

# TDA7255V - UWLink<sup>©</sup> Evaluation Kit

Universal Wireless Link

# **TDA7255V**

ASK/FSK Transceiver for the 434 MHz frequency band

## User Manual

Revision 1.0, 2010-12-01

# Wireless Control

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#### TDA7255V

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Introduction

### 1 Introduction

The **TDA7255V UWLINK Extension-Board** can either be used as stand-alone module with any other system environment or together with the **UWLink Mainboard** as Interface to your Windows PC.

The **TDA7255V-Explorer** Windows Software may be used to set the configuration registers and to read out the status registers of the **TDA7255V**.



Figure 1 Evaluation-Kit: 2 x TDA7255V UWLink Mainboard & Extension-Board



Using the TDA7255V UWLink Extension-Board as stand-alone module

# 2 Using the TDA7255V UWLink Extension-Board as stand-alone module

- Close solder bridge JP1 (see Figure 3; default setting of the TDA7255V UWLink Extension-Board).
- Leave solder bridge JP2, JP3, JP4 and JP5 open (see Figure 3; default setting of the TDA7255V UWLink Extension-Board).
- Select either RX-mode or TX-mode by setting the jumper of the RX/TX-multi-pin connector (X8) accordingly (see Figure 2).
- Select either ASK or FSK by setting the jumper of the ASK/FSK-multi-pin connector (X7) accordingly (see Figure 2).
- Apply a supply voltage of 3V (2.1V to 5V) to connector X3 (for polarity see also Figure 2).
- Apply an antenna or RF-signal generator on the 50 Ω RF-connector (X1; see Figure 2) if the RX-mode is selected (via RX/TX-Jumper). Use an ASK-modulated or FSK-modulated RF-signal according the mode selected by the jumper of the ASK/FSK-multi-pin connector.
- Apply an antenna or Spectrum-Analyzer to be able to measure the spectrum, for instance, on the 50 Ω RF-connector (X1; see Figure 2) if the TX-mode is selected (via RX/TX-Jumper). CAUTION: Applying a signal, from a RF-signal generator for instance, in TX-mode could possibly damage the power amplifier output of the TDA7255V!
- Connect the Data Input/Output (X2; see Figure 2) to an Oscilloscope, for instance, to be able to measure the data output signal, in case of RX-mode (via RX/TX-Jumper) is selected.
- Apply a data signal, a PRBS9-sequence or just a rectangular signal on the Data Input/Output (X2; see Figure 2) if TXmode is selected. For data signal Low- and High-level see the Data Sheet.

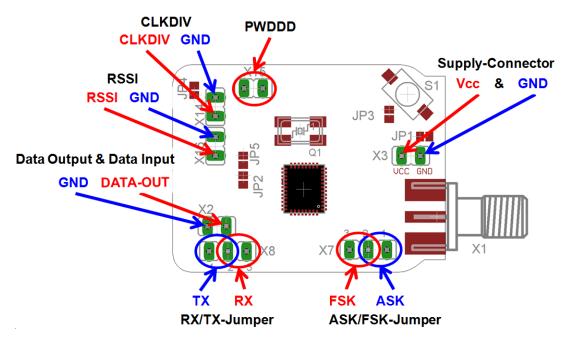


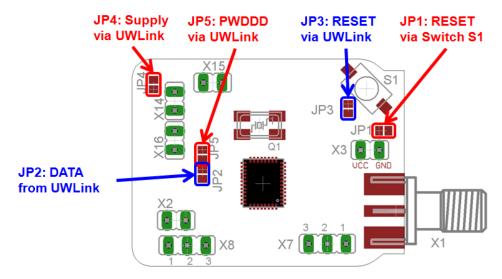
Figure 2 Jumper (axial)



#### Using the TDA7255V UWLink Extension-Board as stand-alone module

#### Name and function of the connectors and Jumpers of the TDA7255V UWLink Extension-Board:

- X1: 50 Ω RF-connector (RF-In in receive-mode/RF-Out in transmit-mode)
- X2: Data Input/Output
- X3: Supply-Connector (Vcc/GND) external supply
- X7: ASK/FSK-multi-pin connector
- X8: RX/TX- multi-pin connector
- X14: CLKDIV-Output-Connector (Clock-output)
- X15: PWDDD-Connector
- X16: RSSI-Output
- S1: Reset-switch
- JP1: Reset via Switch S1
- JP2: Data to UWLink
- JP3: Reset via UWLink
- JP4: Supply via UWLink
- JP5: PWDDD via UWLINK



#### Figure 3 Jumper (SMD)



3

# Using the TDA7255V UWLink Extension-Board together with the UWLink Mainboard as interface to a Windows PC

Before using the UWLink Mainboard as interface, the required software, which can be downloaded from the Infineon Web page (see link below), has to be installed.

Please follow this step-by-step approach when you start up your **TDA7255V-UWLink**-Set for the first time: **Important Note:** The **TDA7255V Explorer** Windows Software requires the **DAS** (Device Access Server) and the SIB-Server services running in the background. Both are automatically installed while following the steps below.

#### Step 1 – Installation of the TDA7255V-Explorer

- Go to www.infineon.com/TDA7255V and download the latest TDA7255V-Explorer Installation Package (e.g. TDA7255V\_Explorer\_E1.1.05.zip)
- Extract the ZIP-archive to a temporary directory on your PC.
- Open the sub-directory 1\_DAS and execute DAS\_setup.exe and follow the on-screen instructions.
- Execute **TDA7255V\_Explorer\_E1.1.05.exe** and follow the on-screen instructions.
- Execute the NextGenLoader and start the installation of the SIB-Server by just double-clicking at the SIB Server button (see Figure 4) and follow the on-screen instructions.



Figure 4 SIB-Server button

#### Step 2 – Usage of the TDA7255V-Explorer

- Start the TDA7255V Explorer by double-clicking at the TDA7255V Explorer button (see Figure 5).
- Click to OPEN in the Wizard-tab to start the communication (see Figure 6).
- Now you are ready to configure the TDA7255V: Either by changing the settings in the Wizard-tab of the TDA7255V Explorer (see Figure 6), or by changing the bit values of each register directly in the Registers-tab (see Figure 9). CAUTION: If you choose RX/TX and ASK/FSK "Register Controlled" (see Figure 8) it is strongly recommend to remove the jumper of the RX/TX-multi-pin connector and ASK/FSK-multi-pin connector to avoid conflicting hardware and software settings and harming of the TDA7255V!



- Furthermore you can read the SFR Status register and SFR ADC register at the Explore-tab. See the RSSI Voltage and Vcc Measurement- and Data valid decision-fields in the Explore-tab (see Figure 10).
- A PRBS9 sequence with variable data rate can be generated by the TDA7255V-Explorer and will be applied to the data input when closing the jumper JP2 (see Figure 3). The desired data rate can be adjusted and the transmission started in the Test transmission-field in the Explore-tab (see also Figure 11).
- The TDA7255V can be switched between Power-Down-Mode and Device-Active-Mode by the TDA7255V-Explorer when closing the jumper JP5 (see Figure 3). You can switch to Power-Down-Mode or Device-Active-Mode by just clicking on the accordant side of the symbolic dip-switch in the Power Down and Data Detect pin-field in the Explore-tab (see Figure 12).
- The TDA7255V can be reset by the "Reset"-button in the Chip Control-field at each tab of the TDA7255V-Explorer (see Figure 13) when closing jumper JP3 and opening jumper JP1 (see Figure 3).
- The registers settings can be saved as config-file (\*\_spi.def) by clicking at the "Save"-button in the Register-tab on the one hand (see Figure 14). Already available config-files can loaded by clicking at the "File-Open"-button on the other hand (see Figure 15)



Figure 5 TDA7255V Explorer button



SIB2 Register Wizard Registers Explore About				
C Subgroup Selection 1 Configuration	- 0			
Witzed Register         Register	XTAL Lung: Setting for positive frequency shift #5K or ASK-RX apf apf apf 200F 200F 200F 200F 200F 200F 200F 200	Filter bandwidth: 3gB Could' frequency of Date Filter (7.kHz •) 3gB Cutoff frequency of ICI Filter (350 kHz •) Datasets thresholds: COUNT_TH2: 0 COUNT_TH2: 0 DruCtl-Time	RSSL_TH3 ADC Input: VCC	Building Blocks Power Down V Bund Gap Reference V RC Concilent V Wholow Counter V ADC V ADC V Posk Detection V Data Silcerer
Low gain	PC THE SET	egisters	Clock divider output © Output from divider © 18.039MHz © 328Hz © Window Count Com Clock divider: 181.00 MHz	Dual Rer     Quad Comitor     Quad Comitor     Uniter     VID Res     VID Res     VID Res     VID Ner     VID Taken     VID Rev     VID     Rever Applier     VID     VID

Figure 6 TDA7255V-Explorer, Open button

Kizard Registers Explore About     Subgroup Selection 1 Configuration	• ()			
General Chip Configuration:	XTAL Tuning	Filter bandwidth:	RSSI_TH3	
<ul> <li>Slave Mod <ul> <li>Timer Mod</li> <li>Bell Polling Mode</li> </ul> </li> <li>RVTX and ASKFSK external controlled <ul> <li>Register Controlled</li> <li>Figure Controlled</li> <li>Figure Controlled</li> <li>Figure Controlled</li> <li>CLK off during power down</li> <li>RX Data riversion</li> <li>RX Data rivers</li></ul></li></ul>	Setting for positive #55 cor 45% 45 cor 45% 50 cor 45% 50 cor 45% 50 cor 45% 50 cor 45% 50 cor 5 50 co	3/8 Could frequency           7 Exits Files:           3/8 Could frequency           3/8 Could frequency           6/10 Files:           0           Datastate thresholds:           0           COUNT_TH1:           0           COUNT_TH2:           Count_Th2:           Count_Th2:           Count_Th2:           Count_Th2:           Count_Th2:           Count_Th2:           Count_Th2:           Count_Th2:           Count_Th2	ADC Input VCC - RSSI RSSI threshold: 53 XTAL Confg FET - Bioler FSK Tamp (only in biolar mole) • 402µs >32 kBits N • 404µ 32 kBits N • 414µs 12 kB	Bullding Blocks Power Dox P Band Gap Reference P RC Dacillator P Wholow Counter P Apoc P Data Steer P Data Filter C Loado Cometor P Data Filter C Loado Cometor P Data Filter C Loado Cometor P Data Filter P Data Filter
No Control 182-17XWI001-GRZW0011 - Open Cose Referato Reset Open Cose	ead Registers Write R		c0080<== 0x03	

Figure 7 TDA7255V-Explorer, Wizard tab



#### TDA7255V

#### Using the TDA7255V UWLink Extension-Board together with the UWLink Mainboard as interface to a Windows PC

Mzard Registers Explore About				
< > Subgroup Selection 1 Configuration	- 🥥			
General Chip Configuration:	XTAL Tuning:	Filter bandwidth:	RSSI_TH3	
Stave Mode     Self Polling Mode     PortX and ASKP5K external controlled     Projecter Controlled     Projecter Controlled     Projecter Controlled     Prover Poly     Poly	Setting for positive frequency all finances for the set of the set of the set of the form of the set of the set of the set of the Source for negative setting for negative setting for negative setting for segative setting for setting for set	3/8 Could frequency of Data Filter 7 KHz • 3/8 Could frequency of I/Q Filter 1/50 KHz • Datarate thresholds: COUNT_TH1: 0 COUNT_TH2: 0	ADC Input VCC	Building Bocks Power Down
One shot	129F     ASK - TX or FSK -     RX     BpF     2 4pF     10F     500F     250F	0n/0ff-Time f_RC: 32000 Hz T_On: 10 ms T_Off: 100 ms On-Time Register: 65216 Off-Time Register: 62336	Clock Divider: Clock divider output: © Output from divider 18.039MHz © Window Count Com Clock divider: 18-1.00 MHz	Peak Detectors     Data Sicer     Data Sicer     Data Sicer     Data Sicer     Data Net     Data Sicer     Dudit Corelator     Uniter     UQ Recer     UQ Recer     Int Macer     Int Macer     Power Amplifier     Power Amplifier     PlL     VXTAL Oscillator
hip Control 582-5FXW1801-GRZW0011 ~ )	ead Registers Write Re	311, 311, 103, 0		

#### Figure 8 RX/TX and ASK/FSK external controlled or register controlled

Wizard	Registers Explore About			
	Register	Address	Value	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Register Map / SPI File Control
	SFR_CONFIG	0x00	0x04F9	Select fie
	SFR_FSK	0x01	0x0A0C	
	SFR_XTAL_TUNING	0x02	0x0012	Lood Defaults Save Al
	SFR_LPF	0x03	Ox18	C C C C C C C C C C C C C C C C C C C
	SFR_ON_TIME	0x04	0xFEC0	
	SFR_OFF_TIME	0x05	0xF380	
	SFR_COUNT_TH1	0x06	0x0000	
	SFR_COUNT_TH2	0x07	Gx0000	Note: Manual changes in the register in are allowed in principle, but not subject
	SFR_RSSI_TH3	0x08	<b>DxFF</b>	input validation 1 Therefore an inconsistent setting might
	SFR_CLK_DIV	0x0D	0x08	generated !!
	SFR_XTAL_CONFIG	0x0E	0x01	
	SFR_BLOCK_PD	0x0F	<b>OxFFFF</b>	
	SFR_STATUS	0x80	0x03	
	SFR_ADC	0x81	Ox5F	
				Find register enter register name

#### Figure 9 TDA7255V-Explorer, Register tab



TDA7255V Explorer (build E1.1.05)		
SIB2 Register		
Wizard Registers Explore About		
Subgroup Selection Status		
Wated         Registern         Spirore         Alexal           Visited         > Subprove Selection         Ratual           SSI Vikage and Vec Measurement         Occursion         Season           ADC ruppet         • VCC         • Season         Season           Pressing the "Wine"         • VCC         • Season         Season           ADC value: 0x : IF         • Update this mater by pressing the "Read registers" button           • ADC power down feedback         • SELECT feedback bit	Data Nate < TH1           • Data Nate < TH1           • TH1 < Data Nate < TH2           • Data Nate < TH2           • Data Nate < TH2           • Data Nate < 0.5TH1           • 0.5TM1 < Data Nate < 0.5TH2           • Data Nate > 0.5TH2           • Data Nate > 0.5TH2           • RSSI value = TH3           • RSSI value > TH3	
Power Down and Data Detect pin Note: Power Down mode can be also activated by bit D14 in register 00b. Power Down	Text transmission PRES9 Generator: Stat TX Stop TX Distantic [Hz] 2000 - 0	
Note: In order to get this register's current data it is increasery to turn on the counter Counter Dip Control St02::FXWI001:GR2W0011 Refer. Refer.	SIB Solue 2 register and SFF, ACC Co001 c+= 0x5F SFF, ACC CO001 c+=	

Figure 10 TDA7255V-Explorer, Explorer tab

12 Register	
Wizard Registers Explore About	
Subgroup Selection Status	•
a BSSI 400 600 800	Data valid decision                • Data Rate < TH1                 • Th1 < Data Rate < TH2                 • Data Rate > TH2                 • Data Rate < 0.5'TH1                 • Data Rate < 0.5'TH2                 • Data Rate > 0.5'TH2
ADC power down feedback     SELECT feedback bit	RSSI value = TH3     RSSI value > TH3
Power Down and Data Detect pin Note: Power Down mode can be also activated by bit D14 in register 00h. Power Down	Test transmision PRESS Generator: Stat TX: Stop TX Dutarate (Hz) 2000 -
Note: In order to get this register's current data it is necessary to turn on the continuous mode of ADC and Prequency Counter Disp Control	SiB Status
SIB2-IFXWIB01-GRZW0011 *	Updatd         SFI ACC 0001+x+0.05F           Read Register         With Register

#### Figure 11 TDA7255V-Explorer, Explorer tab, Test transmission field



Wizard Registers Explore About		
Subgroup Selection Status	• 🔾	
Apply the setting by pressing the "White Registers" button ADC value: 0x 1F	590,5 mV         Data valid decision           600,800         Data Rate < TH1           910,1000         TH1 < Data Rate < TH2           911,200         Data Rate < 0.5 TH1           9, pressing the 'Read         Data Rate < 0.5 TH1           9, BSS value = 7 H2         Data Rate < 0.5 TH1           9, BSS value = 7 H2         Data Rate < 0.5 TH1	PTH2
SELECT feedbacker      Power Down and Data Detect pin      Note: Power Down mode can     by bit D14 in regis      Power Down	r 00h. PRBS9 Generator: Statt evice Active	TX Stop TX
Note: In order to get this register's current data it is necessary to turn on the Counter	-0	
Chip Control SIB2:IFXWIB01:GRZW0011		SIB Status 2 registers read 5 FR_AGC bc0081<== 0x5F 5 FR_STATUS bc0080<== 0x03

#### Figure 12 TDA7255V-Explorer, Explorer tab, Power Down and Data Detect pin

Chip Control		SIB Status	
SIB2:IFXWBH CR2W0011   Refresh Reset One Cose	Vodsted     Read Registers     Write Registers     Vodsted	2 registers read SFR_ADC 0x0081c== 0x5F SFR_STATUS 0x0000c== 0x03 2 registers read SFR_ADC 0x0081c== 0x00	

#### 22 TDA7255V Explorer (build E1.1.05) SIB2 Register Wizard Registers Explore About Address Value 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0x00 0x0475 1 1 -</t TDA7255V Register SFR\_CONFIG SFR\_FSK Register Map / SPI File Contro Select file SFR\_FSK SFR\_XTAL\_TUNING SFR\_LPF SFR\_ON\_TIME SFR\_OFF\_TIME SFR\_COUNT\_TH1 Load Defaults Save All Logging SFR\_COUNT\_TH2 SFR\_RSSI\_TH3 SFR\_CLK\_DIV inp Th SFR\_XTAL\_CONFIG SFR\_BLOCK\_PD SFR\_STATUS 0x0E Ox0F 0x80 "Save"-button SFR\_ADC 0x81 Ox5F Find registe SIB Status 2 registers read SFR\_ADC 0x0081<== 0x5F SFR\_STATUS 0x0080<== 0x03 Chip Control SIB2::IFXWIB01::GRZW0011 - 0 Refresh Reset Open Close Read Registers 2 registers read SFR\_ADC 0x0081<== 0x00 Write Registers

#### Figure 13 Reset button

#### Figure 14 Save button



Wizard	rgister Registers Explore About			
_	Register	Address	Value	15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Register Map / SPI File Control
	SFR_CONFIG	0x00	0x04F9	
	SFR_FSK	0x01	0x0A0C	
	SFR_XTAL_TUNING	0x02	0x0012	2 Cod Defaults Save Al
	SFR_LPF	0x03	0x18	cplease enter a setting description
	SFR_ON_TIME	0x04	0xFEC0	
	SFR_OFF_TIME	0x05	0xF380	
	SFR_COUNT_TH1	0x06	0x0000	
	SFR_COUNT_TH2	0x07	0x0000	Note: Manual changes in the register
	SFR_RSSI_TH3	0x08	0xFF	
	SFR_CLK_DIV	0x0D	0×08	Therefore an inconsister setting mi
	SFR_XTAL_CONFIG	0x0E	0x01	
	SFR_BLOCK_PD	0x0F	<b>CxFFFF</b>	F V V V V V V V V V V V V V V
	SFR_STATUS	0x80	0x03	
	SFR_ADC	0x81	0x5F	
				"File-Open"-butt

#### Figure 15 File-Open button

# Step 3 – Configure the TDA7255V UWLink Extension-Board by the TDA7255V-Explorer via the USB connector of the PC

- If "reset" via TDA7255V-Explorer is desired or required you have to close solder bridge JP3 and open JP1 (see Figure 3).
- If you intend to send the PRBS9 sequence of the TDA7255V-Explorer (see Test transmission-field in the Exploretab) in TX-mode you have to close solder bridge JP2 (see Figure 3).
- If you intend to supply the TDA7255V UWLink Extension-Board via the UWLink Mainboard you have to close JP4 (see Figure 3).
- If you intend to control the power-mode (Power-Down-Mode/Device-Active-Mode) of the TDA7255V by the TDA7255V-Explorer you have to close solder bridge JP5 (see Figure 3).
- Connect the TDA7255V UWLink Extension-Board to the UWLink Mainboard.
- The TDA7255V UWLink Extension-Board can be supplied by the USB-connector via the UWLink-Mainboard by closing jumper JP4 (see Figure 3). Alternatively, the TDA7255V UWLink Extension-Board may be supplied by an external power supply of 3V (2.1V to 5V) via connector X3 (JP4 must be open). For the polarity of X3 see also Figure 2.
- Connect the **UWLink Mainboard** to the USB-connector of your PC.
- Start the TDA7255V Explorer by double-clicking at the TDA7255V Explorer button (see Figure 5).
- Click to OPEN in the Wizard-tab to start the communication (see Figure 6).
- It is strongly recommended to remove the jumper of the RX/TX-multi-pin connector and ASK/FSK-multi-pin connector before you select "RX/TX and ASK/FSK Register Controlled" (see Figure 8) to avoid conflicting hardware and software settings and harming of the TDA7255V! If you select "RX/TX and ASK/FSK external controlled" (see Figure 8) you have to set the jumper of the ASK/FSK- and RX/TX-multi-pin connector according the desired mode (see Figure 2).



- Apply an antenna or RF-signal generator on the 50 Ω RF-connector (X1; see Figure 2) if the RX-mode is selected. Use an ASK-modulated or FSK-modulated RF-signal according the selected mode.
- Apply an antenna or Spectrum-Analyzer to be able to measure the spectrum, for instance, on the 50 Ω RF-connector (X1; see Figure 2) if the TX-mode is selected (via RX/TX-Jumper). CAUTION: Applying a signal, from a RF-signal generator for instance, in TX-mode could possibly damage the power amplifier output of the TDA7255V!
- Connect the Data Input/Output (X2; see Figure 2) to an Oscilloscope, for instance, to be able to measure the data signal, in case of RX-mode (via RX/TX-Jumper) is selected.
- Apply a data signal or just a rectangular signal on the Data Input/Output (X2; see Figure 2) if TX-mode is selected or use the PRBS9-sequence of the TDA7255V-Explorer when JP2 is closed. For data signal Low- and High-level see Data Sheet.

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