



SANYO Semiconductors

DATA SHEET

LA5779MP

Monolithic Linear IC Separately-excited Step-down Switching Regulator (Variable Type)

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 $T_a = 25^\circ\text{C}$

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	$P_d\ max$	Mounted on a substrate.*	3.9	W
Operating temperature	T_{opr}		-30 to +125	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

* Specified substrate : $76.1 \times 114.3 \times 1.6\text{mm}^3$: Copper foil ratio 60% FR4

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

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

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LA5779MP

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_O = 3.3\text{V}$

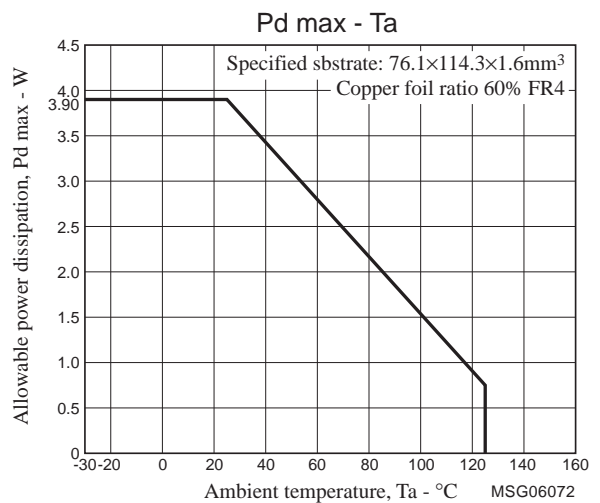
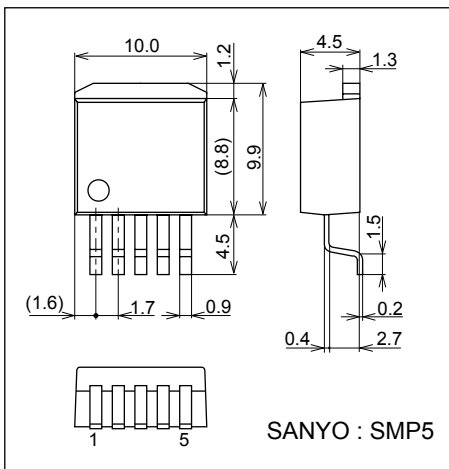
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference voltage	V_{OS}	$V_{IN} = 15\text{V}$, $I_O = 1.0\text{A}$	1.20	1.23	1.26	V
Efficiency	η	$V_{IN} = 15\text{V}$, $I_O = 1.0\text{A}$, Set $V_O = 5\text{V}$		84		%
Switching frequency	f	$V_{IN} = 15\text{V}$, $I_O = 1.0\text{A}$	128	160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

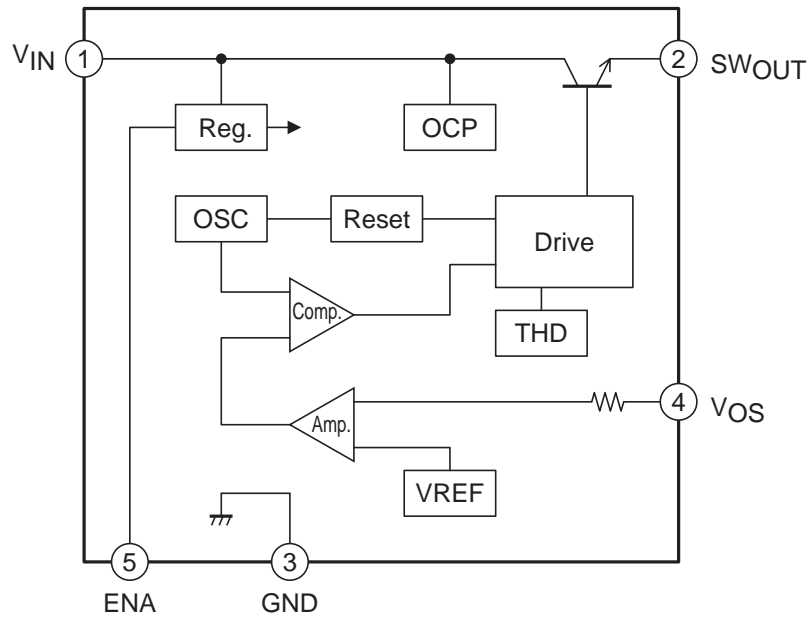


Pin Assignment

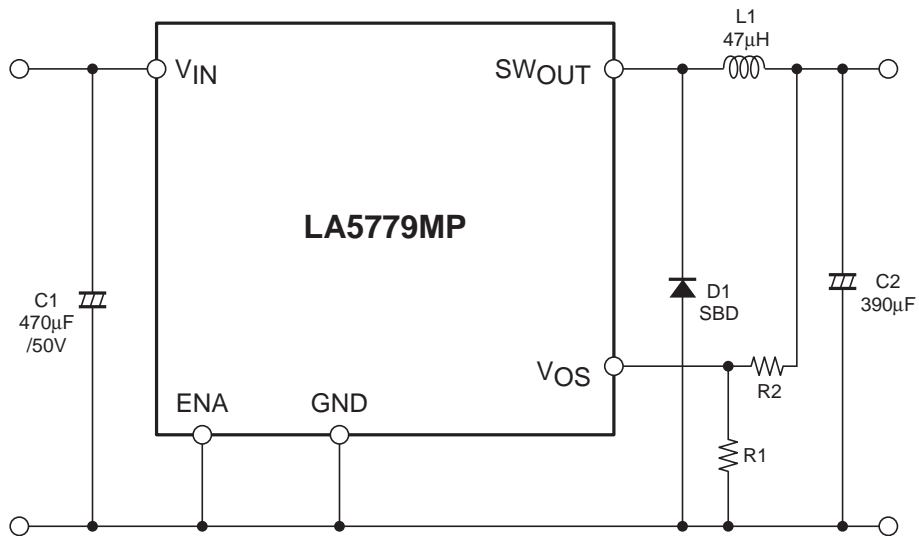
(1) V_{IN} (2) SW_{OUT} (3) GND (4) V_{OS} (5) ENA

LA5779MP

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:

$$V_O = \left(1 + \frac{R_2}{R_1}\right) \times 1.23V(\text{typ})$$

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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