

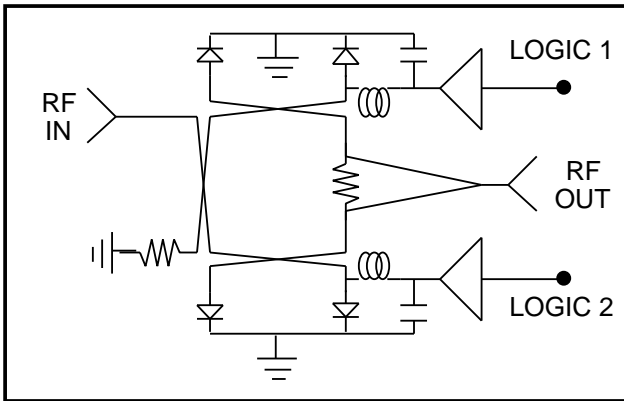
STANDARD PRODUCTS

DESCRIPTION

This line of inexpensive quadrature modulators find use in narrow-band (less than 10 percent) applications. Several options exist to allow tailoring and specifying devices to meet particular requirements.

QUADRAPHASE MODULATOR SERIES "NQPM-"

SCHEMATIC



ELECTRICAL SPECIFICATIONS

Frequency Range: Any specified frequency between 1 and 20 GHz over a maximum of a 10% bandwidth. (see note 1)

Relative Phase States: 0, 90, 180, and 270

Phase State Accuracy: $\pm \{5^\circ + X^\circ\}$ (where X° is defined in note 2)

Resulting Amplitude Modulation: ± 1 dB max.

Logic Impedance: TTL, ECL (see note 1)

Switching Speed: 25 nS max. (see note 3)

Transition Time: 5 nS max. (see note 4)

Repetition Rate: 10 MHz max. (see note 5)

Video Transients: (see notes 1 and 6)

Operating Power: +20 dBm CW or Peak

Survival Power: +27 dBm CW or Peak

Spurious Harmonics: -30 dBc

Supply Requirements: +V $\pm 5\%$ @ 50 mA max., -V $\pm 5\%$ @ 50 mA max. (see note 1)

R.F. PERFORMANCE

FREQUENCY RANGE (GHZ)	INSERTION LOSS (DB) (7)	VSWR (8)
1.0-2.0	7.0	1.50
2.0-4.0	7.2	1.65
4.0-8.0	7.5	1.75
8.0-12.0	8.0	1.85
12.0-18.0	8.5	2.00
18.0-20.0	9.0	2.20

(1) Specified by options designated in part number.

(2) The factor, "X°", is defined as the bandwidth (%) times the frequency (GHz) divided by 10. For example: A 5% BW unit centered at 10 GHz would have an "X°" of 10° or a total "Phase State Accuracy" of $\pm 10^\circ$.

(3) "Switching Speed" is defined as the time between the 50% point of the control voltage and where the detected phase has reached 90% of its final value.

(4) "Transition Time" is defined as the time between the 10% and the 90% points of the detected phase.

(5) Exceeding specified modulation rate may result in excessive driver dissipation and can cause device failure.

(6) Measured into a 50 ohms with a 150MHz B.W. oscilloscope. Typically 2V p-p max. unfiltered and 50mV p-p max. with filtering. Filtering will typically add 0.3dB insertion loss per filter in a transmission path.

(7) Insertion Loss may be improved over that specified for either very narrow band units or for units operating near the low end of each frequency band listed.

(8) VSWR may be improved over that specified for either very narrow band units or for units operating near the low end of each frequency band listed.

ENVIRONMENTAL RATINGS

Temperature:

Operating ——— -55°C to +85°C
 Non-operating ——— -65°C to +125°C

Altitude:

MIL-STD-202C, Method 105C,
 Cond. B (50,000ft)

Humidity:

MIL-STD-202C, Method 103B,
 Cond. B (96 hrs. at 95%)

Temp Cycling:

MIL-STD-202C, Method 105C,
 Cond. D, 5 cycles

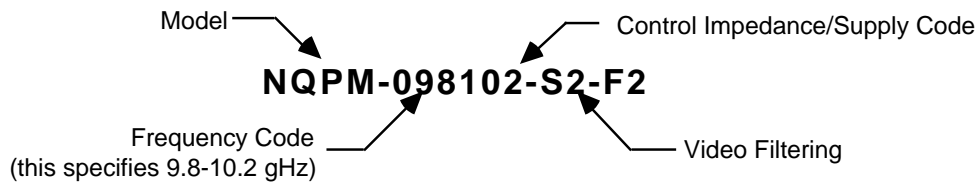
Vibration:

MIL-STD-202C, Method 204A,
 Cond. B (0.06" double amplitude
 or 15G, whichever is less)

Shock:

MIL-STD-202C, Method 213,
 Cond. B (750G, 6ms)

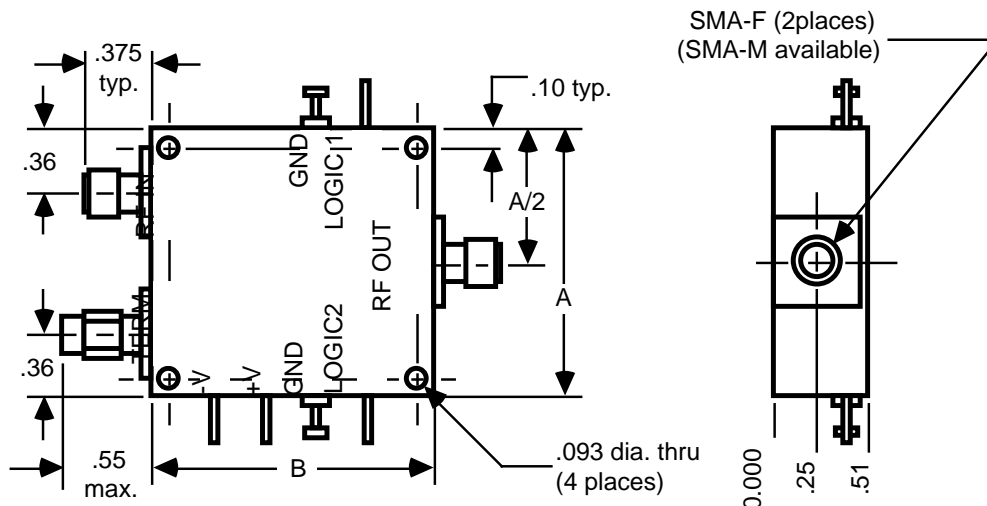
SPECIFYING A QUADRAPHASE MODULATOR



CONTROL IMPEDANCE	SUPPLIES R'QD	CODE
ECL	+5V, -5.2V	S1
TTL	+5V, -5V	S2
	+5V, -12V	S3
	+5V, -15V	S4

PORTS WITH VIDEO FILTERS	CODE
(NONE)	(STD)
RF IN	F2
RF OUT	F3
RF IN & OUT	F4

OUTLINE



FREQUENCY (GHZ)	DIM. "A"	DIM. "B"
1.0-2.0	2.50	2.58
2.0-4.0	2.00	2.08
4.0-8.0	1.50	1.58
8.0-20.0	1.25	1.33



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