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

WT7525

PC POWER SUPPLY SUPERVISOR

Data Sheet

REV. 0.20

March 08, 2004

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GENERAL DESCRIPTION

The WT7525 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 V33, V5, V12A and V12B input voltage level. The Over Current Detector (OCD) monitor IS33, IS5, IS12A and IS12B 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.

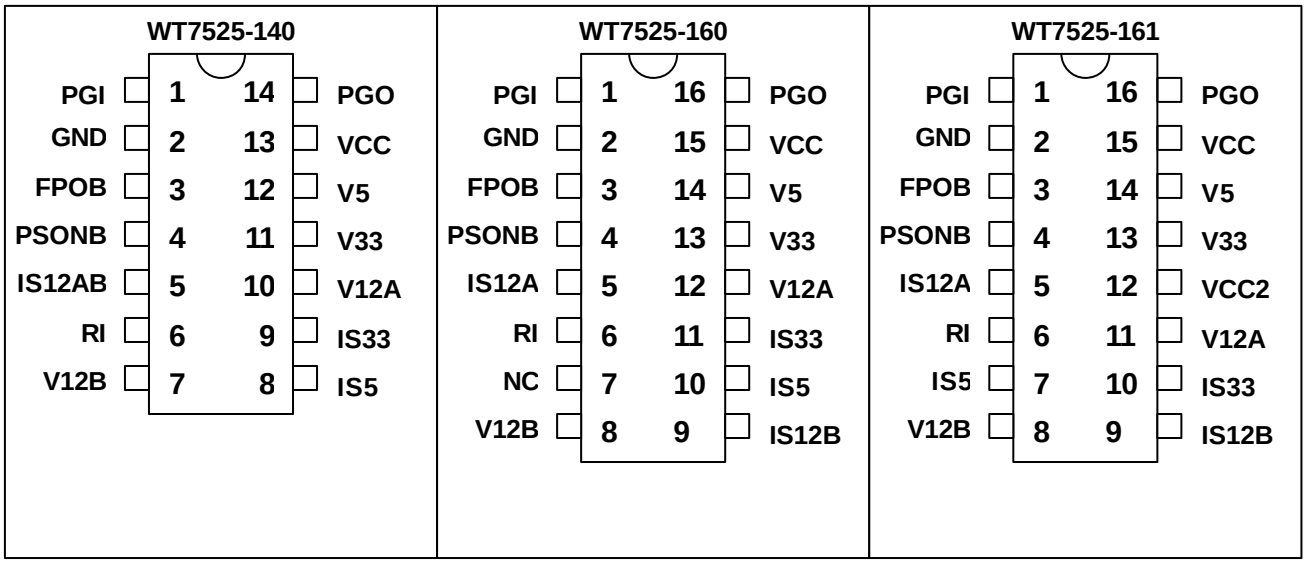
When OVD and UVD and OCD detect the right voltage level, the power good output (PGO) will be issue.

FEATURES

- The Over / Under Voltage Detector (OVD / UVD) monitors V33, V5, V12A and V12B input voltage level.
- The Over Current Detector (OCD) monitors IS33, IS5, IS12A and IS12B 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

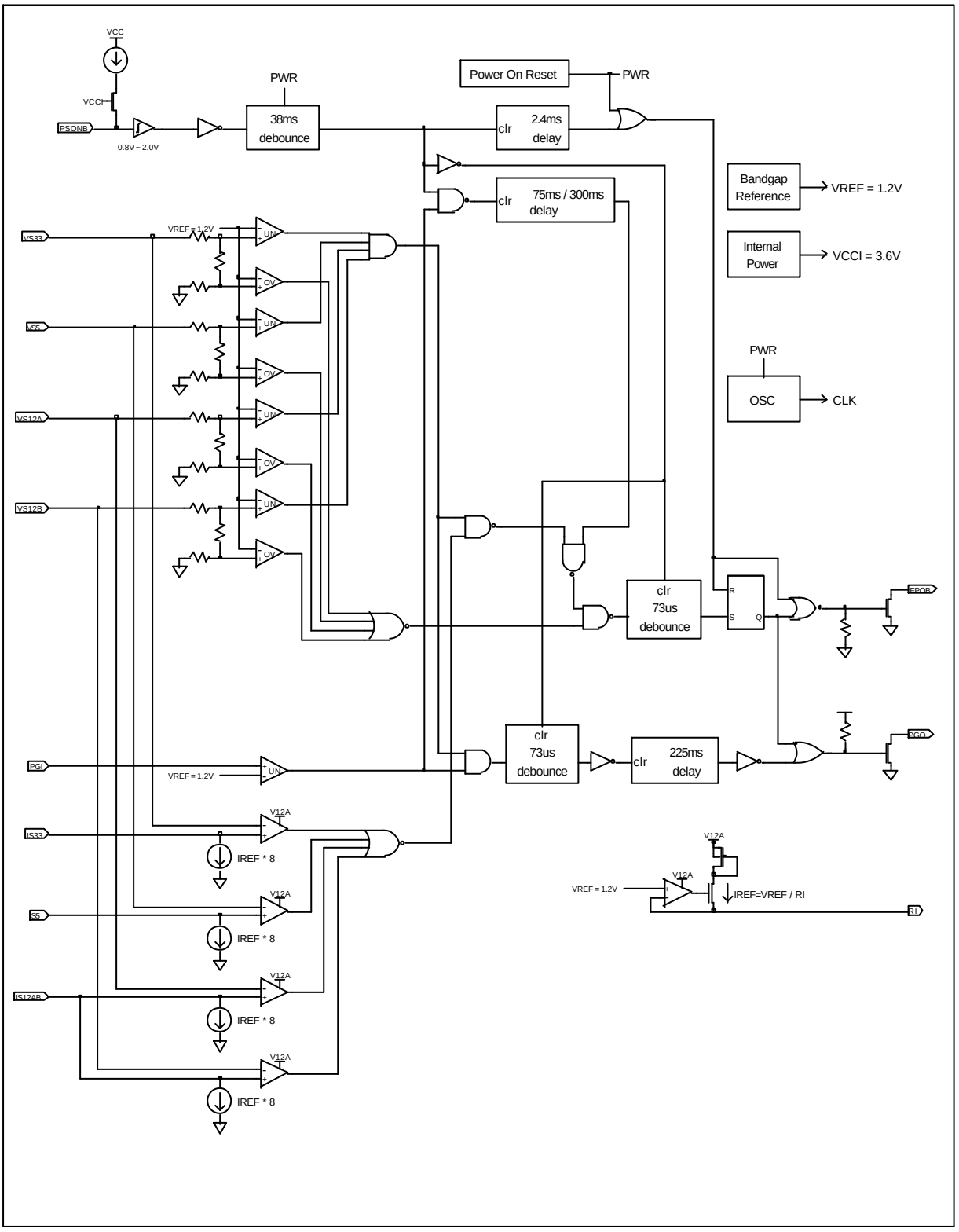
Package type	ORDERING INFORMATION
14–Pin Plastic DIP	WT7525N140
14–Pin Plastic SOP	WT7525S140
16–Pin Plastic DIP	WT7525N160
16–Pin Plastic SOP	WT7525S160
16–Pin Plastic DIP	WT7525N161
16–Pin Plastic SOP	WT7525S161

PIN DESCRIPTION

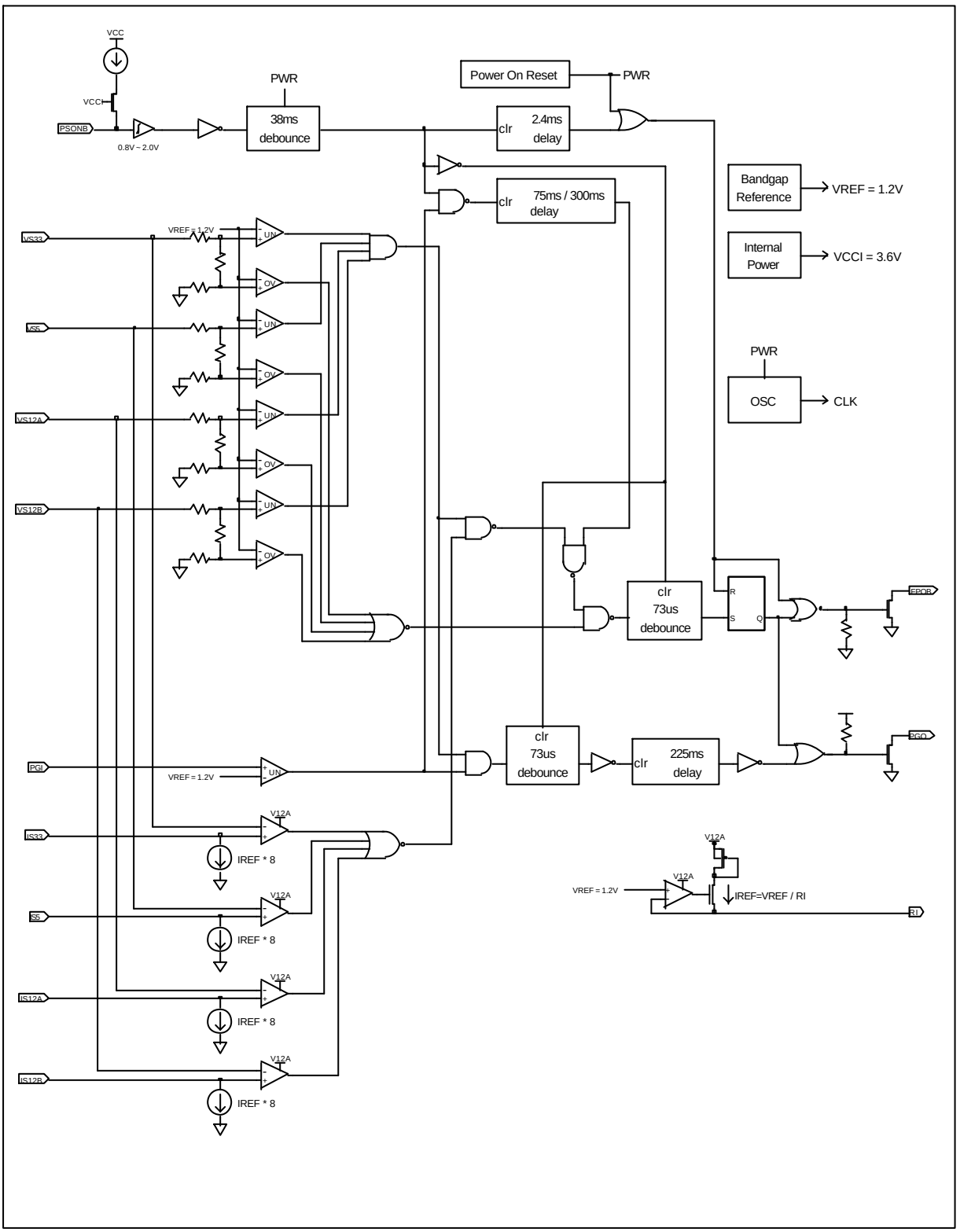
Pin Name	TYPE	Description
PGI	I	Power good input signal pin
GND	P	Ground
FPOB	O	Fault protection output pin, open drain output
PSONB	I	On/Off switch input
IS12A	I	12VA over current protection sense input
IS12AB	I	12VAB over current protection sense input
RI	I	Current sense adjust input
V12B	I	12VB over/under voltage input pin
IS12B	I	12VB over current protection sense input
IS5	I	5V over current protection sense input
IS33	I	3.3V over current protection sense input
V12A	I	12VA over/under voltage input pin
VCC2	I	Current sense power supply
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

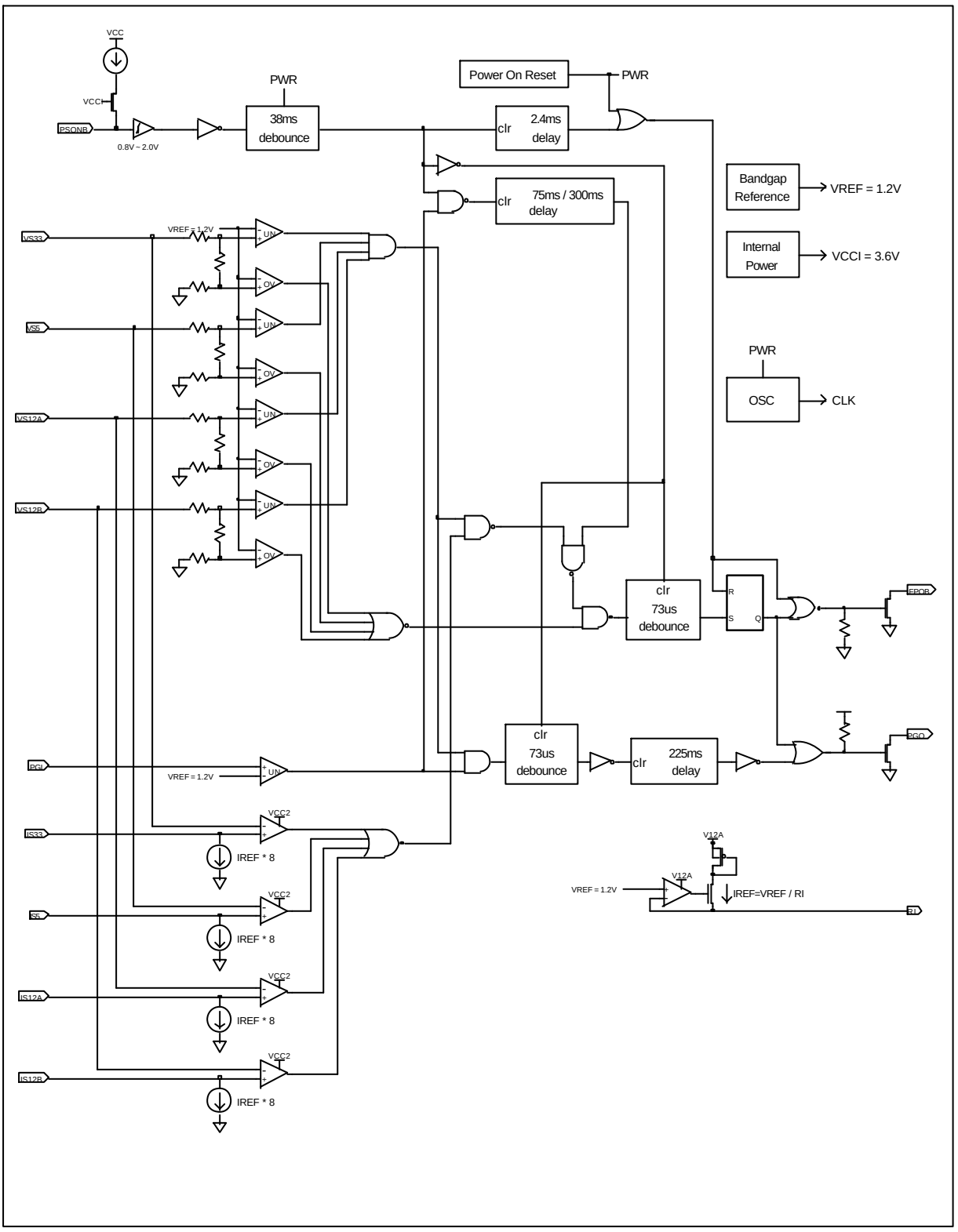
WT7525-140



WT7525-160


VCC
VCCI
PSONB
0.8V ~ 2.0V
PWR
38ms debounce
Power On Reset
PWR
clr
2.4ms delay
clr
75ms / 300ms delay
Bandgap Reference
VREF = 1.2V
Internal Power
VCCI = 3.6V
PWR
OSC
CLK
VREF = 1.2V
VS33
VS5
VS12A
VS12B
UN
OV
clr
73us debounce
R
S
Q
EPOB
PGI
clr
73us debounce
clr
225ms delay
PGO
V12A
IS33
IS5
IS12A
IS12B
IREF * 8
VREF = 1.2V
IREF=VREF / RI
RI

WT7525-161


VCC
VCCI
PSONB
0.8V ~ 2.0V
PWR
38ms
debounce
Power On Reset
PWR
clr
2.4ms
delay
clr
75ms / 300ms
delay
Bandgap
Reference
VREF = 1.2V
Internal
Power
VCCI = 3.6V
PWR
OSC
CLK
VREF = 1.2V
VS33
VS5
VS12A
VS12B
UN
OV
clr
73us
debounce
R
S
Q
EPOB
PGI
clr
73us
debounce
clr
225ms
delay
PGO
VCC2
IS33
IS5
IS12A
IS12B
IREF * 8
V12A
IREF=VREF / RI
RI

ABSOLUTE MAXIMUM RATINGS

Parameter		Min.	Max.	Unit
Supply voltage, VCC, VCC2, V12A		–0.3	16	V
Input voltage	PGI	–0.3	VCC+0.3	V
	PSONB, V5, V33, I5, I33	–0.3	7	V
	V12B, I12AB	–0.3	16	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	V
Input voltage	PSONB, V5, V33, PGI				7	V
	V12A, V12B				15	V
Output voltage	FPOB, PGO				7	V
Output sink current	FPOB	0.7V			30	mA
	PGO	0.4V			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
	V12AB		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
	V12AB		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

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

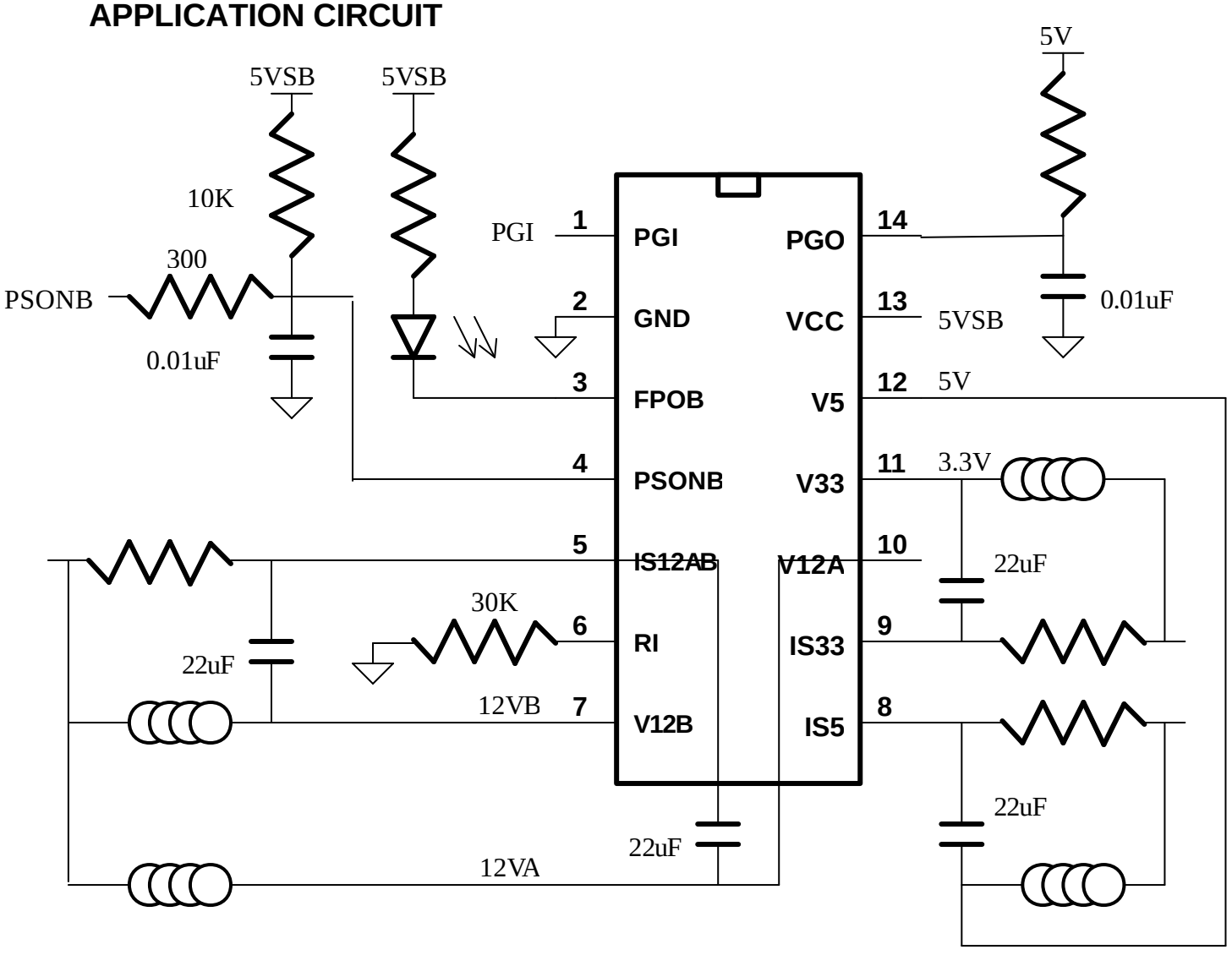
TOTAL DEVICE

Parameter	Condition	Min.	Typ.	Max.	Unit
Icc Supply current	PDON _N= 5V			1	mA
Vcc low voltage			3		V

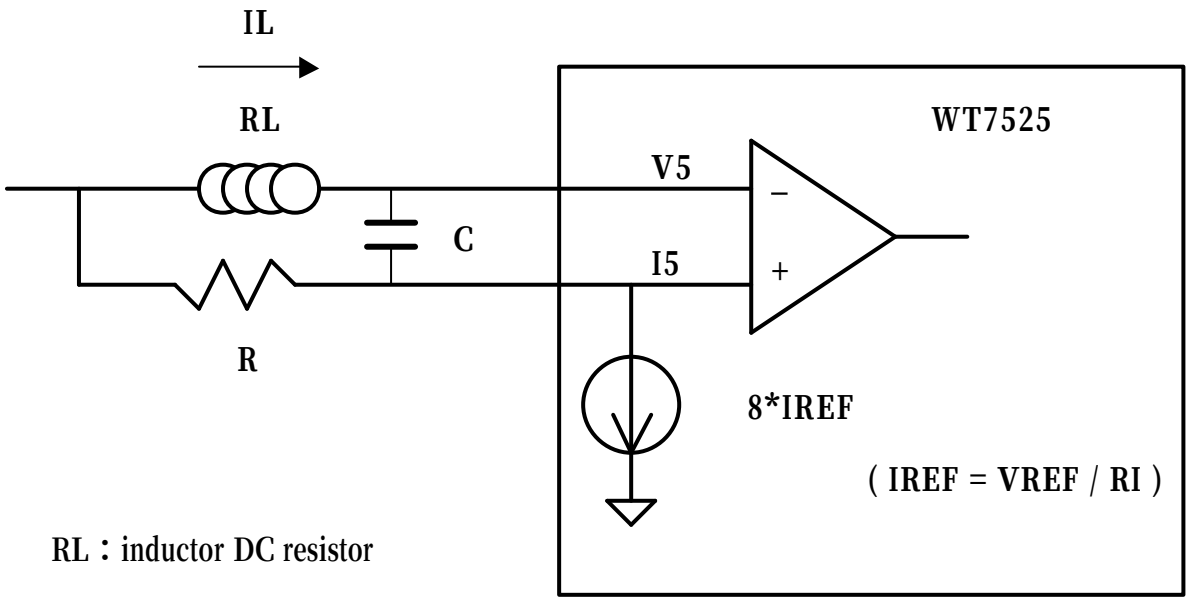
SWITCHING CHARACTERISTICS, Vcc=5V

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



APPLICATION NOTE



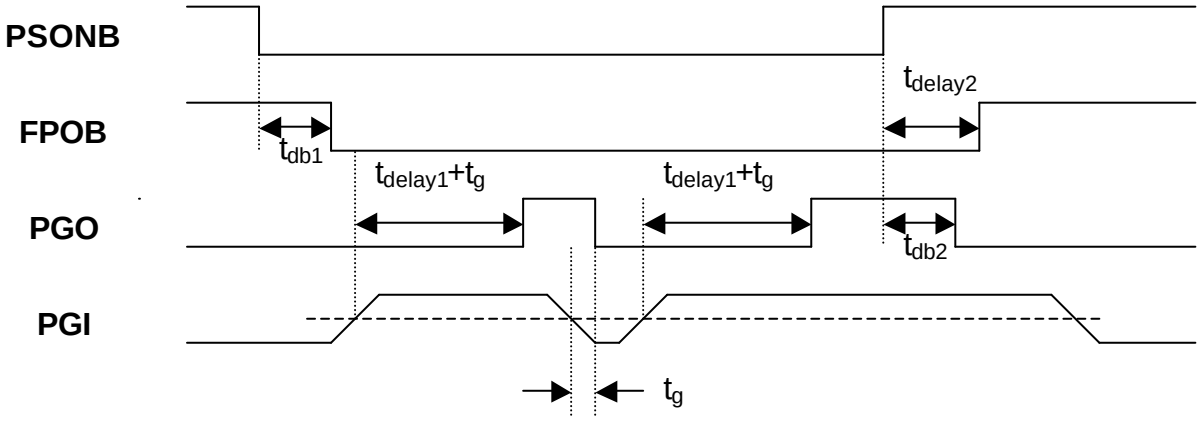
If IL * RL ＞ (8 * IREF) * R, then OCP active.
And the capacitor C is used to avoide power on fail or dynamic load fail. We suggest C > 1uF.

EX：How to select the resistor of R? Assume RI=30KΩ, RL=3mΩ, OCP=20A。

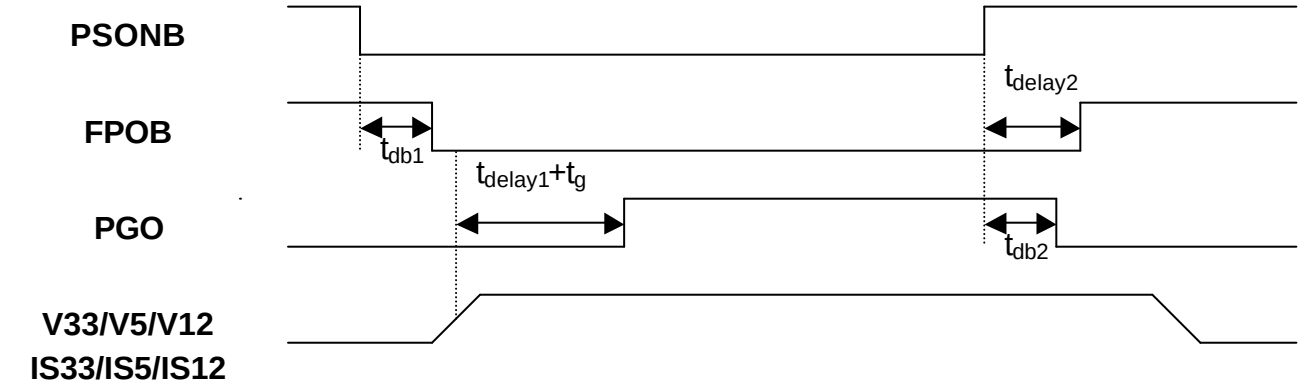
Sol：R = (IL * RL) / (8 * IREF)
= (20A * 3mΩ) / { 8 * (1.2V / 30KΩ)}
= 187.5Ω

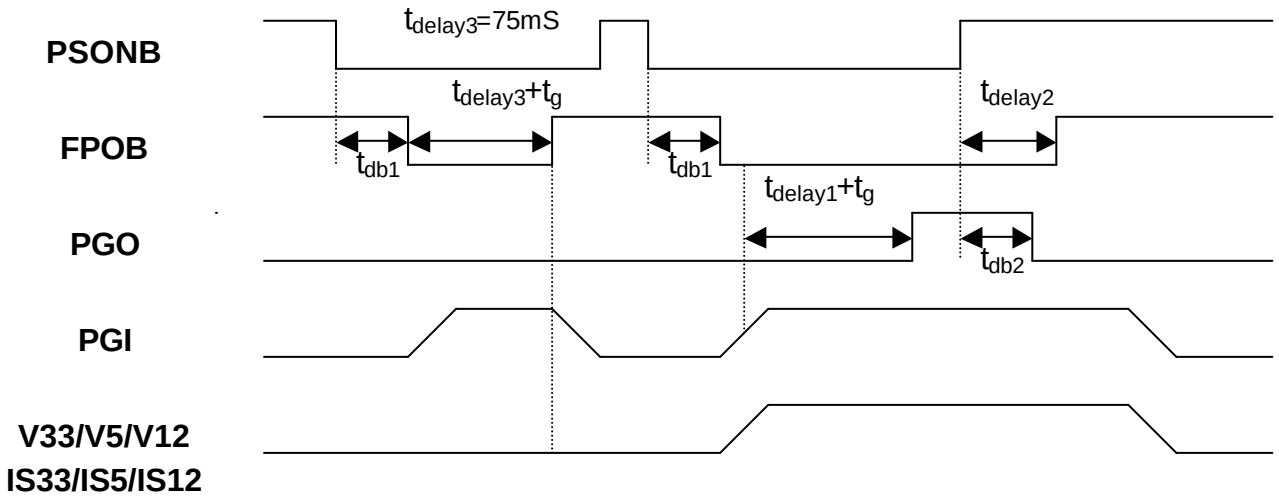
APPLICATION TIMMING

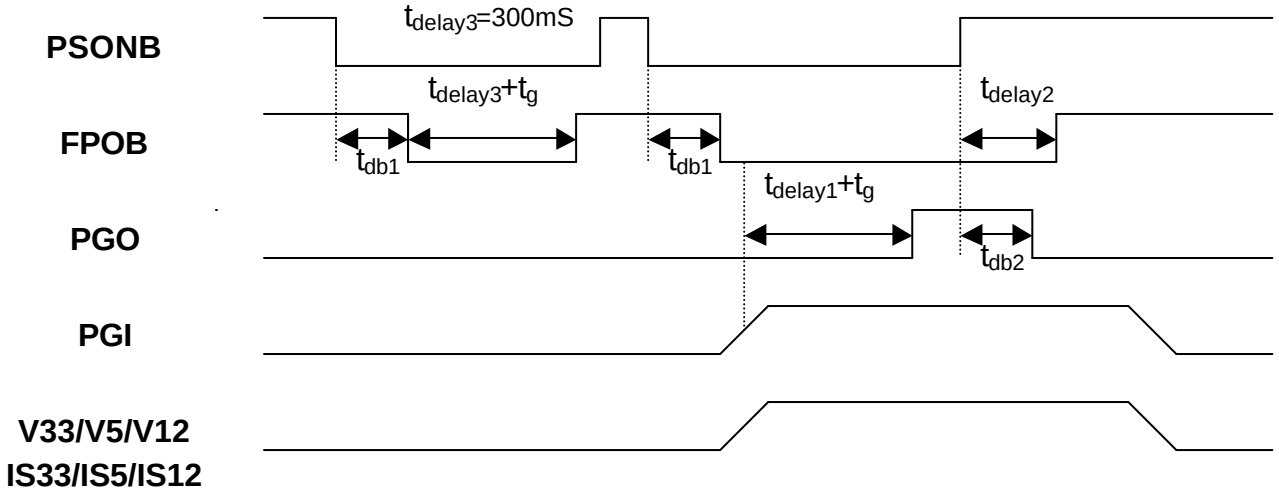
1.) PGI (UNDER_VOLTAGE)：



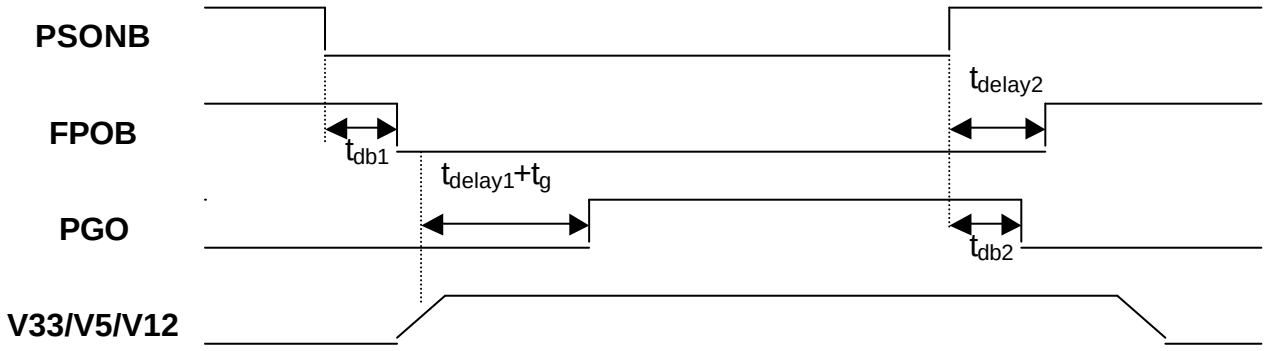
2.) V33, V5, V12 (UNDER_VOLTAGE) or IS33, IS5, IS12 (OVER_CURRENT)：

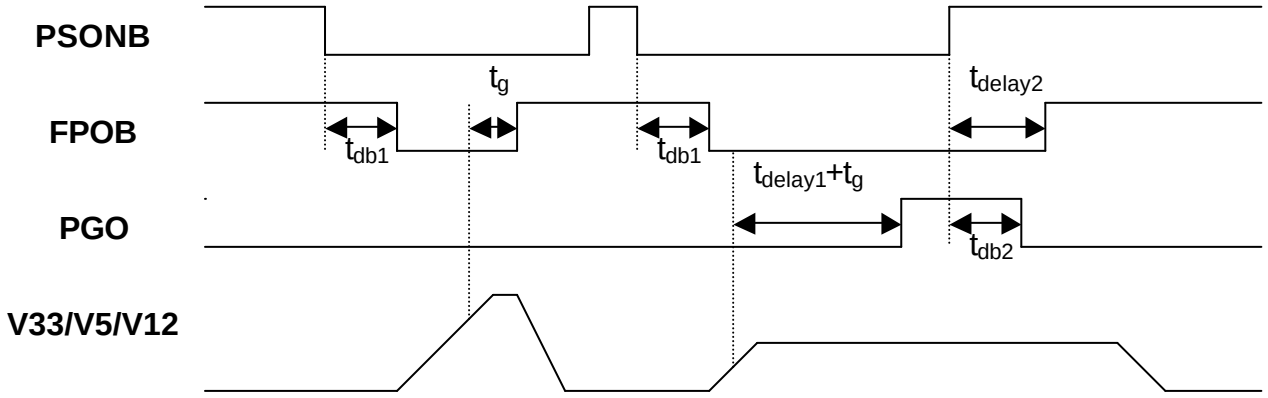






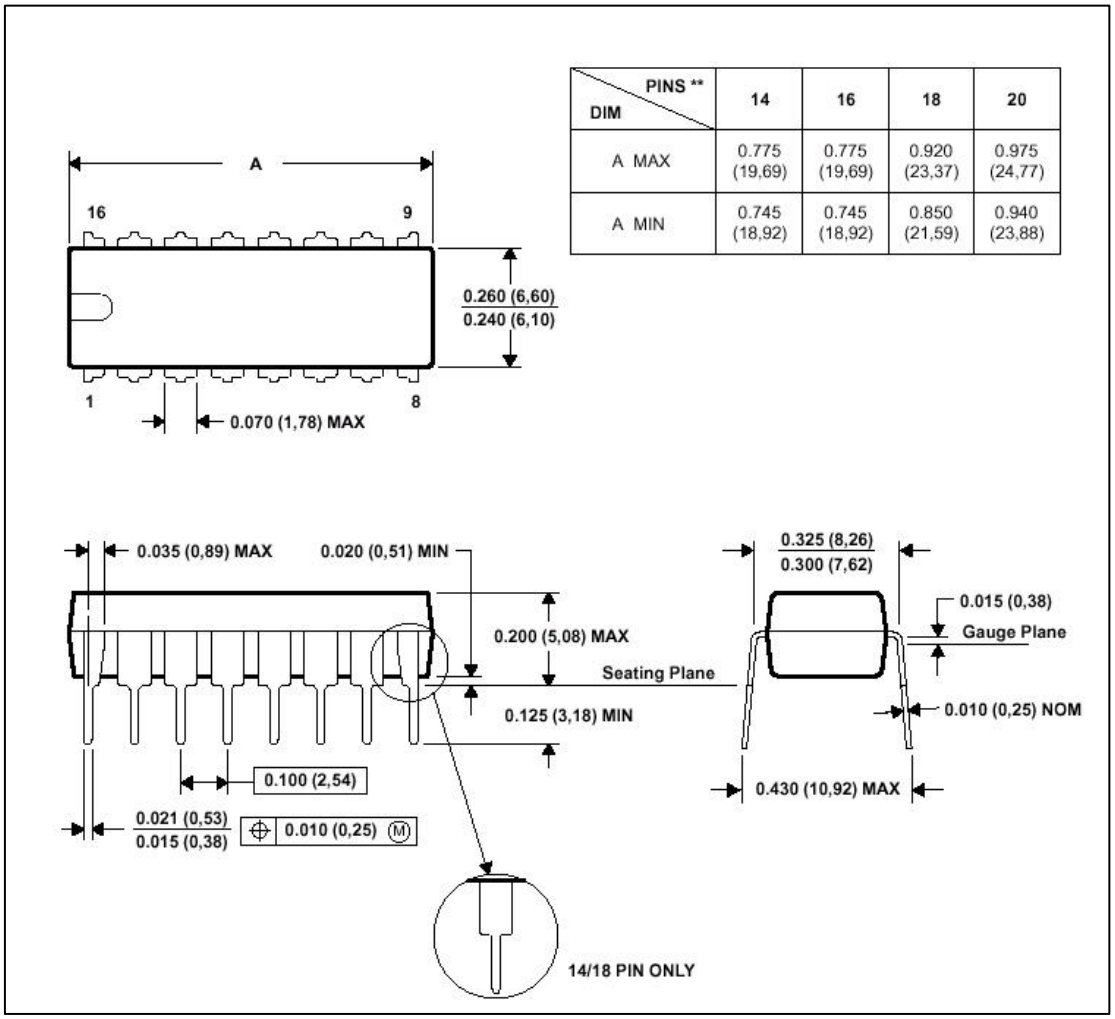
3.) V33, V5, V12 (OVER_VOLTAGE)：





MECHANICAL INFORMATION

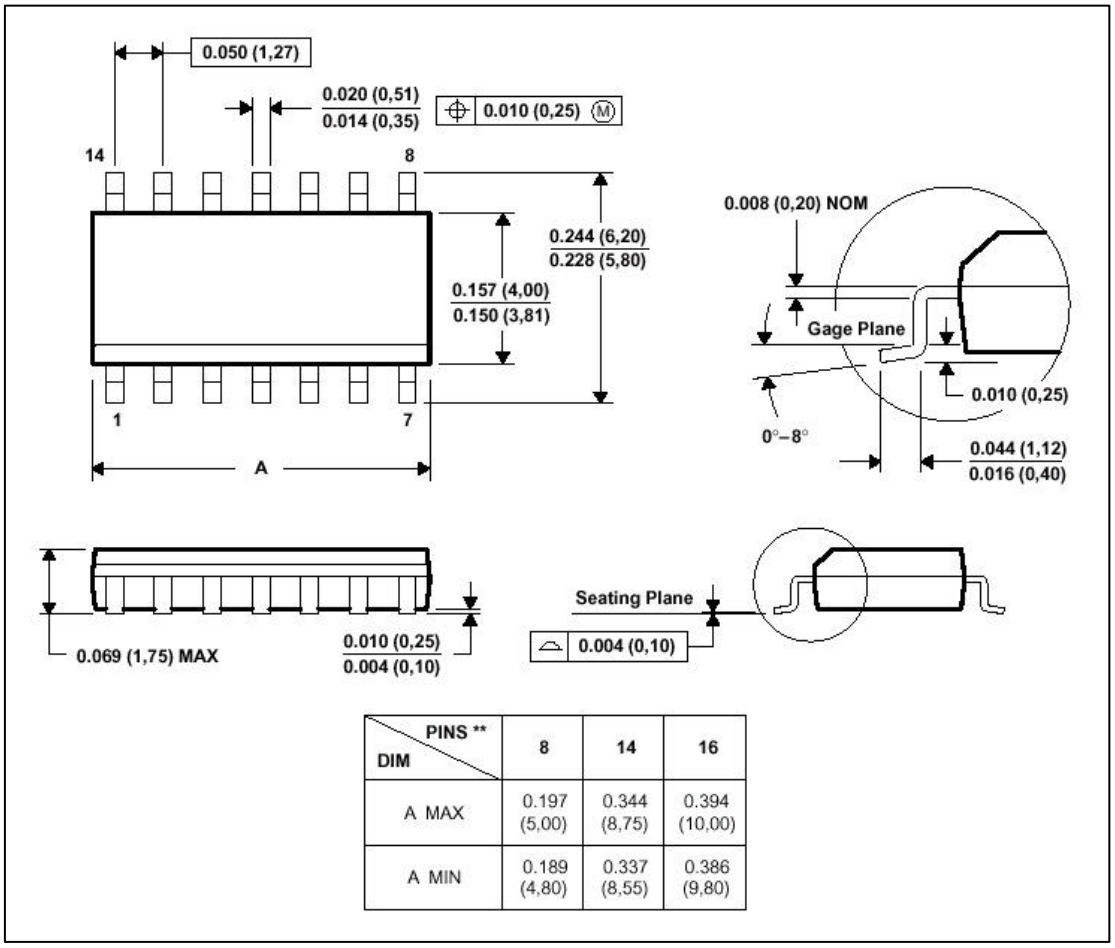
PLASTIC DUAL–IN–LINE PACKAGE



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