



**austriamicrosystems AG**

**is now**

**ams AG**

The technical content of this austriamicrosystems application note is still valid.

**Contact information:**

**Headquarters:**

ams AG

Tobelbaderstrasse 30

8141 Unterpremstaetten, Austria

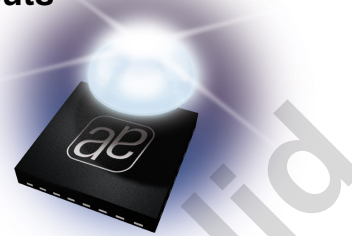
Tel: +43 (0) 3136 500 0

e-Mail: [ams\\_sales@ams.com](mailto:ams_sales@ams.com)

Please visit our website at [www.ams.com](http://www.ams.com)

# AS3492

## Highly Efficient 2-10 LEDs Backlight Driver with 2 PWM Inputs



### 1 General Description

The AS3492 is an inductive highly efficient DCDC boost converter. The DCDC converter operates at a fixed frequency of 2MHz and includes soft startup to allow easy integration into noise sensitive RF systems. A predictable startup is guaranteed even with very low duty cycle PWM input signals. The voltage on the output capacitor is controlled to minimize ripple and to avoid any acoustic effects for low frequency PWM input signals.

The output of the DCDC converter is used for five current sources connected to up to 10 LEDs. If a current source is not required, it shall be connected to VOUT or GND - the AS3492 detects this condition and disables this current source automatically; this keep the efficiency of the system constantly high.

The AS3492 is controlled by two enable inputs, ON13 and ON45. These inputs can also be used to connect a PWM input (like DLS or DBC).

The AS3492 includes several protection functions like undervoltage lockout, overcurrent and overtemperature. No microvias are required to assemble the AS3492 if only four channels are used and ON13=ON45.

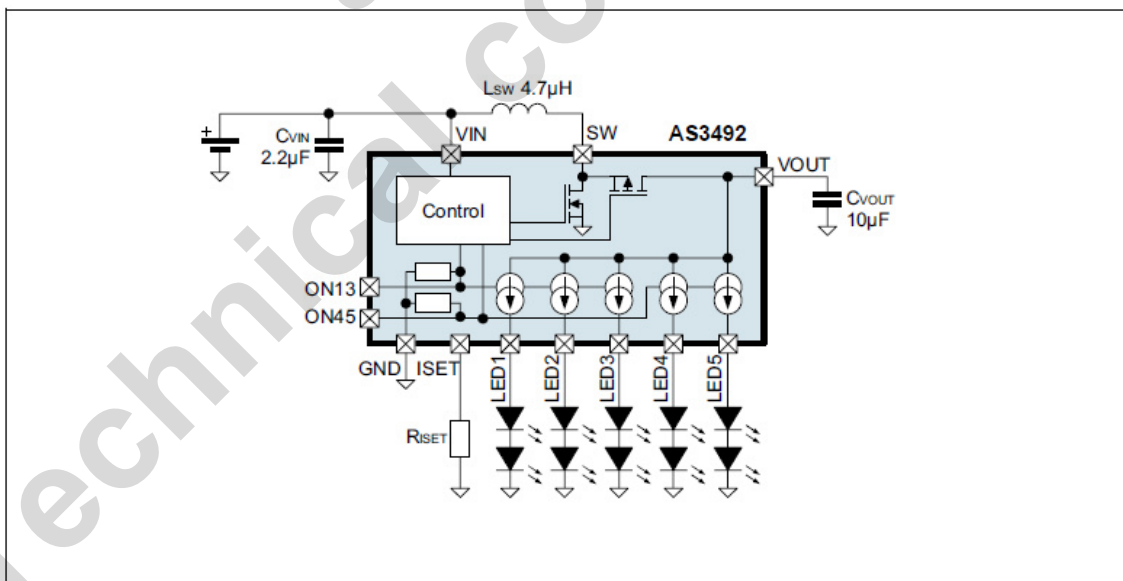
The AS3492 is available in a space-saving WL-CSP package measuring only 1.7x1.4x0.5mm and operates over the -30°C to +85°C temperature range.

### 2 Key Features

- 2 MHz DCDC Boost converter
  - Small 4.7µH external coil
  - Very high application efficiency of up to 90%
  - Very low voltage changes on output to avoid acoustic noise on output capacitor even with PWM
  - Smooth startup even under low duty cycle PWM conditions
- Five Current sources up to 25mA
  - Low voltage compliance (150mV)
  - High side current source to simplify layout and thermal management of the LEDs
  - Automatically detect and disable failing or not used LEDs to keep efficiency high
  - Current matching <4%
  - Current accuracy <7.5%
- Excellent LED current output ripple <500µA
- Support DLS (Dynamic Luminance Scaling or DBC)
- Undervoltage lockout and overcurrent protection
- Overtemperature protection
- Available in a tiny WL-CSP package
  - 3x4 balls, 0.4mm pitch, 1.7x1.4x0.5mm

### 3 Application

Display backlight driver for mobile phones, digital cameras, PND and PMPs.



## Table of Contents

1	GENERAL DESCRIPTION .....	1
2	KEY FEATURES .....	1
3	APPLICATION .....	1
4	FURTHER APPLICATIONS .....	3
5	REVISION STATUS .....	3
6	GENERAL DESCRIPTION .....	3
7	GETTING STARTED .....	3
8	PCB: GET THE BOARD FUNCTIONAL .....	3
9	AS3492 DEMOBOARD 2V0 JUMPER AND DEVICE LOCATIONS .....	4
10	APPLICATION SCHEMATIC AS3492 DEMO BOARD 1V0 .....	5
11	AS3492 DEMOBOARD 1V0: LAYOUT (TOP VIEW) .....	5
12	AS3492 DEMOBOARD 2V0: LAYOUT (BOTTOM VIEW) .....	6
13	AS3492 DEMOBOARD 2V0: LAYOUT (MULTILAYER 1) .....	6
14	AS3492 DEMOBOARD 2V0: LAYOUT (MULTILAYER 2) .....	7
	COPYRIGHT .....	8

## 4 Further Applications

Visit our home-page: <http://www.austriamicrosystems.com>

## 5 Revision status

AS3492 - AN02 - Demoboard

Rev.: 1V0

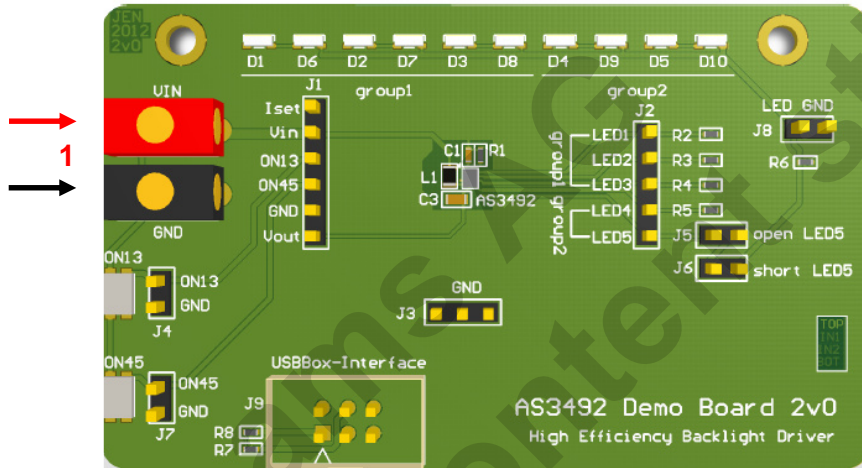
## 6 General description

Remark: all subsequent component numbering refers to the application schematics, shown in par"Application Schematic".

## 7 Getting Started

For this Application no Software is required

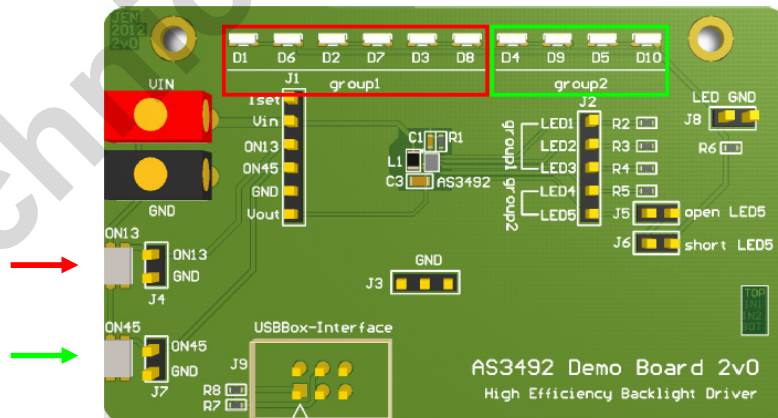
Connect the battery to VBAT and GND @ Point 1.



## 8 PCB: Get the board functional

Push the switch SW1 and all LEDs of "group1" should be turned on.

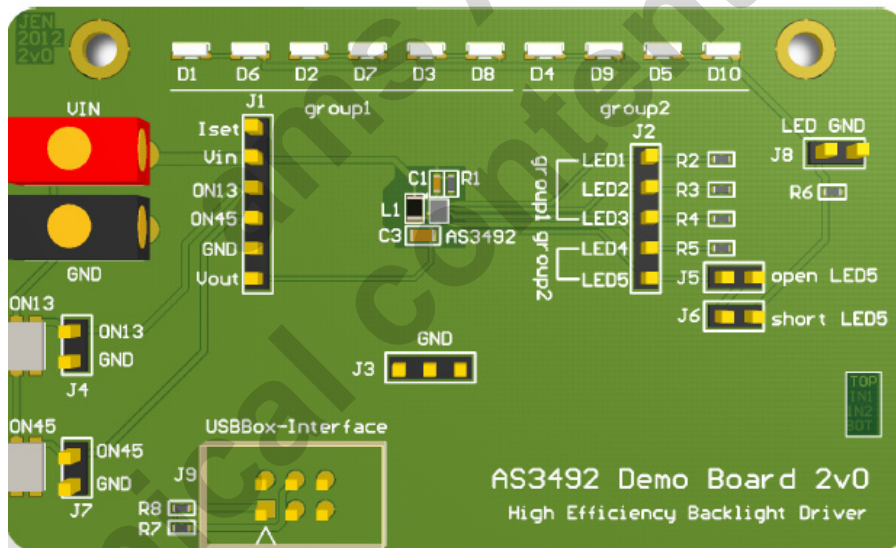
Push the switch SW2 and all LEDs of "group2" should be turned on



## 9 AS3492 Demoboard 2v0 jumper and device locations

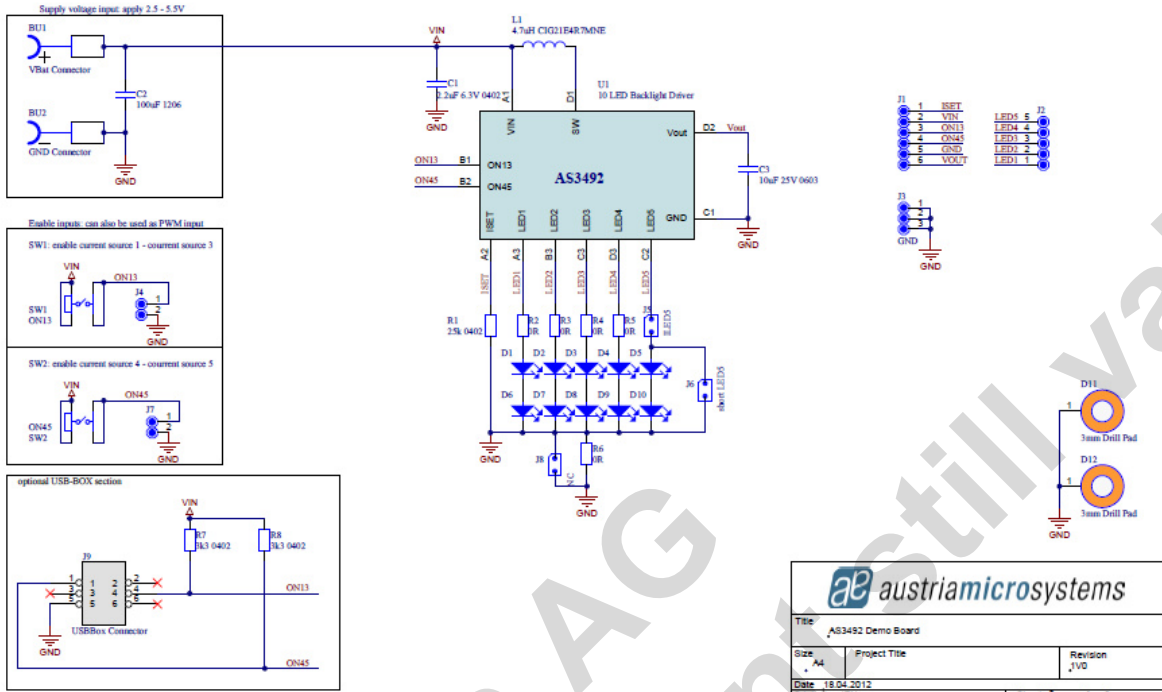
Listed below are the various connectors and jumpers.

Jumper	Function	Jumper setting	comment
J8	Connection of all LEDs to GND	Closed	Useful for all LED current measurements, remove therefore R6
J5	Open LED5 string	Closed	Open open LED detection
J6	Short LED5 string	open	Connect Jumper to short led detection
J3	GND		For GND connection of measurement probes
GND	Ground Connection		PWM input for current source LED4 and LED5
VIN	Vbat Connection		Supply voltage input: apply 2.5V – 5.5V
SW1	ON13		if pressed, ON13 is pulled to Vbat
SW2	ON45		if pressed, ON45 is pulled to Vbat
J9	USB-BOX Interface		austriamicrosystems USB-BOX IF – not assembled
Device	Value		comment
U1	AS3492		High Efficient 2-10 LEDs Backlight Driver IC
D1~D10	CL120		Citizen CL-120 LED SideLED
C1	2.2µF +/- 20% - X5R – 6V3		Semco CL05A225MQ5NNN
C3	10µF – X5R – 25V		Semco CL10A106MA8NRNC
L1	4.7µH - 2x1,2x1mm		Semco CIG21E4R7MNE
Device	Value		comment



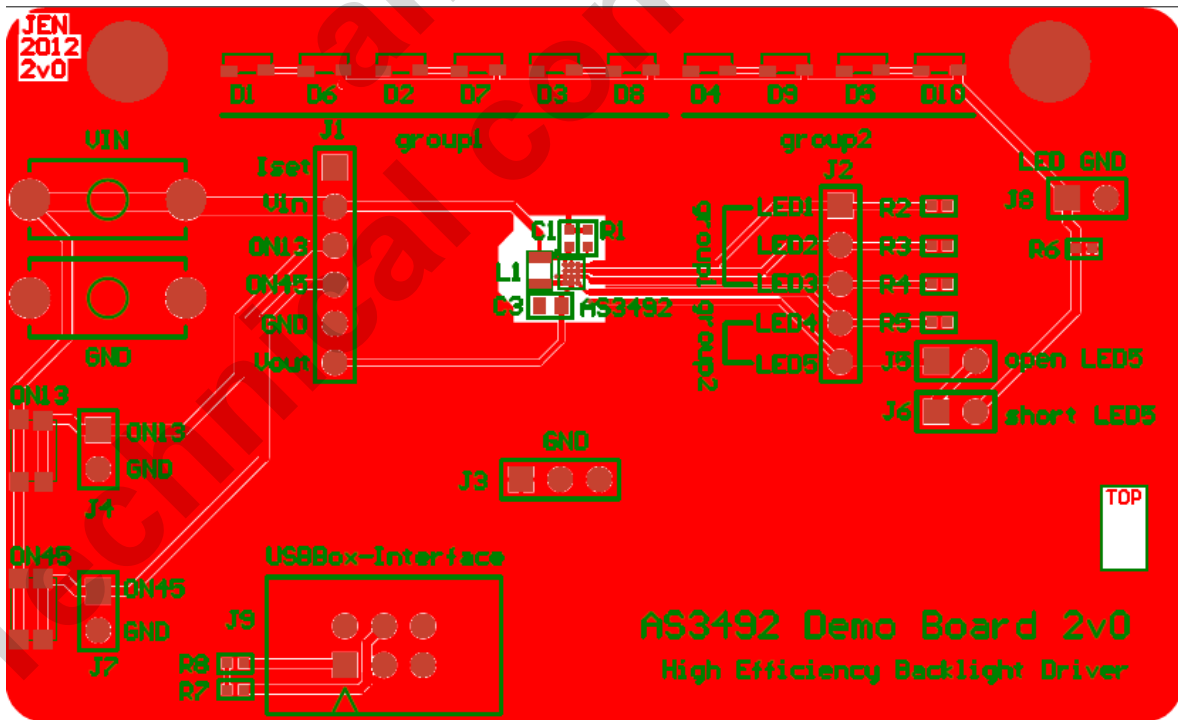
Connector and Jumper locations of AS3492 Demo Board 2V0

### 10 Application Schematic AS3492 Demo Board 1V0



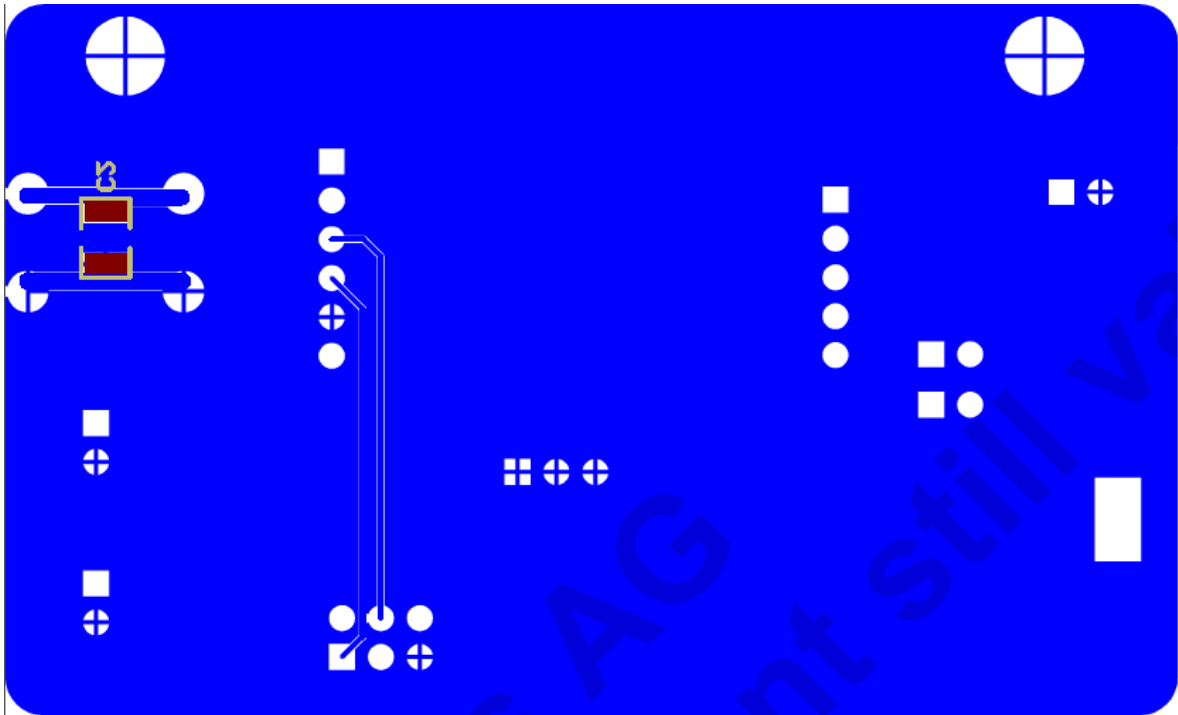
Application Schematic AS3492 Demo Board V2.0

### 11 AS3492 Demoboard 2V0: Layout (top view)



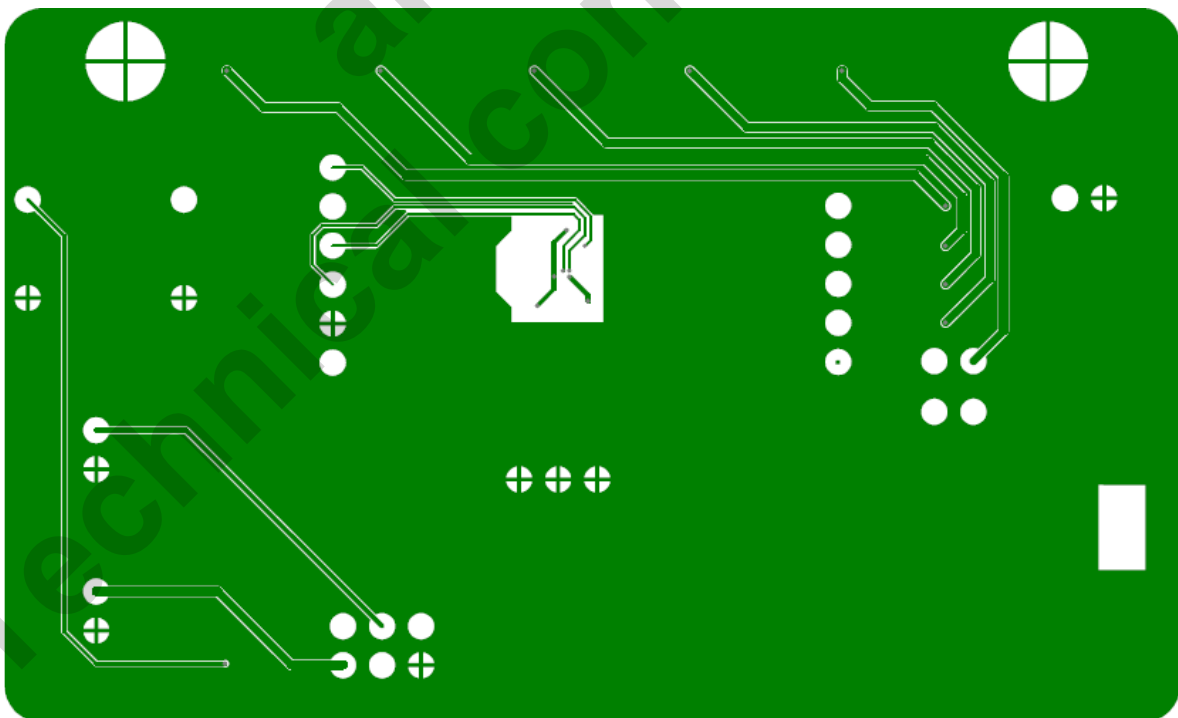
Layout (top view)

### 12 AS3492 Demoboard 2V0: Layout (bottom view)



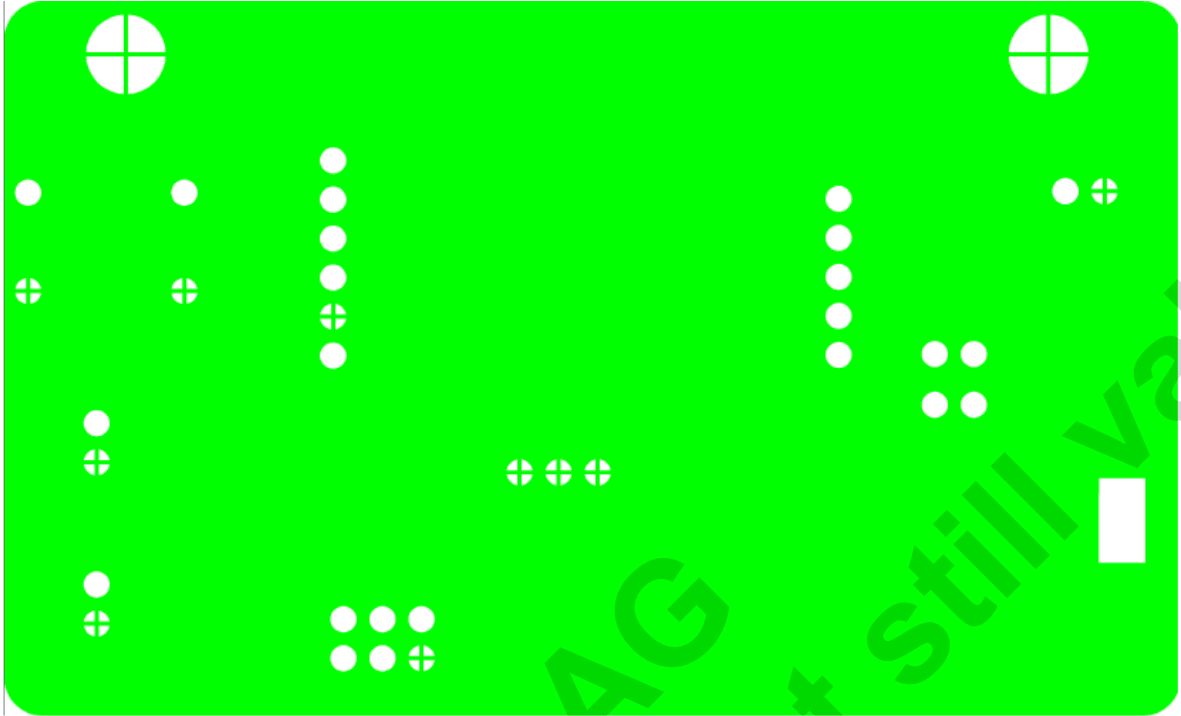
Layout (bottom view)

### 13 AS3492 Demoboard 2V0: Layout (Multilayer 1)



Layout (Multilayer 1)

14 AS3492 Demoboard 2V0: Layout (Multilayer 2)



Layout (Multilayer 2)

ams AG  
Technical content still valid



## Copyright

Copyright © 1997-2012, austriamicrosystems AG, Tobelbaderstrasse 30, 8141 Unterpremstaetten, Austria-Europe. Trademarks Registered ®. All rights reserved. The material herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner.

All products and companies mentioned are trademarks or registered trademarks of their respective companies.

## Disclaimer

Devices sold by austriamicrosystems AG are covered by the warranty and patent indemnification provisions appearing in its Term of Sale. austriamicrosystems AG makes no warranty, express, statutory, implied, or by description regarding the information set forth herein or regarding the freedom of the described devices from patent infringement. Austriamicrosystems AG reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with austriamicrosystems AG for current information.

This product is intended for use in normal commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or lifesustaining equipment are specifically not recommended without additional processing by austriamicrosystems AG for each application. For shipments of less than 100 parts the manufacturing flow might show deviations from the standard production flow, such as test flow or test location.

The information furnished here by austriamicrosystems AG is believed to be correct and accurate. However, austriamicrosystems AG shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of austriamicrosystems AG rendering of technical or other services.



## Contact Information

### Headquarters

austriamicrosystems AG  
A-8141 Tobelbaderstrasse 30, Austria  
T. +43 (0) 3136 500 0  
F. +43 (0) 3136 5692

For Sales Offices, Distributors and Representatives, please visit:  
<http://www.austriamicrosystems.com/contact>

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [LED Lighting Development Tools](#) category:*

*Click to view products by [ams](#) manufacturer:*

Other Similar products are found below :

[MIC2870YFT EV](#) [ADP8860DBCP-EVALZ](#) [LM3404MREVAL](#) [ADM8843EB-EVALZ](#) [TDGL014](#) [ISL97682IRTZEVALZ](#) [LM3508TLEV](#)  
[EA6358NH](#) [MAX16826EVKIT](#) [MAX16839EVKIT+](#) [TPS92315EVM-516](#) [MAX1698EVKIT](#) [MAX6956EVKIT+](#) [OM13321,598](#) [DC986A](#)  
[DC909A](#) [DC824A](#) [STEVAL-LLL006V1](#) [IS31LT3948-GRLS4-EB](#) [104PW03F](#) [PIM526](#) [PIM527](#) [MAX6946EVKIT+](#) [MAX20070EVKIT#](#)  
[MAX21610EVKIT#](#) [MAX20090BEVKIT#](#) [MAX20092EVSYS#](#) [PIM498](#) [AP8800EV1](#) [ZXLD1370/1EV4](#) [MAX6964EVKIT](#)  
[MAX25240EVKIT#](#) [MAX25500TEVKITC#](#) [MAX77961BEVKIT06#](#) [1216.1013](#) [TPS61176EVM-566](#) [TPS61197EVM](#) [TPS92001EVM-628](#)  
[1270](#) [1271.2004](#) [1272.1030](#) [1273.1010](#) [1278.1010](#) [1279.1002](#) [1279.1001](#) [1282.1000](#) [1293.1900](#) [1293.1800](#) [1293.1700](#) [1293.1500](#)