

SANYO

No. 4185

LA5685N

Multi-function, multi-power supply IC for car radios

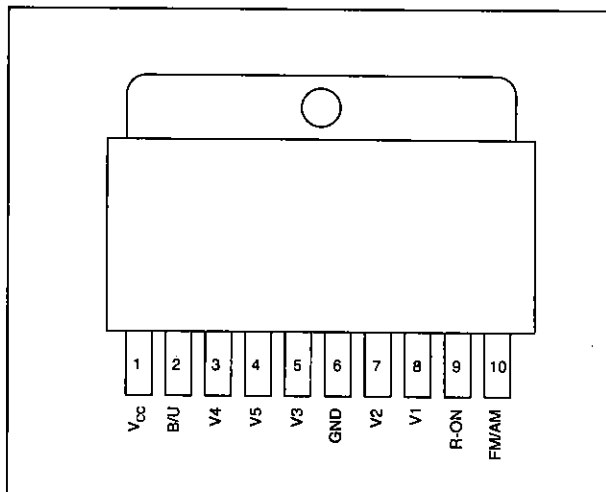
OVERVIEW

The LA5685N is a multi-function, multi-power supply IC developed for car radios. It has 8.5V AM output, 8.5V FM output, 8.5V common output, 5.2V microcomputer output, and 5.1V bias output, making it the ideal power supply for LA1833 and LA1887 ICs for FM/AM tuner systems.

FEATURES

- A total of five built-in outputs: $V_1=8.5\text{ V}$ (AM), $V_2=8.5\text{ V}$ (FM), $V_3=8.5\text{ V}$ (common), $V_4=5.2\text{ V}$ (microcomputer), and $V_5=5.1\text{ V}$
- R ON/OFF, FM/AM switching functions
- Minimal static current for back up (120 μA typ.)
- Built-in overvoltage protection circuit (V_1 , V_2 , and V_3 go off at 28 V (typ.), V_4 and V_5 go off at 56 V (typ.))
- Built-in thermal shutdown circuit (output goes off at $T_j = 170^\circ\text{C}$ (typ.))
- Built-in short protection circuit

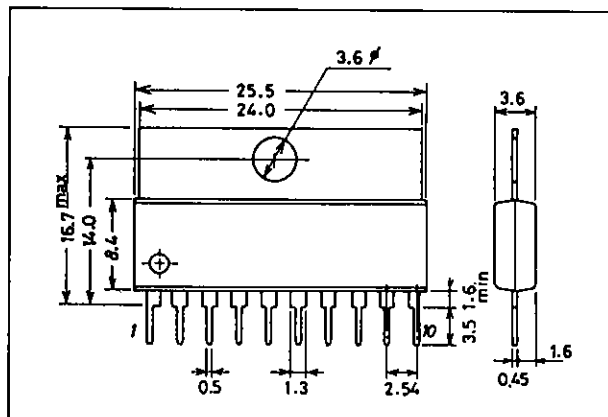
Pinout



Package Dimensions

Unit: mm

3046B-SIP10F



LA5685N

Maximum Ratings / Ta = 25°C

			unit
Input voltage	V _{CC} max1 4% duty pulse width 200 mS pulse input (input pulse when output on)	75	V
	V _{CC} max2	25	V
Output current	I1 max	80	mA
	I2 max	100	mA
	I3 max	200	mA
	I4 max	50	mA
	I5 max	5	mA
Allowable power dissipation	Pd max	2.45	W
Operation temperature	T _{opr}	-35~+85	°C
Storage temperature	T _{stg}	-40~+125	°C

Operating Conditions / Ta=25°C

			unit
Power supply voltage	V _{CC} op	9 V~10.5 V not regulated	9~16 V
B/U voltage	B/U	6 V~8.5 V not regulated	6~16 V

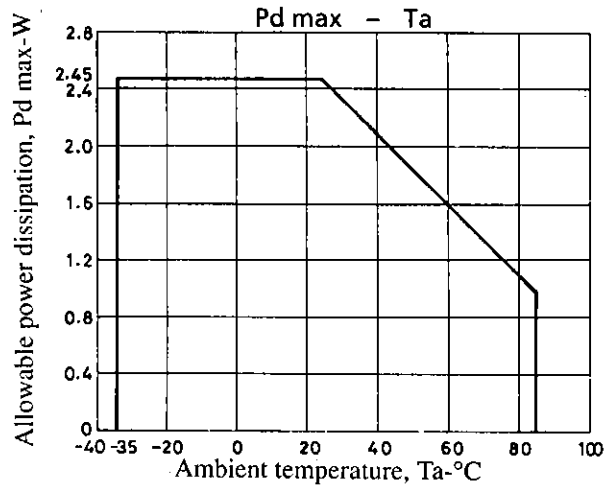
Operating Characteristics / Ta=25°C; unless otherwise noted, V_{CC}= 12V, R-ON=FM/AM=5V

External 33μF OS capacitor connected to V1, V2, V3, and V4

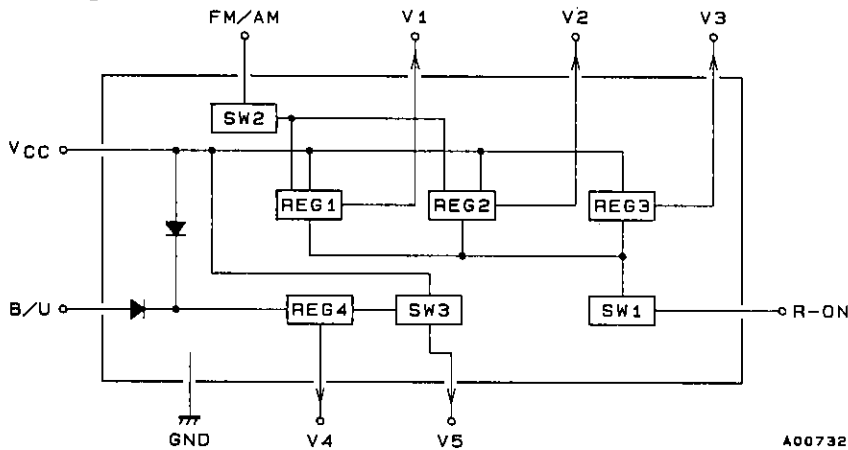
	x		min	typ	max	unit	Note
Static current	I _{CC} 1	R-ON=FM/AM=0V		4.5	7.0	mA	
	I _{CC} 2	R-ON=FM/AM=5V		4.5	7.0	mA	
Output voltage	V1	FM/AM=0V, I1=20mA	7.8	8.5	9.2	V	
	V2	FM/AM=5V, I2=50mA	7.8	8.5	9.2	V	
	V3	I3=100mA	7.8	8.5	9.0	V	
	V4	I4=20mA	4.9	5.2	5.5	V	
	V5	I5=1mA	V4-0.5		V4	V	
Line regulation	ΔV1 line	FM/AM=0V, 11V<V _{CC} <15V, I1=20mA			50	mV	
	ΔV2 line	FM/AM=5V, 11V<V _{CC} <15V, I2=50mA			50	mV	
	ΔV3 line	I3=100mA, 11V<V _{CC} <15V			50	mV	
	ΔV4 line	I4=20mA, 11V<V _{CC} <15V			50	mV	
	ΔV5 line	I5=1mA, 11V<V _{CC} <15V			50	mV	
B/U static current	IB/U	B/U=16V, V _{CC} =0V			0.3	mA	
V5 On-Off TH voltage	V5 _{TH}	B/U=12V	6	7	8	V	
R-ON on voltage	R-ON ON		2.5		V _{CC}	V	
R-ON off voltage	R-ON OFF		-0.3		+1.0	V	
FM/AM on voltage	FM/AM ON		2.5		V _{CC}	V	
FM/AM off voltage	FM/AM OFF		-0.3		+1.0	V	
Input current R-ON	IR-ON	R-ON=5V			0.2	mA	
Input current FM/AM	IFM/AM	FM/AM=5V			0.2	mA	
Load regulation	ΔV1 Load	FM/AM=0V, 1mA<I1<65mA			50	mV	
	ΔV2 Load	FM/AM=5V, 1mA<I2<90mA			50	mV	
	ΔV3 Load	1mA<I3<160mA			100	mV	
	ΔV4 Load	1mA<I4<40mA			50	mV	
	ΔV5 Load	0.1mA<I5<2mA			200	mV	
Ripple regulation	Rr1	FM/AM=0V, f=120Hz, I1=20mA	40			dB	※
	Rr2	FM/AM=5V, f=120Hz, I2=50mA	40			dB	※
	Rr3	f=120Hz, I3=100mA	40			dB	※
	Rr4	f=120Hz, I4=20mA	40			dB	※
	Rr5	f=120Hz, I5=1mA	40			dB	※

Note: ※ indicates design guaranteed value.

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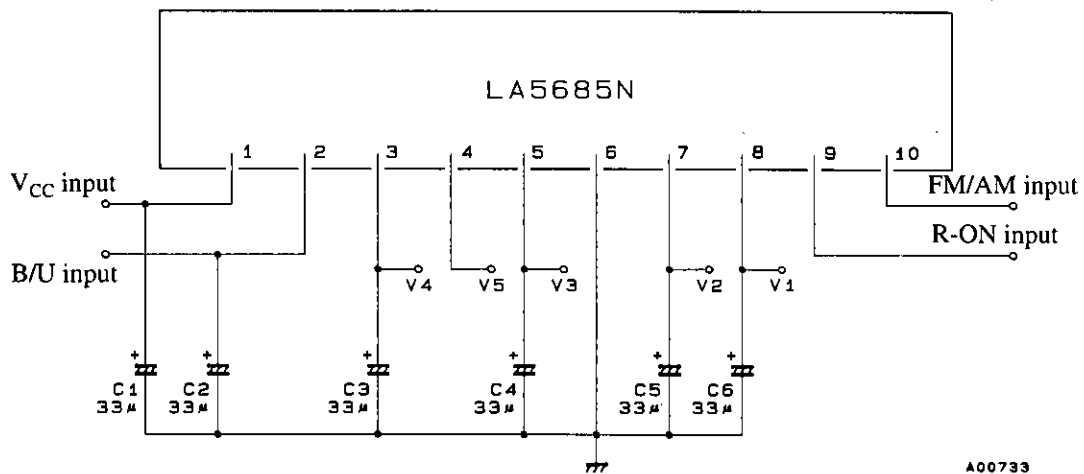


Block Diagram



Pin	Name	Pin	Name
1	V _{CC}	6	GND
2	B/U	7	V2
3	V4	8	V1
4	V5	9	R-ON
5	V3	10	FM/AM

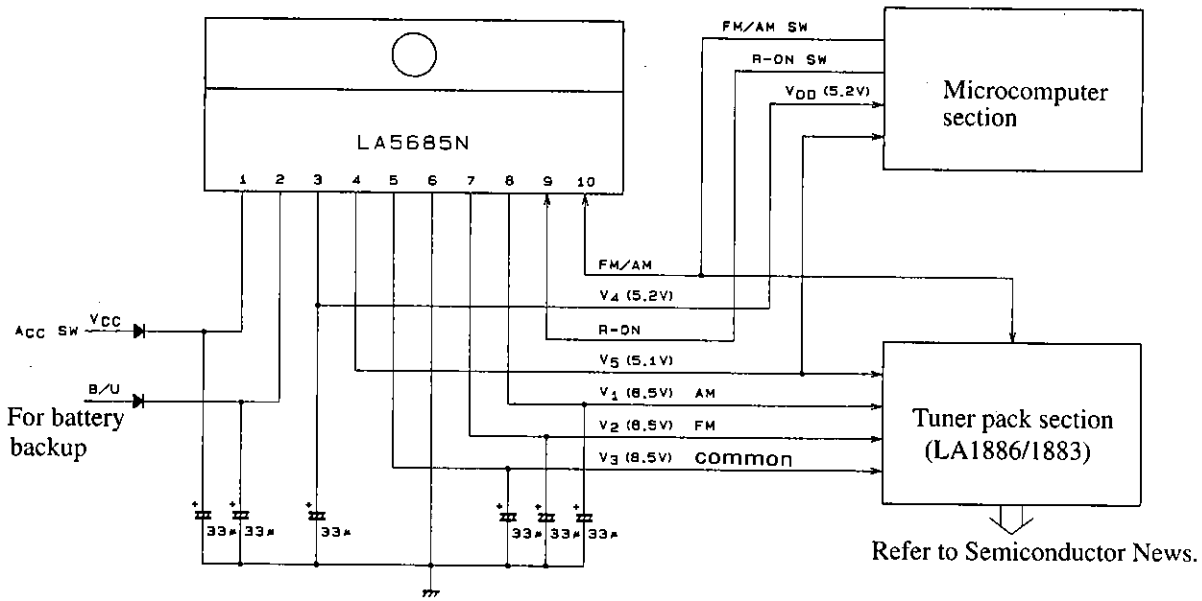
Measurement Circuit



Unit (capacitance: F)

LA5685N

Application Circuit Examples



AC0734

Input/Output Table

Inputs				Outputs				
ACC	B/U	R-ON	FM/AM	V1	V2	V3	V4	V5
L	L	*	*	L	L	L	L	L
L	H	*	*	L	L	L	H	L
H	*	H	L	H	L	H	H	H
H	*	H	H	L	H	H	H	H
H	*	L	*	L	L	L	H	H

- Negative voltages are not to be applied to these pins.
- Always use input/output capacitors (instead of for V5).
(We recommend OS capacitors with good characteristics at low temperature.)
- Built-in overvoltage protection circuit (V1, V2, and V3 go off at 28V (typ.), V4 and V5 go off at 56V (typ.))
- Built-in thermal shutdown circuit (output goes off at $T_j = 170^\circ\text{C}$ (typ.))
- Built-in short protection circuit

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