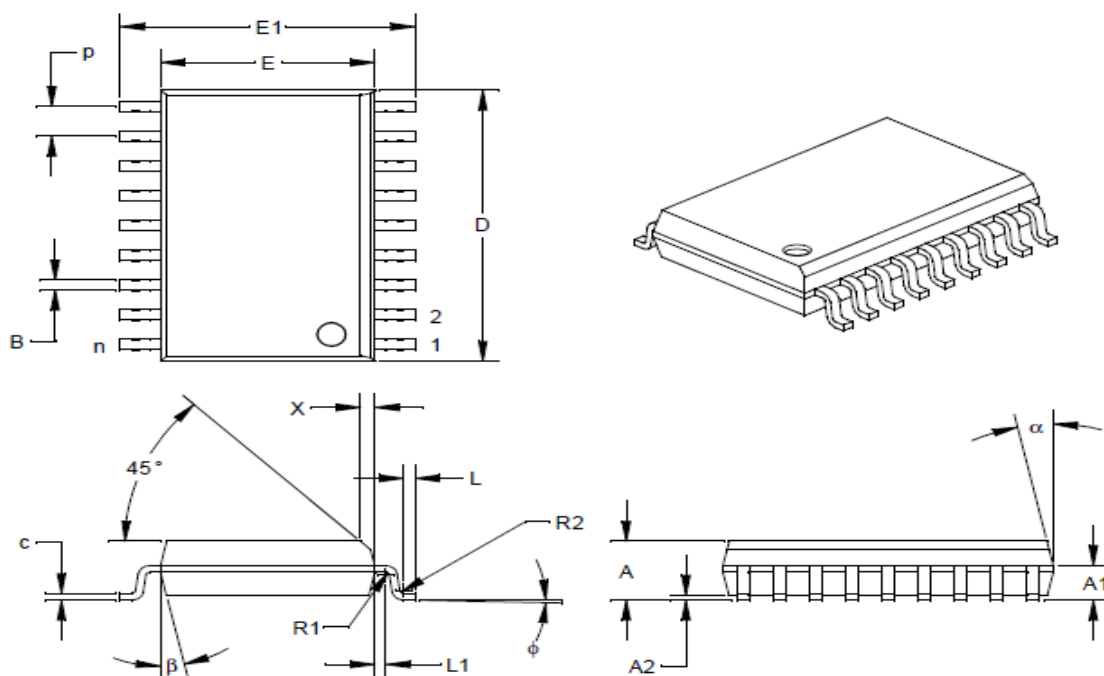


# ANNEXE - A :

## A-1) les détails du pic 16F84A :



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Pitch	p		0.050			1.27	
Number of Pins	n		18			18	
Overall Pack. Height	A	0.093	0.099	0.104	2.36	2.50	2.64
Shoulder Height	A1	0.048	0.058	0.068	1.22	1.47	1.73
Standoff	A2	0.004	0.008	0.011	0.10	0.19	0.28
Molded Package Length	D <sup>‡</sup>	0.450	0.456	0.462	11.43	11.58	11.73
Molded Package Width	E <sup>‡</sup>	0.292	0.296	0.299	7.42	7.51	7.59
Outside Dimension	E1	0.394	0.407	0.419	10.01	10.33	10.64
Chamfer Distance	X	0.010	0.020	0.029	0.25	0.50	0.74
Shoulder Radius	R1	0.005	0.005	0.010	0.13	0.13	0.25
Gull Wing Radius	R2	0.005	0.005	0.010	0.13	0.13	0.25
Foot Length	L	0.011	0.016	0.021	0.28	0.41	0.53
Foot Angle	phi	0	4	8	0	4	8
Radius Centerline	L1	0.010	0.015	0.020	0.25	0.38	0.51
Lead Thickness	c	0.009	0.011	0.012	0.23	0.27	0.30
Lower Lead Width	B <sup>†</sup>	0.014	0.017	0.019	0.36	0.42	0.48
Mold Draft Angle Top	alpha	0	12	15	0	12	15
Mold Draft Angle Bottom	beta	0	12	15	0	12	15

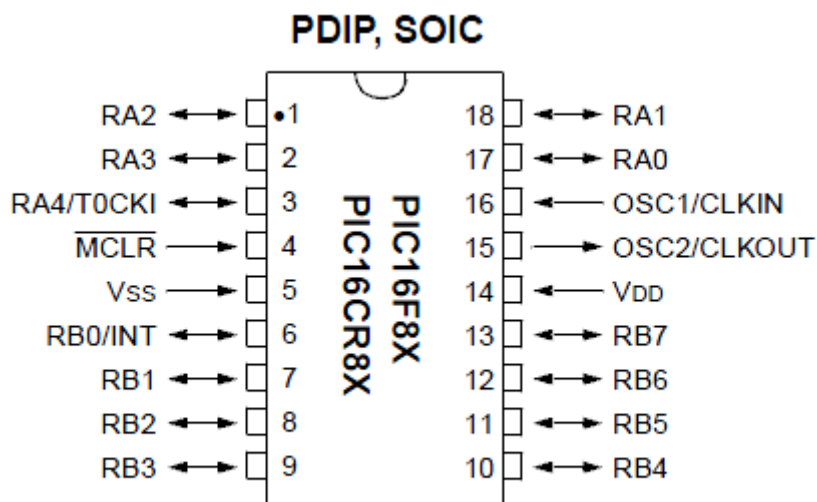
\* Controlling Parameter.

† Dimension "B" does not include dam-bar protrusions. Dam-bar protrusions shall not exceed 0.003" (0.076 mm) per side or 0.006" (0.152 mm) more than dimension "B."

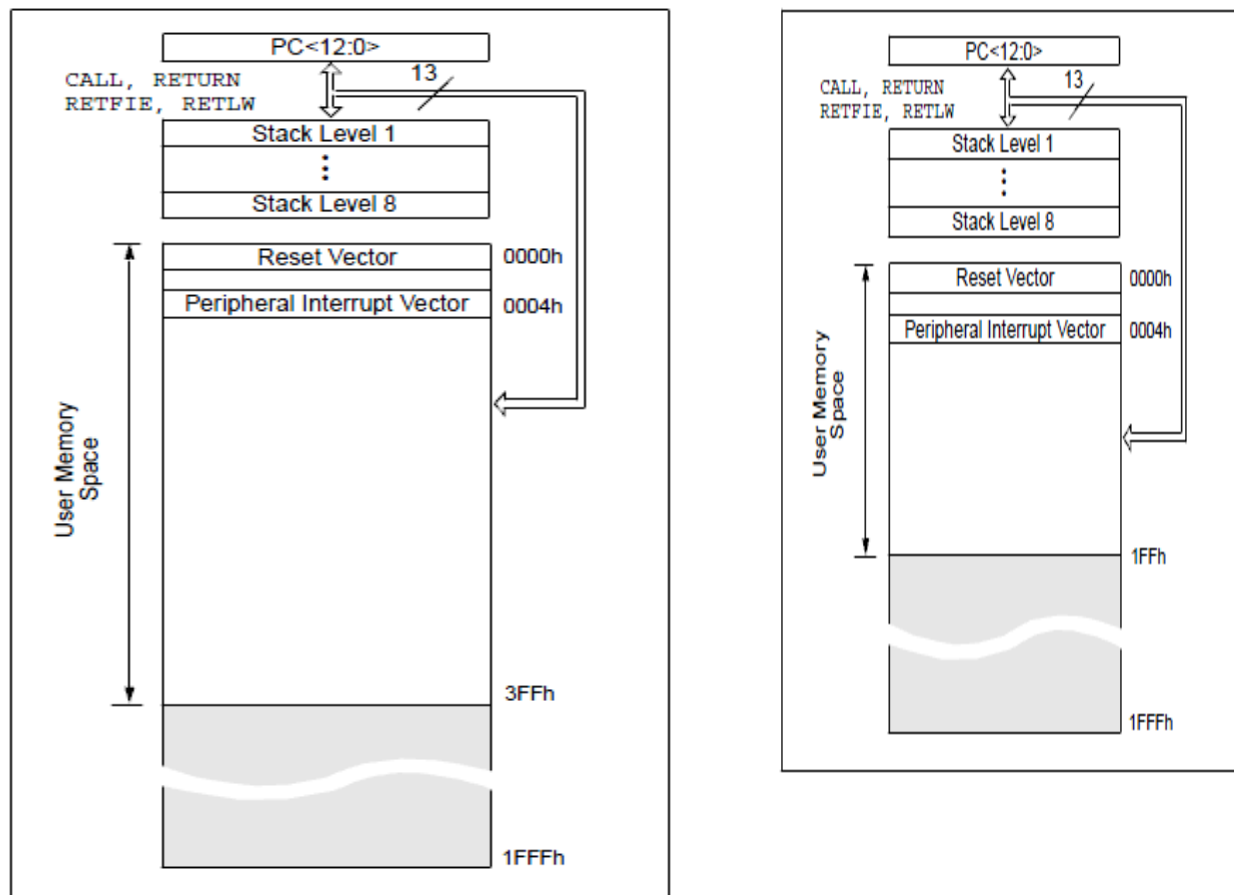
‡ Dimensions "D" and "E" do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010" (0.254 mm) per side or 0.020" (0.508 mm) more than dimensions "D" or "E."

Tableau (A-1) : les détails du pic16F84A.

## A-2) le brochage du pic16F84A :



## A-3) l'organisation de mémoire du pic16F84A (mémoire de programme et de donnée) :

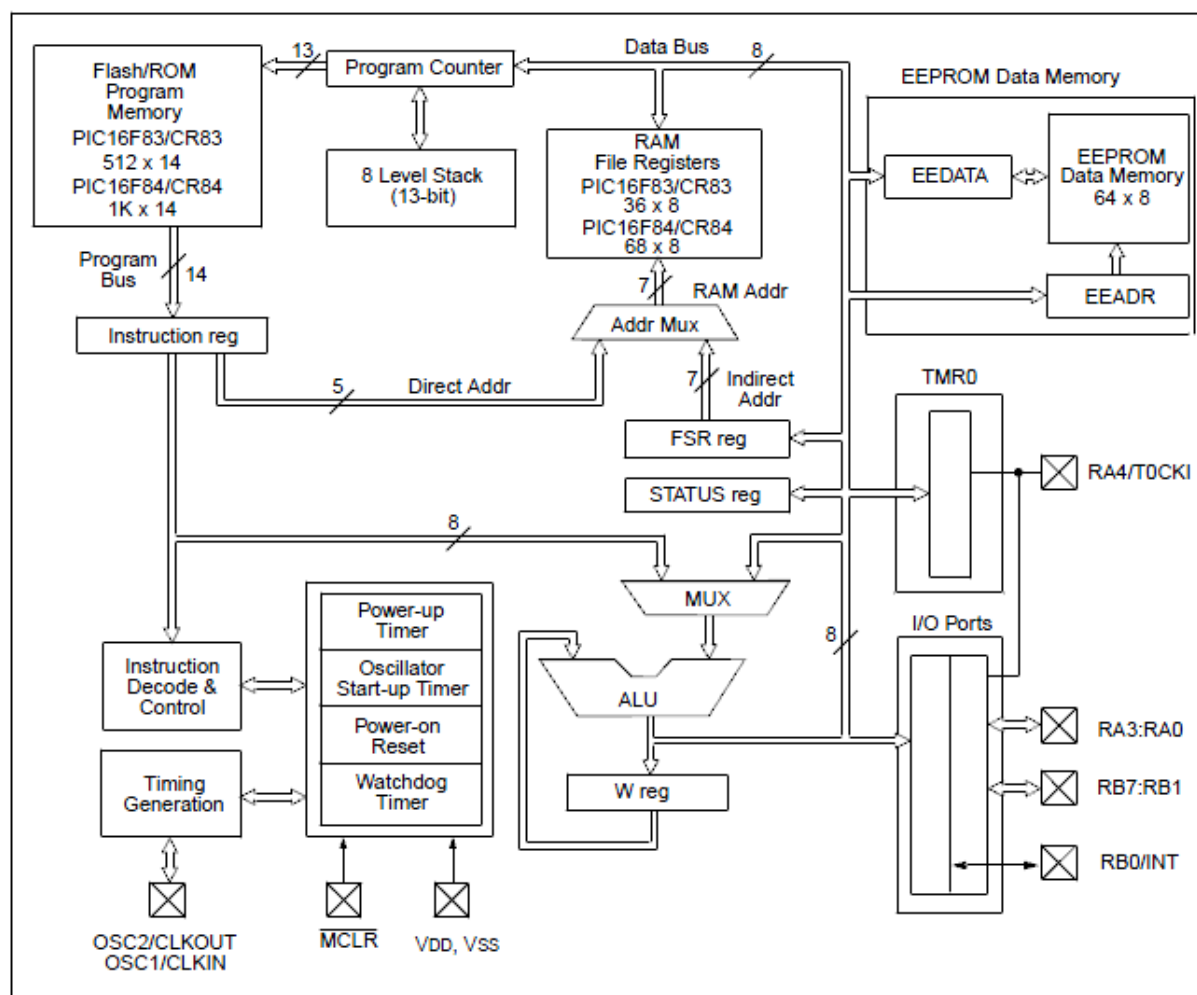


## A-4) la famille du pic16F8x :

		PIC16F83	PIC16CR83	PIC16F84	PIC16CR84
<b>Clock</b>	Maximum Frequency of Operation (MHz)	10	10	10	10
	Flash Program Memory	512	—	1K	—
<b>Memory</b>	EEPROM Program Memory	—	—	—	—
	ROM Program Memory	—	512	—	1K
	Data Memory (bytes)	36	36	68	68
	Data EEPROM (bytes)	64	64	64	64
<b>Peripherals</b>	Timer Module(s)	TMR0	TMR0	TMR0	TMR0
	Interrupt Sources	4	4	4	4
	I/O Pins	13	13	13	13
<b>Features</b>	Voltage Range (Volts)	2.0-6.0	2.0-6.0	2.0-6.0	2.0-6.0
	Packages	18-pin DIP, SOIC	18-pin DIP, SOIC	18-pin DIP, SOIC	18-pin DIP, SOIC

All PICmicro™ Family devices have Power-on Reset, selectable Watchdog Timer, selectable code protect and high I/O current capability. All PIC16F8X Family devices use serial programming with clock pin RB6 and data pin RB7.

Tableau (A.2) Les caractéristiques des différentes familles du PIC 16F8x.

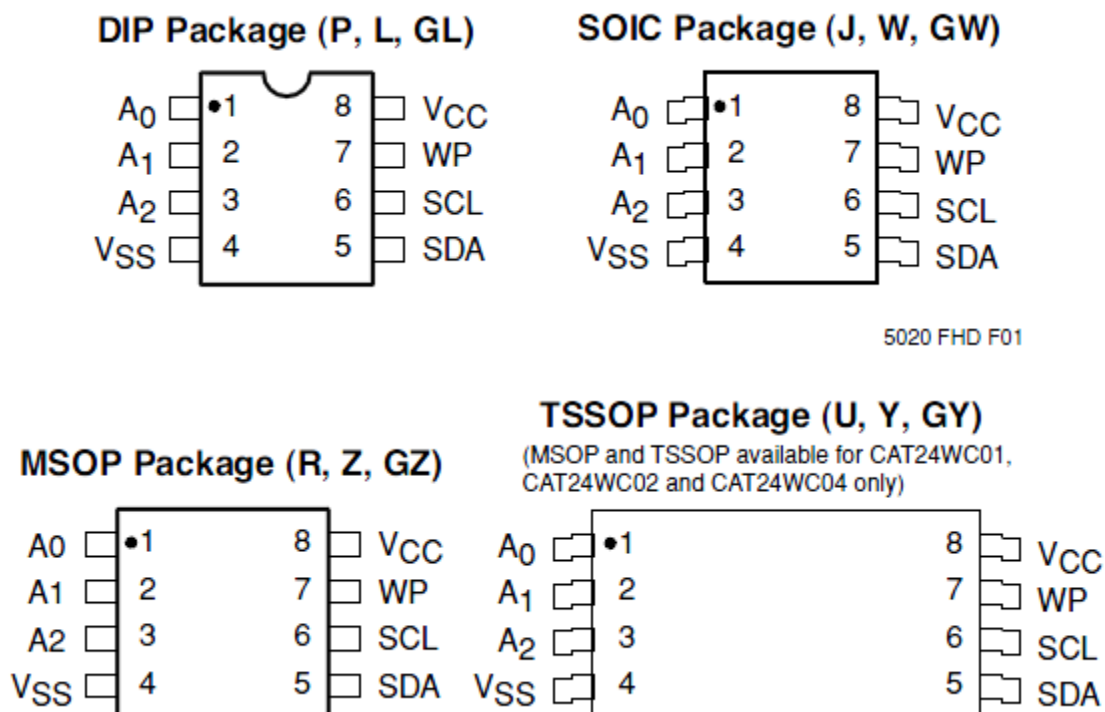


Mnemonic, Operands	Description	Cycles	14-Bit Opcode				Status Affected	Notes	
			MSb		LSb				
BYTE-ORIENTED FILE REGISTER OPERATIONS									
ADDWF	f, d	Add W and f	1	00	0111	dfff	ffff	C,DC,Z	1,2
ANDWF	f, d	AND W with f	1	00	0101	dfff	ffff	Z	1,2
CLRF	f	Clear f	1	00	0001	1fff	ffff	Z	2
CLRWF	-	Clear W	1	00	0001	0xxx	xxxx	Z	
COMF	f, d	Complement f	1	00	1001	dfff	ffff	Z	1,2
DECf	f, d	Decrement f	1	00	0011	dfff	ffff	Z	1,2
DECFSZ	f, d	Decrement f, Skip if 0	1(2)	00	1011	dfff	ffff		1,2,3
INCF	f, d	Increment f	1	00	1010	dfff	ffff	Z	1,2
INCFSZ	f, d	Increment f, Skip if 0	1(2)	00	1111	dfff	ffff		1,2,3
IORWF	f, d	Inclusive OR W with f	1	00	0100	dfff	ffff	Z	1,2
MOVF	f, d	Move f	1	00	1000	dfff	ffff	Z	1,2
MOVWF	f	Move W to f	1	00	0000	1fff	ffff		
NOP	-	No Operation	1	00	0000	0xx0	0000		
RLF	f, d	Rotate Left f through Carry	1	00	1101	dfff	ffff	C	1,2
RRF	f, d	Rotate Right f through Carry	1	00	1100	dfff	ffff	C	1,2
SUBWF	f, d	Subtract W from f	1	00	0010	dfff	ffff	C,DC,Z	1,2
SWAPF	f, d	Swap nibbles in f	1	00	1110	dfff	ffff		1,2
XORWF	f, d	Exclusive OR W with f	1	00	0110	dfff	ffff	Z	1,2
BIT-ORIENTED FILE REGISTER OPERATIONS									
BCF	f, b	Bit Clear f	1	01	00bb	bfff	ffff		1,2
BSF	f, b	Bit Set f	1	01	01bb	bfff	ffff		1,2
BTFSC	f, b	Bit Test f, Skip if Clear	1(2)	01	10bb	bfff	ffff		3
BTFSS	f, b	Bit Test f, Skip if Set	1(2)	01	11bb	bfff	ffff		3
LITERAL AND CONTROL OPERATIONS									
ADDLW	k	Add literal and W	1	11	111x	kkkk	kkkk	C,DC,Z	
ANDLW	k	AND literal with W	1	11	1001	kkkk	kkkk	Z	
CALL	k	Call subroutine	2	10	0kkk	kkkk	kkkk		
CLRWDT	-	Clear Watchdog Timer	1	00	0000	0110	0100	TO,PD	
GOTO	k	Go to address	2	10	1kkk	kkkk	kkkk		
IORLW	k	Inclusive OR literal with W	1	11	1000	kkkk	kkkk	Z	
MOVLW	k	Move literal to W	1	11	00xx	kkkk	kkkk		
RETFIE	-	Return from interrupt	2	00	0000	0000	1001		
RETLW	k	Return with literal in W	2	11	01xx	kkkk	kkkk		
RETURN	-	Return from Subroutine	2	00	0000	0000	1000		
SLEEP	-	Go into standby mode	1	00	0000	0110	0011	TO,PD	
SUBLW	k	Subtract W from literal	1	11	110x	kkkk	kkkk	C,DC,Z	
XORLW	k	Exclusive OR literal with W	1	11	1010	kkkk	kkkk	Z	

Tableau (A.3) : liste de jeux d'instruction.

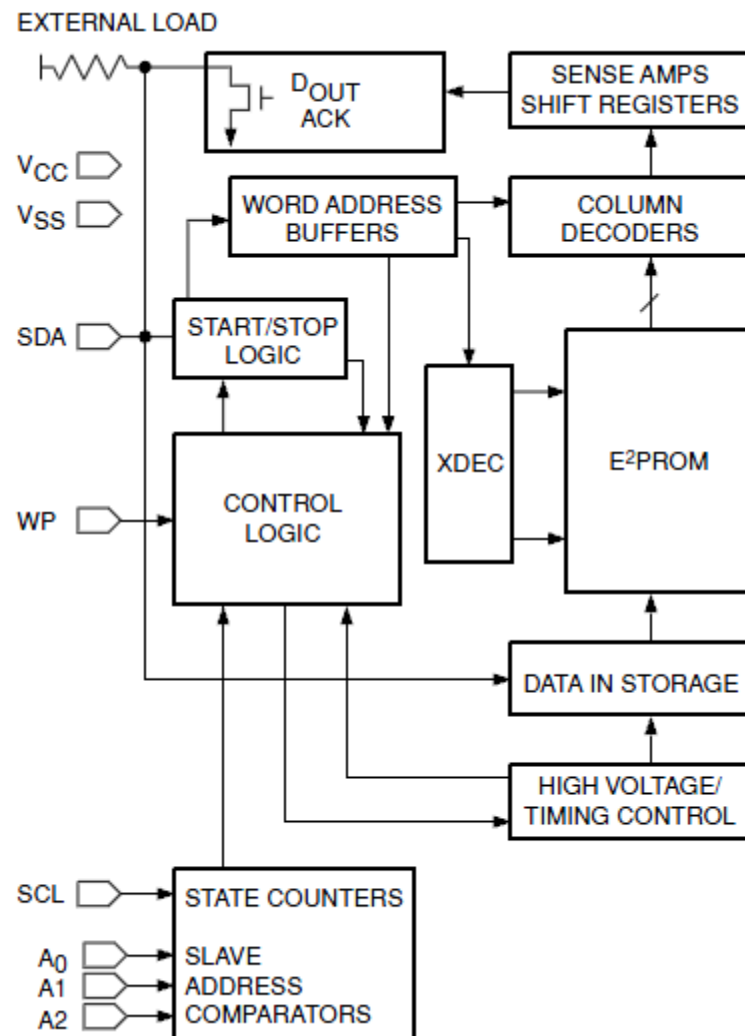
## ANNEXE – B :

### B-1) Le brochage de l'EEPROM :



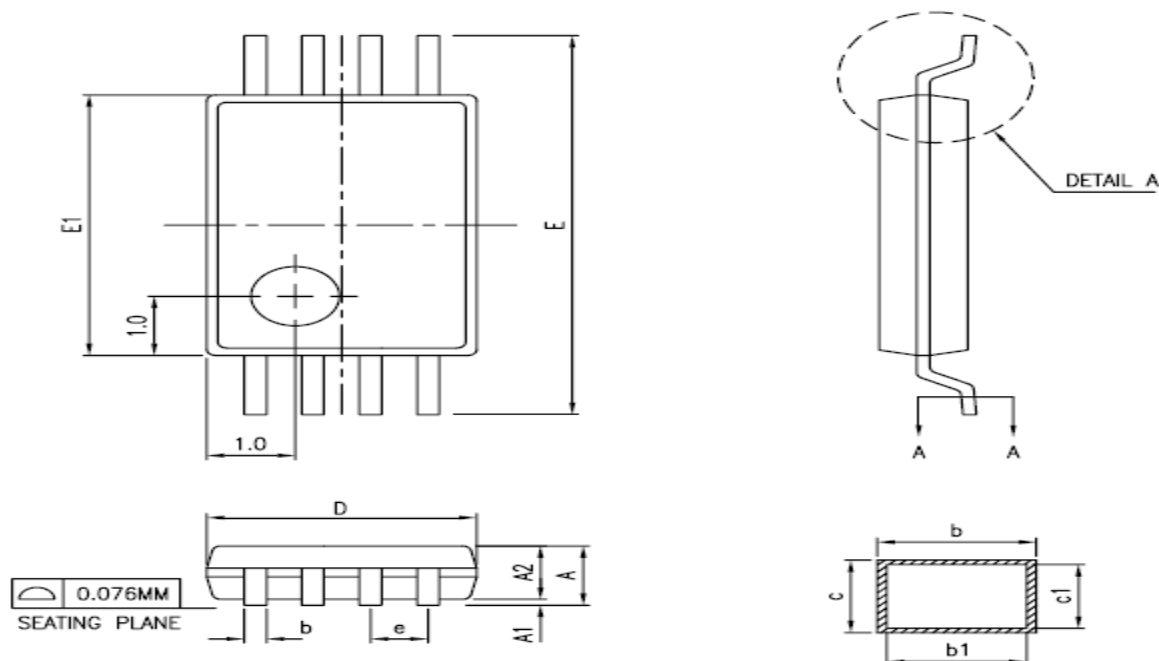
Name	Function
Vss	Ground
SDA	Serial Data
SCL	Serial Clock
Vcc	+4.5V to 5.5V Power Supply
A0, A1, A2	Chip Selects
Test	Test Pin: may be tied high, low or left floating

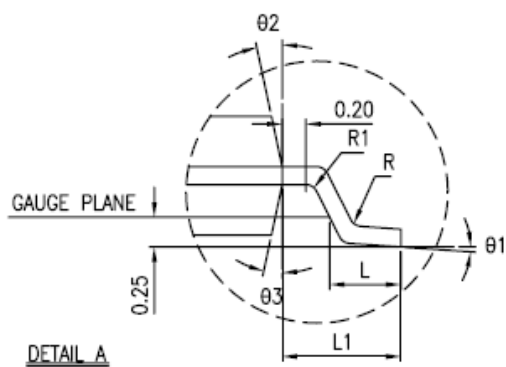
Tableau (B.1) : Description de brochage de l'EEPROM.

**B-2) la structure interne de l'EEPROM :**

Symbol	Parameter	CAT24WCXX-1.8		CAT24WCXX				Units
		1.8V-5.5V		2.5V-5.5V		4.5V-5.5V		
		Min.	Max.	Min.	Max.	Min.	Max.	
F <sub>SCL</sub>	Clock Frequency		100		100		400	kHz
T <sub>I</sub> <sup>(1)</sup>	Noise Suppression Time Constant at SCL, SDA Inputs		200		200		200	ns
t <sub>AA</sub>	SCL Low to SDA Data Out and ACK Out		3.5		3.5		1	μs
t <sub>BUF</sub> <sup>(1)</sup>	Time the Bus Must be Free Before a New Transmission Can Start	4.7		4.7		1.2		μs
t <sub>HD:STA</sub>	Start Condition Hold Time	4		4		0.6		μs
t <sub>LOW</sub>	Clock Low Period	4.7		4.7		1.2		μs
t <sub>HIGH</sub>	Clock High Period	4		4		0.6		μs
t <sub>SU:STA</sub>	Start Condition Setup Time (for a Repeated Start Condition)	4.7		4.7		0.6		μs
t <sub>HD:DAT</sub>	Data In Hold Time	0		0		0		ns
t <sub>SU:DAT</sub>	Data In Setup Time	50		50		50		ns
t <sub>R</sub> <sup>(1)</sup>	SDA and SCL Rise Time		1		1		0.3	μs
t <sub>F</sub> <sup>(1)</sup>	SDA and SCL Fall Time		300		300		300	ns
t <sub>SU:STO</sub>	Stop Condition Setup Time	4		4		0.6		μs
t <sub>DH</sub>	Data Out Hold Time	100		100		100		ns

Tableau (B.2) : lire et écrire un cycle limite.

**B-3) Les détails de l'EEPROM :**



SYMBOL	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM	MAX.	MIN.	NOM	MAX.
A			1.20			.043
A1	0.05		0.15	.002		.006
A2	0.80	0.90	1.05	.031	.035	.041
L	0.50	0.60	0.75	.020	.024	.030
D	2.90	3.00	3.10	.114	.118	.122
E	6.30	6.40	6.50	.248	.252	.256
E1	4.30	4.40	4.50	.169	.173	.177
R	0.09			.004		
R1	0.09			.004		
b	0.19		0.30	.007		.012
b1	0.19	0.22	0.25	.007	.009	.010
c	0.09		0.20	.004		.008
c1	0.09		0.16	.004		.006
L1	1.0 REF.			.039 REF.		
e	0.65 BSC.			.026 BSC.		
θ1	0		8	0		8
θ2	12 REF.			12 REF.		
θ3	12 REF.			12 REF.		
N	8					
REF	JEDEC MO-153 VARIATION AA					

Tableau (B-3) : dimensions de longueur.