

GENERAL DESCRIPTION

The CM3718 is a low-noise, pulse-width-modulated (PWM), DC-DC step-down converter. It powers logic and transmitters in small wireless systems such as cellular phones, communicating PDAs, and handy-terminals. The device features an internal synchronous rectifier for high efficiency; it requires no external Schottky diode. Excellent noise characteristics and fixed-frequency operation provide easy post-filtering. The CM3718 is ideally suited for Li-Ion battery applications. It is also useful for +3V or +5V fixed input applications.

The device operates in one of four modes. Forced PWM mode operates at a fixed frequency regardless of the load. Shutdown mode places the device in standby, reducing quiescent supply current to under 0.1 μ A.

The CM3718 can deliver over 1.5A. The output voltage can be adjusted from VREF to VIN. The input range is from 2.0V to 5.0V. Other features of the CM3718 include high efficiency, low dropout voltage. It is available in a space-saving 8-pin SOP package.

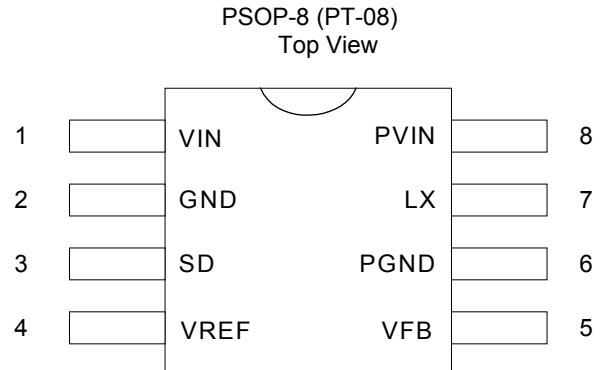
FEATURES

- ◆ Patent Number #6,452,366
- ◆ 1.2MHz switching and synchronization
- ◆ Dynamic output-voltage adjustment from VREF to VIN
- ◆ 1.5A Guaranteed Output Current
- ◆ 95% Efficiency
- ◆ No Schottky Diode Required
- ◆ External Soft Start
- ◆ 8-pin PSOP power packages

APPLICATIONS

- ◆ Cellular Phone
- ◆ Cordless Phone
- ◆ PDAs and Handy-Terminals
- ◆ CPU I/O Supplies
- ◆ Notebook Chipset Supplies
- ◆ Battery Operated Devices

PIN CONFIGURATION



PIN DESCRIPTION

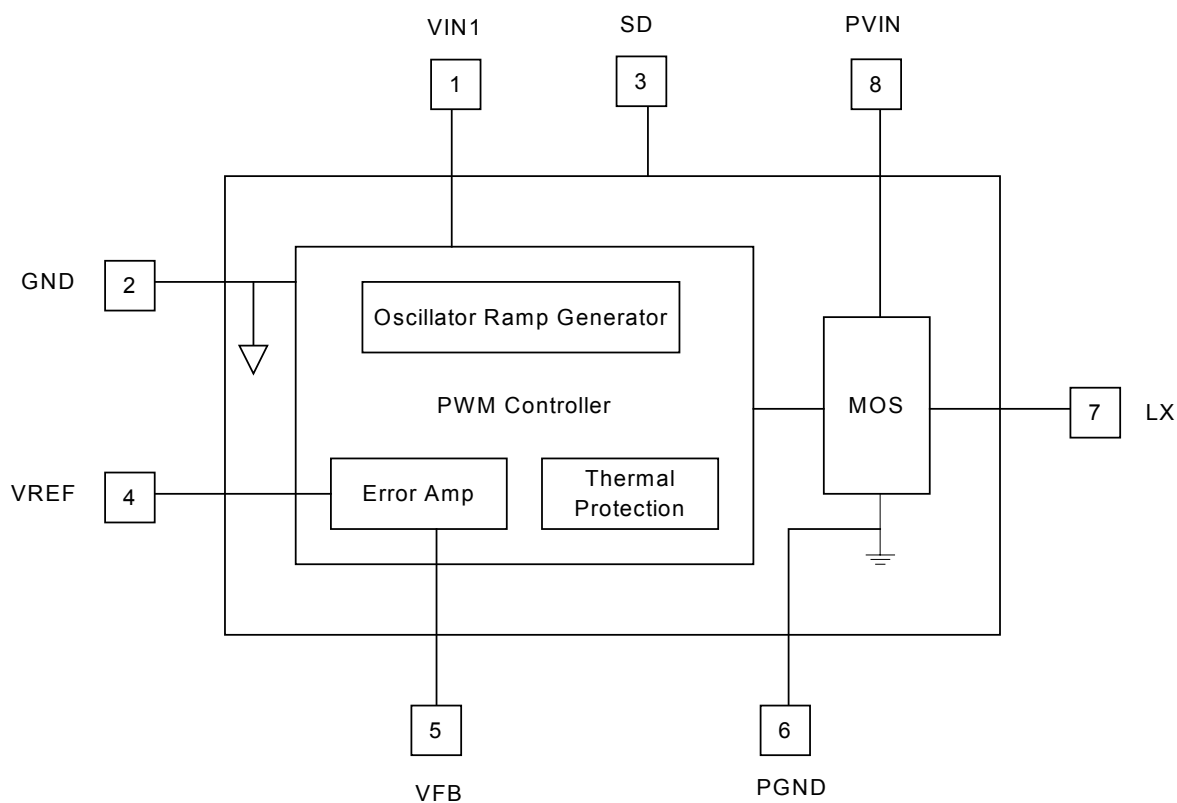
Pin No.	Symbol	Description	Operating Rating			
			Min.	Typ.	Max.	Unit
CM3718						
1	VIN	Voltage supply for internal circuits	2	2.5	5.5	V
2	GND	Ground for internal reference voltage divider				
3	SD	CMOS input level	Shutdown level		VIN + 0.3	V
			Enable level		2.0	
4	VREF	V _{OUT} Set Voltage	1.1		VIN	V
5	VFB	Feedback node for the V _{OUT}		VREF		V
6	PGND	Ground for output power transistors				
7	LX	Inductor connection to the Drains of the internal power MOSFETs			5.5	V
8	PVIN	Voltage supply for output power transistors	2	2.5	5.5	V

ORDERING INFORMATION

Part Number	Temperature Range	Package
CM3718IS	-40°C to 85°C	8-Pin PSOP (PS08)
CM3718GIS*	-40°C to 85°C	8-Pin PSOP (PS08)

*Note: G : Suffix for Pb Free Product

BLOCK DIAGRAM





Patent

CM3718

1.5A LOW-NOISE PWM STEP-DOWN REGULATOR

ABSOLUTE MAXIMUM RATINGS

Absolute maximum ratings are those values beyond which the device could be permanently damaged.

PVIN/VIN -0.3V to 6.0V
Voltage on Any Other Pin GND – 0.3V to VIN + 0.3V
Output Current, Source or Sink 1.5A

Junction Temperature 150°C
Storage Temperature -65°C to 125°C
Lead Temperature (Soldering, 5 sec)..... 260°C
Thermal Dissipation(θ_{JC})..... 50°C/W

OPERATING CONDITIONS

Temperature Range -40°C to 85°C
PVIN Operating Range 2.0V to 4.0V

ELECTRICAL CHARACTERISTICS (Unless otherwise stated, these specifications apply $T_A=25^\circ\text{C}$; VIN=+3.3V and PVIN=+3.3V) maximum ratings are stress ratings only and functional device operation is not implied.

(Note 1)

Note 1)

Symbol	Parameter	Test Conditions	CM3718			Unit
			Min.	Typ.	Max.	
SWITCHING REGULATOR						
V _{REF}	Adjustable Output Voltage		VREF		V _{IN}	V
f _{sw}	Switching Frequency	CM3718		1.2		MHz
I _{OUT(RMS)}	Maximum Output RMS Current	CM3718			1.5	A
I _{OUT(PEAK)}	Maximum Output Peak Current	CM3718			3	A
MOSFETs						
R _{DS(ON)}	Drain to Source on-State Resistance	PVIN=5V		250		mΩ
SUPPLY						
I _{VIN}	Quiescent Current	VFB = 1.4V LC unconnected		220		μA
I _{PVIN}		VFB = 1.4V LC unconnected		500		μA



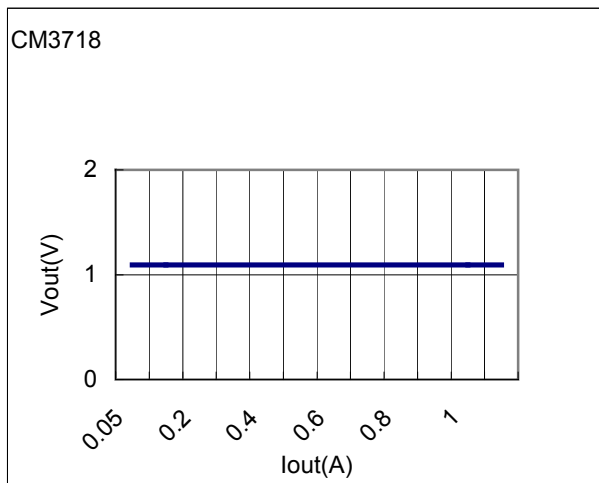
The schematic diagram illustrates the power supply and voltage divider circuit for the CM3718-8PIN module. The module is represented by a blue box with pins labeled: PVIN, LX, PGND, VFB, VIN, GND, SD, VREF, and JP3. The circuit includes the following components and connections:

- Power Input:** J1 (PWR/IN) provides the main power input to the module's PVIN pin.
- Input Filtering:** C1 (100uF/6.3V) and C2 (105) are connected to the PVIN pin for input filtering. L1 (3.3uH/2A) is an inductor in series with the input.
- Diode Protection:** D1 and D2 (SK12) are Schottky diodes connected in series with the input line for protection.
- Module Grounding:** The module's PGND pin is connected to the system ground.
- Feedback Network:** R1 (100k) and R2 (1k) form a voltage divider connected to the VFB pin. C3 (470) is a capacitor connected to the VFB pin.
- Output Regulation:** The module's VIN pin is connected to the output of the voltage divider (R1 and R2). The VREF pin is connected to ground.
- Output Filtering:** C4 (105) and C5 (104F) are capacitors connected to the output line (SD pin) for output filtering.
- Output Load:** R3 (100k) is a load resistor connected to the output line.
- Control and Monitoring:** J2 (VTT) and J3 (VREF-OUT) are test points for monitoring the output voltage. R5 (0) is a resistor connected to the output line.
- Power Switch:** JP4 (on/off sw) is a switch connected to the output line.
- External Voltage Setting:** JP3 is connected to an external voltage setting board (PIN 1, 2 SHORT).

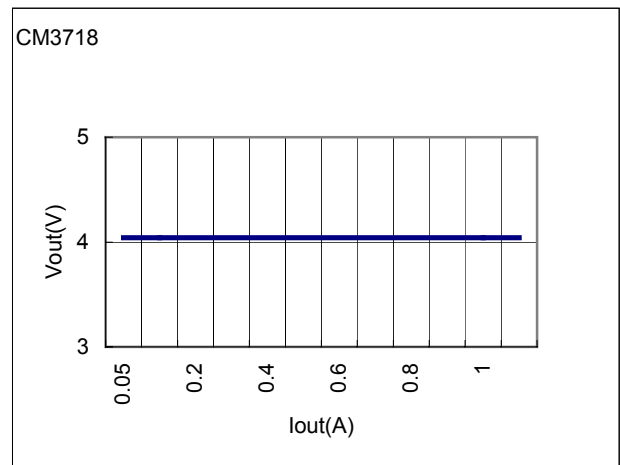
NOTE:
JP3---->USEING EXTERNAL VOLTAGE SETTING BOARD (PIN 1, 2 SHORT)

LOAD REGULATION

Vin=5V, VREF input=1.09V

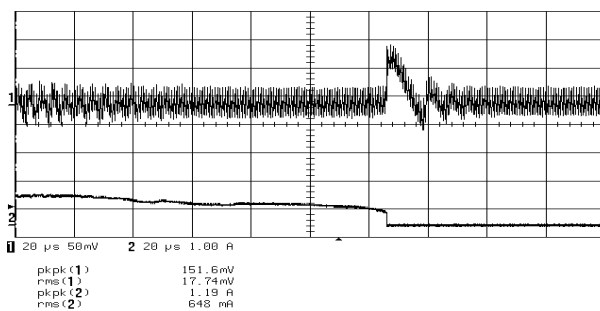


Vin=5V, VREF input=4.04V

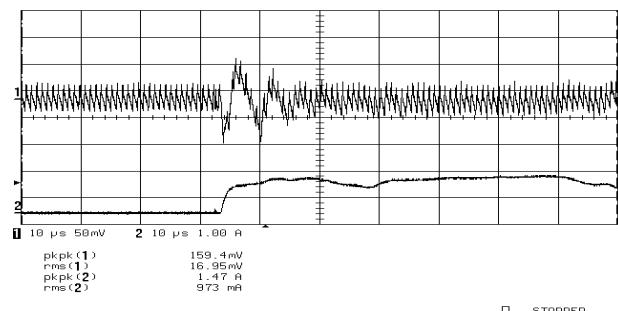


LOAD TRANSIENT RESPONSE

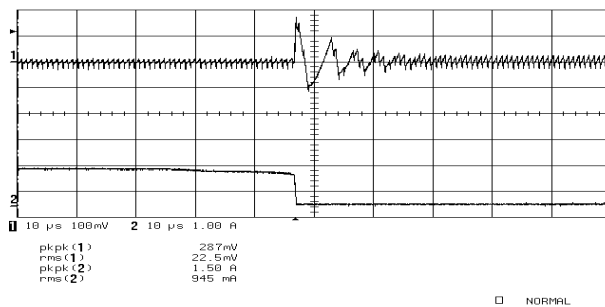
CM3718 Transient Response VREF=1V, (I_{OUT} from 1.5A- 0A)



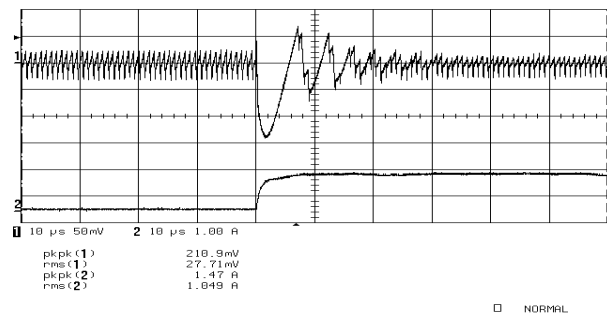
CM3718 Transient Response VREF=1V, (I_{OUT} from 0A- 1.5A)



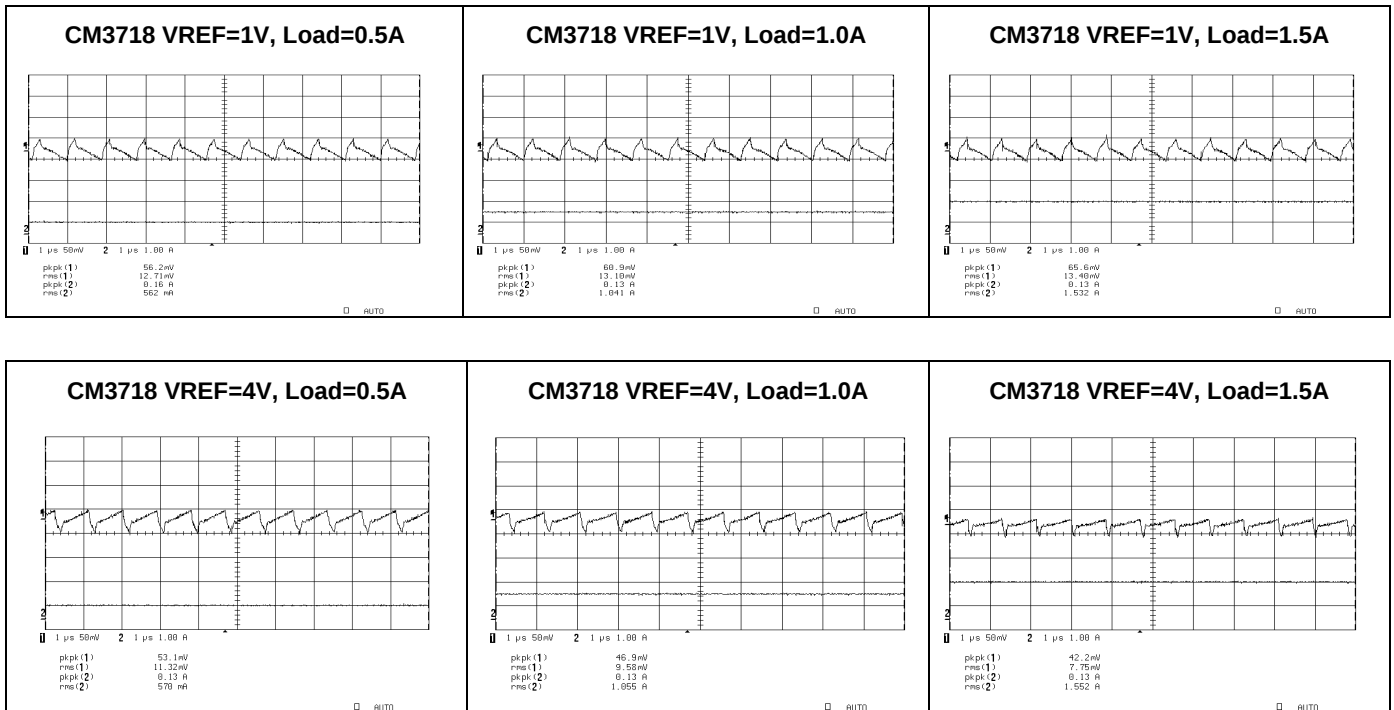
CM3718 Transient Response VREF=4V , (I_{OUT} from 1.5A- 0A)



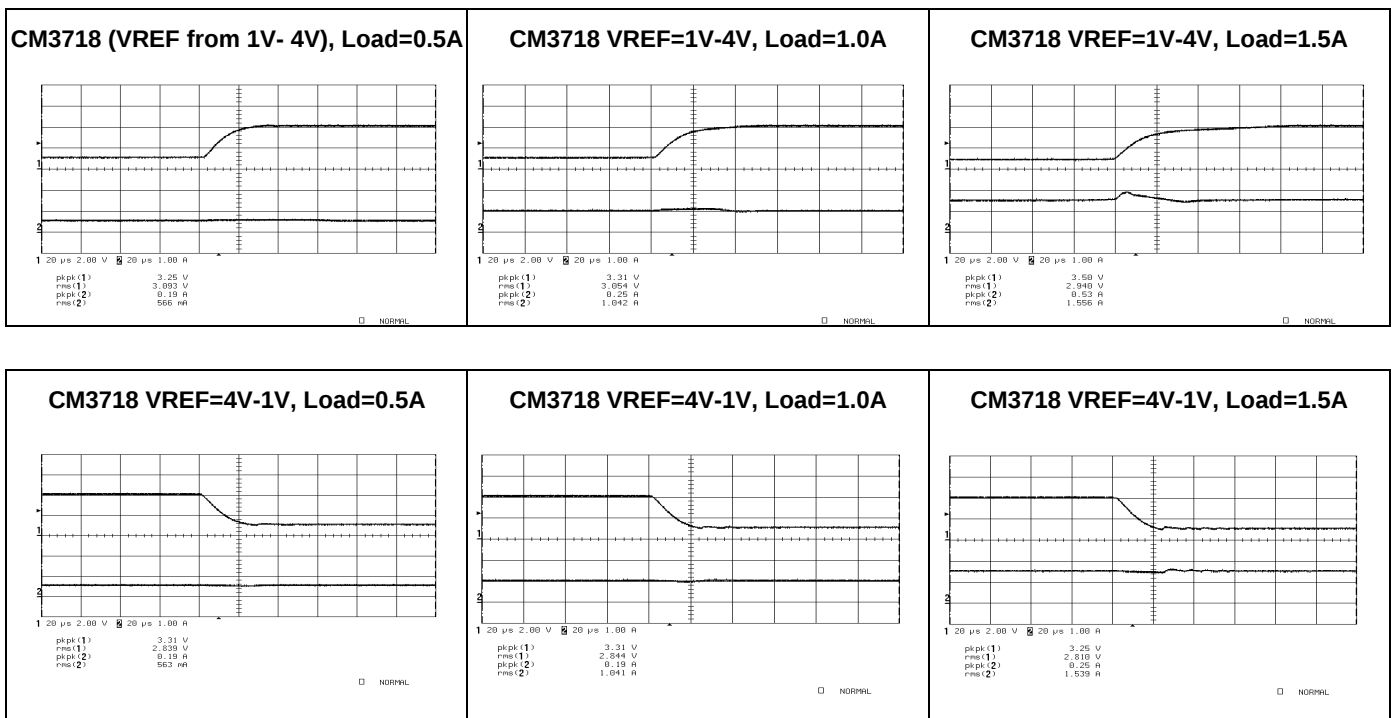
CM3718 Transient Response VREF=4V , (I_{OUT} from 0A- 1.5A)



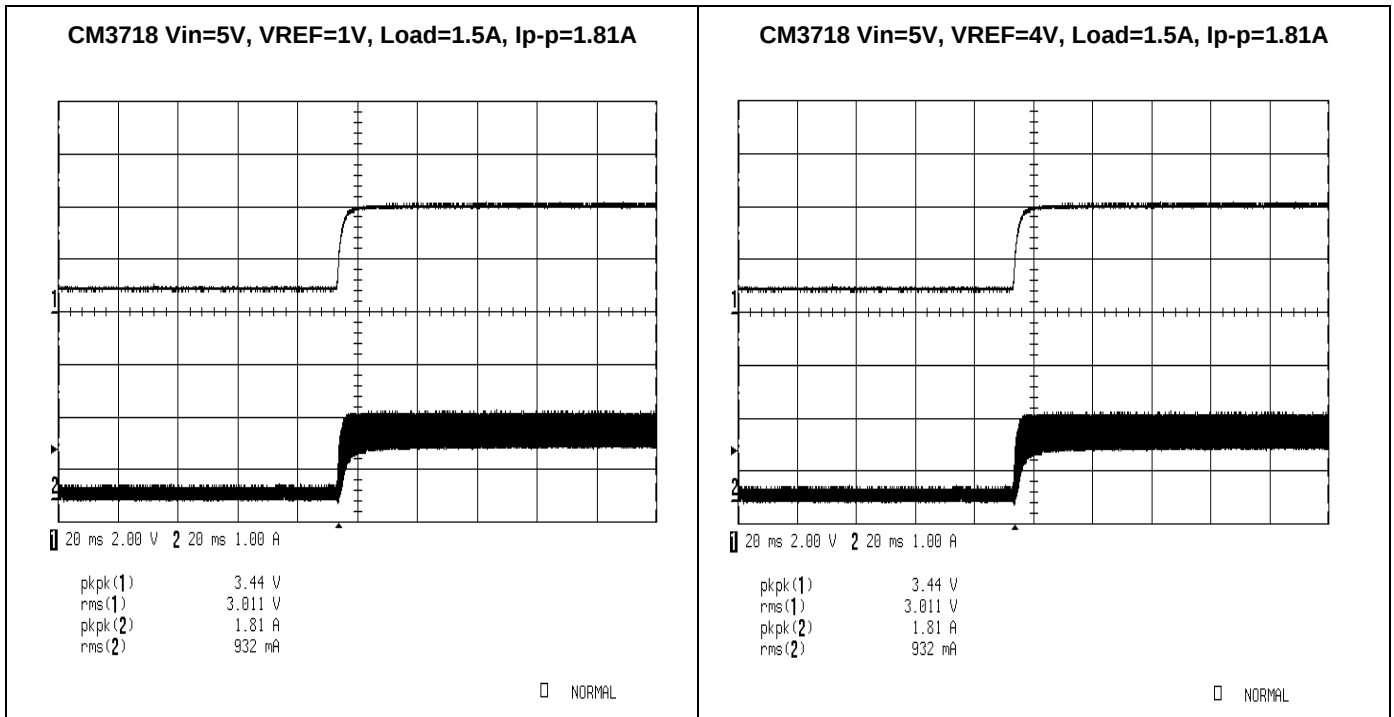
V_{OUT} OUTOUT RIPPLE AND NOISE



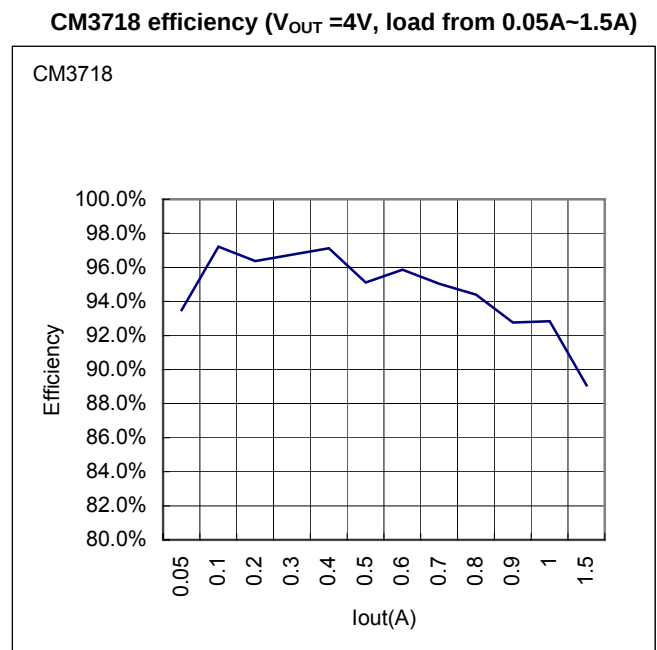
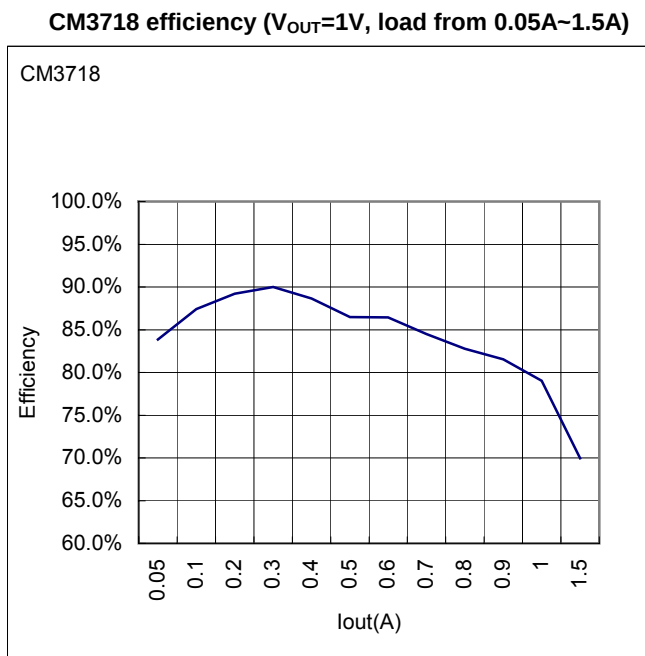
VOLTAGE SETTING STEP RESPONSE



IN-RUSH CURRENT

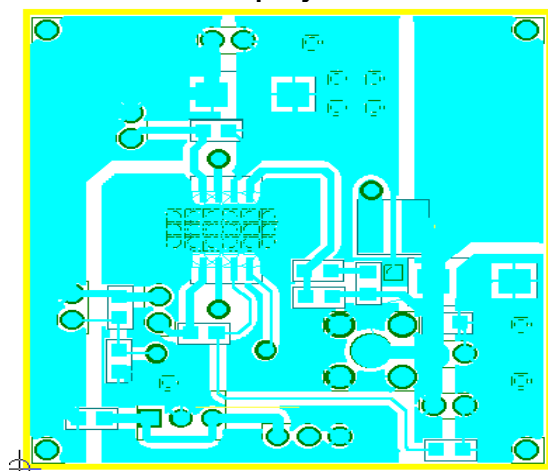


EFFICIENCY

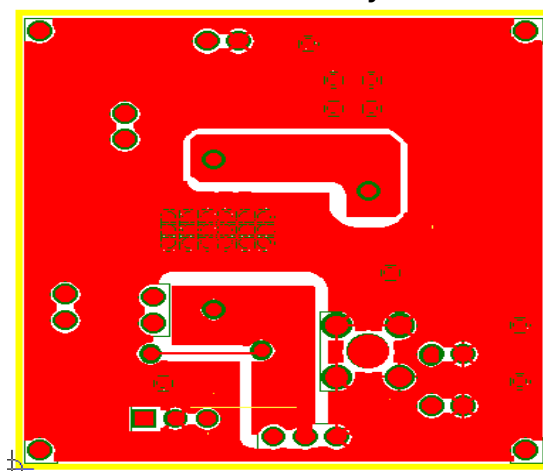


PCB LAYOUT

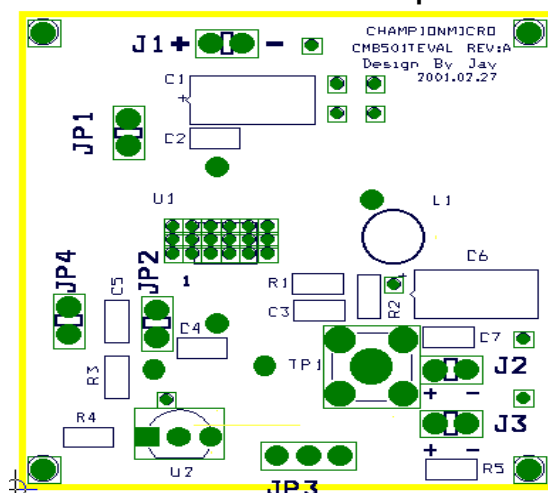
Top layer



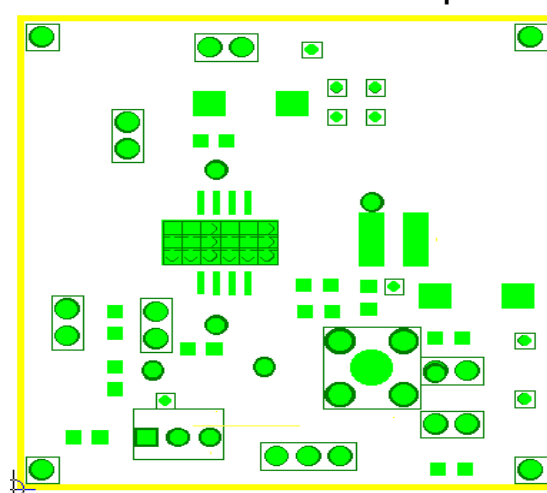
Bottom Layer



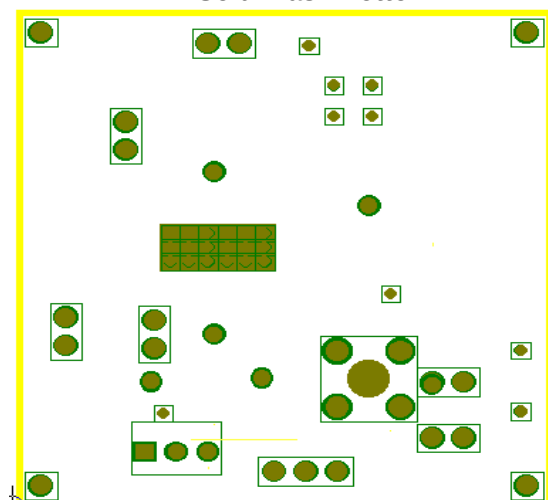
Silkscreen Top



Sold-mask Top

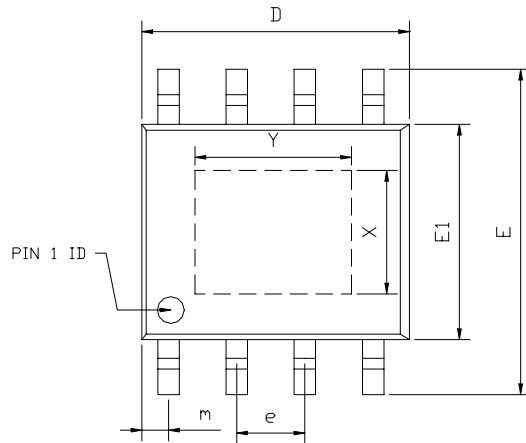


Sold-mask Bottom



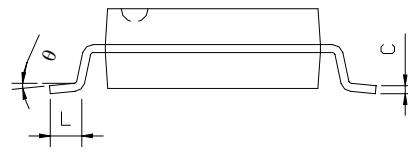
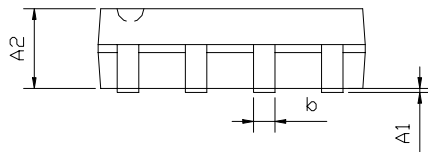
PACKAGE DIMENSION

8-PIN PSOP (PS08)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A1	0.10	---	0.25	0.004	---	0.010
A2	1.40	---	1.55	0.055	---	0.061
b	0.30	---	0.51	0.012	---	0.020
C	0.15	---	0.26	0.006	---	0.010
D	4.60	---	5.06	0.169	---	0.199
E	5.79	---	6.20	0.228	---	0.244
E1	3.76	---	4.01	0.148	---	0.158
e	---	1.27	---	---	0.050	---
L	0.38	---	0.69	0.015	---	0.035
m	0.43	---	0.69	0.017	---	0.027
θ	0°	---	8°	0°	---	8°

EXPOSED PAD DIMENSION : (mm)
PAD SIZE: X=2.34 ; Y=2.92



IMPORTANT NOTICE

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