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IT8281M

K8 Power Sequence Controller

Preliminary Specification V0.1

INTEGRATED TECHNOLOGY EXPRESS, INC.

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Contents

Figures

Tables

1. Features

- **K8 Power Sequence Controller**
  - Built-in enhanced voltage comparator
- **System Power-Good Generation**
  - Built-in power-good glue logic
- **Single 5VSB Power Supply**
- **16-pin SOP**

2. General Description

The IT8281M incorporates glue logics for AMD K8 CPU power sequence application and provides the system power-good request.

Outstanding features of this controller IC include special voltage comparators for VLDT, VDDA and VDIMM_STR power detected without the need of any external components. All power-good generation circuits support AMD K8 main board design for saving glue logics cost.

The following figure is the application hint.

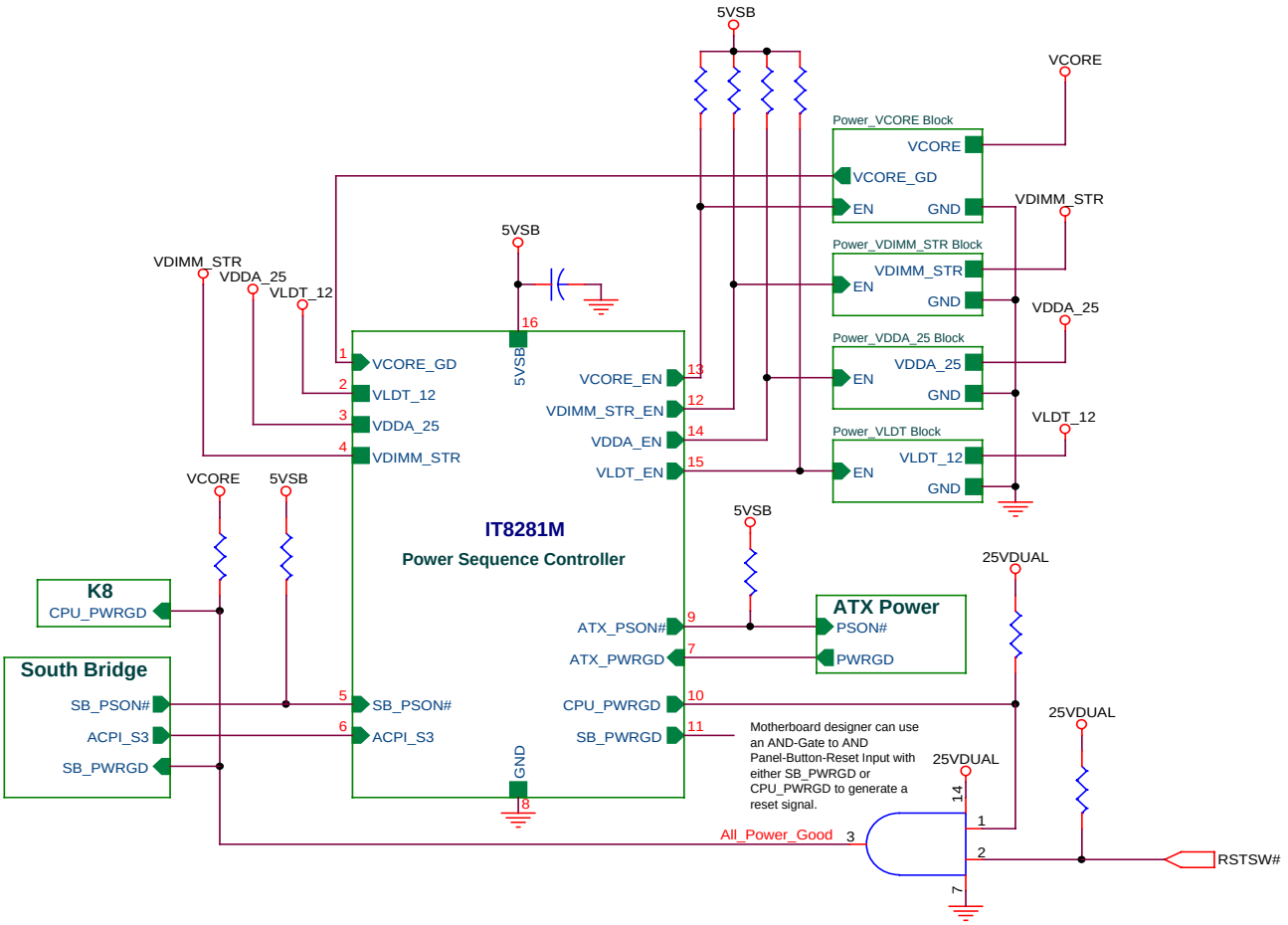
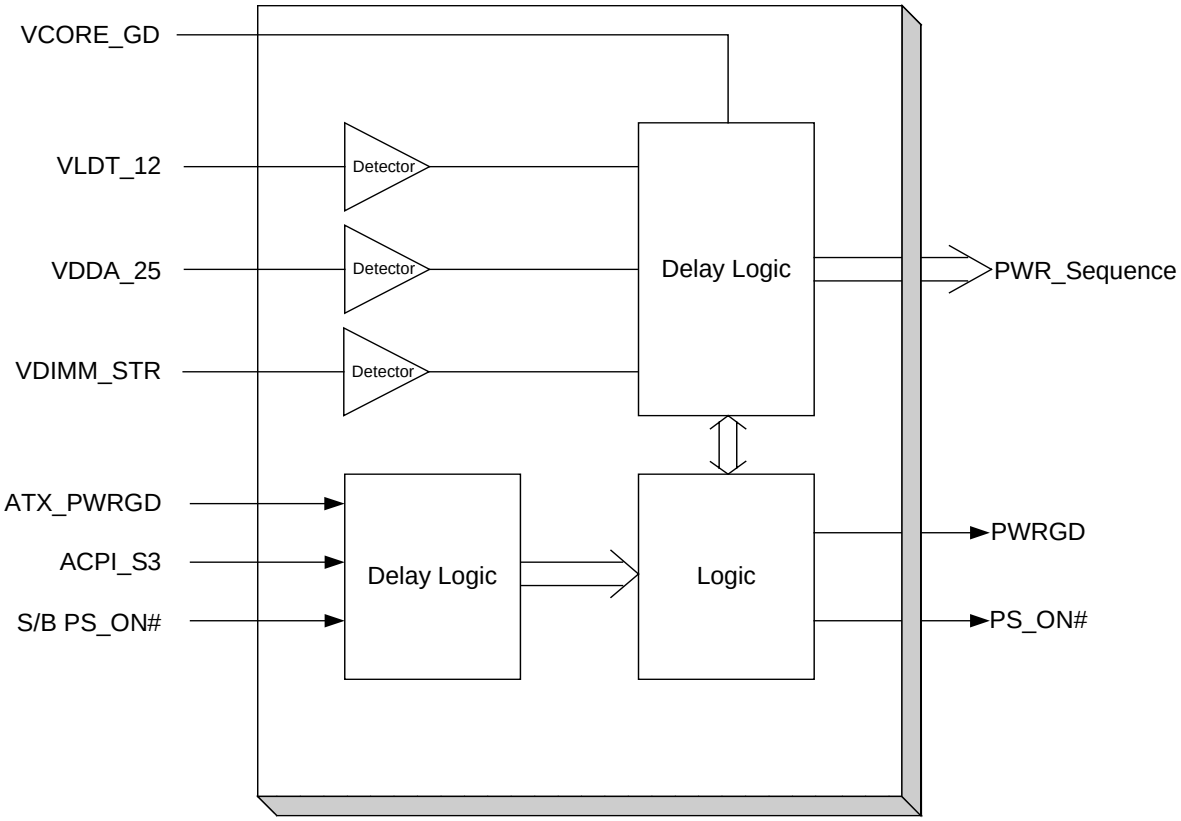


Figure 2-1. Application Circuit

3. Block Diagram



4. Pin Configuration

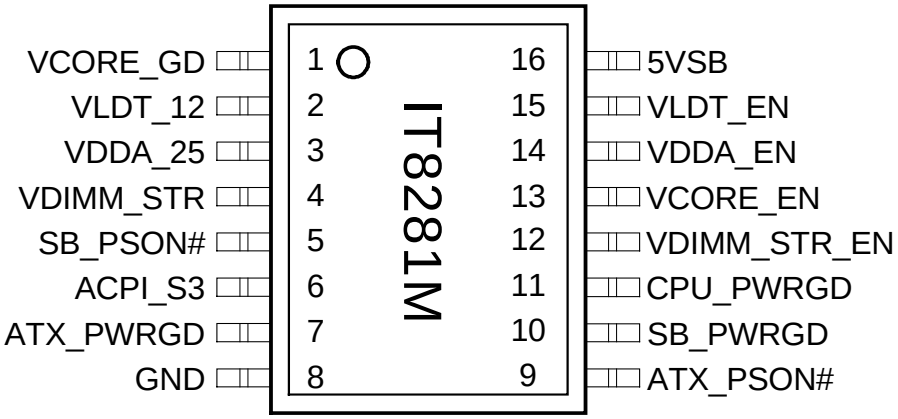


Table 4-1. Pins Listed in Numeric Order

Pin	Signal	Pin	Signal
1	VCORE_GD	9	ATX_PSON#
2	VLDT_12	10	SB_PWRGD
3	VDDA_25	11	CPU_PWRGD
4	VDIMM_STR	12	VDIMM_STR_EN
5	SB_PSON#	13	VCORE_EN
6	ACPI_S3	14	VDDA_EN
7	ATX_PWRGD	15	VLDT_EN
8	GND	16	5VSB

5. IT8281M Pin Descriptions

Table 5-1. Pin Descriptions of Power Sequence

Pin(s) No.	Symbol	Attribute	Description
1	VCORE_GD	DI	***VCORE Power- Good.*** Active high. This pin indicates that the power-good signal from the PWM controller for CPU core voltage.
2	VLDT_12	AI	***VLDT (1.2V) analog inputs.***
3	VDDA_25	AI	***VDDA (2.5V) analog inputs.***
4	VDIMM_STR	AI	***VDIMM DUAL STR (2.5V) analog inputs.***
5	SB_PSON#	DI	***South Bridge PSON#.*** Active low. This signal is connected to the PSON# signal from the south bridge or Super I/O to control the on/off of ATX power supply.
6	ACPI_S3	DI	***A GPIO pin from S/B.*** Active high. This pin indicates that the system is in ACPI S3 state.
9	ATX_PSON#	DOD8	***ATX Power PSON#.*** Active low. The function of this pin is ATX Power Supply On-Off.
12	VDIMM_STR_EN	DOD8	***VDIMM STR Enable.*** Active high. The function of this pin is to enable the PWM for VDIMM_STR dual voltage.
13	VCORE_EN	DOD8	***VCORE Enable.*** Active high. The function of this pin is to enable the PWM for CPU VCORE.
14	VDDA_EN	DOD8	***VDDA Enable.*** Active high. The function of this pin is to enable the VDDA power for K8 CPU.
15	VLDT_EN	DOD8	***VLDT Enable.*** Active high. The function of this pin is to enable the VLDT voltage.

Table 5-2. Pin Descriptions of Power-Good Generation

Pin(s) No.	Symbol	Attribute	Description
7	ATX_PWRGD	DI	***ATX Power-Good.*** Active high. Input indicates that ATX power supply power-good is ready.
10	SB_PWRGD	DOD8	***South Bridge Power-Good.*** Active high. Output indicates that the south bridge power-good is ready.
11	CPU_PWRGD	DOD8	***CPU Power-Good.*** Active high. Output indicates that CPU power-good is ready.

Table 5-3. Pin Descriptions of Power/Ground Signals

Pin(s) No.	Symbol	Attribute	Description
8	GND	PWR	***Ground***
16	5VSB	PWR	***+5V Standby Power Supply***

IO Cell:
DOD8: 8mA Digital Open-Drain Output buffer
AI: Analog input
DI: Digital Input

6. DC Characteristics (VCC = 5.0V±5%. Ta=0°C to 70°C)

Absolute Maximum Ratings

Power Supply (V_{CC}) ..... -0.5V to 7.0V

Input Voltage ..... -0.5V to VCC + 0.5V

Output Voltage ..... -0.5V to VCC + 0.5V

Storage Temperature ..... -55°C to 125°C

***Comments**

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

DC Electrical Characteristics (Operation Condition Vcc=5V ± 5%, Ta = 0°C to + 70°C)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
AI Type Buffer						
V_{trig}	Trigger point for VDDA_25 and VDIMM_STR	VCC=5V	-	2.25	-	V
V_{trig}	Trigger point for VLDT_12	VCC=5V	-	1.0	-	V
DOD8 Type Buffer						
V_{OL}	Output Low Voltage	I_{OL}=8mA	-	-	0.4	V
V_{OH}	Output High Voltage	I_{OH}=8mA	2.4	-	-	V
DIOD8 Type Buffer						
V_{IL}	Input Low Voltage		-	-	0.8	V
V_{IH}	Input High Voltage		2.2	-	-	V
V_{OL}	Output Low Voltage	I_{OL}=8mA	-	-	0.4	V
I_{IL}	Low Input Leakage current	V_{IN}=0	-	10		uA
I_{IH}	High Input Leakage current	V_{IN}=VCC	-	-	-10	uA
I_{OZ}	Tri-state leakage current		-	-	20	uA
DI Type Buffer						
V_{IL}	Input Low Voltage		-	-	0.8	V
V_{IH}	Input High Voltage		2.2	-	-	V
I_{IL}	Input Leakage current	V_{IN}=0	-	10	-	uA
I_{IH}	High Input Leakage current	V_{IN}=VCC	-	-	-10	uA

7. AC Characteristics

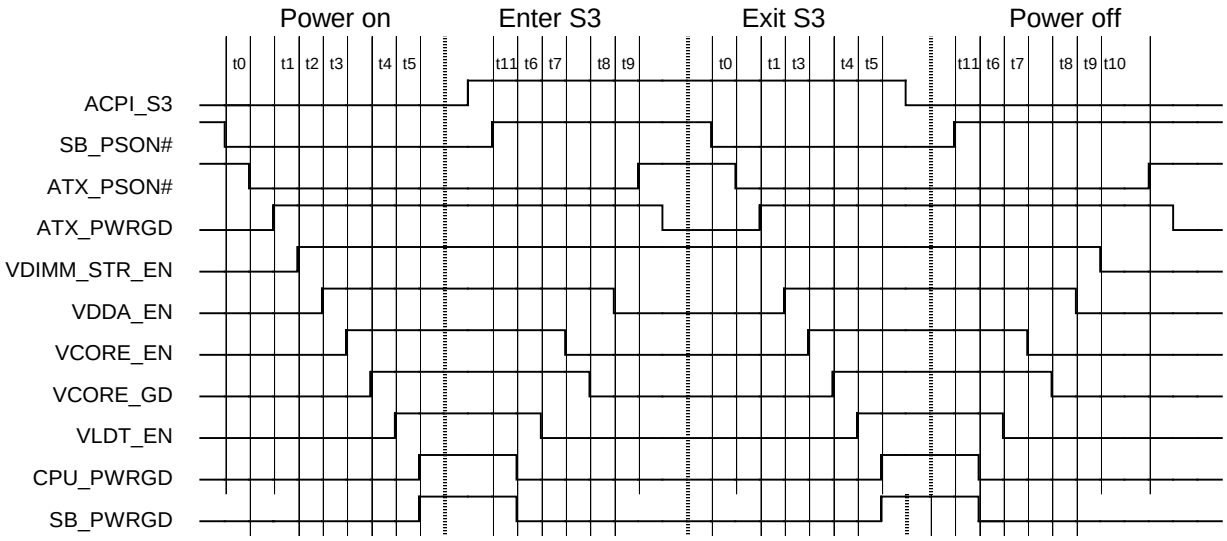


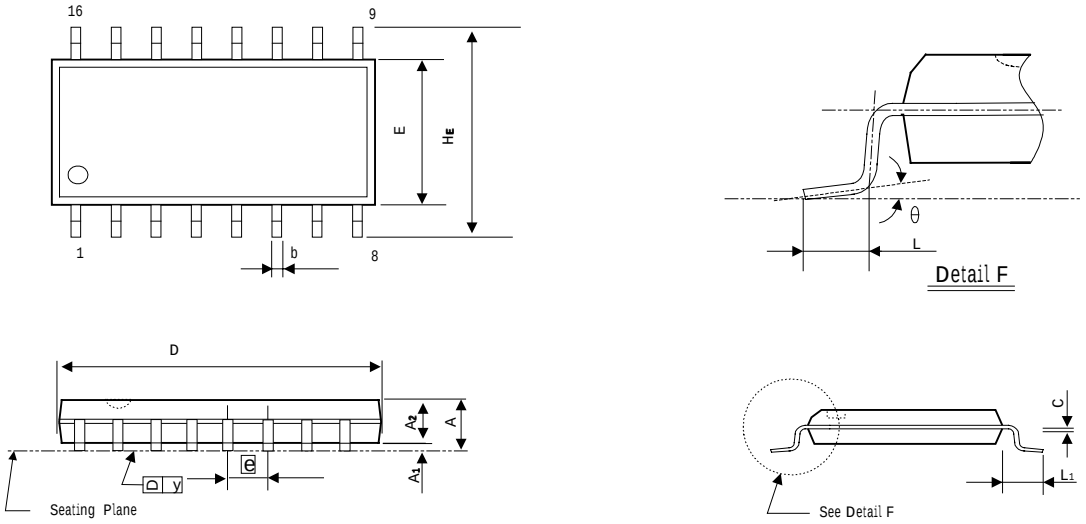
Table 7-1. AC Timing Parameter

Item	Max	Typ	Min	Description
t0		1us	0	The falling edge of SB_PSON# to the assertion of ATX_PSON#.
t1		50us		The rising edge of ATX_PWRGD to the assertion of VDIMM_STR_EN
t2	50us + t_vdimm_gd		50us	The assertion of VDIMM_STR_EN to the assertion of VDDA_EN. The t_vdimm_gd is the rise time of the VDIMM_STR_EN voltage from 0V to 2.25V.
t3	50us + t_vdda_gd		50us	The assertion of VDDA_EN to the assertion of VCORE_EN. The t_vdda_gd is the rise time of the VDDA voltage from 0V to 2.25V.
t4		50us		The rising edge of VCORE_GD to the assertion of VLDT_EN.
t5	50us + t_vldt_gd		50us	The assertion of VLDT_EN to the assertion of CPU_PWRGD and SB_PWRGD. The t_vldt_gd is the rise time of the vldt voltage from 0V to 1.0V.
t6		50us		The de-assertion of CPU_PWRGD and SB_PWRGD to the de-assertion of VLDT_EN.
t7		10ms		The de-assertion of VLDT_EN to the de-assertion of VCORE_EN.
t8		10ms		The falling edge of VCORE_GD to the de-assertion of VDDA_EN.
t9		10ms		The de-assertion of VDDA_EN to the de-assertion of VDIMM_STR_EN or ATX_PSON#.
t10		50ms		The de-assertion of VDIMM_STR_EN to the de-assertion of ATX_PSON#.
t11		50us		The rising edge of SB_PSON# to the de-assertion of CPU_PWRGD and SB_PWRGD.

8. Package Information

SOP16L Outline Dimensions

unit: inches/mm



Symbol	Dimension in inches			Dimension in mm		
	Min	Nom	Max	Min	Nom	Max
A	0.053	0.064	0.069	1.35	1.63	1.75
A1	0.004	0.006	0.010	0.10	0.15	0.25
A2	0.051	0.055	0.059	1.30	1.40	1.50
b	0.013	0.016	0.020	0.33	0.41	0.51
C	0.007	-	0.010	0.19	-	0.25
D	0.386	0.390	0.394	9.80	9.91	10.01
E	0.150	0.154	0.157	3.80	3.90	4.00
e	0.050BSC			1.27BSC		
HE	0.228	0.236	0.244	5.80	6.00	6.20
L	0.016	0.025	0.050	0.40	0.64	1.27
L1	0.042REF.			1.07REF.		
y	-	-	0.004	-	-	0.10
θ	0°	-	8°	0°	-	8°

9. Ordering Information

Part No.	Package
IT8281M	16 SOP