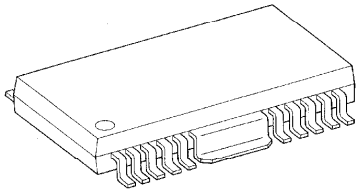
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8192F

POWER DRIVER IC FOR CD PLAYER

TA8192F is a power driver IC developed for CD players. It controls the focus / tracking coil of a 3-beam pickup head, the disc motor and feed motor.



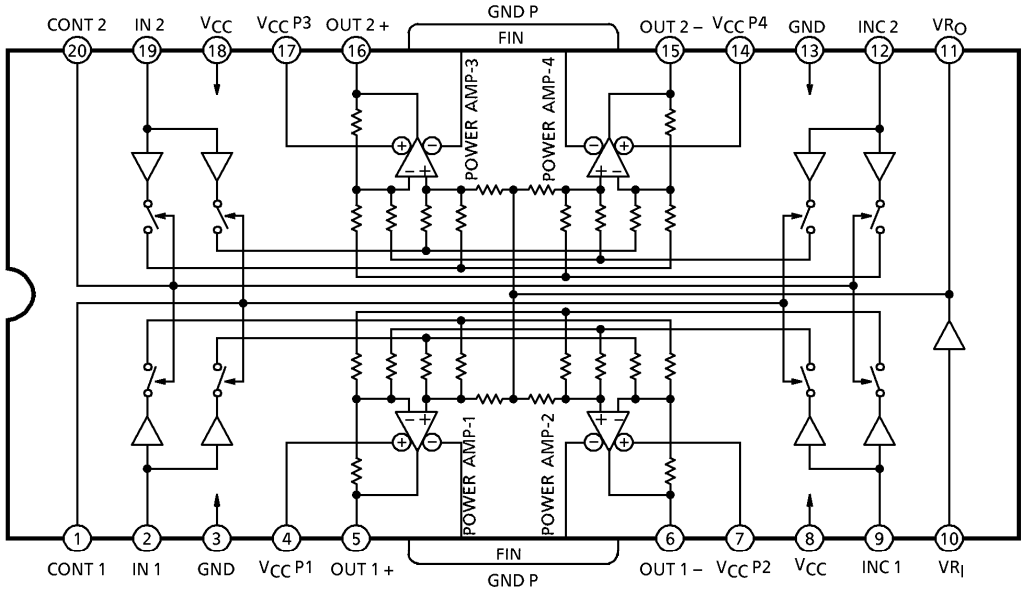
HSOP20-P-450-1.00

Weight : 0.8g (Typ.)

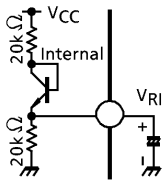
FEATURES

- BTL power drivers for 2 channels.
- Circuits can reduce external components without utilizing a bootstrap technique.
- High output voltage.
- High output current : I_O (Typ.) = 0.5A
- Wide operating power supply voltage range : V_{CC} = 4~12V
- Gain switch / output off (VR fixed output) are possible.
  Gain selection : 2, 4, 6 times
- Built-in thermal shutdown circuit.
- 20 pin power flat package.

BLOCK DIAGRAM / PIN CONNECTION



FUNCTION OF EACH PIN

<table>
<tr><th>PIN No.</th><th>SYMBOL</th><th>I / O</th><th>FUNCTION DESCRIPTION</th><th>REMARKS</th></tr>
<tr><td>1
20</td><td>CONT 1
CONT 2</td><td>I</td><td>Input terminal for gain switch.
<table>
<tr><th>CONT 1</th><th>CONT 2</th><th>Gain</th></tr>
<tr><td>0</td><td>0</td><td>VR fixed</td></tr>
<tr><td>1</td><td>0</td><td>2 times</td></tr>
<tr><td>0</td><td>1</td><td>4 times</td></tr>
<tr><td>1</td><td>1</td><td>6 times</td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>IN 1</td><td>I</td><td>Control signal input terminal for power Amp-1 and 2.</td><td></td></tr>
<tr><td>3</td><td>GND</td><td>—</td><td>Ground terminal.</td><td></td></tr>
<tr><td>4</td><td>V_{CC} P1</td><td>—</td><td>Power supply voltage terminal. (Power Amp-1)</td><td></td></tr>
<tr><td>5</td><td>OUT 1 +</td><td>O</td><td>Power Amp-1 output terminal.</td><td></td></tr>
<tr><td>6</td><td>OUT 1 –</td><td>O</td><td>Power Amp-2 output terminal.</td><td></td></tr>
<tr><td>7</td><td>V_{CC} P2</td><td>—</td><td>Power supply voltage terminal. (Power Amp-2)</td><td></td></tr>
<tr><td>8</td><td>V_{CC}</td><td>—</td><td>Power supply voltage terminal.</td><td></td></tr>
<tr><td>9</td><td>INC 1</td><td>I</td><td>Control signal input terminal common to power Amp-1 and 2.</td><td></td></tr>
<tr><td>10</td><td>VR_I</td><td>I</td><td>Internal reference voltage terminal.
Capacitor for filter is connected with GND.</td><td> 
</td></tr>
<tr><td>11</td><td>VR_O</td><td>O</td><td>Reference voltage output terminal. $VR_O = VR_I$</td><td></td></tr>
<tr><td>12</td><td>INC 2</td><td>I</td><td>Control signal input terminal common to power Amp-3 and 4.</td><td></td></tr>
<tr><td>13</td><td>GND</td><td>—</td><td>Ground terminal.</td><td></td></tr>
<tr><td>14</td><td>V_{CC} P4</td><td>—</td><td>Power supply voltage terminal. (Power Amp-4)</td><td></td></tr>
<tr><td>15</td><td>OUT 2 –</td><td>O</td><td>Power Amp-4 output terminal.</td><td></td></tr>
<tr><td>16</td><td>OUT 2 +</td><td>O</td><td>Power Amp-3 output terminal.</td><td></td></tr>
<tr><td>17</td><td>V_{CC} P3</td><td>—</td><td>Power supply voltage terminal. (Power Amp-3)</td><td></td></tr>
<tr><td>18</td><td>V_{CC}</td><td>—</td><td>Power supply voltage terminal.</td><td></td></tr>
<tr><td>19</td><td>IN 2</td><td>I</td><td>Control signal input terminal for power Amp-3 and 4.</td><td></td></tr>
<tr><td>FIN</td><td>GND P</td><td>—</td><td>Heat sink and power ground terminal.</td><td></td></tr>
</table>

MAXIMUM RATINGS (Ta = 25°C)

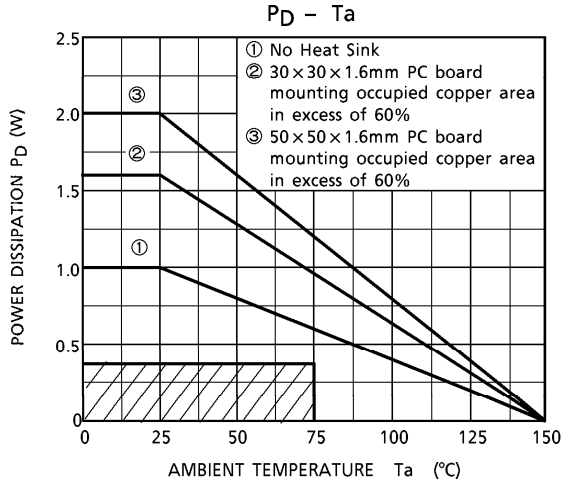
CHARACTERISTIC		SYMBOL	RATING	UNIT
Power Supply Voltage		V_{CC}	14	V
Output Current		I_O (Typ.)	0.5	A
Power Dissipation	No Heat Sink	P_D	1	W
	Heat Sink		2	
Operating Temperature		T_{opr}	−25~75	°C
Storage Temperature		T_{stg}	−55~150	°C

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_{CC} = 5V, Ta = 25°C, BTL connection)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Operating Power Supply Voltage	V_{CC}	—	V_{CC}, V_{CC} P1 − V_{CC} P4		4	5	12	V
Power Supply Current	I_{CCQ}	—	IN 1 = IN 2 = 2.1V INC 1 = INC 2 = 2.1V	2 times	10	16	30	mA
				4 times		16		
				6 times		18		
Input Offset Current	$\lvert I_{IO} \rvert$	—	IN 1 − INC 1, IN 2 − INC 2		—	10	100	nA
Input Bias Current	I_{IB}	—	IN 1, INC 1, IN 2, INC 2 terminals		—	500	1600	nA
Output Offset Voltage	$\lvert V_{OS} \rvert$	—	IN 1 = IN 2 = 2.1V INC 1 = INC 2 = 2.1V	V_{CC} = 5V	—	10	30	mV
				V_{CC} = 8V		—	50	
				V_{CC} = 12V		—	100	
Output Voltage	V_O	—	f = 1kHz, R_L = 5Ω		4.5	5.0	—	V_{p-p}
Voltage Gain	G_V	—	f = 1kHz, R_L = 5Ω V_{in} = 100mV_{rms}	2 times	4.5	5.0	6.5	dB
				4 times	10.5	11.0	12.5	
				6 times	14.5	15.0	16.5	
Frequency Band Range	f_c	—	R_L = 5Ω V_{in} = 100mV_{rms}	2 times	—	220	—	kHz
				4 times		180		
				6 times		150		
Total Harmonic Distortion	THD	—	f = 1kHz, R_L = 5Ω V_{in} = 100mV_{rms} V_o = 4V_{p-p}	2 times	—	−46	—	dB
				4 times		−49		
				6 times		−51		
Slew Rate	SR	—	R_L = 5Ω, Vo = 2V_{p-p}	2 times	—	1.5	—	V / μs
				4 times		1.2		
				6 times		1.0		
Output Noise Voltage	V_{ON}	—	R_g = 10kΩ DIN AUDIO	2 times	—	15	—	μV_{rms}
				4 times		25		
				6 times		30		

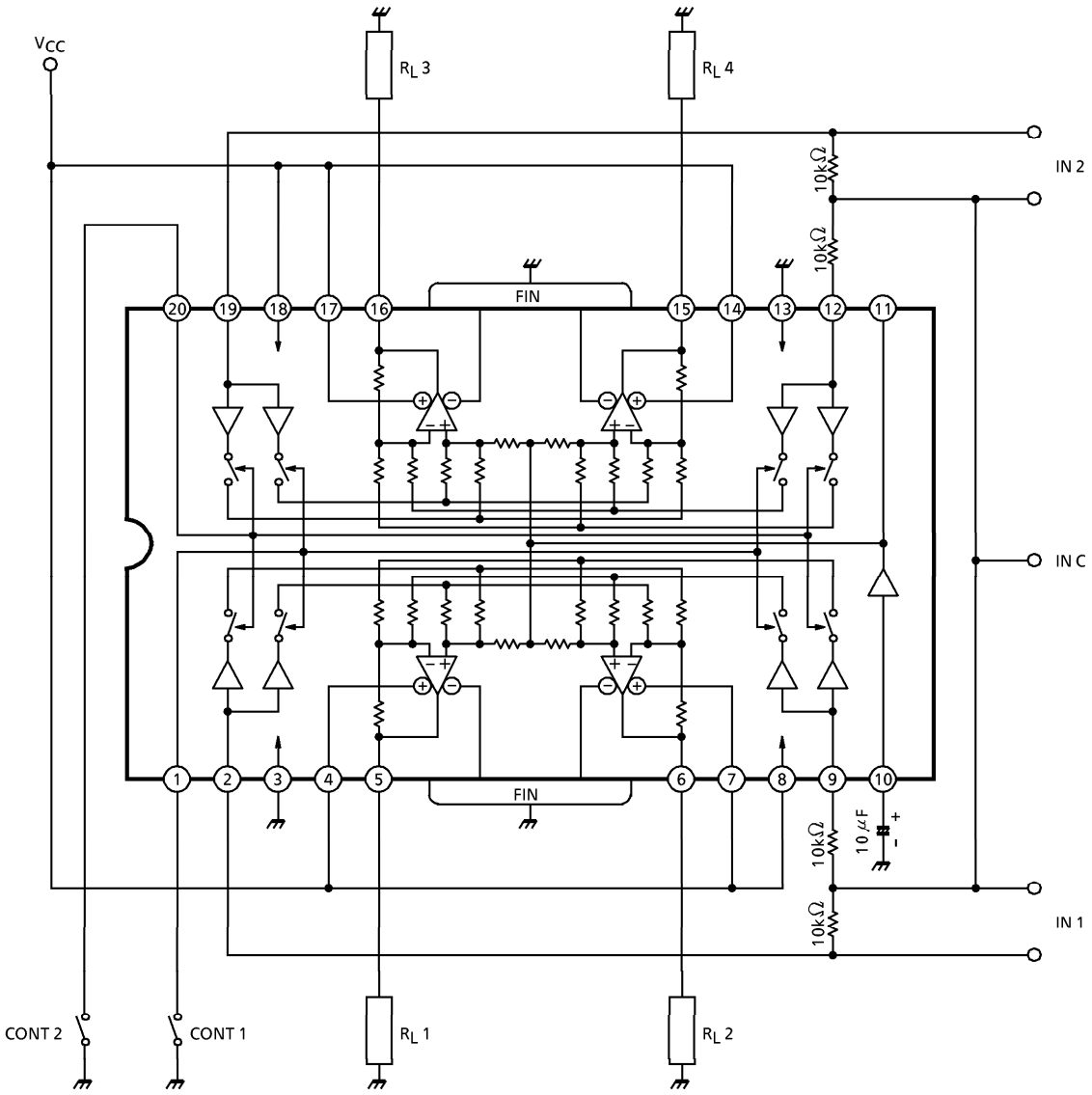
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Cross-talk		CT	—	$f = 1kHz$, $R_L = 5\Omega$ $V_O = 1V_{rms}$	2 times	—	−88	—	dB
					4 times		−86		
					6 times		−80		
Ripple Rejection Ratio		RR	—	$f_R = 100Hz$, $77.5mV_{rms}$ (−20dBm)	2 times	—	−70	—	dB
					4 times		−66		
					6 times		−60		
Reference Output Voltage		VR_O	—	VR_O terminal, $VR_O = (V_{CC} - V_{BE}) / 2$		—	2.1	—	V
Input Voltage	"H" level	V_{IH}	—	CONT 1, CONT 2 terminals		2.0	—	—	V
	"L" level	V_{IL}				—	—	0.3	
Thermal Shutdown Operation Temperature		T_{ON}	—			—	165	—	°C

HSOP 20 POWER DISSIPATION



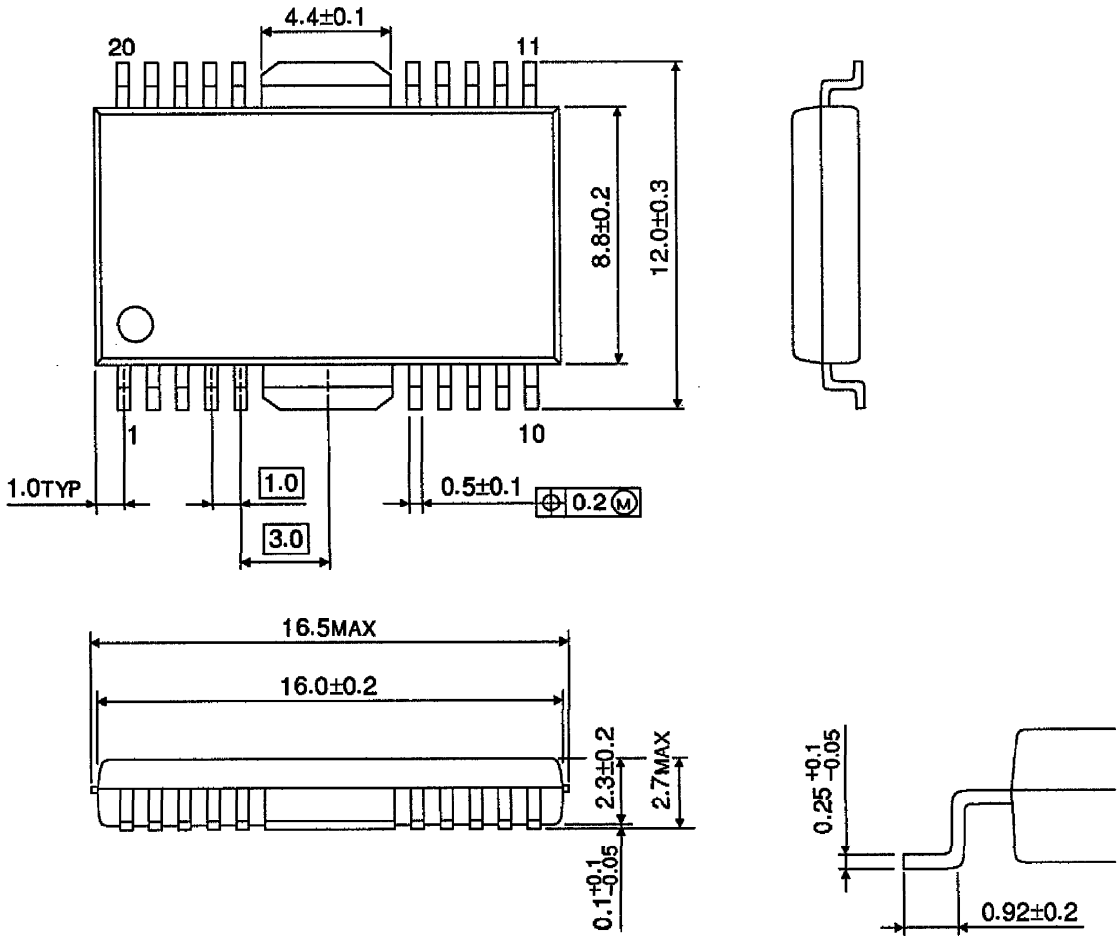
(Note) In case of normal use, power dissipation of IC only is oblique line portion.

TEST CIRCUIT / APPLICATION CIRCUIT



PACKAGE DIMENSIONS

HSOP20-P-450-1.00 Unit : mm



Weight : 0.8g (Typ.)

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