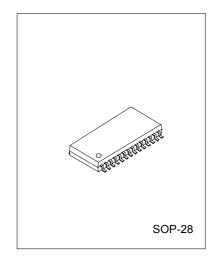
RADIO AND CASSETTE RECORDER CIRCUIT

DESCRIPTION

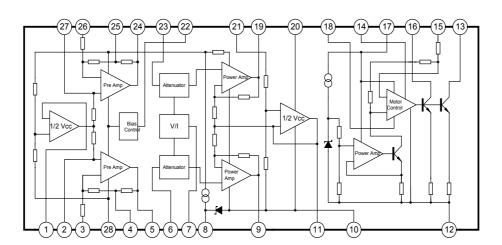
The UTC LAG668 is a monolithic integrated circuit, designed for portable radio cassette.

FEATURES

*1-Chip IC for headphone stereo



BLOCK DIAGRAM



PIN CONFIGURATION

VBPRE	1 🔘	28		GNDPRE
1IN+	2	27		2IN+
1IN-	3	26		2IN-
INFPRF	4	25		2NFPRE
IOUTPRE	5	24		20UTPRE
ATT1	6	23		ATT2
CONVOL	7	22		PREOFF
VREF	8	21		VCCPRE
10UTP	9	20		Vcc
GNDP	10	19		2OUTP
VBP	11	18		MOOFF
GNDMD	12	17		Vссмо
VCON	13	16		CONT
MOON	14	15		CONS
			I	

PIN NO.	SYMBOL	DESCRIPTION	PIN NO.	SYMBOL	DESCRIPTION
1	VBPRE	Pre Amp Bias Voltage	15	CONs	Speed Control
2	1 IN+	Channel 1 "+" Input	16	CONT	Torqul Control
3	1 IN -	Channel 1 "-" Input	17	Vссмо	Motor Power Control
4	1 NFpre	Feedback 1	18	MOoff	Motor Forced Stop
5	1 OUTPRE	Pre Amp Output 1	19	2 OUTP	Power Amp Output 2
6	ATT 1	Attenuator 1	20	Vcc	Supply Voltage
7	CONVOL	Volume Control	21	VCCPRE	Supply Voltage
8	VREF	Reference Voltage	22	PREoff	Pre Amp Off
9	1 OUT _P	Power Amp Output	23	ATT 2	Attenuator 2
		1			
10	GNDP	Power GND	24	2 OUTPRE	Pre Amp Output 2
11	VBP	Power Amp Bias	25	2 NFPRE	Feedback 2
		Voltage			
12	GND _{MD}	Motor GND	26	2 IN-	Channel 2 "-" Input
13	Vcon	Motor Control Voltage	27	2 IN+	Channel 2 "+" Input
14	MOon	Motor Forced Start	28	GNDPRE	Pre GND

ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	-0.3~+7.5	V
Power Dissipation	Pd	750	mW
Operating Voltage	Vop	2~5	V
Operating Temperature	Topr	-20~+65	°C
Storage Temperature	Tstg	-40~+125	°C

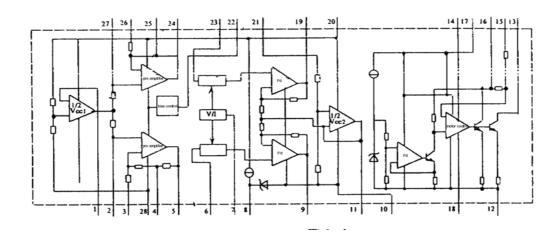
AMPLIFIER ELECTRICAL CHARACTERISTICS(Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current	Icc	Vin=0V, IM=0mA		18	25	mA
PRE-AMPLIFIER				,		
Open Loop Gain	Gvo	Vo=-10dBm, RL=∞		72		dB
Close Loop Gain	Gvc	Vo=-10dBm	40	42	44	dB
Maximum Output Voltage	Vom	THD=10%	0.45	0.6		Vrms
Total Harmonic Distortion	THD	Vout=100mVrms		0.05	0.5	%
Output Noise Voltage	Von	Vin=0, Rg=2.2k, BPF(30~20k)		150	300	μVrms
Input Impedance	Zin	Vout=-10dBm	18	22		kΩ
Cross Talk between CH	CT	Rg=2.2k, Vout=-10dBm	30			dB
Output Voltage when Pre-Off	Vooff	Vin=100mVrms			-50	dB
Output Impedance when Pre-Off	Rooff			10		kΩ
Input Impedance when Pre-Off	Rloff			10		kΩ
Attenuator						
Maximum Input Voltage	Vimax		0.2			Vrms
Maximum Attenuation	Vamax	Vcont=Min	66			dB
Attenuation Error	Vaerr	Vcont=Max		0		dB
Input Impedance	Zia		200			kΩ
Control Ternimal Input Impedance	Zicot		100			kΩ
Power Amplifier				•	•	•
Voltage Gain	GV	Pout=5mW	36	38	40	dB
Channel Voltage Difference	ΔGV	Vcont=Max		0	3	dB
Maximum Output Power I	Pom 1	THD=10%, RL=32Ω	20	28		mW
Maximum Output Power II	Pom 2	THD=10%, RL=16Ω	30			mW
Total Harmonic Distortion	THD	Pout=5mW		0.5	2	%
Cross Talk between CH	СТ	Pout=5mW	20	30		dB
Output Noise Voltage	Von	Rg=2.2k, Vcont=Max		1	2	mVrms
Ripple Rejection	RR	Vcc=3V, 100Hz, 100mVp-p	31	37		dB
Pre + Pulse Boost + Power Noise	Vnto	Vin=0V, Rg=2.2k, Vcont=Max*		3	6	mVrms

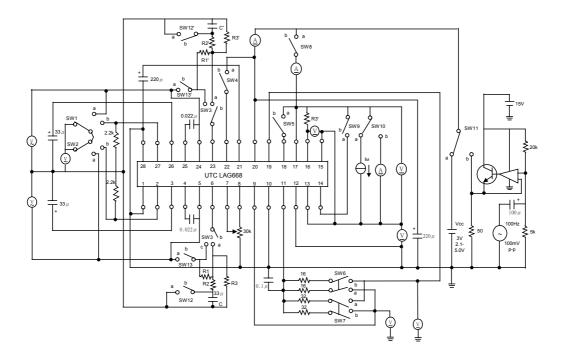
^{*}Vcc=3V, f=1kHz, RL=16 Ω , unless otherwise specified.

MOTOR ELECTRICAL CHARACTERISTICS(Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Current Consumption	IMC			3	5	mA
Starting Current	IMS		500			mA
Reference Voltage	Vref		0.72	0.8	0.87	V
Reference Voltage Change I	Vref 1	Vcc=2.1~5V		0.05		%/V
Reference Voltage Change II	Vref 2	Im=25~250mA		0.01		%/mA
Reference Voltage Change III	Vref 3	Ta=-10~50°C		0.01		%/°C
Current Factor	K		32	38	43	
Current Factor Change I	K 1	Vcc=2.1~5V		0.5		%/V
Current Factor Change II	K 2	Im=25~250mA		0.05		%/mA
Current Factor Change III	K 3	Ta=-10~50°C		0.02		%/°C
Saturation Voltage at Forced ON	VCEsa	IM=200mA, Pin 14=Vcc			0.6	V
Input Impedance at Forced ON Pin	Rion			5.6		ΚΩ
Leakage Current at Forced OFF	IML				200	μΑ
Input Impedance at Forced OFF Pin	Ricon			33		ΚΩ



TEST CIRCUIT 1



NOTE1: SW12,SW12

R1,R'=33k Ω R2,R2'=5.1kΩ R3,R3'=200kΩ R2,R2,=5.1k Ω C1,C'=0.1μF

NOTE2: See figure 1/2 for SW

TEST CIRCUIT 2

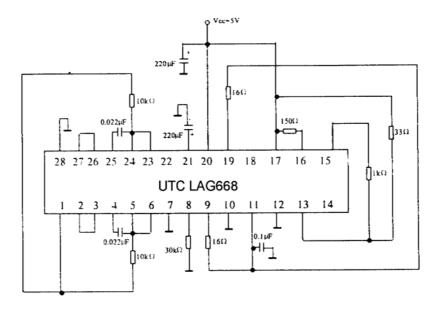


FIGURE 1

FIGURE	I														T
Item	Symbol	bol SW No.													TEST CONDITION
		1	2	3,3'	4	5	6	7	8	9	10	11	12,12'	13,13'	Vcc=3V,f=1kHz,RL=16Ω
AMP												1			,
Supply Current	Icc	С	С	а	b	b	а	b	b	b	а	а	а	а	Im=0mA
Pre AMP															
Open Loop Gain	Gvo	b	b	b	b	b	а	b	b	b	а	а	b	b	Vo=244mV
Maximum Output Voltage	Vom	b	b	b	b	b	а	а	b	b	а	а	b	b	THD=10%
Total Harmonic Distortion	THD	b	b	b	b	b	а	b	b	b	а	а	b	b	Vo=400mV
Output Noise Voltage	Von	С	С	b	b	b	а	b	b	b	а	а	b	b	B.P.F.(30-20kHz)
Cross Talk between CH	СТ	b-c	c-b	b	b	b	а	b	b	b	а	а	b	b	Vo=244mV
Output Voltage when Pre-Off	Vooff	b	b	b	а	b	а	b	b	b	а	а	b	b	Vin=100mV
Attenuator															
Maximum Input Voltage	Vimax	а	а	С	а	b	а	b	b	b	а	а	b	a	Vr=Min, THD=10%,
Maximum Attenuation	Vamax	а	а	С	а	b	а	b	b	b	а	а	b	а	
Power AMP															
Voltage	GV	а	а	С	а	b	а	b	b	b	а	а	b	а	Pout=5mV
Gain Channel Voltage	∆GV	а	а	С	а	b	а	b	b	b	а	а	b	а	VR=MAX
Difference Maximum Output Power I	Pom 1	а	а	С	а	b	b	а	b	b	а	а	b	а	RL=32Ω,THD=10%
Maximum Output Power II	Pom 2	а	а	С	а	а	а	b	b	b	а	а	b	а	RL=16Ω,THD=10%

UTC UNISONIC TECHNOLOGIES CO., LTD.

FIGURE 2

Item	Symbol		SW No.										TEST CONDITION		
		1	2	3,3'	4	5	6	7	8	9	10	11	12,12'	13,13'	
POWER AMP															
Total	THD														
Harmonic		а	С	С	а	b	а	b	b	b	а	а	b	а	Pout=5mV
Distortion															
Cross Talk	CT														
between CH		a-c	c-a	С	а	b	а	b	b	b	а	а	b	а	Pout=5mV
Output	Von	_	_	_							_		_	_	VO-MINI
Noise		С	С	С	b	b	а	b	b	b	а	а	b	а	VR=MIN
Voltage															
Ripple	RR			b		h		b	b	b			b	b	VR=MAX
Rejection		С	С	Ü	а	b	а	O	O	۵	а	а	υ	υ	vK=IVIAX
Pre + Pulse	Vnto	С	С	а	b	b	а	b	b	b	а	а	b	а	VR=MAX, BB ON
Boost +				a	U	ь	а	D	D	D	а	a	ь	a	VR-IVIAX, BB OIN
Power Noise															
Motor															
Current	IMC														
Consump-tio		С	С	а	а	b	а	b	а	b	а	а	а	а	Im=0mA
n															
Starting	IMS														
Current		С	С	а	а	b	а	b	а	b	а	а	а	а	
Reference	Vref														
Voltage		С	С	а	а	b	а	b	а	b	а	а	а	а	Im=100mA
Reference	Vref 1														
Voltage		С	С	а	а	b	а	b	а	b	а	а	а	а	Im=100mA,Vcc=2.1-5V
Change I															
Reference	Vref 2														
Voltage		С	С	а	а	b	а	b	а	b	а	а	а	а	Vcc=3V,Im=25-250mA
Change II															
Saturation	VCEsa					١. ً									
Voltage at		С	С	а	а	b	а	b	а	b	а	а	а	а	Im=200mA
Forced ON															
Input	Ricon														
Impedance		С	С	а	а	а	а	b	а	b	а	а	а	а	
at Forced															
OFF Pin															

*Note: a=ON, b=OFF

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.

UTC UNISONIC TECHNOLOGIES CO., LTD. 9