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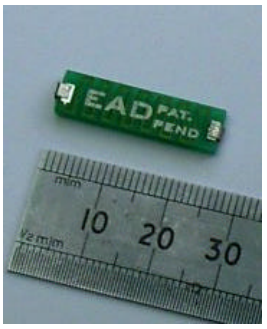
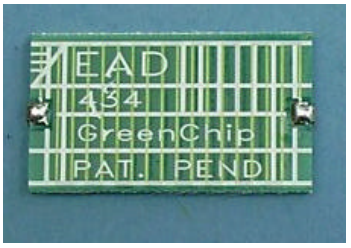
MTX- GreenChip™ – Surface Mount Chip Antenna (434 and 868 MHz)



868MHz



434MHz

Features

- Surface mount chip antenna
- Ground plane dependent
- MTX - GreenChip™ 434 operates at 434MHz
- MTX - GreenChip™ 868 operates at 868MHz (also covers 900MHz)
- Designed to be embedded in PCBs
- Available with Evaluation Board for testing purposes

Specifications

Radiating element	Quarter wave meander line
Frequency range	434MHz & 868MHz
Peak gain	-1.0 dBi
Polarisation	Linear (both vertical and horizontal components)
Return loss	GreenChip™ 434: –7dB; GreenChip™ 868: –7dB
Power rating	GreenChip™ 434 - 1W; GreenChip™ 868 – 1W
Cable / Connector	Solder pads
Dimensions	GreenChip™ 434 – 37 x 20 x 2.2mm GreenChip™ 868 – 26 x 7 x 2.2mm

Ordering Options

	MTX - GreenChip™ 434MHz Surface Mount Chip Antenna
	MTX - GreenChip™ 868MHz Surface Mount Chip Antenna

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MTX-GREENCHIP 868 MHz

The GreenChip is a surface mount antenna for applications at the 868 MHz frequency band. The antenna can cover the 900 MHz band too.

The GreenChip is essentially a 1/4 wave meander line antenna. It is ground plane dependent, which means it needs a ground plane to radiate efficiently. The size and shape of the groundplane will impact the electrical performance of the antenna significantly.

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Surface Mount Antenna

APPLICATION NOTE

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Contents

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Product overview

The MTX-GreenChip is a surface mount antenna for applications at the 868MHz frequency band. The antenna can cover the GSM900 band too.

The MTX-GreenChip antenna is mounted directly to the printed circuit board (PCB) using two metal clips. The clips are also used as RF (Radio Frequency) tuning elements since they form an integral part of the radiating structure. By changing the dimensions and the shape of the clips the antenna resonant frequency and input impedance can be changed.

The MTX-GreenChip is basically a quarter-wave meander line antenna. It is ground plane dependent, which means it requires a ground plane to radiate efficiently. The size and the shape of the ground plane will impact the antenna electrical performance significantly.

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Antenna dimensions

?? Antenna overall size: 26mm x 7mm x 2.2mm (length x width x height);

?? Mass: 0.6g.

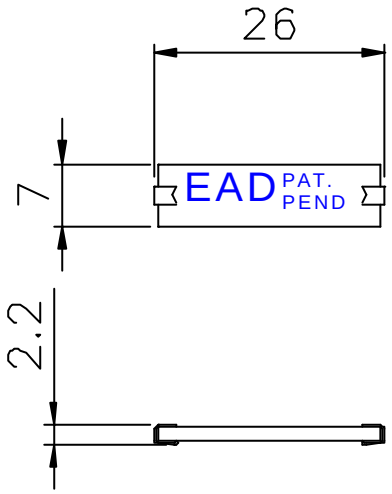

Figure 1. The antenna layout.

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Evaluation board dimensions

The antenna performance is specified for the size of the PCB given in Figure 2.

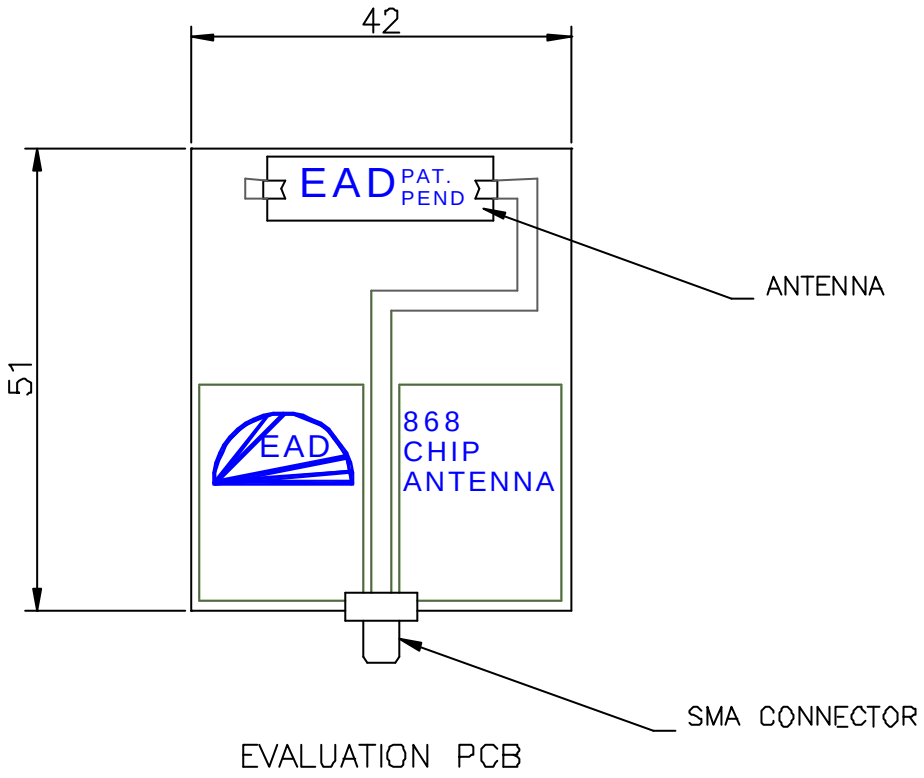

Figure 2. Evaluation board dimensions.

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RF specifications

?? Return loss: better than –10dB;

?? Peak gain: up to 1.0dBi (-1dBi on the evaluation board);

?? Average gain: up to 0dBi (-2dBi on the evaluation board).

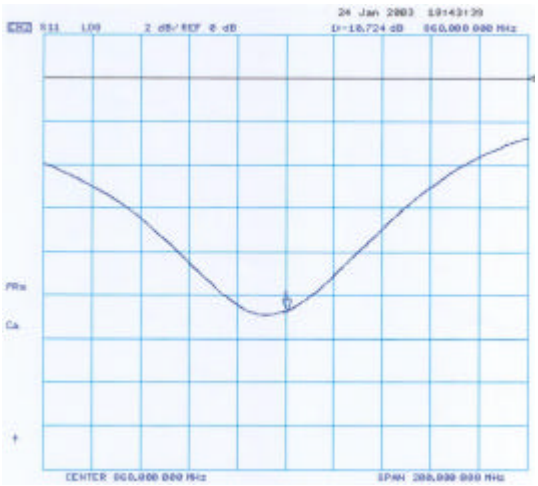

Figure 3. Return loss vs. frequency.

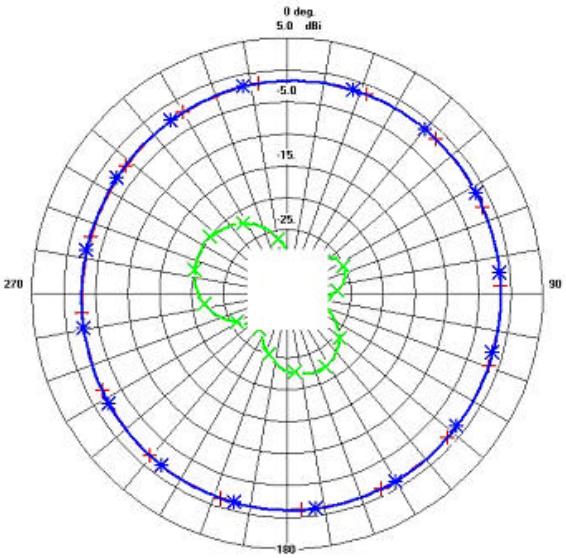

Figure 4. Typical radiation pattern.

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How to place the antenna on a PCB

The antenna is mounted using standard surface mount techniques. The solder pad layout on the evaluation board is given below. The size of the pads can be changed if necessary. Pads do not have to be the same size.

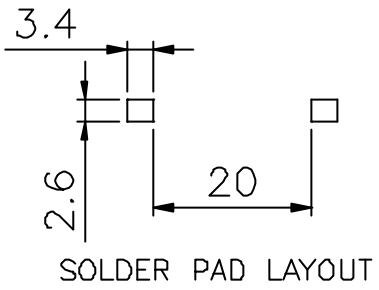

Figure 5. The solder pad layout.

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Where to place the antenna on a PCB

Some of the obvious places for the antenna to be positioned on a PCB are shown below.

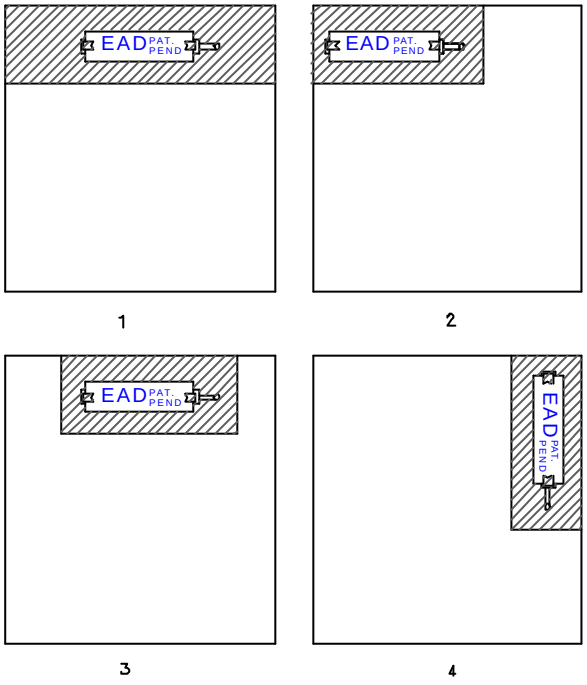

Figure 6. Possible antenna placements (shaded area MUST NOT have metal traces on it or ground plane below it - see Section "Important Warning").

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Important warning

?? The PCB ground plane must not extend below the MTX-GreenChip antenna;

?? The PCB ground plane must not be closer than 5mm to the MTX-GreenChip antenna.

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How to tune the antenna

The RF performance of the MTX-GreenChip antenna is influenced by the size and proximity of surrounding components. In order to tune the antenna to the radio transceiver one or more of the following ideas can be used:

?? Change the width and/or the length of the transmission line feeding the antenna;

?? Change the width and/or the length of the PCB solder pads; start with the one which is not connected to the feeding line;

?? Change the geometry of the ground plane close to the antenna;

?? Use a matching network. A series element (an inductor or a capacitor) is recommended. In very rare cases a parallel element may have to be added too.

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MTX-MORAVA

SINGLE-BAND INTERNAL 868 MHz Antenna

Features

- Ground-plane independent design
- Covers 868MHz band (as well as GSM900)
- Suitable for either hand-held devices or access points
- Various cable/connector options available

Specifications

Radiating element	Half-wave dipole
Frequency range	868MHz (and GSM900 band)
Peak gain	1.5 dBi
Polarisation	Linear (both vertical and horizontal components)
Return loss	-7.0 dB
Power rating	10W
Cable / Connector	RG178 with MMCX connector – other options available
Dimensions	81mm by 21mm by 0.8mm