Ordering number : EN5286

Monolithic Linear IC

LA5616

Microprocessor-Controlled Audio Power Supply

Overview

The LA5616 is appropriate for use in power supplies for microprocessor-controlled CD players, tuners, receivers, and similar audio equipment.

Functions

- Low-saturation 5-V, 400-mA power supply
- 7.0-V, 1.0-A power supply
- Output reset generation function
- The 5.0-V system can be controlled (on/off) from the provided active-high enable pin.

Features

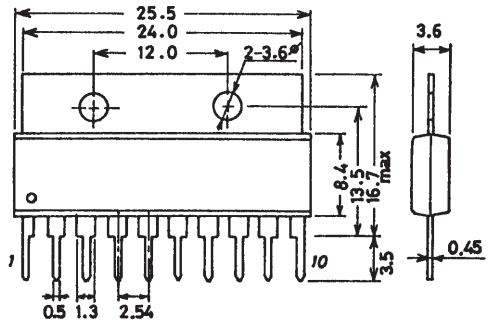
- The reset output delay time can be set with an external capacitor.
- Sharp-cutoff current limiter circuit and thermal protection circuit
- Active pull-up element incorporated in reset output circuit for improved noise suppression.

Package Dimensions

unit: mm

3018A-SIP10F

[LA5616]



SANYO: SIP10F

Specifications

Absolute Maximum Ratings at Ta = 25°C

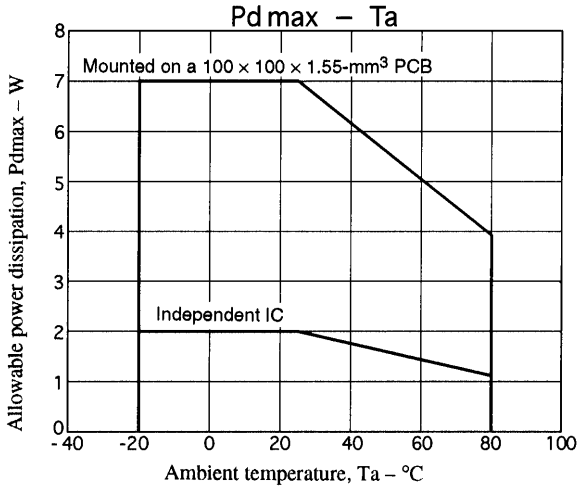
Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	V_{IN} max		18	V
Enable pin voltage	V_{EN} max		V_{IN} max	V
Reset output pin voltage	$V_{\overline{RES}}$ max		18	V
Allowable power dissipation	Pd max		2	W
Operating temperature	Topr		–20 to +80	°C
Storage temperature	Tstg		–55 to +150	°C

Operating Conditions at Ta = 25°C

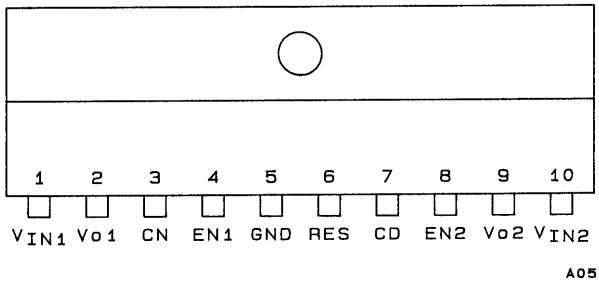
Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	V_{IN}		5.6 to 17	V
Output current	$I_{OUT}1$		0 to 400	mA
	$I_{OUT}2$		0 to 1.0	A
Reset output source current	I_{ORH}	High level	0 to 200	µA
Reset output sink current	I_{ORL}	Low level	0 to 2	mA

Electrical Characteristics at Ta = 25°C

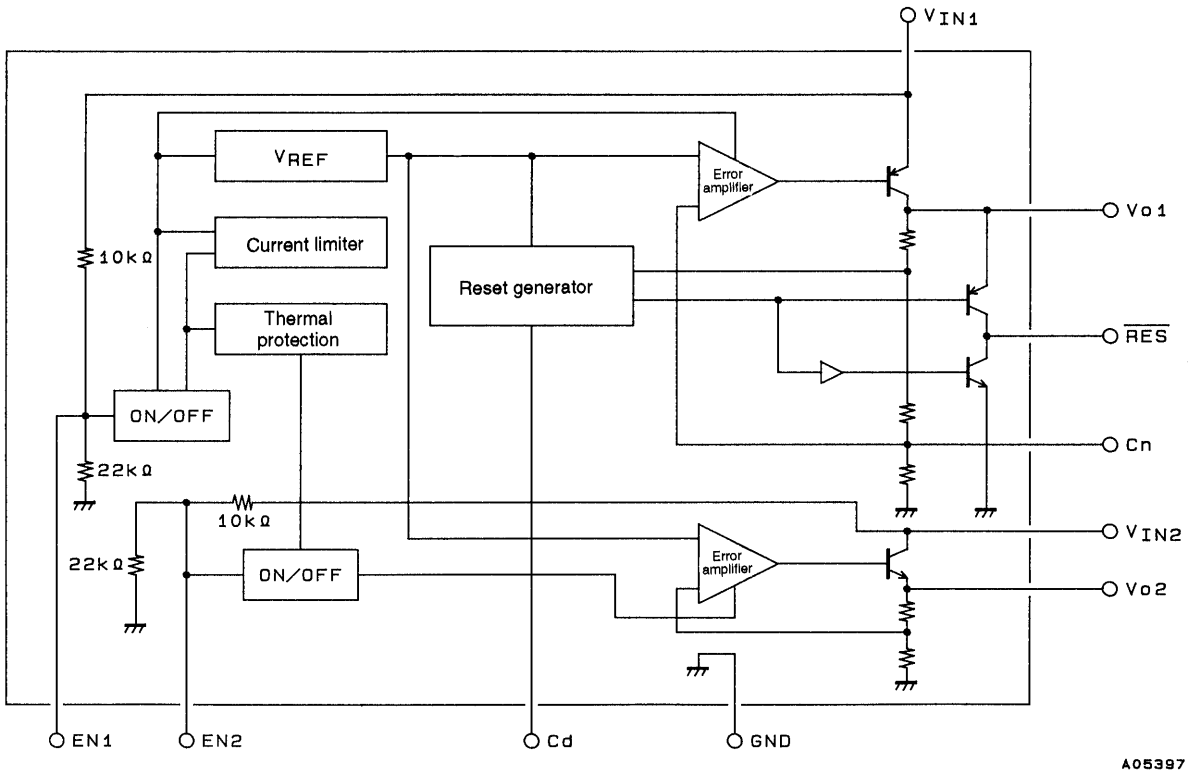
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[5.0-V Power Supply Block] $V_{IN}1 = V_{IN}2$, $C_{OUT}2$ = 47 µF						
Output voltage	$V_{OUT}1$	$V_{IN}1$ = 12 V, $I_{OUT}1$ = 400 mA	4.75	5.0	5.25	V
Dropout voltage	$V_{DROP}1$	$V_{IN}1$ = 4.9 V, $I_{OUT}1$ = 400 mA		0.5	1.0	V
Line regulation	$\Delta V_{OLN}1$	5.6 ≤ $V_{IN}1$ ≤ 17 V, $I_{OUT}1$ = 400 mA		20	100	mV
Load regulation	$\Delta V_{OLD}1$	5 mA ≤ I_O ≤ 400 mA, $V_{IN}1$ = 12 V		50	150	mV
Peak output current	$I_{OP}1$	$V_{IN}1$ = 12 V	400	500		mA
Output shorted current	$I_{OSC}1$	$V_{IN}1$ = 12 V		100	400	mA
Output noise voltage	V_N1	10 Hz ≤ f ≤ 100 kHz		70		µVrms
Output voltage temperature coefficient	$\Delta V_O/\Delta Tal$	Tj = 25 to 125°C		1.6		mV/°C
Ripple rejection	Rref1	f = 120 Hz, 6 V ≤$V_{IN}1$ ≤ 17 V		60		dB
Output on control voltage	$V_{ENH}1$	$V_{IN}1$ = 12 V	2.6			V
Output off control voltage	$V_{ENL}1$	$V_{IN}1$ = 12 V			1.0	V
Low-level output voltage	$V_{O\ OFF}1$	$V_{IN}1$ = 12 V			0.3	V
[Reset Block] $V_{IN}1 = V_{IN}2$ = 12 V						
High reset output voltage	V_{ORH}	I_{ORH} = 200 µA, Cd pin open	4.73	4.98	5.23	V
Low reset output voltage	V_{ORL}	I_{SRL} = 2 mA, with Cd shorted to GND		100	200	mV
Reset threshold voltage	V_{RT}		3.95	4.2	4.45	V
Reset hysteresis voltage	Vhys		40	100	200	mV
Reset output delay time	td	Cd = 0.1 µF	7.5	10	12.5	ms
[7.0-V Power Supply Block] $V_{IN}1 = V_{IN}2$, $C_{OUT}2$ = 47 µF						
Output voltage	$V_{OUT}2$	$V_{IN}2$ = 12 V, $I_{OUT}2$ = 1 A	6.5	7.0	7.5	V
Dropout voltage	$V_{DROP}2$	$V_{IN}2$ = 6.5 V, $I_{OUT}2$ = 1 A		1.0	2.0	V
Line regulation	$\Delta V_{OLN}2$	9.0 ≤ $V_{IN}2$ ≤ 17 V, $I_{OUT}2$ = 1 A			200	mV
Load regulation	$\Delta V_{OLD}2$	5 mA ≤ I_O ≤ 1.0 A, $V_{IN}2$ = 12 V			300	mV
Peak output current	$I_{OP}2$	$V_{IN}2$ = 12 V	1.0			A
Output shorted current	$I_{OSC}2$	$V_{IN}2$ = 12 V		500		mA
Ripple rejection	Rref2	f = 120 Hz, 9.0 V ≤ $V_{IN}2$ ≤ 17 V		50		dB
Output on control voltage	$V_{ENH}2$	$V_{IN}2$ = 12 V	2.6			V
Output off control voltage	$V_{ENL}2$	$V_{IN}2$ = 12 V			1.0	V
Low-level output voltage	$V_{O\ OFF}2$	$V_{IN}2$ = 12 V			0.3	V



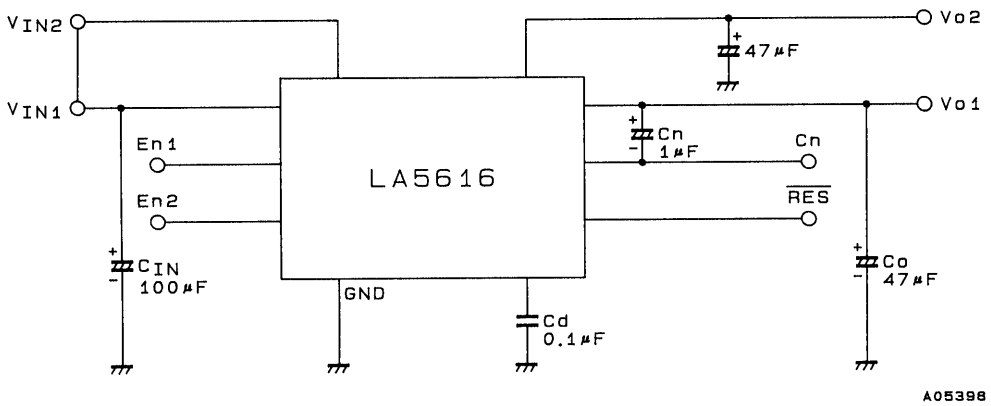
Pin Assignment



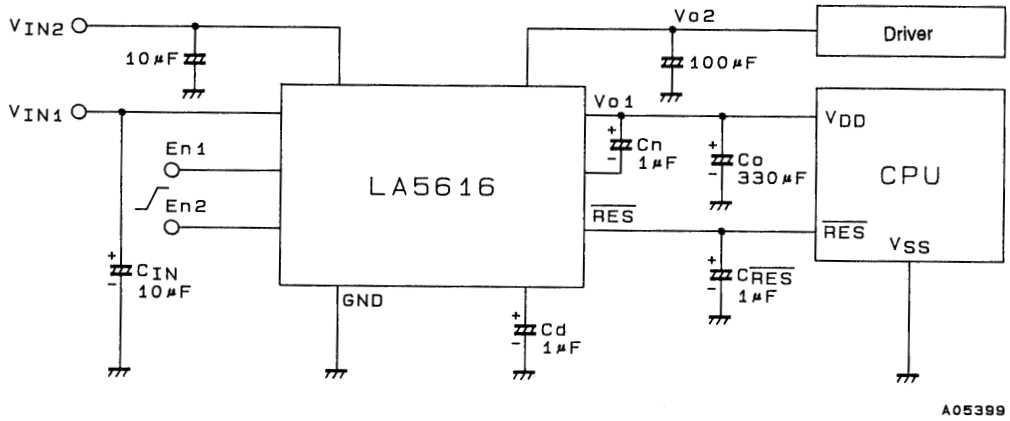
Equivalent Circuit Block Diagram



Test Circuit Diagram



Application Circuit Example



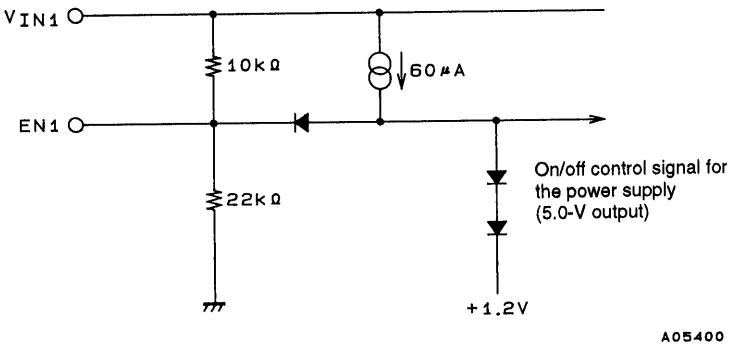
Note: 1. The capacitors Cn and $C_{\overline{RES}}$ are only needed when external noise is a problem.
If these capacitors are used, then capacitor Co must have a value at least 1/3 that of capacitor C_{IN}.
A certain amount of noise may occur when V_{IN} goes off due to differences in discharge timings between the capacitors.
2. A capacitor with a low temperature dependence must be used for the delay capacitor Cd.
3. The minimum value for the output capacitor Co is 47 µF.
4. The input voltages must obey the relationship $V_{IN}1 \leq V_{IN}2$, and must be brought up at the same time.

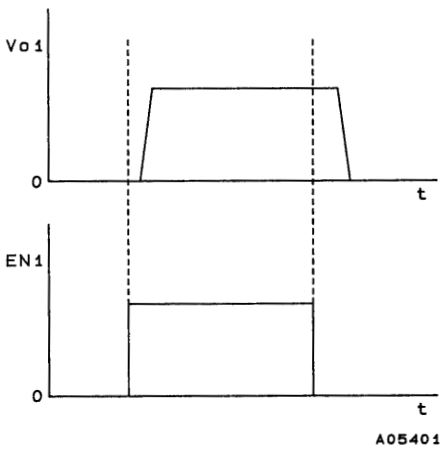
Function Table

EN1, EN2	V_O1
L	L
H	H

Note: Open is also possible for the $V_{EN}1 = V_{EN}2$ = high state.
(EN_1, EN_2 is independent.)

Enable Input Equivalent Circuit





Reset Operation