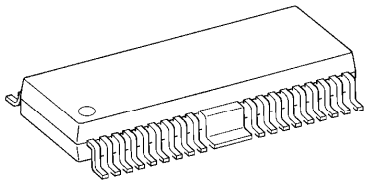
TENTATIVE TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA2125F

POWER DRIVER IC FOR CD PLAYER

TA2125F is a power driver IC developed for CD players. This IC have built-in 4 channel BTL power amplifiers and 1 channel H-Bridge driver. Which drives focus-coil and tracking coil for 3-beam pick-up head, disk motor, feed motor and loading motor.



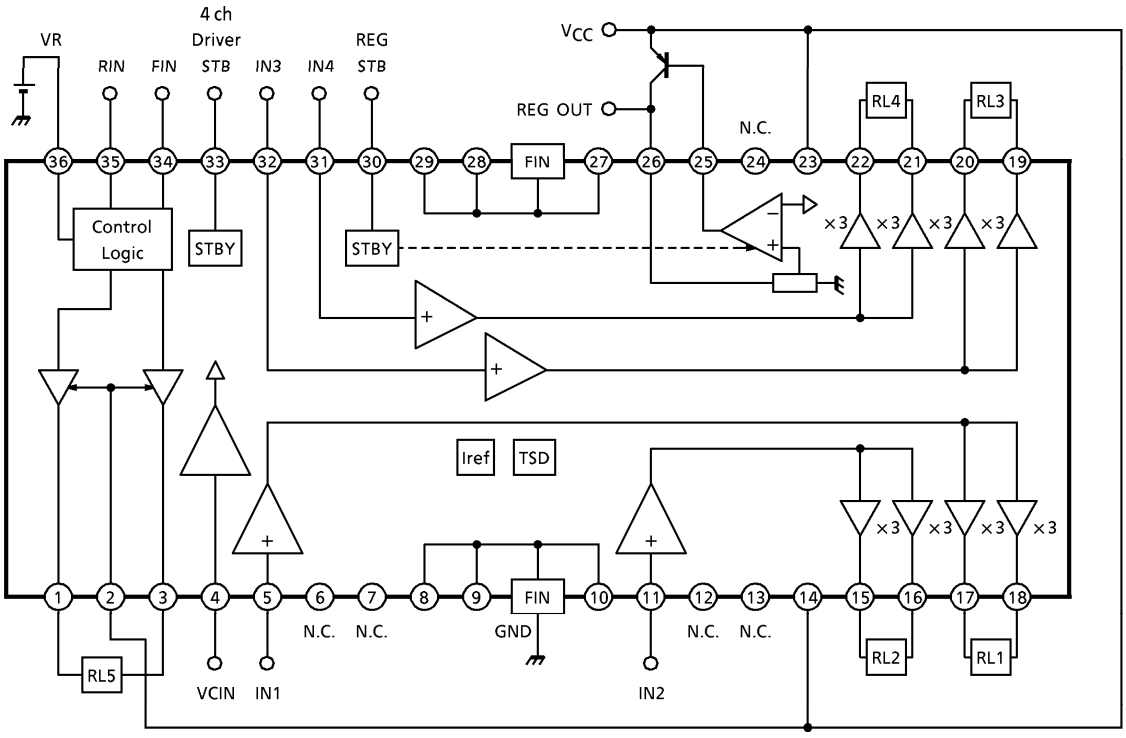
HSOP36-P-375-0.80

Weight : 0.74 g (Typ.)

FEATURES

- 4 channel BTL linear drivers
  - High output power : V_{out} = 5.1 Vp-p (V_{CC} = 8 V, R_L = 8 Ω)
  - Stand-by switch for BTL drivers
- 1 channel H-Bridge : V_{CE} (H) + V_{CE} (L) = 1.3 V (V_R = V_M = 8 V, Io = 200 mA)
  - Logic control (Forward, Revers, Brake, Stand-by)
- Punch through current restriction diode for H-Bridge
- 5 V Regulator Reference Amp (with external output Tr.)
- Thermal Shut Down Protection
- Operating Supply Voltage Range : 5 V~9 V

BLOCK DIAGRAM



TERMINAL EXPLANATION

No.	SYMBOL	FUNCTION	
1	OUT5A	Output terminal	H-Bridge
2	VM	Supply voltage terminal for Logic	H-Bridge
3	OUT5B	Output terminal	H-Brdige
4	VCIN	Input reference voltage	4ch BTL
5	IN1	Input for ch1	4ch BTL
6	N.C.	Open	—
7	N.C.	Open	—
8	N.C.	8, 9, 10, 27, 28, 29 are connected to PW GND (FIN)	—
9	N.C.	8, 9, 10, 27, 28, 29 are connected to PW GND (FIN)	—
10	N.C.	8, 9, 10, 27, 28, 29 are connected to PW GND (FIN)	—
11	IN2	Input for ch2	4ch BTL
12	N.C.	Open	—
13	N.C.	Open	—
14	V_{CC1}	Supply voltage terminal for ch1 / ch2	4ch BTL
15	OUT2M	Inverted output for ch2	4ch BTL
16	OUT2P	Non-inverted output for ch2	4ch BTL
17	OUT1M	Inverted output for ch1	4ch BTL
18	OUT1P	Non-inverted output for ch1	4ch BTL
19	OUT3P	Non-inverted output for ch3	4ch BTL
20	OUT3M	Inverted output for ch3	4ch BTL
21	OUT4P	Non-inverted output for ch4	4ch BTL
22	OUT4M	Inverted output for ch4	4ch BTL
23	V_{CC2}	Supply voltage terminal for ch3 / ch4	4ch BTL
24	N.C.	Open	—
25	REG	Connection with BASE of PNP Tr.	REGULATOR
26	REG OUT	Output for regulator (5 V)	REGULATOR
27	N.C.	8, 9, 10, 27, 28, 29 are connected to PW GND (FIN)	—
28	N.C.	8, 9, 10, 27, 28, 29 are connected to PW GND (FIN)	—
29	N.C.	8, 9, 10, 27, 28, 29 are connected to PW GND (FIN)	—
30	REG STBY	Standby control for Regulator	REGULATOR
31	IN4	Input for ch4	4ch BTL
32	IN3	Input for ch3	4ch BTL
33	STBY	Standby control for 4ch BTL	4ch BTL
34	FIN	Logic control input	H-Bridge
35	RIN	Logic control input	H-Bridge
36	VR	Supply voltage terminal for Motor driver	H-Bridge

PRECAUTION USE

<4ch BTL>

- Input Stage

  Minimum input DC voltage range for buffer is 0.2 V.

- Driver Stage

  Each channel driver consists of BTL configuration linear amplifier.
  Voltage gain is fixed : GV = 15.2 dB

- VCIN Terminal

  VCIN is reference voltage terminal for input signal

- GND

  Pin 8~10 and Pin 27~29 are connected to FIN through inner lead frame.
  Each FIN are not connected each other also.
  The heat of power dissipation is transferred to PCB, through PW-GND Pin.PW GND is connected to substrate of Pellet to connected copper foil area as large as possible.

- V_{CC1} / V_{CC2}

  Pin 14 and pin 23 are not connected through AL layer on chip.

<H-Bridge>

- VR / VM Terminal

  VR Terminal is Control for H-Brige Dynamic Range. 136 = 30 mA (Brake Mode)
  VM Terminal is VCC Terminal for H-Bridge.

- STBY / REG STBY

  STBY is standby control terminal for 4ch BTL.
  REG STBY is standby control terminal for Regulator.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V_{CC}	12	V
Power Dissipation	P_D	1.7	W
Operating Temperature	T_{opr}	−35~85	°C
Storage Temperature	T_{stg}	−55~150	°C

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{CC} = 8 V, R_L = 8 Ω, VBIAS = 2.1 V, f = 1 kHz, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Operating Supply Voltage	$V_{CC1, 2}$	—		5	8	9	V
Quiescent Current	I_{CCQ}	—	V_{IN} = VBIAS, R_L = OPEN (With out H-SW)	27	37	60	mA

4ch BTL Driver

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Offset Voltage	V_{OS}	—	Rg = 0	−50	10	50	mV
Maximum Output Voltage	V_{OM}	—	V_{IN} = 4 V / GND	4.5	5.1	—	VP
Voltage Gain	G_V	—	V_{IN} = VBIAS ± 200 mV	14.0	15.2	16.4	dB
Stand-by 1 Control Voltage	VSTB (on)	—		—	—	0.5	V
	VSTB (off)	—		3.0	—	—	
Stand-by Current	ISTB1	—	V_{IN} = VBIAS, R_L = OPEN H-Gridge : Stand-by 5 V REG : Stand-by	—	—	1	μA

Regulator Reference Amp

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Voltage	V_{reg}	—	I_O = 200 mA, Tr.2SA1203Y	4.6	5	5.2	V
Regulator Control Voltage	V_{reg} (on)	—		2.5	—	V_{CC}	V
	V_{reg} (off)	—		GND	—	1.5	

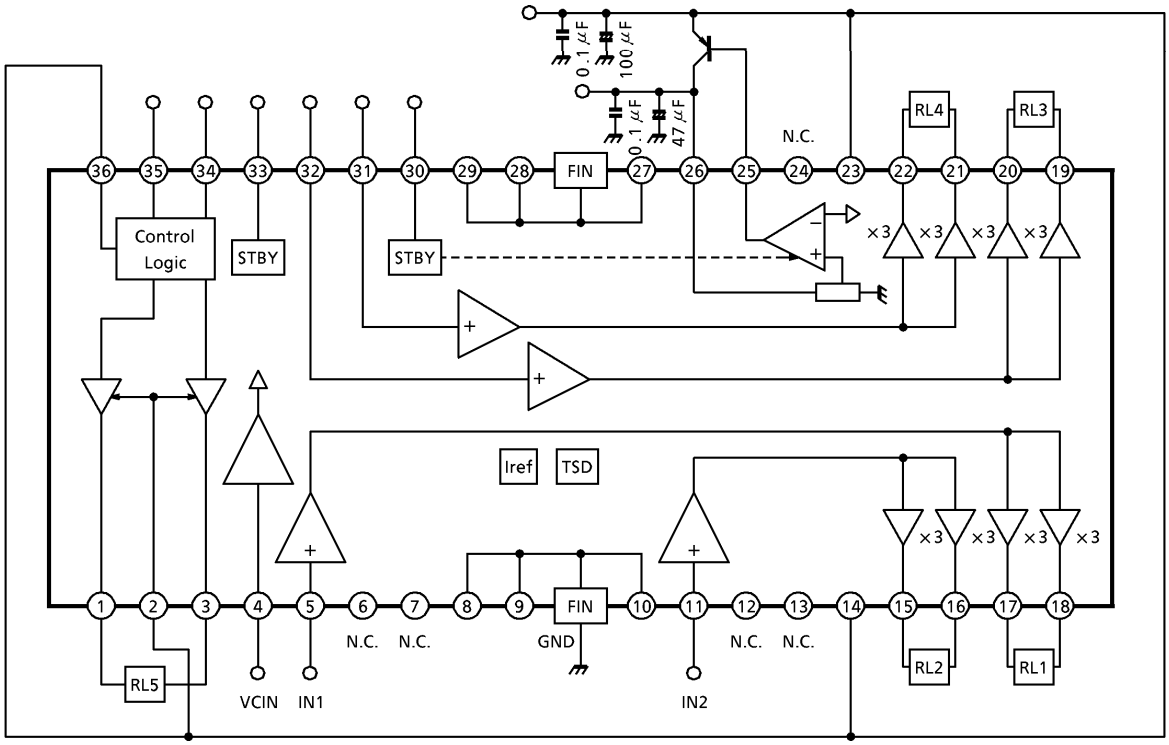
H-Bridge

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Saturation Voltage	V_{CE}	—	I_O = 200 mA,	—	1.3	1.4	V
Stand-by Current	ISTB2	—	4ch BTL : Stand-by 5 V REG : Stand-by	—	—	1	μA
Control Voltage	V_{HB} (on)	—		2.5		V_{CC}	V
	V_{HB} (off)	—		GND		0.7	

H-Bridge Control Logic / VR Current (36pin)

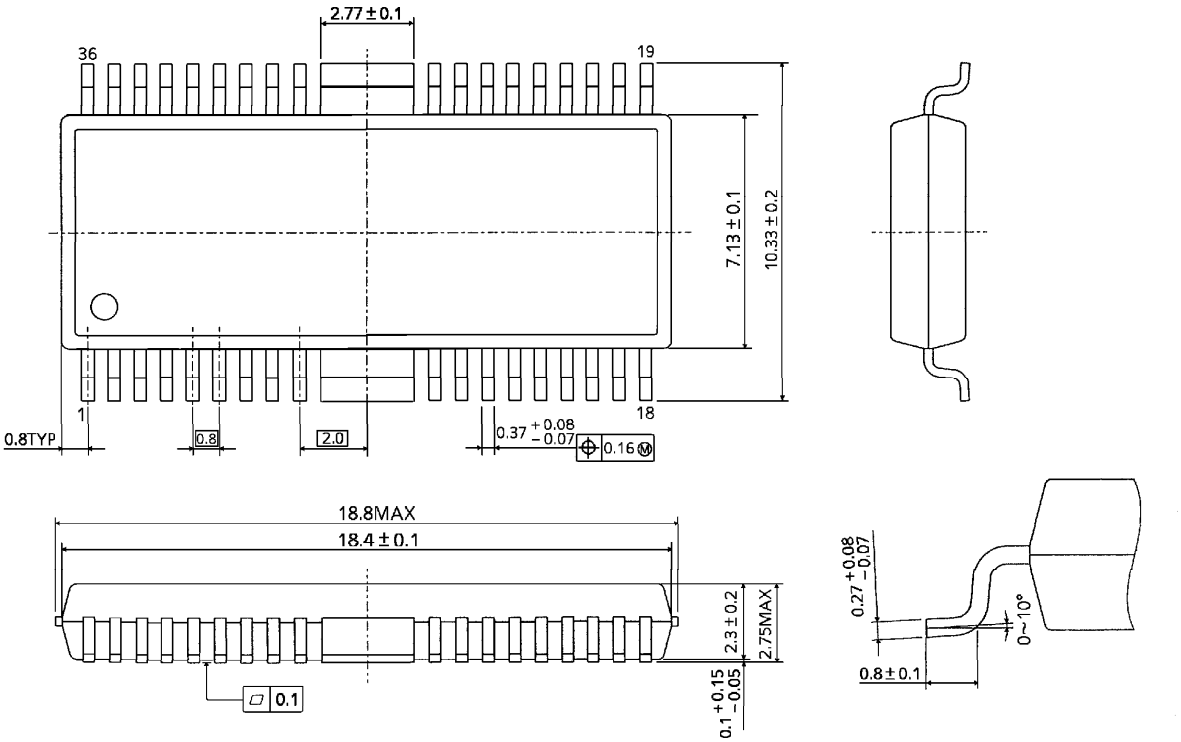
OPERATION MODE	FIN	RIN	OUT5A	OUT5B	VR CURRENT	UNIT
FORWARD	H	L	L	H	19.5	mA
REVERS	L	H	H	L	19.5	mA
BRAKE	H	H	L	L	30	mA
STAND-BY	L	L	OPEN	OPEN	1	μA

TEST CIRCUIT



PACKAGE DIMENSIONS

HSOP36-P-375-0.80 Unit : mm



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