


LA5603

Multifunction, Multiple Voltage Power Supply

Overview

The LA5603 is a multifunction, low dropout voltage, multiple voltage power supply for use in microcomputer controlled audio equipment such as CD players and minicomponent stereo systems.

The LA5603 features a 5.6V, 0.5A supply, a 7.5V, 1.0A supply and a -7.5V, -1.0A supply each with an on/off switch, a 4.8V ($I_{OA2}=0.1A$, $I_{OA1}=0$) supply with a reverse current prevention diode and a 5.6V ($I_{OA1}=0.1A$, $I_{OA2}=0$) supply enabling it to power both analog and digital components.

The LA5603 incorporates reset, mute and power-on functions for generating signals for the components (s) being powered and an adjustable startup delay function for controlling the sequence in which system components are powered up.

The LA5603 operates from a ± 8.5 to $\pm 16V$ dual supply and is available in 18-pin SIPs.

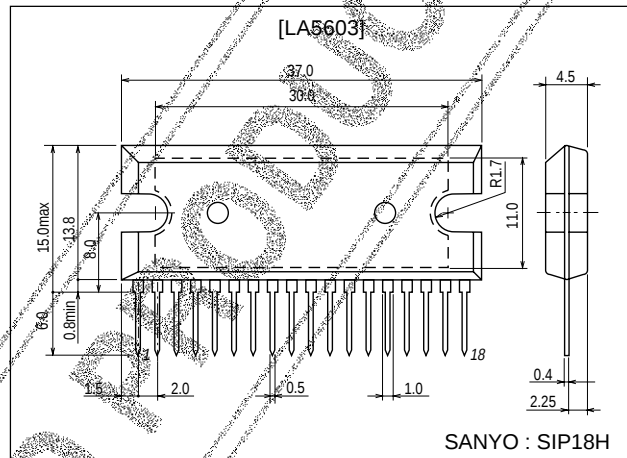
Features

- Low dropout voltage power supply.
- 5.6V, 0.5A supply with on/off switch.
- 7.5V, 1.0A and -7.5V, -1.0A supplies with on/off switches.
- 4.8V ($I_{OA2}=0.1A$, $I_{OA1}=0$) supply with diode to prevent reverse currents.
- 5.6V ($I_{OA1}=0.1A$, $I_{OA2}=0$) supply.
- Reset function.
- Mute function.
- Auto power-on function.
- Powers both analog and digital components.
- ± 8.5 to $\pm 16V$ dual supply.
- 18-pin SIP.

Package Dimensions

unit:mm

3109-SIP18H



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51001TN (KT)/N042TS No.4063-1/4

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}/V_{EE} max		± 16	V
QUICK IN input voltage	$V_{\text{QUICK IN}}$		16	V
Allowable power dissipation	P_d max		15	W
Operating temperature	T_{opr}		-20 to $+85$	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to $+150$	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}/V_{EE}		± 8.5 to ± 16	V
Output current 1	I_{O1}		0 to 500	mA
Output current 2	I_{O2}		0 to 1.0	A
Output current 3	I_{O3}		-1.0 to 0	A
MUTE output current	I_{MUTE}		0 to 10	mA
RES low-level output sink current	I_{ORL}		0 to 2	mA
RES high-level output source current	I_{ORH}		0 to 200	μA
Auxiliary power total supply output current	$I_{\text{OA1}}, I_{\text{OA2}}$	$I_{\text{OA1}} + I_{\text{OA2}}$	0 to 100	mA

Operating Characteristics

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[Main power supply] at Ta=25°C, Tj=25°C, VCC/VEE=±8.5V, VOA1=5.6V, VOA2=4.8V, IOA1=100mA, unless otherwise noted						
Output voltage	VOA1	IOA2=0 (IOA1=100mA)	5.2	5.6	5.9	V
	VOA2	IOA2=100mA (IOA1=0)	4.2	4.8	5.2	V
Dropout voltage	VDROP			0.6	1.0	V
Line regulation	ΔVOA1 LN	VCC=7 to 12V, IOA1=50mA		10	80	mV
Load regulation	ΔVOA1 LD	IOA1=1 to 100mA		20	100	mV
Peak output current	IOP		100	200		mA
Output short-circuit current	IOSC			10		mA
Output leakage current	IOALEAK	VCC=0V, VOA2=6V			2	μA
Current drain with positive power supply	IQP1	IO1, IO2, IO3, IOA1 and IMUTE=0A		6.5	19.5	mA
	IQP2	IO1=200mA, IO2=500mA, IO3=0mA, IOA1=100mA, IMUTE=5mA		26	78	mA
Current drain with negative power supply	IQM1	IO1, IO2, IO3, IOA1 and IMUTE=0A		-3.2	-9.6	mA
	IQM2	IO1, IO2, IOA1 and IMUTE=0A, IO3=-500mA		-6.3	-19	mA
[Reset] at Ta=25°C, Tj=25°C, VCC/VEE=±8.5V						
Output high-level voltage	VORH	IORH=200μA	4.47	4.97	5.47	V
Output low-level voltage	VORL	IORL=2mA, Cd grounded		100	200	mV
Output voltage threshold	VRT	IOA1=5mA, VOA1 detection voltage low	3.7	3.9	4.1	V
Hysteresis voltage	Vhys	IOA1=5mA		100	200	mV
Output delay time	td	Cd=1μF	240	300	360	ms
[5.6V power supply] at Ta=25°C, Tj=25°C, VCC/VEE=±8.5V, IO=200mA unless otherwise noted						
Output voltage	VO1		5.1	5.6	5.9	V
Dropout voltage	VDROP			0.6	1.0	V
Line regulation	ΔVOLN	VCC=8.5 to 16V		20	100	mV
		VCC=9.5 to 16V		20	100	mV
Load regulation	ΔVOLD	IO=5 to 500mA		50	150	mV
		IO=5 to 100mA		20	100	mV
Peak output current	IOP		500	750		mA
Output short-circuit current	IOSC			80		mA
Output noise voltage	VNO	f=10Hz to 100kHz		70		μV
Output voltage temperature coefficient	ΔVO/ΔTa	Tj=25 to 85°C		-0.7		mV/°C
Ripple rejection ratio	Rrej	f=120Hz, VCC=8.5 to 16V		74		dB
EN high-level output voltage	VENH	Main power source ON	0		0.3	V

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LA5603

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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[7.5V power supply] at Ta=25°C, Tj=25°C, VCC/VEE=±8.5V, IO=500mA, CO=100μF unless otherwise noted						
Output voltage	VO2		7.1	7.5	7.8	V
Dropout voltage	VDROP			0.6	1.0	V
		IO=300mA		0.4	0.8	V
Line regulation	ΔVOLN	VCC=8.5 to 16V		20	100	mV
Load regulation	ΔVOLD	IO=5mA to 1A		80	200	mV
Peak output current	IOP	VCC/VEE=±12V	1.0	1.5		A
Output short-circuit current	IOSC			0.1		A
Output noise voltage	VNO	f=10Hz to 100kHz		70		μVrms
Output voltage temperature coefficient	ΔVO/ΔTa	Tj=25 to 85°C		-0.5		mV/°C
Ripple rejection ratio	Rrej	f=120Hz, VCC=8.5 to 16V		60		dB
[-7.5V power supply] at Ta=25°C, Tj=25°C, VCC/VEE=±8.5V, IO=-500mA, CO=100μF unless otherwise noted						
Output voltage	VO3		-7.8	-7.5	-7.1	V
Dropout voltage	VDROP			0.6	1.0	V
		IO=-300mA		0.4	0.8	V
Line regulation	ΔVOLN	VEE=-16 to -8.5V		200	300	mV
Load regulation	ΔVOLD	IO=-1A to -5mA		80	200	mV
Peak output current	IOP	VCC/VEE=±12V		-1.5	-1.0	A
Output short-circuit current	IOSC			-0.3		A
Output noise voltage	VNO	f=10Hz to 100kHz		70		μV
Output voltage temperature coefficient	ΔVO/ΔTa	Tj=25 to 85°C		+0.5		mV/°C
Ripple rejection ratio	Rrej	f=120Hz, VCC=-16 to -8.5V		60		dB
[5.0V power supply with mute] at Ta=25°C, Tj=25°C, VCC/VEE=±8.5V, IO=5mA						
MUTE ON output voltage	VMUTE ON		4.6	5.0	5.4	V
MUTE OFF output voltage	VMUTE OFF	VQUICK IN=5.5V		0.2	0.3	V
QUICK IN high-level input voltage	VQUICK IN H		7.5		VCC	V
QUICK IN low-level input voltage	VQUICK IN L				5.5	V
QUICK IN high-level current	IQUICK IN H	VQUICK IN=7.5V		240	480	μA

Design Notes

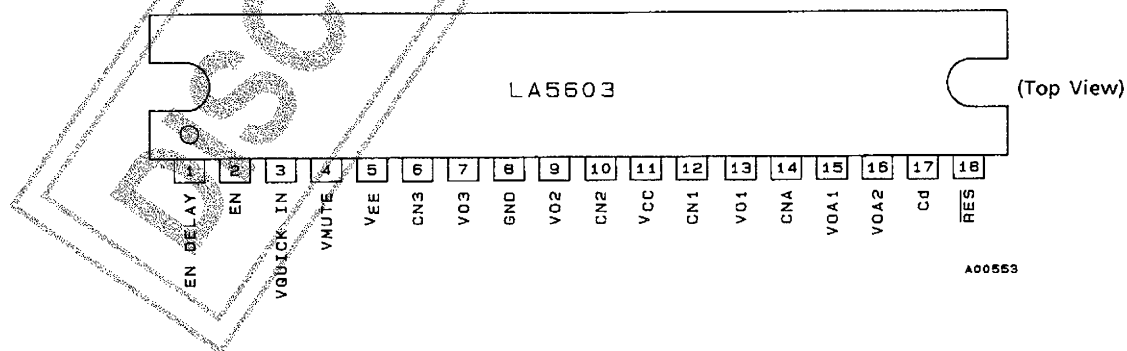
When the 5.6 (VO1), 7.5 and -7.5V output are ON, EN is high impedance.

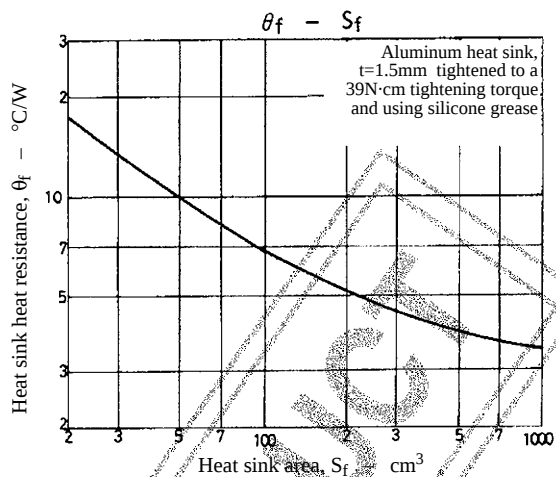
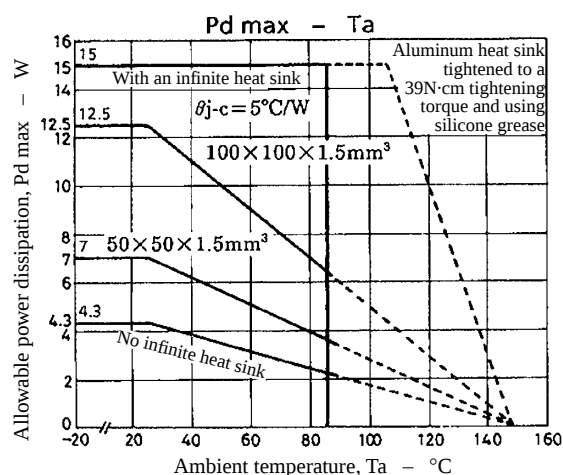
When QUICK IN is HIGH, mute mode is ON. When QUICK IN is LOW, mute mode is OFF.

The output capacitors for VO1, VOA1, and VOA2 should be 47μF or greater. The output capacitors for VO2 and VO3 should be 100μF or greater. The output capacitors and Cd, the startup delay capacitor, should have good temperature stability to prevent oscillations at low temperatures.

Capacitors CN1, CN2, CN3 and CNA suppress noise and improve ripple rejection.

Pin Assignment





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