Translated from chinese by:
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ATX 2005

POWER SUPPLY PWM SUPERVISOR

Power Supply Pulse Width Modulation Integrated Circuit Controller

Specs
(English version)

version 1.0

April, 2012

Original chinese document downloaded from:
http://www.4shared.com/office/_E8A5czR/ATX_2005.html

General Description

The integrated circuit ATX-2005 is a pulse width modulation (PWM) controller, which can be used in the power supplies' secondary side, ready to provide the total voltage and load switching control.

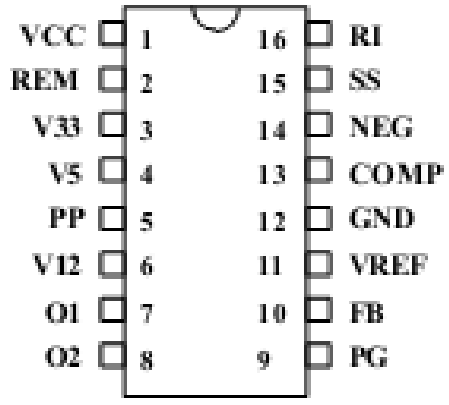
ATX-2005 has all inside functions for protection and control, undervoltage/overvoltage detection, output voltage status monitor (PG), external remote control (REM)... and more.

The ATX-2005 is able to set the power supply's behavior in order to reduce the external devices usage to get required control. The undervoltage (UVP) and overvoltage (OVP) modules assist the 3.3V, 5V, and 12V voltage levels. The PP function is set to monitor power and negative voltages, and a built-in shunt regulator module (the 431 shunt regulator) is built to make the PWM's correct level control, providing a stable output voltage through a group of amplifiers that monitor the feedback pattern. Besides, the anti-noise filter prevents malfunction caused by outer interference.

Features

- 3.3V / 5V e 12V Overvoltage Protection
- 3.3V / 5V / 12V Undervoltage Protection
- 3.3V / 5V / 12V Undervoltage Detection
- PP: Overcharge and Negative voltage protection
- Pulse Width Modulation (PWM) control device
- "Soft-Start" improvement, using external capacitor to perform easy quick start
- RI – External resistor to settle down the internal reference current, noise immunity and delay time protection
- PG-Shifter: monitor the normal voltage condition test
- Undervoltage Protection (UVP): noise reduction function added
- Overvoltage Protection (OVP): noise reduction function added
- Undervoltage Protection (UVP): 250ms delay time function
- Remote switching control (REM): noise reduction function added
- Built-in shunt regulator to provide stable output voltage (431 Shunt Regulator)
- Package type: 16-Pins Dual In-line Package (DIP-16)

Pin Assignment



Pinning

Pin	Symbol	Function	Description
1	VCC	Source	Positive power source input
2	REM	Input	Remote switch on/off signal (low: On / high: Off)
3	V3.3	Input	3,3V voltage monitor
4	V5	Input	5V voltage monitor
5	PP	Input	Power/ Negative voltage protection input
6	V12	Input	12V voltage monitor
7	O1	Output	Open collector output driver #1
8	O2	Output	Open collector output driver #2
9	PG	Output	"Power Good" status sensor input
10	FB	Output	Shunt (shunt regulator) output
11	VREF	Input	Shunt (shunt regulator) input
12	GND	Ground	Negative power source input
13	COMP	Output	Compensation OpAmp output *– Duty Cycle Control*
14	NEG	Input	Compensation OpAmp negative input *– Negative Feedback Sensor*
15	SS	Input	Compensation OpAmp positive input *– Soft-start Capacitor pin*
16	RI	Input	External connection of a resistor to set the internal reference current value, this feature can also adjust the internal noise immunity and protection delay time

Limiting Values

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage	VCC		4,5	5	5,5	V
Power dissaption	Pd		--	1000	--	mW
Operating temperature			-10	--	+70	℃
Storage temperature			-65	--	+150	℃

Electrical Characteristics
TA temperature = 25 °C, main voltage VCC = 5V

Voltage protection levels (V33, V5, V12, PP)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Overvoltage • Protection	V33	PG low	3.9	4.1	4.4	V
	V5	PG low	5.6	6.0	6.4	V
	V12	PG low	13.4	14.0	14.4	V
	PP	PG low	2.3	2.6	2.8	V
Undervoltage • Protection	V33	PG low	2.0	2.4	--	V
	V5	PG low	3.0	3.6	--	V
	V12	PG low	5.9	7.1	--	V
Undervoltage • Detection	V33	PG low	2.6	2.9	3.1	V
	V5	PG low	4.1	4.45	4.7	V
	V12	PG low	9.6	10.3	10.7	V
Undervoltage • Delay Time	Td1	Remon On/Off	150	250	350	ms

Start Switch – On/Off (REM)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
High Level Input Voltage	VIH	---	1.8			V
Low Level Input Voltage	VIL	---			0.8	V
REMOTE Delay Time	$t_{db\text{-}rem}$	---	22	28	34	ms
REMOTE OFF Delay Time	$t_{db\text{-}remoff}$	---			4	ms

Pulse Width Modulation (PWM) Output 1, 2 (O1, O2)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Leakage Current	$I_{LEAKAGE}$	Output = 5v	--	5	--	uA
Duty Cycle (máx.)	DC_{max}	Duty cycle (max.)	84	--	93	%

Power Good Sensor (PG)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
PG – Leakage Current	I_{PGL}	PG=5V	--	--	2	uA
PG – Delay Delay Time	Td	--	100	220	400	ms
Output Voltage Low level	V_{OL}	I_{PGO}=10mA	--	0.2	0.4	V

Shunt Regulator (VREF FB)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reference voltage for Shunt Reg.	V_{REF}	I_{FB} = 0.5mA	2.45	2.50	2.55	V
Output Sink Current	I_{OUT}	V_{FB} > 3V	10	--	--	mA

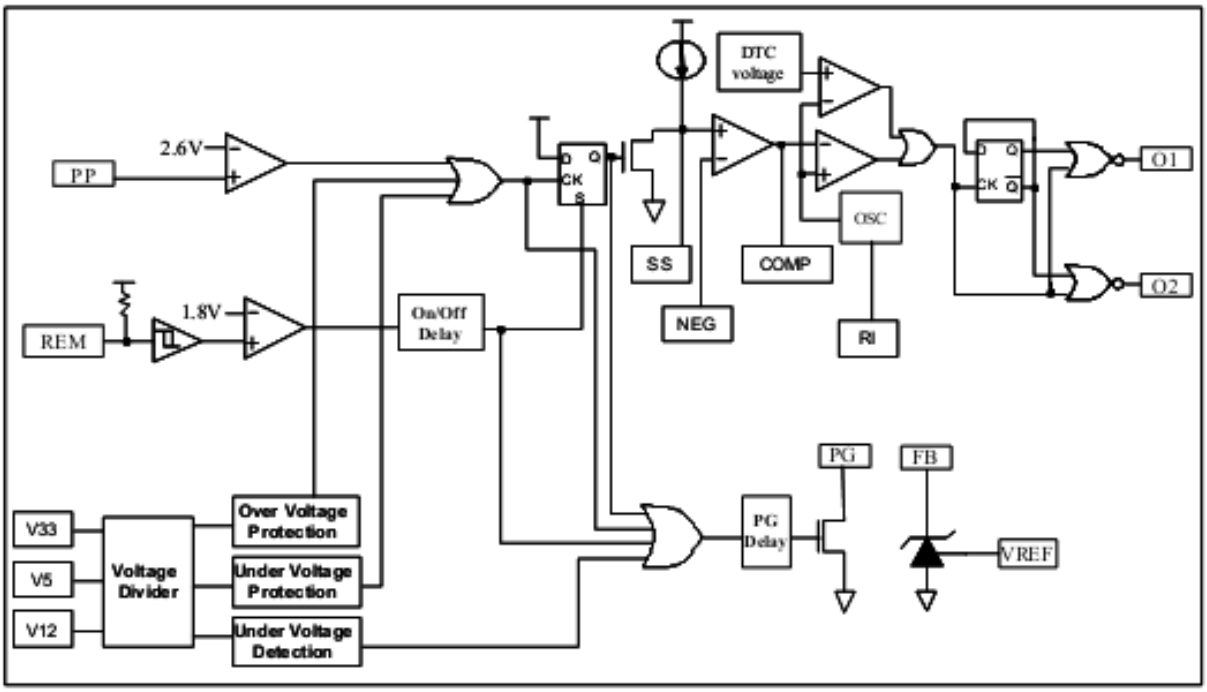
Op-amp OP (COMP NEG, e SS)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Close Loop Voltage gain	--	0.5V~3.5V	--	65	--	dB
Cross over crossing point	--	0 dB	--	310	--	KHZ

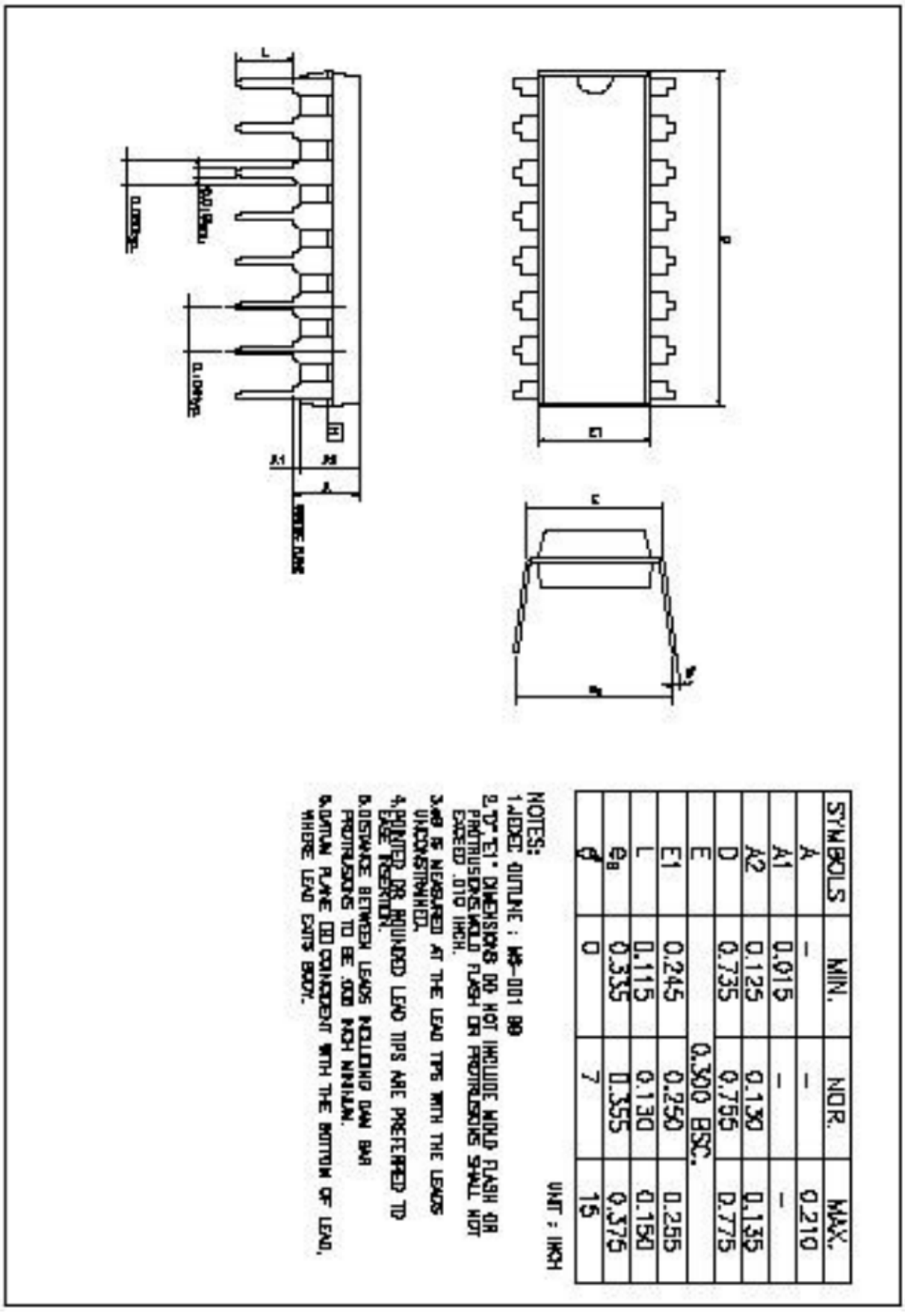
Soft-start (SS,RI)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Soft Start charge current	I_{CH}	RI=75KΩ	8.0	9.5	11.0	μA

Reference:
Internal Control Circuit Diagram



Package Outline



SYMBOLS	MIN.	NOR.	MAX.
A	–	–	0.210
A1	0.015	–	–
A2	0.125	0.130	0.135
D	0.735	0.755	0.775
E		0.300 BSC.	
E1	0.245	0.250	0.255
L	0.115	0.130	0.150
e_B	0.335	0.355	0.375
θ	0	7	15

UNIT : INCH

NOTES:
1.JEDEC OUTLINE : MS-001 BB
2."D" "E1" DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED .010 INCH.
3."B" IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
4.POINTED OR ROUNDED LEAD TIPS ARE PREFERRED TO EASE INSERTION.
5.DISTANCE BETWEEN LEADS INCLUDING DAM BAR PROTRUSIONS TO BE .008 INCH MINIMUM.
6.DATUM PLANE [H] COINCIDENT WITH THE BOTTOM OF LEAD, WHERE LEAD EXITS BODY.