WP2906

4.5V to 25V, 15A, 5mΩ Power Switch with Reverse Current Blocking Function

1. General Description

WP2906 is a high current switch which designed for the power input side of equipment such as desktop computer. The built-in ultra-low on resistance N-MOSFET power switch can support 15A high current. Protection features include input UVLO, wrong input voltage protection, short-circuit protection, over-temperature protection, surge protection, and reverse current blocking. Other features include a deglitched VINOK output to indicate the fault condition, input current monitor, two-level OCP alert, soft-start, and an enable input to enable or disable the device.

The WP2906 is available in a 4mm x 4mm QFN-24 package which can operate over -40℃ to +85℃ junction temperature range.

2. Features

- Build-in 5mΩ Ultra-low R_{DS_ON} N-MOSFET
- 4.5V-25V DC Operation, 30V Abs DC
- Build-in Surge Protection Function for VIN
- Wrong Input Voltage Protection by VINSEL pin
- Output Current Capability: 15A
- Input Current Monitor by IMON pin
- Adjustable OCP Alert Threshold by ISET pin
- Build-in Two-level OCP Alert
- Fast-trip Response for SCP
- Adjustable Soft-start Time
- Fault Report Function by VINOK pin
- Build-in OTP
- QFN4x4-24 Package

3. Applications

- Adapter Input Protection for Notebook and Desktop Computers
- Type-C USB PD Protection for PC, Notebook, Monitors, Docks
- Hot-swap Devices and Peripheral Ports
- Power MUX/Oring

4. Typical Application

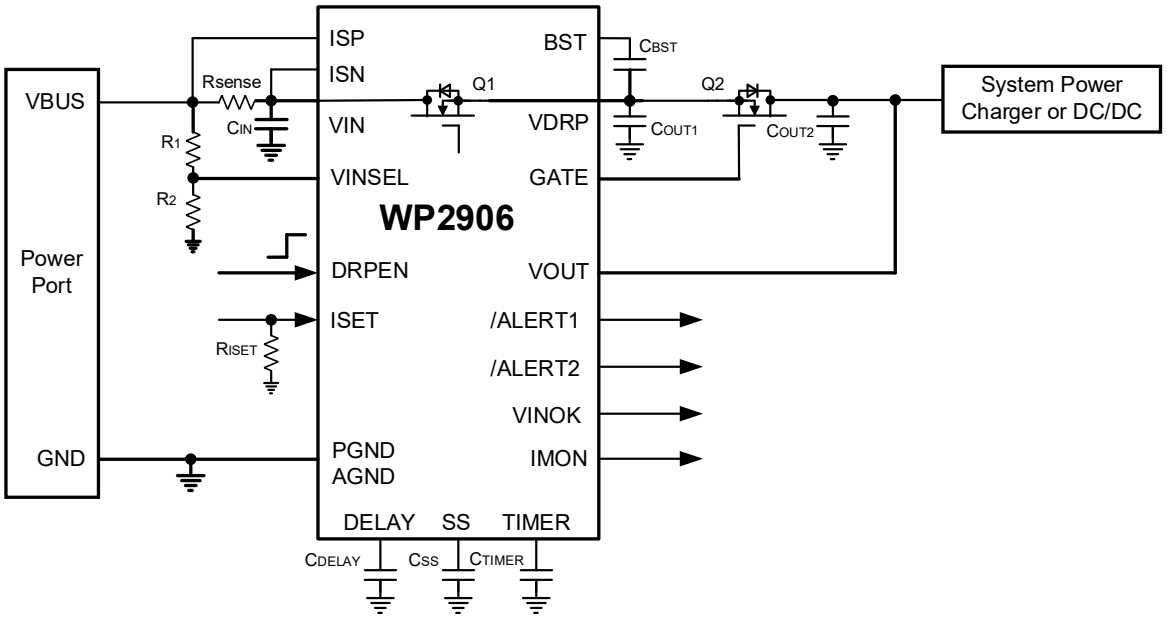
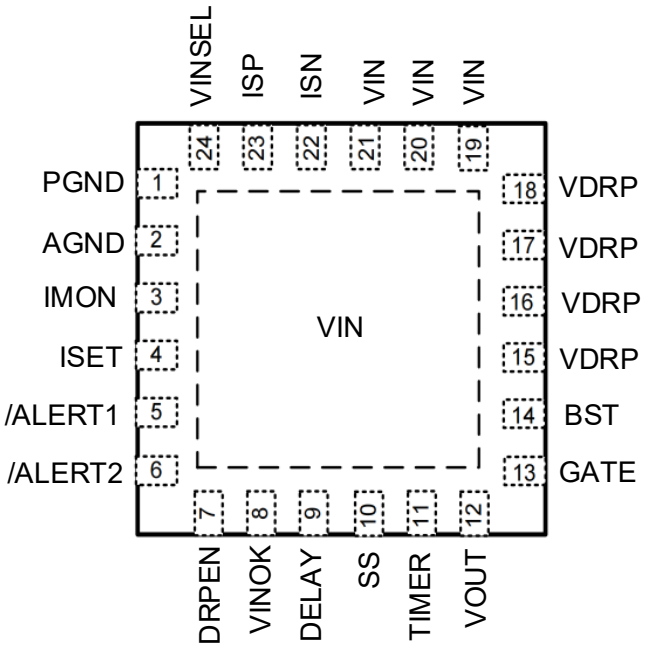


Figure 1 Simplified Schematic

5. Pin Configuration

(Top View)



QFN4x4-24

6. Pin Description

PIN NUMBER	PIN NAME	I/O	PIN FUNCTION
1	PGND	-	Power ground for internal Surge MOS.
2	AGND	-	Signal ground.
3	IMON	O	VIN input current monitoring output pin.
4	ISET	I	Current threshold setting for adapter power path.
5	/ALERT1	O	Alert output 1, when input OCP1 condition is detected, /ALERT1 goes low, otherwise /ALERT1 keeps high. Set the time through the Timer pin.
6	/ALERT2	O	Alert output 2, when input OCP2 condition is detected, /ALERT2 goes low, otherwise /ALERT2 keeps high. The time is fixed at 1ms.
7	DRPEN	I	Enable input. Pulling this pin to high enables the device while pulling low disables the device. The DRPEN pin cannot be left floating.

PIN NUMBER	PIN NAME	I/O	PIN FUNCTION
8	VINOK	O	Fault indication pin. This pin goes low when SCP, VIN Wrong Voltage and OTP are detected.
9	DELAY	I	Delay time setting. Connecting a capacitor from this pin to ground sets the delay time which determines when ANTI_SC charge is activated.
10	SS	I	VDRP softstart slew rate control. Connect this pin with a capacitor to ground to adjust VDRP softstart slew rate.
11	TIMER	I	Debounce time setting pin for /ALERT. When the event of OCP persists over the debounce time set by the TIMER pin, the WP2906 latches /ALERT at low level. Do not float this pin.
12	VOUT	O	Output sense pin for Reverse Current Block function.
13	GATE	O	GATE control pin for external MOS.
14	BST	I	Bootstrap pin for driving the external Blocking N-MOSFET.
15~18	VDRP	O	Output Voltage Pin. The output voltage follows the input voltage. When DRPEN is low the output voltage is disconnected from input. It is recommended that the output capacitor be placed greater than 10μF*2.
19~21 Exposed Pad	VIN	I	Power Supply Input. Connect this pin to an external DC power supply. It is recommended that the input capacitor be placed greater than 22μF.
22	ISN	I	Current sense negative input pin.
23	ISP	I	Current sense positive input pin.
24	VINSEL	I	Input voltage sense pin. Connect a resistive divider from VIN to VINSEL to GND to monitor the input voltage. Pull the pin low to disable the function.

7. Absolute Maximum Ratings [1]

SYMBOL	PARAMETER	RATING	UNIT
V_{IN}, V_{DRP}, V_{OUT}	VIN, VDRP, VOUT Voltage	-0.3 to +30	V
$V_{ISP/N}$	ISP, ISN Voltage	-0.3 to +30	V
V_{VINSEL}	VINSEL Voltage	-0.3 to +30	V
V_{DRPEN}	DRPEN Voltage	-0.3 to +30	V
V_{GATE}, V_{BST}	GATE, BST Voltage	-0.3 to +35	V
$V_{I/O}$	/ALERT1/2, VINOK, ISET, IMON, DELAY, TIMER, SS Voltage	-0.3 to +6	V
$R_{\theta JA}$	Junction-to-ambient Thermal Resistance	25	℃/W
T_J	Junction Temperature	-40 to 150	℃
T_{STG}	Storage Temperature	-65 to 150	℃
T_{SDR}	Lead Temperature (Soldering, 10 sec)	260	℃

NOTE 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

8. Recommended Operating Conditions

SYMBOL	PARAMETER	MIN	MAX	UNIT
V_{IN}	VIN Supply Voltage	4.5	25	V
I_{OUT}	Output Current (continue)	0	15	A
C_{IN}	Input Capacitor range	22	100	μF
C_{OUT}	Output Capacitor range	20	100	μF
C_{SS}	SS pin external capacitor range	2.2	15	nF
C_{DELAY}	DELAY pin external capacitor range	10	100	nF
T_A	Operating Ambient Temperature	-40	85	℃
T_J	Operating Junction Temperature	-40	125	℃

9. Electrical Characteristics

(V_{IN} = 20V, V_{DRPEN} = 3.3V, T_A=25℃, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Power						
V_{IN}	VIN Input Voltage		4.5		25	V
I_{VIN}	VIN Supply Current	No Load, V_{DRPEN}=0V		40		μA
		No Load, V_{DRPEN}=3.3V		300		μA
I_{VDRP_OFF}	VDRP Off State Leakage Current	VIN=20V, V_{DRP}=GND, V_{DRPEN}=0V			4	μA
Power On Reset (POR)						
V_{IN_UVLO}	Rising VIN POR Voltage	VIN Rising	3.6	3.8	4	V
$V_{IN_UVLO_HYS}$	VIN UVLO Hysteresis			0.2		V
DRPEN Input Voltage						
V_{DRPEN_H}	Input Logic High		1.2			V
V_{DRPEN_L}	Input Logic Low				0.5	V
I_{DRPEN}	Input Current	V_{DRPEN}=5V			1	μA
Soft Start Setup						
I_{SS}	SS Source Current			6		μA
$t_{D(ON)}$	Turn On Delay Time	C_{OUT}=0.1μF, C_{SS}=Open		200		μs
$t_{D(OFF)}$	Turn Off Delay Time	C_{OUT}=0.1μF, C_{SS}=Open		5		μs
t_{SS}	Soft Start Time	No Load, V_{IN}=20V, C_{OUT}=10μF, C_{SS}=2.7nF, V_{OUT}=10 to 90%		1		ms
		No Load, V_{IN}=20V, C_{OUT}=10μF, C_{SS}=Open, V_{OUT} =10 to 90%		230		μs

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Switch Resistance						
R_{DIS}	Discharge Resistance	VDRP Pin		600		Ω
$R_{DS(ON)}$	Power Switch On Resistance	I_{OUT}=5A		5		mΩ
Wrong Input Voltage Protection and Surge Protection						
$V_{VINSEL(L)}$	VINSEL Low Detection Rising Vth	VINSEL Rising, IC is on	0.712	0.75	0.787	V
	VINSEL Low Detection Falling Vth	VINSEL Falling, IC is Latch off	0.665	0.7	0.735	V
$V_{VINSEL(H)}$	VINSEL High Detection Rising Vth	VINSEL Rising, IC is off	1.045	1.1	1.155	V
	VINSEL High Detection Falling Vth	VINSEL Falling, IC is on	0.95	1	1.05	V
I_{VINSEL}	VINSEL Input Current	V_{VINSEL}=25V			1	μA
V_{SURGE}	VIN Surge Protection Threshold			27		V
VINOK and /ALERT1/2 Output Pin						
	Output Low Voltage	Input Current=5mA			0.4	V
	Leakage Current	Input Voltage=5V, MOS off			1	μA
	ALERT2 Debounce Time	Only for Alert2		1.15		ms
	ALERT2 Release Time	Only for Alert2		72		ms
Input Current Report						
K	ISP to ISN Differential Voltage to IMON Voltage Gain	V_{IN}=20V		20		V/V
	IMON Voltage Accuracy	V_{IN}=20V, R_{SENSE}=5mΩ, Load=5A	-3		3	%
		V_{IN}=20V, R_{SENSE}=5mΩ, Load=15A	-3		3	%
		V_{IN}=20V, R_{SENSE}=3mΩ, Load=5A	-6		6	%
		V_{IN}=20V, R_{SENSE}=3mΩ, Load=15A	-3		3	%

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
	IMON Driving Capability			100		μA
I_{ISET}	ISET Internal Pull High Current	V_{ISET}=1V		10		μA
I_{TIMER}	Timer Internal Pull High Current			10		μA
$V_{/ALERT1}$	/ALERT1 Threshold	V_{IMON}/V_{ISET}		1		V/V
$V_{/ALERT2}$	/ALERT2 Threshold	V_{IMON}/V_{ISET}		1.15		V/V
Reverse Current Block						
	Reverse Current Block Threshold	VOUT-VDRP		10		mV
	VDRP to VOUT Regulation Voltage	VDRP-VOUT		20		mV
Over Current Protection						
I_{SCP}	Short Circuit Protection Threshold	R_{SENSE}=5mΩ	33			A
t_{SCP}	SCP Response Time				1	μs
t_{HICCUP}	Recovery Time During Hiccup Mode			15*Tdelay		ms
I_{CHARGE}	ANTI_SC Charge Current			50		mA
V_{CH_TH}	VDRP ANTI_SC Charge Threshold			0.5		V
I_{DELAY}	Delay Source Current			12		μA
V_{Delay_TH}	Delay Threshold Voltage			1		V
Thermal Protection						
T_{SD}	Thermal Shutdown Threshold			150		℃
T_{SD_HYS}	Thermal Shutdown Hysteresis			30		℃

10. Typical Performance Characteristics

(V_{IN}=20V, V_{DRPEN}=3.3V, C_{IN}=22μF, C_{OUT}=2*10μF, C_{SS}=2.7nF, C_{TIMER}=10nF, C_{DELAY}=0.1μF, R_{ISET}=90kΩ, unless otherwise specified.)

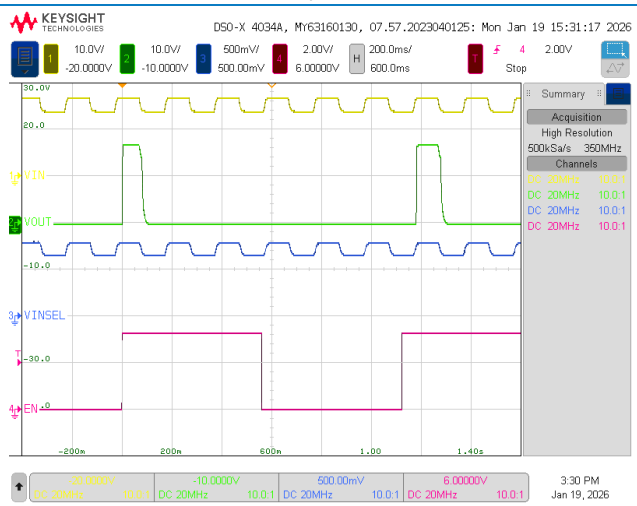


Figure 2 Input Voltage UVP

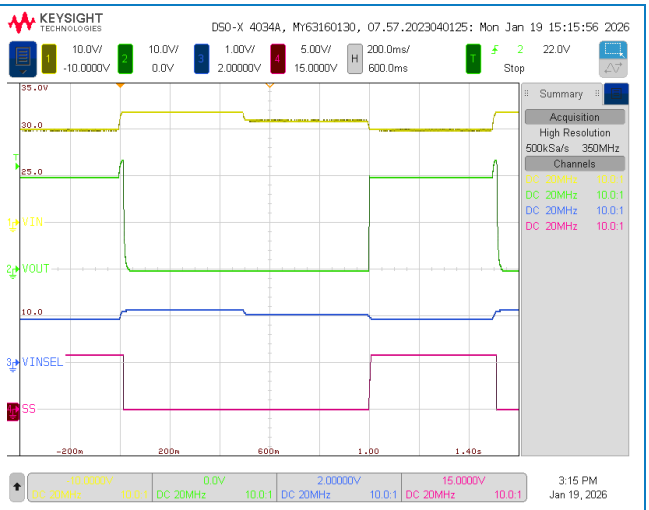


Figure 3 Input Voltage OVP

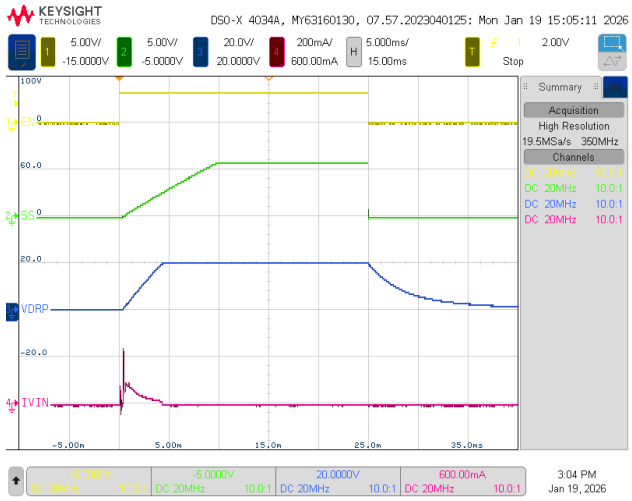


Figure 4 Turn on/off by DRPEN (C_{SS}=10nF)

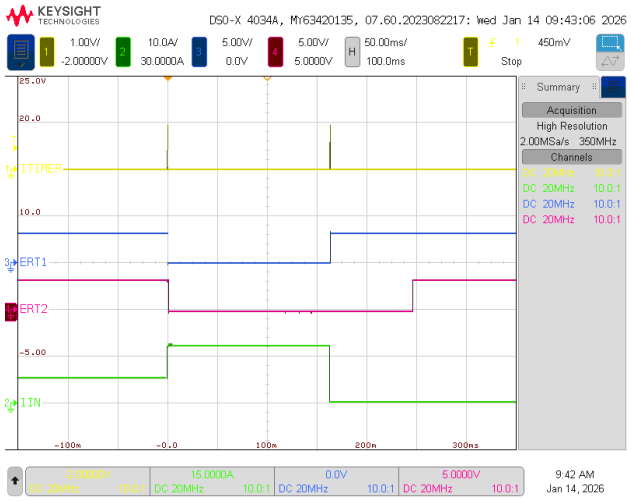


Figure 5 OCP Alert1/ALert2

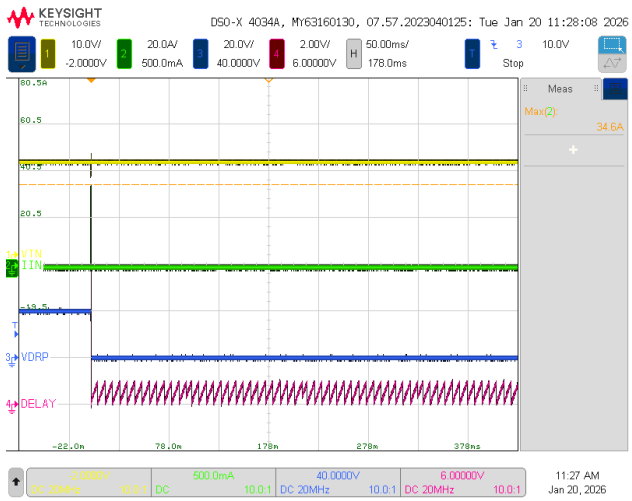


Figure 6 Hard SCP during steady state

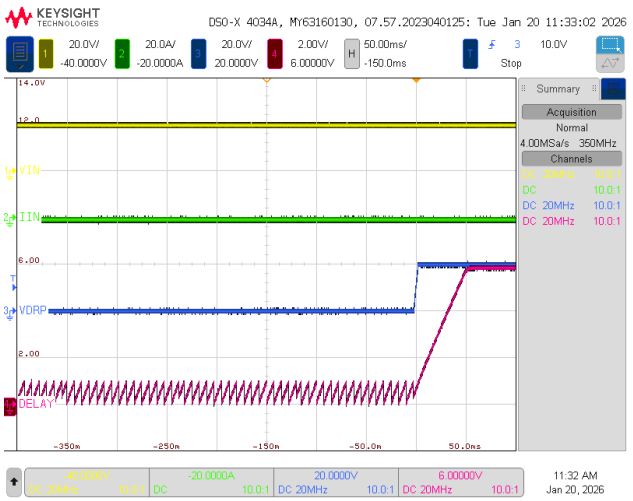


Figure 7 Recovery after SCP removal

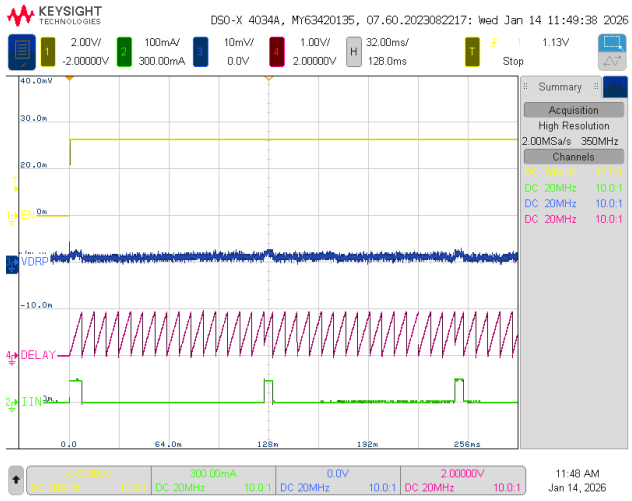


Figure 8 Turn-on during SCP

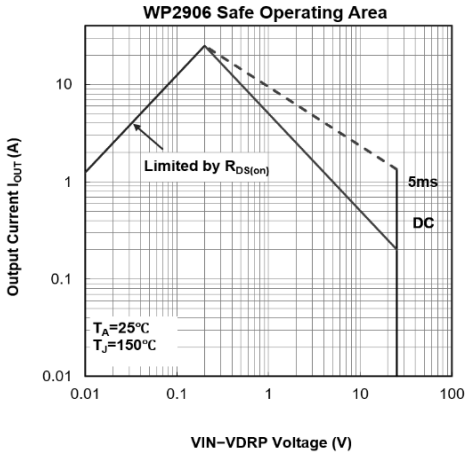


Figure 9 WP2906 Safe Operating Area

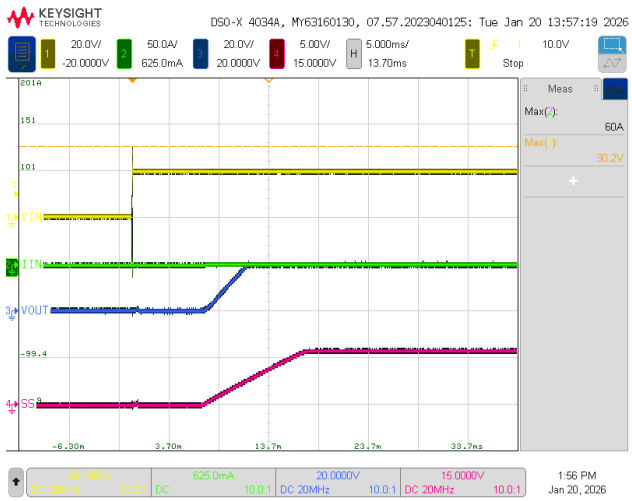


Figure 10 Hot Plug-in (C_{SS}=10nF)

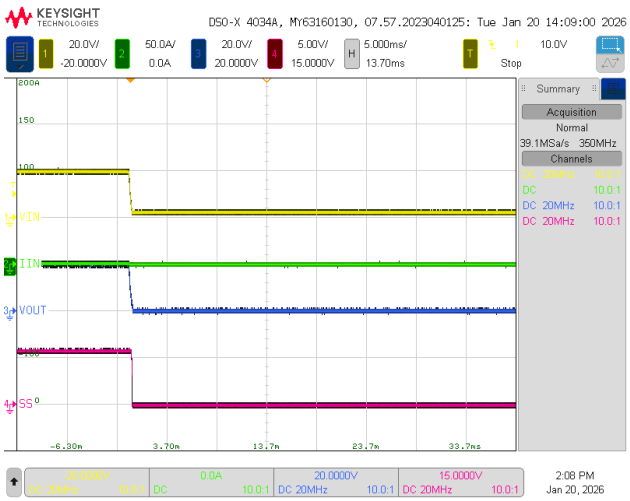


Figure 11 Hot Plug-out

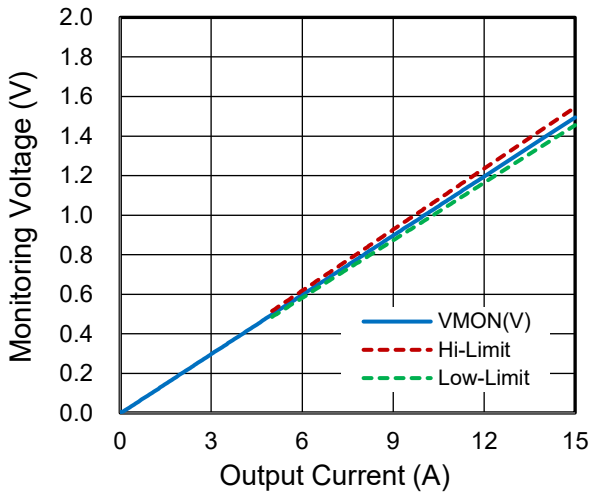


Figure 12 IMON Accuracy with R_{SENSE}=5mΩ

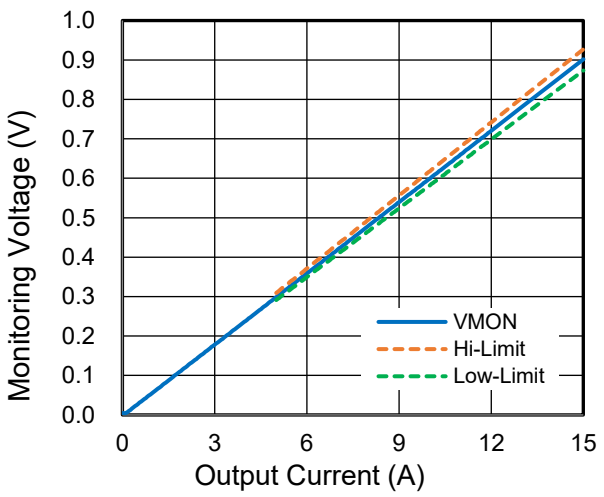


Figure 13 IMON Accuracy with R_{SENSE}=3mΩ

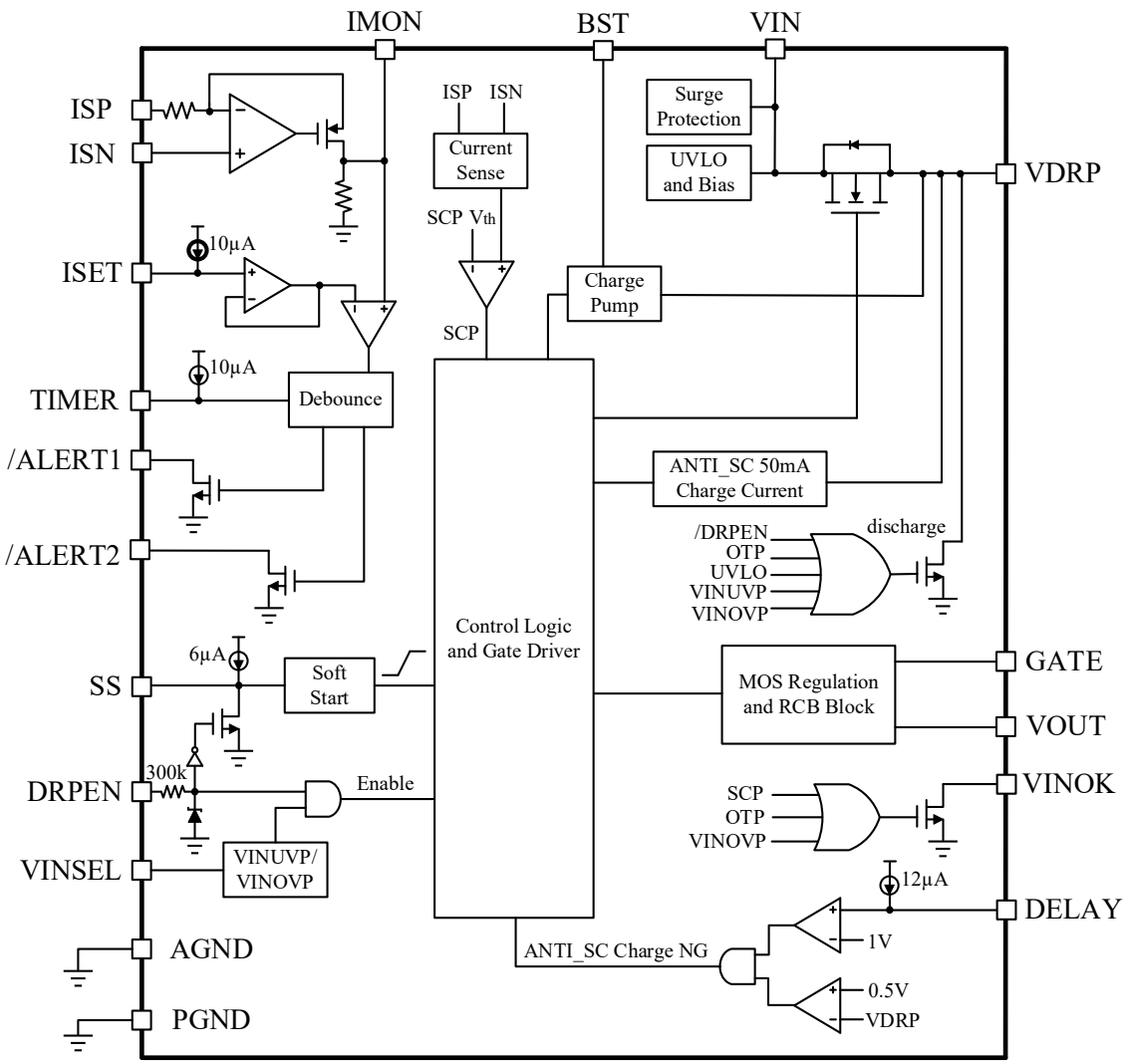
11. Function Description

11.1 Overview

WP2906 is a high current Power Switch that is used to ensure safe power delivery in a system which provides multi-protection functions such as UVLO, wrong input voltage protection, surge protection, reverse current blocking protection, SCP, OTP and over current two-level alert with very few external components.

WP2906 is capable of operating from 4.5V to 25V and rated up to 15A, has an absolute maximum voltage rating of 30V. In case VINSEL voltage exceeds the VINSEL low or high detection threshold, wrong input voltage protection is activated which can be set by an external resistor R_1 and R_2. After a successful start-up sequence, the device now actively monitors its current load and VINSEL voltage, if OCP condition is detected, ALERT will go low. The OCP threshold can be set by an external resistor R_{ISET}. The internal soft start circuitry controls inrush current due to highly capacitive loads. The soft start can be adjusted using an external capacitor C_{SS}.

11.2 Block Diagram



11.3 Typical Application Circuit

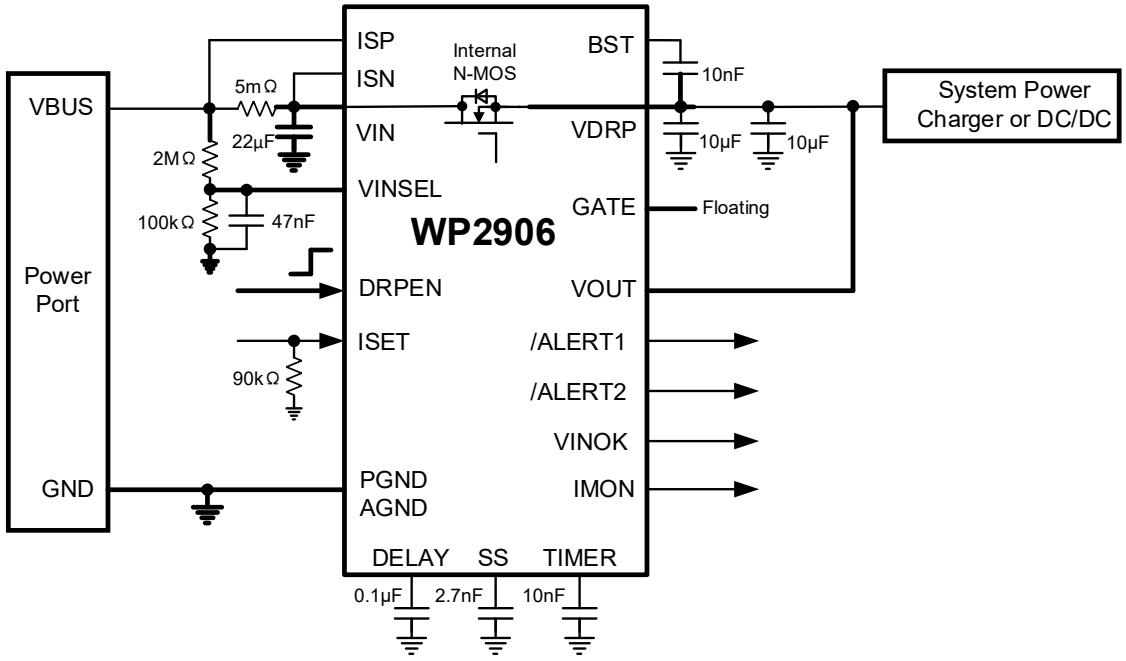


Figure 14 Single Switch Application Circuit

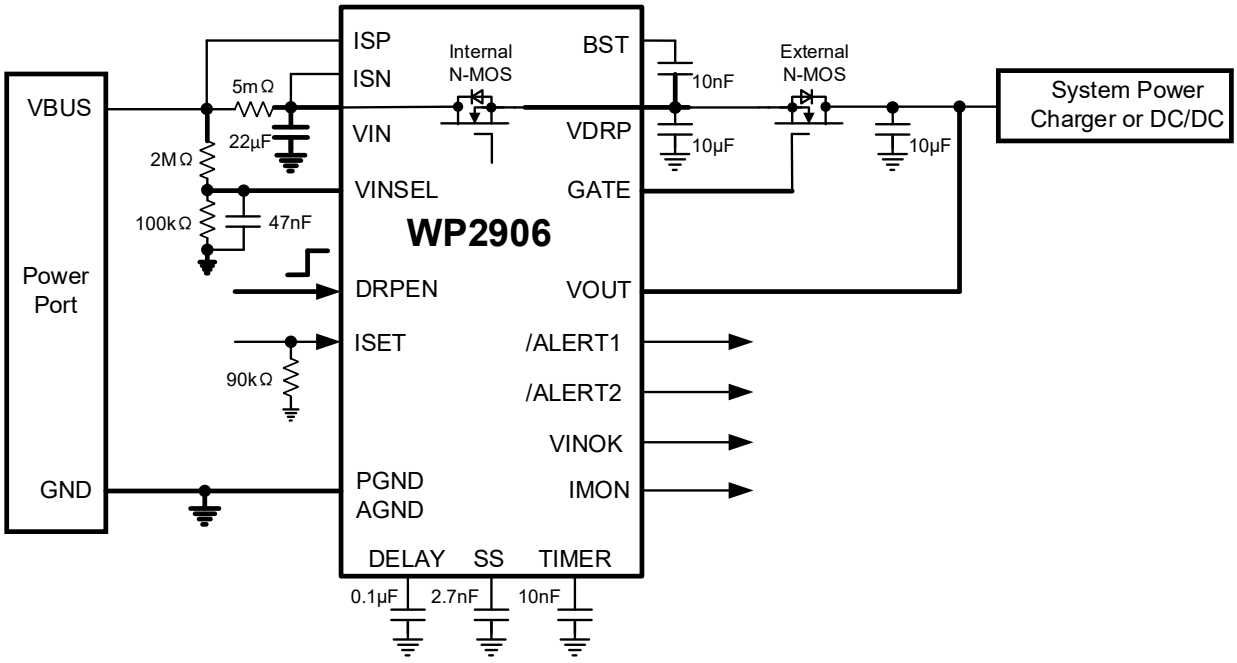


Figure 15 Dual Back-to-Back Switch with Reverse Current Block Application Circuit

11.4 Feature Description

WP2906 is a high current power switch with adjustable soft start, UVLO, wrong input voltage protection, surge protection, reverse current blocking protection, SCP, OTP and over current two-level alert. It is capable of operating from 4.5V to 25V and rated up to 15A.

The power switch has an integrated N-channel MOSFET. When switch is enabled, the overall resistance between VIN and VDRP is only 5mΩ in typical condition, minimizing power lose and thermal dissipation. If there is an external N-MOS, it can form a back-to-back structure with the internal N-MOS to provide the reverse current block (RCB) when the device is enabled or disabled. The back-to-back configuration of switches completely isolates between VIN and VOUT when turned off, preventing leakage between the two pins.

11.4.1 Enable

The DRPEN pin is the ON/OFF control for the power switch. The device is enabled when DRPEN pin is high, and the device is not in UVLO lockout state. The DRPEN pin must be driven to a logical high or logic low state to guarantee operation. While disabled, VDRP pin of WP2906 only draws 1μA (typical) of supply current. The DRPEN pin cannot be left floating.

11.4.2 Input Under-Voltage Lockout (UVLO)

The internal circuitry of WP2906 is powered by VIN. The under-voltage lockout (UVLO) circuit of WP2906 monitors the voltage at VIN pin and only allows the power switch to turn on when VIN is higher than 3.8V. If VIN pin is below 3.6V, the device is in under-voltage lockout state.

11.4.3 Soft-start and ANTI_SC Charge

When WP2906 is enabled, it initiates a ANTI_SC (Anti Short Circuit) charge process to determine if a short circuit exists in the VDRP. During the ANTI_SC charge process, a 50mA current source is activated to charge the output capacitor and a 12μA current source is activated to charge the C_{DELAY}. If the VDRP is over 0.5V during the delay time which is set by C_{DELEY}, WP2906 then initiates a soft-start process, turning on the internal N-MOSFET.

If a short circuit occurs at VDRP during the ANTI_SC charge process, the DELAY Voltage will reach 1V before VDRP Voltage reaches 0.5V, at which point the IC decides not to turn on the N-MOSFET and enters hiccup mode. When the short circuit event disappears, the IC can start the ANTI_SC charge and soft-start process to increase the V_{DRP} voltage. During the soft-start process, the ratio of the SS voltage to the VDRP voltage is 0.125 times. The soft-start time is calculated using the following formula, the charge current (I_{SS}) of SS capacitor is 6μA:

$$V_{SS} = V_{DRP} \times 0.125(V)$$

$$t_{SS} = \frac{C_{SS} \times V_{SS}}{I_{SS}}(s)$$

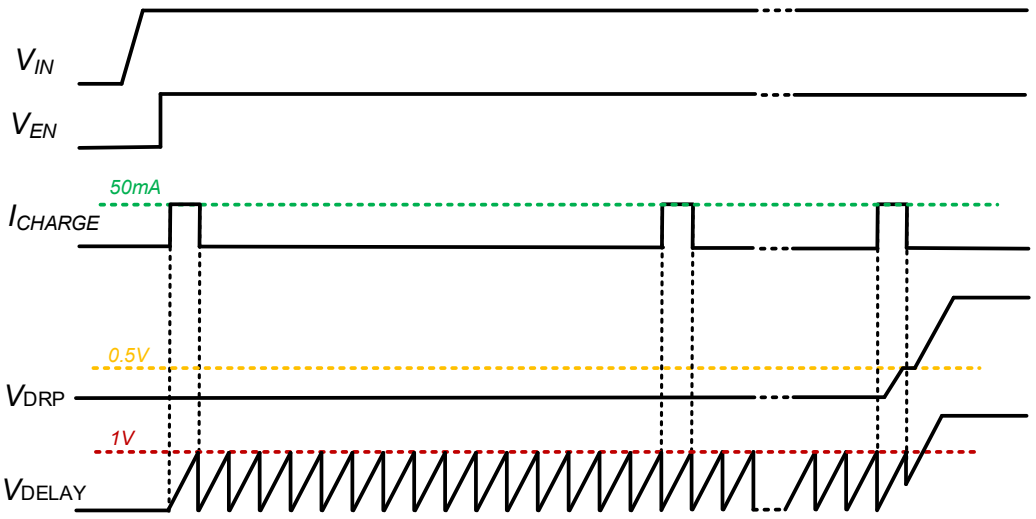


Figure 16 ANTI_SC charging behavior for start-up during SCP

11.4.4 VINOK Report

WP2906 protects its load from the following fault conditions: VIN OVP, short-circuit, and over-temperature. When the device is first enabled, the power switch is off, and fault conditions are checked. If voltage at VINSEL is higher or lower than the VINSEL high or lower detection threshold, or die temperature is higher than thermal shutdown threshold. The VINOK pin is pulled low to report to host controller. After the power switch turned on, the device continuously monitors all fault conditions. The switch is turned off when VIN wrong voltage, short-circuit, or over-temperature is detected. VINOK pin is pulled low.

11.4.5 IMON Current Report and OCP Report

The value of the IMON output voltage can reflect the value of the input current. The relationship between IMON voltage and input current IIN is given by the following equation.

$$V_{IMON} = I_{IN} \times R_{SENSE} \times K\ (V)$$

I_{IN} is the input current flow into VIN pin. R_{SENSE} is the sensing resistor which could either be the internal N-MOSFET $R_{DS(ON)}$ or the external sense resistor, depending on how ISN and ISP are connected. Please refer to the Typical Application Circuit. K is 20, which is a constant.

When V_{IMON}>V_{ISET} persists over the debounce time set by the TIMER pin, the /ALERT1 is pulled low. To reset /ALERT1 low state needs to V_{IMON}<V_{ISET}, and the /ALERT1 release time set by the TIMER pin. When the event of V_{IMON}>1.15*V_{ISET} is detected, /ALERT2 goes low, the time is fixed at 1.15ms. To reset /ALERT2 low state needs to V_{IMON}<1.15*V_{ISET}, and the /ALERT2 release time is fixed at 72ms.

The debounce and release time of /ALERT1 is set by a capacitor connected from TIMER pin to ground. The ISET voltage is determined by an external resistor connected from ISET to ground. The charge current (I_{ISET}) of ISET resistor (R_{ISET}) is 10μA, and the charge current (I_{TIMER}) of TIMER capacitor (C_{TIMER}) is 10μA. The debounce time, release time of /ALERT1 and ISET voltage can be calculated by the following equations.

$$V_{ISET} = I_{\mathrm{ISET}} \times R_{ISET}\ (V)$$

$$t_{alert} = t_{set} = \frac{C_{TIMER}}{I_{\mathrm{TIMER}}}\ (s)$$

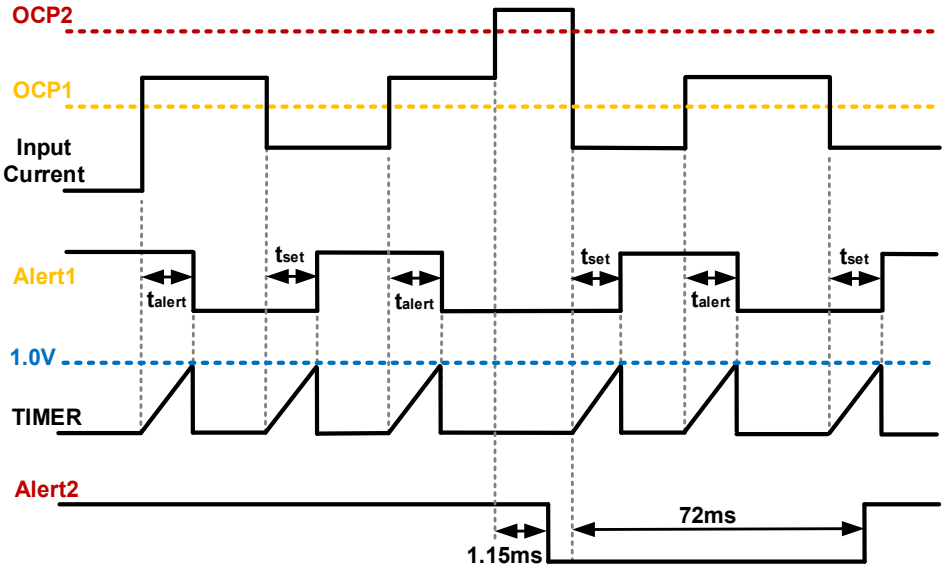


Figure 17 ALERT1/2 Debounce Time and Release Time

11.4.6 Short-Circuit Protection (SCP)

WP2906 has built-in SCP protection to prevent overload or short circuit conditions. When output current above 33A (R_{SENSE}=5mΩ), Short-circuit function is enabled and the WP2906 immediately shuts off the internal N-MOSFET and then enters hiccup mode. In the hiccup mode, the output periodically executes a ANTI_SC charge process, and a soft-start process until the short circuit event has disappeared. The SCP can be calculated by the following equation.

$$I_{SCP} = \frac{3.3}{20 \times R_{SENSE}}(A)$$

11.4.7 Over-Temperature Protection (OTP)

During current limit, the power switch resistance is increased to limit the load current. This increases device power dissipation dramatically and causes the die temperature to rise. When the die temperature reaches 150°C the power switch is turned off. There is a 30°C hysteresis. Over-temperature fault is removed when die temperature drops below approximately 120°C.

11.4.8 Revere Current Block (RCB)

WP2906 provides RCB protection to prevent current from flowing from VDRP to VIN. This function can emulate the external N-MOS as an ideal diode. The current is only allowed to flow from VIN to VDRP but forbidden from VDRP to VIN. There are two cases to trigger RCB protection, the first case is when VOUT voltage is higher than VDRP voltage (VOUT-VDRP > 10mV), RCB can be triggered; the second case is when the VIN pin is short-circuited, it can prevent the current from flowing from VOUT to VIN terminal. When VDRP to VOUT

is higher than 20mV, WP2906 will exit RCB Protection. In light load or no-load conditions, The VOUT is regulated at (VDRP-20mV) until load current is large enough to produce a voltage drop (=I_{LOAD}*$R_{DS(ON)}$) across VDRP to VOUT higher than 20mV.

11.4.9 Surge Protection

WP2906 implements a surge protection function in VIN pin. When a sudden voltage spike appearing on VIN pin is high enough to trigger the surge protection, the WP2906 will limit this voltage to 27V (typical value) and conduct the surge current to ground through an internal low impedance path until the surge protection is no longer activated.

The surge protection function can only deal with transient voltage. If the surge protection function is activated for a long time, the WP2906 junction temperature will rise and eventually cause potential damage. WP2906 can deal with a surge up to V=100V. The capability of surge protection function was evaluated by the method depicted below diagram. We used an IEC61000-4-5 and IEC801-5 compliant surge generator to test the capability of surge protection function. The surge generator generates a voltage which is 1.2μs/50μs (open circuit) as shown in the profile below.

Evaluation Method of Surge Protection.

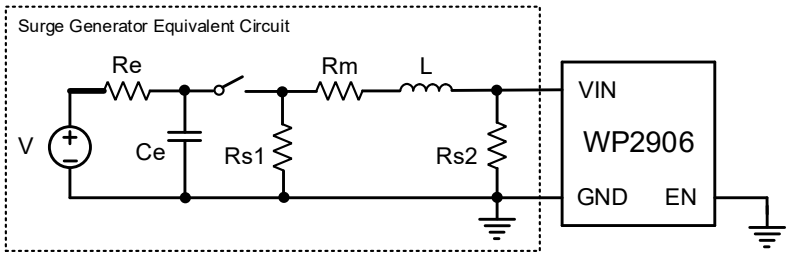


Figure 18 Surge Generator Equivalent Circuit

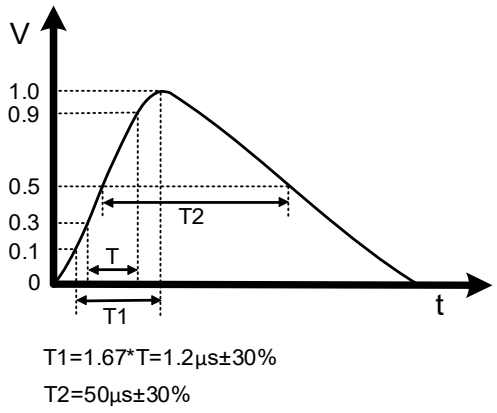


Figure 19 Surge Voltage Profile (open circuit)

12. Application Guide

Note: The information in the Applications section below is not part of WAY-ON's product specifications and WAY-ON does not guarantee its accuracy or completeness. The customer is responsible for determining the suitability of the component for its intended use and should verify and test its design implementation to confirm system functionality.

12.1 Input Capacitor Selection

The input capacitor prevents VIN from ringing too high during a short circuit. When the load current reaches the SCP threshold during an overload condition such as a short circuit, hot swap, or heavy load transient, the presence of inductance between the power supply and VIN causes VIN to ring, which can damage the internal control circuitry. The input capacitors should be placed as close to the pins as possible. A low-ESR 10μFx2 ceramic capacitor is recommended between VIN and GND. However, a higher capacitance value (47μF/35V E-cap) will further reduce the transient voltage at the input to avoid exceeding the absolute withstand value and damaging the WP2906.

12.2 Output Capacitor Selection

The output capacitor must supply enough current for a large load that it may encounter during system transient. This bulk capacitor must be large enough to supply fast transient load to prevent the output from dropping. A low-ESR 10μFx2 between VDRP and GND is recommended to reduce the voltage droop during hot attachment of downstream peripheral.

12.3 Power Dissipation (P_D)

The reliability of the circuit requires reasonable consideration of the power dissipation of the device, the location of the circuit on the PCB, and the proper sizing of the thermal plane. The device should be surrounded by no other heat generating devices as much as possible. The power dissipation of the device depends on the input and output voltage difference and the load conditions.

P_D can be calculated using the following equation:

$$P_D = R_{ON} \times (I_{OUT})^2$$

The worst-case power dissipation occurs when the load current is excessive due to over-current or short-circuit fault. Power dissipation under these conditions can be calculated using the following equation:

$$P_D = |V_{IN} - V_{DRP}| \times I_{Load}$$

The maximum power dissipation determines the maximum allowable ambient temperature (T_A) of the device. Power dissipation and junction temperature are typically related to the junction-ambient thermal resistance ($R_{\theta JA}$) and ambient air temperature (T_A) of the PCB and package and are calculated as follows:

$$T_J = T_A + (R_{\theta JA} \times P_D)$$

The thermal resistance ($R_{\theta JA}$) depends primarily on the thermal dispersion capability of the PCB design. The total copper area, copper weight, and the location of the plane all affect the thermal dispersion capability, and the PCB and copper laydown area can only be used as a relative measure of the package's thermal performance.

13. Evaluation Modules

Evaluation Modules (EVMs) are available to help evaluate initial circuit performance.

The module name is listed in the following table.

NAME	PACKAGE	EVALUATION MODULE
WP2906	QFN4×4-24	WP2906_EVB

13.1 Typical Application Circuits

This section discusses the application of WP2906 in the circuit. The following figure shows the schematic of the evaluation module circuit.

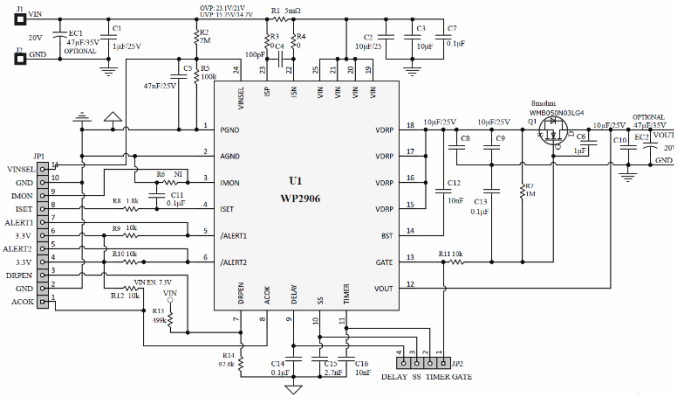


Figure 20 Schematic for EVB

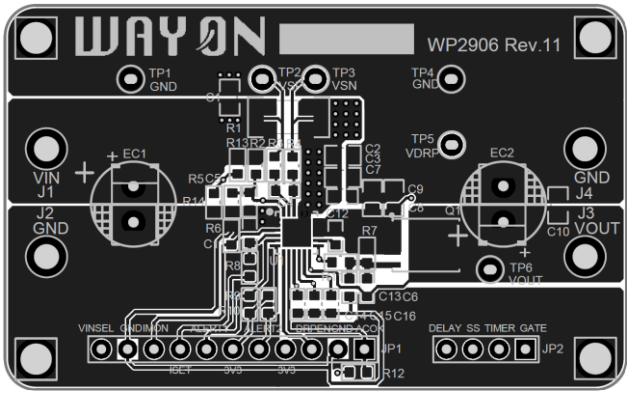


Figure 21 PCB Layout for EVB

13.2 Layout of Typical Application Circuits

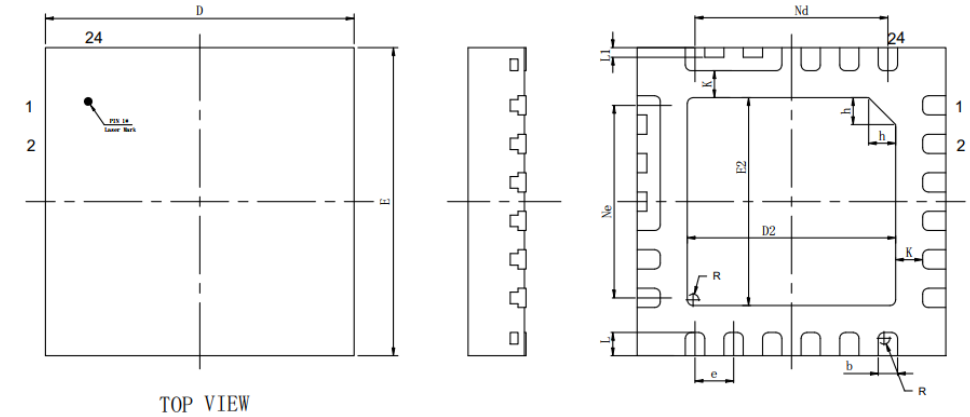
Layout Guidelines

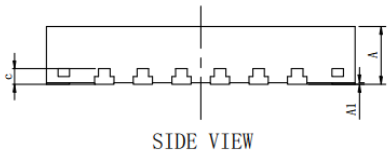
Good PCB layout is important for improving the thermal and overall performance of WP2906. To optimize the switch response time to output short-circuit conditions, keep all traces as short as possible to reduce the effect of unwanted parasitic inductance. Place the input and output bypass capacitors as close as possible to the VIN/VDRP and VOUT pins. The input and output PCB traces should be as wide as possible for the given PCB space. Use a ground plane to enhance the power dissipation capability of the device. For accuracy current detection, the current sense resister R1 signal must be Kevin connection to ISP and ISN pin. The sense location for R1 should be as close to the resistor terminal as possible to reduce the effect of resistance from PCB trace.

14. Electrostatic Discharge Warning

ESD can cause irreversible damage to integrated circuits, ranging from minor performance degradation to device failure. Precision ICs are more susceptible to damage because very minor parameter changes can cause the device to be out of compliance with its published specifications. WAY-ON recommends that all ICs be handled with proper precautions. Failure to follow proper handling practices and installation procedures may damage the IC.

15. Package Information





** 特殊设计：引脚根部无缩小

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.20	0.25	0.30
c		0.203REF	
D	3.90	4.00	4.10
D2	2.60	2.70	2.80
e		0.50BSC	
Nd		2.50BSC	
Ne		2.50BSC	
E	3.90	4.00	4.10
E2	2.60	2.70	2.80
L	0.25	0.30	0.35
L1		0.125REF	
h	0.30	0.35	0.40
K		0.35REF	
R		0.075REF	

16. Ordering Information

Part Number	Op Temp (℃)	Package	Packing Quantity	Marking*
WP2906-QRR	-40 to 85	QFN4×4-24	5k/Reel	WP2906 XXXX

* XXXX is variable.

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Specifications are subject to change without notice.
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
Users should verify actual device performance in their specific applications.

Product Specification Statement

- The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.
- The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.
- WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.
- Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.
- The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.
- Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.