



dsPIC33EP512MU810 and PIC24EP512GU810

dsPIC33EP512MU810 and PIC24EP512GU810 100-pin TQFP to 100-pin Plug-In Module (PIM) Information Sheet

OVERVIEW

The dsPIC33EP512MU810 and PIC24EP512GU810 PIMs (MA330025-1 and MA240025-1, respectively) are designed to demonstrate the capabilities of the dsPIC33EP512MU810 and PIC24EP512GU810 devices. The dsPIC33EP512MU810 is a high-performance 16-bit Digital Signal Controller (DSC) and the PIC24EP512GU810 is a high-performance 16-bit Microcontroller (MCU). Both devices include a USB 2.0 OTG interface. Refer to [Figure 1](#) for the device schematics and [Figure 2](#) for the PIM connector schematics.

These PIMs can be used for USB as well as non-USB applications by configuring jumpers on the PIM PC board. This routing is intended to maximize the compatibility of the PIM with the Explorer 16 Development Board (DM240001) and its related PICtail™ Plus daughter boards. For non-USB applications, jumpers J1 through J5 must be populated

across positions 1 and 2, while jumpers J6 through J10 should be populated. For USB applications, jumpers J1 through J5 must be populated across positions 2 and 3, while jumpers J6 through J10 should not be populated. [Figure 3](#) shows the jumper locations.

[Table 1](#) shows the mapping between the 100-pin PIM interface board and the device pins when the jumpers on the PIM are configured for USB applications. [Table 2](#) shows the mapping between the 100-pin PIM interface board and the device pins when the jumpers on the PIM are configured for non-USB applications.

In addition, the dsPIC33EP512MU810 PIM can be used to control the Microchip MCLV (DM330021), MCHV (DM330023) and MCSM (DM330022) motor control development boards. The Microchip application note AN1208 “*Integrated Power Factor Correction (PFC) and Sensorless Field Oriented Control (FOC) System*” (DS01208) requires that an optional zero Ohm resistor to be installed at location R1.

TABLE 1: 100-PIN TQFP TO 100-PIN PIM FOR USB APPLICATIONS

Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #
1	RP127/RG15	—
2	VDD	2
3	AN29/PWM3H/PMD5/RP85/RE5	3
4	AN30/PWM4L/PMD6/RP86/RE6	4
5	AN31/PWM4H/PMD7/RP87/RE7	5
6	AN16/PWM5L/RP49/RC1	6
7	AN17/PWM5H/RP50/RC2	7
8	AN18/PWM6L/RP51/RC3	8
9	AN19/PWM6H/RP52/RC4	9
10	C1IND/SCK2/PMA5/RP118/RG6	10
11	C1INC/SDI2/PMA4/RP119/RG7	11
12	C2IND/SDO2/PMA3/RP120/RG8	12
13	MCLR	13
14	C2INC/PMA2/RP121/RG9	14
15	VSS	15
16	VDD	16
17	TMS/RP16/RA0	17
18	AN20/RP88/RE8	18
37	VDD	37

Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #
19	AN21/RP89/RE9	19
20	AN5/C1INA/VBUSON/VBUSST/RP37/RB5	96
21	AN4/C1INB/USBOEN/RP36/RB4	21
22	AN3/C2INA/VPIO/RP35/RB3	22
23	AN2/C2INB/VMIO/RP34/RB2	23
24	PGEC3/AN1/RP33/RB1	24
25	PGED3/AN0/RP32/RB0	25
26	PGEC1/AN6/RP38/RB6	26
27	PGED1/AN7/RCV/RP39/RB7	27
28	VREF-/RA9	28
29	VREF+/RA10	29
30	AVDD	30
31	AVSS	31
32	AN8/PMA6/RP40/RB8	32
33	AN9/PMA7/RP41/RB9	33
34	AN10/CVREF/PMA13/RP42/RB10	34
35	AN11/PMA12/RP43/RB11	35
36	VSS	36
69	ASDA1/DPLN/RP73/RD9	69

dsPIC33EP512MU810 and PIC24EP512GU810

TABLE 1: 100-PIN TQFP TO 100-PIN PIM FOR USB APPLICATIONS (CONTINUED)

Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #	Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #
38	TCK/RP17/RA1	38	70	ASCL1/PMCS2/RP74/RD10	70
39	RP109/RF13	39	71	PMCS1/RP75/RD11	71
40	RP108/RF12	40	72	INT0/DMH/RP64/RD0	72,55
41	AN12/PMA11/RP44/RB12	41	73	PGED2/SOSCI/C3IND/RP61/RC13	73
42	AN13/PMA10/RP45/RB13	42	74	PGEC2/SOSCO/C3INC/T1CK/RP62/RC14	74
43	AN14/PMA1/RP46/RB14	43	75	Vss	75
44	AN15/PMA0/RP47/RB15	44	76	VCPCON/RP65/RD1	76
45	Vss	45	77	DPH/RP66/RD2	77
46	VDD	46	78	PMBE/RP67/RD3	78
47	RP78/RD14	47	79	RP76/RD12	79
48	RP79/RD15	48	80	RP77/RD13	80
49	SDA2/PMA9/RP100/RF4	49	81	PMWR/RP68/RD4	81
50	SCL2/PMA8/RP101/RF5	50	82	PMRD/RP69/RD5	82
51	USBID/RP99/RF3	95	83	C3INB/RP70/RD6	83
52	RP98/RF2	52	84	C3INA/VCMPST3/RP71/RD7	84
53	RP104/RF8	53	85	VCAP	85
54	VBUS	1	86	VDD	86
55	VUSB	62	87	VCMPST1/RP96/RF0	87
56	D-/RG3	89	88	VCMPST2/RP97/RF1	88
57	D+/RG2	90	89	RP113/RG1	—
58	ASCL2/RP18/RA2	58	90	RP112/RG0	—
59	ASDA2/RP19/RA3	59	91	AN22/RP22/RA6	91
60	TDI/RP20/RA4	60	92	AN23/RP23/RA7	92
61	TDO/RP21/RA5	61	93	AN24/PWM1L/PMD0/RP80/RE0	93
62	VDD	62	94	AN25/PWM1H/PMD1/RP81/RE1	94
63	OSC1/RP60/RC12	63	95	RP126/RG14	—
64	OSC2/CLKO/RC15	64	96	RP124/RG12	—
65	Vss	65	97	RP125/RG13	97
66	RP30/RA14	66	98	AN26/PWM2L/PMD2/RP82/RE2	98
67	RP31/RA15	67	99	AN27/PWM2H/PMD3/RP83/RE3	99
68	RTCC/DMLN/RP72/RD8	68	100	AN28/PWM3L/PMD4/RP84/RE4	100

dsPIC33EP512MU810 and PIC24EP512GU810

TABLE 2: 100-PIN TQFP TO 100-PIN PIM FOR NON-USB APPLICATIONS

Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #	Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #
1	RP127/RG15	1	48	RP79/RD15	48
2	VDD	2	49	SDA2/PMA9/RP100/RF4	49
3	AN29/PWM3H/PMD5/RP85/RE5	3	50	SCL2/PMA8/RP101/RF5	50
4	AN30/PWM4L/PMD6/RP86/RE6	4	51	USBID/RP99/RF3	51
5	AN31/PWM4H/PMD7/RP87/RE7	5	52	RP98/RF2	52
6	AN16/PWM5L/RP49/RC1	6	53	RP104/RF8	53
7	AN17/PWM5H/RP50/RC2	7	54	VBUS	54
8	AN18/PWM6L/RP51/RC3	8	55	VUSB	62
9	AN19/PWM6H/RP52/RC4	9	56	D-/RG3	56
10	C1IND/SCK2/PMA5/RP118/RG6	10	57	D+/RG2	57
11	C1INC/SDI2/PMA4/RP119/RG7	11	58	ASCL2/RP18/RA2	58
12	C2IND/SDO2/PMA3/RP120/RG8	12	59	ASDA2/RP19/RA3	59
13	MCLR	13	60	TDI/RP20/RA4	60
14	C2INC/PMA2/RP121/RG9	14	61	TDO/RP21/RA5	61
15	VSS	15	62	VDD	62
16	VDD	16	63	OSC1/RP60/RC12	63
17	TMS/RP16/RA0	17	64	OSC2/CLKO/RC15	64
18	AN20/RP88/RE8	18	65	VSS	65
19	AN21/RP89/RE9	19	66	RP30/RA14	66
20	AN5/C1INA/VBUSON/VBUSST/RP37/RB5	20	67	RP31/RA15	67
21	AN4/C1INB/USBOEN/RP36/RB4	21	68	RTCC/DMLN/RP72/RD8	68
22	AN3/C2INA/VPIO/RP35/RB3	22	69	ASDA1/DPLN/RP73/RD9	69
23	AN2/C2INB/VMIO/RP34/RB2	23	70	ASCL1/PMCS2/RP74/RD10	70
24	PGEC3/AN1/RP33/RB1	24	71	PMCS1/RP75/RD11	71
25	PGED3/AN0/RP32/RB0	25	72	INT0/DMH/RP64/RD0	72,55
26	PGEC1/AN6/RP38/RB6	26	73	PGED2/SOSCI/C3IND/RP61/RC13	73
27	PGED1/AN7/RCV/RP39/RB7	27	74	PGEC2/SOSCO/C3INC/T1CK/RP62/RC14	74
28	VREF-/RA9	28	75	VSS	75
29	VREF+/RA10	29	76	VCPCON/RP65/RD1	76
30	AVDD	30	77	DPH/RP66/RD2	77
31	AVSS	31	78	PMBE/RP67/RD3	78
32	AN8/PMA6/RP40/RB8	32	79	RP76/RD12	79
33	AN9/PMA7//RP41/RB9	33	80	RP77/RD13	80
34	AN10/CVREF/PMA13/RP42/RB10	34	81	PMWR/RP68/RD4	81
35	AN11/PMA12/RP43/RB11	35	82	PMRD/RP69/RD5	82
36	VSS	36	83	C3INB/RP70/RD6	83
37	VDD	37	84	C3INA/VCMPST3/RP71/RD7	84
38	TCK/RP17/RA1	38	85	VCAP	85
39	RP109/RF13	39	86	VDD	86
40	RP108/RF12	40	87	VCMPST1/RP96/RF0	87
41	AN12/PMA11/RP44/RB12	41	88	VCMPST2/RP97/RF1	88
42	AN13/PMA10/RP45/RB13	42	89	RP113/RG1	89
43	AN14/PMA1/RP46/RB14	43	90	RP112/RG0	90
44	AN15/PMA0/RP47/RB15	44	91	AN22/RP22/RA6	91
45	VSS	45	92	AN23/RP23/RA7	92
46	VDD	46	93	AN24/PWM1L/PMD0/RP80/RE0	93
47	RP78/RD14	47	94	AN25/PWM1H/PMD1/RP81/RE1	94

dsPIC33EP512MU810 and PIC24EP512GU810

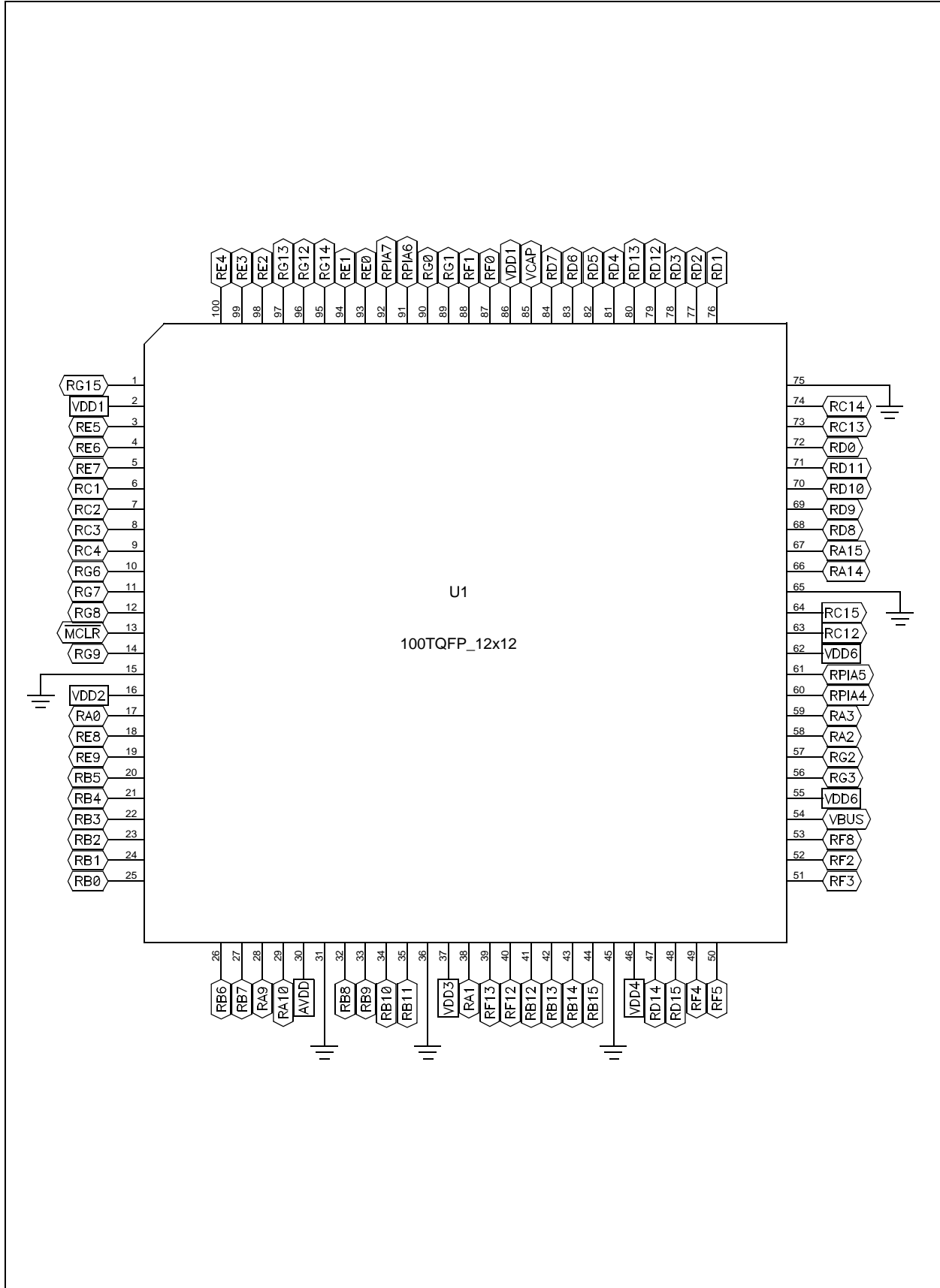
TABLE 2: 100-PIN TQFP TO 100-PIN PIM FOR NON-USB APPLICATIONS (CONTINUED)

Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #
95	RP126/RG14	95
96	RP124/RG12	96
97	RP125/RG13	97

Device Pin #	dsPIC33EP512MU810 and PIC24EP512GU810 Functional Description	PIM Pin #
98	AN26/PWM2L/PMD2/RP82/RE2	98
99	AN27/PWM2H/PMD3/RP83/RE3	99
100	AN28/PWM3L/PMD4/RP84/RE4	100

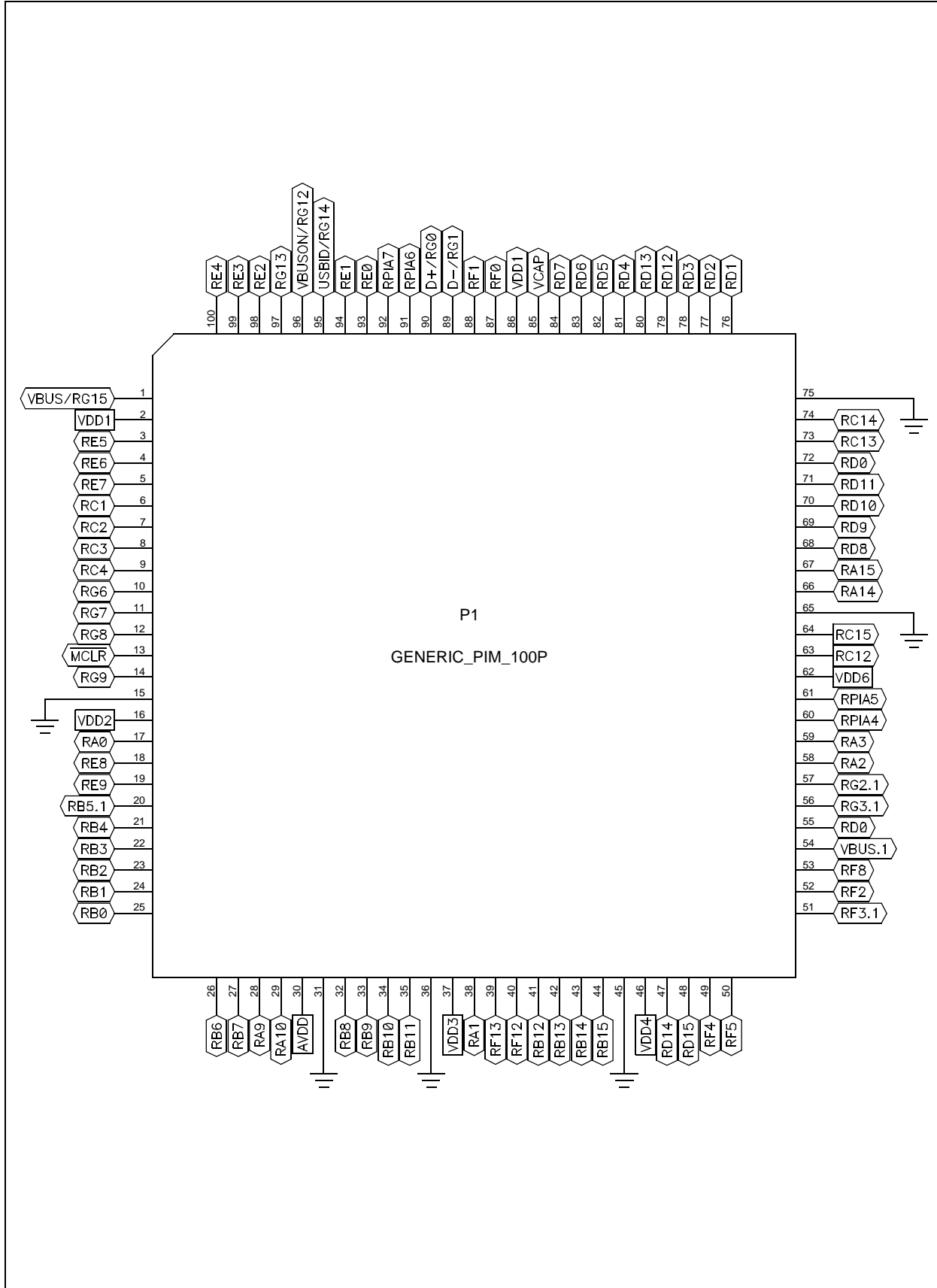
dsPIC33EP512MU810 and PIC24EP512GU810

FIGURE 1: 100-PIN DEVICE SCHEMATIC



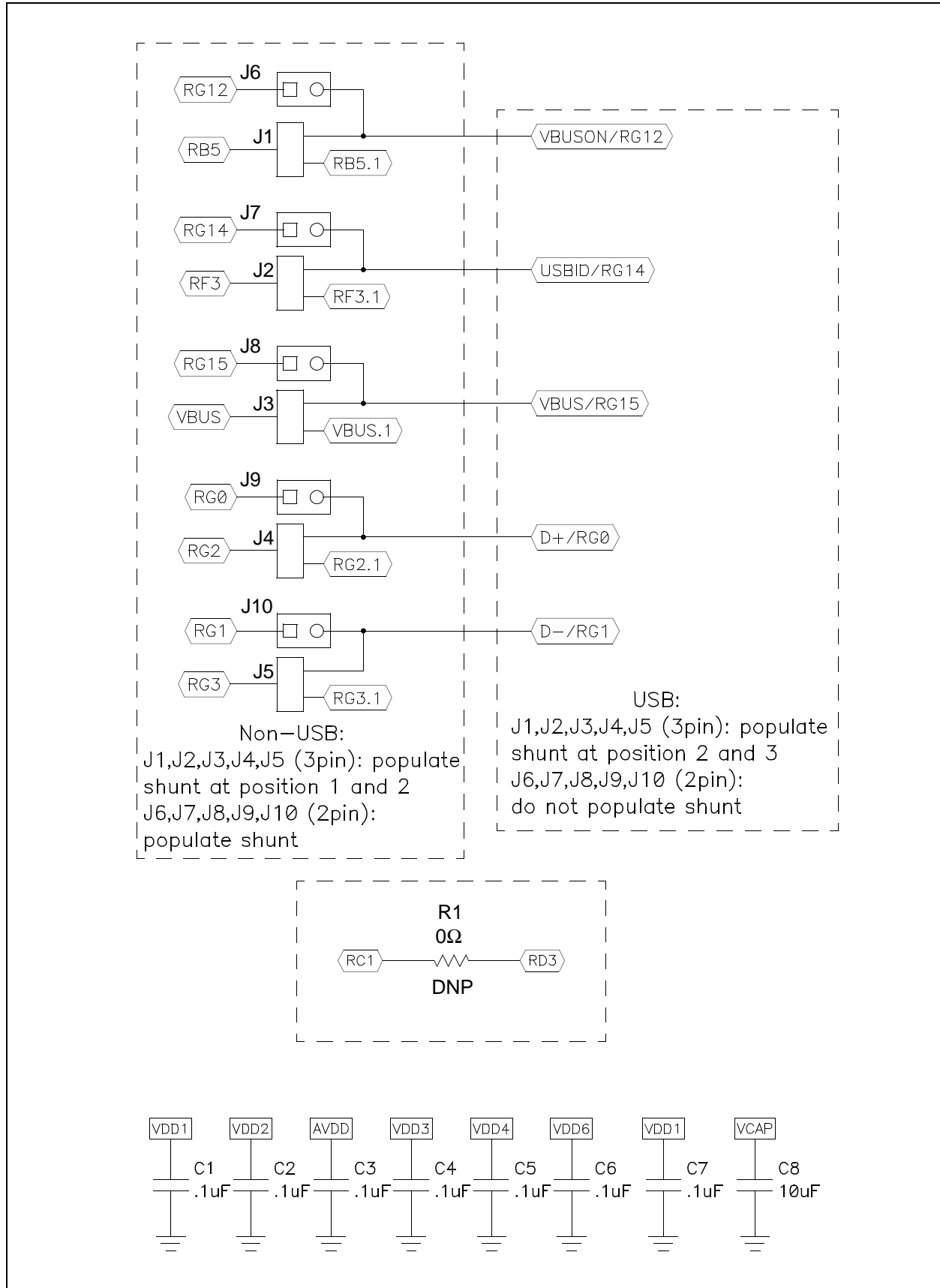
dsPIC33EP512MU810 and PIC24EP512GU810

FIGURE 2: 100-PIN PIM SOCKET SCHEMATIC



dsPIC33EP512MU810 and PIC24EP512GU810

FIGURE 3: JUMPER CONFIGURATION SCHEMATIC



dsPIC33EP512MU810 and PIC24EP512GU810

NOTES:

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “unbreakable.”

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

Trademarks

The Microchip name and logo, the Microchip logo, dsPIC, KEELOQ, KEELOQ logo, MPLAB, PIC, PICmicro, PICSTART, PIC³² logo, rPIC and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.


FilterLab, Hampshire, HI-TECH C, Linear Active Thermistor, MXDEV, MXLAB, SEEVAL and The Embedded Control Solutions Company are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Application Maestro, CodeGuard, dsPICDEM, dsPICDEM.net, dsPICworks, dsSPEAK, ECAN, ECONOMONITOR, FanSense, HI-TIDE, In-Circuit Serial Programming, ICSP, Mindi, MiWi, MPASM, MPLAB Certified logo, MPLIB, MPLINK, mTouch, Omniscient Code Generation, PICC, PICC-18, PICDEM, PICDEM.net, PICkit, PICTail, REAL ICE, rLAB, Select Mode, Total Endurance, TSHARC, UniWinDriver, WiperLock and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

All other trademarks mentioned herein are property of their respective companies.

© 2011, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

 Printed on recycled paper.

ISBN: 978-1-61341-064-6

Microchip received ISO/TS-16949:2002 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

**QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
== ISO/TS 16949:2002 ==**



MICROCHIP

Worldwide Sales and Service

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
<http://www.microchip.com/support>
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Cleveland
Independence, OH
Tel: 216-447-0464
Fax: 216-447-0643

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Farmington Hills, MI
Tel: 248-538-2250
Fax: 248-538-2260

Indianapolis
Noblesville, IN
Tel: 317-773-8323
Fax: 317-773-5453

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608

Santa Clara
Santa Clara, CA
Tel: 408-961-6444
Fax: 408-961-6445

Toronto
Mississauga, Ontario,
Canada
Tel: 905-673-0699
Fax: 905-673-6509

ASIA/PACIFIC

Asia Pacific Office
Suites 3707-14, 37th Floor
Tower 6, The Gateway
Harbour City, Kowloon
Hong Kong
Tel: 852-2401-1200
Fax: 852-2401-3431

Australia - Sydney
Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing
Tel: 86-10-8528-2100
Fax: 86-10-8528-2104

China - Chengdu
Tel: 86-28-8665-5511
Fax: 86-28-8665-7889

China - Chongqing
Tel: 86-23-8980-9588
Fax: 86-23-8980-9500

China - Hong Kong SAR
Tel: 852-2401-1200
Fax: 852-2401-3431

China - Nanjing
Tel: 86-25-8473-2460
Fax: 86-25-8473-2470

China - Qingdao
Tel: 86-532-8502-7355
Fax: 86-532-8502-7205

China - Shanghai
Tel: 86-21-5407-5533
Fax: 86-21-5407-5066

China - Shenyang
Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen
Tel: 86-755-8203-2660
Fax: 86-755-8203-1760

China - Wuhan
Tel: 86-27-5980-5300
Fax: 86-27-5980-5118

China - Xian
Tel: 86-29-8833-7252
Fax: 86-29-8833-7256

China - Xiamen
Tel: 86-592-2388138
Fax: 86-592-2388130

China - Zhuhai
Tel: 86-756-3210040
Fax: 86-756-3210049

ASIA/PACIFIC

India - Bangalore
Tel: 91-80-3090-4444
Fax: 91-80-3090-4123

India - New Delhi
Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-2566-1512
Fax: 91-20-2566-1513

Japan - Yokohama
Tel: 81-45-471- 6166
Fax: 81-45-471-6122

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-6578-300
Fax: 886-3-6578-370

Taiwan - Kaohsiung
Tel: 886-7-213-7830
Fax: 886-7-330-9305

Taiwan - Taipei
Tel: 886-2-2500-6610
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

UK - Wokingham
Tel: 44-118-921-5869
Fax: 44-118-921-5820

02/18/11