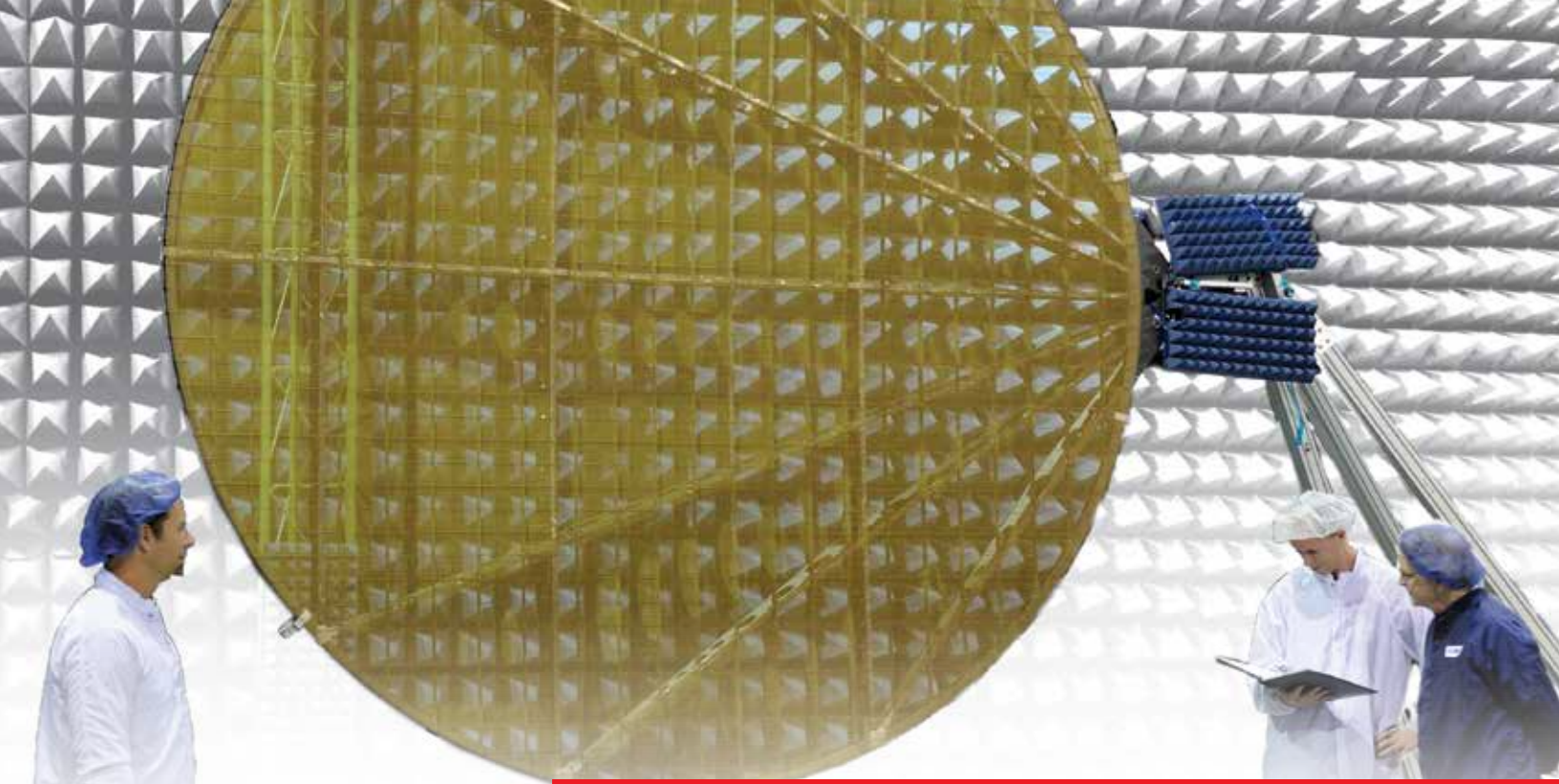


FIXED-MESH REFLECTOR

HIGHLY EFFECTIVE, LIGHTWEIGHT ALTERNATIVE TO SOLID REFLECTORS

To meet the increasing demand for higher bandwidth, improved performance, and better spectral efficiency for satellite operators, Harris has developed the fixed-mesh reflector (FMR) as a lightweight alternative to conventional solid reflectors—without losing any of the desired RF performance.

BENEFITS

- Increases data capacity through smaller spot beam coverage
- Reduces mass up to 40% through through use of Harris' unique mesh reflector surface
- Reduces solar torque to increase longevity of satellites
- Enables near-zero acoustic loads
- Commercial Communications reflector not subject to ITAR controls

PUSHING THE BOUNDARIES OF TECHNOLOGY

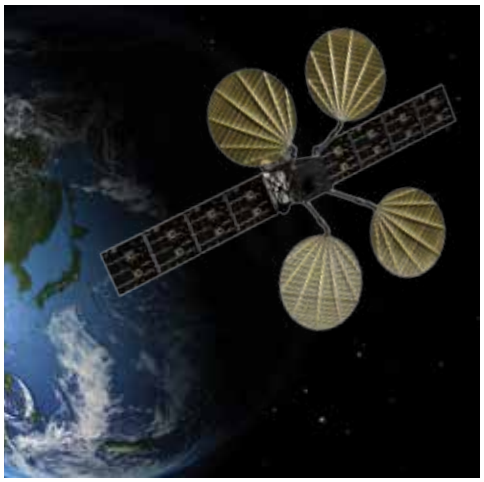
With over 50 years of experience in space antenna solutions, Harris is recognized as the most experienced reflector manufacturer in the world. Due to our ongoing research and development program, Harris customers get the most innovative, accurate, and stable reflectors on the market. Our FMRs are an innovative hybrid design that combines the high-frequency mesh surface technology of Harris' legacy unfurlable antennas with a fixed graphite frame. Together, they provide an effective solution for high-throughput satellites, which demand larger apertures and smaller spot beams than currently possible with solid reflectors. Unlike solid reflectors, the FMR has a mesh surface that offers significant improvements in shadowing reduction, solar torque, and acoustic load, which enables additional mass reductions in spacecraft support and interface structures.

FACTS

Harris precision mesh surfaces have been used for over 40 years on unfurlable antenna reflectors for communication satellites.

Harris designs and manufactures customized and complex parts and assemblies that withstand the harsh space environment.

Harris technology helps deliver content to millions of direct-to- home broadcast consumers and digital audio radio subscribers every day.



FMRs provide satellites with higher communications capacity at lower costs and half the weight of conventional antennas

OUR SOLUTIONS

The combination of Harris' patented gold-plated knit wire fabric, graphite frame, and use of 3D printed components offers customers a lighter weight antenna with one of the most efficient RF reflective surfaces on the planet. 3D printing also enables us to manufacture complex components in smaller quantities more quickly and less expensively than injection molded plastic parts.

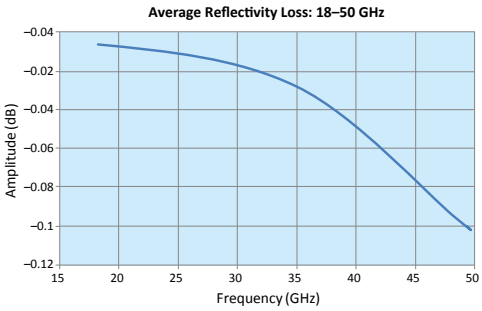
INCREASED CAPACITY

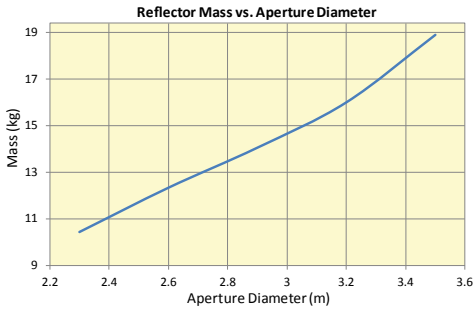
Harris helps satellite operators increase data capacity to accommodate more customers and extend the use of their satellites' lives. The FMR offering is best suited for systems ranging from 2.9 meters to 3.5 meters, where substantial mass savings can be achieved. The 3.5 meter aperture version allows for smaller spot beam coverage of a given geographic region over existing 2.6 to 2.7 meter standard systems and supports operator goals of increased capacity.

HIGH-THROUGHPUT

Harris FMRs are qualified in sizes ranging from 1.5 to 3.5 meters and are available for satellite applications from UHF to V band (to 50 GHz or higher). By maximizing antenna aperture size within the available launch fairing envelop, the FMR is perfectly suited for applications requiring small spot beams needed for frequency reuse and increased satellite capacity.

SPECIFICATIONS





ADVANTAGES OF MESH REFLECTORS OVER CONVENTIONAL SOLID REFLECTORS

Weight	Up to 40% reduction in mass
RF Performance	Reflectivity and cross-polarization losses equivalent to solid surfaces up to 50 GHz
Acoustic Response	None with mesh surface
Shadowing	Up to 85% mesh transparency
Solar Torque	Minimal for large surface areas
Surface Accuracy	Manufacturing surface accuracy as low as 0.08 mm RMS

About Harris Corporation
Harris Corporation is a leading technology innovator, solving customers' toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports government and commercial customers around the world. Learn more at harris.com.

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