

## **Data Sheet**

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**品 名：POWER SUPPLY SUPERVISOR  
WITH PWM CONTROLLER**

**奇高料號：CG8010**

**版 本：Rev 0.30**

**日 期：October 4, 2007**

**頁 數：8 頁**

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# CG8010

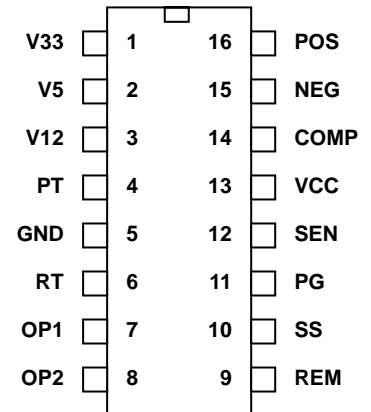
## POWER SUPPLY SUPERVISOR WITH PWM CONTROLLER

The CG8010 is designed with a pulse-width-modulation control circuit and a complete power supervisor for use in the switched mode power supply .  
 It contains various functions, like under voltage protection (UVP), over voltage protection (OVP), power good output (PG) and ON/OFF control (REM).  
 UVP(Under voltage protection) function is for +3.3V, +5V, +12V outputs.  
 OVP(Over voltage protection) function is for +3.3V, +5V, +12V and PT is for extra protection input.  
 PG(Power good signal) is a safe operation signal to inform the external parts.  
 REM(Remote on/off) is used to control the SMPS on/off. The REM control signal has the on/off transferred debounce–time.

### FEATURE

- 3-channel under voltage protection (UVP)
- 3-channel over voltage protection (OVP)
- 1-channel extra protection (PT)
- 1-channel sense input to control the PG (SEN)
- Remote on/off control function (REM)
- Dual output for push-pull operation (OP1/OP2)
- Soft start capability by external capacitor (SS)
- VCC under voltage lockout
- 16-Pin dual in-line package
- Pb-free Package are available

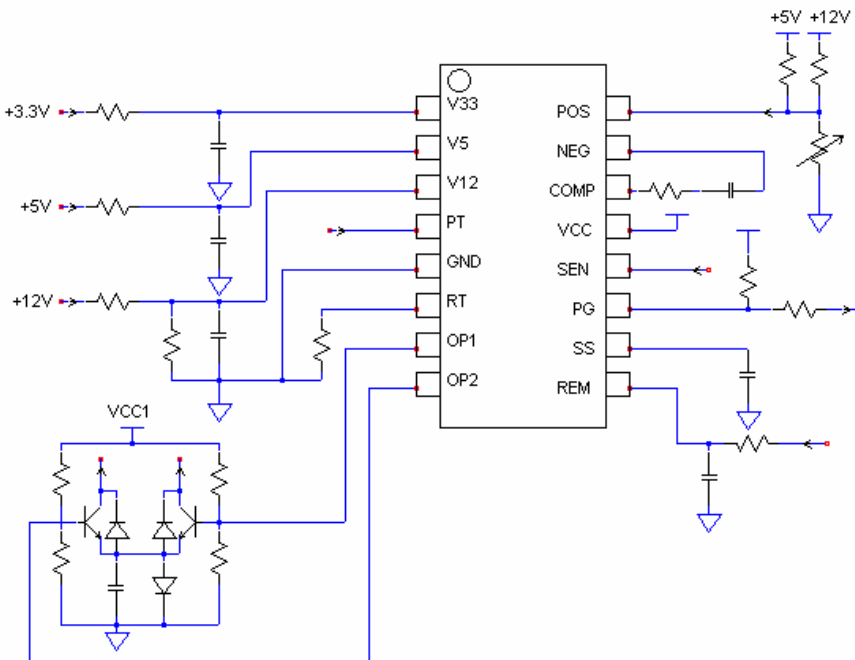
### PIN CONFIGURATION (Top View)



### ORDERING INFORMATION

ORDER NUMBER	Package	Shipping	Top Marking
CG8010DX16	DIP-16 (Pb-free)	Tube	CG8010DX16

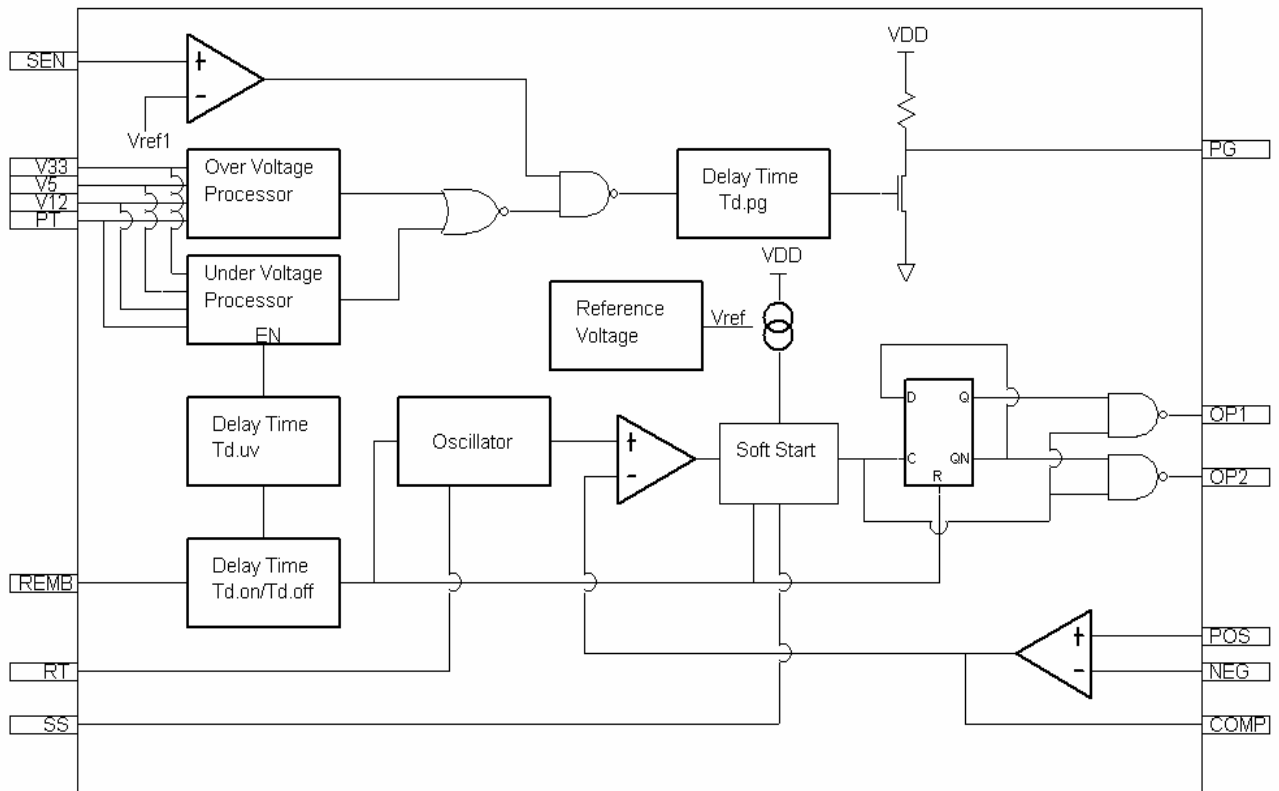
### REFERENCE APPLICATION CIRCUIT



**PIN DESCRIPTION**

Pin	Symbol	Type	Function
1	V33	I	OVP, UVP for +3.3V
2	V5	I	OVP, UVP for +5V
3	V12	I	OVP, UVP for +12V
4	PT	I	Extra protection input
5	GND	-	Ground
6	RT	-	Oscillation frequency setting resistor
7	OP1	O	PWM output1
8	OP2	O	PWM output2
9	REM	I	Remote ON/OFF control input
10	SS	-	Soft start function setting capacitor
11	PG	O	Power good signal
12	SEN	I	Sense signal input
13	VCC	I	Supply voltage
14	COMP	O	Error amplifier output
15	NEG	I	Error amplifier (-) input
16	POS	I	Error amplifier (+) input

**FUNCTION BLOCK DIAGRAM**



### ABSOLUTE MAXIMUM RATINGS

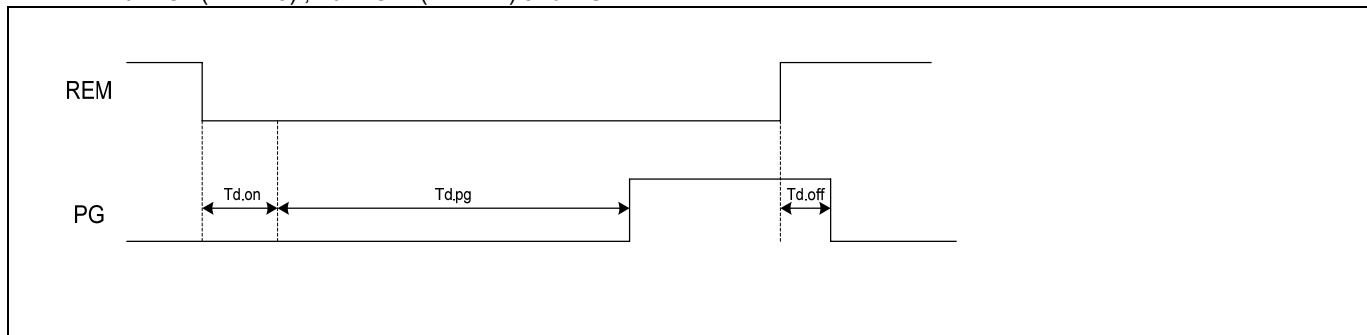
PARAMETER		MIN	MAX	UNITS
Supply Voltage	VCC	-0.3	7	V
Input Voltage	V33,V5,V12,PT,REMB,SEN,POS,NEG	-0.3	7	V
Output Voltage	OP1,OP2,PG,COMP	-0.3	7	V
Operating Temperature Range	T <sub>O</sub>	-20	+85	°C
Storage Temperature Range	T <sub>S</sub>	-65	150	°C

### ELECTRICAL CHARACTERISTICS ( For VCC=5V and T<sub>J</sub>=25°C )

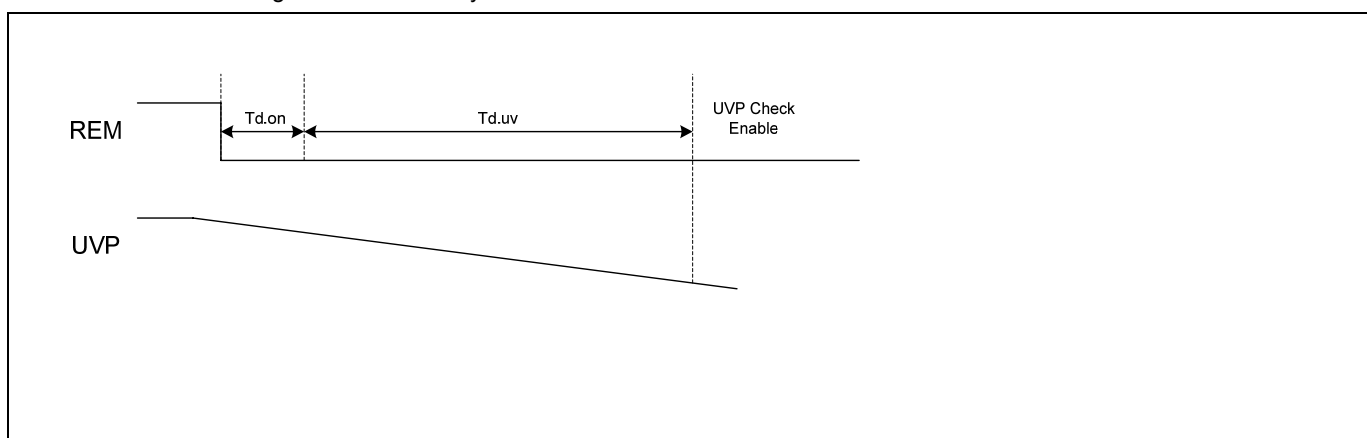
PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
<b>Over Voltage Protection (OVP- V33,V5,V12,PT)</b>						
Over voltage threshold	OV33		3.8	4.1	4.4	V
	OV5		5.8	6.2	6.6	V
	OV12		4.4	4.6	4.9	V
	PT		1.23	1.28	1.33	V
Noise debounce time	Tg.ov		510			us
<b>Under Volatge Protection (UVP- V33,V5,V12)</b>						
Under voltage threshold	UV33		1.7	1.9	2.2	V
	UV5		2.7	3.0	3.3	V
	UV12		2.1	2.4	2.7	V
Noise debounce time	Tg.uv		120			us
PG check under voltage delay time	Td.uv		180	280	380	ms
<b>Soft Start (SS)</b>						
Sink current	Isink	RT=100 KΩ		15		uA
Source current	Isource			310		uA
<b>VCC Under Voltage Lockout (UVLO)</b>						
Start-up voltage				4.2		V
<b>REM Input Pin (REM)</b>						
High level input voltage	V <sub>IH</sub>		1.8			V
Low level input voltage	V <sub>IL</sub>				0.7	V
REM delay time	Td.on/off			40		ms
<b>Power Good (PG)</b>						
PG delay time	Td.pg		180	280	380	ms
SEN voltage threshold				0.68		V
Sink current	Ipg.sink	VPG=0.2V		10		mA
Output load resistor	Rload		0.5	1	2	KΩ
PG internal pull high resistor	Rpull.up			5		KΩ
<b>Oscillation Frequency</b>						
PWM frequency	Fosc	RT=100 KΩ	70	75	80	KHz
<b>Error Amplifier (POS,NEG,COMP)</b>						
Reference voltage	Vref	Vneg	2.40	2.45	2.50	V
Open loop gain	Avo		75	85		dB
Unity gain bandwidth	BW	0dB		1		MHz
Power supply rejection ratio	PSRR		45			dB
<b>Total Device</b>						
Supply current	I <sub>cc</sub>	REM = 5V		6		mA

**TIMING DIAGRAM**

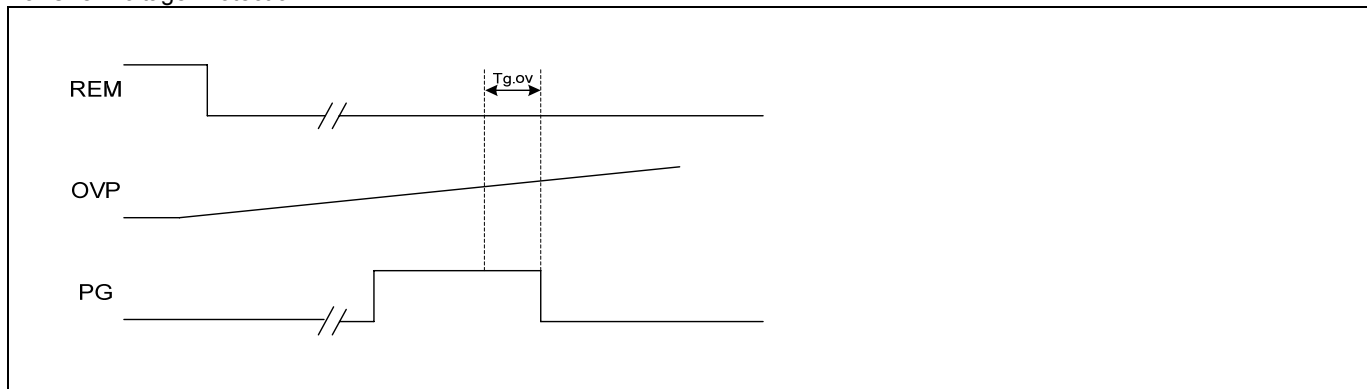
1. REM Turn ON(REM=0) , Turn OFF(REM=1) and PG



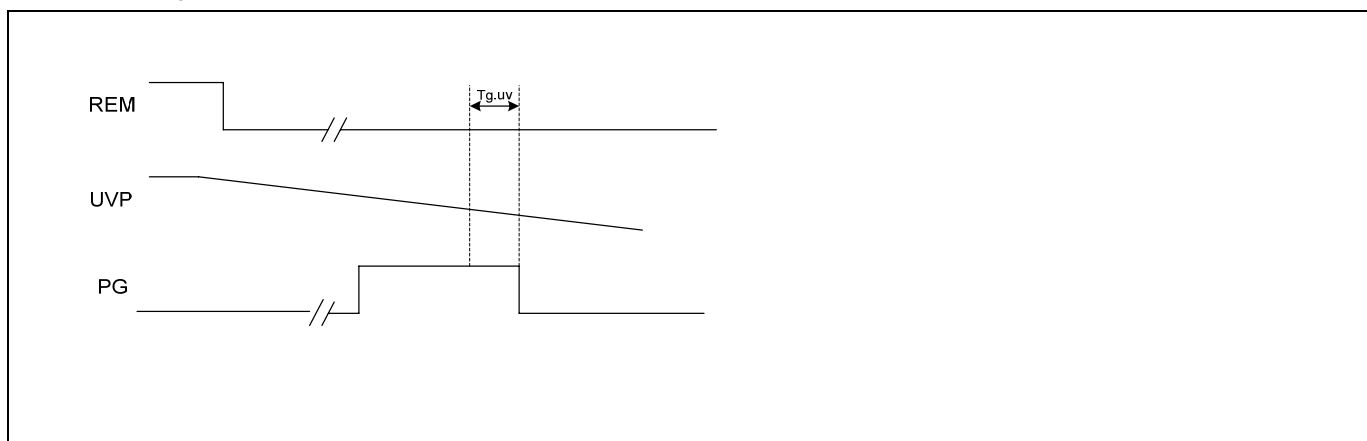
2. REM vs. Under Voltage Protection Delay time



3. Over Voltage Protection



4. Under Voltage Protection

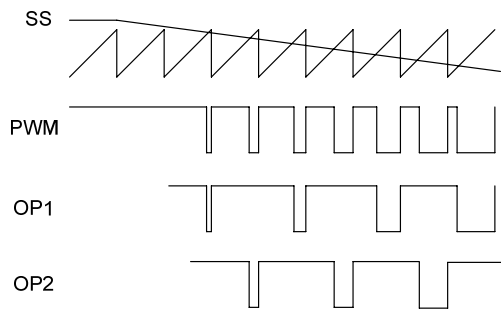


**APPLICATION HINTS**

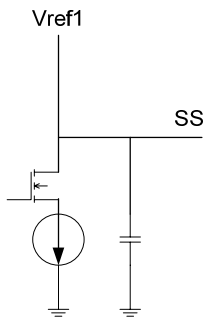
1. Input Impedence

Pin Name	Input Impedence
V33	52KΩ
V5	81KΩ
V12	52KΩ
PT	Pull-high to VCC= 24 KΩ Pull-low to GND= 4.7 KΩ

2. Soft Start



$I_{ss} = 15\mu A \quad (R_T=100K\Omega)$



3. PWM Frequency

$T_{pwm} = K2 \cdot RT$   
 $K2 = 1.3 \cdot 10^{-10}$

Example.

$RT = 100K\Omega$   
 $T_{pwm} = (1.33 \cdot 10^{-10}) \cdot (100 \cdot 10^3) = 13.3\mu s$   
 $F_{pwm} = 75KHz$

4.PT

PT Voltage Level	Function
PT>1.25V	Over voltage protection
PT<0.62V	Disable under voltage check function

5.REM

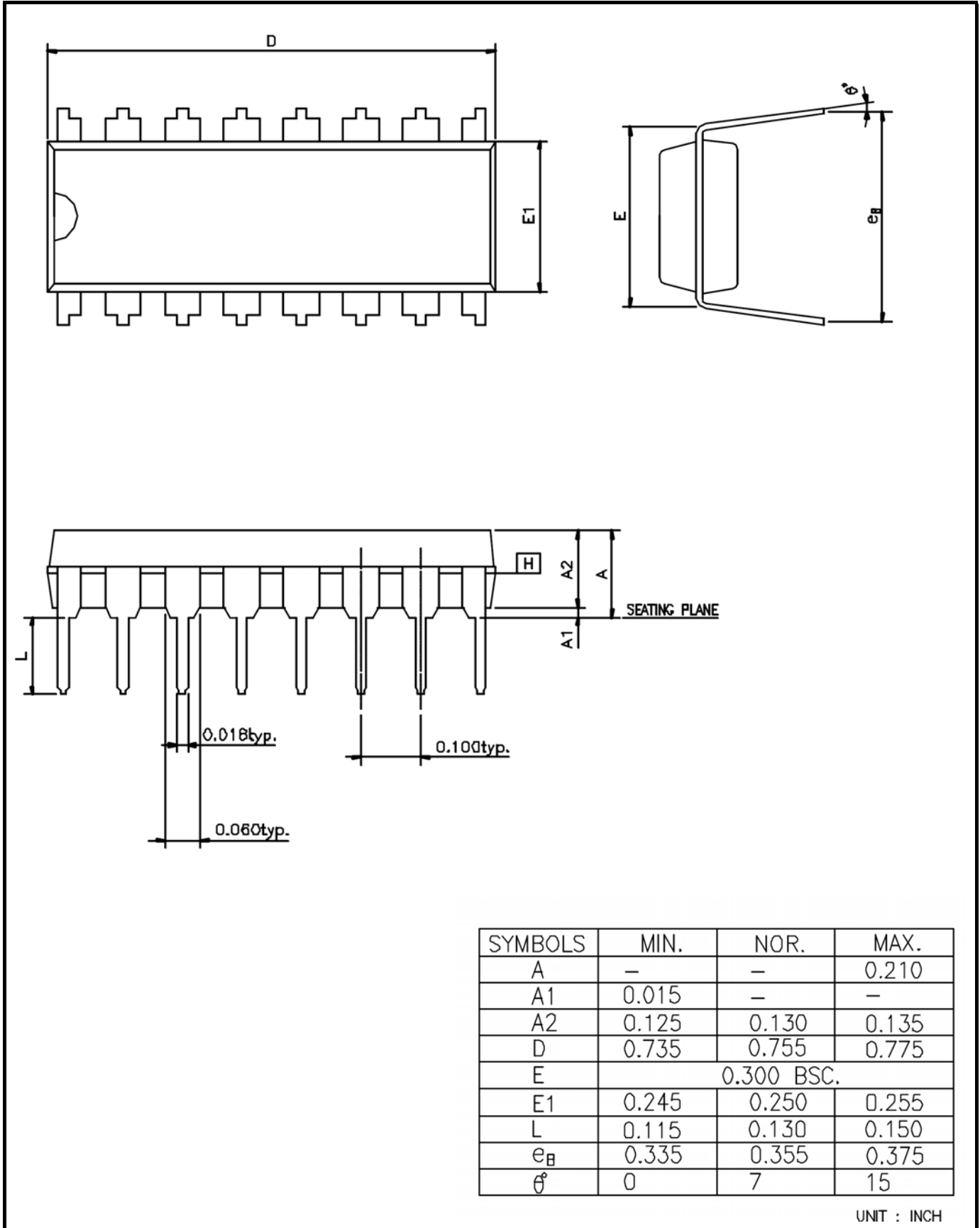
In some application circuits, adding a resistor in series with the REM pin could reduce the noise spike and avoid the pin from damage.

**CG8010**  
**POWER SUPPLY SUPERVISOR WITH PWM CONTROLLER**



PACKAGE DIMENSIONS  
 PDIP-16  
 P SUFFIX

PLASTIC DUAL IN LINE PACKAGE  
 JEDEC OUTLINE : MS - 001  
 UNIT : INCH





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## POWER SUPPLY SUPERVISOR WITH PWM CONTROLLER

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Last Modified: October 4, 2007

Document Version: 0.3

Revision Number	Revision
0.1	1.Preliminary
0.2	1.Modify the data value by the measurement
0.3	1.Modify Reference voltage (Typ. 2.45V ... ) on page 3