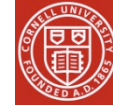


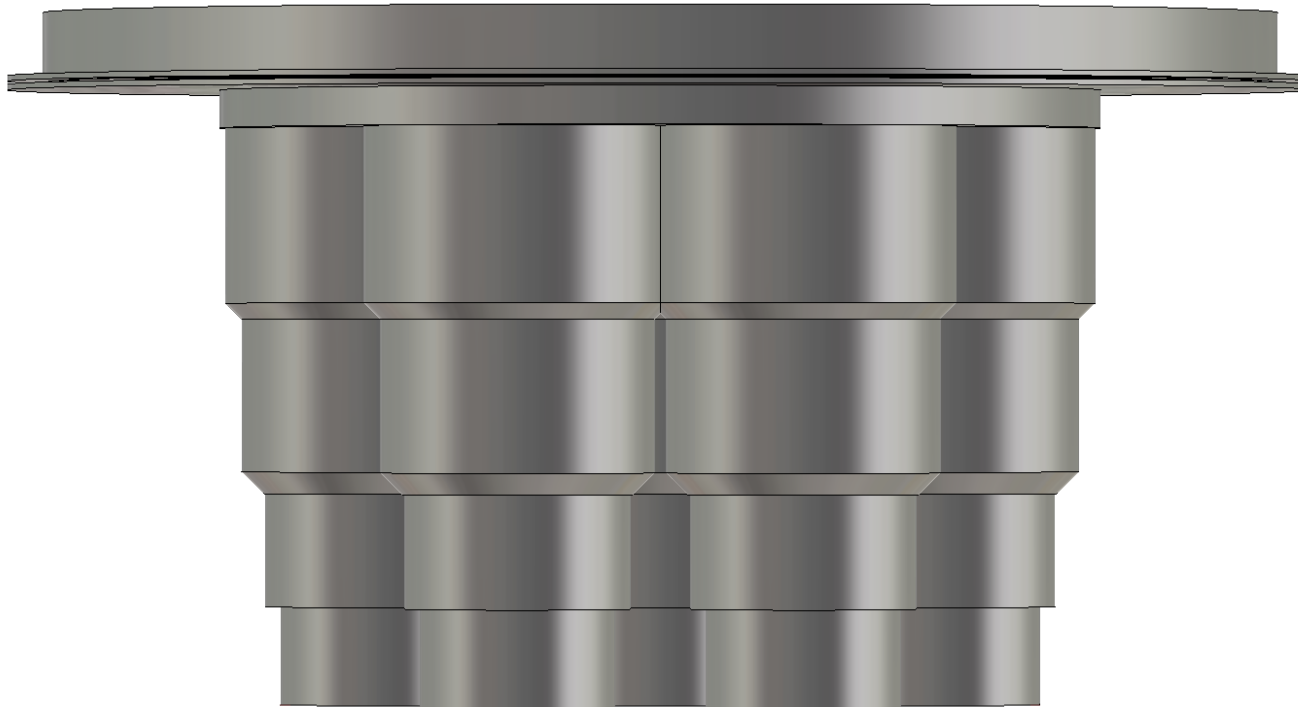
ALFA Cover Studies II

7 Horns Analysis and Design



ALFA with Cover

Side View (Choke V-B 3mm gap)



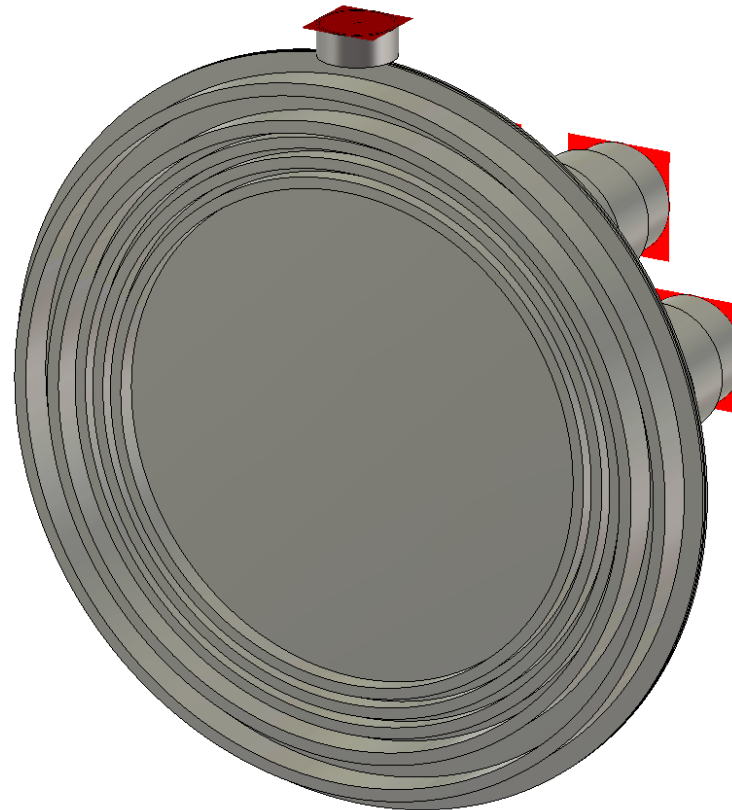
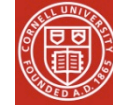
Cover: **CHOKE**
 $d\emptyset = 120\text{cm}$
 $\text{gap} = 0.3\text{cm}$
 $\text{CWG}_{\emptyset} = 25\text{cm}$
 $\text{Port}_{\text{W}} = 11.35\text{cm}$
 $\text{CHK}_{\emptyset\text{min}} = 80\text{cm}$
 $\text{CHK}_{\text{L}} = \lambda 126\text{mm}/4 = \lambda S/4$
 $\text{CHK}_{\text{W}} = 0.8\text{cm}$
 $\text{CWG}_{\emptyset} = 25\text{cm}$
 $\text{CHK2}_{\emptyset\text{min}} = +\lambda S/4$
 $\text{CHK2}_{\text{L}} = \lambda S/4$
 $\text{CHK2}_{\text{W}} = 0.8\text{cm}$
 $\text{CHK3}_{\emptyset\text{min}} = ++\lambda S/4$
 $\text{CHK3}_{\text{L}} = \lambda 126\text{mm}/4$
 $\text{CHK3}_{\text{W}} = 0.8\text{cm}$
 $\text{CHK4}_{\emptyset\text{min}} = ++\lambda S/4$
 $\text{CHK4}_{\text{L}} = \lambda 232.4\text{mm}/4$
 $\text{CHK4}_{\text{W}} = 1.0\text{cm}$
 $\text{CHK5}_{\emptyset\text{min}} = ++\lambda 232.4\text{mm}/4$
 $\text{CHK5}_{\text{L}} = \lambda 232.4\text{mm}/4$
 $\text{CHK5}_{\text{W}} = 1.0\text{cm}$





ALFA with Cover

Perspective (Choke V-B 3mm gap)

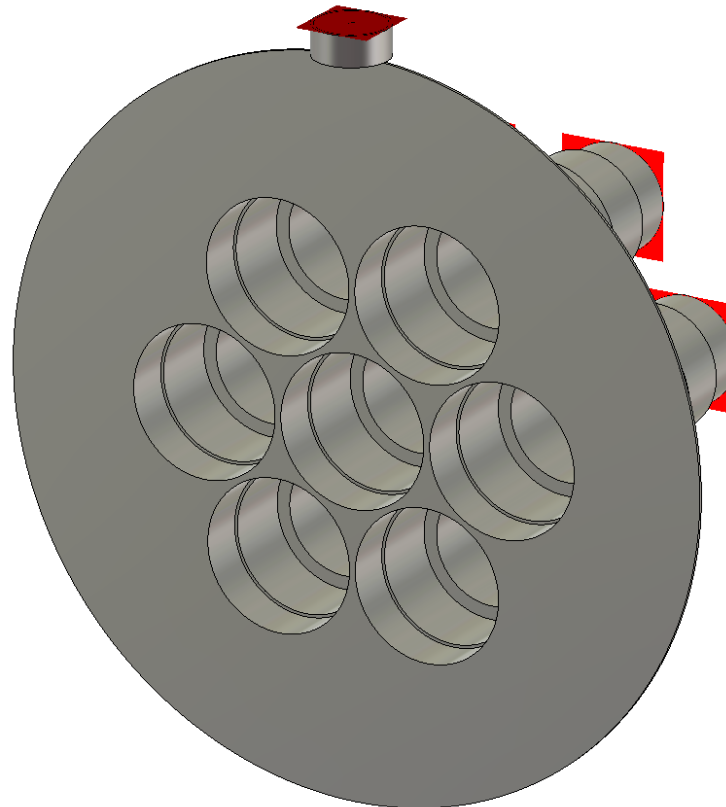
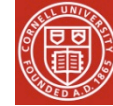


Cover: **CHOKE**
 $d\emptyset = 120\text{cm}$
 $\text{gap} = 0.3\text{cm}$
 $\text{CWG}_{\emptyset} = 25\text{cm}$
 $\text{Port}_{\text{W}} = 11.35\text{cm}$
 $\text{CHK}_{\emptyset\text{min}} = 80\text{cm}$
 $\text{CHK}_{\text{L}} = \lambda 126\text{mm}/4 = \lambda S/4$
 $\text{CHK}_{\text{W}} = 0.8\text{cm}$
 $\text{CWG}_{\emptyset} = 25\text{cm}$
 $\text{CHK2}_{\emptyset\text{min}} = +\lambda S/4$
 $\text{CHK2}_{\text{L}} = \lambda S/4$
 $\text{CHK2}_{\text{W}} = 0.8\text{cm}$
 $\text{CHK3}_{\emptyset\text{min}} = ++\lambda S/4$
 $\text{CHK3}_{\text{L}} = \lambda 126\text{mm}/4$
 $\text{CHK3}_{\text{W}} = 0.8\text{cm}$
 $\text{CHK4}_{\emptyset\text{min}} = ++\lambda S/4$
 $\text{CHK4}_{\text{L}} = \lambda 232.4\text{mm}/4$
 $\text{CHK4}_{\text{W}} = 1.0\text{cm}$
 $\text{CHK5}_{\emptyset\text{min}} = ++\lambda 232.4\text{mm}/4$
 $\text{CHK5}_{\text{L}} = \lambda 232.4\text{mm}/4$
 $\text{CHK5}_{\text{W}} = 1.0\text{cm}$

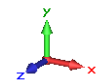




ALFA Cover Removed

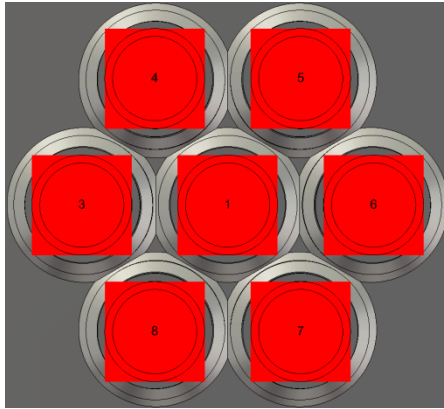
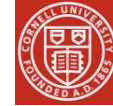


Cover: **CHOKE**
 $d\emptyset = 120\text{cm}$
 $\text{gap} = 0.3\text{cm}$
 $\text{CWG}_{\emptyset} = 25\text{cm}$
 $\text{Port}_W = 11.35\text{cm}$
 $\text{CHK}_{\emptyset\text{min}} = 80\text{cm}$
 $\text{CHK}_L = \lambda 126\text{mm}/4 = \lambda S/4$
 $\text{CHK}_W = 0.8\text{cm}$
 $\text{CWG}_{\emptyset} = 25\text{cm}$
 $\text{CHK2}_{\emptyset\text{min}} = +\lambda S/4$
 $\text{CHK2}_L = \lambda S/4$
 $\text{CHK2}_W = 0.8\text{cm}$
 $\text{CHK3}_{\emptyset\text{min}} = ++\lambda S/4$
 $\text{CHK3}_L = \lambda 126\text{mm}/4$
 $\text{CHK3}_W = 0.8\text{cm}$
 $\text{CHK4}_{\emptyset\text{min}} = ++\lambda S/4$
 $\text{CHK4}_L = \lambda 232.4\text{mm}/4$
 $\text{CHK4}_W = 1.0\text{cm}$
 $\text{CHK5}_{\emptyset\text{min}} = ++\lambda 232.4\text{mm}/4$
 $\text{CHK5}_L = \lambda 232.4\text{mm}/4$
 $\text{CHK5}_W = 1.0\text{cm}$

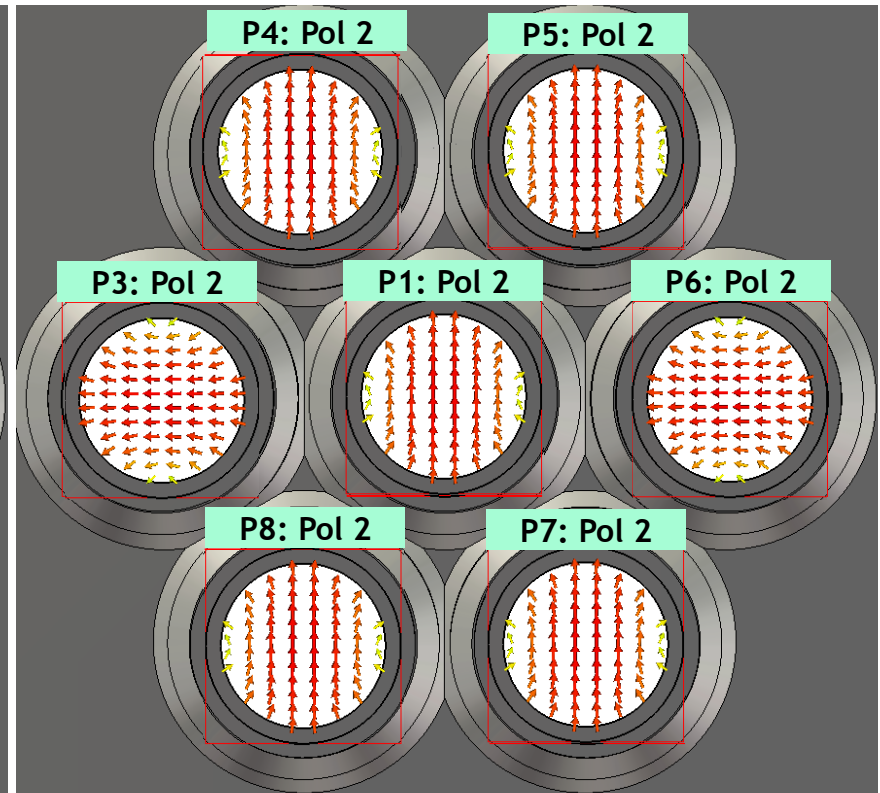
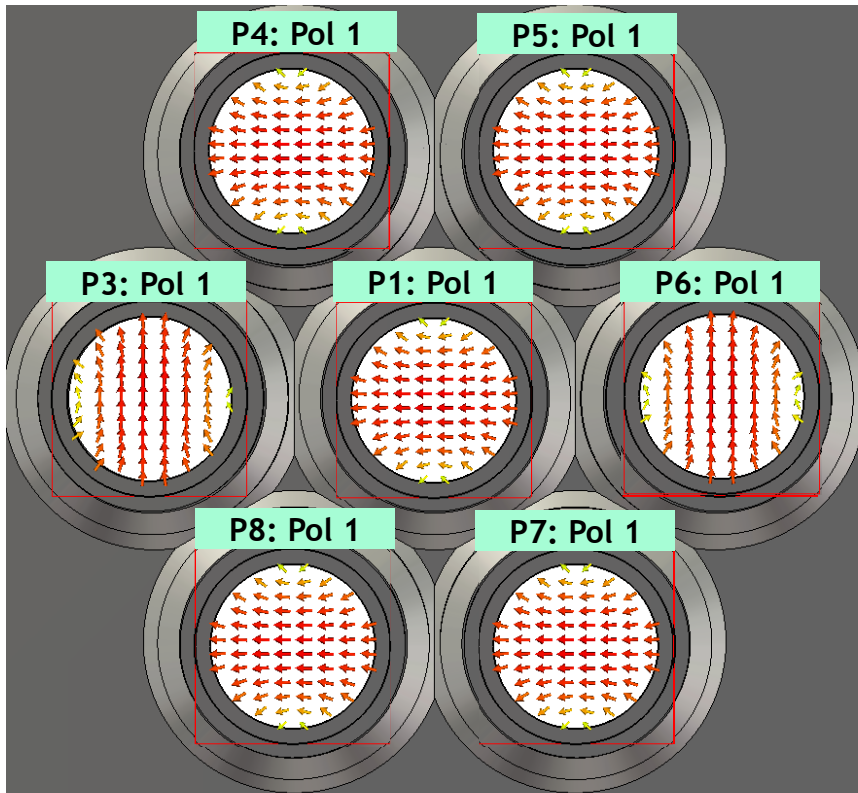




ALFA Port Excitation Modes (Ref.)



Type	E-Field (peak)
Mode type	TE
Accuracy	4.08235e-011
Fcutoff	1.17076
Beta	21.2894 1/m
Wave Imp.	574.855 Ohms
Plane at z	-570
Maximum-2D	260.97 U/m at -3.82212 / -1.42109e-014 / -570
Frequency	1.55
Phase	0 degrees



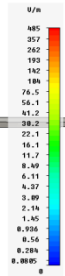
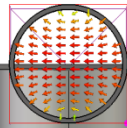


Port 2 Modes



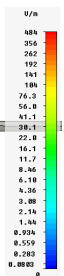
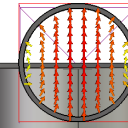
National Astronomy and Ionosphere Center

P2: Pol 1



Type	E-Field (peak)
Mode type	TE
Accuracy	4.88235e-011
Factor f	1.55288
Alpha	18.2823 1/m
Dist. -R00	447.872 mm
Wave Imp.	1103.72 Ohms
Plane at y	651
Maximum-ZD	485.296 U/m at -3.82212 / 651 / -1.09579e-015
Frequency	1.4725
Phase	0 degrees

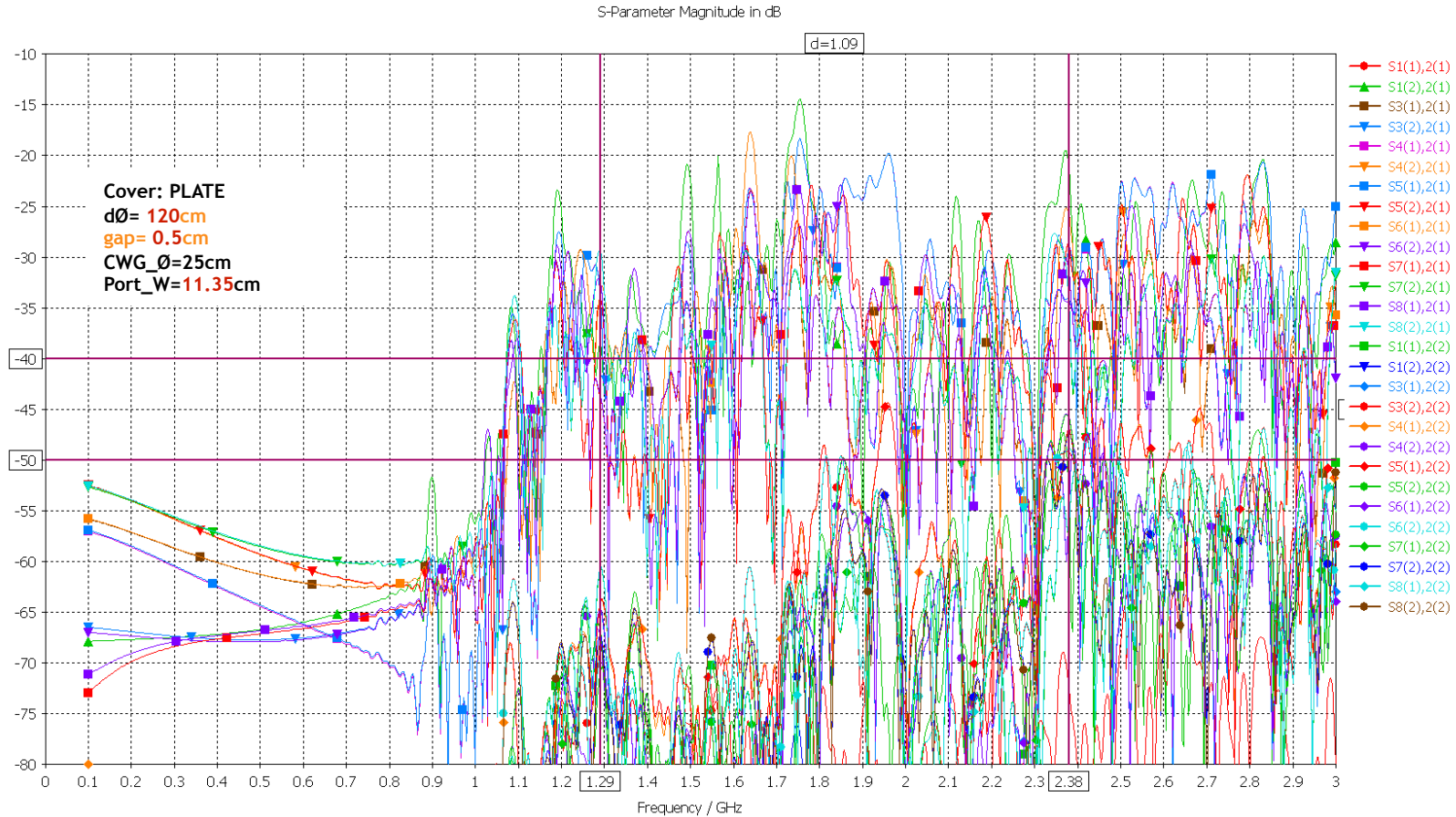
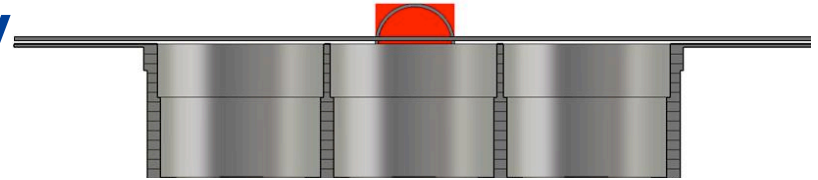
P2: Pol 2



Type	E-Field (peak)
Mode type	TE
Accuracy	5.49262e-011
Factor f	1.55288
Alpha	18.2815 1/m
Dist. -R00	445.154 mm
Wave Imp.	1103.85 Ohms
Plane at y	651
Maximum-ZD	483.988 U/m at -2.84217e-014 / 651 / -5
Frequency	1.4725
Phase	0 degrees

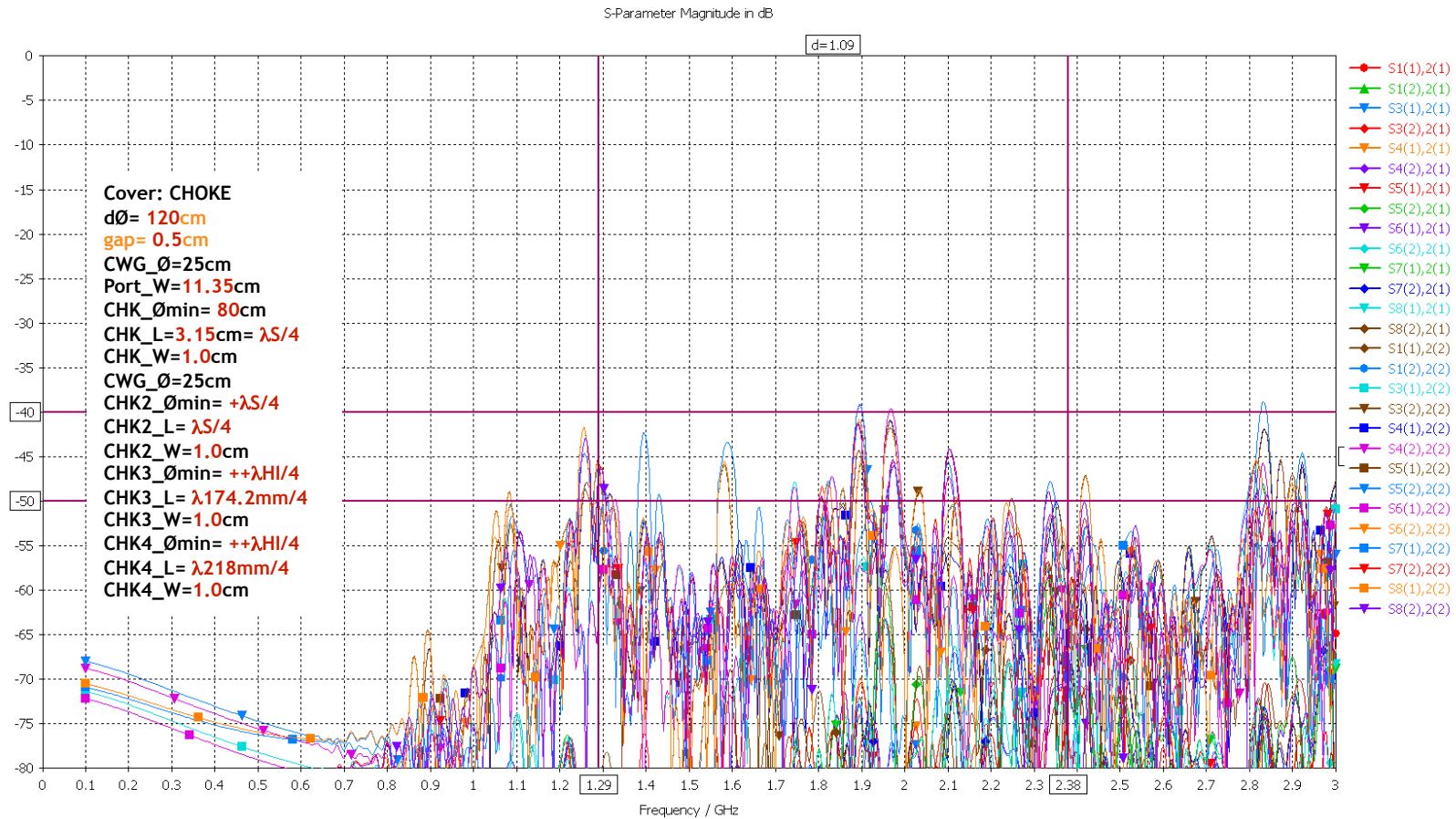
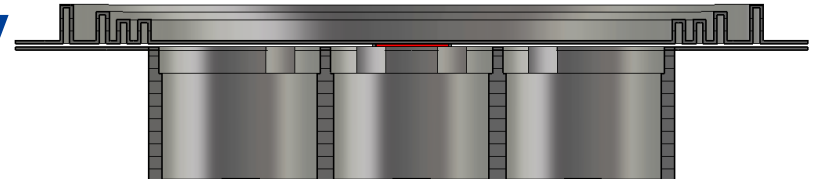


Plate Cover, No Choke 5mm gap $|S|$ vs. Frequency



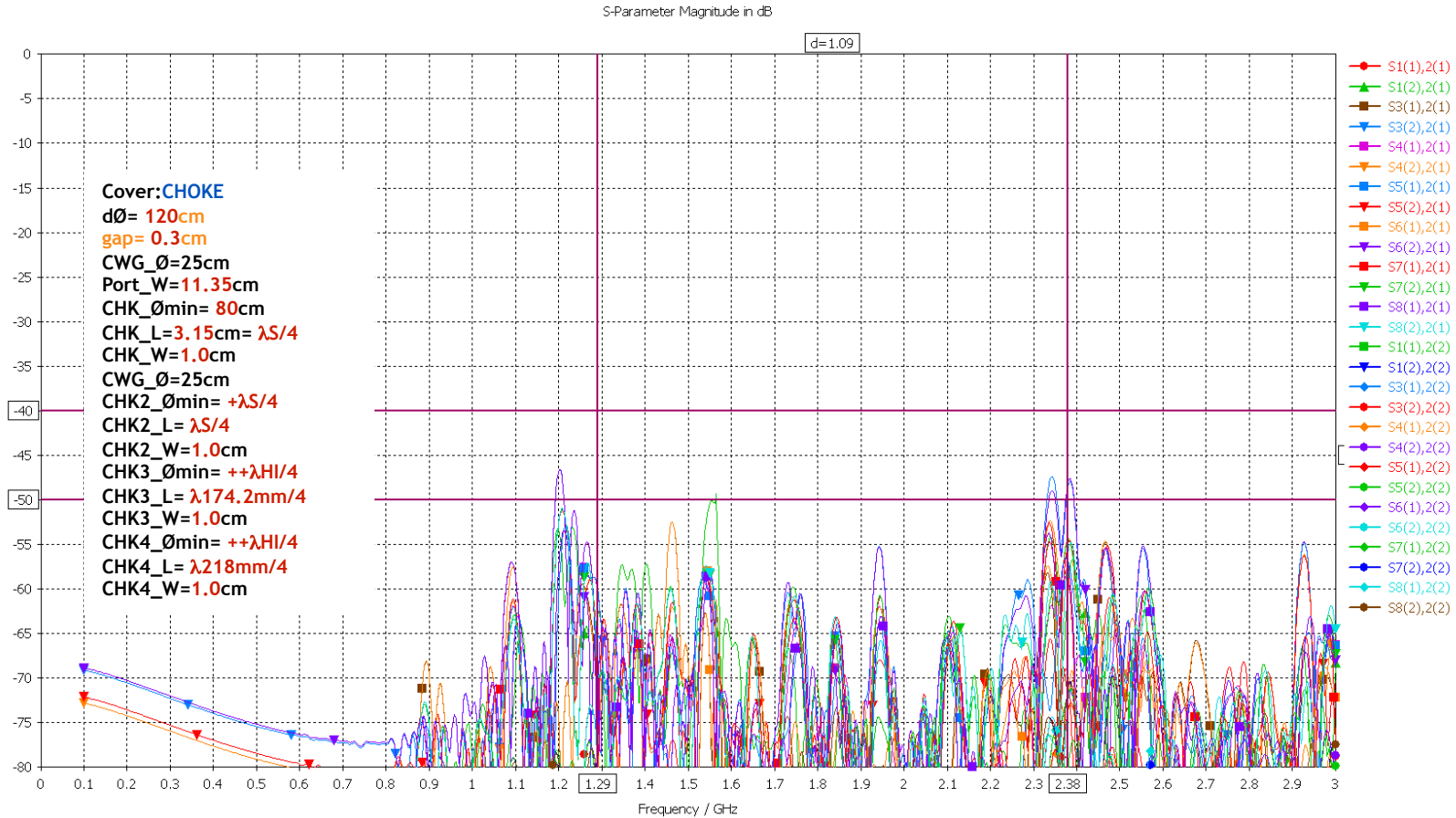
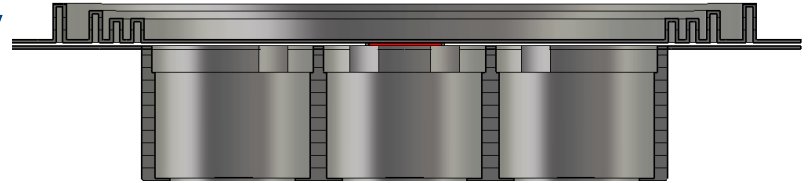


Cover with Choke IV 5mm gap |S| vs. Frequency



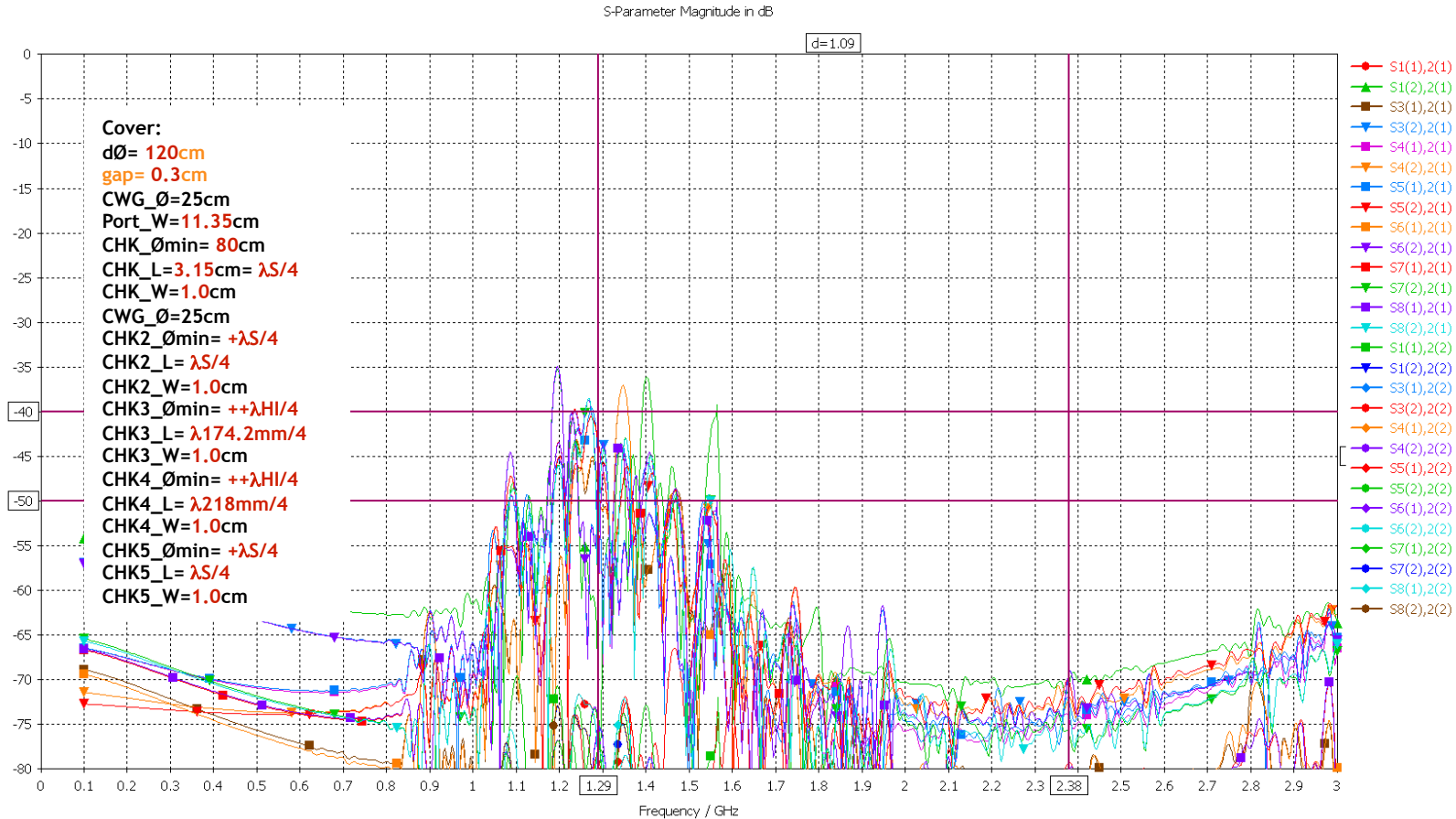
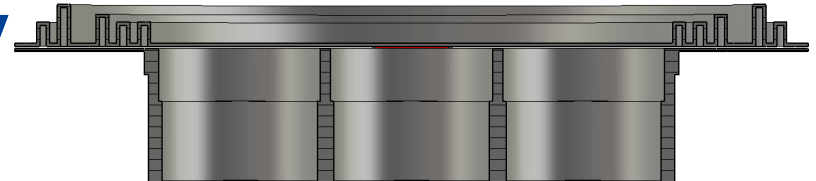


Cover with Choke IV 3mm gap |S| vs. Frequency





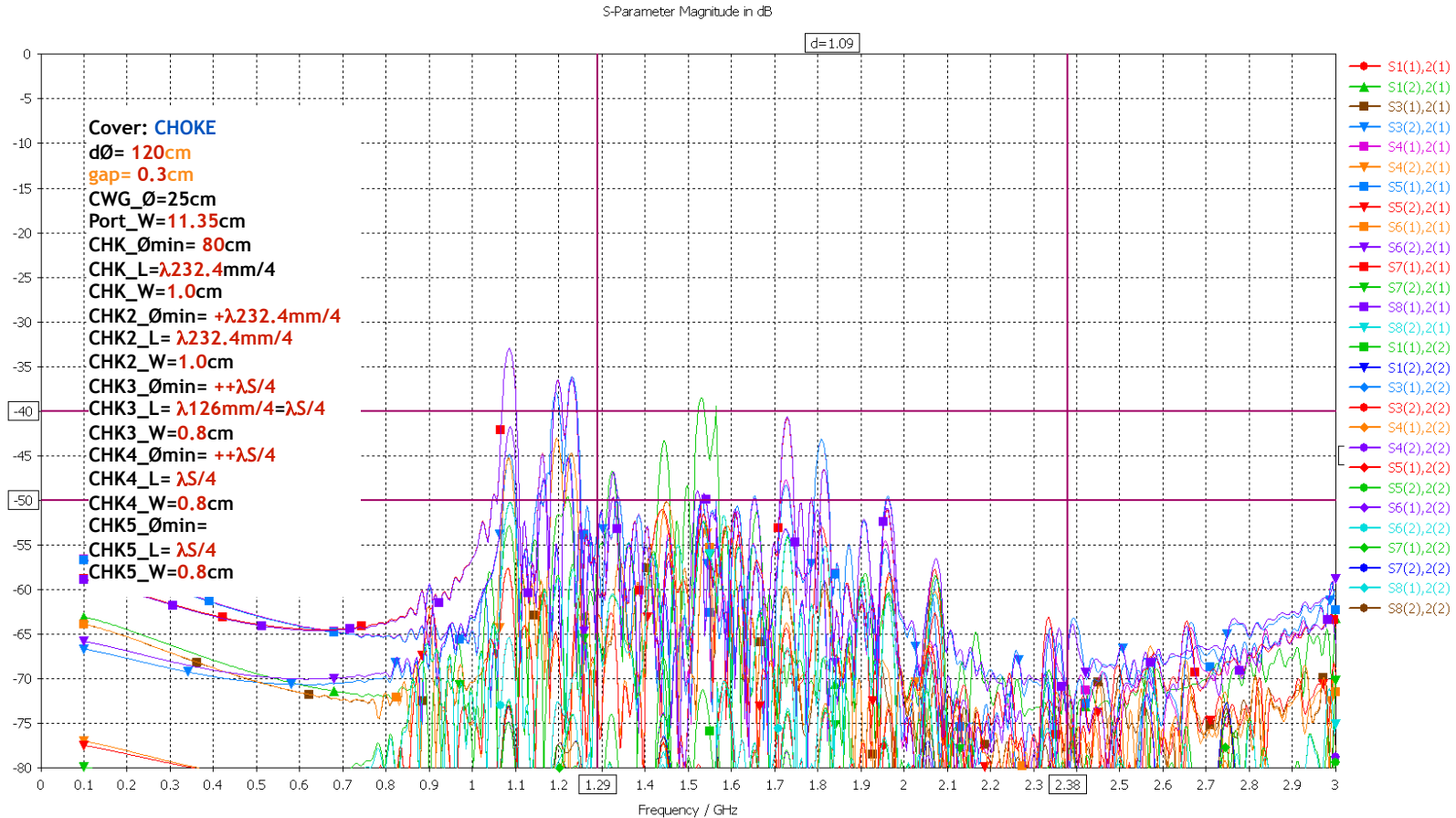
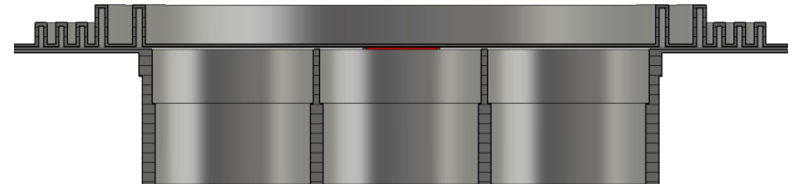
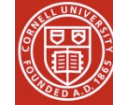
Cover with Choke V-A 3mm gap |S| vs. Frequency





Cover with Choke V-C 3mm gap

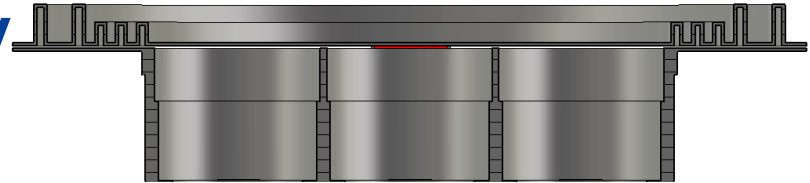
|S| vs. Frequency





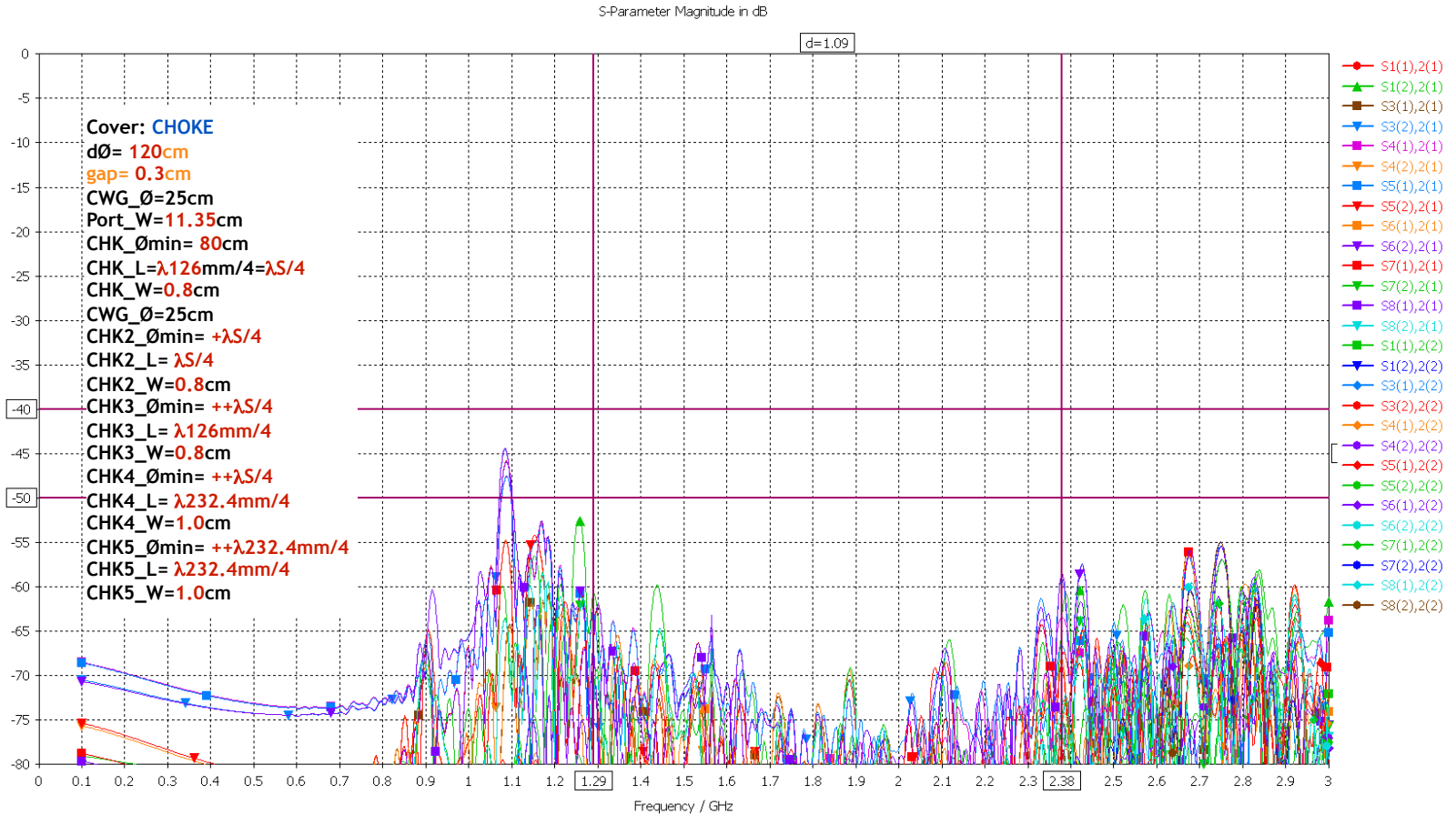
Cover with Choke V-B 3mm gap

|S| vs. Frequency



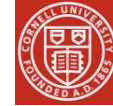
Recommendation

National Astronomy and Ionosphere Center



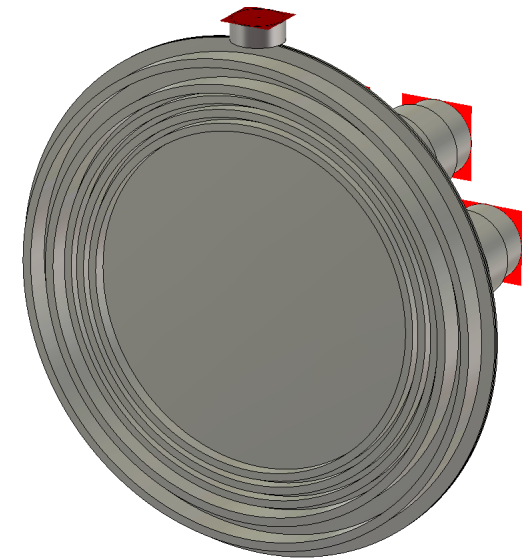
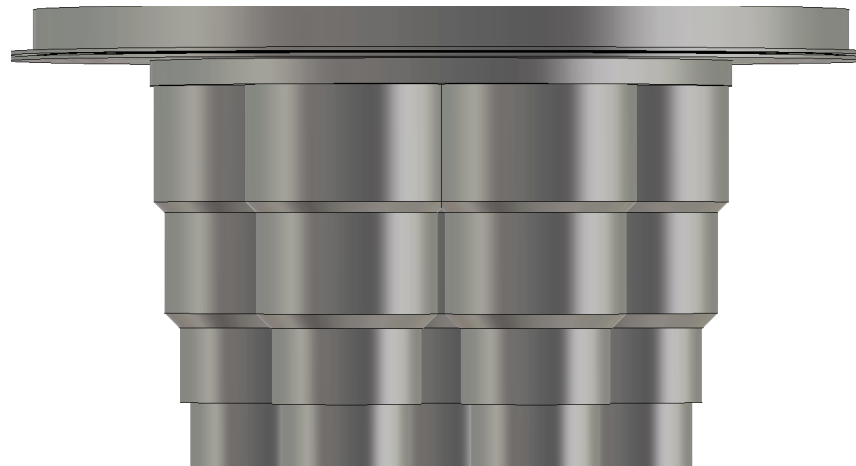
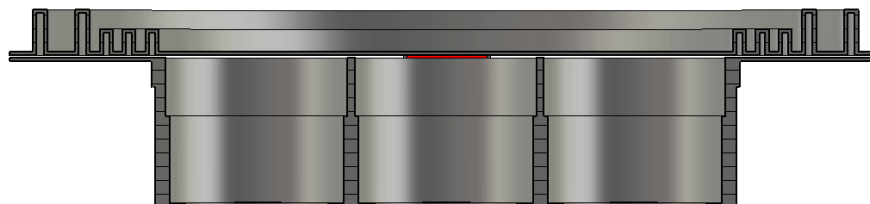


Cover with Choke V-B 3mm gap $|S|$ vs. Frequency



Recommendation

Cover: **CHOKE**
 $d\phi = 120\text{cm}$
gap= 0.3cm
CWG_φ=25cm
Port_W=11.35cm
CHK_φmin= 80cm
CHK_L= $\lambda 126\text{mm}/4 = \lambda S/4$
CHK_W=0.8cm
CWG_φ=25cm
CHK2_φmin= $+\lambda S/4$
CHK2_L= $\lambda S/4$
CHK2_W=0.8cm
CHK3_φmin= $++\lambda S/4$
CHK3_L= $\lambda 126\text{mm}/4$
CHK3_W=0.8cm
CHK4_φmin= $++\lambda S/4$
CHK4_L= $\lambda 232.4\text{mm}/4$
CHK4_W=1.0cm
CHK5_φmin= $++\lambda 232.4\text{mm}/4$
CHK5_L= $\lambda 232.4\text{mm}/4$
CHK5_W=1.0cm





Cover with Choke V-B 3mm gap



Recommendation

