC-6GHz, SMA male to SMA female, specify QMPS20-6-S.

QMPS45

45°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

Frequency: DC~8GHz
 Impedance: 50Ω
 Average Power: 50W
 Peak Power*1: 5KW

[1] Pulse width: 5us, duty cycle: 1%.

Frequency (GHz)	VSWR (max.)	Insertion Loss (dB, max.)	Phase Adjustment*2 (°)
DC~1	1.20	0.3	0~45
DC~2	1.30	0.5	0~90
DC~4	1.40	0.75	0~180
DC~6	1.50	1.0	0~270
DC~8	1.50	1.25	0~360

[2] Phase shift varies linearly corresponding to the frequency. For example, if the maximum phase shift is 360°@8GHz, the maximum phase shift is 180°@4GHz.

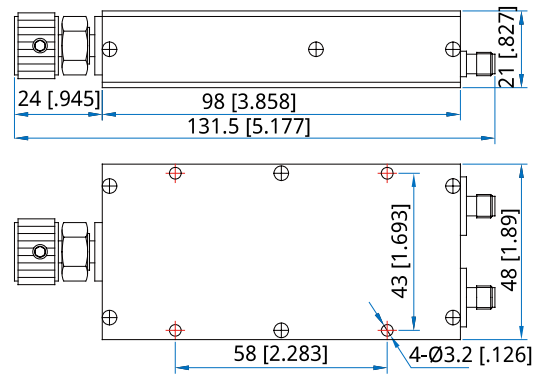
Mechanical

Size: 131.5*48*21mm
 5.177*1.89*0.827in
 Weight: 200g
 RF Connectors: SMA Female
 Outer Conductor: Gold plated brass
 Male Inner Conductor: Gold plated brass
 Female Inner Conductor: Gold plated beryllium copper
 Housing: Aluminum

Environmental

Operating Temperature: -10~+50°C
 Non-operating Temperature: -40~+70°C

Outline Drawings



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

How To Order

QMPS45-X-Y

X: Frequency in GHz
 Y: Connector type

Connector naming rules:
 S - SMA

Examples:
 To order a phase shifter, DC-6GHz, SMA male to SMA female, specify QMPS45-6-S.

QMPS60

60°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

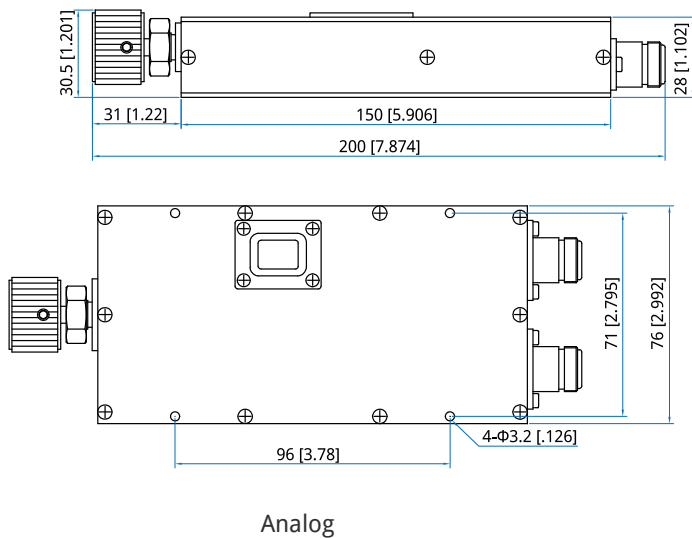
Frequency: DC~8GHz
 Impedance: 50Ω
 Average Power: 100W
 Peak Power*1: 5KW

[1] Pulse width: 5us, duty cycle: 2%.

Frequency (GHz)	VSWR (max.)	Insertion Loss (dB, max.)	Phase Adjustment*2 (°)
DC~1	1.2	0.3	0~60
DC~2	1.3	0.5	0~120
DC~3	1.4	0.8	0~180
DC~4	1.4	1.0	0~240
DC~6	1.5	1.0	0~360
DC~8	1.5	1.25	0~480

[2] Phase shift varies linearly corresponding to the frequency. For example, if the maximum phase shift is 360°@6GHz, the maximum phase shift is 180°@3GHz.

Outline Drawings



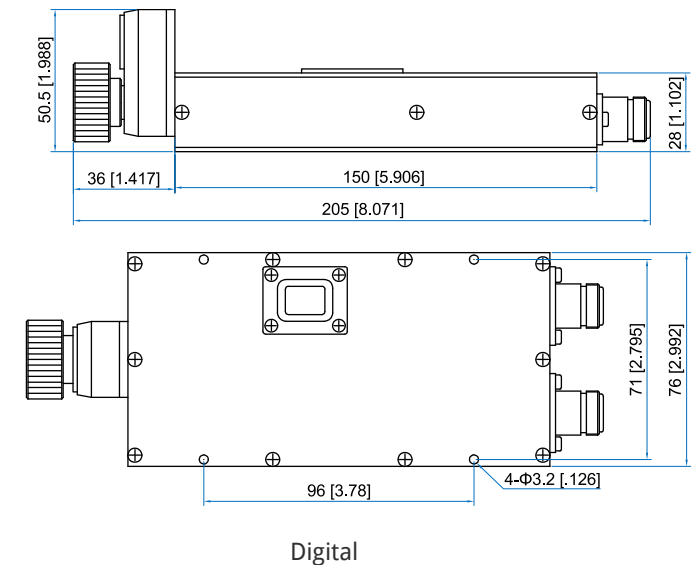
Mechanical

Size*3: 200*76*30.5mm
 7.874*2.992*1.201in
 Size*4: 205*76*50.5mm
 8.071*2.992*1.988in
 Weight: 490g
 RF Connectors: N Female, SMA Female
 Outer Conductor: Gold Plated Brass
 Inner Conductor: Gold Plated Beryllium Bronze
 Housing Material: Aluminum

[3] Analog.
 [4] Digital.

Environmental

Operating Temperature: -10~+50°C
 Non-operating Temperature: -40~+70°C



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

How To Order**QMPS60-X-Y-Z**

X: Frequency in GHz

Y: Connector type

Z: Display

Examples:

To order a digital phase shifter, DC-4GHz, N female to N female, specify QMPS60-4-N-D.

Connector naming rules:

S - SMA

N - N

Display naming rules:

A - Analog

D - Digital

QMPS90

90°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

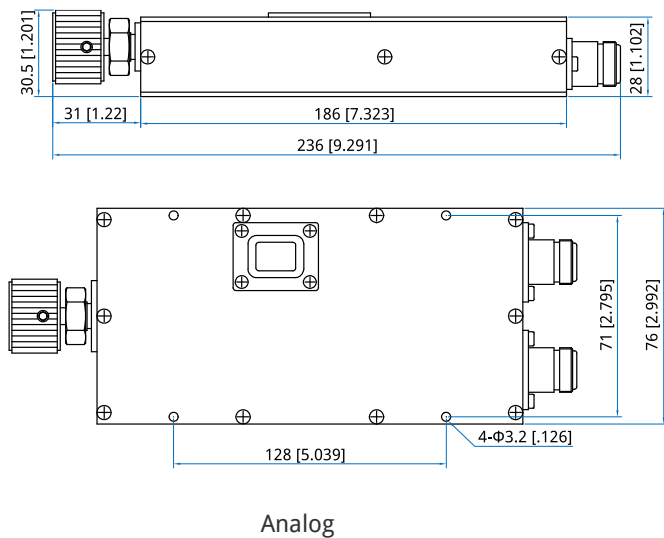
Frequency: DC~8GHz
 Impedance: 50Ω
 Average Power: 100W
 Peak Power*1: 5KW

[1] Pulse width: 5us, duty cycle: 2%.

Frequency (GHz)	VSWR (max.)	Insertion Loss (dB, max.)	Phase Adjustment*2 (°)
DC~1	1.2	0.5	0~90
DC~2	1.3	0.8	0~180
DC~3	1.4	1.2	0~270
DC~4	1.4	1.2	0~360
DC~6	1.5	1.4	0~540
DC~8	1.5	1.5	0~720

[2] Phase shift varies linearly corresponding to the frequency. For example, if the maximum phase shift is 360°@6GHz, the maximum phase shift is 180°@3GHz.

Outline Drawings



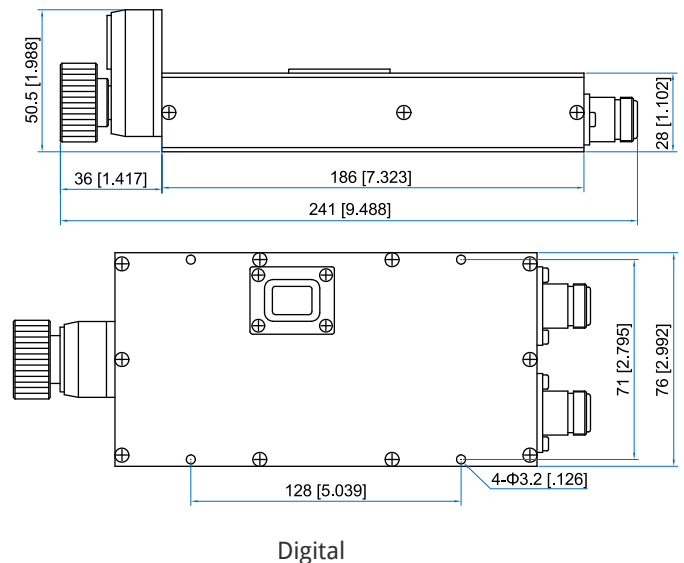
Mechanical

Size*3: 236*76*30.5mm
 9.291*2.992*1.201in
 Size*4: 241*76*50.5mm
 9.488*2.992*1.988in
 Weight: 550g
 RF Connectors: N Female, SMA Female
 Outer Conductor: Nickel Plated Brass
 Inner Conductor: Gold Plated Beryllium Bronze
 Housing Material: Aluminum

[3] Analog.
 [4] Digital.

Environmental

Operating Temperature: -10~+50°C
 Non-operating Temperature: -40~+70°C



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

How To Order**QMPS90-X-Y-Z**

X: Frequency in GHz

Y: Connector type

Z: Display

Examples:

To order a digital phase shifter, DC-4GHz, N female to N female, specify QMPS90-4-N-D.

Connector naming rules:

S - SMA

N - N

Display naming rules:

A - Analog

D - Digital

QMPS180

180°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

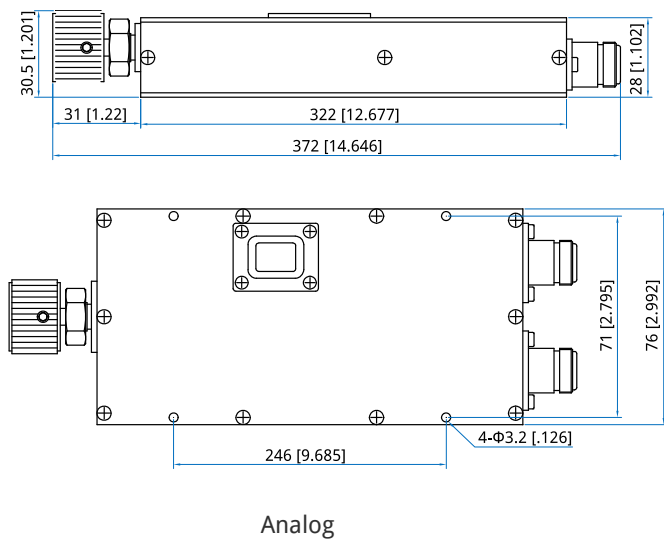
Frequency: DC~4GHz
 Impedance: 50Ω
 Average Power: 100W
 Peak Power*1: 5KW

[1] Pulse width: 5us, duty cycle: 2%.

Frequency (GHz)	VSWR (max.)	Insertion Loss (dB, max.)	Phase Adjustment*2 (°)
DC~1	1.4	1.0	0~180
DC~2	1.5	1.5	0~360
DC~3	1.5	1.75	0~540
DC~4	1.5	2.0	0~720

[2] Phase shift varies linearly corresponding to the frequency. For example, if the maximum phase shift is 360°@2GHz, the maximum phase shift is 180°@1GHz.

Outline Drawings



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

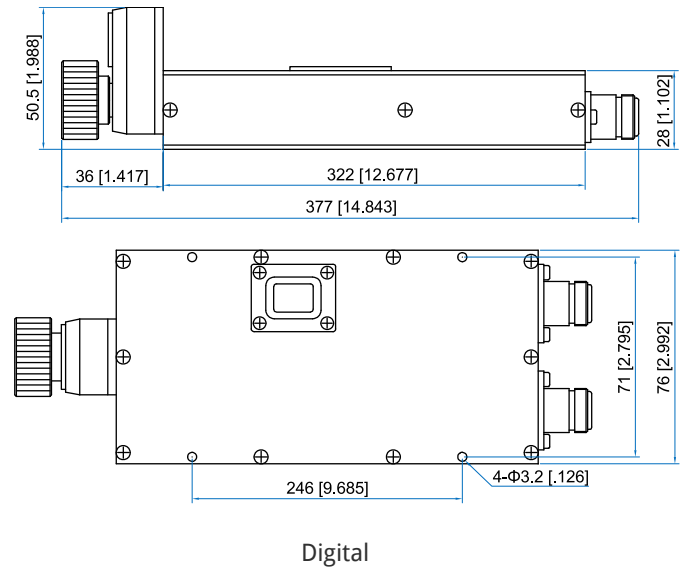
Mechanical

Size*3: 372*76*30.5mm
 14.646*2.992*1.201in
 Size*4: 377*76*50.5mm
 14.843*2.992*1.988in
 Weight: 795g
 RF Connectors: N Female, SMA Female
 Outer Conductor: Nickle Plated Brass
 Inner Conductor: Gold Plated Beryllium Bronze
 Housing Material: Aluminum

[3] Analog.
 [4] Digital.

Environmental

Operating Temperature: -10~+50°C
 Non-operating Temperature: -40~+70°C



How To Order

QMPS180-X-Y-Z

X: Frequency in GHz

Y: Connector type

Z: Display

Examples:

To order a digital phase shifter, DC-3GHz, N female to N female, specify QMPS180-3-N-D.

Connector naming rules:

S - SMA

N - N

Display naming rules:

A - Analog

D - Digital

QMPS360

360°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

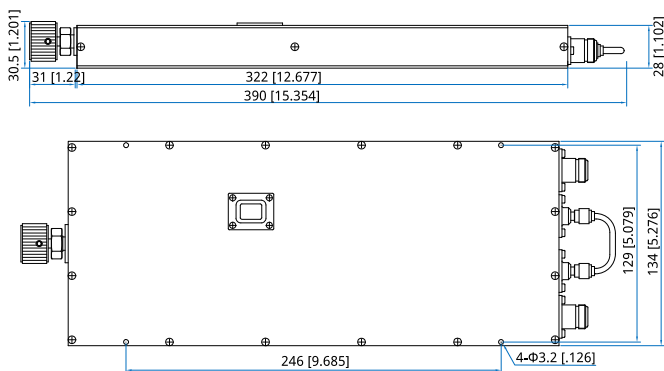
Frequency: DC~2GHz
 Impedance: 50Ω
 Average Power: 100W
 Peak Power*1: 5KW

[1] Pulse width: 5us, duty cycle: 2%.

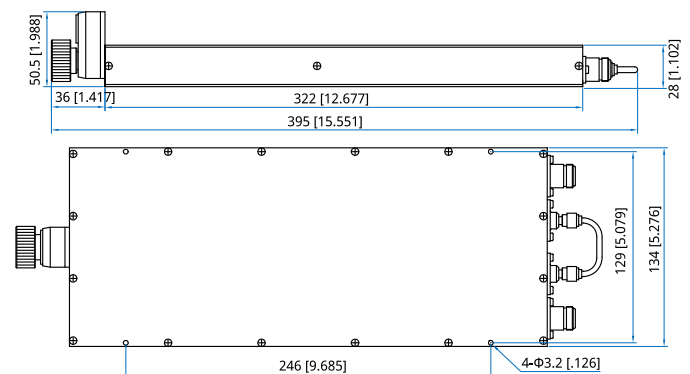
Frequency (GHz)	VSWR (max.)	Insertion Loss (dB, max.)	Phase Adjustment*2 (°)
DC~1	1.4	1.5	0~360
DC~2	1.5	2	0~720

[2] Phase shift varies linearly corresponding to the frequency. For example, if the maximum phase shift is 720°@2GHz, the maximum phase shift is 360°@1GHz.

Outline Drawings



Analog



Digital

Unit: mm [in]

Tolerance: ±0.2mm [±0.008in]

Mechanical

Size*3: 390*134*30.5mm
 15.354*5.276*1.201in
 Size*4: 395*134*50.5mm
 15.351*5.276*1.988in

Weight: 1800g

RF Connectors: N Female, SMA Female

Outer Conductor: Nickel Plated Brass

Inner Conductor: Gold Plated Beryllium Bronze

Housing Material: Aluminum

[3] Analog.

[4] Digital.

Environmental

Operating Temperature: -10~+50°C

Non-operating Temperature: -40~+70°C

How To Order**QMPS360-X-Y-Z**

X: Frequency in GHz

Y: Connector type

Z: Display

Examples:

To order a digital phase shifter, DC-1GHz, N female to N female, specify QMPS360-1-N-D.

Connector naming rules:

S - SMA

N - N

Display naming rules:

A - Analog

D - Digital

QMPS900

900°/GHz

Features:
 * Low Insertion Loss
 * High Power
 * High Reliable

Applications:
 * Laboratory Test
 * Transmitter
 * Instrumentation
 * Wireless

Electrical

Frequency:	DC~1GHz
Impedance:	50Ω
Average Power:	100W
Peak Power*1:	5KW
VSWR:	1.5 max.
Insertion Loss:	2.5dB max.
Phase Adjustment:	0~900°

[1] Pulse width: 5us, duty cycle: 2%.

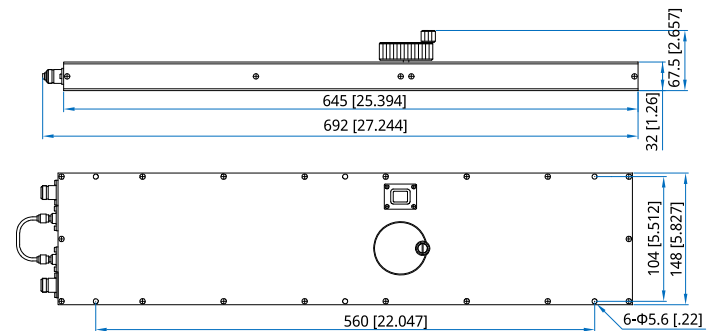
Mechanical

Size*3:	692*148*67.5mm 27.244*5.827*2.657in
Weight:	2700g
RF Connectors:	N Female, SMA Female
Outer Conductor:	Nickel Plated Brass
Inner Conductor:	Gold Plated Beryllium Bronze
Housing Material:	Aluminum

Environmental

Operating Temperature:	-10~+50°C
Non-operating Temperature:	-40~+70°C

Outline Drawings



Analog

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

How To Order

QMPS900-X-Y-Z

X: Frequency in GHz
 Y: Connector type
 Z: Display

Examples:
 To order an analog phase shifter, DC-1GHz, N female to N female, specify QMPS900-1-N-A.

Connector naming rules:

S - SMA
 N - N

Display naming rules:

A - Analog
 D - Digital