FIDES-AC ABSOLUTE STANDBY ZERO

IEC62301 STANDBY ZERO FOR PROXIMITY SWITCH

PRELIMINARY BRIEF DATA

The FIDES-AC absolute standby power switch is free voltage for any load of IEC62301. Absolute standby zero system for proximity touch switch is safe isolated data commands supports and LED status indicates management supports.

The absolute standby zero switching are advance proximity switch for home appliance machines likes washing machine, combination oven.

Absolute standby zero are patented technology employed isolated data communication for supports all the attractive features.

Low cost, design flexibility, and easy design-in, these parts are targeted to more sophisticated applications and offer several enhanced technology and features, including continuous AC input voltage coverage from 80-380V wide ranges and control load up to any KWatts for heater or motor and SMPS.

Also included built-in (custom order) features likes temp / humidity with light sensor compliant with IEC 61131-9 are direct reading room environments are free to connect smart grid network.

The employed standby zero technology is cost reduced non battery backup switch for standby power saving under 30mW at any load environments.

These features simplify the task of the ordinary Total Energy Consumption limit to clear 0.5W of IEC62301-2 law.

FEATURES

• Free input AC80~380V Range

• IEC62301 Stand by zero support (under 30mW at standby mode)

• Multiple AC loads supports

• Standby status Indicator LED are direct reading supports.

• Adjustable sensitive proximity touch sensor switch support.

• Temperature / Humidity / AC power measurement with isolated On/Off data remote control supports to through the internet.

• IoT demand management supports

• IEC 61000-4-2(ESD) EN-550022

• -40°C- to +85°C

• 10 year limited warranty.

Fig 1. Block diagram circuit
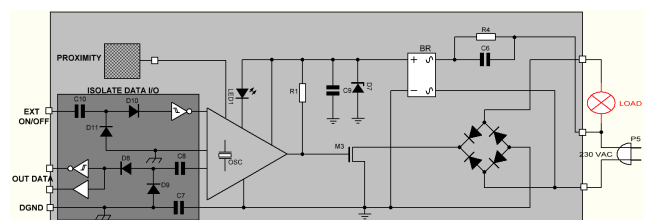
Absolute Maximum Ratings Unless otherwise specified, VDD=4.5V and Ta=25℃

Item	Symbol	Parameter	min	typ	max	unit	Condition
Rated Voltage Range	ACV		80	-	380	ACV	Max V =ORDER
Logic High input V	ViH	Out0,1 Terminal			30	V	
High Level input I	IoH				50	mA	
Switchable Clock Freq	FCLK	Out0,1 Terminal		2		KHz	
Drive current	I_DRV	Out0,1 Terminal	40			mA	
Max AC current	I_AC	AC Load	0		1	A	
LED 電流検出 Threshold	VTHIS	IS0 Terminal				V	Comparare with saw
Power consuption	mW				30	mW	Status indicate LED ON

Notes:

1. Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device.
2. All voltage values, accept differential voltages, are given with respect to GND pin.

Terminal descriptions

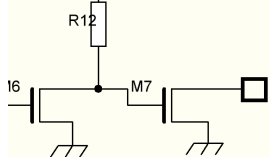IO: I=input, O=output, B=Bidirectional, - = no connection

Pin #	Pin Name	Description	Circuit (shows Input or output port)	Voltage
1	AC Load	Output to AC load switch by module	（AC INPUT） 	AC **0 – 380V**
2	AC_N220	AC Power line input range 150~380V		
3	AC_N100	When under AC 160V input, needs to connect with AC_N220 pin.		
4	AC_P	AC common input from 80~380V		
5	OUT0	Open drain output of on/off status.	（ Analog Switch ） 	0~30V 50mA max Normal off

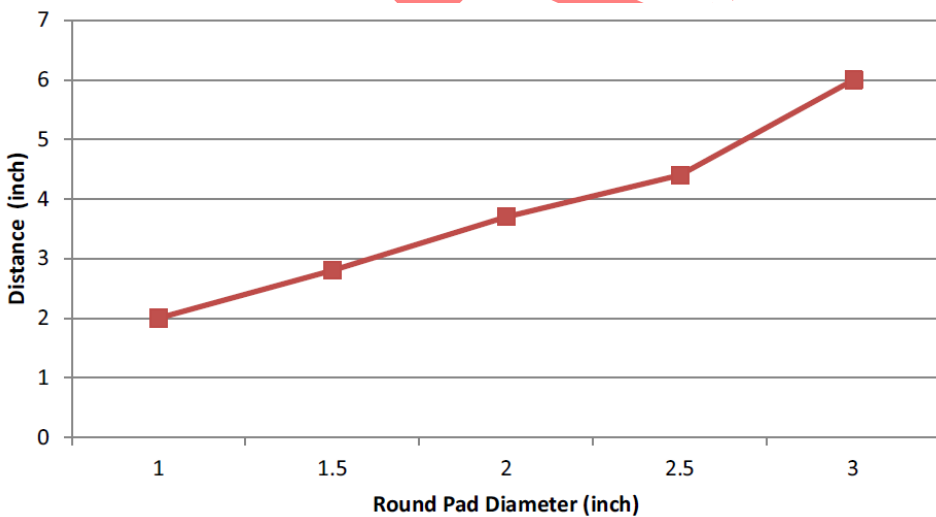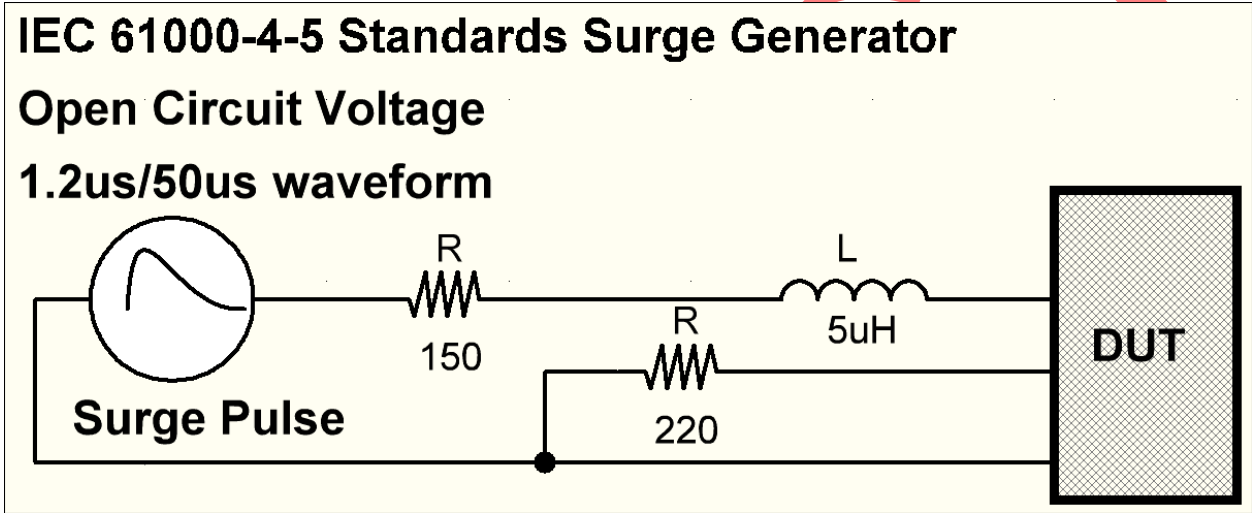| 6	GND	Isolated on/off GND		
8	OUT1	Open drain output of on/off status.	(Analog Switch) 	0~30V 50mA max Normal on

Electrical Characteristics (Test condition: VIN=AC220V/60Hz, Ta=25, unless otherwise specified.)

ESD Ratings: Human Body Model, 3B 8000 V

Machine Model, C 400 V

**Recommended Peak Pulse voltage Operating Conditions**

Fig 2. Distance vs sensor area

Package information (size, pin map)

The FIDES-P7 ADSZ is supplied in a RoHS compliant leadless mold package. The package is lead (Pb) free, and used a 'green' compound. The package is fully compliant with European Union directive 2002/95/EC.
This package is 94mm x 21.3mm. The solder pads are on a 2.54mm pitch. The above mechanical drawing shows the package. All dimensions are in millimeters.
The date code format is XXYY where XX = two-digit week number, YY = two-digit year number.
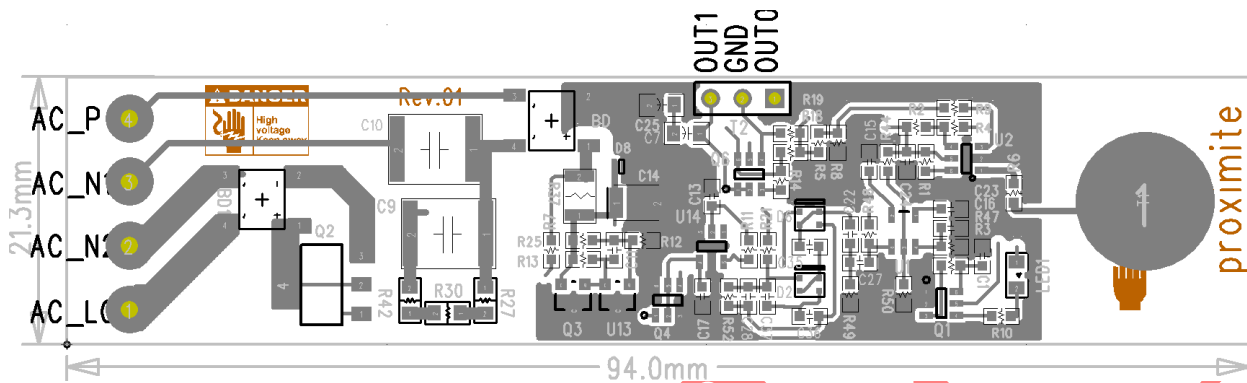
PIN Description		
AC_P	AC INPUT COMMON	
AC_N100	AC INPUT 80V~150V	**AC LOAD CURRENT ARE UNDER 1A**
AC_N220	AC INPUT 150V~250V	Shape and Function with absolute rating are changeable by custom order
AC_LOAD	AC LOAD	
OUT1	ISOLATED PROXIMITY STATUS (NORMAL OPEN DRAIN)	
GND	ISOLATED GND	
OUT0	ISOLATED PROXIMITY STATUS (NORMAL CLOSED DRAIN)	

units: mm[inch]

tolerance: ±0.50[±0.020]

pin section tolerance: ±0.10[±0.004]

The FIDES-P7 ADSZ   is supplied in Pb free module package.
The recommended solder reflow profile for package options is show below.
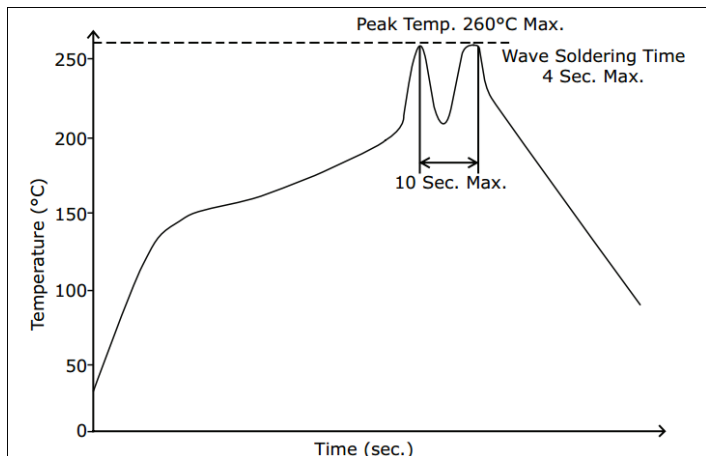
Recommended Soldering Thermal Data

parameter	conditions/description	min	typ	max	units
hand soldering	1.5 mm from case for 10 seconds			300	°C
wave soldering	see wave soldering profile			260	°C

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SPI interface timing

Host MPU to P1 data write.

P1 send the data to host MPU.

Write timing
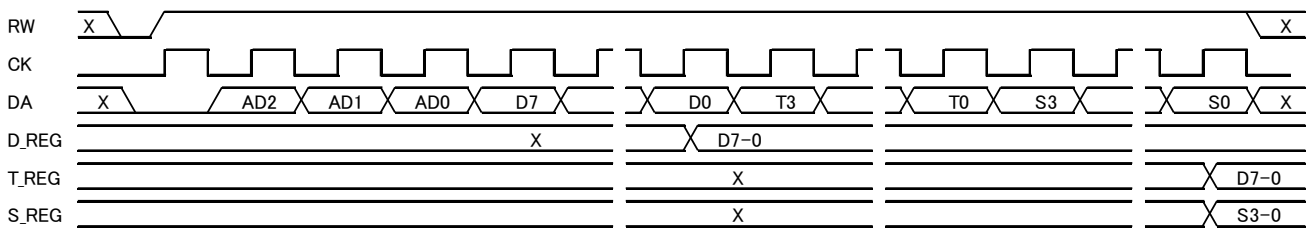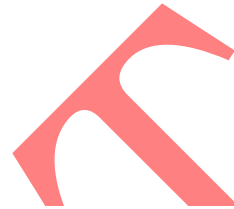
D7-0 : Dimming data (Write)

AD2_0 : Chip address data (0-7)

D_REG : dimming data (resistor output)

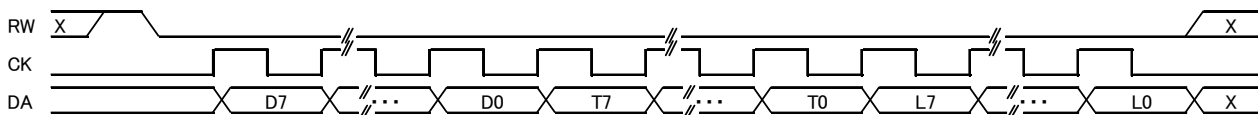T_REG : test data (register output); Select the test monitor output

S_REG : test data (register output);

S<1>=0→ PS data enable   S<1>=1→ Dimmer data change by register

S<3>=0→ Test output   S<3>=1→ Test 2 output

P1 will be edge detection from CK and ignored first data.

Read timing

D7-0 : Dimming data (Read)

T7-0 : Temperature data

L7-0 : Photo diode ambient data

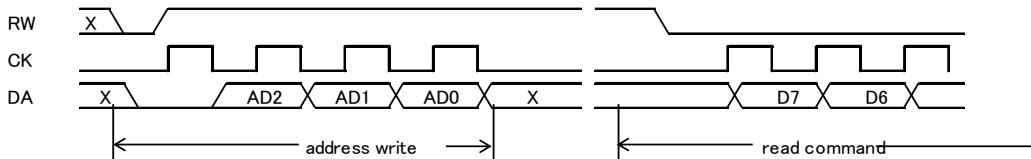P1 can read edge rise of CK and MPU can edge down of CK read.

Read timing (address reserved)

| RW | CK | DA — address write / read command timing diagram with X, AD2, AD1, AD0, X, D7, D6 |

Write Timing

RW — X
CK — pwr, tr, td, tr, pwh, tf, pwl
DA — ts, Invalid, AD2, AD1

Read Timing

RW — X
CK — pwr, tf, td, tr, pwh, tf, pwl
DA — ts, AD2, AD1
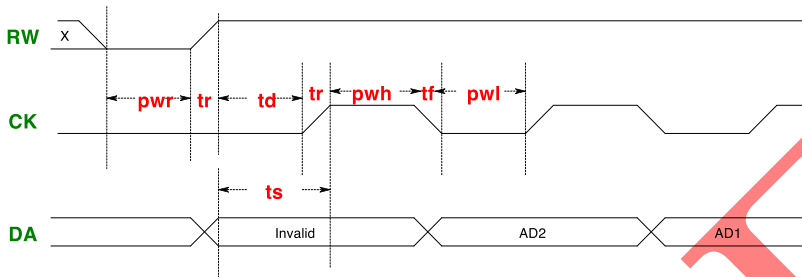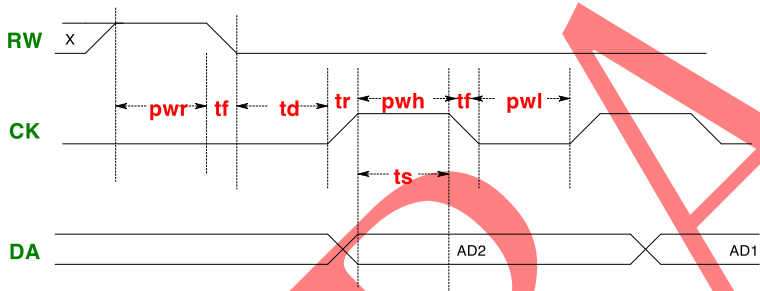
Timing:

pwr: RW pulse width   ; >10uS

tf: Fall time   ; <100nS

td : Delay time   ; >5uS

tr: Rise time   ; <100nS

pwh; Clock High level   ; >5uS

pwl; Clock low level   ; > 5uS

SPI resister Data

* Write Data

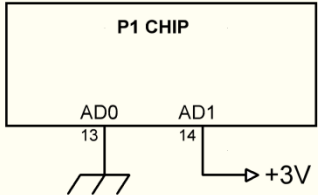（1）AD2-0：address data(0-3)

The chip address are 2bit selectable by AD0,1. (internally AD2 are "0" reserved)

AD1 (pin #14)and AD0   pin are chip addressed to control by SPI when it's matched chip address.

Table. Chip address

#	Chip Select Address of Register			Selected chip
	AD0	AD1	AD2	

P1 CHIP

AD0   AD1
13   14

+3V

0	0	0	0	chip 0	
1	1	0	0	chip 1	
2	0	1	0	chip 2	
3	1	1	0	chip 3	

Example of Fig　FIDES-P1 Chip address set are illustrated "2". The access AD[2:0] are "010"to serial data send.

⑵ D_REG：dimming data (Dimming)resister output

Dimming control data for external commands.

D[7:0]=FFh are maximum bright.　D[7:0]=01 are minimum brightness (Max Dimming)

Also, this resister to make enable needs to set　**S<1>=1**

⑶ S_REG：Test data resistor output：

S<0> ; reserved

S<1>=0 →Photo Sensor(PS) are enable.　S<1>=1→resister can **Dimmer data change**

S<2> ; reserved

S<3>=0 →Test monitor1 (TO)output　　　S<3>=1 →Test monitor2 (TO)output

⑷ T _REG：Test data (resister output)　：Test monitor output　choose the selector

This resister can be select for monitoring signals. S-register　S<3> are selected signal to Monitor pin　"TO" can monitoring.

Fig for chip monitoring mode table.

#	T<3:0>	TOoutput　S<3>=0	TO 出力　S<3>=1
0	0000	Open	Open
1	0001	GNDQ (quiet Ground)	GNDQ (quiet Ground)
2	0010	BGRO(Band Gap Regulator) output 1.16V	RNX(Power On reset output)
3	0011	V3Q (Quiet 3V)	V3N (Noisy 3V)
4	0100	VHA (ADC6 Reference High Voltage)	VLA(ADC6 Reference Low Voltage)
5	0101	ADTA (Temperature voltage for ADC)	TAO (Temperature Sense Voltage)

6	0110	GNDQ (quiet Ground)	GNDQ (quiet Ground)
7	0111	VSWO (Saw Tooth wave of main reg)	ISOOO (LED Current Sense Buffer Voltage)
8	1000	CK39 (Around 39Hz output)	ILMLO (ISOOO & 0.12V Comparator Output)
9	1001	CK78 (Twice Frequency of CK39)	CK10K (10KHz clock output)
10	1010	CKMON (Clock Signal)	DMO (Dimmer Pulse output)
11	1011	ISRPO (Error Amp Comparator Output)	LSRPO (Error Amp ILM Output)
12	1100	ACZ (AC zero Cross Output)	ACPLS —Not used
13	1101	MODU (DUEN (Up/Down) Output)	MOMCK (Sub —reg clock output)
14	1110	SHTDWN (Shut Down at Tj>125C)	Open
15	1111	Open	Open

* Read Register

(1) D7-0 : Dimming data (Read)

L <7:0> – T <7:0> OUTPUT for ambient data PS or D-Register Write data, temperature data to Write are push out to removed temperature data results return to give.

(2) T7-0 : Temperature data (output)

Temperature data output. But LSB 2bit are ignored $T<2>$ = T00 is lowest temperature data.

T(7)	T(6)	T(5)	T(4)	T(3)	T(2)	T(1)	T(0)
T05	T04	T03	T02	T01	T00	X	X

Temperature data MSB   Temperature data LSB

(3) L7-0:Photo diode's ambient data

Photo Sensor or   ambient resister data are.

But LSB 2bit are ignored L<2>are minimum ambient data.

L(7)	L(6)	L(5)	L(4)	L(3)	L(2)	L(1)	L(0)
L05	L04	L03	L02	L01	L00	X	X

Description

The FIDES-P1 is a highly integrated, flexible, multi-string LED driver that uses external MOSFETs to allow high LED string currents, and includes temperature power supply control to maximize LED life efficiency. The driver optionally connects to a LED string faults fix-up functions help to black out of luminaire system.

The easy install to plug in light sensor offer automatic dimming control for intelligent ECO power saving. Synchronization for use in PLC or MCU by LCD TV backlight applications.

The drivers provide multiple methods of controlling LED brightness, through both peak current control and pulse width control of the PLC and light sensor, internal temperature drive signals. Peak temperature control offers excellent MTBF consistency, while pulse width control allows brightness management.

FIDES-P1 provides protection features such as open-LED and over temperature protection.

An on-chip temperature sensor is selectable 2bits control register values. At over temperature, automatically shut-down or decrees power driving. All resistor values are read and wright to changeable through the serial interface if a different power condition is desired.

High-voltage start-up regulator

The FIDES-P1 contains an internal high voltage to low voltage regulator that allows the AC input to be supply to 5VDC of main IC and 15V high side drive supply. This startup circuits is totally current required 500uA (internally 200uA). The first stage desired output voltages can adjust by FB resistors.

This example circuits current consumption

are 20~25mA with zener diode.

Applications Information

Internal temperature sensor temp vs V

Shutdown V = 1.79V

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