NIKO-SEM

LOW POWER OFF LINE SMPS PRIMARY SWITCHER

N3862P
REV: A

GENERAL DESCRIPTION

The N3862P is the low cost integrated PWM primary switcher, it combines a current mode PWM controller with a high voltage power MOSFET, specifically designed for use in the low power output, any universal and single input AC / DC converters, DC / DC converters, battery chargers, AC adapters or stand-by switching power supplies.

The N3862P features a burst mode function at light load condition, when output power works at light load and the duty of gate driver is under 900nS, the N3862P will enter the burst mode condition to reduce operating frequency and switching loss, this special function helps decrease power consumption to be Green Mode Requirement.

The N3862P features a protective circuitry which in presence of an over load condition or an over voltage condition, the device controls a delayed time to disable the output pulses and pull down the VCC voltage to 4V, then trying to restart, once the default has gone, the power device auto-recovers.

The N3862P is capable of powers to 15W maximum for a universal line input.

FEATURES

Low Start-up Current (typ.=10uA)
Low Operating Supply Current
Current Mode Control
10V~26V Range For VCC Voltage
Adjustable Operating Frequency
Over Load Protection
Over Voltage Protection
Pulse Output For Driving MOSFET
Green Mode Requirement
Burst Mode at Light Load Condition
Built-in High Voltage Power MOSFET
Very Low Cost Solution
DIP-8 package

DEVICE SELECTION GUIDE

SnPb	Pb Free
N3862P	N3862PG

BLOCK DIAGRAM
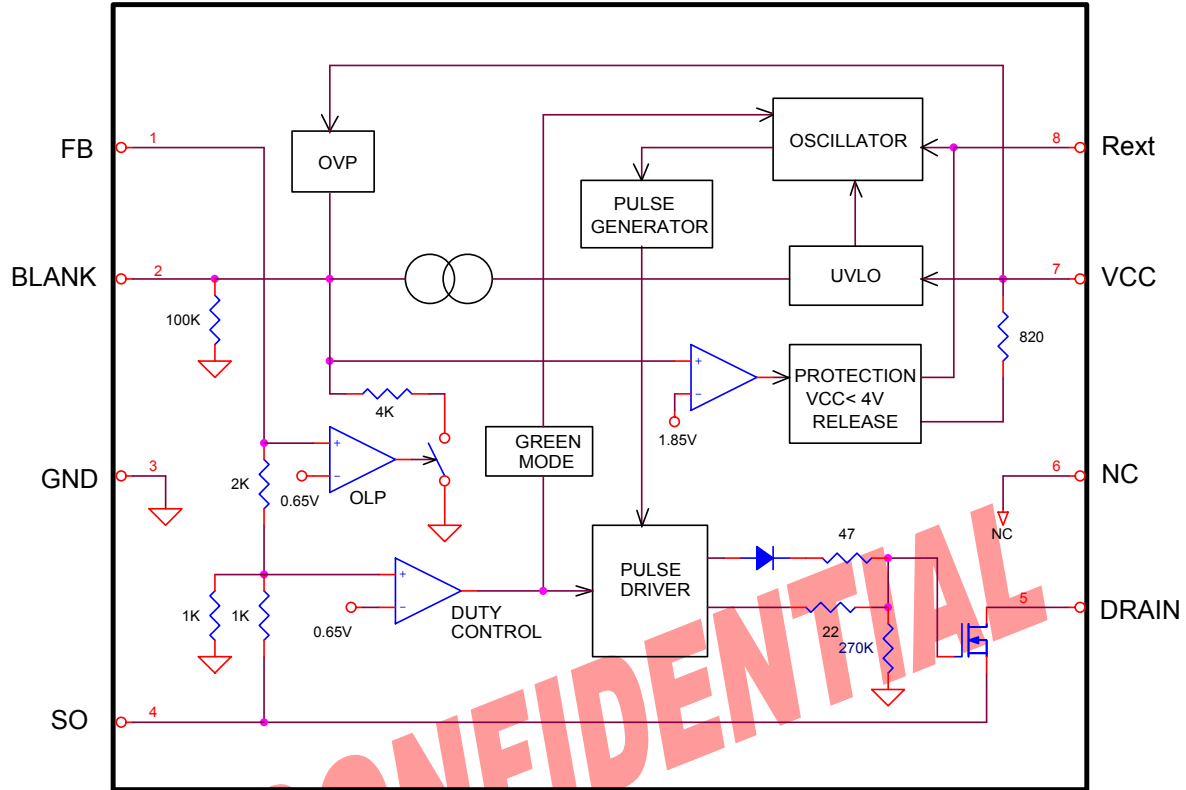
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMITS	UNITS
Power supply voltage	Vcc	30	V
Switching Drain-Source Voltage	V_{DS}	-0.3 to 650	V
Continuous Drain Current	ID	2	A
Source to GND Voltage	Vso	-0.3 to 5	V
Power Dissipation at Ta =50	P_{TOT}	1200	mW
Junction Temperature	Tj	- 25~ 150	
Storage Temperature	T_{STG}	- 55 ~ 150	
Lead Temperature (Soldering) 10S	T_{LEAD}	300	

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THERMAL DATA

| PARAMETER	SYMBOL	DIP-8	UNIT
Thermal Resistance Junction to Ambient	θja	53	/W
Thermal Resistance Junction to Case	θjc	23	/W

ELECTRICAL SPECIFICATIONS

(Vcc =15V ,Ta = - 25   to 125   ;unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
SUPPLY VOLTAGE SECTION						
Turn-on Threshold	Vcc(on)		16	17	18	V
Turn-off Threshold	Vcc(off)		9.5	10	10.5	V
Operating Voltage Range	Vcc		10.5	15	26	V
Operating Supply Current	Icc			1.0		mA
OSCILLATOR SECTION						
Frequency Range	fs	Rext=100K	47	52	57	KHz
POWER SECTION						
Drain-Source Voltage	BV$_{DSS}$	I$_D$ =1mA	650			V
Off State Drain Current	I$_{DSS}$	V$_{DS}$=650V, Tj=25 V$_{DS}$=650V, Tj=125			0.1 0.3	mA
Drain-Source On State Resistance	R$_{DS(ON)}$	Ta=25 ,ID=2A,	-	5.2	6.5	Ω
Drain Capacitance		V$_{DS}$=25V		37		pF
Rise Time	t$_r$			250		nS
Fall Time	t$_f$			150		nS
Max.Current Sense Voltage	Vcs(max)	Tc = 25	1.2	1.3	1.4	V
		Tc = 100	1.1	1.2	1.3	V
Over Voltage Protection Threshold	V$_{OVP}$	Vcc= V$_{OVP}$	26	28	30	V

TYPICAL APPLICATION
N3862P---- OUTPUT<15W
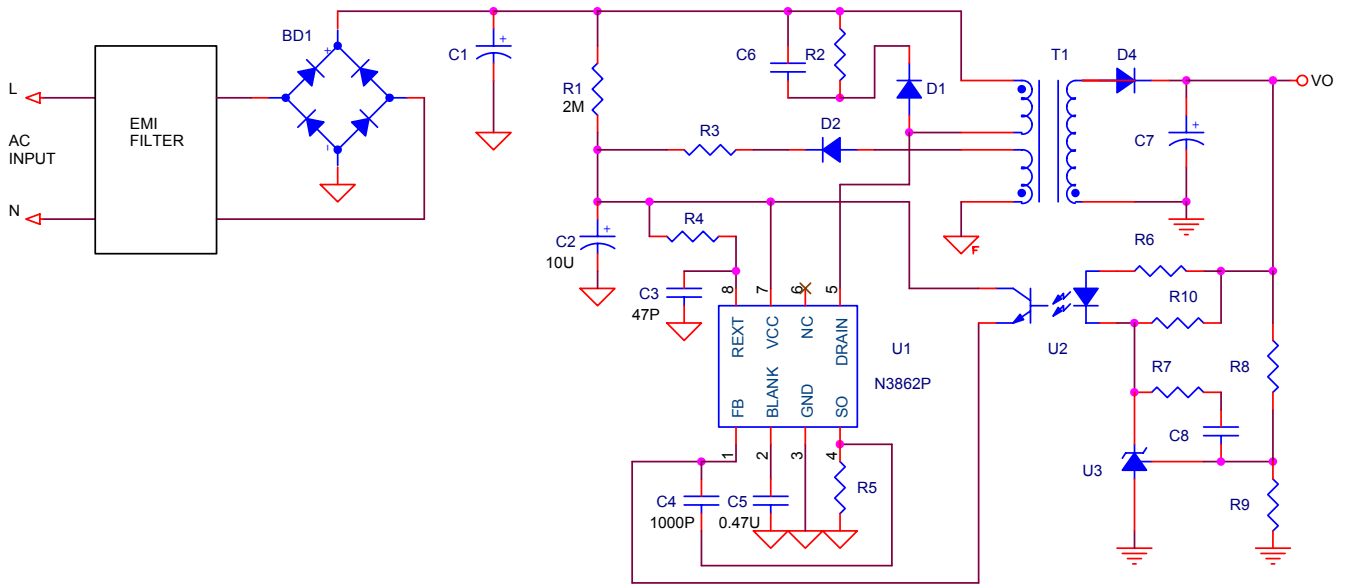
The maximum peak switch current is :

$$I_{PK} = 1.1 / Rcs \quad (Tc= 100 \quad)$$

The frequency set by R4

$$fs = 5.4E9 / R4$$

OPERATION DESCRIPTION

Under Voltage Lockout (UVLO)

The turn-on/turn-off threshold are fixed at 17V/10V, The hold-up capacitor must be charged to 17V through the start-up resistor, then the device starts to work, if the hold-up capacitor be discharged to 10V,the device stops to work.

The hold-up capacitor should be enough to supply VCC before energy can be delivered from the auxiliary winding of the main transformer. VCC must not drop below 10V during start-up process. The UVLO function ensures the hold-up capacitor can adequately supply VCC.

Start-Up Current

The typical start-up current is only 10uA, This allows to use a high resistance of start-up resistor for minimizing power loss, therefore, a 2 M   start-up resistor and a 10uF VCC hold-up capacitor would be sufficient for the typical application.

Internal Over-Voltage Protection

The N3862P has built in a internal OVP function to prevent damage due to over-voltage of VCC, When the voltage of VCC exceeds 28V, to disable the output pulses and pull down the VCC voltage to 4V, then trying to restart, once the default has gone, the power device auto-recovers.
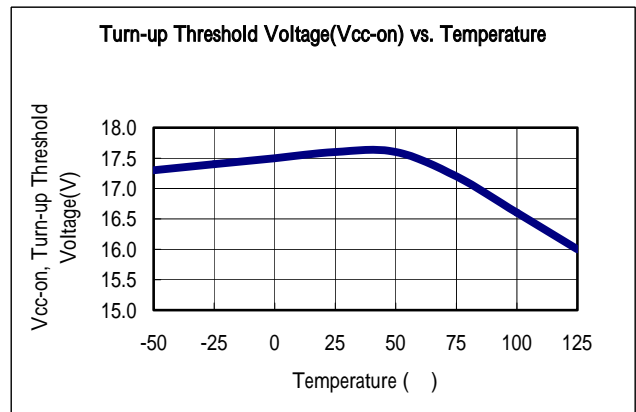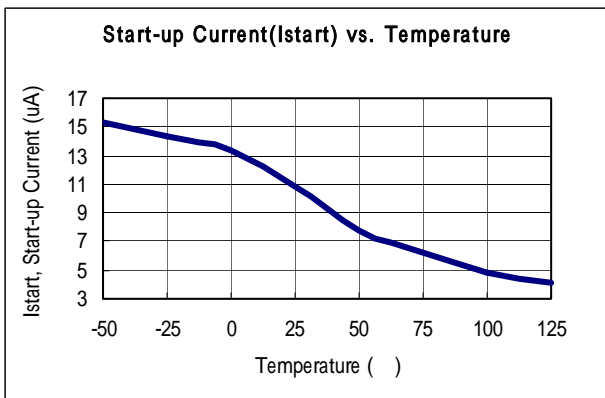
External Over-Voltage Protection

The 3862P is also provided an external OVP function to set lower over voltage threshold than internal OVP. The external over-voltage protection with an external zener diode is showing on the following application circuit.
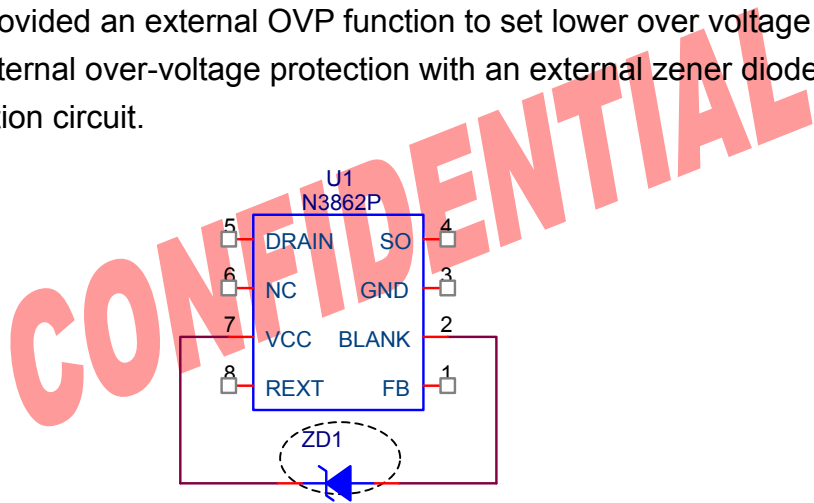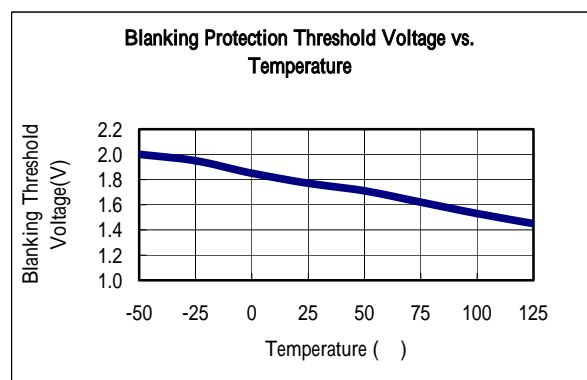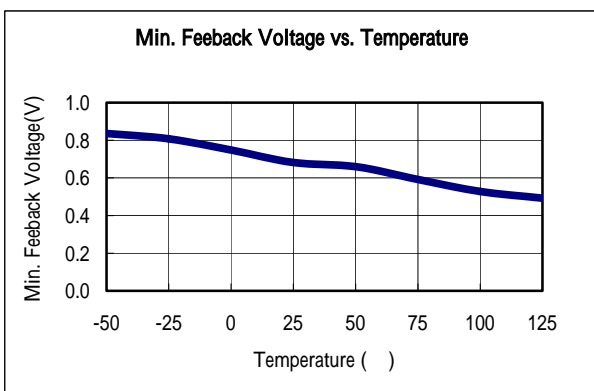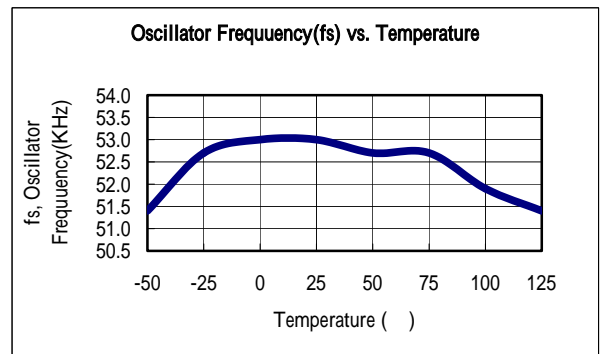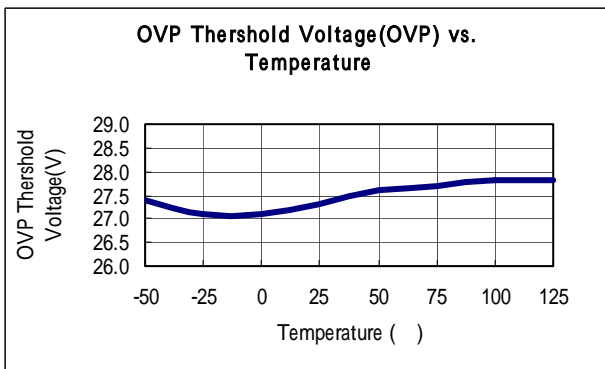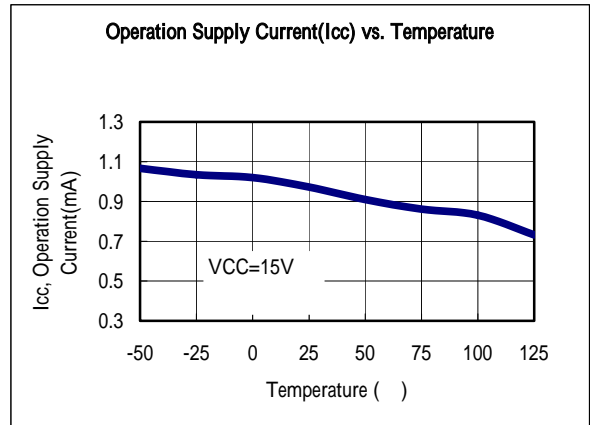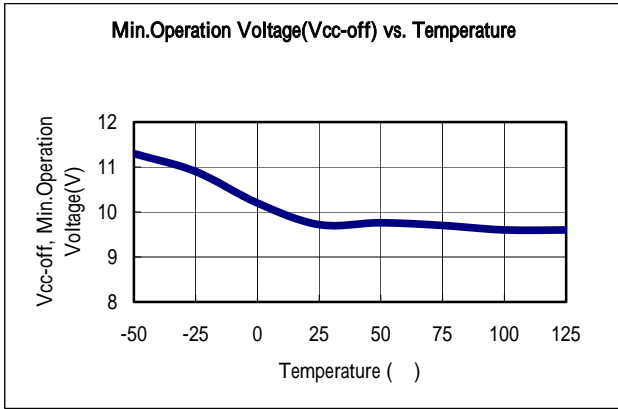

Constant Limited Power compensation

The N3862P provides a constant limited power compensation, It used a special feedback control with an external capacitor 1000pF across FB pin and SO pin to make output power equal, no mater input is low or high line condition.

TYPICAL CHARACTERISTICS

Min Operation Voltage(Vcc-off) vs. Temperature

Operation Supply Current(Icc) vs. Temperature

VCC=15V

OVP Thershold Voltage(OVP) vs. Temperature

Oscillator Frequency(fs) vs. Temperature

Min. Feeback Voltage vs. Temperature

Blanking Protection Threshold Voltage vs. Temperature

PIN CONFIGURATION

TOP VIEW

FB	1	8	Rext
BLANK	2	7	VCC
GND	3	6	NC
SO	4	5	DRAIN

DIP-8
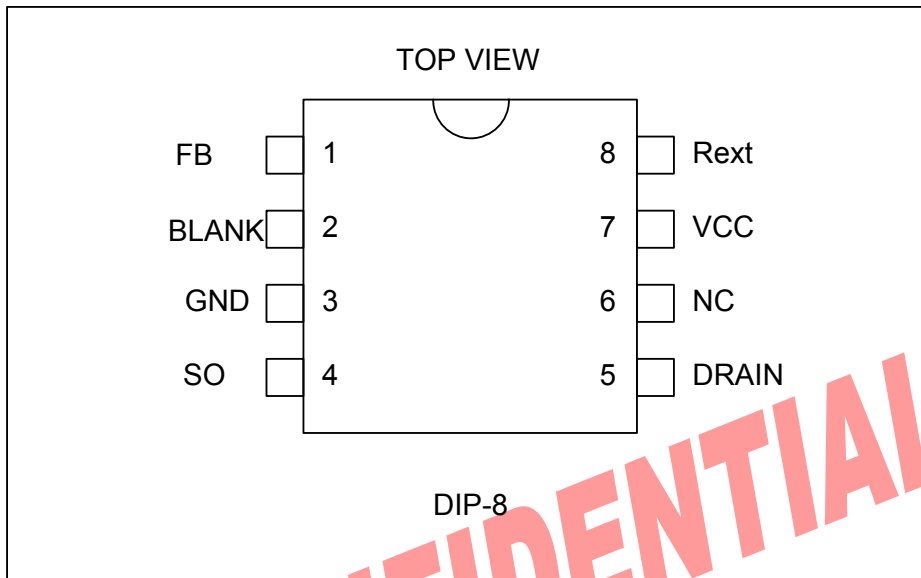
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PIN FUNCTIONS

NO	FUNCTION	DESCRIPTION
1	FB	Voltage feedback input .
2	BLANK	Set the blanking time to delay the protection operation.
3	GND	Ground , Current return for both the signal and drive circuit .
4	SO	Source of the internal power MOSFET.
5	DRAIN	Drain of the internal power MOSFET.
6	NC	Not connect.
7	VCC	Supply Voltage of this IC .
8	Rext	Frequency setting resistor, connects a resistor to VCC pin and a capacitor to GND.(The capacitor is fixed to 47pF)

DIP-8 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.8		9.6	H	7.95		9.75
B	6.2		7.0	I			
C	0.35	0.45	0.55	J			
D		2.54		K			
E	0.5		0.8	L			
F	3.05	3.28	3.56	M			
G	7.48	7.62	8.13	N			