The smallest on-ground antenna of its kind, Molex's 2.4 GHz SMD antenna requires no ground clearance and offers significant PCB real-estate savings

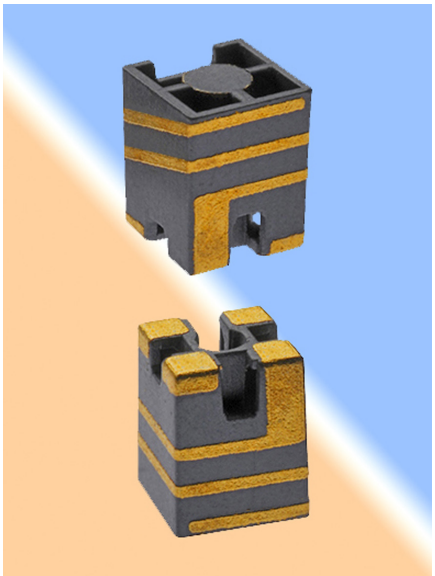
2.4 GHz Surface Mount Device (SMD) On-ground Antenna

47948 2.4 GHz SMD On-ground Antenna

Developed with the power and precision of Laser Direct Structuring (LDS) technology, Molex's 2.4 GHz SMD on-ground antenna is the smallest on-ground MID (Molded Interconnect Device) antenna in the market. The lightweight Molded Interconnect Device (MID) chip antenna weighs only 0.03g and is used in portable electronic devices based on Bluetooth*, Wi-Fi**, ZIGBEE† and other wireless standards. These devices include tablet PCs, headsets, smart meters and more. Measuring only 3.00mm by 3.00mm by 4.00mm (0.118" by 0.118" by 0.157") and used on one side of the PCB, the antenna allows board makers to realize significant PCB real estate savings by leaving the ground layers in the PCB intact while freeing up space on the reverse side of the PCB for other component assemblies.

This monopole antenna has an omni-directional radiation pattern and requires only simple stripline matching on the PCB, without the need for discrete components. It is fully compatible with SMD and reflow processes and usable as a stand-alone device without the need for cable connection. Besides offering good thermal properties, the LCP body of the antenna provides a higher mechanical strain tolerance than ceramic ones.

Visit our website at www.molex.com/link/SMD_antenna.html for more information.



Smallest On-ground Molded Interconnect Device (MID) Antenna

FEATURES AND BENEFITS

- Valuable PCB real estate savings on both sides of the PCB with the use of this miniature antenna
- No removal of ground layers from beneath the antenna is needed
- Consistent antenna RF performance with the application of Laser Direct Structuring (LDS) - a technology known for its excellent precision, performance and repeatability
- The high-temperature base material and the metal plating technology employed allows the antenna to endure reflow temperatures - an ideal condition for a standard SMT process
- The product is halogen-free and RoHS-compliant

SPECIFICATIONS

Reference Information

Packaging: Tape on reel

Reference Platform:
100mm by 40mm (3.91" by 1.57")

Designed In: mm

RoHS: Yes

Halogen Free: Yes

Ground Clearance: None needed

SMD Compatible: Yes

Electrical

RF Power (Watt): 2

Frequency (MHz): 2400 to 2483.5

Return Loss - S11 (dB): < -9

Average Total Efficiency (%): > 70

Peak Gain (dBi): 3.0

Polarization: Linear

Input Impedance (Ohms): 50

Mechanical

Peeling Force: 1N (0.225 lb force)

Physical

Dimension:
3.00mm by 3.00mm by 4.00 mm
(0.118" by 0.118" by 0.157")

Housing:
LCP-LDS, Vectra E840ILDS,
40% mineral-filled LDS grade

Flammability: UL 94V-0

Plating:
Hatched Area —
0.1µm (4µ") Gold (Au) min.
MID Plane —
2.0µm (8µ") Nickel (Ni) min.
Underplating —
12µm (472µ") Copper min.

Operating Temperature: -35 to +85°C

Storage Temperature: -40 to +85°C

*Bluetooth is a registered trademark of Bluetooth SIG
**Wi-Fi is a registered trademarks of the Wi-Fi Alliance
†ZIGBEE is a registered trademark of trademark of ZigBee Alliance

PRODUCT FEATURES

- In the left diagram below, four SMD pads are shown. Three dummy pads are to be attached to the PCB for strong mechanical bonding while the remaining signal SMD pad connects to the radio transceiver circuit on the PCB
- In the right diagram below, the pick-and-place feature of the antenna works with a standard vacuum nozzle for component assembly operations

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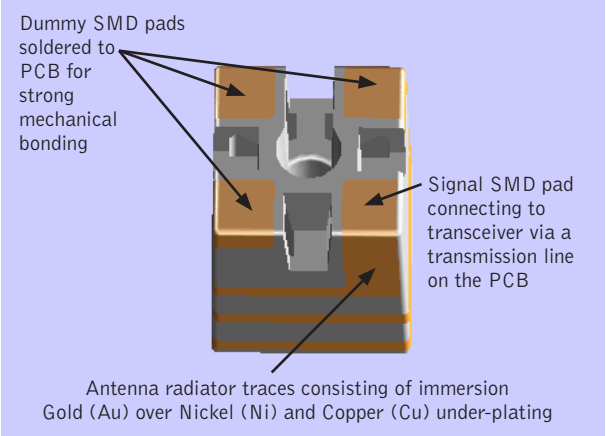

Illustration showing the plated SMD pads of the 2.4GHz SMD On-ground antenna base

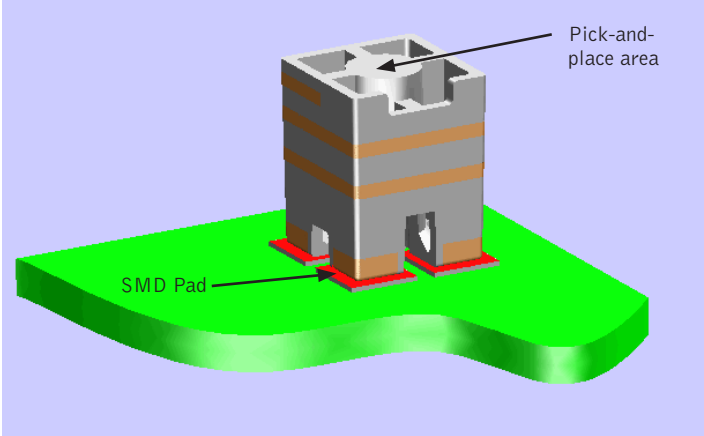

Illustration showing the 2.4GHz SMD On-ground antenna mounted onto a PCB

RF PERFORMANCE

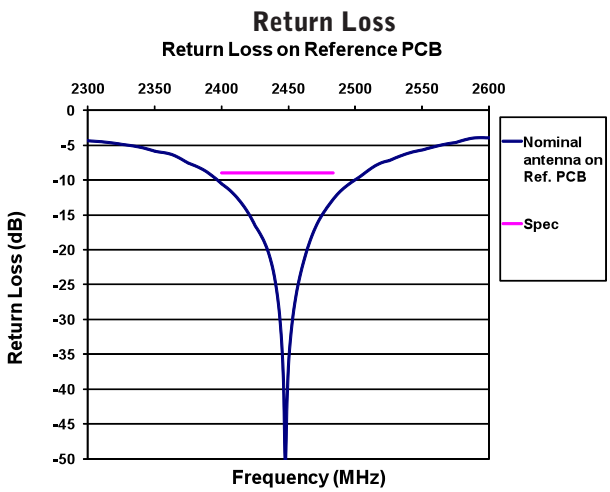

Figure 1: Return Loss (S11) as measured on reference board

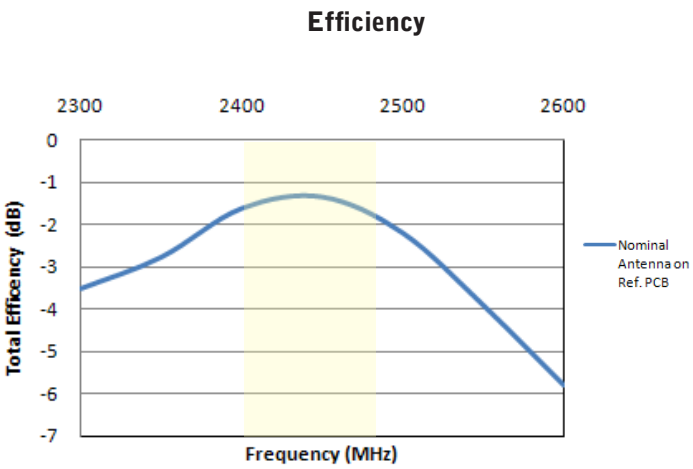

Figure 2: Total Efficiency (including Mismatch losses) as measured on reference board

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Radiation Plots

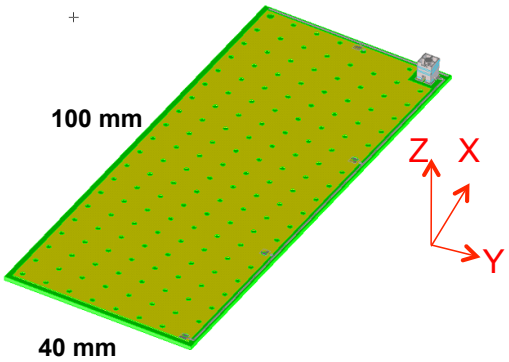

Figure 3a: Antenna on a 100mm by 40mm reference board with full ground on the reverse side of the board

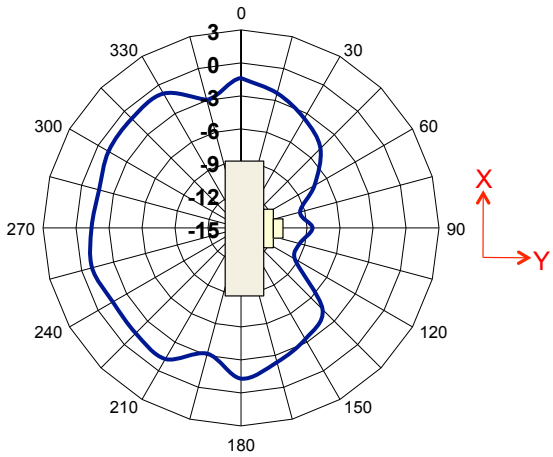

Figure 3b: Radiation diagram of X-Y plane shows combined polarizations as measured on reference board

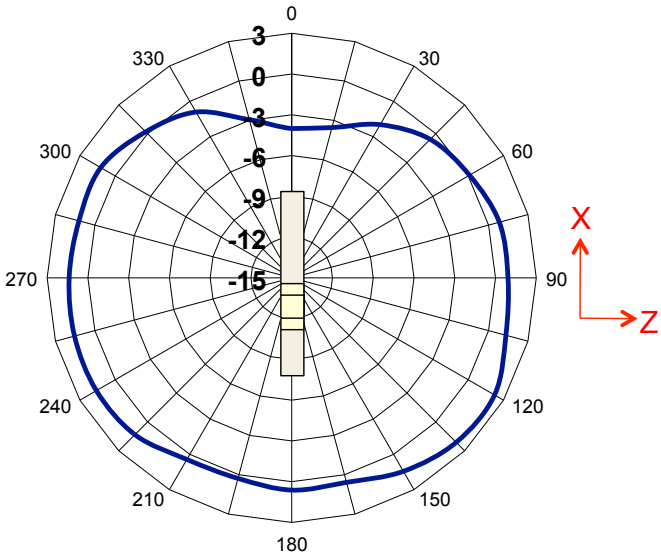

Figure 3c: Radiation diagram of X-Z plane shows combined polarizations as measured on reference board

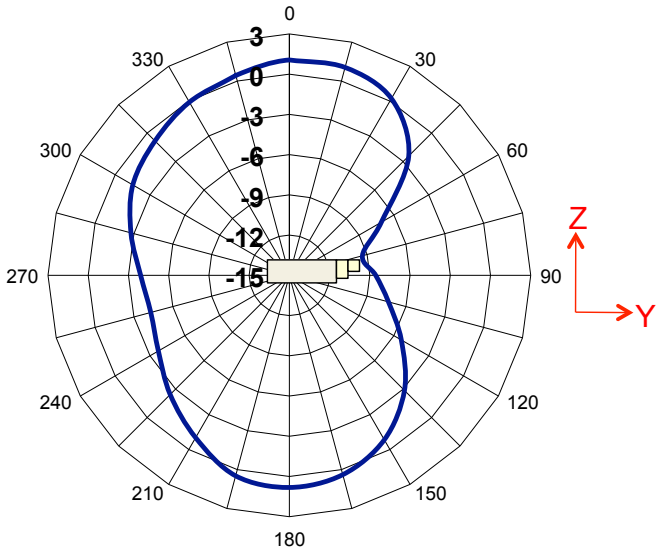

Figure 3d: Radiation diagram of Z-Y plane shows combined polarizations as measured on reference board

APPLICATIONS

- Telecommunication Applications
  - Bluetooth devices
  - Headsets
  - Notebooks and netbooks
  - Smart Phones
  - Tablet PCs
  - WiFi devices
  - Wireless LAN (WLAN)
  - IEEE 802.11b/g/n devices
- Industrial Applications
  - Machine-to-machine (M2M) communications
  - Smart meters
  - Lighting controls
  - ZigBee IEEE 802.15.4 devices
  - 2.4 GHz Industrial, Scientific and Medical (ISM) band systems and wireless devices
- Consumer Electronics (CE) Applications
  - Cameras
  - Mobile gaming devices
  - Personal navigation devices
  - Wireless internet TV and Audio
- Automotive Applications
  - Bluetooth devices
  - Infotainment systems
- Medical Applications
  - Telemedicine and Telehealth devices

Tablet PCs

Smart meters

Car Infotainment systems

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Wireless headsets

ORDERING INFORMATION

Order No.	Mounting Configuration
47948-0001	SMD

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