

*Order from the microwave specialist -
highest linear output power at microwave frequencies*

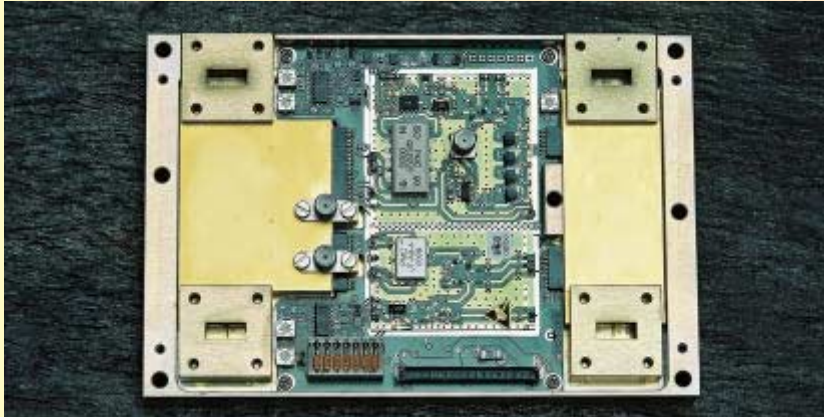


Typical Local Multipoint Distribution System - Transceiver Modules

LMDS is a wireless network which is capable of providing a broadband two-way communications pipe to homes and business via fixed terminals at the customers premises. LMDS networks enable broadband wireless access to multiple subscribers in the same geographic area. LMDS operates in the frequency bands 24.5 - 26.5 GHz, 27.5 - 31.3 GHz, and 38.6 - 42.5 GHz. LMDS cells are able to provide a maximum speed of 1.5 Gbps downstream and 200 Mbps upstream. The systems large capacity can support multiple services such as video-on-demand, cable TV programming, video-conferencing and fast internet connectivity to each subscriber in addition to local telecom agencies.

RF outdoor unit built by ASTYX to customer specification for Point to Point and Point to Multipoint applications (15 GHz up to 42 GHz)

Communication Module Production and Development



**Typical
design of
27.5 to 31.
GHz RF
Outdoor
Unit**

Typical LMDS transceiver / RX-TX-Module Performance

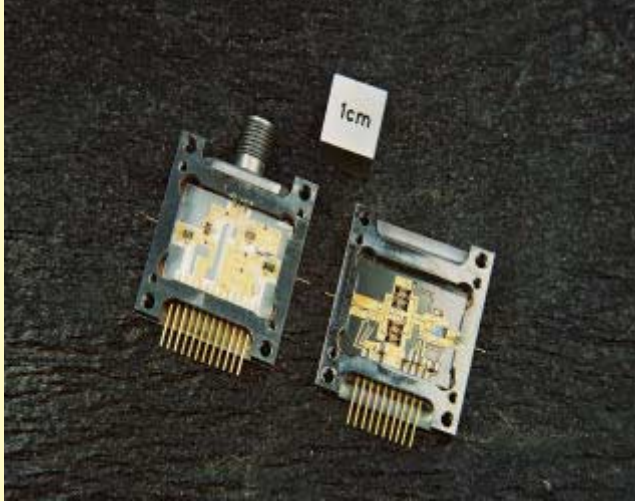
Receiver characteristics (RX-Module alone) without filtering

Receive RF-frequency	27.35 to 31.7 GHz
Input/Output Return loss	> 10 dB
Noise figure	<5 dB
Receive IF-frequency	0.1 to 0.4 GHz
Receiver gain (per channel)	12 dB
Gain flatness over 200 MHz	±1.0 dB
Image rejection mixer with quadrature output:	
Amplitude imbalance between IF-channels	<1 dB
Phase imbalance	<10 °
LO-Section:	
LO-Port Return loss	> 12 dB
LO-Input frequency	9 .. 11 GHz
LO Input power (at fundamental)	16 .. 19 dBm
LO-Output power at RF-Input (x3 of fundamental)	< -28 dBm
IP3 input power	-10 dBm
Operational Supply Voltages:	
LO and RX chain	5 V (350 mA),
Operating temperature	-40 to + 80 °C



ASTYX has developed the LMDS transceiver technology in cooperation with Infineon/Germany and has started series production (over 500 Transceiver modules produced by 1st quarter 2002).

Communication Module Development



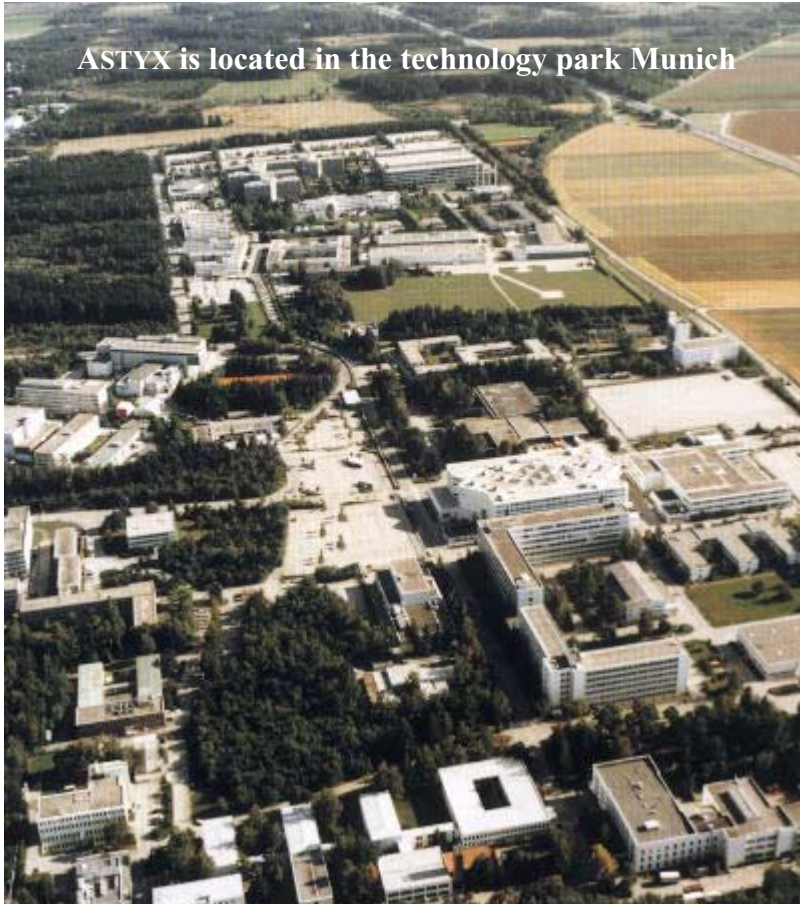
ASTYX has developed the miniaturized TxRx and High Power Submodules to meet LMDS customer specification at significantly reduced cost. Thermal and mechanical design optimized for performance and output power.

Performance of typical LMDS High Power - Module

RF Characteristics

Transmit RF-frequency	27.35 to 31.7 GHz
Input/Output Returnloss	> 10 dB
1 dB output power	30 dBm for base station, 26 dBm for customer unit
IP3 output power	>40 dBm for base station
Small Signal Gain (at 25 °C)	29 dB ±2.0 dB
Gain variation (- 40° .. +80 °C)	+3 .. -2.5 dB
Gain flatness over 200 MHz	±1.5 dB
Operational Supply Voltages:	
HPA section	+ 5 V (2,5 A), -1V (100mA)
Telemetry (at P-1dB)	2.5 V ±0.4V
Gain control (analogue)	-1 .. -20 dB
Operating temperature	-40 to + 80 °C

ASTYX is located in the technology park Munich



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