Winbond
ACPI-STR Controller
W83305S
W83305G

W83305S

Data Sheet Revision History

	PAGES	DATES	VERSION	VERSION ON WEB	MAIN CONTENTS
1		Apr./06	0.5	N.A.	All version before 0.5 are for internal use only

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Winbond customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Winbond for any damages resulting from such improper use or sales.

Table of Contents-

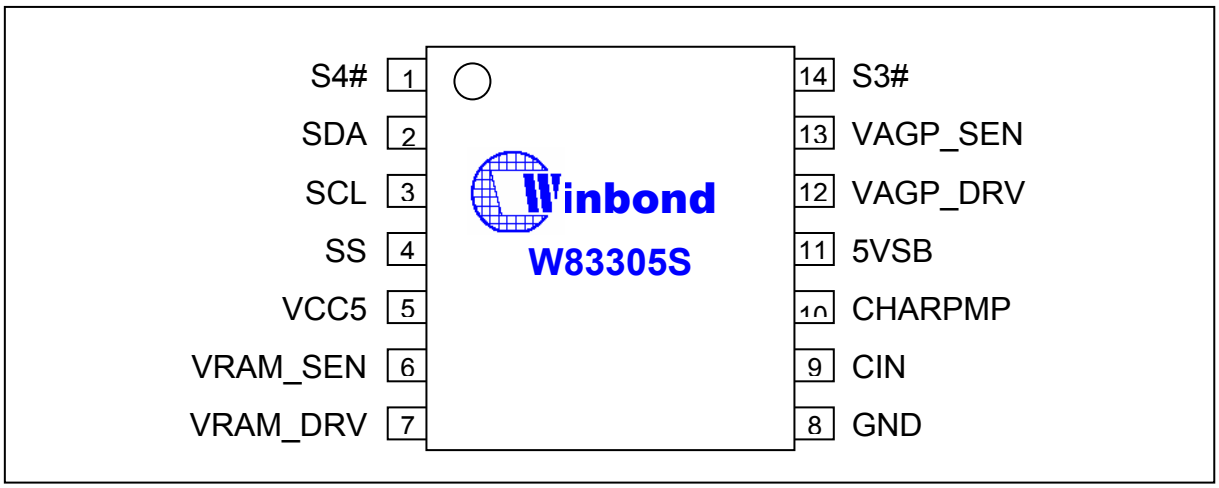
1. GENERAL DESCRIPTION

W83305S is a new power management IC which compliant ACPI specification 2.0 for desktop PC and motherboard. The chip regulates two most voltage-relative powers for DDR SDRAM and AGP slot applications. As the two devices on board, a stable, reliable, and programmable power should be performed for higher reliability, stability, compatibility and better-performance for diverse combination of devices (RAM module and AGP card). The chip is operated basing on a simple dual-wire bus SMBus. Via SMBus control, the power for DDR SDRAM can be adjusted ranging from 2.50V to 3.00V; and the power for AGP slot can be adjusted ranging from 1.50V to 2.00V with 50mV/step. Besides for safety consideration, linear under voltage and soft-start are applied on the two regulated powers. With design of W83305S, a **cost-effective**, **sample, modular, stable, reliable, flexible** and **high-performance** power solution is provides for the motherboard and desktop PC design.

2. FEATURES

- Provides ACPI-Compliant Voltages
  - Programmable 2.55V_{STR} Power for DDR SDRAM
  - Programmable 1.55V_{CC} Power for AGP Slot
- I2C Interface
- Internal Charge Pump Support Voltage Up to 9.5V
- Drive All N-Channel MOSFET
- Soft Start
- Under-Voltage Protection for VAGP, VRAM
- Small footprint package 14-SOP 150mil

3. PIN CONFIGURATION



4. PIN DESCRIPTION

NO	NAME	I/O	FUNCTION DESCRIPTION
1	S4#	I_{ST}	ACPI control signal.
2	SDA	I/O	I2C Interface Pins. The address is defined as 5EH (0101 111X), and X is used to control read/write.
3	SCL	I	
4	SS	I	Soft-Start Pin. Attach an external capacitor (0.1u) on this pin to adjust the soft-start slope-rate.
5	VCC5	I_{ST}	Power VCC5 Input.
6	VRAM_SEN	I	Linear Regulator for DDR SDRAM.
7	VRAM_DRV	O	
8	GND	P	Power Ground.
9	C_{IN}	I	Charge Pump Pins. It supports 5mA driving current and insures output voltage 10V or above.
10	CHRPMP	P	
11	5VSB	P	Power Pin.
12	VAGP_DRV	O	Linear Regulator for AGP slot.
13	VAGP_SEN	I	
14	S3#	I_{ST}	ACPI Control Signal.

5. REGISTER DESCRIPTION

5.1 CR01 (VAGP Over-clocking Configuration Register, Default 0x00h, Read/Write)

BIT0	BIT1	BIT2	V_{AGP} OUTPUT (V)
0	0	0	1.55
0	0	1	1.50
0	1	0	1.60
0	1	1	1.65
1	0	0	1.70
1	0	1	1.80
1	1	0	1.90
1	1	1	2.00

5.2 CR02 (VRAM Over-clocking Configuration Register, Default 0x00h, Read/Write)

BIT0	BIT1	BIT2	V_{RAM} OUTPUT (V)
0	0	0	2.55
0	0	1	2.50
0	1	0	2.60
0	1	1	2.65
1	0	0	2.70
1	0	1	2.80
1	1	0	2.90
1	1	1	3.00

CR03 (Linear Under Voltage Enable/Disable Register, Default 0x03h, Read/Write)

Bit1: Linear under voltage protection enable/disable bit for V_{AGP}

0: Disable 1: Enable

Bit0: Linear under voltage protection enable/disable bit for V_{RAM}

0: disable 1: Enable

5.3 Index 4Ch - Winbond Vendor ID (Low Byte)

Power-on default [7:0] = 1010, 0011 b (A3h)

BIT	NAME	READ/WRITE	DESCRIPTION
7:0	VIDL[7:0]	Read Only	**Vendor ID Low Byte.** Default A3h.

5.4 Index 4Dh - Winbond Vendor ID (High Byte)

Power-on default [7:0] = 0101, 1100 b (5Ch)

BIT	NAME	READ/WRITE	DESCRIPTION
7:0	VIDH[7:0]	Read Only	**Vendor ID High Byte.** Default 5Ch

5.5 Chip ID -- Index 4Eh

Power on default [7:0] = 1010, 0000 b

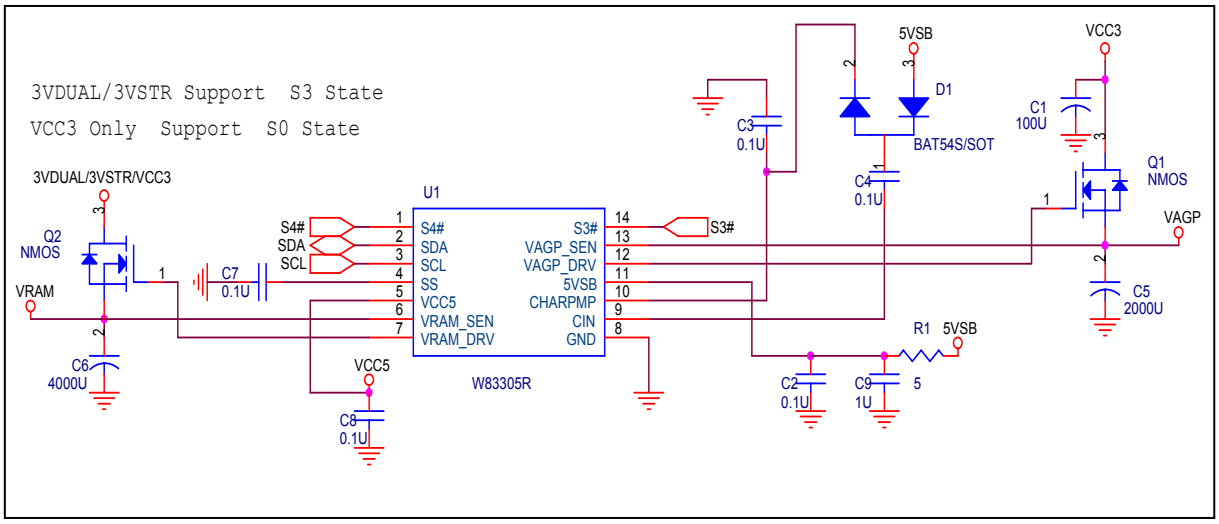
BIT	NAME	READ/WRITE	DESCRIPTION
7-0	CHIPID[7:0]	Read Only	**Winbond Chip ID number.** Read this register will return 0xa0h for W83305S.

5.6 Reversion ID -- Index 4Fh

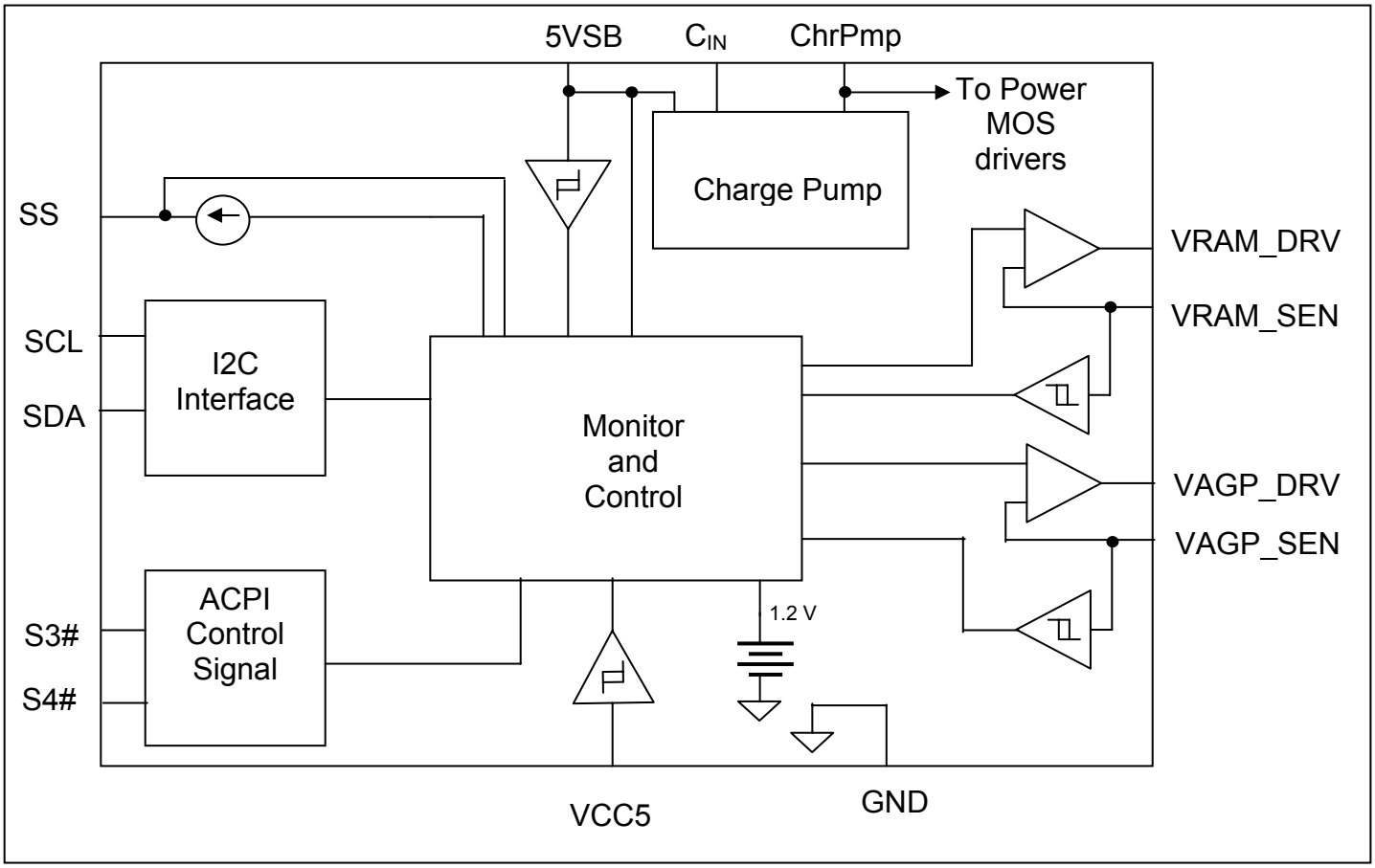
Power on default [7:0] = 0000, 0000 b

BIT	NAME	READ/WRITE	DESCRIPTION
7-0	CHIPID[7:0]	Read Only	**Winbond Chip ID number.** Read this register will return 0x00h for W83305S.

6. APPLICATION CIRCUIT



7. INTERNAL BLOCK DIAGRAM



8. ELECTRICAL CHARACTERISTICS

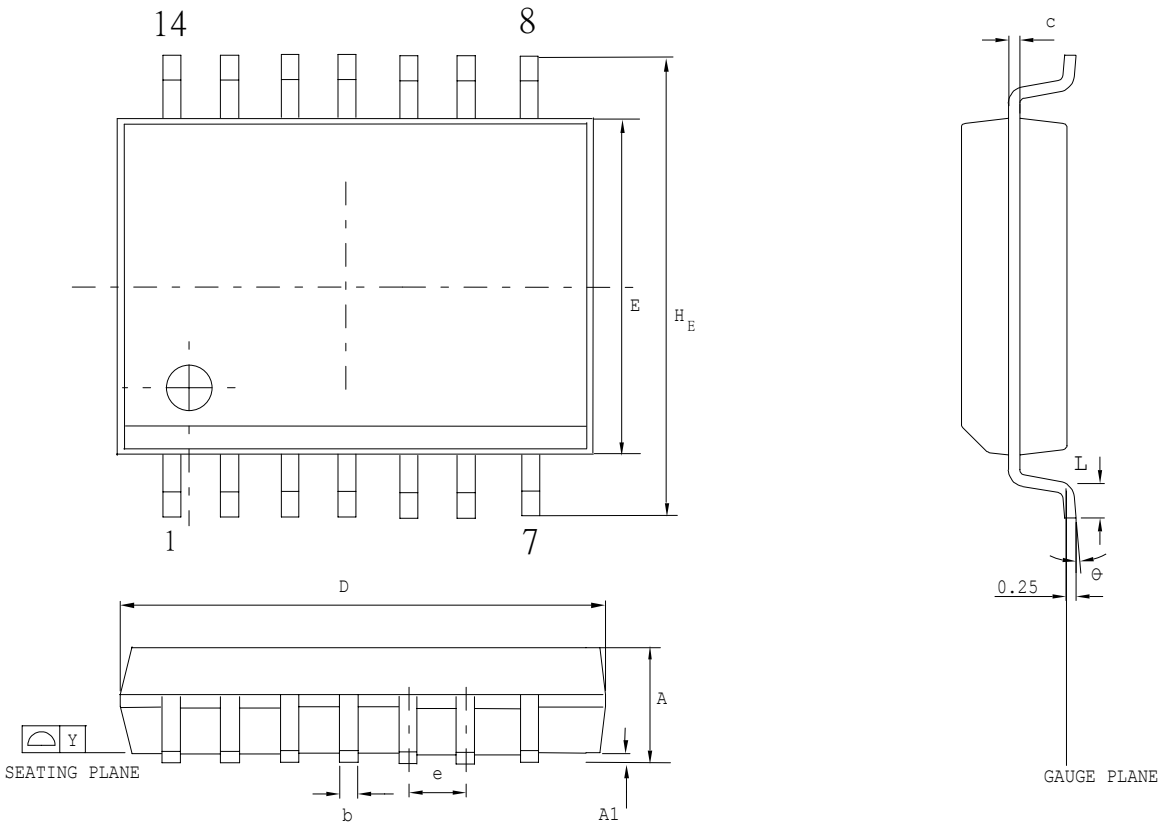
AC Characteristics

VCC=5V ± 5 %, T_A = 0°C TO +70°C						
PARAMETER	**SYMBOL**	**MIN**	**TYP**	**MAX**	**UNITS**	**TEST CONDITIONS**
VAGP REGULATOR 0						
Nominal Output Voltage			1.55		V	CR01(bit0,bit1,bit2)=000
Nominal Output Voltage			1.50		V	CR01(bit0,bit1,bit2)=001
Nominal Output Voltage			1.60		V	CR01(bit0,bit1,bit2)=010
Nominal Output Voltage			1.65		V	CR01(bit0,bit1,bit2)=011
Nominal Output Voltage			1.70		V	CR01(bit0,bit1,bit2)=100
Nominal Output Voltage			1.80		V	CR01(bit0,bit1,bit2)=101
Nominal Output Voltage			1.90		V	CR01(bit0,bit1,bit2)=110
Nominal Output Voltage			2.00		V	CR01(bit0,bit1,bit2)=111
Regulation				5	%	
Under-Voltage Falling Threshold			73.3 %		%	
VAGP_DRV Output Voltage		8			V	CR0F=80h I(VAGP_DRV) < 0.1mA
VRAM2.5 REGULATOR						
Nominal Output Voltage			2.55		V	CR02(bit0,bit1,bit2)=000
Nominal Output Voltage			2.50		V	CR02(bit0,bit1,bit2)=001
Nominal Output Voltage			2.60		V	CR02(bit0,bit1,bit2)=010
Nominal Output Voltage			2.65		V	CR02(bit0,bit1,bit2)=011
Nominal Output Voltage			2.70		V	CR02(bit0,bit1,bit2)=100
Nominal Output Voltage			2.80		V	CR02(bit0,bit1,bit2)=101
Nominal Output Voltage			2.90		V	CR02(bit0,bit1,bit2)=110
Nominal Output Voltage			3.00		V	CR02(bit0,bit1,bit2)=111
Regulation				5	%	
Under-Voltage Falling Threshold			76%		%	
MAX VRAM_2.5_DRV Output Voltage		8			V	I(VRAM_2.5_DRV) < 0.1mA

CHARGE PUMP						
Charge Pump Frequency		160	200	240	KHz	
Charge Pump Voltage		9.2	9.5			

LOGIC LEVEL		HIGH	LOW
S3	2.55±0.3V	2.55±0.3V	
S4	2.55±0.3V	2.55±0.3V	

9. PACKAGE SPECIFICATION



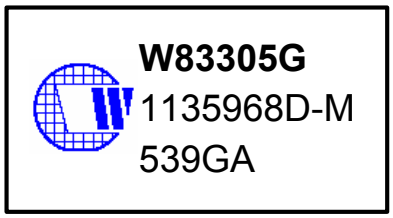
Control demensions are in milmeters .

SYMBOL	DIMENSION IN MM		DIMENSION IN INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
b	0.33	0.51	0.013	0.020
c	0.19	0.25	0.008	0.010
E	3.80	4.00	0.150	0.157
D	8.55	8.75	0.337	0.344
e	1.27 BSC		0.050 BSC	
H_E	5.80	6.20	0.228	0.244
Y	—	0.10	—	0.004
L	0.40	1.27	0.016	0.050
θ	0	8	0	8

10. ORDERING INFORMATION

PART NO.	PACKAGE	REMARKS
W83305S	14-SSOP	Operation - Commercial 0~70℃
W83305G	14 SSOP	Operation - Commercial 0~70℃ PB-free package

11. HOW TO READ THE TOP MARKING



Left Line: Winbond Logo

1st Line: IC Part No - W83305S,W83305G(Pb-free package)

2nd Line: IC Lot No – XXXXXXXX

3rd Line: Assembly Date (X: Assembly Year + XX: Assembly Week) + Assembly House Code (G- GR; O- OSE; A- ASE, etc…) + IC Version (X)

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