BROADBAND

SPST SWITCH

SERIES QB/QB-HA

HIGH ISOLATION-REFLECTIVE AND ABSORPTIVE 0.02-18 GHz

GENERAL INFORMATION:

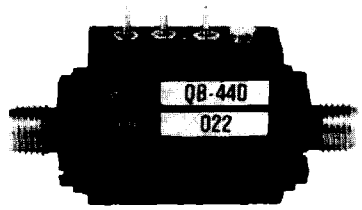
Series QB and QB-HA broadband switches are medium power devices that operate over relatively wide frequency ranges. Carefully selected diodes placed in either series, series-shunt, or shunt configurations produce excellent electrical performance from UHF through KU bands.

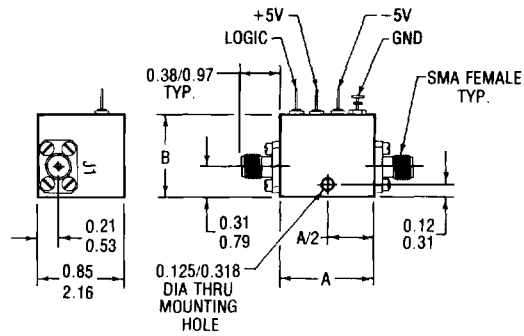
GENERAL SPECIFICATIONS:

Frequency Coverage:	0.02 to 18.0 GHz.
RF Impedance:	50 OHMS.
RF Power:	+20 dBm operational. Consult factory for high power options.
DC Requirements:	Switches without drivers require +50 mA max for the "off" condition. For the "on" condition models QB-11 through QB-39 and models QB-10-HA through QB-99-HA require −5 volts at −60 mA max and models QB-41 through QB-95 require −5 volts at 0 mA. Switches with drivers require a ±5 volt supply at ±70 mA. Logic is TTL "0" when "on" and "1" when "off". Different supply voltages and logic available when specified at time order is placed.
Temperature Information:	Operating temperature from −55°C to +85°C.
Switching Speed:	10% to 90% or 90% to 10% of RF. There is an additional 30 nanosec of driver delay.
Environment:	MIL-E-5400, MIL-STD-202, MIL-E-16400 MIL-STD-883 (Special request only).
Connectors:	RF connectors are SMA. Other connectors available (if specified when order is placed) include types N, TNC, and BNC.

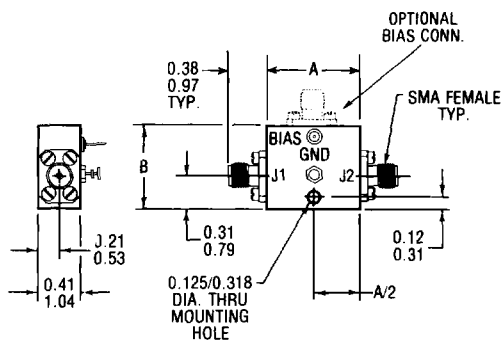
NOTES:

1. Drive connection is normally supplied as a solder feedthrough terminal. Other connectors available (if specified when order is placed) include SMA and SMC.
2. If driver is required, add "D" to the model number when ordering, i.e. Model QB-11, with driver, becomes QB-11D.
3. When ordering, the complete model number should be given. The model number consists of the model number for a standard switch plus the dash number for any options, i.e. model QB-82D-2 is a SPST reflective switch, with driver, whose frequency range is 7.0 to 12.4 GHz and a switching speed of 10 nanosecs.
4. Any unit listed can be supplied with pins instead of RF connectors. (Consult factory.)
5. Any of the switches listed are available with absorptive input and output on request.





OUTLINE WITH DRIVER J1-INPUT



OUTLINE WITHOUT DRIVER J1-INPUT

TYPICAL MODEL NO.

QB - XX or XXHA - D - X

Model Series	Freq Code	Driver Option (Note 2)	Speed Option (Note 3)

Hermetic Seal
and Mil STD 883
Screening Available

MECHANICAL OUTLINES

Outline	A Inches cm.	B Inches cm.
1	0.91 2.31	0.76 1.93
2	1.10 2.79	1.26 3.20
3	1.00 2.54	1.06 2.69
4	1.10 2.79	0.71 1.80
5	0.90 2.29	1.11 2.82
6	1.10 2.79	1.16 2.95
7	1.50 3.81	1.16 2.95

Inches/Centimeters
xx ±0.3 xxx±.010/ xx±.08 xxx±.025

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SPST SWITCH SERIES QB/QB-HA

HIGH ISOLATION-REFLECTIVE AND ABSORPTIVE 0.02-18 GHz

ELECTRICAL PERFORMANCE

Power: 1 watt average, 10 watts peak

STANDARD SWITCH							HIGH SPEED OPTION			
Isolation: 60 dB or 80 dB minimum Speed: 2 microsec. maximum							MODEL-1		MODEL-2	
Reflective Model No.	Absorptive Model No.	Frequency Range GHz	Isolation Min. dB.	Insertion Loss Max. dB Ref. / Abs.	VSWR† Max.	Outline Ref. / Abs.	Speed Nanosec.	Insertion Loss Max. dB Ref. / Abs.	Speed Nanosec. Ref. / Abs.	Insertion Loss Max. dB Ref. / Abs.
QB-11	QB-10-HA	0.02-0.1	60	0.50 / 0.60	1.50	3 / 5	500	0.55 / 0.65	N/A	N/A
QB-13	QB-12-HA	0.02-0.1	80	0.60 / 0.70	1.50	3 / 5	500	0.65 / 0.75	N/A	N/A
QB-15	QB-14-HA	0.1-1.0	60	0.80 / 0.90	1.50	1 / 5	500	0.85 / 0.95	N/A	N/A
QB-17	QB-16-HA	0.1-1.0	80	0.90 / 1.00	1.50	1 / 5	500	0.95 / 1.05	N/A	N/A
QB-19	QB-18-HA	0.1-2.0	60	1.10 / 1.20	1.50	1 / 5	500	1.15 / 1.25	N/A	N/A
QB-21	QB-21-HA	0.1-2.0	80	1.20 / 1.30	1.50	1 / 5	500	1.25 / 1.35	N/A	N/A
QB-22	QB-23-HA	0.25-0.5	60	0.80 / 0.90	1.50	1 / 5	500	0.85 / 0.95	N/A	N/A
QB-24	QB-25-HA	0.25-0.5	80	0.90 / 1.00	1.50	1 / 5	500	0.95 / 1.05	N/A	N/A
QB-26	QB-27-HA	0.25-1.0	60	0.80 / 0.90	1.50	1 / 5	500	0.85 / 0.95	N/A	N/A
QB-28	QB-29-HA	0.25-1.0	80	0.90 / 1.00	1.50	1 / 5	500	0.95 / 1.05	N/A	N/A
QB-30	QB-30-HA	0.5-1.0	60	0.70 / 0.80	1.50	1 / 5	100	0.80 / 0.90	10 / 20	0.90 / 1.00
QB-31	QB-32-HA	0.5-1.0	80	0.80 / 0.90	1.50	1 / 5	100	0.90 / 1.00	10 / 20	1.00 / 1.10
QB-33	QB-34-HA	0.5-2.0	60	0.80 / 0.90	1.50	1 / 5	100	0.90 / 1.00	10 / 20	1.00 / 1.10
QB-35	QB-36-HA	0.5-2.0	80	0.90 / 1.00	1.50	1 / 5	100	1.00 / 1.10	10 / 20	1.10 / 1.20
QB-37	QB-38-HA	1.0-2.0	60	0.70 / 0.80	1.50	4 / 5	100	0.85 / 0.90	10 / 20	0.95 / 1.10
QB-39	QB-41-HA	1.0-2.0	80	0.80 / 0.90	1.50	4 / 5	100	0.90 / 1.00	10 / 20	1.00 / 1.10
QB-41	QB-43-HA	1.0-4.0	60	0.80 / 0.90	1.50	4 / 5	100	0.90 / 1.00	10 / 20	1.00 / 1.10
QB-42	QB-45-HA	1.0-4.0	80	0.90 / 1.00	1.50	4 / 5	100	1.00 / 1.10	10 / 20	1.10 / 1.20
QB-44	QB-47-HA	1.0-6.0	60	0.90 / 1.10	1.50	4 / 5	100	1.10 / 1.20	10 / 20	1.25 / 1.30
QB-46	QB-49-HA	1.0-6.0	80	1.00 / 1.20	1.50	4 / 5	100	1.20 / 1.30	10 / 20	1.35 / 1.40
QB-48	QB-50-HA	1.5-3.0	60	0.80 / 1.00	1.50	4 / 5	100	0.95 / 1.10	10 / 20	1.10 / 1.20
QB-50	QB-52-HA	1.5-3.0	80	0.90 / 1.10	1.50	4 / 5	100	1.10 / 1.20	10 / 20	1.25 / 1.30
QB-51	QB-54-HA	2.0-4.0	60	0.70 / 0.80	1.50	2 / 5	100	0.85 / 0.90	10 / 20	0.95 / 1.00
QB-53	QB-56-HA	2.0-4.0	80	0.80 / 0.90	1.50	2 / 5	100	0.90 / 1.00	10 / 20	1.00 / 1.10
QB-55	QB-58-HA	2.0-8.0	60	1.00 / 1.20	1.50	4 / 6	100	1.15 / 1.30	10 / 20	1.30 / 1.40
QB-57	QB-61-HA	2.0-8.0	80	1.10 / 1.30	1.50	4 / 7	100	1.25 / 1.40	10 / 20	1.40 / 1.50
QB-59	QB-63-HA	3.0-12.0	60	2.00 / 2.25	2.00	4 / 6	100	2.40 / 2.50	10 / 20	2.60 / 2.75
QB-61	QB-65-HA	3.0-12.0	80	2.20 / 2.40	2.00	4 / 7	100	2.50 / 2.60	10 / 20	2.75 / 2.80
QB-62	QB-67-HA	4.0-8.0	60	1.00 / 1.20	1.50	4 / 6	100	1.15 / 1.30	10 / 20	1.30 / 1.40
QB-64	QB-69-HA	4.0-8.0	80	1.10 / 1.30	1.50	4 / 7	100	1.25 / 1.40	10 / 20	1.40 / 1.50
QB-66	QB-70-HA	2.0-18.0	60	2.50 / 2.70	2.50	3 / 6	100	2.75 / 2.90	10 / 20	3.00 / 3.10
QB-68	QB-72-HA	2.0-18.0	80	2.70 / 2.90	2.50	3 / 7	100	2.95 / 3.10	10 / 20	3.25 / 3.30
QB-70	QB-74-HA	5.0-10.0	60	1.40 / 1.60	1.50	4 / 6	100	1.50 / 1.70	10 / 20	1.70 / 1.90
QB-71	QB-76-HA	5.0-10.0	80	1.50 / 1.70	1.50	4 / 7	100	1.60 / 1.85	10 / 20	1.80 / 2.00
QB-73	QB-78-HA	6.0-12.0	60	1.60 / 1.80	2.00	4 / 6	100	1.75 / 2.00	10 / 20	1.90 / 2.10
QB-75	QB-81-HA	6.0-12.0	80	1.70 / 1.90	2.00	4 / 7	100	1.90 / 2.10	10 / 20	2.10 / 2.25
QB-77	QB-83-HA	6.0-18.0	60	2.50 / 2.70	2.50	3 / 6	100	2.75 / 2.90	10 / 20	3.00 / 3.10
QB-79	QB-85-HA	6.0-18.0	80	2.70 / 2.90	2.50	3 / 6	100	2.95 / 3.10	10 / 20	3.25 / 3.30
QB-81	QB-87-HA	7.0-12.4	60	1.70 / 1.90	1.60	4 / 6	100	1.90 / 2.10	10 / 20	2.10 / 2.30
QB-82	QB-89-HA	7.0-12.4	80	1.80 / 2.00	1.60	4 / 7	100	2.00 / 2.25	10 / 20	2.20 / 2.40
QB-84	QB-90-HA	7.0-18.0	60	2.50 / 2.70	2.20	3 / 6	100	2.75 / 2.90	10 / 20	3.00 / 3.10
QB-86	QB-92-HA	7.0-18.0	80	2.70 / 2.90	2.20	3 / 7	100	2.95 / 3.10	10 / 20	3.25 / 3.30
QB-88	QB-94-HA	8.0-18.0	60	2.50 / 2.70	2.00	3 / 6	100	2.75 / 2.90	10 / 20	3.00 / 3.10
QB-90	QB-96-HA	8.0-18.0	80	2.70 / 2.90	2.00	3 / 7	100	2.95 / 3.10	10 / 20	3.25 / 3.30
QB-93	QB-97-HA	12.0-18.0	60	2.50 / 2.70	2.00	1 / 6	100	2.75 / 2.90	10 / 20	3.00 / 3.10
QB-95	QB-99-HA	12.0-18.0	80	2.70 / 2.90	2.00	1 / 7	100	2.95 / 3.10	10 / 20	3.25 / 3.30

If improvement of any of the electrical specifications listed above is required, consult factory.

†Reflective Switch: VSWR measured in the 'ON' Input and 'ON' Output Position.
Absorptive Switch: VSWR measured in the 'ON' Input and 'ON' Output and 'OFF' Input Position.

Insertion Loss measured with input power less than 100 mW.

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