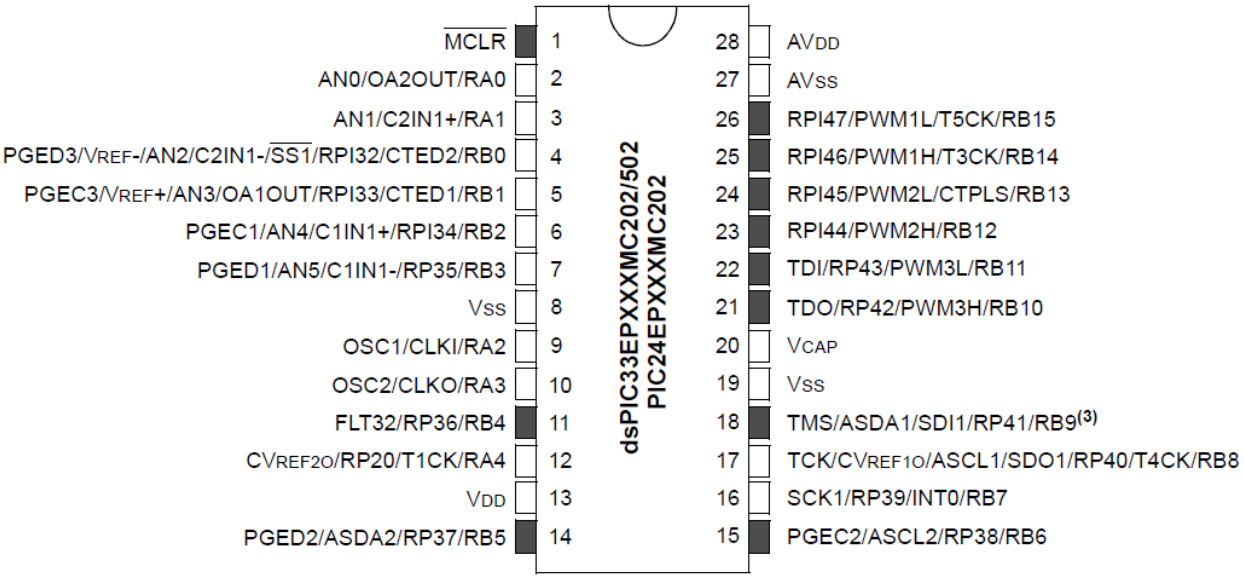
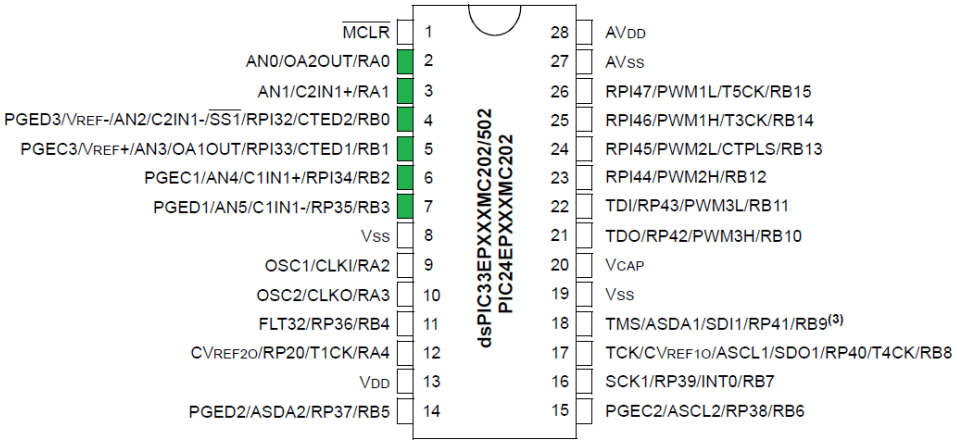
D.COURTEVILLE

Summary sheet:

Basic Pins functionalities and Register on dsPIC33



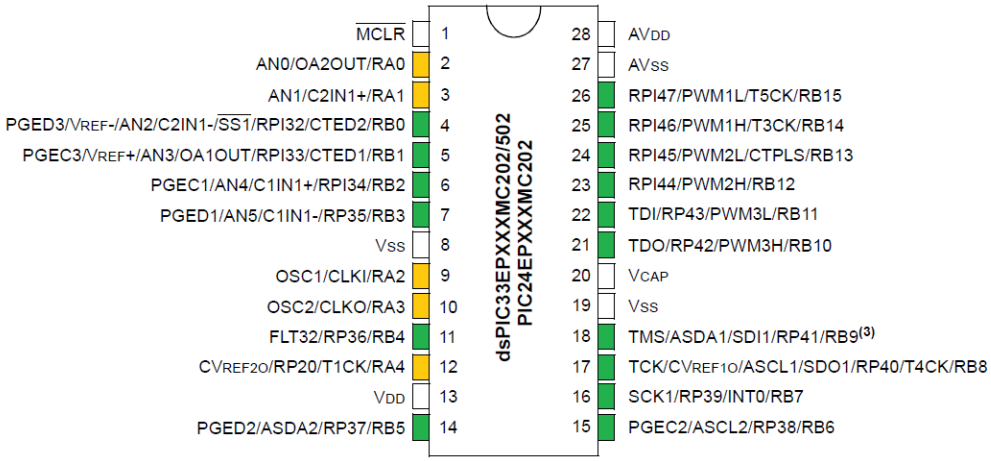
- **Analog pins (ANx) :**



➔ **Activated by default, and override all other functionalities on the pin**

➔ Deactivated on ports RAx or RBx by clearing ANSELA (bits _ANSAx) or ANSELB (bits _ANSBx) registers

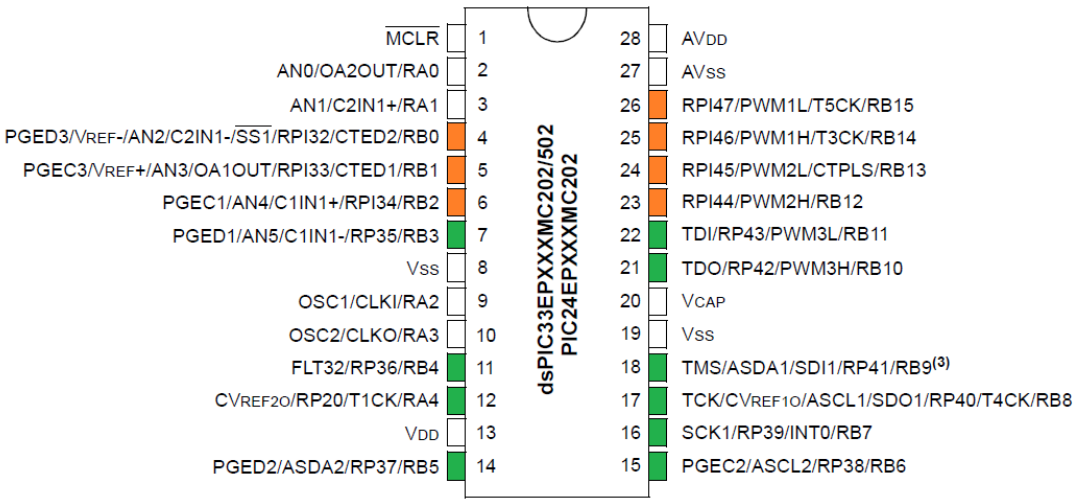
- **Ports I/O (RAx and RBx) :**



➔ Set as input or output with TRISA and TRISB registers (bits _TRISAx et _TRISBx) :
- 0 = Out / 1 = In
- **Input by default**

➔ Reading/Writing with registers: LATA (bits _LATAx), LATB (bits _LATBx), PORTA (bits _RAx) and PORTB (bits _RBx):
- If it's an Input pin you must use PORT
- If it's an output and you want to know what you have written to, use LAT
- If it's an output and you want to know the actual state at the pin, use PORT

- **PPS : Peripheral Pin Select (RPx/RPIx):**



➔ Allow to choose the pins used by some functionalities of the PIC (UART, CAN, …).

➔ RPx pins can be either input or output, but **RPIx pins are input only.**

➔ Setting an input pin:

- Search the Peripheral Pin Select Input Register associated **to the functionality** in the datasheet (p.177).
- Its name has the form RPINRn (n=18 for UART1, n=26 for CAN1, n=…).
- Set its configuration bits values to the x of the RPx/RPIx you want (ex : RPINR18bits.U1RXR = x for UART1).

TABLE 11-1: SELECTABLE INPUT SOURCES (MAPS INPUT TO FUNCTION)

Input Name(1)	Function Name	Register	Configuration Bits
External Interrupt 1	INT1	RPINR0	INT1R<6:0>
External Interrupt 2	INT2	RPINR1	INT2R<6:0>
Timer2 External Clock	T2CK	RPINR3	T2CKR<6:0>
Input Capture 1	IC1	RPINR7	IC1R<6:0>
Input Capture 2	IC2	RPINR7	IC2R<6:0>
Input Capture 3	IC3	RPINR8	IC3R<6:0>
Input Capture 4	IC4	RPINR8	IC4R<6:0>
Output Compare Fault A	OCFA	RPINR11	OCFAR<6:0>
PWM Fault 1(3)	FLT1	RPINR12	FLT1R<6:0>
PWM Fault 2(3)	FLT2	RPINR12	FLT2R<6:0>
QEI1 Phase A(3)	QEA1	RPINR14	QEA1R<6:0>
QEI1 Phase B(3)	QEB1	RPINR14	QEB1R<6:0>
QEI1 Index(3)	INDX1	RPINR15	INDX1R<6:0>
QEI1 Home(3)	HOME1	RPINR15	HOM1R<6:0>
UART1 Receive	U1RX	RPINR18	U1RXR<6:0>
UART2 Receive	U2RX	RPINR19	U2RXR<6:0>
SPI2 Data Input	SDI2	RPINR22	SDI2R<6:0>
SPI2 Clock Input	SCK2	RPINR22	SCK2R<6:0>
SPI2 Slave Select	SS2	RPINR23	SS2R<6:0>
CAN1 Receive(2)	C1RX	RPINR26	C1RXR<6:0>
PWM Sync Input 1(3)	SYNCI1	RPINR37	SYNCI1R<6:0>
PWM Dead-Time Compensation 1(3)	DTCMP1	RPINR38	DTCMP1R<6:0>
PWM Dead-Time Compensation 2(3)	DTCMP2	RPINR39	DTCMP2R<6:0>
PWM Dead-Time Compensation 3(3)	DTCMP3	RPINR39	DTCMP3R<6:0>

➔ Setting an output pin:

- Search the Peripheral Pin Select Output Register associated **to the RPx pin you want** in the datasheet (p.197).
- Its name has the form RPINRn and it hold two field for two pins (RPxR).
- Set the value of the field associated to the pin you want to the identifier of the functionality.

(ex : RPOR3bits.RP41R = 0x1 for setting UART1 TX on RP41)

TABLE 11-3: OUTPUT SELECTION FOR REMAPPABLE PINS (RPn)

Function	RPxR<5:0>	Output Name
Default PORT	000000	RPn tied to Default Pin
U1TX	000001	RPn tied to UART1 Transmit
U2TX	000011	RPn tied to UART2 Transmit
SDO2	001000	RPn tied to SPI2 Data Output
SCK2	001001	RPn tied to SPI2 Clock Output
$\overline{SS2}$	001010	RPn tied to SPI2 Slave Select
C1TX(2)	001110	RPn tied to CAN1 Transmit
OC1	010000	RPn tied to Output Compare 1 Output
OC2	010001	RPn tied to Output Compare 2 Output
OC3	010010	RPn tied to Output Compare 3 Output
OC4	010011	RPn tied to Output Compare 4 Output
C1OUT	011000	RPn tied to Comparator Output 1
C2OUT	011001	RPn tied to Comparator Output 2
C3OUT	011010	RPn tied to Comparator Output 3
SYNCO1(1)	101101	RPn tied to PWM Primary Time Base Sync Output
QEI1CCMP(1)	101111	RPn tied to QEI 1 Counter Comparator Output
REFCLKO	110001	RPn tied to Reference Clock Output
C4OUT	110010	RPn tied to Comparator Output 4

Registers associated to the output pins	
RPx	**RPORn**
RP20	RPOR0
RP35	
RP36	RPOR1
RP37	
RP38	RPOR2
RP39	
RP40	RPOR3
RP41	
RP42	RPOR5
RP43	