



# Microwave Assembly 1.0 - 18.0 GHz

**Datasheet 203**

## FEATURES:

- TYPE 1 TUNER
- 65 dB INSTANTANEOUS DYNAMIC RANGE
- -65 dBm CHANNEL SENSITIVITY
- PRECONVERSION CHANNELS: 8 EACH;
- -65 dBc; 15% FROM BAND EDGES
- -60 dB CHANNEL TO CHANNEL ISOLATION
- BUILT-IN 65 dB LOG VIDEO OUT @ 1.0GHz

**AKON** is a leading manufacturer of high quality converter assemblies. Model A20-MX152 covers the 1.0 - 18.0 GHz input range. Using 8 pre-mixer channels and dual conversion, the input frequency is translated to 1.0 GHz with IF bandwidths of +/- 250, +/- 125, +/- 25 and extremely narrow +/-10MHz. Log Video (SDLA's) at 1.0 GHz and 1.0 - 18.0GHz is built-in. Capability exists for the unit to receive an external signal of 750-1250 MHz and upconvert it to 1 - 18 GHz using unique architecture. AKON is qualified to MIL-I-45208 Quality System Requirements by agencies of the U,S, Department of Defense and well as by leading foreign and domestic military OEMs. Screening to requirements of MIL-STD-883 is available. All specifications described below are over the full operating temperature.

## SPECIFICATIONS:

| Model Number                | A20-MX152  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
|-----------------------------|--|-----------------------------------|-----------|---------------------|------|---------------|--------------------------------|------|---------------|--------------------------------|------|---------------|---------------------------------|------|---------------|-------------------------------|------|---------------|---------------------------------|------|----------------|---------------------------------|------|-----------------|-----------------------------------|------|-----------------|---------------|
| <b>INPUT PORTS</b>          |  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Frequency Range (GHz)       | Port J1 (Antenna) ..... 1.0 - 18.0<br>Port J2 (Internal Connection) ..... 1.0 - 18.0<br>Port J3 (BITE) ..... 1.0 - 18.0<br>Port J9 (External Input) ..... 0.75 - 1.250; -6 to +6 dBm<br>Port J11 (LO-1)..... 7.5 - 16.8; 0 dBm (max)<br>Port J12 (LO-2) ..... 5.5; 0 dBm (max)   |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Noise Figure (dB)           | 17 (max); 16 (nom)   |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Dynamic Range (dBm)         | -65 to 0 (1.0 dB compression)  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Input Pre-Selection         | <table border="0"> <thead> <tr> <th>Channel</th> <th>Frequency</th> <th>Stop-Band (-60 dBc)</th> </tr> </thead> <tbody> <tr> <td>CH:1</td> <td>1.0 - 1.8 GHz</td> <td>DC - 850 GHz; 2.07 to 18.0 GHz</td> </tr> <tr> <td>CH:2</td> <td>1.5 - 2.3 GHz</td> <td>DC - 1.3 GHz; 2.64 to 18.0 GHz</td> </tr> <tr> <td>CH:3</td> <td>2.0 - 3.8 GHz</td> <td>DC - 1.73 GHz; 4.37 to 18.0 GHz</td> </tr> <tr> <td>CH:4</td> <td>3.5 - 5.8 GHz</td> <td>DC - 3.0 GHz; 6.3 to 18.0 GHz</td> </tr> <tr> <td>CH:5</td> <td>5.5 - 8.1 GHz</td> <td>DC - 4.7 GHz; 9.315 to 18.0 GHz</td> </tr> <tr> <td>CH:6</td> <td>7.8 - 12.3 GHz</td> <td>DC - 6.8 GHz; 14.14 to 18.0 GHz</td> </tr> <tr> <td>CH:7</td> <td>12.0 - 16.3 GHz</td> <td>DC - 10.4 GHz; 18.745 to 24.0 GHz</td> </tr> <tr> <td>CH:8</td> <td>16.0 - 18.0 GHz</td> <td>DC - 13.9 GHz</td> </tr> </tbody> </table> | Channel                           | Frequency | Stop-Band (-60 dBc) | CH:1 | 1.0 - 1.8 GHz | DC - 850 GHz; 2.07 to 18.0 GHz | CH:2 | 1.5 - 2.3 GHz | DC - 1.3 GHz; 2.64 to 18.0 GHz | CH:3 | 2.0 - 3.8 GHz | DC - 1.73 GHz; 4.37 to 18.0 GHz | CH:4 | 3.5 - 5.8 GHz | DC - 3.0 GHz; 6.3 to 18.0 GHz | CH:5 | 5.5 - 8.1 GHz | DC - 4.7 GHz; 9.315 to 18.0 GHz | CH:6 | 7.8 - 12.3 GHz | DC - 6.8 GHz; 14.14 to 18.0 GHz | CH:7 | 12.0 - 16.3 GHz | DC - 10.4 GHz; 18.745 to 24.0 GHz | CH:8 | 16.0 - 18.0 GHz | DC - 13.9 GHz |
| Channel                     | Frequency  | Stop-Band (-60 dBc)               |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:1                        | 1.0 - 1.8 GHz  | DC - 850 GHz; 2.07 to 18.0 GHz    |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:2                        | 1.5 - 2.3 GHz  | DC - 1.3 GHz; 2.64 to 18.0 GHz    |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:3                        | 2.0 - 3.8 GHz  | DC - 1.73 GHz; 4.37 to 18.0 GHz   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:4                        | 3.5 - 5.8 GHz  | DC - 3.0 GHz; 6.3 to 18.0 GHz     |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:5                        | 5.5 - 8.1 GHz  | DC - 4.7 GHz; 9.315 to 18.0 GHz   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:6                        | 7.8 - 12.3 GHz   | DC - 6.8 GHz; 14.14 to 18.0 GHz   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:7                        | 12.0 - 16.3 GHz  | DC - 10.4 GHz; 18.745 to 24.0 GHz |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| CH:8                        | 16.0 - 18.0 GHz  | DC - 13.9 GHz                     |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| <b>OUTPUT PORTS</b>         |  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Port J5                     | Frequency Range: 1 - 18 GHz; +19 dBm (max); +13 dBm (min)  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Port J6                     | Linear Receiver Gain: 5.0 dB Nom.<br>Output: -60 to +5 dBm<br>Frequency Ripple: +/- 2.0 dB<br>Frequency Flatness: +/- 3.0 dB (Including Temp.)   |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Port J7 (Band Limited)      | Output: -2 dBm +/- 2.0dB @750 - 1250MHz<br>Harmonics: -50 dBc  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Port J8 (Band limited)      | Output: +7dBm +/- 2dB @750 - 1250 MHz<br>Harmonics: -50 dBc  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |
| Port J10 (Log Video Output) | Frequency: 0.75 - 1.25 GHz<br>Dynamic Range: -65 to 0 dBm<br>Rise Time: 10 nS<br>Fall Time: 75 nS<br>Log Linearity: +/- 1.0 dB<br>Localized DLVA Flatness: +/- 1.0 dB (nom)  |                                   |           |                     |      |               |                                |      |               |                                |      |               |                                 |      |               |                               |      |               |                                 |      |                |                                 |      |                 |                                   |      |                 |               |

Note: All dimensions are specified in inches (mm)



2135 Ringwood Ave. San Jose, CA 95131 Tel. (408) 432-8039 Fax (408) 432-1089  
www.akoninc.com sales@akoninc.com

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### SPECIFICATIONS CONT'D:

| Model Number          | A20-MX152                 |                                 |
|-----------------------|---------------------------|---------------------------------|
| Port J13 (SDLA)       | Frequency Range:          | 750 MHz-18.0 GHz                |
|                       | Dynamic Range:            | -65 to 0 dBm                    |
|                       | Log Linearity :           | +/- 1.0 dB (nom); +/- 2.0 (max) |
|                       | Localized Flatness:       | +/- 2.5 (dB)                    |
|                       | Rise Time:                | 10 nS                           |
|                       | Recovery Time:            | 100 nS                          |
|                       | Log Slope:                | 25 mV/dB                        |
| IF Bandwidth          | Center Frequency:         | 1.0 GHz                         |
|                       | BW1:                      | +/- 10 MHz                      |
|                       | BW2:                      | +/- 25 MHz                      |
|                       | BW3:                      | +/- 125 MHz                     |
|                       | BW4:                      | +/- 250 MHz                     |
| Digital Attenuator    | Frequency Range (GHz):    | 1.0 - 18.0 +/- 1.0 (nom)        |
|                       | Response Time:            | 100 nS                          |
|                       | Dynamic Range:            | 15.5 dBm                        |
|                       | Accuracy:                 | +/- 1.0 dB                      |
|                       | Step Size:                | 0.5 dB                          |
| Power Supply (VDC)    | +8 @ 2800 mA; -8 @ 700 mA |                                 |
| Power Consumption (W) | 28                        |                                 |

Note: All dimensions are specified in inches (mm)

### BLOCK DIAGRAM:



