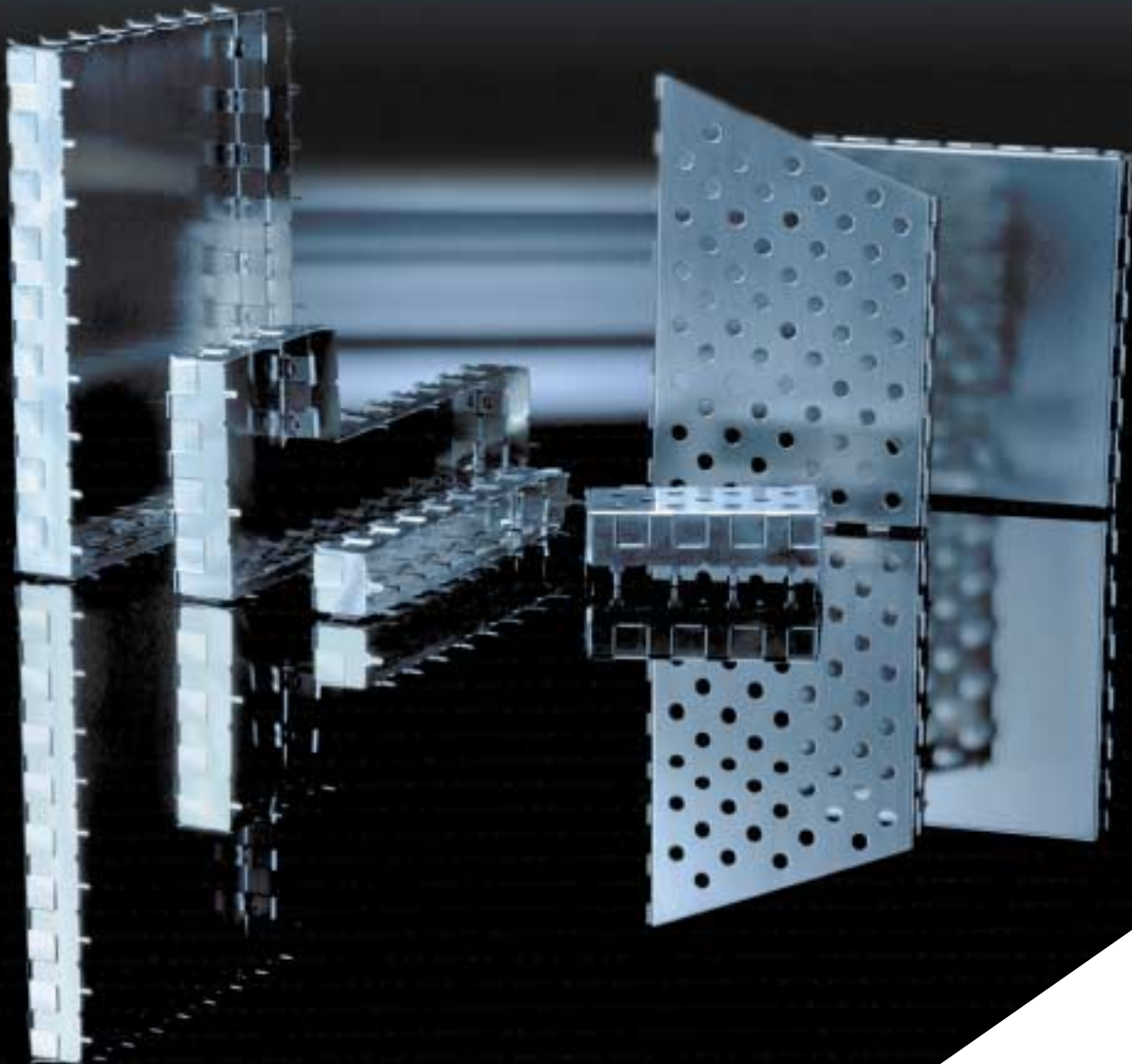


CBS Circuit Board Shielding  
**DESIGN**  
**GUIDE**

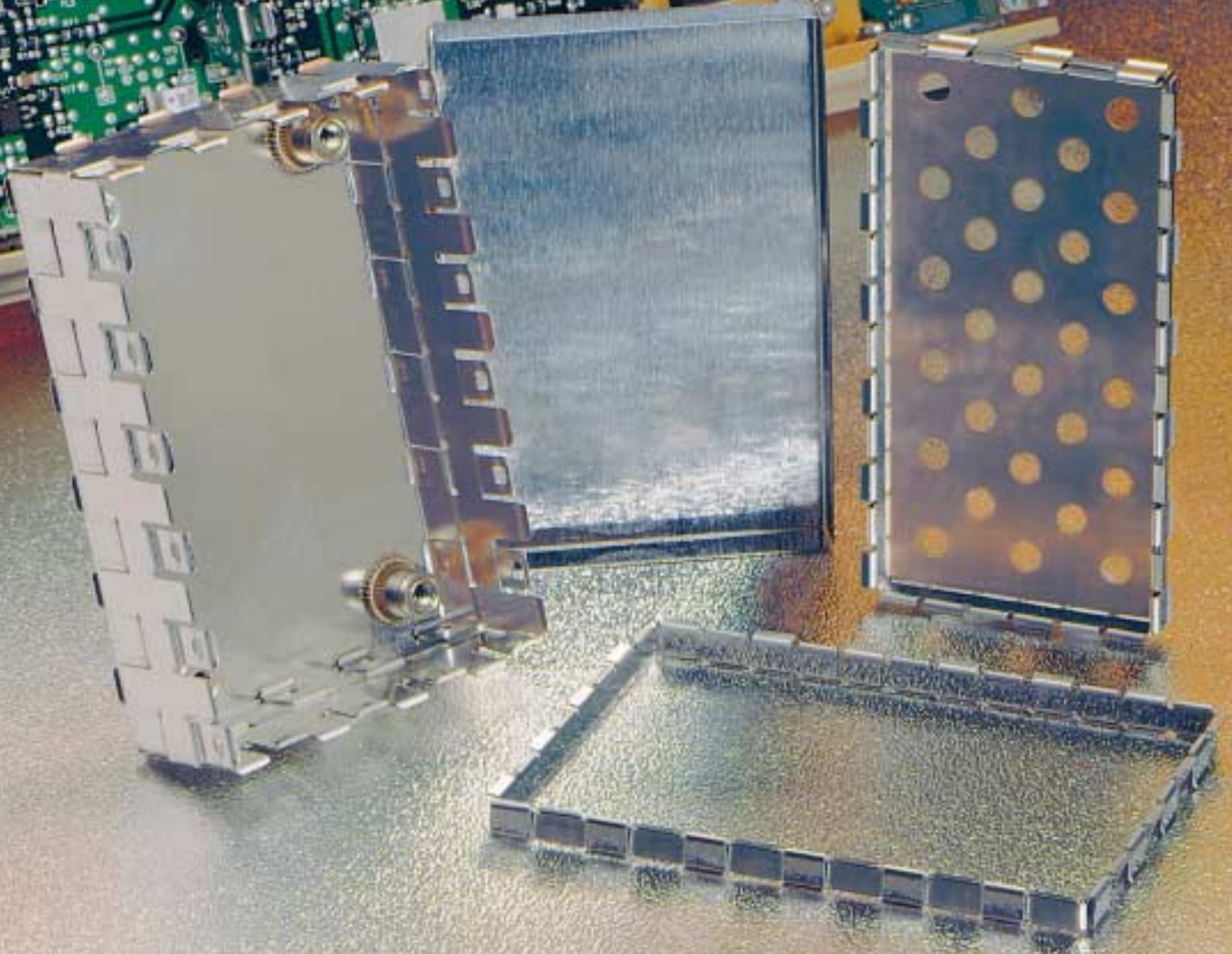
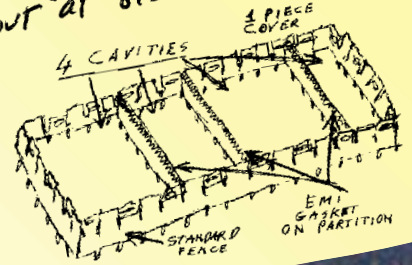


**LEADER  
TECH**   
a HEICO company

*The Leading Edge In EMI Shielding Technology*

[www.leadertechinc.com](http://www.leadertechinc.com)

Multi Cavity Idea!  
Took Fence from this LT Cat.  
& sketched this. could save  
space, wgt. & cost. Call Darrell,  
LT's engineer, with our board  
layout at 813-855-6921.



**Shut out the noise  
not the technicians**

---

## **Circuit Board Shields (CBS) Using Standard Modular “off-the-shelf” Fence and Covers.**

EMI designers are demanding extremely tight circuit board shields to prevent EMI/RFI radiation and susceptibility. This **CBS Circuit Board Shielding Design Guide** features Leader Tech’s patented two-piece construction with a solderable fence and removable cover, considered by designers to have the strongest cover retention in the industry. It provides protection for sensitive components while allowing your technician access to adjust and repair.

Leader Tech provides EMI designers flexibility and cost-effective custom solutions. This is achieved by stocking a large variety of standard off-the-shelf fence options, which can be formed and combined with a cover to create a fully custom design. Additional features such as special cutouts, vent holes, insulating materials and other special requirements, can be added to create the right Circuit Board Shield for your application. Avoid long lead-times and expensive custom tooling by reviewing these EMI shielding innovations and selecting the right one for your next application. You will find that Leader Tech’s product diversity includes simple one-piece shields to more complicated multicavity shields using a variety of through-hole and surface mounting options.

### **5 step commitment to our valued customers**

#### **1. Our Vision** (An aspiration worthy to strive for)

We are committed to become the most reliable and innovative supplier of EMI/RFI shielding in the industry and, as our name implies, The Leader. In order to achieve this we will consistently strive to provide you with unparalleled innovation, service, and solutions.

#### **2. Our Mission** (Our daily commitment to you)

We are committed to consistently provide you with innovation and flexibility of design, engineering expertise, and conscientious customer service that will provide you with the right product, delivered on time. We are dedicated to making you look good to your customers. We want your repeat business.

#### **3. Our Products** (Precision engineered to work in your application)

Our patented CBS Circuit Board Shields offer the strongest cover retention in the industry and, for more than a decade, they have been considered the standard for Circuit Board Shielding applications. They combine the flexibility and short lead times of a standard component, while fulfilling the custom needs of today’s designers. This innovative product approach provides you with a Circuit Board Shielding solution that meets your design requirements within your time frame and budget.

#### **4. Our Facilities** (Continually expanding to meet your needs)

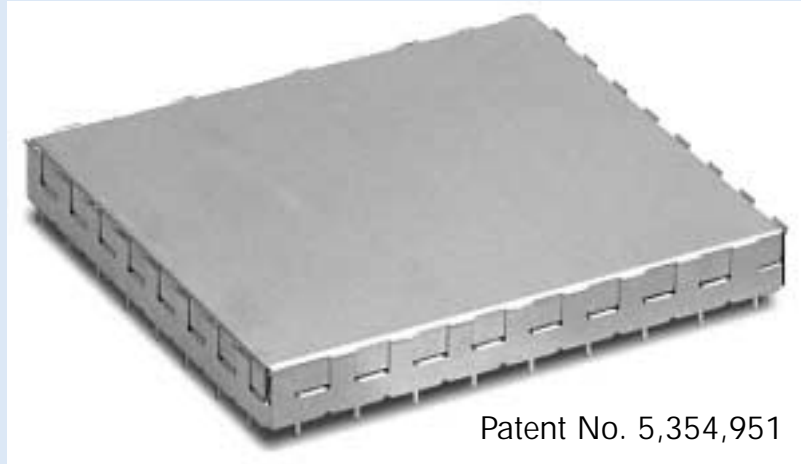
We are committed to expansion wherever and whenever necessary. We are constantly updating our hardware and software programs and investing in new equipment to manufacture and deliver the most precise and cost efficient shielding in the industry. And, with the backing of our parent company, HEICO, the possibilities for new space and equipment are an ever present reality.

#### **5. Our Services** (Consistent reliability each time you order)

We are committed to excellent service. Our staff undergoes a rigorous daily product, sales, and service education in order to serve you better. We want your calls answered by a person not a machine, someone trained to qualify your needs, and get answers to you in 24-48 hours. At Leader Tech we believe that the right people and the right equipment go hand in hand.

# CBS

## Circuit Board Shielding



Patent No. 5,354,951

### Standard Sizes

Sizes from .50" x .50" to 12.00" x 24.00",  
(12.7 x 12.7 to 304.8 x 609.6)  
including squares, rectangles, and odd shapes  
formed at .25" (6.35) increments.  
Height sizes from .13" to 2.00" (3.3 to 50.8).  
Other sizes available. Please consult factory.

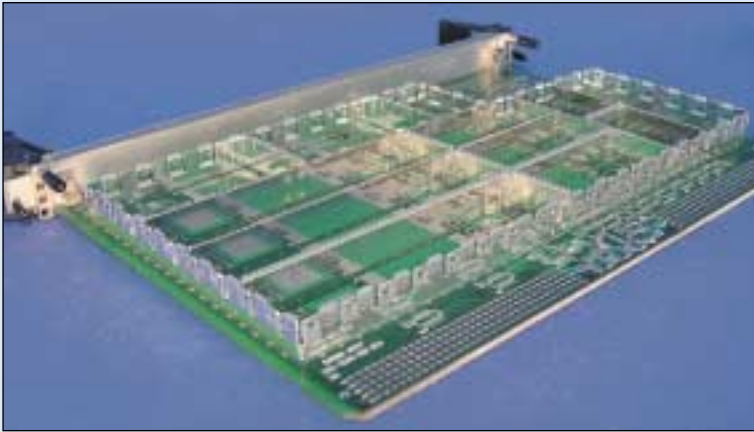
### Standard Options

Fences available with mounting pins spaced  
.25", .50" or 1.00" (6.35, 12.7 or 25.4).  
Fences available with or without .010" (.25) to .05" (1.27) board standoffs.  
Dimples are available upon request to secure the cover to the fence where severe  
vibration or shock is a factor. Fences can be formed for surface mount applications.

### Features

Leader Tech is the worlds' leading supplier of standard off the shelf modular fence and cover circuit board shields

- "Off-the-shelf" availability
- "Strong gripping fingers for excellent cover retention
- Removable covers for easy access to circuitry
- Variety of mounting options – thru-hole, surface mount, mechanical fasteners
- Many standard and custom modifications allow for rapid implementation of most custom requirements for notches, holes and ventilation patterns
- A variety of shapes from rectangles, 'L' shapes and multi cavities, to complicated customs including multiple height and multi-cavity designs
- Excellent EMI performance

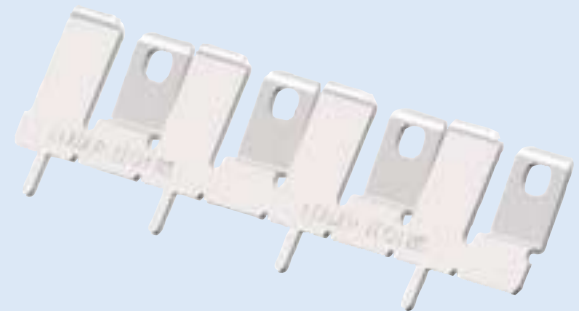


## Multi Cavity Shields

Leader Tech's range of multi cavity circuit board shields (CBS) saves space, weight, assembly costs and time-to-market.

These shields typically consist of multiple internal cavities sharing connecting walls; from simple two cavity shields to more complex multiple cavity shields. With the current trend for decreasing circuit board sizes, circuit board real estate is at a premium. Design Engineers now require shielding that will provide superior shielding effectiveness while still focusing on size and weight requirements.

As the world leader in standard modular 'off-the-shelf' circuit board shields for more than a decade; Leader Tech is pleased to offer the future of CBS by combining this technology into a range of multi cavity shields that offer the best shielding, space and mechanical features in the industry. Leader Tech intends to be the ideal partner for all your multi cavity applications.



## High Performance Design

"HP" Shield from Leader Tech

What do you do when you already manufacture the leading circuit board shields (CBS) in the industry... you make them better.

Leader Tech is launching a new series of CBS fence components using enhanced materials, improved mechanical features and design options. This new "HP" series will allow engineers the flexibility of lower profiles, multiple pin locations, backward compatibility with all of our existing product lines, while enhancing shielding effectiveness and cover retention.

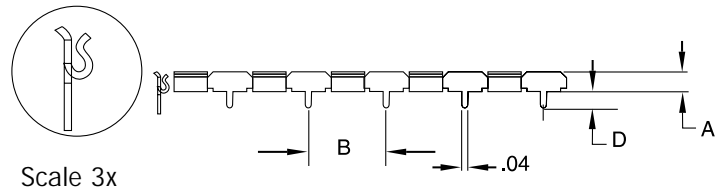
**Our Engineering Team is available to assist you through your design process. Please contact us with your requirements.**

## 10-CBS Series

STYLE	FIG.	A HEIGHT	B PIN SPACING	C STANDOFFS	D PIN LENGTH
14R-CBS	1	.13 (3.3)	.50 (12.7)	N/A	.10 (2.54)
14RA-CBS	1	.13 (3.3)	.50 (12.7)	N/A	.050 (1.27)
18R-CBS	1	.13 (3.3)	.50 (12.7)	N/A	.13 (3.3)

FIGURE: .50" Pin Spacing, No Standoff

FIGURE 1

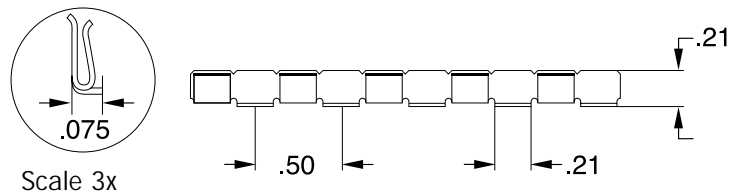


## 20S-CBS Series

STYLE	FIG.	A HEIGHT	B PAD SPACING	C STANDOFFS	D PAD LENGTH
20S-CBS	1	.20 (5.08)	.50 (12.7)	N/A	.075 x .210 (1.9 x 5.33)

FIGURE: .50" Pad Spacing, No Standoff

FIGURE 1



## 20-CBS Series

STYLE	FIG.	A HEIGHT	B PIN SPACING	C STANDOFFS	D PIN LENGTH
21-CBS	2	.225 (5.72)	.50 (12.7)	.025 (.635)	.10 (2.54)
22-CBS	1	.20 (5.08)	1.0 (25.4)	N/A	.10 (2.54)
23-CBS	2	.25 (6.35)	.50 (12.7)	.05 (1.27)	.10 (2.54)
24-CBS	3	.20 (5.08)	.50 (12.7)	N/A	.10 (2.54)
25-CBS	2	.225 (5.72)	1.0 (25.4)	.025 (.635)	.10 (2.54)
29-CBS	3	.20 (5.08)	.50 (12.7)	N/A	.13 (3.3)

FIGURE: 1 - 1.0" Pin Spacing, No Standoff  
2 - .50" Pin Spacing, With Standoff  
3 - .50" Pin Spacing, No Standoff

FIGURE 1

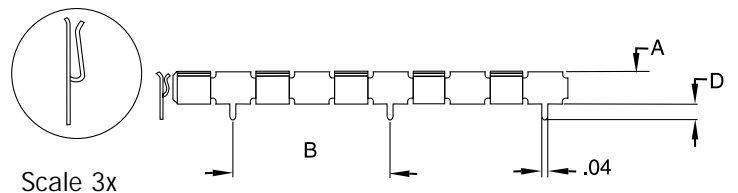


FIGURE 2

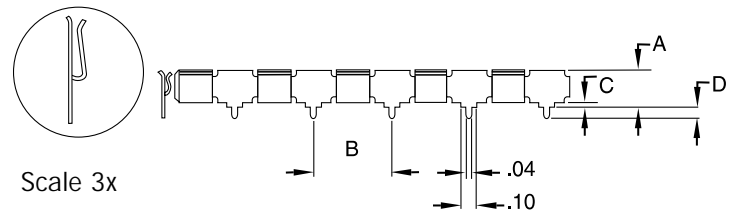
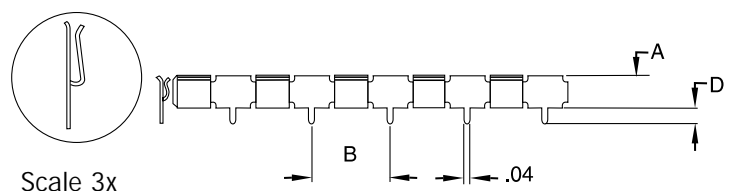


FIGURE 3

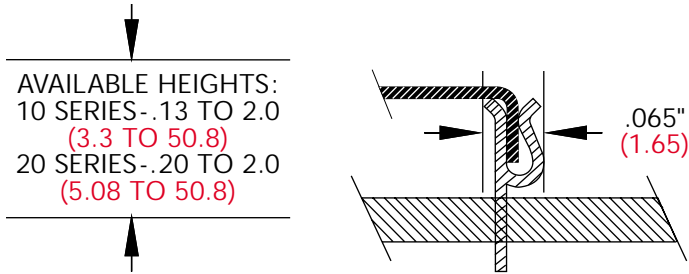


All Dimensions In Inches & (mm)

Standard Material .015 (.38) Pre-Tin Plated Steel

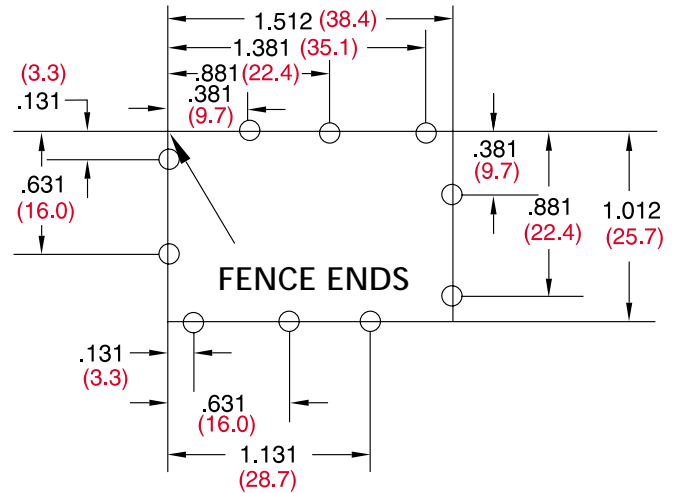
# CBS

## 10 & 20 Series Configuration

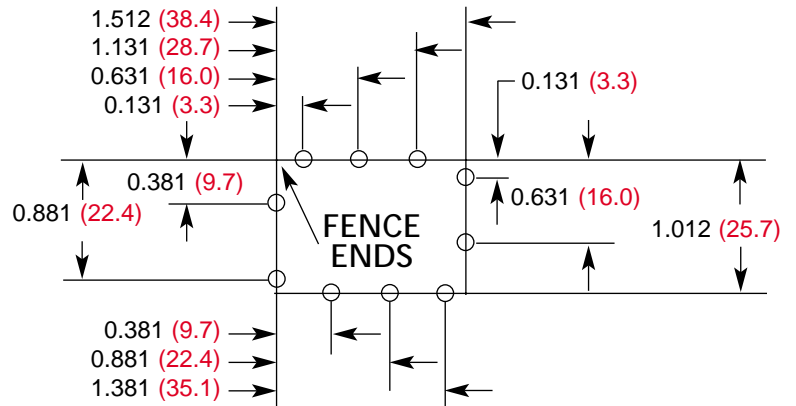
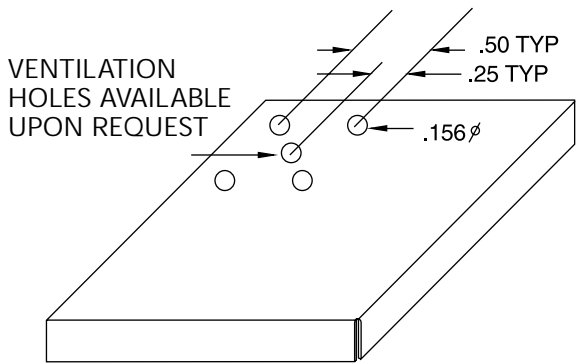


Recommended hole size: .050" (1.27)

### Example: Mounting Hole Pattern For 10 & 20 Series



### Example: Opt #1 Mounting Hole Pattern For 10 & 20 Series



## Ordering Information

Part No. Width Length Height (from board to cover)  
 21-CBS — 2.5 X 4.5 X .225

Available from .13" to 2.00" (3.3 to 50.8)  
 In .25" increments from .50" to 24.00" (12.7 to 609.6)  
 In .25" increments from .50" to 12.00" (12.7 to 304.8)

### Please Specify:

- How parts are to be supplied:
- Flat fence and formed cover
  - Formed fence, formed cover, unassembled
  - Assembled fence and cover
  - Formed for surface mount
  - See additional info on pg.13

## 40-CBS Series

STYLE	FIG.	A HEIGHT	B PIN SPACING	C STANDOFFS	D PIN LENGTH
42-CBS	2	.40 (10.16)	1.0 (25.4)	N/A	.12 (3.05)
44-CBS	3	.40 (10.16)	.50 (12.7)	N/A	.12 (3.05)
45-CBS	1	.40 (10.16)	1.0 (25.4)	.01 (.25)	.12 (3.05)
47-CBS	1	.40 (10.16)	1.0 (25.4)	.01 (.25)	.15 (3.81)
48-CBS	3	.40 (10.16)	.50 (12.7)	N/A	.15 (3.81)
49-CBS	4	.40 (10.16)	.25 (6.35)	N/A	.12 (3.05)

FIGURE: 1 - 1.0" Pin Spacing, With Standoff  
 2 - 1.0" Pin Spacing, No Standoff  
 3 - .50" Pin Spacing, No Standoff  
 4 - .25" Pin Spacing, No Standoff

FIGURE 1

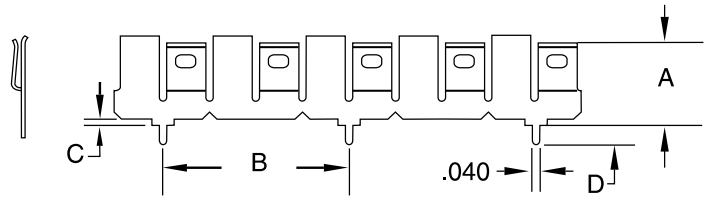


FIGURE 2

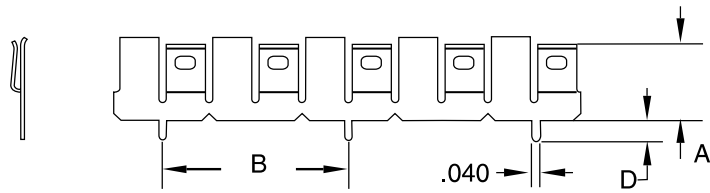


FIGURE 3

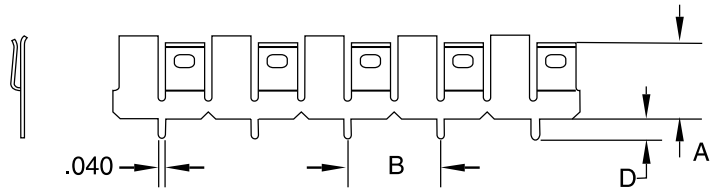
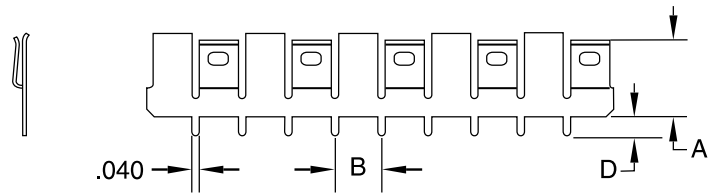


FIGURE 4



All Dimensions In Inches & (mm)

Standard Material .015 (.38) Pre-Tin Plated Steel

## 50-CBS Series

STYLE	FIG.	A HEIGHT	B PIN SPACING	C STANDOFFS	D PIN LENGTH
51-CBS	1	.50 (12.7)	1.0 (25.4)	.05 (1.27)	.12 (3.05)
52-CBS	2	.50 (12.7)	1.0 (25.4)	N/A	.12 (3.05)
53-CBS	3	.50 (12.7)	.50 (12.7)	.05 (1.27)	.12 (3.05)
53A-CBS	3	.50 (12.7)	.50 (12.7)	.05 (1.27)	.06 (1.53)
54-CBS	4	.50 (12.7)	.50 (12.7)	N/A	.12 (3.05)
55-CBS	1	.50 (12.7)	1.0 (25.4)	.01 (.25)	.12 (3.05)
56-CBS	1	.50 (12.7)	1.0 (25.4)	.05 (1.27)	.15 (3.81)
57-CBS	1	.50 (12.7)	1.0 (25.4)	.01 (.25)	.15 (3.81)
58-CBS	4	.50 (12.7)	.50 (12.7)	N/A	.15 (3.81)
59-CBS	5	.50 (12.7)	.25 (6.35)	N/A	.12 (3.05)

**FIGURE:** 1 - 1.0" Pin Spacing, With Standoff  
 2 - 1.0" Pin Spacing, No Standoff  
 3 - .50" Pin Spacing, With Standoff  
 4 - .50" Pin Spacing, No Standoff  
 5 - .25" Pin Spacing, No Standoff

FIGURE 1

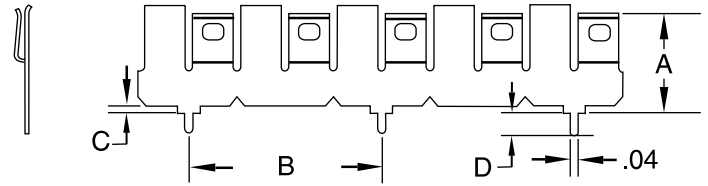


FIGURE 2

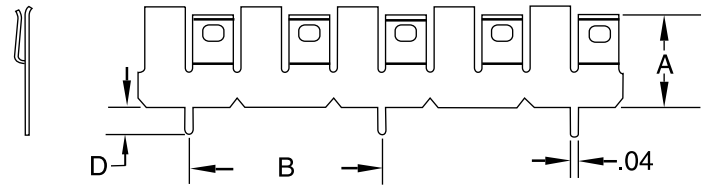


FIGURE 3

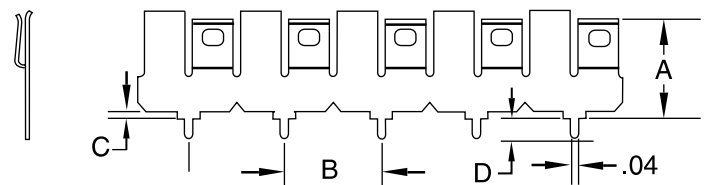


FIGURE 4

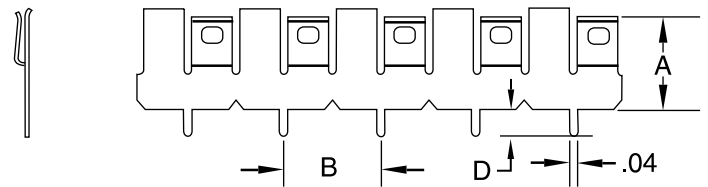
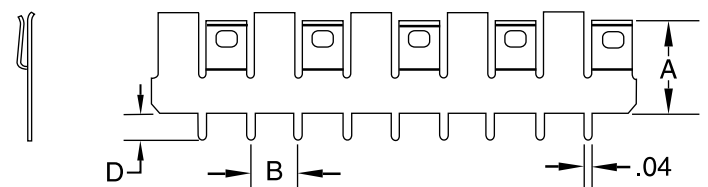


FIGURE 5



All Dimensions In Inches & (mm)

Standard Material .015 (.38) Pre-Tin Plated Steel

# 80-CBS Series

STYLE	FIG.	A HEIGHT (mm)	B PIN SPACING (mm)	C STANDOFFS (mm)	D PIN LENGTH (mm)
81-CBS	1	.80 (20.3)	1.0 (25.4)	.05 (1.27)	.12 (3.05)
82-CBS	2	.80 (20.3)	1.0 (25.4)	N/A	.12 (3.05)
83-CBS	3	.80 (20.3)	.50 (12.7)	.05 (1.27)	.12 (3.05)
83A-CBS	3	.80 (20.3)	.50 (12.7)	.05 (1.27)	.06 (1.53)
84-CBS	4	.80 (20.3)	.50 (12.7)	N/A	.12 (3.05)
85-CBS	1	.80 (20.3)	1.0 (25.4)	.01 (.25)	.12 (3.05)
86-CBS	1	.80 (20.3)	1.0 (25.4)	.05 (1.27)	.15 (3.81)
87-CBS	1	.80 (20.3)	1.0 (25.4)	.01 (.25)	.15 (3.81)
88-CBS	4	.80 (20.3)	.50 (12.7)	N/A	.15 (3.81)
89-CBS	5	.80 (20.3)	.25 (6.35)	N/A	.12 (3.05)

**FIGURE:** 1 - 1.0" Pin Spacing, With Standoff  
 2 - 1.0" Pin Spacing, No Standoff  
 3 - .50" Pin Spacing, With Standoff  
 4 - .50" Pin Spacing, No Standoff  
 5 - .25" Pin Spacing, No Standoff

All Dimensions In Inches & (mm)

Standard Material .015 (.38) Pre-Tin Plated Steel

FIGURE 1

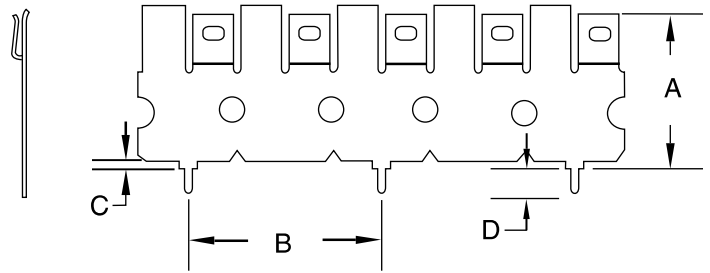


FIGURE 2

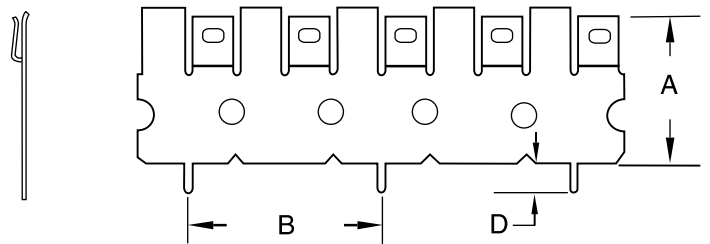


FIGURE 3

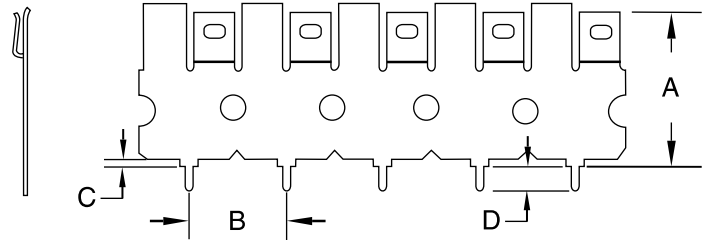


FIGURE 4

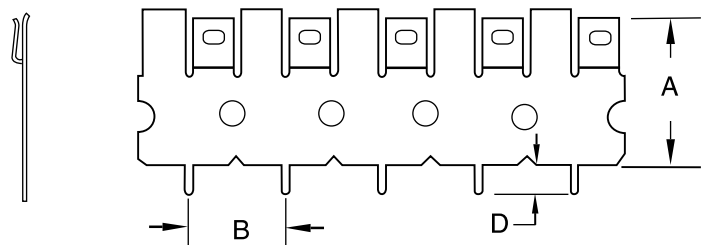
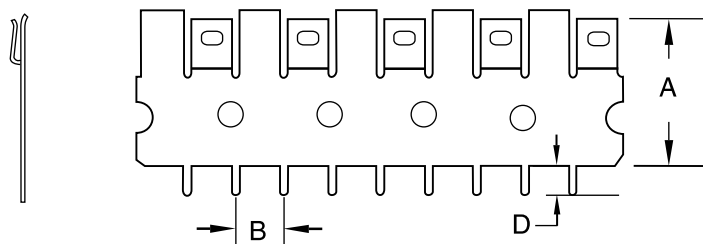


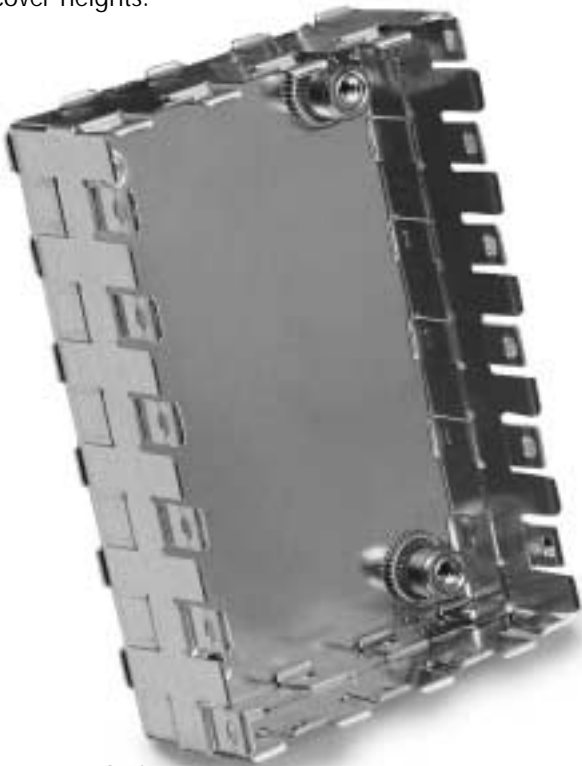
FIGURE 5



## CBS2 Series

STYLE	FIG.	A HEIGHT	PACKAGE HEIGHT
CBS2	1	.800 (20.32)	.840 min 2.240 max (21.36 min 56.90 max)

**CBS2:** Specific packaging heights and relative PCB locations are obtained by adjusting individual cover heights.



CBS 2

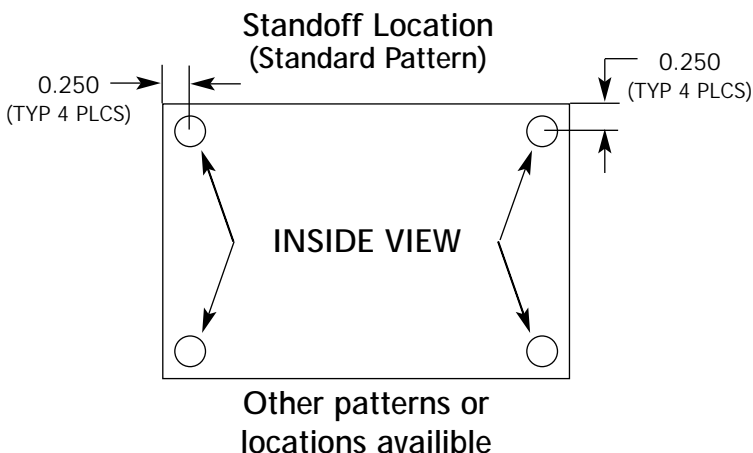
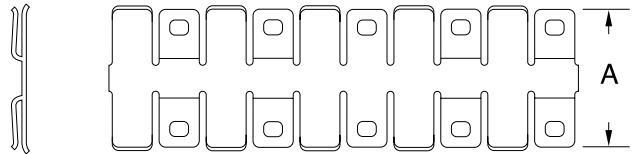


FIGURE 1



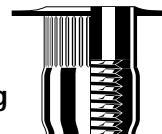
## CBS2 Series: Mounting And Application Information

The versatile CBS2 Shielding Box can be mounted on any side or orientation. We recommend the use of GRIP-SERT style threaded inserts. These inserts are completely threaded, enabling them to be utilized both as a method of exterior box attachment and for PCB attachment inside of the shielding box. This allows the use of CBS2 shielding boxes in a wide variety of unique mounting applications.

These highly versatile inserts deliver high torque-out resistance and high pull-out values in our standard .015" cold rolled steel or phosphor bronze material.

### Here's Why

**Axial Knurling**



#### Before Installation

Note the long band of axial knurling on every insert. This unique design feature is one of the keys to GRIP-SERT's strength. The knurled body expands 360° filling the hole.



#### After Installation

GRIP-SERT not only grips the surface on the inside of the hole, but has folded over and formed a "bubble" that firmly grips a wide surface underneath. This results in high resistance to spinning and increased pull-out values.

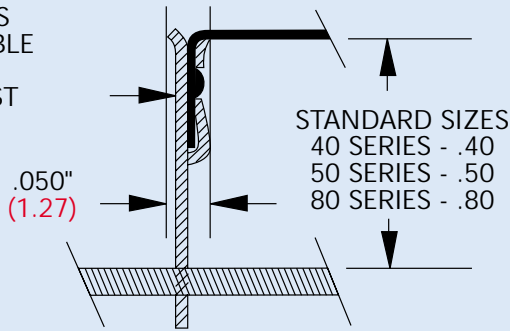
### Features:

- High torque-out values resists spinning due to cross-threading or overtightening
- Bubble on backside resists pull-out
- High torque strength is achieved as the GRIP-SERTS knurled body expands filling the hole
- Plated to QQ-P-416 type II class 2 specs for corrosion protection

# CBS

## 40/50/80 Series Configuration

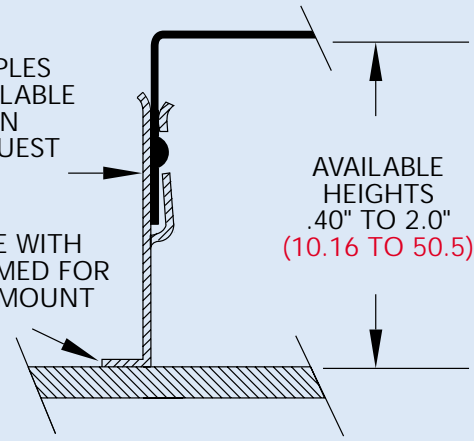
DIMPLES  
AVAILABLE  
UPON  
REQUEST



DIMPLES  
AVAILABLE  
UPON  
REQUEST

AVAILABLE WITH  
PINS FORMED FOR  
SURFACE MOUNT

AVAILABLE  
HEIGHTS  
.40" TO 2.0"  
(10.16 TO 50.5)

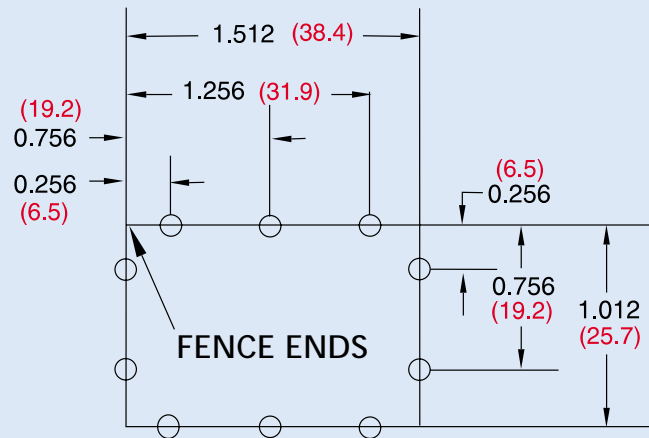


### Example:

### Mounting Hole Pattern For 0.5" (12.7) Spacing - Series 40, 50, & 80

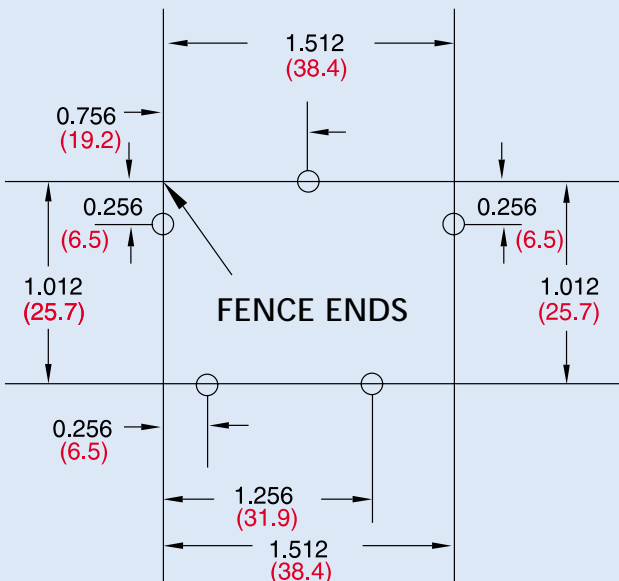
Mounting hole patterns for 40, 50, and 80 series are detailed in the following examples. Note: *Pins that fall on corners will be removed.* Mounting hole patterns for your specific size assembly are available upon request. **(Always consult the factory for L-shape mounting hole patterns.)**

Recommended hole size: .050" (1.27)



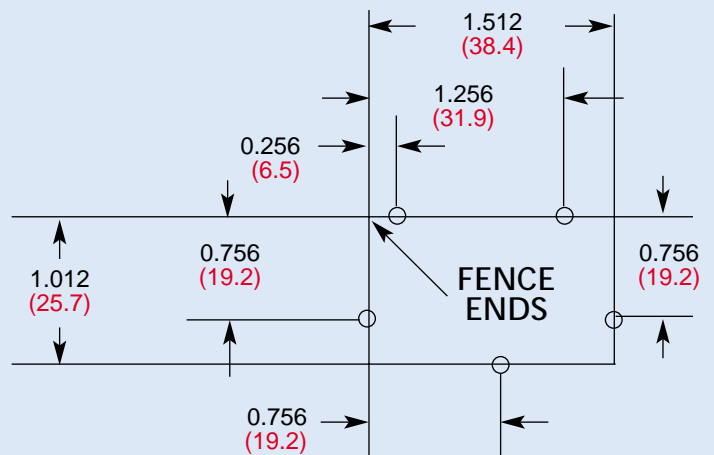
### Example:

### Mounting Hole Pattern For 1.0" (25.4) Spacing - Series 40, 50, & 80



### Example: OPT #1

### Mounting Hole Pattern For 1.0" (25.4) Spacing - Series 40, 50, & 80



# Ordering (Quote) Information

Part No. Width Length Height (from PcB to inside cover)  
 53-CBS — 2.0 X 3.0 X .50

Available from .13" to 2.00" (3.3 to 50.8)  
 In .25" (6.35) increments from .50" to 24.00" (12.7 to 609.6)  
 In .25" (6.35) increments from .50" to 12.00" (12.7 to 304.8)

**Please Specify:**

1. Dimples for positive locking if required (40, 50, and 80 series only)
2. How parts to be supplied:
  - Flat fence and formed cover
  - Formed fence, formed cover, unassembled
  - Assembled fence and cover
  - Formed for surface mount

## Ordering Information "Example"

Part No. Width Length Height (under the cover assembly height)  
 Example: 53-CBS-FPSV-2.0 X 3.0 X .55  
 This part utilizes a 50 Series fence 1/2" pin spacing with .05" standoffs (53) part will be supplied formed fence, formed cover (F), material utilized is Pre-Plate Phos-Bronze (P), with standard vent holes (SV) and dimensions are 2" wide by 3" long, with a .55" height from PcB to inside cover.

## Leader Tech Style CBS Quote Form

Company Name \_\_\_\_\_  
 Your P/N \_\_\_\_\_ Rev \_\_\_\_\_  
 Leader Tech P/N \_\_\_\_\_

Phone # 813-855-6921 Fax # 813-855-3291

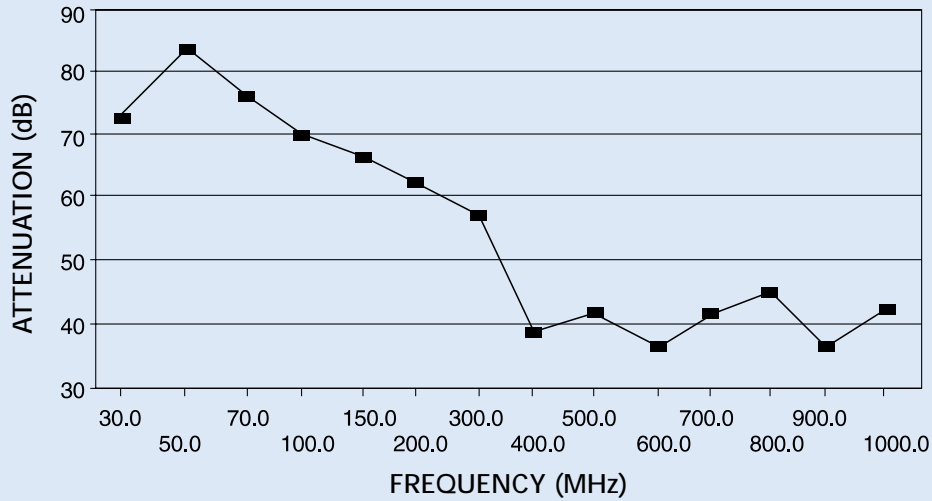
### Standard Material: Is Pre-Tin Plated Steel 0.015" Thickness

**Available Options:**  Flat Fence (U)  Formed Fence (F)  Assembled (A)  Surf. Mt. (SM)  
 Cover Hole (CH)  Cover Notch (CN)  Fence Hole (FH)  Fence Notch (FN)  Post Plated Steel (PS)  
 Pre-Plated Phos. Brz. (P)  Dimples (D)  
**Ventilation Holes:**  Standard (SV) 15% Open  Double Density (DV) 30% Open

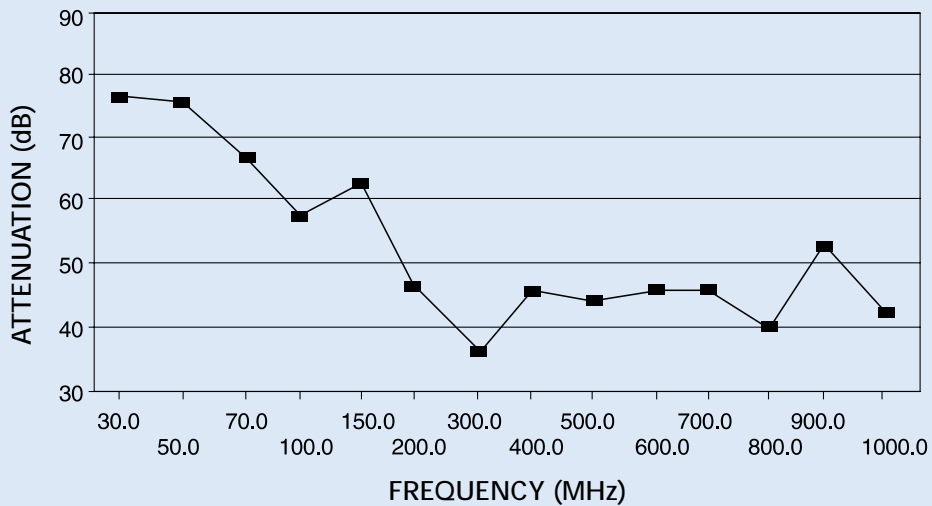
QUANTITY	FENCE STYLE	OPTIONS	WIDTH	LENGTH	(under cover) HEIGHT
	-CBS				
	-CBS				
	-CBS				
	-CBS				

Quote # \_\_\_\_\_ Quote Date \_\_\_\_\_  
 Engineer/Buyers Name \_\_\_\_\_ Phone/Fax \_\_\_\_\_ / \_\_\_\_\_

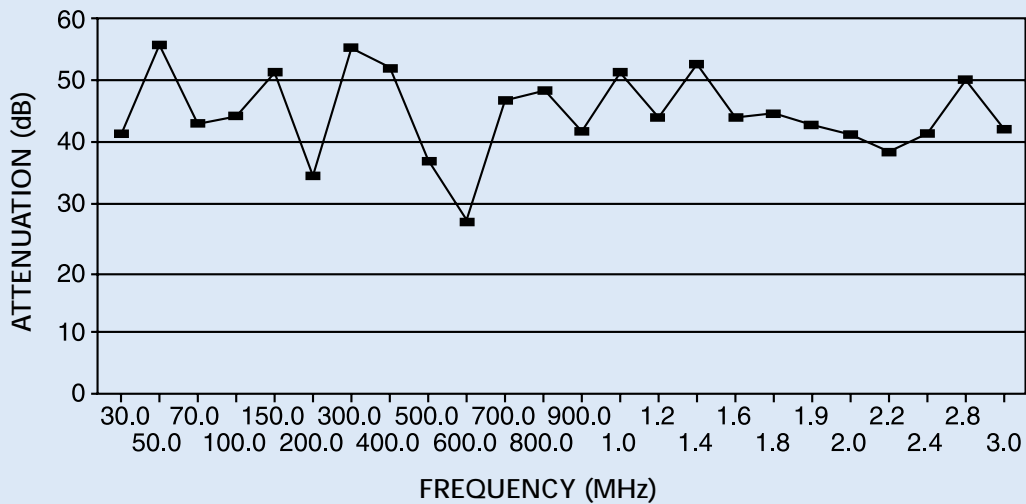
# Shielding Effectiveness • Leader Tech, Inc.



14R-CBS-2.0X3.0X0.13



54-CBS-2.0X3.0X0.5



20S-CBS-2.0X3.0X0.215

# CBS

## Answers To Some Often Asked Questions

### What sizes are available?

Standard sizes are from .50" x .50" (12.7 x 12.7) to 12.00" x 24.00" (304.8 x 609.6) at .25" (6.35) increments. Other sizes available. Please consult factory.

### What heights are available?

Standard heights are from .13" to 2.00" (3.3 to 50.8); by simply changing the cover height, any specific height is attainable.

### What shapes are available?

Squares, rectangles, and L-shapes are available.

### Do the different series and part numbers relate to the physical aspects of the parts?

Yes, each series number indicates a different fence height; the minimum height of an assembly using the specific series is indicated by the series number:

- 10 SERIES = .13" MIN. (3.3)
- 20 SERIES = .20" MIN. (5.08)
- 40 SERIES = .40" MIN. (10.16)
- 50 SERIES = .50" MIN. (12.7)
- 80 SERIES = .80" MIN. (20.32)

Taller assemblies using a specific series number can be attained by increasing the cover height; for example, a 1" (25.4) tall assembly can be achieved using the 50-CBS series fencing by increasing the standard cover height by .50" (12.7).

Each specific series sub-number indicates a different fence configuration relating to mounting pin spacing and standoff availability.

### Suppose I need to run a lead wire into an assembly?

Clearance notches can be added to the bottom of the fence material to allow wires to run to components that will be under the CBS assembly.

### Can access holes be added to the cover?

Yes, access holes can be added to allow for component adjustment when the cover is assembled to the fence.

### How do I deal with heat dissipation?

Ventilation holes can be added to the covers; page 7 of the Style CBS design guide shows our standard ventilation hole pattern which can be added without tooling charges.

### When would I need the optional securing dimples?

In most applications, the CBS fence design provides sufficient holding power without the addition of securing dimples in the cover; when severe shock or vibration are a consideration, dimples may be required.

### What are the available materials?

The standard material is a .015" (.38) thick pre-tin plated steel, which is readily solderable. Phosphorous Bronze alloy 510 and Nickel Silver alloy 770, is the standard material for the new "HP" line of fences. Other materials are available; please consult factory.

### How do I lay out my board for a CBS assembly?

Pages 7 & 12 of the CBS design guide provides examples of mounting hole patterns; please feel free to request a mounting hole pattern from the factory should you have any doubts as to the correct mounting hole pattern for your specific size assembly. Always consult factory for L-shape mounting hole patterns.

### Can I get samples?

Yes, a reasonable amount of samples may be requested from the factory.

### What is standard lead time?

For samples, standard lead time is 1 week after receipt of request.

For most orders of standard product, lead time is 3 - 4 weeks ARO.

For custom products, please contact the factory.

(These are our current lead times and are subject to change).



## EMI Gasket Selection Guide

**NOW AVAILABLE**, Leader Tech's new **EMI/RFI Designer's Gasket Selection Guide**, which serves as both a product catalog and instruction manual. It contains beryllium copper and stainless steel gasket profiles that are arranged into easy to use profile families with detailed CAD drawings. It provides the designer with valuable reference information: a chart illustrating the differences between beryllium copper and cloth-over-foam gaskets, an adhesive application guide, plus galvanic potential and elastic performance charts. In addition, **FEATURING** new CompactPCI and VME gasket profiles.



*The Leading Edge In EMI Shielding Technology*

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