



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

WT7517
PC POWER SUPPLY SUPERVISOR
Data Sheet

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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 WT7517-164~167 and V12C within WT7517-183.

The Over Current Detector (OCD) is monitor IS33, IS5, IS12A and IS12B within WT7517-164~167 and IS12C within WT7517-183.

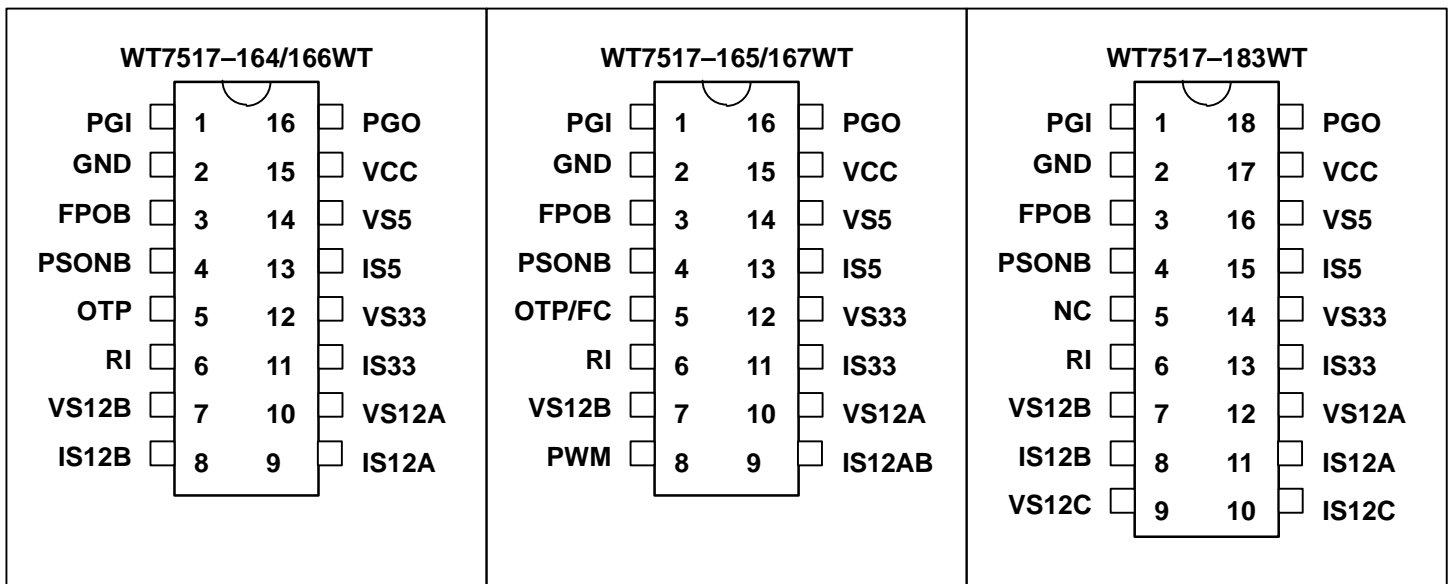
The Over Temperature Protection (OTP) input has hysteresis function. In OTP condition the WT7517 will shut-down. When the OTP input has low level WT7517 shall restart power automatically.

WT7517-165/167 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.
- 75ms / 300ms time delay for UVD.
- 300ms time delay for PGO.
- 38ms / 19ms for PSONB input signal De-bounce.
- 73us / 27us for Internal signal De-glitches.
- 2.4ms time delay for PSONB turn-off FPOB.

PIN ASSIGNMENT AND PACKAGE TYPE



ORDERING INFORMATION

PACKAGE	Plastic DIP-16	Plastic SOP-16	Plastic SOP-16 with reel (Reel of 2500ea)
	WT7517-N164WT WT7517-N165WT WT7517-N166WT WT7517-N167WT	WT7517-S164WT WT7517-S165WT WT7517-S166WT WT7517-S167WT	WT7517-S164WT-reel WT7517-S165WT-reel WT7517-S166WT-reel WT7517-S167WT-reel
Lead-Free (Pb)	WT7517-N164WT Pb WT7517-N165WT Pb WT7517-N166WT Pb WT7517-N167WT Pb	WT7517-S164WT Pb WT7517-S165WT Pb WT7517-S166WT Pb WT7517-S167WT Pb	WT7517-S164WT-reel Pb WT7517-S165WT-reel Pb WT7517-S166WT-reel Pb WT7517-S167WT-reel Pb

PACKAGE	Plastic DIP-18	Plastic SOP-18	Plastic SOP-18 with reel (Reel of 1000ea)
	WT7517-N183WT	WT7517-S183WT	WT7517-S183WT-reel
Lead-Free (Pb)	WT7517-N183WT Pb	WT7517-S183WT Pb	WT7517-S183WT-reel Pb

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

FUNCTION DESCRIPTION

ORDERING	OTP low level	OTP high level	FC / PWM	tdb1 tdb2	tdelay3	tg2	Vcc low voltage	
WT7517	N164/S164	2.45V	3.25V	X	38ms	75ms / 300ms	73us	2.0V
	N165/S165		O					
	N166/S166	2.85V	2.85V	X	19ms	27us	3.6V	
	N167/S167		O					
N183/S183	X	X	X	19ms	75ms	19us	2.6V	

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	
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
Input voltage	PSONB, V5, V33, PGI, OTP				7	V
	V12n				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	164~167	3.7	3.9	4.1	V
	V5		5.7	5.95	6.2	V
	V12n		13.3	13.8	14.3	V
	V33	Only for 183	3.7	3.8	3.9	V
	V5		5.7	5.8	5.9	V
	V12n		13.3	13.6	13.9	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
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
I _{cc} Supply current	PDON_N= 5V			1	mA
V _{cc} low voltage	164 / 165		2.0		V
	166 / 167		3.6		V
	183		2.6		V

SWITCHING CHARACTERISTICS

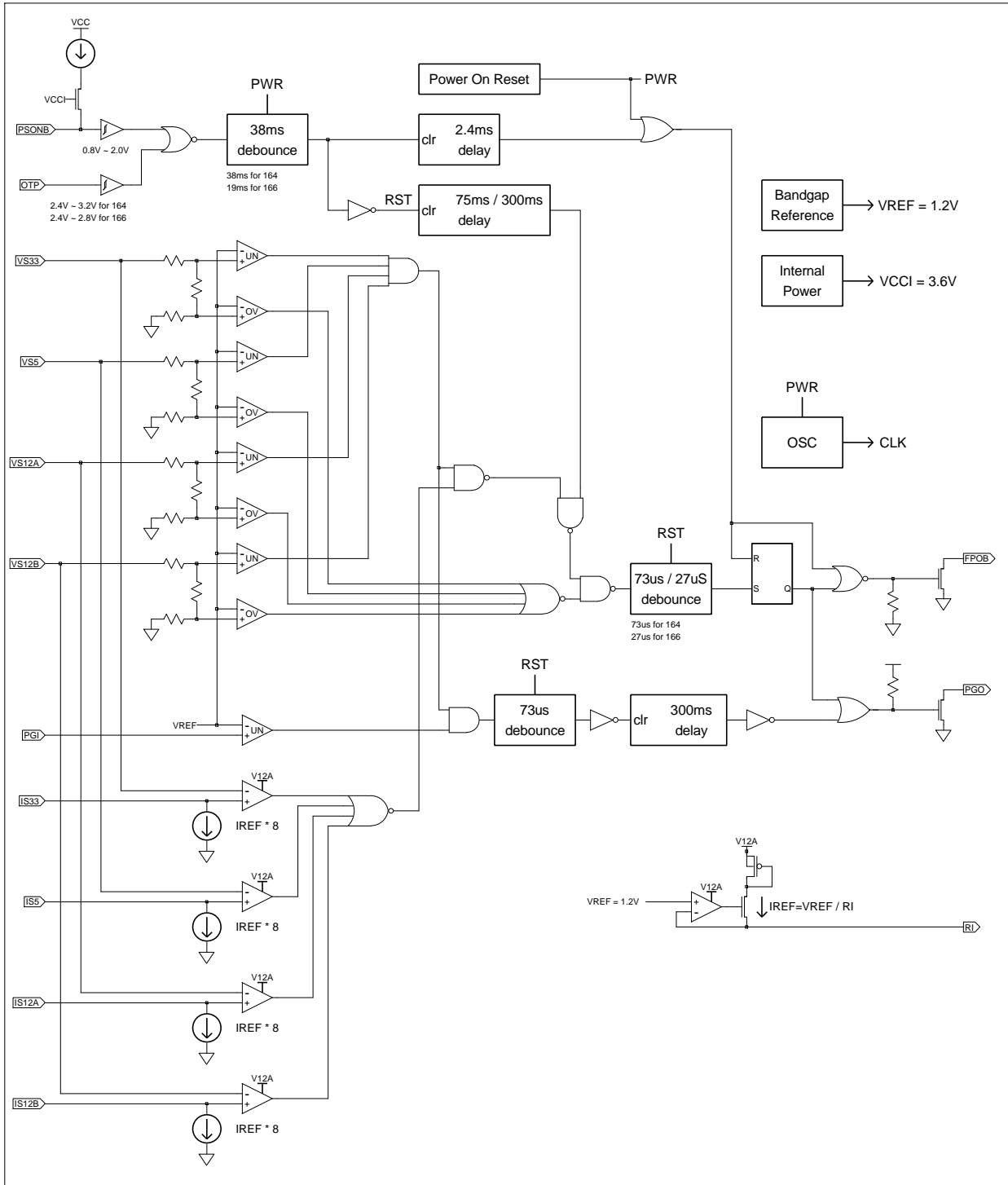
Parameter	Condition	Min.	Typ.	Max.	Unit
t _{db1} , t _{db2} De-bounce time (PSONB)	164 / 165	32	38	61	ms
	166 / 167	14	19	24	ms
t _{delay1} Delay time (PGI to PGO)		200	300	490	ms
t _{g1} De-glitch time		63	73	120	us
t _{g2} De-glitch time for latch	164 / 165	63	73	120	us
	166 / 167	15	27	45	us
	183	6	19	21	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
t _{delay3} Internal UVD/OCD delay time	183	65	75	122	ms

OTP / FC and PWM

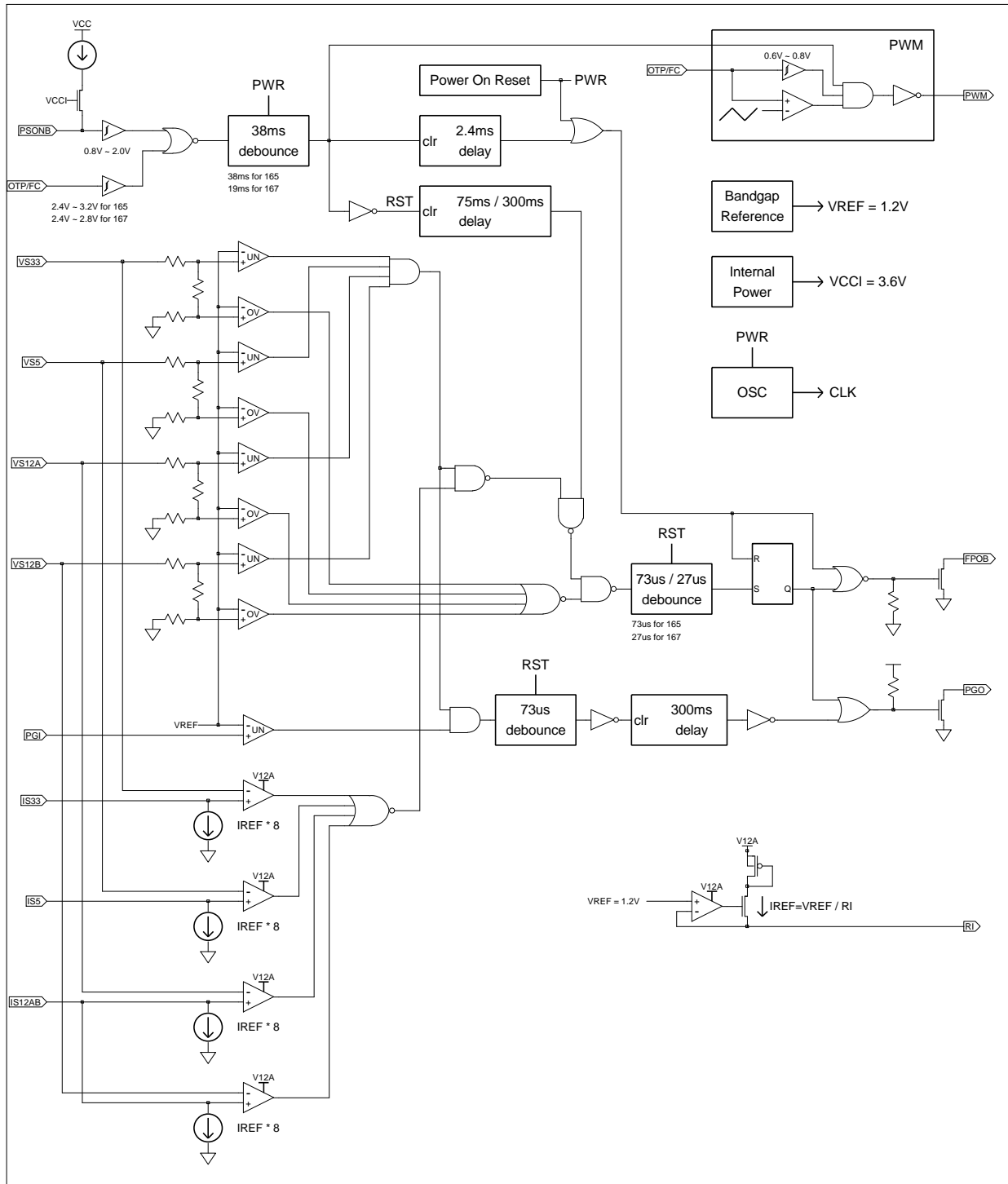
Parameter	Condition	Min.	Typ.	Max.	Unit
OTP High-level input voltage	166/167	2.70	2.85	3.00	V
	164/165	3.10	3.25	3.40	V
OTP Low-level input voltage		2.30	2.45	2.60	V
FC start-up voltage		0.7	0.8	0.9	V
FC stop voltage		0.55	0.65	0.75	V
f _{PWM} PWM frequency		28	35	42	KHz
I _{LEAKAGE} Leakage current(PWM)			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

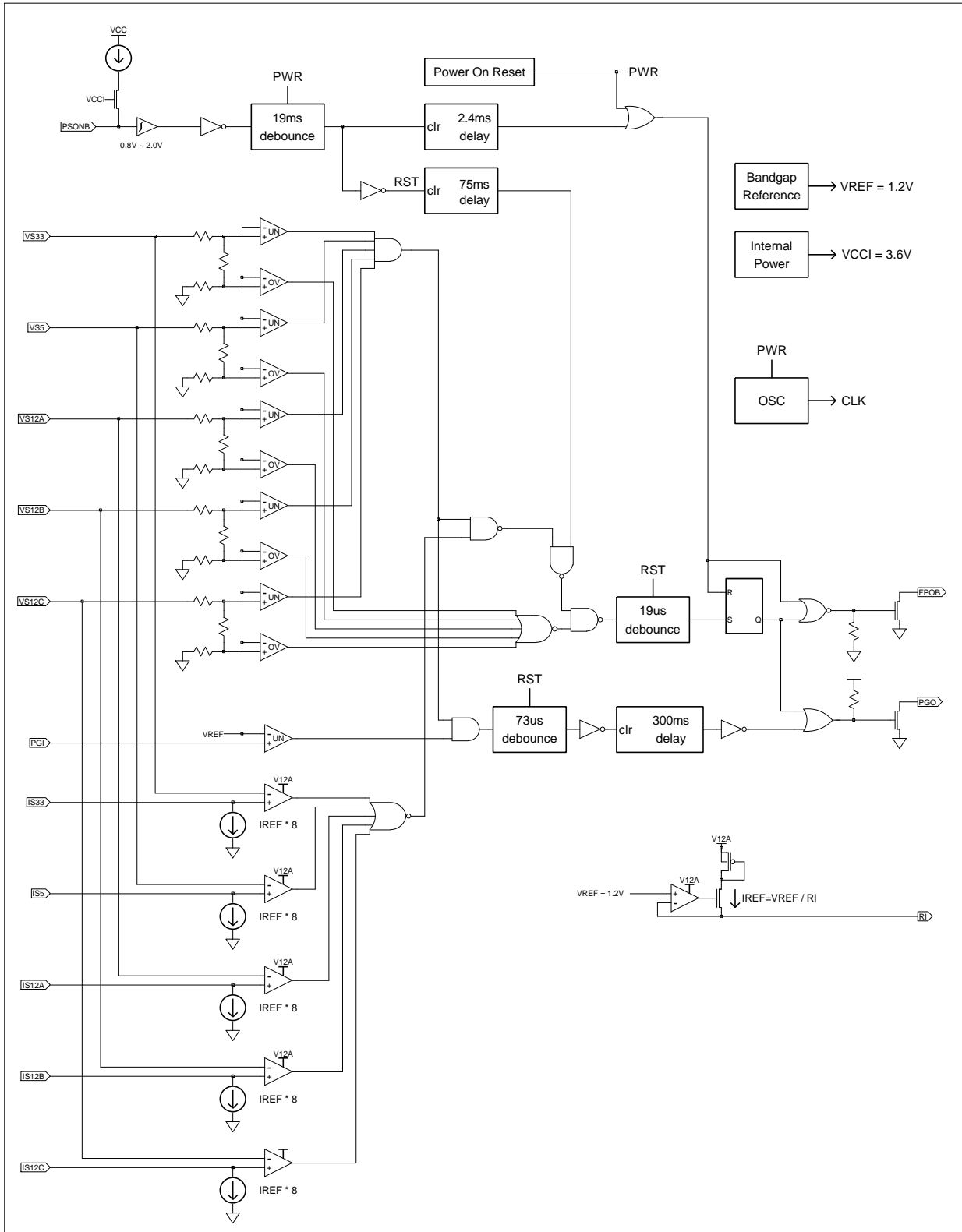
WT7517-164/166WT



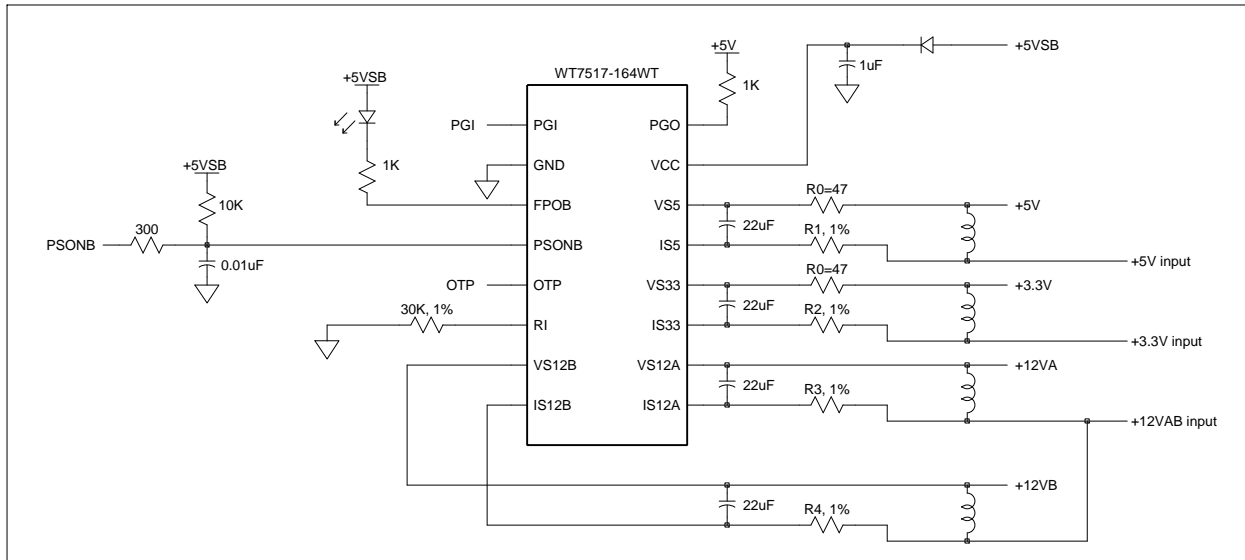
WT7517-165/167WT



WT7517-183WT



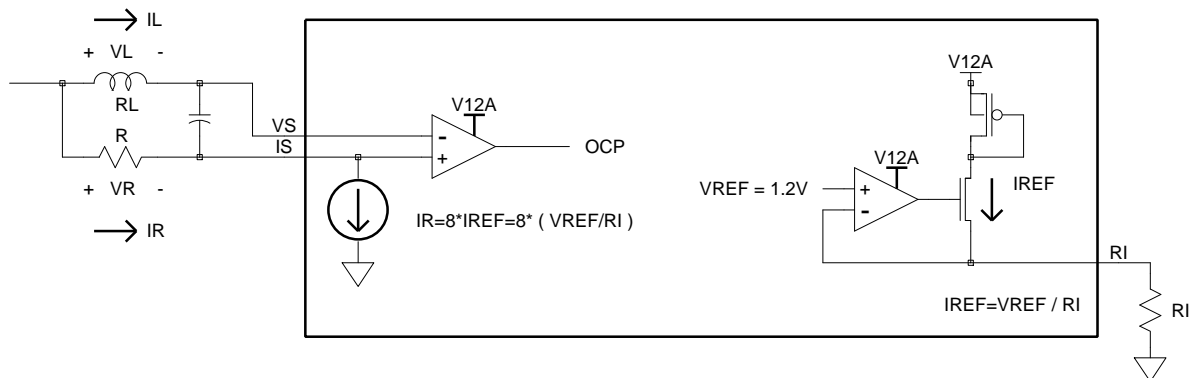
APPLICATION CIRCUIT



NOTE1 : For WT7517-164, 165, 166, 167, the R0 can not be omitted at VS5 and VS33.

NOTE2 : For WT7517-183, the R0 can be omitted at VS5 and VS33.

APPLICATION NOTE

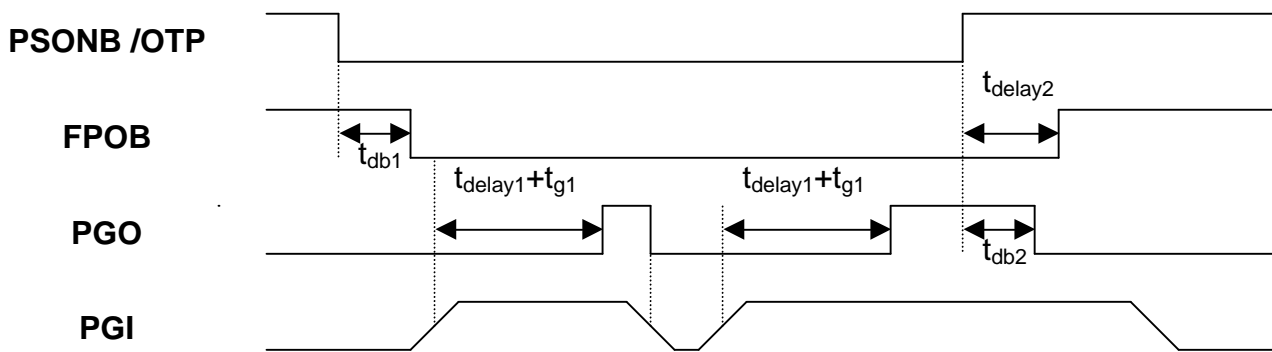
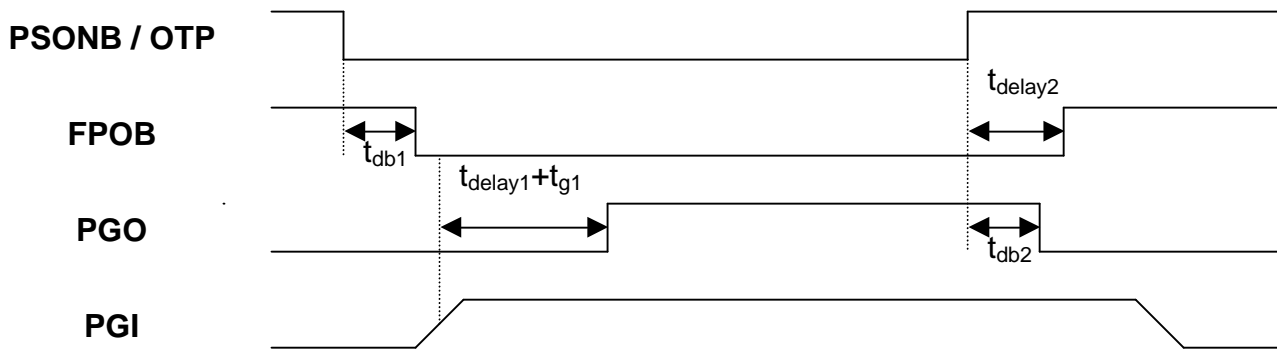


When the current cross inductor raised, inductor voltage raised.
 And when inductor voltage exceeded resistor voltage, the OCP active.
 We can setup OCP point by the following equation

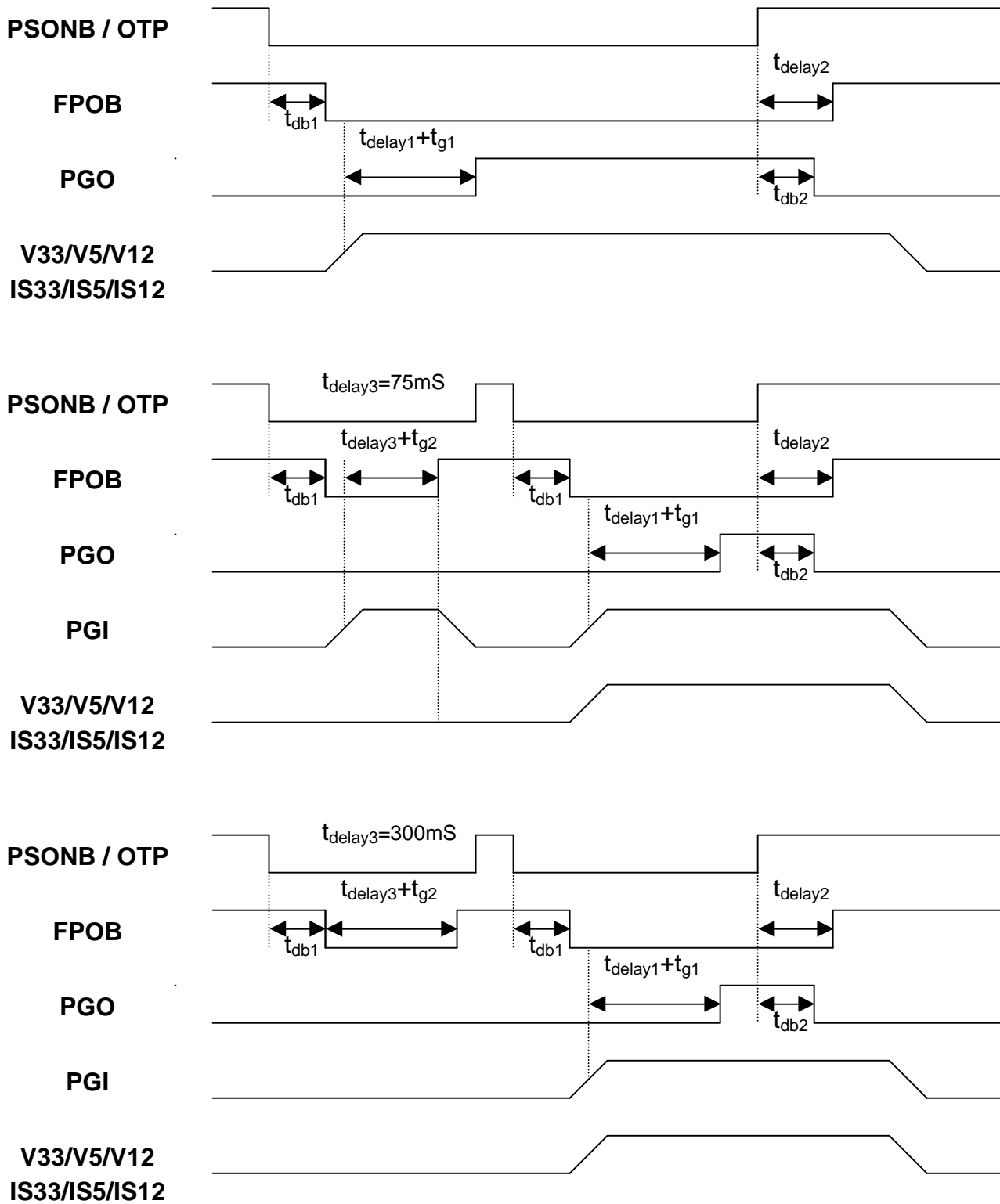
$$\begin{aligned}
 \text{Let } VR &= VL \\
 R * IR &= RL * IL \\
 IR &= 8 * IREF \\
 R * (8 * VREF / RI) &= RL * IL \\
 R &= (RL * IL) / (8 * VREF / RI) \quad \text{--- (1)}
 \end{aligned}$$

APPLICATION TIMMING

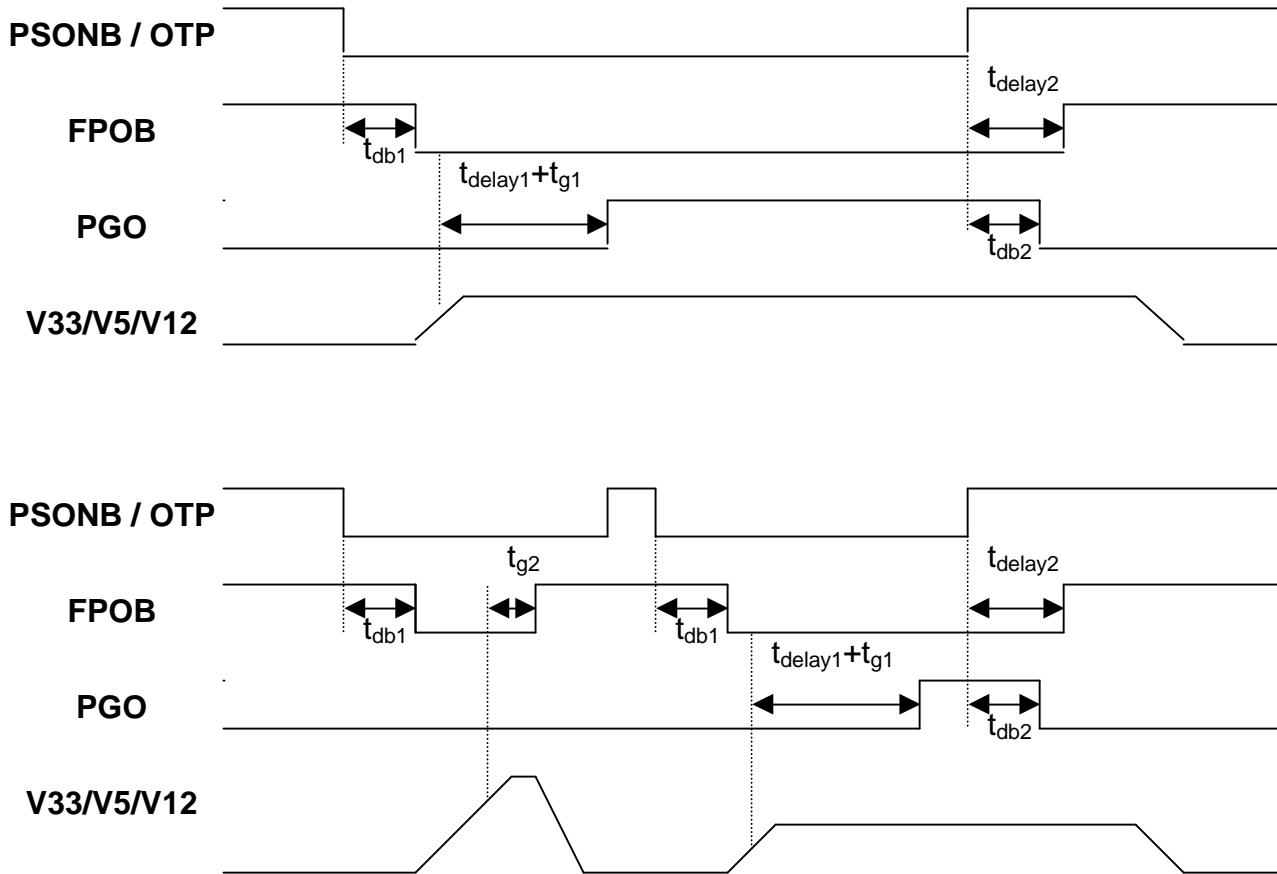
1.) PGI (UNDER_VOLTAGE) :



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

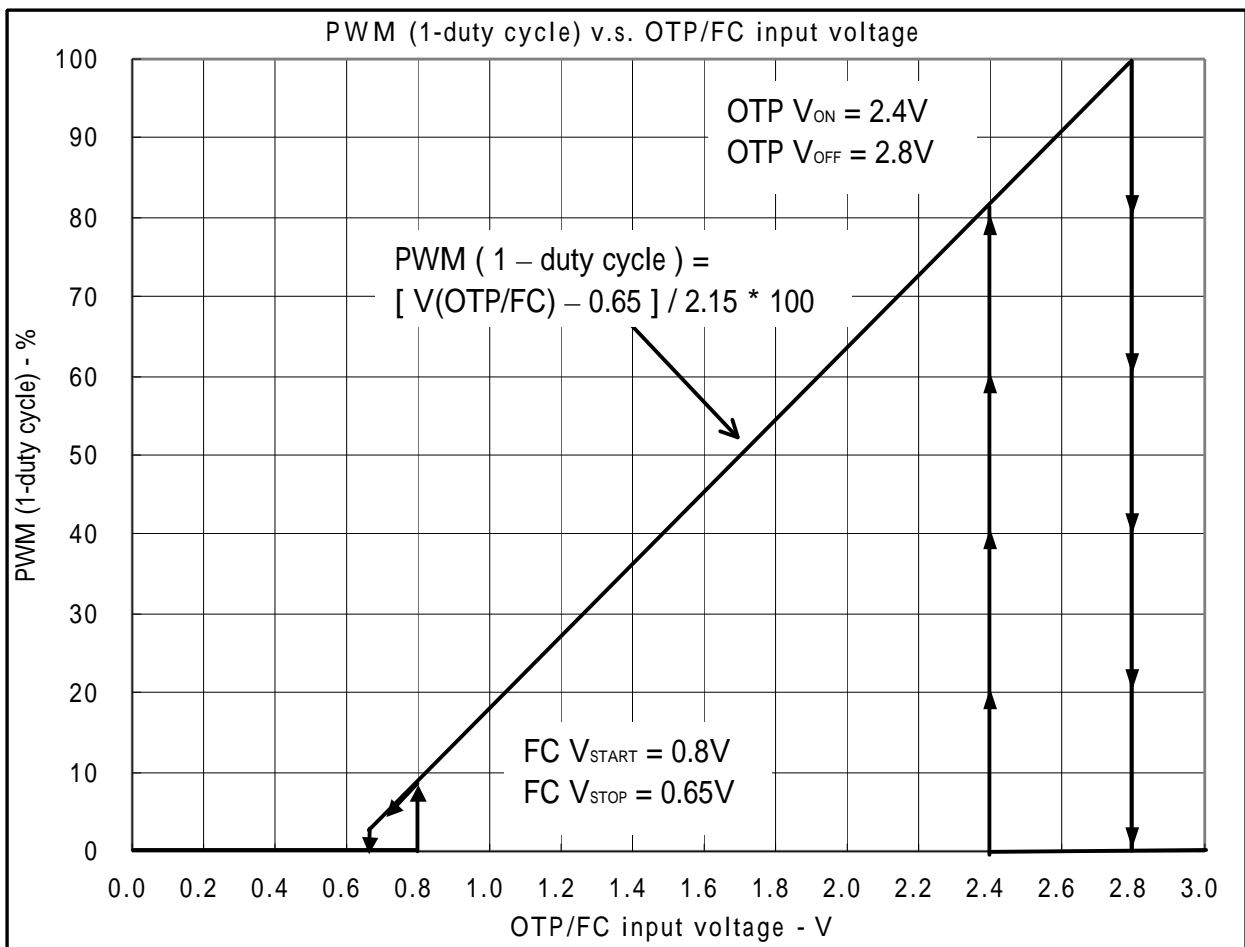
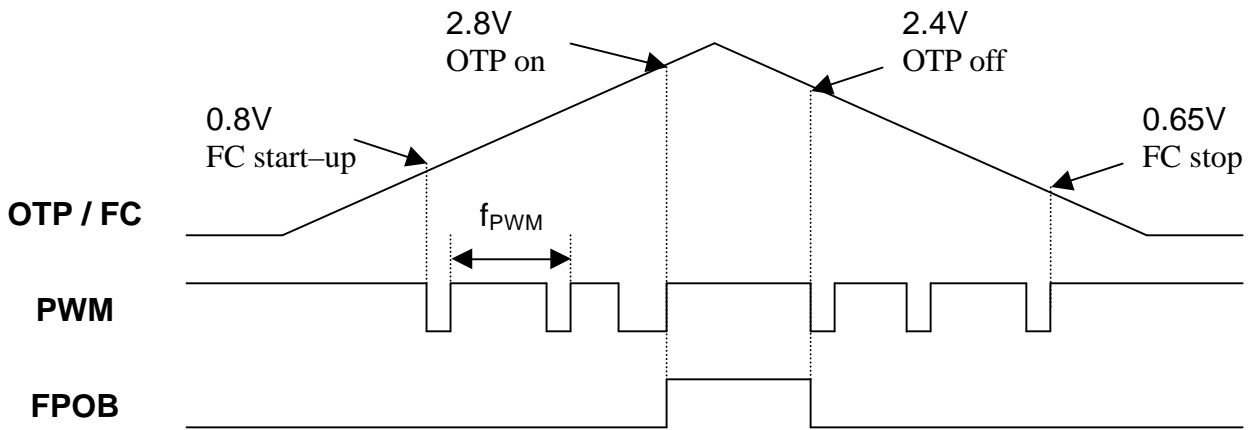


3.) V33, V5, V12n (OVER_VOLTAGE) :



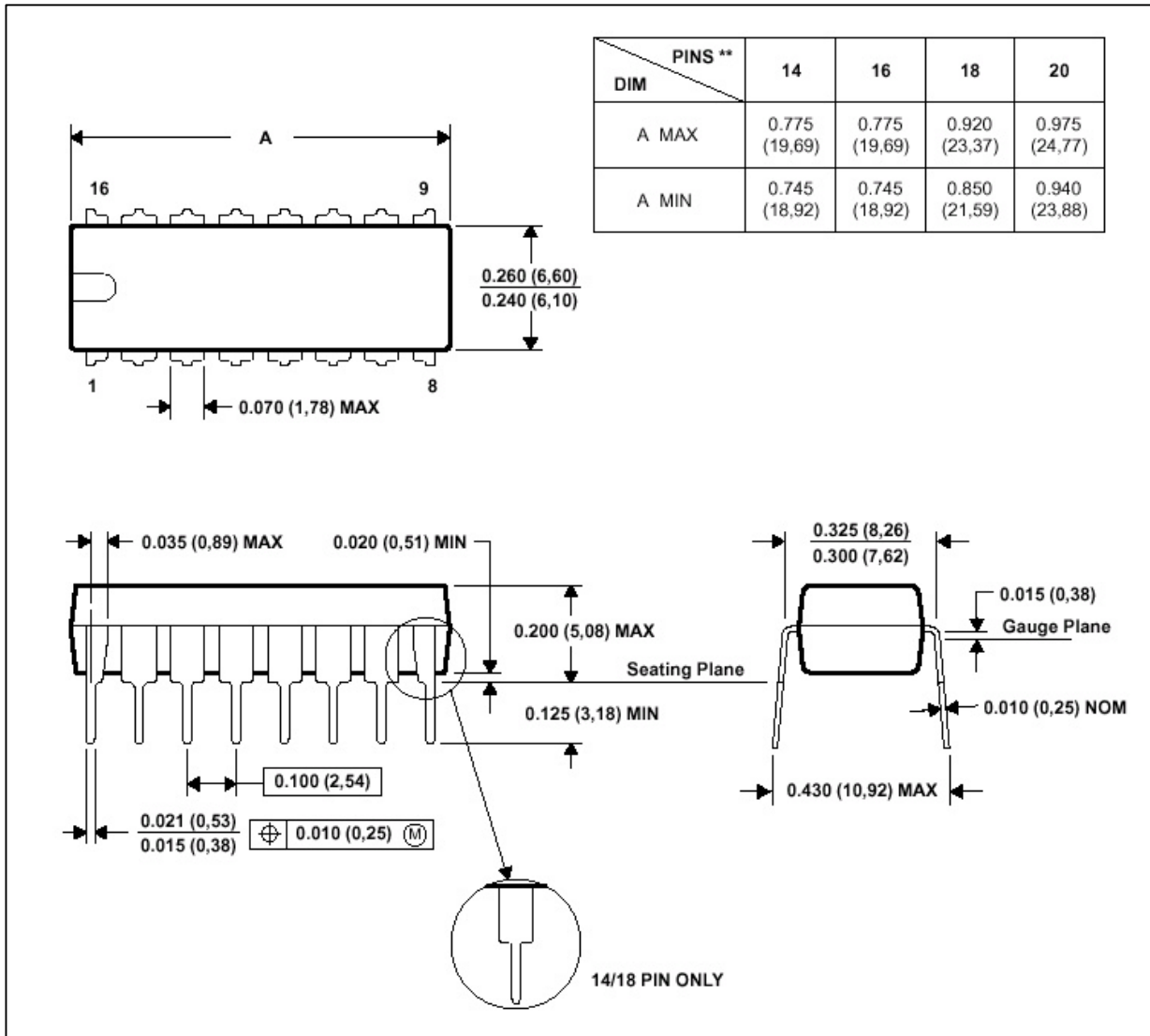
4.) OTP / FC, PWM, FPOB :

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



MECHANICAL INFORMATION

PLASTIC DUAL-IN-LINE PACKAGE

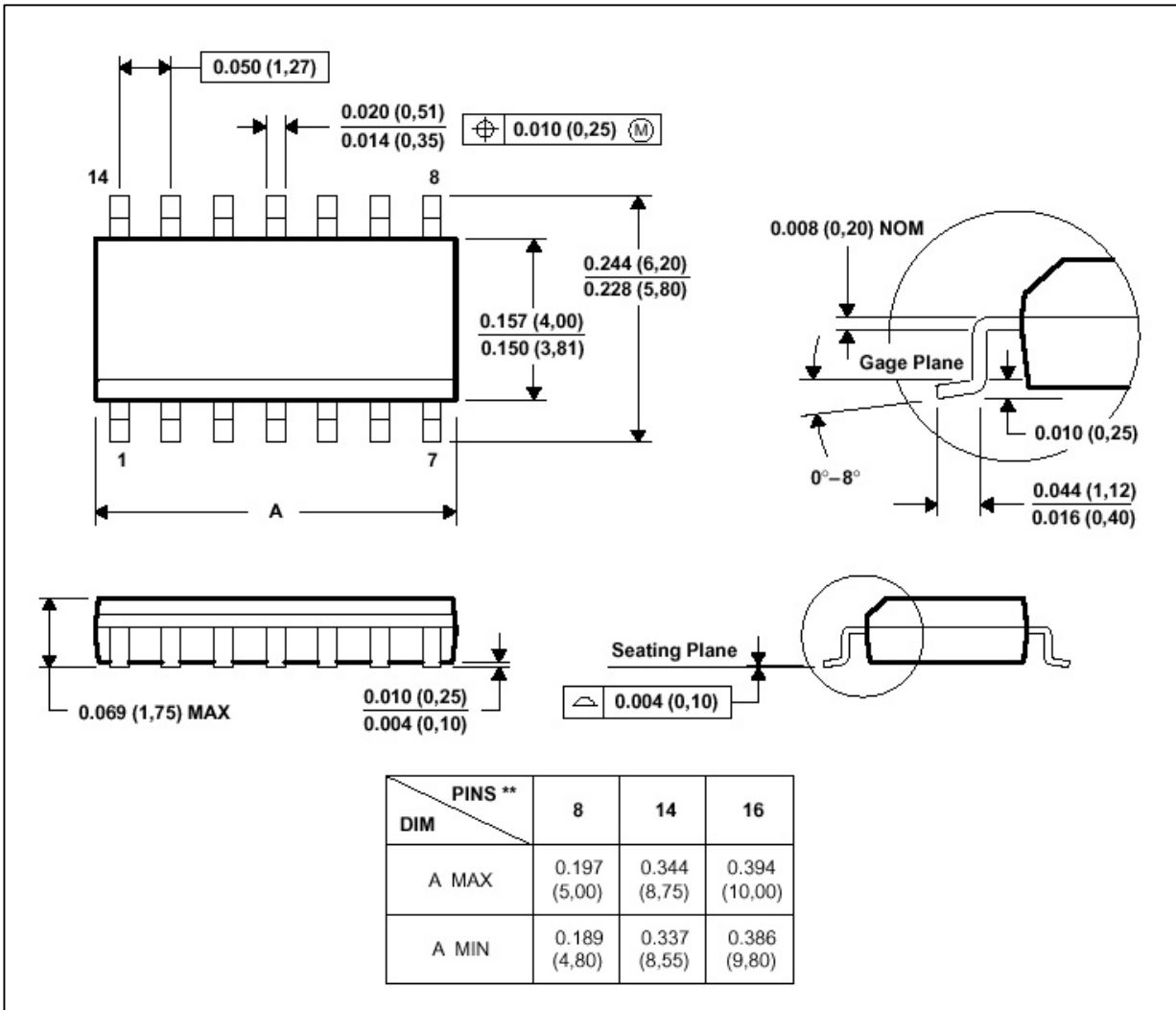


NOTE 1 : All linear dimensions are in inches (millimeters) .

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

NOTE 3 : Falls within JEDEC MS-001

PLASTIC SMALL-OUTLINE 16 PACKAGE

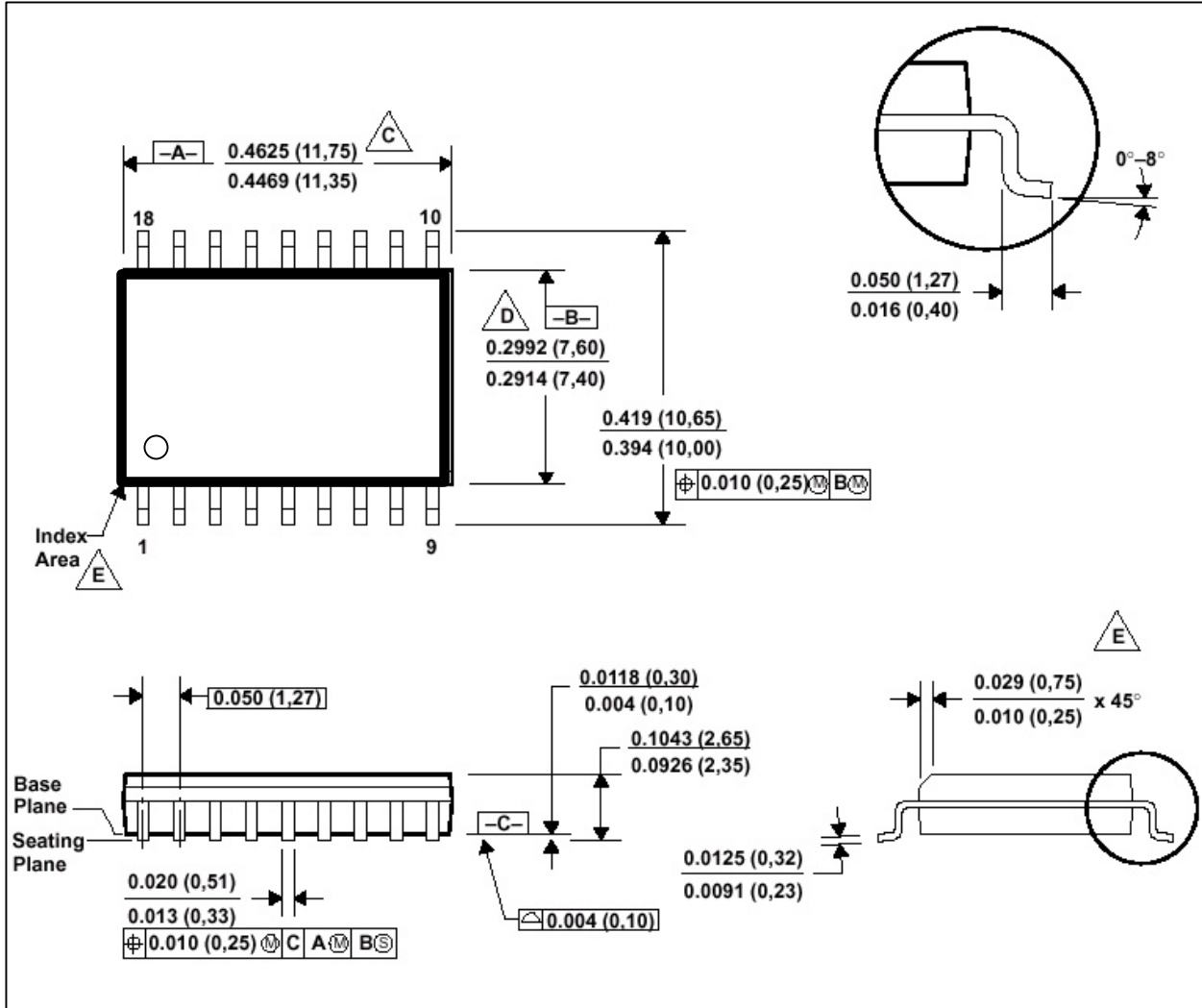


NOTE 1 : All linear dimensions are in inches (millimeters) .

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) .

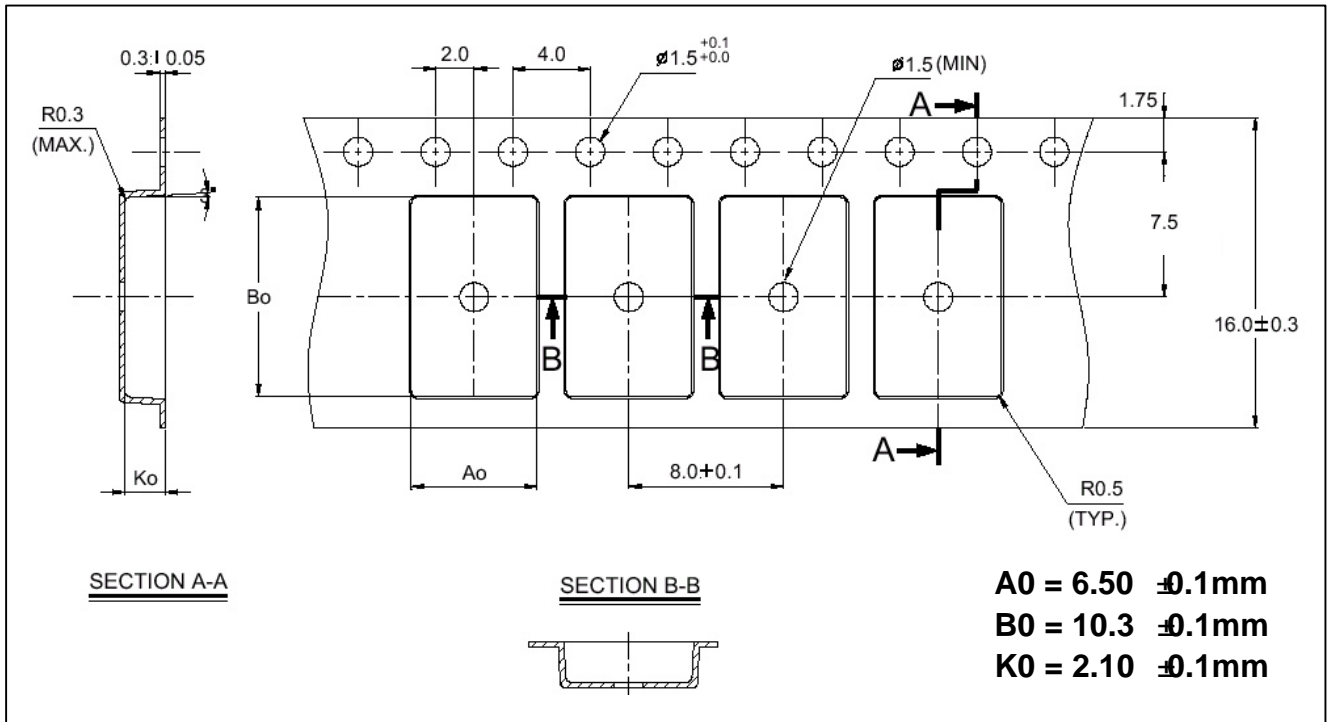
NOTE 2 : This drawing is subject to change without notice.

NOTE 3 : Falls within JEDEC MS-013 AB

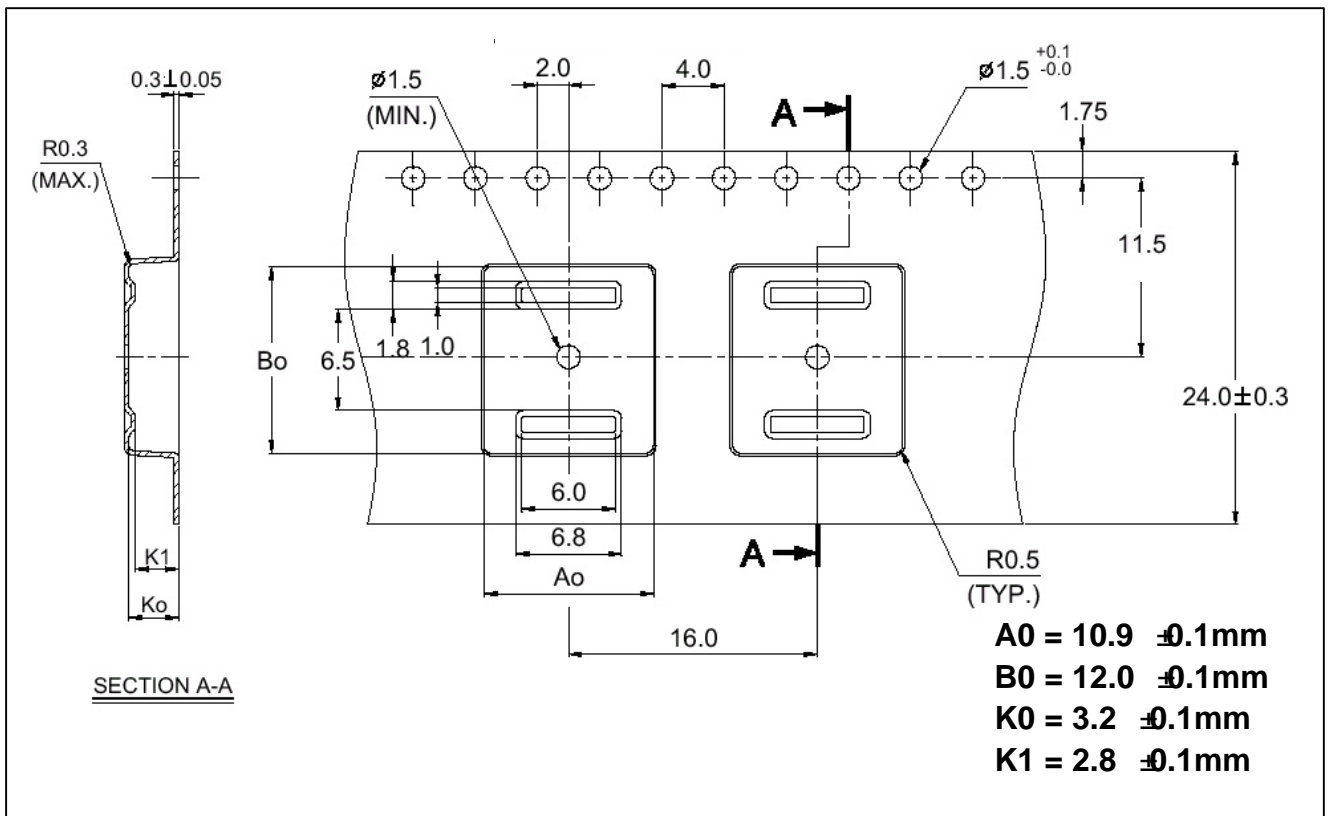
NOTE 4 : Body length dimensions A does not include mold flash, protrusions or gate burrs. Mold flash, protrusions and gate burrs shall not exceed 0.006in (0.15mm) per side.

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.

SOP16 outline drawing of carrier tape [Unit : mm]



SOP18 outline drawing of carrier tape [Unit : mm]



SOP16 and SOP18 outline drawing of reel [Unit : mm]

