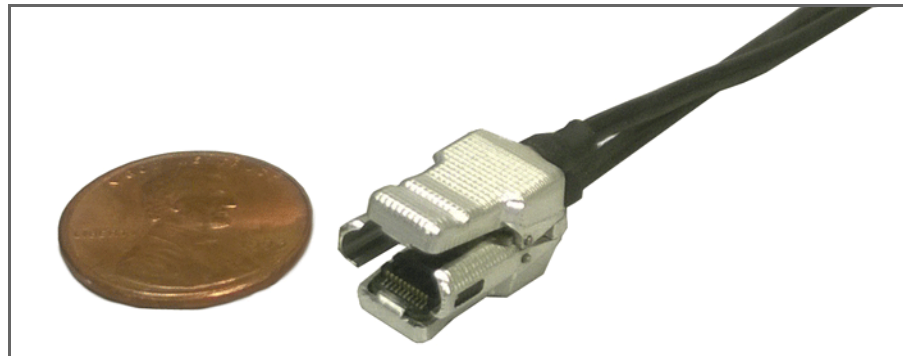


ZIF-Clip® Analog Headstages



32-Channel ZIF-Clip® Headstage

ZIF-Clip® ZC Overview

ZIF-Clip® standard headstages are analog headstages recommended for use with probe impedance that range from 20 Kohm to 5 Mohm. They are designed to connect directly to a PZ preamplifier/neurodigitizer but may be connected to an RA16PA with the use of an adapter. Analog signals are buffered inside the headstage and digitized on the preamplifier/neurodigitizer for transfer to a base station processor, such as the RZ2 or RZ5.

By default, ground and reference are separate on all ZIF-Clip® headstages yielding a referential configuration. Reference and ground may be tied together on the headstage adapter or ZIF-Clip® microwire array for single-ended configurations.

The ZIF-Clip® headstage (Patent No. 7540752) features an innovative, hinged headstage design that ensures quick, easy headstage connection with almost no insertion force applied to the subject. ZIF-Clip® headstage contacts seat inside the probe array and snap in place, firmly locking the headstage and probe with very little applied pressure. These self-aligning headstages provide long-lasting low insertion performance for a variety of channel number and electrode configurations. An aluminum finish provides increased durability.

Part Numbers:

- ZC16 – 16-channel Aluminum ZIF-Clip® headstage
- ZC32 – 32-channel Aluminum ZIF-Clip® headstage
- ZC64 – 64-channel Aluminum ZIF-Clip® headstage
- ZC96 – 96-channel Aluminum ZIF-Clip® headstage
- ZC128 – 128-channel Aluminum ZIF-Clip® headstage

ZIF-Clip® Passive Headstages

ZIF-Clip passive headstages contain no active electronics. They provide passive cabling in 16, 32, 64, 96, 128 channel ZIF-Clip form factors.

Part Numbers:

ZC16-P – 16 channel ZIF-Clip® passive headstage

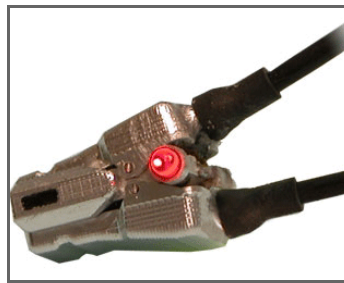
ZC32-P – 32 channel ZIF-Clip® passive headstage

ZC64-P – 64 channel ZIF-Clip® passive headstage

ZC96-P – 96 channel ZIF-Clip® passive headstage

ZC128-P – 128 Channel ZIF-Clip® passive headstage

ZIF-Clip® LED Headstages



ZIF-Clip LED headstages have built-in red and green LEDs on each side. The LEDs provide an ample amount of light for tracking test subjects and are available for 16, 32 and 64-channel ZIF-Clip standard headstages.

Note: ZIF-Clip headstage LEDs cannot be added to existing non-LED headstages.

Part Numbers:

ZC16-LED – 16-channel ZIF-Clip® headstage with LEDs

ZC32-LED – 32-channel ZIF-Clip® headstage with LEDs

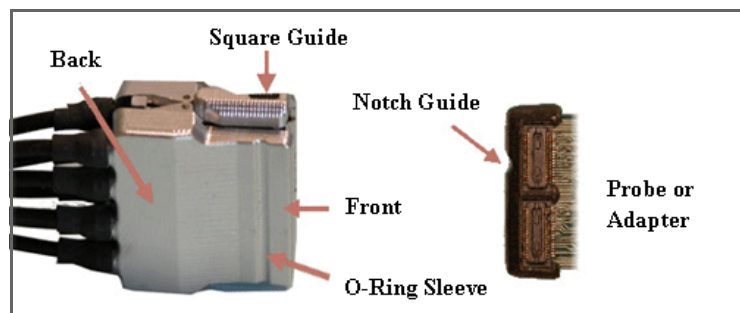
ZC64-LED – 64-channel ZIF-Clip® headstage with LEDs

Adapter and Probe Connection



The headstage has sensitive electronics. Always ground yourself before handling.

ZIF-Clip® headstages are designed to automatically position the high density connectors on the headstage and probe (or adapter).

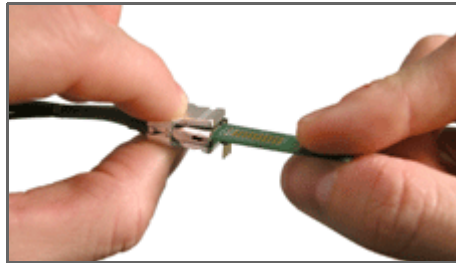


Standard ZIF-Clip® Headstage

Connect probes and adapters to the headstage as described below.



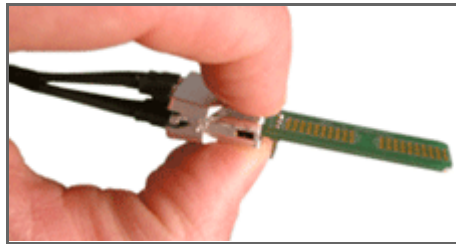
Firmly press and hold the **back** to open the headstage.



Align the **notch guide** of connector to the **black square guide** of the fully opened headstage then move headstage into position.



WARNING! The ZIF-Clip® headstage must be held in the fully open position while being slid into position. The headstage should only be closed when fully engaged. Sliding the headstage into position while applying pressure to the tip will **permanently damage** the ZIF-Clip® headstage and micro connectors.



Press the **front** of the headstage together as shown to lock the connector in place. You should hear an audible click when the locking mechanism is engaged.

ZIF-Clip® Headstage O-Rings

All ZIF-Clip® headstages are shipped with two o-rings for additional connection security. Gently slip the o-ring onto the headstage sleeve and then roll the o-ring towards the back of the headstage. Connect the probe or adapter to the headstage as described above. Once the connection is secure, roll the o-ring forward until it settles into the sleeve on the front of the headstage.



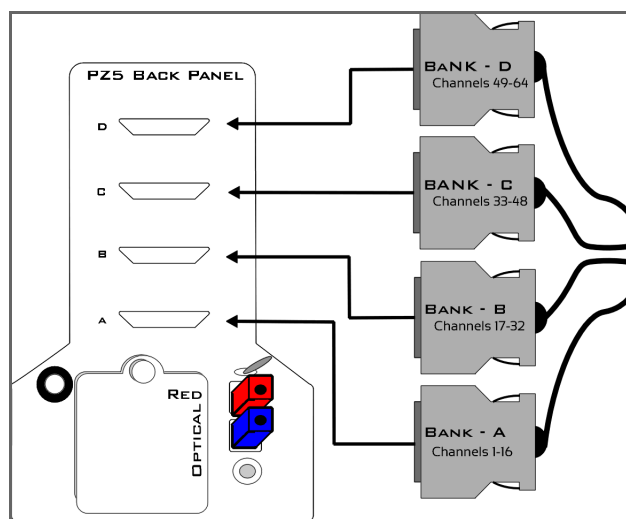
O-Ring Use and Positioning

ZIF-Clip® Headstages to Amplifier Connection

One or more MiniDB26 connectors are used to connect the ZIF-Clip® standard headstage to a PZ5 or PZ2 preamplifier depending on the number of channels in the headstage. Each MiniDB26 connector carries 16 channels and is labeled with a bank letter that corresponds to its matching bank on the preamplifier. For example the MiniDB26 connector labeled “Bank A” should connect to bank A on the PZ5 or bank 1 on the PZ2 and will carry channels 1-16. Subsequently, “Bank B” corresponds to the next 16 channels of the headstage, etc. Below is a table which shows the Bank labels along with their matching PZ5 bank.

| ZIF-Clip® Headstage | Bank Label on MiniDB26 | Connect to PZ5 Bank |
|------------------------------|------------------------|------------------------|
| ZC16 (Connects Bank A) | Bank - A | A (Channels 1 - 16) |
| ZC32 (Connects Banks A - B) | Bank - B | B (Channels 17 - 32) |
| ZC64 (Connects Banks A - D) | Bank - C | C (Channels 33 - 48) |
| ZC96 (Connects Banks A - F) | Bank - D | D (Channels 49 - 64) |
| ZC128 (Connects Banks A - H) | Bank - E | E (Channels 65 - 80) |
| | Bank - F | F (Channels 81 - 96) |
| | Bank - G | G (Channels 97 - 112) |
| | Bank - H | H (Channels 113 - 128) |

The diagram below illustrates the connection of a ZC64 ZIF-Clip® headstage to the PZ5. Note that the bank channel numbering matches on both the preamplifier and headstage MiniDB26 connectors.



Headstages to NeuroDigitizer Connection

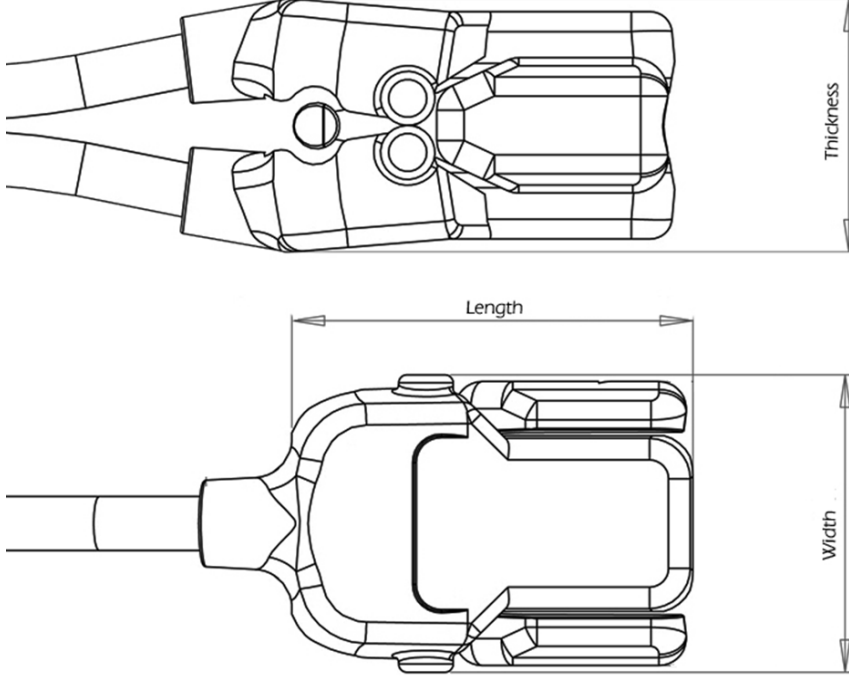
Headstage Voltage Range

When using a TDT preamplifier the voltage input range of the preamplifier (PZ5, PZ2, RA16PA) is typically lower than the headstage and must be considered the effective range of the system. Also keep in mind that the output range of the headstage varies depending on the power supply provided by the preamplifier. TDT preamplifiers supply $\pm 1.5V$, but third party preamplifiers may vary. TDT recommends using preamplifiers which deliver $\pm 2.5V$ or less. The table below

lists the input voltage ranges for the ZIF-Clip® standard headstage for either +/- 1.5V or +/- 2.5V power sources.

| | Headstage input range when using +/- 1.5V DC power source | Headstage input range when using +/- 2.5V DC power source |
|------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| ZIF-Clip® standard headstage | +/- 1.48 V | +/- 2.49 V |

ZIF-Clip® ZC Headstages Technical Specifications

| | | | | | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------|--------------|-----------------------|-------------------------|-------------|
| Input referred noise | 3 μ V _{RMS} bandwidth 300-3000 Hz 6 μ V _{RMS} bandwidth 30-8000 Hz | | | | | |
| Headstage Gain | Unity (1x) | | | | | |
| Frequency Response | DC - 25 kHz | | | | | |
| Input Impedance | 1e14 ohms | | | | | |
| Dimensions (Approx.) | | | | | | |
|  | | | | | | |
| Headstage | Length Open | Length Closed | Width | Thickness Open | Thickness Closed | Mass |
| ZC16/ZC32* | 14.401 mm | 14.300 mm | 10.500 mm | 10.255 mm | 10.051 mm | 2.6 g |
| ZC64 | 16.461 mm | 16.400 mm | 15.500 mm | 10.328 mm | 10.051 mm | 4.8 g |
| ZC96 | 17.452 mm | 17.400 mm | 19.000 mm | 10.015 mm | 10.051 mm | 6.5 g |
| ZC128 | 17.948 mm | 17.900 mm | 25.500 mm | 10.212 mm | 10.051 mm | 9.9 g |
| * Form factor for both the ZC16 and ZC32 is the same. | | | | | | |

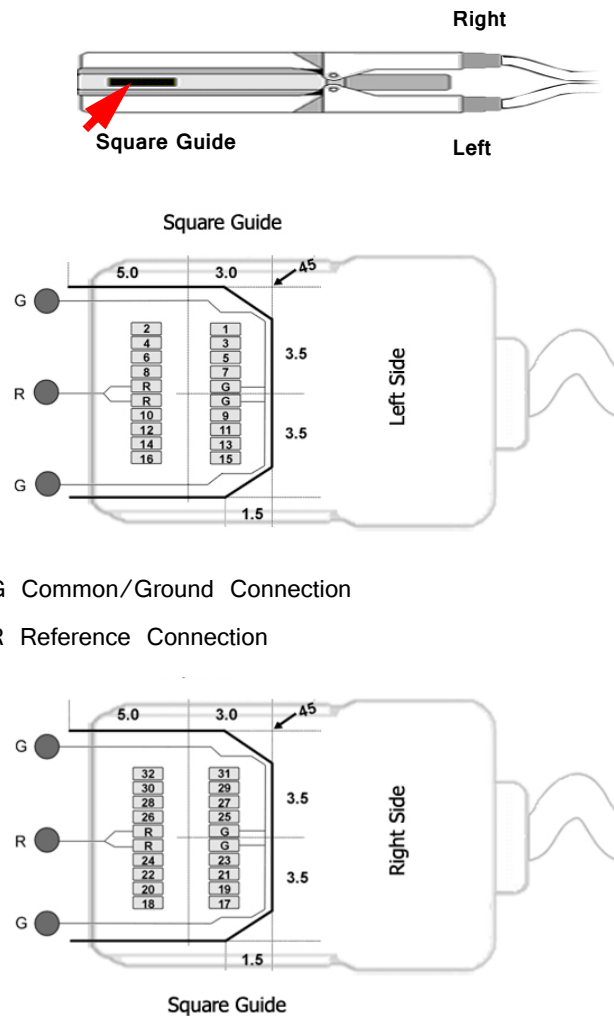
Important! When using multiple headstages, ensure that a single ground is used for all headstages. This will avoid unnecessary noise contamination in recordings. See “Headstage Connection Guide” on page 6-99, for more information.

ZIF-Clip® Headstage Pinouts

If you are interested in using a third party electrode see “ZIF-Clip® Headstage Adapters” on page 12-9. If there is no adapter offered for the desired electrode, the following diagrams show the headstage pinouts (channel connections to the amplifier) and board dimensions for connectors to match ZIF-Clip® headstages. A black square guide is used to align the headstage to ZIF-Clip® compatible connectors and can be used in the diagrams below to orient “left” and “right” sides of the headstage shell.

16- and 32-Channel Headstage Pinouts

Images are not to scale. Pinouts are looking through the headstage shell (or into a matching board connector). All board dimensions are in millimeters and are identical for both sides, board thickness is 0.75 mm, and connectors are centered as shown.



Note: The 16-channel ZIF-Clip® headstage does not have any pins connected on the right side of the headstage; the Hirose connector is there for mechanical support. See Hirose specification for recommended footprint.

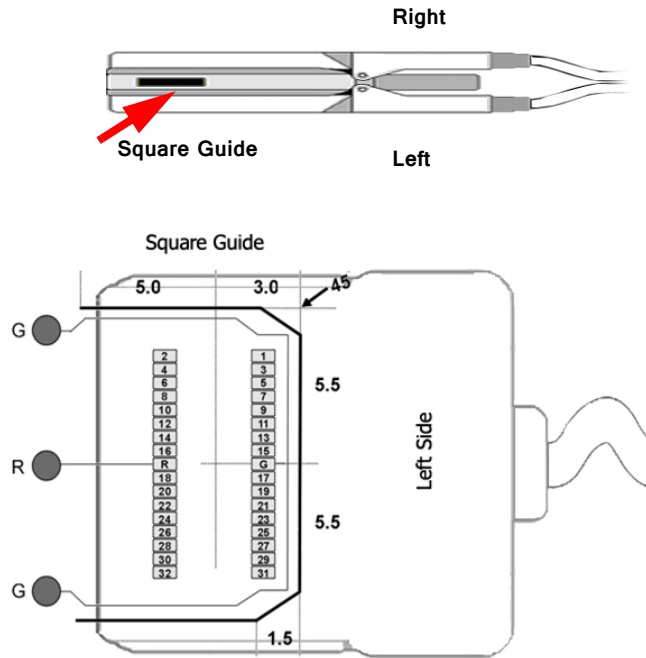
Hirose Connectors:

ZC16 - DF30FC-20DS-0.4V x 1

ZC32 - DF30FC-20DS-0.4V x 2

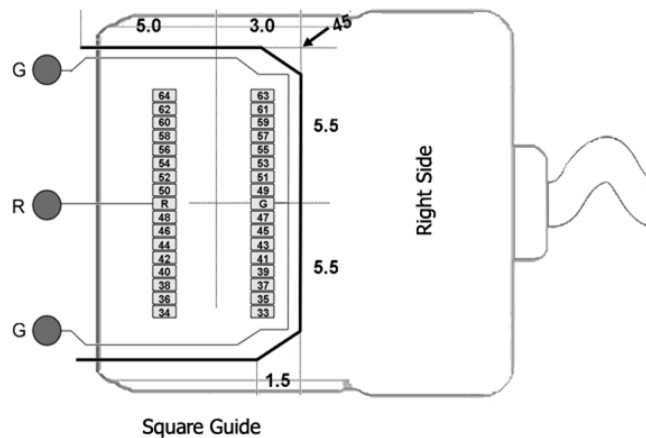
64-Channel Headstage Pinouts

Images are not to scale. Pinouts are looking through the headstage shell (or into a matching board connector). All board dimensions are in millimeters and are identical for both sides, board thickness is 0.75 mm, and connectors are centered as shown.



G Common/Ground Connection

R Reference Connection



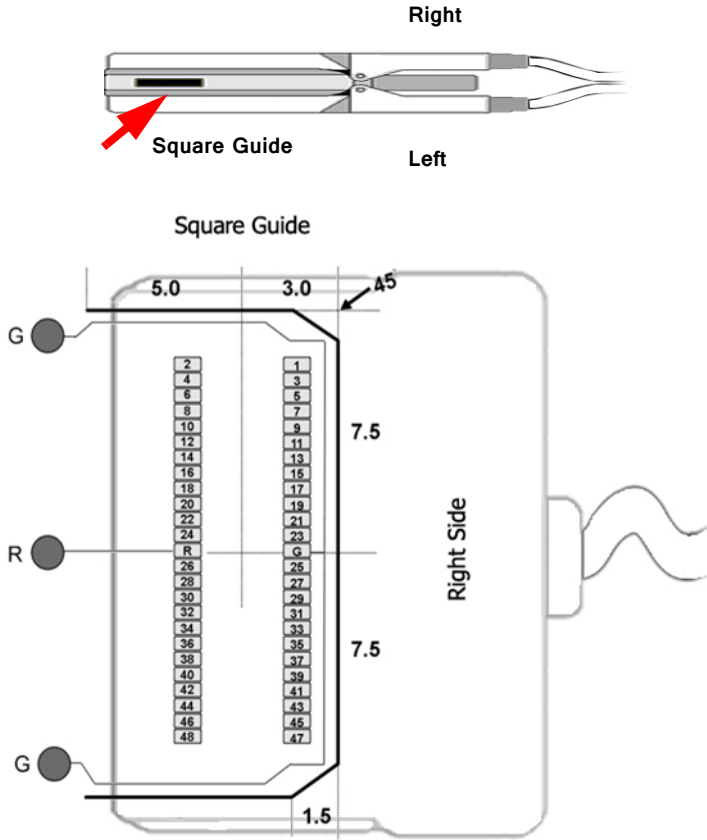
See Hirose specification for recommended footprint.

Hirose Connectors:

ZC64 - DF30FC-34DS-0.4V x 2

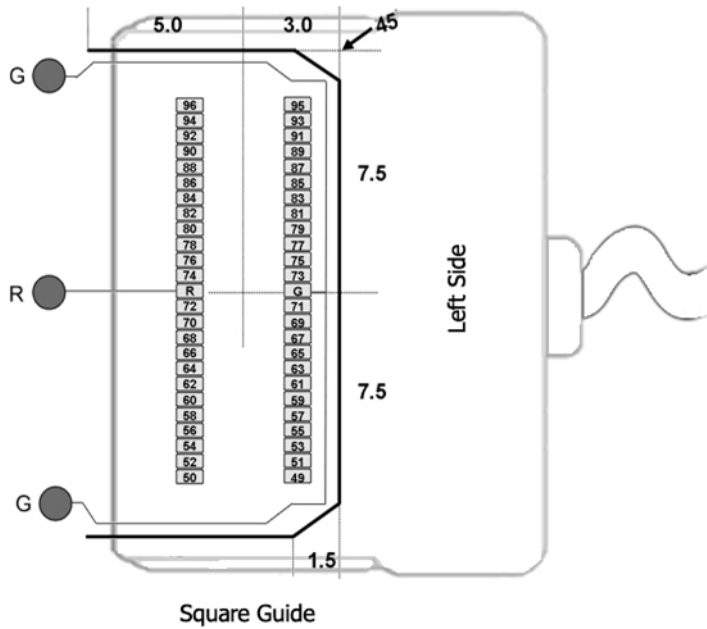
96-Channel Headstage Pinouts

Images are not to scale. Pinouts are looking through the headstage shell (or into a matching board connector). All board dimensions are in millimeters and are identical for both sides, board thickness is 0.75 mm, and connectors are centered as shown.



G Common/Ground Connection

R Reference Connection



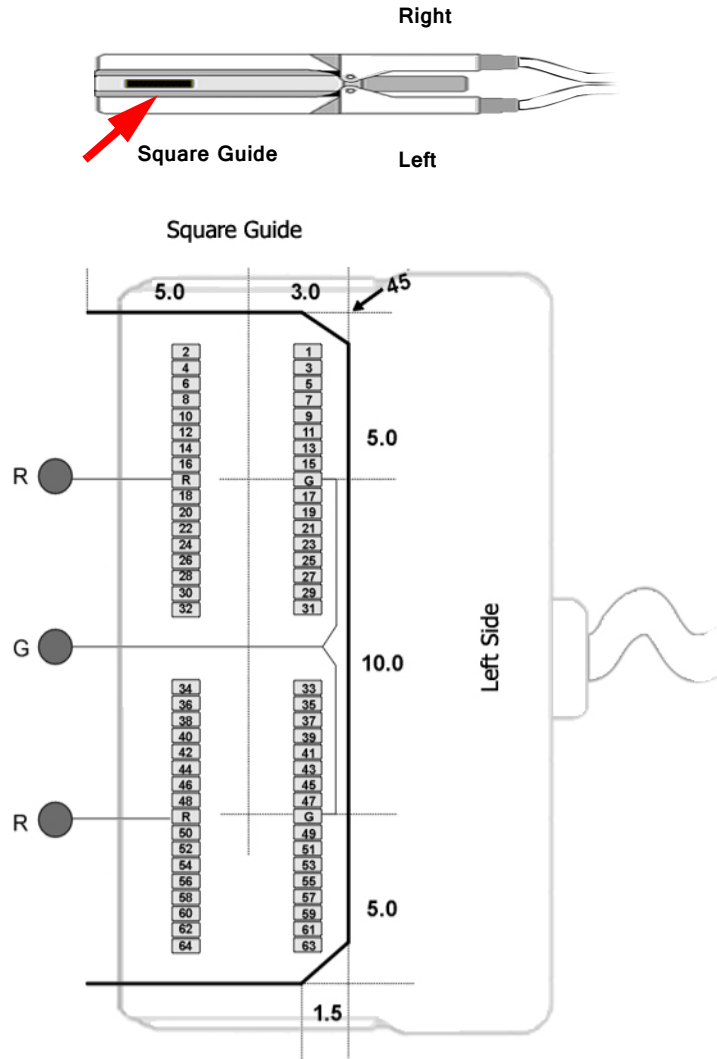
See Hirose specification for recommended footprint.

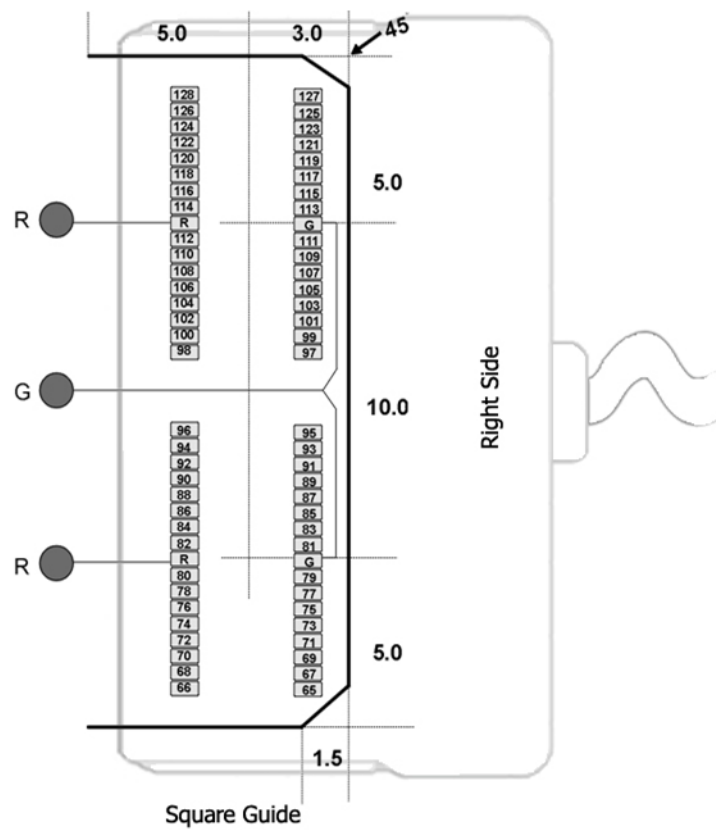
Hirose Connectors:

ZC96 - DF30FC-50DS-0.4V x 2

128-Channel Headstage Pinouts

Images are not to scale. Pinouts are looking through the headstage shell (or into a matching board connector). All board dimensions are in millimeters and are identical for both sides, board thickness is 0.75 mm, and connectors are centered as shown.





G Common/Ground Connection

R Reference Connection

See Hirose specification for recommended footprint.

Hirose Connectors:

ZC128 - DF30FC-34DS-0.4V x 4