Ordering number : ENA0476A

SANYO Semiconductors
DATA SHEET

Monolithic Linear IC

LA5779 — Separately-excited Step-down Switching Regulator (Variable Type)

Overview

The LA5779 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 max1	Infinitely large heat sink.	7.5	W
	Pd max2	Independent IC.	1.75	W
Operating temperature	Topr		-30 to +125	°C
Storage temperature	Tstg		-40 to +150	°C
Junction temperature	Tj max		150	°C

Recommended Operating Conditions at Ta = 25°C

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

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

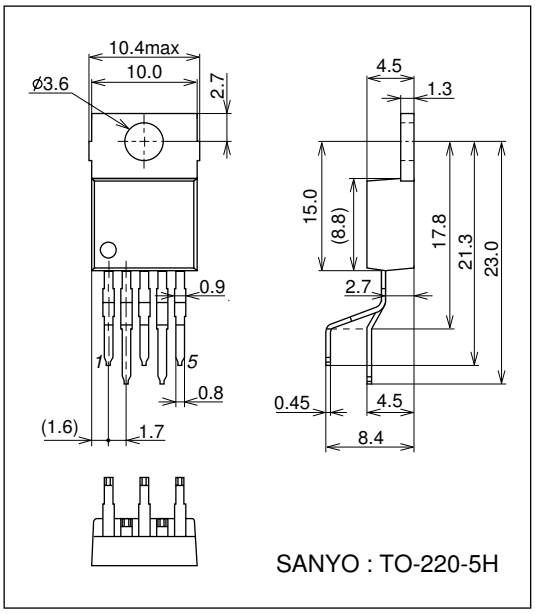
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference voltage	V_{OS}	V_{IN} = 15V, I_O = 1.0A	1.20	1.23	1.26	V
Efficiency	η	V_{IN} = 15V, I_O = 1.0A, Set V_O = 5V		84		%
Switching frequency	f	V_{IN} = 15V, I_O = 1.0A	128	160	192	kHz
Switching frequency when short-circuit protection is 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			200	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

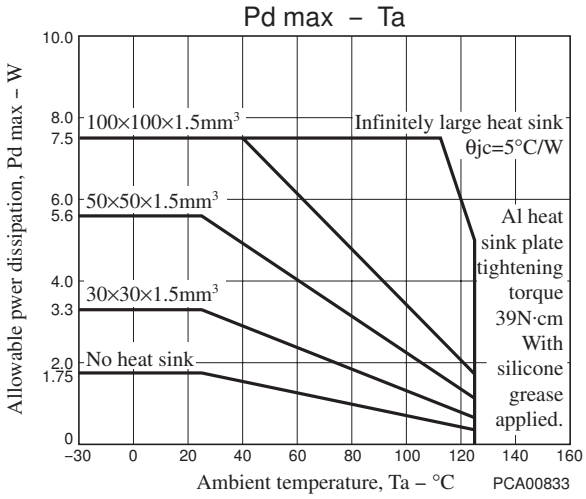
* Design target value: No measurement made.

Package Dimensions

unit : mm (typ)

3079A

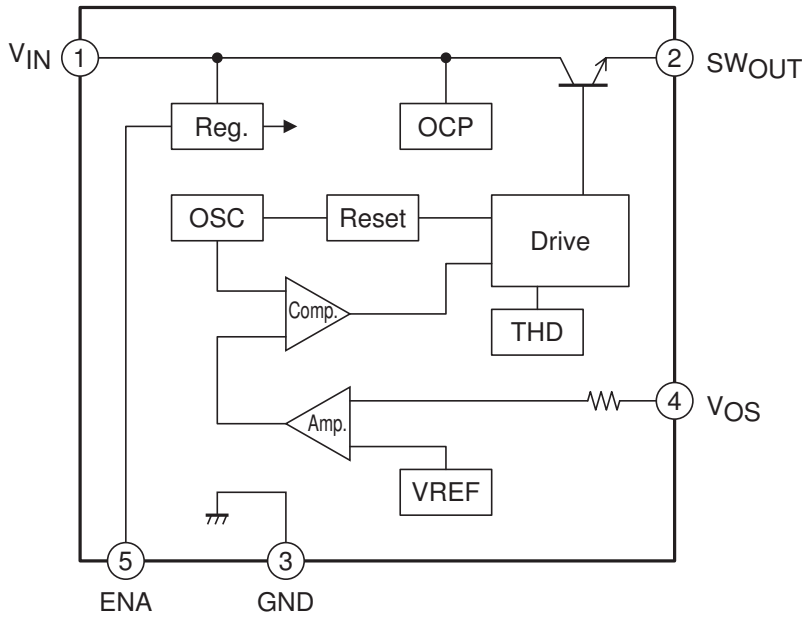




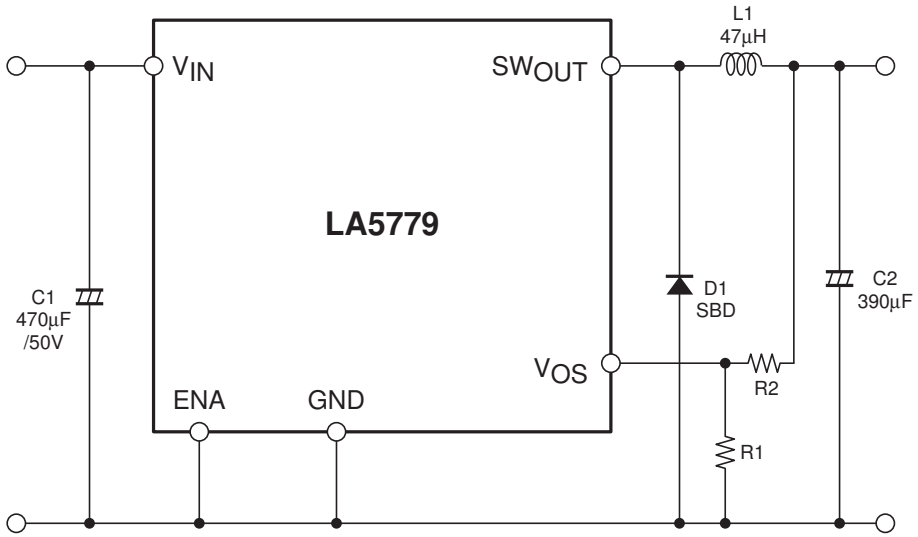
Pin Assignment

(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.