

MONOPULSE DETECTORS

MODEL: MMDQ SERIES

The use of a complete three-channel monopulse IF processing system removes the critical interface problems normally encountered by the system designer. The block diagram configuration is designed for in-phase signal inputs, and reflects a field proven, straightforward use of the necessary IF elements. Other input phase configurations can also be supplied when required. Packaging is straightforward. An IF matrix, a detector matrix, and three matched limiter channels are all mounted to an aluminum base plate, with all power connectors brought out to a single barrier strip. If desired, all the individual modules can be removed from the plate and be separately mounted in the user's system.

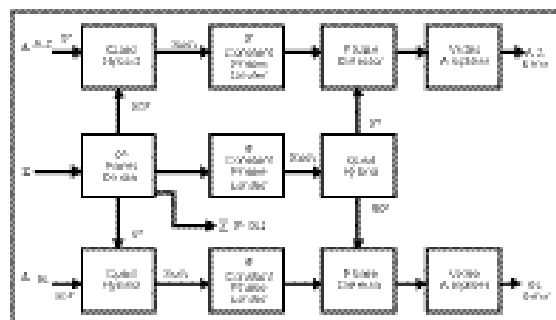
The monopulse detector determines the difference nulls in an amplitude monopulse system for two axes by measuring the DIFFERENCE (Δ) to SUM (Σ) ratio. Each video output is proportional to this ratio and to the cosine of the phase angle between the Δ and Σ signals. The detector is usually used in a return-to-boresight system, but may be used to determine the angle off boresight.

The output is of the form:

$$E_o = \frac{1.4(\Delta/\Sigma)\cos\theta}{[1+2(\Delta/\Sigma)\sin\theta + (\Delta/\Sigma)^2]^{1/2}}$$

Where:

- E_o = Instantaneous output voltage
- Δ/Σ = Ratio of Δ input voltage to Σ input voltage
- θ = Phase angle between Δ and Σ inputs



Ratio Accuracy: On a return-to-boresight system, the monopulse detector is used to determine the location of the crossover null in the Δ signal, and also the polarity of error. The ratio accuracy is a measure of how closely the system can detect crossover. The accuracy is given as the highest ratio of Δ/Σ that will produce a zero output.

MODEL NUMBER	OPERATING FREQUENCY (MHz)	-3 dB BANDWIDTH (MHz)	SETTLING TIME (μ s)	RATIO ACCURACY (dB)
MMDQ-3010-65	30	10	0.1	26
MMDQ-6020-65	60	20	0.08	26
MMDQ-7020-65	70	20	0.08	26
MMDQ-16020-60	160	20	0.08	23

ADDITIONAL SPECIFICATIONS

- Input dynamic range is from -60 to +5 dBm (-60 to 0 dBm for 160 MHz model).
- Input impedance is 50 Ω for DIFFERENCE and SUM IF input ports (VSWR 1.5:1 typical).
- Supplemental Σ IF output is approximately 7 dB below Σ IF input.
- Video output is DC coupled and rated into 75 Ω .
- Video output provides +2, \pm 0.2 volts at equal level signals and 0° phase between DIFFERENCE and SUM ports, and -2, \pm 0.2 volts at equal level signals and 180° phase between DIFFERENCE and SUM ports.
- Power: +12 VDC at 100 mA typical and -12 VDC at 500 mA typical.
- Other input phase configurations, input dynamic range and operational frequencies can also be provided when specified.
- Contact factory for availability.

ORDER OPTIONS

- For \pm 15 VDC, add suffix "C".
- Typical part number: MMDQ-3010-65C.

NOTE: FOR MODIFICATION OF OUR STANDARD MODELS, PLEASE CONSULT FACTORY.

