Ordering number : ENA0498

LA5779MP

Monolithic Linear IC

Separately-excited Step-down Switching Regulator (Variable Type)

ON Semiconductor®

http://onsemi.com

Overview

The LA5779MP is a Separately-excited step-down switching regulator (variable type).

Functions

- High efficiency.
- Six external parts.
- Time-base generator (160kHz) incorporated.
- Current limiter incorporated.
- Thermal shutdown circuit incorporated.
- ON/OFF function.

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Input voltage	V_{IN} max		30	V
Maximum Output current	I_O max		3	A
SW pin application reverse voltage	V_{SW}		-1	V
Allowable power dissipation	Pd max	Mounted on a substrate.*	3.9	W
Operating temperature	Topr		-30 to +125	°C
Storage temperature	Tstg		-40 to +150	°C

* Specified substrate : 76.1×114.3×1.6mm^3 : Copper foil ratio 60% FR4

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage range	V_{IN}		4.5 to 28	V

Electrical Characteristics at Ta = 25°C, V_O = 3.3V

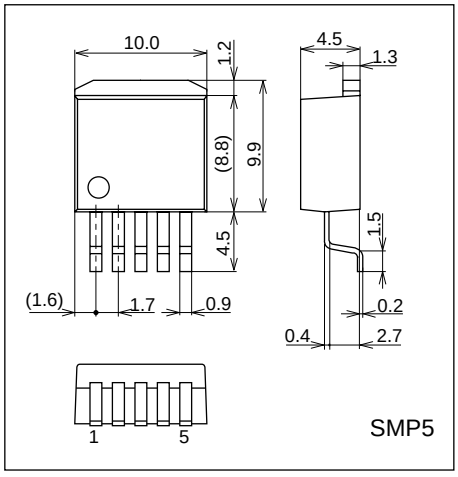
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference voltage	V_{OS}	V_{IN} = 15V, I_O = 1.0A	1.20	1.23	1.26	V
Efficiency	η	V_{IN} = 15V, I_O = 1.0A, Set V_O = 5V		84		%
Switching frequency	f	V_{IN} = 15V, I_O = 1.0A	128	160	192	kHz
Switching frequency when short-circuit protection is active	fshort	V_{IN} = 15V, V_{OS} = 0V	15	30	45	kHz
Line regulation	ΔV_OLINE	V_{IN} = 8 to 20V, I_O = 1.0A		40	100	mV
Load regulation	ΔV_OLOAD	V_{IN} = 15V, I_O = 0.5 to 1.5A		10	30	mV
Output voltage temperature coefficient	$\Delta V_O/\Delta Ta$	Designed target value. *		±0.5		mV/°C
Ripple attenuation factor	RREJ	f = 100 to 120Hz		45		dB
Output leak current	$I_O$leak	V_{IN} = 15V, SW_{OUT} = -0.4V			50	μA
Current limiter operating voltage	I_S	V_{IN} = 15V	3.1			A
Operating current	IV_{IN}	V_{IN} = 15V		5.6		mA
Standby current	I_{STBY}	V_{IN} = 15V, ENA = 5V		50	100	μA
ENA pin LOW voltage range	V_{ENA}L				0.6	V
ENA pin HIGH voltage range	V_{ENA}H		2.4		V_{IN}	V
Thermal shutdown operating temperature	TSD	Designed target value. *		165		°C
Thermal shutdown Hysteresis width	ΔTSD	Designed target value. *		15		°C

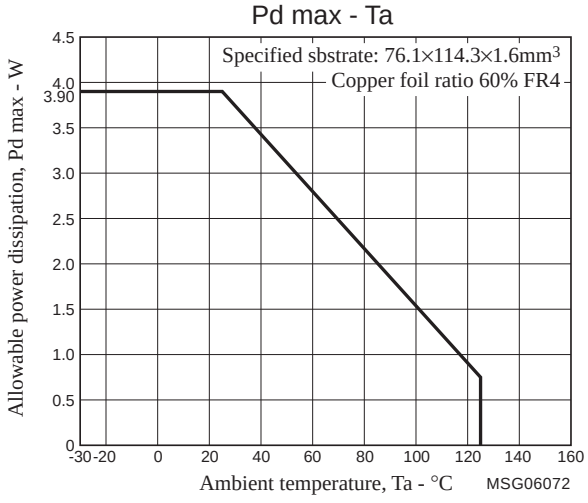
* Design target value: No measurement made.

Package Dimensions

unit : mm (typ)

3275

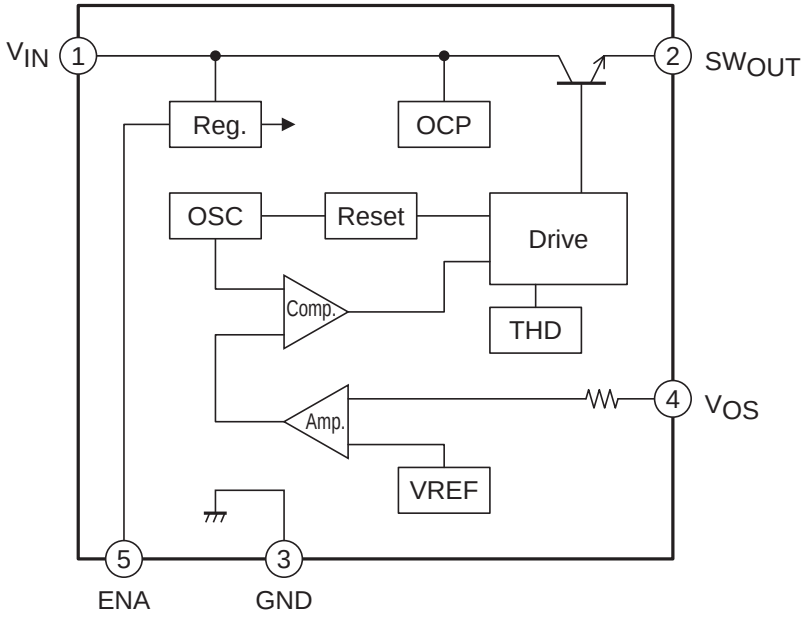




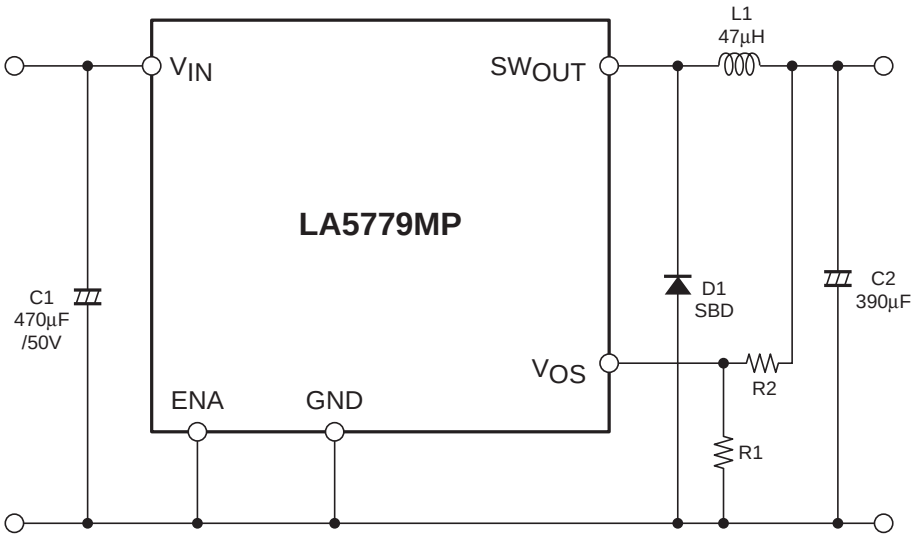
Pin Assignment

(1) V_{IN} (2) SW_{OUT} (3) GND (4) V_{OS} (5) ENA

Block Diagram



Application Circuit Example



Description of Functional Settings

Calculation equation to set the output voltage

This IC controls the switching output so that the V_{OS} pin voltage becomes 1.23V (typ).

The equation to set the output voltage is as follows:

$$V_O = \left(1 + \frac{R2}{R1}\right) \times 1.23V(typ)$$

The V_{OS} pin has the inrush current of 1μA (typ). Therefore, the error becomes larger when R1 and R2 resistance values are large.

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