



# TDA10026HN

Single cable demodulator with Out-Of Band receiver

Rev. 1 — 6 October 2011

Product short data sheet

## 1. General description

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The TDA10026HN is a Single Cable Downstream Processor.

The Cable Downstream Processor (CDP) implements the physical interfaces and protocols required to provide the highest quality services of an in-band DOCSIS, EuroDOCSIS, DVB and OpenCable Set-Top Box (STB). The downstream signals are digitized by 12-bit ADC and passed to the Demod and Forward Error Correction (FEC) blocks, which do all the cable physical layer processing. This processing includes demodulating and Annex A (Europe), Annex B (US) or Annex C (Japan) FEC for the in-band data.

The Out-Of Band (OOB) receiver consists of a QPSK demodulator with FEC, compliant to SCTE55-1 and SCTE55-2 standards, with either internal MAC or POD support. Data are digitized by a 10-bit ADC.

## 2. Features and benefits

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- QPSK, 16 QAM, 32 QAM, 64 QAM, 128 QAM and 256 QAM Demodulator
- ITU-T J83 Annex A, B and C FEC
- Transport Stream Multiplex Frame (TSMF) module for Annex C compliance
- Time interleaved parallel mode or serial mode for Transport Stream (TS) interface
- On chip PLL for crystal frequency multiplication (16 MHz external)
- Reuse of the tuner clock, saving one crystal
- Embedded 12-bit ADC
- 3.3 V and 1.2 V power supplies
- Low power < 160 mW for dual stream operation
- Small size package
- Low cost Bill of Material
- OOB:
  - ◆ QPSK demodulator
  - ◆ SCTE55-1 and SCTE55-2 FEC
  - ◆ Embedded 10-bit ADC



### 3. Quick reference data

Table 1. Quick reference data

| Symbol               | Parameter                | Conditions                                                                                          | Min  | Typ                | Max                        | Unit |
|----------------------|--------------------------|-----------------------------------------------------------------------------------------------------|------|--------------------|----------------------------|------|
| P                    | power dissipation        | Standby mode:<br>all 3 ADC in Power-down mode and all clocks disabled                               | -    | 10 <sup>[1]</sup>  | 30 <sup>[2]</sup>          | mW   |
|                      |                          | operation mode:<br>1.2 V supply voltage; 1 DVB-C demodulation (256 QAM 6.9 Msps) and 1 OOB SCTE55-1 | -    | 130 <sup>[1]</sup> | 190 <sup>[2]</sup>         | mW   |
|                      |                          | 3.3 V supply voltage; 1 DVB-C demodulation (256 QAM 6.9 Msps) and 1 OOB SCTE55-1                    | -    | 30 <sup>[1]</sup>  | 50 <sup>[2]</sup>          | mW   |
| P <sub>tot</sub>     | total power dissipation  | 1 DVB-C demodulation (256 QAM 6.9 Msps) and 1 OOB SCTE55-1                                          | -    | 160 <sup>[1]</sup> | 240 <sup>[2]</sup>         | mW   |
| V <sub>DD(1V2)</sub> | supply voltage (1.2 V)   |                                                                                                     | 1.15 | 1.2                | 1.3                        | V    |
| V <sub>DD(3V3)</sub> | supply voltage (3.3 V)   |                                                                                                     | 3.0  | 3.3                | 3.6                        | V    |
| V <sub>IH</sub>      | HIGH-level input voltage | V <sub>DD(3V3)</sub> related input levels                                                           | 2.0  | -                  | V <sub>DD(3V3)</sub> + 0.5 | V    |
| V <sub>IL</sub>      | LOW-level input voltage  |                                                                                                     | -0.5 | -                  | +0.8                       | V    |

[1] T<sub>amb</sub> = 25 °C, V<sub>DD(1V2)</sub> and V<sub>DD(3V3)</sub> typical.

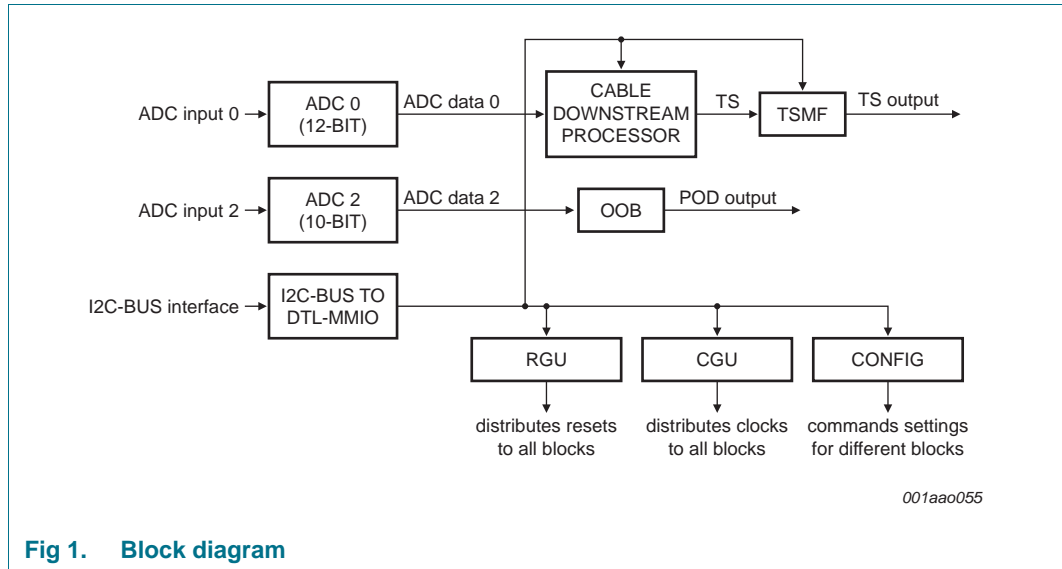
[2] T<sub>j</sub> = 120 °C, V<sub>DD(1V2)</sub> and V<sub>DD(3V3)</sub> maximum.

### 4. Ordering information

Table 2. Ordering information

| Type number   | Package |                                                                                                     |          |
|---------------|---------|-----------------------------------------------------------------------------------------------------|----------|
|               | Name    | Description                                                                                         | Version  |
| TDA10026HN/C1 | HVQFN64 | plastic thermal enhanced very thin quad flat package; no leads; 64 terminals; body; 9 × 9 × 0.85 mm | SOT804-4 |

## 5. Block diagram



## 6. Limiting values

**Table 3. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter                       | Conditions               | Min     | Max  | Unit |
|------------------|---------------------------------|--------------------------|---------|------|------|
| T <sub>stg</sub> | storage temperature             |                          | -40     | +150 | °C   |
| T <sub>j</sub>   | junction temperature            |                          | -       | 120  | °C   |
| V <sub>ESD</sub> | electrostatic discharge voltage | EIA/JESD22-A114 (HBM)    | 2       | -    | kV   |
|                  |                                 | EIA/JESD22-C101-C (FCDM) | [1] 0.5 | -    | kV   |

[1] It withstands class IV of JEDEC standard.

## 7. Abbreviations

**Table 4. Abbreviations**

| Acronym | Description                                      |
|---------|--------------------------------------------------|
| ADC     | Analog to Digital Converter                      |
| CDP     | Cable Downstream Processor                       |
| CGU     | Clock Generation Unit                            |
| DOCSIS  | Data Over Cable Service Interface Specifications |
| DVB-C   | Digital Video Broadcasting - Cable               |
| DVD     | Digital Versatile Disc                           |
| FCDM    | Field-Induced Charged-Device Model               |
| FEC     | Forward Error Correction                         |
| HBM     | Human Body Model                                 |
| MAC     | Media Access Control                             |

Table 4. Abbreviations ...continued

| Acronym | Description                      |
|---------|----------------------------------|
| MUX     | MUltipleXer                      |
| OOB     | Out-Of Band                      |
| PLL     | Phase-Locked Loop                |
| POD     | Point Of Deployment              |
| QAM     | Quadrature Amplitude Modulation  |
| QPSK    | Quadrature Phase Shift Keying    |
| RGU     | Reset Generation Unit            |
| STB     | Set-Top Box                      |
| TS      | Transport Stream                 |
| TSMF    | Transport Stream Multiplex Frame |
| US      | United States                    |

## 8. Revision history

Table 5. Revision history

| Document ID        | Release date | Data sheet status        | Change notice | Supersedes |
|--------------------|--------------|--------------------------|---------------|------------|
| TDA10026HN_SDS v.1 | 20111006     | Product short data sheet | -             | -          |

## 9. Legal information

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| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition                                                                            |
|-----------------------------------|-------------------------------|---------------------------------------------------------------------------------------|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
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| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

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