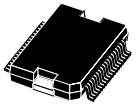
L5961

MOST power management device (PMD)

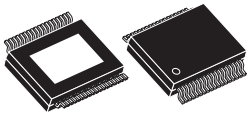
Data Brief

Features

- 5V or 3.3V / 650mA DC-DC Converter with external sync
- 5V or 3.3V/ 40mA standby voltage regulator
- 5V or 3.3V / 60mA switchable voltage regulator
- Very low quiescent current (zero power mode and ultra zero power mode feature)
- Power management fully compatible to MOST specification
- Provides power supply for physical layer and control unit
- Switch to power pulse generator
- Reacts on four different wake-up events
  - Switch to power pulse (STPP)
  - Light ON (for status)
  - Activity on Diagnostic_I/O
  - ON/OFF switch
- I^2C interface
- Programmable system configuration
- Reset generator
- Intrinsic diagnostic transceiver (standard LIN2.0)
- 3 battery detectors for battery voltage monitoring
- Watchdog circuit
- PowerSS0-36 and PowerSO-36 packages options



PowerSO-36



PowerSSO-36

Description

The L5961 MOST PMD integrates all the discrete circuitry usually necessary to implement power supplies and power management for a MOST node. It includes intrinsic MOST specific power management together with sophisticated diagnostic and fail-safe functions. The MOST PMD is designed to provide direct power supply for the physical layer, the Network Controller and the External Host Controller of a MOST Node.

The L5961 also allows the implementation of a generic MOST node design that can be reproduced "as is" in any other project, thus avoiding the activities of redesign and re-verification of MOST PMD compliance

The L5961 implements complete monitoring of the supply voltage (over-voltage, under-voltage, critical voltage), moreover it supports multiple power modes like Zeropower-mode (where one complete MOST node sinks around 25µA current) and Ultra-zero power mode (5µA). All the diagnostic protocols from major carmakers are supported and the device reacts to many different wake-up events.

The L5961 is completely configurable through its I^2C bus and fully compatible with MOST specifications.

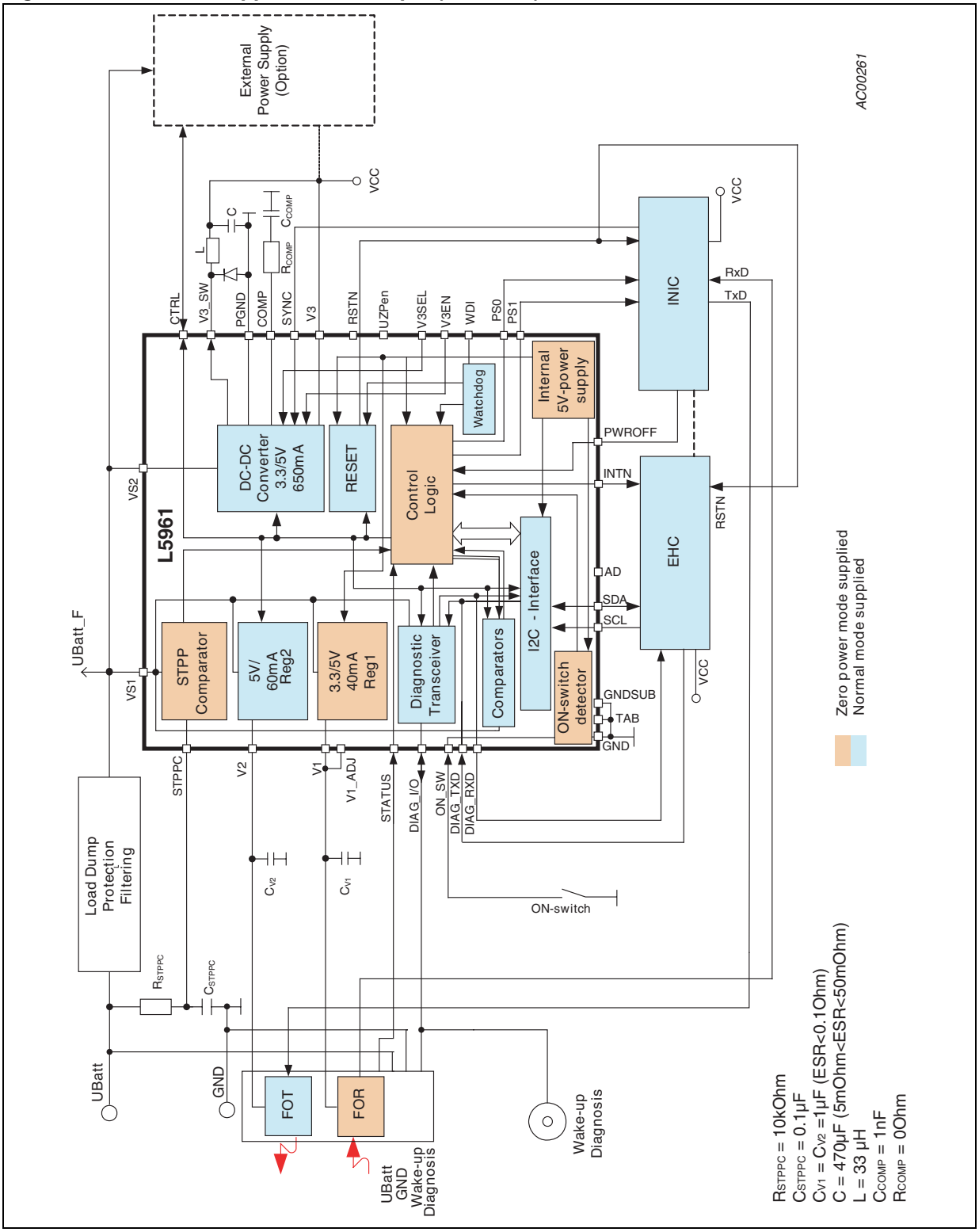
L5961 has been specified in cooperation with SMSC and represents a "chipset" solution when used with SMSC's MOST network interface controllers (INIC or NIC).

Table 1. Device summary

Order code	Package	Packing
L5961	PowerSSO-36	Tube
L5961PD	PowerSO-36	Tube

1 Block and application diagram example (with INIC)

Figure 1. Block and application example (with INIC)



2 Functionality details

- Provides three basic states:
  - Zero power mode
    All external HW is switched off. PM-chip is switched Off except "REG1 voltage regulator", "Switch-to-power-pulse comparator" and "Control logic".
  - Ultra zero power mode
    All external HW is switched off. PM-chip is switched Off except "ON/OFF Control logic". PMD can be woken up to reach "Zero current mode" by activities on DIAG_I/O line
  - Normal
    PMD and external HW is powered. One of the four possible wake-up conditions occurs and the wake-up event is confirmed either by means of PWROFF pin or I^2C bus.
    To confirm the on-event:
    - PWROFF pin must be driven low OR
    - the right I^2C bus command is provided.
- Reacts on four different wake-up events
  - Switch to power pulse (STPP)
  - Light ON (for status)
  - Activity on Diag_I/O
  - ON/OFF switch
- I^2C interface (allowing system programmability)
- Generation of switch to power pulse (STPP)
- Online battery monitoring, reacts on battery changes/ events:
  - Over voltage
  - Critical voltage
  - Under voltage
- Hardware watchdog triggered with discrete input, available to monitor the activity of the controller
- Fail-safe behavior:
  - Intrinsic filtering time of wake-up events
  - Protection against software caused failures
  - Over-temperature warning / thermal protection
- Diagnostic transceiver compatible to standard LIN2.0

3 Package information

In order to meet environmental requirements, ST (also) offers these devices in ECOPACK® packages. ECOPACK® packages are lead-free. The category of second Level Interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label.

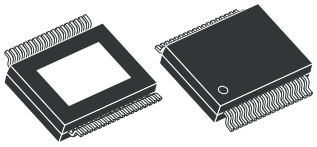
ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Figure 2. PowerSSO-36 mechanical data and package dimensions

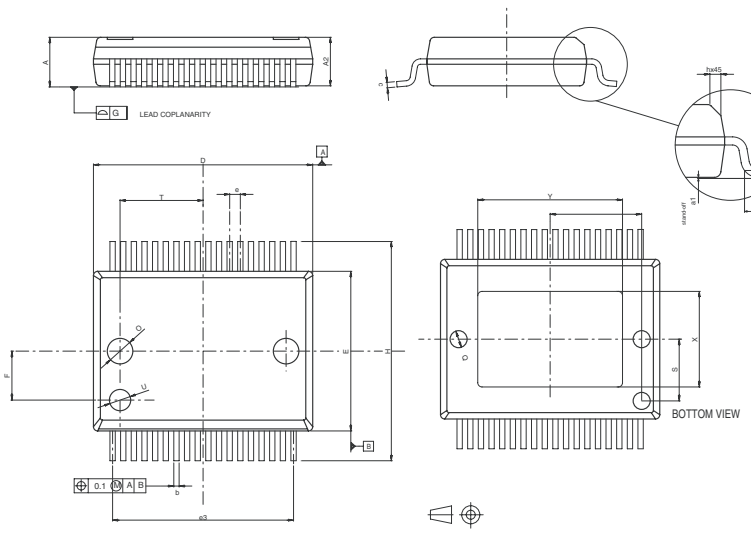
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.15		2.47	0.084		0.097
A2	2.15		2.40	0.084		0.094
a1	0		0.075	0		0.003
b	0.18		0.36	0.007		0.014
c	0.23		0.32	0.009		0.012
D (1)	10.10		10.50	0.398		0.413
E (1)	7.4		7.6	0.291		0.299
e		0.5			0.019	
e3		8.5			0.335	
F		2.3			0.090	
G			0.10			0.004
G1			0.06			0.002
H	10.10		10.50	0.398		0.413
h			0.40			0.016
k		5°			5°	
L	0.55		0.90	0.022		0.035
M		4.3			0.169	
N			10°			10°
O		1.2			0.047	
Q		0.8			0.031	
S		2.9			0.114	
T		3.65			0.144	
U		1.0			0.039	
X	4.1		4.7	0.161		0.185
Y	6.5		7.3	0.256		0.287

(1) "D" and "E" do not include mold flash or protrusions Mold flash or protrusions shall not exceed 0.15 mm per side(0.006")

OUTLINE AND MECHANICAL DATA



PowerSSO-36 (exposed pad)



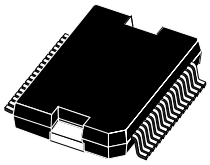
7587131 A

Figure 3. PowerSO-36 mechanical data and package dimensions

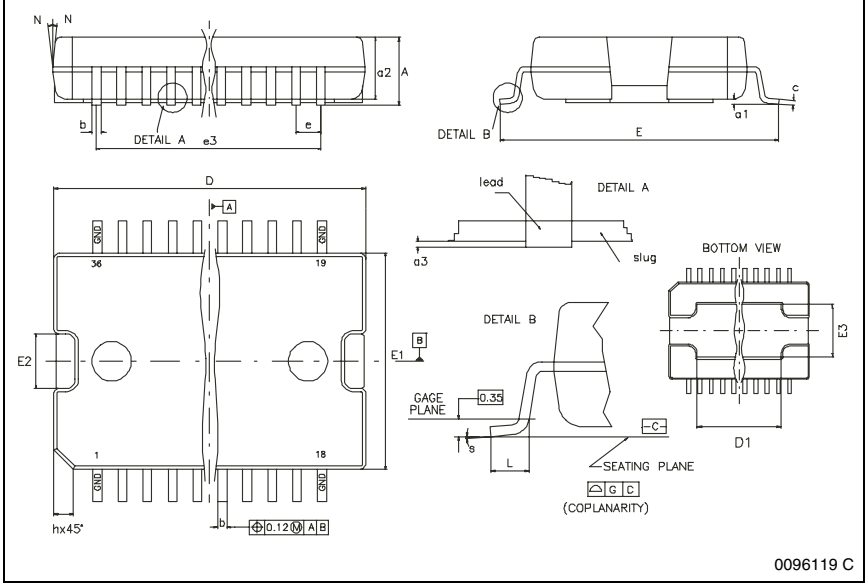
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.60			0.1417
a1	0.10		0.30	0.0039		0.0118
a2			3.30			0.1299
a3	0		0.10			0.0039
b	0.22		0.38	0.0087		0.0150
c	0.23		0.32	0.0091		0.0126
D	15.80		16.00	0.6220		0.6299
D1	9.40		9.80	0.3701		0.3858
E	13.90		14.5	0.5472		0.5709
E1	10.90		11.10	0.4291		0.4370
E2			2.90			0.1142
E3	5.80		6.20	0.2283		0.2441
e		0.65			0.0256	
e3		11.05			0.4350	
G	0		0.10			0.0039
H	15.50		15.90	0.6102		0.6260
h			1.10			0.0433
L	0.8		1.10	0.0315		0.0433
N	10° (max)					
s	8° (max)					

Note: “D and E1” do not include mold flash or protusions.
- Mold flash or protusions shall not exceed 0.15mm (0.006”)
- Critical dimensions are "a3", "E" and "G".

OUTLINE AND MECHANICAL DATA



PowerSO-36



4 Revision history

Table 2. Document revision history

Date	Revision	Changes
21-Jan-2008	1	Initial release.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST’s terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST’S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER’S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com