Preliminary Data Sheet

α1510

Analog Switch IC

Description

The integrated circuit α1510 is used to switch arbitrary loads on AC lines.
These loads may be inductivities, capacities or resistances.
The circuit has a CMOS/TTL input with schmitt trigger character.
Integrated functions protect the circuit versus short circuit and overtemperature.

Features

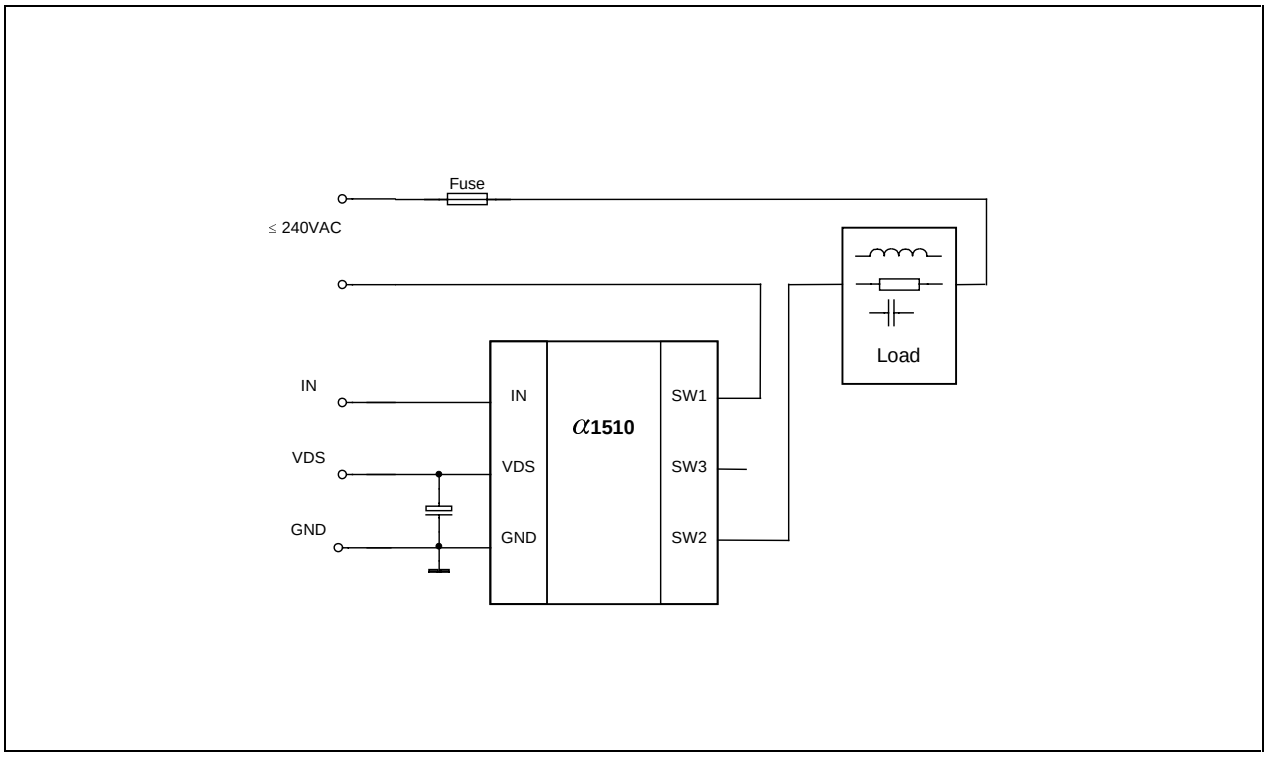
- ❑ Small switch-ON-resistance < 15Ω
- ❑ Stand-by power dissipation < 0.02W
- ❑ Minimum external components
- ❑ ESD-protected input
- ❑ Integrated short circuit and overtemperature protection
- ❑ Temperature range 0°C ... +70°C
- ❑ Package SOP12LP 1510BT

Applications

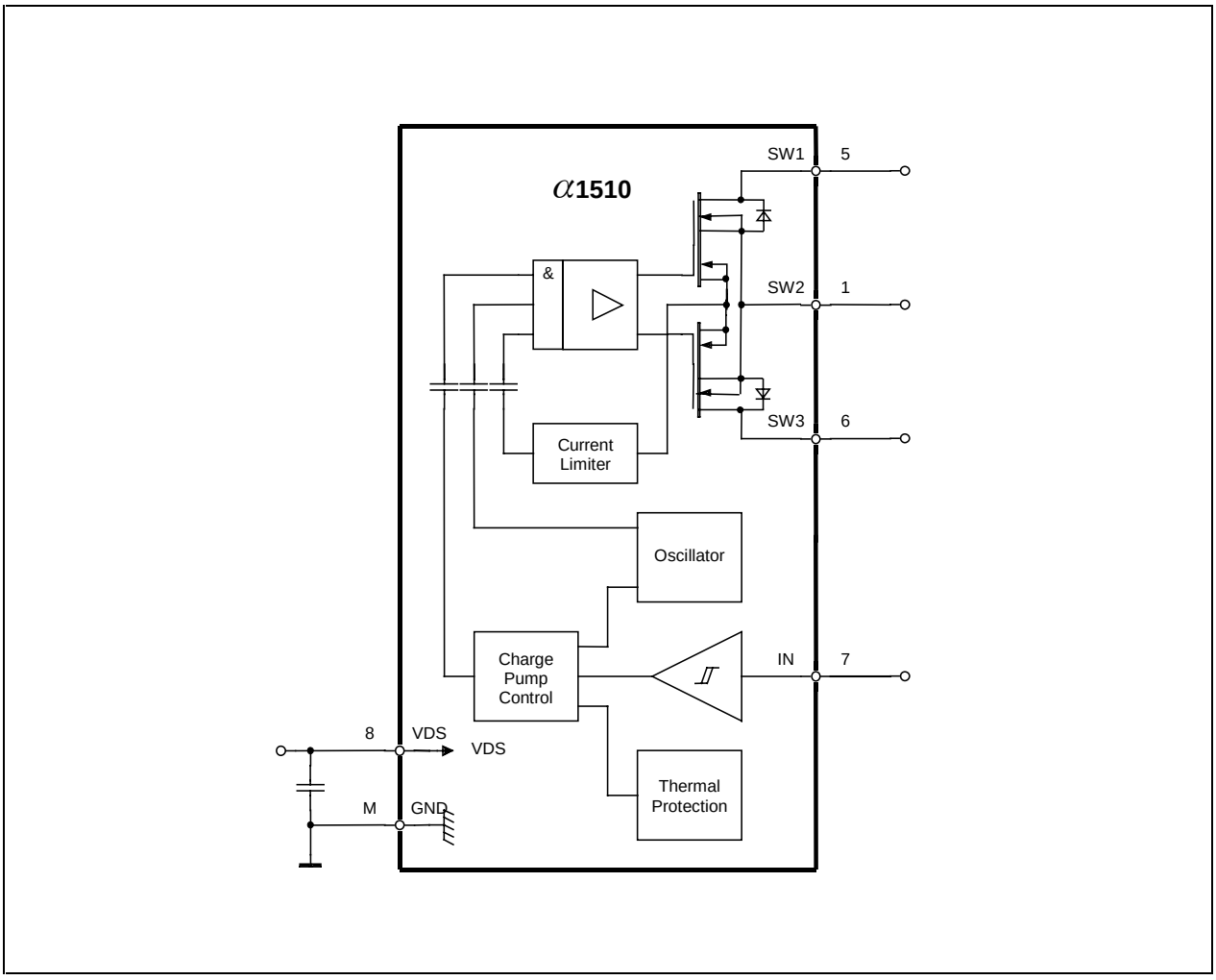
- ❑ General switching element for analog voltages
- ❑ Electronic switch for power supply engines, relays, magnetic valves, etc.

Typical Application

α1510 - electronic switch for loads on AC-lines



Functional Block Diagram



Pin Definition

Pin	Symbol	Designation
5	SW1	Switch port 1
1	SW2	Switch port 2
6	SW3	Switch port 3
7	IN	Input
8	VDS	Power Supply
M	GND	Ground

The location of pins can be changed during the development

General function and description

The α1510 is an electronic switch for common applications on the 120V/230V main and allows to switch inductive, capacitive and resistive loads. The switch disposes an CMOS / TTL input. The IC is protected versus short circuit and overtemperature.

Two fundamental configurations of the switch are possible:

- A bi-directional switch without a bridge rectifier is realisable by a series connection of the two integrated high voltage DMOS transistors.
- The parallel connection of the high voltage DMOS transistors allows an unidirectional application.

PIN function and description

VDS

The α1510 is designed for a supply voltage of VDS = 10 ... 14V. This pin supplies the control circuit with an internal oscillator.

GND

The ground pin supplies the control circuit.

IN

The input of the switch is designed for TTL and CMOS applications. This pin owns an internal pull up to support a simple input circuit.

SW1

SW1 is the Drain of a high voltage DMOS – Transistor. The SW1 is dielectric isolated from the control circuit

SW2

SW2 educates the common Source of 2 high voltage DMOS – Transistors. The SW2 is dielectric isolated from the control circuit

SW3

SW3 is the Drain of a high voltage DMOS – Transistor. The SW3 is dielectric isolated from the control circuit

Absolute Maximum Ratings

at T_{amb} = 0°C ... +70°C

Symbol	Parameter	Conditions	Min	Max	Unit
V_{SW13}	Switching Voltage 1 - 3			276	V_{rms}
V_{SW32}	Switching Voltage 1/3 -2	short between Pin5 and Pin6		400	V
V_{DIE}	Dielectric Voltage (Switch 1/2/3 – Ground M)	short between Pin1; Pin5 and Pin6		±500	V
V_{DS}	Power Supply		-0.7	15	V
V_{IN}	Input Voltage		-0.7	7	V
P_{TOT}	Power Dissipation			1	W
T_{amb}	Operating temperature		0	70	°C
T_{SD}	Switch off temperature (Thermal shutdown)		150	170	°C
T_j	Junction temperature		-25	150	°C
T_{stg}	Storage temperature		-55	150	°C
R_{thja}	Thermal resistance (junction - ambient)			70	K/W

Electrical Characteristics

DC Characteristics

at T_a = 0°C ... 70°C, unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{SW(leak)}$	Leakage current of the switch	V_{SW13} = 300V			10	µA
R_{SW13_ON}	On resistance of the switch	I_{SW13} = 0.5A		45	50	Ω
V_{DS}	Power Supply		10		14	V
I_{DS}	Current Supply	V_{DS} = 12V		2	4	mA
$V_{IN\ Low}$	Input voltage low		-0.3		0.8	V
$V_{IN\ High}$	Input voltage high		2		5	V
$-I_{IN\ Low}$	Input current low	V_{IN} = 0V			30	µA
$I_{IN\ High}$	Input current high	V_{IN} = 5V			10	µA

AC Characteristics

at T_a = 25°C, unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_1	Turn on delay time of the switch	V_{SW13} = 300V; I_{SW13} =0.5A			10	µs
t_2	Turn on time of the switch	V_{SW13} = 300V; I_{SW13} =0.5A			20	µs
t_3	Turn off delay time of the switch	V_{SW13} = 300V; I_{SW13} =0.5A			10	µs
t_4	Turn off time of the switch	V_{SW13} = 300V; I_{SW13} =0.5A			20	µs

Further application

Examples for further applications of the α1510 are:

- Speed regulation of an engine (See Fig.1)
- Remote control of an incandescent lamp (See Fig.2)
- DC Load (See Fig.3)

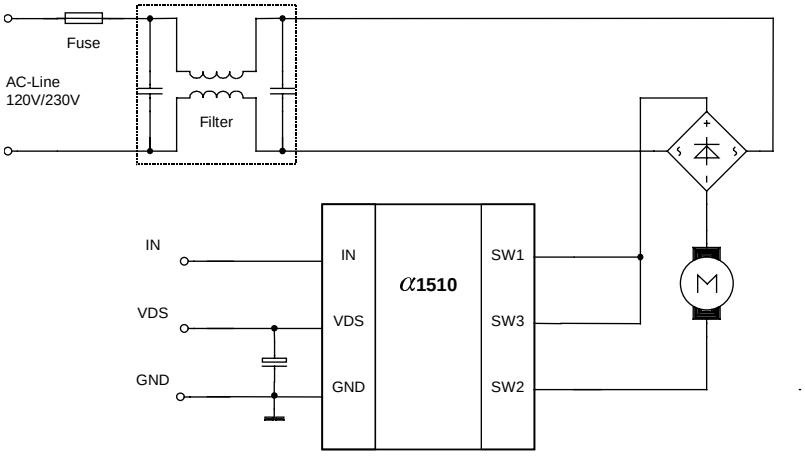


Fig.1 Speed regulation of an engine

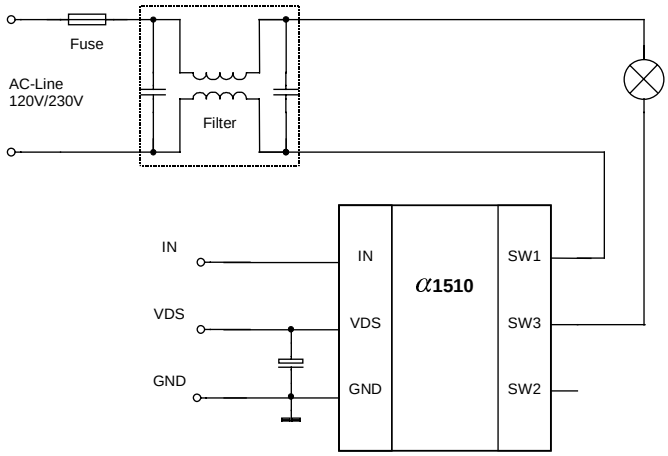


Fig.2 Remote control of an incandescent lamp

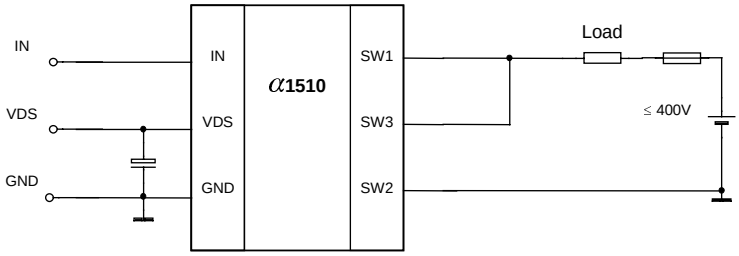
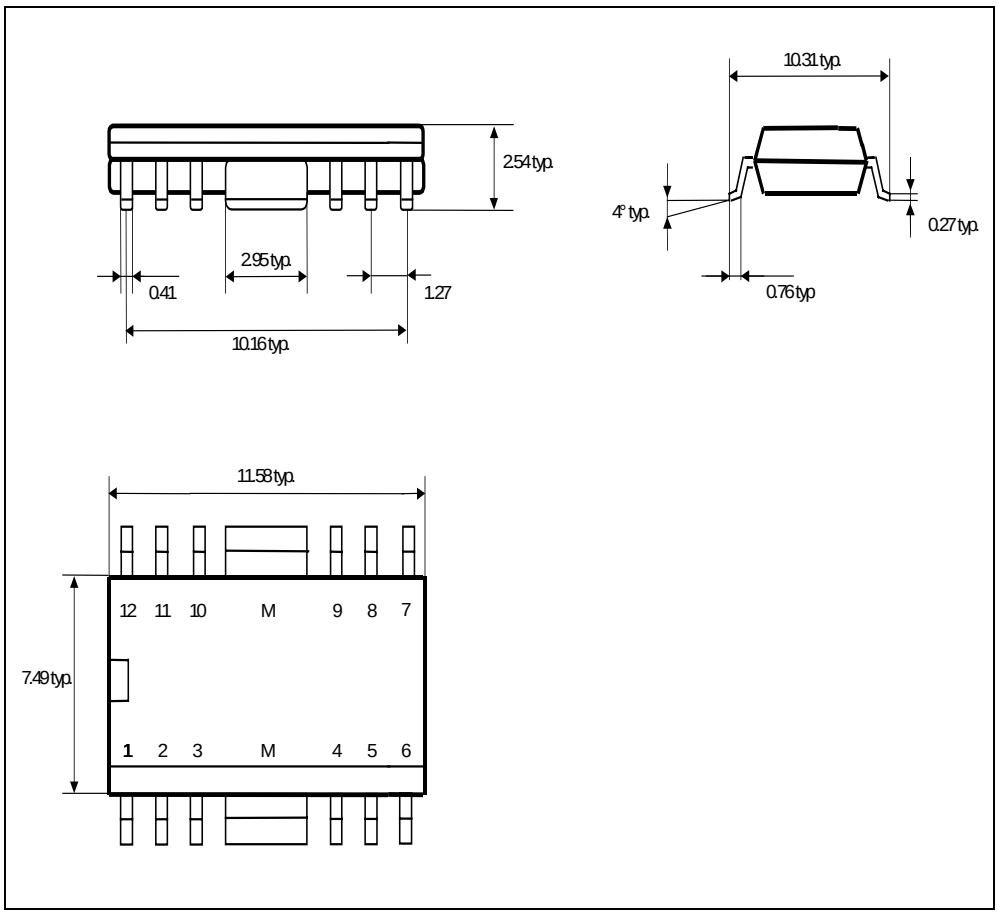


Fig.3 DC Load

Package 12-pin Plastic Power-SOP



SOP 12LP

Note

It is not given warranty that the declared circuits, devices, facilities; components, assembly groups or treatments included herein are free from legal claims of third parties.
The declared data are serving only to description of product. They are not guarantee properties as defined by law. The examples are given without obligation and cannot given rise to any liability.

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