

GENERAL DESCRIPTION

The WT7517 is semiconductor integrated circuits designed for Server System switching power supply. It provides protection circuits, power good output (PGO), fault protection latch (FPOB), and a PSONB control.

The Over Voltage Detector (OVD) and Under Voltage Detector (UVD) are monitor V33, V5, V12A and V12B within WT7517–N16 and external control VXOV and VXUN within WT7517–N180 and V12C within WT7517–N181.

The Over Current Detector (OCD) monitor IS33, IS5, IS12A and IS12B within WT7517–N16 and external control IX and VX within WT7517–N180 and IS12C within WT7517–N181.

The Over Temperature Protection (OTP) input has hysteresis function. In OTP condition the WT7517 will shut-down. When the OTP input has low level WT7517 shall restart power automatically.

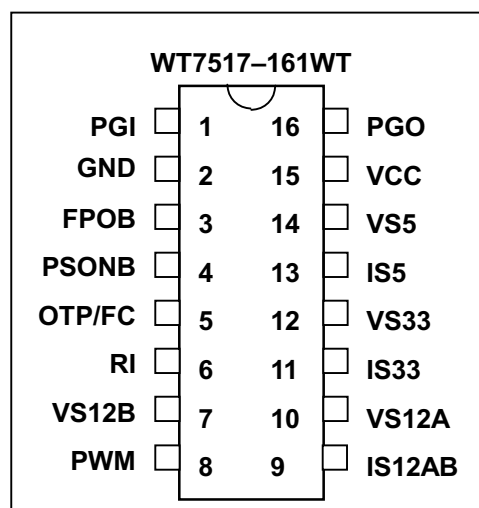
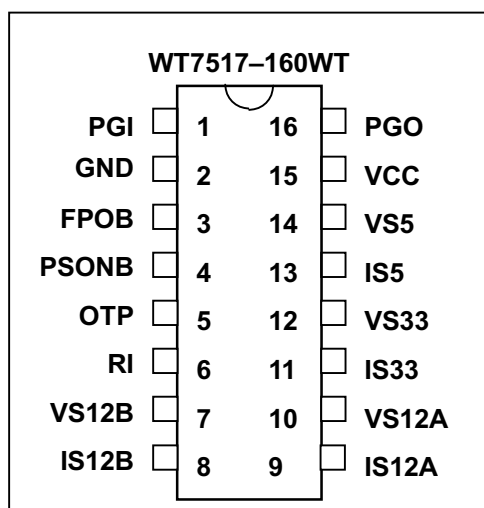
WT7517-N161 has FAN C function in OTP/FC pin .The output PWM is active low.

FEATURES

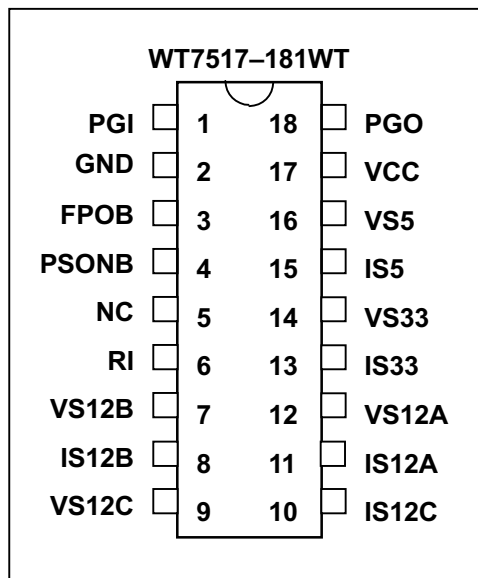
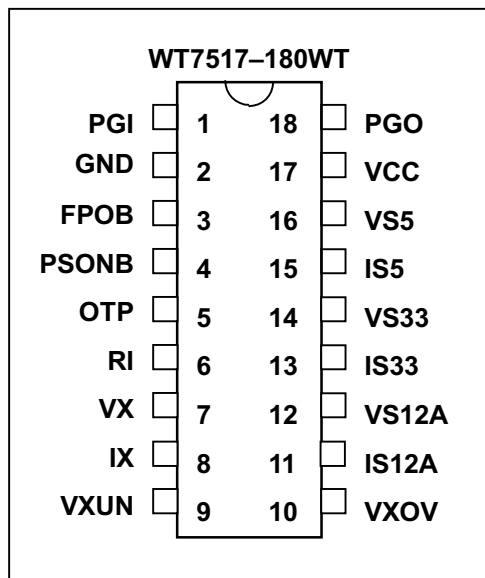
- The Over / Under Voltage Detector (OVD / UVD) monitors 3.3V, 5V, 12VA, 12VB and 12VC input voltage level.
- The Over Current Detector (OCD) monitors IS33, IS5, IS12A, IS12B and IS12C input current sense.
- Both of the power good output (PGO) and fault protection latch (FPOB) are Open Drain Output.
- 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



Package type	16–Pin Plastic DIP	16–Pin Plastic SOP
ORDERING	WT7517–N160WT	WT7517–S160WT
	WT7517–N161WT	WT7517–S161WT



Package type	16-Pin Plastic DIP	16-Pin Plastic SOP
ORDERING	WT7517-N180WT WT7517-N181WT	WT7517-S180WT WT7517-S181WT

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
OTP/FC	I	Over temperature protection / Fan C
RI	I	Current sense adjust input
PWM	O	Pulse width modulation
VX	I	Extra Over current protection sense input
IX	I	Extra Over current protection sense input
VXUN	I	Extra Under voltage input pin, when VXUN < 1.2V then UVP action
VXOV	I	Extra Over voltage input pin, when VXOV > 1.2V then OVP action
IS33	I	3.3V over current protection sense input
VS33	I	3.3V over/under voltage input pin
IS5	I	5V over current protection sense input
VS5	I	5V over/under voltage input pin
IS12A	I	12V over current protection sense input
VS12A	I	12V over/under voltage input pin
VS12B	I	12V over/under voltage input pin
IS12B	I	12V over current protection sense input
VS12C	I	12V over/under voltage input pin
IS12C	I	12V over current protection sense input
VCC	I	Power supply
PGO	O	Power good output signal pin, open drain output

ABSOLUTE MAXIMUM RATINGS

Parameter	Min.	Max.	Unit	
Supply voltage, VCC	-0.3	16	V	
Input voltage	PSONB, V5, V33, PGI, OTP	-0.3	7	V
	V12n, VX, VXUN, VXOV	-0.3	16	
	I12n, I5, I33, IX	-0.3	V12A+0.3	V
Output voltage	FPOB, PGO	-0.3	VCC+0.3	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		4	12	15	V
Input voltage	PSONB, V5, V33, PGI, OTP			7	V
	V12n, VX, VXUN, VXOV			15	
	I12n, I5, I33, IX			15	V
Output voltage	FPOB, PGO			7	V
Output sink current	FPOB			30	mA
	PGO			10	mA
VCC rising time		1			ms
Output current for RI	RI	10		65	uA

ELECTRICAL CHARACTERISTICS, at Ta=25°C and VCC=5V and V12A=12V.

Over Voltage Detection

Parameter	Condition	Min.	Typ.	Max.	Unit
Over voltage threshold	V33	3.7	3.9	4.1	V
	V5	5.7	5.95	6.2	V
	V12n	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
	V12n	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		2.2			V
Low-level input voltage				0.6	V



TOTAL DEVICE

Parameter	Condition	Min.	Typ.	Max.	Unit
I _{cc} Supply current	PDON_N= 5V			1	mA
V _{cc} low voltage			3.6		V

SWITCHING CHARACTERISTICS, V_{cc}=5V

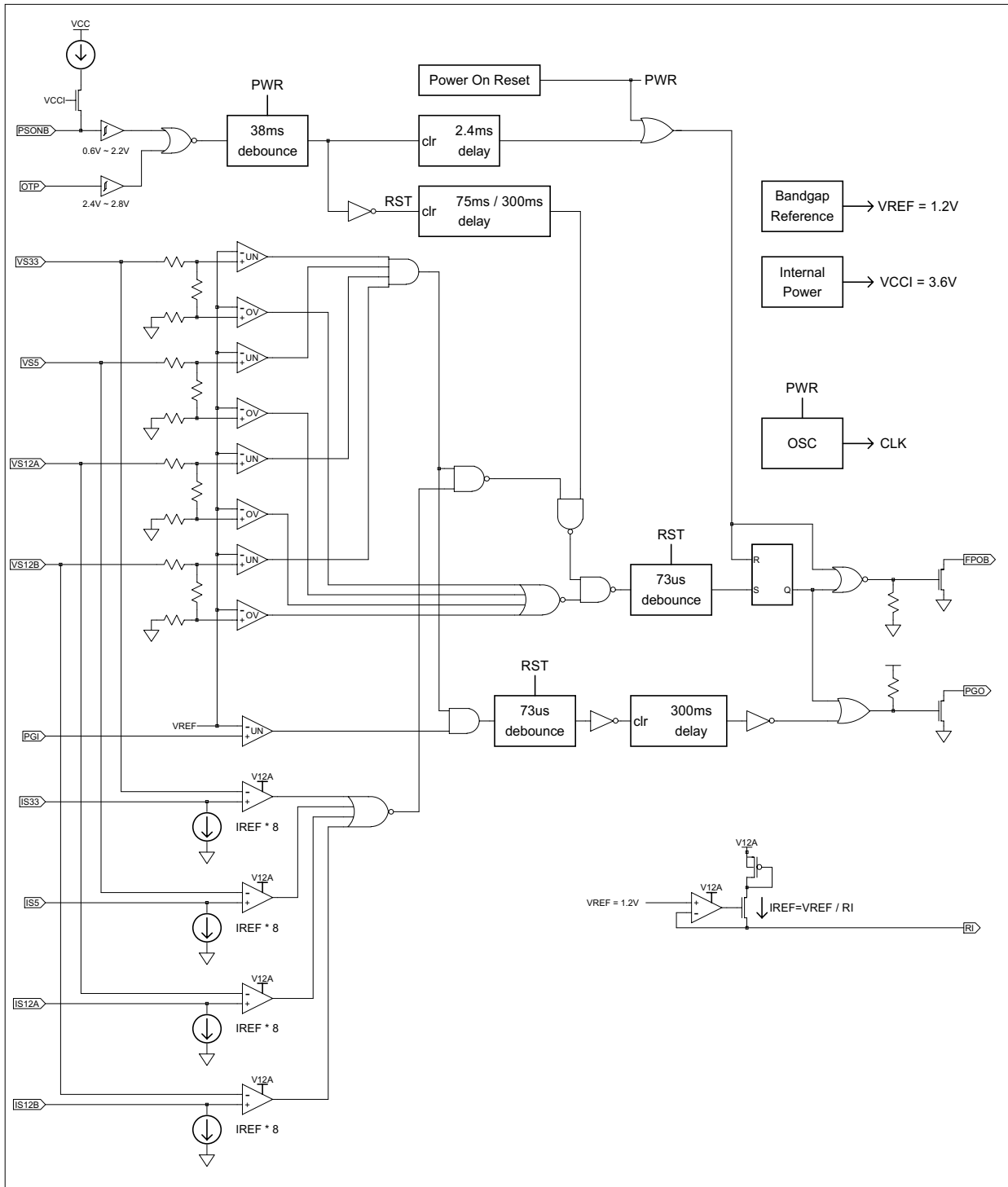
Parameter	Condition	Min.	Typ.	Max.	Unit
t _{db1} De-bounce time (PSONB)		32	38	61	ms
t _{dleav1} Delay time (PGI to PGO)		200	300	490	ms
t _{db2} De-bounce time (PSONB)		32	38	61	ms
t _g De-glitch time		63	73	120	us
t _{delay2} PSONB to FPOB delay time		t _{db2} +2.0	t _{db2} +2.4	t _{db2} +3.8	ms
t _{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

OTP / FC and PWM

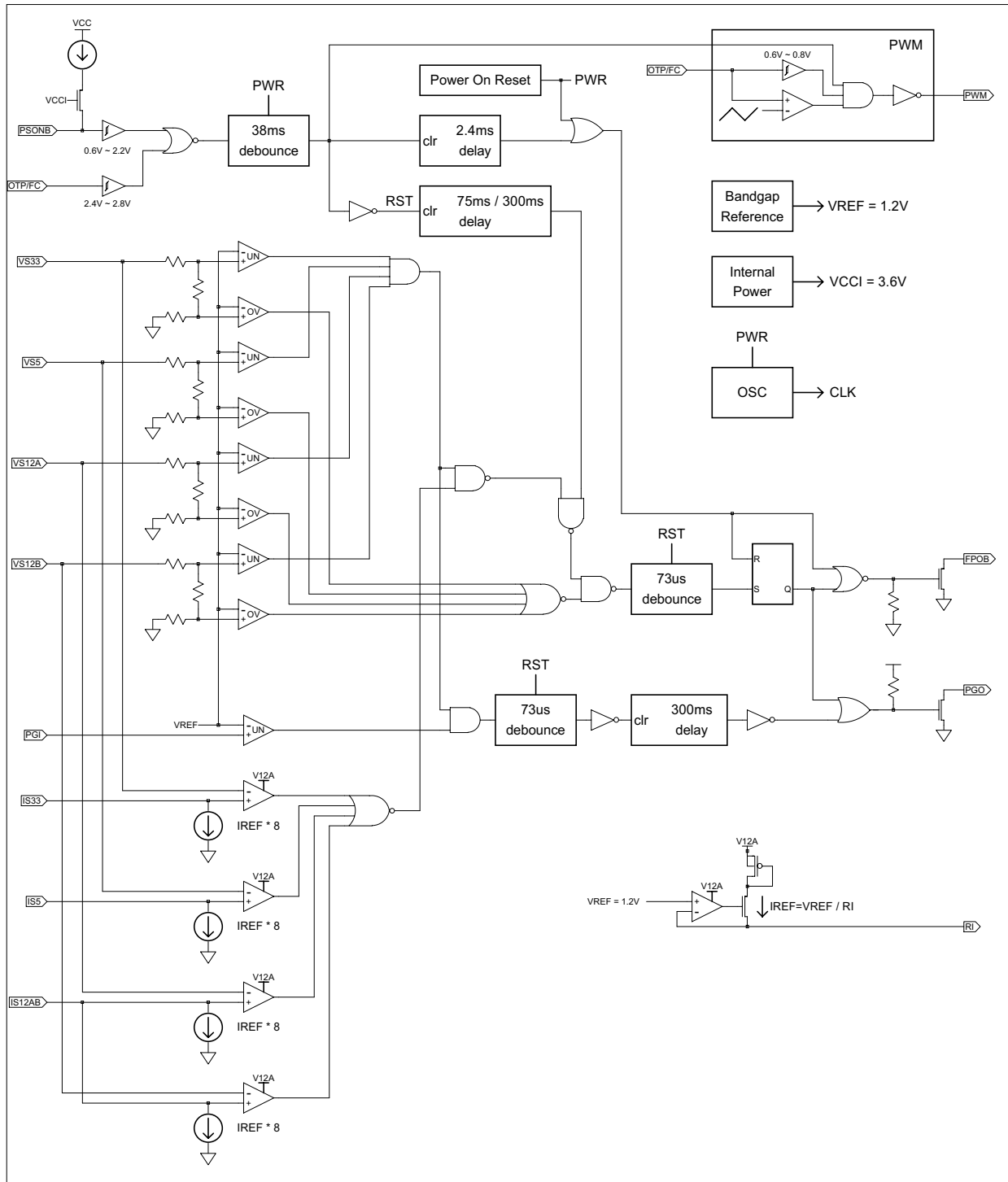
Parameter	Condition	Min.	Typ.	Max.	Unit
OTP High-level input voltage			2.8	2.9	V
OTP Low-level input voltage		2.3	2.4		V
FC start-up voltage			0.8	0.9	V
FC stop voltage		0.55	0.65		V
f _{PWM} PWM frequency		28	35	42	KHz
I _{LEAKAGE} Leakage current(PWM)			5		uA
V _{OL} Low level output voltage(PWM)	I _{sink} =4mA		0.4		V
V _{OH} High level output voltage(PWM)	I _{source} =4mA		V12A-0.4		V

BLOCK DIAGRAM

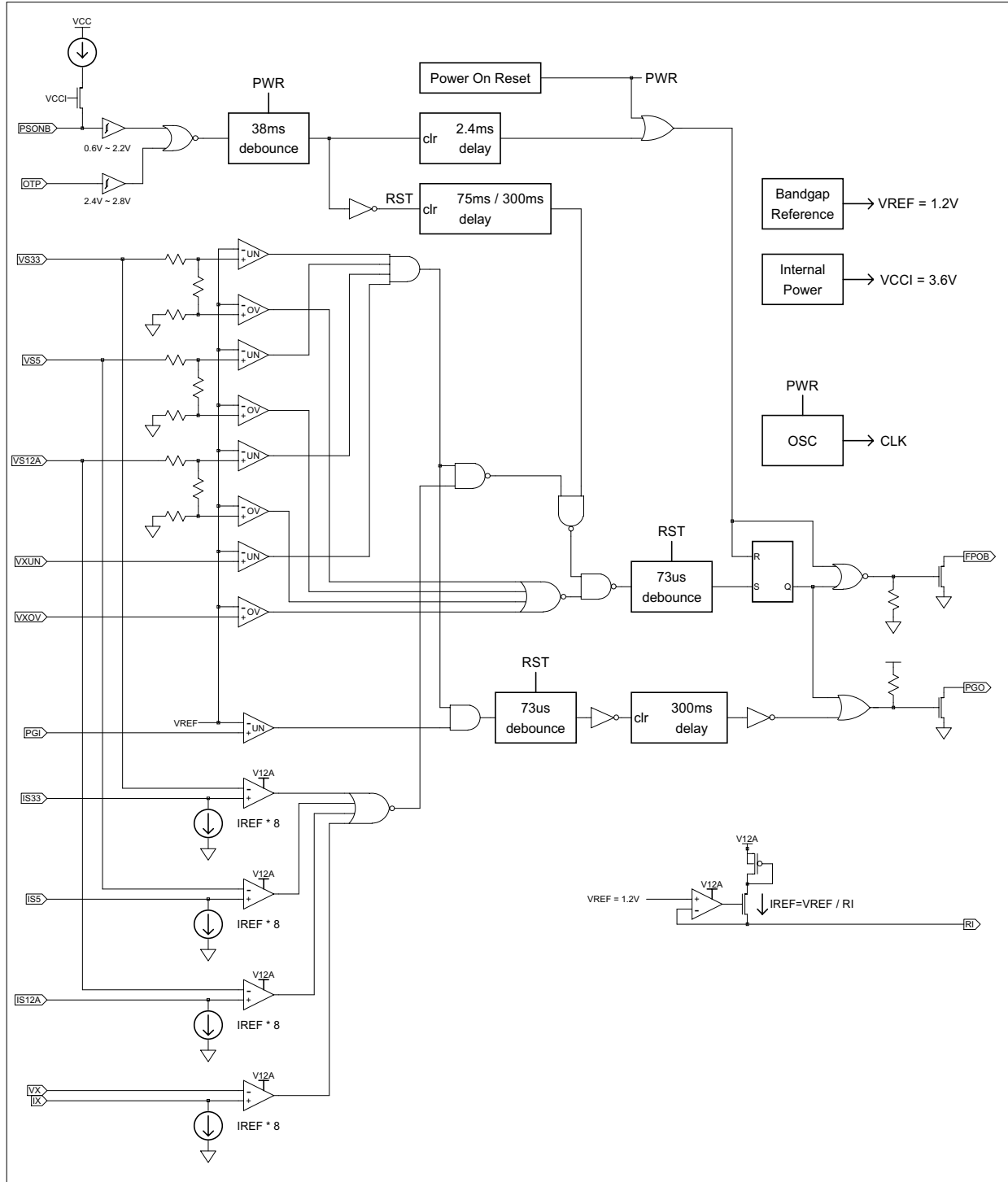
WT7517-N160WT



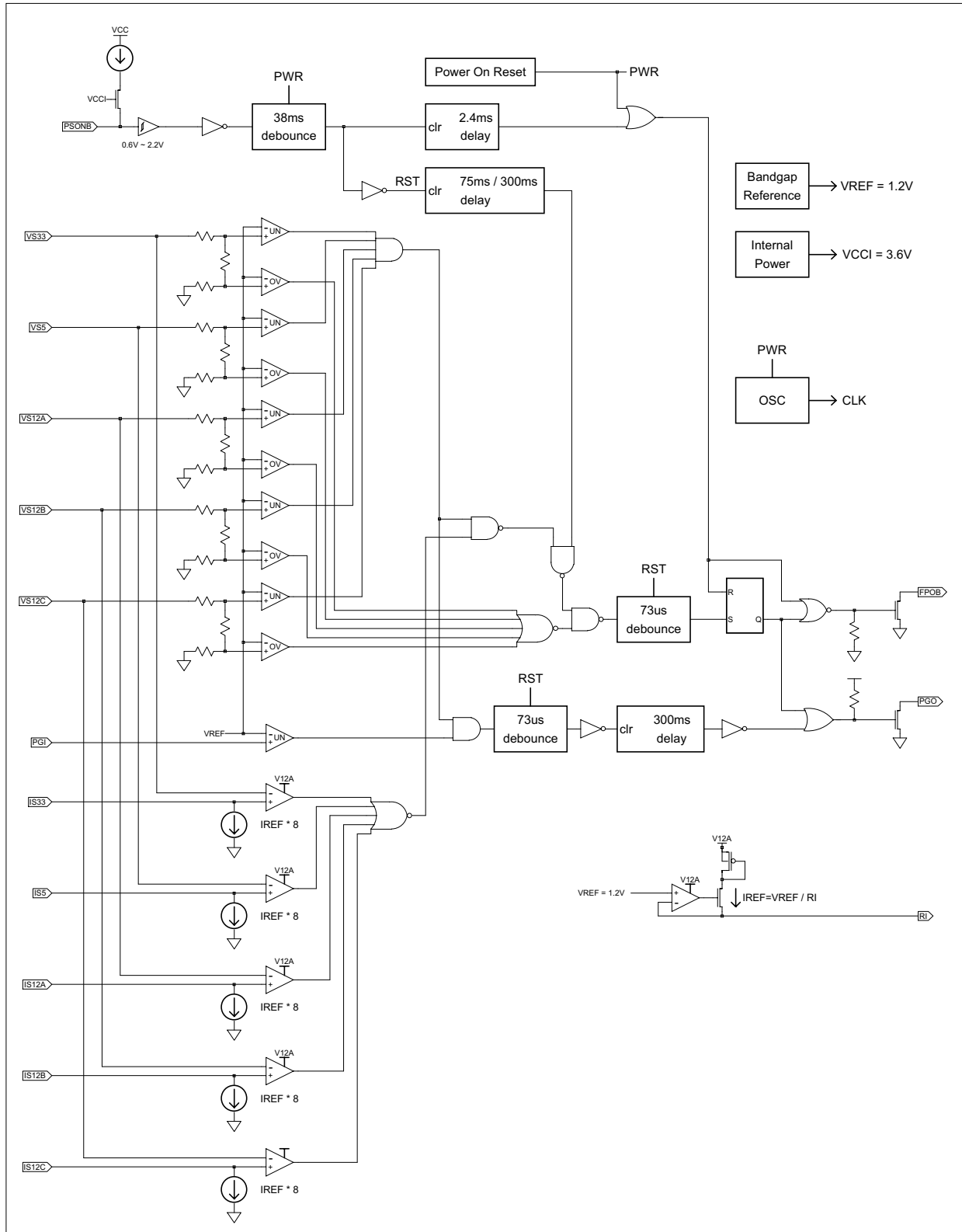
WT7517-N161WT



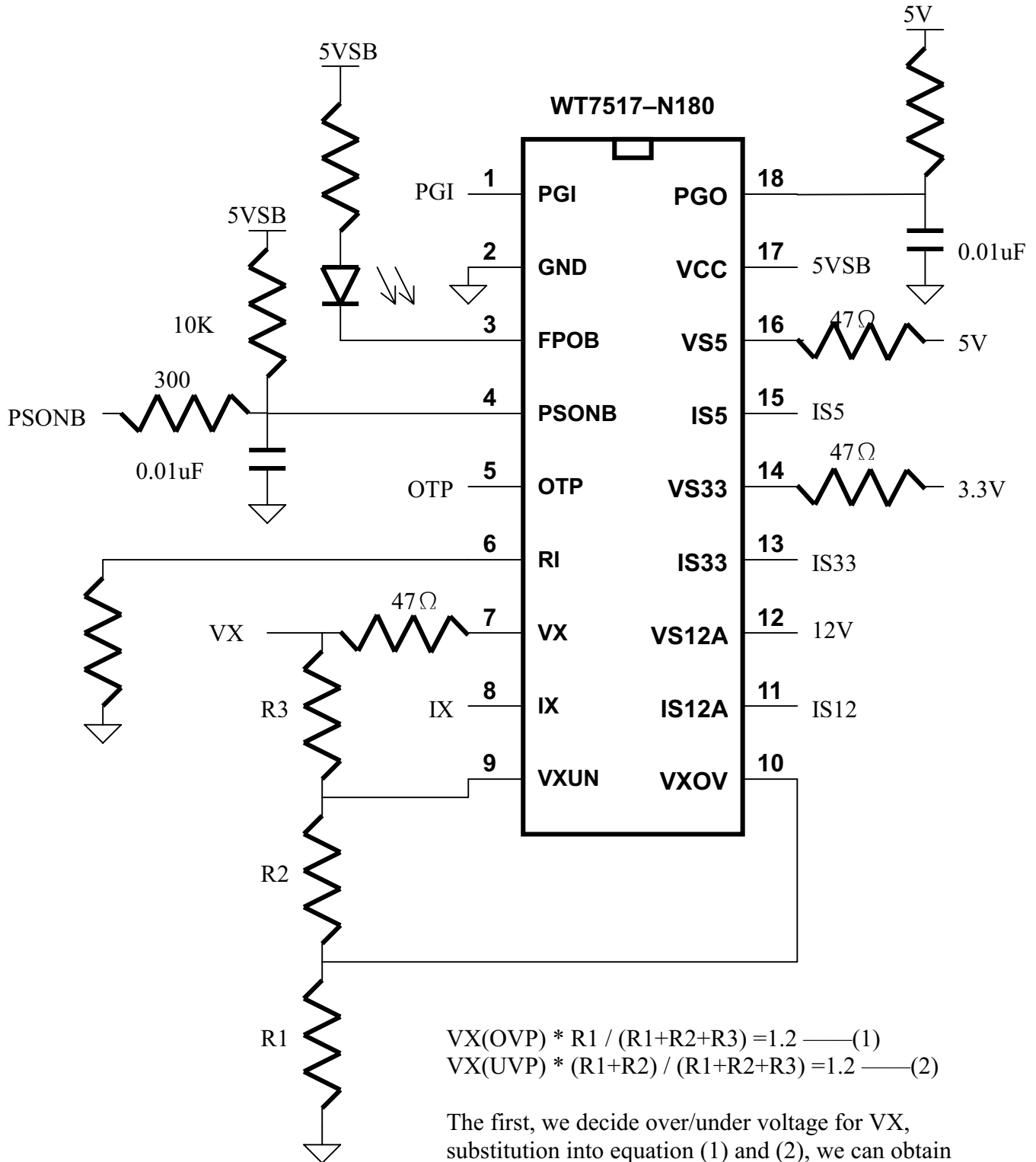
WT7517-N180WT



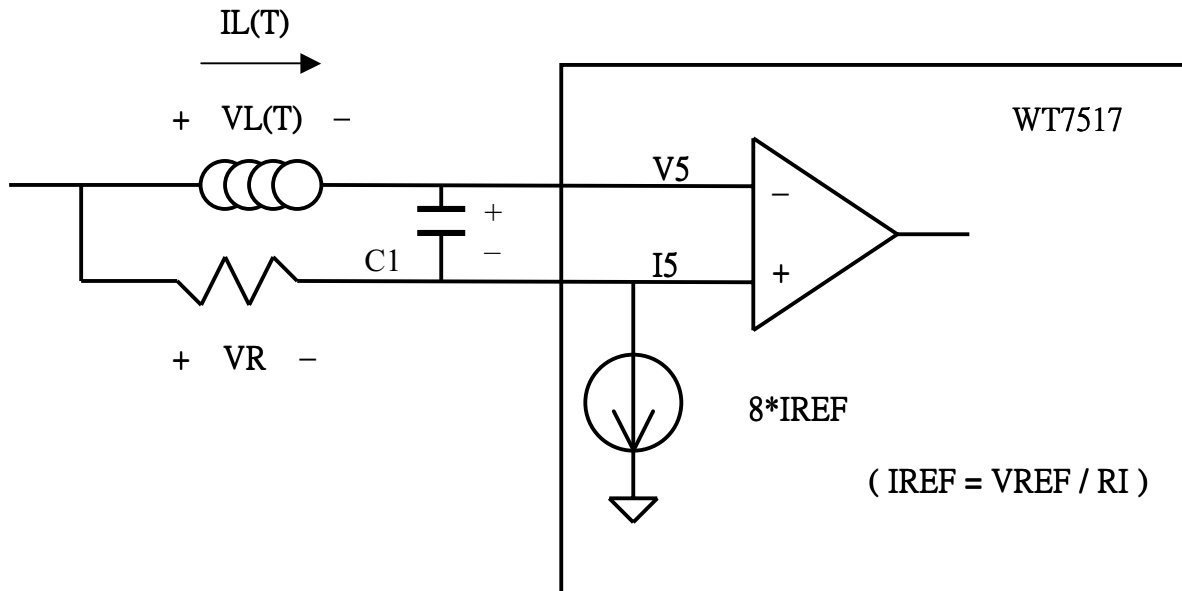
WT7517-N181WT



APPLICATION CIRCUIT



APPLICATION NOTE



When the current cross inductor raised immediately, inductor voltage raised.

And when inductor voltage exceeded resistor voltage, the OCP active.

We can setup OCP point by the following equation

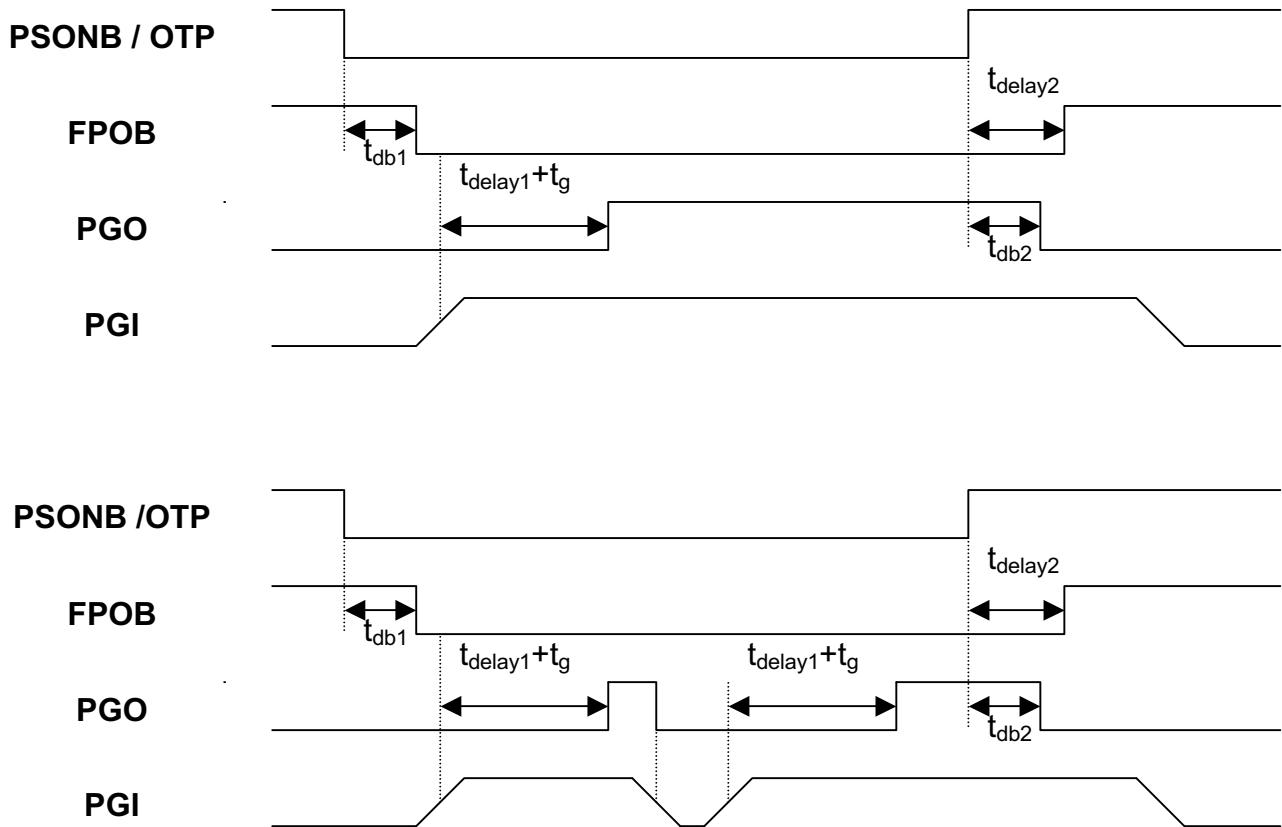
$$V_L(T) = V_R$$

$$L \cdot [d I_L(T) / dT] = (8 \cdot V_{REF} / R_I) \cdot R$$

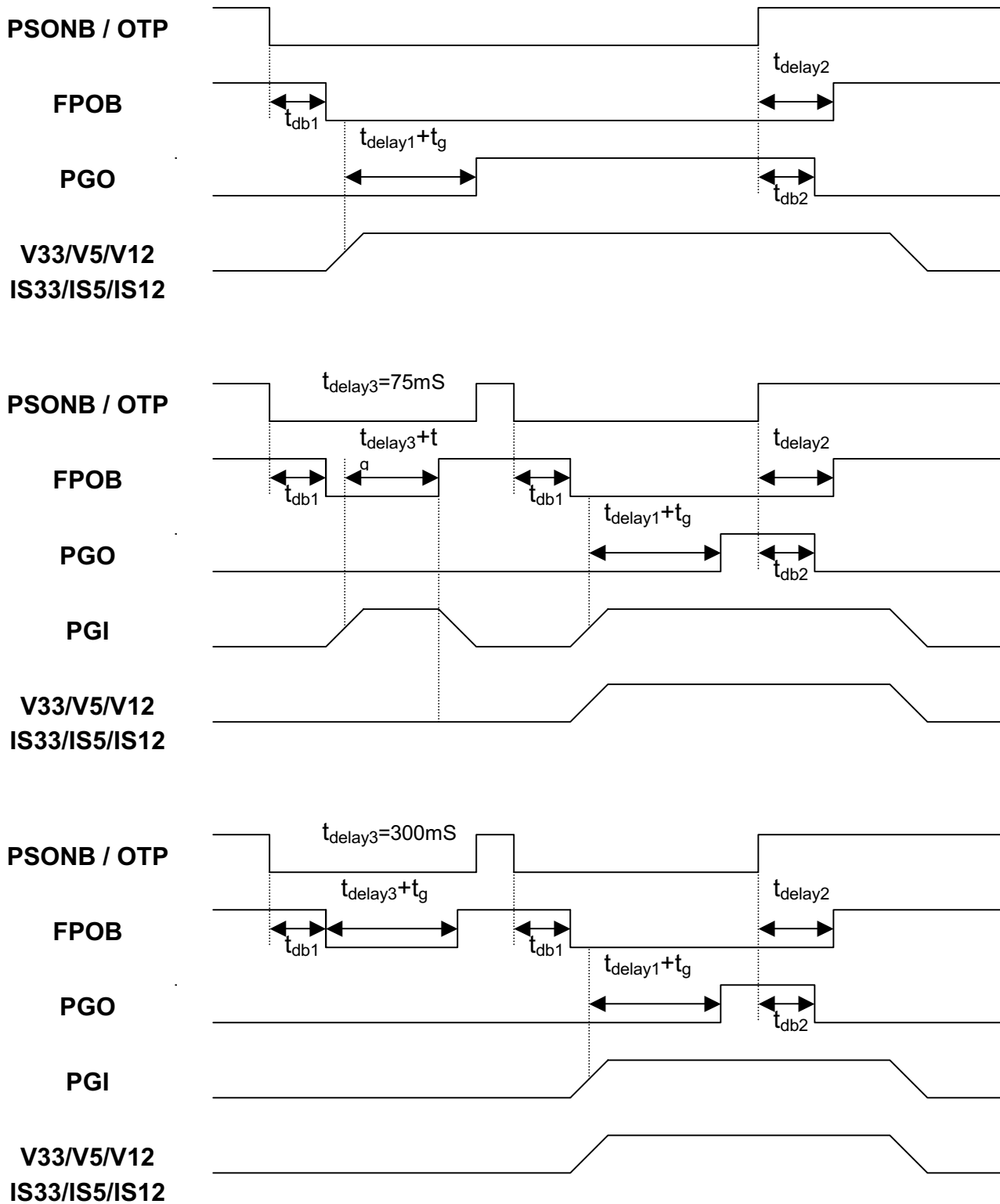
$$d I_L(T) / dT = (8 \cdot V_{REF} / R_I) \cdot R / L \quad \dots(1)$$

APPLICATION TIMMING

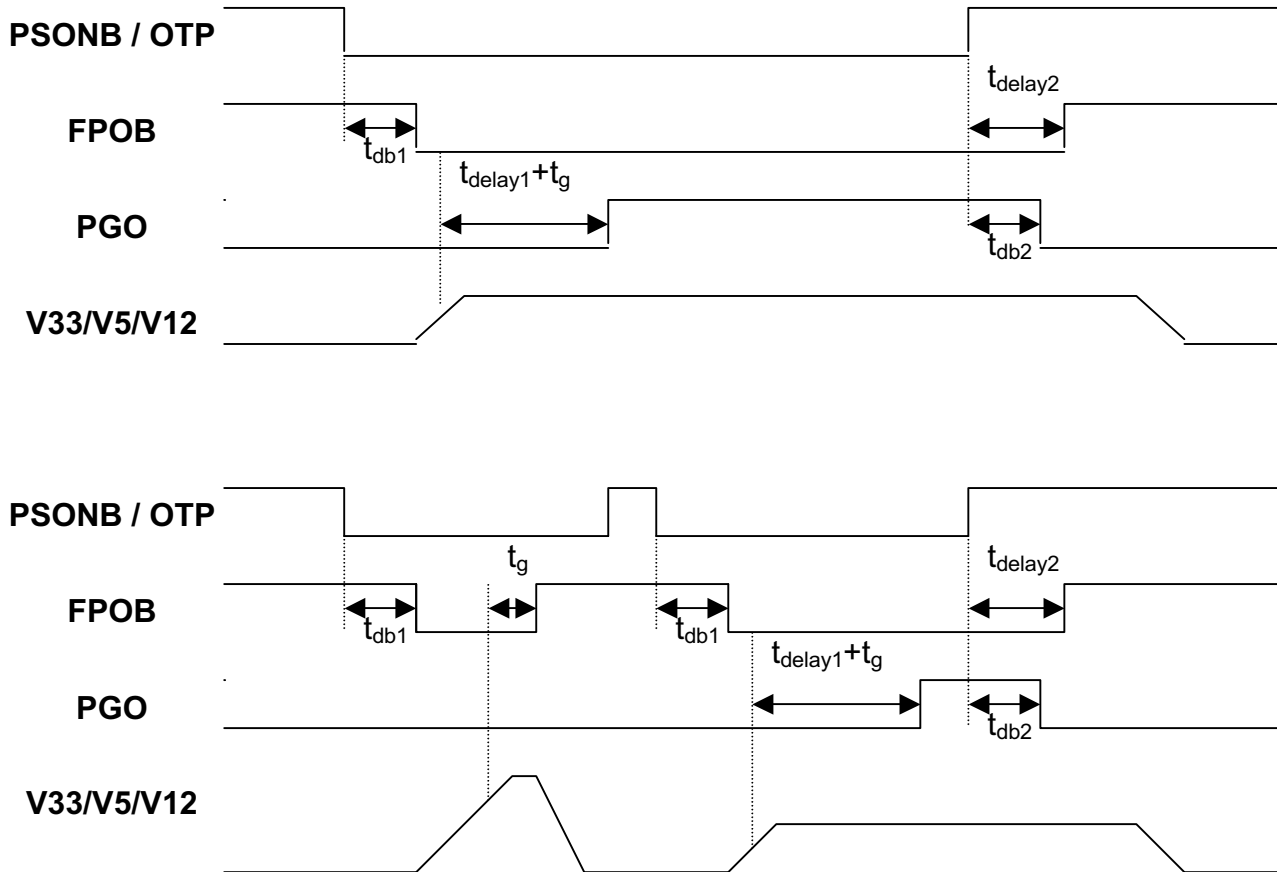
1.) PGI (UNDER_VOLTAGE) :



2.) V33, V5, V12n (UNDER_VOLTAGE) or IS33, IS5, IS12n (OVER_CURRENT) :

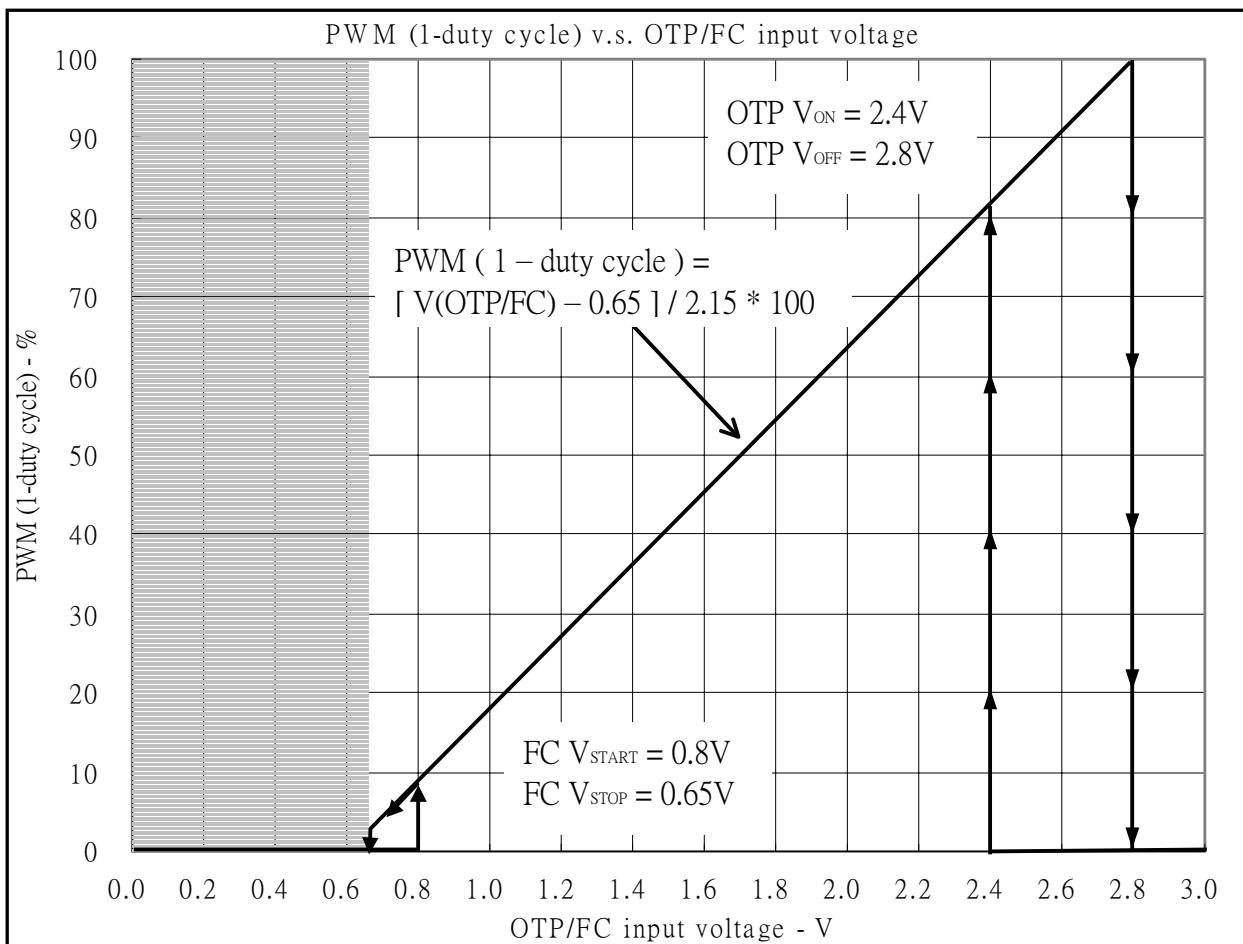
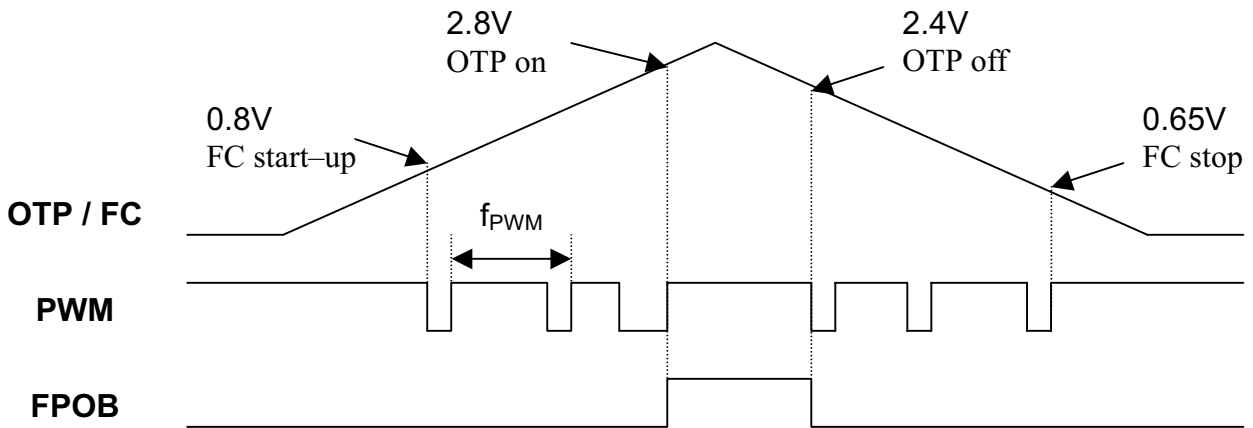


3.) V33, V5, V12n (OVER_VOLTAGE) :



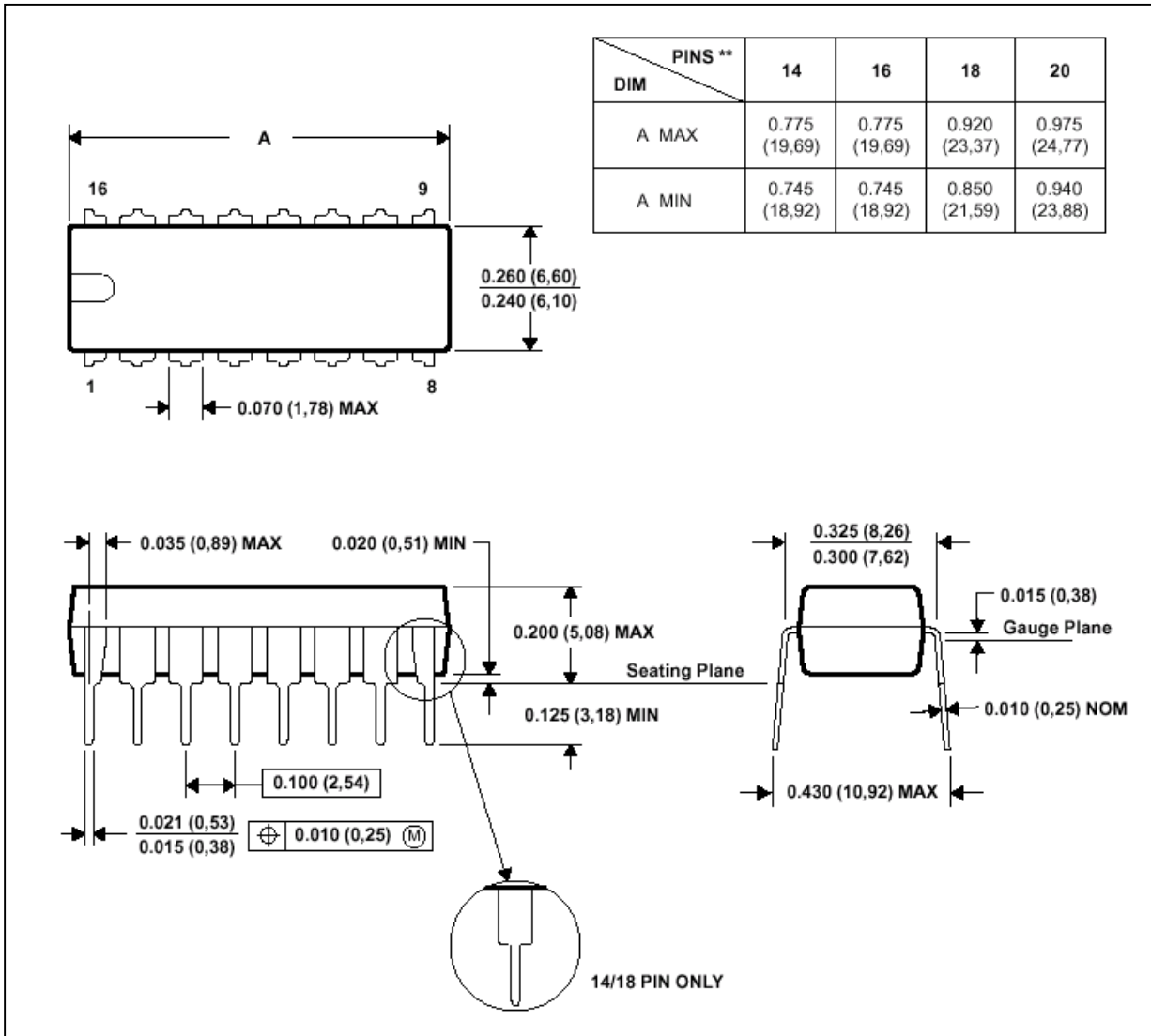
4.) OTP / FC, PWM, FPOB :

(at VCC=5V, PSONB=0V, V12n=12V, V5=5V, V33=3.3V)



MECHANICAL INFORMATION

PLASTIC DUAL-IN-LINE PACKAGE

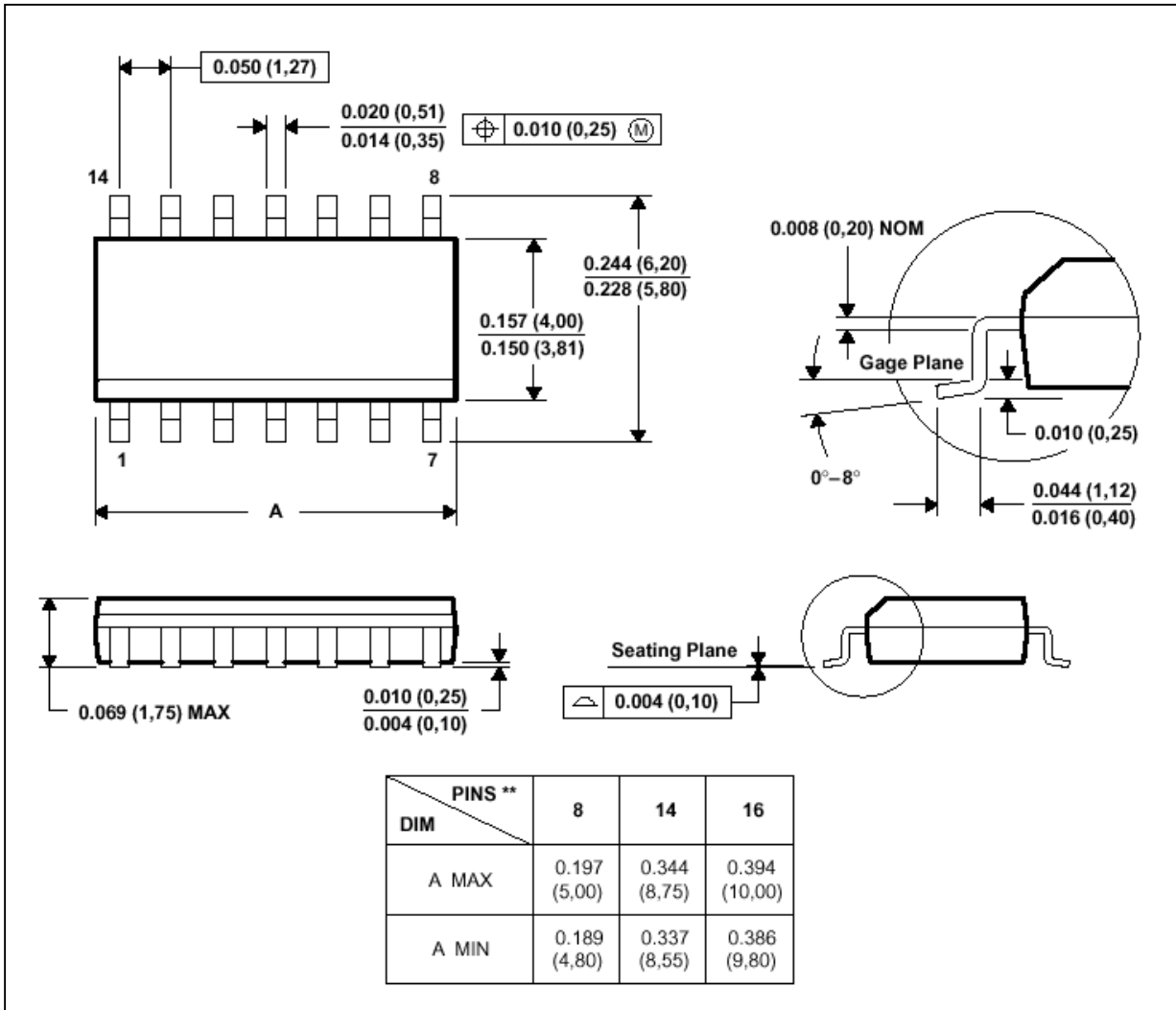


NOTE 1 : All linear dimensions are in inches (millimeters) .

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

NOTE 3 : Falls within JEDEC MS-001

PLASTIC SMALL-OUTLINE 16 PACKAGE

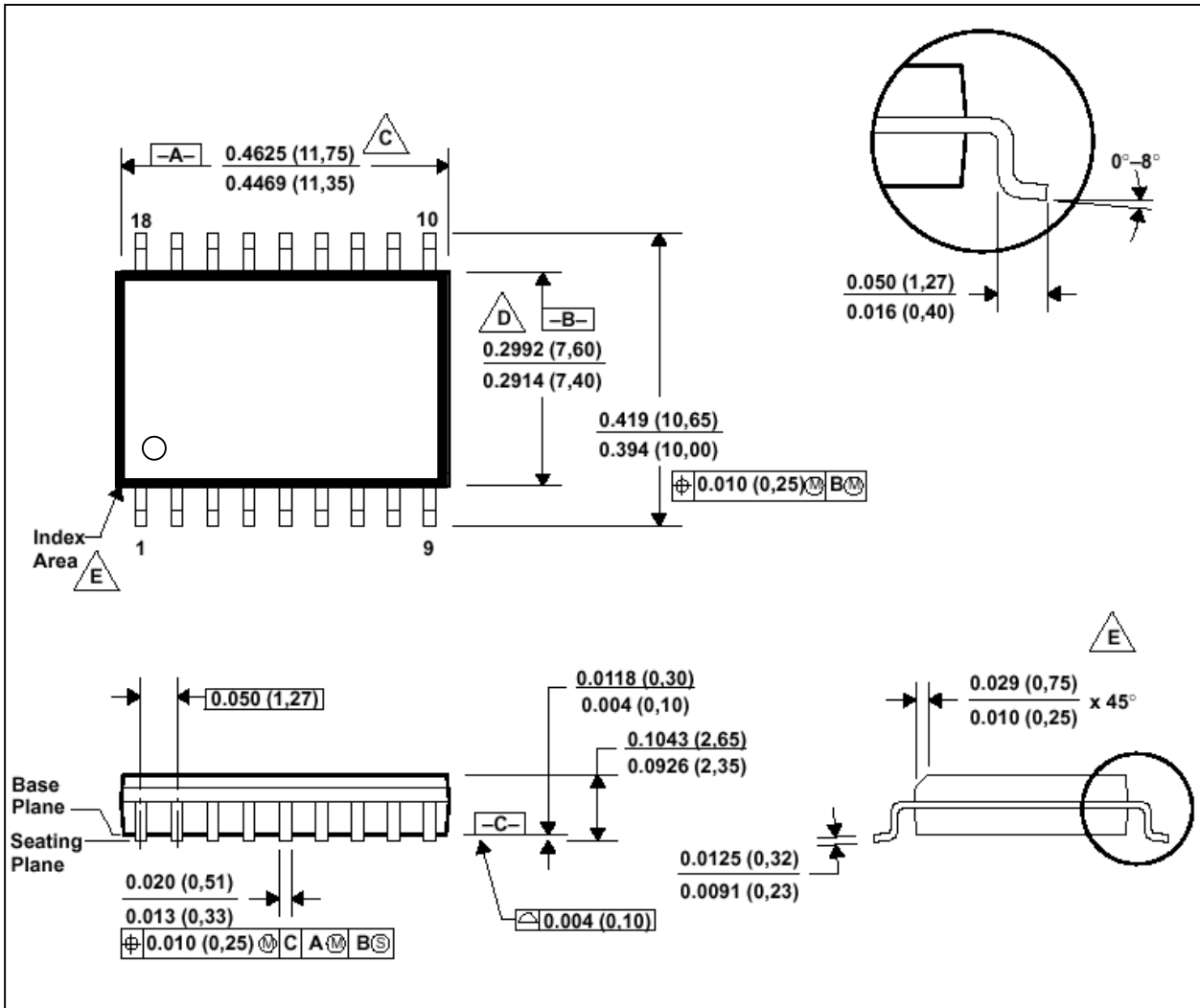


NOTE 1 : All linear dimensions are in inches (millimeters) .

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

NOTE 3 : Falls within JEDEC MS-012

PLASTIC SMALL-OUTLINE 18 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-013 AB

NOTE 4 : Body length dimensions A does not include mold flash, protrusions or gate burrs. Mold flash, protrusions and gate burrs shall not exceed 0.006in (0.15mm) per side.

NOTE 5 : Body width dimensions B does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 0.010in (0.25mm) per side.