Ordering number : EN4459B

SANYO Semiconductors
DATA SHEET

LA5605 — Monolithic Linear IC For CD Radio Cassette Recorders Power Supply System

Overview

The LA5605 is an AC/DC power supply IC that incorporates a 7.5V/500mA low saturation regulator and a number of control functions. It is optimal for use as the power supply IC for CD radio cassette recorders and other applications.

Features

- Facilitates designing the AC/DC power supply system for CD radio cassette recorders.
- A wide variety of control circuits incorporated, which realizes further miniaturization in electronic products.
- The adoption of a low-saturation regulator circuit reduces internal power dissipation.

Functions

- Power supply system for CD radio cassette recorders
- For small electronic products
- Low saturation regulator (7.5V/500mA)
- Limiter power supply (9V/60mA)

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	V_{CC} max		24	V
V_{REF} pin voltage	V_{REF} max		6	V
Power Control pin voltage	V_{CONT} max		6	V
Mute pin voltage	V_{MUTE} max		6	V
Remote controller standby pin voltage	V_{REMO} max		6	V
AC standby pin voltage	V_{AC} max		6	V
Allowable power dissipation	Pd max		2.0	W
Operating temperature	Topr		-20 to +80	°C
Storage temperature	Tstg		-55 to +150	°C

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Operating Condition at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	V_{CC}		9 to 22	V
	V_{REF}		4.5 to 5.5	V
7.5V output current	I_O7.5		0 to 500	mA
9V limiter output current	I_O9.0		0 to 60	mA
Remote controller standby output current	I_OREM		0 to 10	mA

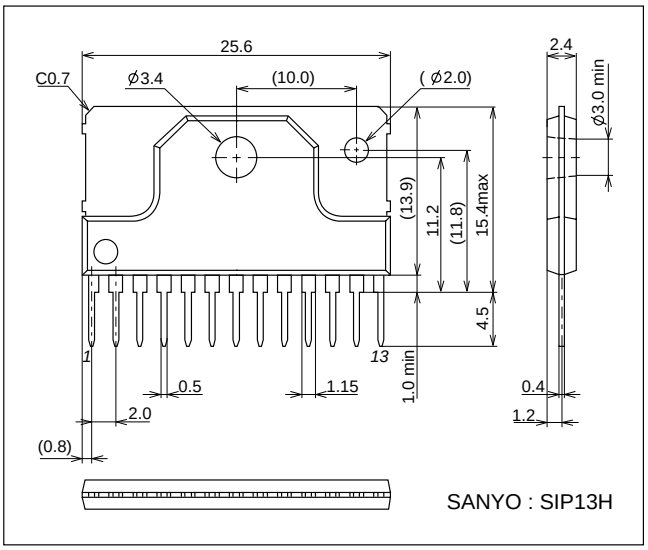
Electrical Characteristics at Ta = 25°C, in the specified test circuit

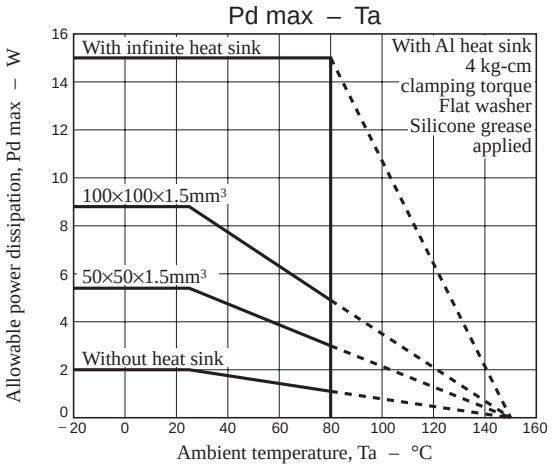
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
No load current						
V_{CC} inflow current	I_{CC}	POWER CONT : "L"			450	μA
Vref5V inflow current	I_{REF1}	V_{CC} = 0V, AC STBY : "L" MUTE IN : "L"			10	μA
	I_{REF2}	V_{CC} = 12V, AC STBY : "L" POWER CONT : "L"		5	10	mA
7.5V regulator block V_{CC} = 12V, I_O7.5 = 500mA, POWER CONT = 5V						
Output voltage	V_O7.5		7.3	7.5	7.7	V
Dropout voltage	V_{DROP1}-7.5			0.5	1.0	V
	V_{DROP2}-7.5	I_O7.5 = 250mA		0.4	0.8	V
Line regulation	ΔV_{OLN}-7.5	V_{CC} = 9V to 22V			200	mV
Load regulation	ΔV_{OLD}-7.5	I_O7.5 = 500mA			200	mV
Peak output current	I_{OP}-7.5		500	800		mA
Output short circuit current	I_{OSC}-7.5			200		mA
9.0V limiter block V_{CC} = 12V, I_O9.0 = 60mA						
Output voltage	V_O9.0		8.0	9.0	9.5	V
Dropout voltage	V_{DROP1}-9.0			1.0		V
Peak output current	I_{OP}-9.0		60	150		mA
Output short circuit current	I_{OSC}-9.0			200		mA
Remote controller standby V_{CC} = 12V, I_O = 10mA						
Output voltage	V_{OREM}		4.8	5.0	5.2	V
Dropout voltage	V_{DROP1}-REM			50	100	mV
Peak output current	I_{OP}-REM		10	70		mA
Output short circuit current	I_{OSC}-REM			70		mA
MUTE OUT V_{CC} = 12V, MUTE IN = 1.2V						
Output residual voltage	V_{SAT}-MUTE	I_{OMUTE} = 50μA			2	V
Switched REF V_{CC} = 12V, POWSER CONT = 5V						
Output residual voltage	V_{SAT}-SWIT	I_{OSWIT} = 1mA			2	V
PWR DET V_{CC} = 12V						
Output residual voltage	V_{SAT}-PWR	I_{OPWR} = 1mA			0.5	V
Detection voltage	V_{DET}	R_{PWR}		8.0		V
Variable width	V_W		-2.0		2.0	V
MUTE IN V_{CC} = 12V						
Output on control voltage	V_{IMUTE}-ON		1.2			V
Output off control voltage	V_{IMUTE}-OFF				0.6	V
POWER CONT V_{CC} = 12V						
Output on control voltage	V_{ICONT}-ON		3.0			V
Output off control voltage	V_{ICONT}-OFF				2.0	V
AC STBY V_{CC} = 12V						
Output on control voltage	V_{IAC}-ON		2.0			V
Output off control voltage	V_{IAC}-OFF				1.0	V

Package Dimensions

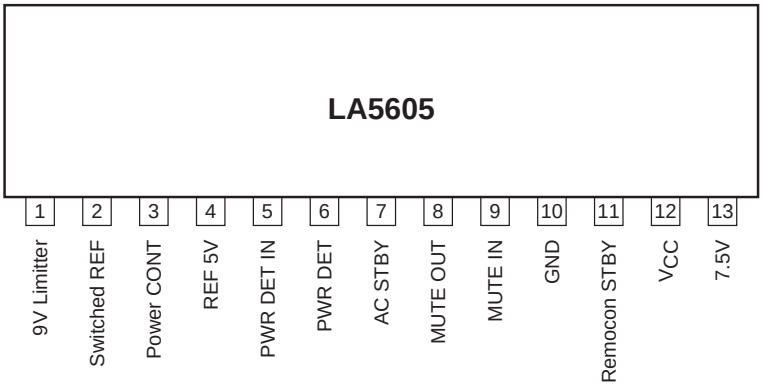
unit : mm (typ)

3107B

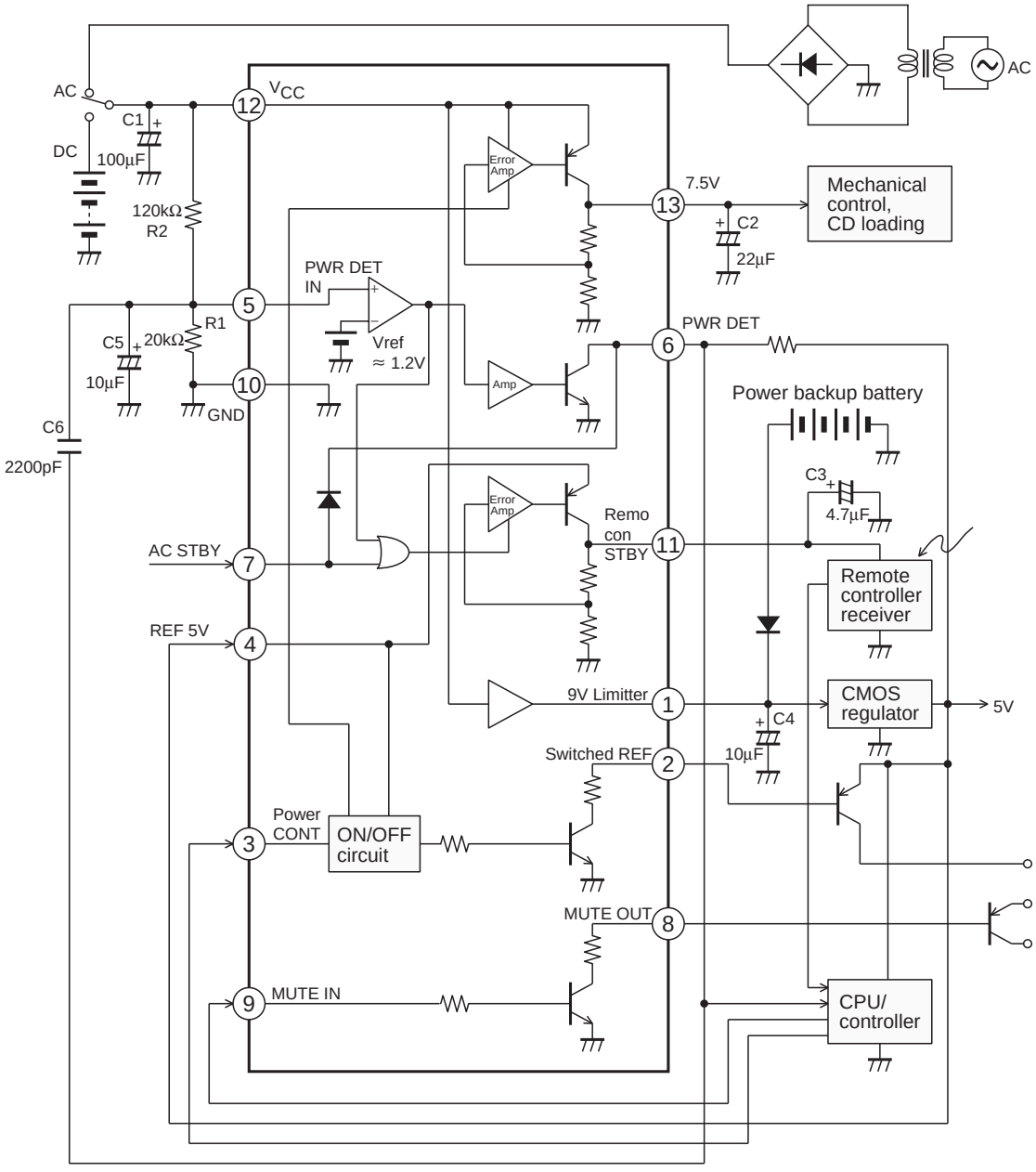




Pin Assignments



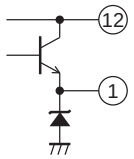
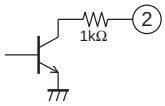
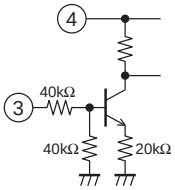
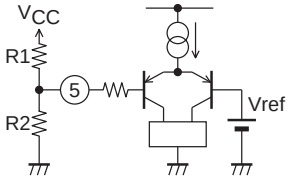
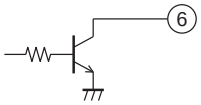
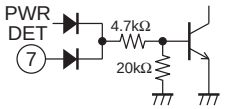
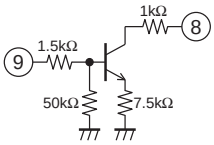
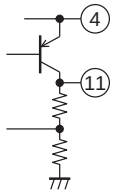
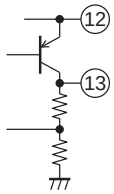
Block Diagram and Sample Application Circuit



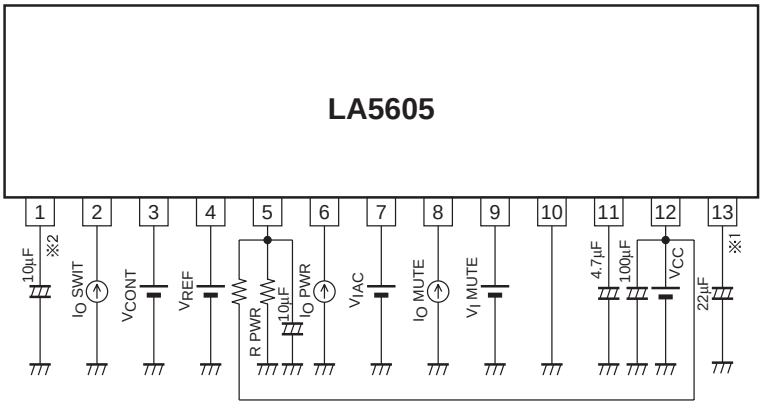
Notes :

1. The capacitance of the C2 7.5V output capacitor must be 22µF (equivalent to a SANYO HW series aluminum electrolytic capacitor) or larger.
2. The capacitance of the C4 9.0V limiter output capacitor must be 10µF (equivalent to a SANYO HW series aluminum electrolytic capacitor) or larger.
3. C5 and C6 must always be connected to suppress noises that may occur during transient operations.

Pin Functions

Pin No.	Symbol	Description	Remarks	Equivalent Circuit
1	9V Limitter	•Used with an external CMOS regulator to make up a backup power supply. •Blocks current from flowing into the IC when V_{CC} is turned off.		
2	Swutched REF	•Transistor switch that conducts current when Power CONT is set high.	•For controlling external transistors.	
3	Power CONT	•7.5V regulator and Switched REF output control (high active)	•On/off control of this pin is enabled when predefined voltage is present at the V_{CC} and REF 5V pins.	
4	REF 5V	•Power source for the on/off and remote controller STBY circuits	•Supplied from the backup power supply	
5	PWR DET IN	•Input pin for detecting the source voltage •The threshold level is determined by external resistors.	•V_{CC} (DET) = Vref (1+ $\frac{R2}{R1}$) •Vref ≈ 1.2V	
6	PWR DET	•Supply voltage detection output		
7	AC STBY	•AC power monitoring input		
8	MUTE OUT	•Independent transistor switch (output)	•Used for mute operation, etc.	
9	MUTE IN	•Independent transistor switch (input)		
10	GND	•Lowest voltage level of this IC		
11	Remocon STBY	•Used to control the remote controller power supply via the Power DET and AC STBY pins.	•Stops function of the remote controller when voltage drops.	
12	V_{CC}	•External power supply input pin		
13	7.5V	•7.5V low saturation regulator output •On/off of this pin is controlled by Power CONT.		

Designated Test Circuit Diagram



Function Tables

V_{CC} : On, REF 5V : On

Power CONT	7.5V Regulator	Switched REF *
L	L	H
H	H	L

* : When pulled up with a resistor

V_{CC} : On, REF 5V : On, Power CONT : High

PWR Voltage Setting	AC STBY	Power DET *	Remocon STBY
V5 < 1.2V	L	H	L
V5 > 1.2V	L	L	H
V5 < 1.2V	H	H	H
V5 > 1.2V	H	L	H

* : When pulled up with a resisto