

[Click here for Chip Antenna Product Portal](#)



TDK's ANT series ceramic chip antennas feature compact and low profile designs utilizing low temperature co-fired ceramic technology (LTCC). Even with their small size and thin profile, TDK antennas maintain high performance and reliability, all with the industry's smallest "keep-out" area on the PCB which enable ease of PCB design and revision at each development stage.

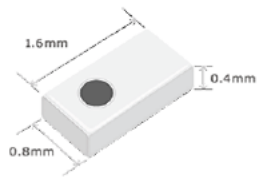
This Tech Note will offer some valuable information to assist you on designing your product with TDK's ANT series chip antenna.

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Product Feature 1: Compact sizes

Antenna size



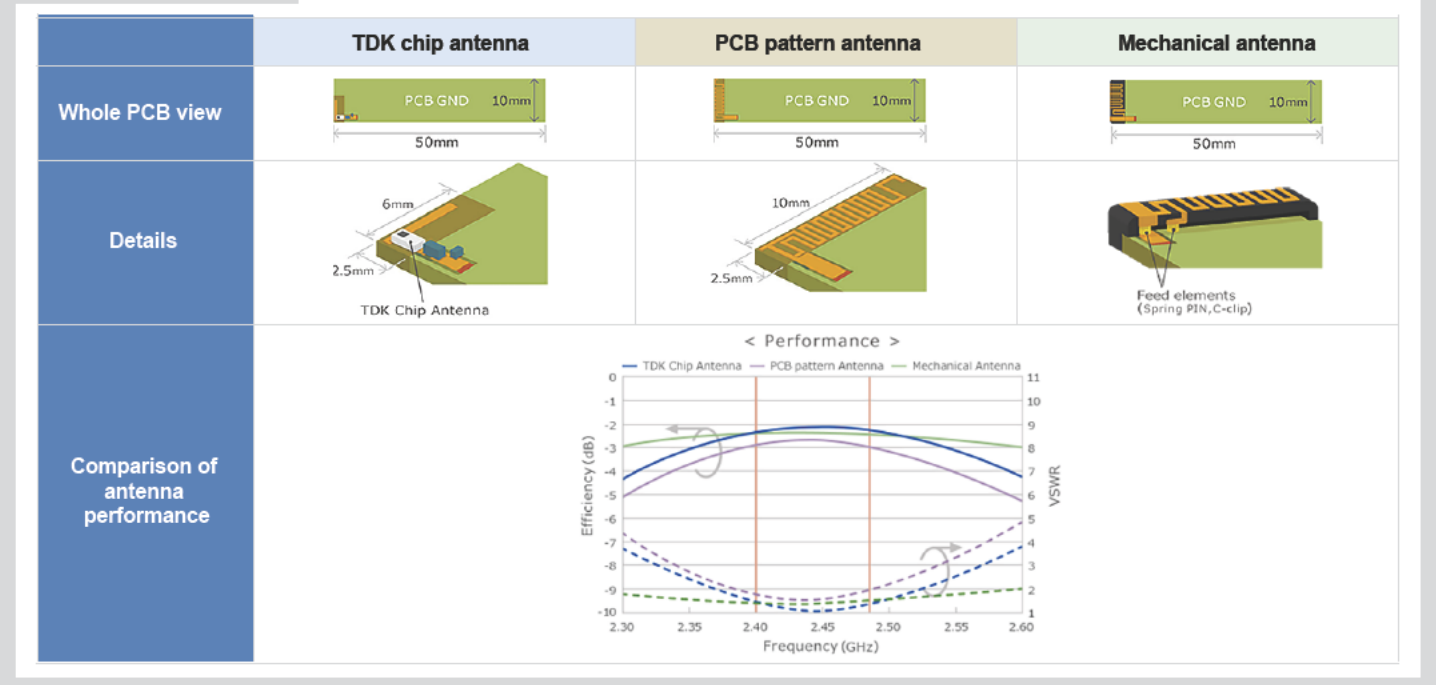
TDK's chip antennas are designed according to the concept of "compact size with low profiles", such as the majority of antenna products are 1.6 x 0.8 x 0.4mm in size.

Antenna area size

Figure 1 shows the results of simulations performed on a circuit board using 3 different types of antennas.

Compared to PCB pattern antennas and mechanical antennas, TDK's chip antennas can successfully reduce antenna area sizes with no degradation of performance.

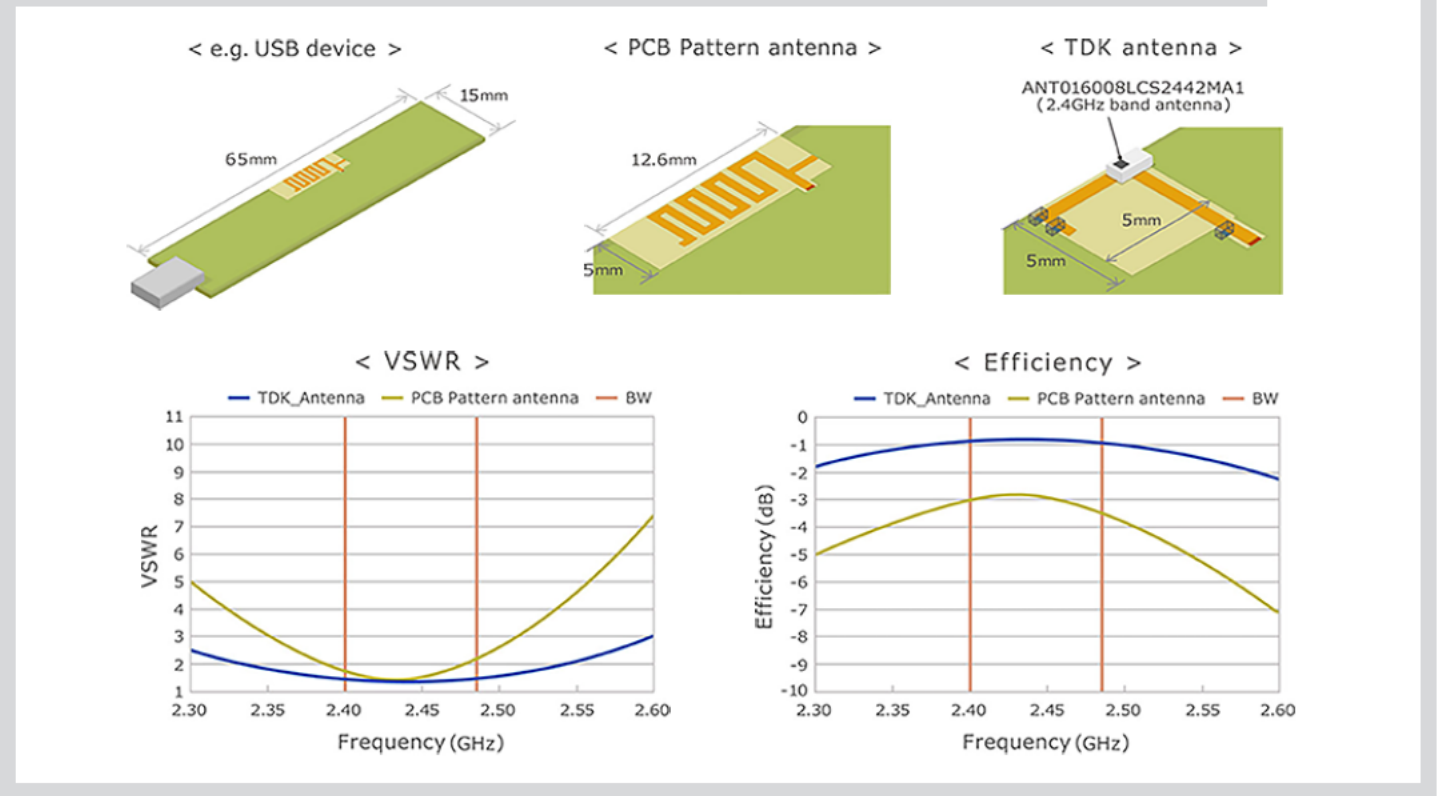
Figure 1: Antenna area sizes



Product Feature 2: High performance even at positions other than PCB corners

TDK offer antennas suitable for a variety of mounting position on the PCB allowing for greater design flexibility. In certain antenna mounting position where PCB Pattern antenna do not performance so well, chip antenna can provide excellent performance in comparison, as shown in Figure 2. In the simulation below, TDK's antenna are shown to have better performance by 2dB or greater, even with less than half the antenna area as PCB pattern antenna.

Figure 2: Example of improvement achieved by a TDK chip antenna (half the antenna area while improving efficiency by 2dB or more)

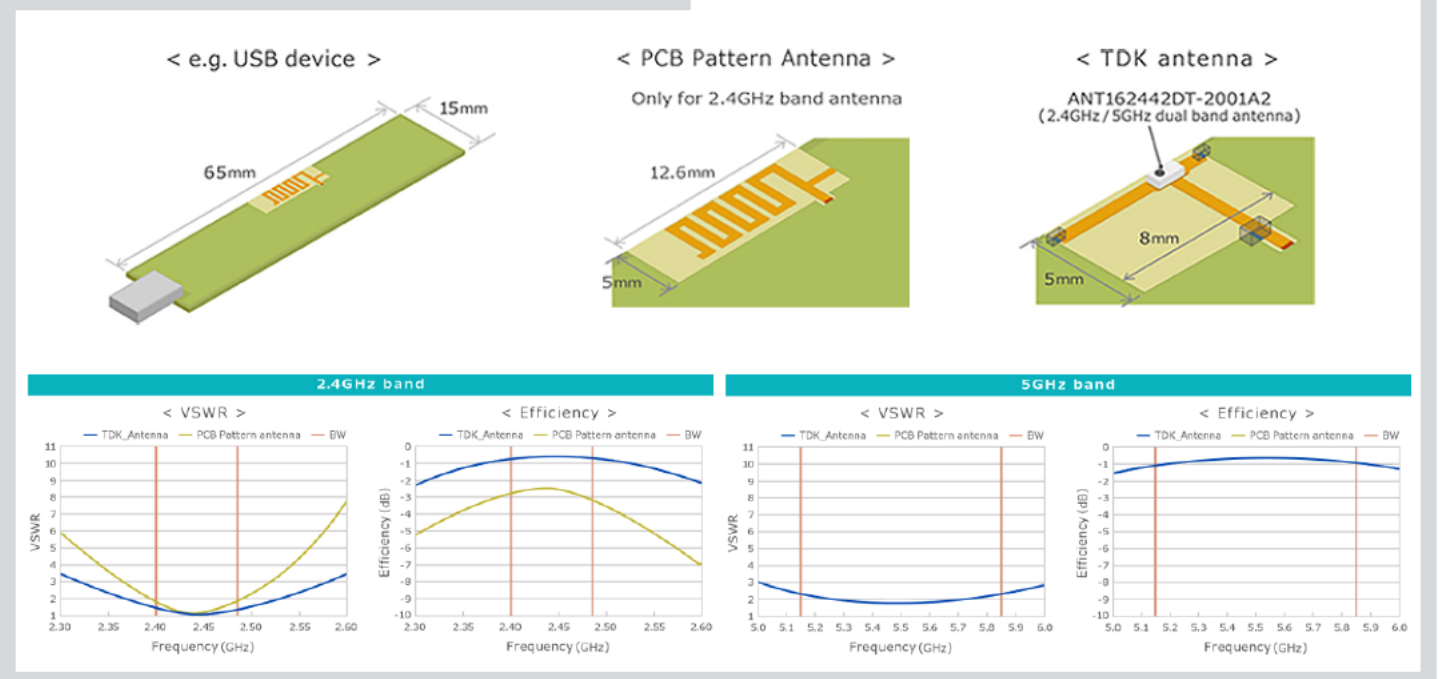


Product Feature 3: Multi-band antenna lineup

TDK's chip antennas are available as multi-band antennas.

Figure 3 shows the modification of a 2.4GHz-band PCB pattern antenna into a 2.4/5GHz dual-band antenna using a chip antenna from TDK. In this example, the antenna area is reduced and it is successfully changed to a dual-band type with no degradation of its 2.4GHz-band performance.

Figure 3: Change to 2.4/5GHz dual bands by using a TDK chip antenna

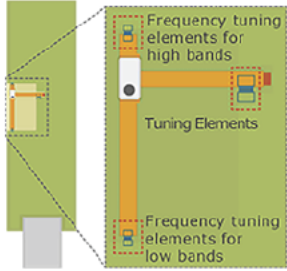
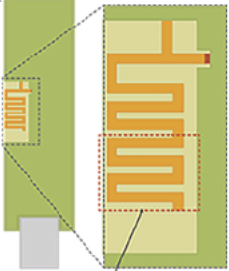


Product Feature 4: Board revisions at each development stage are unnecessary

TDK's chip antenna performance can be optimized using capacitor and/or inductor as tuning elements. This flexible design aspect allow for easy fine-tuning at each stage of design without changing the PCB layout.

TDK offers simplified antenna simulation tool to help you gauge the antenna performance by changing antenna mounting positions and keep out area size to determine feasibility study for your application.

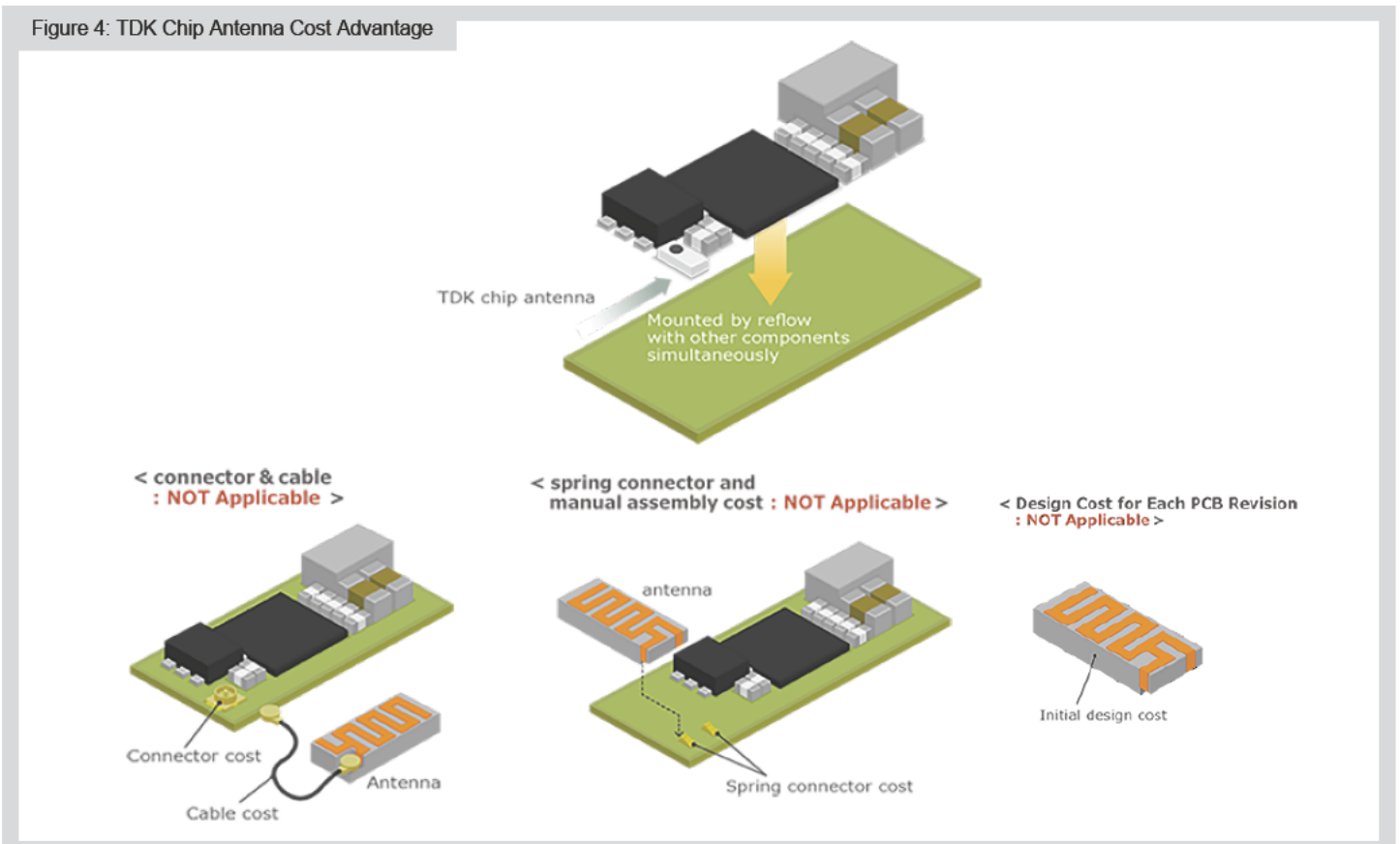
[Click here for Chip Antenna Simulation Tools](#)

Additional costs associated with changes in mounting positions or surrounding metallic materials	TDK chip Antenna	PCB pattern antenna
	<p>TDK's chip antenna can be tuned with capacitors and inductors. Since the values for these elements can be changed at each development stage, there is no need to revise the board layout.</p>  <p>Revisions at each development stage are not necessary</p>	<p>The resonant frequency of the antenna will be slightly affected by factors such as the surrounding metallic materials. Therefore, if PCB pattern antennas are used, it will be necessary for the layout to be revised at each customer development stage.</p>  <p>Layout revision is necessary at each development stage</p>

Product Feature 5: Simple product design compatible with automatic mounting and reflow

As shown in figure 4, TDK chip antenna are SMD components so they do not have additional cost associated with other types of antenna design since they can be mounted by reflow process.

Figure 4: TDK Chip Antenna Cost Advantage



Contact Information

Inquiries on products, sales, or technical matters

Related Links

Product Portal



RF Components and Modules product information

A comprehensive guide to information on RF Components and Modules from the TDK Group.



Chip Antennas product information

A comprehensive guide to information on chip antennas from the TDK Group.

Selection Guides



Chip Antennas Selection Guide

Products & Technologies



General Technical Information (ANT Series)



Design Note

"information on substrates, mounting positions, and matching and tuning"

Technical Support Tools



Chip Antenna Simulation



TVCL - TDK Virtual Component Library