

POWER MANAGEMENT SOLUTIONS

POWER MANAGEMENT ICs

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POWER MANAGEMENT ICs

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INTRODUCTION TO POWER MANAGEMENT ICs

Today's advanced electrical equipment is required to be more compact, to have higher performance and consume less power than ever before. To meet these requirements, Fujitsu has developed a full range of high-performance power management devices, such as AC/DC and DC/DC converters, voltage detectors, battery management and voltage monitoring ICs. The devices have many

competitive features, notably low power consumption, low-voltage operation, high precision, multi-channelling, high efficiency, and low ON resistance.

Highly integrated and customised Power Management ICs are also available to address specific wireless applications such as cellular phones and PDAs.

- BiCMOS Technology
- Trimmed band-gap references
- Low current consumption
- High precision/efficiency
- Wide supply voltage range
- Extensive package line-up

PRODUCT PORTFOLIO

Supply Voltage Monitoring Devices

These devices monitor the voltage level of one or more power supplies in a Microcontroller- or Microprocessor-based system. If the circuit's power supply deviates more than a specified amount, a reset signal is generated.

Thus, the system can be protected from malfunction and data loss.

- One- and two-channel devices
- Integrated Watchdog
- Detection voltage range from 2.4 to 4.9V in 0.1V steps
- SSOP, SOP, SOL packages

DC/DC Converters

DC/DC converters are used in electronic power supplies for automotive, industrial and consumer products where high efficiency is required. Typical applications are LCDs, digital cameras, PDAs and car dashboards.

- Step up/down, invert
- 1 to 8 channels
- High efficiency, high accuracy
- Low input voltage devices

- Short circuit protection
- Soft start
- High precision reference voltage
- High frequency operation
- Small size packages
- Evaluation boards available
- BCC, LQFP, TSSOP, SSOP, SOP, SOL, DIP packages

AC/DC Converters

Fujitsu's AC/DC converter ICs are designed for highly efficient AC adaptors. They allow the number of components and the size of the transformer to be reduced.

- Multi-resonance
- Overload detection
- Under-voltage lockout
- SOP, DIP packages

Battery management

- Chargers for 1 to 4 Li battery cells based on DC/DC converters
- Dynamically controlled charging
- Parallel charging
- Charging voltage and current independently controllable

- Internal high precision voltage reference
- LQFP, TSSOP, SSOP packages

Power Management Switches

Devices for use in power management switching applications like USB. Features are low and stable on-resistance, overcurrent protection and notification.

Power Management Systems for Mobile Devices

Power Management systems for mobile devices feature multiple channel DC/DC converters, linear regulators and Li Battery charge function in one device.

The development of custom solutions is also possible.

POWER MANAGEMENT ICs

SUPPLY VOLTAGE MONITORING

Supply Voltage Monitoring

Part Number	Watch Dog Timer	Features	Functions	Detection Voltage (V)	Reset Certified Voltage (V) (Typ.)	Power Supply Voltage (V)	Package ³
MB3761	-	Wide operating voltage range, Easy addition of hysteresis characteristics	Voltage detectors	Set by resistor	-	+2.5 to +40	SIP-8P,SOP-8P
MB3771	-	Accurate supply voltage drop detection, External add-on allows detection of any desired voltage drop	Supply voltage monitoring applications	Any voltage level in addition to 4.2V	0.8	+3.5 to +18	SIP-8P,SOP-8P
MB3773	Single system	Accurate supply voltage drop detection	Supply voltage monitoring applications with watchdog timer	Any voltage level in addition to 4.2V	0.8	+3.5 to +16	SIP-8P,SOP-8P
MB3793-27A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	2.7 +/- 0.07	0.8	+4 (Max.)	SOP-8P,SOL-8P, SSOP-8P
MB3793-28A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	2.8 +/- 0.07	0.8	+4 (Max.)	SOP-8P,SOL-8P, SSOP-8P
MB3793-30A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	3.0 +/- 0.07	0.8	+6 (Max.)	SOP-8P,SOL-8P, SSOP-8P
MB3793-34A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	3.4 +/- 0.08	0.8	+6 (Max.)	(SOP-8P),SOL-8P, (SSOP-8P) ²
MB3793-37A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	3.7 +/- 0.08	0.8	+6 (Max.)	SOP-8P,SOL-8P, (SSOP-8P) ²
MB3793-42A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	4.2 +/- 0.08	0.8	+6 (Max.)	SOP-8P,SOL-8P, (SSOP-8P) ²
MB3793-45A	Double system	Accurate supply voltage drop detection	Supply voltage monitoring applications with dual watchdog timer systems	4.5 +/- 0.08	0.8	+6 (Max.)	SOP-8P,SOL-8P, SSOP-8P

*1: Detection voltages of the MB3793 series are available in the range from 2.4V to 4.9V in 0.1V increments. Consult with supplier

*2: () option, Packages: P - Plastic

*3: DIP packages are available for evaluation purposes

DC/DC CONVERTER

DC/DC Converter

Part Number	Number of Channels	Oscillator Frequencies (kHz)	Power Supply Voltage (V)	Precision (%)	Step Up	Chopper method Step Down	Step Up/Down	Invert	Features	Package
MB3789	1	100	3.0 to 18	4	0	-	-	-	Adaptable for external synchronization. Two internal error amplifiers	SSOP-16P
MB3776A	1	500	2.0 to 15	4	0	-	-	-	Low voltage operation, Power on/off control function	SOP-8P, SOL-8P, SSOP-8P
MB3817	1	500	2.5 to 18	2	-	0	0	0	Power on/off control function	SSOP-16P
MB3885	1	500	5.5 to 18	1	-	0	-	-	Synchronous rectification Built-in over voltage protection circuit	SSOP-20P
MB3800	1	1000	5.5 to 18	4	0	-	-	-	Low voltage operation, Internal timer-latch type short protection circuit	SOP-8P, SOL-8P, SSOP-8P, TSSOP-16P
MB39A105	1	1000	1.8 to 6	1	0	-	-	-	Low voltage operation, Internal timer-latch type short protection circuit	TSSOP-8P
MB3775	2	500	3.6 to 18	1.5	0	0	-	0	Low voltage operation	SOP-16P, SSOP-16P
MB3778	2	500	3.6 to 18	2	0	0	-	0	Low voltage operation, Power on/off control function	SOP-16P, SSOP-16P
MB3821	2	500	4.5 to 30	2	-	0	-	-	Synchronous rectification	SSOP-24P
MB3882	2	500	5.5 to 18	1	-	0	-	-	Synchronous rectification Built-in over voltage protection circuit	SSOP-24P
MB3886	2	500	5.5 to 18	1	-	0	-	-	Synchronous rectification Built-in over voltage protection circuit, over current protection circuit (Unnecessary current sense resistor) Symmetrical-Phase method adoption	SSOP-30P
MB3889	2	500	5.5 to 18	1	-	0	-	-	Synchronous rectification Built-in over voltage protection circuit, over current protection circuit (Unnecessary current sense resistor) Symmetrical-Phase method adoption	TSSOP-30P
MB3788	2	1000	3.6 to 18	1	-	0	-	0	Slave, Internal high-precision reference voltage circuit	SSOP-24P
MB39A104	2	1000	7 to 9	1	-	0	-	-	Built-in over current protection circuit (no current sense resistor necessary)	SSOP-24P
MB3782	3	500	3.6 to 18	2	0	0	-	0	High generality	SSOP-20P
MB3785A	4	1000	4.5 to 18	1	-	0	-	0	Internal high-precision reference voltage circuit, Channel on/off control function	LQFP-48P
MB39A102	4	1000	2.5 to 11	1	0	0	0	-	Support for control and soft-start of each channel, High-precision reference voltage, Support for external input short detection	BCC-32P, TSSOP-30P
MB39A103	4	1000	1.7 to 11	1	0	0	0	-	Low voltage operation, Support for control and soft-start of each channel, High-precision reference voltage, Support for external input short detection	BCC-32P, TSSOP-30P
MB3825A	4	800	2.5 to 12	1	-	0	-	0	High-precision reference voltage, Synchronous rectification	LQFP-64P ^{*2}
MB3827	6	800	1.8 to 13	1	-	0	0	0	Low voltage operation, High-precision reference voltage, Synchronous rectification	LQFP-64P
MB3883	6	1000	1.7 to 9	1	0	0	0	-	Low voltage operation, High-precision reference voltage, Synchronous rectification	LQFP-48P, BCC-48P
MB3881	8	800	1.8 to 13	1	-	0	0	0	Low voltage operation, High-precision reference voltage, Synchronous rectification, Adaptable for external synchronization	LQFP-64P [*]

0: Ideal method

*1 : 0.4 mm pitch

*2 : 0.4 mm pitch, 0.5 mm pitch

Packages: P - Plastic, C - Ceramic

POWER MANAGEMENT ICs

AC/DC CONVERTER

AC/DC Converter

Part Number	Oscillator Frequencies (kHz)	Error Amplifiers	Features	Functions	Package
MB3759	300	Operational amplifier type	Push-pull, Single-end function switchable, TL494-equivalent	PWM-type controllers for AC/DC converters	DIP16, SOP16
MB3873	300	Operational amplifier type	PFM multi-resonant converter	PWM-type controllers for AC/DC converters	SOP16
MB3769A	300	Operational amplifier type	MOS FET compatible, dynamic over-current detection	PWM-type controllers for AC/DC converters	DIP16, SOP16

BATTERY MANAGEMENT

Lithium Chargers

Part Number	Number of Cells	Power Supply Voltage (V)	Features	Functions	Output Voltage (V)	Precision (%) (Ta=+25 oC)	Package
MB3876	4 cell	7 to 25	Applicable to lithium ion battery (4-cell) charging Parallel charging, Dynamically-controlled charging	Charge control DC/DC converters	16.8	+/- 0.8	SSOP-24P
MB3877	4 cell	7 to 25	Applicable to lithium ion battery (4-cell) charging Dynamically-controlled charging	Charge control DC/DC converters	16.8	+/- 0.8	SSOP-24P
MB3879	3/4 cell	8 to 25	Applicable to lithium ion battery 3/4 cell 2 mode charging (Dynamically controlled charging, differential charging)	Charge control DC/DC converters	12.6/16.8, 4 12.3/16.	Output voltage: 12.6/16.8: +/- 0.8, 12.3/16.4: +/- 0.9	LQFP-48P
MB3813A	3 cell	12 to 18	Applicable to lithium ion battery (4-cell) charging	Charge control DC/DC converters	12.6/12.3	+/- 1.0	SSOP-16P
MB3875	3 cell	7 to 25	Applicable to lithium ion battery (4-cell) charging Dynamically-controlled charging	Charge control DC/DC converters	12.6	+/- 0.8	SSOP-24P
MB3874	3 cell	7 to 25	Applicable to lithium ion battery (4-cell) charging. Parallel charging, Dynamically-controlled charging	Charge control DC/DC converters	16.8	+/- 0.8	SSOP-24P
MB3833A	2 cell	8 to 18	Applicable to lithium ion battery (2-cell) charging	Charge control DC/DC converters	8.4/8.2	+/- 1.0	SSOP-16P
MB3843	1 cell	7 to 18	Applicable to lithium ion battery (1-cell) charging	Charge control DC/DC converters	4.2/4.1	+/- 1.0	SSOP-16P
MB3832A	1 to 3 Cell	3.6 to 18	Output voltage and current are independently controllable Applicable to 1 to 4-cell charging. Internal high-precision reference supply voltage	Charge control DC/DC converters	Any voltage level	+/- 0.5	SSOP-20P
MB3878	1 to 4 Cell	7 to 25	Output voltage and current are independently controllable Applicable to 1 to 4-cell charging. Internal high-precision reference supply voltage, Dynamically-controlled charging	Charge control DC/DC converters	4.2V/cell	+/- 0.8	SSOP-24P
MB3887	1 to 4 Cell	8 to 25	Output voltage and current are independently controllable Applicable to 1 to 4-cell charging. Internal high-precision reference supply voltage, High charging current accuracy Dynamically-controlled charging	Charge control DC/DC converters	4.2V/cell	+/- 0.8	SSOP-24P
MB3888	1 to 4 Cell	8 to 25	Output voltage and current are independently controllable Applicable to 1 to 4-cell charging. Internal high-precision reference supply voltage, High charging current accuracy	Charge control DC/DC converters	Any voltage level	+/- 0.5	SSOP-20P
MB3888	1 to 4 Cell	8 to 25	Synchronous rectification Output voltage and current are independently controllable Applicable to 1 to 4-cell charging Internal current detection amp by which offset voltage can be adjusted Internal high-precision reference supply voltage Dynamically-controlled charging	Charge control DC/DC converters	4.2V/cell	+/- 0.5	TSSOP-30P

Packages: P - Plastic

BATTERY MANAGEMENT



Backup

Part Number	Features	Output Current	Power supply Voltage (V)	Package
MB3790	Battery backup for IC cards, SRAM cards, etc. Alarm function for primary and secondary battery	200mA (Max.)	5.5 (Max.)	SOP16, SSOP20

POWER MANAGEMENT SWITCHES

Power Management Switches

Part Number	Features	Functions	Number of Channels	On-resistance (Ω) Current	Drive (A) (Max.)	Power supply Voltage (V)	Package
MB3802	Low on-resistance switch	Power management switch	2	0.12	1.2	+6.0 (Max.)	SOP-16P
MB3841	Low on-resistance switch	Power management switch	1	0.045	2.0	+5.5 (Max.)	SOP-8P
MB3842	Low on-resistance switch	Power management switch	2	0.1	0.6	+5.5 (Max.)	SSOP-20P
MB3845	Low on-resistance switch	Power management switch	2	0.1	0.6	+5.5 (Max.)	SSOP-20P

DOCUMENTATION AND TOOLS

- Data Sheets with application examples are available for all products at:

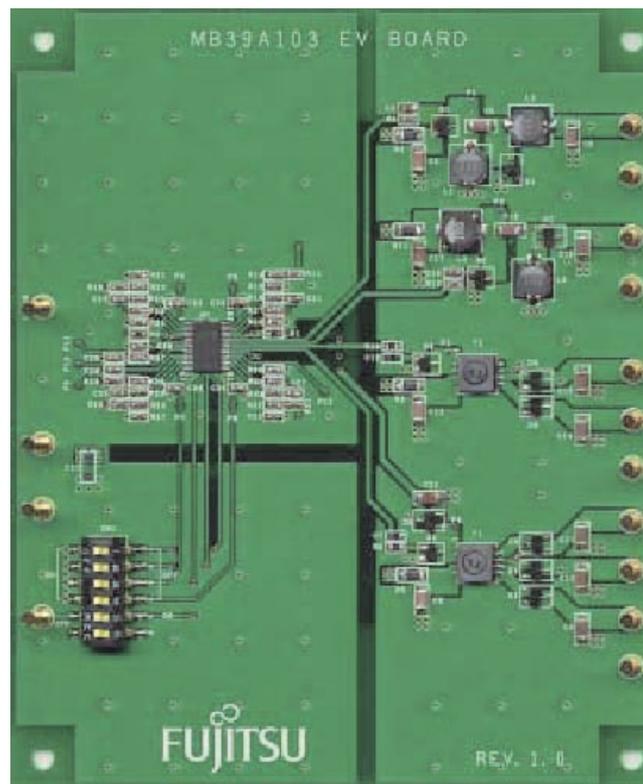
<http://www.fme.fujitsu.com>

or

<http://edevic.fujitsu.com>

- The following Evaluation boards are available. Please contact your nearest sales office for further information.

MB3887EVB
 MB3888EVB
 MB39A102EVB
 MB39A103EVB
 MB39A104EVB
 MB39A105EVB



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