VERY HIGH DC CURRENT

# RF Choke

# ADCH-1220+

50Ω 5 to 1220 MHz

## THE BIG DEAL

- Very Wideband, 5 to 1220 MHz
- Maximum DC Current Handling Capability of 200 mA
- Excellent Insertion Loss, 0.2 dB Typical
- Good Return Loss, 25 dB Typ.
- Low Parasitic Capacitance, 0.1 pF Typ.
- Effective Parallel Resistance, Rch 800Ω Typ.
- SMT Package
- Aqueous Washable
- Protected by US Patent, 6,133,525

*Generic photo used for illustration purposes only*

CASE STYLE: CD637

**+RoHS Compliant**
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

## APPLICATIONS

- Biasing Amplifiers
- Biasing of Laser Diodes
- Biasing of Active Antennas

## PRODUCT OVERVIEW

Mini-Circuits' ADCH-1220+ RF Choke achieves a very wide bandwidth from 5 up to 1220 MHz. The choke is wound with AWG32 wire, making the maximum continuous current 200 mA DC. Excellent Insertion Loss, good VSWR (1.1:1 typ.), flatness and rugged construction make this model an ideal solution for rf-choke applications across a very wide frequency range. This unit supports a broad range of system and test applications.

## KEY FEATURES

| Features | Advantages |
|---|---|
| Extremely Wideband, 5 to 1220 MHz | Ideal for an exceptionally wide variety of lab and system applications. |
| Excellent Insertion Loss, 0.2 dB Typ. Across Entire Range | Provides excellent signal transmission from input to output with consistent performance across its entire frequency range. |
| Good Return Loss, 25 dB Typ. | Efficient power utilization with minimal signal power reflected back to source. |
| 200 mA DC Continuous | Ideal for DC injection applications requiring high current levels. |
| Rugged Construction | Withstands harsh environmental conditions for high reliability and long life of use. |

REV. B
ECO-027902
ADCH-1220+
MCL NY
260519

# RF Choke

# ADCH-1220+

50Ω 5 to 1220 MHz

## ELECTRICAL SPECIFICATIONS AT +25 °C

| Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Frequency Range | | 5 | | 1220 | MHz |
| Insertion Loss | 5-10 MHz<br>10-1220 MHz | –<br>– | 0.3<br>0.2 | 0.8<br>0.5 | dB |
| VSWR[1] | 5-10 MHz<br>10-1220 MHz | –<br>– | 1.64<br>1.1 | –<br>1.29 | :1 |
| DC Current | – | – | – | 200 | mA |
| Inductance | @ 0 mA | – | 3.4 | – | µH |

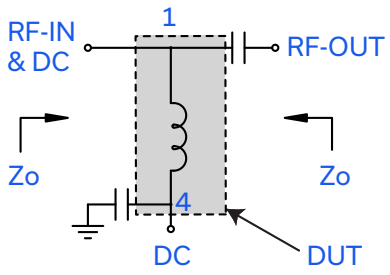
1. Tested with circuit shown below, $Z_0$ = 50Ω.

## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Operating Temperature | -40 °C to +85 °C |
| Storage Temperature | -55 °C to +100 °C |
| DC Current | 300 mA |

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

## TEST CIRCUIT[1]



VERY HIGH DC CURRENT

# RF Choke

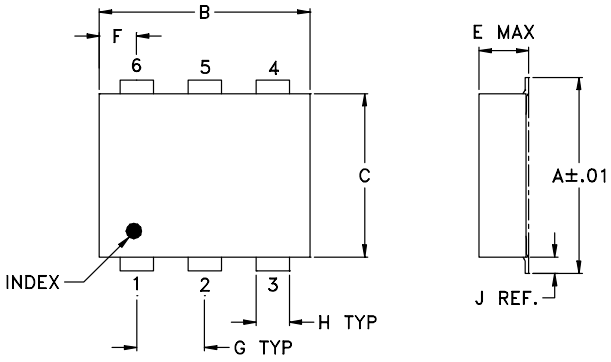
# ADCH-1220+

50Ω 5 to 1220 MHz

## PIN CONNECTIONS

| | |
|---|---|
| RF-IN & DC | 1 |
| RF GROUND | 4 |
| NOT USED | 2,3,5,6 |

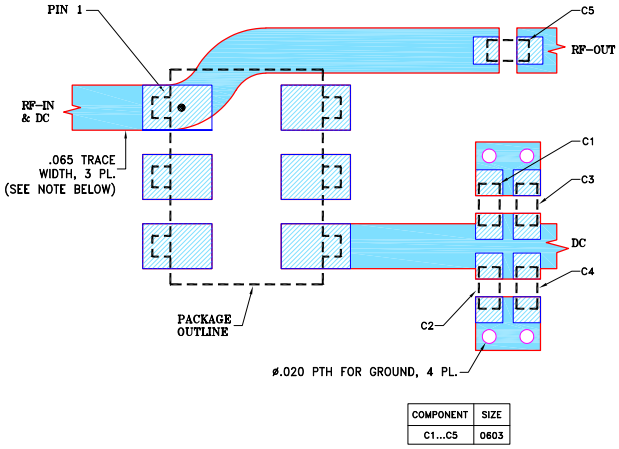
## OUTLINE DRAWING




## PRODUCT MARKING: N/A

## DEMO BOARD MCL P/N: TB-ADCH-1220+

## SUGGESTED PCB LAYOUT (PL-699)




| COMPONENT | SIZE |
|---|---|
| C1...C5 | 0603 |

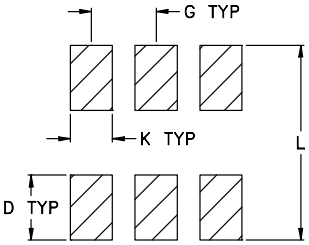
NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030±.0015"; COPPER: 1/2 OZ. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-ADCH-1220+.
3. UNIT LAND PATTERN WAS OPTIMIZED FOR BETTER PERFORMANCE.
4. BOTTOM COPPER OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

PBC Land Pattern




Suggested Layout,
Tolerence to be within ±.002 in

## OUTLINE DIMENSIONS (Inches / mm)

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| .272 | .310 | .220 | .100 | .206 | .055 | .100 |
| 6.91 | 7.87 | 5.59 | 2.54 | 5.23 | 1.40 | 2.54 |

| H | J | K | L | | | wt |
|---|---|---|---|---|---|---|
| .030 | .026 | .065 | .300 | | | grams |
| 0.76 | 0.66 | 1.65 | 7.62 | | | 0.40 |

## TAPE & REEL INFORMATION: F46

VERY HIGH DC CURRENT

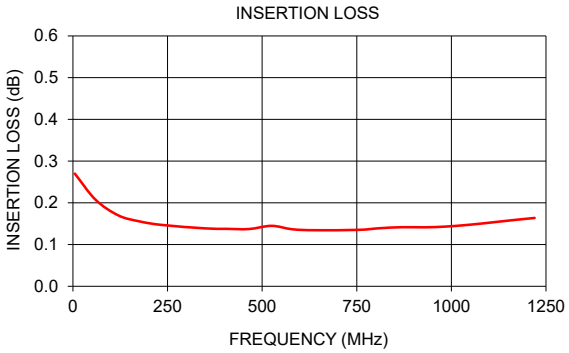
# RF Choke

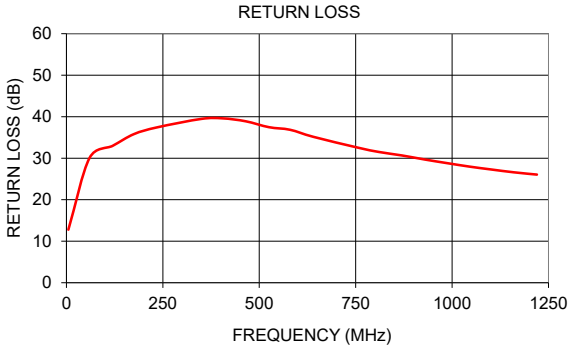
# ADCH-1220+

50Ω 5 to 1220 MHz

## TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) |
|---|---|---|
| 5 | 0.27 | 12.78 |
| 60 | 0.21 | 30.08 |
| 120 | 0.17 | 32.99 |
| 175 | 0.16 | 35.80 |
| 235 | 0.15 | 37.43 |
| 350 | 0.14 | 39.47 |
| 405 | 0.14 | 39.60 |
| 465 | 0.14 | 38.89 |
| 525 | 0.14 | 37.48 |
| 580 | 0.14 | 36.84 |
| 640 | 0.13 | 35.16 |
| 755 | 0.14 | 32.56 |
| 810 | 0.14 | 31.50 |
| 870 | 0.14 | 30.66 |
| 930 | 0.14 | 29.67 |
| 985 | 0.14 | 28.84 |
| 1045 | 0.15 | 27.97 |
| 1100 | 0.15 | 27.30 |
| 1160 | 0.16 | 26.60 |
| 1220 | 0.16 | 26.05 |




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.

C. 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/terms/viewterm.html

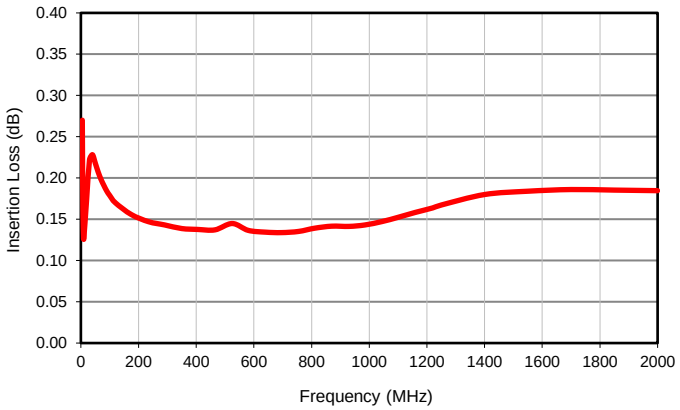
# RF Choke ADCH-1220+

## *Typical Performance Data*

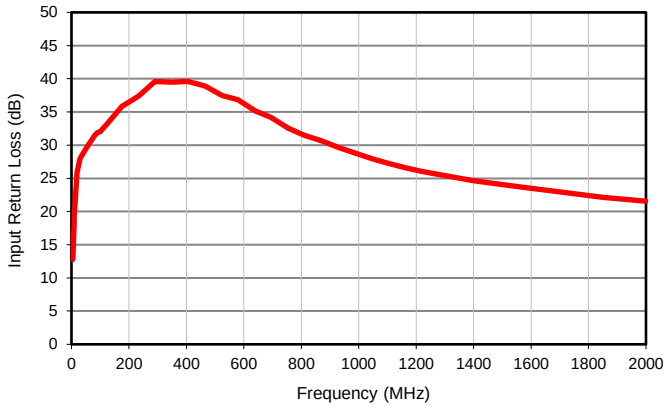
| FREQUENCY (MHz) | AVERAGE INSERTION LOSS (dB) | INPUT RETURN LOSS (dB) |
|---|---|---|
| 5 | 0.27 | 12.78 |
| 7 | 0.16 | 15.82 |
| 9 | 0.13 | 18.18 |
| 10 | 0.13 | 19.23 |
| 20 | 0.17 | 25.91 |
| 30 | 0.22 | 27.93 |
| 40 | 0.23 | 28.68 |
| 50 | 0.22 | 29.39 |
| 60 | 0.21 | 30.08 |
| 70 | 0.20 | 30.71 |
| 80 | 0.19 | 31.39 |
| 90 | 0.18 | 31.86 |
| 100 | 0.18 | 32.03 |
| 120 | 0.17 | 32.99 |
| 175 | 0.16 | 35.80 |
| 235 | 0.15 | 37.43 |
| 290 | 0.14 | 39.59 |
| 350 | 0.14 | 39.47 |
| 405 | 0.14 | 39.60 |
| 465 | 0.14 | 38.89 |
| 525 | 0.14 | 37.48 |
| 580 | 0.14 | 36.84 |
| 640 | 0.13 | 35.16 |
| 695 | 0.13 | 34.20 |
| 755 | 0.14 | 32.56 |
| 810 | 0.14 | 31.50 |
| 870 | 0.14 | 30.66 |
| 930 | 0.14 | 29.67 |
| 985 | 0.14 | 28.84 |
| 1045 | 0.15 | 27.97 |
| 1100 | 0.15 | 27.30 |
| 1160 | 0.16 | 26.60 |
| 1220 | 0.16 | 26.05 |
| 1250 | 0.17 | 25.82 |
| 1400 | 0.18 | 24.64 |
| 1550 | 0.18 | 23.77 |
| 1700 | 0.19 | 22.97 |
| 1850 | 0.19 | 22.12 |
| 2000 | 0.18 | 21.56 |

## *Typical Performance Data*

**Average Insertion Loss**



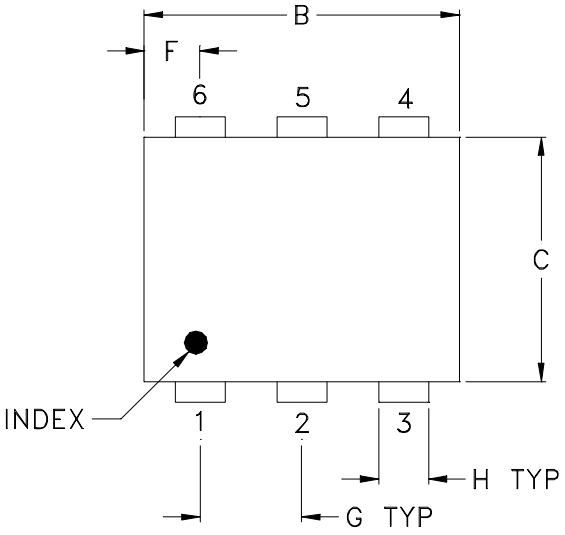

**Input Return Loss**

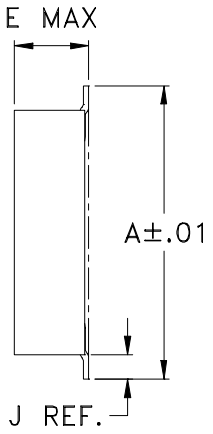


# Case Style CD

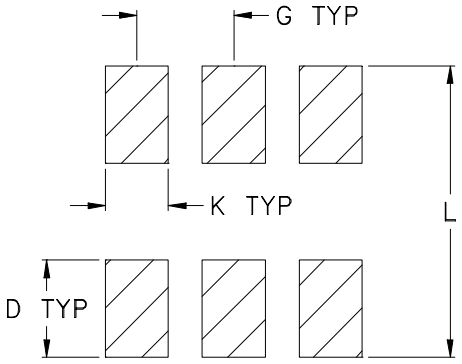
**CD541**
**CD542**
**CD636**
**CD637**

## Outline Dimensions




## PCB Land Pattern




Suggested Layout,
Tolerance to be within ±.002

| CASE# | A | B | C | D | E | F | G | H | J | K | L | WT, GRAM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD541 | .272 (6.91) | .310 (7.87) | .220 (5.58) | .100 (2.54) | .082 (2.08) | .055 (1.40) | .100 (2.54) | .030 (0.76) | .026 (0.66) | .065 (1.65) | .300 (7.62) | .15 |
| CD542 | | | | | .112 (2.84) | | | | | | | .20 |
| CD636 | | | | | .162 (4.11) | | | | | | | .25 |
| CD637 | | | | | .206 (5.23) | | | | | | | .40 |

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005**

**Notes:**

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.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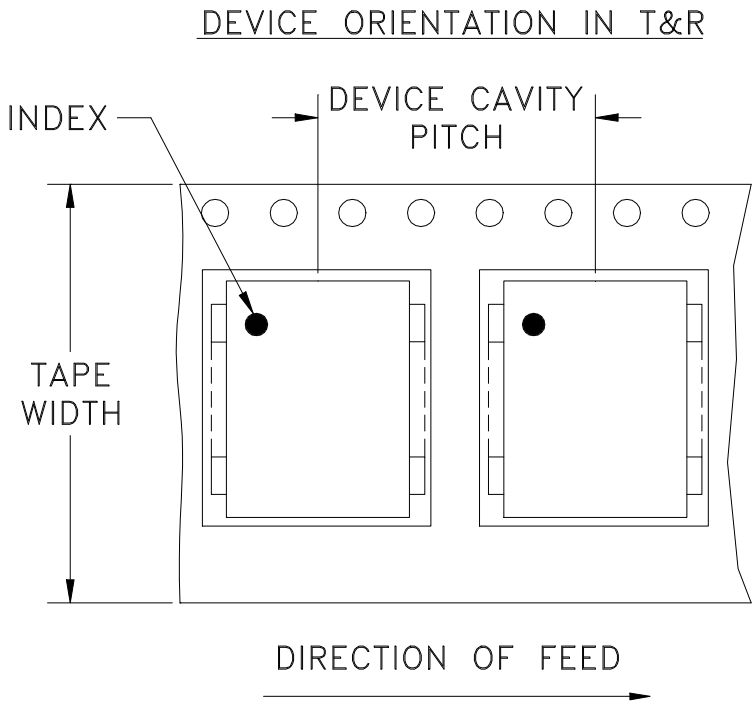
# Tape & Reel Packaging TR-F46




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel |
|---|---|---|---|
| 16 | 12 | 13 | 900 |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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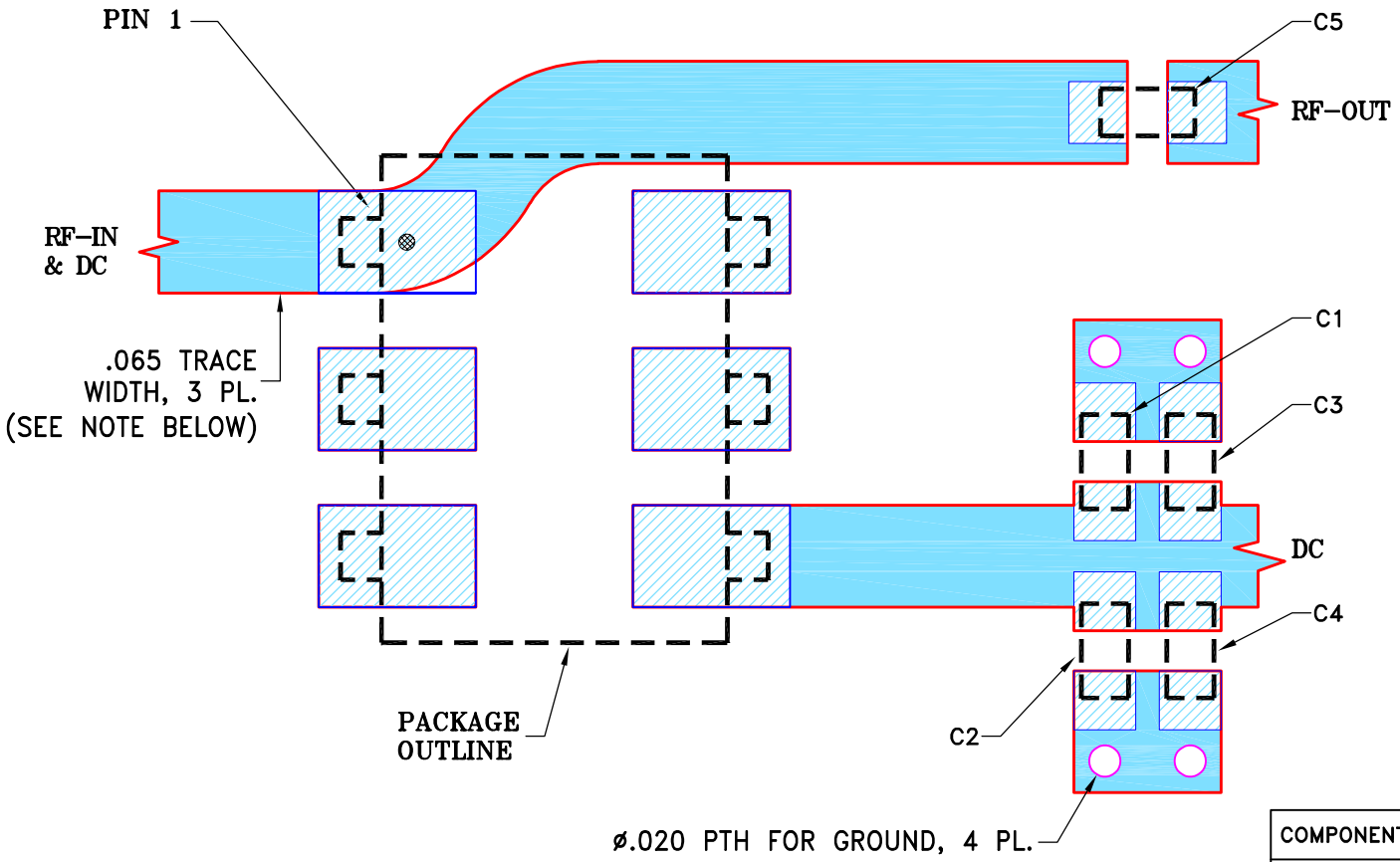
THIRD ANGLE PROJECTION

| REVISIONS | | | | | |
|---|---|---|---|---|---|
| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
| OR | ECO-006963 | NEW RELEASE | 03/19/21 | ITG | IL |
| | | | | | |
| | | | | | |
| | | | | | |

# SUGGESTED MOUNTING CONFIGURATION FOR CD637 CASE STYLE




| COMPONENT | SIZE |
|---|---|
| C1...C5 | 0603 |

## NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030±.0015"; COPPER: 1/2 OZ. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-ADCH-1220+.
3. UNIT LAND PATTERN WAS OPTIMIZED FOR BETTER PERFORMANCE.
4. BOTTOM COPPER OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | ITG | 03/18/21 |
| TOLERANCES ON: | CHECKED | GF | 03/18/21 |
| 2 PL DECIMALS ± | APPROVED | IL | 03/19/21 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

Mini-Circuits®



ASHEETA1.DWG REV:A DATE:01/12/95

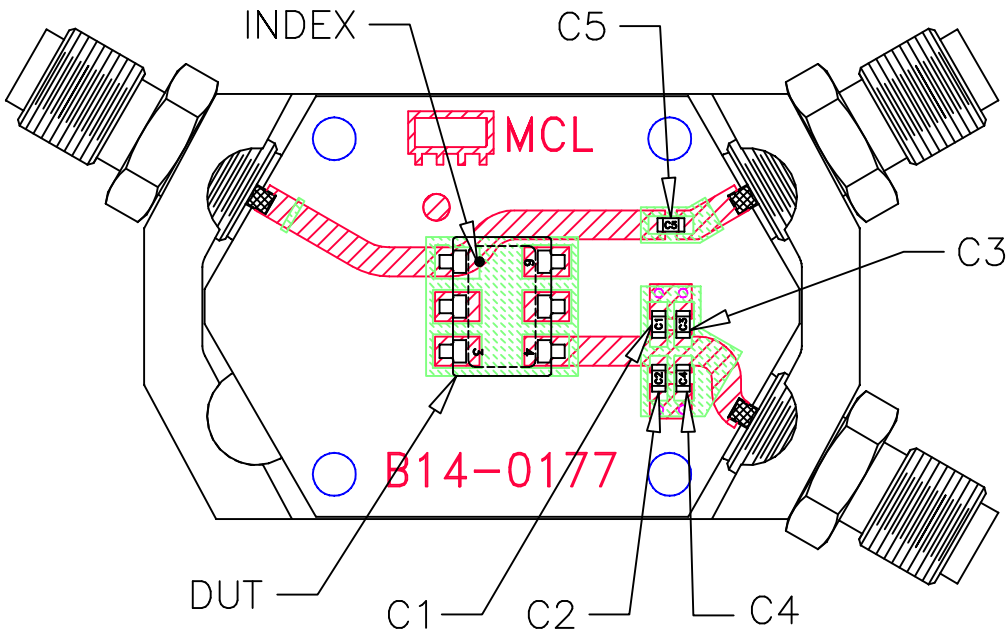
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

# PL, CD637, TB-ADCH-1220+

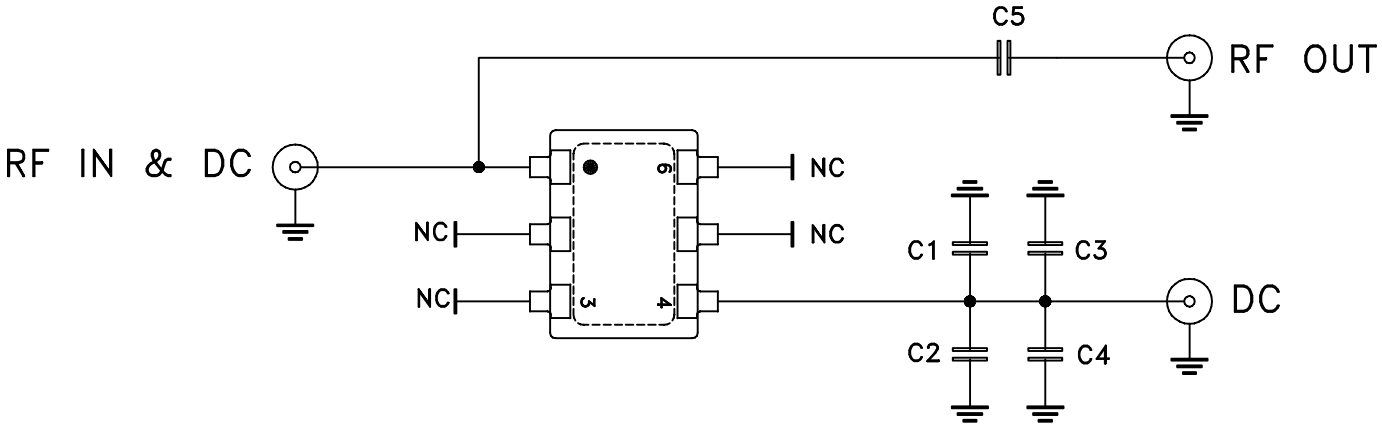
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-699 | OR |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL699 | 8:1 | 1 OF 1 |

# Evaluation Board and Circuit




TB-1167+




| COMPONENT | VALUE | SIZE |
|---|---|---|
| DUT | MCL ADCH-1220+ | 7.87X6.91 mm |
| C1,C2 | Capacitor 82 pF | 0603 |
| C3,C4,C5 | Capacitor .1uF | |

## SCHEMATIC DIAGRAM

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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Mini-Circuits

# Environmental Specifications ENV02T1

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 | -40° to 85°C<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet |
| Humidity | 90 to 95% RH, 240 hours, 50°C | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Solder Reflow Heat | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, 95% Coverage |
| 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 | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes | MIL-STD-202, Method 213, Condition A |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |