



Synthetic Aperture Radar Components

Data Sheet

Synthetic Aperture Radars provide extremely high resolution imagery from long ranges in all types of weather, day or night. Microwave Applications Group (MAG) provides components for several well-known Synthetic Aperture Radar systems. Among these components are MAG's Rotary-Field Phase Shifters and MAG's low-cost Dual-Mode Phase Shifters.



■ **MAG Rotary-Field Ferrite Phase Shifters** are uniquely designed to provide unlimited phase shift with modulo-360 degree phase control characteristics that are independent of frequency, temperature, power level, and ferrite material parameters. These units offer the advantage of continuously variable phase scanning and are capable of handling high power levels while maintaining rms phase error to less than one degree.



■ **MAG Dual-Mode Phase Shifters** are the only latching, reciprocal ferrite phase shifters successfully produced in large quantities, and have successfully been applied to numerous military and commercial applications. These units have been proven to be much more robust and significantly less costly than active array elements, and are capable of handling moderate levels of power.

MAG provides components for the following Synthetic Aperture Radar systems:

■ **U.S. Air Force U-2 Aircraft ASARS-2 Advanced Synthetic Aperture Radar System;**

■ **U.S. Air Force RQ-4 Global Hawk UAV Synthetic Aperture Radar;**

■ **U.K. Ministry of Defence ASTOR Sentinel R1 Airborne Stand-Off Radar;**

■ **U.S. Air Force RQ-1 Predator UAV TESAR Synthetic Aperture Radar.**



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The use of ferrite phase shifters in Synthetic Aperture Radars allows electronic steering of the antenna beam. The use of Rotary-Field Phase Shifters with continuously variable phase capability allows real time slewing of the antenna beam at a moderate rate.

Typical data is shown below for the specific programs listed, however MAG's ferrite phase shifters are readily available from S-Band to K-Band.

Parameter	X-Band Rotary-Field	Ku-Band Dual-Mode
Bandwidth	10%	8%
Insertion Loss	0.7 dB avg.	1.0 dB avg.
Return Loss	-17.69 dB	-17.69 dB
Peak RF Power	4 kW	28 W min.
Average RF Power	60 W	4 W min.
RMS Phase Error	1 Degree	6 Degrees
Switching Time	100 Microseconds	50 Microseconds
Weight	3 Ounces	0.4 Ounce



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