STRUCTURE Silicon Monolithic Integrated Circuit

TYPE Bipolar System Power Supply

PRODUCT SERIES **BA4911**

FEATURES
- Terminal for micro controller power supply hold
- 5ch Regulator Outputs
- 2ch High Side Switches

○ABSOLUTE MAXIMUM RATINGS(Ta=25℃)

Parameter	Symbol	Limits	Unit
Supply Voltage	VCC	36	V
Power Dissipation	Pd	3400	mW
Operating Temperature Range	Topr	-30～+85	℃
Storage Temperature Range	Tstg	-55～+150	℃
Maximum Junction Temperature	Tjmax	150	℃
Peak Supply Voltage	VCC PEAK	50 (*1)	V

(*1)tr≧1msec Bias voltage less than 200msec

○RECOMMENDED OPERATING RANGES(Ta=25℃)

Parameter	Limits	Unit	Comment
Recommended Supply Voltage 1	10～18	V	Except VDD and ILM output
Recommended Supply Voltage 2	8.2～18	V	VDD output
Recommended Supply Voltage 3	11.4～18	V	ILM output

*This product is not designed for protection against radioactive rays.

*The product described in this specification is a strategic product (and/or service) subject to COCOM regulations. It should not be exported without authorization from the appropriate government.

*Status of this document
The Japanese version of this document is the formal specification.
A customer may use this translation version only for a reference to help reading the formal version.
If there are any differences in translation version of this document, formal version takes priority.

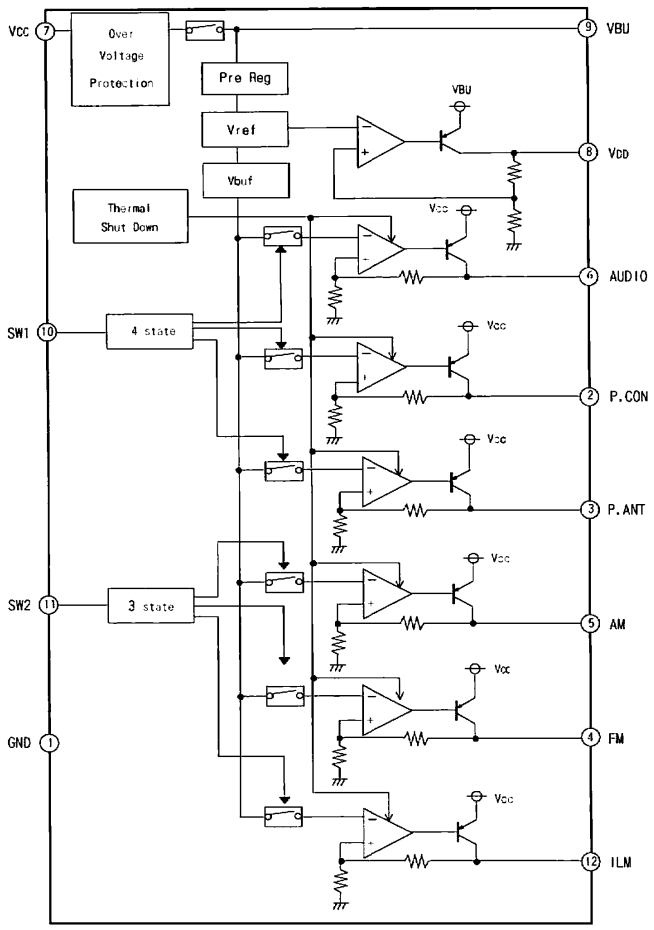
○ELECTRICAL CHARACTERISTICS(Unless otherwise specified Ta=25℃, VCC= 14.4V)

Parameter	Symbol	Limits			Unit	Conditon
		Min.	Typ.	Max.		
Standby Circuit Current 1	Ist1	–	100	150	μA	VCC=13.2V
Standby Circuit Current 2	Ist2	–	100	150	μA	
Output Voltage (VDD) 1	VO1	4.80	5.00	5.20	V	IO=300mA VCC=10～18V
Dropout Voltage 1	△VO1	–	0.4	0.7	V	IO=300mA, VBU-VO1
Dropout Voltage 2	△VO1'	–	2.5	3.0	V	IO=300mA, VCC-VO1
Peak Output Current	IO1	300	–	–	mA	VO1≧4.8V
Ripple Rejection	R.R1	–	55	–	dB	f=100Hz, VRR=-10dBV
Low Vcc Output Voltage	VO1'	3.7	4.0	–	V	VCC=5V, IO=10mA
Output Voltage (AUDIO) 2	VO2	7.8	8.12	8.3	V	IO2=200mA, VCC=10～18V, -30℃～80℃ *1
Dropout Voltage 3	△VO2	–	0.4	0.7	V	IO2=200mA, VCC-VO2
Peak Output Current	IO2	200	–	–	mA	VO 2≧7.8V
Ripple Rejection	R.R2	–	55	–	dB	f=100Hz, VRR=-10dBV
Dropout Voltage (P.CON) 3	△VO3	–	0.4	0.7	V	IO3=200mA
Peak Output Current	IO3	300	–	–	mA	VO3≧13.7V
Dropout Voltage (P.ANT) 4	△VO4	–	0.4	0.7	V	IO4=200mA
Peak Output Current	IO4	300	–	–	mA	VO4≧13.7V
Output Voltage (AM) 5	VO5	7.5	7.9	8.3	V	IO5=50mA, VCC=10～18V, -30℃～80℃ *1
Dropout Voltage	△VO5	–	0.4	0.7	V	IO5=50mA
Peak Output Current	IO5	50	–	–	mA	VO5≧7.5V
Ripple Rejection	R.R5	–	55	–	dB	f=100Hz, VRR=-10dBV
Output Voltage (FM) 6	VO6	7.8	8.12	8.3	V	IO6=50mA, VCC=10～18V, -30℃～80℃ *1
Dropout Voltage	△VO6	–	0.4	0.7	V	IO6=50mA, VCC-VO6
Peak Output Current	IO6	50	–	–	mA	VO6≧7.8V
Ripple Rejection	R.R6	–	55	–	dB	f=100Hz, VRR=-10dBV
Output Voltage (ILM) 7	VO7	9.9	10.3	10.7	V	IO7=250mA, VCC=10～18V
Dropout Voltage	△VO7	–	0.4	0.7	V	IO7=250mA, VCC-VO7
Peak Output Current	IO7	250	–	–	mA	VO7≧9.9V
Ripple Rejection	R.R7	–	50	–	dB	f=100Hz, VRR=-10dBV
Input Pin (SW1)						
Standby Input Voltage	Vth1-1	–	–	1.0	V	
AUDIO ON	Vth1-2	1.5	–	3.0	V	
AUDIO, P-CON ON	Vth1-3	3.5	–	5.0	V	
AUDIO, P-CON, P-ANT ON	Vth1-4	7.0	–	VCC	V	
SW1 Input Impedance	Rin1	100	–	–	kΩ	
Input Pin (SW2)						
Standby Input Voltage	Vth2-1	–	–	1.0	V	
ILM, FM ON	Vth2-2	2.0	–	3.0	V	
ILM, AM ON	Vth2-3	4.0	–	VCC	V	
SW2 Input Impedance	Rin2	100	–	–	kΩ	

*1 Design Guarantee (Output Inspection is not done on al products)

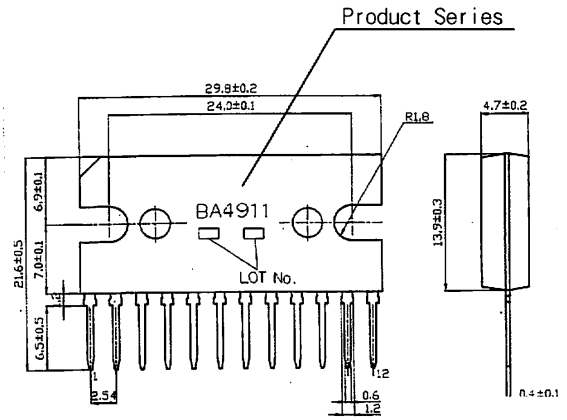
- Use Peak Output Current less than Limits Min. values.

○BLOCK DIAGRAM



※Refer to the Technical Note about the details of the applicaton.

○PHYSICAL DIMENSIONS・MARKING



SIP-M12 (Unit:mm)

○PIN NO. / PIN NAME

PIN NO.	PIN NAME
1	GND
2	P.CON
3	P.ANT
4	FM
5	AM
6	AUDIO
7	VCC
8	VDD
9	VBU
10	SW1
11	SW2
12	ILM

NOTES FOR USE

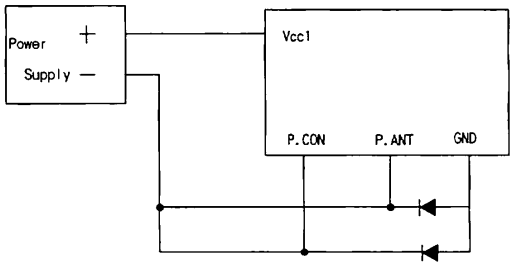
1. Over Voltage Protection Circuit
The Over Voltage Protection Circuit function is that when the difference voltage of VIN1 and GND exceeds over about 27V (room temperature), the each output turn off. Please be sure of the power supply voltage range you use.

2. The oscillation stopper of output capacitor
Please use the oscillation stopper between the every output and GND. The capacitor is over 10 μF and recommended the small temperature change Tantalum Electronic Capacitor.
In case of the capacitor temperature change is big, it may get characteristic improvement to use the serial 1 μF ceramic capacitor and 1 Ω resistor in pararell.

3. Over Current Protection Circuit
Each output, has the Over Current Protection circuit that is enough for the each output current ability, and it protects the IC destruction against the huge current load.
The protection circuit is fold back type current limiter and designed not as to occur the Latch Up by the huge current in a moment by the huge capacitor.
But, these protection circuits are effective for preventing destruction by unexpected accident. Please don't use in the situation of continuous protection circuit on and off. And for the peak current ability, because this chip has minus characteristic, be careful for the thermal design.

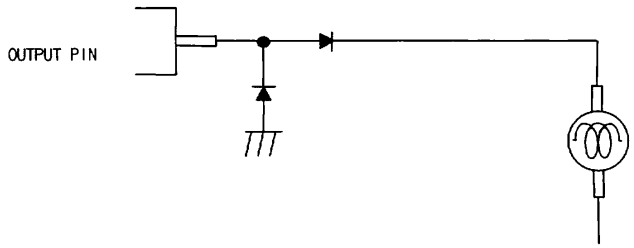
4. Thermal Shut Down Circuit
The Thermal Shut Down circuit is built in IC to prevent the damage due to over heating. Therefore, all the output except V_{DD} are turned off when it works, and turned on when the temperature goes down to the specified level. But, built-in the IC a temperature control circuit to protect itself. Make sure of the thermal design under 150℃.

5. P.CON, PANT terminals short to GND
In case of the P.CON(2pin), P.ANT(3pin) connects to Battery (-) terminal (short to GND) and IC GND (1pin) is Open, The parasitic element occurs in the IC and IC might be destroyed. We recommend to take countermeasure as the using shotteky diode between P.CON, PANT and GND.



6. In the application, in case of the each terminal is lower than GND, it recommend to use the bypass circuit.

7. We recommend using Diode for protection purpose in case of output pin connected with large loads of impedance or reverse current at initial stages or output off stage.
(Example)



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