DATA SHEET

TDA7073A; TDA7073AT
Dual BTL power driver

Product specification
Supersedes data of 1994 July

1999 Aug 30

FEATURES

- No external components
- Very high slew rate
- Single power supply
- Short-circuit proof
- High output current (0.6 A)
- Wide supply voltage range
- Low output offset voltage
- Suited for handling PWM signals up to 176 kHz
- ESD protected on all pins.

GENERAL DESCRIPTION

The TDA7073A/AT are dual power driver circuits in a BTL configuration, intended for use as a power driver for servo systems with a single supply. They are specially designed for compact disc players and are capable of driving focus, tracking, sled functions and spindle motors.

Missing Current Limiter (MCL)

A MCL protection circuit is built-in. The MCL circuit is activated when the difference in current between the output terminal of each amplifier exceeds 100 mA (typical 300 mA). This level of 100 mA allows for headphone applications (single-ended).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_P	positive supply voltage range		3.0	5.0	18	V
G_v	voltage gain		32.5	33.5	34.5	dB
I_P	total quiescent current	V_P = 5 V; $R_L = \infty$	–	8	16	mA
SR	slew rate		–	12	–	V/μs
I_O	output current		–	–	0.6	A
I_{bias}	input bias current		–	100	300	nA
f_{co}	cut-off frequency	–3 dB	–	1.5	–	MHz

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA7073A	DIP16	plastic dual in-line package; 16 leads (300 mil); long body	SOT38-1
TDA7073AT	SO16	plastic small outline package; 16 leads; body width 7.5 mm	SOT162-1

BLOCK DIAGRAM

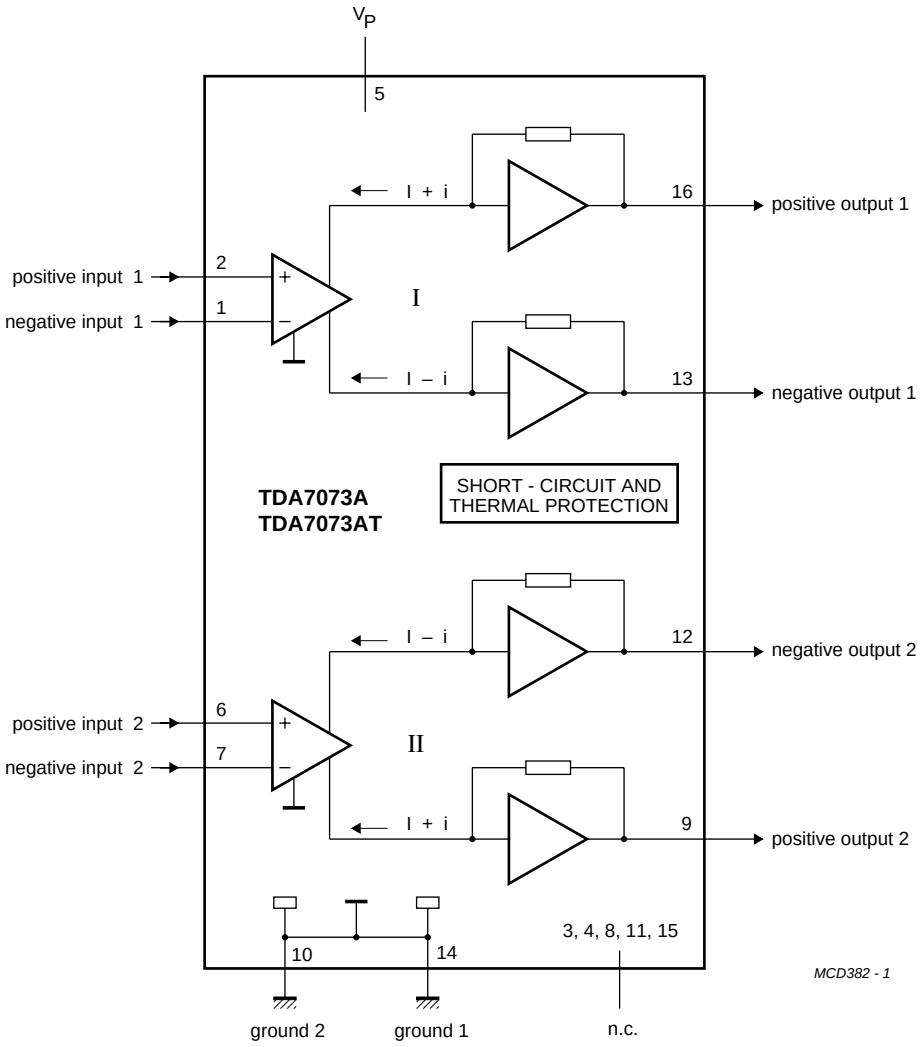

Fig.1 Block diagram.

PINNING

SYMBOL	PIN	DESCRIPTION
IN1−	1	negative input 1
IN1+	2	positive input 1
n.c.	3	not connected
n.c.	4	not connected
V_P	5	positive supply voltage
IN2+	6	positive input 2
IN2−	7	negative input 2
n.c.	8	not connected
OUT2+	9	positive output 2
GND2	10	ground 2
n.c.	11	not connected
OUT2−	12	negative output 2
OUT1−	13	negative output 1
GND1	14	ground 1
n.c.	15	not connected
OUT1+	16	positive output 1

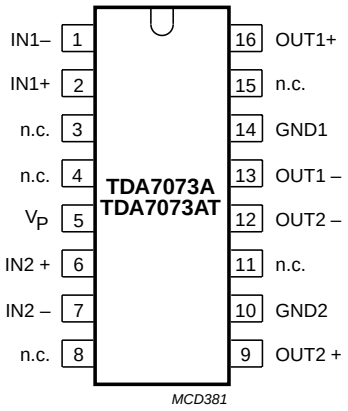

Fig.2 Pin configuration.

FUNCTIONAL DESCRIPTION

The TDA7073A/AT are dual power driver circuits in a BTL configuration, intended for use as a power driver for servo systems with a single supply. They are particular designed for compact disc players and are capable of driving focus, tracking, sled functions and spindle motors.

Because of the BTL configuration, the devices can supply a bi-directional DC current in the load, with only a single supply voltage. The voltage gain is fixed by internal feedback at 33.5 dB and the devices operate in a wide supply voltage range (3 to 18 V). The devices can supply a maximum output current of 0.6 A. The outputs can be short-circuited over the load, to the supply and to ground at all input conditions. The differential inputs can handle common mode input voltages from ground level up to (V_P − 2.2 V with a maximum of 10 V). The devices have a very high slew rate. Due to the large bandwidth, they can handle PWM signals up to 176 kHz.

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_P	positive supply voltage range		–	18	V
I_{ORM}	repetitive peak output current		–	1	A
I_{OSM}	non repetitive peak output current		–	1.5	A
P_{tot}	total power dissipation				
	TDA7073A	$T_{amb} < 25$ °C	–	2.5	W
	TDA7073AT	$T_{amb} < 25$ °C	–	1.32	W
T_{stg}	storage temperature range		−55	+150	°C
T_{vj}	virtual junction temperature		–	150	°C
T_{sc}	short-circuit time	see note 1	–	1	hr

Note

1. The outputs can be short-circuited over the load, to the supply and to ground at all input conditions.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ (j\text{-}a)}$	from junction to ambient			
	TDA7073A	in free air; note 1	50	K/W
	TDA7073AT	in free air; note 2	95	K/W

Notes

1. TDA7073A: $V_P = 5$ V; $R_L = 8\ \Omega$; The typical voltage swing = 5.8 V and V_{loss} is 2.1 V therefore $I_O = 0.36$ A and $P_{tot} = 2 \times 0.76$ W = 1.52 W; $T_{amb\ (max)} = 150 - 1.52 \times 50 = 74$ °C.
2. TDA7073AT: $V_P = 5$ V; $R_L = 16\ \Omega$; typical voltage swing = 5.8 V and V_{loss} is 2.1 V therefore $I_O = 0.18$ A and $P_{tot} = 2 \times 0.38$ W = 0.76 W; $T_{amb\ (max)} = 150 - 0.76 \times 95 = 77$ °C.

CHARACTERISTICS

V_P = 5 V; f = 1 kHz; T_{amb} = 25 °C; unless otherwise specified (see Fig.3). TDA7073A: R_L = 8 Ω; TDA7073AT: R_L = 16 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_P	positive supply voltage range		3.0	5.0	18	V
I_{ORM}	repetitive peak output current		–	–	0.6	A
I_P	total quiescent current	V_P = 5 V; R_L = ∞; note 1	–	8	16	mA
ΔV_{OUT}	output voltage swing	note 2	5.2	5.8	–	V
THD	total harmonic distortion					
	TDA7073A	V_{OUT} = 1 V (RMS)	–	0.3	–	%
	TDA7073AT	V_{OUT} = 1 V (RMS)	–	0.1	–	%
G_v	voltage gain		32.5	33.5	34.5	dB
$V_{no(rms)}$	noise output voltage (RMS value)	note 3	–	75	150	μV
B	bandwidth		–	–	1.5	MHz
SVRR	supply voltage ripple rejection	note 4	38	55	–	dB
$\lvert\Delta V_{16\text{-}13,12\text{-}9}\rvert$	DC output offset voltage	R_S = 500 Ω	–	–	100	mV
$V_{I(CM)}$	DC common mode voltage range	note 5	0	–	2.8	V
CMRR	DC common mode rejection ratio	note 6	–	100	–	dB
Z_I	input impedance		–	100	–	kΩ
I_{bias}	input bias current		–	100	300	nA
α	channel separation		40	50	–	dB
$\lvert\Delta GV\rvert$	channel unbalance		–	–	1	dB
SR	slew rate		–	12	–	V/μs

Notes

1. With a load connected to the outputs the quiescent current will increase, the maximum value of this increase being equal to the DC output offset voltage divided by R_L.
2. The output voltage swing is typically limited to 2 × (V_P − 2.1 V) (see Fig.4).
3. The noise output voltage (RMS value), unweighted (20 Hz to 20 kHz) is measured with R_S = 500 Ω.
4. The ripple rejection is measured with R_S = 0 Ω and f = 100 Hz to 10 kHz. The ripple voltage of 200 mV (RMS value) is applied to the positive supply rail.
5. The DC common mode voltage range is limited to (V_P − 2.2 V with a maximum of 10 V).
6. The common mode rejection ratio is measured at V_{ref} = 1.4 V, $V_{I(CM)}$ = 200 mV and f = 1 kHz.