



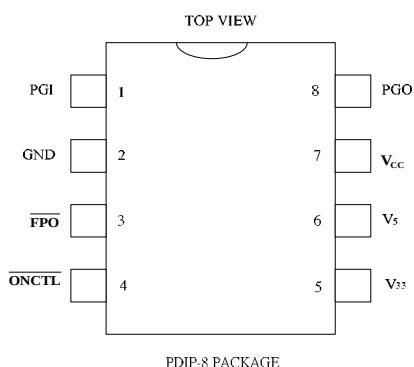
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3-CHANNEL PC POWER SUPPLY SUPERVISOR

FEATURES

- 3-Channel PC Power Supply Supervisor
- Over Voltage Protection for 3.3V, 5V, and 12V
- Under Voltage Protection for 3.3V, 5V
- Fault Protection Output with Open Drain Output
- Open Drain Power Good Output
- 300 ms Power Good Delay
- 2.3 ms $\overline{\text{ONCTL}}$ to $\overline{\text{FPO}}$ Turn Off Delay
- 38 ms $\overline{\text{ONCTL}}$ Signal De-bounce
- 73 μs Noise De-bounce Time
- Latch Function Controlled by $\overline{\text{ONCTL}}$ and Protection Input.

PIN CONFIGURATION



GENERAL DESCRIPTION

The AAT1014 is a 3-channel PC power supply supervisor. It provides Over Voltage Protection (OVP), Under Voltage Protection (UVP), and Power Good Indicator to monitor and control the output of the switching power supply system.

Over voltage fault protection and under voltage fault protection can be directly triggered without any external voltage divider. AAT1014 could also greatly reduce the printed circuit board space for PC power supply system. Furthermore, remote function from external signal, *i.e.*, On/Off Control ($\overline{\text{ONCTL}}$), is also implemented.

The versatile AAT1014 comes in a compact PDIP-8 package with optimized external parts to offer its users simple and effective solutions.



FPO (Fault Protection Output)

NORMAL="LOW", FAULT="HIGH"

FPO indicates the fault condition of either Over Voltage or Under Voltage. When a fault state occurs, the FPO latches high and combines with a low PGO output.

PGO (Power Good Output)

NORMAL="HIGH", FAULT="LOW".

The Power Good signal will be issued with 300 ms delay after 3.3V, 5V, 12V and PGI are ready. Power Good Output should be low before the output voltage is out of regulation at turn-off.

OVP and UVP (Over Voltage Protection and Under Voltage Protection)

OVP monitors 3.3V, 5V, and 12V via V_{CC} pin, while UVP monitors 3.3V and 5V. OVP and UVP levels are determined by internal voltage dividers. The typical values are 3.9V, 6.1V, 13.4V for OVP and 2.69V, 4.3V for UVP, respectively.

$\overline{ONCTL}$ (On/Off Control)

On/Off Control is used to reset the latched state of $\overline{FPO}$ and to externally control the switching power supply system with 38 ms de-bounce time. AAT1014 offers 2.3 ms delay time after de-bounce to trigger $\overline{FPO}$ when $\overline{ONCTL}$ switches from low to high.

**PIN DESCRIPTION**

PIN NO	NAME	I/O	DESCRIPTION
1	PGI	I	Power Good Input
2	GND		Ground
3	$\overline{\text{FPO}}$	O	Inverted Fault Protection Output, Open Drain Output Stage
4	$\overline{\text{ONCTL}}$	I	ON/OFF Control
5	V_{33}	I	Over and Under Voltage Protection for 3.3V
6	V_5	I	Over and Under Voltage Protection for 5V
7	V_{CC}	I	Supply Voltage and 12V Over Voltage Protection Input
8	PGO	O	Power Good Output, Open Drain Output Stage

ABSOLUTE MAXIMUM RATINGS

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	16	V
$\overline{\text{FPO}}$ Output Voltage	$V_{\overline{\text{FPO}}}$	16	V
PGO Output Voltage	V_{PGO}	8	V
Supply Current	I_{CC}	1	mA
Operating Free-Air Temperature Range	T_C	- 20 to +85	°C
Storage Temperature Range	T_{storage}	- 45 to +125	°C

RECOMMENDED OPERATING CONDITIONS

		TEST CONDITION	MIN TYP MAX	UNIT
Supply Voltage, V_{CC}			4 15	V
Input Voltage, V_I	$\overline{\text{ONCTL}}, V_5, V_{33}, \text{PGI}$		7	V
Output Voltage	$V_{\overline{\text{FPO}}}$		15	V
	V_{PGO}		7	V
Output Sink Current, I_O (sink)	$I_{\overline{\text{FPO}}}$		30	mA
	I_{PGO}		10	mA
Supply Voltage Rising Time	t_r	See Note 1	1	ms

Note 1: V_{CC} slew rate must be less than 14 V/ms.



ELECTRICAL CHARACTERISTICS, $V_{CC} = 5\text{ V}$ (Unless Otherwise Specified)

OVP AND UVP

PARAMETER			TEST CONDITION	MIN	TYP	MAX	UNIT
Over Voltage Threshold	V_{33}			3.7	3.9	4.1	V
	V_5			5.7	6.1	6.5	
	V_{CC}			12.8	13.4	13.9	
Under Voltage Threshold	V_{33}			2.55	2.69	2.83	V
	V_5			4.10	4.30	4.47	
	V_{CC}				3.8		

PGO AND $\overline{\text{FPO}}$

PARAMETER		TEST CONDITION	MIN	TYP	MAX	UNIT
I_{LEAK}	Leakage Current (PGO)	PGO = 5 V			5	μA
V_{OL}	Low Level Output Voltage (PGO)	$I_{\text{sink}} = 10\text{ mA}$			0.4	V
I_{LEAK}	Leakage Current ($\overline{\text{FPO}}$)	$V(\overline{\text{FPO}}) = 5\text{ V}$			5	μA
V_{OL}	Low Level Output Voltage ($\overline{\text{FPO}}$)	$I_{\text{sink}} = 10\text{ mA}$			0.3	V
		$I_{\text{sink}} = 30\text{ mA}$			0.7	

PGI AND $\overline{\text{ONCTL}}$

PARAMETER		TEST CONDITION	MIN	TYP	MAX	UNIT
Input Threshold Voltage (PGI)			1.16	1.20	1.24	V
Input Pull-Up Current ($\overline{\text{ONCTL}}$)		$\overline{\text{ONCTL}} = 0\text{ V}$		150		μA
High-Level Input Voltage ($\overline{\text{ONCTL}}$)			2.4			V
Low-Level Input Voltage ($\overline{\text{ONCTL}}$)					1.2	V

OPERATING CURRENT

PARAMETER		TEST CONDITION	MIN	TYP	MAX	UNIT
I_{CC}	Supply Current	$\overline{\text{ONCTL}} = 5\text{ V}$			1	mA



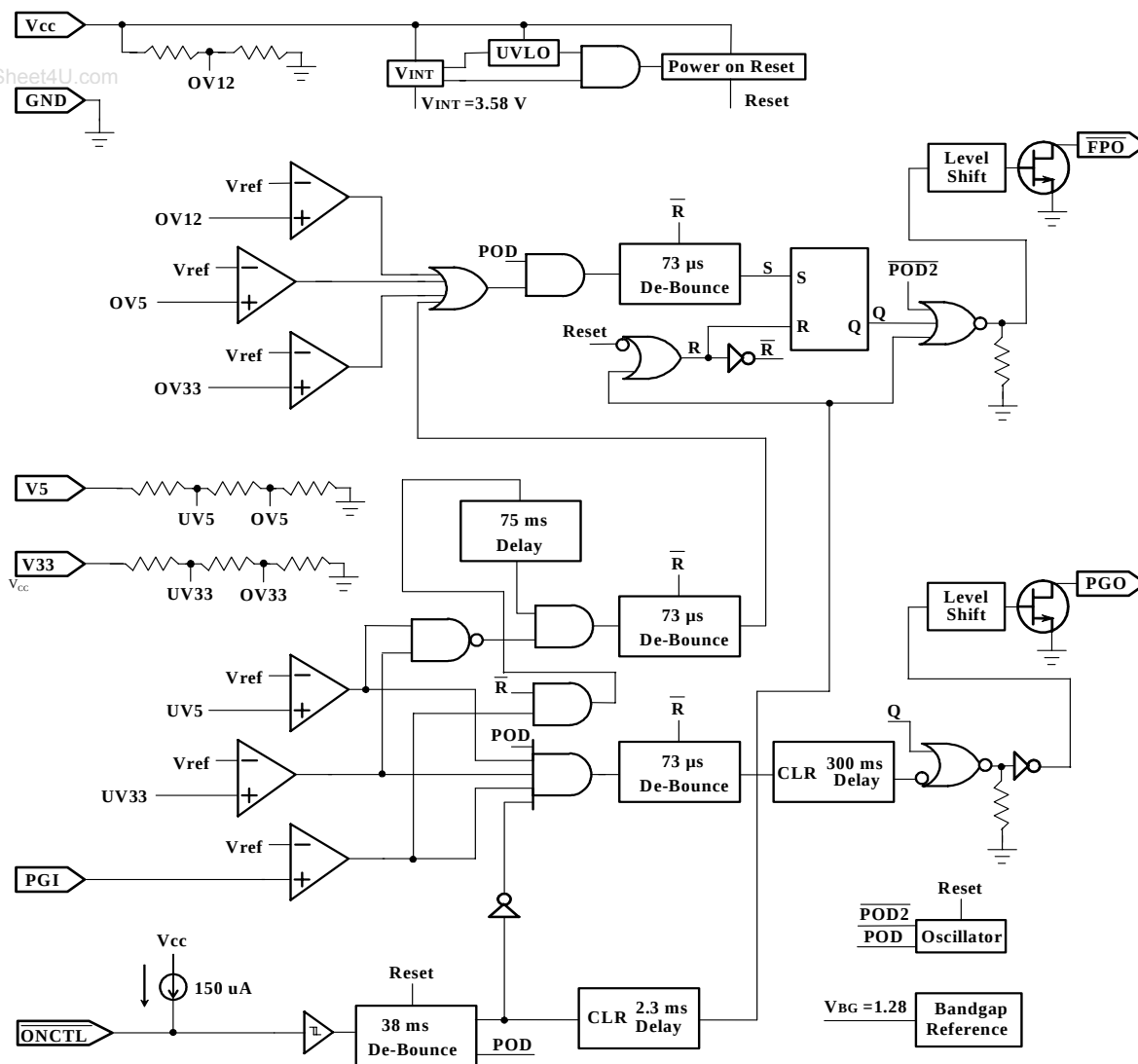
**ELECTRICAL CHARACTERISTICS, $V_{CC} = 5\text{ V}$ (Unless Otherwise Specified)
(CONT.)**

SWITCHING CHARACTERISTICS, $V_{CC} = 5\text{ V}$, $T_{op} = \text{FULL RANGE}$

PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
t_{d1} PGO Delay Time		200	300	490	ms
t_{d2} UVP Delay Time		65	75	122	ms
t_{d3} $\overline{\text{ONCTL}}$ off to $\overline{\text{FPO}}$ Delay Time		$t_{b1} + 1.1$	$t_{b1} + 2.3$	$t_{b1} + 4.4$	ms
t_{b1} $\overline{\text{ONCTL}}$ De-Bounce Time		32	38	61	ms
t_{b2} Noise De-Bounce Time		47	73	110	μs

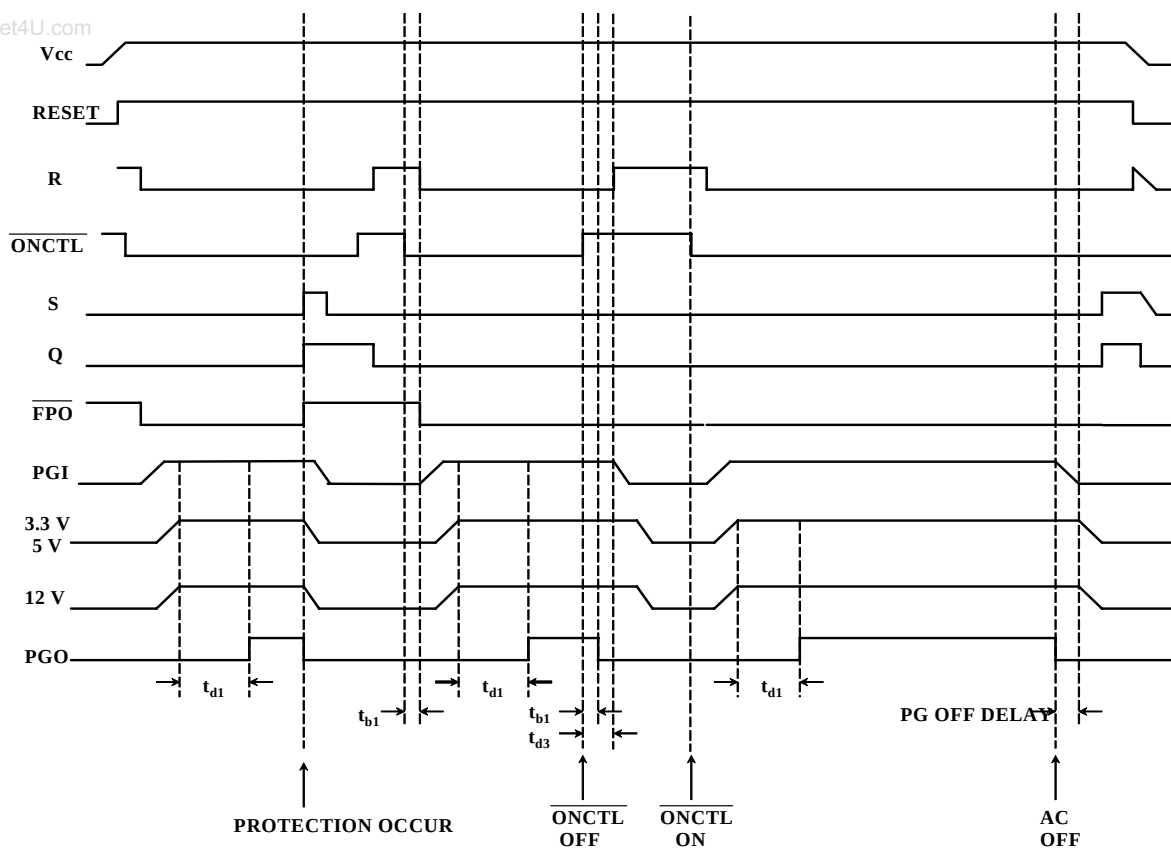


BLOCK DIAGRAM



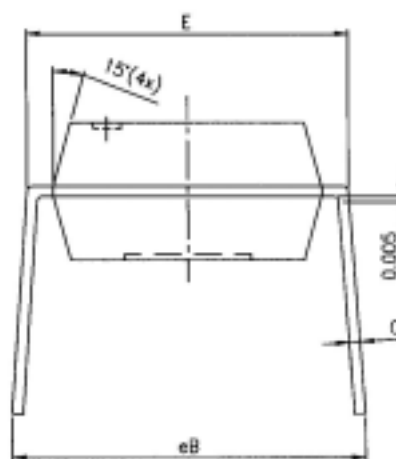
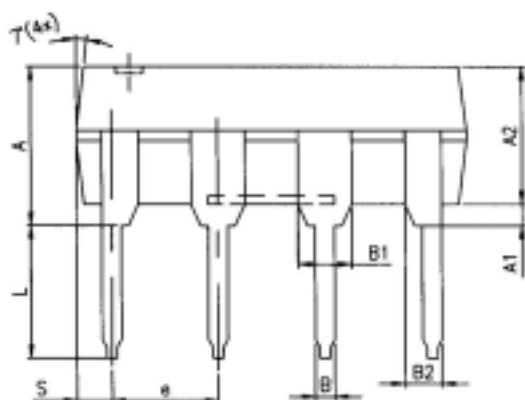
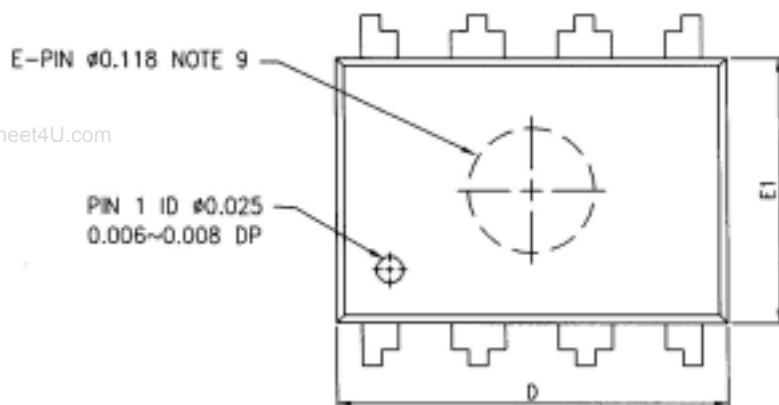


TIMING CHART





PACKAGE DIMENSION



**PACKAGE DIMENSION (CONT.)**

SYMBOL	DIMENSION IN MILLIMETERS			DIMENSION IN INCHES		
	MIN	TYP	MAX	MIN	TYP	MAX
A	3.6	3.9	4.2	0.142	0.154	0.165
A1	0.38	-----	-----	0.015	-----	-----
A2	3.25	3.30	3.45	0.128	0.130	0.136
B	0.36	0.46	0.56	0.014	0.018	0.022
B1	1.400	1.524	1.650	0.055	0.060	0.065
B2	0.813	0.990	1.170	0.032	0.039	0.046
C	0.20	0.25	0.33	0.008	0.010	0.013
D	9.12	9.30	9.53	0.359	0.366	0.375
E	7.62	7.87	8.26	0.300	0.310	0.325
E1	6.20	6.35	6.60	0.244	0.250	0.260
e	-----	2.54	-----	-----	0.100	-----
L	3.18	-----	-----	0.125	-----	-----
eB	8.38	-----	9.40	0.330	-----	0.370
S	0.71	0.84	0.97	0.028	0.033	0.038

NOTES:

1. CONTROLLING DIMENSION: INCH.
2. LEAD FRAM MATERIAL: C194.
3. PACKAGE DIMENSION EXCLUDE MOLDING FLASH.
4. AFTER SOLDER PLATING, LEAD THICKNESS WILL BE 0.013" MAX.
5. AFTER SOLDER DIPPING, LEAD THICKNESS WILL BE 0.020" MAX.
6. THE MAX. ALLOWABLE MOLDING FLASH IS 0.010".
7. TOLERANCE: 0.010" UNLESS OTHERWISE SPECIFIED.
8. OTHERWISE DIMENSION FOLLOW ACCEPTABLE SPECS.
9. THE BOTTOM E – PIN INDENT IS MARKED AS BELOW.



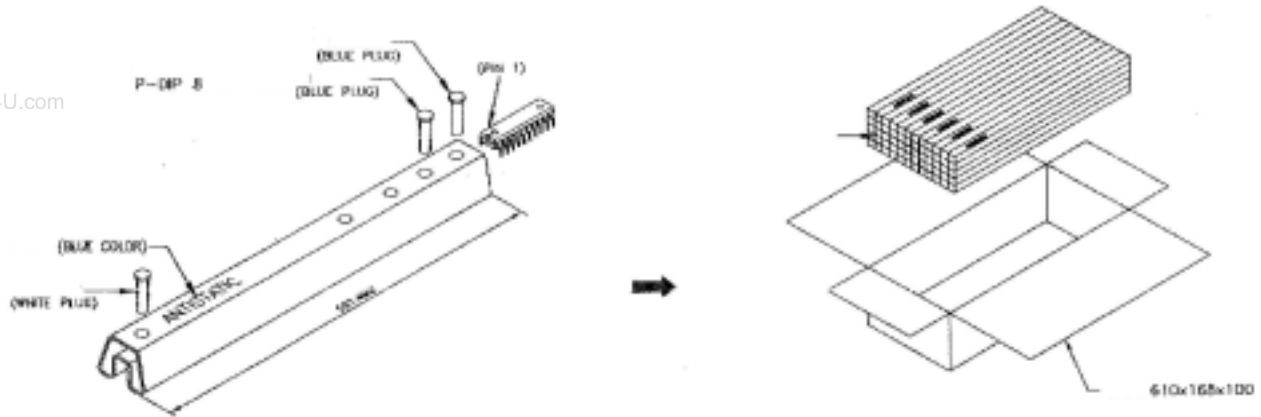
X : A-T
Y : 0-9

10. PACKAGE DIMENSION IS IN COMPLIANCE WITH JEDEC STANDARD MS-001 AB JUL85' ISSUE B.



TAPE AND REEL

PACKING METHOD: 60PCS/TUBE, 3,000PCS/BOX, 12,000PCS/CARTON

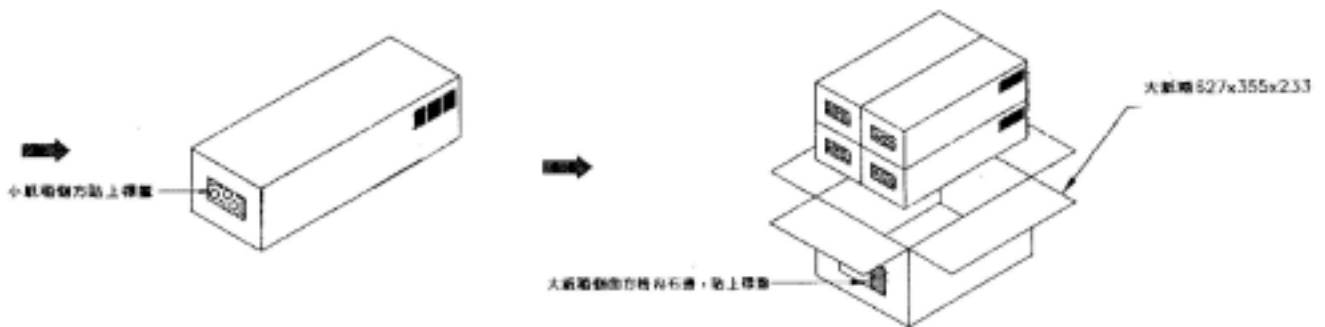


POSITION OF THE PRODUCT INSIDE OF THE PLASTIC TUDE

NOTE: 60PCS/TUBE

→ TUBES ARE PLACED IN SMALL PAPER
BOXES, WITH THE WHITE PLUG FACING
THE SIDE WITH MARKING

NOTE: 50TUBES/BOX



MARKING FOR THE SMALL PAPER BOX SHOULD BE POSITIONED AS SHOWN ABOVE

NOTE: USE CLEAR TAPE TO SEAL THE SMALL
BOX INSTEAD OF QA SEAL

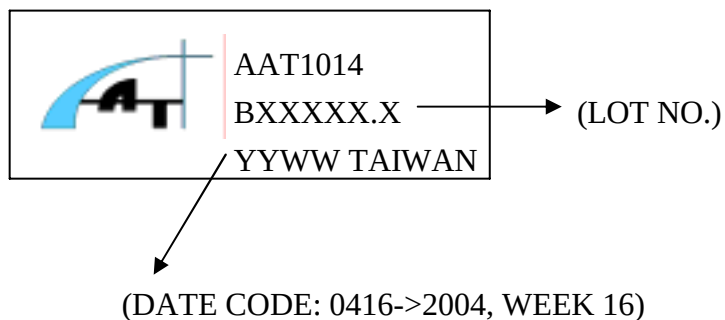
→ POSITION LABEL ON THE RIGHT
CORNER OF THE BLANK BOXES
MARKING ON THE LARGE BOX AS
SHOWN ABOVE

NOTE: 4 SMALL BOXES/LARGE BOX, WITH NO QA
SEAL



PART MARKING

PDIP8 TOP MARKING



NOTE: PDIP8 HAS NO BACK MARKING.