



28-Pin, Low-Power High-Performance High-Temperature Microcontrollers

Description

The PIC18F24/25K42 microcontrollers are available in 28-pin devices. These devices feature a 12-bit ADC with Computation (ADC²) automating Capacitive Voltage Divider (CVD) techniques for advanced touch sensing, averaging, filtering, oversampling and threshold comparison, Temperature Sensor, Vectored Interrupt Controller with fixed latency for handling interrupts, System Bus Arbiter, Direct Memory Access capabilities, UART with support for Asynchronous, DMX, DALI and LIN transmissions, SPI, I²C, memory features like Memory Access Partition (MAP) to support customers in data protection and bootloader applications, and Device Information Area (DIA) which stores factory calibration values to help improve temperature sensor accuracy.

Core Features

- C Compiler Optimized RISC Architecture
- Operating Speed:
 - Up to 64 MHz clock input
 - 62.5 ns minimum instruction cycle
- Two Direct Memory Access (DMA) Controllers:
 - Data transfers to SFR/GPR spaces from either Program Flash Memory, Data EEPROM or SFR/GPR spaces
 - User-programmable source and destination sizes
 - Hardware and software-triggered data transfers
- System Bus Arbiter with User-Configurable Priorities for Scanner and DMA1/DMA2 with Respect to the Main Line and Interrupt Execution
- Vectored Interrupt Capability:
 - Selectable high/low priority
 - Fixed interrupt latency
 - Programmable vector table base address
- 31-Level Deep Hardware Stack
- Low-Current Power-on Reset (POR)
- Configurable Power-up Timer (PWRT)
- Brown-out Reset (BOR)
- Low-Power BOR (LPBOR) Option
- Windowed Watchdog Timer (WWDT):
 - Variable prescaler selection
 - Variable window size selection
 - Configurable in hardware or software

Memory

- Up to 128 KB Flash Program Memory
- Up to 8 KB Data SRAM Memory
- Up to 1 KB Data EEPROM
- Memory Access Partition (MAP):
 - Configurable boot and app region sizes with individual write-protections
- Programmable Code Protection
- Device Information Area (DIA) stores:
 - Unique IDs and Device IDs
 - Temp Sensor factory-calibrated data
 - Fixed Voltage Reference calibrated data
- Device Configuration Information (DCI) Stores:
 - Erase row size
 - Number of write latches per row
 - Number of user rows
 - Data EEPROM memory size
 - Pin count

Operating Characteristics

- Operating Voltage Range:
 - 2.7V to 5.5V
- Temperature Range:
 - High-Temp: -40°C to 150°C

Power-Saving Functionality

- Doze mode: Ability to run CPU core slower than the system clock
- Idle mode: Ability to halt CPU core while internal peripherals continue operating
- Sleep mode: Lowest power consumption
- Peripheral Module Disable (PMD):
 - Ability to disable unused peripherals to minimize power consumption

Digital Peripherals

- Three 8-Bit Timers (TMR2/4/6) with Hardware Limit Timer (HLT):
 - Hardware monitoring and Fault detection
- Four 16-Bit Timers (TMR0/1/3/5)
- Four Configurable Logic Cell (CLC):
 - Integrated combinational and sequential logic
- Three Complementary Waveform Generators (CWGs):
 - Rising and falling edge dead-band control
 - Full-bridge, half-bridge, 1-channel drive
 - Multiple signal sources
 - Programmable dead band
 - Fault-shutdown input
- Four Capture/Compare/PWM (CCP) Modules
- Four 10-Bit Pulse-Width Modulators (PWMs)
- Numerically Controlled Oscillator (NCO):
 - Generates true linear frequency control
 - High resolution using 20-bit accumulator and 20-bit increment values
- DSM: Data Signal Modulator:
 - Multiplex two carrier clocks, with glitch prevention feature
 - Multiple sources for each carrier
- Programmable CRC with Memory Scan:
 - Reliable data/program memory monitoring for fail-safe operation (e.g., Class B)
 - Calculate CRC over any portion of program memory or data EEPROM
- Two UART Modules:
 - Modules are asynchronous and compatible with RS-232 and RS-485
 - One of the UART modules supports LIN master and slave, DMX-512 mode, DALI gear and device protocols
 - Automatic and user-timed BREAK period generation
 - DMA compatible
 - Automatic checksums
 - Programmable 1, 1.5, and 2 Stop bits
 - Wake-up on BREAK reception
- One SPI Module:
 - Configurable length bytes
 - Configurable length data packets
 - Receive-without-transmit option
 - Transmit-without-receive option
 - Transfer byte counter
 - Separate transmit and receive buffers with 2-byte FIFO and DMA capabilities
- Two I²C Modules, SMBus, PMBus™ Compatible:
 - Supports Standard-mode (100 kHz), Fast-mode (400 kHz) and Fast-mode plus (1 MHz) modes of operation
 - Dedicated address, transmit and receive buffers
 - Bus collision detection with arbitration
 - Bus time-out detection and handling
 - Multi-Master mode
 - Separate transmit and receive buffers with 2-byte FIFO and DMA capabilities
 - I²C, SMBus 2.0 and SMBus 3.0, and 1.8V input level selections
- Device I/O Port Features:
 - 24 I/O pins
 - One input-only pin (RE3)
 - Individually programmable I/O direction, open-drain, slew rate, weak pull-up control
 - Interrupt-on-change (on up to 25 I/O pins)
 - Three external interrupt pins
- Peripheral Pin Select (PPS):
 - Enables pin mapping of digital I/O
- Signal Measurement Timer (SMT):
 - 24-bit timer/counter with prescaler

Analog Peripherals

- Analog-to-Digital Converter with Computation (ADC²):
 - 12-bit with up to 35 external channels
 - Automated post-processing
 - Automated math functions on input signals: averaging, filter calculations, oversampling and threshold comparison
 - Operates in Sleep
 - Integrated charge pump for improved low-voltage operation
- Hardware Capacitive Voltage Divider (CVD):
 - Automates touch sampling and reduces software size and CPU usage when touch or proximity sensing is required
 - Adjustable sample and hold capacitor array
 - Two guard ring output drives
- Temperature Sensor:
 - Internal connection to ADC
 - Can be calibrated for improved accuracy
- Two Comparators:
 - Low-Power/High-Speed mode
 - Fixed Voltage Reference at noninverting input(s)
 - Comparator outputs externally accessible
- 5-Bit Digital-to-Analog Converter (DAC):
 - 5-bit resolution, rail-to-rail
 - Positive Reference Selection
 - Unbuffered I/O pin output
 - Internal connections to ADCs and comparators
- Voltage Reference:
 - Fixed Voltage Reference with 1.024V, 2.048V and 4.096V output levels

Flexible Oscillator Structure

- High-Precision Internal Oscillator:
 - Selectable frequency range up to 64 MHz
 - $\pm 1\%$ at calibration (nominal)
- Low-Power Internal 32 kHz Oscillator (LFINTOSC)
- External 32 kHz Crystal Oscillator (SOSC)
- External Oscillator Block with:
 - x4 PLL with external sources
 - Three crystal/resonator modes up to 20 MHz
 - Three external clock modes up to 20 MHz
- Fail-Safe Clock Monitor
- Oscillator Start-up Timer (OST):
 - Ensures stability of crystal oscillator sources

Note: This document is supplemented by the “PIC18(L)F24/25K42 Low-Power High Performance Microcontrollers with XLP” Data Sheet (DS40001869). See [Section 1.0, Device Overview](#).

PIC18(L)F24/25K42 FAMILY TYPES

Device	Data Sheet Index	Program Flash Memory (KB)	Data EEPROM (B)	Data SRAM (bytes)	I/O Pins	12-Bit ADC ² (ch)	5-Bit DAC	Comparator	8-Bit/ (with HLT) /16-Bit Timer	Window Watchdog Timer (WWDT)	Signal Measurement Timer (SMT)	CCP/10-Bit PWM	CWG	NCO	CLC	Zero-Cross Detect	Direct Memory Access (DMA) (ch)	Memory Access Partition	Vectored Interrupts	UART	I ² C/SPI	Peripheral Pin Select	Peripheral Module Disable	Debug ⁽¹⁾
PIC18(L)F24K42	A	16	256	1024	25	24	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F25K42	A	32	256	2048	25	24	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F26K42	B	64	1024	4096	25	24	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F27K42	B	128	1024	8192	25	24	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F45K42	B	32	256	2048	36	35	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F46K42	B	64	1024	4096	36	35	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F47K42	B	128	1024	8192	36	35	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F55K42	B	32	256	2048	44	43	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F56K42	B	64	1024	4096	44	43	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I
PIC18(L)F57K42	B	128	1024	8192	44	43	1	2	3/4	Y	Y	4/4	3	1	4	Y	2	Y	Y	2	2/1	Y	Y	I

Note 1: I – Debugging integrated on chip.

Data Sheet Index:

Unshaded devices are described in this document.

- A:** DS40001869 [PIC18\(L\)F24/25K42 Data Sheet, 28-Pin](#)
B: DS40001919 [PIC18\(L\)F26/27/45/46/47/55/56/57K42 Data Sheet, 28/40/44/48-Pin](#)

Note: For other small form-factor package availability and marking information, visit <http://www.microchip.com/packaging> or contact your local sales office.

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An errata sheet, describing minor operational differences from the data sheet and recommended workarounds, may exist for current devices. As device/documentation issues become known to us, we will publish an errata sheet. The errata will specify the revision of silicon and revision of document to which it applies.

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1.0 DEVICE OVERVIEW

This document contains device-specific information for the following devices, operating in an ambient temperature range between -40°C and 150°C:

- PIC18F24K42
- PIC18F25K42

Note: This data sheet documents only the devices' features and specifications that are in addition to the features and specifications of the non-specialty PIC18(L)F24/25K42 devices. For information on the features and specifications shared by this document's high-temperature devices and the non-specialty devices, see the "*PIC18(L)F24/25K42 28-Pin, Low-Power High Performance Microcontrollers with XLP Technology*" Data Sheet (DS40001869).

The PIC18F24/25K42 devices offer the advantages of all PIC18 microcontrollers, namely high computational performance at an economical price, with the addition of high-endurance Program Flash Memory, Universal Asynchronous Receiver Transmitter (UART), Serial Peripheral Interface (SPI), Inter-integrated Circuit (I²C), Direct Memory Access (DMA), Configurable Logic Cells (CLC), Signal Measurement Timer (SMT), Numerically Controlled Oscillator (NCO), and Analog-to-Digital Converter with Computation (ADC²).

The primary differentiating features and specifications of the high-temperature PIC18F24/25K42 devices are:

- Above 125°C, the number of program Flash memory and EEPROM programming cycles are significantly reduced (see [Section 2.0 "Electrical Characteristics"](#))

All AC timing specifications are increased by 30%. This derating factor includes parameters, such as TPWRT

- Maximum HS+PLL frequency of operation (See [Table 2-1](#))

Note 1: The test duration for AEC-Q100 reliability testing for devices operating at 150°C is 1,000 hours. Any design operating at 125°C to 150°C for longer than that period is not warranted without prior written approval from Microchip Technology Inc.

- 2: Writes are not allowed for Flash program memory above 125°C.
- 3: The low voltage versions of these devices, PIC18LF24/25K42, are not released for operation above +125°C.
- 4: Errata Sheet DS80000724 lists various mask revisions. 150°C operation applies only to revisions A4 and later.

2.0 ELECTRICAL CHARACTERISTICS

Note: Other than some basic data, this section documents only the high-temperature PIC18F24/25K42 devices' specifications that differ from those of the non-specialty PIC18F24/25K42 devices. For detailed information on the electrical specifications shared by the high-temperature and non-specialty devices, see the "PIC18(L)F24/25K42 28-Pin, Low-Power High Performance Microcontrollers with XLP Technology" Data Sheet (DS40001869).

2.1 Absolute Maximum Ratings^(†)

Ambient temperature under bias	-40°C to +150°C
Storage temperature	-65°C to +155°C
Maximum junction temperature	155°C
Voltage on pins with respect to V _{SS}	
on V _{DD} pin	
PIC18F24/25K42	-0.3V to +6.5V
on $\overline{\text{MCLR}}$ pin	-0.3V to +9.0V
on all other pins	-0.3V to (V _{DD} + 0.3V)
Maximum current	
on V _{SS} pin ⁽¹⁾	
-40°C ≤ T _A ≤ +85°C	350 mA
85°C < T _A ≤ +125°C	120 mA
125°C ≤ T _A ≤ +150°C	24 mA
on V _{DD} pin ⁽¹⁾	
-40°C ≤ T _A ≤ +85°C	250 mA
85°C < T _A ≤ +125°C	85 mA
125°C ≤ T _A ≤ +150°C	24 mA
on any I/O pin	±5 mA
Clamp current, I _K (V _{PIN} < V _{SS} or V _{PIN} > V _{DD})	±20 mA
Total power dissipation ⁽²⁾	800 mW

Note 1: Maximum current rating requires even load distribution across I/O pins. Maximum current rating may be limited by the device package power dissipation characterizations, see Table XX-Y to calculate device specifications.

2: Power dissipation is calculated as follows:

$$P_{DIS} = V_{DD} \times \{I_{DD} - \sum I_{OH}\} + \sum \{(V_{DD} - V_{OH}) \times I_{OH}\} + \sum (V_{OL} \times I_{OL})$$

† NOTICE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure above maximum rating conditions for extended periods may affect device reliability.

2.2 Standard Operating Conditions

The standard operating conditions for any device are defined as:

Operating Voltage: $V_{DDMIN} \leq V_{DD} \leq V_{DDMAX}$

Operating Temperature: $T_{A_MIN} \leq T_A \leq T_{A_MAX}$

V_{DD} — Operating Supply Voltage⁽¹⁾

PIC18F24/25K42

V_{DDMIN} (F_{osc} ≤ 32 MHz)..... +2.7V

V_{DDMIN} (F_{osc} > 32 MHz)..... +3.0V

V_{DDMAX}..... +5.5V

T_A — Operating Ambient Temperature Range

High Temperature

T_{A_MIN}..... -40°C

T_{A_MAX}..... +150°C

Note 1: See Parameter [Supply Voltage](#), DC Characteristics: Supply Voltage (High Temperature).

2.3 DC Characteristics

TABLE 2-1: SUPPLY VOLTAGE (HIGH TEMPERATURE)

PIC18F24/25K42			Standard Operating Conditions (unless otherwise stated)				
Param No.	Symbol	Characteristic	Min. +150°C	Typ.†	Max. +150°C	Units	Conditions
Supply Voltage							
D002	V _{DD}		2.7	—	5.5	V	F _{OSC} ≤ 32 MHz
			3.0	—	5.5		F _{OSC} > 32 MHz

† Data in "Typ." column is at 3.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

FIGURE 2-1: VOLTAGE-FREQUENCY GRAPH, -40°C ≤ T_A ≤ +150°C

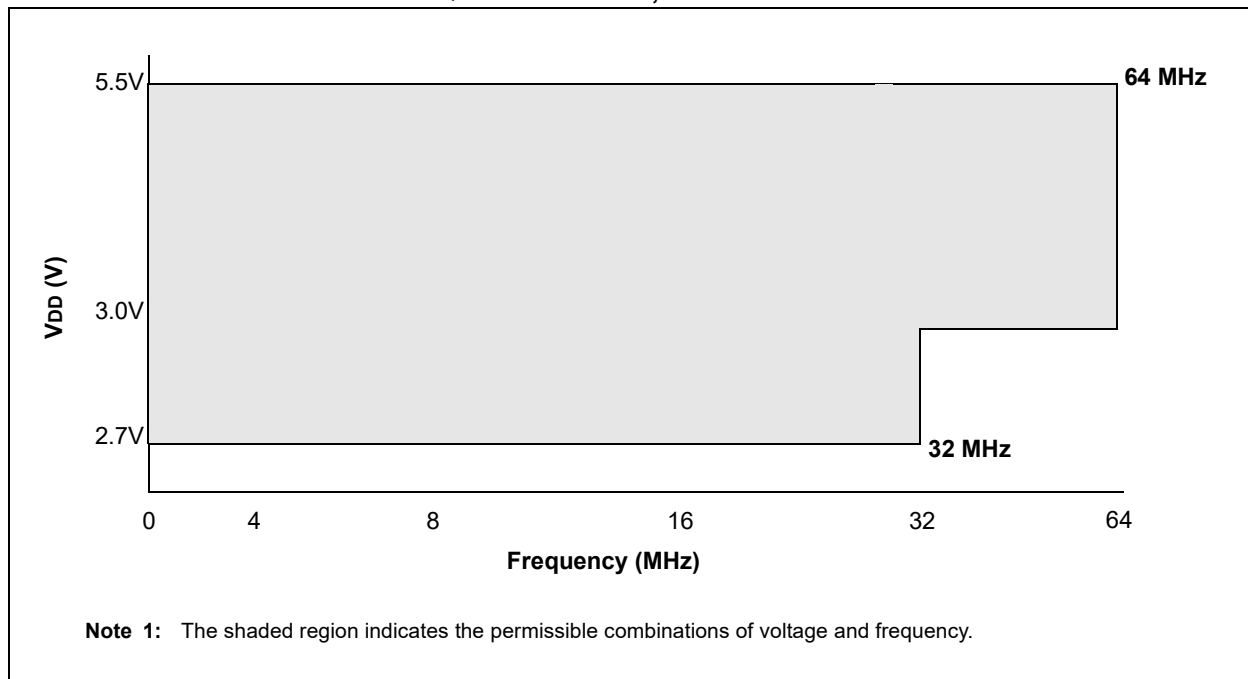


TABLE 2-2: DC CHARACTERISTICS: SUPPLY CURRENT (IDD)^(1,2)

PIC18F24/25K42			Standard Operating Conditions (unless otherwise stated)			
Param No.	Symbol	Device Characteristic	Max. +150°C	Units	Conditions	
					VDD	Notes
D100	IDDXT4	XT = 4 MHz	1400	uA	3.0V	
D101	IDDHFO16	HFINTOSC = 16 MHz	4.5	mA	3.0V	
D102	IDDHFOPLL	HFINTOSC = 64 MHz	16.3	mA	3.0V	
D103	IDDHSPLL64	HS+PLL = 64 MHz	15.3	mA	3.0V	
D104	IDDIDLE	Idle mode, HFINTOSC = 16 MHz	3.5	mA	3.0V	

- Note 1:** The test conditions for all IDD measurements in Active-Operation mode are: OSC1: external square wave, from rail-to-rail; all I/O pins tri-stated, pulled to VDD; MCLR=VDD; WDT disabled.
- Note 2:** The supply current is mainly a function of the operating voltage and frequency. Other factors, such as I/O pin loading and switching rate, oscillator type, internal code execution pattern and temperature, also have an impact on the current consumption.

TABLE 2-3: DC CHARACTERISTICS: POWER-DOWN CURRENTS (IPD)^(1,2,3)

PIC18F24/25K42			Standard Operating Conditions (unless otherwise stated) VREGPM = 1			
Param No.	Symbol	Device Characteristic	Max. +150°C	Units	Conditions	
					VDD	Notes
D200	IPD	IPD Base	39.0	uA	3.0V	
D200A			71.0	uA	3.0V	VREGPM=0
D201	IPD_WDT	Low Frequency Internal Oscillator/WDT	40.0	uA	3.0V	
D202	IPD_SOSC	Secondary Oscillator (SOSC)	41.0	uA	3.0V	
D203	IPD_FVR	FVR	96.0	uA	3.0V	
D204	IPD_BOR	Brown-out Reset (BOR)	48.0	uA	3.0V	
D206	IPD_HLVD	High/Low-Voltage Detect (HLVD)	48.0	uA	3.0V	
D207	IPD_ADCA	ADC – Non-converting	39.0	uA	3.0V	ADC not converting ⁽⁴⁾
D208	IPD_CMP	Comparator	76.0	uA	3.0V	High-powering mode

- Note 1:** The peripheral current is the sum of the base IPD and the additional current consumed when this peripheral is enabled. The peripheral Δ current can be determined by subtracting the base IDD or IPD current from this limit. Max. values should be used when calculating total current consumption.
- Note 2:** The power-down current in Sleep mode does not depend on the oscillator type. Power-down current is measured with the part in Sleep mode, with all I/O pins in high-impedance state and tied to Vss.
- Note 3:** All peripheral currents listed are on a per-peripheral basis if more than one instance of a peripheral is available.
- Note 4:** ADC clock source is ADCRC.

TABLE 2-4: MEMORY SPECIFICATIONS (150°C)

Param. No.	Sym.	Characteristic	Min. +150°C	Typ.†	Max. +150°C	Units	Conditions
Data EEPROM Memory Specifications							
MEM20	ED	DataEE Byte Endurance	1k	—	—	E/W	125°C ≤ TA ≤ 150°C
Program Flash Memory Specifications							
MEM30	EP	Flash Memory Cell Endurance	100	—	—	E/W	125°C ≤ TA ≤ 150°C

† Data in "Typ." column is at 3.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

2.4 AC Characteristics

TABLE 2-5: INTERNAL OSCILLATOR PARAMETERS⁽¹⁾

PIC18F24/25K42			Standard Operating Conditions (unless otherwise stated)				
Param No.	Symbol	Device Characteristic	Min. +150°C	Typ.†	Max. +150°C	Units	Conditions
OS50	FHFOSC	Precision Calibrated HFINTOSC Frequency	—	4	—	MHz	See Figure 3-2
			—	8	—		
			—	12	—		
			—	16	—		
			—	48	—		
—	64	—					
OS51	FHFOSCLP	Low-Power Optimized HFINTOSC Frequency	0.85 1.70	1 2	1.15 2.30	MHz	-40°C to 150°C
OS53*	FLFOSC	Internal LFINTOSC Frequency	23.25	31	38.75	kHz	-40°C to 150°C

* These parameters are characterized but not tested.

† Data in "Typ" column is at 3.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: To ensure these oscillator frequency tolerances, VDD and VSS must be capacitively decoupled as close to the device as possible. 0.1 μF and 0.01 μF values in parallel are recommended.

FIGURE 3-2: PRECISION-CALIBRATED HFINTOSC FREQUENCY ACCURACY OVER DEVICE VDD AND TEMPERATURE

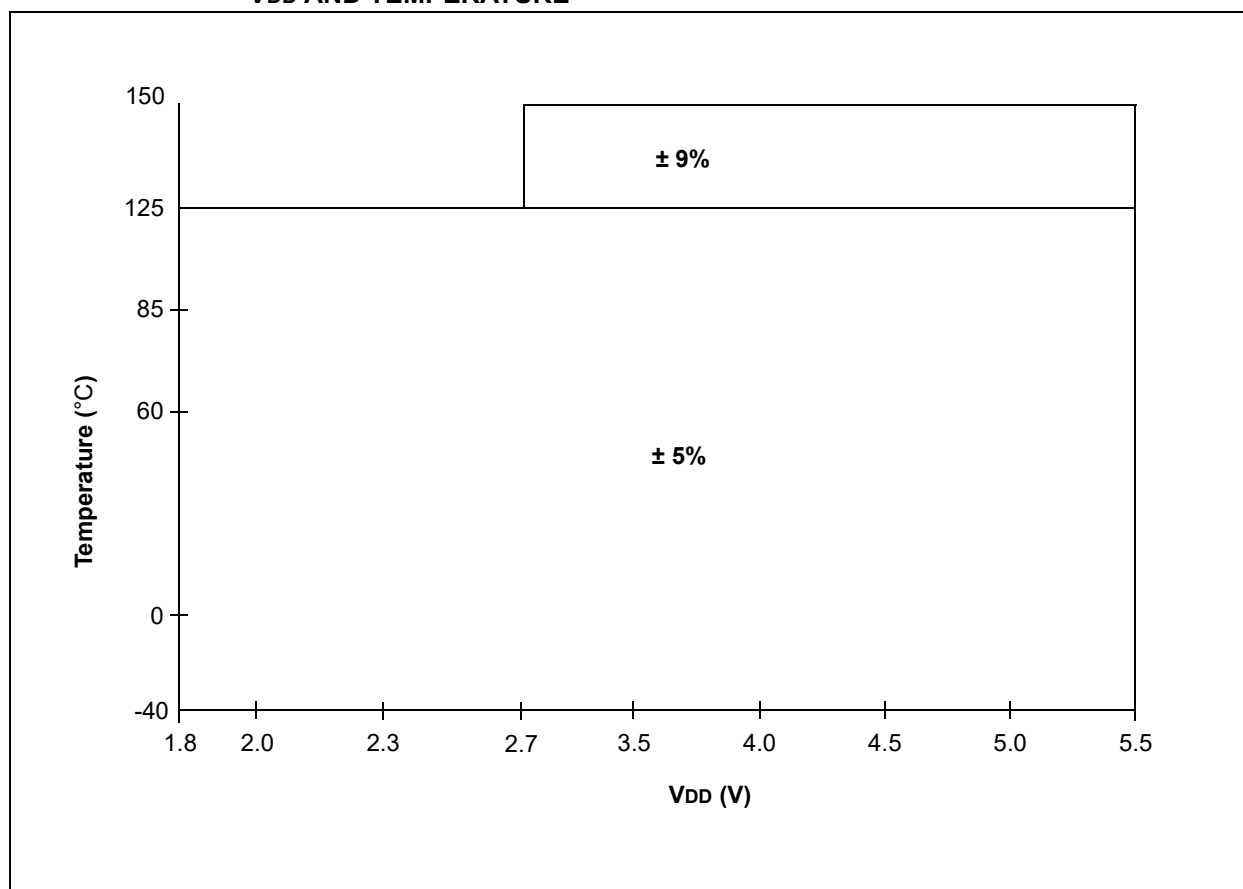


TABLE 2-6: RESET, WATCHDOG TIMER, OSCILLATOR START-UP TIMER, POWER-UP TIMER, BROWN-OUT TIMER AND LOW-POWER BROWN-OUT RESET SPECIFICATIONS

PIC18F24/25K42			Standard Operating Conditions (unless otherwise stated)				
Param No.	Symbol	Device Characteristic	Min. +150°C	Typ.†	Max. +150°C	Units	Conditions ⁽¹⁾
RST06	VBOR	Brown-out Reset Voltage	2.56 2.43	2.85 2.7	3.14 2.97	V	BORV = 00 BORV = 01

† Data in “Typ” column is at 3.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: Do not use BORV = 10 and 11 for High-Temperature operation (125°C ≤ TA ≤ 150°C).

TABLE 2-7: HIGH/LOW-VOLTAGE DETECT CHARACTERISTICS

Param. No.	Sym.	Characteristic	Min. +150°C	Typ.†	Max. +150°C	Units	Conditions ⁽¹⁾
HLVD01	VDET	Voltage Detection	2.45	2.75	3.05	V	HLVDSEL[3:0] = 0101
			2.58	2.90	3.22	V	HLVDSEL[3:0] = 0110
			2.80	3.15	3.50	V	HLVDSEL[3:0] = 0111
			2.98	3.35	3.72	V	HLVDSEL[3:0] = 1000
			3.20	3.60	4.00	V	HLVDSEL[3:0] = 1001
			3.34	3.75	4.16	V	HLVDSEL[3:0] = 1010
			3.56	4.00	4.44	V	HLVDSEL[3:0] = 1011
			3.74	4.20	4.66	V	HLVDSEL[3:0] = 1100
			3.87	4.35	4.83	V	HLVDSEL[3:0] = 1101
4.14	4.65	5.16	V	HLVDSEL[3:0] = 1110			

† Data in “Typ” column is at 3.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: Do not use HLVDSEL[3:0] = 0000 through 0100 for High-Temperature operation (125°C ≤ TA ≤ 150°C).

TABLE 2-8: FIXED VOLTAGE REFERENCE (FVR) SPECIFICATIONS

PIC18F24/25K42			Standard Operating Conditions (unless otherwise stated)				
Param. No.	Symbol	Characteristic	Min. +150°C	Typ.†	Max. +150°C	Units	Conditions
FVR01	VFVR1	1x Gain (1.024V)	-9	—	+9	%	VDD ≥ 2.7V, -40°C to 150°C
FVR02	VFVR2	2x Gain (2.048V)	-9	—	+9	%	VDD ≥ 2.7V, -40°C to 150°C
FVR03	VFVR4	4x Gain (4.096V)	-9	—	+9	%	VDD ≥ 4.75V, -40°C to 150°C

† Data in “Typ” column is at 3.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

APPENDIX A: REVISION HISTORY

Revision A (02/2020)

Original mini data sheet for the high-temperature devices in the PIC18F24/25K42 devices.

THE MICROCHIP WEBSITE

Microchip provides online support via our WWW site at www.microchip.com. This website is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the website contains the following information:

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<u>PART NO.</u>	<u>XI</u> ⁽¹⁾	<u>X</u>	<u>XX</u>	<u>XXX</u>	
Device	Tape and Reel Option	Temperature Range	Package	Pattern	
Device:	PIC18F24K42 PIC18F25K42				
Tape and Reel Option:	Blank = Standard packaging (tube or tray) T = Tape and Reel ⁽¹⁾				
Temperature Range:	H = -40°C to +150°C (High Temperature)				
Package:	SS = SSOP 5N = VQFN with Wettable Flanks				
Pattern:	QTP, SQTP, Code or Special Requirements (blank otherwise)				
					Examples: a) PIC18F25K42-H/P: Part number: PIC18F25K42, Tape and Reel Option: Blank, Temperature Range: H, Package: P, Pattern: Blank b) PIC18F25K42T-H/ST: Part number: PIC18F25K42, Tape and Reel Option: T, Temperature Range: H, Package: ST, Pattern: Blank Note 1: Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.

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