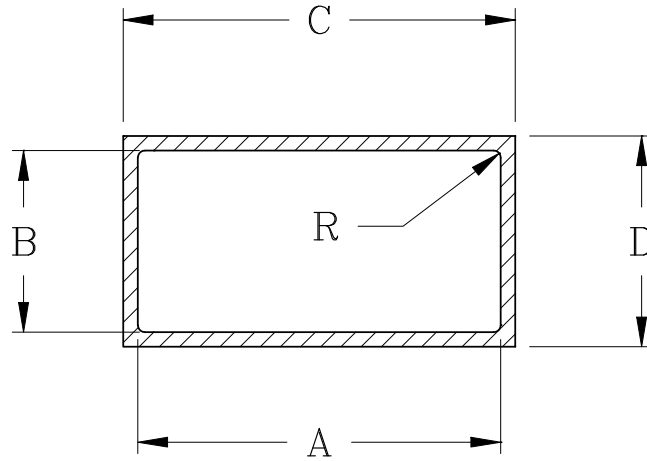
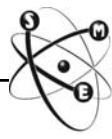


Appendix A

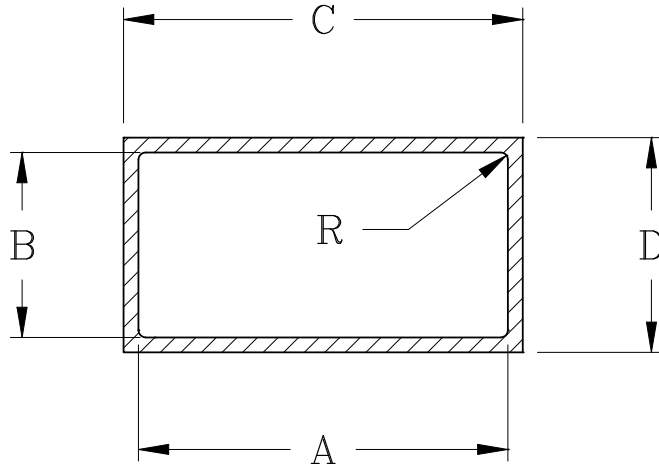
Rectangular Waveguide Physical Dimensions



| WR | Band | A (in) | B (in) | Tolerance (+/-) | C (in) | D (in) | Tolerance (+/-) | Nom. Wall Thickness (in) | Max Inner Radius R |
|-------|------|--------|--------|-----------------|--------|--------|-----------------|--------------------------|--------------------|
| 975 | - | 9.750 | 4.875 | 0.0100 | 10.000 | 5.125 | 0.010 | 0.125 | 0.063 |
| 770 | - | 7.700 | 3.850 | 0.0100 | 7.950 | 4.100 | 0.010 | 0.125 | 0.063 |
| 650 | T | 6.500 | 3.250 | 0.0080 | 6.660 | 3.410 | 0.008 | 0.080 | 0.047 |
| 510 | - | 5.100 | 2.550 | 0.0080 | 5.268 | 2.710 | 0.008 | 0.080 | 0.047 |
| 430 | L | 4.300 | 2.150 | 0.0080 | 4.460 | 2.310 | 0.008 | 0.080 | 0.047 |
| 340 | F | 3.400 | 1.700 | 0.0060 | 3.560 | 1.860 | 0.006 | 0.080 | 0.047 |
| 284 | S | 2.840 | 1.340 | 0.0060 | 3.000 | 1.500 | 0.006 | 0.080 | 0.047 |
| 284HW | S | 2.840 | 1.340 | 0.0050 | 3.238 | 1.738 | 0.005 | 0.199 | 0.047 |
| 229 | U | 2.290 | 1.145 | 0.0060 | 2.418 | 1.273 | 0.006 | 0.064 | 0.031 |
| 187 | G | 1.872 | 0.872 | 0.0050 | 2.000 | 1.000 | 0.005 | 0.064 | 0.031 |
| 187HW | G | 1.872 | 0.872 | 0.0050 | 2.172 | 1.172 | 0.005 | 0.150 | 0.031 |
| 159 | D | 1.590 | 0.795 | 0.0050 | 1.718 | 0.923 | 0.005 | 0.064 | 0.031 |
| 137 | C | 1.372 | 0.622 | 0.0040 | 1.500 | 0.750 | 0.004 | 0.064 | 0.031 |
| 137TW | C | 1.372 | 0.622 | 0.0040 | 1.412 | 0.662 | 0.004 | 0.020 | 0.031 |
| 112 | H | 1.122 | 0.497 | 0.0040 | 1.250 | 0.625 | 0.004 | 0.064 | 0.031 |
| 112HW | H | 1.122 | 0.497 | 0.0030 | 1.378 | 0.753 | 0.005 | 0.128 | 0.030 |
| 112TW | H | 1.122 | 0.497 | 0.0030 | 1.162 | 0.537 | 0.005 | 0.020 | 0.030 |



Appendix A Rectangular Waveguide Physical Dimensions



| WR | Band | A (in) | B (in) | Tolerance (+/-) | C (in) | D (in) | Tolerance (+/-) | Nom. Wall Thickness (in) | Max Inner Radius R |
|------|------|--------|--------|-----------------|--------|--------|-----------------|--------------------------|--------------------|
| 102 | - | 1.020 | 0.510 | 0.0030 | 1.148 | 0.638 | 0.005 | 0.064 | 0.016 |
| 90 | X | 0.900 | 0.400 | 0.0040 | 1.000 | 0.500 | 0.004 | 0.050 | 0.031 |
| 90HW | X | 0.900 | 0.400 | 0.0040 | 1.100 | 0.600 | 0.004 | 0.100 | 0.031 |
| 90TW | X | 0.900 | 0.400 | 0.0040 | 0.940 | 0.440 | 0.004 | 0.020 | 0.031 |
| 75 | M | 0.750 | 0.375 | 0.0030 | 0.850 | 0.475 | 0.003 | 0.050 | 0.031 |
| 75TW | M | 0.750 | 0.375 | 0.0030 | 0.790 | 0.415 | 0.003 | 0.020 | 0.031 |
| 62 | Ku | 0.622 | 0.311 | 0.0025 | 0.702 | 0.391 | 0.003 | 0.040 | 0.016 |
| 51 | N | 0.510 | 0.255 | 0.0025 | 0.590 | 0.335 | 0.003 | 0.040 | 0.016 |
| 42 | K | 0.420 | 0.170 | 0.0020 | 0.500 | 0.250 | 0.003 | 0.040 | 0.016 |
| 34 | Ka | 0.340 | 0.170 | 0.0020 | 0.420 | 0.250 | 0.003 | 0.040 | 0.016 |
| 28 | Ka | 0.280 | 0.140 | 0.0015 | 0.360 | 0.220 | 0.002 | 0.040 | 0.008 |
| 22 | Q | 0.224 | 0.112 | 0.0010 | 0.304 | 0.192 | 0.002 | 0.040 | 0.007 |
| 19 | - | 0.118 | 0.094 | 0.0010 | 0.268 | 0.174 | 0.002 | 0.040 | 0.006 |
| 15 | - | 0.148 | 0.074 | 0.0010 | 0.228 | 0.154 | 0.002 | 0.040 | 0.006 |
| 12 | - | 0.122 | 0.061 | 0.0010 | 0.202 | 0.141 | 0.002 | 0.040 | 0.006 |
| 10 | - | 0.100 | 0.050 | 0.0010 | 0.180 | 0.130 | 0.002 | 0.040 | 0.006 |



Appendix B
Rectangular Waveguide Electrical Data

| WR | M85/ RG- | Material | Frequency (GHz) | Cutoff TE10 (GHz) | Attenuation (Low-High) dB/100ft | Peak Power (Low-High) MW | CW Power (Low-High) KW | |
|-------|-------------|----------|--------------------|-------------------------|---------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|
| 975 | 1-011 | 204/U | 1100 | 0.750 – 1.120 | 0.605 | 0.147-0.098 0.173-0.115 0.159-0.106 | 231.2-346.9 196.4-295.4 213.6-320.5 | |
| | 1-012 | - | | | | | | 6061 |
| | 1-166 | - | | | | | | 6063 |
| 770 | 1-013 | 205/U | 1100 | 0.960 – 1.450 | 0.766 | 0.205-0.139 0.240-0.163 0.222-0.151 | 137.8-203.3 117.6-173.2 127.9-187.0 | |
| | 1-014 | - | | | | | | 6061 |
| | 1-167 | - | | | | | | 6063 |
| 650 | 1-015 | - | OF-DLP Cu Alloy | 1.120 – 1.700 | 0.908 | 0.213-0.141 0.316-0.209 0.273-0.180 0.320-0.212 0.295-0.195 | 114.8-173.6 80.53-121.8 88.45-135.7 76.26-115.1 82.72-125.1 | |
| | 1-017 | 69/U | | | | | | 1100 |
| | 1-018 | 103/U | | | | | | 6061 |
| | 1-019 | - | | | | | | 6063 |
| | 1-168 | - | | | | | | 6063 |
| 510 | 1-021 | - | OF-DLP Cu Alloy | 1.450 – 2.200 | 1.154 | 0.296-0.201 0.440-0.299 0.380-0.258 0.446-0.303 0.411-0.279 | 68.22-100.4 47.87-70.44 53.19-78.34 45.29-66.67 49.14-72.39 | |
| | 1-023 | 337/U | | | | | | 1100 |
| | 1-025 | 338/U | | | | | | 6061 |
| | 1-026 | - | | | | | | 6063 |
| | 1-169 | - | | | | | | 6063 |
| 430 | 1-027 | - | OF-DLP | 1.700 – 2.600 | 1.375 | 0.393-0.261 0.502-0.334 0.509-0.392 0.583-0.387 0.544-0.361 | 45.14-68.00 35.30-53.05 30.03-45.20 31.67-41.71 32.57-49.08 | |
| | 1-029 | 105/U | | | | | | 1100 |
| | 1-030 | - | | | | | | 6061 |
| | 1-031 | 104/U | | | | | | Cu Alloy |
| | 1-170 | - | | | | | | 6063 |
| 340 | 1-033 | - | OF-DLP | 2.200 – 3.300 | 1.737 | 0.533-0.371 0.682-0.474 0.801-0.557 0.791-0.550 0.739-0.514 | 27.82-40.00 21.73-31.26 18.50-26.60 19.52-28.07 20.05-28.83 | |
| | 1-035 | 113/U | | | | | | 1100 |
| | 1-036 | - | | | | | | 6061 |
| | 1-037 | 112/U | | | | | | Cu Alloy |
| | 1.171 | - | | | | | | 6063 |
| 284 | 1-039 | - | OF-DLP | 2.600 – 3.950 | 2.080 | 0.742-0.508 0.950-0.651 1.116-0.764 1.102-0.754 1.029-0.704 | 17.19-25.11 13.42-19.59 11.42-16.69 12.06-17.62 12.39-18.12 | |
| | 1-041 | 75/U | | | | | | 1100 |
| | 1-042 | - | | | | | | 6061 |
| | 1-043 | 48/U | | | | | | Cu Alloy |
| | 1-172 | - | | | | | | 6063 |
| 284HW | 2-001 | 375/U | 1100 | 2.600- 3.950 | 2.080 | 0.950-0.651 1.116-0.764 1.028-0.705 | 14.56-21.25 12.39-18.08 13.48-19.63 | |
| | 2-002 | - | 6061 | | | | | |
| | 2-004 | - | 6063 | | | | | |



Appendix B
Rectangular Waveguide Electrical Data

| WR | M85/ RG- | Material | Frequency (GHz) | Cutoff TE ₁₀ (GHz) | Attenuation (Low-High) dB/100ft | Peak Power (Low-High) MW | CW Power (Low-High) KW |
|-------|-------------|----------|--------------------|-------------------------------------|---------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 229 | 1-045 | - | OF-DLP | 3.300 – 4.900 | 2.577 | 0.946-0.671 1.211-0.858 1.422-1.009 1.404-0.996 1.311-0.930 | 11.52-16.23 8.993-12.69 7.659-10.79 8.083-11.39 8.307-11.71 |
| | 1-047 | 341/U | 1100 | | | | |
| | 1-048 | - | 6061 | | | | |
| | 1-049 | 340/U | Cu Alloy | | | | |
| | 1-173 | - | 6063 | | | | |
| 187 | 1-051 | - | OF-DLP | 3.950 – 5.850 | 3.155 | 1.395-0.967 1.785-1.238 2.097-1.454 2.071-1.436 1.934-1.341 | 6.612-9.354 5.165-7.446 4.397-6.340 4.369-6.690 4.767-6.874 |
| | 1-053 | 95/U | 1100 | | | | |
| | 1-054 | - | 6061 | | | | |
| | 1-055 | 49/U | Cu Alloy | | | | |
| | 1-174 | - | 6063 | | | | |
| 187HW | 2-003 | - | 1100 | 3.950 – 5.850 | 3.155 | 1.785-1.238 1.933-1.340 1.399-0.970 | 5.673-8.127 5.206-7.506 6.961-10.05 |
| | 2-006 | - | 6063 | | | | |
| | 2-005 | - | OF-DLP | | | | |
| 159 | 1-057 | - | OF-DLP | 4.900 – 7.050 | 3.705 | 1.533-1.160 1.988-1.485 2.334-1.744 2.305-1.722 2.152-1.608 | 5.374-7.193 4.196-5.617 3.574-4.783 3.771-5.047 3.876-5.187 |
| | 1-059 | 344/U | 1100 | | | | |
| | 1-060 | - | 6061 | | | | |
| | 1-061 | 343/U | Cu Alloy | | | | |
| | 1-175 | - | 6063 | | | | |
| 137 | 1-063 | - | OF-DLP | 5.850 – 8.200 | 4.285 | 1.978-1.562 5.320-1.999 4.148-2.348 2.936-2.319 3.824-2.164 | 3.708-4.695 2.076-3.667 1.768-3.122 2.602-3.294 1.917-3.387 |
| | 1-065 | 106/U | 1100 | | | | |
| | 1-066 | - | 6061 | | | | |
| | 1-067 | 50/U | Cu Alloy | | | | |
| | 1-176 | - | 6063 | | | | |
| 137TW | - | - | 6061 | 5.850 – 8.200 | 4.285 | 4.148-2.348 | 1.975-2.531 1.768-3.122 |
| 112 | 1-069 | - | OF-DLP | 7.050 – 10.00 | 5.260 | 2.776-2.154 3.548-2.756 4.166-3.238 4.144-3.197 3.841-2.985 | 2.290-2.946 1.788-2.301 1.523-1.958 1.607-2.067 1.652-2.124 |
| | 1-071 | 68/U | 1100 | | | | |
| | 1-072 | - | 6061 | | | | |
| | 1-073 | 51/U | Cu Alloy | | | | |
| | 1-177 | - | 6063 | | | | |
| 112HW | 2-007 | - | OF-DLP | 7.050 – 10.00 | 5.260 | 2.779-2.159 | 1.284-1.702 2.382-3.066 |
| 112TW | - | - | 6061 | 7.050 – 10.00 | 5.260 | 4.166-3.238 | 1.284-1.702 1.523-1.958 |

Appendix B
Rectangular Waveguide Electrical Data

| WR | M85/ | RG- | Material | Frequency (GHz) | Cutoff TE10 (GHz) | Attenuation (Low-High) dB/100ft | Peak Power (Low-High) MW | CW Power (Low-High) KW |
|------|-------|-------|----------|-----------------|-------------------|---------------------------------|--------------------------|------------------------|
| 102 | 1-155 | 320/U | Cu Alloy | 7.000 – 11.000 | 5.780 | 5.219-3.291 | 1.017-1.534 | 1.220-1.935 |
| | 1-156 | - | OF-DLP | | | 3.516-2.217 | | 1.725-2.735 |
| | 1-157 | - | 1100 | | | 4.500-2.838 | | 1.358-2.154 |
| | 1-158 | - | 6061 | | | 5.285-3.333 | | 1.156-1.834 |
| | 1-160 | - | 6063 | | | 4.874-3.073 | | 1.254-1.989 |
| 90 | 1-075 | - | OF-DLP | 8.200 – 12.40 | 6.560 | 4.328-2.995 | 0.758-1.124 | 1.229-1.776 |
| | 1-077 | 67/U | 1100 | | | 5.540-3.883 | | 0.959-1.386 |
| | 1-078 | - | 6061 | | | 6.506-4.502 | | 0.817-1.180 |
| | 1-079 | 52/U | Cu Alloy | | | 6.424-4.445 | | 0.862-1.246 |
| | 1-178 | - | 6063 | | | 5.998-4.150 | | 0.886-1.280 |
| 90HW | 2-008 | - | OF-DLP | 8.200 – 12.40 | 6.560 | 4.339-3.003 | 0.758-1.124 | 3.314-4.788 |
| | 2-009 | - | OF-DLP | | | 4.339-3.003 | | 3.314-4.788 |
| 90TW | - | - | 6061 | 8.200 – 12.40 | 6.560 | 6.506-4.502 | 0.758-1.124 | 0.817-1.180 |
| 75 | 1-081 | - | OF-DLP | 10.00 – 15.00 | 7.847 | 5.121-3.577 | 0.622-0.903 | 0.944-1.351 |
| | 1-083 | 347/U | 1100 | | | 6.554-4.578 | | 0.737-1.055 |
| | 1-084 | - | 6061 | | | 7.698-5.377 | | 0.627-0.898 |
| | 1-085 | 346/U | Cu Alloy | | | 7.601-5.309 | | 0.662-0.948 |
| | 1-179 | - | 6063 | | | 7.097-4.957 | | 0.680-0.947 |
| 75TW | - | - | 6061 | 10.00 – 15.00 | 7.847 | 7.698-5.377 | 0.622-0.903 | 0.627-0.898 |
| 62 | 1-087 | - | OF-DLP | 12.40 – 18.00 | 9.490 | 6.451-4.743 | 0.457-0.633 | 0.643-0.875 |
| | 1-089 | 91/U | Cu Alloy | | | 9.578-7.041 | | 0.451-0.614 |
| | 1-090 | 349/U | 1100 | | | 8.259-6.071 | | 0.502-0.683 |
| | 1-091 | - | 6061 | | | 9.700-7.131 | | 0.428-0.582 |
| | 1-093 | 107/U | Ag | | | 6.910-5.079 | | 0.602-0.818 |
| | 1-180 | - | 6063 | | | 8.943-6.574 | | 0.464-0.631 |
| 51 | 1-094 | 352/U | OF-DLP | 15.00 – 22.00 | 11.54 | 8.812-6.384 | 0.312-0.433 | 0.413-0.570 |
| | 1-096 | 353/U | Cu Alloy | | | 13.08-9.477 | | 0.290-0.400 |
| | 1-097 | 351/U | 1100 | | | 11.27-8.172 | | 0.323-0.445 |
| | 1-098 | - | 6061 | | | 13.25-9.598 | | 0.275-0.379 |
| | 1-181 | - | 6063 | | | 12.21-8.849 | | 0.298-0.411 |



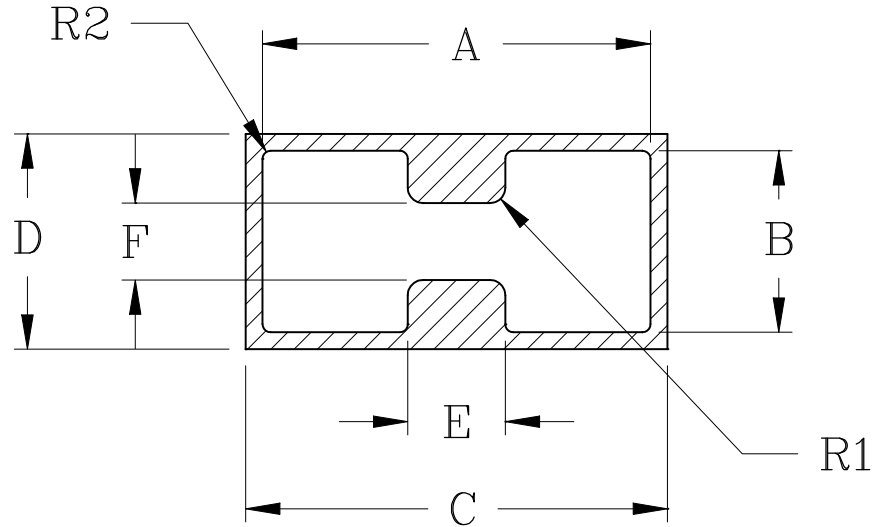
Appendix B

Rectangular Waveguide Electrical Data

| WR | M85/ | RG- | Material | Frequency (GHz) | Cutoff TE10 (GHz) | Attenuation (Low-High) dB/100ft | Peak Power (Low-High) MW | CW Power (Low-High) KW |
|----|-------|-------|-------------|-----------------|-------------------|---------------------------------|--------------------------|------------------------|
| 42 | 1-100 | - | OF-DLP | 18.00 – 26.50 | 14.08 | 13.80-10.13 | 0.171-0.246 | 0.223-0.304 |
| | 1-102 | 53/U | Cu Alloy | | | 20.48-15.04 | | 0.157-0.213 |
| | 1-103 | 121/U | 1100 | | | 17.66-12.97 | | 0.174-0.237 |
| | 1-104 | - | 6061 | | | 20.74-15.23 | | 0.148-0.202 |
| | 1-106 | 66/U | Ag | | | 14.77-10.85 | | 0.209-0.284 |
| | 1-182 | - | 6063 | | | 19.12-14.04 | | 0.161-0.219 |
| 34 | 1-107 | - | OF-DLP | 22.00 – 33.00 | 17.28 | 16.86-11.73 | 0.139-0.209 | 0.168-0.241 |
| | 1-109 | 354/U | Cu Alloy | | | 25.03-17.41 | | 0.118-0.169 |
| | 1-110 | 355/U | 1100 | | | 21.58-15.01 | | 0.131-0.188 |
| | 1-111 | - | 6061 | | | 25.35-17.63 | | 0.111-0.160 |
| | 1-113 | 357/U | Ag&Cu Alloy | | | 16.18-11.25 | | 0.175-0.252 |
| | 1-183 | - | 6063 | | | 23.37-16.26 | | 0.121-0.174 |
| 28 | 3-006 | 96/U | Ag | 26.50 – 40.00 | 21.10 | 24.55-16.80 | 96.0-146.0 KW | 103.1-150.1 |
| | 3-007 | - | OF-DLP | | | 23.02-15.77 | | 109.7-160.1 |
| | 3-008 | 271/U | Ag&Cu Alloy | | | 21.99-15.06 | | 115.1-168.0 |
| | 3-009 | - | 6061 | | | 34.46-23.59 | | 73.27-107.0 |
| 22 | 3-010 | 97/U | Ag | 33.00 – 50.00 | 26.35 | 34.57-23.50 | 64.4-97.0 KW | 64.73-95.30 |
| | 3-011 | - | OF-DLP | | | 32.44-22.05 | | 68.89-101.4 |
| | 3-012 | 272/U | Ag&Cu Alloy | | | 30.98-21.06 | | 72.29-106.3 |
| | 3-013 | - | 6061 | | | 48.53-32.99 | | 46.05-67.74 |
| 19 | 3-014 | - | Ag | 40.00 – 60.00 | 30.69 | 42.39-30.46 | 48.0-70.0 KW | 43.30-67.21 |
| | 3-015 | - | OF-DLP | | | 39.81-28.60 | | 51.32-71.43 |
| | 3-016 | 358/U | Ag&Cu Alloy | | | 38.02-27.32 | | 53.85-74.94 |
| 15 | 3-017 | 98/U | Ag | 50.00 – 75.00 | 39.90 | 64.23-43.89 | 30.0-40.0 KW | 28.46-41.44 |
| | 3-018 | - | OF-DLP | | | 60.25-41.17 | | 30.27-44.30 |
| | 3-019 | 273/U | Ag&Cu Alloy | | | 57.55-39.32 | | 32.76-46.49 |
| 12 | 3-020 | 99/U | Ag | 60.00 – 90.00 | 48.40 | 87.89-58.86 | 20.0-30.0 KW | 19.15-28.56 |
| | 3-021 | - | OF-DLP | | | 82.37-55.22 | | 20.37-30.38 |
| | 3-022 | 274/U | Ag&Cu Alloy | | | 78.67-52.74 | | 21.37-31.88 |
| 10 | 3-023 | - | Ag | 75.00 – 110.00 | 58.85 | 112.5-79.26 | 14.0-20.0 KW | 13.82-19.63 |
| | 3-024 | - | OF-DLP | | | 105.6-74.37 | | 14.73-20.86 |
| | 3-025 | 359/U | Ag&Cu Alloy | | | 100.9-71.03 | | 15.40-21.88 |



Appendix C Double Ridge Waveguide Physical Dimensions



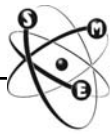
| WRD | A | B | C | D | E | F | R1 | R2 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 200D24 | 2.590 | 1.205 | 2.750 | 1.365 | 0.648 | 0.512 | 0.102 | 0.050 |
| 250D30 | 1.655 | 0.715 | 2.000 | 1.000 | 0.440 | 0.150 | 0.092 | 0.020 |
| 350D24 | 1.480 | 0.688 | 1.608 | 0.816 | 0.370 | 0.292 | 0.058 | 0.030 |
| 475D24 | 1.090 | 0.506 | 1.190 | 0.606 | 0.272 | 0.215 | 0.043 | 0.030 |
| 500D36 | 0.752 | 0.323 | 0.852 | 0.423 | 0.188 | 0.063 | 0.013 | 0.015 |
| 580D28 | 0.780 | 0.370 | 0.880 | 0.470 | 0.200 | 0.120 | 0.043 | 0.015 |
| 650D28 | 0.721 | 0.321 | 0.821 | 0.421 | 0.173 | 0.101 | 0.022 | 0.020 |
| 750D24 | 0.691 | 0.321 | 0.791 | 0.421 | 0.173 | 0.136 | 0.027 | 0.020 |
| 110C24 | 0.471 | 0.219 | 0.551 | 0.299 | 0.118 | 0.093 | 0.019 | 0.015 |
| 180C24 | 0.288 | 0.134 | 0.368 | 0.214 | 0.072 | 0.057 | 0.011 | 0.015 |

All dimensions are in inches.



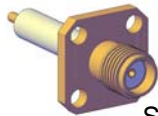
Appendix D
Double Ridge Waveguide Electrical Data

| WRD | Mil-W-23351 | Material | Frequency TE10 Mode (GHz) | Cutoff TE10 (GHz) | Attenuation dB/ft | Peak Power KW | CW Power KW |
|---------------|--------------------|-----------------|----------------------------------|--------------------------|--------------------------|----------------------|--------------------|
| 200D24 | 4-025 | Aluminum | 2.00 – 4.80 | 1.614 | 0.0134 | 470 | 49.0 |
| | 4-026 | Brass | | | 0.0132 | | |
| | 4-027 | Copper | | | 0.0089 | | |
| | 4-028 | Silver | | | 0.0095 | | |
| 250D30 | | Aluminum | 2.60 – 7.80 | 1.985 | 0.025 | 120 | 24.0 |
| | | Brass | | | 0.025 | | |
| | | Copper | | | 0.018 | | |
| | | Silver | | | 0.018 | | |
| 350D24 | 4-029 | Aluminum | 3.50 – 8.20 | 2.895 | 0.0307 | 150 | 18.0 |
| | 4-030 | Brass | | | 0.0303 | | |
| | 4-031 | Copper | | | 0.0204 | | |
| | 4-032 | Silver | | | 0.0218 | | |
| 475D24 | 4-033 | Aluminum | 4.75 – 11.00 | 3.934 | 0.0487 | 85 | 8.0 |
| | 4-034 | Brass | | | 0.0481 | | |
| | 4-035 | Copper | | | 0.0324 | | |
| | 4-036 | Silver | | | 0.0347 | | |
| 500D36 | 2-025 | Aluminum | 5.00 – 18.00 | 4.391 | 0.146 | 15 | 4.0 |
| | 2-026 | Brass | | | 0.141 | | |
| | 2-027 | Copper | | | 0.095 | | |
| | 2-028 | Silver | | | 0.102 | | |
| 580D28 | | Aluminum | 5.80 – 16.00 | 5.096 | 0.100 | 32 | 5.2 |
| | | Brass | | | 0.098 | | |
| | | Copper | | | 0.067 | | |
| | | Silver | | | 0.070 | | |
| 650D28 | | Aluminum | 6.50 – 18.00 | 5.567 | 0.106 | 25 | 4.0 |
| | | Brass | | | 0.105 | | |
| | | Copper | | | 0.070 | | |
| | | Silver | | | 0.076 | | |
| 750D24 | 4-037 | Aluminum | 7.50 – 18.00 | 6.195 | 0.0964 | 35 | 4.8 |
| | 4-038 | Brass | | | 0.0951 | | |
| | 4-039 | Copper | | | 0.0641 | | |
| | 4-040 | Silver | | | 0.0686 | | |
| 110C24 | 4-041 | Aluminum | 11.00 – 26.50 | 9.092 | 0.171 | 15 | 1.4 |
| | 4-042 | Brass | | | 0.169 | | |
| | 4-043 | Copper | | | 0.114 | | |
| | 4-044 | Silver | | | 0.122 | | |
| 180C24 | 4-045 | Aluminum | 18.00 – 40.00 | 14.88 | 0.358 | 5 | 0.8 |
| | 4-046 | Brass | | | 0.353 | | |
| | 4-047 | Copper | | | 0.238 | | |
| | 4-048 | Silver | | | 0.255 | | |



Appendix E Connector Options

Space Machine offers a wide variety of connector options. Our standard options are listed and described below. Other options such as 3.5mm, 7/16 DIN, E.I.A. varieties and HN are available upon request. All of the connectors we offer are manufactured IAW Mil-PRF-39012 where applicable. Graphs illustrating the maximum power capacity are on the following pages.



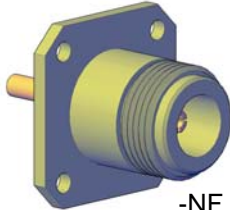
-SF



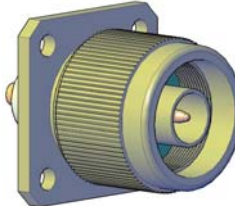
-SM

SMA

This is one of the most popular and least expensive types of microwave connectors. It has an upper frequency limit of 26.5 GHz making it usable on waveguides down to WR42, WRD650 and 750. Due to its small size, it's generally not recommended on waveguide sizes larger than WR650. Straight configurations as shown are standard, other options such as right angle and with a two hole pattern flange are available upon request. Generally, SMA connectors will hold pressures of approximately 20 PSIG with only a slight amount of leakage around the center pin and dielectric. However, Space Machine does offer a hermetic version where absolute pressurization is a necessity. SMA connectors are compatible with the K (2.92mm) and 3.5mm connectors.



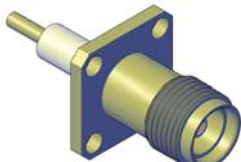
-NF



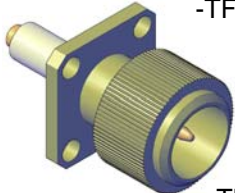
-NM

TYPE N

This is another one of the most popular and least expensive types of microwave connectors. Space Machine utilizes two types, a standard version which has an upper frequency limit of 10 GHz and a high frequency model that is usable up to 18 GHz. The standard model we use on waveguide sizes down to WR112 and WRD350 while the high frequency model is used on waveguide sizes WR90, WR75, WR62, WRD475, WRD500, WRD580, WRD650 and WRD750. Straight configurations as shown are standard, other options such as right angle and a thread on configuration are available upon request. Generally, Type N connectors will hold pressures of approximately 20 PSIG with only a slight amount of leakage around the center pin and dielectric. However, Space Machine does offer a hermetic version where absolute pressurization is a necessity.



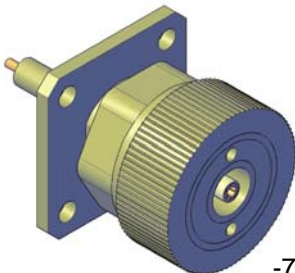
-TF



-TM

TNC

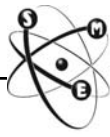
The TNC is considered a ruggedized connector. Space Machine utilizes two types, a standard version which has an upper frequency limit of 14 GHz and a high frequency model that is usable up to 18 GHz. The standard model we use on waveguide sizes down to WR112, WR90, WRD350 and WRD475 while the high frequency model is used on waveguide sizes WR75, WR62, WRD500, WRD580, WRD650 and WRD750. Straight configurations as shown are standard, other options such as right angle and a thread on configuration are available upon request. Generally, TNC connectors will hold pressures of approximately 20 PSIG with only a slight amount of leakage around the center pin and dielectric however, Space Machine does offer a hermetic version where absolute pressurization is a necessity.



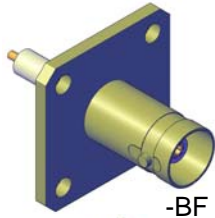
-7

7mm

7mm are precision sexless connectors that are durable and can tolerate many repeatable connections. They also offer a low VSWR and are usable up to 18 GHz. The 7mm is most commonly used in precision applications such as waveguide to coax adapters that are used in calibration kits. The 7mm is an air dielectric connector and is not suitable for use in a pressurized system.



Appendix E Connector Options

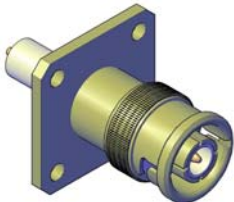


-BF

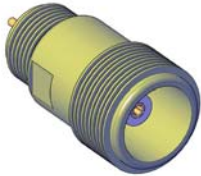
BNC

The BNC is a ruggedized all purpose connector for low frequency applications. The upper frequency limit is 4 GHz which restricts it's use down to waveguide size WR284 and larger.

Straight configurations as shown are standard, other options such as right angle and a thread on configurations are available upon request. Generally, BNC connectors will hold pressures of approximately 20 PSIG with only a slight amount of leakage around the center pin and dielectric.



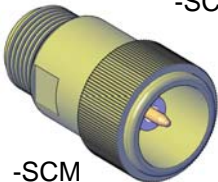
-BM



-SCF

SC

The SC is a specialized connector for medium frequency applications. The upper frequency limit is 10 GHz which makes its uses similar to that of the standard Type N. SC connectors will not generally hold pressure and should be avoided in pressurized applications.

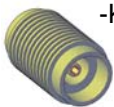


-SCM

K* Type (2.92mm)

K connectors are precision connectors that are the most commonly used connector for high frequency applications. They have an upper frequency limit of 46 GHz, making them usable for waveguide sizes down to WR28 and WRD180. Due to it's small size, it's generally not recommended using on waveguide sizes larger than WR51 or WRD110. The K connector is an air dielectric connector and is not suitable for use in a pressurized or vacuum system. K connectors are compatible with the SMA and 3.5mm connectors.

**K is a trademark of the Anritsu Company.*



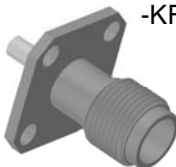
-KF



-KM

K* Type (2.92mm) Panel Mount

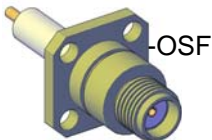
(K-connectors are precision connectors that are the most commonly used connector for high frequency applications. They have an upper frequency limit of 40 GHz, making them usable for waveguide sizes down to WR28 and WRD180. Due to its small size, it's generally not recommended using on waveguide sizes larger than WR51 or WRD110. Optimum results are achieved with the use of a 2.4mm outer conductor diameter and air dielectric. K-connectors are compatible with the SMA and 3.5mm connectors.)



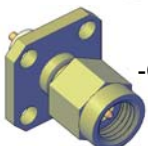
-KFPM

2.4mm (OS-50)

The 2.4mm is another option for high frequency uses. It has an upper frequency limit of 50 GHz making it usable on waveguide sizes down to WR22 and WRD180. Due to its small size, it's generally not recommended using on waveguide sizes larger than WR51 or WRD110. Generally, 2.4mm connectors will hold pressure of approximately 20 PSIG with only a slight amount of leakage around the center pin and dielectric however, Space Machine does offer a hermetic version where absolute pressurization is a necessity.



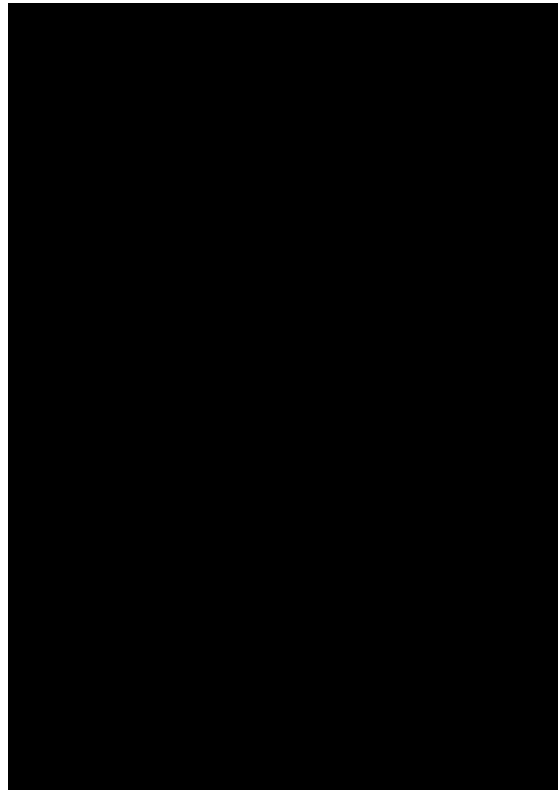
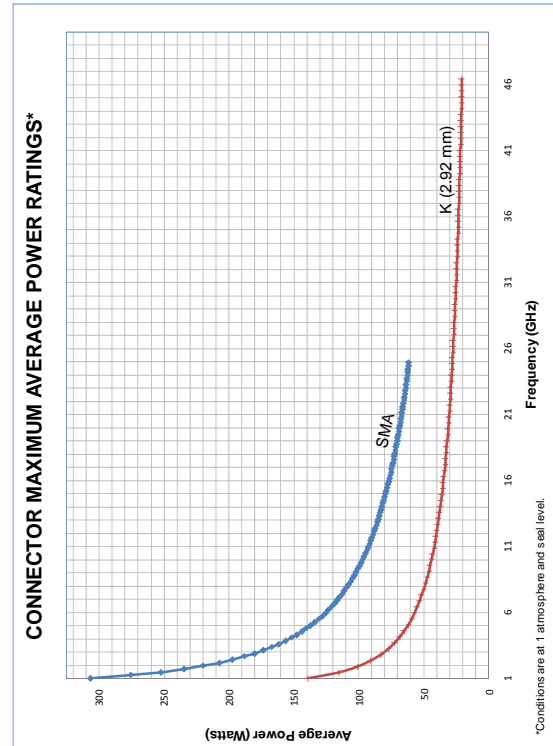
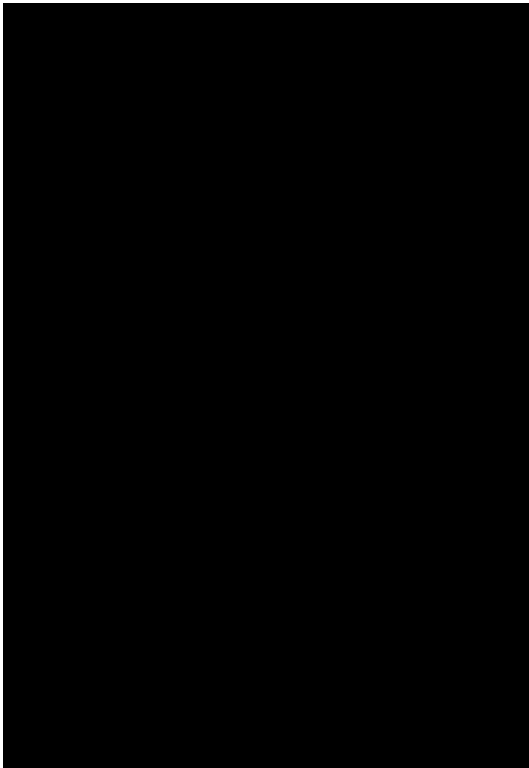
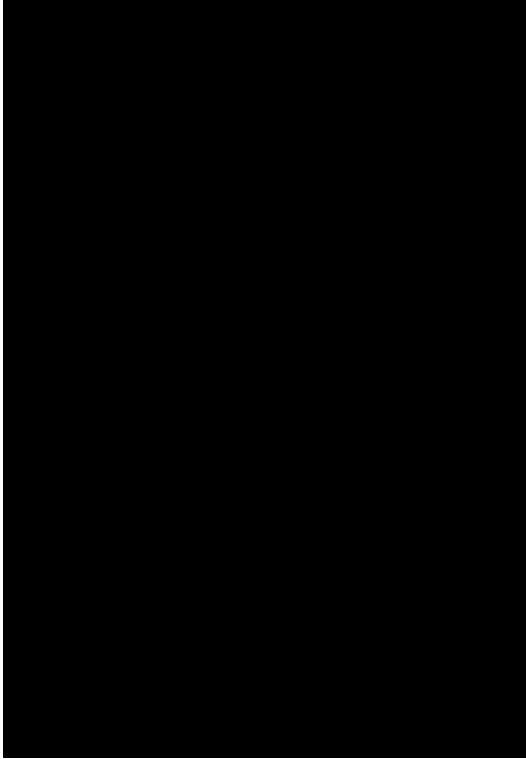
-OSF



-OSM

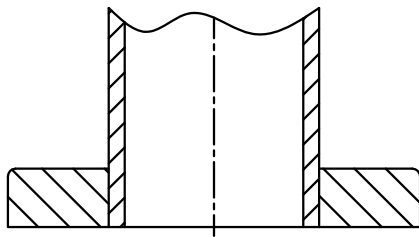
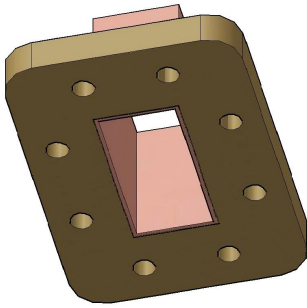


Appendix E Connector Options

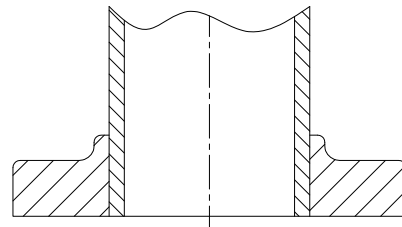
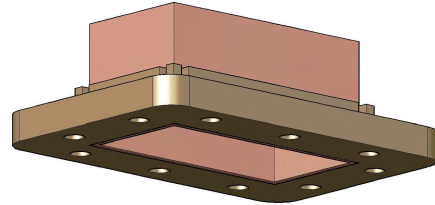




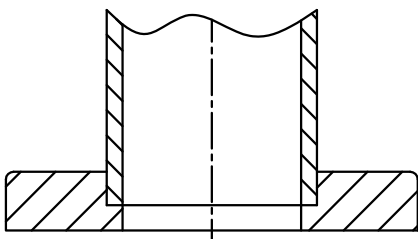
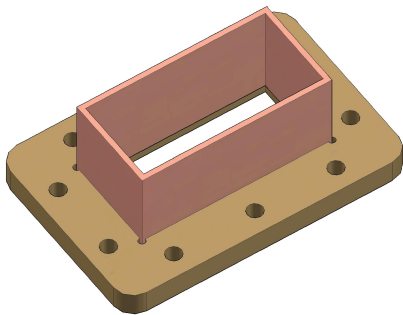
Appendix F *Waveguide Flange Mounting Methods*



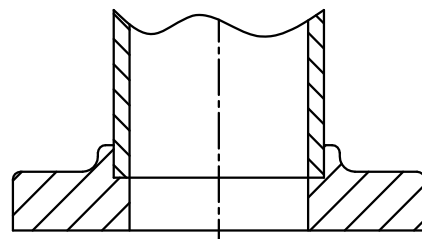
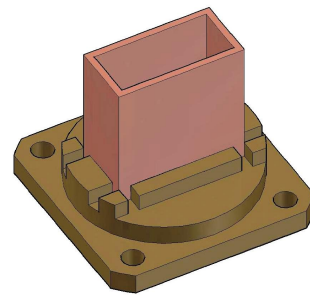
Thru Type



*Butt Type,
Corral Thru Type*



*Butt Type,
Socket*



*Butt Type,
Corral*



UG Style

see Appendix I for Flange Part Number Conversion Chart

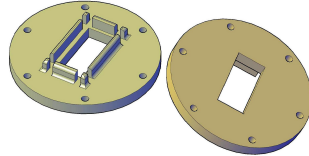
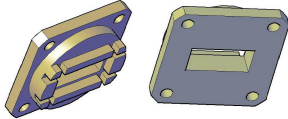
W.G. sizes WR22—WR112

W.G. sizes WR137—WR284

W.G. sizes WR22—WR112

W.G. sizes WR137—WR284

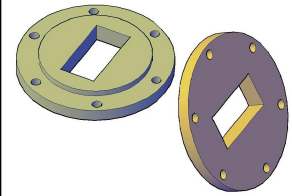
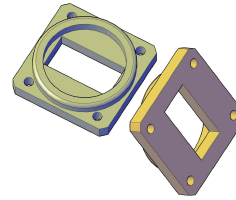
Flange Option -01, 11 (Cover, Butt Type, Corral*)



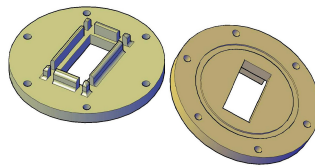
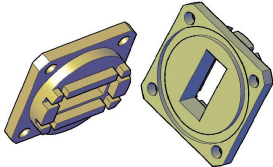
W.G. sizes WR22—WR112

W.G. sizes WR137—WR284

Flange Option -12, 13 (Cover, Thru Type*)



Flange Option -14, 15 (Grooved, Butt Type, Corral*)



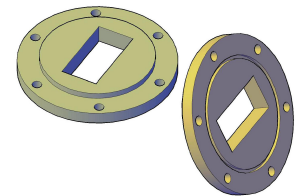
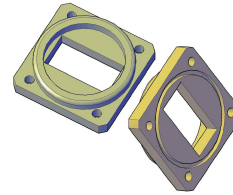
W.G. sizes WR22—WR112

W.G. sizes WR137—WR284

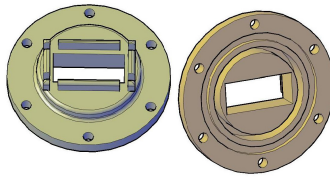
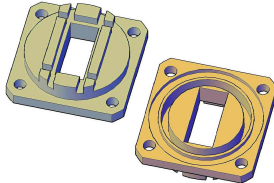
W.G. sizes WR22—WR112

W.G. sizes WR137—WR284

Flange Option -22, 23 (Grooved, Thru Type*)



Flange Option -02, 21 (Choke, Butt Type, Corral*)



| Standard | UG Style | | | | | | | | | |
|----------------|-------------------|------------|-----------|------------|-------------------|------------|-----------|------------|-------------------|-----------|
| | COVER | | | | GROOVED | | | | CHOKE | |
| | Butt Type, Corral | | Thru | | Butt Type, Corral | | Thru | | Butt Type, Corral | |
| Mounting Holes | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Tapped | All Clear |
| WR28 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR34 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR42 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR51 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR62 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR75 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR90 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR102 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR112 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR137 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR159 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR187 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |
| WR284 | 01 | 11 | 12 | 13 | 14 | 15 | 22 | 23 | 02 | 21 |

* See appendix F for explanation of flange type.



Appendix G Rectangular Waveguide Flange Options

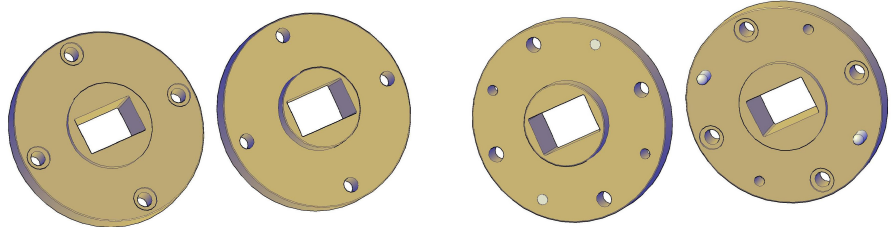
Millimeter (mm)

see Appendix I for Flange Part Number Conversion Chart

Flange Option –06, 61 (mm Round, Thru Type*)

W.G. sizes WR10—WR28

| | MM | |
|----------------|------------|-----------|
| Standard | ROUND | |
| | Thru | |
| Mounting Holes | All Tapped | All Clear |
| WR10 | 06 | 61 |
| WR12 | 06 | 61 |
| WR15 | 06 | 61 |
| WR19 | 06 | 61 |
| WR22 | 06 | 61 |
| WR28 | 06 | 61 |



Flange before brazing

Finished Flange after brazing

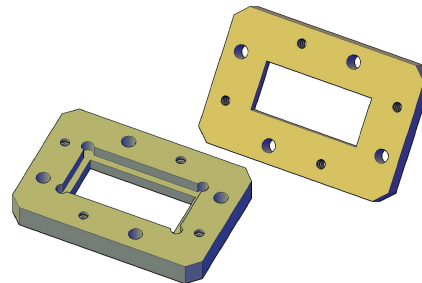
* See appendix F for explanation of flange type.

CMR (NON PRESSURIZABLE)

Flange Option – 03, 31, 32 (CMR, Butt Type, Socket*)

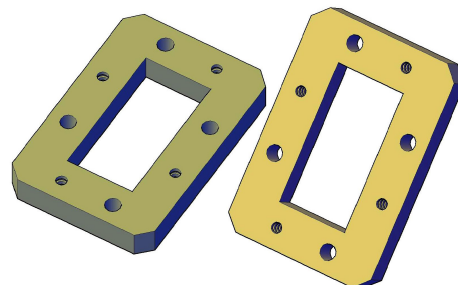
W.G. sizes WR90—WR284

| | CMR | | | | | |
|----------------|-------------------|-----------|------------|-------------------|-----------|------------|
| Standard | COVER | | | | | |
| | Butt Type, Socket | | | Thru | | |
| Mounting Holes | Alt. Clear/Tapped | All Clear | All Tapped | Alt. Clear/Tapped | All Clear | All Tapped |
| WR90 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR102 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR112 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR137 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR159 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR187 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR229 | 03 | 31 | 32 | 33 | 34 | 35 |
| WR284 | 03 | 31 | 32 | 33 | 34 | 35 |



Flange Option – 33-35 (CMR, Thru Type*)

W.G. sizes WR90—WR284



* See appendix F for explanation of flange type.



Space Machine & Engineering CORP.

Appendix G Rectangular Waveguide Flange Options

CPR

see Appendix I for Flange Part Number Conversion Chart

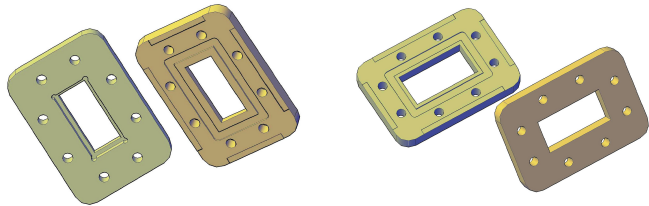
Flange Option -04, 41, 42
(CPR, Grooved,
Butt Type, Socket *)

Flange Option - 43 44
(CPR, Grooved,
Thru Type*)

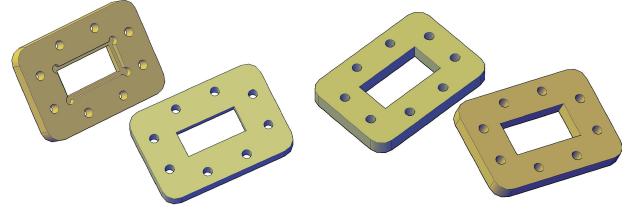
Flange Option -05, 51, 52
(CPR, Flat,
Butt Type, Socket *)

Flange Option - 53, 54
(CPR, Flat,
Thru Type*)

W.G. sizes WR75—WR975



W.G. sizes WR75—WR975

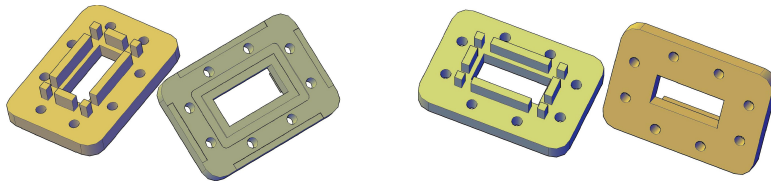


Flange Option - 07, 71
(CPR, Grooved, Butt Type, Corral*)

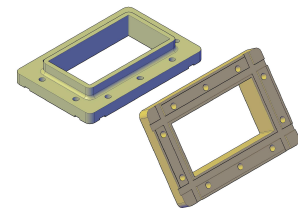
Flange Option - 08, 81
(CPR, Flat, Butt Type, Corral*)

Flange Option - 72, 73
(CPR, Grooved, Butt Type, Corral Thru*)

W.G. sizes WR75—WR975



W.G. sizes WR340—WR650



| Standard | CPR | | | | | | | | | | | | | | | |
|----------------|-------------------|------------|------------|-----------|------------|-------------------|------------|------------------------|------------|-------------------|------------|------------|-----------|------------|-------------------|------------|
| | GROOVED (Contact) | | | | | | | | | FLAT | | | | | | |
| | Butt Type, Socket | | | Thru | | Butt Type, Corral | | Butt Type, Corral Thru | | Butt Type, Socket | | | Thru | | Butt Type, Corral | |
| Mounting Holes | All Clear | All Tapped | 3/8" Thick | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | 3/8" Thick | All Clear | All Tapped | All Clear | All Tapped |
| WR75 | 04 | 41 | | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR90 | 04 | 41 | | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR112 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR137 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR159 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR187 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR229 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR284 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR340 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | 72 | 73 | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR430 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | 72 | 73 | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR510 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | | | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR650 | 04 | 41 | 42 | 43 | 44 | 07 | 71 | 72 | 73 | 05 | 51 | 52 | 53 | 54 | 08 | 81 |
| WR770 | 04 | 41 | 42 | 43 | 44 | | | | | 05 | 51 | 52 | 53 | 54 | | |
| WR975 | 04 | 41 | 42 | 43 | 44 | | | | | 05 | 51 | 52 | 53 | 54 | | |

* See appendix F for explanation of flange type.



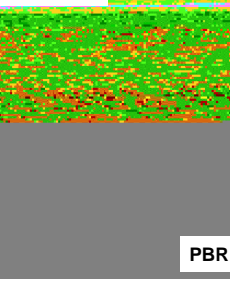
Appendix G Rectangular Waveguide Flange Options

EUROPEAN (IEC Standard)

see Appendix I for Flange Part Number Conversion Chart

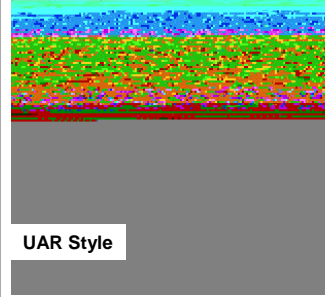
Flange Option – 16-19 (Cover, Grooved Butt Type, Corral*)

UBR Style



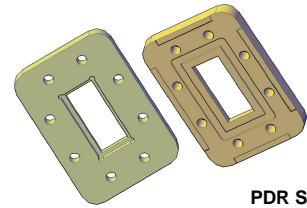
PBR Style

PAR Style



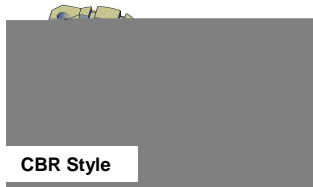
UAR Style

Flange Option – 45, 46 (Grooved Butt Type, Socket Back*)

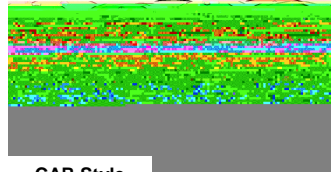


PDR Style

Flange Option – 26, 27 (Choke, Butt Type, Corral*)

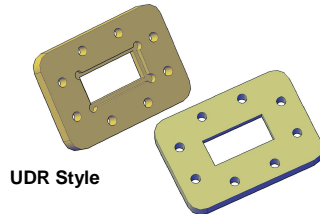


CBR Style



CAR Style

Flange Option – 55, 56 (Flat Butt Type Socket Back*)



UDR Style

| Waveguide Size | | | EUROPEAN (IEC Standard) | | | | | | | | | | | | | | | |
|----------------|-------|------|-------------------------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| EIA | RCSC | IEC | UBR | | PBR | | CBR | | UAR | | PAR | | CAR | | PDR | | UDR | |
| Mounting Holes | | | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped | All Clear | All Tapped |
| WR28 | WG22 | R320 | 16 | 18 | 17 | 19 | | | | | | | | | | | | |
| WR34 | WG21 | R260 | 16 | 18 | 17 | 19 | | | | | | | | | | | | |
| WR42 | WG20 | R220 | 16 | 18 | 17 | 19 | 26 | 27 | | | | | | | | | | |
| WR51 | WG19 | R180 | 16 | 18 | 17 | 19 | | | | | | | | | | | | |
| WR62 | WG18 | R140 | 16 | 18 | 17 | 19 | 26 | 27 | | | | | | | | | | |
| WR75 | WG17 | R120 | 16 | 18 | 17 | 19 | 26 | 27 | | | | | | | 45 | 46 | 55 | 56 |
| WR90 | WG16 | R100 | 16 | 18 | 17 | 19 | 26 | 27 | | | | | | | 45 | 46 | 55 | 56 |
| WR112 | WG15 | R84 | 16 | 18 | 17 | 19 | 26 | 27 | | | 26 | 27 | | | 45 | 46 | 55 | 56 |
| WR137 | WG14 | R70 | | | | | | | 17 | 19 | 26 | 27 | 16 | 18 | 45 | 46 | 55 | 56 |
| WR159 | WG13 | R58 | | | | | | | 17 | 19 | 26 | 27 | 16 | 18 | 45 | 46 | 55 | 56 |
| WR187 | WG12 | R48 | | | | | | | 17 | 19 | 26 | 27 | 16 | 18 | 45 | 46 | 55 | 56 |
| WR229 | WG11A | R40 | | | | | | | | | | | | | 45 | 46 | 55 | 56 |
| WR284 | WG10 | R32 | | | | | | | 17 | 19 | 26 | 27 | 16 | 18 | 45 | 46 | 55 | 56 |
| WR340 | WG9A | R26 | | | | | | | | | | | | | 45 | 46 | 55 | 56 |
| WR430 | WG8 | R22 | | | | | | | | | | | | | 45 | 46 | 55 | 56 |
| WR650 | WG6 | R14 | | | | | | | | | | | | | 45 | 46 | 55 | 56 |

* See appendix F for explanation of flange type.



Space Machine & Engineering CORP.

Appendix H

Double Ridge Waveguide Flange Options

see Appendix I for Flange Part Number Conversion Chart

| Standard | COVER | | | | | |
|----------------|-------------------|-----------|------------|-------------------|-----------|------------|
| | Butt Type, Socket | | | Thru Type | | |
| | Alt. Clear/Tapped | All Clear | All Tapped | Alt. Clear/Tapped | All Clear | All Tapped |
| Mounting Holes | | | | | | |
| WRD200 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD250 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD350 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD475 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD500 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD580 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD580 SL | N/A | 11 | 12 | N/A | N/A | N/A |
| WRD650 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD650 SL | N/A | 11 | 12 | N/A | N/A | N/A |
| WRD750 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD750 SL | N/A | 11 | 12 | N/A | N/A | N/A |
| WRD110 | 01 | 11 | 12 | 13 | 14 | 15 |
| WRD180 | 01 | 11 | 12 | 13 | 14 | 15 |

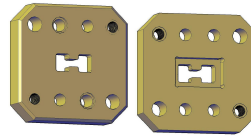
| Standard | Gasket | | | | | |
|----------------|-------------------|-----------|------------|-------------------|-----------|------------|
| | Butt Type, Socket | | | Thru Type | | |
| | Alt. Clear/Tapped | All Clear | All Tapped | Alt. Clear/Tapped | All Clear | All Tapped |
| Mounting Holes | | | | | | |
| WRD200 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD250 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD350 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD475 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD475 SL | N/A | 21 | 22 | N/A | N/A | N/A |
| WRD500 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD580 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD580 SL | N/A | 21 | 22 | N/A | N/A | N/A |
| WRD650 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD650 SL | N/A | 21 | 22 | N/A | N/A | N/A |
| WRD750 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD750 SL | N/A | 21 | 22 | N/A | N/A | N/A |
| WRD110 | 02 | 21 | 22 | 23 | 24 | 25 |
| WRD180 | 02 | 21 | 22 | 23 | 24 | 25 |

* See appendix F for explanation of flange type.

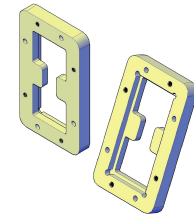
Alignment pins are installed after assembly. Standard hole pattern is alternate tapped and thru holes. Other hole configuration are possible, please contact us for custom configurations.

Flange Option – 01, 11, 12 (Cover, Butt Type, Socket *)

W.G. sizes
WRD750-WRD580

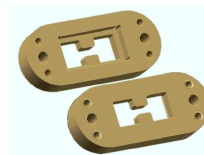


W.G. sizes
WRD500—WRD250



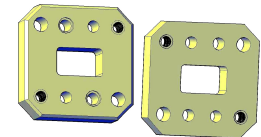
Flange Option – 11,12 (Cover, Butt Type, Socket*)

W.G. size WRD580, WRD650,
WRD750 Slim-Line



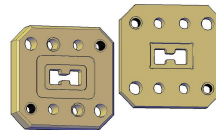
Flange Option – 13-15 (Cover, Thru Type*)

W.G. sizes
WRD180—WRD110

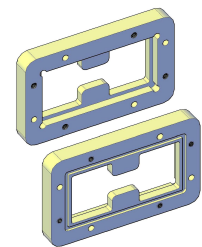


Flange Option – 02, 21, 22 (Gasket, Butt Type, Socket *)

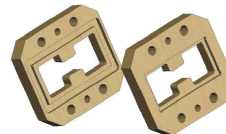
W.G. sizes
WRD750-WRD580



W.G. sizes
WRD500—WRD250

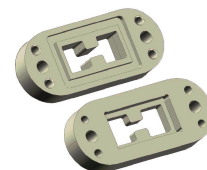


W.G. sizes WRD475 Slim-Line



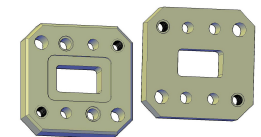
Flange Option – 21, 22 (Gasket, Butt Type, Socket *)

W.G. size WRD580, WRD650,
WRD750 Slim-Line



Flange Option – 23-25 (Gasket, Thru Type*)

W.G. sizes
WRD180 - WRD110



Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|----------------------------------|--------------------------|-----------------------|-------------|
| WGF10-B06 | 67-010 | | Round mm |
| WGF12-B06 | 67-009 | 387/U | Round mm |
| WGF15-B06 | 67-008 | 385/U | Round mm |
| WGF19-B06 | 67-007 | | Round mm |
| WGF22-A01 | | | Cover Butt |
| WGF22-A12 | | | Cover Thru |
| WGF22-A06 | | | Round mm |
| WGF22-B01 | | | Cover Butt |
| WGF22-B12 | | | Cover Thru |
| WGF22-B06 | 67-006 | 383/U | Round mm |
| WGF28-A01 | | | Cover Butt |
| WGF28-A12 | | | Cover Thru |
| WGF28-A02 | | | Choke Butt |
| WGF28-A06 | 67-012 | | Round mm |
| WGF28-B01 | 68-001 | | Cover Butt |
| WGF28-B12 | 54-003 | 599/U | Cover Thru |
| WGF28-B02 | 59-005 | 600A/U | Choke Butt |
| WGF28-B06 | 67-005 | 381/U | Round mm |
| WGF42-A01 | 70-028 | | Cover Butt |
| WGF42-A12 | 54-002 | 597/U | Cover Thru |
| WGF42-A02 | 59-004 | 598A/U | Choke Butt |
| WGF42-A06 | 67-011 | | Round mm |
| WGF42-B01 | 70-027 | | Cover Butt |
| WGF42-B12 | 54-001 | 595/U | Cover Thru |
| WGF42-B02 | 59-003 | 596A/U | Choke Butt |
| WGF42-B06 | 67-004 | 425/U | Round mm |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|----------------------------------|--------------------------|-----------------------|-------------|
| WGF51-A01 | 70-023 | | Cover Butt |
| WGF51-A12 | | | Cover Thru |
| WGF51-A02 | 69-005 | | Choke Butt |
| WGF51-B01 | 70-022 | | Cover Butt |
| WGF51-B12 | | | Cover Thru |
| WGF51-B02 | 69-004 | | Choke Butt |
| WGF62-A01 | 70-020 | | Cover Butt |
| WGF62-A12 | 53-006 | 1665/U | Cover Thru |
| WGF62-A02 | 59-002 | 1666/U | Choke Butt |
| WGF62-B01 | 70-019 | | Cover Butt |
| WGF62-B12 | 53-005 | 419/U | Cover Thru |
| WGF62-B02 | 59-001 | 541/U | Choke Butt |
| WGF75-A01 | 70-005 | | Cover Butt |
| WGF75-A12 | 53-008 | | Cover Thru |
| WGF75-A02 | 59-011 | | Choke Butt |
| WGF75-A04 | | | CPRG Butt |
| WGF75-A05 | | | CPRF Butt |
| WGF75-B01 | 70-004 | | Cover Butt |
| WGF75-B12 | 53-007 | | Cover Thru |
| WGF75-B02 | 59-010 | | Choke Butt |
| WGF75-B04 | | | CPRG Butt |
| WGF75-B05 | | | CPRF Butt |
| WGF90-A01 | 54-014 | | Cover Butt |
| WGF90-A12 | 53-003 | 135/U | Cover Thru |
| WGF90-A02 | 59-008 | 136B/U | Choke Butt |
| WGF90-A03 | | | CMR Butt |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|---------------------------|-------------------|----------------|----------------------|
| WGF90-A33 | 63-008 | 1483/U | CMR Thru |
| WGF90-A04 | | | CPRG Butt |
| WGF90-A05 | | | CPRF Butt |
| WGF90-A07 | 52-044 | 1361/U | Contact Grooved Butt |
| WGF90-A08 | 52-022 | 1737/U | Contact Flat Butt |
| WGF90-B01 | 54-013 | | Cover Butt |
| WGF90-B12 | 53-001 | 39/U | Cover Thru |
| WGF90-B02 | 59-006 | 40B/U | Choke Butt |
| WGF90-B03 | | | CMR Butt |
| WGF90-B33 | 63-004 | 1478/U | CMR Thru |
| WGF90-B04 | | | CPRG Butt |
| WGF90-B05 | | | CPRF Butt |
| WGF90-B07 | 52-043 | 1360/U | Contact Grooved Butt |
| WGF90-B08 | 52-021 | 1736/U | Contact Flat Butt |
| WGF102-A01 | 70-014 | | Cover Butt |
| WGF102-A12 | | | Cover Thru |
| WGF102-A02 | 69-002 | | Choke Butt |
| WGF102-B01 | 70-013 | 1493/U | Cover Butt |
| WGF102-B12 | | | Cover Thru |
| WGF102-B02 | 69-001 | 1494/U | Choke Butt |
| WGF112-A01 | 54-012 | | Cover Butt |
| WGF112-A12 | 53-004 | 138/U | Cover Thru |
| WGF112-A02 | 59-009 | 137B/U | Choke Butt |
| WGF112-A03 | | | CMR Butt |
| WGF112-A33 | 63-007 | 1482/U | CMR Thru |
| WGF112-A04 | | | CPRG Butt |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|----------------------------------|--------------------------|-----------------------|----------------------|
| WGF112-A05 | | | CPRF Butt |
| WGF112-A07 | 52-042 | 1359/U | Contact Grooved Butt |
| WGF112-A08 | 52-020 | 1735/U | Contact Flat Butt |
| WGF112-B01 | 54-011 | | Cover Butt |
| WGF112-B12 | 53-002 | 51/U | Cover Thru |
| WGF112-B02 | 59-007 | 52B/U | Choke Butt |
| WGF112-B03 | | | CMR Butt |
| WGF112-B33 | 63-003 | 1477U | CMR Thru |
| WGF112-B04 | | | CPRG Butt |
| WGF112-B05 | | | CPRF Butt |
| WGF112-B07 | 52-041 | 1358/U | Contact Grooved Butt |
| WGF112-B08 | 52-019 | 1734/U | Contact Flat Butt |
| WGF137-A01 | | | Cover Butt |
| WGF137-A12 | 55-002 | 441/U | Cover Thru |
| WGF137-A02 | 60-002 | 440B/U | Choke Butt |
| WGF137-A03 | | | CMR Butt |
| WGF137-A33 | 63-006 | 1481/U | CMR Thru |
| WGF137-A04 | | | CPRG Butt |
| WGF137-A05 | | | CPRF Butt |
| WGF137-A07 | 52-040 | 1357/U | Contact Grooved Butt |
| WGF137-A08 | 52-018 | 1733/U | Contact Flat Butt |
| WGF137-B01 | | | Cover Butt |
| WGF137-B12 | 55-001 | 344/U | Cover Thru |
| WGF137-B02 | 60-001 | 343B/U | Choke Butt |
| WGF137-B03 | | | CMR Butt |
| WGF137-B33 | 63-002 | 1476U | CMR Thru |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|----------------------------------|--------------------------|-----------------------|----------------------|
| WGF137-B04 | | | CPRG Butt |
| WGF137-B05 | | | CPRF Butt |
| WGF137-B07 | 52-039 | 1356/U | Contact Grooved Butt |
| WGF137-B08 | 52-017 | 1732/U | Contact Flat Butt |
| WGF159-A01 | | | Cover Butt |
| WGF159-A12 | | | Cover Thru |
| WGF159-A02 | | | Choke Butt |
| WGF159-A03 | | | CMR Butt |
| WGF159-A04 | | | CPRG Butt |
| WGF159-A05 | | | CPRF Butt |
| WGF159-A07 | 52-038 | 1355/U | Contact Grooved Butt |
| WGF159-A08 | 52-016 | 1731/U | Contact Flat Butt |
| WGF159-B01 | | | Cover Butt |
| WGF159-B12 | | | Cover Thru |
| WGF159-B02 | | | Choke Butt |
| WGF159-B03 | | | CMR Butt |
| WGF159-B04 | | | CPRG Butt |
| WGF159-B05 | | | CPRF Butt |
| WGF159-B07 | 52-037 | 1354/U | Contact Grooved Butt |
| WGF159-B08 | 52-015 | 1730/U | Contact Flat Butt |
| WGF187-A01 | | | Cover Butt |
| WGF187-A12 | 57-001 | 407/U | Cover Thru |
| WGF187-A02 | 62-001 | 406B/U | Choke Butt |
| WGF187-A03 | | | CMR Butt |
| WGF187-A33 | 63-005 | 1480/U | CMR Thru |
| WGF187-A04 | | | CPRG Butt |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|----------------------------------|--------------------------|-----------------------|----------------------|
| WGF187-A05 | | | CPRF Butt |
| WGF187-A07 | 52-036 | 1353/U | Contact Grooved Butt |
| WGF187-A08 | 52-014 | 1729/U | Contact Flat Butt |
| WGF187-B01 | | | Cover Butt |
| WGF187-B12 | 57-002 | 149A/U | Cover Thru |
| WGF187-B02 | 62-002 | 148C/U | Choke Butt |
| WGF187-B03 | | | CMR Butt |
| WGF187-B33 | 63-001 | 1475U | CMR Thru |
| WGF187-B04 | | | CPRG Butt |
| WGF187-B05 | | | CPRF Butt |
| WGF187-B07 | 52-035 | 1352/U | Contact Grooved Butt |
| WGF187-B08 | 52-013 | 1728/U | Contact Flat Butt |
| WGF229-A03 | | | CMR Butt |
| WGF229-A04 | | | CPRG Butt |
| WGF229-A05 | | | CPRF Butt |
| WGF229-A07 | 52-034 | 1351/U | Contact Grooved Butt |
| WGF229-A08 | 52-012 | 1727/U | Contact Flat Butt |
| WGF229-B03 | | | CMR Butt |
| WGF229-B04 | | | CPRG Butt |
| WGF229-B05 | | | CPRF Butt |
| WGF229-B07 | 52-033 | 1350/U | Contact Grooved Butt |
| WGF229-B08 | 52-011 | 1726/U | Contact Flat Butt |
| WGF284-A01 | | | Cover Butt |
| WGF284-A12 | 56-002 | 584/U | Cover Thru |
| WGF284-A02 | 61-001 | 585A/U | Choke Butt |
| WGF284-A03 | | | CMR Butt |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|----------------------------------|--------------------------|-----------------------|----------------------|
| WGF284-A33 | 64-002 | 1484/U | CMR Thru |
| WGF284-A04 | | | CPRG Butt |
| WGF284-A05 | | | CPRF Butt |
| WGF284-A07 | 52-032 | 1349/U | Contact Grooved Butt |
| WGF284-A08 | 52-010 | 1725/U | Contact Flat Butt |
| WGF284-B01 | | | Cover Butt |
| WGF284-B12 | 56-001 | 53/U | Cover Thru |
| WGF284-B02 | 62-002 | 54B/U | Choke Butt |
| WGF284-B03 | | | CMR Butt |
| WGF284-B33 | 64-001 | 1479/U | CMR Thru |
| WGF284-B04 | | | CPRG Butt |
| WGF284-B05 | | | CPRF Butt |
| WGF284-B07 | 52-031 | 1348U | Contact Grooved Butt |
| WGF284-B08 | 52-009 | 1724/U | Contact Flat Butt |
| WGF340-A04 | | | CPRG Butt |
| WGF340-A05 | | | CPRF Butt |
| WGF340-A07 | 52-030 | 1347/U | Contact Grooved Butt |
| WGF340-A72 | 58-012 | 554A/U | Contact Grooved Thru |
| WGF340-A08 | 52-008 | 1713/U | Contact Flat Butt |
| WGF340-B04 | | | CPRG Butt |
| WGF340-B05 | | | CPRF Butt |
| WGF340-B07 | 52-029 | 1346/U | Contact Grooved Butt |
| WGF340-B72 | 58-011 | 552A/U | Contact Grooved Thru |
| WGF340-B08 | 52-007 | 1712/U | Contact Flat Butt |
| WGF430-A04 | | | CPRG Butt |
| WGF430-A05 | | | CPRF Butt |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M3922/ | EQUIVALENT UG- | NAME |
|--------------------------------------|------------------------------|---------------------------|----------------------|
| WGF430-A07 | 52-028 | 1345/U | Contact Grooved Butt |
| WGF430-A72 | 58-010 | 437B/U | Contact Grooved Thru |
| WGF430-A08 | 52-006 | 1711/U | Contact Flat Butt |
| WGF430-B04 | | | CPRG Butt |
| WGF430-B05 | | | CPRF Butt |
| WGF430-B07 | 52-027 | 1344/U | Contact Grooved Butt |
| WGF430-B72 | 58-007 | 435B/U | Contact Grooved Thru |
| WGF430-B08 | 52-005 | 1716/U | Contact Flat Butt |
| WGF650-A04 | | | CPRG Butt |
| WGF650-A05 | | | CPRF Butt |
| WGF650-A07 | 52-024 | 1343/U | Contact Grooved Butt |
| WGF650-A72 | 58-008 | 418B/U | Contact Grooved Thru |
| WGF650-A08 | 52-002 | 1720/U | Contact Flat Butt |
| WGF650-B04 | | | CPRG Butt |
| WGF650-B05 | | | CPRF Butt |
| WGF650-B07 | 52-023 | 1362/U | Contact Grooved Butt |
| WGF650-B72 | 58-007 | 417B/U | Contact Grooved Thru |
| WGF650-B08 | 52-001 | 1714/U | Contact Flat Butt |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M39000/ | EQUIVALENT UG- | NAME |
|----------------------------------|---------------------------|-----------------------|---------------------------------|
| DGF200-A01 | 3-024 | - | Double Ridge Cover |
| DGF200-A02 | 3-048 | - | Double Ridge Groove |
| DGF200-B01 | 3-025 | - | Double Ridge Cover |
| DGF200-B02 | 3-049 | - | Double Ridge Groove |
| DGF250-A01 | - | - | Double Ridge Cover |
| DGF250-A02 | - | - | Double Ridge Groove |
| DGF250-B01 | - | - | Double Ridge Cover |
| DGF250-B02 | - | - | Double Ridge Groove |
| DGF350-A01 | 3-030 | - | Double Ridge Cover |
| DGF350-A02 | 3-054 | - | Double Ridge Groove |
| DGF350-B01 | 3-031 | - | Double Ridge Cover |
| DGF350-B02 | 3-055 | - | Double Ridge Groove |
| DGF475-A01 | 3-036 | - | Double Ridge Cover |
| DGF475-A02 | 3-060 | - | Double Ridge Groove |
| DGF475-A22 SL | - | - | Double Ridge Groove Slim - Line |
| DGF475-B01 | 3-037 | - | Double Ridge Cover |
| DGF475-B02 | 3-061 | - | Double Ridge Groove |
| DGF475-B22 SL | - | - | Double Ridge Groove Slim - Line |
| DGF500-A01 | - | - | Double Ridge Flat |
| DGF500-A02 | 4-022 | - | Double Ridge Groove Thru |
| DGF500-A25 | 4-010 | 1596/U | Double Ridge Cover Thru |
| DGF500-B01 | - | - | Double Ridge Flat |
| DGF500-B02 | 4-023 | - | Double Ridge Groove Thru |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M39000/ | EQUIVALENT UG- | NAME |
|----------------------------------|---------------------------|-----------------------|-------------------------------|
| DGF500-B25 | 4-011 | 1599/U | Double Ridge Cover Thru |
| DGF580-A01 | - | - | Double Ridge Flat |
| DGF580-A11 SL | - | - | Double Ridge Flat Slim-Line |
| DGF580-A02 | - | - | Double Ridge Groove |
| DGF580-A21 SL | - | - | Double Ridge Groove Slim-Line |
| DGF580-B01 | - | - | Double Ridge Flat |
| DGF580-B11 SL | - | - | Double Ridge Flat Slim-Line |
| DGF580-B02 | - | - | Double Ridge Groove |
| DGF580-B21 SL | - | - | Double Ridge Groove Slim-Line |
| DGF650-A01 | - | - | Double Ridge Flat |
| DGF650-A11 SL | - | - | Double Ridge Flat Slim-Line |
| DGF650-A02 | - | - | Double Ridge Groove |
| DGF650-A22 SL | - | - | Double Ridge Groove Slim-Line |
| DGF650-B01 | - | - | Double Ridge Flat |
| DGF650-B11 SL | - | - | Double Ridge Flat Slim-Line |
| DGF650-B02 | - | - | Double Ridge Groove |
| DGF650-B22 SL | - | - | Double Ridge Groove Slim-Line |
| DGF750-A01 | 4-076 | - | Double Ridge Flat |
| DGF750-A11 SL | - | - | Double Ridge Flat Slim-Line |
| DGF750-A02 | 4-078 | - | Double Ridge Groove |

Appendix I
Flange Part Number Conversion Chart

| SPACE MACHINE PART NUMBER | EQUIVALENT M39000/ | EQUIVALENT UG- | NAME |
|----------------------------------|---------------------------|-----------------------|-------------------------------|
| DGF750-A22 SL | - | - | Double Ridge Groove Slim-Line |
| DGF750-B01 | 4-077 | - | Double Ridge Flat |
| DGF750-B11 SL | - | - | Double Ridge Flat Slim-Line |
| DGF750-B02 | 4-079 | - | Double Ridge Groove |
| DGF750-B22 SL | - | - | Double Ridge Groove Slim-Line |
| DGF110-A01 | - | - | Double Ridge Flat |
| DGF110-B01 | - | - | Double Ridge Flat |
| DGF180-A01 | - | - | Double Ridge Flat |
| DGF180-A02 | - | - | Double Ridge Groove |
| DGF180-B01 | - | - | Double Ridge Flat |
| DGF180-B02 | - | - | Double Ridge Groove |
| DGF10-A01 | 3-042 | - | Double Ridge Flat |
| DGF10-A02 | - | - | Double Ridge Groove |
| DGF10-B01 | 3-043 | - | Double Ridge Flat |
| DGF10-B02 | - | - | Double Ridge Groove |

Appendix J
Recommended Waveguide Flange Torque

| Screw Size | Threads Per Inch | Recommended Torque | Tension (lb.) |
|-------------------|-------------------------|---------------------------|----------------------|
| No. 4 | 40 | 4.5 | 235 |
| | 80 | 5.5 | 280 |
| No. 6 | 32 | 8.5 | 360 |
| | 40 | 10 | 410 |
| No. 8 | 32 | 18 | 625 |
| | 36 | 20 | 685 |
| No. 10 | 24 | 23 | 705 |
| | 32 | 32 | 940 |
| 1/4" | 20 | 80 | 1800 |
| | 28 | 100 | 2200 |
| 5/16" | 18 | 140 | 2540 |
| | 24 | 150 | 2620 |
| 3/8" | 16 | 250 | 3740 |
| | 24 | 275 | 3950 |
| 7/16" | 14 | 400 | 4675 |
| | 20 | 425 | 4700 |
| 1/2" | 13 | 550 | 6110 |
| | 20 | 575 | 6140 |

Appendix K
Flexible Non-Twistable Waveguide

| WR | Frequency Range (GHz) | VSWR | Insertion Loss (dB/foot) | CW Power (Watts) | Peak Power (kW) | Bend Radii With Jacket | |
|-----|-----------------------|------|--------------------------|------------------|-----------------|------------------------|---------|
| | | | | | | E-Plane | H-Plane |
| 28 | 26.5-40.0 | 1.30 | 0.50 | 150 | 20 | 0.75 | 1.13 |
| 34 | 22.0-33.0 | 1.20 | 0.35 | 200 | 30 | 0.75 | 1.13 |
| 42 | 18.0-26.5 | 1.20 | 0.32 | 300 | 39 | 0.88 | 1.25 |
| 51 | 15.0-22.0 | 1.20 | 0.32 | 500 | 70 | 0.88 | 1.25 |
| 62 | 12.4-18.0 | 1.12 | 0.15 | 1000 | 100 | 1.00 | 1.88 |
| 75 | 10.0-15.0 | 1.12 | 0.13 | 1500 | 140 | 1.13 | 2.25 |
| 90 | 8.2-12.4 | 1.10 | 0.09 | 3000 | 180 | 1.75 | 2.50 |
| 102 | 7.0-11.0 | 1.10 | 0.08 | 4000 | 300 | 2.00 | 2.88 |
| 112 | 7.05-10.0 | 1.10 | 0.06 | 4000 | 315 | 2.25 | 3.25 |
| 137 | 5.85-8.2 | 1.10 | 0.05 | 5000 | 500 | 2.38 | 3.38 |
| 159 | 4.9-7.05 | 1.10 | 0.04 | 6000 | 1100 | 4.00 | 6.00 |
| 187 | 3.95-5.85 | 1.10 | 0.03 | 6500 | 1250 | 4.38 | 6.50 |
| 229 | 3.3-4.9 | 1.10 | 0.02 | 8000 | 1550 | 6.50 | 8.00 |
| 284 | 2.6-3.95 | 1.10 | 0.02 | 10000 | 2000 | 7.00 | 9.50 |
| 340 | 2.2-3.3 | 1.10 | 0.01 | 16000 | 3700 | 10.00 | 16.00 |
| 430 | 1.7-2.6 | 1.10 | 0.01 | 20000 | 4700 | 12.00 | 25.00 |
| 650 | 1.12-1.7 | 1.10 | 0.01 | 20000 | 10700 | 20.00 | 40.00 |

Appendix L
Flexible-Twistable Waveguide

| WR | Frequency Range (GHz) | VSWR | Insertion Loss (dB/foot) | CW Power (Watts) | Peak Power (kW) | Bend Radii With Jacket | |
|-----|-----------------------|------|--------------------------|------------------|-----------------|------------------------|---------|
| | | | | | | E-Plane | H-Plane |
| 28 | 26.5-40.0 | 1.30 | 0.60 | 75 | 20 | 0.75 | 1.13 |
| 34 | 22.0-33.0 | 1.30 | 0.50 | 100 | 30 | 0.75 | 1.13 |
| 42 | 18.0-26.5 | 1.20 | 0.35 | 100 | 39 | 0.88 | 1.25 |
| 51 | 15.0-22.0 | 1.20 | 0.35 | 200 | 70 | 0.88 | 1.25 |
| 62 | 12.4-18.0 | 1.12 | 0.20 | 400 | 100 | 1.00 | 1.88 |
| 75 | 10.0-15.0 | 1.12 | 0.15 | 750 | 140 | 1.13 | 2.25 |
| 90 | 8.2-12.4 | 1.10 | 0.10 | 1000 | 180 | 1.75 | 2.50 |
| 102 | 7.0-11.0 | 1.10 | 0.09 | 1500 | 300 | 2.00 | 2.88 |
| 112 | 7.05-10.0 | 1.10 | 0.08 | 1500 | 315 | 2.25 | 3.25 |
| 137 | 5.85-8.2 | 1.10 | 0.07 | 2000 | 500 | 2.38 | 3.38 |
| 159 | 4.9-7.05 | 1.10 | 0.06 | 2500 | 1100 | 4.00 | 6.00 |
| 187 | 3.95-5.85 | 1.10 | 0.05 | 3000 | 1250 | 4.38 | 6.50 |
| 229 | 3.3-4.9 | 1.10 | 0.02 | 4000 | 1550 | 6.50 | 8.00 |
| 284 | 2.6-3.95 | 1.10 | 0.02 | 4000 | 2000 | 7.00 | 9.50 |
| 340 | 2.2-3.3 | 1.10 | 0.01 | 8000 | 3700 | 10.00 | 16.00 |
| 430 | 1.7-2.6 | 1.10 | 0.01 | 10000 | 4700 | 12.00 | 25.00 |

Appendix M
Flexible Seamless Waveguide

| WR | Frequency Range (GHz) | VSWR | Insertion Loss (dB/foot) | CW Power (Watts) | Peak Power (kW) | Bend Radii With Jacket | |
|-----|-----------------------|------|--------------------------|------------------|-----------------|------------------------|---------|
| | | | | | | E-Plane | H-Plane |
| 28 | 26.5-40.0 | 1.30 | 0.65 | 75 | 20 | 0.44 | 0.94 |
| 34 | 22.0-33.0 | 1.30 | 0.50 | 100 | 30 | 0.44 | 0.94 |
| 42 | 18.0-26.5 | 1.20 | 0.35 | 100 | 39 | 0.57 | 1.00 |
| 51 | 15.0-22.0 | 1.20 | 0.35 | 200 | 70 | 0.57 | 1.00 |
| 62 | 12.4-18.0 | 1.12 | 0.20 | 400 | 100 | 0.69 | 1.25 |
| 75 | 10.0-15.0 | 1.10 | 0.15 | 750 | 140 | 0.63 | 1.25 |
| 90 | 8.2-12.4 | 1.10 | 0.10 | 1000 | 180 | 1.25 | 1.50 |
| 102 | 7.0-11.0 | 1.10 | 0.09 | 1500 | 300 | 1.30 | 1.94 |
| 112 | 7.05-10.0 | 1.10 | 0.08 | 1500 | 315 | 1.40 | 1.82 |
| 137 | 5.85-8.2 | 1.10 | 0.07 | 2000 | 500 | 1.50 | 2.07 |
| 159 | 4.9-7.05 | 1.10 | 0.06 | 2500 | 1100 | 1.60 | 2.25 |
| 187 | 3.95-5.85 | 1.10 | 0.05 | 3000 | 1250 | 1.94 | 3.00 |
| 229 | 3.3-4.9 | 1.10 | 0.02 | 4000 | 1550 | 2.13 | 3.25 |
| 284 | 2.6-3.95 | 1.10 | 0.02 | 4000 | 2000 | 2.94 | 5.50 |

Flexible Seamless Millimeter Waveguide Assemblies

| WR | Frequency Range (GHz) | VSWR | Insertion Loss (dB/foot) | Avg. Power (Watts) | Peak Power (kW) |
|----|-----------------------|------|--------------------------|--------------------|-----------------|
| 10 | 75.00-110.00 | 1.15 | 0.25 | 30 | 2.5 |
| 12 | 60.00-90.00 | 1.12 | 0.20 | 40 | 3.8 |
| 15 | 50.00-75.00 | 1.10 | 0.11 | 50 | 5.7 |
| 19 | 40.00-60.00 | 1.10 | 0.08 | 60 | 10 |
| 22 | 33.00-50.00 | 1.10 | 0.05 | 75 | 12 |
| 28 | 26.50-40.00 | 1.10 | 0.04 | 150 | 20 |



Appendix N

Double Ridge Flexible Waveguide Specifications

| WRD SIZE | Frequency Range (GHz) | VSWR | Insertion Loss (dB/foot) * | CW Power (Watts) | Peak Power (kW) | Bend Radii | |
|----------|-----------------------|------|----------------------------|------------------|-----------------|------------|---------|
| | | | | | | E-Plane | H-Plane |
| 180 | 18.0-40.0 | 1.35 | 1.00 | 150 | 2.5 | 1.00 | 3.00 |
| 650 | 6.5-18.0 | 1.30 | 0.35 | 600 | 12.0 | 2.50 | 5.00 |
| 750 | 7.5-18.0 | 1.25 | 0.35 | 750 | 15.0 | 2.50 | 5.00 |
| 580 | 5.8-16.0 | 1.20 | 0.25 | 1500 | 20.0 | 2.50 | 3.25 |
| 475 | 4.75-11.0 | 1.20 | 0.20 | 1750 | 40.0 | 3.00 | 6.50 |
| 350 | 3.5-8.2 | 1.20 | 0.15 | 2000 | 75.0 | 4.50 | 8.00 |
| 250 | 2.6-7.8 | 1.20 | 0.15 | 3000 | 150.0 | 8.00 | 12.00 |
| 200 | 2.0-4.8 | 1.15 | 0.10 | 4000 | 200.0 | 10.00 | 16.00 |

Double Ridge Flexible-Twistable Waveguide Specifications

| WRD SIZE | Frequency Range (GHz) | VSWR | Insertion Loss (dB/foot) * | CW Power (Watts) | Peak Power (kW) | Bend Radii | |
|----------|-----------------------|------|----------------------------|------------------|-----------------|------------|---------|
| | | | | | | E-Plane | H-Plane |
| 180 | 18.0-40.0 | 1.35 | 1.50 | 50 | 2.5 | 1.00 | 3.00 |
| 650 | 6.5-18.0 | 1.30 | 0.40 | 200 | 12.0 | 2.50 | 5.00 |
| 750 | 7.5-18.0 | 1.25 | 0.40 | 250 | 15.0 | 2.50 | 5.00 |
| 580 | 5.8-16.0 | 1.20 | 0.30 | 500 | 20.0 | 2.50 | 3.25 |
| 475 | 4.75-11.0 | 1.20 | 0.25 | 700 | 40.0 | 3.00 | 6.50 |
| 350 | 3.5-8.2 | 1.20 | 0.20 | 750 | 75.0 | 4.50 | 8.00 |
| 250 | 2.6-7.8 | 1.20 | 0.20 | 1000 | 150.0 | 8.00 | 12.00 |
| 200 | 2.0-4.8 | 1.15 | 0.15 | 1500 | 200.0 | 10.00 | 16.00 |

*Attenuation values are for silver plated waveguide.

Appendix O
Inside Bend Radius for Formed Bends

| WR SIZE | Minimum Inside Bend Radius | | Standard Inside Bend Radius | |
|---------|----------------------------|---------|-----------------------------|---------|
| | E-Plane | H-Plane | E-Plane | H-Plane |
| 28 | 1/4 | 5/16 | 1/2 | 1/2 |
| 34 | 1/4 | 5/16 | 1/2 | 1/2 |
| 42 | 1/4 | 5/16 | 1/2 | 1/2 |
| 51 | 5/16 | 7/16 | 1/2 | 1/2 |
| 62 | 3/8 | 1/2 | 5/8 | 3/4 |
| 75 | 7/16 | 5/8 | 3/4 | 1.0 |
| 90 | 1/2 | 3/4 | 1.0 | 1-1/4 |
| 102 | 3/4 | 1.0 | 1-1/4 | 1-1/2 |
| 112 | 3/4 | 1.0 | 1-1/4 | 1-1/2 |
| 137 | 7/8 | 1-1/4 | 1-5/16 | 1-5/8 |
| 159 | 1.0 | 1-1/2 | 1-1/2 | 1-3/4 |
| 187 | 1.0 | 1-1/2 | 1-1/2 | 1-3/4 |
| 229 | 1-1/2 | 2.0 | 2.0 | 2-1/2 |
| 284 | 2.0 | 2-1/2 | 2-1/2 | 3.0 |

Appendix P
EMI/RFI Gaskets Physical Properties & Temperature Range

| Elastomer | | Conductive Silicone | Conductive Silicone |
|--------------------------------|---------|---------------------|---------------------|
| MIL-83528 | | Type B | Type K |
| Temperature Range | Min | -48°C | -43°C |
| | Max | +71°C | +52°C |
| Hardness | Shore A | 65 | 85 |
| Tensile Strength | PSI | 200 | 400 |
| Tear Strength | PI | 30 | 40 |
| Elongation % | Min | 100 | 100 |
| | Max | 300 | 300 |
| Compression Deflection (% min) | | 3.5 | 2.5 |
| Compression Set (%) | | 32 | 35 |
| Tear Strength | lb/in | 30 | 40 |
| Shielding Effectiveness | 100 MHz | 120 | 120 |
| | 500 MHz | 120 | 120 |
| | 2 GHz | 115 | 120 |
| | 10GHz | 115 | 120 |
| Shelf Life | years | 15 | 15 |