

Over voltage and over current protection IC

Description

The HM4803 is an Over-Voltage-Protection (OVP) and Over-Current-Protection (OCP) device. The device will switch off internal MOSFET to disconnect IN 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.

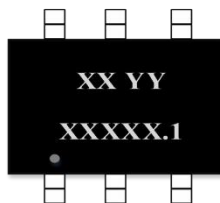
Application

- PAD
- GPS
- MID
- PMP
- Digital Cameras
- Digital Videos

Features

- High voltage technology
- Maximum input voltage :40V
- Output power ON time :8ms(Typ.)
- OVP threshold :6.1V(Typ.)
- OVP response time :<1us
- OCP threshold :2.0A(Min)
- Output auto discharge
- Small Package :SOT-23-6L

Ordering information



XX YY: Product code

XXXXX.1: Wafer batch

Fig.1 Top view



Table 1

Package	SOT-23-6L
MOQ	3000 pcs

Typical Application

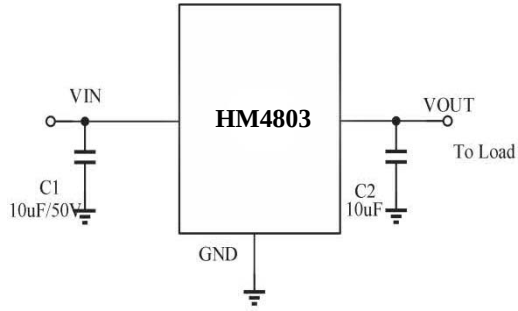


Fig.2

Pin Configuration and Function

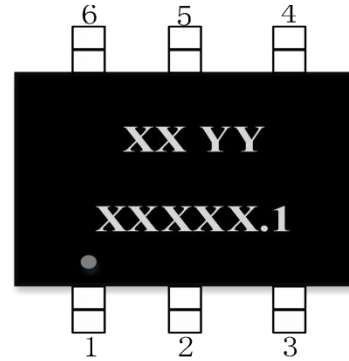


Fig.3 Pin configuration (Top view)

Table 2

NO.	Symbol	Type	Description
1/2/5/6	GND	GROUND	Ground
3	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.
4	VOUT	OUTPUT	Output pin, Connect to load.

Functional Block Diagram

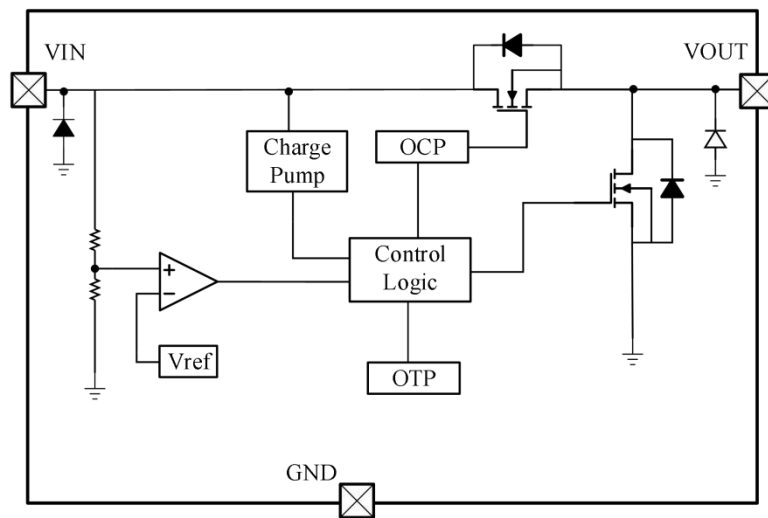


Fig.4

Absolute Maximum Ratings

Table 3

Parameter	Symbol	Value	Unit
Input voltage (IN pin)	VIN	-0.3 ~ 40	V
Output voltage (OUT pin)	VOUT	-0.3 ~ 6.5	V
Power dissipation *1 *3	PD	0.5	W
Power dissipation *2 *3		0.3	W
Thermal resistance *1	RθJA	250	°C/W
Thermal resistance *2		416	°C/W
Junction temperature	TJ	150	°C
Lead temperature(10s)	TL	260	°C
Storage temperature	Tstg	-55 ~ 150	°C
ESD Ratings	HBM	±8000	V
	MM	±1000	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.

***1:** Surface mounted on FR-4 Board using 1 square inch pad size, dual side, 1oz copper

***2:** Surface mounted on FR-4 board using minimum pad size, 1oz copper

***3:** Power dissipation is calculated by $P_D = (V_{IN} - V_{OUT}) \times I_{OUT}$

Recommend Operating Conditions

Table 4 (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Input voltage	VIN	3 ~ 40	V
Output current	IOUT	1.5	A
Ambient operating temperature	Topr	-40 ~ 85	°C

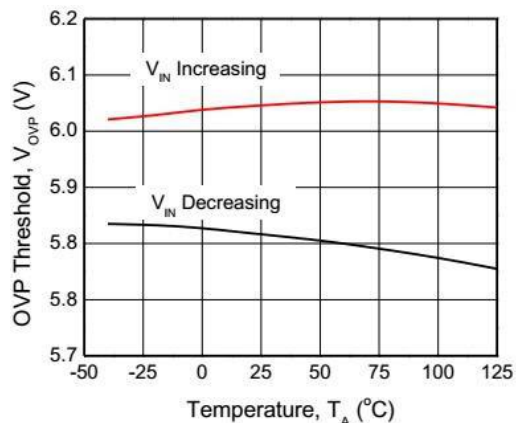
Electrical Characteristics

Table 5

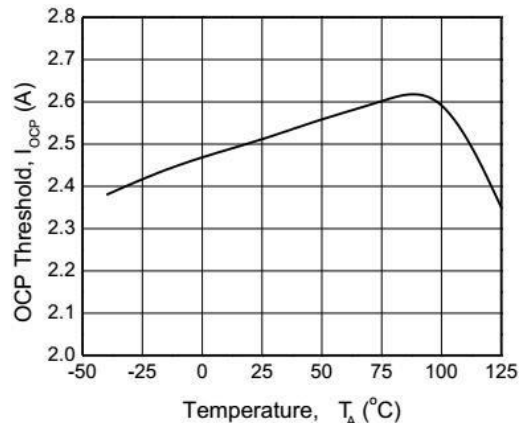
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
DC characteristics and Power-ON-Reset						
Input quiescent current	I_Q	$V_{IN}=5V, I_{OUT}=0A$		150	300	μA
IN-to-OUT ON resistance *3	R_{ON}	$V_{IN}=5V, I_{OUT}=0.7A$		150	200	$m\Omega$
Output discharge resistance	$R_{DISCHARGE}$			500		Ω
Under voltage lock out threshold	UVLO	V_{IN} increasing from 0~3V	2.3		2.8	V
Under voltage lock out hysteresis	$V_{HYS-UVLO}$	V_{IN} decreasing from 3~0V	200	250	300	mV
Output power-on time	T_{ON}	$V_{IN}=0 \rightarrow 5V$ to output ON	6	8	10	ms
Input Over-Voltage-Protection (OVP)						
OVP threshold	V_{OVP}	V_{IN} increasing from 5~7V	5.8	6.1	6.4	V
OVP hysteresis	$V_{HYS-OVP}$	V_{IN} decreasing from 7~5V	200	300	400	mV
OVP active time	T_{OVP}	$V_{IN}=5 \rightarrow 10V$			1	μs
OVP recovery time	$T_{ON(OVP)}$	$V_{IN}=10 \rightarrow 5V$ to output ON	6	8	10	ms
Input Over-Current-Protection (OCP)						
OCP threshold	I_{OCP}			2.3		A
Over-Temperature-Protection (OTP)						
OTP threshold				165		$^{\circ}C$
OTP hysteresis				40		$^{\circ}C$

*3: Single Pulse, Pulse width=10ms

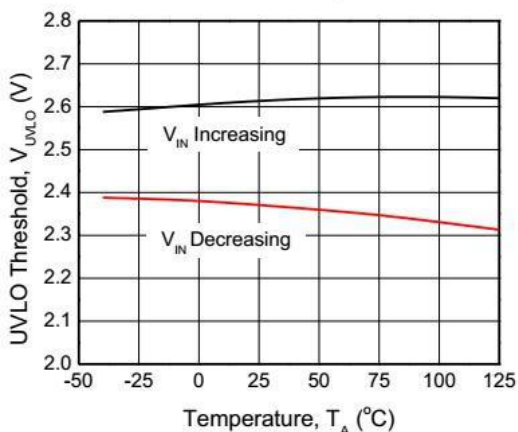
Typical characteristics



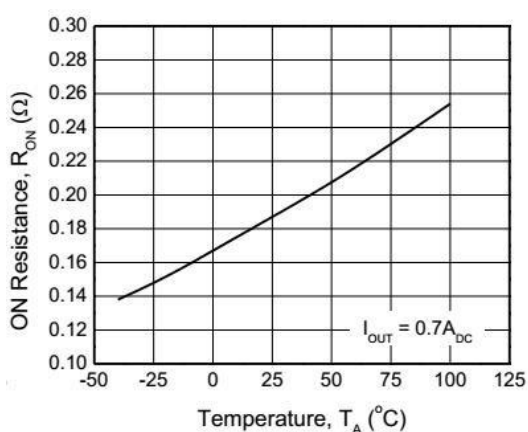
OVP threshold vs. Temperature



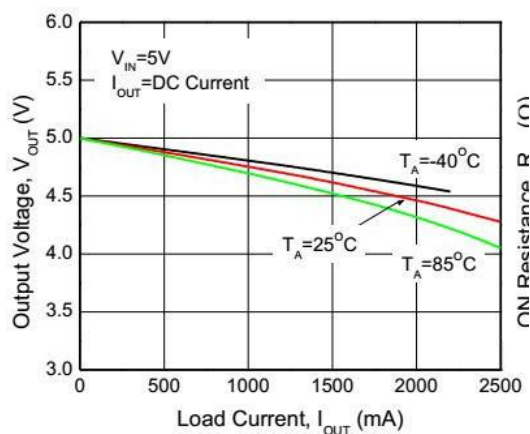
OCP threshold vs. Temperature



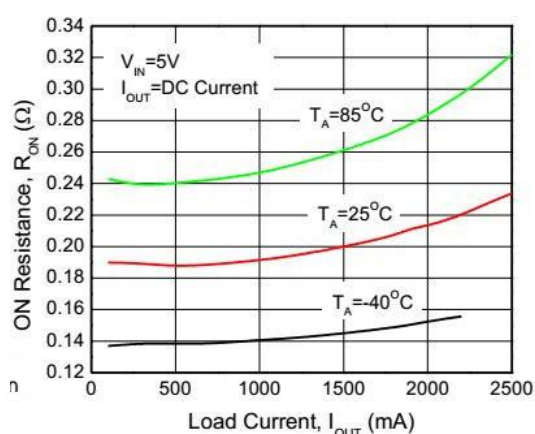
UVLO threshold vs. Temperature



IN-to-OUT ON resistance vs. Temperature



Output voltage vs. Output current



ON resistance vs. Output current

Typical Application

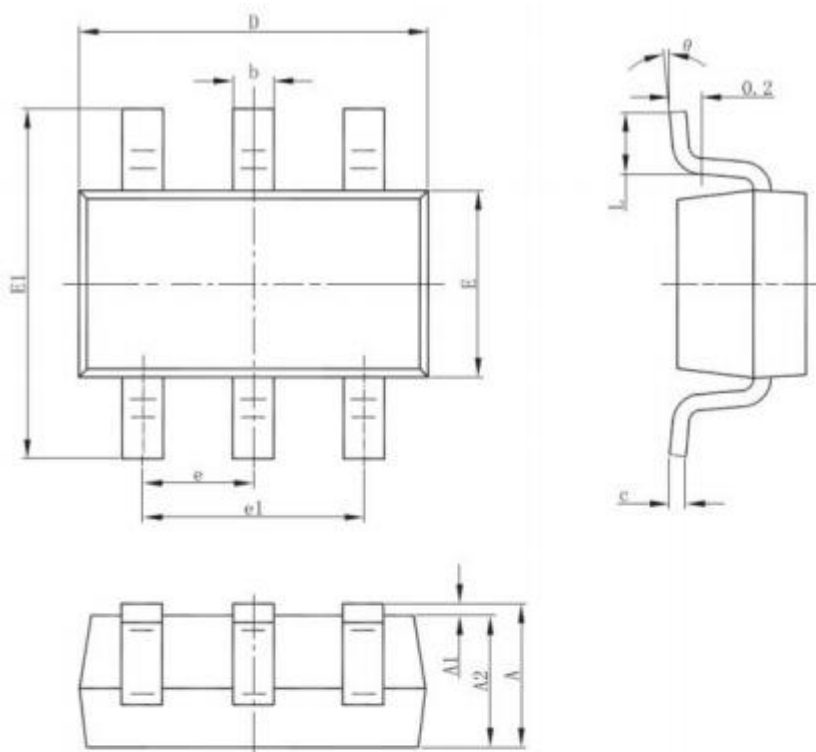


Fig. 5 Package outline

Table 6

Symbol	Min (mm)	Type(mm)	Max(mm)
A	1.050	-	1.250
A1	0.000	-	0.100
A2	1.050	-	1.150
b	0.300	0.400	0.500
c	0.100	-	0.200
D	2.820	2.900	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
e	0.950Typ.		
e1	1.800	1.900	2.000
L	0.300	-	0.600
θ	0°	-	8°