Weltrend Semiconductor, Inc.

WT7527

PC POWER SUPPLY SUPERVISOR

Data Sheet

Version 0.30 Preliminary release

December 29, 2004

The information in this document is subject to change without notice.

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 WT7527 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 VS33, VS5, VS12A and VS12B input voltage level. The Over Current Detector (OCD) monitor IS33, IS5, IS12A and IS12B input current sense. The pin VX provides an extra protection function. When OVD or UVD or OCD or VX 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 4 ms delay time for PSONB turn off FPOB.
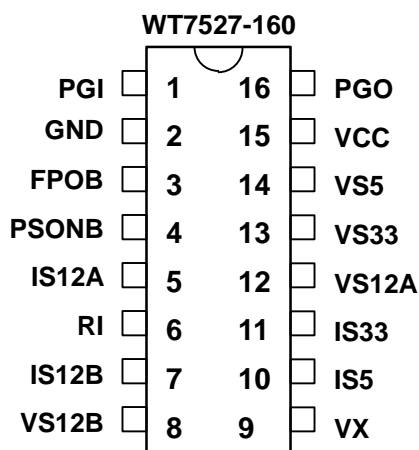
When OVD and UVD and OCD detect the right voltage level, the power good output (PGO) will be issue.

FEATURES

- The Over/Under Voltage Detector (OVD / UVD) monitors VS33, VS5, V12A and V12B input voltage.
- The Over Current Detector (OCD) monitors IS33, IS5, IS12A and IS12B input current sense.
- The VX provide an extra protection.
- Both of the power good output (PGO) and fault protection latch (FPOB) are Open Drain Output.
- 75 / 600 ms time delay for UVD / OCD.
- 300 ms time delay for PGO.
- 38 ms for PSONB input signal De–bounce.
- 14 us for OVD internal signal De–glitch.
- 1 ms for UVD internal signal De–glitch.
- 20 ms for OCD internal signal De–glitch.
- 73 us for PGI internal signal De–glitch.
- 4 ms for PSONB turn-off FPOB.

PIN ASSIGNMENT AND PACKAGE TYPE

Pin assignment

WT7527-160

PGI	1	16	PGO	
GND	2	15	VCC	
FPOB	3	14	VS5	
PSONB	4	13	VS33	
IS12A	5	12	VS12A	
RI	6	11	IS33	
IS12B	7	10	IS5	
VS12B	8	9	VX	

ORDERING INFORMATION

PACKAGE	16–Pin Plastic DIP	16–Pin Plastic SOP
	WT7527–N160WT	WT7527–S160WT
Lead–Free Pb	WT7527–N160WT Pb	WT7527–S160WT Pb

The Top-Side Marking would be added a dot   in the right side for lead-free package.

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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
IS12A	**I**	12VA over current protection sense input
RI	**I**	Current sense adjust input
IS12B	**I**	12VB over current protection sense input
VS12B	**I**	12VB over/under voltage input pin
VX	**I**	Extra protection sense input
IS5	**I**	5V over current protection sense input
IS33	**I**	3.3V over current protection sense input
VS12A	**I**	12VA over/under voltage input pin
VS33	**I**	3.3V over/under voltage input pin
VS5	**I**	5V over/under voltage input pin
VCC	**I**	Power supply
PGO	**O**	Power good output signal pin, open drain output

BLOCK DIAGRAM

WT7527-160

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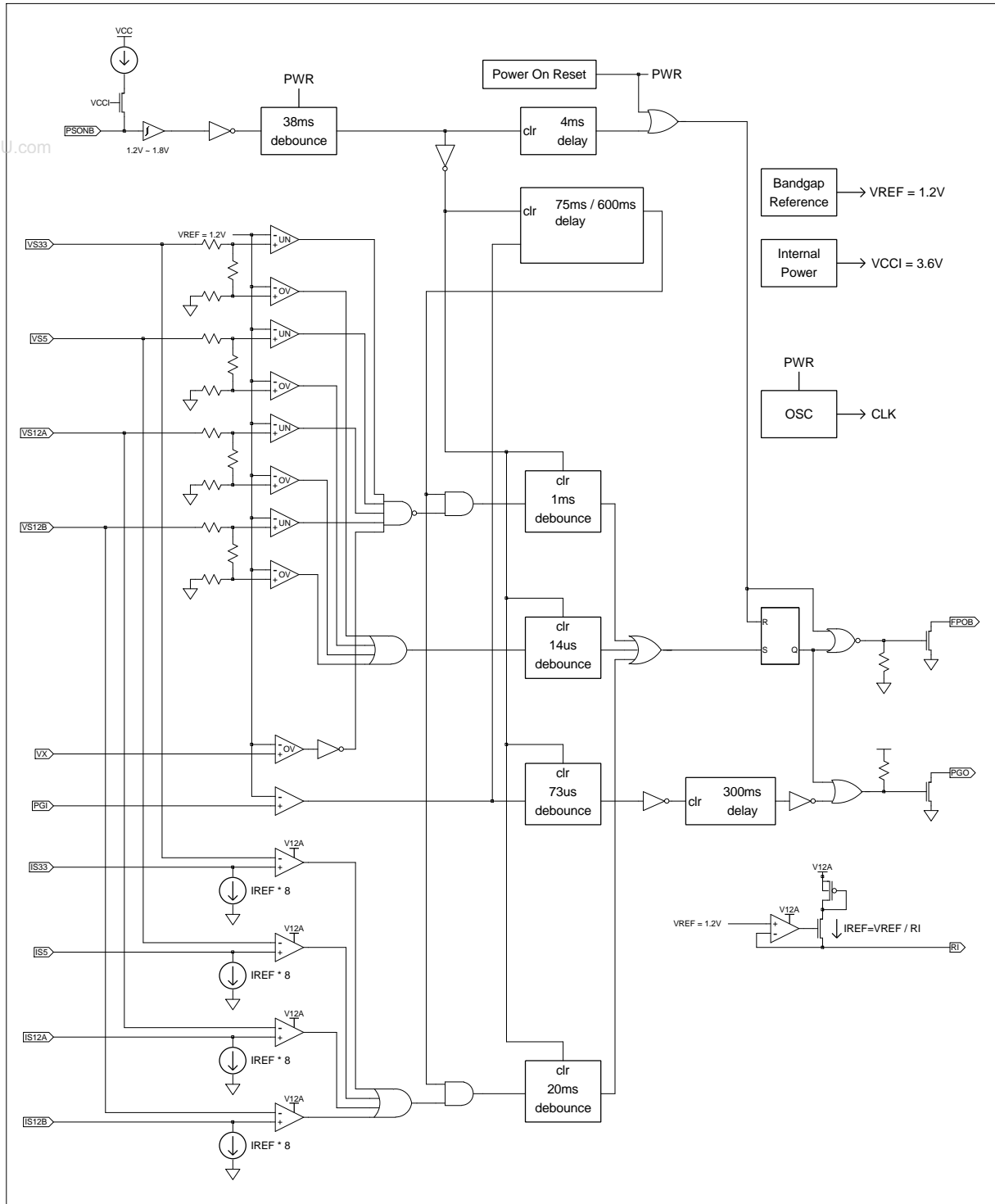
ABSOLUTE MAXIMUM RATINGS

Parameter		Min.	Max.	Unit
Supply voltage, VCC, V12A		−0.3	16	V
Input voltage	PGI, PSONB		VCC + 0.3 Max. 7V	V
	VS5, IS5, VS33, IS33	−0.3	V12A + 0.3 Max. 7V	V
	IS12A, VS12B, IS12B		V12A + 0.3 Max. 16V	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			3.8	5	16	V
Input voltage	PGI, PSONB, VS5, VS33				7	V
	VS12A, VS12B				16	V
Output voltage	FPOB, PGO				7	V
Output sink current	FPOB	0.3V			10	mA
	PGO	0.3V			10	mA
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	VS33		3.8	3.9	4.0	V
	VS5		5.6	5.8	6.0	V
	VS12AB		13.5	13.85	14.2	V
$I_{LEAKAGE}$ Leakage current (FPOB)		V(FPOB) = 5V		5		uA
V_{OL} Low level output voltage (FPOB)		I_{sink} =10mA			0.3	V

PGI and PGO

Parameter		Condition	Min.	Typ.	Max.	Unit
Under voltage threshold	VS33		2.8	2.9	3.0	V
	VS5		4.2	4.4	4.6	V
	VS12AB		10.3	10.65	11.0	V
	VX		1.176	1.20	1.224	V
Input threshold voltage(PGI)			1.176	1.20	1.224	V
$I_{LEAKAGE}$ Leakage current(PGO)		PGO = 5V		5		uA
V_{OL} Low level output voltage(PGO)		I_{sink} =10mA			0.3	V
Offset Voltage of OCP comparators			−3		3	mV

PSONB

Parameter	Condition	Min.	Typ.	Max.	Unit
Input pull-up current	PSONB= 0V		150		uA
High-level input voltage		1.8			V
Low-level input voltage				1.2	V

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TOTAL DEVICE

Parameter	Condition	Min.	Typ.	Max.	Unit
Icc Supply current	PSONB= 5V			1	mA
Vcc operation start up voltage		3.2	3.4	3.6	V
Vcc under lockout voltage		1.8	2.0	2.2	V

SWITCHING CHARACTERISTICS, at Ta=-40 ~125

Parameter		Condition	Min.	Typ.	Max.	Unit
PGI to PGO Delay Time	Td1		200	300	400	mS
Short circuit Delay Time	Td2		49	75	100	mS
	Td2-1		392	600	800	mS
PGO to FPOB Delay Time	Td3		2	4	6	mS
Under Voltage Delay Time	Td4		0.6	1	1.4	mS
Over Current Delay Time	Td5		13	20	27	mS
Over Voltage Delay Time	Td6		9	14	19	uS
VX Delay Time	Td7		0.6	1	1.4	mS
PSONB De-bounce Time	Tb1		24	38	52	mS
PGI De-bounce Time	Tb2		47	73	100	uS

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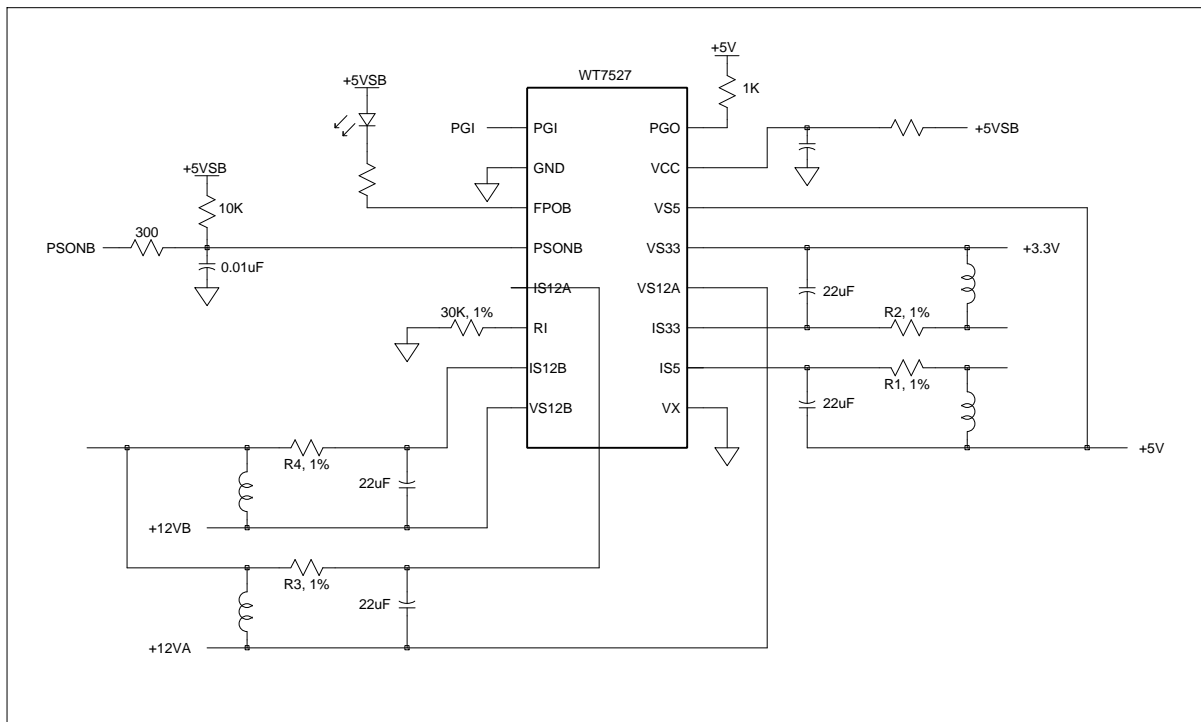
APPLICATION NOTE
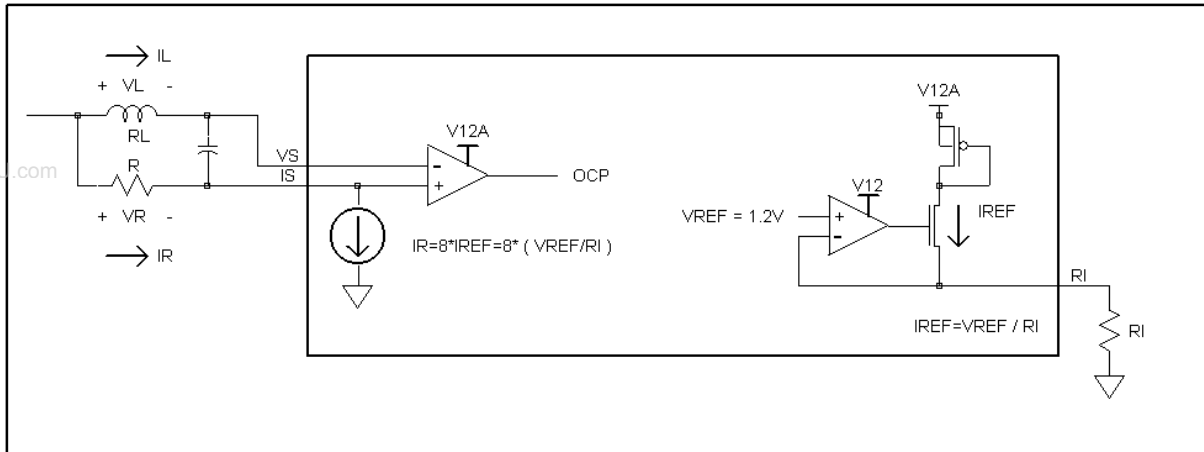
When the current cross inductor raised, inductor voltage raised.
And when inductor voltage exceeded resistor voltage, the OCP active.
We can setup OCP point by the following equation

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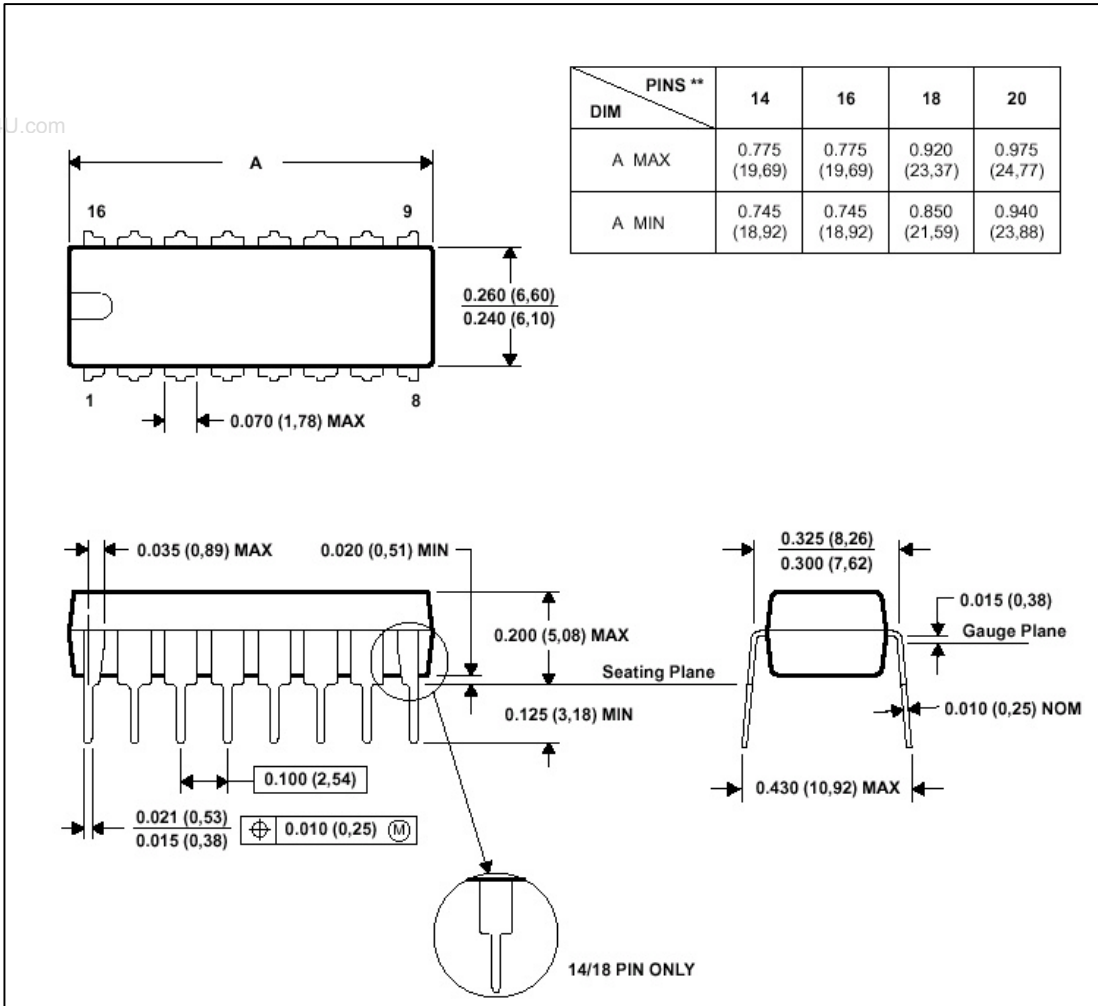R * (8 * VREF / RI) = RL * IL
R = (RL * IL) / (8 * VREF / RI) ———— (1)

And the capacitor C is used to avoide power on fail or dynamic load fail. We suggest C > 1uF.

EX   How to select the resistor of R? Assume RI=30K , RL=5m , OCP IL=20A

Sol   R = (IL * RL) / (8 * IREF)
          = (20A * 5m) / { 8 * (1.2V / 30K)}
          = 312.5

MECHANICAL INFORMATION

PLASTIC DUAL–IN–LINE PACKAGE

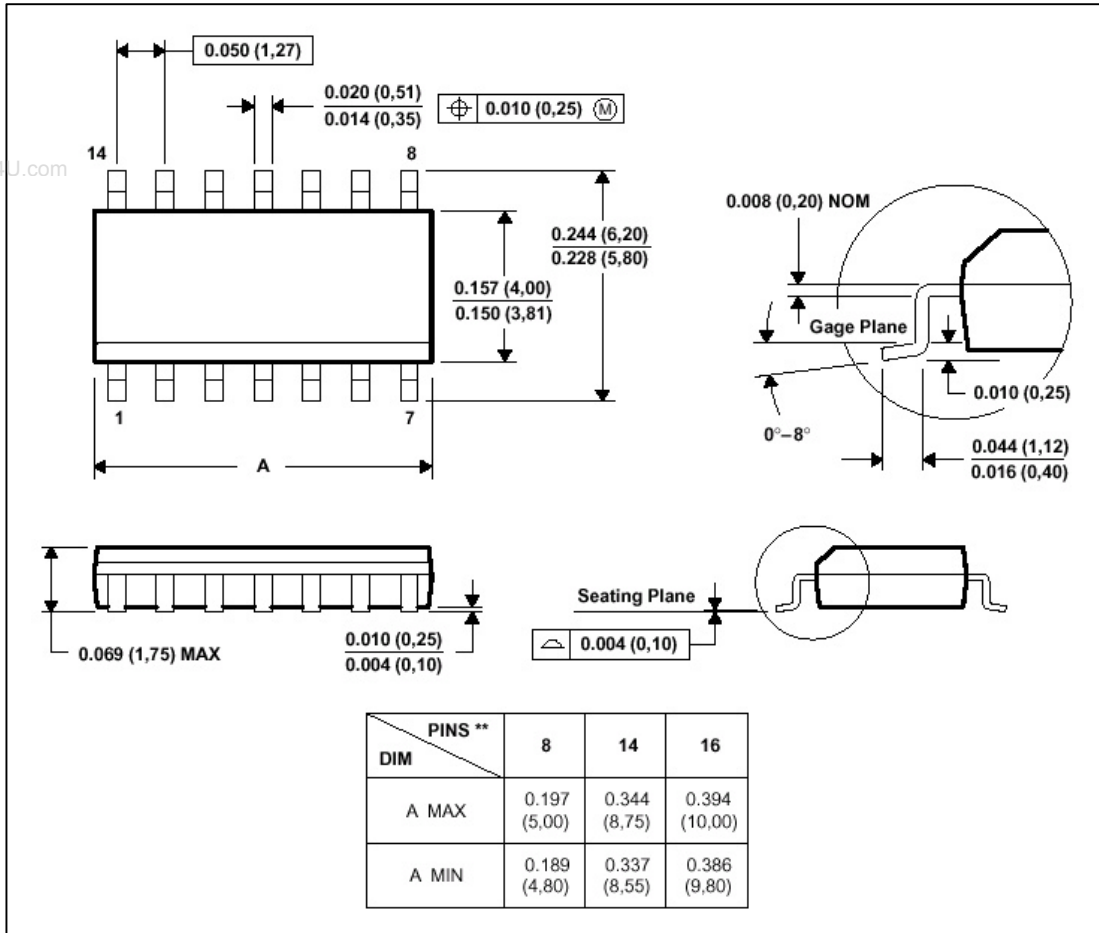| DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	0.975 (24,77)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)

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

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PLASTIC SMALL–OUTLINE PACKAGE

PINS ** DIM	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

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