

**Three-Channel CD-ROM Bridge Driver (BTL)****Overview**

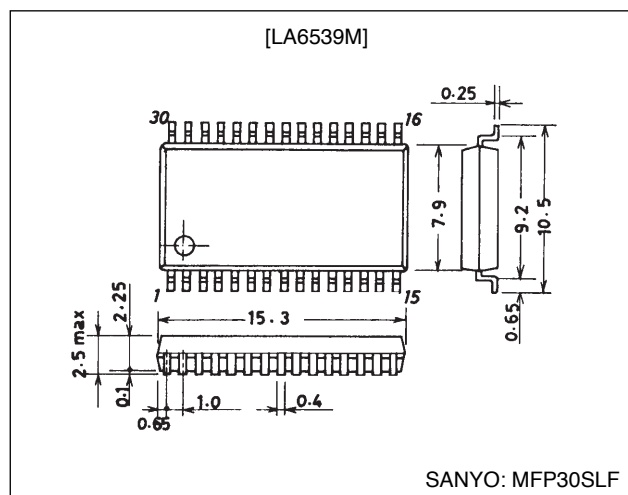
The LA6539M is a three-channel bridge driver (BTL) developed for use in CD-ROM drives.

Functions

- Three-channel balanced transformerless (BTL) power amplifier
- I_O max: 1 A
- Muting circuit
- Thermal shutdown function
- Slew rate (SR): 0.5 V/ μ s (typical)

Package Dimensions

unit: mm

3073A-MFP30SLF**Specifications****Maximum Ratings at $T_a = 25^\circ\text{C}$**

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		14	V
	V_S max	Maximum rating for V_{S1} and V_{S2}	14	V
Maximum input voltage	V_{IN}	V_{IN1} to V_{IN3}	13	V
Mute pin voltage	V_{MUTE}	MUTE1, 2	13	V
Allowable power dissipation	P_d max		0.9	W
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		4 to 13	V
Operating voltage 2-1	V_{S1}	The channel U operating voltage	4 to 13	V
Operating voltage 2-2	V_{S2}	The channel U and W operating voltage	4 to 13	V

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{ V}$, $V_{S1} = V_{S2} = 5\text{ V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{CC} no-load current drain	I_{CC1}	All outputs on (mute 1 and 2: high) *1, 2	4	8	15	mA
	I_{CC2}	All outputs off (mute 1 and 2: low) *1		4	10	mA
V_{S1} no-load current drain	I_{S1-1}	Channel U: on (mute 1: high)		5	10	mA
	I_{S1-2}	Channel U: off (mute 1: low)			1	mA
V_{S2} no-load current drain	I_{S2-1}	Channels V and W: on (mute 2: high) *2		10	20	mA
	I_{S2-2}	Channels V and W: off (mute 2: low)			1	mA
Output offset voltage	V_{OF1} to V_{OF3}	Voltage differential between the channel U and W outputs	-50		+50	mV
Input voltage range	V_{IN}	Voltage range for V_{IN1} to V_{IN3}	0.5		5	V
Buffer amplifier output voltage	$V_{BUFFER1}$	Voltage difference relative to $1/2 V_{S1}$	-50	0	+50	mV
	$V_{BUFFER2}$	Voltage difference relative to $1/2 V_{S2}$	-50	0	+50	mV
Output source voltage	V_{O1}	Output high, $I_O = 700\text{ mA}$, all + outputs	4.4	4.7		V
Output sink voltage	V_{O2}	Output low, $I_O = 700\text{ mA}$, all + outputs		0.3	0.6	V
Closed circuit voltage gain	VG	Bridge amplifier		6		dB
Slew rate	SR			0.5		V/ μs
Mute on voltage	$V_{MUTE1, 2}$	The voltage applied to MUTE1 or MUTE2 at the point where the output goes on.		1.5	2	V
Mute on current	$I_{MUTE1, 2}$	The influx current to MUTE1 or MUTE2 at the point where the output goes on.		6	10	μA

Notes: 1. When MUTE1 is high, the channel U output will be on.
2. When MUTE2 is high, the channel V and W outputs will be on.

Truth Table

Input (V_{IN} pins)	MUTE (MUTE1, 2)	CH-U		CH-V		CH-W	
		U_{OUT+}	U_{OUT-}	V_{OUT+}	V_{OUT-}	W_{OUT+}	W_{OUT-}
H	H	H	L	H	L	H	L
	L	—	—	—	—	—	—
L	H	L	H	L	H	L	H
	L	—	—	—	—	—	—

Note: MUTE1 only operates for channel U, and MUTE2 only operates for channels V and W. MUTE1 and MUTE2 operate independently.

Pin Functions

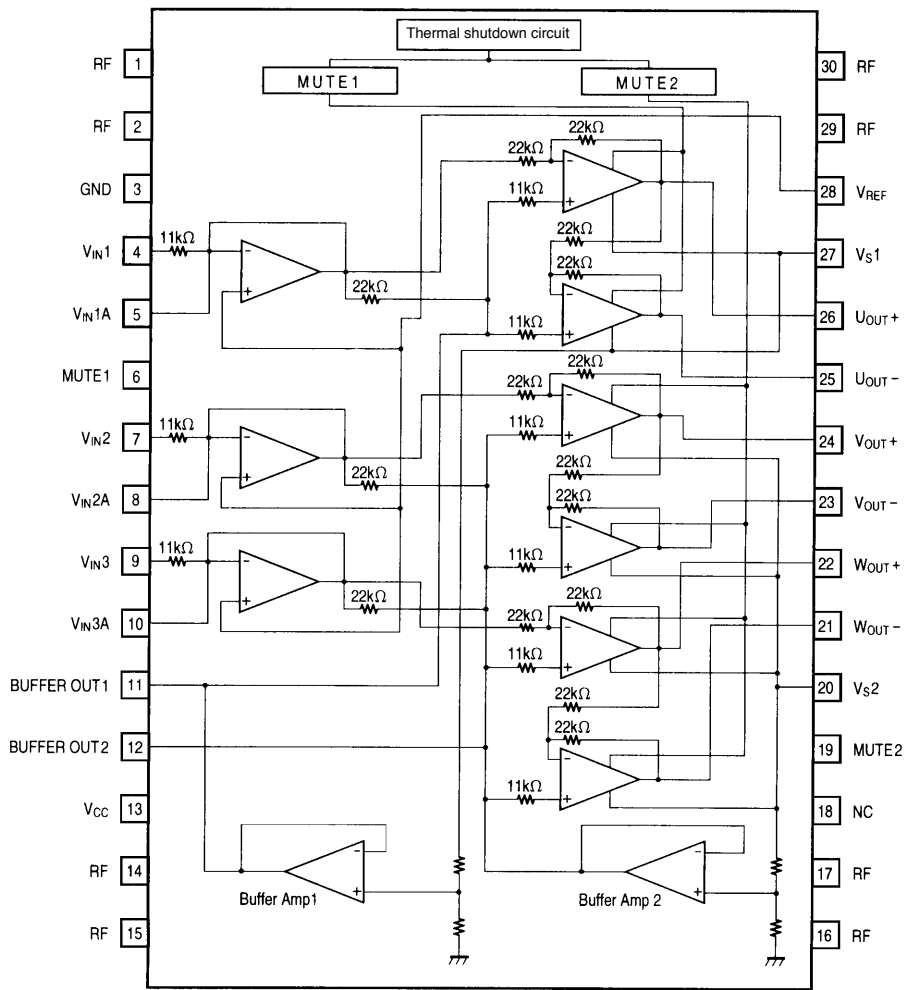
Pin No.	Pin	Function	Equivalent circuit
1, 2, 14, 15, 16, 17, 29, 30	RF	Substrate (lowest potential)	
3	GND	Ground	
4	V_{IN1}	Channel U input	
5	V_{IN1A}	Channel U input (for gain adjustment)	
7	V_{IN2}	Channel V input	
8	V_{IN2A}	Channel V input (for gain adjustment)	
9	V_{IN3}	Channel W input	
10	V_{IN3A}	Channel W input (for gain adjustment)	
6	MUTE1	Channel U output on/off control	
11	BUFFER OUT1	Buffer amplifier 1 output ($1/2 V_{S1}$: typical), Generates the output stage reference voltage for channel U.	
12	BUFFER OUT2	Buffer amplifier 2 output ($1/2 V_{S2}$: typical), Generates the output stage reference voltage for channels V and W.	
13	V_{CC}	Power supply	
18	NC	Unused	
19	MUTE2	Channels V and W on/off control	
20	V_{S2}	Channels V and W output stage power supply	

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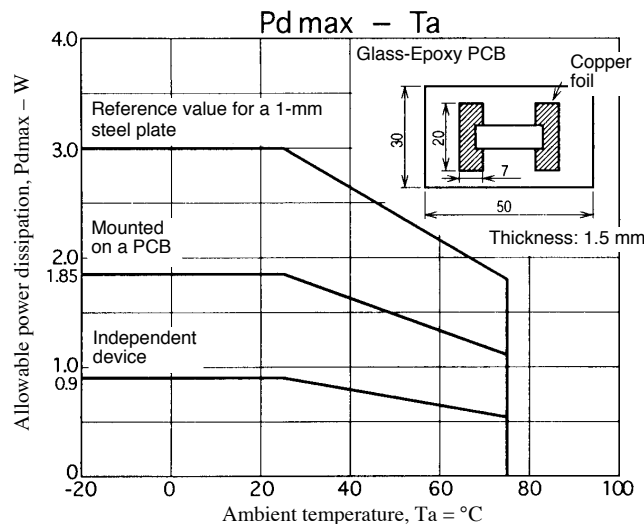
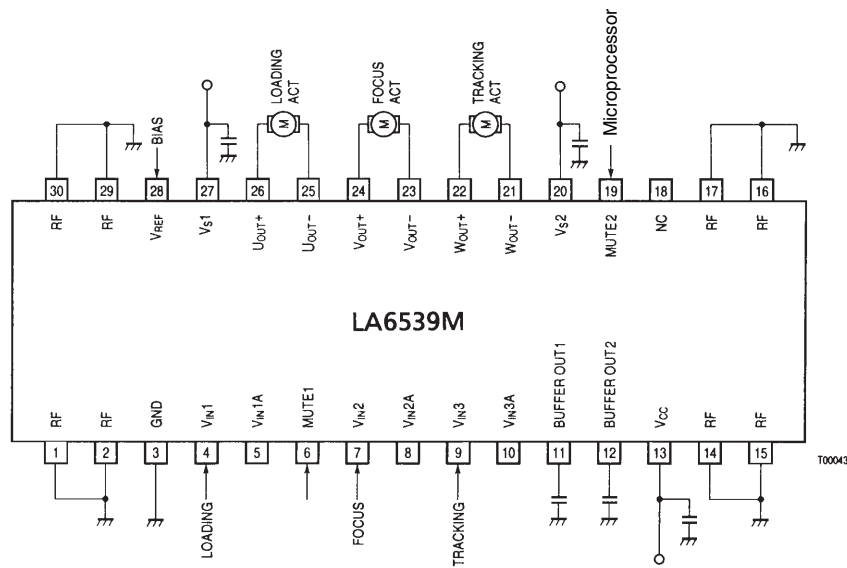
Pin No.	Pin	Function	Equivalent circuit
21	W _{OUT} -	Channel W inverting output	
22	W _{OUT} +	Channel W noninverting output	
23	V _{OUT} -	Channel V inverting output	
24	V _{OUT} +	Channel V noninverting output	
25	U _{OUT} -	Channel U inverting output	
26	U _{OUT} +	Channel U noninverting output	
27	V _{S1}	Channel U output stage power supply	
28	V _{REF}	Reference voltage for the level shifting circuit (shared by all channels)	

Block Diagram



T00042

Sample Application Circuit



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