

Over voltage and over current protection IC

Description

HM4801 is an Over-Voltage-Protection (OVP) IC. The device will switch off internal MOSFET to disconnect VIN to OUT to protect load when any of input voltage, input current over the threshold. The Over temperature protection (OTP) function monitors chip temperature to protect the device.

Application

- PND
- Tablet
- HD Player
- OTT
- Digital Cameras
- Digital Videos

Features

- High voltage technology
- Maximum input voltage :30V
- Output power ON time :8ms(Typ)
- OVP threshold :Used Pin PROADJ Options
- OVP response time :<1us
- Output auto discharge
- Small Package :DFN8L (0203-0.75-0.50)

Ordering information



XX YY : Product code

XXXXX.1 : Wafer batch

Fig.1 Top view

Table 1

Package	DFN8L (0203-0.75-0.50)
MOQ	3000 pcs

Typical Application

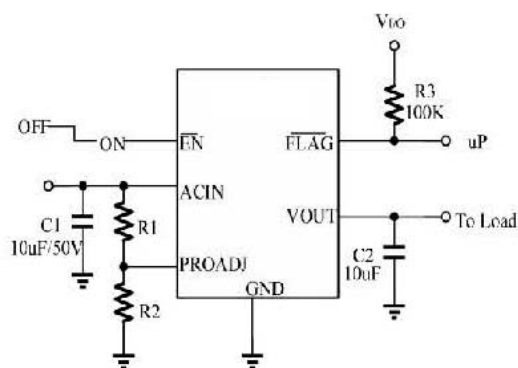
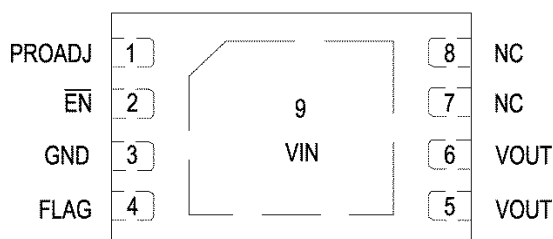


Fig.2

Pin Configuration and Function



HM4801

Fig.3 Pin configuration (Top view)

Table 2

NO.	Symbol	Type	Description
1	PROADJ	INPUT	Over voltage options pin
2	$\overline{\text{EN}}$	INPUT	Enable pin. Active Low.
3	GND	GROUND	Ground
4	FLAG	OUTPUT	Flag Pin. Open-Drain, Active low if any OVP, OTP occur.
5/6	VOUT	OUTPUT	Output pin. Connect to load.
7/8	NC		
9(Bottom pad)	VIN	POWER	Input pin. A 10uF low ESR ceramic capacitor or larger must be connected as close as to this pin. It is recommended to use 50V capacitor or according to application.

Functional Block Diagram

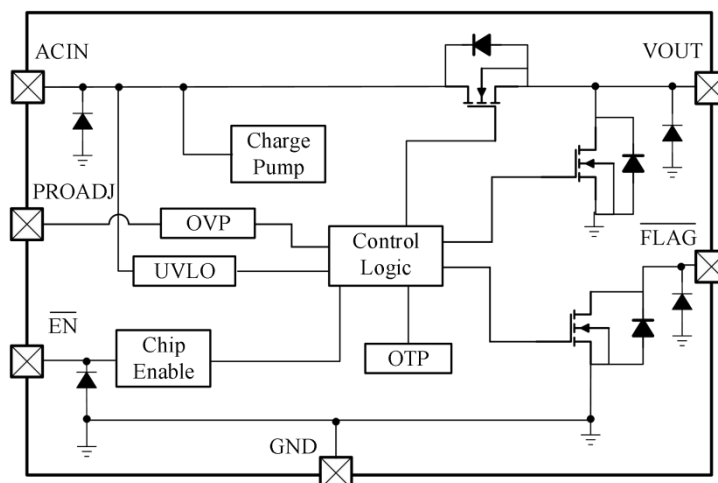


Fig.4

Absolute Maximum Ratings

Table 3

Parameter	Symbol	Value	Unit
Input voltage (ACIN pin)	V_{IN}	-0.3 ~ 30	V
Output voltage (VOUT pin)	V_{OUT}	-0.3 ~ 30	V
Junction temperature	T_J	150	°C
Storage temperature	T_{stg}	-55 ~ 150	°C
ESD Ratings	HBM	±3000	V
	MM	±200	V

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Recommend Operating Conditions

Table 4($T_a=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Input voltage	V_{IN}	3.5 ~ 30	V
Output current	I_{OUT}	3.5	A
Ambient operating temperature	T_{opr}	-40 ~ 85	°C

Electrical Characteristics

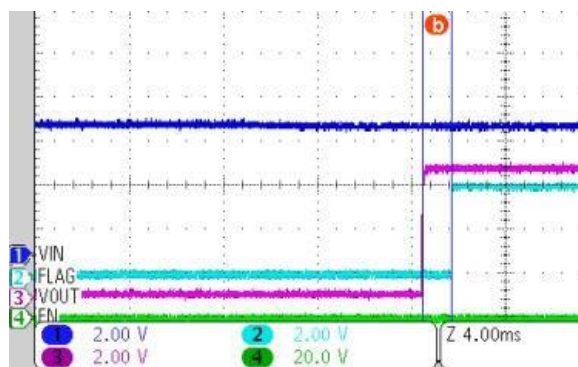
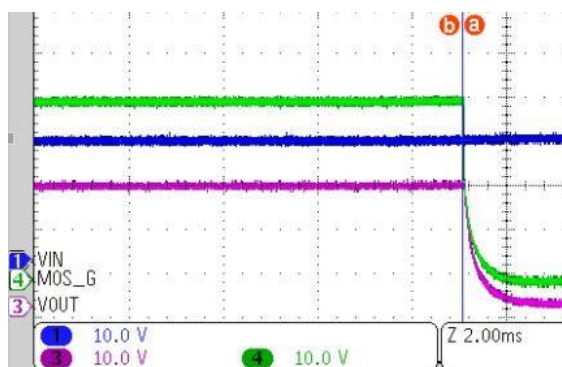
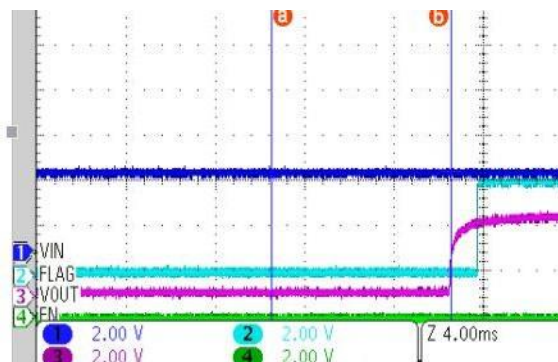
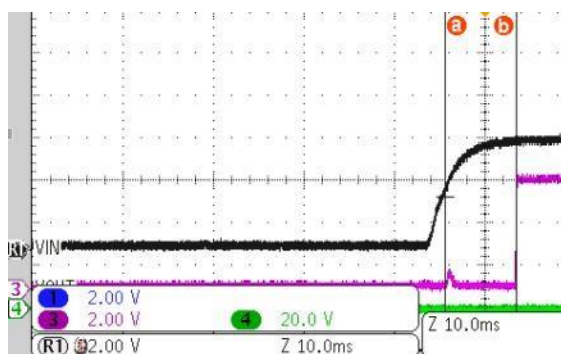
Table 5

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
DC characteristics and Power-ON-Reset						
Input quiescent current	I _Q	V _{ACIN} =5V, I _{out} =0A		120	200	uA
IN-to-OUT ON resistance	R _{ON}	V _{ACIN} =5V, I _{out} =3A		40@4.5V		mΩ
Output auto discharge resistance	R _{DISCHARGE}			500		Ω
Under voltage lock out threshold	UVLO	V _{ACIN} increasing from 0~3.5V		3.4		V
Under voltage lock out hysteresis	V _{HYS-UVLO}	V _{ACIN} decreasing from 3.5~0V		300		mV
Output power-on time	T _{ON}	V _{ACIN} =0 -> 5V to output ON	6	8	10	ms
EN Threshold Voltage	VENL				0.4	V
	VENH		1.2			V
EN to GND current	I _{EN}				2	uA
Input Over-Voltage-Protection (OVP)						
PROADJ threshold	V _{PROADJ}	V _{ACIN} increasing from 5~7V		1.21		V
PROADJ hysteresis	V _{HYS-PROADJ}	V _{ACIN} decreasing from 7~5V		70		mV
OVP active time	T _{OVP}	V _{ACIN} =5 -> 10V			1	us
OVP recovery time	T _{ON(OVP)}	V _{ACIN} =10 -> 5V to output ON	6	8	10	ms
Over-Temperature-Protection (OTP)						
OTP threshold				155		°C
OTP hysteresis				40		°C
Power Switch Body Diode						
Forward peak surge current	I _{FSM}	Pulse Width=10ms			15	A
		Pulse Width=20us			50	A

The formula for over voltage:

$$OVP = 1.21 * (\frac{R1}{R2} + 1)$$

Typical characteristic



Temperature Stability

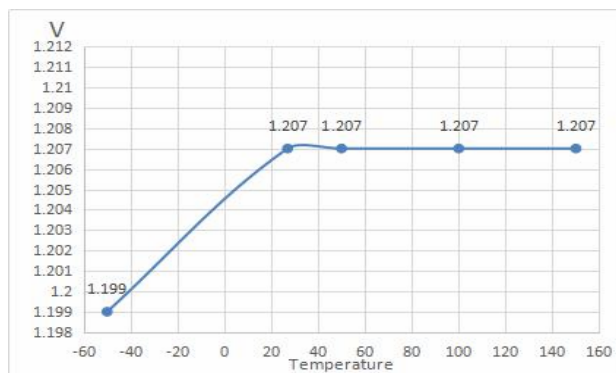


Fig. 9 OVP threshold V-PROADJ & Temperature

Package Outline

DFN8L (0203-0.75-0.50)

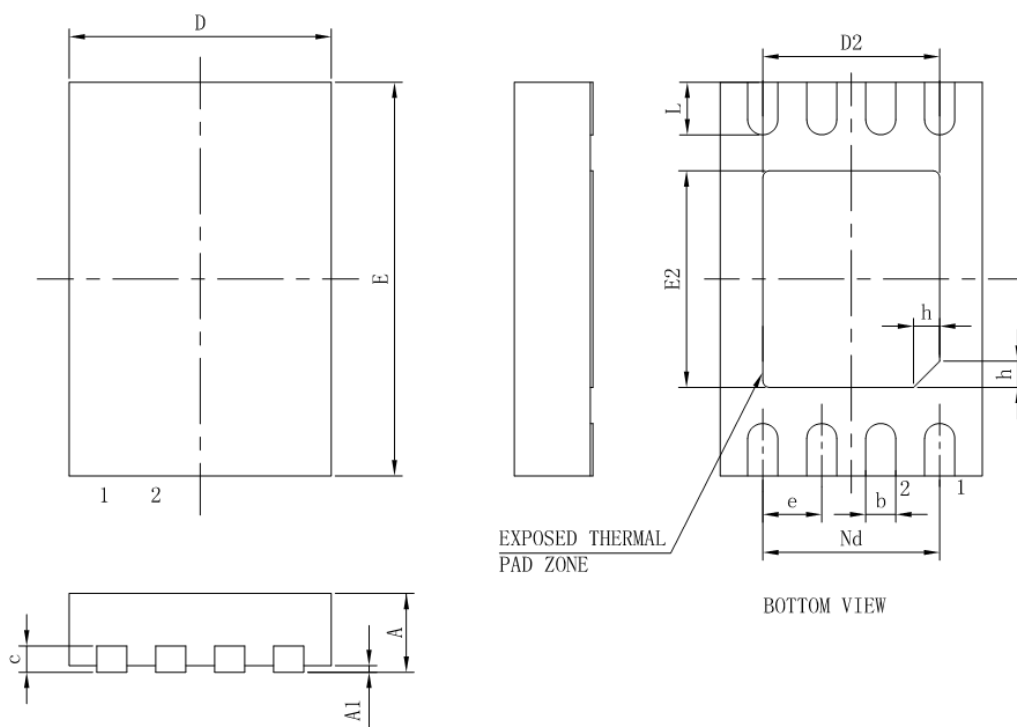


Fig. 10 Package outline

Table 6

Symbol	Min	Type	Max
A	0.70	0.75	0.80
A1	-	0.02	0.05
b	0.20	0.25	0.30
c	0.18	0.20	0.25
D	1.90	2.00	2.10
D2	1.40	1.50	1.60
E	2.90	3.00	3.10
E2	1.50	1.60	1.70
e	0.50BSC		
Nd	1.50BSC		
L	0.30	0.40	0.50
h	0.20	0.25	0.30