

Characteristics of High-Quality SATA Assemblies

PHYSICAL CHARACTERISTICS

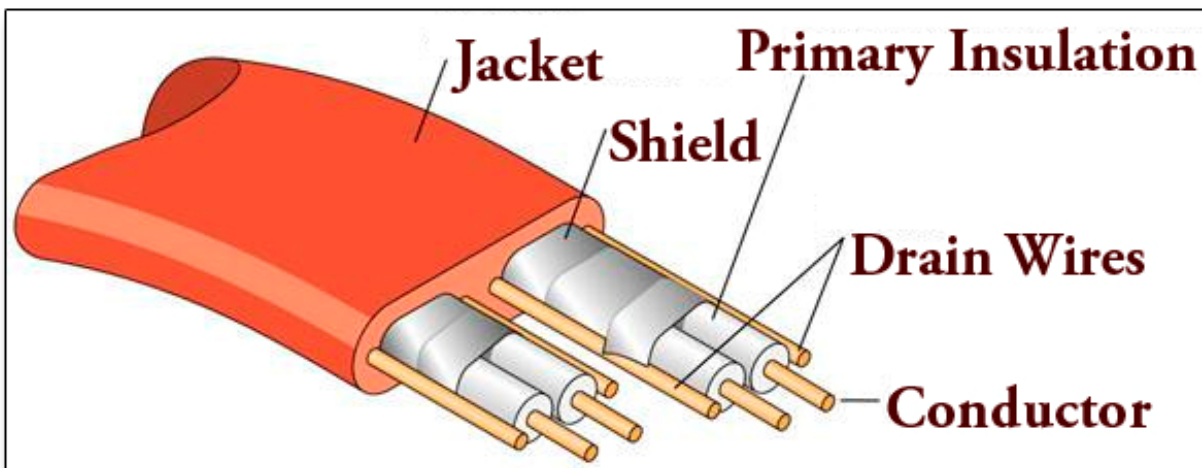
SATA, an acronym for Serial ATA, maintains high-bandwidth, differential signaling within twin-ax (or twin-axial) wiring. The cable style is a coax-like transmission cable (Figure 1).

Different versions of the cable are used for different applications:

- Single-Lane, Twin-Ax for [Internal](#) Applications
- Multi-Lane, Twin-Ax for [Internal](#) Applications
- Multi-Lane, Twin-Ax for [External](#) Applications

High-quality cables must be manufactured by reputable suppliers to ensure quality production methods and top electrical performance. *It is recommended that cables are not to be constructed on a bench top.*

Figure 1: Details of the Inside of a SATA Cable



Shielding & Drain Wires

The method used to shield cables has a profound effect on the cable's performance and is a major factor in determining quality and cost.

Proper Shielding

Strict adherence to premium shielding methods is a prime factor in producing high-quality cables.

Proper shielding of the cable is explained (refer to Figure 1):

- First, insulation covers each conductor.
- Second, a precision-wound, spiral-wrapped foil shield, in either a solid or braided foil, completely covers the pair of insulated conductors. *Drain wires* are incorporated into the shield to guarantee continuity.
- Last, an insulating and protective flexible outer layer called the jacket (usually PVC), covers the entire cable.

Inadequate Shielding

Poor shielding causes a wide-range of electrical problems.

Unraveled shielding or broken shield connections cause major data transfer and performance problems such as:

- Impedance Discontinuities
- Cross-Talk, Signal Loss, EMI (electromagnetic interference)
- Excessive Conductor Skew

ELECTRICAL CHARACTERISTICS

Frequency and speed are synonymous terms when discussing data transmission in these second generation SATA (SATA II) cables.

High & Low Frequency Cables

When buying SATA cables, make sure they are high frequency cables. High frequency cables meet the latest 3.0Gb transmission rate and have high electrical and shielding integrity. TCC only sells high frequency cables.

High Frequency Cables:

The signals are transmitted down the cable quickly and:

- Run at 3.0Gbs

- Meet SATA specifications

Low Frequency Cables:

The signals are transmitted down the cable slowly because they are:

- Low quality cables that cannot perform at 3.0Gbs
- Usually poor quality because of inadequate soldering at joints, careless cable preparation, and inferior cable and cable assembly manufacturing methods
- Not meeting SATA specifications

* Remember "High Frequency" cables meet the SATA standard for data transmission, while "Low Frequency" do not and are generally poor quality cables.

All TCC SATA and SATA fanout cables are high-quality, high frequency assemblies.

Visit the links below for more information and purchasing requests for in-stock and custom-built RoHS assemblies:

[SATA Cables](#)

[SAS Cables](#)

[Mini-SAS Cables](#)