

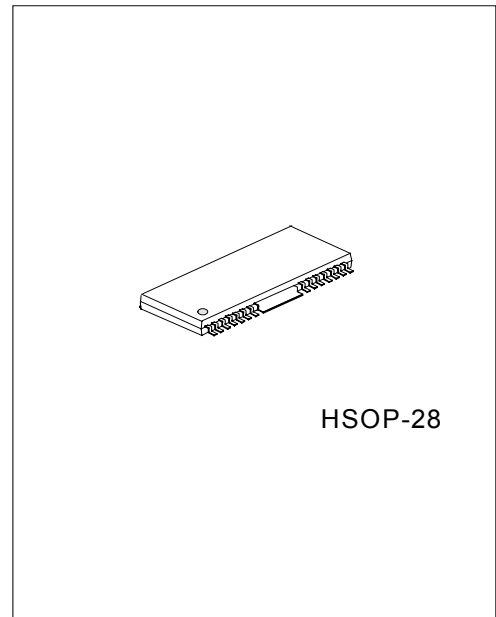
5-CHANNEL BTL DRIVER FOR DVD PLAYER

DESCRIPTION

The UTC **UA8868S** is a five-channel BTL driver IC for driving the motors and actuators such as used in DVD player and CD-ROM.

FEATURES

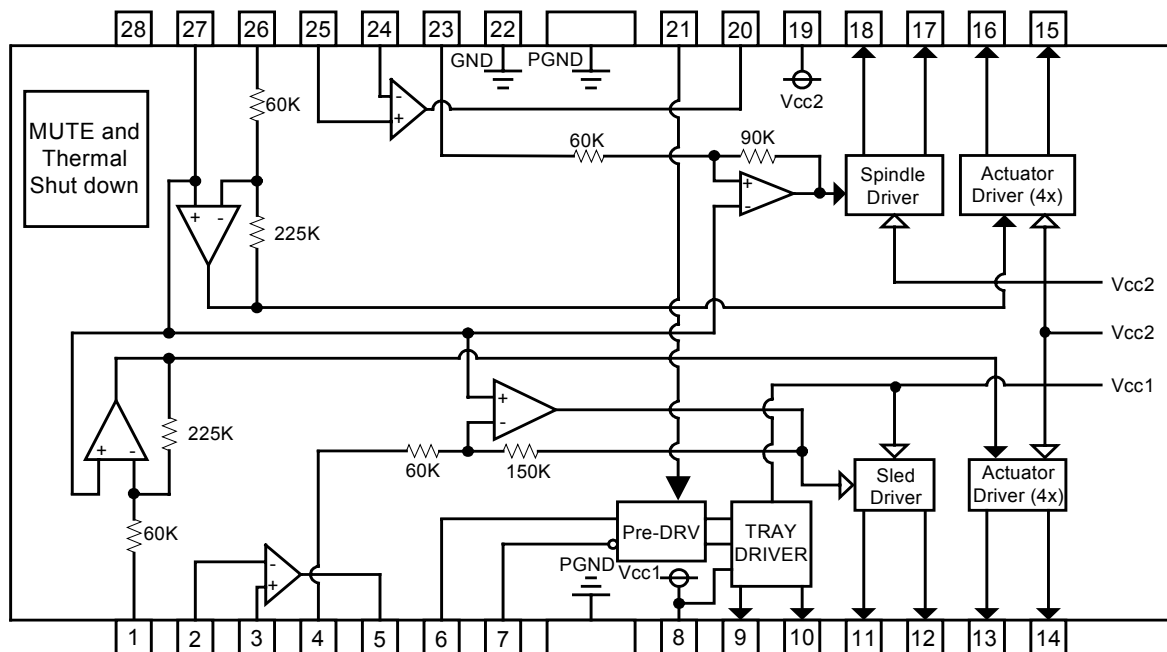
- * **Built-in 5 channel drivers:**
 - Dual actuator drivers
 - Sled motor driver
 - Spindle driver
 - Tray in-out driver
- * **Built-in Two independent comparators**
- * **Thermal shut down and Mute circuit.**



HSOP-28

*Pb-free plating product number: UA8868SL

BLOCK DIAGRAM



PIN DESCRIPTION

PIN NO	PIN NAME	FUNCTION
1	V _{INFC}	Input for focus driver
2	OP2IN-	Comparator 2 input (-)
3	OP2IN+	Comparator 2 input (+)
4	V _{INSL+}	Input for the sled driver
5	OP2OUT	Comparator 2 output
6	FWD	Tray driver forward input
7	REV	Tray driver reverse input
8	V _{CC1}	Vcc for pre-drive block and power block of sled and tray
9	V _{OTR-}	Tray driver output (-)
10	V _{OTR+}	Tray driver output (+)
11	V _{OSSL+}	Sled driver output (+)
12	V _{OSSL-}	Sled driver output (-)
13	V _{OFC-}	Focus driver output (-)
14	V _{OFC+}	Focus driver output (+)
15	V _{OTK+}	Tracking driver output (+)
16	V _{OTK-}	Tracking driver output (-)
17	V _{OLD+}	Spindle driver output (+)
18	V _{OLD-}	Spindle driver output (-)
19	V _{CC2}	Vcc for power block of spindle, tracking and focus
20	OP1OUT	Comparator 1 output
21	V _{CTL}	Speed control input of tray driver
22	GND	Ground
23	V _{INLD}	Input for spindle driver
24	OP1IN-	Comparator 1 input (-)
PIN NO	PIN NAME	FUNCTION
25	OP1IN+	Comparator 1 input (+)
26	V _{INTK}	Input for tracking driver
27	BIAS	Input for reference voltage
28	MUTE	Input for mute control

Notes: Pin Name of + and – (output of drivers) means polarity to input pin.
(For example, if voltage of pin1 is high, pin14 is high.)

ABSOLUTE MAXIMUM RATINGS

(Ta=25)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{cc1} V _{cc2}	15	V
Power dissipation	P _d	*1.7	W
Operating Temperature Range	T _{opr}	-35 ~ +85	
Storage Temperature Range	T _{stg}	** -55 ~ +150	

*When mounted on a 70mm x70mm x1.6mm glass epoxy board.

*Reduced by 13.6mW for each increase in Ta of 1 over 25 .

**Should not exceed P_d or ASO and T_j=150 values

GUARANTEED OPERATING CONDITIONS

(Ta=25)

PARAMETER	SYMBOL	RATINGS	UNIT
Power supply voltage	Vcc1	4.3 ~ 13.2	V
	Vcc2	4.3 ~ Vcc1	V

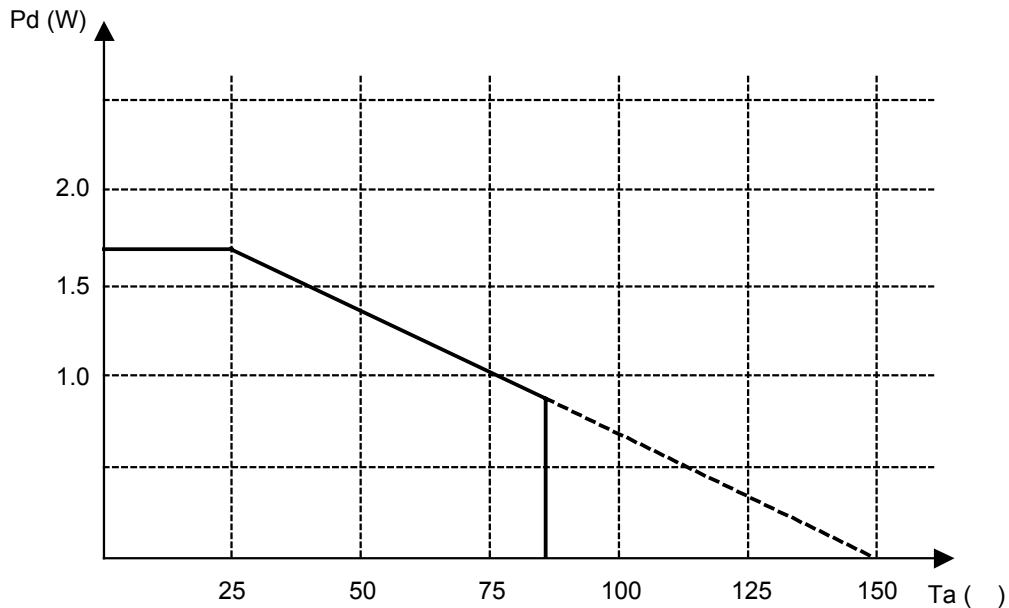
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified Ta=25 , Vcc1=12V, Vcc2=5V, BIAS=2.5V, RL=8Ω/10Ω/20Ω/45Ω)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Voltage for mute ON	V _{ston}		0		0.5	V
Voltage for mute OFF	V _{stoft}		2.0		5	V
Quiescent current	I _{cc}			25		mA
Actuator drivers						
Maximum output voltage	V _{om}	@10Ω Load	3.6	4.0		V
Output offset voltage	V _{oo}				± 50	mV
Voltage gain	G _v	V _{IN} =BIAS+0.2Vpp ac @1KHz		23.5		dB
Sled motor driver						
Maximum output voltage	V _{omsl}	@ 8Ω Load	7.5	9.0		V
Output offset voltage	V _{oofsl}				± 100	mV
Closed loop voltage gain	G _{vsl}	V _{IN} =BIAS+0.2Vpp ac @1KHz	18	20	22	dB
Spindle motor driver						
Maximum output voltage	V _{omax}	@ 8Ω Load		3.5		V
Output offset voltage	V _{oofld}				± 50	mV
Voltage gain	G _{vld}	V _{IN} =BIAS+0.2Vpp ac @1KHz	13.3	15.5	17.5	dB
Gain error by polarity	G _{vld}	V _{IN} =BIAS+0.2Vpp ac @1KHz	0	1	2	dB
Tray motor driver						
Output saturation voltage 1	V _{SAT1}	Upper+Lower saturation, I _L =200mA	0.7	1.1	1.5	V
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output saturation voltage between F&R	V _{SAT1}	Output saturation voltage 1 between FWD and REV			0.1	V
Output saturation voltage 2	V _{SAT2}	Upper+Lower saturation, I _L =500mA	1.0	1.5	2.2	V
Output adjustable gain on "H" Side voltage	V _{VtrH}	V _{CTL} =2V	7.4	9.2	11	dB
Tray motor driver input logic						
High level input voltage	V _{IH}		1.5		Vcc	V
Low level input voltage	V _{IL}		-0.3		0.5	V
High level input current	I _{IH}	V _{FWD} =V _{REV} =5V		180	270	μA
Comparator						
Input common-mode voltage range	V _{CMC}		0		Vcc1 ± 1.5	V
Input offset voltage	V _{oofc}			± 1.0	± 2.0	mV
Saturation voltage	V _{sc}	I _{osc} ≤ 4mA		250	400	mV
Voltage gain	G _{vc}	R _L ≥ 15kΩ	40	200		V/mV
Output sink current	I _{osc}	V _{out} < 1.5V		8.0		mA

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

POWER DISSIPATION CURVE:



*70mmx70mmx1.6mm glass epoxy board.
 *Debating in done at 17.6mW/ for operating above Ta=25

OPERATING NOTES:

- (1) The built-in thermal shutdown circuit mutes the output current when the chip temperature reaches 175 (typ.). The hysteresis is set to 25 (typ.), so the circuit will start up again when the chip temperature falling to 150 (typ.).
- (2) In case mute pin voltage is under 0.5V or NC, output current is muted (except for tray motor driver). Mute pin voltage should be more than 2.0V for normal application.
- (3) when Vcc1 voltage drop to below 3.8V,shematice are muted. The schematic will return to work when Vcc1 rise up with a hysteresis of 03.V(typ.)
- (4) Bias pin (pin 27) should be pulled up to more than 1.2V. In case the bias pin voltage is pulled down below 0.9V (typ.), the output current is muted.
- (5) Insert the bypass capacitor (~ 0.1μF) between Vcc pin and GND pin as close as possible.
- (6) Heat dissipation fins are attached to the GND on the inside of the package. Make sure to connect them to the external GND.
- (7) Tray driver logic input:

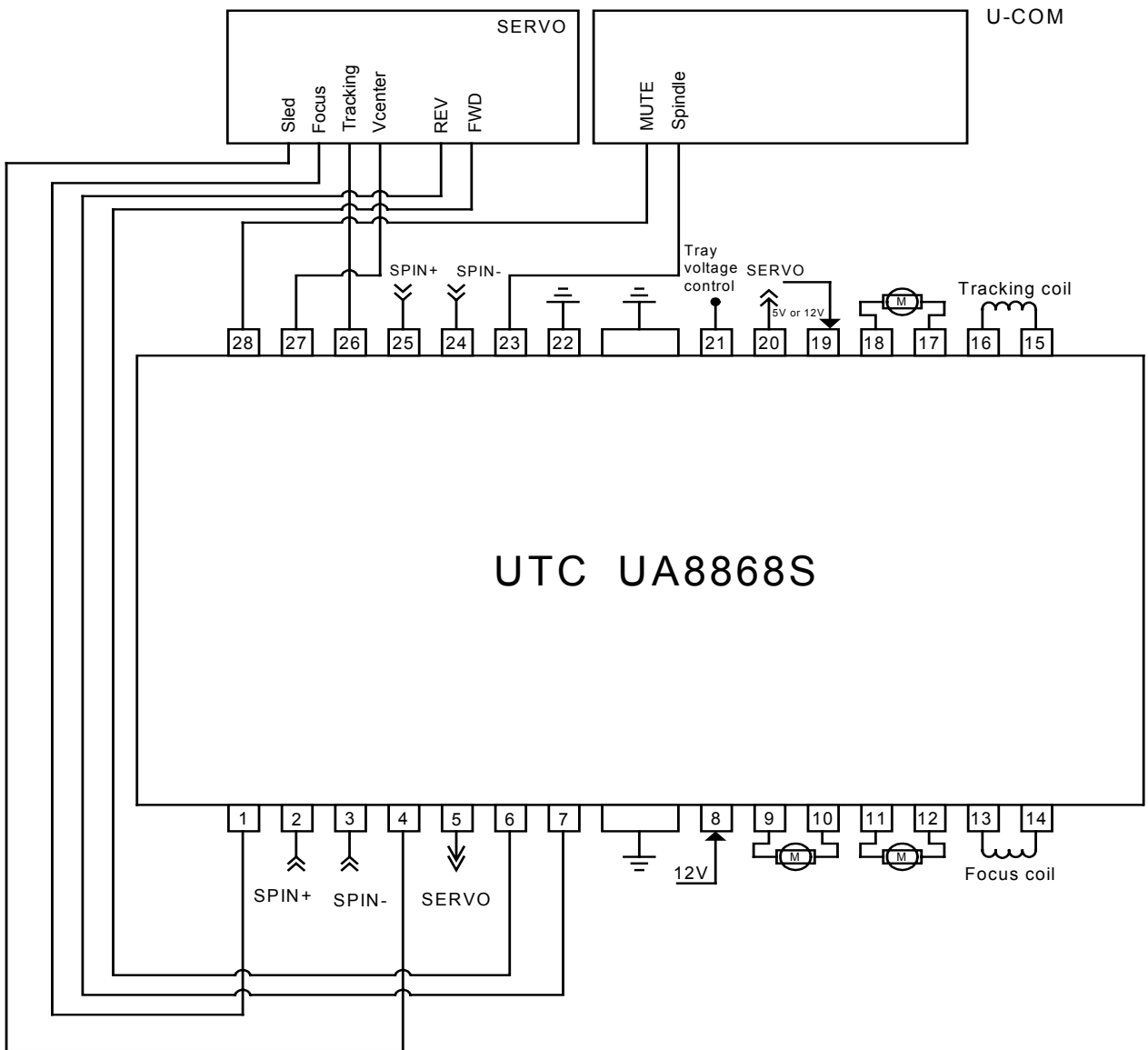
FWD (pin6)	REV (pin7)	VOTR+ (pin10)	VOTR- (pin9)	Function
L	L	OPEN	OPEN	Open mode
L	H	L	H	Reverse mode
H	L	H	L	Forward mode
H	H	L	L	Brake mode

Input circuit of pin6 and pin7 is designed to avoid simultaneous activation of upper and lower output tr. ; however, in order to improve reliability, apply motor forward/reverse input once through open mode.

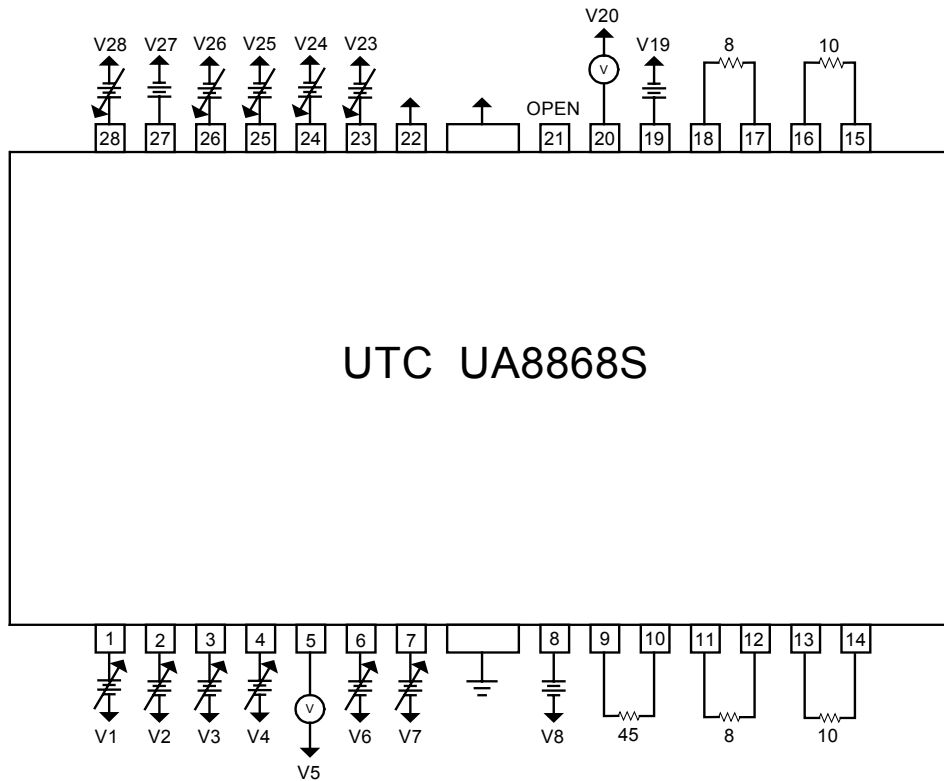
We recommend time period for open longer than 10msec.

The voltage between “H” side Output voltage and “L” side output voltage is eaqual to three times (9.2dB Typ.) V_{TCL} voltage (pin21). And the “H” side and “L” side output voltage both eaqual to $V_{CC}/2$ when in open mode and brake mode.

APPLICATION CIRCUIT



TESTING CIRCUIT



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