



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

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WT7527

PC POWER SUPPLY SUPERVISOR

Data Sheet

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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.

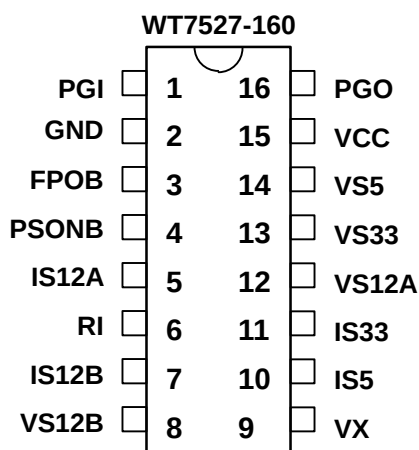
When OVD and UVD and OCD detect the right voltage level, the power good output (PGO) will be issue.

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



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.

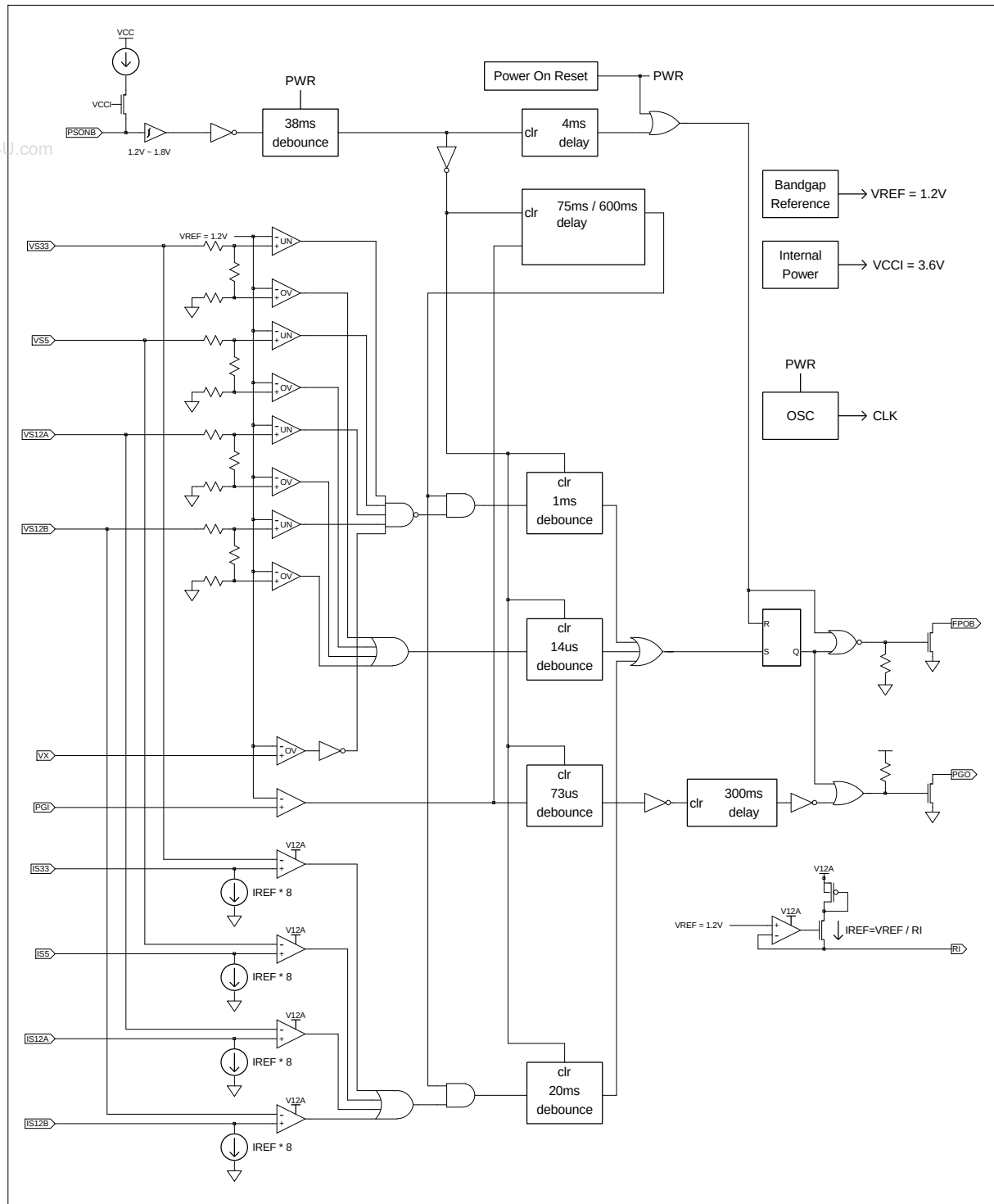


PIN DESCRIPTION

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





ABSOLUTE MAXIMUM RATINGS

Parameter		Min.	Max.	Unit
Supply voltage, VCC, V12A		-0.3	16	V
Input voltage	PGI, PSONB	-0.3	VCC + 0.3 (Max. 7V)	V
	VS5, IS5, VS33, IS33		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	°C
Storage temperature		-55	150	°C

*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 VCC=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



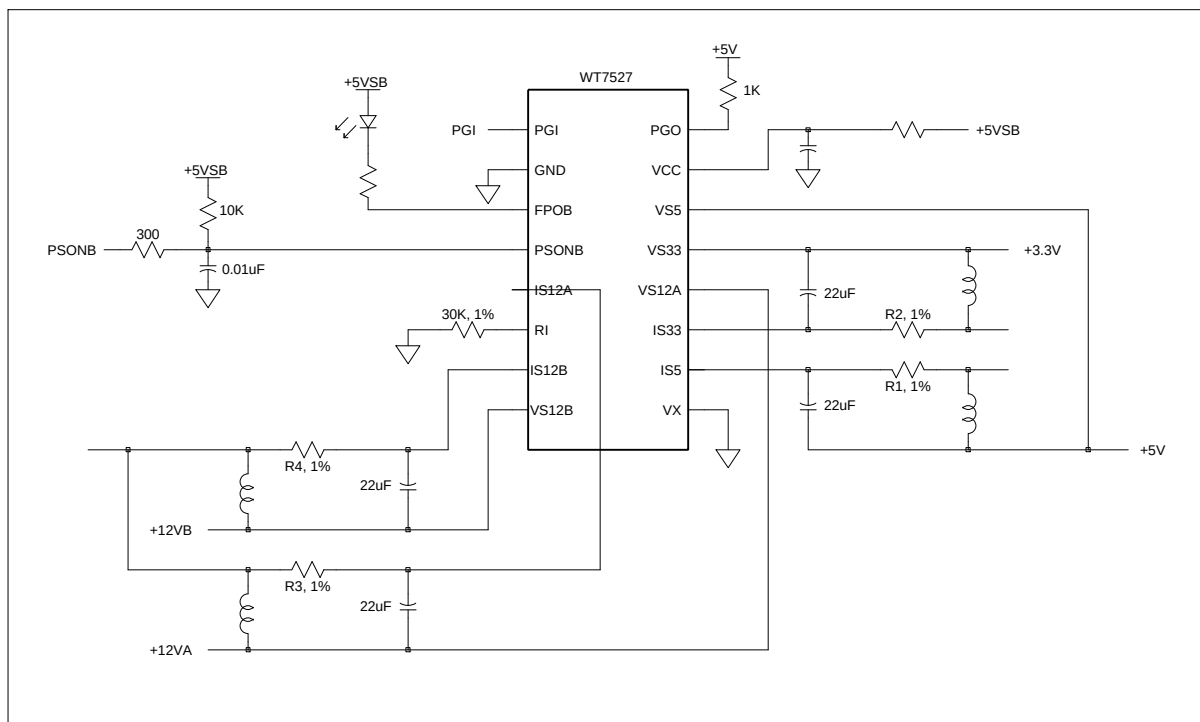
TOTAL DEVICE

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

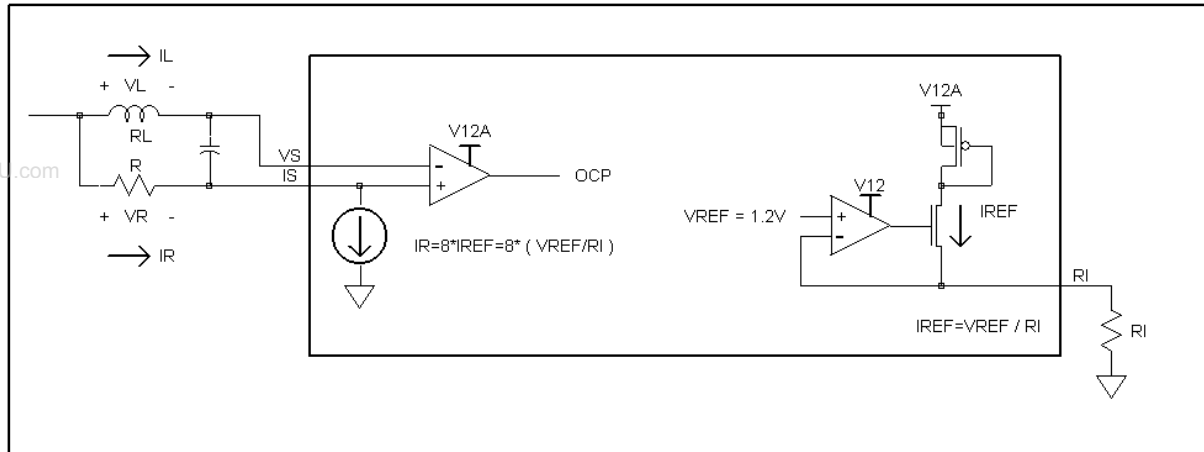
SWITCHING CHARACTERISTICS, at Ta=-40°C~125°C

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

$$\begin{aligned} \text{Let } V_R &= V_L \\ R * I_R &= R_L * I_L \\ \therefore I_R &= 8 * I_{REF} \\ R * (8 * V_{REF} / R_I) &= R_L * I_L \\ R &= (R_L * I_L) / (8 * V_{REF} / R_I) \text{ —— (1)} \end{aligned}$$

And the capacitor C is used to avoid power on fail or dynamic load fail. We suggest $C > 1\mu F$.

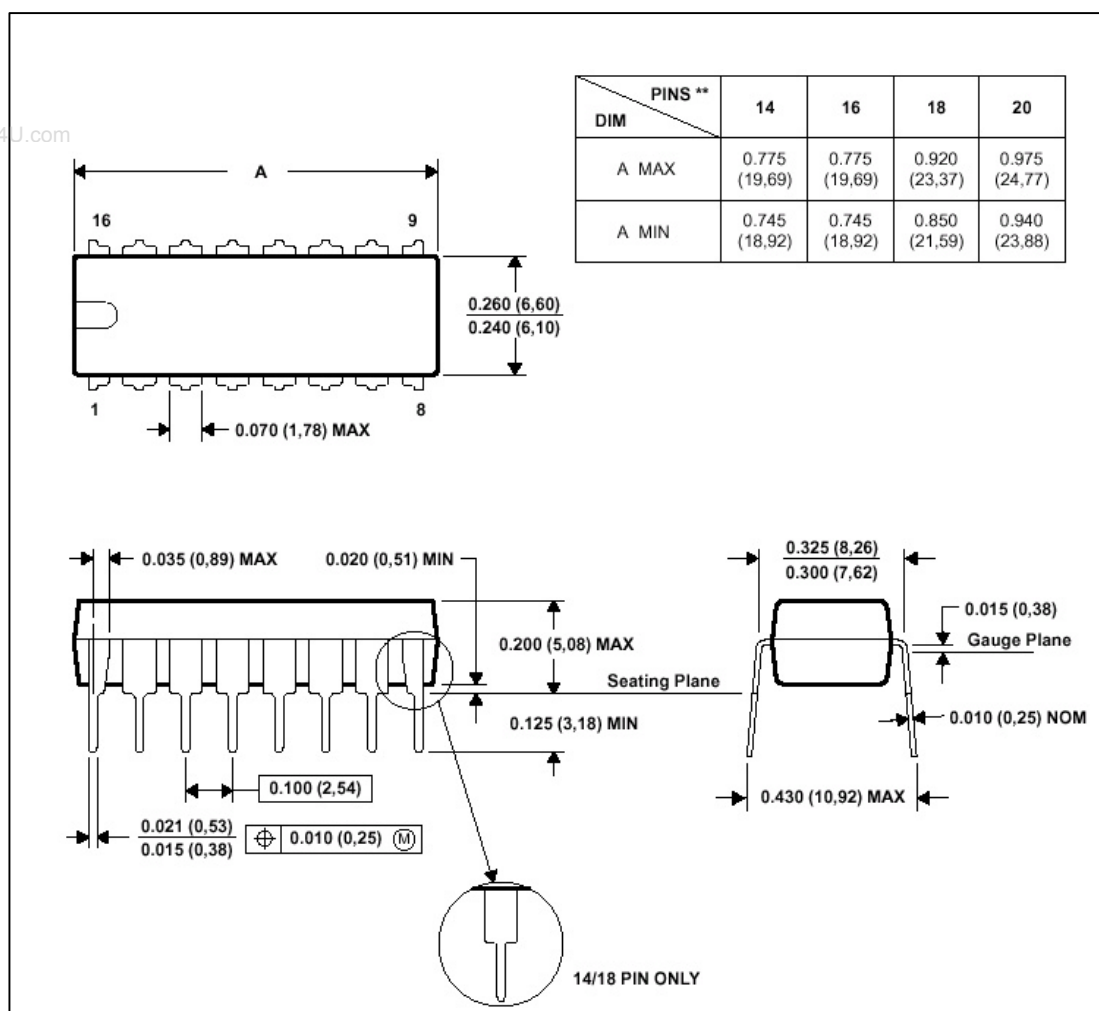
EX : How to select the resistor of R? Assume $R_I=30K\Omega$, $R_L=5m\Omega$, OCP $I_L=20A$.

$$\begin{aligned} \text{Sol : } R &= (I_L * R_L) / (8 * I_{REF}) \\ &= (20A * 5m\Omega) / \{8 * (1.2V / 30K\Omega)\} \\ &= 312.5\Omega \end{aligned}$$

MECHANICAL INFORMATION

PLASTIC DUAL-IN-LINE PACKAGE

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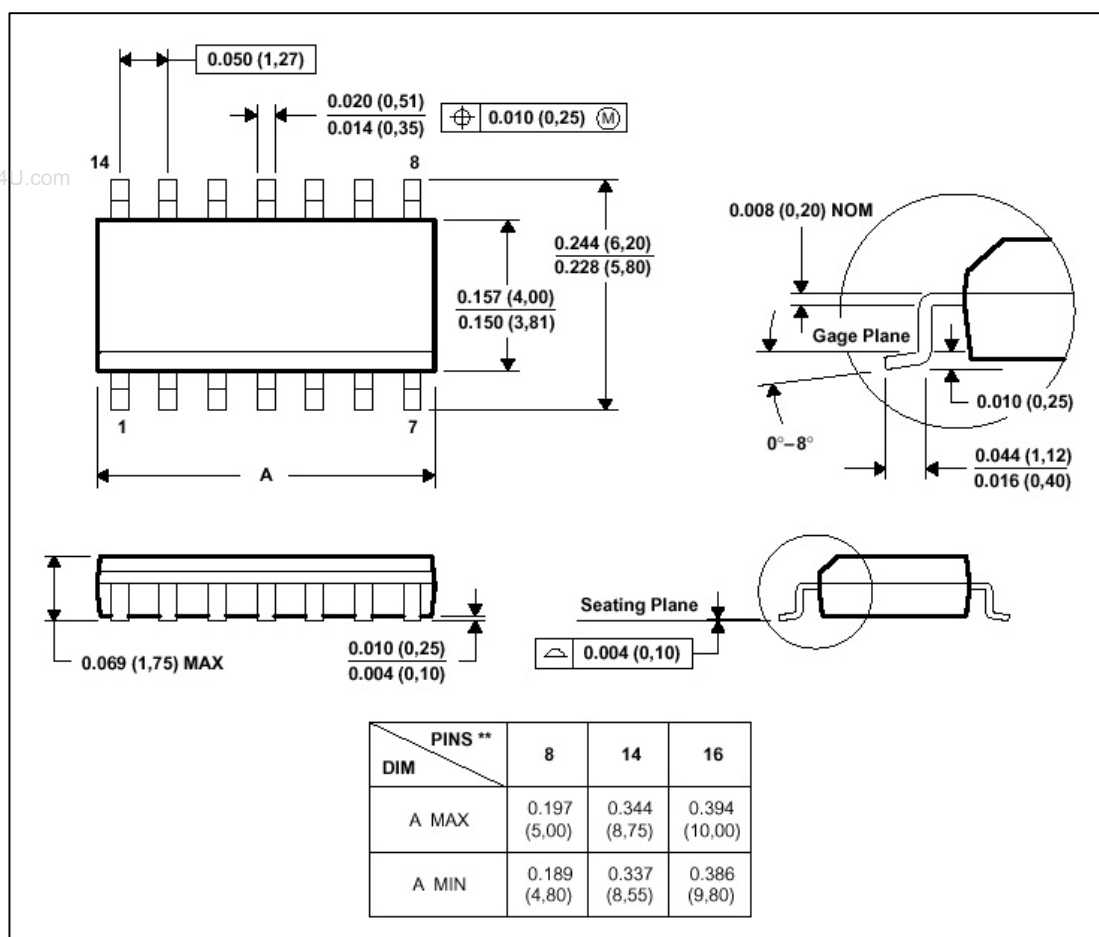


NOTE 1 : All linear dimensions are in inches (millimeters) .

NOTE 2 : This drawing is subject to change without notice.

NOTE 3 : Falls within JEDEC MS-001

PLASTIC SMALL-OUTLINE PACKAGE



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