

PROFET® ITS711L1

For Industrial Applications

PROFET ITS711L1

Data Sheet

Rev. 1.3, 2010-03-16

Standard Products



Smart Four Channel Highside Power Switch for Industrial Applications



Features

- Overload protection
- Current limitation
- Short-circuit protection
- Thermal shutdown
- Overvoltage protection (including load dump)
- Fast demagnetization of inductive loads
- Reverse battery protection¹)
- Undervoltage and overvoltage shutdown with auto-restart and hysteresis
- Open drain diagnostic output
- Open load detection in ON-state
- CMOS compatible input
- Loss of ground and loss of V_{bb} protection
- Electrostatic discharge (ESD) protection

Product Summary

Overvoltage Protection	$V_{\rm bb(AZ)}$		43	٧
Operating voltage	$V_{\rm bb(on)}$	5.	0 34	V
Operating temperature	T_{a}	-30	+85	°C
active channels:	one	two parallel	four parallel	
On-state resistance R _{ON}	200	100	50	mΩ
Nominal load current I _{L(NOM)}	1.9	2.8	4.4	Α
Current limitation I _{L(SCr)}	4	4	4	Α



Green Product (RoHS compliant)

Application

- μC compatible power switch with diagnostic feedback for 12 V and 24 V DC grounded loads in industrial applications
- All types of resistive, inductive and capacitive loads
- Replaces electromechanical relays and discrete circuits

General Description

N channel vertical power FET with charge pump, ground referenced CMOS compatible input and diagnostic feedback, monolithically integrated in Smart SIPMOS® technology. Providing embedded protective functions.

Pin Definitions and Functions

Pin	Symbol	Function
1,10, 11,12, 15,16, 19,20	V _{bb}	Positive power supply voltage. Design the wiring for the simultaneous max. short circuit currents from channel 1 to 4 and also for low thermal resistance
3	IN1	Input 1 4, activates channel 1 4 in case of
5	IN2	logic high signal
7	IN3	
9	IN4	
18	OUT1	Output 1 4, protected high-side power output
17	OUT2	of channel 1 4. Design the wiring for the
14	OUT3	max. short circuit current
13	OUT4	
4	ST1/2	Diagnostic feedback 1/2 of channel 1 and channel 2, open drain, low on failure
8	ST3/4	Diagnostic feedback 3/4 of channel 3 and channel 4, open drain, low on failure
2	GND1/2	Ground 1/2 of chip 1 (channel 1 and channel 2)
6	GND3/4	Ground 3/4 of chip 2 (channel 3 and channel 4)

Pin configuration (top view)

_			_
V_{bb}	1 •	20	V_{bb}
GND1/2	2	19	V_{bb}
IN1	3	18	OUT1
ST1/2	4	17	OUT2
IN2	5	16	V_{bb}
GND3/4	6	15	V_{bb}
IN3	7	14	OUT3
ST3/4	8	13	OUT4
IN4	9	12	V_{bb}
V_{bb}	10	11	V _{bb}

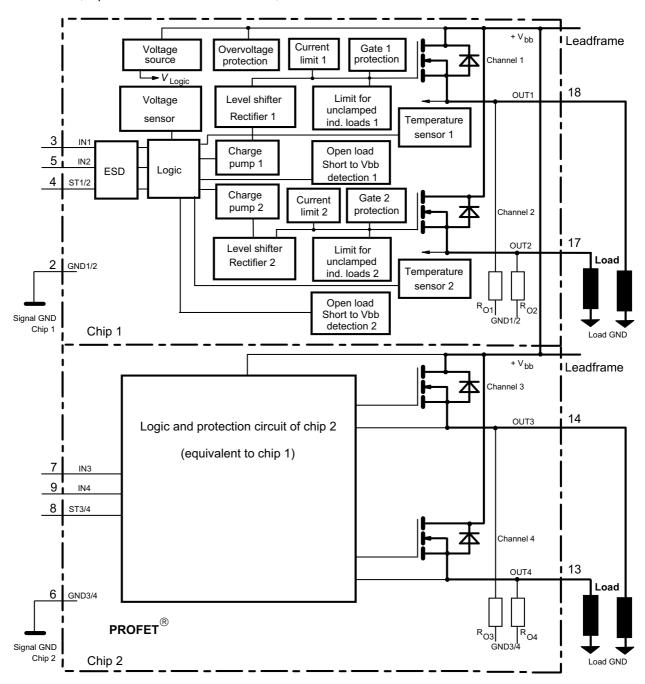
Data Sheet 2 Rev. 1.3, 2010-03-16

With external current limit (e.g. resistor R_{GND} =150 Ω) in GND connection, resistor in series with ST connection, reverse load current limited by connected load.



Block diagram

Four Channels; Open Load detection in on state;



Leadframe connected to pin 1, 10, 11, 12, 15, 16, 19, 20



Maximum Ratings at $T_i = 25$ °C unless otherwise specified

Parameter	Symbol	Values	Unit	
Supply voltage (overvoltage prot	$V_{ m bb}$	43	V	
Supply voltage for full short circut, $T_{j,\text{start}} = -40 \dots + 150^{\circ}\text{C}$	it protection	$V_{ m bb}$	34	V
Load current (Short-circuit currer	nt, see page 5)	I _L	self-limited	Α
Load dump protection ²⁾ V_{LoadDump} $R_{\text{l}^3)} = 2 \Omega$, $t_{\text{d}} = 200 \text{ ms}$; $\text{IN} = \text{low}$ each channel loaded with $R_{\text{L}} =$	or high,	$V_{Load} \ dump^{4)}$	60	V
Junction temperature		T_{j}	+150	°C
Operating temperature range		T _a	-30 +85	
Storage temperature range		$T_{\rm stg}$	-40 +105	
Power dissipation (DC) ⁵	$T_{\rm a}$ = 25°C:	P _{tot}	3.6	W
(all channels active)	$T_{\rm a} = 85^{\circ}{\rm C}$:		1.9	
Inductive load switch-off energy $V_{bb} = 12V$, $T_{j,start} = 150^{\circ}C^{5)}$,	dissipation, single pulse			
$I_{L} = 1.9 \text{ A}, Z_{L} = 66 \text{ mH}, 0 \Omega$	one channel:	E _{AS}	150	mJ
$I_{L} = 2.8 \text{ A}, Z_{L} = 66 \text{ mH}, 0 \Omega$	two parallel channels:		320	
$I_{L} = 4.4 \text{ A}, Z_{L} = 66 \text{ mH}, 0 \Omega$	four parallel channels:		800	
see diagrams on page 9 and page 10				
Electrostatic discharge capability (Human Body Model)	(ESD)	V _{ESD}	1.0	kV
Input voltage (DC)		V _{IN}	-10 +16	V
Current through input pin (DC)		I _{IN}	±2.0	mA
Current through status pin (DC)		I _{ST}	±5.0	
see internal circuit diagram page 8				
Thermal resistance				
junction - soldering point ^{5),6)}	each channel:	R_{thjs}	16	K/W
junction - ambient ⁵⁾	one channel active:	R_{thja}	44	
	all channels active:		35	

Data Sheet 4 Rev. 1.3, 2010-03-16

Supply voltages higher than $V_{bb(AZ)}$ require an external current limit for the GND and status pins, e.g. with a 150 Ω resistor in the GND connection and a 15 k Ω resistor in series with the status pin. A resistor for input protection is integrated.

 $R_{\rm l}$ = internal resistance of the load dump test pulse generator

⁴⁾ V_{Load dump} is setup without the DUT connected to the generator per ISO 7637-1 and DIN 40839

Device on 50mm*50mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70μm thick) copper area for V_{bb} connection. PCB is vertical without blown air. See page 15

⁶⁾ Soldering point: upper side of solder edge of device pin 15. See page 15



Electrical Characteristics

Parameter and Conditions, each of the four channels	Symbol		Values	}	Unit
at T _j = 25 °C, V _{bb} = 12 V unless otherwise specified		min	typ	max	
Load Switching Capabilities and Characteristic	s				
On-state resistance (V _{bb} to OUT)					
$I_L = 1.8 \text{ A}$ each channel, $T_j = 25^{\circ}\text{C}$: R _{ON}		165	200	mΩ
$T_{\rm j} = 150^{\circ}{\rm C}$:		320	400	
two parallel channels, $T_j = 25^{\circ}$ C	:		83	100	
four parallel channels, $T_j = 25^{\circ}C$:		42	50	
Nominal load current one channel active	:	1.7	1.9		A
two parallel channels active	:	2.6	2.8		
four parallel channels active	:	4.1	4.4		
Device on PCB ⁵), $T_a = 85$ °C, $T_j \le 150$ °C					
Output current while GND disconnected or pulled up; $V_{bb} = 30 \text{ V}$, $V_{IN} = 0$, see diagram page 9	I _{L(GNDhigh)}			10	mA
Turn-on time to 90% V _{OUT}	t_{on}	80	200	400	μs
Turn-off time to 10% V_{OUT}	$t_{\rm off}$	80	200	400	
$R_{L} = 12 \Omega, T_{j} = -40 + 150^{\circ}C$					
Slew rate on	dV/dt _{on}	0.1		1	V/μs
10 to 30% V_{OUT} , $R_{\text{L}} = 12 \Omega$, $T_{\text{j}} = -40 + 150 ^{\circ}\text{C}$:				
Slew rate off 70 to 40% V_{OUT} , $R_{\text{L}} = 12 \Omega$, $T_{\text{j}} = -40 + 150 ^{\circ}\text{C}$	-dV/dt _{off}	0.1		1	V/μs
Operating Parameters					
Operating voltage ⁷⁾ $T_j = -40 + 150$ °C	$V_{\mathrm{bb(on)}}$	5.0		34	V
Undervoltage shutdown $T_j = -40 + 150$ °C	: V _{bb(under)}	3.5	1	5.0	V
Undervoltage restart $T_j = -40 + 25$ °C	: V _{bb(u rst)}			5.0	V
$T_{\rm j}$ =+150°C				7.0	
Undervoltage restart of charge pump see diagram page 14 $T_j = -40+150$ °C	$V_{ m bb(ucp)}$		5.6	7.0	V
Undervoltage hysteresis $\Delta V_{bb(under)} = V_{bb(u rst)} - V_{bb(under)}$	$\Delta V_{ m bb(under)}$		0.2		V
Overvoltage shutdown $T_j = -40 + 150$ °C	: V _{bb(over)}	34		43	V
Overvoltage restart $T_j = -40 + 150$ °C	: V _{bb(o rst)}	33			V
Overvoltage hysteresis $T_j = -40 + 150$ °C			0.5		V
Overvoltage protection ⁸⁾ $T_j = -40 + 150$ °C		42	47		V
$I_{bb} = 40 \text{ mA}$					

 $^{^{7)}}$ At supply voltage increase up to V_{bb} = 5.6 V typ without charge pump, $V_{OUT} \approx V_{bb}$ - 2 V

⁸⁾ see also $V_{\rm ON(CL)}$ in circuit diagram on page 8.



Parameter and Conditions, each of the four channels	Symbol		Values		Unit
at T _j = 25 °C, V _{bb} = 12 V unless otherwise specified		min	typ	max	
Standby current, all channels off $T_j = 25^{\circ}\text{C}$: $V_{IN} = 0$ $T_j = 150^{\circ}\text{C}$:	I _{bb(off)}		28 44	60 70	μА
Leakage output current (included in $I_{bb(off)}$) $V_{IN} = 0$	I _{L(off)}			12	μА
Operating current ⁹⁾ , $V_{IN} = 5V$, $T_j = -40+150$ °C $I_{GND} = I_{GND1/2} + I_{GND3/4}$, one channel on: four channels on:	I_{GND}	 	2 8	3 12	mA
Protection Functions ¹⁰⁾					
Initial peak short circuit current limit, (see timing diagrams, page 13)					
each channel, $T_j = -40^{\circ}\text{C}$: $T_j = 25^{\circ}\text{C}$: $T_i = +150^{\circ}\text{C}$:	I _{L(SCp)}	5.5 4.5 2.5	9.5 7.5 4.5	13 11 7	Α
two parallel channels	twice	the curre	nt of one	channel	
four parallel channels	four times	the curre	nt of one	channel	
Repetitive short circuit current limit,					
$T_{\rm j}$ = $T_{\rm jt}$ each channel two parallel channels four parallel channels	I _{L(SCr)}	 	4 4 4	 	Α
(see timing diagrams, page 13)					
Initial short circuit shutdown time $T_{j,start} = -40^{\circ}\text{C}$: $T_{j,start} = 25^{\circ}\text{C}$:	$t_{ m off(SC)}$		48 29		ms
(see page 11 and timing diagrams on page 13) Output clamp (inductive load switch off) ¹¹⁾ at $V_{ON(CL)} = V_{bb} - V_{OUT}$	V _{ON(CL)}		47		V
Thermal overload trip temperature	$T_{\rm jt}$	150			°C
Thermal hysteresis	$\Delta T_{\rm jt}$		10		K
Reverse Battery					
Reverse battery voltage 12)	-V _{bb}			32	V
Drain-source diode voltage ($V_{out} > V_{bb}$) $I_L = -1.9 \text{ A}, T_j = +150 ^{\circ}\text{C}$	-V _{ON}		610		mV

⁹⁾ Add I_{ST} , if $I_{ST} > 0$

Data Sheet 6 Rev. 1.3, 2010-03-16

¹⁰⁾ Integrated protection functions are designed to prevent IC destruction under fault conditions described in the data sheet. Fault conditions are considered as "outside" normal operating range. Protection functions are not designed for continuous repetitive operation.

¹¹⁾ If channels are connected in parallel, output clamp is usually accomplished by the channel with the lowest VON(CL)

Requires a 150 Ω resistor in GND connection. The reverse load current through the intrinsic drain-source diode has to be limited by the connected load. Note that the power dissipation is higher compared to normal operating conditions due to the voltage drop across the intrinsic drain-source diode. The temperature protection is not active during reverse current operation! Input and Status currents have to be limited (see max. ratings page 3 and circuit page 8).



Parameter and Conditions, each of the four channels at T _j = 25 °C, V _{bb} = 12 V unless otherwise specified		Symbol	Values			Unit
			min	typ	max	
Diagnostic Characteristics						
Open load detection current, (on-	condition)					
each ch	annel, $T_i = -40$ °C:	I _{L (OL)}	10		200	mΑ
	$T_{i} = 25^{\circ}C$:		10		150	
	$T_{\rm i} = 150^{\circ}{\rm C}$:		10		150	
two	parallel channels	twice	the curre	nt of one	channel	
	r parallel channels	four times	the curre	nt of one	channel	
Open load detection voltage ¹³)	$T_{\rm i}$ =-40+150°C:	V _{OUT(OL)}	2	3	4	V
Internal output pull down	,	(. ,				
(OUT to GND), V _{OUT} = 5 V	$T_{\rm j}$ =-40+150°C:	Ro	4	10	30	kΩ
Input and Status Feedback ¹⁴⁾						
Input resistance		R_{I}	2.5	3.5	6	kΩ
(see circuit page 8)	$T_{\rm j}$ =-40+150°C:					
Input turn-on threshold voltage	T _j =-40+150°C:	$V_{\text{IN(T+)}}$	1.7		3.5	V
Input turn-off threshold voltage	T _j =-40+150°C:	V _{IN(T-)}	1.5			V
Input threshold hysteresis		$\Delta V_{\rm IN(T)}$		0.5		V
Off state input current T _i =-40+150°C:	$V_{IN} = 0.4 \text{ V}$:	I _{IN(off)}	1		50	μΑ
On state input current T _i =-40+150°C:	V _{IN} = 5 V:	I _{IN(on)}	20	50	90	μA
Delay time for status with open looff (other channel in off state) (see timing diagrams, page 13),	oad after switch $T_{j} = -40 + 150^{\circ}C:$	t _{d(ST OL4)}	100	320	800	μs
Delay time for status with open looff (other channel in on state) (see timing diagrams, page 13),	oad after switch $T_{j} = -40+150^{\circ}\text{C}:$	$t_{ exttt{d(ST OL5)}}$		5	20	μs
Status invalid after positive input	slope	$t_{d(ST)}$		200	600	μs
(open load)	$T_{\rm j}$ =-40+150°C:					
Status output (open drain)						
Zener limit voltage $T_i = -40+150$	$^{\circ}$ C, I_{ST} = +1.6 mA:	V _{ST(high)}	5.4	6.1		V
-	$^{\circ}$ C, I_{ST} = +1.6 mA:	$V_{\rm ST(low)}$			0.4	
9	$^{\circ}$ C, I_{ST} = +1.6 mA:	(.5)			0.6	

 ¹³⁾ External pull up resistor required for open load detection in off state.
 14) If ground resistors R_{GND} are used, add the voltage drop across these resistors.



Truth Table

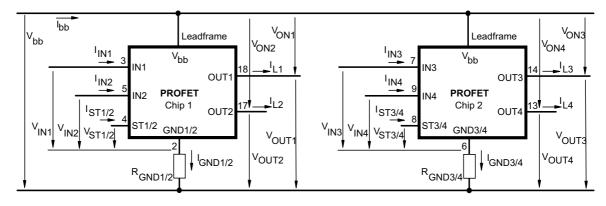
Channel 1 and 2	Chip 1	IN1	IN2	OUT1	OUT2	ST1/2
Channel 3 and 4	Chip 2	IN3	IN4	OUT3	OUT4	ST3/4
(equivalent to channel 1 and	2)					
						BTS 711L1
Normal operation		L	L	L	L	Н
		L	H	L	H	Н
		H	L	Н	L	Н
		Н	H	Н	Н	Н
Open load	Channel 1 (3)	L	L	Z	L	H(L ¹⁵⁾)
		L	H	Z	H	`H ´
		н	X	Н	X	L
	Channel 2 (4)	L	L	L	Z	H(L ¹⁵⁾)
		H	L	Н	Z	Н
		X	Н	Х	н	L
Short circuit to V _{bb}	Channel 1 (3)	L	L	Н	L	∟ 16)
		L	H	Н	Н	н
		Н	X	Н	X	H(L ¹⁷⁾)
	Channel 2 (4)	L	L	L	Н	<u>`</u> 16) ´
		н	L	Н	н	Н
		X	Н	Х	н	H(L ¹⁷⁾)
Overtemperature	both channel	L	L	L	L	Н
		X	H	L	L	L
		Н	X	L	L	L
	Channel 1 (3)	L	Х	L	Х	Н
		Н	X	L	X	L
	Channel 2 (4)	Х	L	Х	L	Н
		X	Н	Х	L	L
Undervoltage/ Overvoltage		Х	X	L	L	Н

L = "Low" Level H = "High" Level X = don't care

Z = high impedance, potential depends on external circuit Status signal valid after the time delay shown in the timing diagrams

Parallel switching of channel 1 and 2 (also channel 3 and 4) is easily possible by connecting the inputs and outputs in parallel (see truth table). If switching channel 1 to 4 in parallel, the status outputs ST1/2 and ST3/4 have to be configured as a 'Wired OR' function with a single pull-up resistor.

Terms



Leadframe (V_{bb}) is connected to pin 1,10,11,12,15,16,19,20

External R_{GND} optional; two resistors R_{GND1/2} ,R_{GND3/4} = 150 Ω or a single resistor R_{GND} = 75 Ω for reverse battery protection up to the max. operating voltage.

Data Sheet 8 Rev. 1.3, 2010-03-16

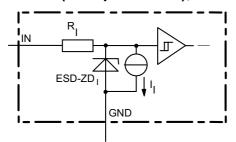
¹⁵⁾ With additional external pull up resistor

¹⁶⁾ An external short of output to V_{bb} in the off state causes an internal current from output to ground. If R_{GND} is used, an offset voltage at the GND and ST pins will occur and the $V_{\text{ST low}}$ signal may be errorious.

¹⁷⁾ Low resistance to $V_{\rm bb}$ may be detected by no-load-detection

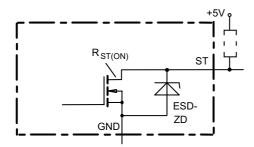


Input circuit (ESD protection), IN1...4



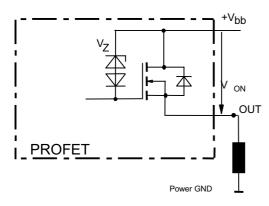
ESD zener diodes are not to be used as voltage clamp at DC conditions. Operation in this mode may result in a drift of the zener voltage (increase of up to 1 V).

Status output, ST1/2 or ST3/4



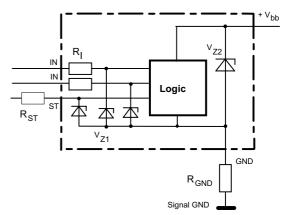
ESD-Zener diode: 6.1 V typ., max 5.0 mA; RST(ON) < 380 Ω at 1.6 mA, ESD zener diodes are not to be used as voltage clamp at DC conditions. Operation in this mode may result in a drift of the zener voltage (increase of up to 1 V).

Inductive and overvoltage output clamp, OUT1...4



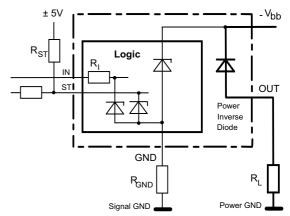
 V_{ON} clamped to $V_{ON(CL)}$ = 47 V typ.

Overvoltage protection of logic part GND1/2 or GND3/4



 V_{Z1} = 6.1 V typ., V_{Z2} = 47 V typ., R_I = 3.5 k Ω typ., R_{GND} = 150 Ω

Reverse battery protection



 R_{GND} = 150 Ω , R_{I} = 3.5 k Ω typ,

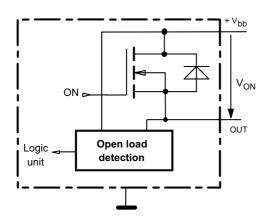
Temperature protection is not active during inverse current operation.



Open-load detection, OUT1...4

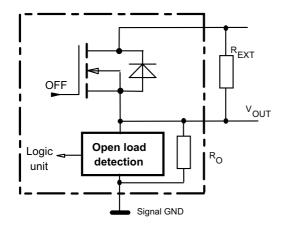
ON-state diagnostic condition:

 $V_{\text{ON}} < R_{\text{ON}} \cdot I_{L(\text{OL})}$; IN high



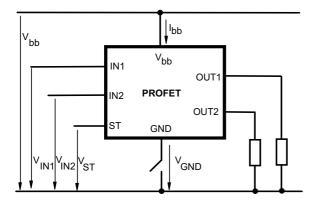
OFF-state diagnostic condition:

 $V_{OUT} > 3 \text{ V typ.}$; IN low



GND disconnect

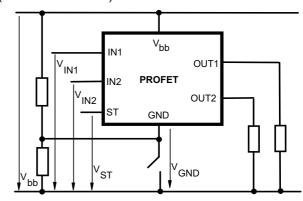
(channel 1/2 or 3/4)



Any kind of load. In case of IN = high is $VOUT \approx VIN - VIN(T+)$. Due to VGND > 0, no VST = low signal available.

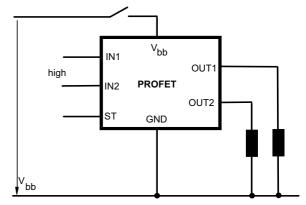
GND disconnect with GND pull up

(channel 1/2 or 3/4)



Any kind of load. If $V_{GND} > V_{IN} - V_{IN}(T+)$ device stays off Due to $V_{GND} > 0$, no $V_{ST} = low$ signal available.

V_{bb} disconnect with energized inductive load

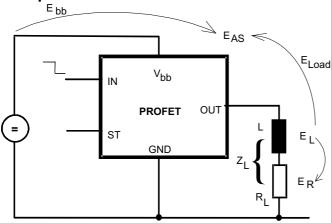


For an inductive load current up to the limit defined by E_{AS} (max. ratings see page 3 and diagram on page 10) each switch is protected against loss of V_{bb} .

Consider at your PCB layout that in the case of Vbb disconnection with energized inductive load the whole load current flows through the GND connection.



Inductive load switch-off energy dissipation



Energy stored in load inductance:

$$E_L = \frac{1}{2} \cdot L \cdot I_L^2$$

While demagnetizing load inductance, the energy dissipated in PROFET is

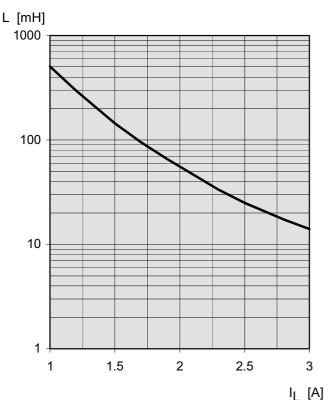
$$E_{AS} = E_{bb} + E_L - E_R = \int V_{ON(CL)} \cdot i_L(t) dt$$

with an approximate solution for $R_L > 0\,\Omega$:

$$E_{\text{AS}} = \frac{I_{\text{L}} \cdot L}{2 \cdot R_{\text{L}}} \left(V_{\text{bb}} + |V_{\text{OUT(CL)}}| \right) \ ln \left(1 + \frac{I_{\text{L}} \cdot R_{\text{L}}}{|V_{\text{OUT(CL)}}|} \right)$$

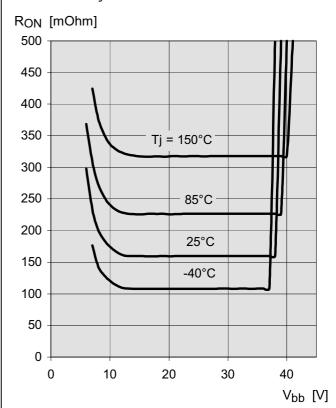
Maximum allowable load inductance for a single switch off (one channel)⁵⁾

$$L = f(I_L)$$
; T_{j,start} = 150°C, V_{bb} = 12 V, R_L = 0 Ω



Typ. on-state resistance

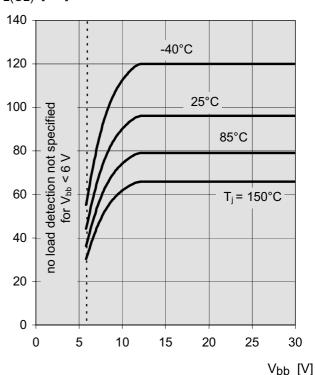
 $R_{ON} = f(V_{bb}, T_i)$; IL = 1.8 A, IN = high



Typ. open load detection current

 $I_{L(OL)} = f(V_{bb}, T_i)$; IN = high

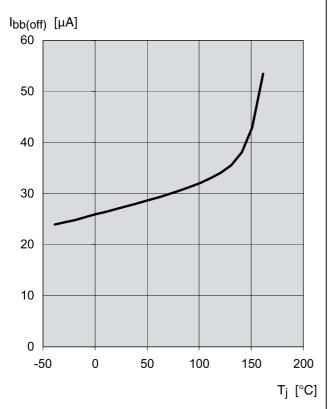
I_{L(OL)} [mA]



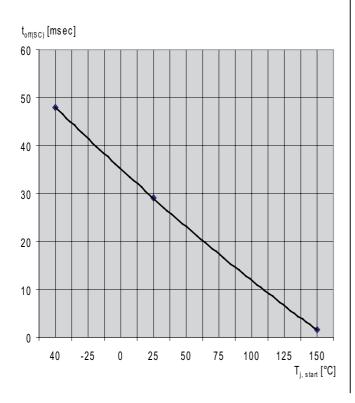


Typ. standby current

 $I_{bb(off)} = f(T_j)$; $V_{bb} = 9...34 \text{ V}$, IN1...4 = low



Typ. initial short circuit shutdown time $t_{off(SC)} = f(T_{j,start}); \ V_{bb} = 12 \ V$





Timing diagrams

Timing diagrams are shown for chip 1 (channel 1/2). For chip 2 (channel 3/4) the diagrams are valid too. The channels 1 and 2, respectively 3 and 4, are symmetric and consequently the diagrams are valid for each channel as well as for permuted channels

Figure 1a: V_{bb} turn on:

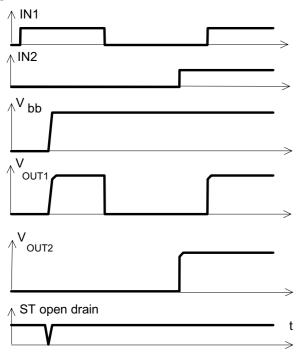
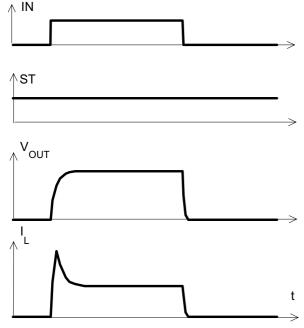
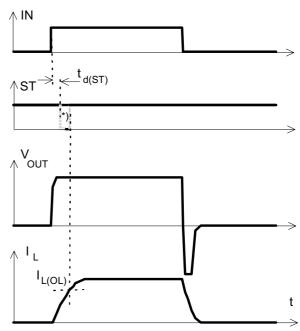


Figure 2a: Switching a lamp:



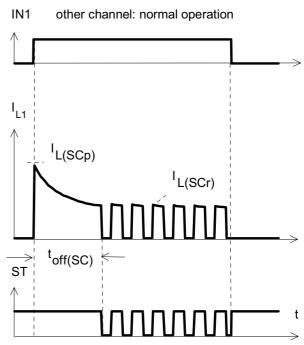
The initial peak current should be limited by the lamp and not by the initial short circuit current $I_{L(SCp)}$ = 7.5 A typ. of the device.

Figure 2b: Switching an inductive load



*) if the time constant of load is too large, open-load-status may occur

Figure 3a: Turn on into short circuit: shut down by overtemperature, restart by cooling



Heating up of the chip may require several milliseconds, depending on external conditions ($t_{off(SC)}$ vs. $T_{i,start}$ see page 11)



Figure 3b: Turn on into short circuit: shut down by overtemperature, restart by cooling (two parallel switched channels 1 and 2)

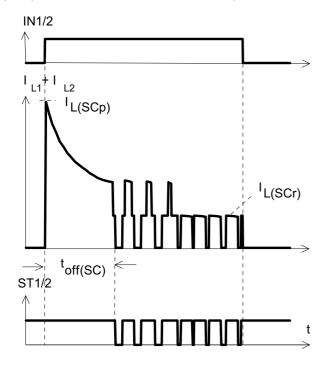


Figure 4a: Overtemperature: Reset if $T_i < T_{it}$

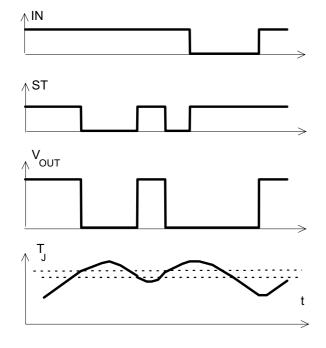


Figure 5a: Open load: detection in ON-state, open load occurs in on-state

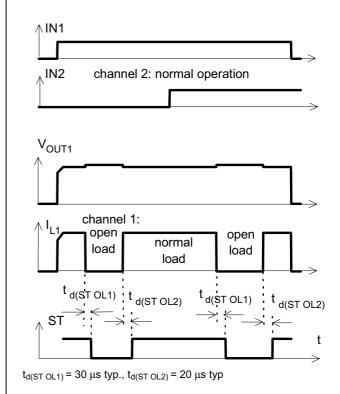
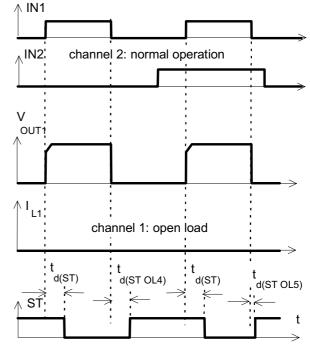


Figure 5b: Open load: detection in ON-state, turn on/off to open load

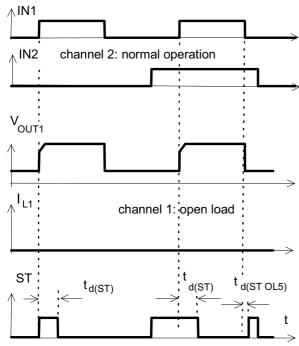


The status delay time td(STOL4) allows to distinguish between the failure modes "open load in ON-state" and "overtemperature".

Data Sheet 14 Rev. 1.3, 2010-03-16



Figure 5c: Open load: detection in ON- and OFF-state (with REXT), turn on/off to open load



 $t_{d(\text{ST}\,\text{OL}5)}$ depends on external circuitry because of high impedance

Figure 6a: Undervoltage:

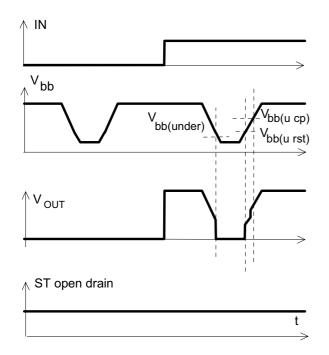
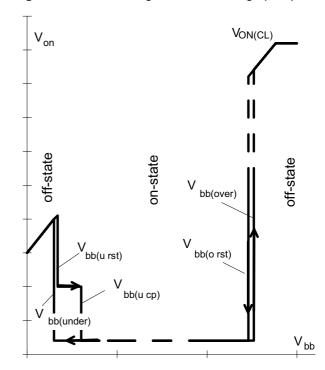
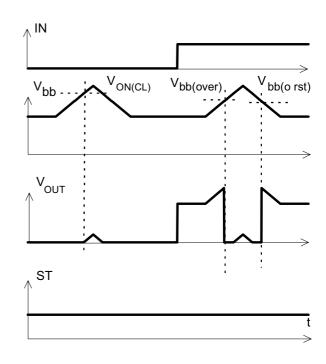


Figure 6b: Undervoltage restart of charge pump



IN = high, normal load conditions. Charge pump starts at $V_{bb(ucp)}$ = 5.6 V typ.

Figure 7a: Overvoltage:





Package Outlines

1 Package Outlines

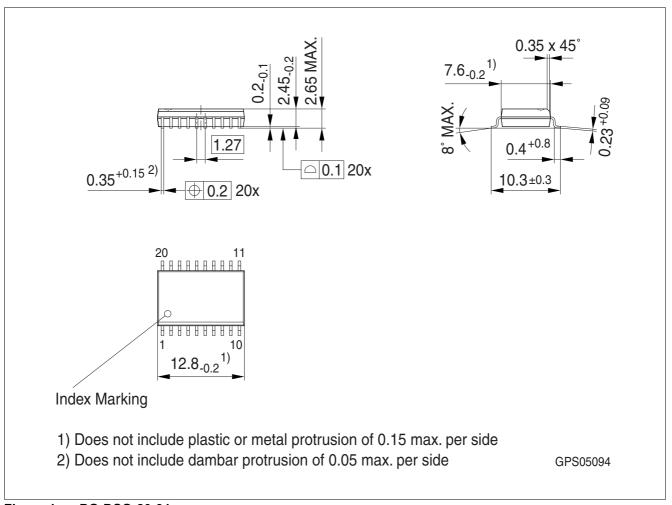


Figure 1 PG-DSO-20-31

Green Product (RoHS compliant)

To meet the world-wide customer requirements for environmentally friendly products and to be compliant with government regulations the device is available as a green product. Green products are RoHS-Compliant (i.e Pb-free finish on leads and suitable for Pb-free soldering according to IPC/JEDEC J-STD-020).



Revision History

2 Revision History

Revision	Date	Changes
1.3	2010-03-16	page 6: changed reference to the timing diagram
1.2	2009-07-21	page 1: added new coverpage page 6: Initial short circuit shutdown time changed: toff(SC) -40 °C to 48 ms toff(SC) 25 °C to 29 ms page 12: changed graphic
1.1	2008-09-30	RoHS-compliant DSO package version of the ITS711L1 All pages: Infineon logo updated Page 1: Added "RoHS" logo, added "Green Product (RoHS compliant)" statement to feature list, package names changed to RoHS compliant versions. Page 15: Package names changed to RoHS compliant versions, added "Green Product" description page 16: added Revision History page 17: added Legal Disclaimer

Edition 2010-03-16

Published by Infineon Technologies AG 81726 Munich, Germany © 2010 Infineon Technologies AG All Rights Reserved.

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (www.infineon.com).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Infineon:

ITS711L1 ITS711L1FUMA1



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: http://oceanchips.ru/

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А