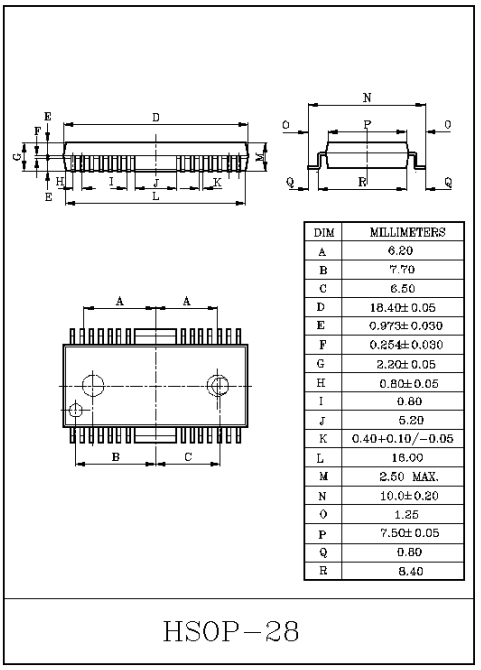
4CH BTL DRIVER FOR CD PLAYERS

The KIA6831HF is 4ch BTL drivers for CD player actuators and motors. This IC have internal 5V regulators and general purpose operational amplifiers.



DIM	MILLIMETERS
A	6.20
B	7.70
C	6.50
D	18.40±0.05
E	0.973±0.030
F	0.254±0.030
G	2.20±0.05
H	0.80±0.05
I	0.80
J	5.20
K	0.40+0.10/−0.05
L	16.00
M	2.50 MAX.
N	10.0±0.20
O	1.25
P	7.50±0.05
Q	0.80
R	8.40

FEATURES

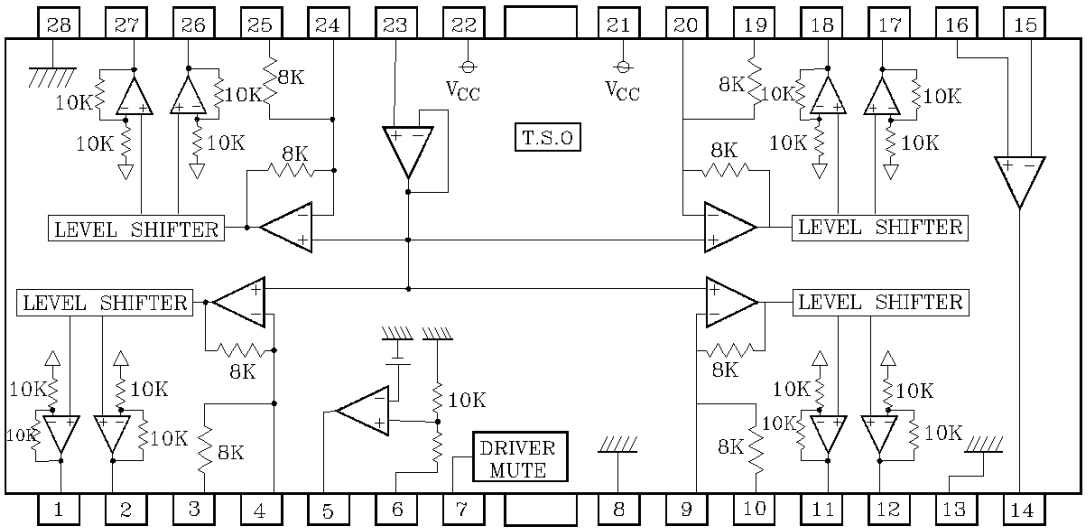
- Built-in Thermal Shutdown Circuit
- Wide Dynamic Range
  : 5.4V(Typ.) (V_{CC}=8V, R_L=8Ω)
- Built in 5V Regulator. (requires Attached PNP transistor)
- Built in OP-Amp.
- Built in Mute Function
- Gain is Adjustable With a Single Attached Resistor.
- Operation supply voltage range : V_{CC}=6.0~9.0V.
  (4.5~9V When regulator not used (pin⑤ and ⑥ may be open))

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	18	V
Power Dissipation	P_D	1.7 (*1)	W
Operating Temperature	T_{opr}	-35~85	℃
Storage Temperature	T_{stg}	-55~150	℃

Note) (*1) : · When mounted on 50mm×50mm×1mm PCB (Phenolics resin material).
· Power Dissipation reduces 13.mW/℃ for using above Ta=25℃
· Do not exceed Pd and SOA.

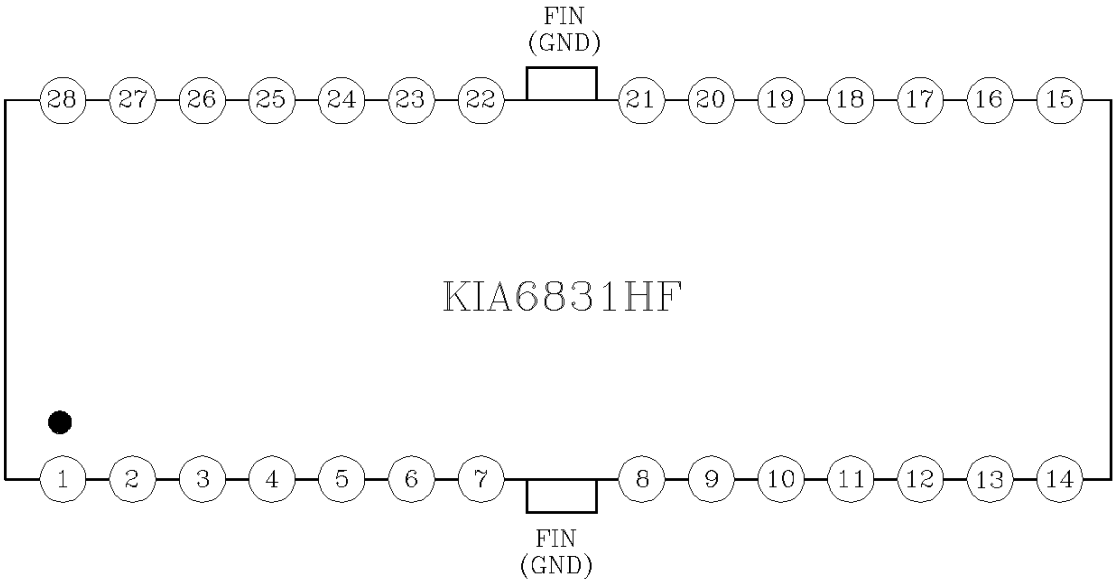
BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS
(Unless otherwise noted, Ta=25℃, V_{CC}=8V, f=1kHz, R_L=8Ω)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CC}	No load	-	9.0	12.0	mA
Output Voltage, Offset	V_{OO}		-50	-	50	mV
Maximum Output Amplitude	V_{OM}		5.0	5.4	-	V
Voltage Gain (Closed Circuit)	G_{VC}	V_{IN}=0.1Vrms, 1kHz	10.5	12.0	13.5	dB
Ripple Rejection	RR	V_{IN}=0.1Vrms, 100Hz	-	60	-	dB
Slew Rate	SR	100kHz square wave, 3 V_{P-P} output	-	2.0	-	V/μS
Mute On Voltage	V_{MON}		-	-	0.5	V
Mute Off Voltage	V_{MOFF}		2.0	-	-	V
[5V regulator]						
Output Voltage	V_{reg}	I_L=100mA	4.75	5.0	5.25	V
Output Load Variation	ΔV_{RLC}	I_L=0~200mA	-50	0	10	mV
Supply Voltage Variation	ΔV_{VCC}	(V_{CC}=6~9V) I_L=100mA	-10	0	25	mV
[Operational Amplifier]						
Offset Voltage	V_{OFOP}		-5	0	5	mV
Input Bias Current	V_{BOP}		-	-	300	nA
High-Level Output Voltage	V_{OHOP}		6.0	-	-	V
Low-Level Output Voltage	V_{OLOP}		-	-	1.8	V
Output Drive Current (Sink)	V_{SINK}	V_{CC} at 50Ω	10	50	-	mA
Output Drive Current (Source)	I_{SOURCE}	50Ω at ground	10	40	-	mA
Voltage Gain (Open Loop)	G_{VO}	V_{IN}=-75dBV, 1kHz	-	78	-	dB
Slew Rate	SR_{OP}	100kHz Square Wave, 4V_{P-P} output	-	1	-	V/μS
Ripple Rejection	RR_{OP}	V_{IN}=-20dBV, 100Hz	-	65	-	dB
Common Mode Rejection Ratio	CMRR	V_{IN}=-20dBV, 1kHz	-	84	-	dB

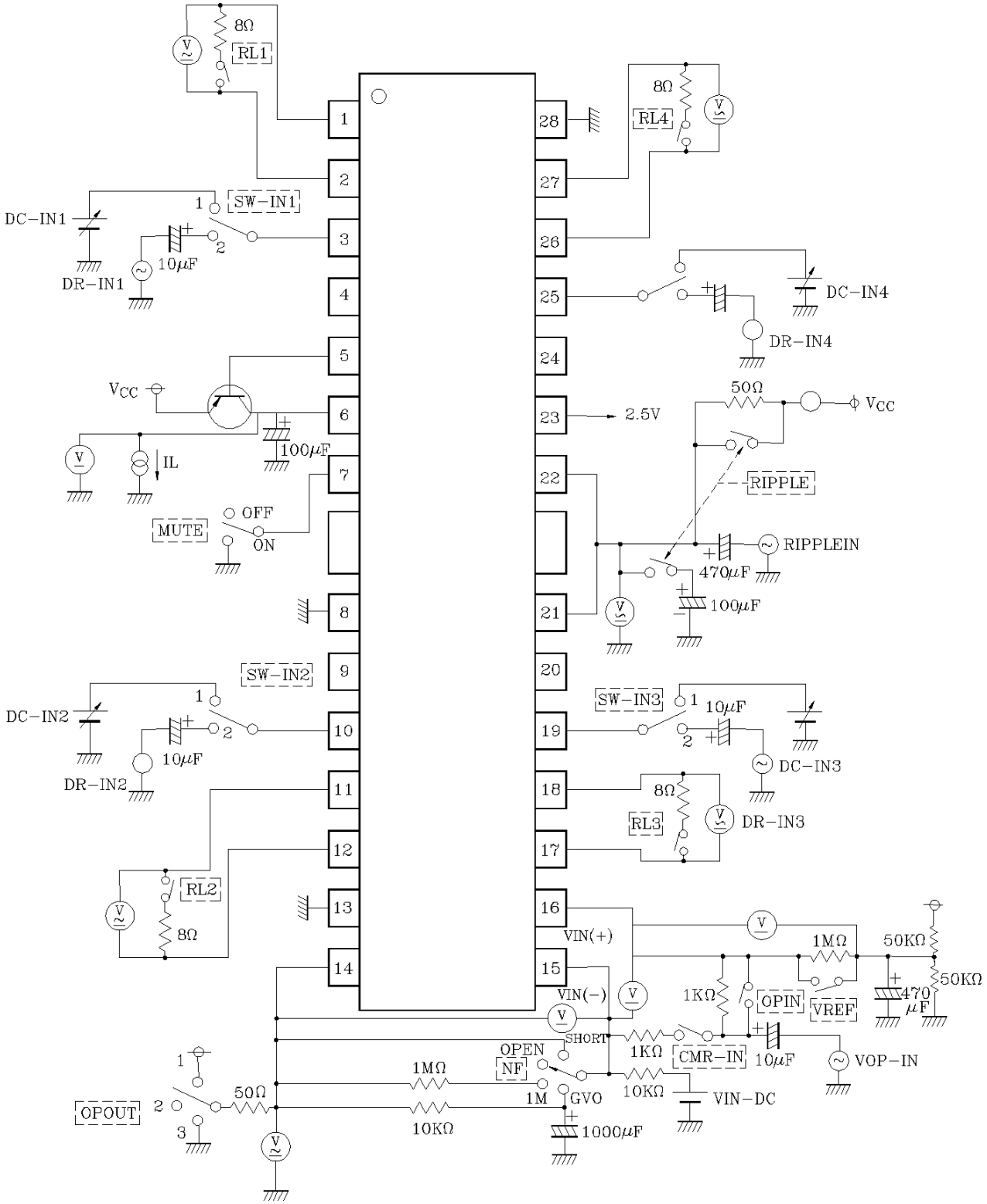
PIN CONFIGURATIONS



PIN DESCRIPTIONS

Pin No.	SYMBOL	DESCRIPTION	Pin No.	SYMBOL	DESCRIPTION
1	VO1 (-)	Driver CH1 negative output	15	OP IN (-)	Operational amplifier input, negative
2	VO1 (+)	Driver CH1 positive output	16	OP IN (+)	Operational amplifier input, positive
3	VIN1	Driver CH1 input	17	VO3 (-)	Driver CH3 negative output
4	VIN1′	Driver CH1 input, gain adjustment pin	18	VO3 (+)	Driver CH3 positive output
5	REG-B	Connect to external transistor base	19	VIN3	Driver CH3 input
6	REG OUT	Constant voltage output, connects to external transistor collector	20	VIN3′	Driver CH3 gain adjustment pin
7	MUTE	Mute control pin	21	V_{CC}	Power supply
8	GND_2	Ground	22	V_{CC}	Power supply
9	VIN2′	Driver CH2 input, gain adjustment pin	23	BIAS IN	Bias amplifier Input
10	VIN2	Driver CH2 input	24	VIN4′	Driver CH4 gain adjustment pin
11	VO2 (+)	Driver CH2 positive output	25	VIN4	Driver CH4 input
12	VO2 (-)	Driver CH2 negative output	26	VO4 (+)	Driver CH4 positive output
13	GND	Substrate ground	27	VO4 (-)	Driver CH4 negative output
14	OP OUT	Operational amplifier output	28	GND	Substrate ground

TEST CIRCUIT

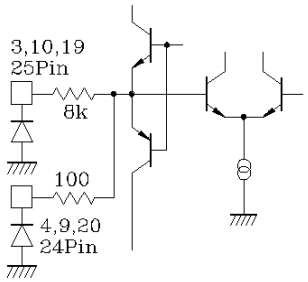


TEST CIRCUIT SWITCH TABLE

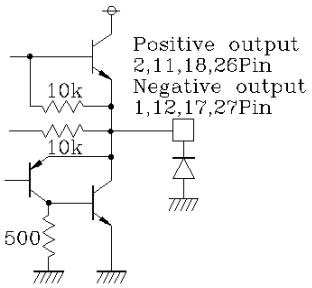
PARAMETER		WITCH									INPUT					CONDITION
		RIPPLE	MUTE	RL	OPIN	VREF	CMR-IN	NF	OPOUT	SW-IN	DR-IN	DC-IN	RIPPLEIN	VOPIN	VINDC	
DRIVER	Quiescent Current	ON	OFF	OFF	ON	ON	OFF	SHORT	2	2	0	0	0	0	OFF	
	Output offse voltage	↓	↓	ON	↓	↓	↓	↓	↓	↓	↓	2.5V	↓	↓	↓	
	Maximum output amplitude	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0V,5V	↓	↓	↓	Only one channel on at a time
	Closed loop voltage gain	↓	↓	↓	↓	↓	↓	↓	↓	2	0.1Vrms	0	↓	↓	↓	
	Ripple rejection	OFF	↓	↓	↓	↓	↓	↓	↓	1	0	2.5V	0.1Vrms	↓	↓	
	Slew rate	ON	↓	↓	↓	↓	↓	↓	↓	2	⎍	0	0	↓	↓	
REGULATOR	Output voltage	↓	↓	OFF	↓	↓	↓	↓	↓	↓	0	↓	↓	↓	↓	
	Output load variation	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
	Supply voltage variation	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
OPERATIONAL AMPLIFIER	Offset voltage	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
	Input bias current	↓	↓	↓	↓	OFF	↓	1M	↓	↓	↓	↓	↓	↓		
	High level output voltage	↓	↓	↓	↓	ON	↓	OPEN	↓	↓	↓	↓	↓	↓	2V	
	Low level output voltage	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	6V	
	Output driver current (sink)	↓	↓	↓	↓	↓	↓	SHORT	↓	↓	↓	↓	↓	↓	OFF	
	Output driver current (source)	↓	↓	↓	↓	↓	↓	↓	3	↓	↓	↓	↓	↓	↓	
	voltage gain (open loop)	↓	↓	↓	↓	↓	↓	GVO	↓	↓	↓	↓	↓	-75dBV	↓	
	Slew rate	↓	↓	↓	↓	↓	↓	SHORT	↓	↓	↓	↓	↓	⎍	↓	
	Ripple rejection	OFF	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	0.1Vrms	0	↓	
	Common mode rejection ratio	ON	↓	↓	OFF	OFF	ON	1M	↓	↓	↓	↓	0	0.1Vrm	↓	

INPUT/OUTPUT CIRCUIT

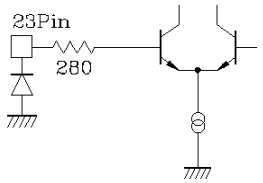
Driver input



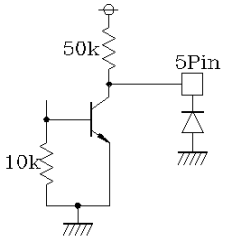
Driver output



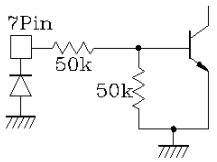
Bias



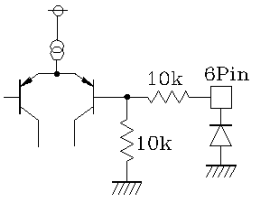
Regulator (base connection)



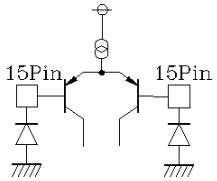
Mute



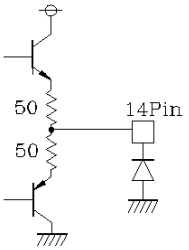
Regulator output



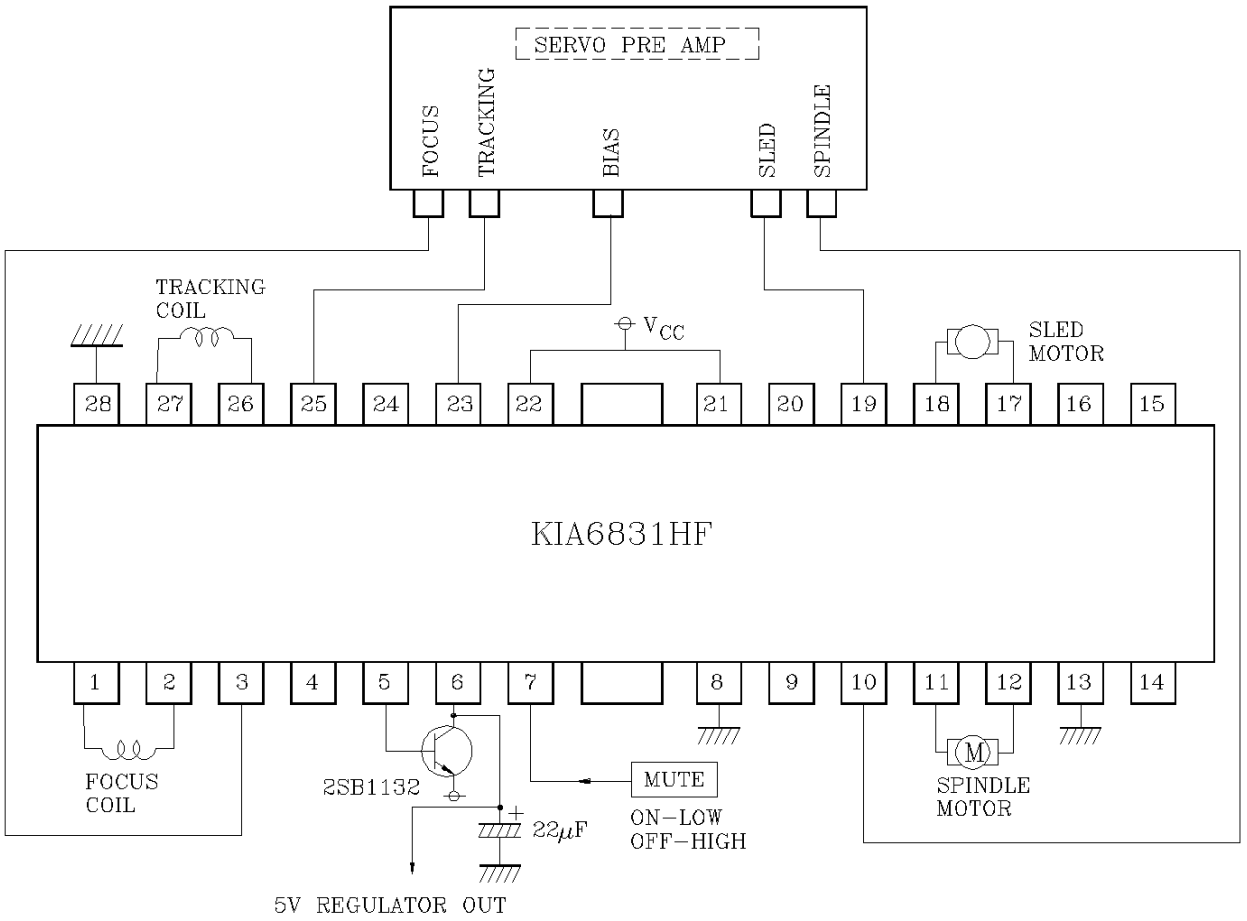
Operational amplifier input



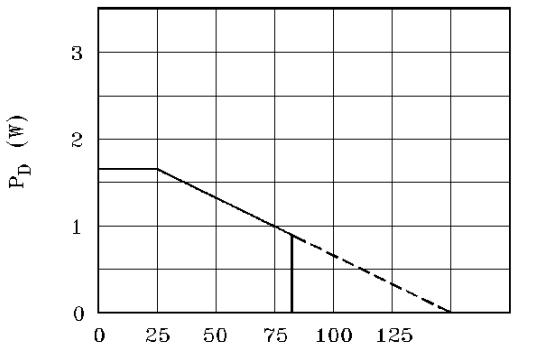
Operational amplifier output



APPLICATION



Thermal reduction curve



Pd:power dissipation
When mounted to a 50mm*50mm*1.6mm board

● Operation notes

1. The KIA6831FP have an internal thermal shutdown circuit. Output current is muted when the chip temperature exceeds 175℃ (typically) and restored when the chip temperature falls to 150℃ (typically).

2. If the mute pin (7pin) voltage is opened or lowered below 0.5V, the output current will be muted. Pin7 should be pulled up above 2.0V during normal use.

3. The bias pin (23pin) is muted when lowered below 1.4V(typically). Make sure it stays above 1.6V during normal use.

4. Muting occurs during thermal shutdown, mute-on operations or drop in the bias pin voltage. In each case, only the drivers are muted. During muting, the output pins remain at the internal bias voltage, roughly (VCC/2).

5. Be sure to connect the IC to a 0.1μF bypass capacitor to the power supply, at the base of the IC.

6. The radiating fin is connected to the package is internal GND, but should also be connected to an external ground.

7. The capacitor between regulator output (6pin) and GND also serves to prevent oscillation of the IC, so select one with good temperature characteristics.