MP24971

1.5A, 50V, 100kHz, 5V Fixed Output Step-Down Converter with Programmable Current Limit and Output Line-Drop Compensation

The Future of Analog IC Technology

MPS CONFIDENTIAL AND PROPRIETARY INFORMATION – CODICO USE ONLY

DESCRIPTION

The MP24971 is a monolithic, step-down, switch-mode converter with a programmable output-current limit. It has a fixed 5V/1.5A continuous output over a wide input supply range, and has excellent load and line regulation. It has an internal 2ms-to-4ms soft-start that prevents inrush current at start-up, and compensates for output line drop.

MP24971 achieves a low EMI signature with well-controlled switching edges.

It has fault-condition protections including hiccup-mode current limit protection, short-circuit protection, output over-voltage protection, and thermal shutdown.

The MP24971 requires a minimal number of readily-available standard external components, and is available in SOIC8 and SOIC8E packages.

FEATURES

- Wide 8V-to-50V Operating Input Range
- Output Over-Voltage Protection
- 5V Fixed Output
- 0.4Ω Internal Power MOSFET
- Internal 4ms Soft-Start
- Stable with Low-ESR Ceramic Output Capacitors
- Fixed 100kHz Frequency
- Low EMI Signature
- Thermal Shutdown
- Output Line-Drop Compensation
- Hiccup Circuit Limit and Short Circuit Protection
- Available in SOIC8 and SOIC8E Package

APPLICATIONS

- USB Power Supplies
- Automotive Power Adapters
- Power Supplies for Linear Chargers

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Products, Quality Assurance page.

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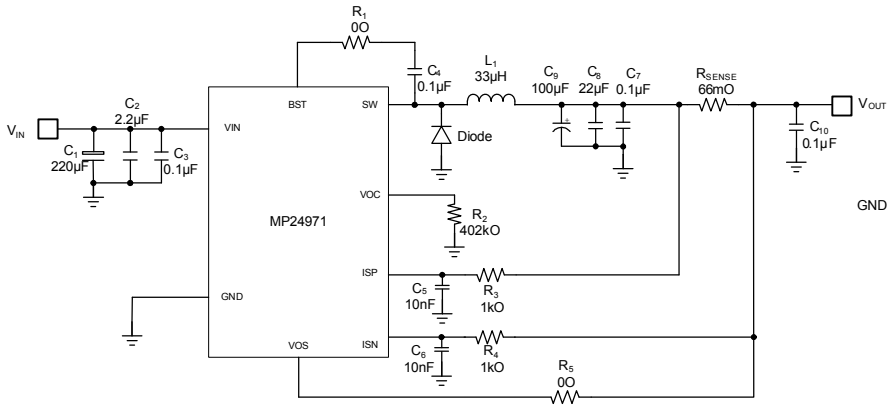
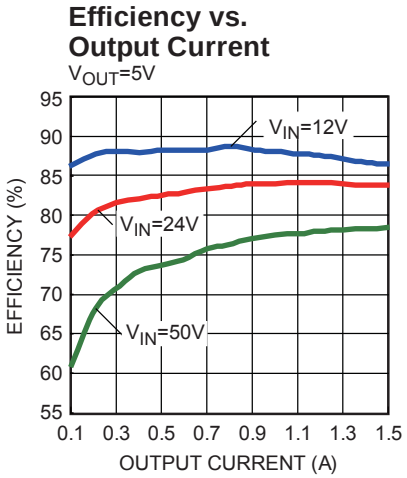
TYPICAL APPLICATION





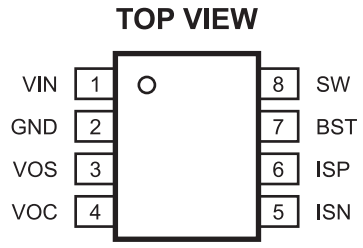
ORDERING INFORMATION

Part Number	Package	Top Marking	Operating Temperature (T_J)
MP24971DS*	SOIC8	MP24971	-40°C to +125°C
MP24971DN**	SOIC8E	MP24971	-40°C to +125°C

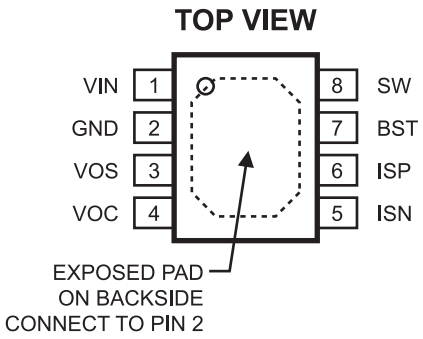
* For Tape & Reel, add suffix –Z (eg. MP24971DS–Z);
For RoHS, compliant packaging, add suffix –LF (eg. MP24971DS–LF–Z).

** For Tape & Reel, add suffix –Z (eg. MP24971DN–Z);
For RoHS, compliant packaging, add suffix –LF (eg. MP24971DN–LF–Z).

PACKAGE REFERENCE



SOIC8



SOIC8E

ABSOLUTE MAXIMUM RATINGS (1)

Input Voltage V_{IN} 60V
V_{ISN}, V_{ISP}, V_{VOS} ..... 0V to 8V
$|V_{ISN} - V_{ISP}|$ ..... 0V to 0.4V
V_{SW} ..... -0.3V to (V_{IN} + 0.3V)
V_{BST} ..... V_{SW} + 6.5V
All Other Pins ..... -0.3V to +6.5V
Junction Temperature ..... 150°C
Lead Temperature ..... 260°C
Storage Temperature ..... -65°C to +150°C
Continuous Power Dissipation (T_A = 25°C) (2)
SOIC8 ..... 1.38W
SOIC8E 2.5W

ESD Susceptibility

HBM (Human Body Mode) 2kV

Recommended Operating Conditions (3)

Input Voltage V_{IN} ..... 8V to 50V
Maximum Junction Temp. (T_J) ..... 125°C

Thermal Resistance (4)

	θ_{JA}	θ_{JC}
SOIC8	90	45 °C/W
SOIC8E	50	10 °C/W

Notes:

1) Exceeding these ratings may damage the device.
2) The maximum allowable power dissipation is a function of the maximum junction temperature T_J (MAX), the junction-to-ambient thermal resistance θ_{JA}, and the ambient temperature T_A. The maximum allowable continuous power dissipation at any ambient temperature is calculated by P_D (MAX) = (T_J (MAX)-T_A)/θ_{JA}. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
3) The device is not guaranteed to function outside of its operating conditions.
4) Measured on JESD51-7, 4-layer PCB.