

# FAN8700

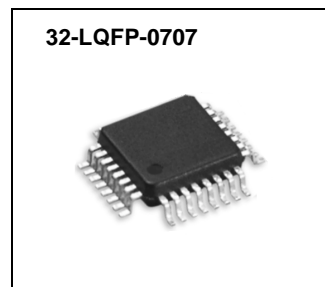
## Camera Motor Drive and Control IC

### Features

- Built-in DC Motor Driver  
: For Film Winding & Zooming
- Voltage Controlled Stepping Motor Driver
- Built-in AE Meter Driver
- Built-in IRED Driver For Auto-Focus
- Low Drop out Regulator(5V/3V)
- Built-in step-up DC/DC Converter Controller

### Description

The FAN8700 is a monolithic integrated circuit, and suitable for the motor driver (AE, AF, zoom and reel motor driver) and the controller ( IRED driver, supply , step-up converter control, etc.) in camera systems.



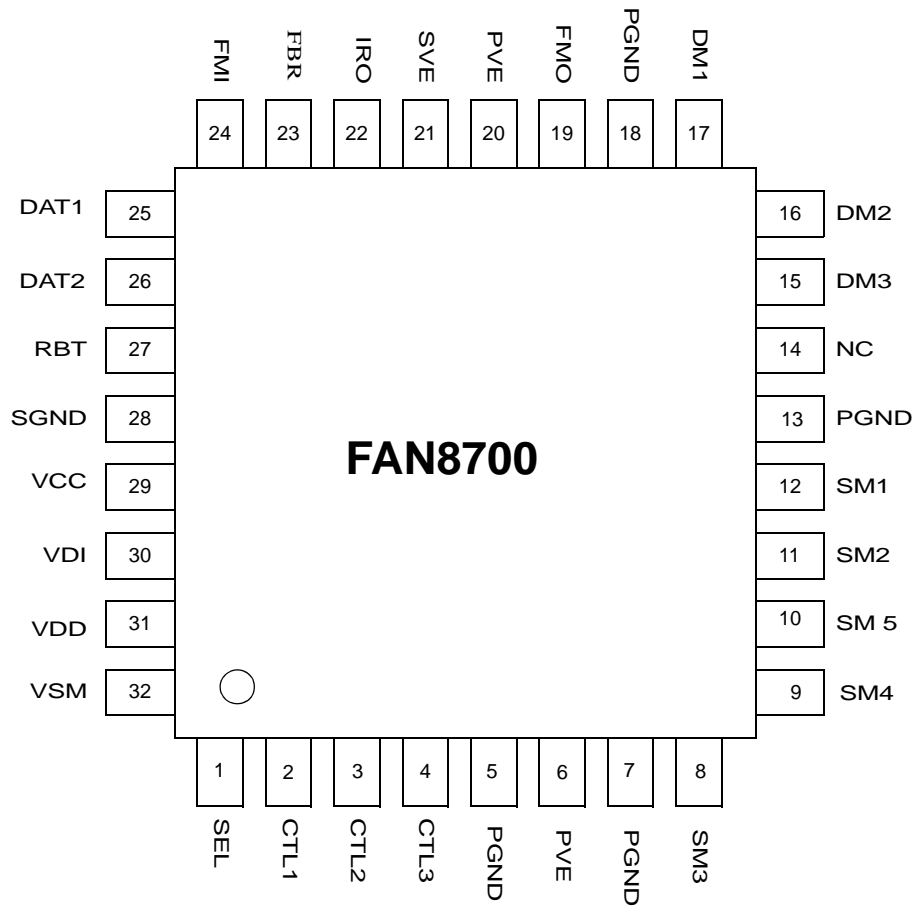
### Typical Applications

- Camera system

### Ordering Information

Device	Package	Operating Temp.
FAN8700	32-LQFP-0707	-20°C ~ +60°C

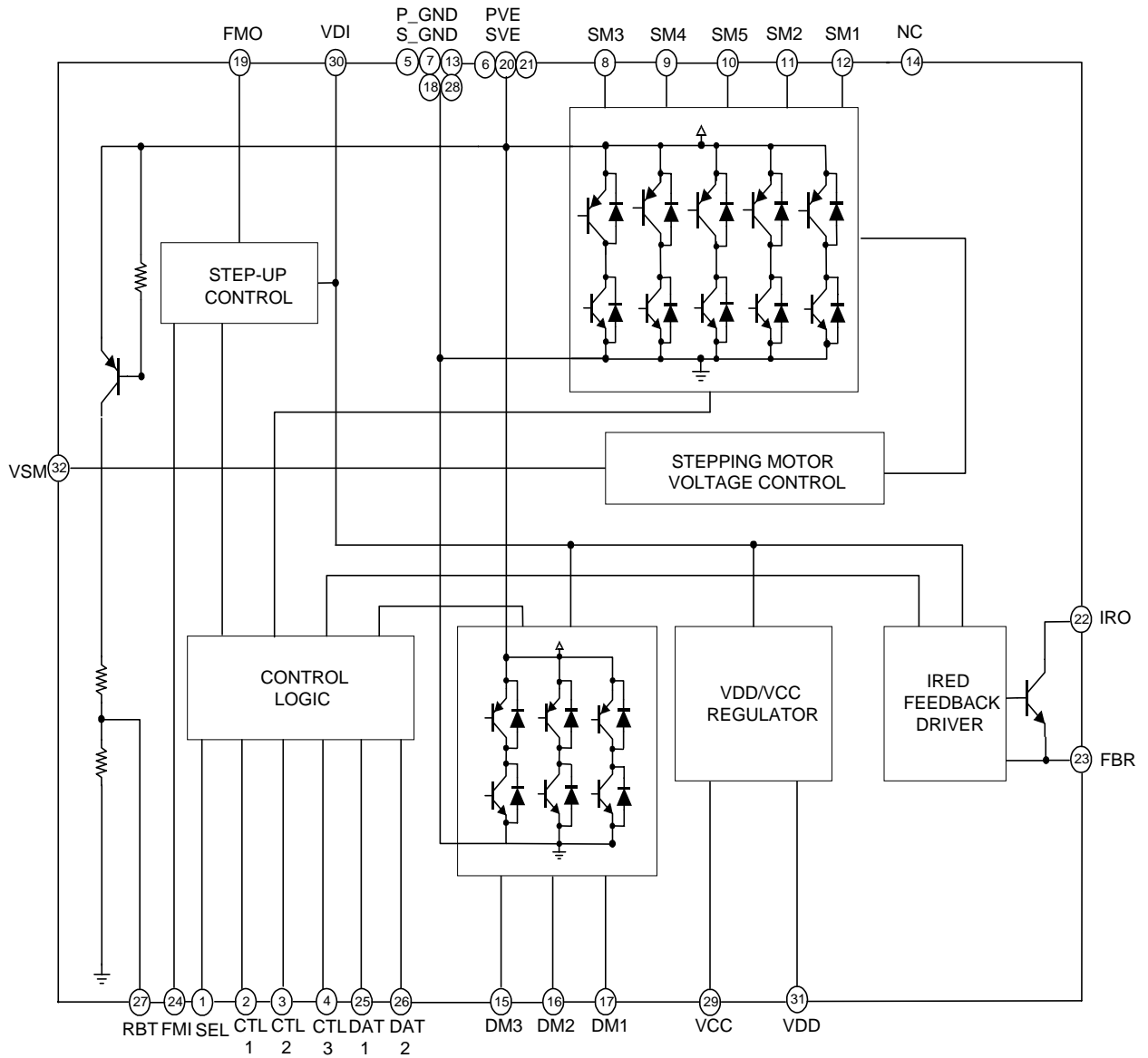
## Pin Assignments



## Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	SEL	IC Enable Input
2	CTL <sub>1</sub>	Operating Mode Control Input1
3	CTL <sub>2</sub>	Operating Mode Control Input2
4	CTL <sub>3</sub>	Operating Mode Control Input3
5	PGND	Power Ground
6	PVE	Power VE
7	PGND	Power Ground
8	SM <sub>3</sub>	Stepping Motor Output3
9	SM <sub>4</sub>	Stepping Motor Output4 /AE Meter Output
10	SM <sub>5</sub>	Stepping Motor Output5 /AE Meter Output
11	SM <sub>2</sub>	Stepping Motor Output2
12	SM <sub>1</sub>	Stepping Motor Output1
13	PGND	Power Ground
14	NC	No Connection
15	DM <sub>3</sub>	DC Motor Output 3
16	DM <sub>2</sub>	DC Motor Output 2
17	DM <sub>1</sub>	DC Motor Output 1
18	PGND	Power Ground
19	FMO	Step-up Converter Switching Output
20	PVE	Power VE
21	SVE	Signal VE
22	IRO	IRED drive output
23	FBR	IRED Drive Current Setting Input
24	FMI	Step-up converter switching Clock input
25	DAT <sub>1</sub>	Each Mode Output Control Input1
26	DAT <sub>2</sub>	Each Mode Output Control Input2
27	RBT	VE Voltage Divided Output
28	SGND	Signal Ground
29	VCC	Low Drop-out Regulator Output
30	VDI	Setp-up Output Voltage Feedback Input
31	VDD	Low Drop-out Regulator Output
32	VSM	Stepping Motor Output Voltage Control Input

# Internal Block Diagram



## Equivalent Circuits

Description	Pin No.	Internal Circuit
<b>1.5-Channel DC Motor Drive Block</b>		
SEL	1	
CTL1~3	2~4	
DAT1~2	25,26	
DM1	17	
DM2	16	
DM3	15	
PVE	6,20	
P_GND	5,7,13,18	
<b>Step-up Control Block</b>		
SEL	1	
CTL1~3	2~4	
DAT1~2	25,26	
SM1	12	
SM2	11	
SM3	8	
SM4	9	
SM5	10	
P_GND	5,7,13,18	
<b>IRED Drive Block</b>		
SEL	1	
CTL1~3	2~4	
DAT1~2	25,26	
IRO	22	
FBR	23	

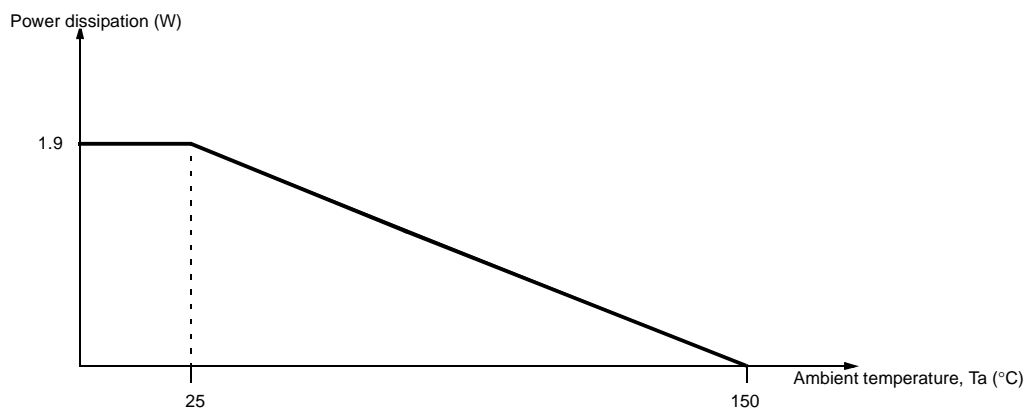
### Equivalent Circuits (Continued)

Description	Pin No.	Internal Circuit
Step-up Control Block		
SEL	1	
FMI	24	
VDI	30	
FMO	19	
P_GND	5, 7, 13, 18	
Regulator Block		
SEL	1	
VCC	29	
VDD	31	
P_GND	5, 7, 13, 18	
RBT Block		
SEL	1	
RBT	27	
P_GND	5, 7, 13, 18	

## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Value	Unit	Remark
Supply voltage	VE	4.5	V	-
VCC output current	IVCC	50	mA	-
VDD output current	IVDD	80	mA	-
Stepping motor output current	ISM1,2,3,4,5	500	mA	-
DC motor output current	IDM	2000	mA	500ms
IRED output current	IRED	2000	mA	(3000mA/10mS)
Output terminal voltage	VOUT	5.5	V	500us
Input terminal voltage	VIN	5.5	V	-
Power dissipation	PD	1.9	W	-
Thermal resistance	Rja	65	°C/W	-
Operating temperature range	TOPR	-20 ~ +60	°C	-
Storage temperature range	TSTG	-55 ~ +125	°C	-

## Power Dissipation Curve



### Note:

1. PCB Information (Ref. EIA/JSED51-3 and EIA/JSED51-7)
2. Board Layer : 1 Layer
3. Board Thickness : 1.6mm
4. Board Dimension : 76.2 X 114.3 mm

## Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating supply voltage	VE	2.0	-	4.0	V

## Electrical Characteristics

(Ta = -20°C ~ 60°C, VE = 2V)

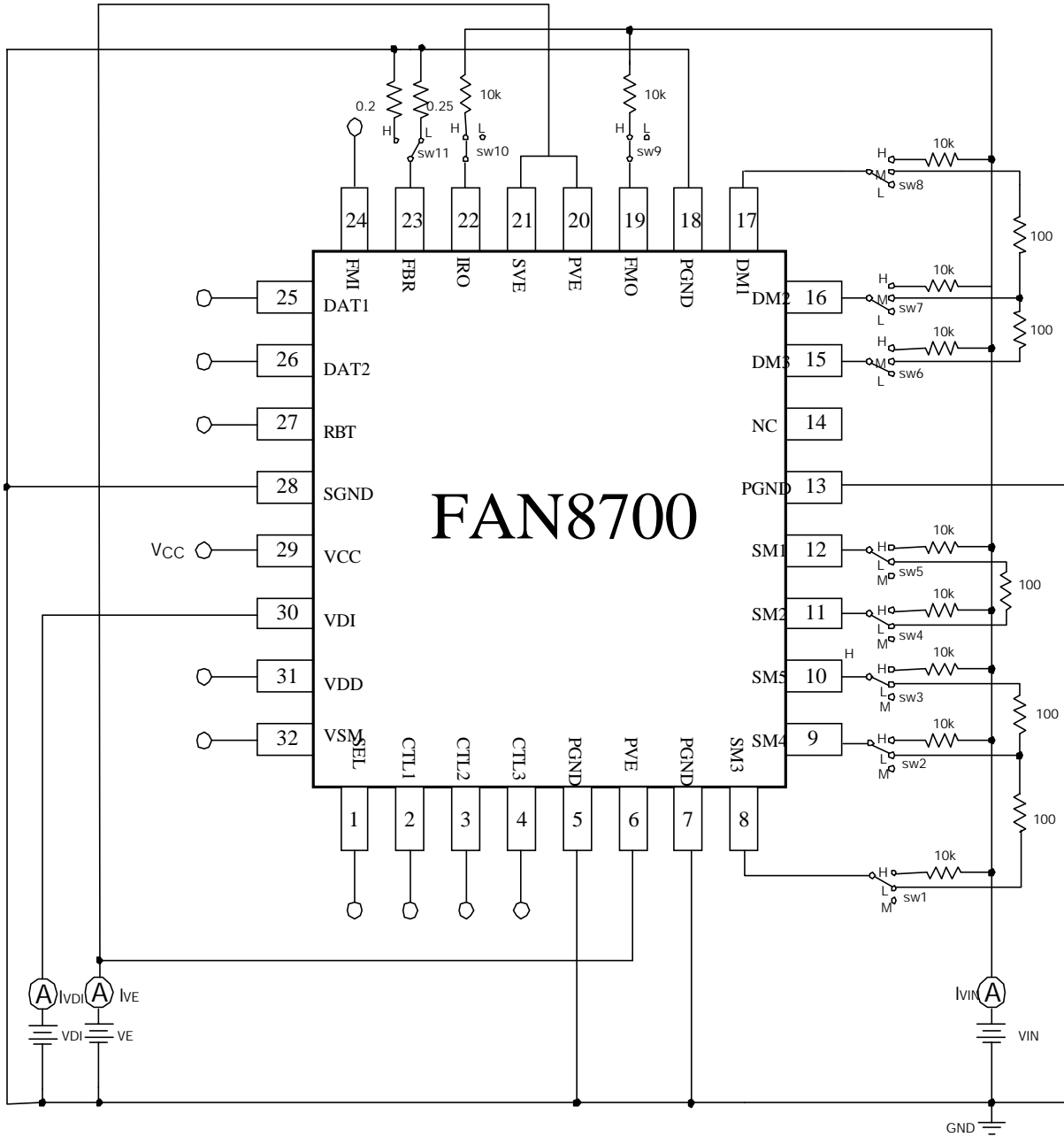
Block	Characteristics	Symbol	Condition	Min.	Typ.	Max.	Unit
Total	Leakage Current	ISTB	VE = 4.0V, VSEL = 0V	-	-	1.0	mA
	Input Threshold Voltage	VIT	-	0.75	1.1	1.5	V
	Input High Current	I <sub>IH</sub>	V <sub>IH</sub> = 3V	-	-	150	mA
Step-up & DC-DC CONVERTER	Minimum Operating Voltage	VOPR1	-	-	-	1.0	V
	Step-up Output Voltage 1	VVDI1	I <sub>LOAD</sub> =100mA	5.3	5.5	5.7	V
	Step-up Output Voltage 2	VVDI2	I <sub>LOAD</sub> =100mA	8.3	8.6	8.9	
	FMO Output Voltage 1	VSAT1/1	I <sub>LOAD</sub> =700mA	-	-	0.3	V
	FMO Output Voltage 2	VSAT1/2	I <sub>LOAD</sub> =1000mA	-	-	0.4	
	FMI Step-up Clock Range	f	-	39	156	313	KHz
Regulator	VDD Output Voltage	VDD	I <sub>VDD</sub> =60mA	2.85	3.0	3.15	V
	VDD Drop-out Voltage	VSAT2/1	I <sub>VDD</sub> =60mA, VDD=2V	-	-	0.3	
	VCC Output Voltage	VCC	I <sub>VCC</sub> =40mA	4.8	5.00	5.2	V
	VCC Drop-out Voltage	VSAT2/2	I <sub>VCC</sub> =40mA, VCC=3V	-	-	0.3	V
RBT	Minimum Operating Voltage	VOPR3	-	-	-	1.5	V
	Stand-by Output Voltage	VSTB	VE=4V, VSEL=0V	-	-	0.1	V
	Output Voltage	VRBT	-	0.47	0.5	0.53	× VE
	Output Voltage Temperature Coefficient	VT	-	-	-	2.0	mV/°C
DC Motor	Minimum Operating Voltage	VOPR4	-	-	-	1.0	V
	Output Saturation Voltage	VSAT4	VE=1.6V, I <sub>DM</sub> =400mA	-	-	0.45	V
Step motor Driver	Minimum Operating Voltage	VOPR5	-	-	-	1.6	V
	Output Saturation Voltage	VSAT5	VE=2.6V, I <sub>SM</sub> =500mA	-	-	0.7	V
	Output Voltage Relative Difference	DV	VE=2.6V V <sub>SM</sub> =1.0V, R <sub>L</sub> =10W SM1-2, SM3-4	-0.1	0	0.1	V
	Output Voltage 1 (Output Pin to Ground)	VO1	VE=2.6V, R <sub>L</sub> =10W, V <sub>SM</sub> =1.0V SM1, SM2, SM3, SM4	1.9	2.0	2.1	V
	Output Voltage 2 (Output Pin to Ground)	VO2	VE=2.6V, R <sub>L</sub> =5W, V <sub>SM</sub> =1.0V, SM4, SM5	1.85	1.95	2.05	V
I <sub>red</sub>	Minimum Operating Voltage	VOPR6	-	-	-	1.5	V
	Output Saturation Voltage	VSAT6	I <sub>IRED</sub> =1000mA	-	-	1.0	V
	Output Current	I <sub>IRED</sub>	R <sub>FBR</sub> =0.3W	0.9	1.0	1.1	A



## Control Code Table

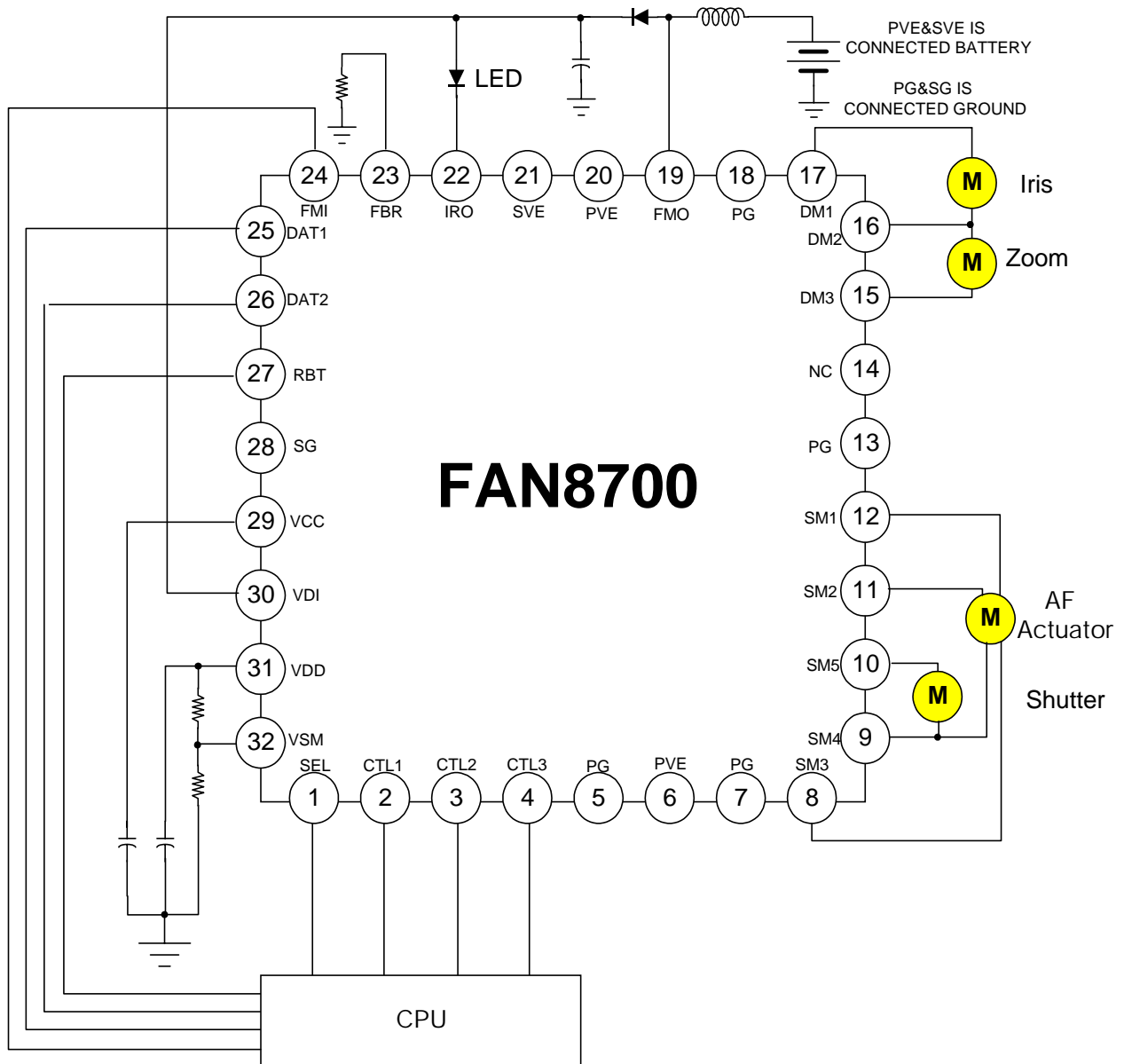
Mode	Sel	Ctl1	Ctl2	Ctl3	Dat1	Dat2	Output Port				Remark	
-	-	L	L	L	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	SM1	SM2	SM3	SM4		
Stepping Motor Drive	H	H	L	H	L	L	L	H	L	H		
					L	H	L	H	H	L		
					H	L	H	L	L	H		
					H	H	H	L	H	L		
-	-	-	-	-	-	-	SM4	SM5	-	-		
Ae Meter Drive	H	H	L	L	L	L	OFF	OFF	-	-		
					L	H	H	L	-	-		
					H	L	L	H	-	-		
					H	H	L	L	-	-		
Ired	H	H	H	H	L	L	-	-	-	-	5.5V Step-up	
					L	H	-	-	-	-	8.6V Step-up	
					H	L	-	-	-	-	Ired On Step-up Off	
					H	H	-	-	-	-	5.5V Step-up	
-	-	-	-	-	-	-	CTL	DM1	DM2	DM3	-	
Dcmotor1 Control	H	L	L	H	L	L	-	OFF	OFF	OFF	OFF	OFF
					L	H	-	H	L	OFF	CW	
					H	L	-	L	H	OFF	CCW	
					H	H	-	L	L	OFF	Brake	
Dcmotor2 Control	H	L	H	L	L	L	-	OFF	OFF	OFF	OFF	OFF
					L	H	-	OFF	H	L	CW	
					H	L	-	OFF	L	H	CCW	
					H	H	-	OFF	L	L	Brake	

# Test Circuits





## Typical Application Circuits 2





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