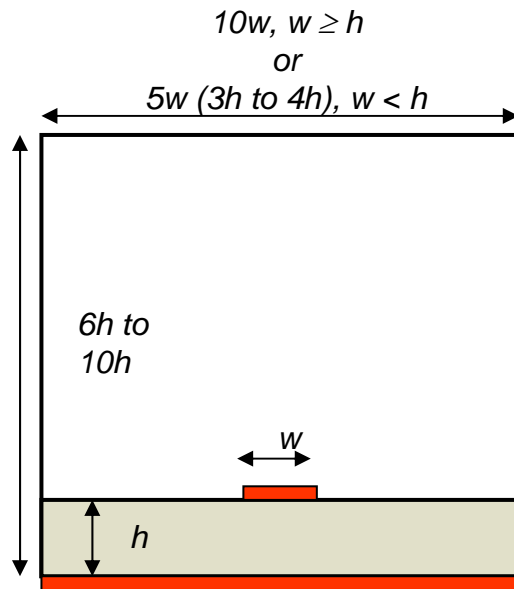


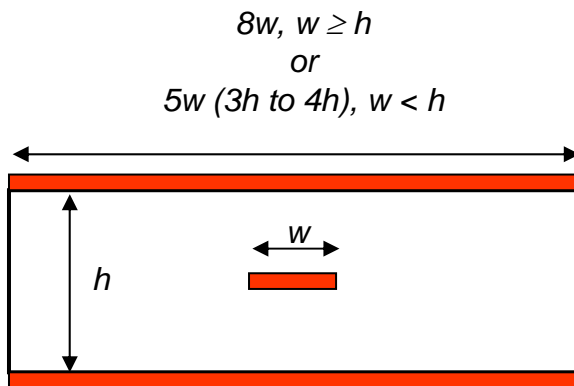
Sizing Handbook I



*Note: Port sizing guidelines are **not** inviolable rules true in all cases. For example, if meeting the height and width requirements outlined result in a rectangular aperture bigger than $\lambda/2$ on one dimension, the substrate and trace may be ignored in favor of a waveguide mode. When in doubt, build a simple ports-only model and test.*

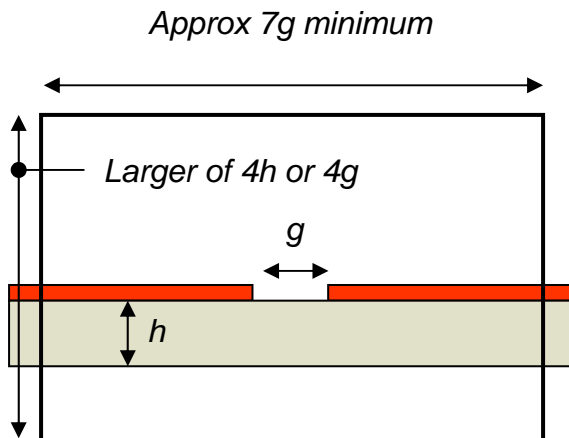
- ▲ Microstrip Port Sizing Guidelines
 - ▲ Assume width of microstrip trace is w
 - ▲ Assume height of substrate dielectric is h
- ▲ Port Height Guidelines
 - ▲ Between $6h$ and $10h$
 - ▲ Tend towards upper limit as dielectric constant drops and more fields exist in air rather than substrate
 - ▲ Bottom edge of port coplanar with the upper face of ground plane
 - ▲ (If real structure is enclosed lower than this guideline, model the real structure!)
- ▲ Port Width Guidelines
 - ▲ $10w$, for microstrip profiles with $w \geq h$
 - ▲ $5w$, or on the order of $3h$ to $4h$, for microstrip profiles with $w < h$

Sizing Handbook II



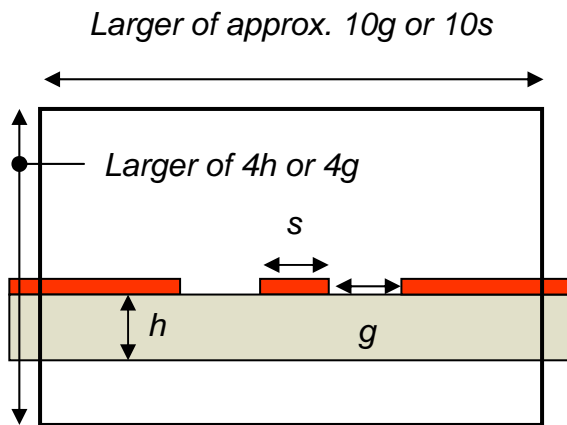
- ▲ Stripline Port Sizing Guidelines
 - ▲ Assume width of stripline trace is w
 - ▲ Assume height of substrate dielectric is h
- ▲ Port Height Guidelines
 - ▲ Extend from upper to lower groundplane, h
- ▲ Port Width Guidelines
 - ▲ $8w$, for microstrip profiles with $w \geq h$
 - ▲ $5w$, or on the order of $3h$ to $4h$, for microstrip profiles with $w < h$
- ▲ Boundary Note: Can also make side walls of port *Perfect H* boundaries

Sizing Handbook III



- ▶▶ Slotline Port Guidelines
 - ▶▶ Assume slot width is g
 - ▶▶ Assume dielectric height is h
- ▶▶ Port Height:
 - ▶▶ Should be at least $4h$, or $4g$ (larger)
 - ▶▶ Remember to include air below the substrate as well as above!
 - ▶▶ If ground plane is present, port should terminate at ground plane
- ▶▶ Port Width:
 - ▶▶ Should contain at least $3g$ to either side of slot, or $7g$ total minimum
 - ▶▶ Port boundary *must* intersect both side ground planes, or they will 'float' and become signal conductors relative to outline 'ground'

Sizing Handbook IV



- ▶ CPW Port Guidelines
 - ▶ Assume slot width is g
 - ▶ Assume dielectric height is h
 - ▶ Assume center strip width is s
- ▶ Port Height:
 - ▶ Should be at least $4h$, or $4g$ (larger)
 - ▶ Remember to include air below the substrate as well as above!
 - ▶ If ground plane is present, port should terminate at ground plane
- ▶ Port Width:
 - ▶ Should contain $3-5g$ or $3-5s$ of the side grounds, whichever is larger
 - ▶ Total about $10g$ or $10s$
 - ▶ Port outline *must* intersect side grounds, or they will 'float' and become additional signal conductors along with the center strip.

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