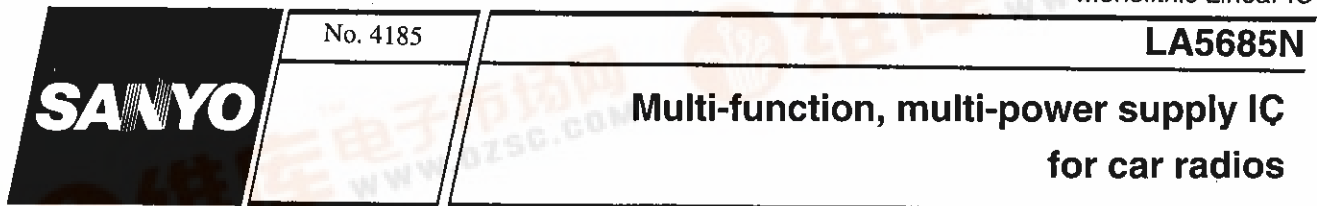


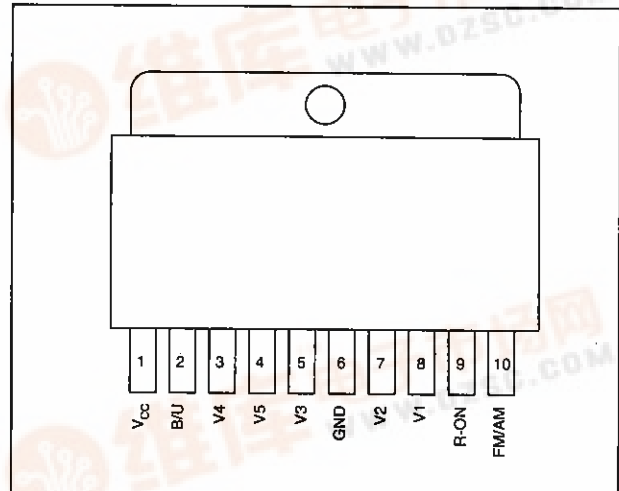
Monolithic Linear IC

**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 micro-computer output, and 5.1V bias output, making it the ideal power supply for LA1833 and LA1887 ICs for FM/AM tuner systems.

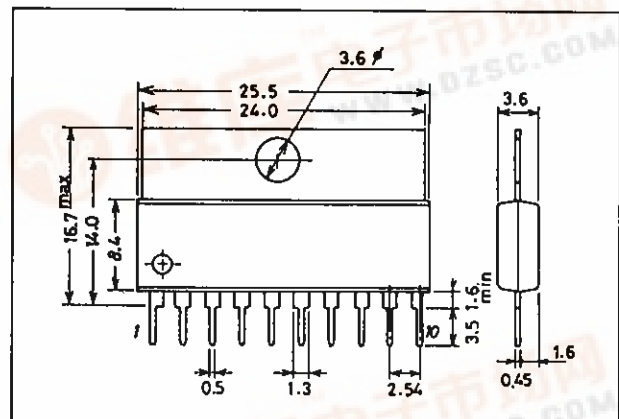
**FEATURES**

- 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  $\mu\text{A}$  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 <sub>CC</sub> max1 4% duty pulse width 200 mS pulse input (input pulse when output on)	75	V
Output current	V <sub>CC</sub> max2	25	V
	I1 max	80	mA
	I2 max	100	mA
	I3 max	200	mA
	I4 max	50	mA
Allowable power dissipation	I5 max	5	mA
	Pd max	2.45	W
Operation temperature	<b>Topr</b>	-35~+85	°C
Storage temperature	<b>Tstg</b>	-40~+125	°C

Operating Conditions / Ta=25°C			unit
Power supply voltage	V <sub>CC</sub> 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

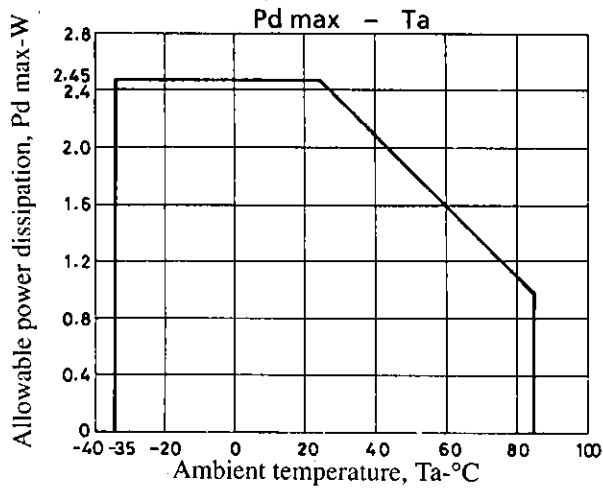
### Operating Characteristics / Ta=25°C; unless otherwise noted, V<sub>CC</sub>= 12V, R-ON=FM/AM=5V

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

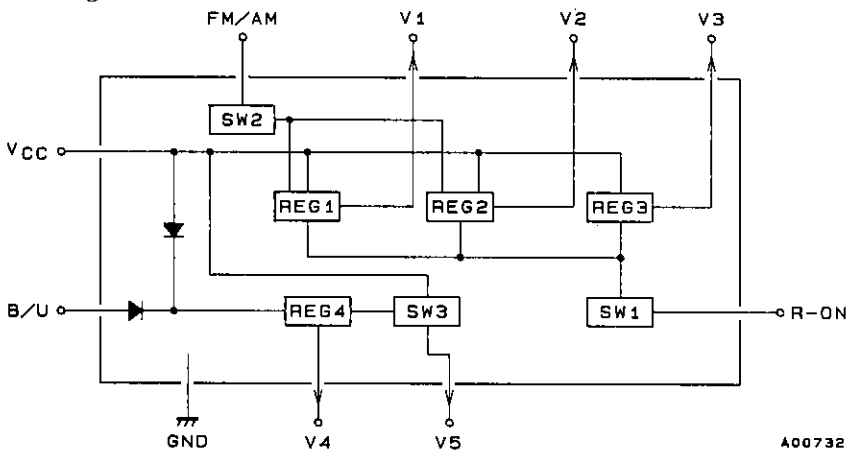
	x		min	typ	max	unit	Note
Static current	I <sub>CC</sub> 1	R-ON=FM/AM=0V		4.5	7.0	mA	
	I <sub>CC</sub> 2	R-ON=FM/AM=5V		4.5	7.0	mA	
Output voltage	V1	FM/AM=0V, I1=20mA	7.8	8.5	9.2	V	
	V2	FM/AM=5V, I2=50mA	7.8	8.5	9.2	V	
	V3	I3=100mA	7.8	8.5	9.0	V	
	V4	I4=20mA	4.9	5.2	5.5	V	
	V5	I5=1mA	V4-0.5		V4	V	
Line regulation	ΔV1 line	FM/AM=0V, 11<V <sub>CC</sub> <15V, I1=20mA			50	mV	
	ΔV2 line	FM/AM=5V, 11V<V <sub>CC</sub> <15V, I2=50mA			50	mV	
	ΔV3 line	I3=100mA, 11V<V <sub>CC</sub> <15V			50	mV	
	ΔV4 line	I4=20mA, 11V<V <sub>CC</sub> <15V			50	mV	
	ΔV5 line	I5=1mA, 11V<V <sub>CC</sub> <15V			50	mV	
B/U static current	IB/U	B/U=16V, V <sub>CC</sub> =0V			0.3	mA	
V5 On-Off TH voltage	V5 <sub>TH</sub>	B/U=12V	6	7	8	V	
R-ON on voltage	R-ON ON		2.5		V <sub>CC</sub>	V	
R-ON off voltage	R-ON OFF		-0.3		+1.0	V	
FM/AM on voltage	FM/AM ON		2.5		V <sub>CC</sub>	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.

# LA5685N



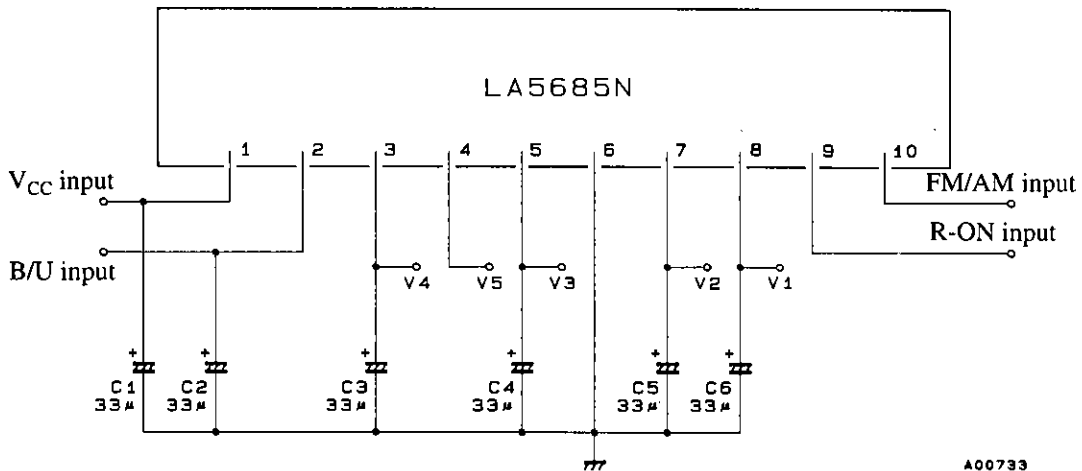
## Block Diagram



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

A00732

## Measurement Circuit

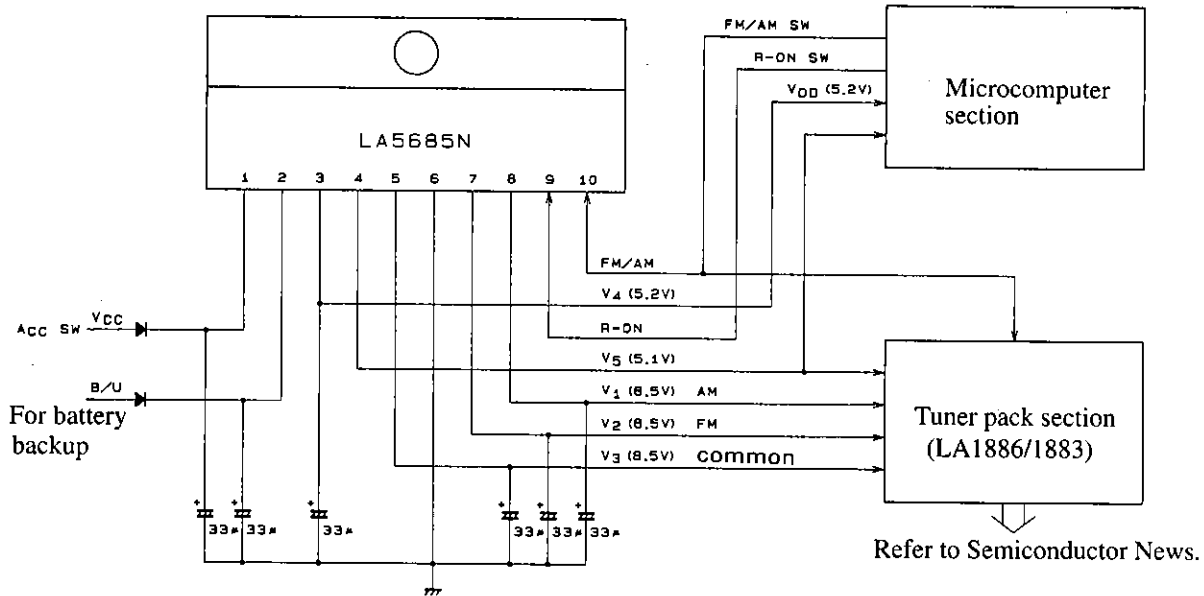


A00733

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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