

General Description

The ADT7210 is system specific power IC that is suitable for color CCD camera.

Other features include over-current protection, UVLO and thermal shutdown. It reduces design complexity and external component count.



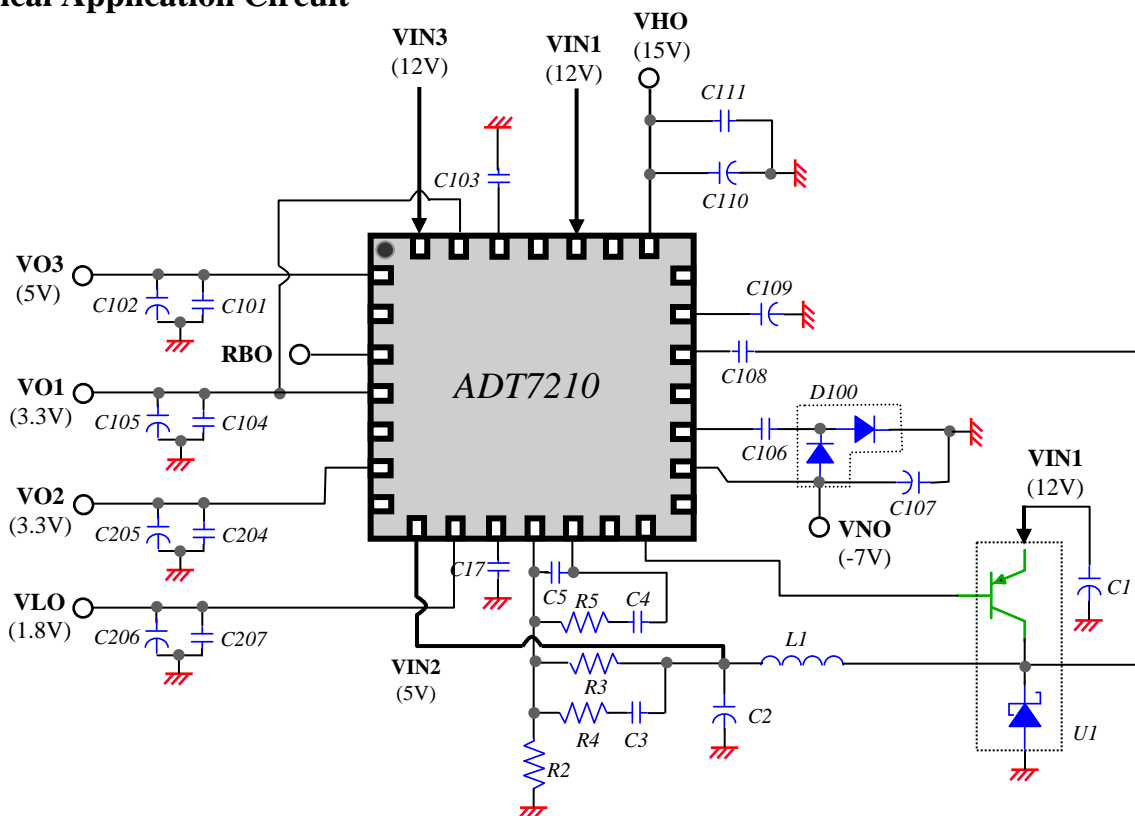
Features

- Input voltage range : 9.5V to 15V
- 2 CH regulated 3.3V output
- Regulated 1.8V / 5V output
- Regulated 15V charge pump output
- Regulated -7V charge pump output
- Power-on-reset output & power sequence
- Protection : thermal shutdown , over-current protection , UVLO
- Small size(5x5 mm² body) and thermally enhanced 28 Pin MLF Package

Applications

- Color CCD camera
- CCTV camera
- distributed power system
(3.3V / 1.8V / 5V / -7V / 15V)

Typical Application Circuit



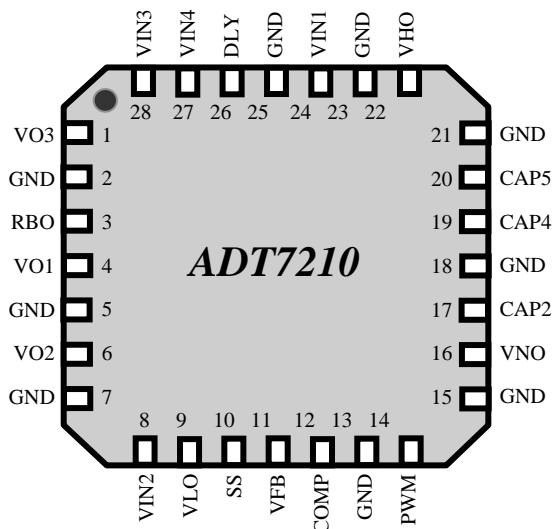
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Part List

Component	Description	Type	Value
U1	Composite type with a PNP transistor and schottky barrier diode	IC	FP102
D100	Two schottky diode integrated	IC	BAT54SWT1
L1 (*1)	Output filter inductor	CHIP INDUCTOR	100uH/450mA
C2 (*2)	Output filter capacitor	TANTALUM CAPACITOR	100uF/10V
C1	Bypass capacitor	TANTALUM CAPACITOR	10uF/20V
C102,C105, C205,C206	Load capacitor for Regulator	TANTALUM CAPACITOR	10uF/10V
C110	Load capacitor for VHO	TANTALUM CAPACITOR	10uF/20V
C107	Load capacitor for Inverter	TANTALUM CAPACITOR	10uF/10V
C109	Load capacitor for Doubler	TANTALUM CAPACITOR	1uF/35V
C106	Flying capacitor for Inverter	MLCC	2.2uF/25V
C108	Flying capacitor for Doubler	MLCC	2.2uF/25V
C101,C104,C204, C207,C111	Load capacitor for Regulator	MLCC	0.1uF/20V
C17	Buck converter soft-start capacitor	MLCC	47nF/20V
C3	Buck converter feedback loop component	MLCC	22nF/20V
C4	Buck converter feedback loop component	MLCC	10nF/20V
C5	Buck converter feedback loop component	MLCC	1.2nF/20V
C103	Delay time control capacitor for RBO signal	MLCC	0.1uF/20V
R2	Buck converter feedback loop component	CHIP RESISTOR	3.3k Ω
R3	Buck converter feedback loop component	CHIP RESISTOR	4.99k Ω
R4	Buck converter feedback loop component	CHIP RESISTOR	33 Ω
R5	Buck converter feedback loop component	CHIP RESISTOR	15K Ω

*1 : SLF6028T-101MR42-PF (by TDK)

*2 : TLM1C107DSSR (by PARTSNIC)

Pin Configuration


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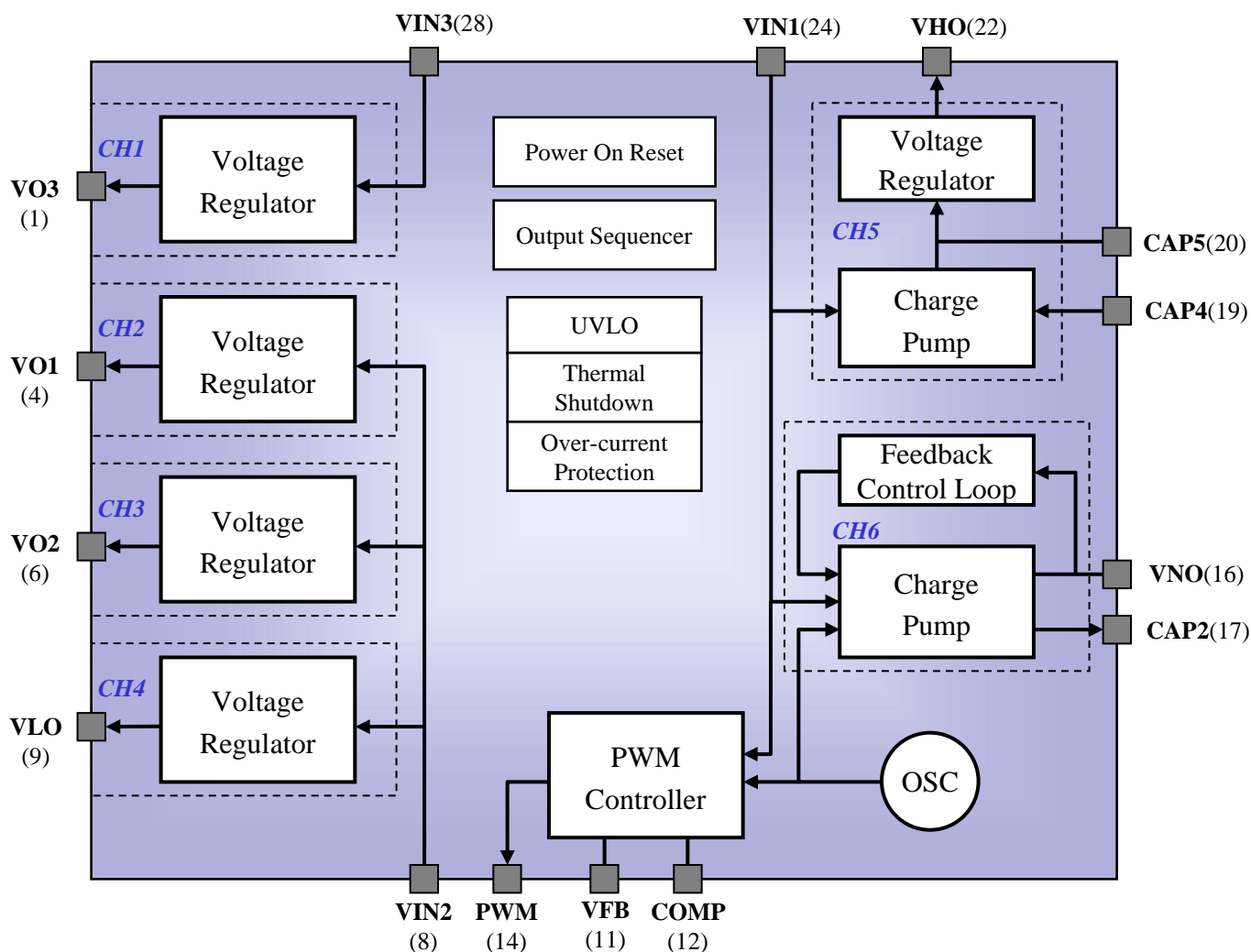
Pin Description

Pin No.	Name	I/O	Type	Description
1	VO3	O	A	Voltage output for +5V general application
2	GND1	-	G	Ground
3	RBO	O	D	Power-on reset output
4	VO1	O	A	Voltage output for +3.3V digital application
5	GND2	-	G	Ground
6	VO2	O	A	Voltage output for +3.3V analog application
7	GND3	-	G	Ground
8	VIN2	-	P	Secondary power input for regulators
9	VLO	O	A	Voltage output for +1.8V digital application
10	SS	IO	A	Soft start capacitor
11	VFB	I	A	Feedback reference voltage input for PWM
12	COMP	IO	A	Compensation input
13	GND4	-	G	Ground
14	PWM	O	D	PWM output
15	GND5	-	G	Ground
16	VNO	O	A	-7V output for CCD
17	CAP2	O	D	Positive flying capacitor terminal for inverter operation
18	GND6	-	G	Ground
19	CAP4	I	D	Positive flying capacitor terminal for doubler operation
20	CAP5	O	A	Positive load capacitor terminal for doubler operation
21	GND7	-	G	Ground
22	VHO	O	A	+15V output for CCD
23	GND8	-	G	Ground
24	VIN1	-	P	Main power input
25	GND9	-	G	Ground
26	DLY	IO	A	Power-on reset delay capacitor terminal
27	VIN4	I	A	Voltage monitoring input for POR
28	VIN3	I	P	Thirdly power input for regulators (normally connected to VIN1)

I : Input pin O : Output pin IO : Input/Output pin
 P : Power pin G : Ground pin
 A : Analog pin D : Digital pin

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Functional Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{IN}	-	-	17	V
Power dissipation ($T_a=70^\circ\text{C}$) (Note1)	P_{Dmax}	-	-	2.25	W
Storage temperature	T_{STG}	-65	-	+150	$^\circ\text{C}$
Junction temperature	T_{Jmax}	-	-	+150	$^\circ\text{C}$
Thermal resistance	Θ_{JA}	-	35	-	$^\circ\text{C}/\text{W}$

Note1. derate $35^\circ\text{C}/\text{W}$ above $+70^\circ\text{C}$.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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Operating Ratings (Ta=25 °C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V _{IN}	9.5	12	15	V
Operating temperature	T _{OPR}	-40	-	+85	°C
Junction temperature	T _J	-40	-	+125	°C
Max. power dissipation (Ta=70 °C)*1	P _D	-	0.65	1.5	W

*1 This spec. indicates that junction temperature of the device is under 125 °C. In specific applications, this is recommended under this power dissipation specification.

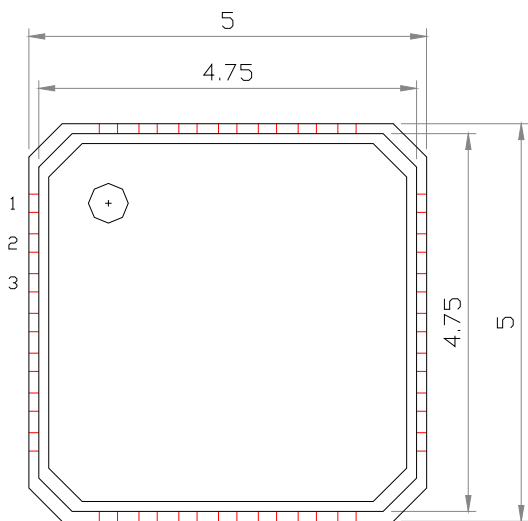
Electrical Characteristics

Ta = 25 °C, V_{IN} = 12V, unless otherwise noted.

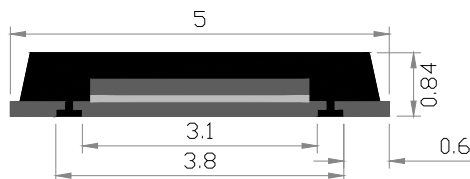
Parameter	Condition	Min	Typ	Max	Unit	Note	
Basic Function							
Operating supply voltage	-	9.5	12	15	V		
Quiescent current at operation	V _{IN} =12V, w/o loading	10	17	24	mA		
Power on reset	Tdelay	C103 = 0.1 μF		25	30	35	msec
	VOH	-	3.0	3.3	3.6	V	
PWM Controller							
VIN2 voltage	-	4.75	5	5.25	V		
Switching frequency	-	375	500	625	kHz		
Channel 1 (+5V General)							
Output voltage	I _O =30mA	4.75	5.0	5.25	V		
Output drive current	-	80	-	-	mA		
Channel 2 (+3.3V Digital)							
Output voltage	V _{IN2} =5V, I _O =80mA	3	3.3	3.6	V		
Output drive current	V _{IN2} =5V	150	-	-	mA		
Channel 3 (+3.3V Analog)							
Output voltage	V _{IN2} =5V, I _O =60mA	3	3.3	3.6	V		
Output drive current	V _{IN2} =5V	100	-	-	mA		
Channel 4 (+1.8V)							
Output voltage	V _{IN2} =5V, I _O =30mA	1.65	1.8	1.95	V		
Output drive current	V _{IN2} =5V	35	-	-	mA		
Channel 5 (+15V CCD)							
Output voltage	I _O =8mA	14.55	15	15.45	V		
Output drive current	-	10	-	-	mA		
Channel 6 (-7V CCD)							
Output voltage	I _O =-2mA	-7.5	-7.0	-6.5	V		
Output drive current	-	-	-	-5	mA		

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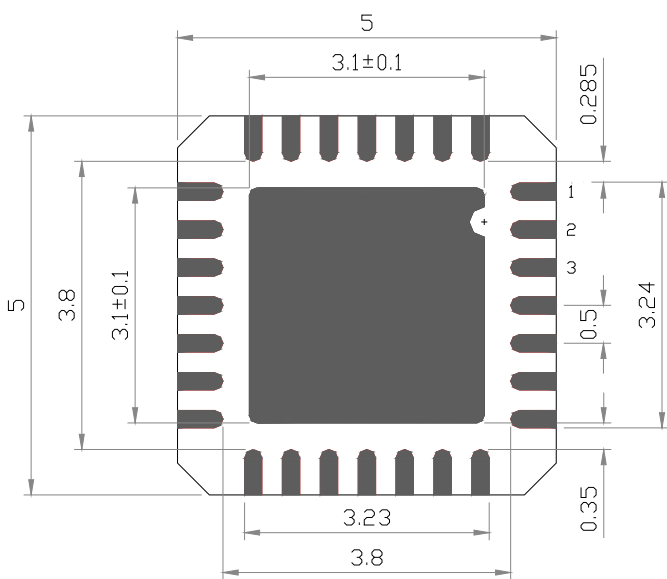
Package ; 28MLF, 5mm x 5mm body (units : mm)



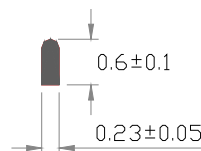
TOP VIEW



SIDE VIEW



BOTTOM VIEW



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