

Coaxial

Power Splitter/Combiner

ZMSCJ-2-2

2 Way-180° 50Ω 0.01 to 20 MHz



CASE STYLE: M21

Connectors Model
SMA ZMSCJ-2-2
BRACKET (OPTION "B")
BRACKET (OPTION "BR")

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 | 0.125W max. |

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

Coaxial Connections

| | |
|----------|---|
| SUM PORT | 2 |
| PORT 1 | 1 |
| PORT 2 | 3 |

Features

- low insertion loss, 0.2 dB typ.
- high isolation, 30 dB typ.
- excellent amplitude unbalance, 0.1 dB typ.
- excellent phase unbalance, 1 deg. typ.
- good VSWR, 1.15:1 typ.
- rugged shielded case

Applications

- HF
- radio communication
- instrumentation
- signal processing

Electrical Specifications

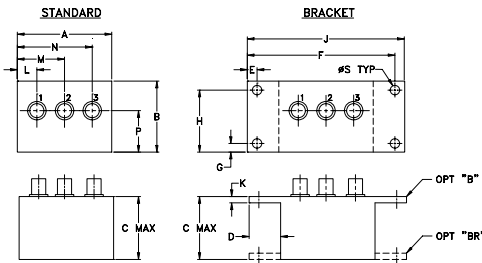
| FREQ. RANGE (MHz) | ISOLATION (dB) | | | | | | INSERTION LOSS (dB) ABOVE 3.0 dB | | | | | | PHASE UNBALANCE (Degrees) | | | AMPLITUDE UNBALANCE (dB) | | |
|-------------------|----------------|-----|------|-----|------|-----|----------------------------------|------|------|------|------|------|---------------------------|------|------|--------------------------|------|------|
| | L | | M | | U | | L | | M | | U | | L | M | U | L | M | U |
| | Typ. | Min | Typ. | Min | Typ. | Min | Typ. | Max. | Typ. | Max. | Typ. | Max. | Max. | Max. | Max. | Max. | Max. | Max. |
| f_L - f_U | | | | | | | | | | | | | | | | | | |
| 0.01-20 | 35 | 25 | 30 | 25 | 25 | 18 | 0.3 | 0.8 | 0.2 | 0.5 | 0.3 | 0.6 | 1* | 2 | 2.5 | 0.1 | 0.1 | 0.2 |

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]

At low range frequency band (f_L to $10 f_L$), linearly derate maximum input power by 13 dB.

* Phase unbalance is 3 degrees max from f_L to $3f_L$

Outline Drawing



Outline Dimensions (inch/mm)

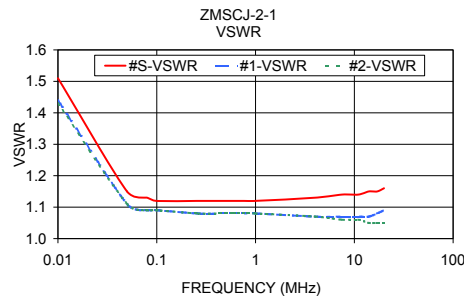
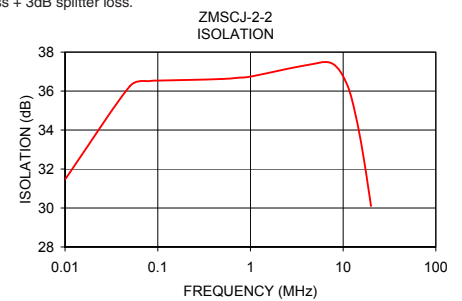
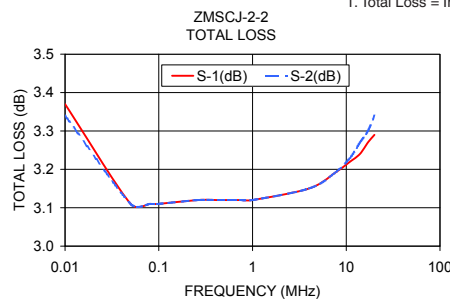
| A | B | C | D | E | F | G | H |
|-------|-------|-------|-------|------|-------|------|-------|
| 1.50 | 1.13 | 1.00 | .50 | .155 | 2.345 | .138 | .987 |
| 38.10 | 28.70 | 25.40 | 12.70 | 3.94 | 59.56 | 3.51 | 25.07 |

| J | K | L | M | N | P | S | wt |
|-------|------|------|-------|-------|-------|------|-------|
| 2.50 | .10 | .31 | .75 | 1.19 | .66 | .150 | grams |
| 63.50 | 2.54 | 7.87 | 19.05 | 30.23 | 16.76 | 3.81 | 40.0 |

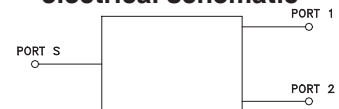
Typical Performance Data

| Frequency (MHz) | Total Loss ¹ (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
| | S-1 | S-2 | | | | | | |
| 0.01 | 3.37 | 3.34 | 0.03 | 31.46 | 180.24 | 1.51 | 1.44 | 1.43 |
| 0.05 | 3.11 | 3.11 | 0.00 | 36.25 | 180.10 | 1.15 | 1.11 | 1.11 |
| 0.08 | 3.11 | 3.11 | 0.00 | 36.51 | 180.07 | 1.13 | 1.09 | 1.09 |
| 0.10 | 3.11 | 3.11 | 0.00 | 36.54 | 180.06 | 1.12 | 1.09 | 1.09 |
| 0.26 | 3.12 | 3.12 | 0.00 | 36.58 | 179.98 | 1.12 | 1.08 | 1.08 |
| 0.43 | 3.12 | 3.12 | 0.00 | 36.61 | 179.97 | 1.12 | 1.08 | 1.08 |
| 0.59 | 3.12 | 3.12 | 0.00 | 36.64 | 179.97 | 1.12 | 1.08 | 1.08 |
| 0.75 | 3.12 | 3.12 | 0.00 | 36.69 | 179.95 | 1.12 | 1.08 | 1.08 |
| 1.00 | 3.12 | 3.12 | 0.00 | 36.74 | 179.94 | 1.12 | 1.08 | 1.08 |
| 4.00 | 3.15 | 3.15 | 0.00 | 37.33 | 179.85 | 1.13 | 1.07 | 1.07 |
| 7.50 | 3.19 | 3.19 | 0.01 | 37.43 | 179.72 | 1.14 | 1.07 | 1.06 |
| 11.00 | 3.22 | 3.23 | 0.01 | 36.35 | 179.59 | 1.14 | 1.07 | 1.06 |
| 14.00 | 3.24 | 3.27 | 0.02 | 34.52 | 179.49 | 1.15 | 1.07 | 1.05 |
| 17.00 | 3.27 | 3.30 | 0.04 | 32.32 | 179.38 | 1.15 | 1.08 | 1.05 |
| 20.00 | 3.29 | 3.34 | 0.05 | 30.10 | 179.29 | 1.16 | 1.09 | 1.05 |

1. Total Loss = Insertion Loss + 3dB splitter loss.



electrical schematic



Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

REV. B
M151107
ZMSCJ-2-2
HYTD/CP/AM
151019



2 Way-180° Power Splitter/Combiner

ZMSCJ-2-2

Typical Performance Data

| FREQ. (MHz) | TOTAL LOSS ¹ (dB) | | AMP. UNBAL. (dB) | ISOLATION (dB) | PHASE UNBAL. (deg.) | FREQ. (MHz) | VSWR (:1) | | |
|----------------|---------------------------------|------|------------------------|-------------------|---------------------------|----------------|--------------|------|------|
| | S-1 | S-2 | | | | | S | 1 | 2 |
| 0.01 | 3.37 | 3.34 | 0.03 | 31.46 | 180.24 | 0.01 | 1.51 | 1.44 | 1.43 |
| 0.02 | 3.19 | 3.18 | 0.01 | 34.10 | 180.18 | 0.02 | 1.29 | 1.25 | 1.24 |
| 0.03 | 3.12 | 3.12 | 0.01 | 35.74 | 180.13 | 0.03 | 1.18 | 1.14 | 1.14 |
| 0.04 | 3.12 | 3.11 | 0.01 | 36.05 | 180.11 | 0.04 | 1.16 | 1.13 | 1.12 |
| 0.05 | 3.11 | 3.11 | 0.00 | 36.25 | 180.10 | 0.05 | 1.15 | 1.11 | 1.11 |
| 0.06 | 3.11 | 3.11 | 0.00 | 36.35 | 180.09 | 0.06 | 1.14 | 1.11 | 1.10 |
| 0.07 | 3.11 | 3.10 | 0.00 | 36.42 | 180.08 | 0.07 | 1.14 | 1.10 | 1.10 |
| 0.08 | 3.11 | 3.11 | 0.00 | 36.51 | 180.07 | 0.08 | 1.13 | 1.09 | 1.09 |
| 0.09 | 3.11 | 3.11 | 0.00 | 36.51 | 180.06 | 0.09 | 1.13 | 1.09 | 1.09 |
| 0.10 | 3.11 | 3.11 | 0.00 | 36.54 | 180.06 | 0.10 | 1.12 | 1.09 | 1.09 |
| 0.18 | 3.12 | 3.11 | 0.00 | 36.57 | 180.03 | 0.18 | 1.12 | 1.09 | 1.08 |
| 0.26 | 3.12 | 3.12 | 0.00 | 36.58 | 179.98 | 0.26 | 1.12 | 1.08 | 1.08 |
| 0.35 | 3.12 | 3.12 | 0.00 | 36.59 | 179.98 | 0.35 | 1.12 | 1.08 | 1.08 |
| 0.43 | 3.12 | 3.12 | 0.00 | 36.61 | 179.97 | 0.43 | 1.12 | 1.08 | 1.08 |
| 0.51 | 3.12 | 3.12 | 0.00 | 36.63 | 179.97 | 0.51 | 1.12 | 1.08 | 1.08 |
| 0.59 | 3.12 | 3.12 | 0.00 | 36.64 | 179.97 | 0.59 | 1.12 | 1.08 | 1.08 |
| 0.67 | 3.12 | 3.12 | 0.00 | 36.67 | 179.96 | 0.67 | 1.12 | 1.08 | 1.08 |
| 0.75 | 3.12 | 3.12 | 0.00 | 36.69 | 179.95 | 0.75 | 1.12 | 1.08 | 1.08 |
| 0.84 | 3.12 | 3.11 | 0.00 | 36.71 | 179.95 | 0.84 | 1.12 | 1.08 | 1.08 |
| 0.92 | 3.12 | 3.11 | 0.00 | 36.72 | 179.95 | 0.92 | 1.12 | 1.08 | 1.08 |
| 1.00 | 3.12 | 3.12 | 0.00 | 36.74 | 179.94 | 1.00 | 1.12 | 1.08 | 1.08 |
| 2.00 | 3.12 | 3.12 | 0.00 | 36.95 | 179.91 | 2.00 | 1.12 | 1.08 | 1.08 |
| 3.00 | 3.13 | 3.13 | 0.00 | 37.16 | 179.87 | 3.00 | 1.13 | 1.08 | 1.07 |
| 4.00 | 3.15 | 3.15 | 0.00 | 37.33 | 179.85 | 4.00 | 1.13 | 1.07 | 1.07 |
| 5.00 | 3.16 | 3.16 | 0.00 | 37.47 | 179.80 | 5.00 | 1.13 | 1.07 | 1.07 |
| 6.25 | 3.17 | 3.18 | 0.01 | 37.51 | 179.76 | 6.25 | 1.14 | 1.07 | 1.07 |
| 7.50 | 3.19 | 3.19 | 0.01 | 37.43 | 179.72 | 7.50 | 1.14 | 1.07 | 1.06 |
| 8.75 | 3.20 | 3.21 | 0.01 | 37.21 | 179.67 | 8.75 | 1.14 | 1.07 | 1.06 |
| 10.00 | 3.21 | 3.22 | 0.01 | 36.79 | 179.63 | 10.00 | 1.14 | 1.07 | 1.06 |
| 11.00 | 3.22 | 3.23 | 0.01 | 36.35 | 179.59 | 11.00 | 1.14 | 1.07 | 1.06 |
| 12.00 | 3.23 | 3.24 | 0.02 | 35.81 | 179.56 | 12.00 | 1.14 | 1.07 | 1.05 |
| 13.00 | 3.23 | 3.25 | 0.02 | 35.20 | 179.52 | 13.00 | 1.15 | 1.07 | 1.05 |
| 14.00 | 3.24 | 3.27 | 0.02 | 34.52 | 179.49 | 14.00 | 1.15 | 1.07 | 1.05 |
| 15.00 | 3.25 | 3.28 | 0.03 | 33.81 | 179.45 | 15.00 | 1.15 | 1.07 | 1.05 |
| 16.00 | 3.26 | 3.29 | 0.03 | 33.07 | 179.42 | 16.00 | 1.15 | 1.07 | 1.05 |
| 17.00 | 3.27 | 3.30 | 0.04 | 32.32 | 179.38 | 17.00 | 1.15 | 1.08 | 1.05 |
| 18.00 | 3.28 | 3.31 | 0.04 | 31.57 | 179.35 | 18.00 | 1.16 | 1.08 | 1.05 |
| 19.00 | 3.28 | 3.33 | 0.04 | 30.83 | 179.31 | 19.00 | 1.16 | 1.08 | 1.05 |
| 20.00 | 3.29 | 3.34 | 0.05 | 30.10 | 179.29 | 20.00 | 1.16 | 1.09 | 1.05 |

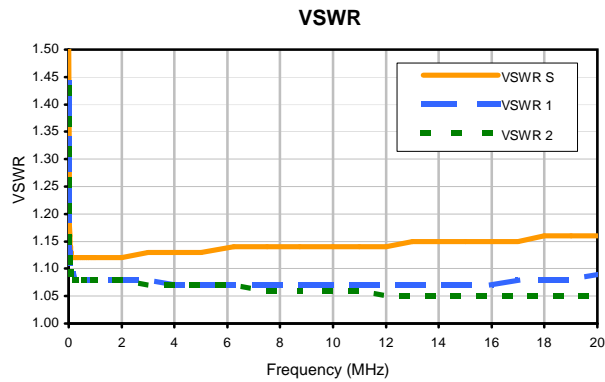
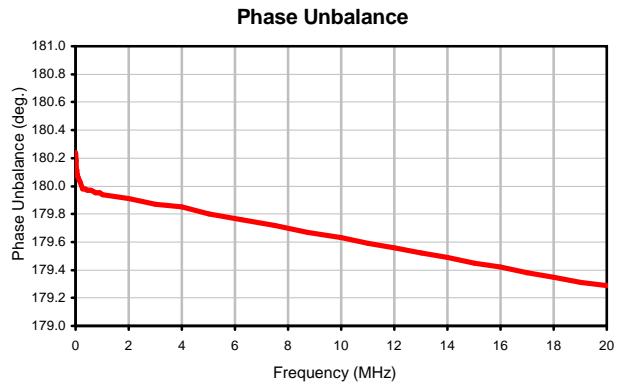
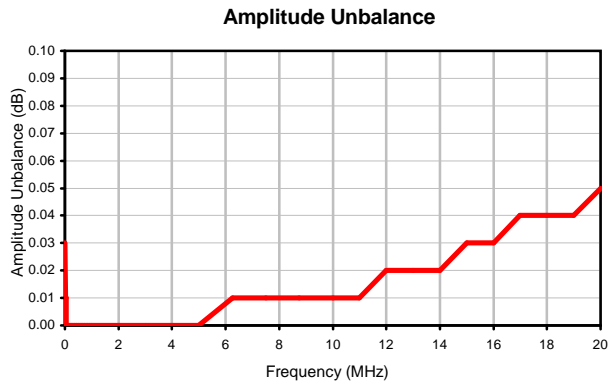
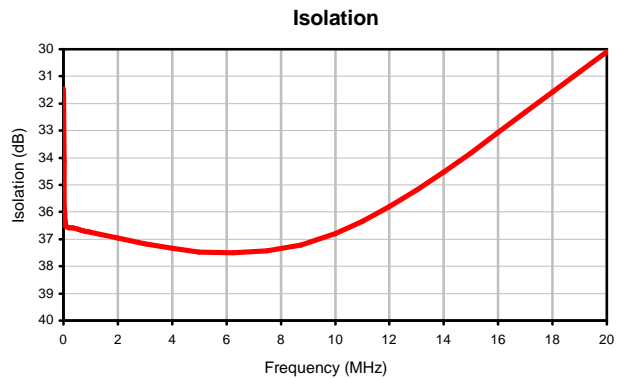
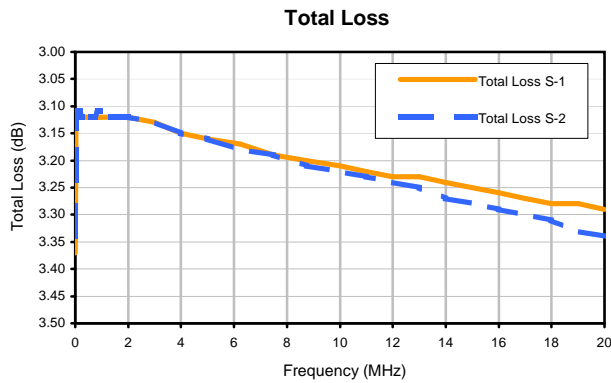
¹ Total Loss = Insertion Loss+ 3dB Splitter Loss



2 Way-180° Power Splitter/Combiner

ZMSCJ-2-2

Typical Performance Curves



REV. X2
ZMSCJ-2-2
100627
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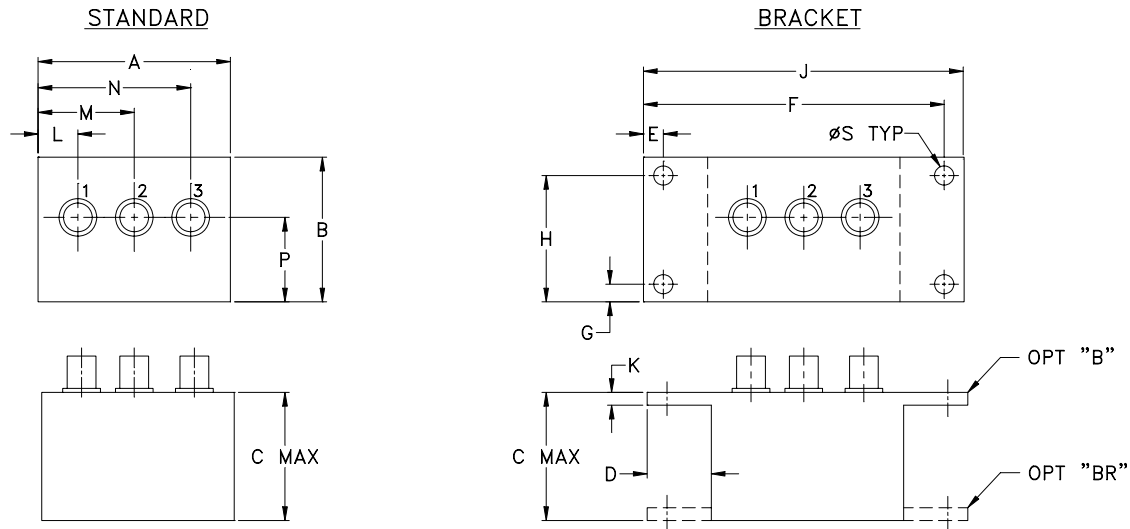
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Outline Dimensions



| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N |
|-------|-----------------|-----------------|-----------------|----------------|----------------|------------------|----------------|------------------|-----------------|---------------|----------------|-----------------|-----------------|
| M21 | 1.50 (38.10) | 1.13 (28.70) | 1.00 (25.40) | .50 (12.70) | .155 (3.94) | 2.345 (59.56) | .138 (3.51) | .987 (25.07) | 2.50 (63.50) | .10 (2.54) | .31 (7.87) | .75 (19.05) | 1.19 (30.23) |
| M22 | 2.25 (57.15) | 1.38 (35.05) | 1.24 (31.50) | | .150 (3.81) | 3.100 (78.74) | | 1.238 (31.45) | 3.25 (82.55) | | .40 (10.16) | 1.15 (29.21) | 1.86 (47.24) |
| M23 | 2.25 (57.15) | 1.38 (35.05) | 1.24 (31.50) | | .150 (3.81) | 3.100 (78.74) | | 1.238 (31.45) | 3.25 (82.55) | | .63 (16.00) | 1.06 (26.92) | 1.63 (41.40) |

| CASE# | P | Q | R | S | WT. GRAMS |
|-------|----------------|----|----|----------------|-----------|
| M21 | .66 (16.76) | -- | -- | .150 (3.81) | 40.0 |
| M22 | .64 (16.26) | -- | -- | | 74.0 |
| M23 | .69 (17.53) | -- | -- | | 70.0 |

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.
 - For Non-RoHS Case Styles: Yellow hexavalent chrome based conversion coating.

Due to transition from non-RoHS to RoHS, models will be supplied with either case style finish until the non-RoHS case inventory is depleted.
- Mounting bracket available on request. For bracket mounted on connector end add suffix B to part number and add \$5.00 to unit cost. For bracket mounted on the rear, add suffix BR to part number and add \$1.50 to unit cost.

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|----------------------------|--|--------------------------------------|
| Operating Temperature | -55° to 100°C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| Barometric Pressure | 100,000 Feet | MIL-STD-202, Method 105, Condition D |
| Humidity | 90% RH, 65°C 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 |