ZHEJIANG UNIU-NE Technology CO.,LTD

浙 江 宇 力 微 新 能 源 科 技 有 限 公 司

U21276 Data Sheet

V 1.0

CURRENT SENSING SINGLE CHANNEL DRIVER

General Description

The U21276 is a high voltage, high speed power MOSFET and IGBT driver. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL outputs, down to 3.3V. The protection circuity detects over-current in the driven power transistor and terminates the gate drive voltage. An open drain $\overline{\text{FAULT}}$ signal is provided to indicate that an over-current shutdown has occurred. The output driver features a high pulse current buffer stage designed for minimum cross-conduction. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high side or low side configuration which operates up to 600 volts.

Key Features

- Floating channel designed for bootstrap operation Fully operational to +600V Tolerant to negative transient voltage dV/dt immune .
- Application- specific gate drive range: 9 to 20V
- Undervoltage lockout
- 3.3V, 5V and 15V input logic compatible
- $\overline{\text{FAULT}}$ lead indicates shutdown occured
- Output in phase with input
- Avaliable in Lead-Free

Applications

- Home appliances
- Industrial applications and drives
- Motor drivers
- Robot applications and drivers
- Induction heating
- Power drive of automotive electronics

Product Summar

VOFFSET	600V max.
IO+/-	4A/6A
VOUT	9-20V
VCSth	1.2V
ton/off (typ.)	220&220ns

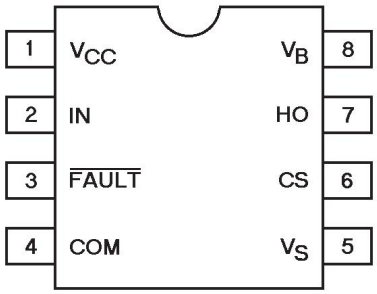
Pakeages

8-Lead SOP

Product information

Base Part Number	Package Type	Standard OUT		VOFFSET	Logic Control
		IO+	IO-		
U21276	SOP8	4A	6A	600V	IN&CS

Pin Assignments

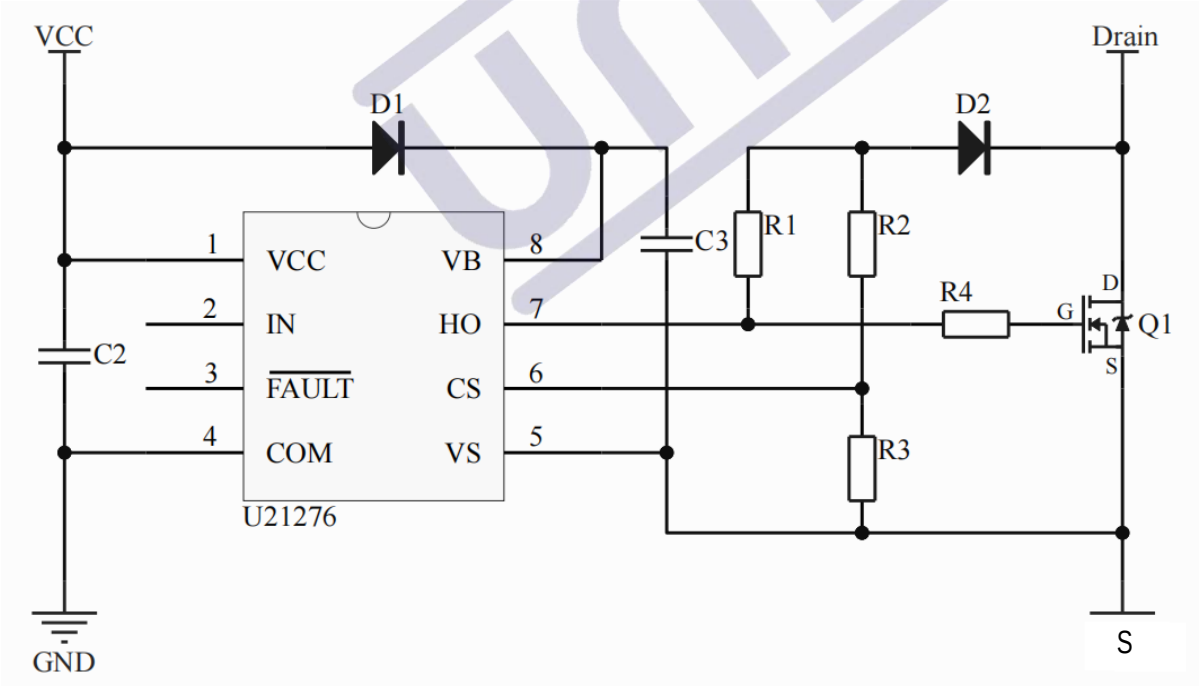


U21276

Pin Function

Number	Symbol	Description
1	VCC	Logic and gate drive supply
2	IN	Logic input for gate driver output(HO),in phase with HO
3	$\overline{\text{FAULT}}$	Indicates over-current shutdown has occurred, negative logic
4	COM	Logic ground
5	VS	High side floating supply return
6	CS	Current sense input to current sense comparator
7	HO	High side gate drive output
8	VB	High side floating supply

Typical Connection



Absolute Maximum Ratings

Absolute Maximum Ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to COM. The Thermal Resistance and Power Dissipation ratings are measured under board mounted and still air conditions.

Symbol	Definition	Min.	Max.	Units
VB	High Side Floating Supply Voltage	-0.3	625	V
VS	High Side Floating Offset Voltage	VB-25	VB+0.3	
VHO	High Side Floating Output Voltage	VS-0.3	VB+0.3	
VCC	Logic Supply Voltage	-0.3	25	
VIN	Logic Input Voltage	-0.3	VCC+0.3	
VFLT	$\overline{\text{FAULT}}$ Output Voltage	-0.3	VCC+0.3	
VCS	Current Sense Voltage	VS-0.3	VB+0.3	
dVS/dt	Allowable Offset Supply Voltage Transient	—	50	V/ns
PD	Package Power Dissipation @ TA≤ +25℃	—	0.625	W
RthJA	Thermal Resistance, Junction to Ambient	—	200	C/W
TJ	Junction Temperature	—	150	°C
TS	Storage Temperature	-55	150	
TL	Lead Temperature (Soldering,10seconds)	—	300	

Recommended Operating Conditions

The Input/Output logic timing diagram is shown in Figure 1. For proper operation the device should be used within the recommended conditions. The VS offset rating is tested with all supplies biased at 15V differential.

Symbol	Definition	Min.	Max.	Units
VB	High Side Floating Supply Voltage	VS+9	VS+20	V
VS	High Side Floating Offset Voltage	-6(Note1)	600	
VHO	High Side Floating Output Voltage	VS	VB	
VCC	Logic Supply Voltage	10	20	
VIN	Logic Input Voltage	0	VCC	
VFLT	$\overline{\text{FAULT}}$ Output Voltage	0	VCC	
VCS	Current Sense Signal Voltage	VS	VS+5	
TA	Ambient Temperature	-40	125	°C

Note1:Logic operational for VS of -6 to +600V. Logic state held for VS of -6V to -VBS.

Dynamic Electrical Characteristic

VBIAS (VCC, VBS) = 15V, CL = 1000 pF and TA = 25℃ unless otherwise specified. The dynamic electrical characteristics are measured using the test circuit shown in Figure 3.

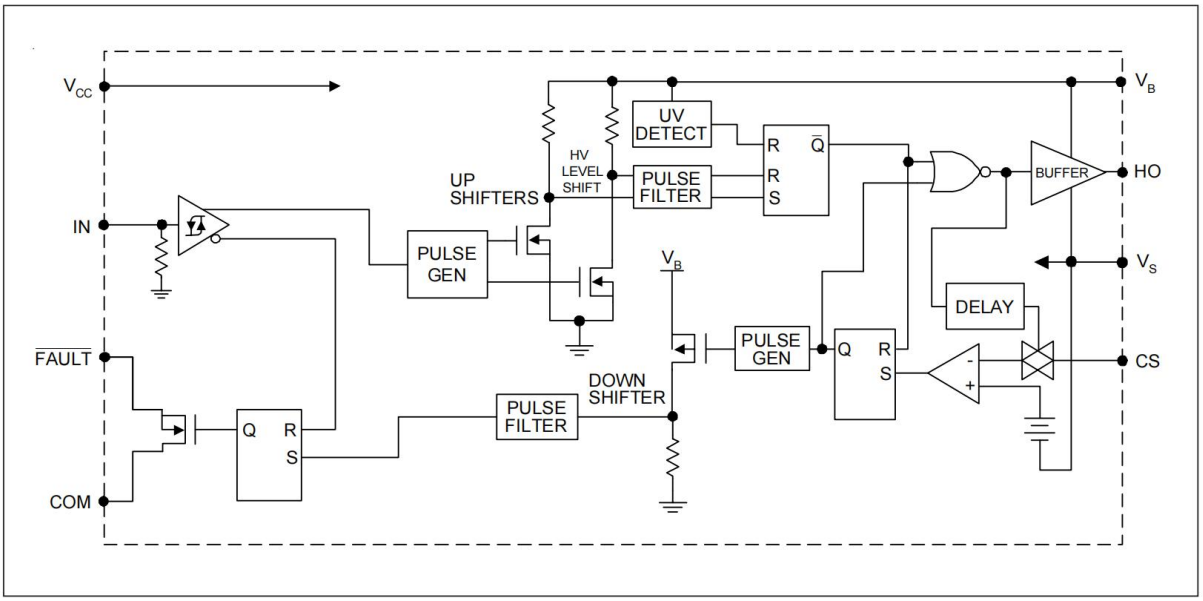
Symbol	Definition	Min.	Typ.	Max.	Units	Test Condition
ton	Turn-On Propagation Delay	—	220	270	ns	VS=0V
toff	Turn-Off Propagation Delay	—	220	270		VS=600V
tr	Turn-On Rise Time	—	14	50		
tf	Turn-Off Fall Time	—	12	45		
tbl	Start-Up Blanking Time	—	1200	—		
tcs	CS Shutdown Propagation Delay	—	520	650		
tfl	CS to $\overline{\text{FAULT}}$ Pull-Up Propagation Delay	—	680	850		

Static Electrical Characteristics

VBIAS(VCC, VBS) = 15V and TA = 25℃ unless otherwise specified. The VIN , VTH and IIN parameters are referenced to COM. The VO and IO parameters are referenced to VS.

Symbol	Definition	Min.	Typ.	Max.	Units	Test Condition
VIH	Logic “1” Input Voltage	3.0	—	—	V	VCC=10V to 20V
VIL	Logic “0” Input Voltage	—	—	0.8		
VCSTH+	Going Threshold	—	1.2	—		
VOH	High Level Output Voltage, V BIAS - VO	—	—	100	mV	IO=0A
VOL	Low Level Output Voltage, VO	—	—	100		IO=0A
ILK	Offset Supply Leakage Current	—	—	50	μA	VB=VS=600V
IQBS	Quiescent VBS Supply Current	—	60	120		VIN=0V or 5V
IQCC	Quiescent VCC Supply Current	—	20	80		
IIN+	Logic “1” Input Bias Current	—	42	60		VIN=5V
IIN-	Logic “0” Input Bias Current	—	—	1.0		VIN=0V
ICS+	“High” CS Bias Current	—	—	1.0		VCS=3V
ICS-	“High” CS Bias Current	—	—	1.0		VCS=0V
VBSUV+	Positive Going Threshold	—	6.4	—	V	
VBSUV-	Negative Going Threshold	—	6.3	—		
IO+	Output High Short Circuit Pulsed Current	—	4	—	A	VO=0V,VIN=5V PW≤10μs
IO-	Output Low Short Circuit Pulsed Current	—	6	—		VO=15V,VIN=5V PW≤10μs
RON,FLT	FAULT - Low on Resistance	—	60	—	Ω	

Block Diagram



Time waveform

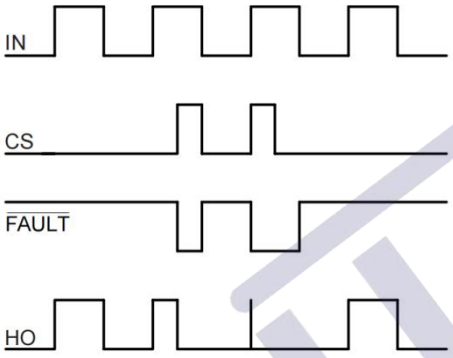


Figure 1. Input/Output Timing Diagram

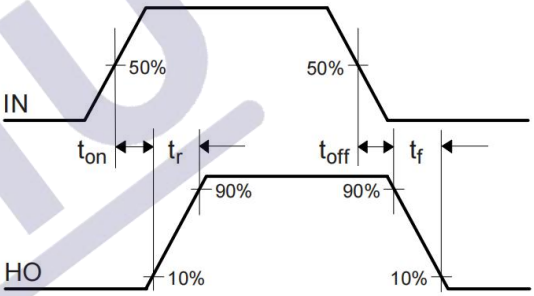


Figure 2. Switching Time Waveform Definition

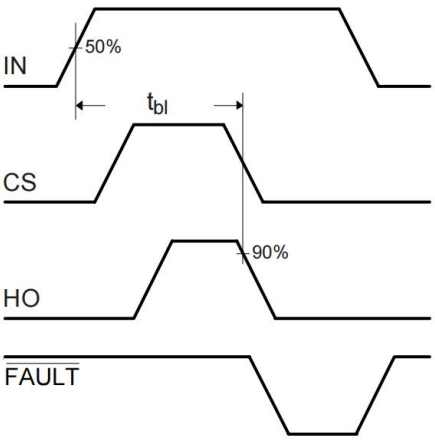


Figure 3. Start-up Blanking Time Waveform Definitions

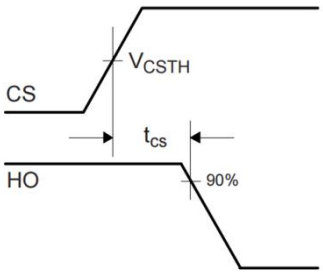


Figure 4. CS Shutdown Waveform Definitions

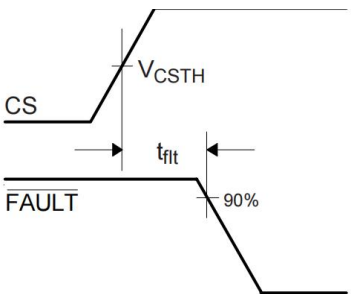
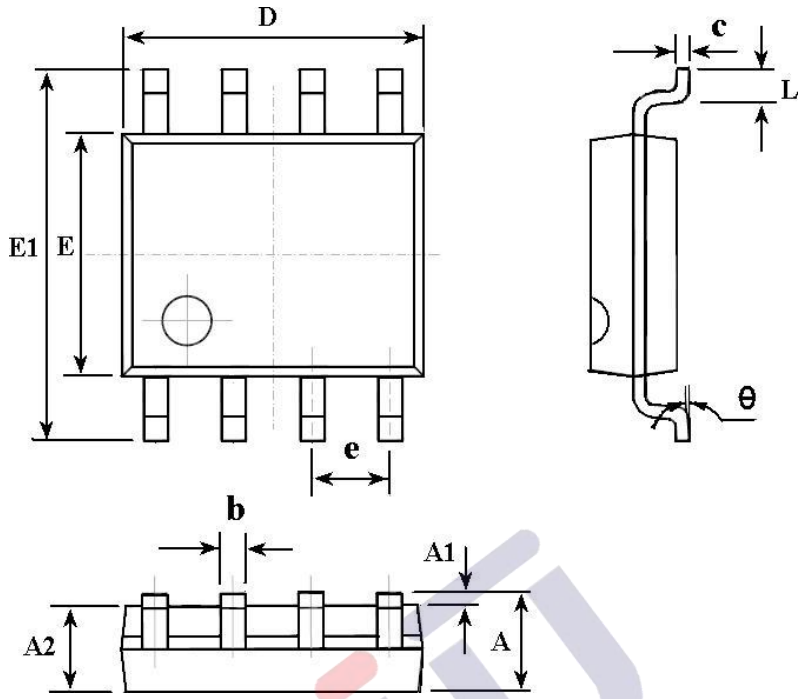


Figure 5. CS to $\overline{\text{FAULT}}$ Waveform Definitions

Packaging information

SOP8



Symbol	Dimensions In Millimeters	
	Min	M
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.70	5.10
E	3.80	4.00
E1	5.80	6.20
e	1.27(BSC)	
L	0.40	1.27
θ	0°	8°

1、版本记录

DATE	REV.	DESCRIPTION
2023/07/19	V1.0	优化电路

2、免责声明

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