

dsPIC33CK256MC006 Motor Control Dual In-Line Module (DIM) Information Sheet



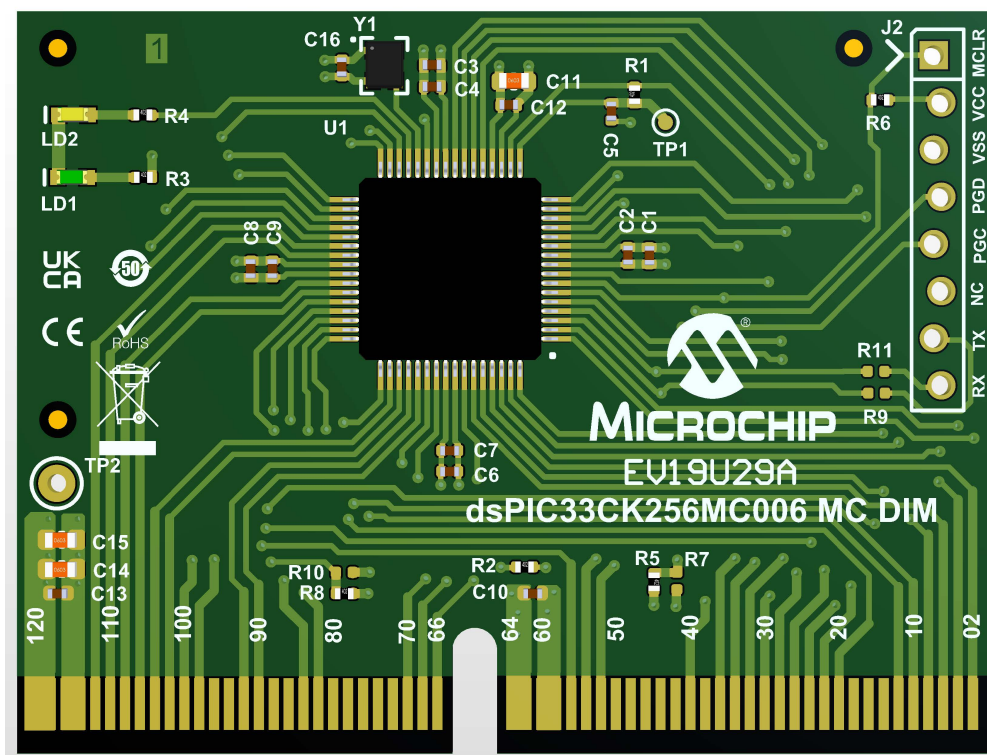
Introduction

The dsPIC33CK256MC006 Motor Control DIM (P/N: [EV19U29A](#)) is designed to demonstrate the motor control capabilities of the dsPIC33CK256MC006 device. This dsPIC[®] DSC features a 100 MIPS, single-core 16-bit Digital Signal Controller (DSC) with enhanced on-chip peripherals.

This motor control DIM is designed to take advantage of the high-speed motor control PWM generators, A/D converters, comparator and DAC.

The DIM can be used to demonstrate and develop motor control applications by inserting it in the DIM interface header, provided on the compatible motor control development boards. The DIM is designed to run a single motor with all the compatible development boards. [Table 1](#) provides information on the hardware versions of the motor control development boards that are compatible with this DIM. For additional information regarding development boards, see the respective user's guide available on the Microchip website (www.microchip.com).

Figure 1. dsPIC33CK256MC006 Motor Control DIM (Part Number: EV19U29A)



The LED LD1 (green) indicates the power-on status of the DIM. A general purpose LED LD2 (yellow) is provided on the board for debug purposes. The clock for the dsPIC DSC is generated by the MEMS Oscillator (Y1—[DSC6011J12B-008.0000](#)) provided on the DIM. The 8-pin header J2 is provided for interfacing with the programmer/debugger. Any 8-pin, single-row, 0.100 inch (2.54 mm) pitch, unshrouded male header can be used (for example, P/N: 61300811121 from Würth Elektronik).

Table 1. Hardware Compatibility¹

Development Board	Part Number	Compatible Hardware Revision
MCLV-48V-300W	EV18H47A	All revisions
MCHV-230VAC-1.5kW	EV78U65A	All revisions

Note:

1. The DIM is not compatible with earlier motor control development boards (for example, dsPICDEM™ MCLV-2 Development Board, dsPICDEM MCHV-3 Development Board).



Do not connect non-isolated oscilloscope probes to the test points on the DIM when inserted in a High-Voltage Development Board. Failure to heed this warning could result in hardware damage.

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1. Pin Mapping

Table 1-1 provides pin mapping from the 64-pin dsPIC33CK256MC006 device to the DIM interface connector.

Table 1-1. Pin Mapping—dsPIC33CK256MC006 to DIM Interface Connector (Sorted By Device Pin Number)

Device Pin No.	dsPIC33CK256MC006 Pin Function	DIM Pin No.	Remarks
1	RP46/PWM1H/RB14	DIM:001	Direct connection
2	RP47/PWM1L/RB15	DIM:003	Direct connection
3	RP60/RC12	DIM:052	Direct connection; can be connected to Pin 7 of Header J2 via 0R (R9) resistor
4	RP61/RC13	DIM:054	Direct connection; can be connected to Pin 8 of Header J2 via 0R (R11) resistor
5	RP62/RC14	DIM:034	Direct connection
6	RP63/RC15	DIM:036	Direct connection
7	MCLR	DIM:047 (MCLR)	Direct connection; also directly connected to Pin 1 of Header J2
8	RP79/PCI22/RD15	DIM:040	Direct connection
9	VSS	DIM:061 to DIM:064, DIM:117 to DIM:120	Digital ground (VSS)
10	VDD	DIM:057 to DIM:060, DIM:113 to DIM:116	Digital power (VCC)
11	RP78/PCI21/RD14	DIM:043	Connected via 0R (R5) resistor
		DIM:041	Can be connected via 0R (R7) resistor
12	ANNO/RP77/RD13	DIM:030	Direct connection
13	AN12/RP48/RC0	DIM:081	Direct connection
14	AN0/CMP1A/RA0	DIM:019	Direct connection
15	AN16/RA1	DIM:082	Direct connection
16	AN9/RA2	DIM:022	Direct connection
17	AN3/CMP1C/RA3	DIM:035	Connected via RC (R1, C5) filter
18	AN4/RA4	DIM:035	Direct connection
19	AVDD	DIM:057 to DIM:060, DIM:113 to DIM:116	Digital power (VCC)
20	AVSS	DIM:061 to DIM:064, DIM:117 to DIM:120	Digital ground (VSS)
21	RP76/RD12	DIM:032	Direct connection
22	AN13/CMP1B/RP49/RC1	DIM:039	Direct connection
23	AN14/RP50/RC2	DIM:028	Direct connection
24	AN19/RP54/RC6	DIM:024	Direct connection
25	VDD	DIM:057 to DIM:060, DIM:113 to DIM:116	Digital power (VCC)
26	VSS	DIM:061 to DIM:064, DIM:117 to DIM:120	Digital ground (VSS)
27	AN15/RP51/RC3	DIM:084	Direct connection
28	OSCI/CLKI/AN5/RP32/RB0	—	CLKI—clock output of MEMS Oscillator (Y1) is connected as an input clock of dsPIC DSC (U1)
29	OSCO/CLKO/AN6/RP33/RB1	—	Connected to a general purpose LED (LD2—Yellow) on the DIM (DIM_LED1)
30	RP75/RD11	DIM:056	Direct connection

Table 1-1. Pin Mapping—dsPIC33CK256MC006 to DIM Interface Connector (Sorted By Device Pin Number)
(continued)

Device Pin No.	dsPIC33CK256MC006 Pin Function	DIM Pin No.	Remarks
31	AN18/RP74/RD10	DIM:026	Direct connection
32	AN7/RP55/RC7	DIM:009	Direct connection
33	AN1/CMP1D/RP34/INT0/RB2	DIM:027	Direct connection
34	PGD2/AN8/RP35/RB3	DIM:011	Direct connection
35	PGC2/AN17/RP36/RB4	DIM:071	Connected via 0R (R8) resistor
		DIM:067	Can be connected via 0R (R10) resistor
36	RP56/ASDA1/SCK2/RC8	DIM:098	Direct connection
37	RP57/ASCL1/SDI2/RC9	DIM:100	Direct connection
38	RP73/PCI20/RD9	DIM:112	Direct connection
39	RP72/SDO2/PCI19/RD8	DIM:110	Direct connection
40	VSS	DIM:061 to DIM:064, DIM:117 to DIM:120	Digital ground (VSS)
41	VDD	DIM:057 to DIM:060, DIM:113 to DIM:116	Digital power (VCC)
42	RP71/RD7	DIM:108	Direct connection
43	RP70/RD6	DIM:106	Direct connection
44	RP69/RD5	DIM:065	Direct connection
45	PGD3/RP37/RB5	DIM:049 (PGD)	Direct connection; also directly connected to Pin 4 of Header J2
46	PGC3/RP38/RB6	DIM:051 (PGC)	Direct connection; also directly connected to Pin 5 of Header J2
47	TDO/AN2/RP39/RB7	DIM:020	Direct connection
48	PGD1/AN10/RP40/SCL1/RB8	DIM:010	Direct connection
49	PGC1/AN11/RP41/SDA1/RB9	DIM:012	Direct connection
50	RP52/RC4	DIM:104	Direct connection
51	RP53/RC5	DIM:102	Direct connection
52	RP58/RC10	DIM:092	Direct connection
53	RP59/RC11	DIM:090	Direct connection
54	RP68/RD4	DIM:070	Direct connection
55	RP67/RD3	DIM:068	Direct connection
56	VSS	DIM:061 to DIM:064, DIM:117 to DIM:120	Digital ground (VSS)
57	VDD	DIM:057 to DIM:060, DIM:113 to DIM:116	Digital power (VCC)
58	RP66/RD2	DIM:066	Direct connection
59	RP65/PWM4H/RD1	DIM:006	Direct connection
60	RP64/PWM4L/RD0	DIM:008	Direct connection
61	TMS/RP42/PWM3H/RB10	DIM:002	Direct connection
62	TCK/RP43/PWM3L/RB11	DIM:004	Direct connection
63	TDI/RP44/PWM2H/RB12	DIM:005	Direct connection
64	RP45/PWM2L/RB13	DIM:007	Direct connection

Table 1-2 provides pin mapping from the DIM interface connector to the 64-pin dsPIC33CK256MC006 device.

Table 1-2. Pin Mapping—DIM Interface Connector to dsPIC33CK256MC006 (Sorted by DIM Pin Number)

DIM Pin No.	Device Pin No.	dsPIC33CK256MC006 Pin Function	Remarks
DIM:001	1	RP46/PWM1H/RB14	Direct connection
DIM:002	61	TMS/RP42/PWM3H/RB10	Direct connection
DIM:003	2	RP47/PWM1L/RB15	Direct connection
DIM:004	62	TCK/RP43/PWM3L/RB11	Direct connection
DIM:005	63	TDI/RP44/PWM2H/RB12	Direct connection
DIM:006	59	RP65/PWM4H/RD1	Direct connection
DIM:007	64	RP45/PWM2L/RB13	Direct connection
DIM:008	60	RP64/PWM4L/RD0	Direct connection
DIM:009	32	AN7/RP55/RC7	Direct connection
DIM:010	48	PGD1/AN10/RP40/SCL1/RB8	Direct connection
DIM:011	34	PGD2/AN8/RP35/RB3	Direct connection
DIM:012	49	PGC1/AN11/RP41/SDA1/RB9	Direct connection
DIM:013 to DIM:018	—	—	No connection
DIM:019	14	AN0/CMP1A/RA0	Direct connection
DIM:020	47	TDO/AN2/RP39/RB7	Direct connection
DIM:021	—	—	No connection
DIM:022	16	AN9/RA2	Direct connection
DIM:023	—	—	No connection
DIM:024	24	AN19/RP54/RC6	Direct connection
DIM:025	—	—	No connection
DIM:026	31	AN18/RP74/RD10	Direct connection
DIM:027	33	AN1/CMP1D/RP34/INT0/RB2	Direct connection
DIM:028	23	AN14/RP50/RC2	Direct connection
DIM:029	—	—	No connection
DIM:030	12	ANN0/RP77/RD13	Direct connection
DIM:031	—	—	No connection
DIM:032	21	RP76/RD12	Direct connection
DIM:033	—	—	No connection
DIM:034	5	RP62/RC14	Direct connection
DIM:035	18	AN4/RA4	Direct connection
	17	AN3/CMP1C/RA3	Connected via RC (R1, C5) filter
DIM:036	6	RP63/RC15	Direct connection
DIM:037 (VREF)	—	—	No connection
DIM:038	—	—	No connection
DIM:039	22	AN13/CMP1B/RP49/RC1	Direct connection
DIM:040	8	RP79/PCI22/RD15	Direct connection
DIM:041	11	RP78/PCI21/RD14	Can be connected via 0R (R7) resistor
DIM:042	—	—	No connection
DIM:043	11	RP78/PCI21/RD14	Connected via 0R (R5) resistor
DIM:044	—	—	No connection
DIM:045	—	—	No connection
DIM:046	—	—	No connection

Table 1-2. Pin Mapping—DIM Interface Connector to dsPIC33CK256MC006 (Sorted by DIM Pin Number)
(continued)

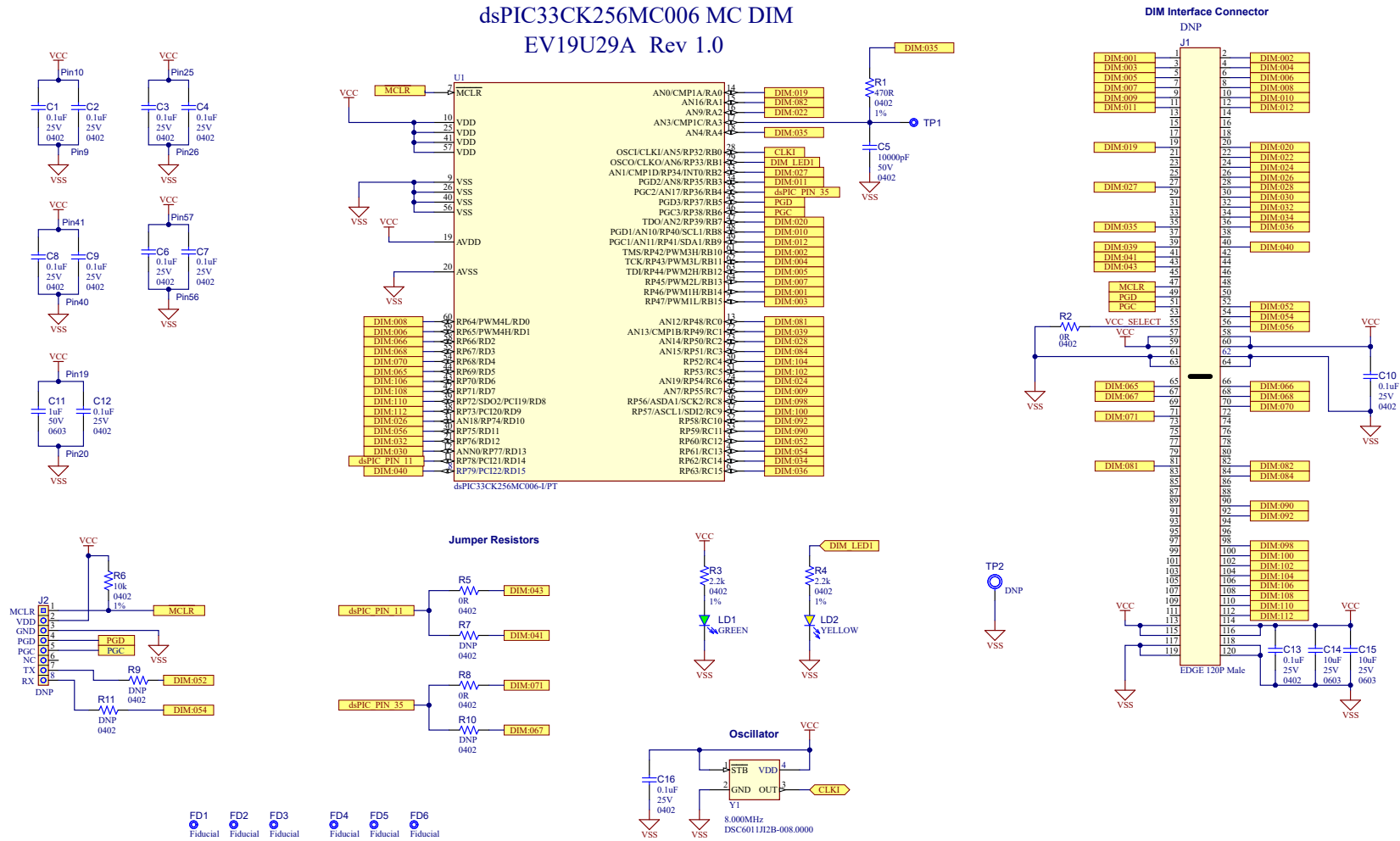
DIM Pin No.	Device Pin No.	dsPIC33CK256MC006 Pin Function	Remarks
DIM:047 (MCLR)	7	MCLR	Direct connection; also directly connected to Pin 1 of Header J2
DIM:048	—	—	No connection
DIM:049 (PGD)	45	PGD3/RP37/RB5	Direct connection; also directly connected to Pin 4 of Header J2
DIM:050	—	—	No connection
DIM:051 (PGC)	46	PGC3/RP38/RB6	Direct connection; also directly connected to Pin 5 of Header J2
DIM:052	3	RP60/RC12	Direct connection; can be connected to Pin 7 of Header J2 via 0R (R9) resistor
DIM:053	—	—	No connection
DIM:054	4	RP61/RC13	Direct connection; can be connected to Pin 8 of Header J2 via 0R (R11) resistor
DIM:055 (VCC_SELECT)	—	—	Connected to Digital ground (VSS) via 0R (R2) resistor
DIM:056	30	RP75/RD11	Direct connection
DIM:057 to DIM:060	10, 19, 25, 41, 57	VDD	Digital power (VCC)
DIM:061 to DIM:064	9, 20, 26, 40, 56	VSS	Digital ground (VSS)
DIM:065	44	RP69/RD5	Direct connection
DIM:066	58	RP66/RD2	Direct connection
DIM:067	35	PGC2/AN17/RP36/RB4	Can be connected via 0R (R10) resistor
DIM:068	55	RP67/RD3	Direct connection
DIM:069	—	—	No connection
DIM:070	54	RP68/RD4	Direct connection
DIM:071	35	PGC2/AN17/RP36/RB4	Connected via 0R (R8) resistor
DIM:072 to DIM:080	—	—	No connection
DIM:081	13	AN12/RP48/RC0	Direct connection
DIM:082	15	AN16/RA1	Direct connection
DIM:083	—	—	No connection
DIM:084	27	AN15/RP51/RC3	Direct connection
DIM:085 to DIM:089	—	—	No connection
DIM:090	53	RP59/RC11	Direct connection
DIM:091	—	—	No connection
DIM:092	52	RP58/RC10	Direct connection
DIM:093 to DIM:097	—	—	No connection
DIM:098	36	RP56/ASDA1/SCK2/RC8	Direct connection
DIM:099	—	—	No connection
DIM:100	37	RP57/ASCL1/SDI2/RC9	Direct connection
DIM:101	—	—	No connection
DIM:102	51	RP53/RC5	Direct connection

Table 1-2. Pin Mapping—DIM Interface Connector to dsPIC33CK256MC006 (Sorted by DIM Pin Number)
(continued)

DIM Pin No.	Device Pin No.	dsPIC33CK256MC006 Pin Function	Remarks
DIM:103	—	—	No connection
DIM:104	50	RP52/RC4	Direct connection
DIM:105	—	—	No connection
DIM:106	43	RP70/RD6	Direct connection
DIM:107	—	—	No connection
DIM:108	42	RP71/RD7	Direct connection
DIM:109	—	—	No connection
DIM:110	39	RP72/SDO2/PCI19/RD8	Direct connection
DIM:111	—	—	No connection
DIM:112	38	RP73/PCI20/RD9	Direct connection
DIM:113 to DIM:116	10, 19, 25, 41, 57	VDD	Digital power (VCC)
DIM:117 to DIM:120	9, 20, 26, 40, 56	VSS	Digital ground (VSS)

2. Board Schematics: Motor Control Dual In-Line Module (MC DIM)

Figure 2-1. Schematic Revision 1.0



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