

IDT

INTEGRATED DATA DOWNLINK TRANSMITTER



VERSION 2019-09



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INTEGRATED DATA DOWNLINK TRANSMITTER (IDT)

Data Downlink Subsystems in X-Band have a considerable heritage in numerous Earth Observation programs conducted for more than 20 years. Based on this long experience, Tesat is developing an integrated Downlink Transmitter solution.

BENEFITS

The solution offers the following advantages:

- Maximized data throughput
- Minimized latency of data
- Reduced Ground Station contacts
- High spectrum efficiency and high transmit power efficiency
- Improved link budget due to strong SCCC encoding
- Digital predistortion for linearization of Power Amplifier
- Reliable end-to-end solution (verified with state-of-the-art receivers)
- Key technology is Adaptive Coding & Modulation (ACM) allowing the volume of data to adapt to link budget characteristics

CHARACTERISTICS

- Compact and lightweight High Data Rate Downlink Transmitter for Earth Observation Satellites
- Cost attractive design based on class 3 components
- Features X-Band with GaN SSPA (20 W RF Output Power)
- High order modulation scheme up to 64-APSK combined with powerful SCCC error correction coding enables reliable communication
- Up to 1,300 Mbps per channel
- Data input interface with state-of-the-art WizardLink incl. Flow Control or Space Fibre
- Technology verified by end-to-end measurements incl. state-of-the-art Ground Station High Data Rate Demodulator

PARAMETERS	VALUES	REMARKS
Radio signal frequency range	X-Band (8,025 - 8,400MHz)	
Symbol rate	max. 250 MSym/s	
Necessary bandwidth	325 MHz	Roll-Off = 0,3
Modulation & coding	QPSK, 8-PSK, 16 / 32 / 64-APSK SCCC Coding	According to CCSDS 131.2.B.1 modes 1...27
Useful data rate	160 Mbps - 1,300 Mbps	ACM modes 1...27
RF output power	Up to 20 W	Depending on back-off
Data interface	WizardLink with Flow Control	Option: Space Fibre
Power bus	21 - 38 V	Others possible
DC power consumption	max. 75 W	At 20 W RF output power
Orbit	LEO (700km)	
Lifetime	7 years	
Mass (without panel, without DC harness)	2.5 kg	
Dimensions	170 x 80 x 100mm ³ (L x W x H)	