

# SSL2101

## SMPS IC for dimmable LED lighting

Rev. 01 — 19 January 2009

Preliminary data sheet

### 1. General description

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The SSL2101 is a Switched Mode Power Supply (SMPS) controller IC that operates directly from rectified mains and also in combination with a phase cut dimmer. It is designed to drive LED devices. The device includes a high-voltage power switch and a circuit to allow start-up directly from the rectified mains voltage. Furthermore the device includes high-voltage circuitry to supply the phase cut dimmer.

For dimmable applications, integrated dedicated circuitry optimizes the dimming curve.

### 2. Features

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- Easy migration to existing lighting control infrastructure, TRIAC and transistor dimmers
- Supports majority of available dimming solutions
- Valley switching efficiency is optimized by built-in dedicated circuitry
- Built-in demagnetization detection
- The IC has built-in OverTemperature Protection (OTP)
- Short-Winding Protection (SWP) and OverCurrent Protection (OCP)
- The IC has internal  $V_{CC}$  generation that allows start-up from rectified mains voltage
- Natural dimming curve by logarithmic correction

### 3. Applications

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The SSL2101 is suitable for different power requirements, these include:

- SSL, retro-fit lamps, e.g. GU10, –1 W to 10 W
- LED modules, separate power supplies, e.g. LED spots, down-lights, 10 W to 15 W
- LED strings, e.g. retail display, 1 W to 15 W

## 4. Quick reference data

**Table 1: Quick reference data**

| Symbol         | Parameter                        | Conditions                                   | Min | Typ | Max  | Unit     |
|----------------|----------------------------------|--|-----|-----|------|----------|
| $R_{DSon}$     | drain-source on-state resistance | power switch; $I_{SOURCE} = -0.50$ A         |     |     |      |          |
|                |                                  | $T_j = 25$ °C                                | -   | 6.5 | 7.5  | $\Omega$ |
|                |                                  | $I_{source} = -0.20$ A                       |     |     |      |          |
|                |                                  | $T_j = 125$ °C                               | -   | 9.0 | 10   | $\Omega$ |
| $V_{CC}$       | supply voltage                   |  | 8.5 | -   | 40   | V        |
| $f_{osc}$      | oscillator frequency             |  | 10  | 100 | 200  | kHz      |
| $I_{DRAIN}$    | current on pin DRAIN             | $V_{DRAIN} > 60$ V;<br>no auxiliary supply   | -   | -   | 2.2  | mA       |
|                |                                  | $V_{DRAIN} > 60$ V;<br>with auxiliary supply | -   | 30  | 125  | $\mu$ A  |
| $V_{DRAIN}$    | voltage on pin DRAIN             |  | 40  | -   | 600  | V        |
| $\delta_{min}$ | minimum duty factor              |  | -   | 0   | -    | %        |
| $\delta_{max}$ | maximum duty cycle               |  | -   | 75  | -    | %        |
| $T_{amb}$      | ambient temperature              |  | -40 | -   | +100 | °C       |

## 5. Ordering information

**Table 2: Ordering information**

| Type number | Package |  | Version  |
|-------------|---------|--|----------|
|             | Name    | Description  |          |
| SSL2101T    | SO16    | plastic small outline package; 16-leads; body width 3.9 mm | SOT109-1 |

### 6. Block diagram

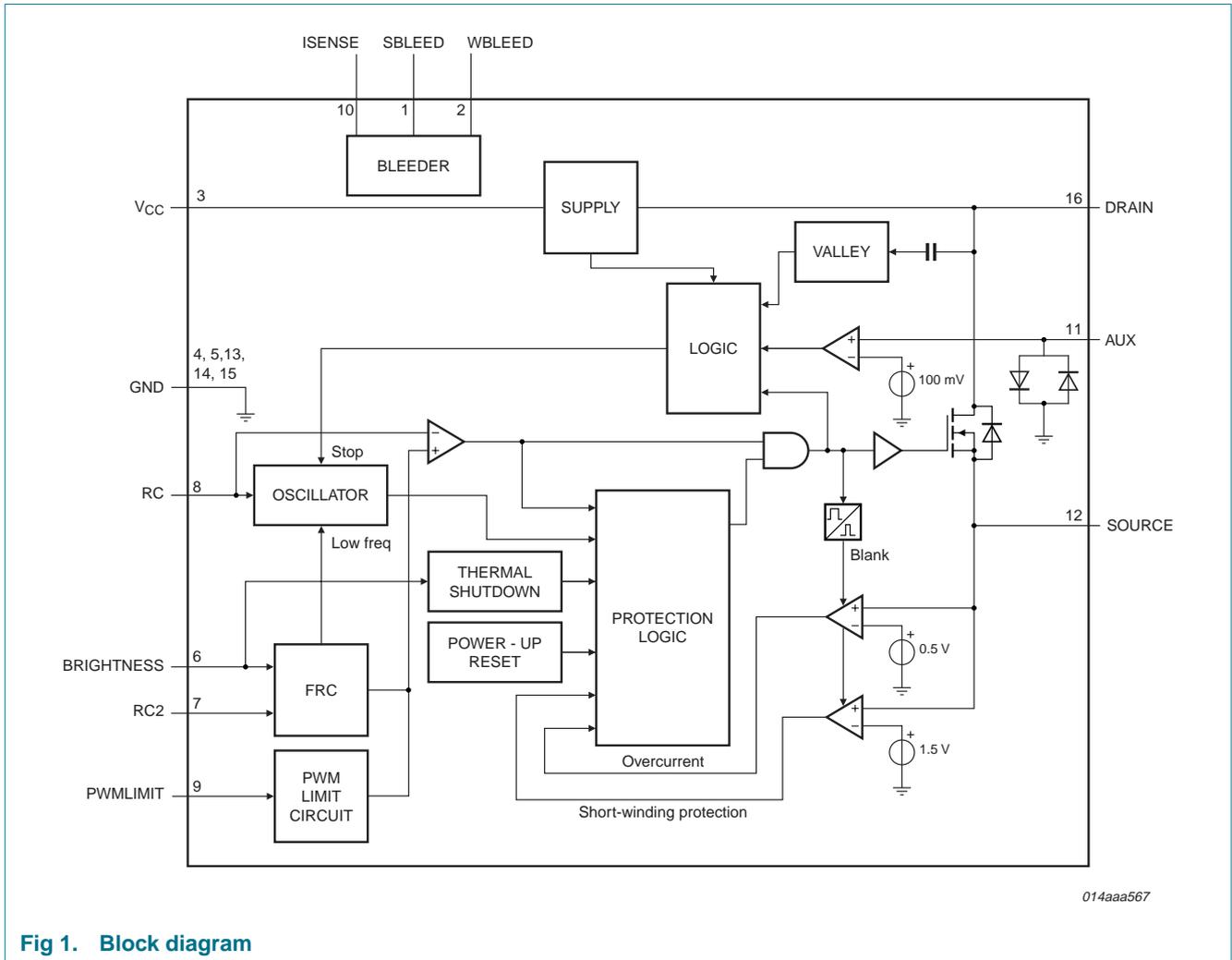


Fig 1. Block diagram

## 7. Pinning information

### 7.1 Pinning

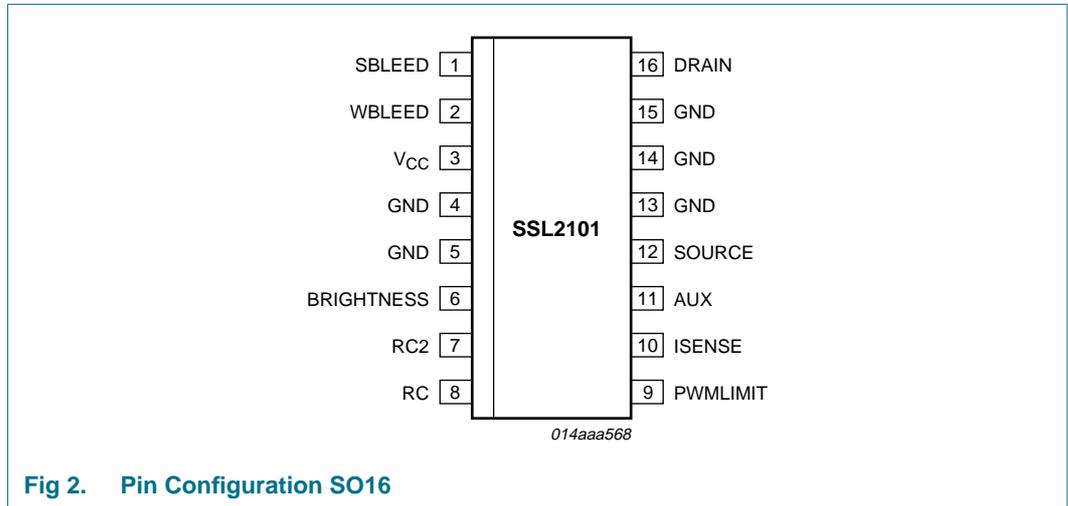


Fig 2. Pin Configuration SO16

### 7.2 Pin description

Table 3: Pin description

| Symbol          | Pin | Description   |
|-----------------|-----|---|
| SBLEED          | 1   | drain of internal strong bleeder switch                                       |
| WBLEED          | 2   | drain of internal weak bleeder switch   |
| V <sub>CC</sub> | 3   | supply voltage  |
| GND             | 4   | ground  |
| GND             | 5   | ground  |
| BRIGHTNESS      | 6   | brightness input  |
| RC2             | 7   | setting for frequency reduction   |
| RC              | 8   | frequency setting   |
| PWMLIMIT        | 9   | PWM limit input   |
| ISENSE          | 10  | current sense input for WBLEED  |
| AUX             | 11  | Input for voltage from auxiliary winding for timing (demagnetization)         |
| SOURCE          | 12  | source of internal power switch   |
| GND             | 13  | ground  |
| GND             | 14  | ground  |
| GND             | 15  | ground  |
| DRAIN           | 16  | drain of internal power switch; input for start-up current and valley sensing |

## 8. Functional description

The SSL2101 is a LED driver IC that operates directly from the rectified mains.

The SSL2101 uses on-time mode control and frequency control to control the LED brightness. The BRIGHTNESS and PWMLIMIT input of the IC can be used to control the LED light output in combination with an external dimmer. The PWMLIMIT input can also be used for Thermal Lumen Management (TLM) and for precision LED current control.

### 8.1 Start-up and UnderVoltage LockOut (UVLO)

Initially, the IC is self-supplying from the rectified mains voltage. The IC starts switching as soon as the voltage on pin  $V_{CC}$  passes the  $V_{CC(\text{startup})}$  level. The supply can be taken over by the auxiliary winding of the transformer as soon as  $V_{CC}$  is high enough and the supply from the line is stopped for high efficiency operation. Alternatively the IC can be supplied via a bleeder resistor connected to a high voltage. Note however the maximum  $V_{CC}$  voltage rating of the IC.

If for some reason the auxiliary supply is not sufficient, the high-voltage supply can also supply the IC. As soon as the voltage on pin  $V_{CC}$  drops below the  $V_{CC(\text{UVLO})}$  level, the IC stops switching and will restart from the rectified mains voltage, if the internal current delivered is sufficient.

### 8.2 Oscillator

An internal oscillator inside the IC provides the timing for the switching converter logics.

The frequency of the oscillator is set by the external resistors and the capacitor on pin RC and pin RC2. The external capacitor is charged rapidly to the  $V_{RC(\text{max})}$  level and, starting from a new primary stroke, it discharges to the  $V_{RC(\text{min})}$  level. Because the discharge is exponential, the relative sensitivity of the duty factor to the regulation voltage at low duty factor is almost equal to the sensitivity at high duty factors. This results in a more constant gain over the duty factor range compared to PWM systems with a linear sawtooth oscillator. Stable operation at low duty factors is easily realized. The frequency of the converter when  $V_{\text{BRIGHTNESS}}$  is high can be estimated using [Equation 1](#):

$$RC = \frac{I}{3.5} \cdot \left( \frac{I}{f_{osc}} - t_{charge} \right) \quad (1)$$

R equals the parallel resistance of both oscillator resistors. C is the capacitor connected at the RC pin (pin 8).

The BRIGHTNESS input controls the frequency reduction mode. In [Figure 3](#) it can be seen that the oscillator switches over from an RC curve with  $R1//R2$  to  $R1$  only. A low BRIGHTNESS voltage will reduce the switching frequency.

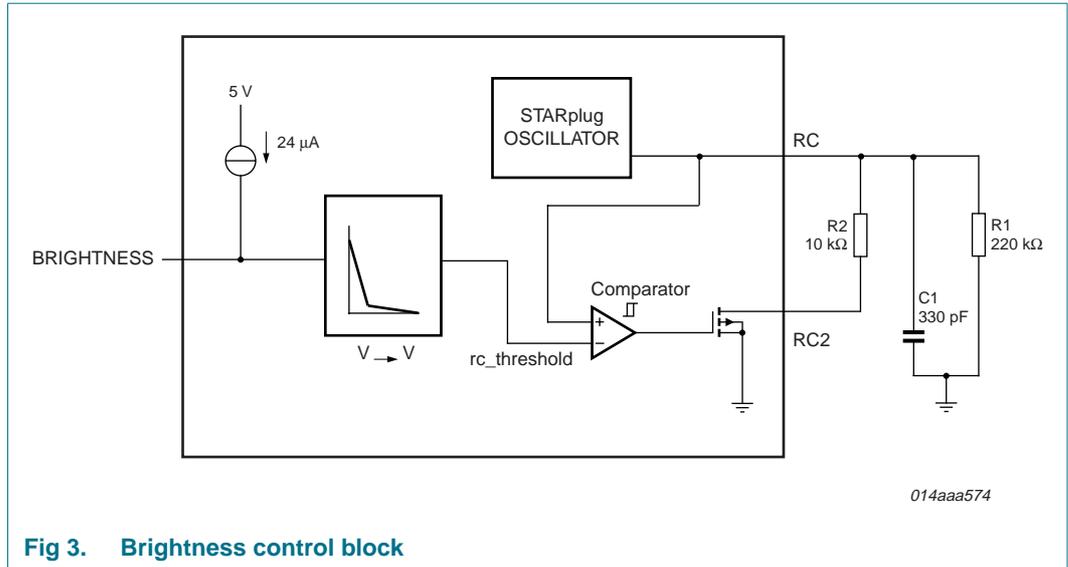


Fig 3. Brightness control block

A typical RC waveform is drawn in [Figure 4](#). The RC switch-over threshold is controlled by the BRIGHTNESS pin.

To ensure that the capacitor can be charged within the charge time, the value of the oscillator capacitor should be limited to 1 nF. Due to leakage current, the value of the resistor connected between the RC pin and the ground should be limited to a maximum of 220 kΩ.

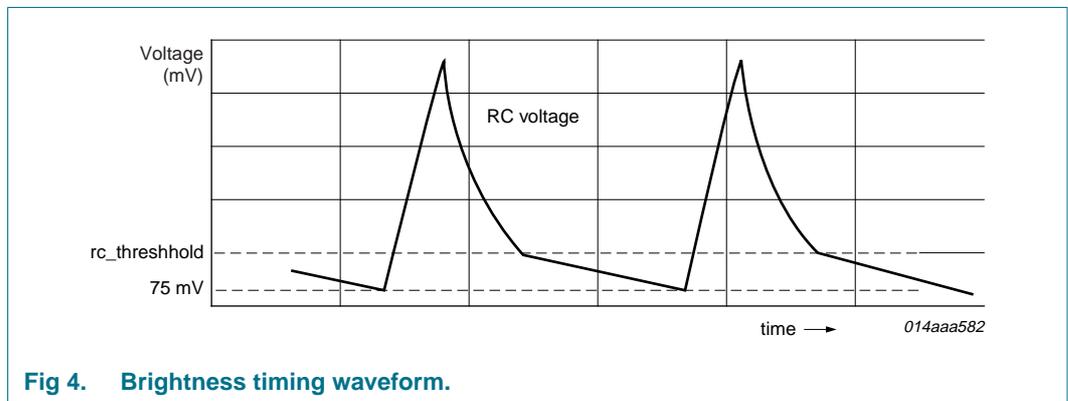


Fig 4. Brightness timing waveform.

### 8.3 Duty factor control

The duty factor is controlled by an internally regulated voltage and the oscillator signal on pin RC. The internal regulation voltage is set by the voltage on the PWMLIMIT pin.

A low PWMLIMIT voltage will result in a low on-time for the internal power switch. The minimum duty factor of the switched mode power supply can be set to 0 %. The maximum duty factor is set to 75 %.

### 8.4 Bleeder for dimming applications

The SSL2101 IC contains some circuitry intended for mains dimmer compatibility. This circuit contains two current sinks that are called bleeders. A strong bleeder is used for zero-cross reset of the dimmer and TRIAC latching. A weak bleeder is added to maintain the hold current through the dimmer.

The strong bleeder switch is switched on when the maximum voltage on pin WBLEED and SBLEED is below the  $V_{th(SBLEED)}$  level (52 V typically). The weak bleeder switch is switched on as soon as the voltage on pin ISENSE exceeds the  $V_{th(high)(ISENSE)}$  level (-100 mV typically). The weak bleeder switch is switched off when the ISENSE voltage drops below the  $V_{th(low)(ISENSE)}$  level (-250 mV typically). The weak bleeder switch is also switched off when the strong bleeder switch is switched on. See [Figure 5](#).

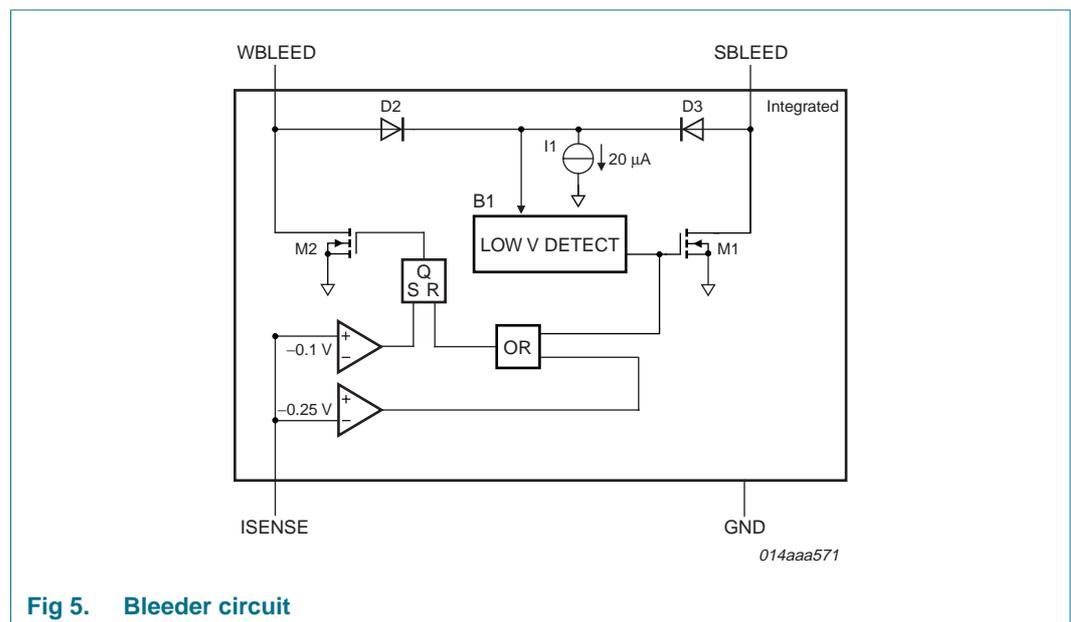


Fig 5. Bleeder circuit

### 8.5 Valley switching

A new cycle is started when the primary switch is switched on (see [Figure 6](#)). After a certain time (determined by the oscillator voltage, RC and the internal regulation level), the switch is turned off and the secondary stroke starts. The internal regulation level is determined by the voltage on pin PWMLIMIT.

After the secondary stroke, the drain voltage shows an oscillation with a frequency of approximately:

$$\frac{I}{2 \times \pi \times \sqrt{(L_p \times C_p)}} \tag{2}$$

where:

$L_p$  = primary self inductance

$C_p$  = parasitic capacitance on drain node

As soon as the oscillator voltage is high again and the secondary stroke has ended, the circuit waits for a low drain voltage before starting a new primary stroke.

Figure 6 shows the drain voltage together with the valley signal, the signal indicating the secondary stroke and the RC voltage.

The primary stroke starts some time before the actual valley at low ringing frequencies, and some time after the actual valley at high ringing frequencies.

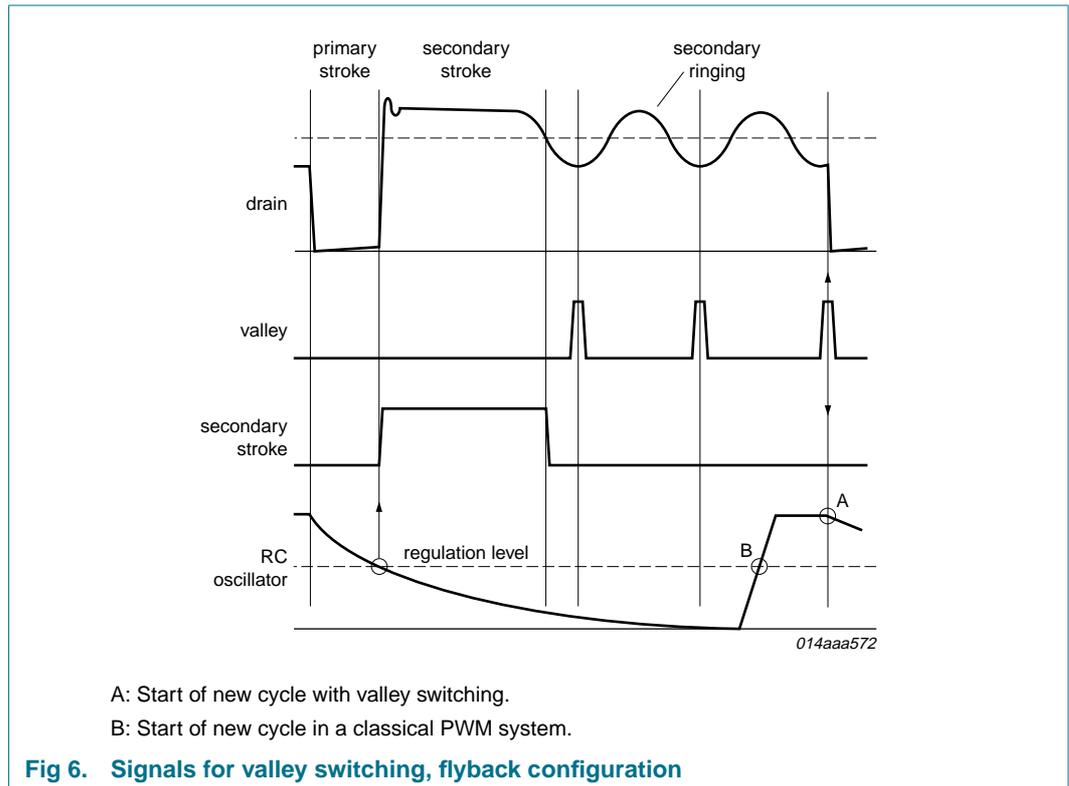


Figure 7 shows a typical curve for a reflected output voltage N at an output voltage of 80 V. This voltage is the output voltage transferred to the primary side of the transformer with the factor N (determined by the turns ratio of the transformer). It shows that the system switches exactly at minimum drain voltage for ringing frequencies of 480 kHz, thus reducing the switch-on losses to a minimum. At 200 kHz, the next primary stroke is started at 33 ° before the valley. The switch-on losses are still reduced significantly.

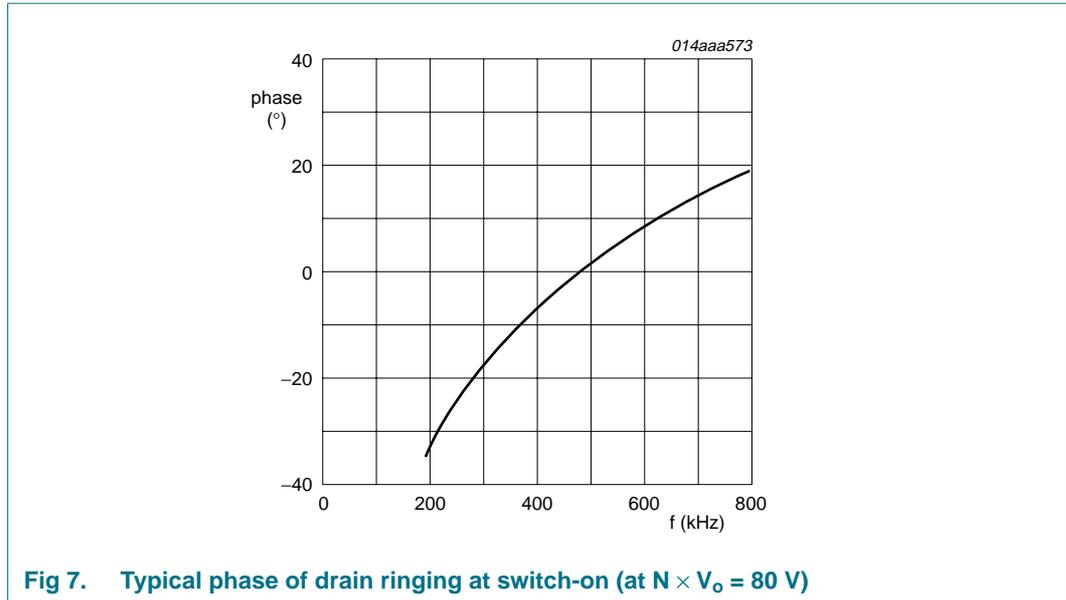


Fig 7. Typical phase of drain ringing at switch-on (at  $N \times V_o = 80 \text{ V}$ )

### 8.6 Demagnetization

The system operates in discontinuous conduction mode if the AUX pin is connected. As long as the secondary stroke has not ended, the oscillator will not start a new primary stroke. During the first  $t_{\text{sup(xfmr\_ring)}}$  seconds, demagnetization recognition is suppressed. This suppression may be necessary in applications where the transformer has a large leakage inductance and at low output voltages.

### 8.7 Overcurrent protection

The cycle-by-cycle peak drain current limit circuit uses the external source resistor  $R_{\text{SENSE}}$  to measure the current. The circuit is activated after the leading edge blanking time  $t_{\text{leb}}$ . The protection circuit limits the source voltage over the  $R_{\text{SENSE}}^1$  resistor to  $V_{\text{th(ocp)SOURCE}}$ , and thus limits the primary peak current.

### 8.8 Short-winding protection

The short-winding protection circuit is also activated after the leading edge blanking time. If the source voltage exceeds the short-winding protection threshold voltage  $V_{\text{th(swp)SOURCE}}$ , the IC stops switching. Only a power-on reset will restart normal operation. The short-winding protection also protects in case of a secondary diode short circuit.

### 8.9 Overtemperature protection

Accurate temperature protection is provided in the device. When the junction temperature exceeds the thermal shut-down temperature, the IC stops switching. During thermal protection, the IC current is lowered to the start-up current. The IC continues normal operation as soon as the overtemperature situation has disappeared.

1.  $R_{\text{SENSE}}$  is the resistor between the SOURCE pin and GND

## 9. Limiting values

**Table 4: Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134). All voltages are measured with respect to ground; positive currents flow into the device; pins  $V_{CC}$  and RC cannot be current driven. Pins ISENSE and AUX cannot be voltage driven.

| Symbol           | Parameter                       | Conditions   | Min   | Max   | Unit |   |
|------------------|---------------------------------|--|-------|-------|------|---|
| <b>Voltages</b>  |                                 |  |       |       |      |   |
| $V_{CC}$         | supply voltage                  | continuous   | -0.4  | +40   | V    |   |
| $V_{RC}$         | voltage on pin RC               |  | -0.4  | +3    | V    |   |
| $V_{RC2}$        | voltage on pin RC2              |  | -0.4  | +3    | V    |   |
| $V_{BRIGHTNESS}$ | voltage on pin BRIGHTNESS       |  | -0.4  | +5    | V    |   |
| $V_{PWMLIMIT}$   | voltage on pin PWMLIMIT         |  | -0.4  | +5    | V    |   |
| $V_{SOURCE}$     | voltage on pin SOURCE           |  | -0.4  | +5    | V    |   |
| $V_{DRAIN}$      | voltage on pin DRAIN            | DMOS power transistor;<br>$T_{amb} = 25\text{ °C}$ | -0.4  | +600  | V    |   |
| $V_{SBLEED}$     | voltage on pin SBLEED           | $T_{amb} = 25\text{ °C}$                           | -0.4  | +600  | V    |   |
| $V_{WBLEED}$     | voltage on pin WBLEED           | $T_{amb} = 25\text{ °C}$                           | -0.4  | +600  | V    |   |
| <b>Currents</b>  |                                 |  |       |       |      |   |
| $I_{ISENSE}$     | current on pin ISENSE           |  | -20   | +5    | mA   |   |
| $I_{AUX}$        | current on pin AUX              |  | -10   | +5    | mA   |   |
| $I_{SOURCE}$     | current on pin SOURCE           |  | -2    | +2    | A    |   |
| $I_{DRAIN}$      | current on pin DRAIN            |  | -2    | +2    | A    |   |
| $I_{SBLEED}$     | current on pin SBLEED           |  | 0     | 40    | mA   |   |
| $I_{WBLEED}$     | current on pin WBLEED           |  | 0     | 25    | mA   |   |
| <b>General</b>   |                                 |  |       |       |      |   |
| $P_{tot}$        | total power dissipation         | $T_{amb} = 70\text{ °C}$                           | -     | 1     | W    |   |
| $T_{stg}$        | storage temperature             |  | -55   | +150  | °C   |   |
| $T_{amb}$        | ambient temperature             |  | -40   | +100  | °C   |   |
| $T_j$            | junction temperature            |  | -40   | +150  | °C   |   |
| $V_{esd}$        | electrostatic discharge voltage | human body model;                                  | [1]   |       |      |   |
|                  |                                 | Pins 16, 1, 2                                      | -1000 | +1000 | V    |   |
|                  |                                 | All other pins                                     | -2000 | +2000 | V    |   |
|                  |                                 | machine model                                      | [2]   | -200  | +200 | V |
|                  |                                 | charged device model                               | [3]   | -500  | +500 | V |

[1] Human body model: equivalent to discharging a 100 pF capacitor through a 1.5 kΩ series resistor.

[2] Machine model: equivalent to discharging a 200 pF capacitor through a 0.75 μH coil and a 10 Ω series resistor.

[3] Charged device model: equivalent to charging the IC up to 1 kV and the subsequent discharging of each pin down to 0 V over a 1 Ω resistor.

## 10. Thermal characteristics

**Table 5: Thermal characteristics**

| Symbol        | Parameter                                   | Conditions      | Typ     | Unit |
|---------------|---|-----------------|---------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air     | [1] 100 | K/W  |
|               |   | Using Jedec PCB | 40      | K/W  |

[1] Thermal resistance  $R_{th(j-a)}$  can be lower when the GND pins are connected to sufficient copper area on the printed-circuit board.

## 11. Characteristics

**Table 6: Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$ ; no overtemperature; all voltages are measured with respect to ground; currents are positive when flowing into the IC and PWMLIMIT and BRIGHTNESS pins are disconnected unless otherwise specified. Typical frequency 100 kHz.

| Symbol                       | Parameter                            | Conditions   | Min  | Typ   | Max   | Unit          |
|------------------------------|--------------------------------------|--|------|-------|-------|---------------|
| <b>Supply</b>                |                                      |  |      |       |       |               |
| $I_{CC}$                     | supply current                       | normal operation;<br>$V_{DRAIN} = 60\text{ V}$ ;<br>$V_{CC} = 20\text{ V}$ | -    | 1.7   | 2     | mA            |
| $I_{CC(ch)}$                 | charge supply current                | $V_{DRAIN} > 60\text{ V}$ ;<br>$V_{CC} = 0\text{ V}$                       | -6   | -4.5  | -     | mA            |
| $V_{CC}$                     | supply voltage                       |  | 8.5  | -     | 40    | V             |
| $V_{CC(startup)}$            | start-up supply voltage              |  | 9.75 | 10.25 | 10.75 | V             |
| $V_{CC(UVLO)}$               | undervoltage lockout supply voltage  |  | 7.9  | 8.2   | 8.5   | V             |
| $I_{DRAIN}$                  | current on pin DRAIN                 | $V_{DRAIN} > 60\text{ V}$ ;<br>no auxiliary supply                         | -    | -     | 2.2   | mA            |
|                              |                                      | $V_{DRAIN} > 60\text{ V}$ ;<br>with auxiliary supply                       | -    | 30    | 125   | $\mu\text{A}$ |
| $V_{DRAIN}$                  | voltage on pin DRAIN                 |  | 40   | -     | 600   | V             |
| <b>Pulse width modulator</b> |                                      |  |      |       |       |               |
| $\delta_{min}$               | minimum duty factor                  |  | -    | 0     | -     | %             |
| $\delta_{max}$               | maximum duty cycle                   | $f = 100\text{ kHz}$   | -    | 75    | -     | %             |
| <b>SOPS</b>                  |                                      |  |      |       |       |               |
| $V_{det(demag)}$             | demagnetization detection voltage    |  | 50   | 100   | 150   | mV            |
| $t_{sup(xfmr\_ring)}$        | transformer ringing suppression time | at start of secondary stroke   | 1.0  | 1.5   | 2.0   | $\mu\text{s}$ |
| <b>RC oscillator</b>         |                                      |  |      |       |       |               |
| $V_{RC(min)}$                | minimum voltage on pin RC            |  | 60   | 75    | 90    | mV            |

**Table 6: Characteristics ...continued**

$T_{amb} = 25\text{ }^{\circ}\text{C}$ ; no overtemperature; all voltages are measured with respect to ground; currents are positive when flowing into the IC and PWMLIMIT and BRIGHTNESS pins are disconnected unless otherwise specified. Typical frequency 100 kHz.

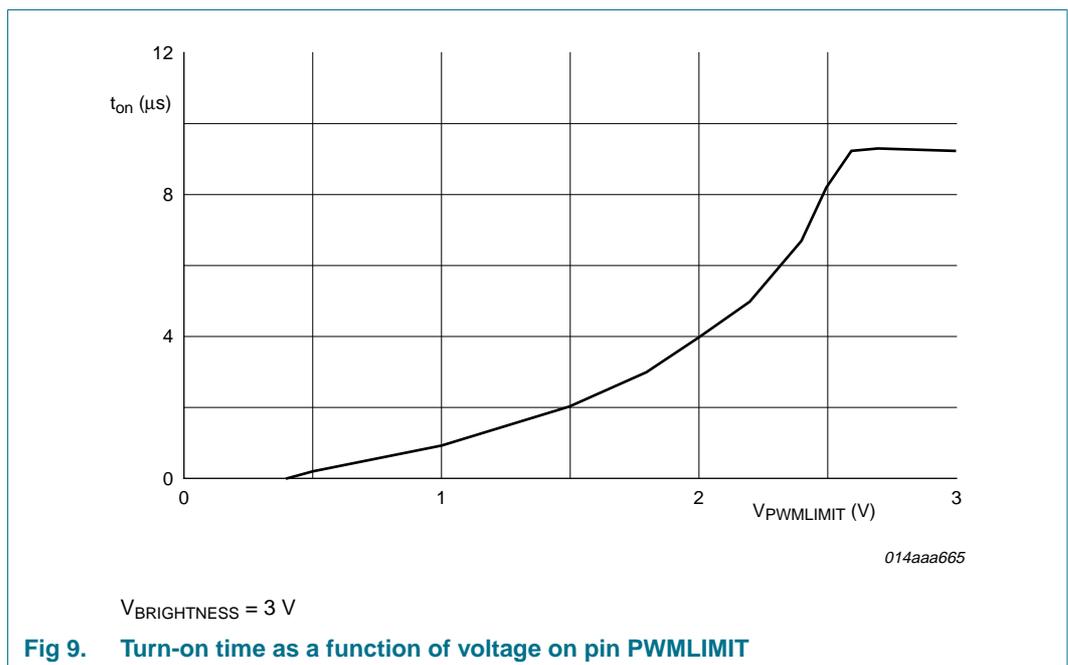
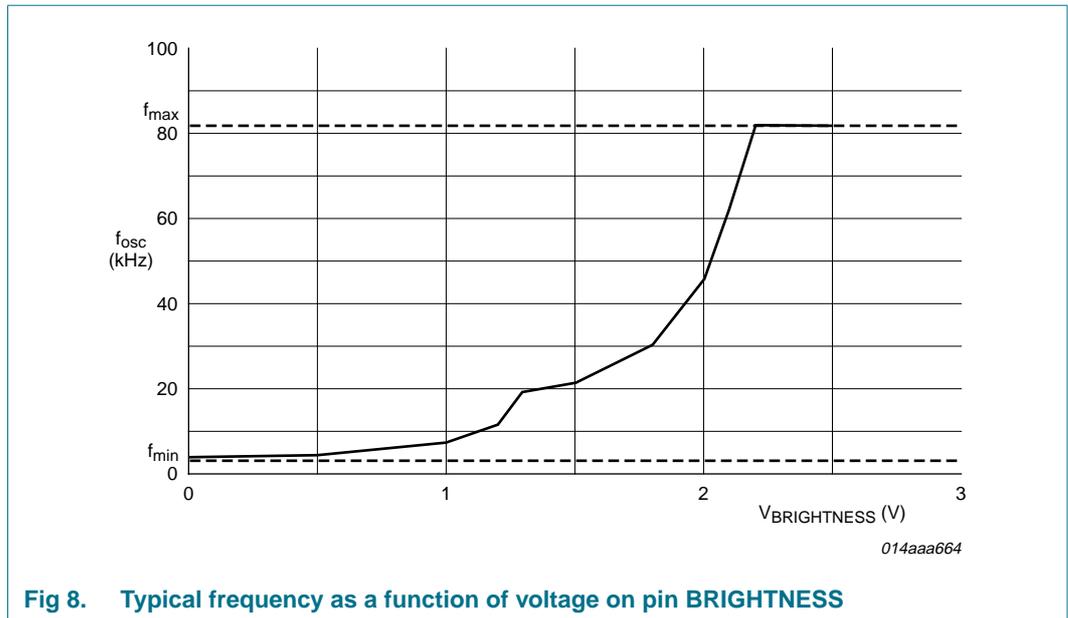
| Symbol                                     | Parameter                                      | Conditions                             | Min                   | Typ  | Max | Unit             |
|--|--|--|-----------------------|------|-----|------------------|
| $V_{RC(max)}$                              | maximum voltage on pin RC                      |  | 2.4                   | 2.5  | 2.6 | V                |
| $t_{ch(RC)}$                               | charge time on pin RC                          |  | -                     | 1    | -   | $\mu\text{s}$    |
| $V_{BRIGHTNESS}$                           | voltage on pin BRIGHTNESS                      | 2.5 V RC2 trip level                   | -                     | 0.5  | -   | V                |
|  |  | 180 mV RC2 trip level                  | -                     | 1.25 | -   | V                |
|  |  | 75 mV RC2 trip level                   | -                     | 2.3  | -   | V                |
| $f_{osc}$                                  | oscillator frequency                           |  | 10                    | 100  | 200 | kHz              |
| $I_{BRIGHTNESS}$                           | current on pin BRIGHTNESS                      | $V_{BRIGHTNESS} = 0\text{ V}$          | -20                   | -24  | -28 | $\mu\text{A}$    |
| <b>Bleeder</b>                             |  |  |                       |      |     |                  |
| $V_{th(SBLEED)}$                           | threshold voltage on pin SBLEED                |  | 50                    | 52   | 56  | V                |
| $V_{th(low)ISENSE}$                        | low threshold voltage on pin ISENSE            |  | -                     | -250 | -   | mV               |
| $V_{th(high)ISENSE}$                       | high threshold voltage on pin ISENSE           |  | -                     | -100 | -   | mV               |
| $R_{DSon(SBLEED)}$                         | drain-source on-state resistance on pin SBLEED | $I_{SBLEED} = 25\text{ mA}$            |                       |      |     |                  |
|  |  | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 140                   | 170  | 200 | $\Omega$         |
|  |  | $T_j = 125\text{ }^{\circ}\text{C}$    | 200                   | 225  | 250 | $\Omega$         |
| $R_{DSon(WBLEED)}$                         | drain-source on-state resistance on pin WBLEED | $I_{WBLEED} = 10\text{ mA}$            |                       |      |     |                  |
|  |  | $T_{amb} = 25\text{ }^{\circ}\text{C}$ | 250                   | 310  | 350 | $\Omega$         |
|  |  | $T_j = 125\text{ }^{\circ}\text{C}$    | 300                   | 400  | 500 | $\Omega$         |
| <b>Duty factor regulator: pin PWMLIMIT</b> |  |  |                       |      |     |                  |
| $I_{PWMLIMIT}$                             | current on pin PWMLIMIT                        |  | -25                   | -    | -18 | $\mu\text{A}$    |
| $V_{PWMLIMIT}$                             | voltage on pin PWMLIMIT                        | maximum duty cycle = 3 V               | -                     | 3    | -   | V                |
|  |  | minimum duty factor threshold          | -                     | 0.45 | -   | V                |
| <b>Valley switching</b>                    |  |  |                       |      |     |                  |
| $(\Delta V/\Delta t)_{vrec}$               | valley recognition voltage change with time    | minimum absolute value                 | <a href="#">[1]</a> - | 100  | -   | V/ $\mu\text{s}$ |
| $f_{ring}$                                 | ringing frequency                              | $N \times V_O = 100\text{ V}$          | 200                   | 550  | 800 | kHz              |
| $t_{d(vrec-swon)}$                         | valley recognition to switch-on delay time     |  | -                     | 150  | -   | ns               |

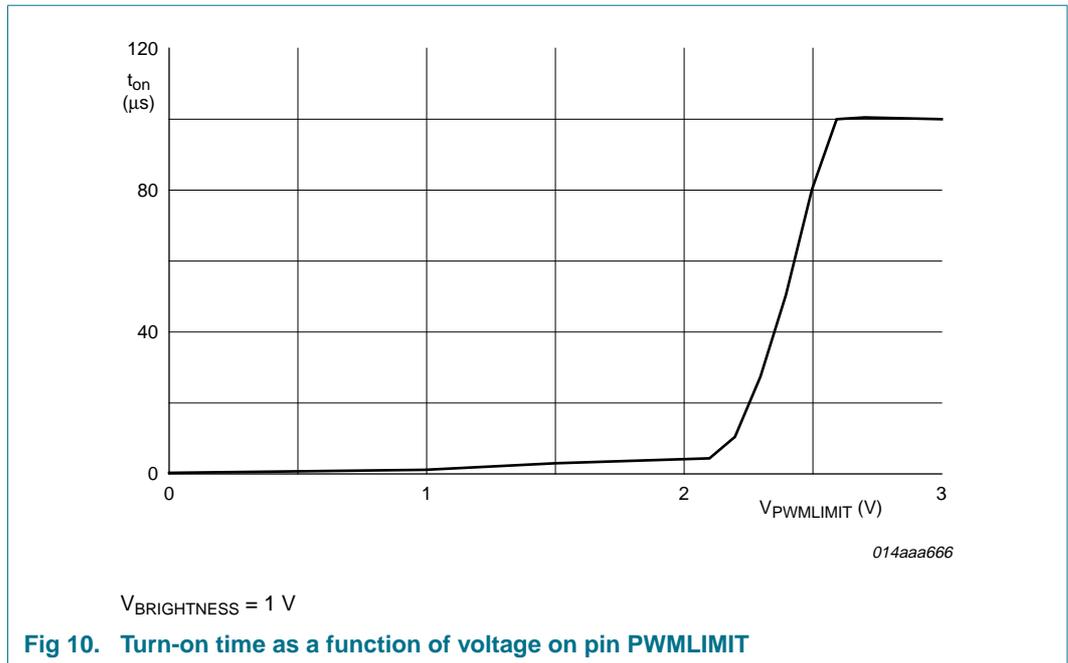
**Table 6: Characteristics ...continued**

$T_{amb} = 25\text{ °C}$ ; no overtemperature; all voltages are measured with respect to ground; currents are positive when flowing into the IC and PWMLIMIT and BRIGHTNESS pins are disconnected unless otherwise specified. Typical frequency 100 kHz.

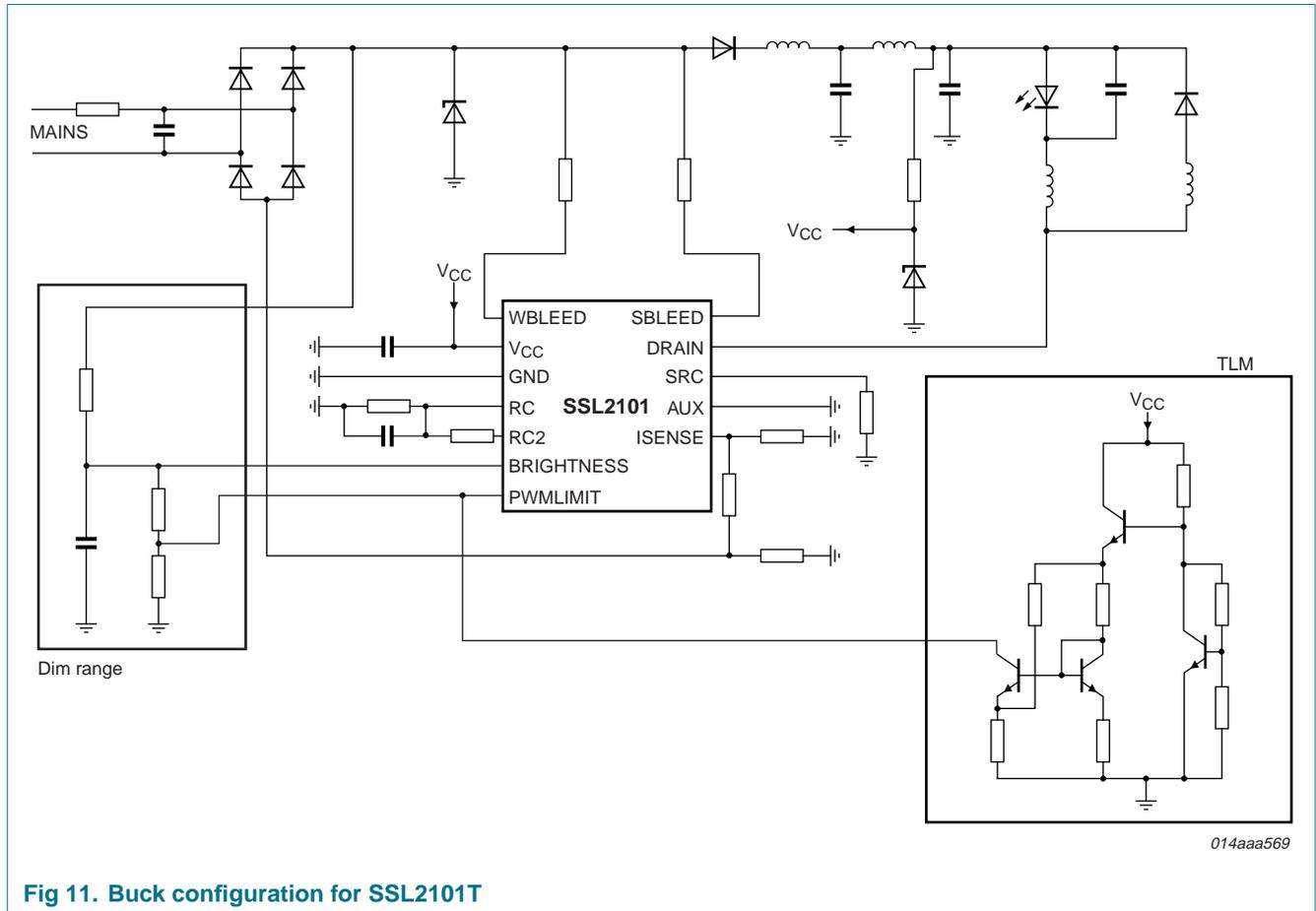
| Symbol  | Parameter  | Conditions   | Min  | Typ  | Max  | Unit               |
|---|--|--|------|------|------|--------------------|
| <b>Current and short circuit winding protection</b> |  |  |      |      |      |                    |
| $V_{th(ocp)SOURCE}$                                 | overcurrent protection threshold voltage on pin SOURCE   | $dV/dt = 0.1\text{ V}/\mu\text{s}$                   | 0.47 | 0.50 | 0.53 | V                  |
| $V_{th(swp)SOURCE}$                                 | short-winding protection threshold voltage on pin SOURCE | $dV/dt = 0.1\text{ V}/\mu\text{s}$                   | -    | 1.5  | -    | V                  |
| $t_{d(ocp-swoff)}$                                  | delay time from overcurrent protection to switch-off     | $dV/dt = 0.5\text{ V}/\mu\text{s}$                   | -    | 160  | 185  | ns                 |
| $t_{leb}$   | leading edge blanking time                               |  | 250  | 350  | 450  | ns                 |
| <b>FET output stage</b>                             |  |  |      |      |      |                    |
| $I_{L(DRAIN)}$                                      | leakage current on pin DRAIN                             | $V_{DRAIN} = 600\text{ V}$                           | -    | -    | 125  | $\mu\text{A}$      |
| $V_{BR(DRAIN)}$                                     | breakdown voltage on pin DRAIN                           | $T_{amb} = 25\text{ °C}$                             | 600  | -    | -    | V                  |
| $R_{DSon}$  | drain-source on-state resistance                         | power switch; $I_{SOURCE} = -0.50\text{ A}$          |      |      |      |                    |
|   |  | $T_j = 25\text{ °C}$                                 | -    | 6.5  | 7.5  | $\Omega$           |
|   |  | $I_{SOURCE} = -0.20\text{ A}$                        |      |      |      |                    |
|   |  | $T_j = 125\text{ °C}$                                | -    | 9.0  | 10   | $\Omega$           |
| $t_f(DRAIN)$  | fall time on pin DRAIN                                   | input voltage: 300 V; no external capacitor at drain | -    | 75   | -    | ns                 |
| <b>Temperature protection</b>                       |  |  |      |      |      |                    |
| $T_{otp}$   | overtemperature protection trip                          | junction temperature                                 | 150  | 160  | 170  | $^{\circ}\text{C}$ |
| $T_{otp(hys)}$                                      | overtemperature protection trip hysteresis               | junction temperature                                 | -    | 2    | -    | $^{\circ}\text{C}$ |

[1] Voltage change in time for valley recognition.





12. Application information



014aaa569

Fig 11. Buck configuration for SSL2101T

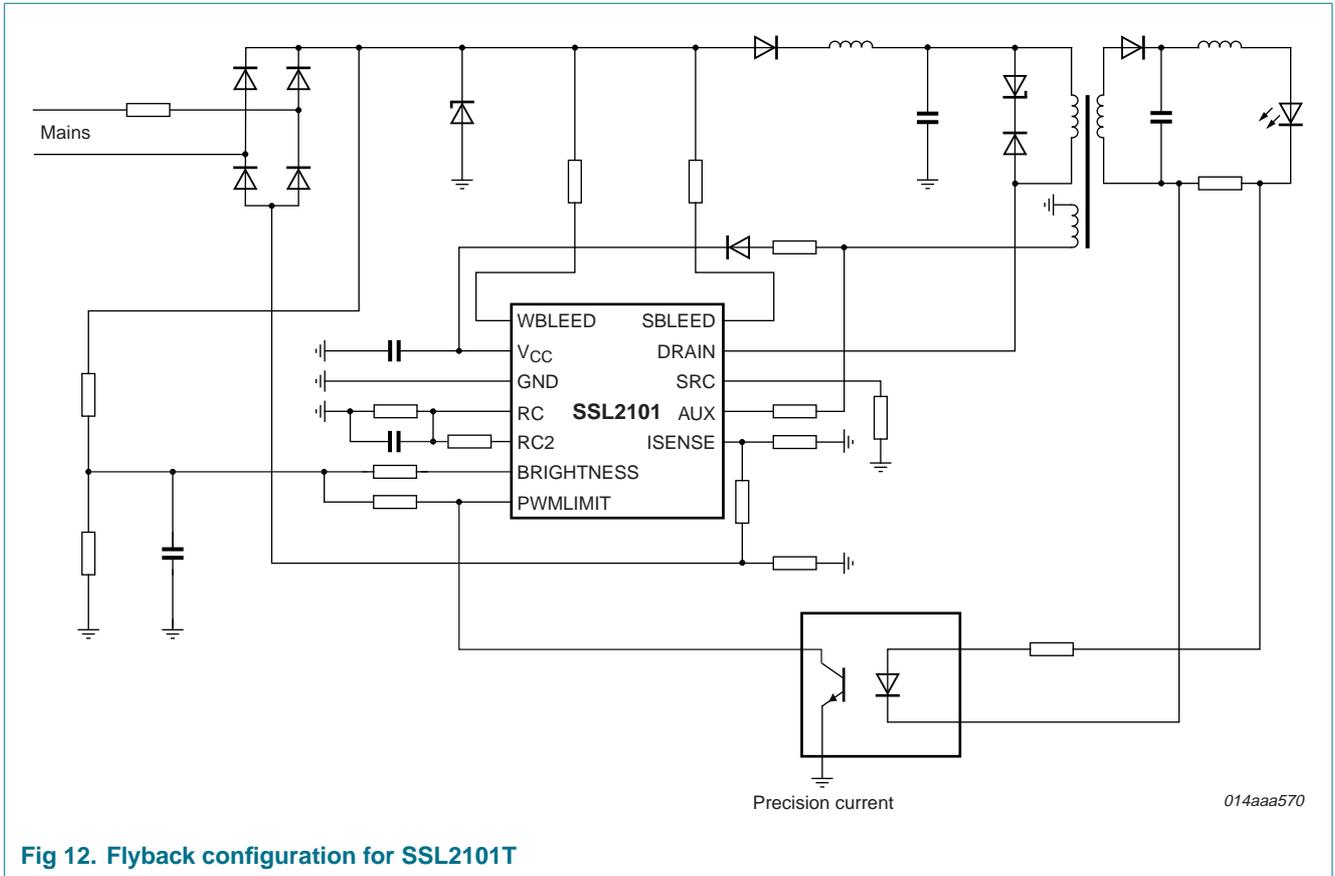


Fig 12. Flyback configuration for SSL2101T

Further application information can be found in the SSL2101 application notes.

13. Package outline

SO16: plastic small outline package; 16 leads; body width 3.9 mm

SOT109-1

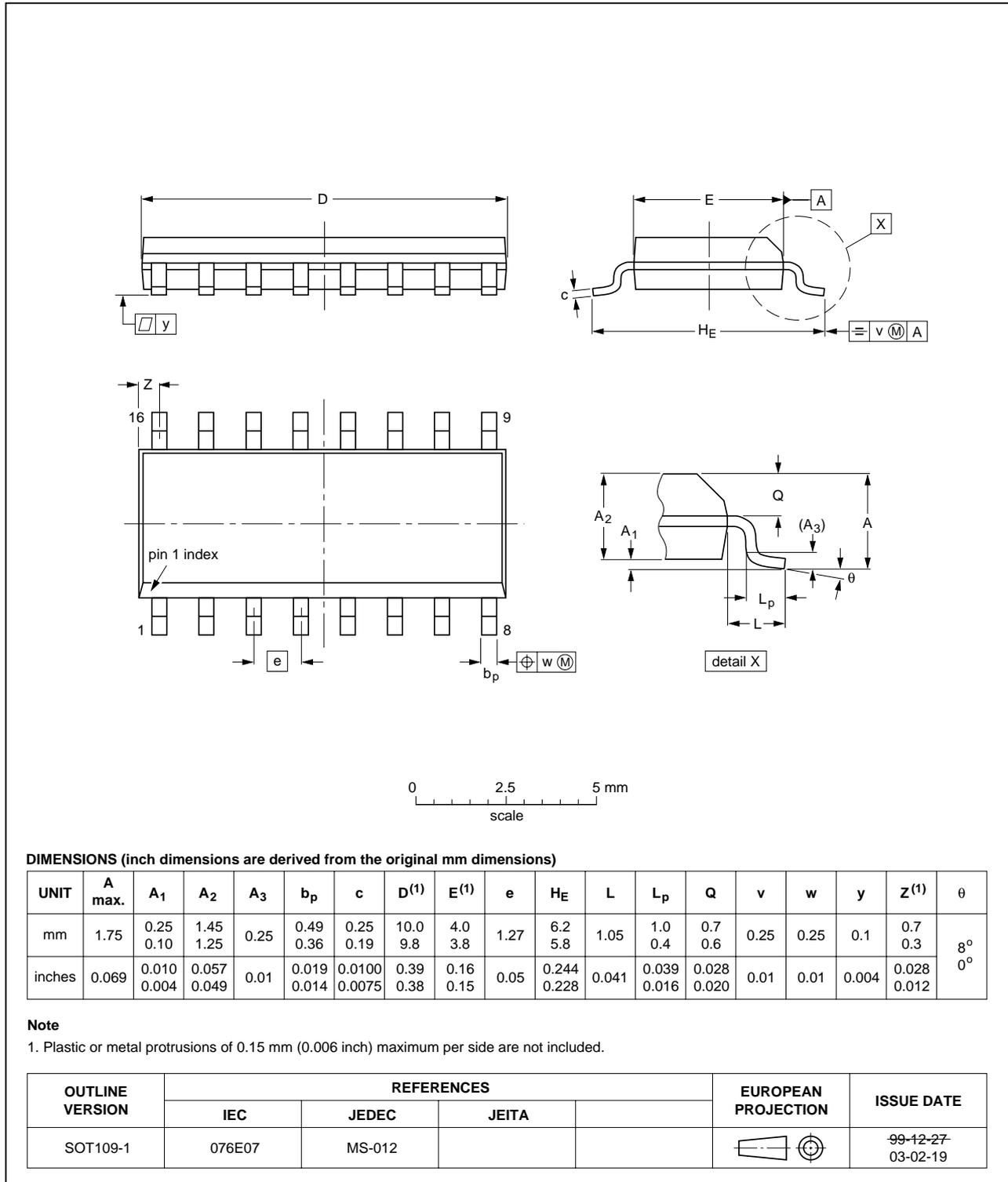


Fig 13. Package outline SOT109-1 (SO16)

## 14. Revision history

Table 7: Revision history

| Document ID | Release date | Data sheet status      | Change notice | Supersedes |
|-------------|--------------|------------------------|---------------|------------|
| SSL2101_1   | 20090119     | Preliminary data sheet | -             | -          |

## 15. Legal information

### 15.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition  |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet    | Qualification                 | This document contains data from the preliminary specification.                       |
| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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