

GENERAL DESCRIPTION

The CM3708A 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 CM3708A 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 CM3708A can deliver over 3.0A. The output voltage can be adjusted from VREF to VIN. The input range is from 2.0V to 5.5V. Other features of the CM3708A include high efficiency, low dropout voltage. It is available in a space-saving 16-pin SOP & TSSOP package.

FEATURES

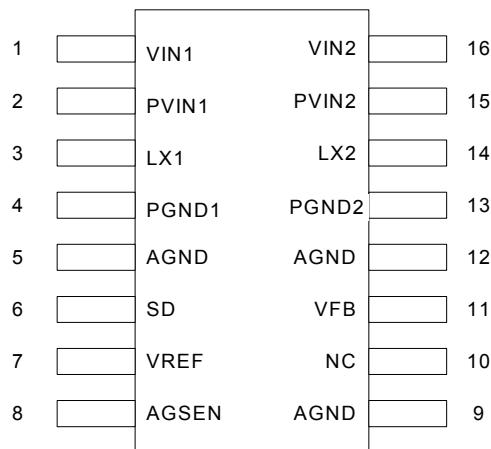
- ◆ Patent Filed #6,452,366
- ◆ 600KHz switching and synchronization
- ◆ Dynamic output-voltage adjustment from VREF to VIN
- ◆ 3A Guaranteed Output Current
- ◆ 95% Efficiency
- ◆ No Schottky Diode Required
- ◆ 16-pin PSOP/PTSSOP power packages
- ◆ 6A Low Noise Current Limit Protection
- ◆ External Soft Start
- ◆ Rail to Rail output Buck Converter

APPLICATIONS

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

PIN CONFIGURATION

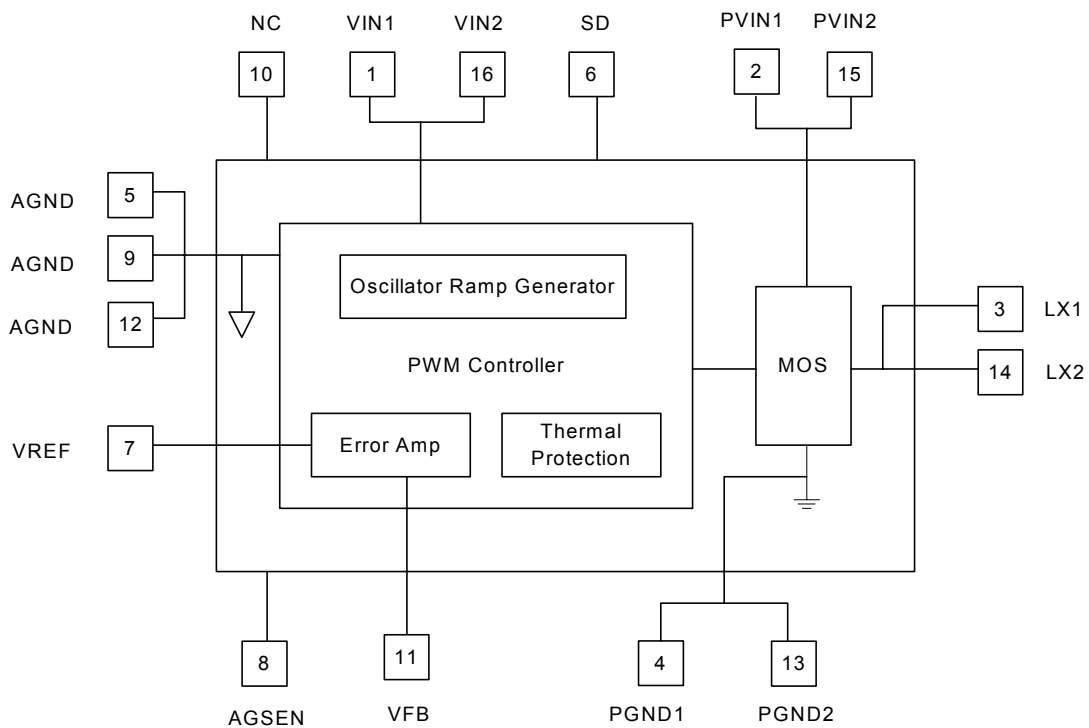
PSOP-16 (PS16) / PTSSOP-16 (PT16)
Top View



PIN DESCRIPTION

Pin No.	Symbol	Description	Operating Rating			
			Min.	Typ.	Max.	Unit
1,16	VIN1, VIN2	Voltage supply for internal circuits	2	2.5	5.5	V
2,15	PVIN1, PVIN2	Voltage supply for output power transistors	2	2.5	5.5	V
3,14	LX1, LX2	Inductor connection to the Drains of the internal power MOSFETs			5	V
4,13	PGND1, PGND2	Ground for output power transistors				
5,9,12	AGND	Ground for internal reference voltage divider				
8	AGSEN	Ground for remote sensing				
6	SD	Shutdown active high. CMOS input level	0.75 x VIN		VIN + 0.3V	V
7	VREF	V _{OUT} Set Voltage	0		VIN	V
10	NC	No Connection				
11	VFB	Feedback node for the V _{OUT}			5	V

BLOCK DIAGRAM





Patent

CM3708A

3A LOW-NOISE PWM STEP-DOWN REGULATOR

ORDERING INFORMATION

Part Number	Temperature Range	Package
CM3708AIT	-40°C to 85°C	16-Pin PTSSOP (PT16)
CM3708AGIT*	-40°C to 85°C	16-Pin PTSSOP (PT16)
CM3708AIS	-40°C to 85°C	16-Pin PSOP (PS16)
CM3708AGIS*	-40°C to 85°C	16-Pin PSOP (PS16)

*Note: G : Suffix for Pb Free Product

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 Sink3.0A

Junction Temperature150°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 Range2.0V to 5.5V

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)

Symbol	Parameter	Test Conditions	CM3708A			Unit
			Min.	Typ.	Max.	
SWITCHING REGULATOR						
V_{REF}	Adjustable Output Voltage		0		VIN	V
fsw	Switching Frequency	CM3708A	480		660	KHz
$I_{OUT(RMS)}$	Maximum Output RMS Current	CM3708A			3.0	A
$I_{OUT(PEAK)}$	Maximum Output Peak Current	CM3708A			6.0	A
I_{limit}	Current limit	CM3708A		6		A
MOSFETs						
$R_{DS(ON)}$	Drain to Source on-State Resistance	PVIN=5V		150	180	m Ω
SUPPLY						
I_{VIN}	Quiescent Current	VFB = 1.4V LC unconnected		200		μA
I_{PVIN}	Quiescent Current	VFB = 1.4V LC unconnected		500		μA

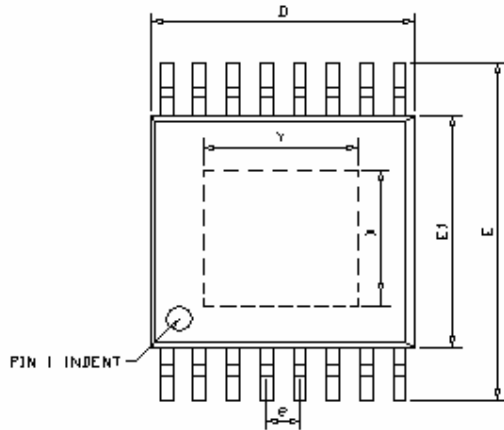
Note 1: Limits are guaranteed by 100% testing, sampling, or correlation with worst case test conditions

Note 2: VIN, PVIN = 3.3V \pm 10%

Note 3: It's not 100% test

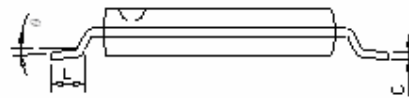
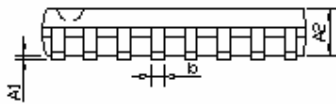
PACKAGE DIMENSION

16-PIN PTSSOP (PT16)

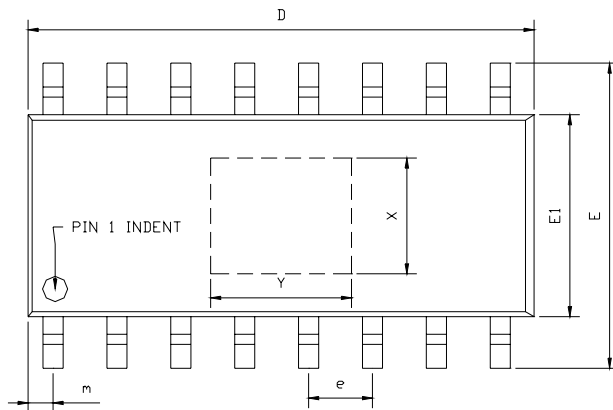


SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A1	0.05	---	0.15	0.002	---	0.006
A2	0.64	---	0.94	0.025	---	0.037
b	0.20	---	0.30	0.008	---	0.012
C	0.10	---	0.20	0.004	---	0.008
D	4.88	---	5.13	0.192	---	0.202
E	8.20	---	8.66	0.323	---	0.341
E1	4.20	---	4.50	0.165	---	0.177
e	---	0.65	---	---	0.026	---
L	0.51	---	0.71	0.020	---	0.028
θ	0°	---	8°	0°	---	8°

EXPOSED PAD DIMENSION : (mm)
PAD SIZE: X=3.0 ; Y=3.0

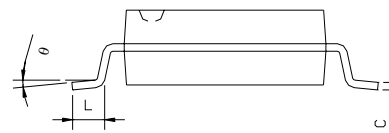
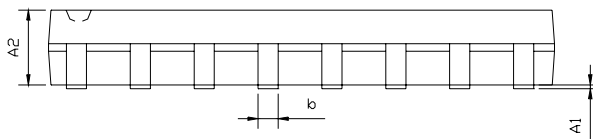


16-PIN PSOP (PS16)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A1	0.05	---	0.15	0.002	---	0.006
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	9.80	---	10.06	0.386	---	0.396
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=2.3 ; Y=2.8





IMPORTANT NOTICE

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