



DIMITTECH

DTX1-1110L

Integrated OBD-II to UART Interface Module

DATA SHEET

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1. Overview

On-Board Diagnostics, Second Generation (OBD-II) is a set of standards for implementing computer-based control of various sub-systems in the modern vehicles.

The DTX1-1110L module is built around STN1110, a Multi-protocol OBD to UART Interpreter (more information is available at the manufacturer's website: <http://www.obdsol.com>) and implements the full external circuitry of approximately 60 discrete components and integrated circuits, that is necessary for a proper operation. This module will automatically handle all OBD-II protocols commonly been used by today's manufacturers: J1850PWM, J1850VPW, ISO9141, ISO14230 (KWP2000) and ISO15765-4 (CAN).

Feature Highlights

16-pin device in small LCC 25x25mm package

Single +5V external DC supply

Fully compatible **ELM327** AT-command set

UART interface (baud rates up to 10Mbps)

Support for **legislated OBD-II protocols:**

ISO15765-4 signalling CAN protocol

ISO14230-4 (Keyword Protocol 2000)

ISO9141-2

SAE J1850VPW (GM vehicles)

SAE J1850PWM (Ford vehicles)

Support for non-legislated OBD protocols:

ISO15765

ISO11898 (raw CAN)

Support for **SAE J1939** OBD protocol

Automatic protocol detection algorithm

Large memory buffer

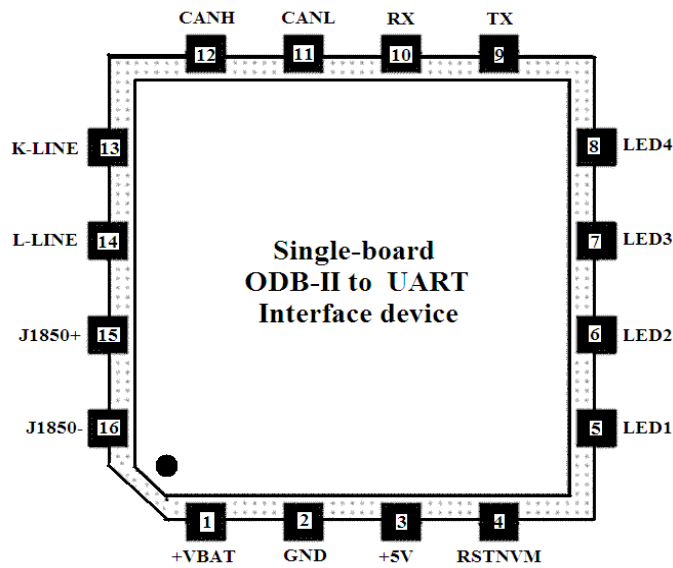
Voltage input for battery monitoring

RoHS compliant

Typical Applications

- Academic projects
- Automotive diagnostic scan tools and code readers
- Digital dashboards
- Fleet management and tracking applications
- Automotive data loggers

2. Pinout



Pinout Summary

Pin	Name	Type	Description
1	+VBAT	P	Vehicle's battery positive wire
2	GND	P	Ground reference for logic and I/O pins
3	+5V	P	DC +5V supply input
4	RSTNVM	I	Active low input to reset non-volatile memory (NVM) settings to factory defaults
5	LED1	O	Active low OBD transmit activity LED output
6	LED2	O	Active low OBD receive activity LED or Interrupt output
7	LED3	O	Active low UART transmit activity LED output
8	LED4	O	Active low UART receive activity LED output
9	TX	OD, 5V	UART transmit output
10	RX	I, 5V	UART receive input
11	CANL	I,O	LOW-level CAN bus line
12	CANH	I,O	HIGH-level CAN bus line
13	K-LINE	I,O	ISO 9141/ISO 14230 K-line output
14	L-LINE	O	ISO 9141/ISO 14230 L-line output
15	J1850+	I,O	SAE J1850 Bus+ line
16	J1850-	I,O	SAE J1850 Bus- line

Legend:

I - input with CMOS levels
OD - open drain output

O - digital output
P - power pin

5V - 5 volt tolerant pin

The module follows closely the STN1110's pin functions. Further and more detailed information about the functions of each pin could be obtained from STN1110's data sheet.

+VBAT

This line also has an internal 62k Ω /10k Ω voltage divider network used for battery voltage measurement.

+5V

Positive 5V DC supply voltage. No external capacitors are required.

RSTNVM

Leave unconnected if unused.

LED1, LED2, LED3, LED4

Implement internal 470 Ω resistors so no external ones are needed when driving LED indicators.

TX, RX

Compatible with TTL level interface. For implementing full RS232 signal levels, a suitable external transceiver (such as MAX3221 or similar) should be used.

CANL, CANH

CAN bus lines. There is no internal termination resistor for the bus so an external one should be used if needed. Leave unconnected if unused.

K-LINE, L-LINE

ISO9141 / ISO14230 lines. Leave unconnected if unused.

J1850+, J1850-

SAEJ1850 bus lines. Leave unconnected if unused.

3. Electrical Characteristics

This section provides an overview of the electrical characteristics of DTX1-1110L.

Absolute Maximum Ratings

Storage temperature.....-65°C to +150°C
 Ambient temperature under bias..... -40°C to +125°C
 Maximum Supply Voltage (pin 3) with respect to GND..... +16V
 Power Dissipation.....Internally Limited
 Maximum current sourced/sunk by Tx, LED1-LED4 outputs.....12mA
 Maximum current sourced/sunk by any other output..... 4 mA

Power Specifications

Sym	Characteristic	Min	Typ	Max	Units	Condition
V _{DD}	Supply Voltage	2.5	5	16	V	
V _{INT}	Internally Derived Voltage	3.0	3.3	3.6	V	
SV _{INT}	VINT Rise Rate	0.03	-	-	V/ms	0-3.0V in 0.1s
V _{BOR}	Brown-out Reset Voltage				V	TBD ₁
I _{OP}	Operating Current		72	139	mA	TBC ₂
I _{PD}	Power-Down Current				µA	TBD ₁

1. to be determined
2. to be confirmed

I/O Pin DC Specifications

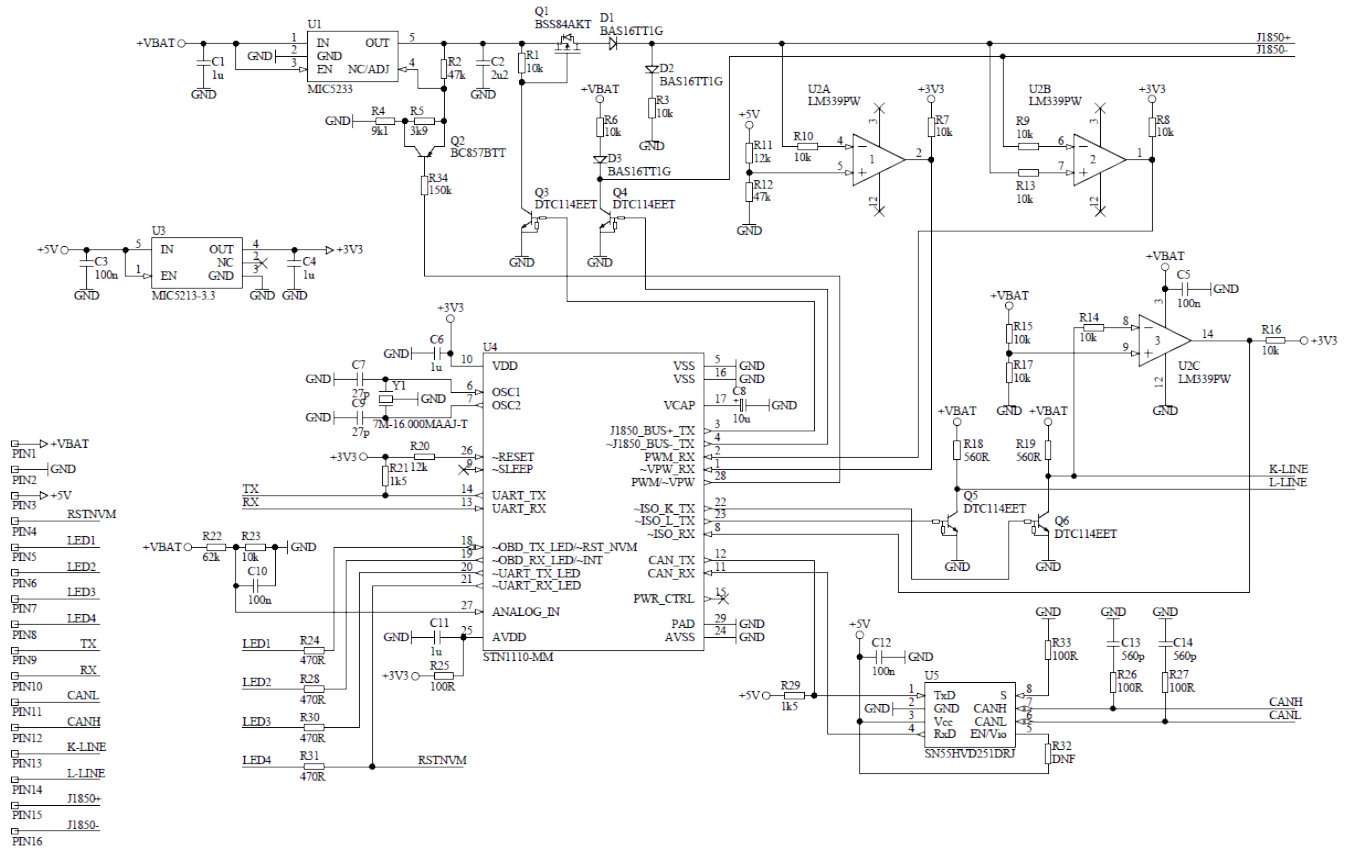
Sym	Characteristic	Min	Typ	Max	Units	Condition
V _{CC}	CAN Supply Voltage	4.5	5	5.5	V	
I _{CC}	CAN Supply Current					
	Off-Mode	1	5	8	µA	
	Silent mode	0.1	1	2.5	mA	
	Normal mode recessive dominant	-	5	10	mA	
		-	50	70	mA	
V _{OL}	Output Low Voltage	-	-	0.4	V	IOL = 2 mA, VINT = 3.3V
V _{OH}	Output High Voltage	2.4	-	-	V	IOH = -2.3 mA, VINT = 3.3V

I/O Pin Timing Requirements

Sym	Characteristic	Min	Typ	Max	Units	Condition
T _{RST}	RSTNVM Pulse Width	2	-	-	µs	
T _{UWM}	Minimum UART Rx Pulse Width	-	20	-	ns	

4. Internal Schematic

The internal circuit of DTX1-1110L is shown on the picture below:



5. Application Circuit

