Manual and Stepper Motor Driven Waveguide Switches

Hughes 4552xH series of Manual Waveguide Switches have a three-channel rotor accurately indexed to eight 45° switch positions with continuous clockwise or counterclockwise rotation. The switch has four ports and four functional switch positions so that each port can be coupled to any other port or be isolated.

The Hughes 4551xH series of Stepper Motor Driven Waveguide Switches are the manual switches described above with a stepper motor drive. The motor steps in increments of 15° for each applied electrical pulse of 30 to 45 milliseconds. Three pulses are required to switch between index positions.

**FEATURES:**

3 Channel 4 Port

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**ELECTRICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th></th>
<th>Frequency Band (GHz)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>K (18-26.5)</td>
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<td>---------------------</td>
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<tr>
<td>Isolation (dB min)</td>
<td>80</td>
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<tr>
<td>Insertion Loss (dB max)</td>
<td>0.4</td>
</tr>
<tr>
<td>Repeatability (dB typ)</td>
<td>0.05</td>
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<tr>
<td>VSWR (max)</td>
<td>1.15:1</td>
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**Stepper Motor Pulse Power Requirement (without driver)**

(Volts/Amps Peak (typ) Occasional Switching 38/5.5 38/5.5 38/5.5 38/5.5 38/5.5 38/5.5 38/5.5 38/5.5
Continuous Switching 30/3.5 30/3.5 30/3.5 30/3.5 30/3.5 30/3.5 30/3.5 30/3.5

**Power Requirements with TTL Drivers (V/A max)**

40/5.5 40/5.5 40/5.5 40/5.5 40/5.5 40/5.5 40/5.5 40/5.5
5/0.2 5/0.2 5/0.2 5/0.2 5/0.2 5/0.2 5/0.2 5/0.2

*Also operates at 28 volts 3 amps or 20 volts 2.5 amps at slower speeds.

**HOW TO ORDER**

Stepper Motor Driven Waveguide Switch ............... 4551xH-x00
Manual Waveguide Switch .......................... 4552xH-x00

**Frequency Band**

0. K
1. Ka
2. Q
3. U
4. V
5. E
6. W
7. F
8. D
9. G

**Flange Type**

1. Round (Ka- through G-bands only)
2. Square (available in K- and Ka-band only)

**Encoder Option**

2. With encoder and TTL driver

Example: To order a G-band Stepper Motor Waveguide Switch with encoder and TTL driver specify a 45519H-1002.
Both the Manual and Stepper Motor Driven Switches are available between 18 and 220 GHz. They have inter-channel isolation of greater than 60 dB to 75 GHz and greater than 50 dB to 220 GHz. The Stepper Motor Driven Waveguide Switch has switching speeds as low as 122 milliseconds between positions for occasional switching and as low as 12 milliseconds on a more continuous basis.

The Stepper Motor Driven Waveguide Switch is available with a built-in encoder and TTL compatible driver. The encoder consists of an optical alignment system comprised of LEDs and phototransistors mounted in the switch assembly. A cable connects the encoder to the driver, TTL logic supplied to the driver controls the switch position. In addition, the switch may be operated by a switch on the driver unit.

The Hughes family of four-port rotary switches are extremely useful in the laboratory as well as in system applications. Laboratory setups requiring more than one source, detector, or thermistor combinations for substitution or comparison purposes prove to be ideal candidates.

Positive Index and Switching Action

60 dB Isolation

**MECHANICAL SPECIFICATIONS**

|------------------|-------|-------|-------|-------|-------|-------|-------|------|------|------|

① Refer to page 157 for specifications and MIL specification cross reference ② Square flange ③ Round flange

**OUTLINE DRAWINGS (Ka- through G-band)**