

Coaxial

# Power Splitter/Combiner

**8 Way-0° 50Ω 0.5 to 175 MHz**
**ZFSC-8-1+  
ZFSC-8-1**


Generic photo used for illustration purposes only

CASE STYLE: R29

| Connectors | Model         |
|------------|---------------|
| BNC        | ZFSC-8-1+     |
| SMA        | ZFSC-8-1-S(+) |

**+RoHS Compliant**

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

## Maximum Ratings

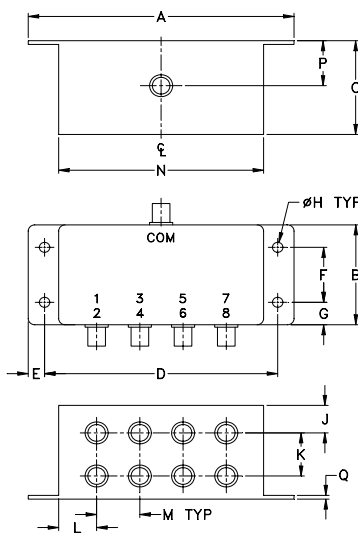
|                             |                |
|-----------------------------|----------------|
| Operating Temperature       | -55°C to 100°C |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 1W max.        |
| Internal Dissipation        | 0.62W max.     |

Permanent damage may occur if any of these limits are exceeded.

## Coaxial Connections

|                      |                 |
|----------------------|-----------------|
| SUM PORT             | S(COM)          |
| PORT 1,2,3,4,5,6,7,8 | 1,2,3,4,5,6,7,8 |

## Outline Drawing



## Outline Dimensions (inch/mm)

| A      | B     | C     | D     | E     | F     | G    | H     |
|--------|-------|-------|-------|-------|-------|------|-------|
| 4.06   | 1.60  | 1.57  | 3.56  | .24   | .88   | .36  | .160  |
| 103.12 | 40.64 | 39.88 | 90.42 | 6.10  | 22.35 | 9.14 | 4.06  |
| J      | K     | L     | M     | N     | P     | Q    | wt.   |
| .43    | .69   | .58   | .66   | 3.13  | .79   | .13  | grams |
| 10.92  | 17.53 | 14.73 | 16.76 | 79.50 | 20.07 | 3.30 | 200   |

## Features

- low insertion loss, 0.8 dB typ.
- high isolation, 30 dB typ.
- excellent amplitude unbalance, 0.2 dB typ.
- rugged shielded case

## Applications

- HF/VHF
- radio communication
- instrumentation

## Electrical Specifications

| FREQ. RANGE (MHz) | ISOLATION (dB) |      |      | INSERTION LOSS (dB) ABOVE 9.0 dB |      |      | PHASE UNBALANCE (Degrees) |      |      | AMPLITUDE UNBALANCE (dB) |      |      |
|-------------------|----------------|------|------|----------------------------------|------|------|---------------------------|------|------|--------------------------|------|------|
|                   | L              | M    | U    | L                                | M    | U    | L                         | M    | U    | L                        | M    | U    |
| $f_L$ - $f_U$     | Typ.           | Min. | Typ. | Min.                             | Typ. | Min. | Typ.                      | Max. | Typ. | Max.                     | Typ. | Max. |
| 0.5-175           | 30             | 25   | 30   | 20                               | 25   | 18   | 0.8                       | 1.2  | 0.8  | 1.2                      | 1.0  | 1.6  |

L = low range [ $f_L$  to  $10 f_L$ ] M = mid range [ $10 f_L$  to  $f_U/2$ ] U = upper range [ $f_U/2$  to  $f_U$ ]

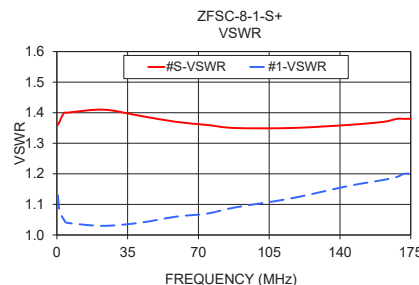
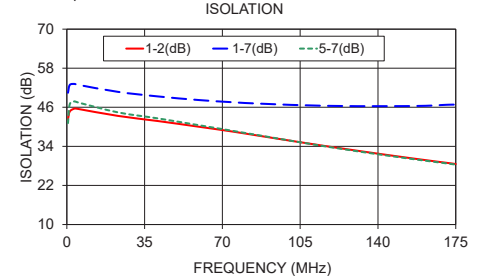
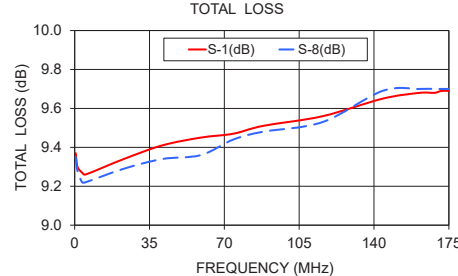
## Typical Performance Data

| Freq. (MHz) | Total Loss <sup>1</sup> (dB) |      |      |      |      |      | Amplitude Unbalance (dB) | Isolation (dB) |       |       |       | VSWR |      |      |
|-------------|------------------------------|------|------|------|------|------|--------------------------|----------------|-------|-------|-------|------|------|------|
|             | S-1                          | S-2  | S-3  | S-4  | S-6  | S-8  |                          | 1-2            | 1-7   | 3-4   | 5-7   | S    | 1    | 8    |
| 0.50        | 9.37                         | 9.37 | 9.37 | 9.38 | 9.37 | 9.35 | 0.05                     | 42.28          | 50.46 | 40.88 | 41.14 | 1.36 | 1.13 | 1.15 |
| 1.30        | 9.30                         | 9.29 | 9.31 | 9.31 | 9.29 | 9.28 | 0.03                     | 44.69          | 52.85 | 45.42 | 46.94 | 1.37 | 1.08 | 1.09 |
| 3.50        | 9.27                         | 9.25 | 9.26 | 9.26 | 9.25 | 9.22 | 0.05                     | 45.61          | 53.16 | 46.49 | 47.81 | 1.40 | 1.05 | 1.05 |
| 5.00        | 9.26                         | 9.25 | 9.27 | 9.25 | 9.24 | 9.22 | 0.05                     | 45.50          | 52.91 | 46.27 | 47.48 | 1.40 | 1.04 | 1.04 |
| 23.00       | 9.34                         | 9.32 | 9.35 | 9.32 | 9.34 | 9.29 | 0.05                     | 43.35          | 50.73 | 43.83 | 44.43 | 1.41 | 1.03 | 1.03 |
| 41.00       | 9.41                         | 9.33 | 9.41 | 9.35 | 9.39 | 9.34 | 0.07                     | 41.77          | 49.33 | 42.26 | 42.58 | 1.39 | 1.04 | 1.04 |
| 59.00       | 9.45                         | 9.34 | 9.45 | 9.35 | 9.42 | 9.36 | 0.11                     | 40.06          | 48.24 | 40.68 | 40.54 | 1.37 | 1.06 | 1.06 |
| 74.20       | 9.47                         | 9.38 | 9.48 | 9.37 | 9.48 | 9.44 | 0.11                     | 38.58          | 47.56 | 39.14 | 38.81 | 1.36 | 1.07 | 1.08 |
| 88.00       | 9.51                         | 9.41 | 9.50 | 9.39 | 9.52 | 9.48 | 0.13                     | 37.09          | 47.08 | 37.71 | 37.21 | 1.35 | 1.09 | 1.09 |
| 116.00      | 9.56                         | 9.45 | 9.58 | 9.42 | 9.57 | 9.53 | 0.17                     | 34.12          | 46.45 | 34.64 | 34.02 | 1.35 | 1.12 | 1.13 |
| 144.00      | 9.65                         | 9.57 | 9.67 | 9.55 | 9.71 | 9.69 | 0.16                     | 31.37          | 46.34 | 31.78 | 31.18 | 1.36 | 1.16 | 1.17 |
| 161.40      | 9.68                         | 9.59 | 9.69 | 9.56 | 9.73 | 9.70 | 0.17                     | 29.77          | 46.45 | 30.13 | 29.59 | 1.37 | 1.18 | 1.19 |
| 168.20      | 9.68                         | 9.59 | 9.70 | 9.56 | 9.73 | 9.70 | 0.17                     | 29.17          | 46.67 | 29.49 | 29.00 | 1.38 | 1.19 | 1.20 |
| 171.60      | 9.69                         | 9.60 | 9.71 | 9.57 | 9.74 | 9.70 | 0.17                     | 28.88          | 46.78 | 29.18 | 28.70 | 1.38 | 1.20 | 1.20 |
| 175.00      | 9.69                         | 9.61 | 9.72 | 9.58 | 9.73 | 9.70 | 0.16                     | 28.57          | 46.82 | 28.88 | 28.40 | 1.38 | 1.20 | 1.21 |

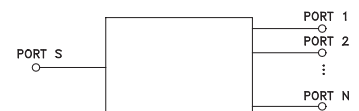
ZFSC-8-1-S+

1. Total Loss = Insertion Loss + 9dB splitter loss.

ZFSC-8-1-S+



## electrical schematic



## Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
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M151107  
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HY/TD/CP/AM  
200818

# 8 Way-0° Power Splitter/Combiner

ZFSC-8-1+

## Typical Performance Data

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup> |      |      |      |      |      | AMP.<br>UNBAL.<br>(dB) | ISOLATION |       |       |       | PHASE<br>UNBAL.<br>(deg.) | FREQ.<br>(MHz) | VSWR |      |      |
|----------------|-------------------------|------|------|------|------|------|------------------------|-----------|-------|-------|-------|---------------------------|----------------|------|------|------|
|                | S-1                     | S-2  | S-3  | S-4  | S-6  | S-8  |                        | 1-3       | 1-8   | 2-4   | 6-8   |                           |                | S    | 1    | 8    |
| 0.5            | 9.37                    | 9.37 | 9.37 | 9.38 | 9.37 | 9.35 | 0.05                   | 42.28     | 50.46 | 40.88 | 41.14 | 0.38                      | 0.5            | 1.36 | 1.13 | 1.15 |
| 0.9            | 9.33                    | 9.33 | 9.32 | 9.34 | 9.33 | 9.31 | 0.04                   | 43.69     | 52.10 | 43.89 | 44.90 | 0.25                      | 0.9            | 1.36 | 1.10 | 1.11 |
| 1.3            | 9.30                    | 9.29 | 9.31 | 9.31 | 9.29 | 9.28 | 0.03                   | 44.69     | 52.85 | 45.42 | 46.94 | 0.25                      | 1.3            | 1.37 | 1.08 | 1.09 |
| 1.7            | 9.29                    | 9.28 | 9.28 | 9.28 | 9.27 | 9.26 | 0.04                   | 45.19     | 53.11 | 45.99 | 47.64 | 0.27                      | 1.7            | 1.38 | 1.07 | 1.07 |
| 2.1            | 9.27                    | 9.27 | 9.28 | 9.27 | 9.26 | 9.24 | 0.04                   | 45.45     | 53.25 | 46.36 | 47.99 | 0.22                      | 2.1            | 1.39 | 1.06 | 1.06 |
| 2.5            | 9.27                    | 9.26 | 9.27 | 9.27 | 9.25 | 9.23 | 0.05                   | 45.58     | 53.19 | 46.51 | 48.10 | 0.23                      | 2.5            | 1.39 | 1.06 | 1.06 |
| 3.0            | 9.26                    | 9.25 | 9.27 | 9.26 | 9.24 | 9.22 | 0.04                   | 45.62     | 53.34 | 46.58 | 47.94 | 0.18                      | 3.0            | 1.40 | 1.05 | 1.05 |
| 3.5            | 9.27                    | 9.25 | 9.26 | 9.26 | 9.25 | 9.22 | 0.05                   | 45.61     | 53.16 | 46.49 | 47.81 | 0.25                      | 3.5            | 1.40 | 1.05 | 1.05 |
| 4.0            | 9.27                    | 9.25 | 9.27 | 9.26 | 9.24 | 9.21 | 0.06                   | 45.60     | 53.07 | 46.47 | 47.75 | 0.14                      | 4.0            | 1.40 | 1.04 | 1.04 |
| 4.5            | 9.26                    | 9.25 | 9.26 | 9.26 | 9.24 | 9.22 | 0.05                   | 45.59     | 52.95 | 46.38 | 47.63 | 0.15                      | 4.5            | 1.40 | 1.04 | 1.04 |
| 5.0            | 9.26                    | 9.25 | 9.27 | 9.25 | 9.24 | 9.22 | 0.05                   | 45.50     | 52.91 | 46.27 | 47.48 | 0.13                      | 5.0            | 1.40 | 1.04 | 1.04 |
| 11.0           | 9.29                    | 9.27 | 9.29 | 9.27 | 9.27 | 9.23 | 0.06                   | 44.65     | 52.03 | 45.22 | 46.08 | 0.13                      | 11.0           | 1.41 | 1.03 | 1.03 |
| 17.0           | 9.32                    | 9.30 | 9.31 | 9.30 | 9.31 | 9.27 | 0.04                   | 44.01     | 51.13 | 44.45 | 45.16 | 0.22                      | 17.0           | 1.41 | 1.03 | 1.03 |
| 23.0           | 9.34                    | 9.32 | 9.35 | 9.32 | 9.34 | 9.29 | 0.05                   | 43.35     | 50.73 | 43.83 | 44.43 | 0.19                      | 23.0           | 1.41 | 1.03 | 1.03 |
| 29.0           | 9.37                    | 9.32 | 9.36 | 9.34 | 9.36 | 9.31 | 0.06                   | 42.86     | 50.17 | 43.31 | 43.76 | 0.22                      | 29.0           | 1.40 | 1.03 | 1.03 |
| 35.0           | 9.38                    | 9.34 | 9.39 | 9.36 | 9.38 | 9.33 | 0.05                   | 42.29     | 49.56 | 42.77 | 43.22 | 0.31                      | 35.0           | 1.40 | 1.04 | 1.04 |
| 41.0           | 9.41                    | 9.33 | 9.41 | 9.35 | 9.39 | 9.34 | 0.07                   | 41.77     | 49.33 | 42.26 | 42.58 | 0.35                      | 41.0           | 1.39 | 1.04 | 1.04 |
| 47.0           | 9.42                    | 9.34 | 9.43 | 9.35 | 9.40 | 9.35 | 0.09                   | 41.19     | 48.91 | 41.71 | 41.85 | 0.39                      | 47.0           | 1.38 | 1.05 | 1.05 |
| 53.0           | 9.43                    | 9.34 | 9.44 | 9.35 | 9.41 | 9.34 | 0.10                   | 40.70     | 48.62 | 41.21 | 41.19 | 0.29                      | 53.0           | 1.38 | 1.05 | 1.06 |
| 59.0           | 9.45                    | 9.34 | 9.45 | 9.35 | 9.42 | 9.36 | 0.11                   | 40.06     | 48.24 | 40.68 | 40.54 | 0.27                      | 59.0           | 1.37 | 1.06 | 1.06 |
| 65.0           | 9.46                    | 9.36 | 9.47 | 9.36 | 9.44 | 9.39 | 0.12                   | 39.54     | 48.00 | 40.12 | 39.85 | 0.21                      | 65.0           | 1.37 | 1.06 | 1.07 |
| 69.6           | 9.48                    | 9.38 | 9.48 | 9.37 | 9.46 | 9.42 | 0.11                   | 39.02     | 47.73 | 39.63 | 39.33 | 0.27                      | 69.6           | 1.36 | 1.07 | 1.07 |
| 74.2           | 9.47                    | 9.38 | 9.48 | 9.37 | 9.48 | 9.44 | 0.11                   | 38.58     | 47.56 | 39.14 | 38.81 | 0.30                      | 74.2           | 1.36 | 1.07 | 1.08 |
| 78.8           | 9.49                    | 9.39 | 9.50 | 9.37 | 9.50 | 9.47 | 0.13                   | 38.06     | 47.21 | 38.67 | 38.27 | 0.33                      | 78.8           | 1.35 | 1.08 | 1.08 |
| 83.4           | 9.50                    | 9.40 | 9.51 | 9.39 | 9.50 | 9.47 | 0.13                   | 37.59     | 47.22 | 38.18 | 37.75 | 0.36                      | 83.4           | 1.35 | 1.08 | 1.09 |
| 88.0           | 9.51                    | 9.41 | 9.50 | 9.39 | 9.52 | 9.48 | 0.13                   | 37.09     | 47.08 | 37.71 | 37.21 | 0.48                      | 88.0           | 1.35 | 1.09 | 1.09 |
| 95.0           | 9.52                    | 9.41 | 9.53 | 9.39 | 9.52 | 9.48 | 0.14                   | 36.34     | 46.86 | 36.94 | 36.38 | 0.62                      | 95.0           | 1.35 | 1.10 | 1.10 |
| 102.0          | 9.53                    | 9.41 | 9.54 | 9.39 | 9.52 | 9.48 | 0.15                   | 35.61     | 46.66 | 36.17 | 35.59 | 0.72                      | 102.0          | 1.35 | 1.11 | 1.11 |
| 109.0          | 9.55                    | 9.42 | 9.56 | 9.40 | 9.55 | 9.51 | 0.16                   | 34.86     | 46.58 | 35.44 | 34.81 | 0.82                      | 109.0          | 1.35 | 1.12 | 1.12 |
| 116.0          | 9.56                    | 9.45 | 9.58 | 9.42 | 9.57 | 9.53 | 0.17                   | 34.12     | 46.45 | 34.64 | 34.02 | 0.97                      | 116.0          | 1.35 | 1.12 | 1.13 |
| 123.0          | 9.58                    | 9.47 | 9.60 | 9.44 | 9.61 | 9.58 | 0.17                   | 33.38     | 46.29 | 33.90 | 33.27 | 0.99                      | 123.0          | 1.35 | 1.13 | 1.14 |
| 130.0          | 9.60                    | 9.51 | 9.63 | 9.48 | 9.65 | 9.63 | 0.17                   | 32.70     | 46.27 | 33.19 | 32.55 | 1.18                      | 130.0          | 1.35 | 1.14 | 1.15 |
| 137.0          | 9.64                    | 9.54 | 9.64 | 9.52 | 9.69 | 9.67 | 0.16                   | 32.02     | 46.38 | 32.48 | 31.86 | 1.36                      | 137.0          | 1.35 | 1.15 | 1.16 |
| 144.0          | 9.65                    | 9.57 | 9.67 | 9.55 | 9.71 | 9.69 | 0.16                   | 31.37     | 46.34 | 31.78 | 31.18 | 1.39                      | 144.0          | 1.36 | 1.16 | 1.17 |
| 151.0          | 9.67                    | 9.59 | 9.69 | 9.56 | 9.73 | 9.71 | 0.17                   | 30.71     | 46.36 | 31.11 | 30.54 | 1.59                      | 151.0          | 1.36 | 1.17 | 1.18 |
| 158.0          | 9.68                    | 9.58 | 9.70 | 9.56 | 9.73 | 9.70 | 0.17                   | 30.06     | 46.51 | 30.45 | 29.90 | 1.69                      | 158.0          | 1.37 | 1.18 | 1.19 |
| 161.4          | 9.68                    | 9.59 | 9.69 | 9.56 | 9.73 | 9.70 | 0.17                   | 29.77     | 46.45 | 30.13 | 29.59 | 1.82                      | 161.4          | 1.37 | 1.18 | 1.19 |
| 164.8          | 9.68                    | 9.59 | 9.70 | 9.55 | 9.74 | 9.70 | 0.18                   | 29.47     | 46.59 | 29.80 | 29.29 | 1.90                      | 164.8          | 1.37 | 1.19 | 1.20 |
| 168.2          | 9.68                    | 9.59 | 9.70 | 9.56 | 9.73 | 9.70 | 0.17                   | 29.17     | 46.67 | 29.49 | 29.00 | 1.95                      | 168.2          | 1.38 | 1.19 | 1.20 |
| 171.6          | 9.69                    | 9.60 | 9.71 | 9.57 | 9.74 | 9.70 | 0.17                   | 28.88     | 46.78 | 29.18 | 28.70 | 2.05                      | 171.6          | 1.38 | 1.20 | 1.20 |
| 175.0          | 9.69                    | 9.61 | 9.72 | 9.58 | 9.73 | 9.70 | 0.16                   | 28.57     | 46.82 | 28.88 | 28.40 | 2.08                      | 175.0          | 1.38 | 1.20 | 1.21 |

<sup>1</sup> Total Loss = Insertion Loss + 9dB Splitter Loss

REV. X2  
ZFSC-8-1+  
100721  
Page 1 of 1

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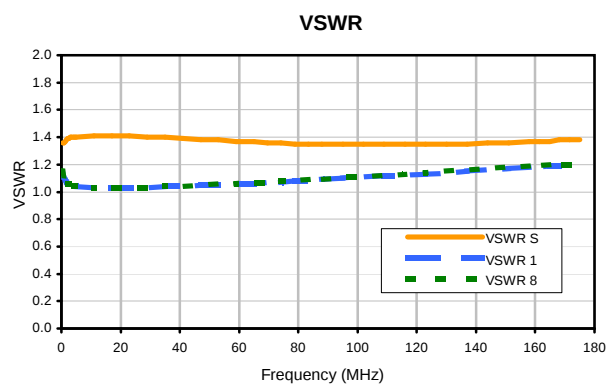
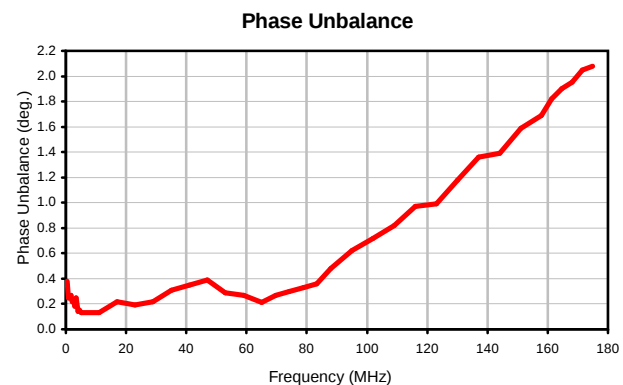
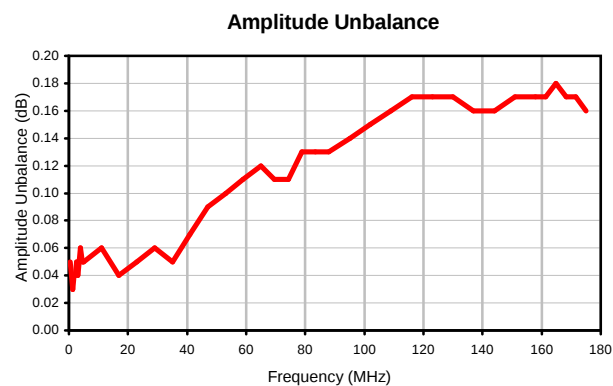
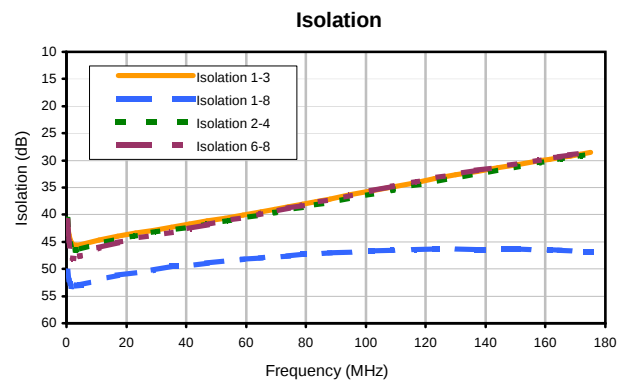
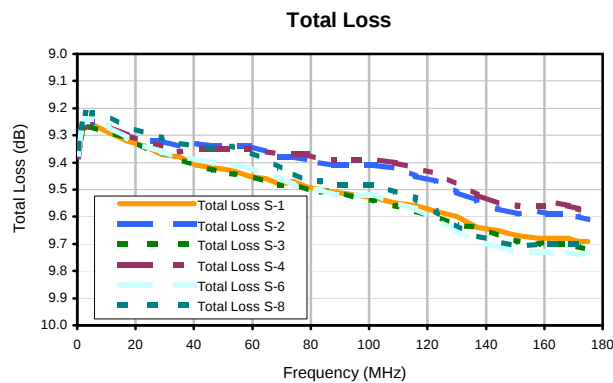
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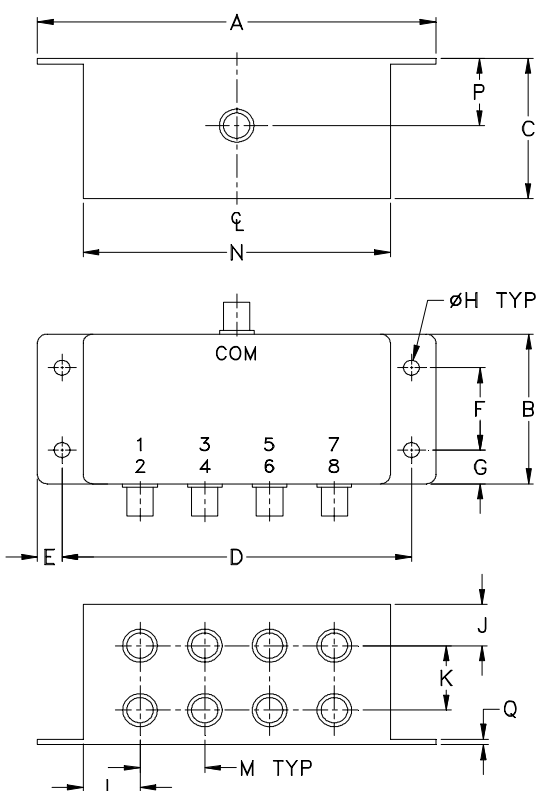
# 8 Way-0° Power Splitter/Combiner

ZFSC-8-1+

## Typical Performance Curves



### Outline Dimensions



| CASE# | A                | B               | C               | D               | E             | F              | G             | H              | J              | K              | L              | M              | N               |
|-------|------------------|-----------------|-----------------|-----------------|---------------|----------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| R29   | 4.06<br>(103.12) | 1.60<br>(40.64) | 1.57<br>(39.88) | 3.56<br>(90.42) | .24<br>(6.10) | .88<br>(22.35) | .36<br>(9.14) | .160<br>(4.06) | .43<br>(10.92) | .69<br>(17.53) | .58<br>(14.73) | .66<br>(16.76) | 3.13<br>(79.50) |

| CASE# | P              | Q             | WT. GRAMS |
|-------|----------------|---------------|-----------|
| R29   | .79<br>(20.07) | .13<br>(3.18) | 200.0     |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

#### Notes:

- Case material: Aluminum alloy.
- Case finish:

For RoHS Case Styles:

Clear chemical conversion coating, non-chrome or trivalent chrome based.



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| Specification              | Test/Inspection Condition                                                              | Reference/Spec                       |
|----------------------------|----------------------------------------------------------------------------------------|--------------------------------------|
| Operating Temperature      | -55° to 100°C<br>Ambient Environment                                                   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment                                                  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)    | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |