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 0.1μA.

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

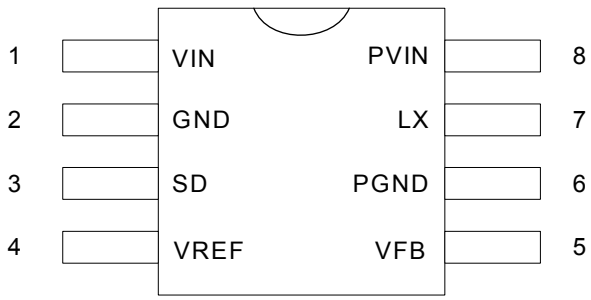
- Patent Number #6,452,366
- 1.2MHz switching and synchronization
- Dynamic output-voltage adjustment from VREF to VIN
- 1.5A Guaranteed Output Current
- 95% Efficiency
- No Schottky Diode Required
- External Soft Start
- 8-pin PSOP power packages

APPLICATIONS

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

PIN CONFIGURATION

PSOP-8 (PT-08)
Top View



PIN DESCRIPTION

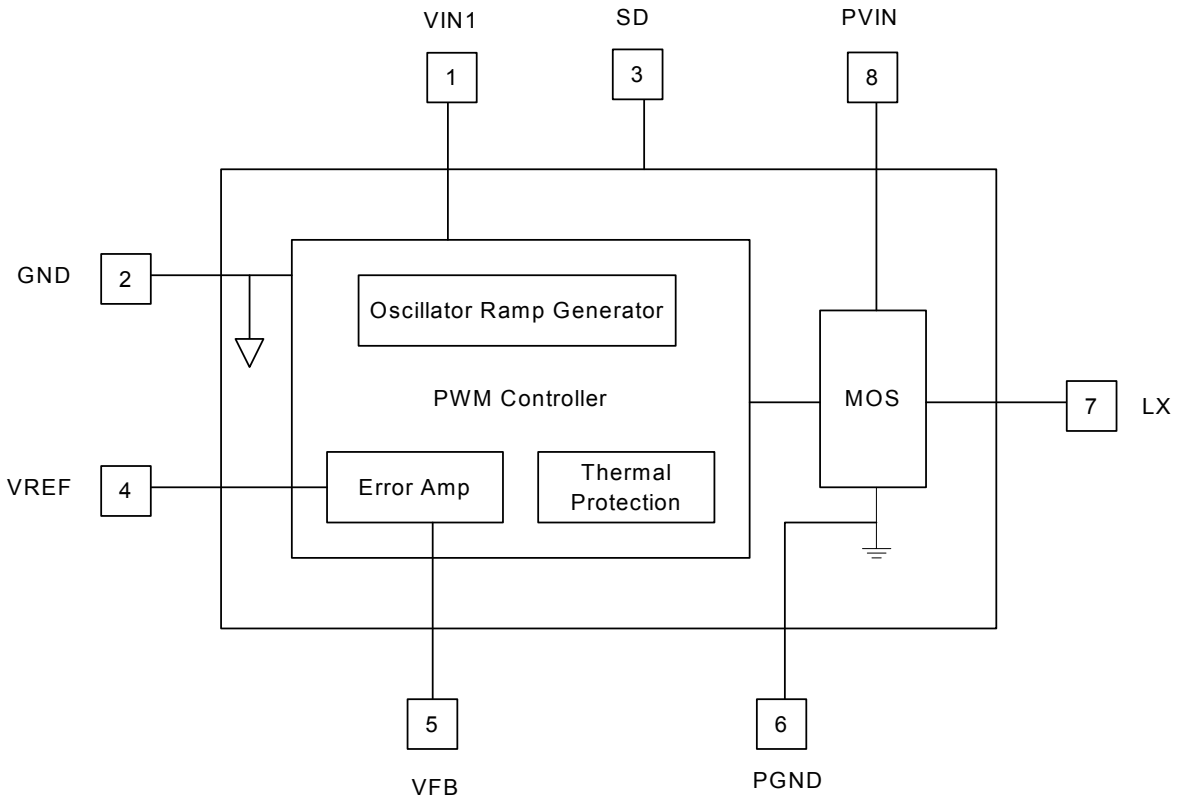
Pin No.	Symbol	Description		Operating Rating			
CM3718				Min.	Typ.	Max.	Unit
1	VIN	Voltage supply for internal circuits		2	2.5	5.5	V
2	GND	Ground for internal reference voltage divider					
3	SD	CMOS input level	Shutdown level	0.75 x VIN		VIN + 0.3	V
			Enable level	0		2.0	
4	VREF	V_{OUT} Set Voltage		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℃ to 85℃	8-Pin PSOP (PS08)
CM3718GIS*	-40℃ to 85℃	8-Pin PSOP (PS08)

***Note:** G : Suffix for Pb Free Product

BLOCK DIAGRAM



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°C; VIN=+3.3V and PVIN=+3.3V)** maximum ratings are stress ratings only and functional device operation is not implied.

(Note 1)

Symbol	Parameter	Test Conditions	CM3718			Unit
			Min.	Typ.	Max.	
SWITCHING REGULATOR						
V_{REF}	Adjustable Output Voltage		VREF		VIN	V
fsw	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						
$RDS_{(ON)}$	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

FUNCTIONAL DESCRIPTION

The CM3718 step-down, pulse-width-modulated (PWM), DC-DC converter has an adjustable output range from VREF to the input voltage (VIN). An internal synchronous rectifier improves efficiency and eliminates an external Schottky diode. Fixed-frequency operation enables easy post-filtering, thereby providing excellent noise characteristics. As a result, the CM3718 is an ideal choice for many small wireless systems.

VREF

The reference voltage could be ranged from 1.1V to VIN.

OUPUTS

The output voltage pins (LX) are tied to the RF power amp, via an external inductor. Output voltage is determined by the VREF inputs.

INPUTS

The input voltage reference pin, VREF determine the output voltages (LX). If a specific voltage is forced at the VREF pin, the output voltage follows the voltage at the VREF pin.

OTHER SUPPLY VOLTAGES

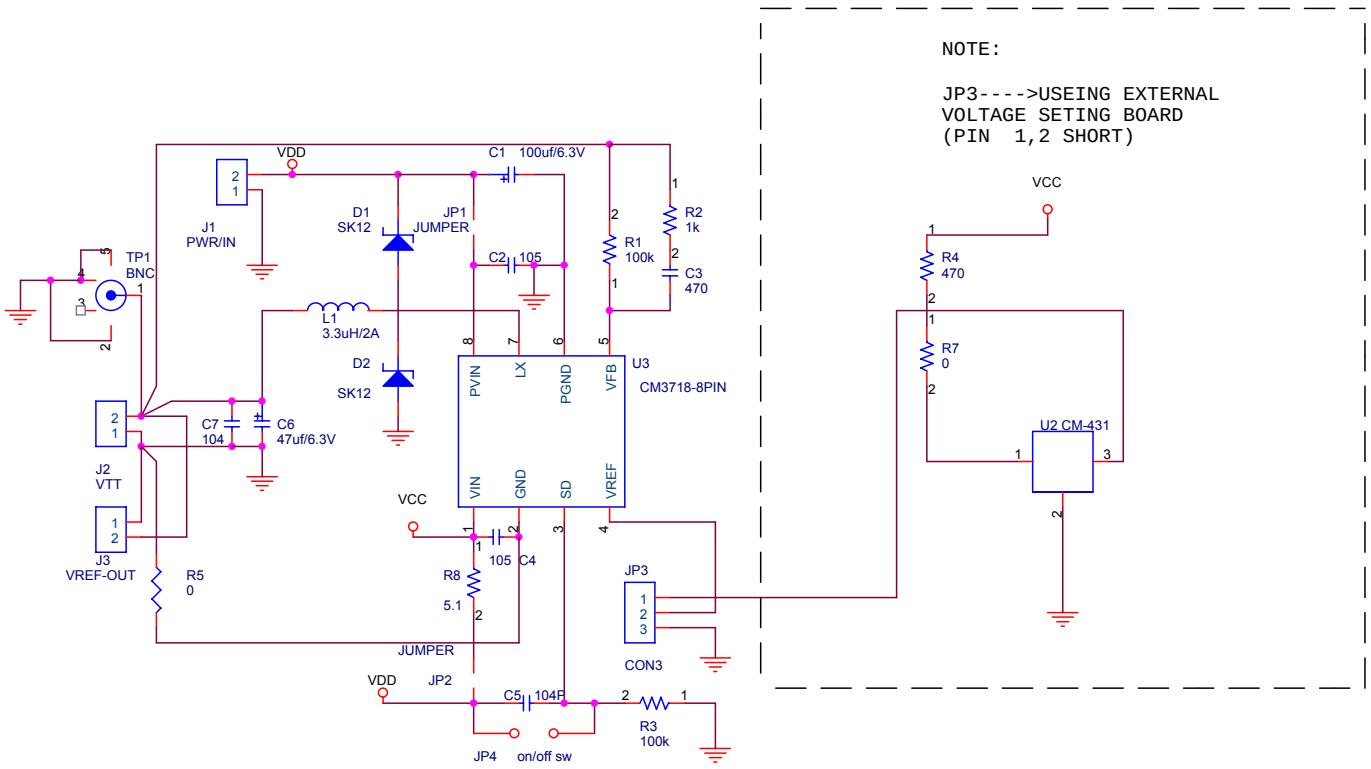
Several inputs are provided for the supply voltages: PVIN and VIN.

The PVIN provide the power supply to the power MOSFETs. VIN provides the voltage supply to the logic section and internal error amplifiers.

FEEDBACK

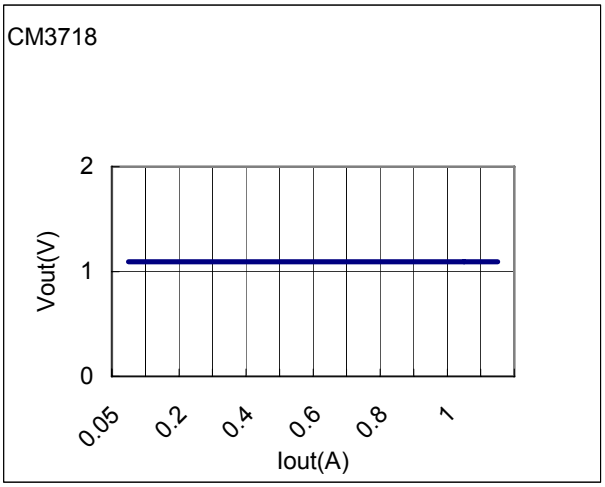
The VFB pin is an input that can be used for closed loop compensation. This input is derived from the voltage output. AGND pin is a contact node of internal resistor divider for remote sense.

APPLICATION CIRCUIT

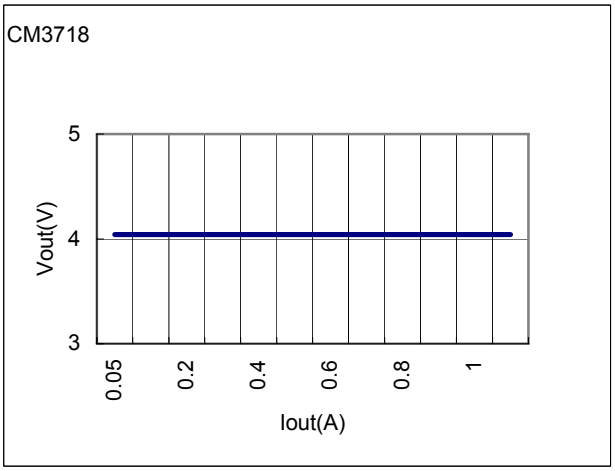


LOAD REGULATION

Vin=5V, VREF input=1.09V

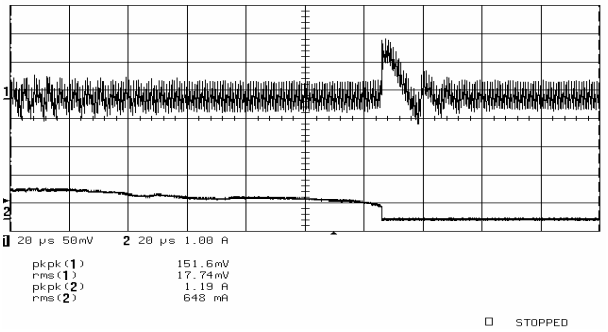


Vin=5V, VREF input=4.04V

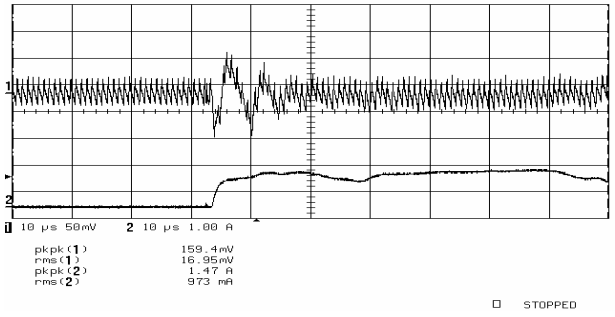


LOAD TRANSIENT RESPONSE

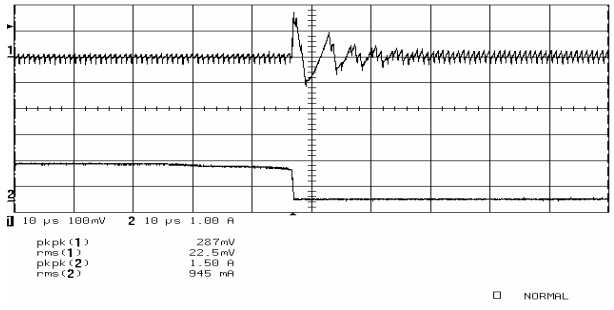
CM3718 Transient Response VREF=1V, (I_{OUT} from 1.5A- 0A)



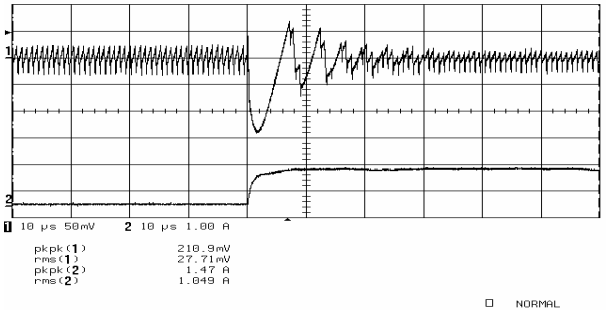
CM3718 Transient Response VREF=1V, (I_{OUT} from 0A- 1.5A)



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

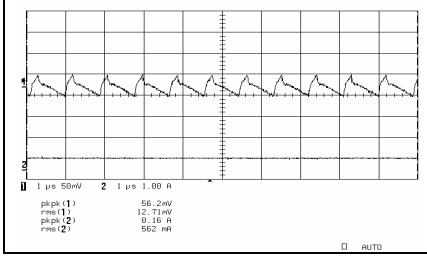


CM3718 Transient Response VREF=4V，(I_{OUT} from 0A- 1.5A)

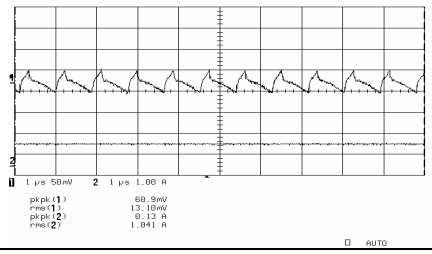


VOUT OUTOUT RIPPLE AND NOISE

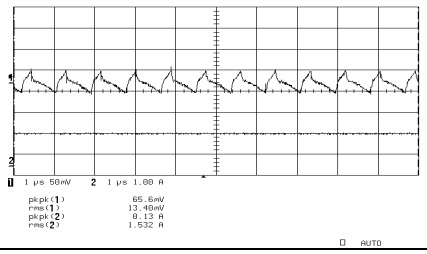
CM3718 VREF=1V, Load=0.5A



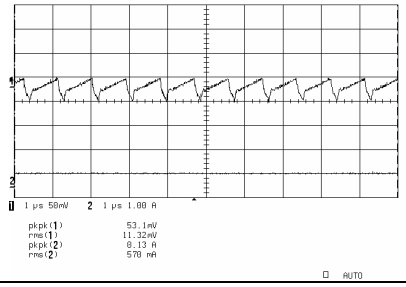
CM3718 VREF=1V, Load=1.0A



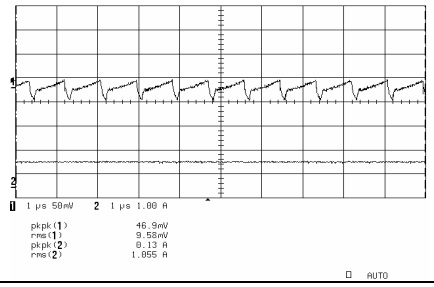
CM3718 VREF=1V, Load=1.5A



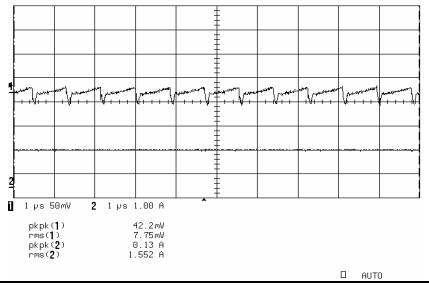
CM3718 VREF=4V, Load=0.5A



CM3718 VREF=4V, Load=1.0A

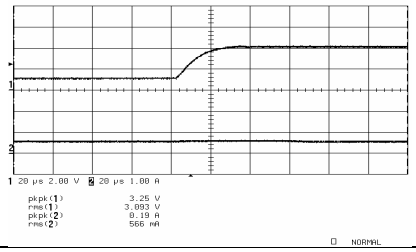


CM3718 VREF=4V, Load=1.5A

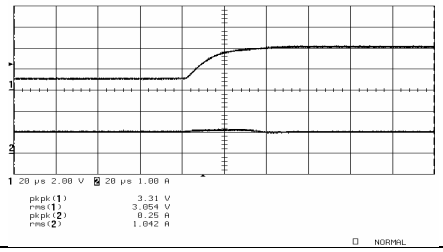


VOLTAGE SETTING STEP RESPONSE

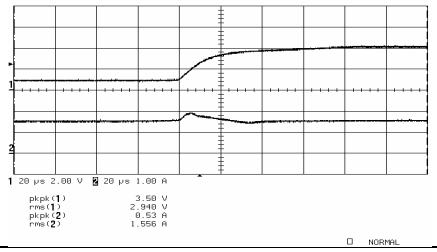
CM3718 (VREF from 1V- 4V), Load=0.5A



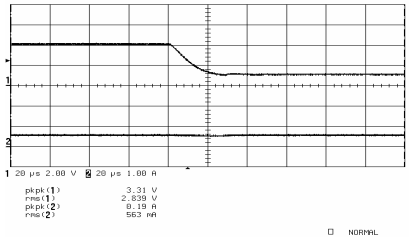
CM3718 VREF=1V-4V, Load=1.0A



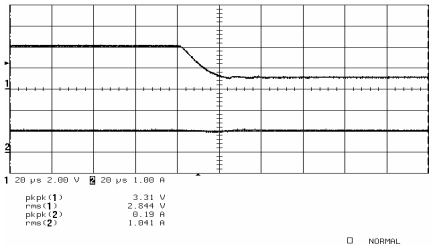
CM3718 VREF=1V-4V, Load=1.5A



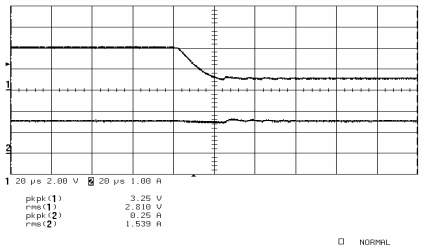
CM3718 VREF=4V-1V, Load=0.5A



CM3718 VREF=4V-1V, Load=1.0A

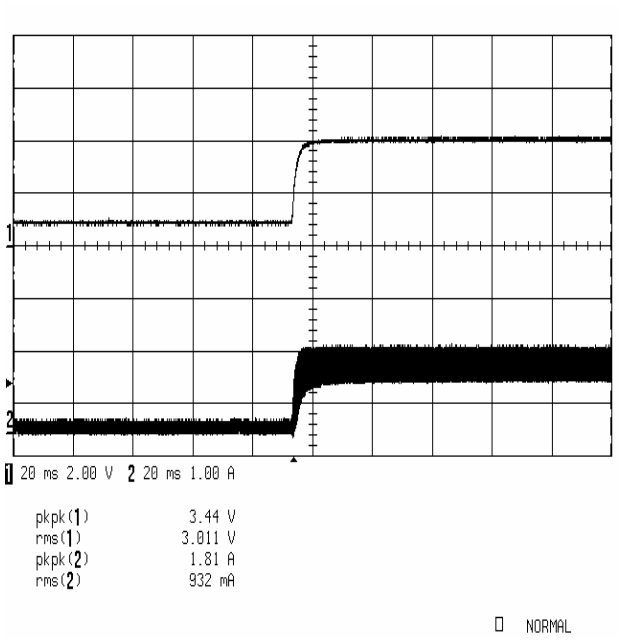


CM3718 VREF=4V-1V, Load=1.5A

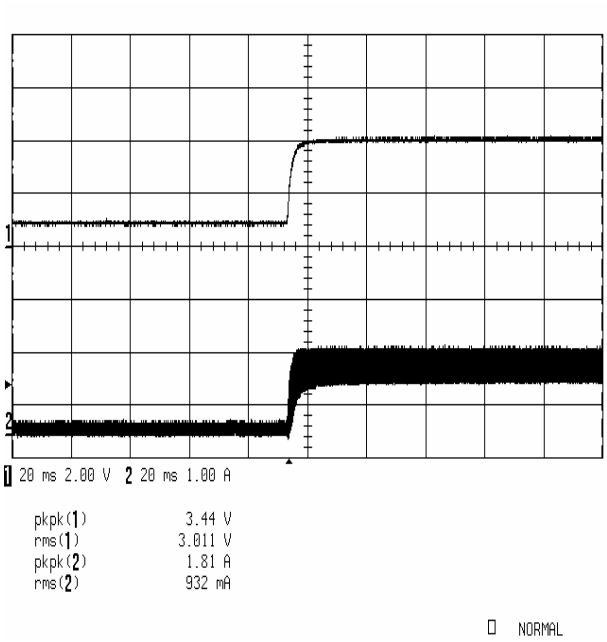


IN-RUSH CURRENT

CM3718 Vin=5V, VREF=1V, Load=1.5A, Ip-p=1.81A

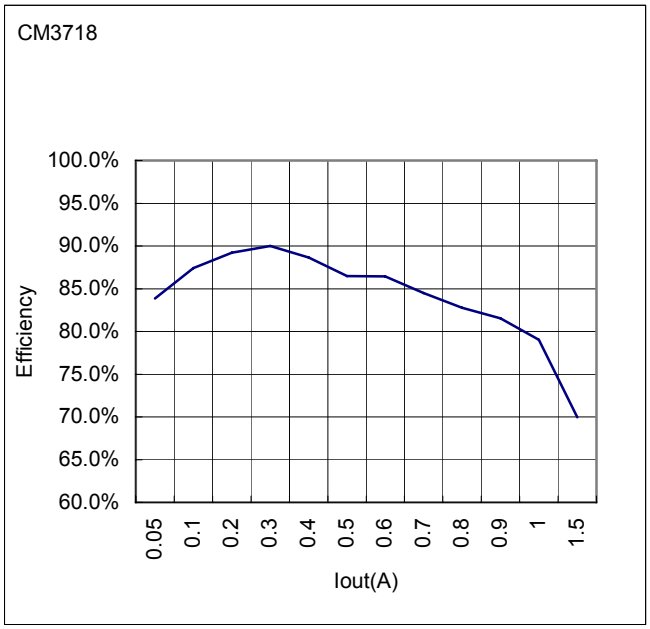


CM3718 Vin=5V, VREF=4V, Load=1.5A, Ip-p=1.81A

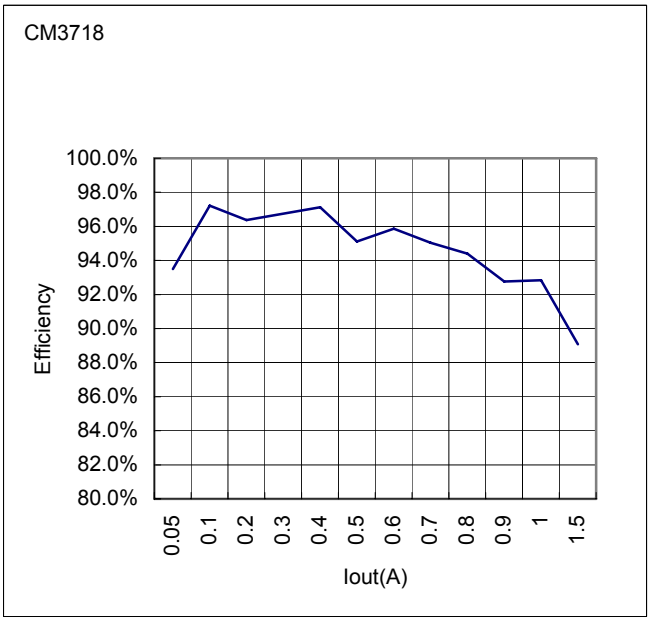


EFFICIENCY

CM3718 efficiency (V_{OUT}=1V, load from 0.05A~1.5A)

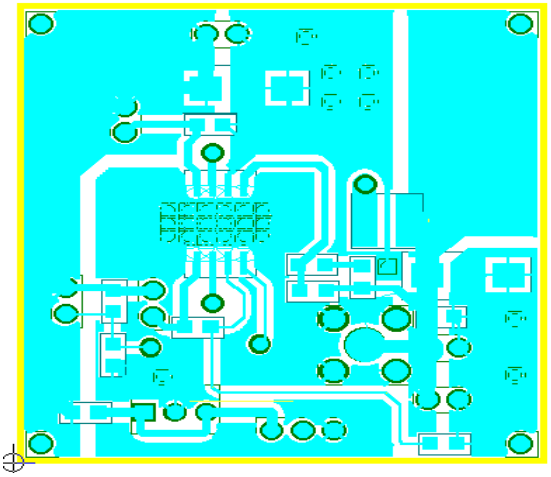


CM3718 efficiency (V_{OUT} =4V, load from 0.05A~1.5A)

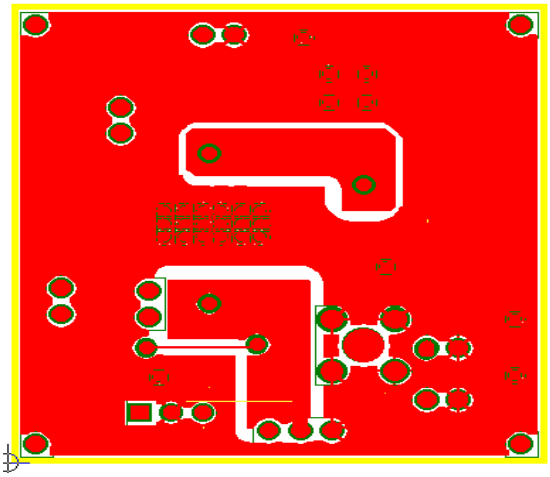


PCB LAYOUT

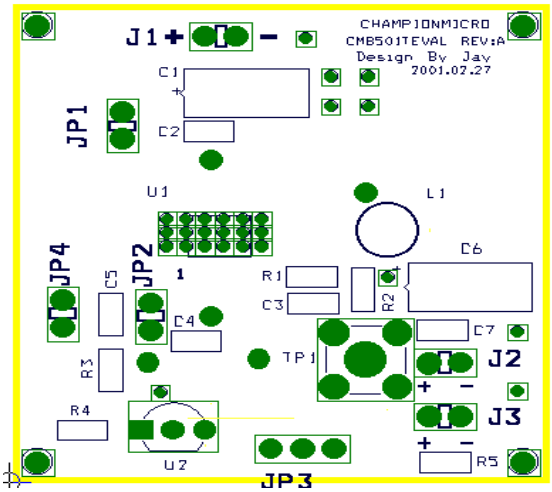
Top layer



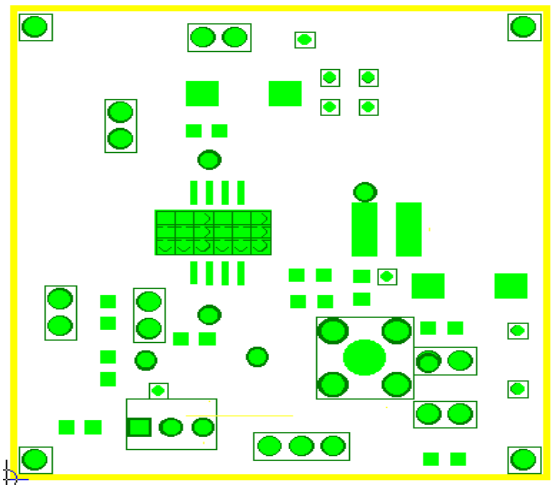
Bottom Layer



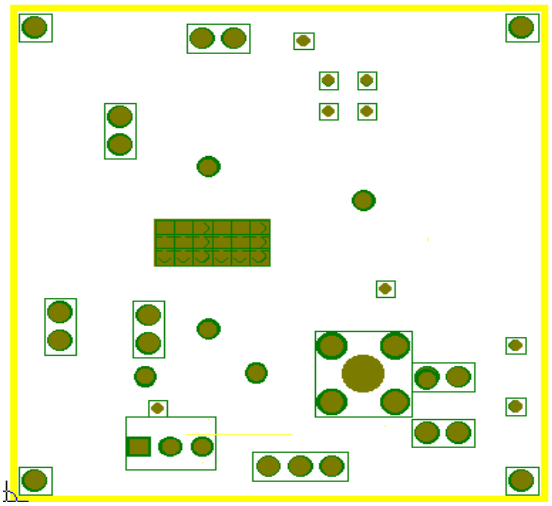
Silkscreen Top



Sold-mask Top

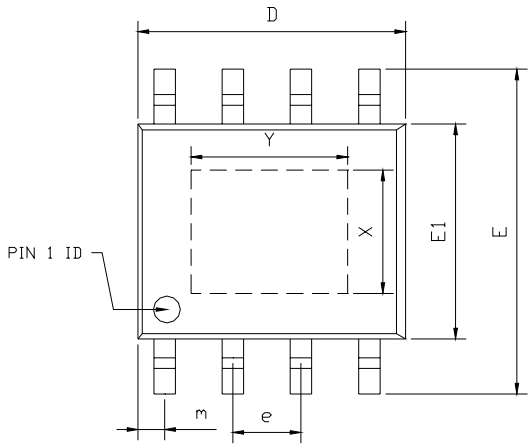


Sold-mask Bottom



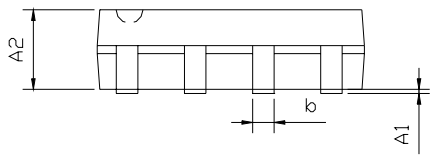
PACKAGE DIMENSION

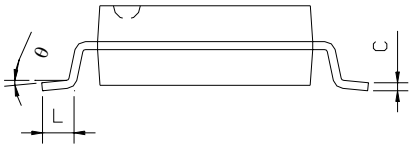
8-PIN PSOP (PS08)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	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





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HsinChu Headquarter

5F, No. 11, Park Avenue II,
Science-Based Industrial Park,
HsinChu City, Taiwan 300

TEL: +886-3-567 9979
FAX: +886-3-567 9909
http://www.champion-micro.com

Sales & Marketing

7F-6, No.32, Sec. 1, Chenggong Rd.,
Nangang District, Taipei City 115, Taiwan

TEL: +886-2-2788 0558
FAX: +886-2-2788 2985