Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

MCP73826

Single Cell Lithium-Ion Charge Management Controller

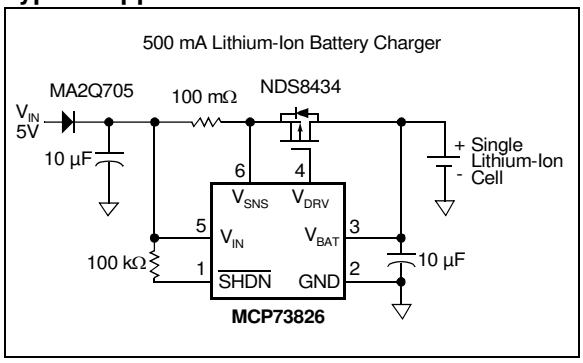
Features

- Linear Charge Management Controller for Single Lithium-Ion Cells
- High Accuracy Preset Voltage Regulation: ±1% (max)
- Two Preset Voltage Regulation Options:
  - 4.1V - MCP73826-4.1
  - 4.2V - MCP73826-4.2
- Programmable Charge Current
- Automatic Cell Preconditioning of Deeply Depleted Cells, Minimizing Heat Dissipation During Initial Charge Cycle
- Automatic Power-Down when Input Power Removed
- Temperature Range: -20°C to +85°C
- Packaging: 6-Pin SOT-23A

Applications

- Single Cell Lithium-Ion Battery Chargers
- Personal Data Assistants
- Cellular Telephones
- Hand Held Instruments
- Cradle Chargers
- Digital Cameras

Typical Application Circuit



Description

The MCP73826 is a linear charge management controller for use in space-limited, cost sensitive applications. The MCP73826 combines high accuracy constant voltage, controlled current regulation, and cell preconditioning in a space saving 6-pin SOT-23A package. The MCP73826 provides a stand-alone charge management solution.

The MCP73826 charges the battery in three phases: preconditioning, controlled current, and constant voltage. If the battery voltage is below the internal low-voltage threshold, the battery is preconditioned with a foldback current. The preconditioning phase protects the lithium-ion cell and minimizes heat dissipation.

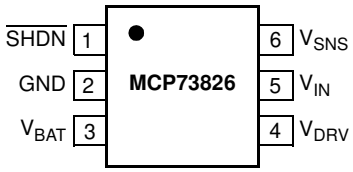
Following the preconditioning phase, the MCP73826 enters the controlled current phase. The MCP73826 allows for design flexibility with a programmable charge current set by an external sense resistor. The charge current is ramped up, based on the cell voltage, from the foldback current to the peak charge current established by the sense resistor. This phase is maintained until the battery reaches the charge-regulation voltage.

Then, the MCP73826 enters the final phase, constant voltage. The accuracy of the voltage regulation is better than ±1% over the entire operating temperature range and supply voltage range. The MCP73826-4.1 is preset to a regulation voltage of 4.1V, while the MCP73826-4.2 is preset to 4.2V.

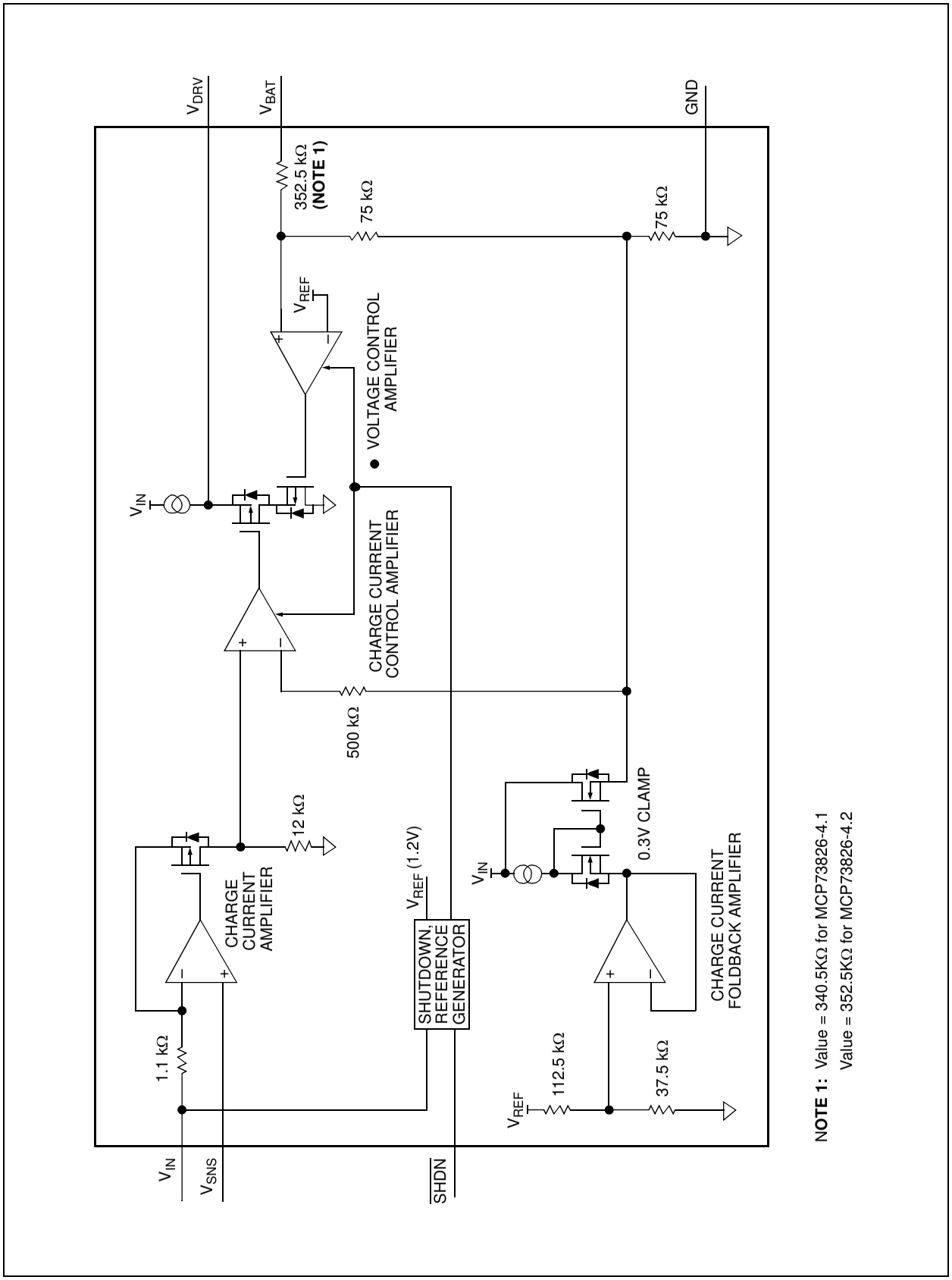
The MCP73826 operates with an input voltage range from 4.5V to 5.5V. The MCP73826 is fully specified over the ambient temperature range of -20°C to +85°C.

Package Type

6-Pin SOT-23A



Functional Block Diagram



1.0 ELECTRICAL CHARACTERISTICS

1.1 Maximum Ratings*

V_{IN} ..... -0.3V to 6.0V

All inputs and outputs w.r.t. GND .....-0.3 to (V_{IN}+0.3)V

Current at V_{DRV}..... +/-1 mA

Maximum Junction Temperature, T_J.....150°C

Storage temperature .....-65°C to +150°C

ESD protection on all pins.....≥ 4 kV

***Notice:** Stresses above those listed under "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 operational listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

PIN FUNCTION TABLE

Pin	Name	Description
1	$\overline{SHDN}$	Logic Shutdown
2	GND	Battery Management 0V Reference
3	V_{BAT}	Cell Voltage Monitor Input
4	V_{DRV}	Drive Output
5	V_{IN}	Battery Management Input Supply
6	V_{SNS}	Charge Current Sense Input

DC CHARACTERISTICS: MCP73826-4.1, MCP73826-4.2

Unless otherwise specified, all limits apply for V_{IN} = [V_{REG}(typ)+1V], R_{SENSE} = 500 mΩ, T_A = -20°C to +85°C. Typical values are at +25°C. Refer to Figure 1-1 for test circuit.

Parameter	Sym	Min	Typ	Max	Units	Conditions
Supply Voltage	V_{IN}	4.5	—	5.5	V	
Supply Current	I_{IN}	— —	0.5 260	15 560	µA	Shutdown, V_{SHDN} = 0V Constant Voltage Mode
Voltage Regulation (Constant Voltage Mode)						
Regulated Output Voltage	V_{REG}	4.059 4.158	4.1 4.2	4.141 4.242	V V	MCP73826-4.1 only MCP73826-4.2 only
Line Regulation	ΔV_{BAT}	-10	—	10	mV	V_{IN} = 4.5V to 5.5V, I_{OUT} = 75 mA
Load Regulation	ΔV_{BAT}	-1	±0.2	1	mV	I_{OUT} = 10 mA to 75 mA
Output Reverse Leakage Current	I_{LK}	—	8	—	µA	V_{IN}=Floating, V_{BAT}=V_{REG}
External MOSFET Gate Drive						
Gate Drive Current	I_{DRV}	— 0.08	— —	1 —	mA mA	Sink, CV Mode Source, CV Mode
Gate Drive Minimum Voltage	V_{DRV}	—	1.6	—	V	
Current Regulation (Controlled Current Mode)						
Current Sense Gain	A_{CS}	—	100	—	dB	$\Delta(V_{SNS}-V_{DRV}) / \Delta V_{BAT}$
Current Limit Threshold	V_{CS}	40	53	75	mV	(V_{IN}-V_{SNS}) at I_{OUT}
Foldback Current Scale Factor	K	—	0.43	—	A/A	
Shutdown Input - $\overline{SHDN}$						
Input High Voltage Level	V_{IH}	40	—	—	%V_{IN}	
Input Low Voltage Level	V_{IL}	—	—	25	%V_{IN}	
Input Leakage Current	I_{LK}	—	—	1	µA	V_{SHDN} = 0V to 5.5V

TEMPERATURE SPECIFICATIONS

Unless otherwise specified, all limits apply for V_{IN} = 4.5V-5.5V

Parameters	Sym	Min	Typ	Max	Units	Conditions
Temperature Ranges						
Specified Temperature Range	T_A	-20	—	+85	°C	
Operating Temperature Range	T_A	-40	—	+125	°C	
Storage Temperature Range	T_A	-65	—	+150	°C	
Thermal Package Resistances						
Thermal Resistance, 6-Pin SOT-23A	θ_{JA}	—	230	—	°C/W	4-Layer JC51-7 Standard Board, Natural Convection

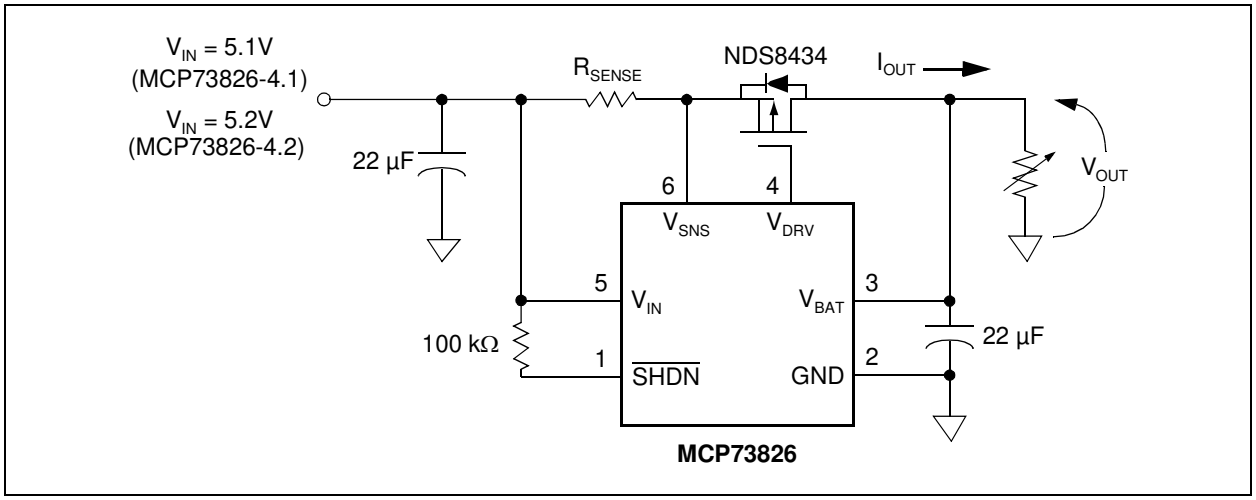


FIGURE 1-1: *MCP73826 Test Circuit.*

2.0 TYPICAL PERFORMANCE CHARACTERISTICS

Note: The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only. The performance characteristics listed herein are not tested or guaranteed. In some graphs or tables, the data presented may be outside the specified operating range (e.g., outside specified power supply range) and therefore outside the warranted range.

Note: Unless otherwise indicated, I_{OUT} = 10 mA, Constant Voltage Mode, T_A = 25°C. Refer to Figure 1-1 for test circuit.

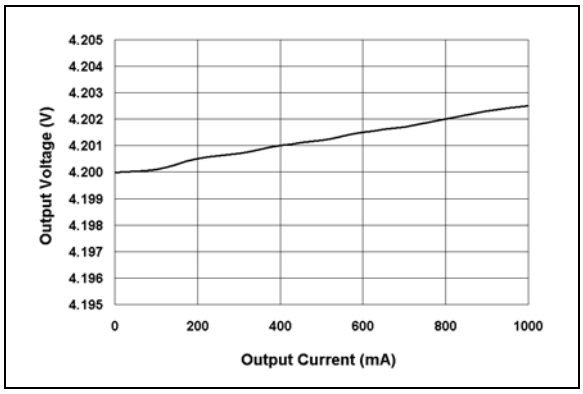


FIGURE 2-1: *Output Voltage vs. Output Current (MCP73826-4.2).*

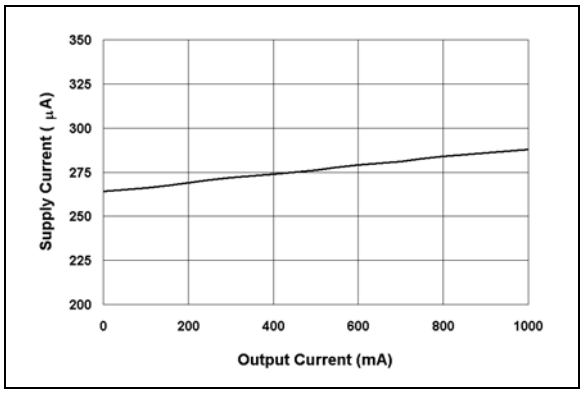


FIGURE 2-4: *Supply Current vs. Output Current.*

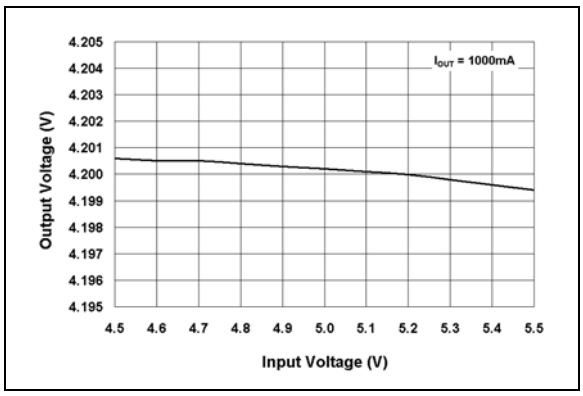


FIGURE 2-2: *Output Voltage vs. Input Voltage (MCP73826-4.2).*

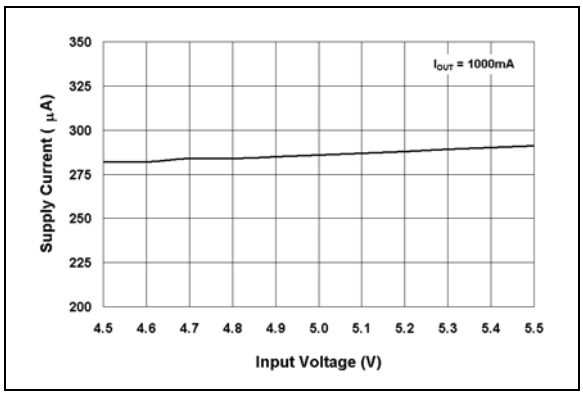


FIGURE 2-5: *Supply Current vs. Input Voltage.*

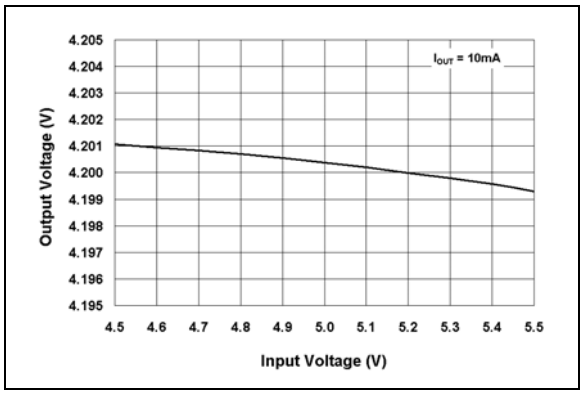


FIGURE 2-3: *Output Voltage vs. Input Voltage (MCP73826-4.2).*

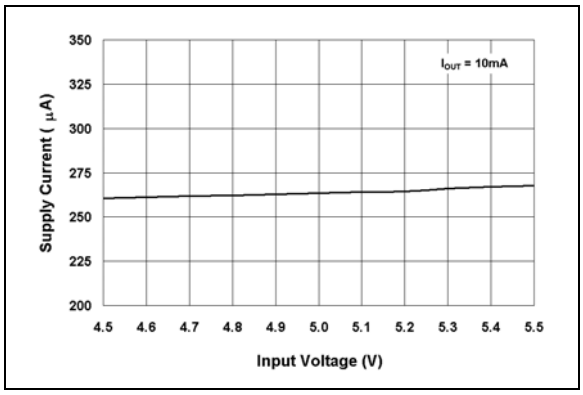


FIGURE 2-6: *Supply Current vs. Input Voltage.*

Note: Unless otherwise indicated, I_{OUT} = 10 mA, Constant Voltage Mode, T_A = 25°C. Refer to Figure 1-1 for test circuit.

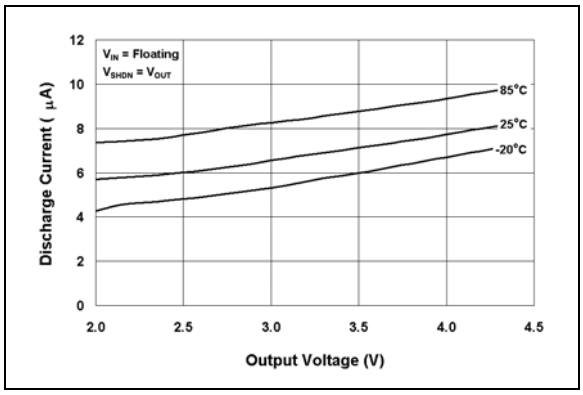


FIGURE 2-7: *Output Reverse Leakage Current vs. Output Voltage.*

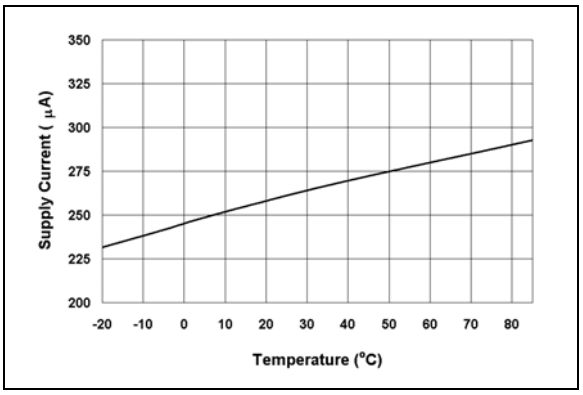


FIGURE 2-10: *Supply Current vs. Temperature.*

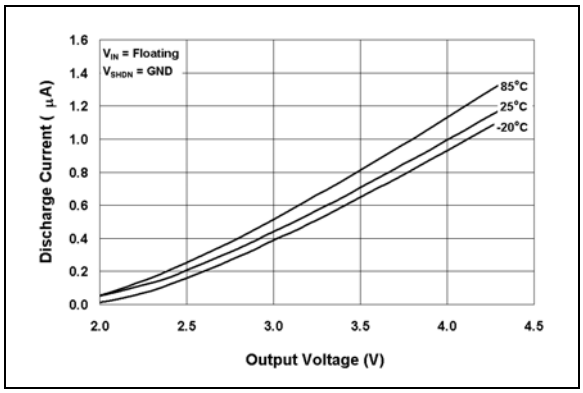


FIGURE 2-8: *Output Reverse Leakage Current vs. Output Voltage.*

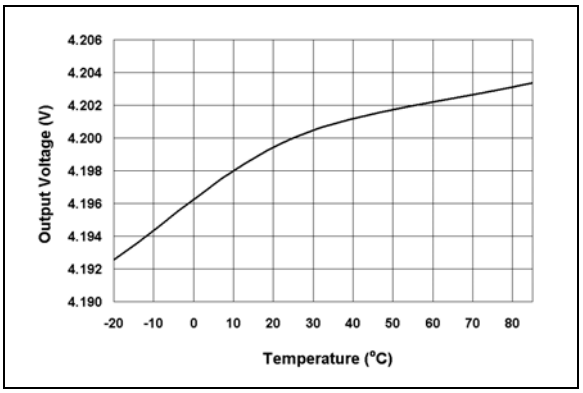


FIGURE 2-11: *Output Voltage vs. Temperature (MCP73826-4.2).*

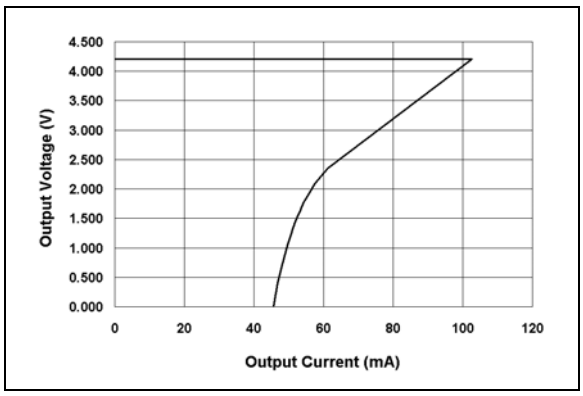


FIGURE 2-9: *Current Limit Foldback.*

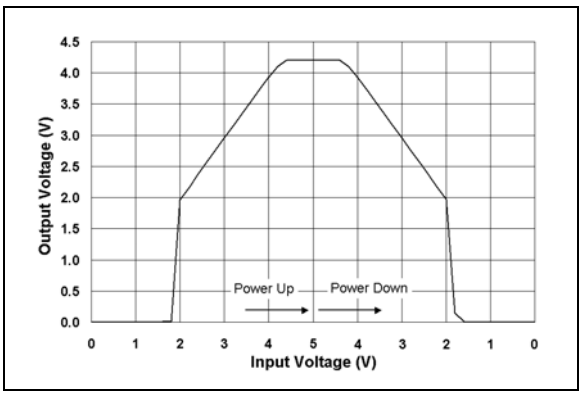


FIGURE 2-12: *Power-Up / Power-Down.*

Note: Unless otherwise indicated, I_{OUT} = 10 mA, Constant Voltage Mode, T_A = 25°C. Refer to Figure 1-1 for test circuit.

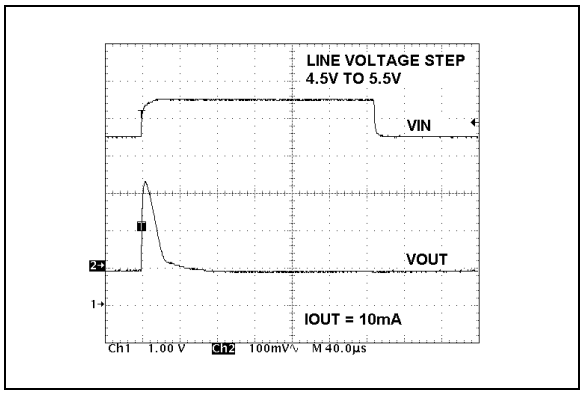


FIGURE 2-13: *Line Transient Response.*

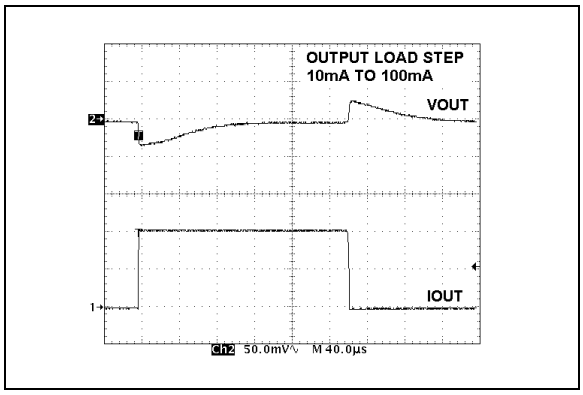


FIGURE 2-15: *Load Transient Response.*

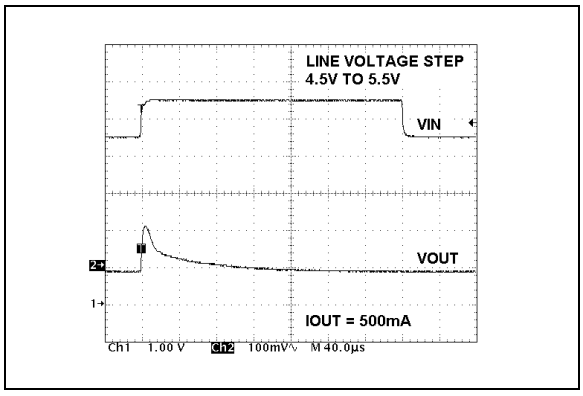


FIGURE 2-14: *Line Transient Response.*

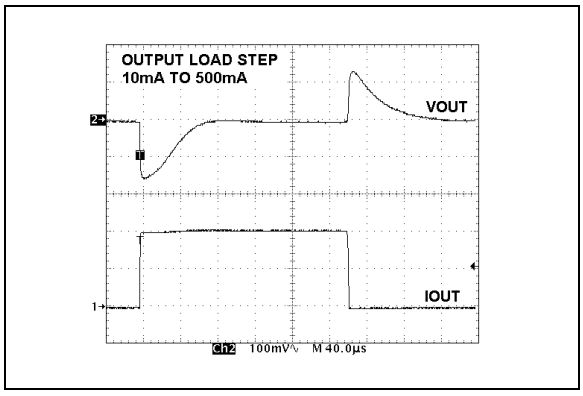


FIGURE 2-16: *Load Transient Response.*

3.0 PIN DESCRIPTION

The descriptions of the pins are listed in Table 3-1.

Pin	Name	Description
1	$\overline{SHDN}$	Logic Shutdown
2	GND	Battery Management 0V Reference
3	V_{BAT}	Cell Voltage Monitor Input
4	V_{DRV}	Drive Output
5	V_{IN}	Battery Management Input Supply
6	V_{SNS}	Charge Current Sense Input

TABLE 3-1: *Pin Function Table.*

3.1 Logic Shutdown ($\overline{SHDN}$)

Input to force charge termination, initiate charge, or initiate recharge.

3.2 Battery Management 0V Reference (GND)

Connect to negative terminal of battery.

3.3 Cell Voltage Monitor Input (V_{BAT})

Voltage sense input. Connect to positive terminal of battery. Bypass to GND with a minimum of 10 µF to ensure loop stability when the battery is disconnected. A precision internal resistor divider regulates the final voltage on this pin to V_{REG}.

3.4 Drive Output (V_{DRV})

Direct output drive of an external P-channel MOSFET pass transistor for current and voltage regulation.

3.5 Battery Management Input Supply (V_{IN})

A supply voltage of 4.5V to 5.5V is recommended. Bypass to GND with a minimum of 10 µF.

3.6 Charge Current Sense Input (V_{SNS})

Charge current is sensed via the voltage developed across an external precision sense resistor. The sense resistor must be placed between the supply voltage (V_{IN}) and the source of the external pass transistor. A 50 mΩ sense resistor produces a fast charge current of 1 A, typically.

4.0 DEVICE OVERVIEW

The MCP73826 is a linear charge management controller. Refer to the functional block diagram on page 2 and the typical application circuit, Figure 6-1.

4.1 Charge Qualification and Preconditioning

Upon insertion of a battery or application of an external supply, the MCP73826 verifies the state of the $\overline{SHDN}$ pin. The $\overline{SHDN}$ pin must be above the logic high level.

If the $\overline{SHDN}$ pin is above the logic high level, the MCP73826 initiates a charge cycle. If the cell is below the preconditioning threshold, 2.4V typically, the MCP73826 preconditions the cell with a scaled back current. The preconditioning current is set to approximately 43% of the fast charge peak current. The preconditioning safely replenishes deeply depleted cells and minimizes heat dissipation in the external pass transistor during the initial charge cycle.

4.2 Controlled Current Regulation - Fast Charge

Preconditioning ends and fast charging begins when the cell voltage exceeds the preconditioning threshold. Fast charge utilizes a foldback current scheme based on the voltage at the V_{SNS} input developed by the drop across an external sense resistor, R_{SENSE}, and the output voltage, V_{BAT}. Fast charge continues until the cell voltage reaches the regulation voltage, V_{REG}.

4.3 Constant Voltage Regulation

When the cell voltage reaches the regulation voltage, V_{REG}, constant voltage regulation begins. The MCP73826 monitors the cell voltage at the V_{BAT} pin. This input is tied directly to the positive terminal of the battery. The MCP73826 is offered in two fixed-voltage versions for battery packs with either coke or graphite anodes: 4.1V (MCP73826-4.1) and 4.2V (MCP73826-4.2).

4.4 Charge Cycle Completion

The charge cycle can be terminated by a host microcontroller after an elapsed time from the start of the charge cycle. The charge is terminated by pulling the shutdown pin, $\overline{SHDN}$, to a logic Low level.

5.0 DETAILED DESCRIPTION

Refer to the typical application circuit, Figure 6-1.

5.1 Analog Circuitry

5.1.1 OUTPUT VOLTAGE INPUT (V_{BAT})

The MCP73826 monitors the cell voltage at the V_{BAT} pin. This input is tied directly to the positive terminal of the battery. The MCP73826 is offered in two fixed-voltage versions for single cells with either coke or graphite anodes: 4.1V (MCP73826-4.1) and 4.2V (MCP73826-4.2).

5.1.2 GATE DRIVE OUTPUT (V_{DRV})

The MCP73826 controls the gate drive to an external P-channel MOSFET, Q1. The P-channel MOSFET is controlled in the linear region, regulating current and voltage supplied to the cell. The drive output is automatically turned off when the input supply falls below the voltage sensed on the V_{BAT} input.

5.1.3 SUPPLY VOLTAGE (V_{IN})

The V_{IN} input is the input supply to the MCP73826. The MCP73826 automatically enters a power-down mode if the voltage on the V_{IN} input falls below the voltage on the V_{BAT} pin. This feature prevents draining the battery pack when the V_{IN} supply is not present.

5.1.4 CURRENT SENSE INPUT (V_{SNS})

Fast charge current regulation is maintained by the voltage drop developed across an external sense resistor, R_{SENSE}, applied to the V_{SNS} input pin. The following formula calculates the value for R_{SENSE}:

$$R_{SENSE} = \frac{V_{CS}}{I_{OUT}}$$

Where:

V_{CS} is the current limit threshold

I_{OUT} is the desired peak fast charge current in amps. The preconditioning current is scaled to approximately 43% of I_{OUT}.

5.2 Digital Circuitry

5.2.1 SHUTDOWN INPUT ($\overline{SHDN}$)

The shutdown input pin, $\overline{SHDN}$, can be used to terminate a charge anytime during the charge cycle, initiate a charge cycle, or initiate a recharge cycle.

Applying a logic High input signal to the $\overline{SHDN}$ pin, or tying it to the input source, enables the device. Applying a logic Low input signal disables the device and terminates a charge cycle. In shutdown mode, the device's supply current is reduced to 0.5 µA, typically.

6.0 APPLICATIONS

The MCP73826 is designed to operate in conjunction with a host microcontroller or in stand-alone applications. The MCP73826 provides the preferred charge algorithm for Lithium-Ion cells, controlled current followed by constant voltage. Figure 6-1 depicts a typical stand-alone application circuit and Figure 6-2 depicts the accompanying charge profile.

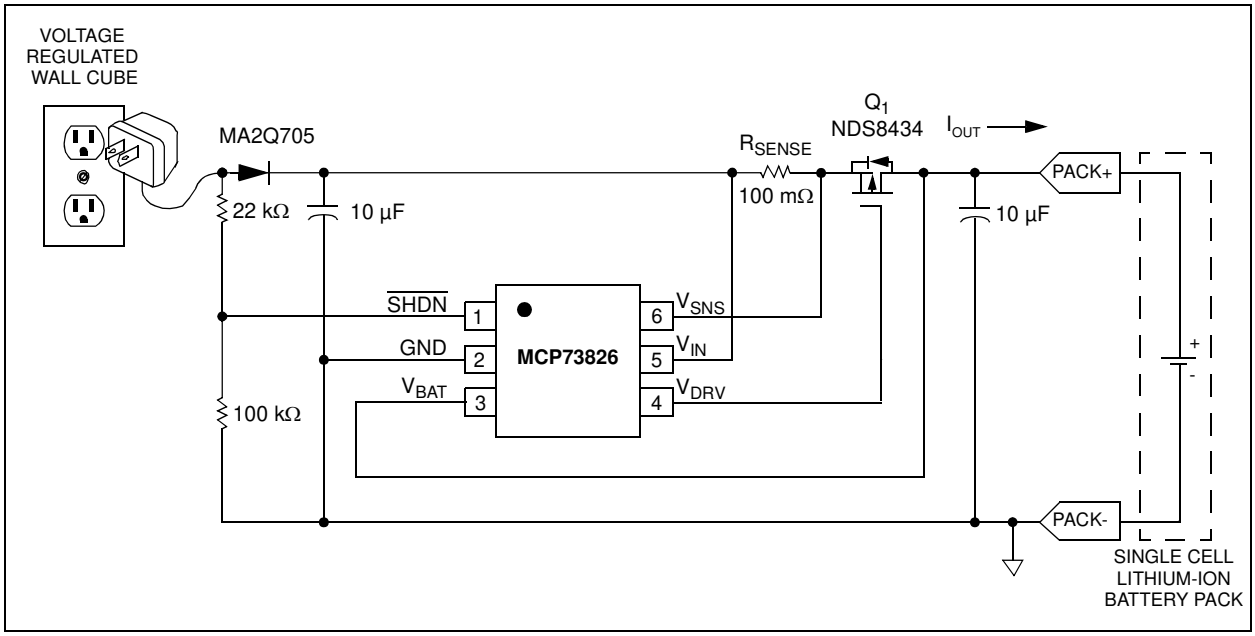


FIGURE 6-1: *Typical Application Circuit.*

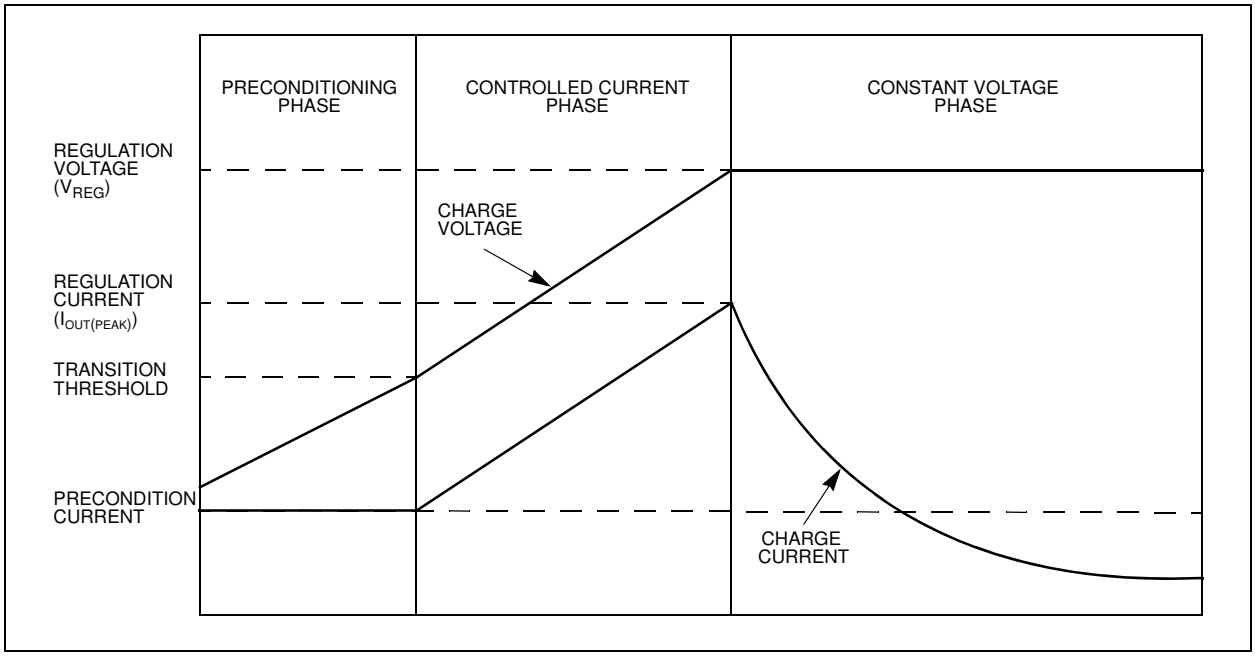


FIGURE 6-2: *Typical Charge Profile.*

6.1 Application Circuit Design

Due to the low efficiency of linear charging, the most important factors are thermal design and cost, which are a direct function of the input voltage, output current and thermal impedance between the external P-channel pass transistor, Q1, and the ambient cooling air. The worst-case situation is when the output is shorted. In this situation, the P-channel pass transistor has to dissipate the maximum power. A trade-off must be made between the charge current, cost and thermal requirements of the charger.

6.1.1 COMPONENT SELECTION

Selection of the external components in Figure 6-1 is crucial to the integrity and reliability of the charging system. The following discussion is intended as a guide for the component selection process.

6.1.1.1 SENSE RESISTOR

The preferred fast charge current for Lithium-Ion cells is at the 1C rate with an absolute maximum current at the 2C rate. For example, a 500 mAH battery pack has a preferred fast charge current of 500 mA. Charging at this rate provides the shortest charge cycle times without degradation to the battery pack performance or life.

The current sense resistor, R_{SENSE}, is calculated by:

$$R_{SENSE} = \frac{V_{CS}}{I_{OUT}}$$

Where:

V_{CS} is the current limit threshold voltage

I_{OUT} is the desired peak fast charge current

For the 500 mAH battery pack example, a standard value 100 mΩ, 1% resistor provides a typical peak fast charge current of 530 mA and a maximum peak fast charge current of 758 mA. Worst case power dissipation in the sense resistor is:

$$PowerDissipation = 100m\Omega \times 758mA^2 = 57.5mW$$

A Panasonic ERJ-L1WKF100U 100 mΩ, 1%, 1 W resistor is more than sufficient for this application.

A larger value sense resistor will decrease the peak fast charge current and power dissipation in both the sense resistor and external pass transistor, but will increase charge cycle times. Design trade-offs must be considered to minimize space while maintaining the desired performance.

6.1.1.2 EXTERNAL PASS TRANSISTOR

The external P-channel MOSFET is determined by the gate to source threshold voltage, input voltage, output voltage, and peak fast charge current. The selected P-channel MOSFET must satisfy the thermal and electrical design requirements.

Thermal Considerations

The worst case power dissipation in the external pass transistor occurs when the input voltage is at the maximum and the output is shorted. In this case, the power dissipation is:

$$PowerDissipation = V_{INMAX} \times I_{OUT} \times K$$

Where:

V_{INMAX} is the maximum input voltage

I_{OUT} is the maximum peak fast charge current

K is the foldback current scale factor

Power dissipation with a 5V, +/-10% input voltage source, 100 mΩ, 1% sense resistor, and a scale factor of 0.43 is:

$$PowerDissipation = 5.5V \times 758mA \times 0.43 = 1.8W$$

Utilizing a Fairchild NDS8434 or an International Rectifier IRF7404 mounted on a 1in^2 pad of 2 oz. copper, the junction temperature rise is 90°C, approximately. This would allow for a maximum operating ambient temperature of 60°C.

By increasing the size of the copper pad, a higher ambient temperature can be realized or a lower value sense resistor could be utilized.

Alternatively, different package options can be utilized for more or less power dissipation. Again, design trade-offs should be considered to minimize size while maintaining the desired performance.

Electrical Considerations

The gate to source threshold voltage and R_{DSON} of the external P-channel MOSFET must be considered in the design phase.

The worst case, V_{GS} provided by the controller occurs when the input voltage is at the minimum and the charge current is at the maximum. The worst case, V_{GS} is:

$$V_{GS} = V_{DRVMAX} - (V_{INMIN} - I_{OUT} \times R_{SENSE})$$

Where:

V_{DRVMAX} is the maximum sink voltage at the V_{DRV} output

V_{INMIN} is the minimum input voltage source

I_{OUT} is the maximum peak fast charge current

R_{SENSE} is the sense resistor

Worst case, V_{GS} with a 5V, +/-10% input voltage source, 100 mΩ, 1% sense resistor, and a maximum sink voltage of 1.6V is:

$$V_{GS} = 1.6V - (4.5V - 758mA \times 99m\Omega) = -2.8V$$

At this worst case, V_{GS}, the R_{DSON} of the MOSFET must be low enough as to not impede the performance of the charging system. The maximum allowable R_{DSON} at the worst case V_{GS} is:

$$R_{DSON} = \frac{V_{INMIN} - I_{OUT} \times R_{SENSE} - V_{BATMAX}}{I_{OUT}}$$

$$R_{DSON} = \frac{4.5V - 758mA \times 99m\Omega - 4.242V}{758mA} = 242m\Omega$$

The Fairchild NDS8434 and International Rectifier IRF7404 both satisfy these requirements.

6.1.1.3 EXTERNAL CAPACITORS

The MCP73826 is stable with or without a battery load. In order to maintain good AC stability in the constant voltage mode, a minimum capacitance of 10 µF is recommended to bypass the V_{BAT} pin to GND. This capacitance provides compensation when there is no battery load. In addition, the battery and interconnections appear inductive at high frequencies. These elements are in the control feedback loop during constant voltage mode. Therefore, the bypass capacitance may be necessary to compensate for the inductive nature of the battery pack.

Virtually any good quality output filter capacitor can be used, independent of the capacitor's minimum ESR (Effective Series Resistance) value. The actual value of the capacitor and its associated ESR depends on the forward trans conductance, g_m, and capacitance of the external pass transistor. A 10 µF tantalum or aluminum electrolytic capacitor at the output is usually sufficient to ensure stability for up to a 1 A output current.

6.1.1.4 REVERSE BLOCKING PROTECTION

The optional reverse blocking protection diode depicted in Figure 6-1 provides protection from a faulted or shorted input or from a reversed polarity input source. Without the protection diode, a faulted or shorted input would discharge the battery pack through the body diode of the external pass transistor.

If a reverse protection diode is incorporated in the design, it should be chosen to handle the peak fast charge current continuously at the maximum ambient temperature. In addition, the reverse leakage current of the diode should be kept as small as possible.

6.1.1.5 SHUTDOWN INTERFACE

In the stand-alone configuration, the shutdown pin is generally tied to the input voltage. The MCP73826 will automatically enter a low power mode when the input voltage is less than the output voltage reducing the battery drain current to 8 µA, typically.

By connecting the shutdown pin as depicted in Figure 6-1, the battery drain current may be further reduced. In this application, the battery drain current becomes a function of the reverse leakage current of the reverse protection diode.

6.2 PCB Layout Issues

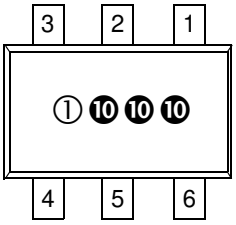
For optimum voltage regulation, place the battery pack as close as possible to the device's V_{BAT} and GND pins. It is recommended to minimize voltage drops along the high current carrying PCB traces.

If the PCB layout is used as a heatsink, adding many vias around the external pass transistor can help conduct more heat to the back-plane of the PCB, thus reducing the maximum junction temperature.

7.0 PACKAGING INFORMATION

7.1 Package Marking Information

6-Pin SOT-23A (EIAJ SC-74) Device



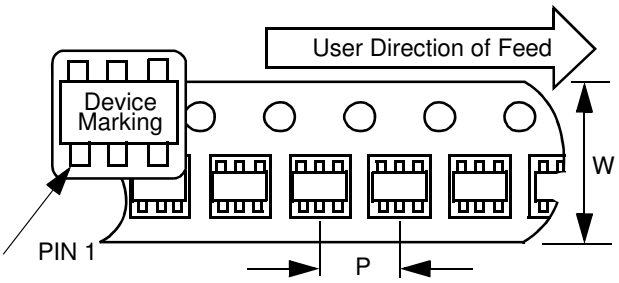
Part Number	Code
MCP73826-4.1VCH	CN
MCP73826-4.2VCH	CP

Legend:	1	Part Number code + temperature range and voltage (two letter code)
	2	Part Number code + temperature range and voltage (two letter code)
	3	Year and 2-month period code
	4	Lot ID number

Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line thus limiting the number of available characters for customer specific information.

7.2 Package Dimensions

Component Taping Orientation for 6-Pin SOT-23A (EIAJ SC-74) Devices

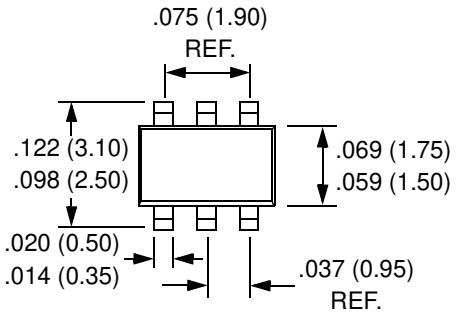


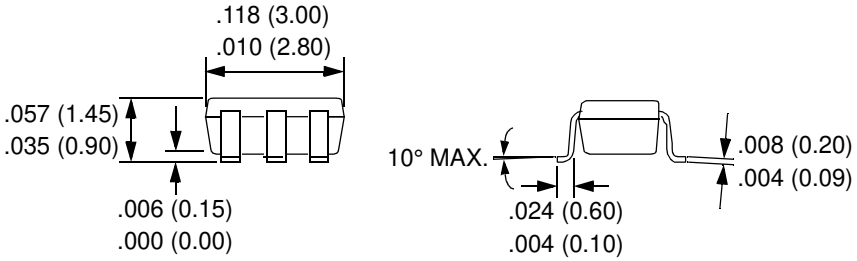
Standard Reel Component Orientation
for TR Suffix Device
(Mark Right Side Up)

Carrier Tape, Number of Components Per Reel and Reel Size:

Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
6-Pin SOT-23A	8 mm	4 mm	3000	7 in.

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





NOTES:

THE MICROCHIP WEB SITE

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

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQ), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com. Under "Support", click on "Customer Change Notification" and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: http://microchip.com/support

READER RESPONSE

It is our intention to provide you with the best documentation possible to ensure successful use of your Microchip product. If you wish to provide your comments on organization, clarity, subject matter, and ways in which our documentation can better serve you, please FAX your comments to the Technical Publications Manager at (480) 792-4150.

Please list the following information, and use this outline to provide us with your comments about this document.

TO: Technical Publications Manager Total Pages Sent _____

RE: Reader Response

From: Name _____

Company _____

Address _____

City / State / ZIP / Country _____

Telephone: (_____) _____ - _____ FAX: (_____) _____ - _____

Application (optional):

Would you like a reply? ___Y ___N

Device: Literature Number: DS21705B

Questions:

1. What are the best features of this document?

2. How does this document meet your hardware and software development needs?

3. Do you find the organization of this document easy to follow? If not, why?

4. What additions to the document do you think would enhance the structure and subject?

5. What deletions from the document could be made without affecting the overall usefulness?

6. Is there any incorrect or misleading information (what and where)?

7. How would you improve this document?

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

PART NO.	-X.X	X	XXXX
Device	Output Voltage	Temperature Range	Package

Device:	MCP73826:	Linear Charge Management Controller
Output Voltage:	= 4.1V = 4.2V	
Temperature Range:	V =	-20°C to +85°C
Package:	CHTR =	SOT-23, 6-lead (Tape and Reel)

Examples:

a) MCP73826-4.1VCHTR: Linear Charge Management Controller, 4.1V, Tape and Reel.

b) MCP73826-4.2VCHTR: Linear Charge Management Controller, 4.2V, Tape and Reel.

Sales and Support

Data Sheets
Products supported by a preliminary Data Sheet may have an errata sheet describing minor operational differences and recommended workarounds. To determine if an errata sheet exists for a particular device, please contact one of the following:

1. Your local Microchip sales office
2. The Microchip Worldwide Site (www.microchip.com)

Please specify which device, revision of silicon and Data Sheet (include Literature #) you are using.

New Customer Notification System
Register on our web site (www.microchip.com/cn) to receive the most current information on our products.

NOTES:

NOTES:

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.

Trademarks

Printed on recycled paper.

ISBN: 9781620768921

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
═ ISO/TS 16949 ═

Microchip received ISO/TS-16949:2009 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.

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: 86-10-8569-7000
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 - Hangzhou
Tel: 86-571-2819-3187
Fax: 86-571-2819-3189

China - Hong Kong SAR
Tel: 852-2943-5100
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: 86-755-8864-2200
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 - Osaka
Tel: 81-6-6152-7160
Fax: 81-6-6152-9310

Japan - Tokyo
Tel: 81-3-6880- 3770
Fax: 81-3-6880-3771

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: 886-3-5778-366
Fax: 886-3-5770-955

Taiwan - Kaohsiung
Tel: 886-7-213-7828
Fax: 886-7-330-9305

Taiwan - Taipei
Tel: 886-2-2508-8600
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

11/29/12