

## **16-bit PIC® Microcontroller Peripheral Integration**

**Quick Reference Guide** 

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					llige ialog			Wa	vefo	rm C	ont	rol	T,		_	and			Safe Mon					Co	mm	unic	atio	ns			U	ser	·e		cure Pata		5	Syst	em	Fle	xibili	ity	
Product Family	Program Flash Memory (KB)	Pin Count	ADC (resolution) <sup>1</sup>	DAC (resolution) <sup>2</sup>		HS Comp OPA	CCP/ECCP	SCCP	PWM	MC PWM	SMPS PWM	DWM Bocolution (no.)	(CIII)				QEI	LVD			CRC Class R Safetv <sup>3</sup>	ן נ	CAN	UART		Irua®	S as	I <sup>2</sup> S <sup>TM</sup>	SENT	el Port	® Sensing	LCD (Segments)		raphic Engine	Secure Key Storage RNG	Dual Partition Flash	CLC	PPS	PTG		IDLE, SLEEP and PMD	XLP	Vват
PIC24 Family	4	14.00	10		<b>V</b>				<b>√</b>			<i>(</i>	<u>.  </u>					<b>√</b>				1		<b>√</b>		/   v	<b>∕</b>   <b>√</b>				<b>√</b>											/ /	
PIC24F04KA20X	4	14-20	10			<b>√</b>			✓ ✓			6		<b>√</b>	-				<b>V</b>		L						-			-	<b>V</b>					+					<b>√</b> ✓		
PIC24F04KL10X	4	14-20	10		-	✓ ✓	V	_	✓ ✓		-	/ 1 / 1	_	<u> </u>	+	-		✓ ✓	✓ ✓	-	L:	_	-	✓ ✓	-	/ v	-		Н	$\dashv$	+					+	+	$\vdash$	$\dashv$	-	<b>√</b>	_	$\square$
PIC24F08KL20X	8	14–20 20–28	10		-	<b>✓</b>	V /		V				_	+	+			<b>∨</b> ✓			L:	_			-	/	-			_						+	+-	$\vdash$	$\vdash$		√ √ √ √	_	$\vdash$
PIC24F08KL30X PIC24FXXKL40X	8 8–16	20–28	10		-	<b>✓</b>	V /	-	V			/ 1 / 1	-	<b>v</b>	+			<b>v</b>	✓ ✓		L:	_	+	<b>∨</b>	-	/			$\vdash$	_						+	+	$\vdash$	$\vdash$		✓ ✓ ✓ ✓	_	$\vdash$
PIC24FXXKL40X PIC24FXXKA10X	8–16	20–28	10			<b>√</b>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		V			6	_	<b>∨</b>	-			<b>∨</b>	<b>√</b>		/ L:			<b>√</b>		/ v					<b>✓</b>										<b>v v</b>		
PIC24FXXKM10X	8–16	20–28	12			<b>√</b>		<b>√</b> ,	/ /			/ 6	_	▼ ✓	-			v _/	<b>√</b>		/ L:			V		/ /	-			-	v v					+	1				v v		
PIC24FXXKM20X	8–16	20–44	12	8		<i>'</i>		<i>y</i> ,			-	/ 6	+	· ·	+			· /	· /	_	/ L:	_	-	· /	-	/ /	+		$\vdash$	$\dashv$	·			$\dashv$		+	1	$\vdash$	$\vdash$		· ·	_	$\vdash$
PIC24HJ12GP20X	12	20–44	12	0	V	V V		V ,	<b>V</b>			/ 2	_	<b>∨</b>				•	<b>√</b>		L					/ /	-				v						ľ	<b>√</b>			<b>v v</b>		
PIC24HJ12GP20X PIC24FXXKA30X	16–32	20–28	12		<b>V</b>	<b>√</b>			V			/ 2		<b>∨</b>				1	<b>✓</b>		/ L:			V		/	ļ.				<u>/</u>					+	-	•			<b>v v</b>		
PIC24FXXXA30X	16–32	28–44	10			<b>√</b>			✓ ✓			/ 1 / 6	_	<b>∨</b>	-			<b>∨</b>	<b>v</b>	-				V	-	/ /	+			1	<b>v</b>							1			<b>v v</b>		
PIC24FJXXMC10X	16-32	20–44	10	4		<b>√</b>			<b>√</b>	1		/ 3		<b>▼</b>		1		•	✓ <b>/</b>	- '	L			<b>V</b>	•	/ /	+			1	<b>√</b>					+		<b>V</b>			<b>v v</b>		
PIC24FJXXWC10X PIC24HJXXGPX0X	16–32	28–44	12	4		•			✓ ✓	7		/ 2	_	<b>∨</b>		•			<b>v</b>		L:			V		/ /	-				•							V			<b>v v</b>		
PIC24EPXXXGP20X	32–512	28–64	12	4		<b>√</b> √			V			/ 2		<b>V</b> ✓					<b>V</b>		_ L.			V	•	/ /					<b>/</b>						-	V	1		<b>v v</b>		
PIC24EPXXXMC20X	32–512	28–64	12	4		<b>√ √</b>			<b>∨</b>	1	√ ,	/ 1	_	<b>∨</b>	_		1		<b>√</b>	-				<b>√</b>	-	/ /	-				<b>∨</b>							V	-	•	<b>v v</b>		
PIC24EFXXXMC20X	32–64	28–44	10	-		<b>√</b>			· ·		-	/ 1		<b>▼</b>				<b>V</b>	✓ <b>/</b>		/ L:			<b>√</b>	✓ .					<b>√</b>	· •							<b>V</b>		-	√		
PIC24FJXXGB00X	32-64	28–44	10			<b>√</b>			<b>√</b>			/ 1		<b>▼</b>				<b>√</b>	<b>√</b>		/ L:			<b>√</b>	-	/ /	+			<b>√</b>	<b>v</b>							<b>V</b>			√		
PIC24HJ32GP30X	32	28–44	12	4		✓ <b>/</b>			·					·				•	✓ <b>/</b>		/ L:				-	/ /	-			<u> </u>							+	· /			· ·		
PIC24HJXXXGP20X	64–128	28–44	12	4		✓ <b> </b>			✓ ×		,	/ 2	_	<b>✓</b>					✓		/ L:					/ /	+			✓ <b> </b>								·		√ ·	√ √		
PIC24HJXXXGP50X	64–128	28–44	12			√			1			/ 2		1	-				√ /		/ L:		1		√ .		-			· ✓								1		•	√ √		
PIC24FJXXXGAOXX	64–128	64–100	10	7		<b>√</b>			·			6	_	-	<b>√</b>				<b>√</b>		/ L:		+	-		/ /	-			✓ <b> </b>											✓ ✓		
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<sup>1: 16-</sup>bit PIC® MCU offers SAR ADC, high-speed ADC and Delta-Sigma ADC

Note: Similar family of devices with fewer variations are grouped with the same color coding

<sup>2: 16-</sup>bit PIC MCU offers general-purpose DAC and audio DAC

<sup>3:</sup> Class B Safety Features:

L1: Includes WDT, oscillator fail-safe, illegal opcode detect, TRAP, reset trace, register lock, frequency check, CodeGuard™ security, PWM lock\*

L2: Includes features of L1 + CRC

L3: Includes features of L1 + Flash ECC + DMT

<sup>\*</sup>PWM lock available in devices with MC PWM/SMPS PWM peripheral

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				ntell		it		Wa	avefo	rm (	Cont	rol				and	Т			and			С	omn	nuni	catio	ns			User		Sec			Sv	stem	Fle	xibi	litv	
	_ ⋒			Ana	alog								M	eas	ure	ment	s	Mo	onito	oring			_			outio				terfac	:e	Da	ta		<b>-</b>	7.0		Albi	,	
Product Family	Program Flash Memory (KB)	Pin Count	ADC (resolution) <sup>1</sup>	DAC (resolution) <sup>2</sup>	CVREF	ns comp OPA	CCP/ECCP	SCCP	MCCP	MC PWM	SMPS PWM	PWM Resolution (ns)	8-bit Timer	16-bit Timer	32-bit Timer	RTCC	QEI	WDT	DMT		Class B Safety <sup>3</sup>	USB	UART	LIN	IrDA®	I <sup>2</sup> C SPI	I <sup>2</sup> S <sup>TM</sup>	SENI Parallel Port	CTMU and mTouch® Sensing	LCD (Segments)	GFX	Cryptographic Engine	Secure hey storage RNG	Dual Partition Flash	CLC	PTG		IDLE, SLEEP and PMD	DUZE XLP	Vват
PIC24 Family (Continue	ed)																																							
PIC24FJXXXGA1XX	64–256	64–100	10		,	/			✓		١,	/ 15	5	✓	✓		٧	/ /		<b>✓</b>	L2		✓	<b>✓</b>	<b>√</b>	< <		✓	✓						v	/		✓ V		
PIC24FJXXXGB1XX	64–256	64–100	10		,	/			✓		,	/ 15	5	✓	✓		V	/ /		✓	L2	✓	✓	✓	✓	< <		✓	✓							/		✓ V		
PIC24FJXXXGA20X	64–128	28–44	12		,	/			✓		,	/ 15	5	✓	✓	✓	٧	/ /					✓			<b>√</b>	✓	✓	✓			✓	/ /		٠	/	✓	✓ V	/ /	✓
PIC24FJXXXGB20X	64–128	28–44	12		,	/			✓		,	/ 15	5	✓	✓	✓	٧	/ /				✓	✓			<b>√</b>	✓	✓	✓			✓	/ /			/	✓	✓ V	/ /	✓
PIC24FJXXXGA3XX	64–128	64–100	12		✓ ,				✓			/ 15	5	✓	✓	<b>✓</b>	v	/ /		<b>✓</b>	L2		✓	<b>✓</b>	<b>√</b>	<b>✓</b>			✓	Up to 480					•		<b>✓</b>	✓ V	/ /	✓
PIC24FJXXXGC0XX	64–128	64–100	16	10	<b>✓</b> ,				✓		,	15	5	✓	✓	<b>✓</b>	,	/ /		✓	L2	✓	✓	<b>✓</b>	<b>√</b>	<b>√</b>		✓	<b>✓</b>	Up to 472					•		<b>✓</b>	✓ <b>∨</b>	/ /	✓
PIC24HJXXXGP2XXA	64–128	64–100	12						✓		,	/ 25	5	✓	✓			✓			L1		✓	✓	✓	<b>√</b>											<b>✓</b>	✓ V		
PIC24HJ128GP3XXA	128	64–100	12						✓		,	/ 25	5	✓	✓			✓			L1		✓	✓	✓	<b>√</b>											✓	✓ V	/	
PIC24HJXXXGP5XXA	64–128	64–100	12						✓		,	/ 25	5	✓	✓			✓			L1	~	<b>/ /</b>	✓	<b>√</b>	<b>√</b> ✓											✓	✓ V	/	
PIC24HJ256GP610A	256	100	12						✓		,	/ 25	5	✓	✓			✓			L1	~	<b>/ /</b>	✓	<b>√</b>	<b>√</b>											✓	✓ V	/	
PIC24FJXXXDA2XX	128–256	64–100	10		,				✓		١,	/ 15	5	✓	✓		v	/ /		✓	L2	✓	✓	✓	✓	< <		✓	✓		<b>✓</b>				٠	/	✓	✓ V		
PIC24FJXXXGA2XX	128–256	64–100	10		,	/			✓		١,	62	2	✓	✓		٧	/ /		✓	L2		✓	✓	<b>√</b>	< <		✓	✓						٧	/		✓ V		
PIC24FJXXXGB2XX	128–256	64–100	10		,	/			✓		,	62	2	✓	✓		٧	/ /		✓	L2	✓	✓	✓	✓	<b>√</b> ✓		✓	✓						v			✓ V		
PIC24FJXXXGA4XX	64–256	64–121	12	10	,			<b>✓</b>	< <		,	62	2	<b>✓</b>	✓	✓	٧	/ /		<b>✓</b>	L2		<b>✓</b>			<b>√</b>	<b>✓</b>	✓	✓	Up to 512		<b>√ √</b>	/ /	<b>√</b> ,	< v		<b>✓</b>	✓ <b>∨</b>	/ /	<b>✓</b>
PIC24FJXXXGB4XX	64–256	64–121	12	10	,	/		<b>✓</b>	< <		,	62	2	✓	✓	✓	٧	/ /		<b>✓</b>	L2	✓	✓			< <	<b>✓</b>	✓	✓	Up to 512		<b>√</b>   <b>√</b>	1	<b>√</b> ,	< \	/	✓	✓ V	/ /	✓
PIC24EPXXXGU81X	256–512	100–144	12	4	,				✓		,	/ 14		✓	✓			✓		✓	L2	✓ <b>∨</b>	<b>/</b>	✓	✓	< <	✓	✓						<b>✓</b>	٧		✓	✓ v		Ш
PIC24EP512GP806	512	64	12	4	١,				✓		,	/ 14	-	✓	✓			✓		✓	L2	~	✓ ✓	✓	<b>√</b>	<b>√</b> ✓	✓	✓						<b>✓</b>	٠		✓	✓ v		Ш
PIC24FJXXXXGA6XX	128–1024	64–121	12		<b>√</b> \			✓	<b>√ √</b>		,	62	2	✓	✓	<b>√</b>	٧	/ /		✓	L2		✓			<b>√</b> ✓	<b>✓</b>	✓	✓						✓ v			✓ V		
PIC24FJXXXXGB6XX	128–1024	64–121	12		<b>√</b> \	/		✓	<b>√</b>   <b>√</b>		,	/ 62	2	✓	✓	✓	~	/   /		✓	L2	✓	✓			<b>√</b>	✓	✓	✓					✓ ,	√   v			✓ V		
dsPIC33F Family																																								
dsPIC33FJ06GS001	6	18	10	10	<b>√</b> 1	/				✓	✓	1		✓			1	✓			L1		✓	✓	<b>√</b>	<b>√</b> ✓									٧	/	Ш	✓ V		
dsPIC33FJ06GS102/1/A	6	18–28	10		✓				✓	✓	✓	1		✓				✓			L1		✓	✓	<b>√</b>	<b>√</b> ✓									٧	/		✓ V		
dsPIC33FJ0XGS202/ A/302	6–9	28	10	10	✓ ,	/			✓	<b>✓</b>	✓ ·	/ 1		<b>✓</b>				<b>✓</b>			L1		<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>									v	/		✓ V		
dsPIC33FJ16GS40X	16	28–44	10		✓				✓	✓	✓ ,	/ 1		✓	✓			✓			L1		✓	✓	✓	<b>√</b>									•	/		✓ v	/	Ш
dsPIC33FJ16GS50X	16	28–44	10	10	<b>√</b> ,	/			✓	✓	✓ ,	/ 1		✓	✓			✓			L1		✓	✓	✓	<b>√</b>									•	/		✓ V	/	
dsPIC33FJXXGP2/30X	12–16	20–28	12						✓		,	/ 25	5	✓	✓			<b>√</b>			L1		✓	✓	✓	<b>√</b>									v	/		✓ V	1	
dsPIC33FJXXMC2/30X	12–16	20–28	12						✓	✓	✓ ,	/ 12	2	✓	✓	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		✓			L1		✓	<b>✓</b>	✓	<b>√</b>									v	/		✓ V	/	

<sup>1: 16-</sup>bit PIC® MCU offers SAR ADC, high-speed ADC and Delta-Sigma ADC 2: 16-bit PIC MCU offers general-purpose DAC and audio DAC

\*PWM lock available in devices with MC PWM/SMPS PWM peripheral

Note: Similar family of devices with fewer variations are grouped with the same color coding

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L2: Includes features of L1 + CRC

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				Intel				W	/avefo	rm (	Contr	ol			g an				and			Co	mmu	nica	tions				Jser		ecur		ę	vete	-m F	lexi	bility	
	<u></u>			An	alog	<u>s</u>			avero			ν. -	Mea	sur	eme	nts	M	onito	ring				IIIIII	11100	ICIOIIS	•			erface		Data			yste	1111	L	oiiicy	
Product Family	Program Flash Memory (KB)	Pin Count	ADC (resolution) <sup>1</sup>	DAC (resolution) <sup>2</sup>	CVREF	HS Comp	OPA	SCCP	MCCP	MC PWM	SMPS PWM	PWM Resolution (ns)	8-bit Timer	22-bit Timer	RTCC	QEI	LVD	DMT	CRC CRC	ם	CAN	UART	LIN	1 <sub>2</sub> C	SPI	SENT	Parallel Port	CTMU and mTouch® Sensing	LCD (Segments) GFX	Cryptographic Engine	ıre Key St	RNG Dual Partition Flash	CLC	PPS	PTG	IDLE, SLEEP and PMD	DOZE	XLP VBAT
dsPIC33F Family (Contin	nued)																																					
dsPIC33FJXXGP10X	16–32	20–44	10	4		✓	Т		<b>✓</b>		~	62	,	/ /	<b>/ /</b>		<b>✓</b>		L	1		<b>✓</b>	<b>√</b>	✓	<b>✓</b>			✓				$\top$		✓		✓	<b>✓</b>	
dsPIC33FJXXMC10X	16–32	20–44	10	4		✓			<b>✓</b>	✓	✓	12	,	/   •	<b>/</b>		<b>✓</b>		L	1		✓	<b>√</b>	✓	<b>✓</b>			✓						✓		✓	✓	
dsPIC33FJ32GP20X	32	28–44	12						<b>✓</b>		<b>✓</b>	25	,	/   •			✓		L	1		✓	<b>√</b>	✓	<b>✓</b>									✓		✓	✓	
dsPIC33FJXXXGP2/30X	32–128	28–44	12	4		✓			✓		~	25	١,	/ /			✓		✓ L	2		<b>✓</b>	<b>√</b>	✓	<b>✓</b>		✓							✓	✓	<b>/</b>	✓	
dsPIC33FJXXXGP80X	64–128	28–44	12	16		✓			✓		~	25	<b> </b>  ,	/ /	/		<b>✓</b>		✓ L	2	✓	✓	<b>√</b>	✓	<b>✓</b>		✓							✓	✓	<b>/ /</b>	<b>✓</b>	
dsPIC33FJXXXGS406	32–64	64	10		✓				✓	<b>√</b>	<b>√</b> ✓	1	,	/ /	/	✓	✓		L	1		✓	<b>√</b>	✓	✓											✓	<b>✓</b>	
dsPIC33FJ32GS6XX	32	64–100	10	10	✓	✓			✓	✓	✓	1	,	/ /	/	✓	✓		L	1		<b>✓</b>	<b>√</b> ✓	✓	<b>✓</b>											✓	✓	
dsPIC33FJ64GS6XX	64	64–100	10	10	✓	✓			<b>✓</b>	✓	✓	1	,	/   •		✓	✓		L	1	1	✓	<b>√</b>	✓	<b>✓</b>										✓	<b>/ /</b>	✓	
dsPIC33FJ32MC20X	32	28–44	12						<b>✓</b>	<b>✓</b>	✓	12	,	/   •		✓	<b>✓</b>		L	1		<b>✓</b>	<b>√</b>	✓	<b>✓</b>									<b>✓</b>		✓	<b>✓</b>	
dsPIC33FJ32MC30X	32	28–44	12	4		✓			<b>✓</b>	✓	<b>✓</b> ✓	12	,	/ /	/	✓	<b>✓</b>		✓ L	2		✓	<b>√</b>	✓	✓		✓							✓		✓	✓	
dsPIC33FJXXXMC20X	64–128	28–44	12	4		✓			<b>✓</b>	✓	<b>✓</b> ✓	12	,	/   •	′	✓	✓		✓ L	2		✓	<b>√</b>   <b>√</b>	✓	✓		✓							✓	✓	<b>/</b>	✓	
dsPIC33FJXXXMC80X	64–128	28–44	12	4 to 16		✓			<b>✓</b>	<b>√</b>	<b>√</b> ✓	12	,	<u> </u>		✓	<b>✓</b>		√ L	2	<b>√</b>	<b>✓</b>	✓ <b>✓</b>	~	<b>/</b>		<b>✓</b>							<b>✓</b>	<b>✓</b>	<b>/</b>	<b>✓</b>	
dsPIC33FJXXXMC5/7XXA	64–128	64–100	12						✓	✓	<b>✓</b> ✓	12	,	/ /		✓	✓		L	1	✓	✓	<b>√</b>	✓	✓										✓	<b>/</b>	✓	
dsPIC33FJXXXGP2/3XXA	64–128	64–100	12						✓		✓	25	,	/ /			✓		L	1		✓	<b>√</b>	✓	✓ .	/									✓	<b>′</b>	<b>✓</b>	
dsPIC33FJXXXGP5/7XXA	64–256	64–100	12						✓		<b>✓</b>	25	,	/ /			✓		L	1	✓	✓	<b>√</b>	✓	✓ .	/									✓	<b>/</b>	✓	
dsPIC33FJ256MC5/710A	256	100	12						✓	✓	<b>✓</b> ✓	12	,	/   •		✓	✓		L	1	✓	✓	<b>√</b>   <b>√</b>	✓	✓										✓	<b>′</b>	✓	
dsPIC33EV Family																																						
dsPIC33EVXXXGM00X	32–256	28–64	12	7		✓	<b>✓</b>		✓		<b>✓</b>			/ /			✓	✓	L			✓	<b>√</b>	✓	✓	✓		✓						✓	<b>✓</b>	· 🗸	✓	
dsPIC33EVXXXGM10X	32–256	28–64	12	7		✓	<b>√</b>		✓	✓	✓	8	,	/   •			✓	✓	L	3	✓	✓	✓ ✓	✓	✓	✓		✓						✓	✓	′ ✓	✓	
dsPIC33EP Family																																						
dsPIC33EPXXGS2/50X	16–64	28–64	12	12	✓	✓			<b>✓</b>		<b>√</b> ✓	1	,	/ /			✓					✓		✓	✓							<b>✓</b>		✓		✓	✓	
dsPIC33EPXXGP50X	32–512	28–64	12	4		✓	<b>✓</b>		<b>✓</b>		✓	14	,	/ /			✓		✓ L	2	✓	✓	<b>√</b>	✓	✓			✓						✓ ,	<b>√</b> ✓	<b>′ √</b>	<b>√</b>	
dsPIC33EPXXXMC20X	32–256	28–64	12	4			<b>✓</b>		✓	✓	<b>√</b> ✓	7	,	/ /		✓	✓		✓ L	2		✓	<b>√</b> ✓	✓	✓			✓						✓ ,	<b>√</b> ✓	<b>/ /</b>	<b>√</b>	
dsPIC33EPXXXMC50X	32–512	28–64	12	4		✓	<b>✓</b>		<b>✓</b>	<b>✓</b>	<b>√</b> ✓	7	,	/ /		✓	✓		✓ L	2	✓	✓	<b>√</b>	✓	✓			✓		L		$\perp$		✓ ,	<b>√</b> ✓	<b>′ √</b>	<b>✓</b>	
dsPIC33EPXXXGM3XX	128–512	44–100	12	4		✓	<b>✓</b>		✓	✓	<b>✓</b> ✓	7	,	/ /		✓	✓		✓ L	2		✓	<b>√</b>   <b>√</b>	✓	<b>√</b>	<b>/</b>	✓	✓						✓ ,	<b>√</b> ✓	<b>/</b>	✓	
dsPIC33EPXXXGM6/7XX	128–512	44–100	12	4		✓	<u> </u>		<b>✓</b>	<b>✓</b>	<b>√</b> ✓	7	,	/ /		✓	✓		✓ L	2	✓	<b>✓</b>	<b>√</b>	✓	<b>√</b>	<b>/</b>	✓	✓				$\perp$		<b>√</b> ,	<b>√</b> ✓	<b>′ √</b>	✓	
dsPIC33EPXXXMU8XX	256–512	64–144	12	4		✓			<b>✓</b>	<b>✓</b>	<b>√</b> ✓	7	,	/ /	/	✓	✓		✓ L	2 •	/ /	✓	<b>√</b>	✓	✓	<b>/</b>	✓					✓		✓	✓	<b>/ /</b>	✓	
dsPIC33EP512GP806	512	64	12	4		✓			<b> </b>		✓	14	<u> </u>	/   •			✓		✓ L	2	✓	✓	<b>√</b>   <b>√</b>	✓	<b>✓</b>	/	✓					_   ✓		✓	✓	<b>✓</b>	✓	

<sup>1: 16-</sup>bit PIC® MCU offers SAR ADC, high-speed ADC and Delta-Sigma ADC 2: 16-bit PIC MCU offers general-purpose DAC and audio DAC 3: Class B Safety Features:

\*PWM lock available in devices with MC PWM/SMPS PWM peripheral

Note: Similar family of devices with fewer variations are grouped with the same color coding

L1: Includes WDT, oscillator fail-safe, illegal opcode detect, TRAP, reset trace, register lock, frequency check, CodeGuard™ security, PWM lock\*

L2: Includes features of L1 + CRC L3: Includes features of L1 + Flash ECC + DMT

INTELLIGENT ANALOG. OCHSOL INCOMO	ng and Signal Conditioning
ADC: Analog-to-Digital Converter	General-purpose ADC with up to 10-/12-/16-bit resolution
HS ADC: High-Speed Analog-to-Digital Converter	High-speed SAR ADC with 12-bit resolution and sampling speed of 10 Msps
$\Delta\Sigma$ ADC: Delta-Sigma Analog-to- Digital Converter	Bipolar differential inputs configurable gain integrated PGA Delta-Sigma ADC
DAC: Digital-to-Analog Converter	General-purpose DAC with resolution up 16-bit resolution
$\Delta\Sigma$ DAC: Delta-Sigma Digital-to-Analog Converter	Second-order digital bipolar, two output channel Delta-Sigma DAC with stereo operation support
CVREF: Internal Voltage Reference	Programmable voltage reference with multiple internal and external connections
HS Comp: High-Speed Comparator	General-purpose rail-to-rail comparator with <1 ns response time
OPA: Operational Amplifier	General-purpose op amp for internal and external signal source conditioning
WAVEFORM CONTROL: PWM Drive and	Waveform Generation
CCP/ECCP: (Enhanced) Capture/Compare/PWM	Multi-purpose timers with functionality of the comparable input capture, output compare and PWM with four outputs
SCCP: Single Capture/Compare/PWM	Multi-purpose 16-/32-bit input capture, output compare and PWM
MCCP: Multiple Capture/Compare/PWM	Multi-purpose 16-/32-bit input capture, output compare and PWM with up to six outputs and an extended range of output control features
PWM: Pulse Width Modulation	16-bit PWM with up to nine independent time bases
MC PWM: Motor Control Pulse Width Modulation	Motor control 16-bit PWM with multiple synchronized pulse-width modulation, up to six outputs with four duty cycle generators and resolution up to 1 ns $$
SMPS PWM: Power Supply Pulse Width Modulation	Power supply 16-bit PWM with multiple synchronized pulse-width modulation, up to eight outputs with four independent time bases and resolution up to 1 $\mbox{ns}$
IC: Input Capture	Input capture with an independent timer base to capture an external event
OC: Output Compare	Output compare with an independent time base to compare value with compare registers and generate a single output pulse, or a train of output pulses on a compare match event
TIMING AND MEASUREMENTS: Signal M	leasurement with Timing and Counter Control
8-/16-/32-bit Timer	General-purpose 8-/16-/32-bit timer/counter with compare capability
RTCC: Real-Time Clock/Calendar	Real-time clock and calendar with a Binary-Coded Decimal (BCD) clock calendar to maintain accurate timing with external 32/768 kHz crystal
QEI: Quadrature Encoder Interface	Quadrature encoder interface to increment encoders for obtaining mechanical position data
SAFETY AND MONITORING: Hardware M	onitoring and Fault Detection
LVD: Low-Voltage Detection	LVD detects drops in system operating voltage using an internal reference voltage for comparison, especially in battery-powered applications
WDT: Watch Dog Timer	System supervisory circuit that generates a reset when software timing anomalies are detected within a configurable critical window
DMT: Dead Man Timer	System supervisory circuit that generates a reset when instruction sequence anomalies are detected within a configurable critical window
CRC: Cyclical Redundancy Check with Memory Scan	Automatically calculates CRC checksum of Program/DataEE memory for NVM integrity and a general-purpose 16-bit CRC for use with memory and communications data
	Hardware Class B support with Flash error correction, backup system

Serial Feripheral Interface	other peripherals or microcontroller devices
I2S: Data Converter Interface	3-wire synchronous half duplex serial interface to handle the stereo data
SENT: Single-Edge Nibble Transmission	SENT is an unidirectional, single-wire serial communications protocol designed for point-to-point transmission of signal values
Parallel Port	General-purpose parallel communication interface
USER INTERFACE: Capacitive Touch Ser	nsing and LCD Control
CTMU and mTouch Sensing: Microchip Proprietary Capacitive Touch Technology Using Charge Time Measurement Unit	Capacitive sensing for touch buttons, sliders and system measurements and detection (e.g. water level, intrusion detection, etc.) using an analog CTMU that provides accurate differential time measurement between pulse sources and asynchronous pulse generation
LCD: Liquid Crystal Display	Highly integrated segmented LCD controller
GFX: Graphics Controller	Highly integrated graphics controller supporting direct interface with display glasses with built-in analog drive for individual pixel control
SECURE DATA: Hardware Integrated Cry	ptographic Engine
Cryptographic Engine	Independent NIST-standard encryption and decryption engine
Secure Key Storage	Multiple option for key storage, selection and management
RNG: Random Number Generator	Hardware true random number generation
SYSTEM FLEXIBILITY: System Periphera	als and Interconnects
Dual Partition Flash	Dual partition Flash operation, allowing the support of robust bootloader systems and fail-safe storage of application code, with options designed to enhance code security
CLC: Configurable Logic Cell	Integrated combinational and sequential logic with custom interconnection and re-routing of digital peripherals
PPS: Peripheral Pin Select	I/O pin remapping of digital peripherals for greater design flexibility and improved EMI board layout
PTG: Peripheral Trigger Generator	User-programmable sequencer, capable of generating complex trigger signal sequences to coordinate the operation of other peripherals
DMA: Direct Memory Access	Direct memory access for transfer of data between the CPU and its peripherals without CPU assistance
IDLE, SLEEP and PMD	Low-power saving modes
DOZE	Ability to run the CPU core slower than the system clock used by the intern peripherals
XLP: eXtreme Low Power Technology	XLP technology devices with extreme low-power operation modes for battery/low power applications
VBAT	Hardware-based power mode that maintains only the most critical operations when a power loss occurs on VDD

USB 2.0 full-speed (host and device), low-speed (host) and On-The-Go (OTG)

General-purpose full-duplex, 8-bit or 9-bit data serial communications with

General purpose 2-wire inter IC serial interface for communicating with other

General-purpose 4-wire synchronous serial interface for communicating with

Industrial- and automotive-centric communication bus

1. Industrial- and automotive-centric communication bus

IrDA encoder and decoder logic support through UART

optional ISO 7816 Smart Card support

peripherals or microcontroller devices

2. Support for LIN when using the EUSART

**COMMUNICATIONS:** General, Industrial, Lighting and Automotive

USB OTG: Universal Serial Bus
CAN: Controller Area Network

**UART:** Universal Asynchronous

LIN: Local Interconnect Network

IrDA: Infrared Data Association

SPI: Serial Peripheral Interface

I<sup>2</sup>C: Inter-Integrated Circuit

Receiver Transceiver

Learn more about 16-bit PIC microcontrollers at www.microchip.com/16bit.