



ACE73901M

Dual-Channel Current Limit Synchronous Step-down DC/DC Converter

Description

The ACE73901M features slew rate control and spread spectrum frequency modulation to minimize EMI/EMC emissions. Switching frequency is internally set to 180kHz. With wide input range from 4V to 36V, the converter can deliver output voltage ranging from 0.8V to VIN with up to 5A continuous output current. The ACE73901M is a high-efficiency, high-voltage, synchronous step-down DC/DC converter with integrated high-side and low-side power MOSFETs. The ACE73901M uses proprietary constant on-time (COT) control to provide excellent line and load transient response. The converter can be configured as single output or dual outputs with independent constant current (CC) regulation for each output. ACE73901M also provides programmable cable voltage drop compensation by selecting appropriate external resistor divider. In the event of output overload or short circuit, the converter will be into hiccup mode. Other protection features include cycle-by-cycle current limit, input under and over voltage protection and thermal shutdown. The ACE73901M is available in ESOP-8 package.

Features

- Short Circuit Protection with Hiccup mode
ACE73901MP/ACE73901MU: CC Foldback; ACE73901MD: Disable CC Foldback
- From 4V to 36V Wide input Voltage Range
- Output Current Continuous 5A
- Integrated 40mΩ High-side Switch and 40mΩ Low-side Switch
- 180kHz Switching Frequency with Spread Spectrum Modulation
- 70ns Minimum on Time
- Internal 3ms Soft Start
- 100% Duty Cycle Low Dropout Operation
- Dual Outputs with Independent 8% Accurate Constant Current Regulation
- Low EMI and Switching Noise
- Thermal Shutdown with Auto Recovery
- Cycle-by-Cycle current limit
- Programmable Output Cable Drop Compensation

Applications

- Point of Load
- Dual-Port Car Charger
- Automotive and Industrial Supplies



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Absolute Maximum Ratings (Reference to GND) ⁽¹⁾

Parameter	Value
Supply Voltage (IN to GND)	36V
BST to SW	-0.3V to 6V
SW to GND	-0.3 V to VIN+0.3V
SW Surge (30ns) to GND	-3V to VIN+3V
PGND to GND	-0.3V to 0.3V
All Other Pins to GND	-0.3V to 6V
Junction Temperature	150°C
Storage Temperature	-65 to 150°C
Lead Temperature	260°C

Note:

(1). Stress exceeding those listed “Absolute Maximum Ratings” may damage the device.

Recommended Operating Conditions ⁽²⁾

Parameter	Symbol	Rating	Unit
Supply Voltage	VIN	4 to 36	V
Output Voltage	VOOUT	0.8 to VIN	V
Operating Junction Temp.	TJ	-40 to 125	°C

Note:

(2). The device is not guaranteed to function outside of the recommended operating conditions.

Thermal Information ^{(3) (4)}

Parameter	Symbol	Value
Maximum Power Dissipation	PD(Max)	2.1W
Thermal Resistance	θ_{JA}	51°C/W
	θ_{JC}	13°C/W

Note:

(3). Measured on JESD51-7, 4-Layer PCB.

(4). 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 $PD_MAX = (T_{J_MAX} - T_A) / \theta_{JA}$. 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.

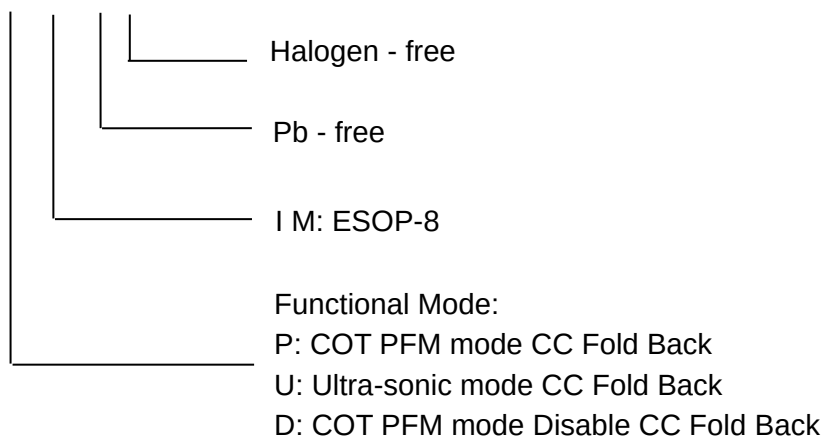


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Ordering information

ACE73901M X XXX + H





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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Technology Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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