3M Introduces RoHS-Compliant Serial Advanced Technology Attachment (SATA) Connector Family, Giving Smaller, Faster and Reliable Solutions for Storage Interface

A family of RoHS-compliant(a) Serial Advanced Technology Attachment (SATA) Connectors has been introduced by the 3M Electronic Solutions Division. The 3M Serial Advanced Technology Attachment (SATA) Connector family provides smaller, faster and more reliable solutions for storage interface than parallel ATA connectors. They are particularly useful for high-speed interfaces for optical, solid state and hard disk drive (HDD) applications aimed at reducing size, increasing transmission speed, improving data reliability and ease of use. The company’s RoHS-compliant connectors replace 3M’s existing SATA connector line.

The 3M SATA Connector components were designed on a 1.27 mm (.050”) in-line contact pitch. All 3M SATA Connectors are designed to interface with standard 2.5” and 3.5” HDD.

Components are recognized in two interface segments: signal and power. In the signal segment, SATA signals have been condensed into a very simple seven-contact format. SATA signal connectors rely on two differential pairs (four contacts), which are surrounded and separated by three ground contacts (G-SS-G-SS-G). The two pairs serve as transmit (Tx) and receive (Rx) contacts, while the three grounds also function as the EMLB contacts, thus making 3M SATA Connectors hot pluggable.

The 3M SATA Signal Plugs are available in both a seven-position stand-alone configuration or in combination with power. The seven-position signal plugs are available in a variety of configurations and PCB attachments to increase ease of access while interfacing the host board (typically a PCI card, RAID controller or SATA port multiplier) with the HDD device.

The 3M SATA Signal Cable Assemblies, seven-position, are constructed of rugged, over-mold connector housings and are available in right angle or straight configurations. The receptacle interface includes the standard L-shaped polarization architecture, which prevents misalignment with the mating interface. The core is a 26 AWG stranded wire that is oriented into two differential pairs and three grounds. The smaller seven-position cabling configuration can improve airflow, which yields cooler electronic appliances. The signal cables are available in 0.5 meter and 1-meter lengths and are designed to support the Generation I and II SATA transmission specifications.

The second interface recognized in the SATA connector family is the power segment. The power segment is comprised of 15 contacts, which accommodate three primary voltage ranges (3.3 V, 5 V & 12 V). Each voltage is allocated three standard contacts: positive (+), negative (-) and ground (G), leaving six additional contacts in the power interface. Those are used for hot plugging with two contacts per voltage range.

The 3M SATA Combo Receptacle, 22-position, is designed to serve as a backplane interface. The combo receptacles are available in SMT, vertical and extended height, thru-hole, and vertical for backplane applications. The combo receptacle versions are designed with an L-shaped polarization and guide post to assist in blind mating with the HDD while providing a direct attach to the backplane, thus eliminating the need for cabling.

The 3M SATA Combo Plug, 22-position, is used on the device side (optical or hard disk drive) and has a variety of features that make it appealing for high-volume environments. First, the connector uses gull-wing surface mount tails, which are housed in molded, high-temp plastic bodies. Second, the connector is oriented in a right

angle configuration and has PCB alignment guides that help ensure proper alignment between the PCB and the contact tails. As specified with all in-the-box SATA connectors, the combo plug includes the L-shaped polarization and guide rails to ensure consistent and accurate blind mating.

3M SATA Power Cable Assemblies are configured to accommodate dual devices. The power supply side connector is a standard six-pin universal plug capable of interfacing with most standard AT-style power supplies. The power supply side connector fans out (Y configuration) to two 15-position power segment receptacles that are constructed of a rugged, over-mold connector housing. The assembly uses 18 AWG wire to distribute power (orange for 3.3 V, red for 5 V and yellow for 12 V) along with two common grounds (black) per 15-position power segment. In addition to the standard positive, negative and ground power configurations, the 15-position power segment also contains six additional EMLB contacts, two for each voltage level. The 15-position power segment incorporates an L-shaped polarization architecture to prevent misorientation while mating to the plug interface connector.

SATA was developed by a working group (SATA International Organization) consisting of APT Technologies, Dell Computer, Intel Corp., Maxtor Corp. and Seagate Technology LLC. Traditionally recognized for desktop (PC) applications, this working group developed a 10-year roadmap for SATA that provides compelling price/performance capabilities, making it a viable alternative to existing technologies in the server and network storage markets.

The entire 3M SATA connector family complements the company’s Serial Attached SCSI (SAS) connector line. Both connectors are used in hard disk drive storage applications.

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(a)"RoHS compliant" means that the product or part does not contain any of the following substances in excess of the following maximum concentration values in any homogeneous material, unless the substance is in an application that is exempt under RoHS: (a) 0.1% (by weight) for lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers; or (b) 0.01% (by weight) for cadmium. Unless otherwise stated by 3M in writing, this information represents 3M's knowledge and belief based on information

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