偉詮電子股份有限公司
Weltrend Semiconductor, Inc.

WT7515

PC POWER SUPPLY SUPERVISOR

Data Sheet

REV. 1.50

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新竹市科學工業園區工業東九路24號2樓
2F, No. 24, Industry E. 9th RD., Science-Based Industrial Park, Hsin-Chu, Taiwan
TEL:886-3-5780241 FAX:886-3-5794278.5770419
Email:support@weltrend.com.tw

GENERAL DESCRIPTION

The WT7515 provides protection circuits, power good output (PGO), fault protection latch (FPOB), and a protection detector function (PSONB) control. It can minimize external components of switching power supply systems in personal computer.

The Over / Under Voltage Detector (OVD / UVD) monitors 3.3V, 5V, 12V input voltage level. The Over Current Detector (OCD) monitor IS33, IS5, IS12 input current sense. When OVD or UVD or OCD detect the fault voltage level, the FPOB is latched HIGH and PGO go low. The latch can be reset by PSONB go HIGH. There is 2.4 ms delay time for PSONB turn off FPOB.

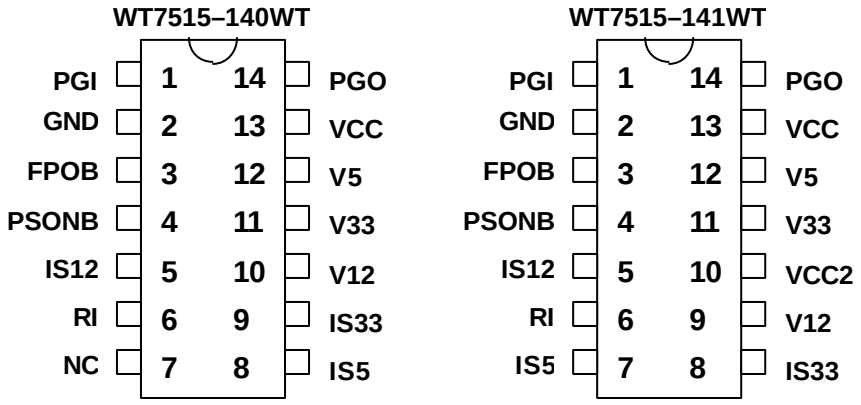
When OVD and UVD and OCD detect the right voltage level, the power good output (PGO) will be issue.

FEATURES

- The Over / Under Voltage Detector (OVD / UVD) monitors 3.3V, 5V, 12V input voltage level.
- The Over Current Detector (OCD) monitors IS33, IS5, IS12 input current sense.
- Both of the power good output (PGO) and fault protection latch (FPOB) are Open Drain Output.
- 75 / 300 ms time delay for UVD.
- 300 ms time delay for PGO.
- 38 ms for PSONB input signal De–bounce.
- 73 us for internal signal De–glitches.
- 2.4 ms time delay for PSONB turn-off FPOB.

PIN ASSIGNMENT AND PACKAGE TYPE

Pin assignment



ORDERING INFORMATION

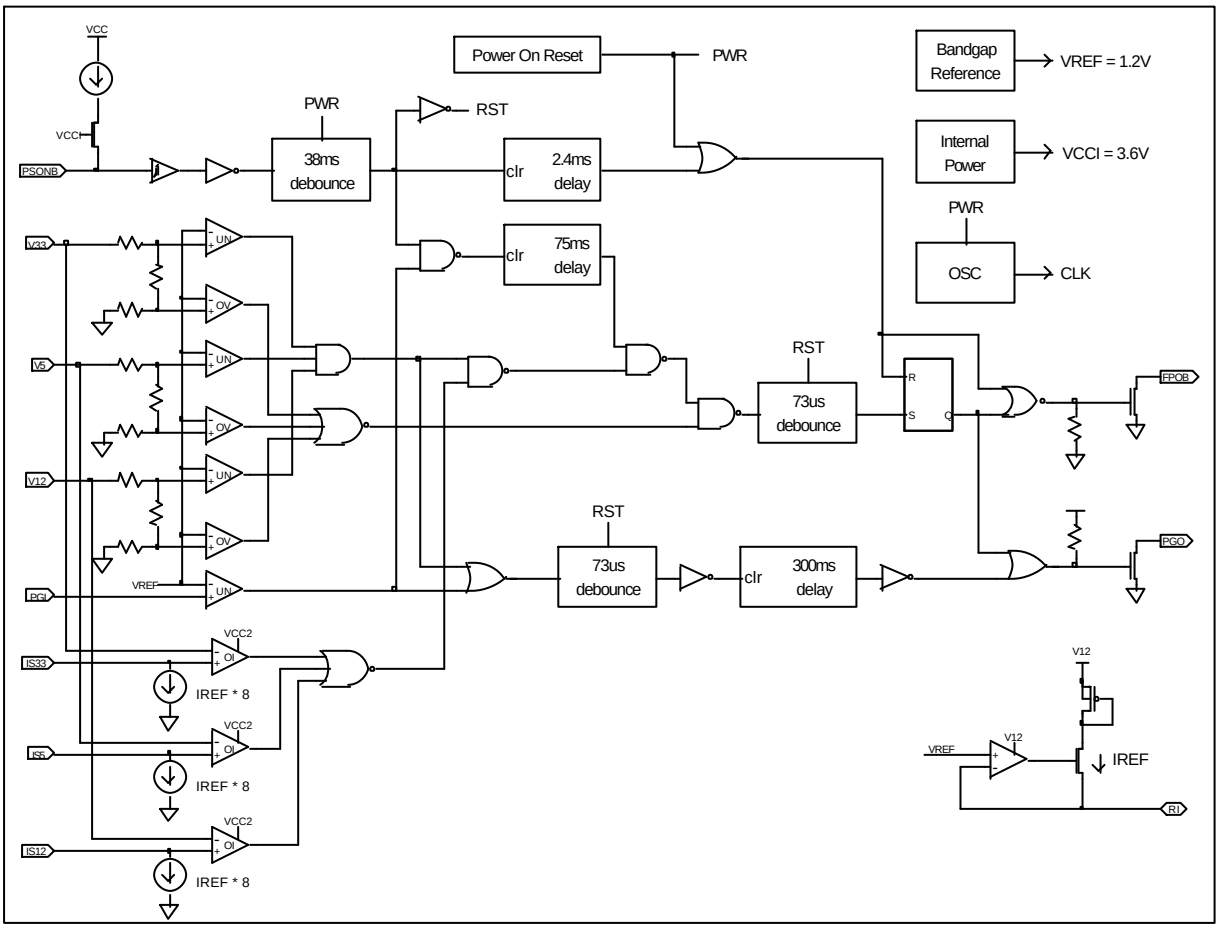
PACKAGE	14–Pin Plastic DIP	14–Pin Plastic SOP
	WT7515–N140WT WT7515–N141WT	WT7515–S140WT WT7515–S141WT
Lead–Free（Pb）	WT7515–N140WT Pb WT7515–N141WT Pb	WT7515–S140WT Pb WT7515–S141WT Pb

※ **The Top-Side Marking would been added a dot（●）in the right side for lead-free package.**

PIN DESCRIPTION

Pin Name	TYPE	Description
PGI	**I**	Power good input signal pin
GND	**P**	Ground
FPOB	**O**	Fault protection output pin, open drain output
PSONB	**I**	On/Off switch input
IS12	**I**	12V over current protection sense input
RI	**I**	Current sense adjust input
VCC2	**I**	Current sense power supply
IS5	**I**	5V over current protection sense input
IS33	**I**	3.3V over current protection sense input
V12	**I**	12V over/under voltage input pin
V33	**I**	3.3V over/under voltage input pin
V5	**I**	5V over/under voltage input pin
VCC	**I**	Power supply
PGO	**O**	Power good output signal pin, open drain output

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter		Min.	Max.	Unit
Supply voltage, VCC, VCC2, V12		–0.3	16	V
Input voltage	PSONB, V5, V33, PGI,	–0.3	7	V
	I12, I5, I33	–0.3	V12+0.3	V
Output voltage	FPOB, PGO	–0.3	7	V
Operating temperature		-40	125	℃
Storage temperature		-55	150	℃

*Note: Stresses above those listed may cause permanent damage to the devices

RECOMMENDED OPERATING CONDITIONS

Parameter		Conditions	Min.	Typ.	Max.	Unit
Supply voltage, VCC			4	12	15	V
Supply voltage, VCC2			9.5	12	15	
Input voltage	PSONB, V5, V33, PGI				7	V
	V12				15	V
Output voltage	FPOB, PGO				7	V
Output sink current	FPOB				30	mA
	PGO				10	mA
Supply voltage rising time			1			ms
Output current for RI	RI		10		65	uA

ELECTRICAL CHARACTERISTICS, at Ta=25° C and V_{CC}=5V.

Over Voltage Detection

Parameter		Condition	Min.	Typ.	Max.	Unit
Over voltage threshold	V33		3.7	3.9	4.1	V
	V5		5.7	6.1	6.5	V
	V12		13.3	13.8	14.3	V
$I_{LEAKAGE}$ Leakage current (FPOB)		V(FPOB) = 5V		5		uA
V_{OL} Low level output voltage (FPOB)		I_{sink} =10mA		0.3		V
		I_{sink} =30mA		0.7		

PGI and PGO

Parameter		Condition	Min.	Typ.	Max.	Unit
Under voltage threshold	V33		2.55	2.69	2.83	V
	V5		4.1	4.3	4.47	V
	V12		9.5	10	10.5	V
Input threshold voltage(PGI)			1.16	1.20	1.24	V
$I_{LEAKAGE}$ Leakage current(PGO)		PGO = 5V		5		uA
V_{OL} Low level output voltage(PGO)		I_{sink} =10mA		0.4		V
Input offset voltage of OCP comparators			-5		5	mV

PSONB

Parameter	Condition	Min.	Typ.	Max.	Unit
Input pull-up current	PSONB= 0V		150		uA
High-level input voltage		2.0			V
Low-level input voltage				0.8	V

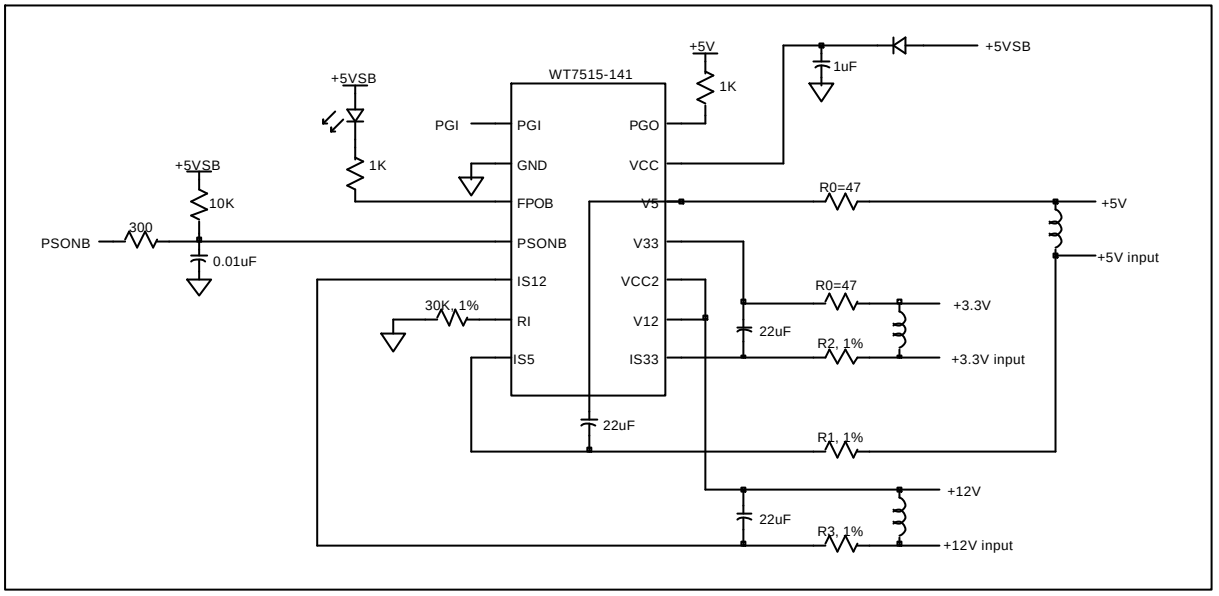
TOTAL DEVICE

Parameter	Condition	Min.	Typ.	Max.	Unit
Icc Supply current	PDON _N= 5V			1	mA
Vcc low voltage			3.6		V

SWITCHING CHARACTERISTICS, Vcc=5V

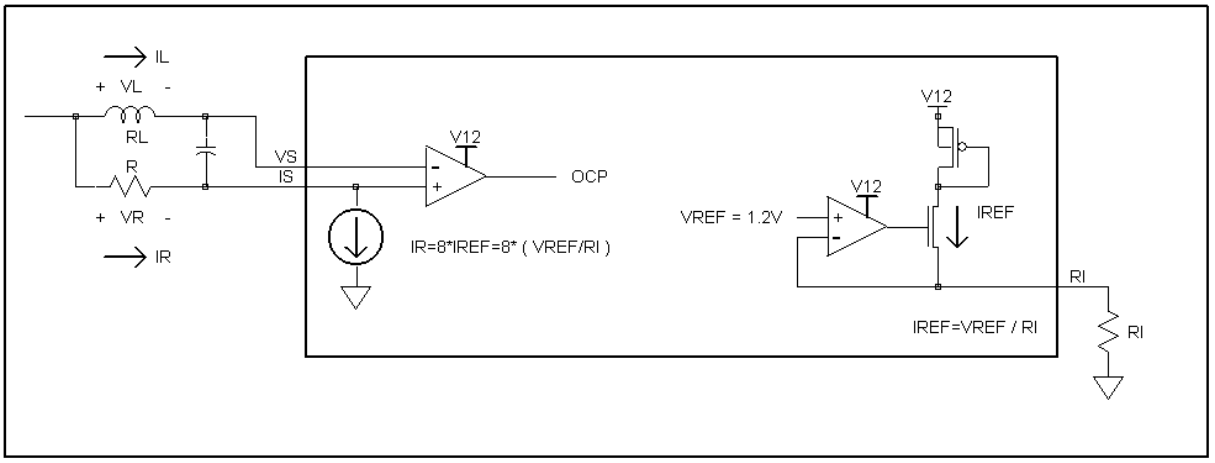
Parameter	Condition	Min.	Typ.	Max.	Unit
t_{db1} De-bounce time (PSONB)		32	38	61	mS
t_{dleay1} Delay time (PGI to PGO)		200	300	490	mS
t_{db2} De-bounce time (PSONB)		32	38	61	mS
t_g De-glitch time		63	73	120	uS
t_{delay2} PSONB to FPOB delay time		t_{db2}+2.0	t_{db2}+2.4	t_{db2}+3.8	mS
t_{delay3} Internal UVD/OCD delay time	after FPOB go low & PGI > 1.2V	65	75	122	mS
	after FPOB go low & PGI < 1.2V	260	300	488	mS

APPLICATION CIRCUIT



NOTE1：The R0 can not be omitted at V5 and V33.

APPLICATION NOTE

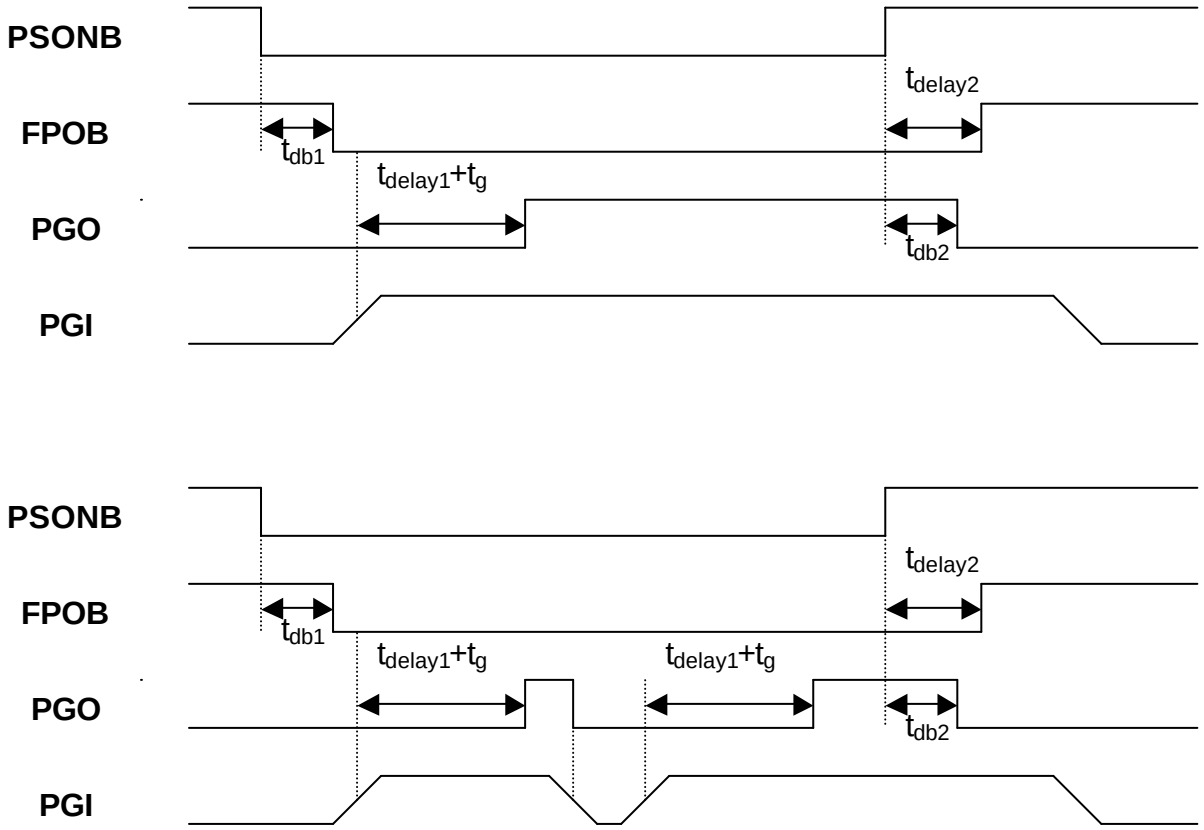


When the current cross inductor raised, inductor voltage raised.
And when inductor voltage exceeded resistor voltage, the OCP active.
We can setup OCP point by the following equation

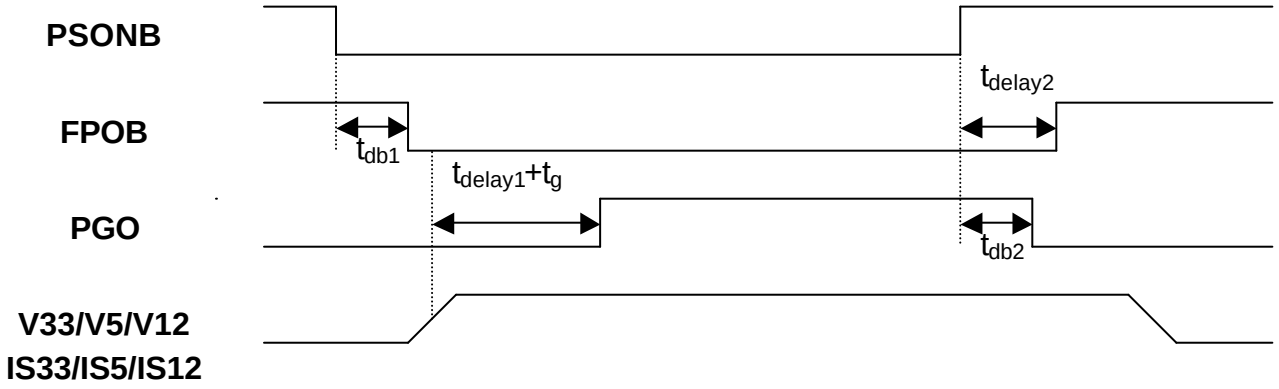
Let VR = VL
R * IR = RL * IL
∵ IR = 8 * IREF
R * (8 * VREF / RI) = RL * IL
R = (RL * IL) / (8 * VREF / RI) ——— (1)

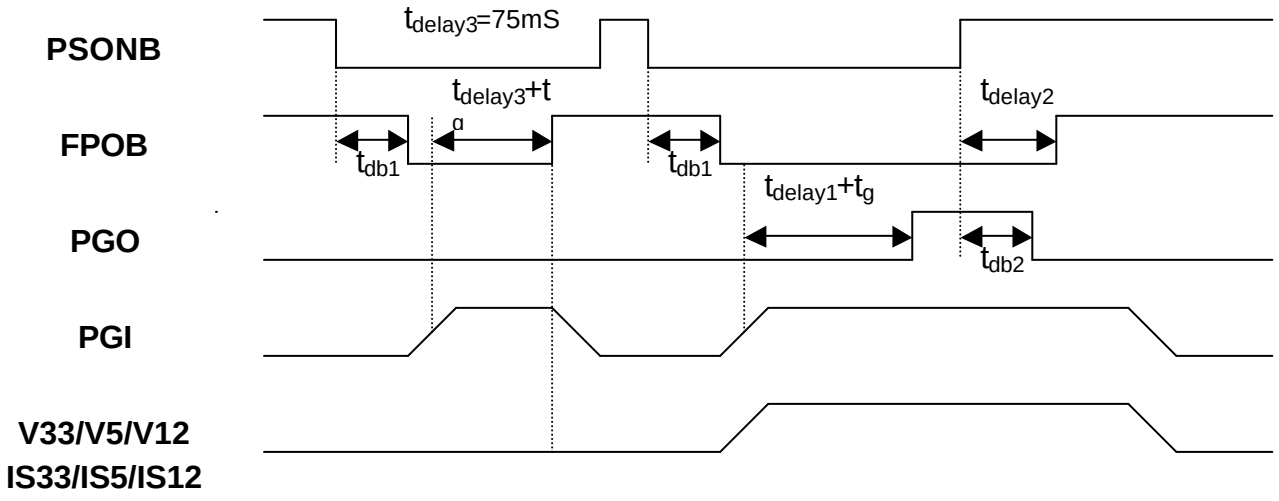
APPLICATION TIMMING

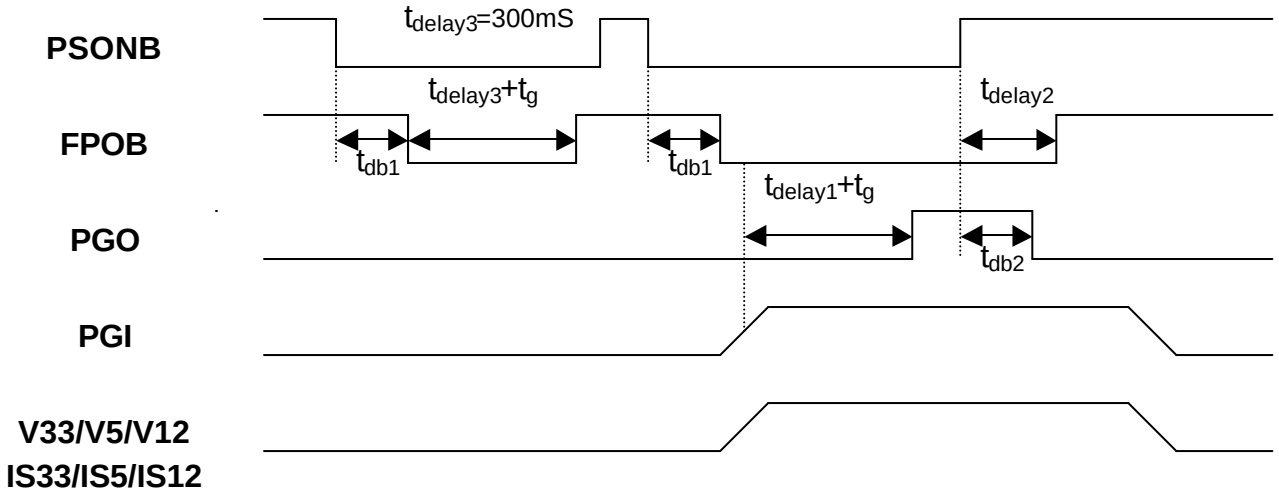
1.) PGI (UNDER_VOLTAGE)：



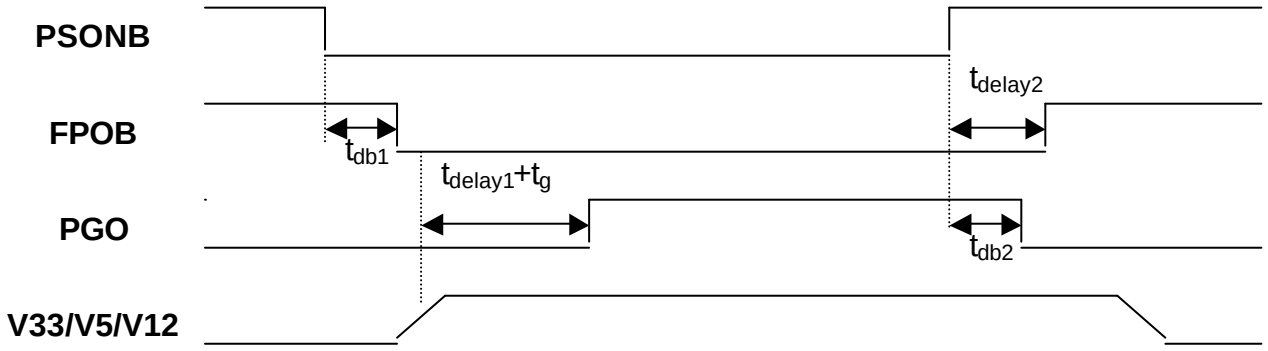
2.) V33, V5, V12 (UNDER_VOLTAGE) or IS33, IS5, IS12 (OVER_CURRENT)：

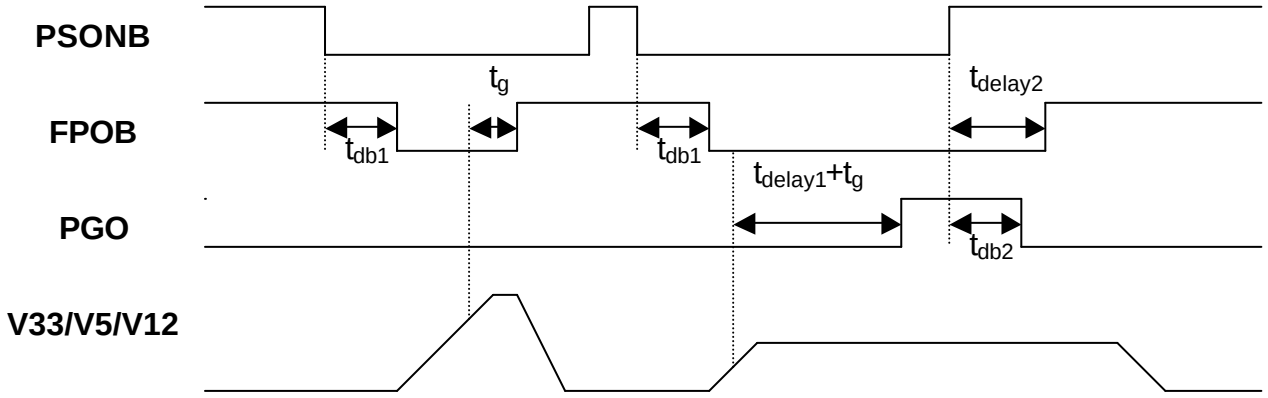






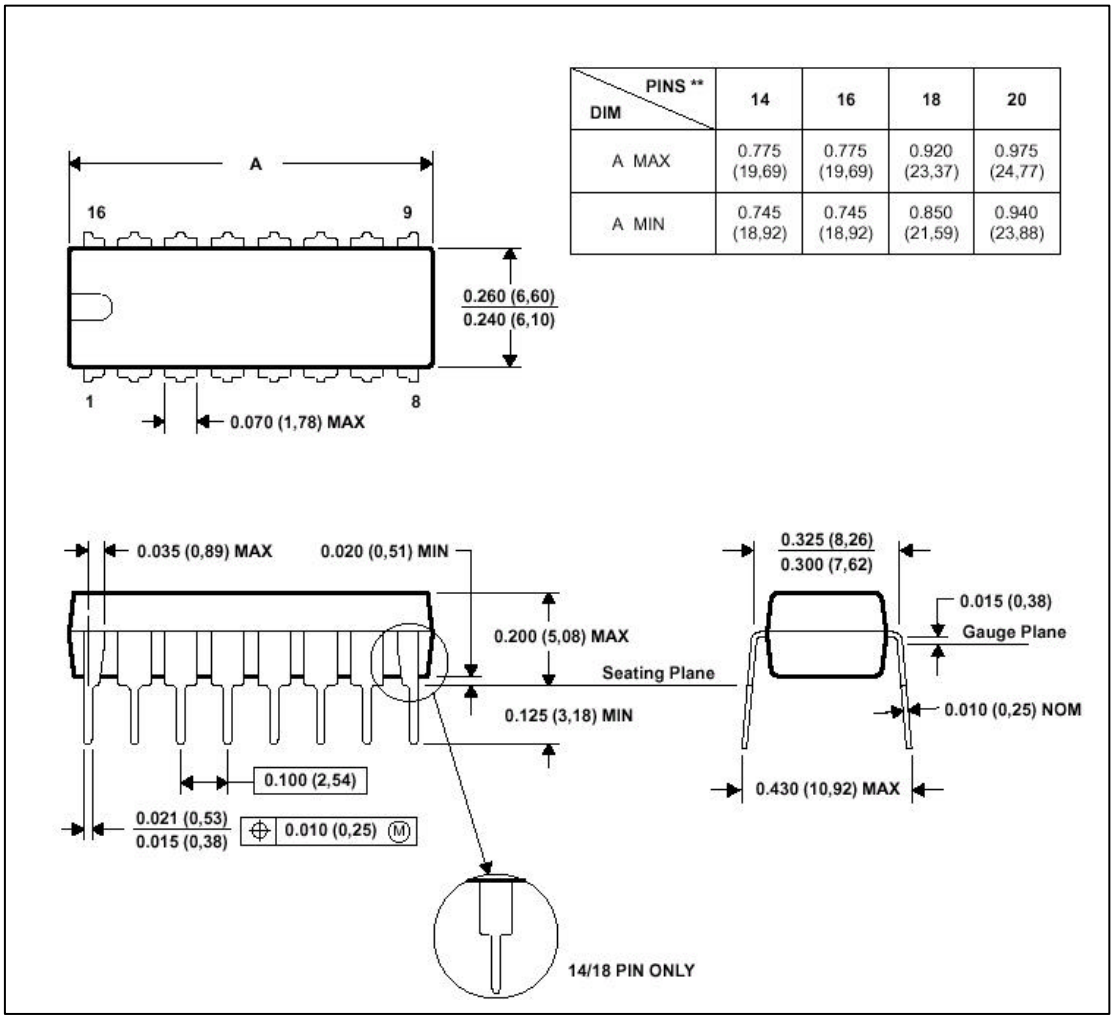
3.) V33, V5, V12 (OVER_VOLTAGE)：





MECHANICAL INFORMATION

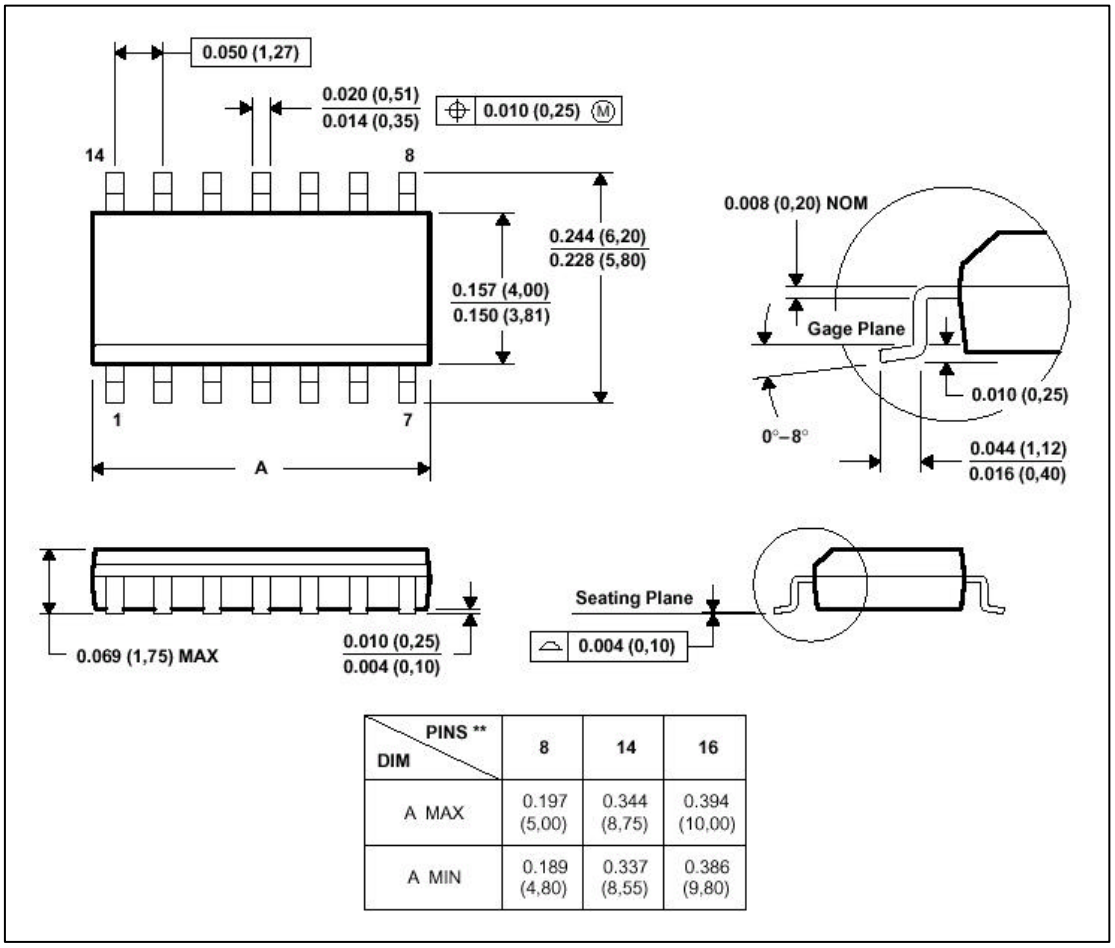
PLASTIC DUAL–IN–LINE PACKAGE



DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	0.975 (24,77)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)

NOTE 1：All linear dimensions are in inches（millimeters）.
NOTE 2：This drawing is subject to change without notice.
NOTE 3：Falls within JEDEC MS–001

PLASTIC SMALL–OUTLINE PACKAGE



DIM \ PINS **	8	14	16
A MAX	0.197 (5,00)	0.344 (8,75)	0.394 (10,00)
A MIN	0.189 (4,80)	0.337 (8,55)	0.386 (9,80)

NOTE 1：All linear dimensions are in inches（millimeters）.
NOTE 2：This drawing is subject to change without notice.
NOTE 3：Falls within JEDEC MS–012