

1 Pins description

1.1 Pins function

Figure 1. Pins connection (Top view)

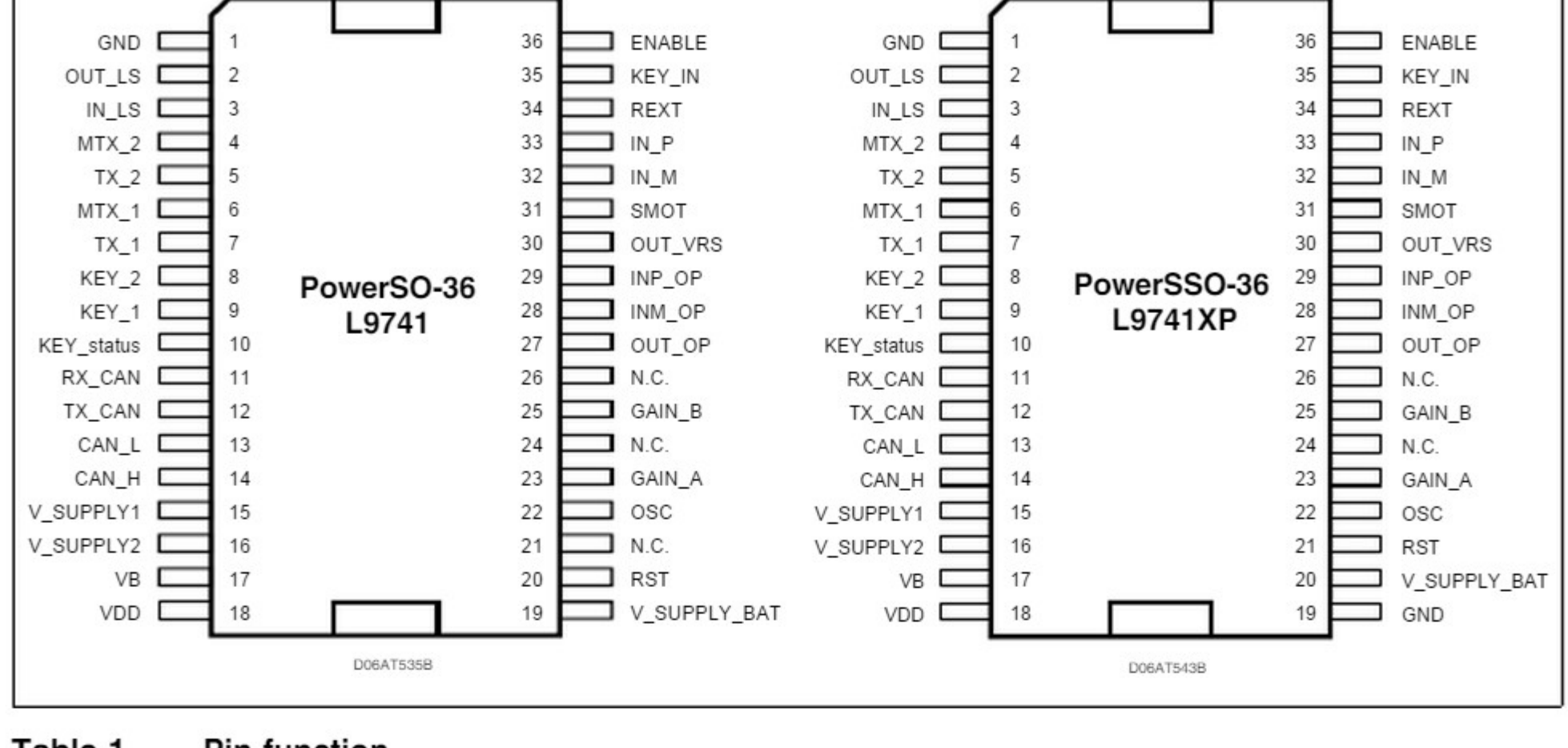


Table 1. Pin function		
N°	Pin	Description
1	GND	GND
2	OUT_LS	Protected Power Low-Side Driver Output
3	IN_LS	Low side Logic Input Voltage (IN_FP = LOW, OUT_FP = OFF). Internal pull-down is provided
4	MTX_2	K-Line 2 Logical Input (MTX_2=LOW, TX_2=ON). Internal pull-up is provided
5	TX_2	Protected K-Line 2 Input/Output
6	MTX_1	K-Line 1 Logical Input (MTX_1=LOW, TX_1=ON). Internal pull-up is provided.
7	TX_1	Protected K-Line 1 Input/Output
8	KEY_2	K-Line 2 Logical Output (TX_2=LOW, KEY_2=LOW).
9	KEY_1	K-Line 1 Logical Output (TX_1=LOW, KEY_1=LOW).
10	KEY_status	Filtered KEY_IN Logical Status
11	RX_CAN	CAN Transceiver Logic Output (to RX micro)
12	TX_CAN	CAN Transceiver Logic Input (from TX micro)
13	CAN_L	Bi-directional Protected CAN_L Wire
14	CAN_H	Bi-directional Protected CAN_H Wire
15	V_SUPPLY1	Protected 5V voltage regulator in tracking with VDD.

Table 1. Pin function (continued)		
N°	Pin	Description
17	VB	Battery Power Supply Input . NOT PROTECTED FROM REVERSE POLARITY.
18	VDD	5V Voltage regulator output.
19	V_SUPPLY_BAT or GND	Battery Voltage High Side Driver with current limitation (L9741) or Ground (L9741XP)
20	RST or V_SUPPLY_BAT	Open collector VDD voltage regulator RESET flag (L9741) or Battery Voltage High Side Driver with current limitation (L9741XP)
21	N.C. or RST	Not Connected (L9741) or Open collector VDD voltage regulator RESET flag (L9741XP)
22	OSC	Rr and Cr connection pin for oscillator
23	GAIN_A	OP-AMP Digital Input to set the gain value.
24	N.C.	Not connected
25	GAIN_B	OP-AMP Digital Input to set the gain value.
26	N.C.	Not connected
27	OUT_OP	Analog Rail-to-Rail Op-Amp Output Voltage.
28	INM_OP	Negative Op-Amp Input Voltage
29	INP_OP	Positive Op-Amp Input Voltage
30	OUT_VRS	VRS Comparator Logical Output Voltage. OUT_VRS = HIGH if Vin_P > Vin_M, OUT_VRS = LOW if Vin_P<Vin_M.
31	SMOT	VRS Mode Input Pin
32	IN_M	VRS Negative Comparator discriminator Input. This pin must be protected with an External Serial 10K (+/-1%) Resistor
33	IN_P	VRS Positive Comparator Input. This pin must be protected with an External Serial 10K (+/-1%) Resistor
34	REXT	VRS Reference Resistor Connection Pin. A 27 Kohm must be connected between this pin and GND. It affects the High and Low VRS Input Hysteresis .
35	KEY_IN	Power Latch ON-MODE input voltage. A HIGH logical level on this pin switches ON the device. Protected with external serial resistor (20K). Internal pull down is provided

2 Electrical specifications

2.1 Absolute maximum ratings

Table 2. Absolute maximum ratings			
Symbol	Parameter	Value	Unit
V _b	Battery Power Supply Voltage	-0.3 to 40	V
I _b	Battery Current	1	A
V _{DD}	5V Logic Supply Output Voltage	-0.3 to 6	V
V _{supply1_2}	5V Logic Supply Output Voltage	-0.3 to 16	V
I _{DD}	5V Logic Supply Ouput Current (Internally limited)	1	A
V _i	Input Voltages (ENABLE, OSC, MTX_1, MTX_2, TX_CAN, RX_CAN, REXT, IN_LS, GAIN_A, GAIN_B, KEY-IN)	-0.3 to VDD +0.3	V
	VRS Input Voltage (IN_M, IN_P) with REXT=10K	-0.3 to internally limited	V
	Input Voltages (INP_OP, INM_OP) with an external serial resistor >1KΩ	-0.3 to 14	V
I _i	Input Currents (INP_OP_, IMP_OP)	±10	mA
V _O	Output Voltages (KEY_STATUS, RST, OUT_OP, OUT_VRS, RX_CAN, SMOT)	-0.3 to VDD +0.3	V
	K-LINE Output Voltage (TX_1, TX_2)	-13.5 to 40	V
	OUT_LS Output Voltage, V_SUPPLY_BAT	-0.3 to 40	V
	CAN Output Voltage (CAN_H, CAN_L)	-3V to 16	V ¹⁾
T _j	Operation Junction Temperature	-40 to 150	°C
T _{stg}	Storage Case Temperature	-40 to 150	°C
VESD	ESD Voltage (MIL-STD 883C) on§ TX_1, TX_2 (with external capacitor)	±4 vs. GND	kV
	CAN_H, CAN_LS		
	ESD Voltage (MIL-STD 883C) on others pins	±2	KV

2.2 Thermal data

Table 3. Thermal data			
Symbol	Parameter	Value	Unit
Rthj-c	Thermal Resistance Junction to case: PowerSO36	< 1.5	°C/W
	Thermal Resistance Junction to case: PowerSSO36	< 2.0	°C/W
Rthj-a ⁽¹⁾	Thermal Resistance Junction to ambient: PowerSO36	<15	°C/W
	Thermal Resistance Junction to ambient: PowerSSO36	<25	°C/W
Ts	Lead Temperature During Soldering (for a time = 10 s max)	260	°C

1. with 2s2p PCB thermally enhanced

2.3 Battery voltage and temperature ranges

All function are available if:

5.2≤VB≤Vb_off

-40°C≤Tj≤150°C

The device goes in switch off mode if VB>Vb_off = 26V to 30V.

The absolute maximum rating of VB is -0.3V to 40V.

All specified parameters are valid if:

6.0≤VB≤24V; -40°C≤Tamb≤25°C

10≤VB≤18V; 25°C≤Tamb≤125°C

2.4 Protection circuits

CAN Transceiver is protected against short circuits or overcurrents: if ICANH or ICANL exceed a current threshold I_{SC} then CANH and CANL power transistors are switched off and transmission is disabled for t_{PD}CAN=25μs typ. The two K lines are protected against short circuit to battery: in this event, output is switched off after a delay of 25μs typ; an input change is necessary to turn on the output transistor again.

Voltage regulator VDD and high side driver V_SUPPLY_BAT are provided with output current limitation.

Sensor supplies V_SUPPLY1 and V_SUPPLY2 are provided with output current limitation to GND and voltage protections versus short circuit to battery up to 16V.

2.5 Thermal warning and shut down

Device has a temperature sensor producing an internal thermal warning when chip temperature overcomes a threshold with hysteresis in the range 150°C to 200°C. In case of