

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8224H

MULTI OUTPUT VOLTAGE REGULATOR FOR CD PLAYER

The TA8224H is voltage regulator IC, designed for compact disc player use, built in 3 outputs and reset circuit.

In addition, protection of over voltage, output to GND short and thermal shut down are involved.

FEATURES

- 3 Regulated Voltage Outputs

V_{OUT1} (for μ -com system) fixed voltage output
: $V_{OUT1} = 5\text{ V (Typ.)} / 100\text{ mA (MAX.)}$

V_{OUT2} (for servo system) fixed voltage output
: $V_{OUT2} = 5\text{ V (Typ.)} / 300\text{ mA (MAX.)}$

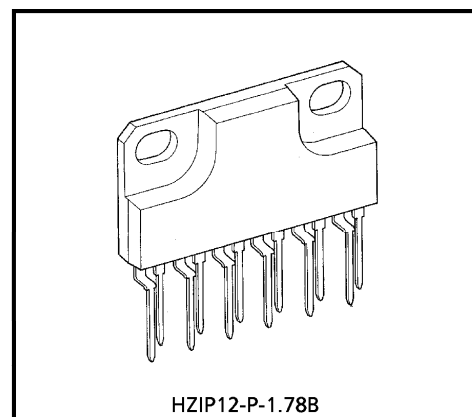
V_{OUT3} (for driver) adjustable voltage output
: $V_{OUT3} = 8\text{ V (Typ.)} / 1.2\text{ A (MAX.)}$

- Built-in Reset Circuit 2 input, 1 output
: Reset Sense Voltage $V_R \leq 3.4\text{ V (Ta = 25}^\circ\text{C)}$

- Built-in Stand-by Circuit
: STB1 for V_{OUT1} , V_{OUT2} , V_{OUT3}
: STB2 for V_{OUT2} , V_{OUT3}

- Built-in Various Protection Circuits
: Over Voltage, Output to GND Short, Thermal Shut Down

- Input Operating Voltage Range
: $V_{IN(\text{opr})} = 7.5\sim 20\text{ V}$
: $V_{IN(\text{opr})} = 7.5\sim 24\text{ V (Operating } V_{OUT1}\text{ only)}$



HZIP12-P-1.78B

Weight : 4.04 g (Typ.)

980910EBA2

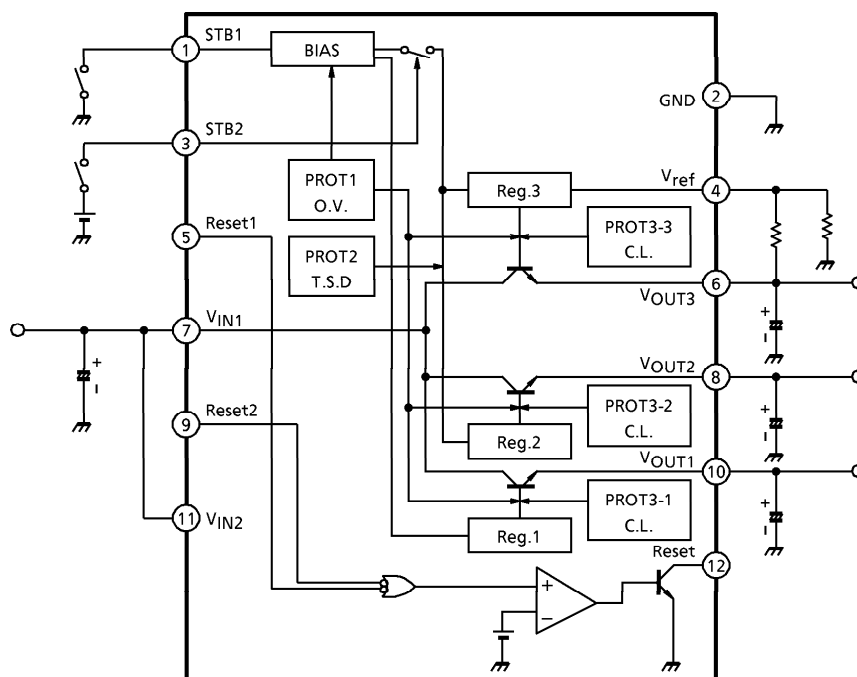
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BLOCK DIAGRAM



PROT1 : Over Voltage
 PROT2 : Thermal Shut Down
 PROT3 : Current Limiter for Output-GND Short

EXPLANATION FOR EACH TERMINAL

PIN No.	SYMBOL	FUNCTION	REMARKS
1	STB1	Stand-by switch for V _{OUT1} , V _{OUT2} , V _{OUT3}	GND terminal for bias circuit. ① → GND : ON, ① → OPEN : OFF
2	GND	GND	GND is except for bias circuit.
3	STB2	Stand-by switch	V _{STB2} ≥ 3.0 V : ON, V _{STB2} ≤ 1.2 V : OFF
4	V _{ref}	Reference for V _{OUT3}	V _{OUT3} is decide a ratio of R ₁ to R ₂ .
5	Reset1	Reset Input 1	V _{R1} ≥ 3.75 V : OFF, V _{R1} ≤ 3.4 V : RESET
6	V _{OUT3}	Adjustable voltage output	Adjust by external resistor R ₁ and R ₂
7	V _{IN1}	Input terminal 1	Driver stage supply terminal
8	V _{OUT2}	5 V output	Output fixed 5 V.
9	Reset2	Reset input 2	V _{R2} ≥ 3.75 V : OFF, V _{R2} ≤ 3.4 V : RESET
10	V _{OUT1}	5 V output	Output fixed 5 V.
11	V _{IN2}	Input 2	Pre stage supply terminal
12	Reset	Reset output	Open collector

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Input Voltage	V _{CC}	30	V
Power Dissipation	P _D (Note)	25	W
Operating Temperature	T _{opr}	- 25~75	°C
Storage Temperature	T _{stg}	- 55~150	°C

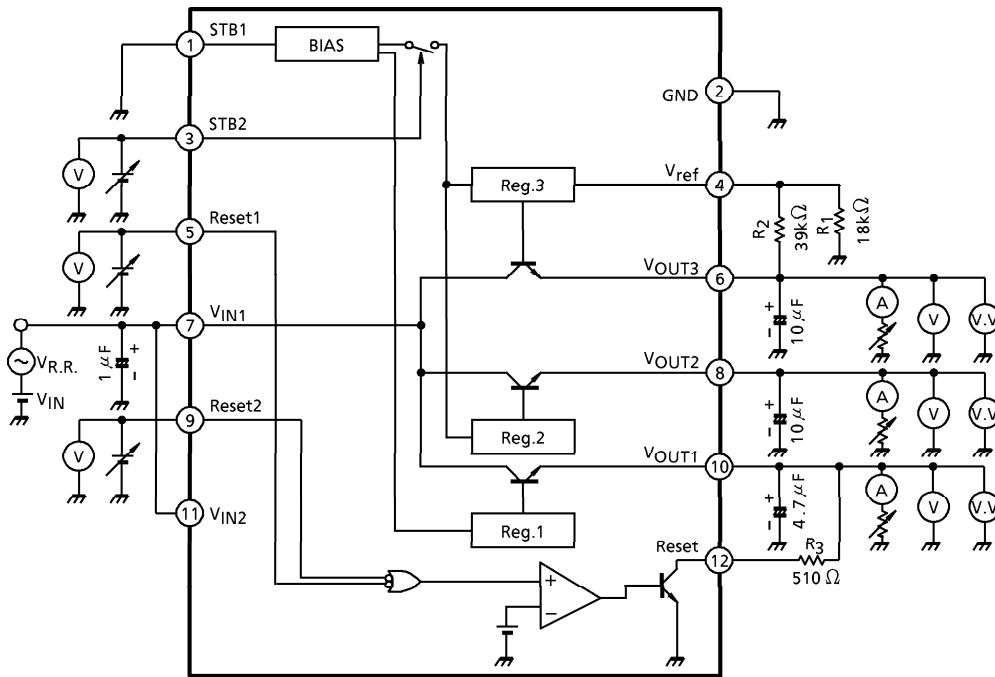
(Note) Derated above Ta = 25°C in the proportion of 200 mW/°C.

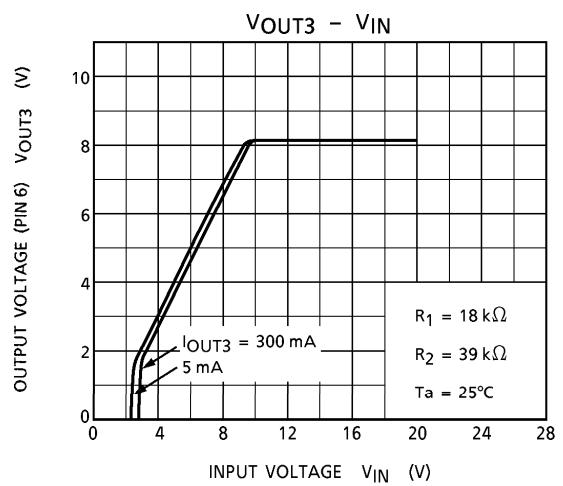
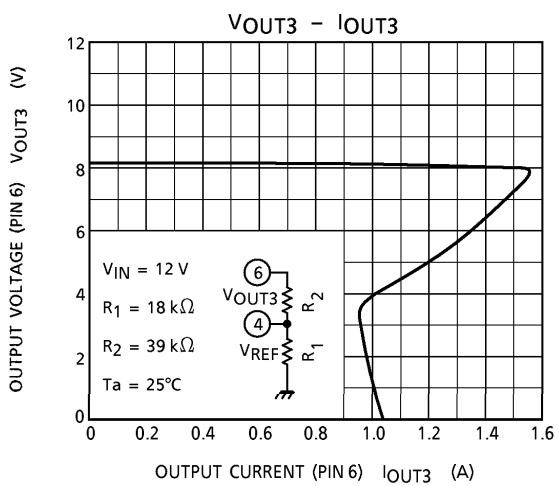
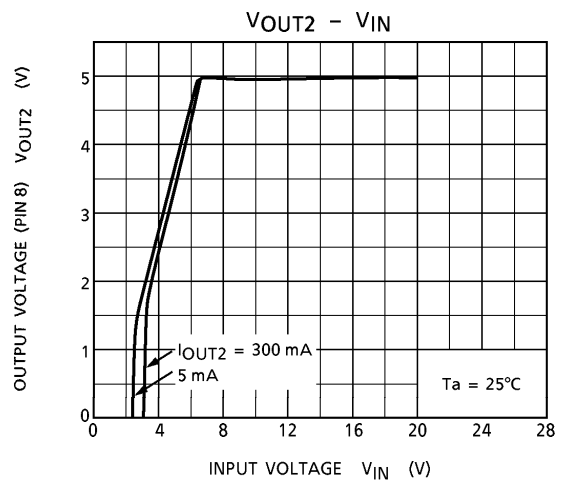
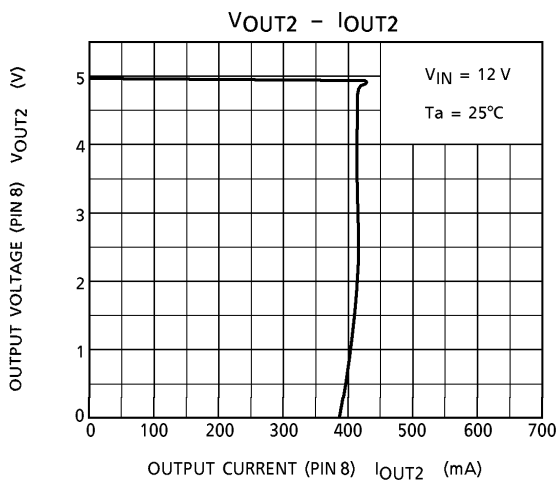
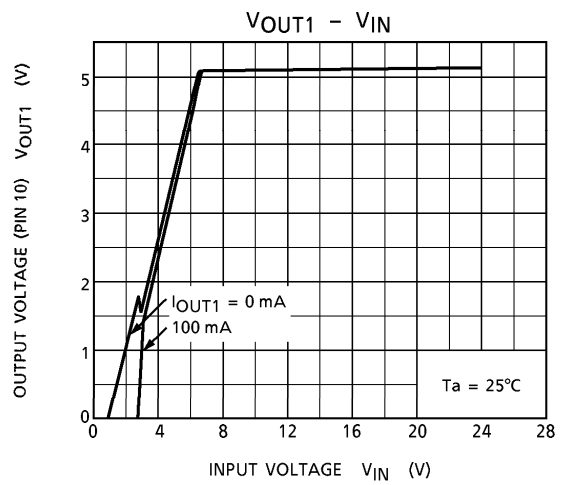
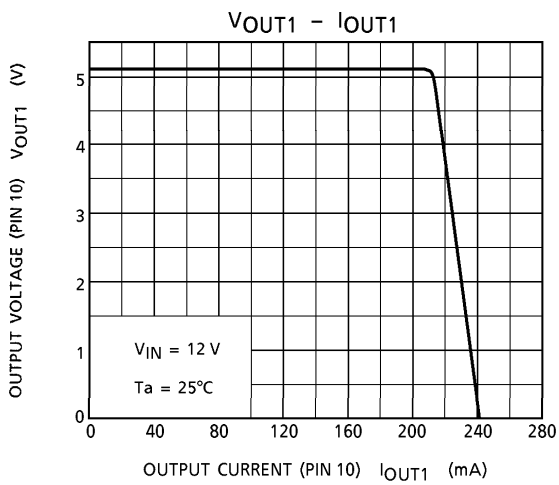
ELECTRICAL CHARACTERISTICS

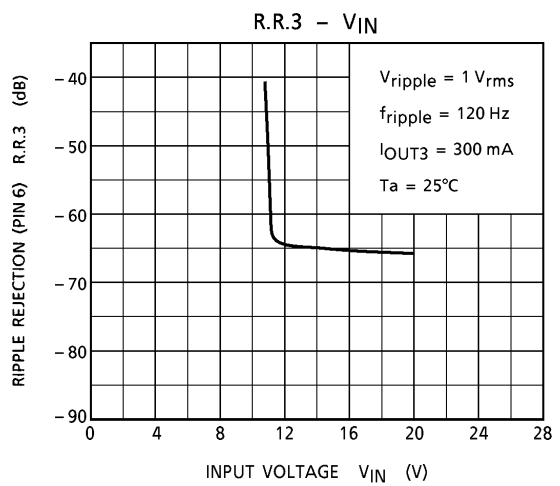
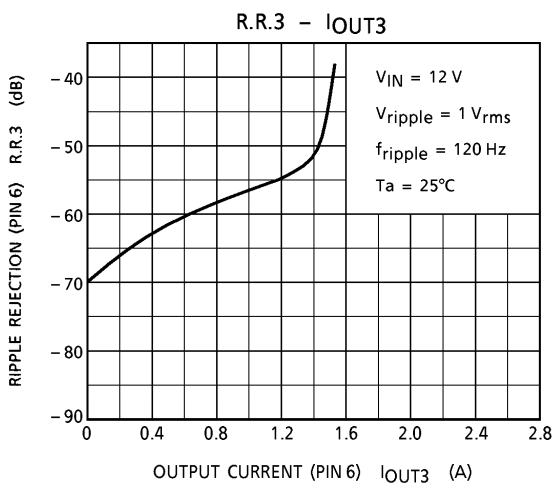
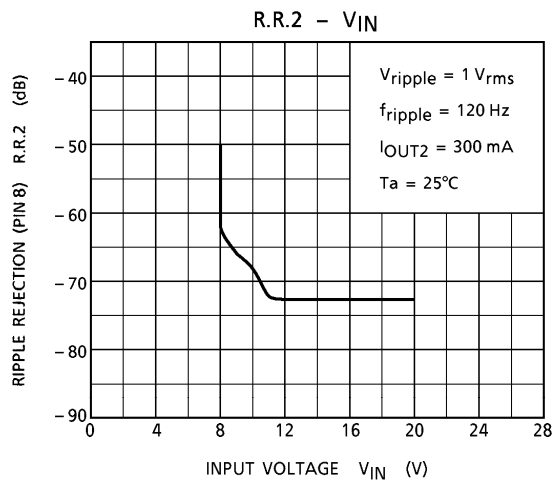
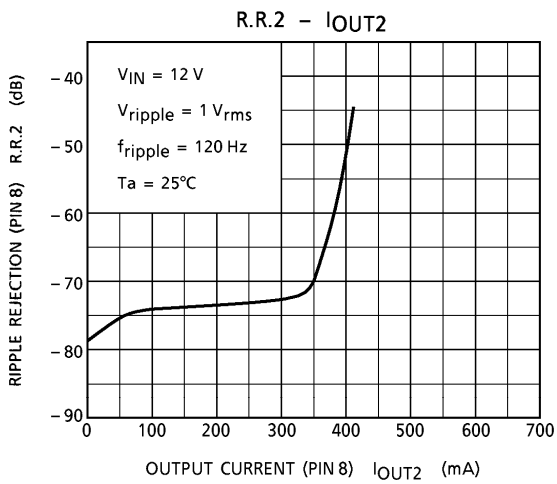
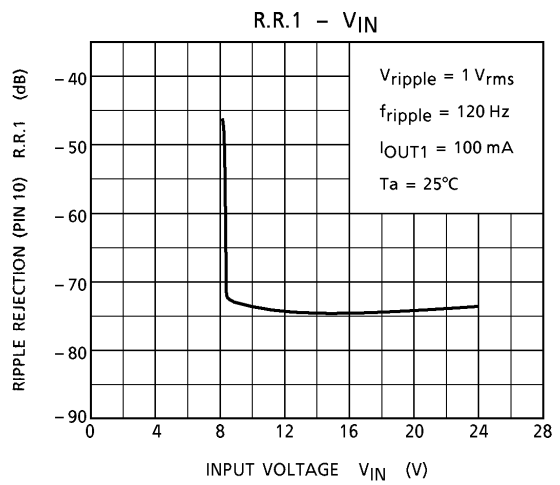
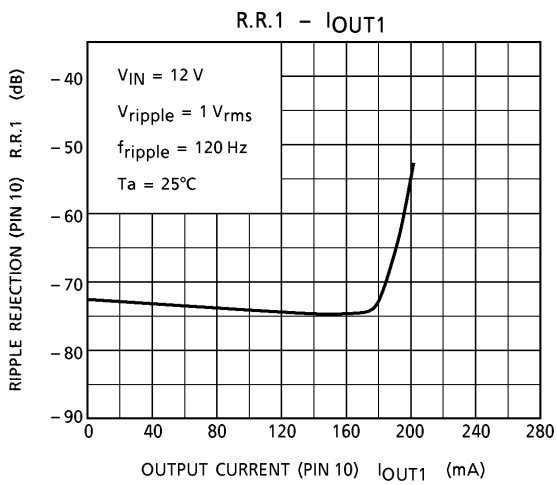
(Unless otherwise specified, $V_{IN} = 12\text{ V}$, $I_{OUT1} = 100\text{ mA}$, $I_{OUT2} = 300\text{ mA}$, $I_{OUT3} = 300\text{ mA}$, $T_a = 25^\circ\text{C}$)

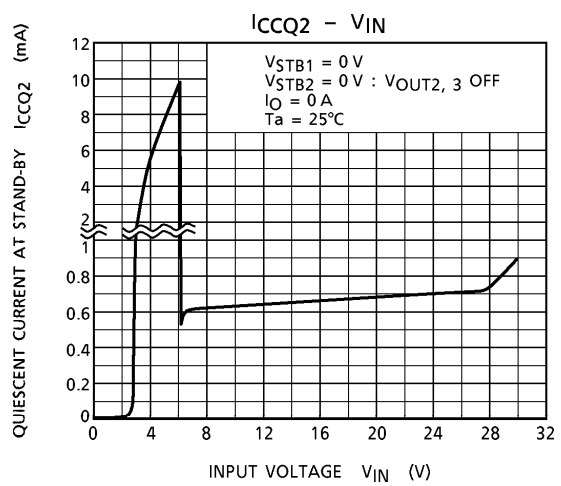
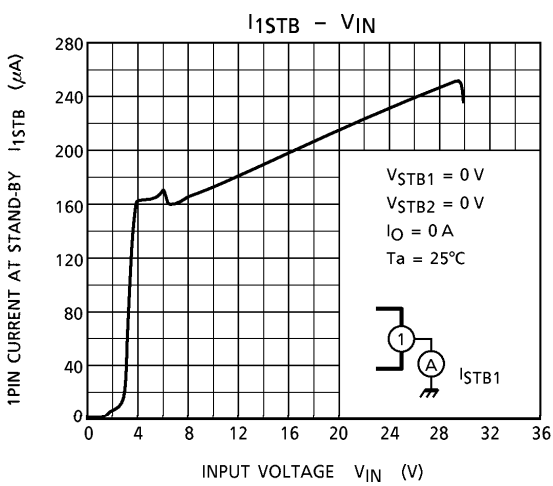
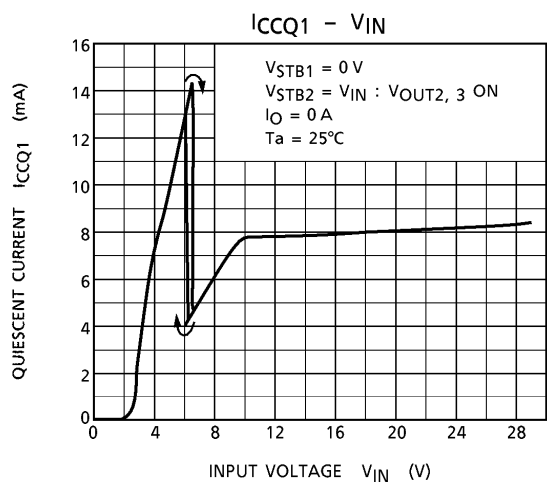
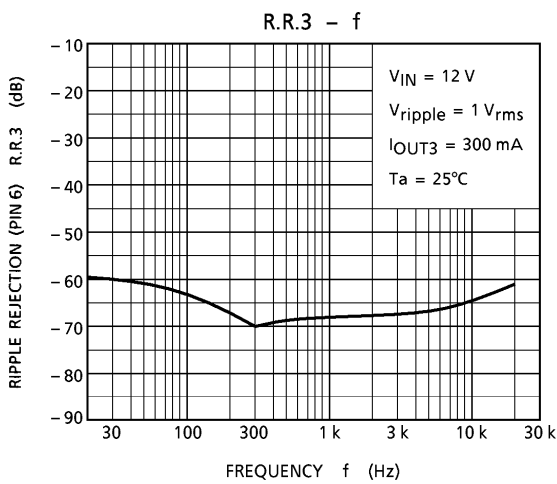
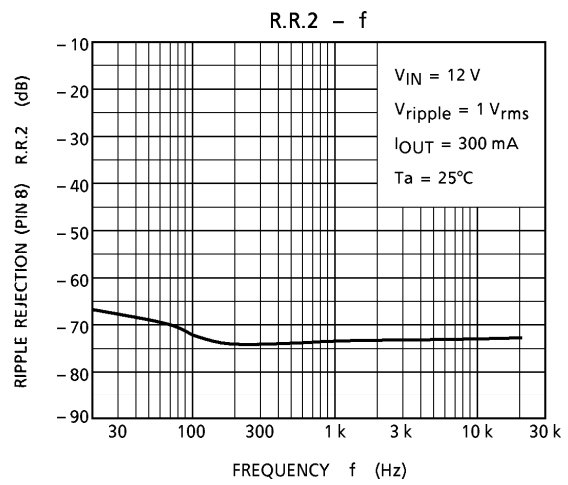
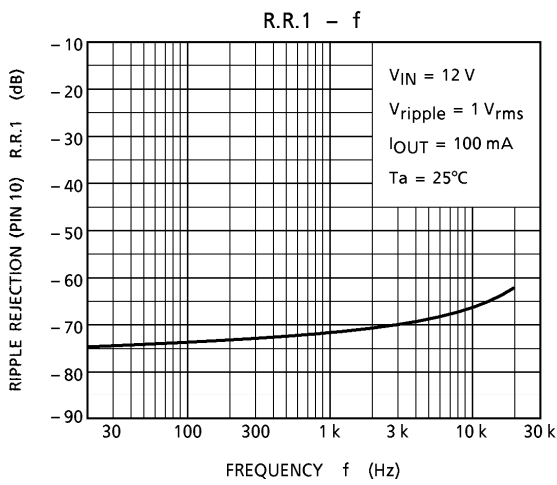
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT1}	—	—	4.8	5.0	5.3	V	
	V_{OUT2}	—	—	4.8	5.0	5.3		
	V_{OUT3}	—	$R_1 = 18\text{ k}\Omega$, $R_2 = 39\text{ k}\Omega$	7.7	8.0	8.3		
Input Regulation	Reg1. line	—	$7.5\text{ V} \leq V_{IN} \leq 24\text{ V}$	—	20	100	mV	
	Reg2. line	—	$7.5\text{ V} \leq V_{IN} \leq 20\text{ V}$	—	20	100		
	Reg3. line	—	$10.3\text{ V} \leq V_{IN} \leq 20\text{ V}$	—	20	150		
Load Regulation	Reg1. load	—	$0\text{ mA} \leq I_{OUT1} \leq 100\text{ mA}$	—	20	100	mV	
	Reg2. load	—	$5\text{ mA} \leq I_{OUT2} \leq 300\text{ mA}$	—	20	100		
	Reg3. load	—	$5\text{ mA} \leq I_{OUT3} \leq 300\text{ mA}$ $5\text{ mA} \leq I_{OUT3} \leq 1.2\text{ A}$	—	20	100		
Ripple Rejection Ratio	R.R.1	—	$V_{in} = 1\text{ V}_{\text{rms}}$ $f = 120\text{ Hz}$	$10\text{ V} \leq V_{IN} \leq 24\text{ V}$	60	70	—	dB
	R.R.2	—		$11\text{ V} \leq V_{IN} \leq 20\text{ V}$	60	70	—	
	R.R.3	—		$12\text{ V} \leq V_{IN} \leq 20\text{ V}$	52	64	—	
Dropout Voltage	V_{D1}	—	$V_{IN} = 6\text{ V}$	—	1.8	—	V	
	V_{D2}	—	$V_{IN} = 6\text{ V}$	—	1.8	—		
	V_{D3}	—	$V_{IN} = 8\text{ V}$	—	1.5	—		
Maximum Output Current	I_{MAX1}	—	—	100	200	—	mA	
	I_{MAX2}	—		300	400	—		
	I_{MAX3}	—		1.2	1.5	—		A
Output Short Current	I_{SC1}	—	—	—	250	—	mA	
	I_{SC2}	—		—	400	—		
	I_{SC3}	—		—	1.0	—		A
Output Noise Voltage	V_{no1}	—	—	—	180	—	μV	
	V_{no2}	—		—	230	—		
	V_{no3}	—		—	260	—		
Output Voltage Temperature Coefficient	T_{CVO1}	—	—	—	0.5	—	mV/ $^\circ\text{C}$	
	T_{CVO2}	—		—	-1.1	—		
	T_{CVO3}	—		—	-1.2	—		
Bias Current	I_B	—	$I_{OUT1} = 0\text{ mA}$, $V_{OUT2, 3} = \text{OFF}$	—	0.6	1.2	mA	
Reset	Reset Sense Voltage	V_R	—	3.4	—	3.75	V	
	Hysteresis Voltage	ΔV_H	—	—	60	—	mV	
	Output Saturation Voltage	V_{sat}	—	$R_3 = 510\ \Omega$	—	0.3	1.0	V
	Sensing Voltage Temperature Coefficient	$T_c\ VO4$	—	—	—	0.5	—	mV/ $^\circ\text{C}$
Stand-by Current	I_{lstb}	—	$V_1 = 0\text{ V}$, $V_{OUT2, 3} = \text{OFF}$	—	180	300	μA	
Threshold Voltage	V_{Sstb2}	—	—	1.2	—	3.0	V	

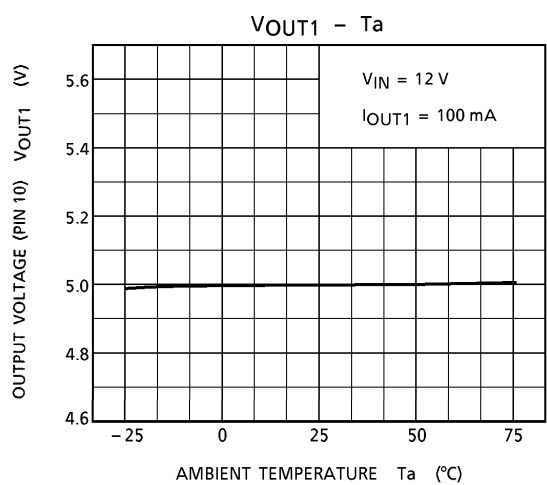
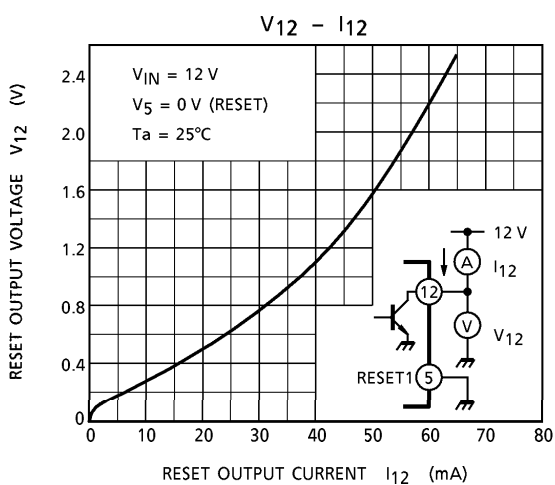
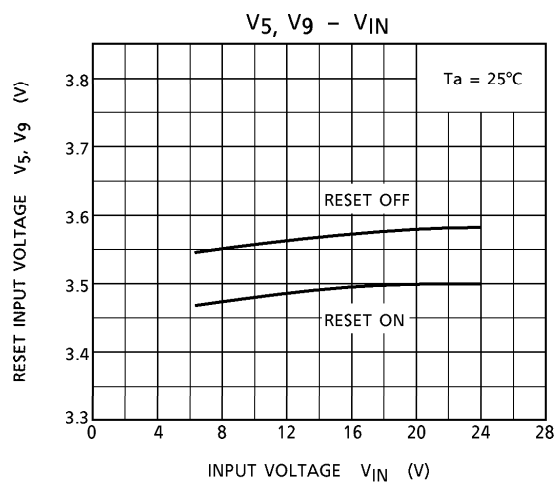
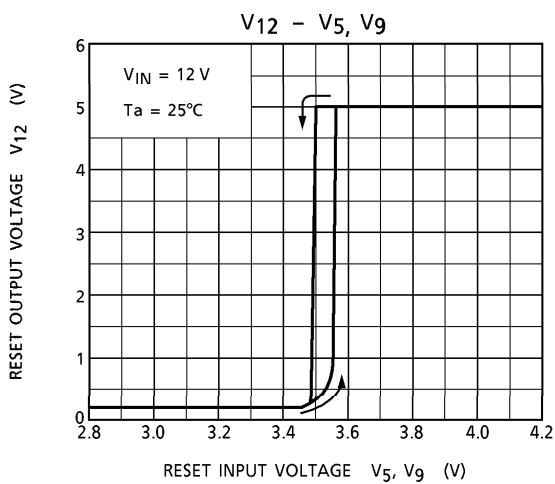
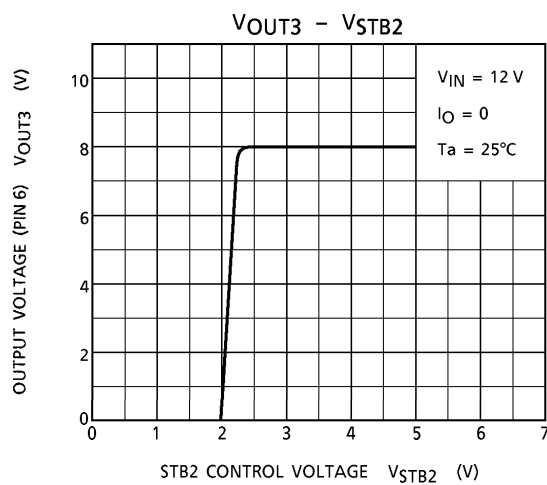
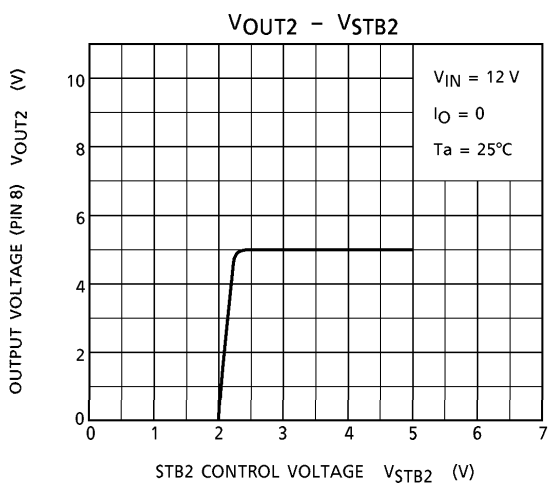
TEST CIRCUIT

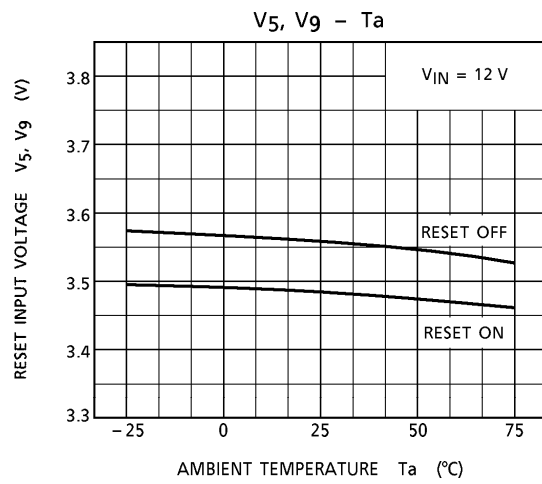
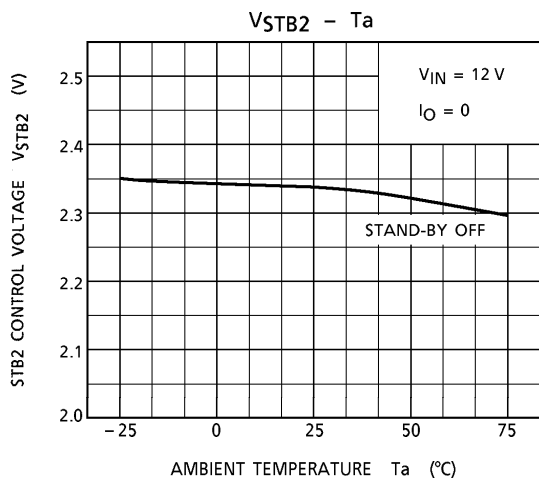
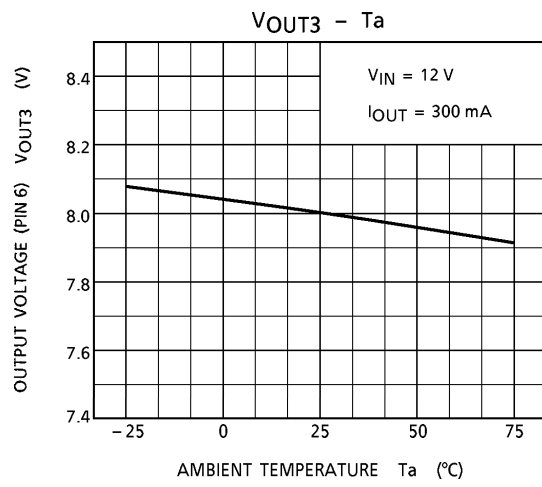
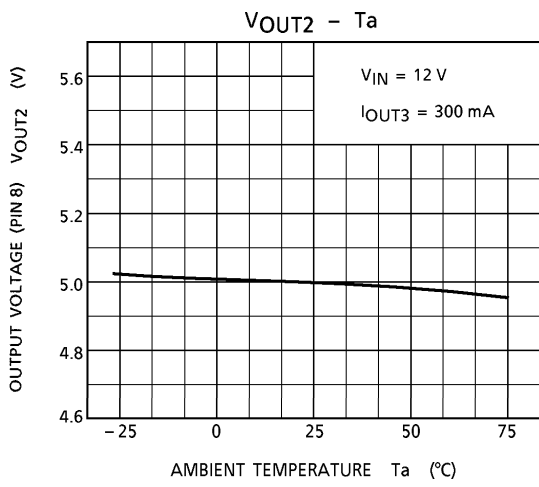




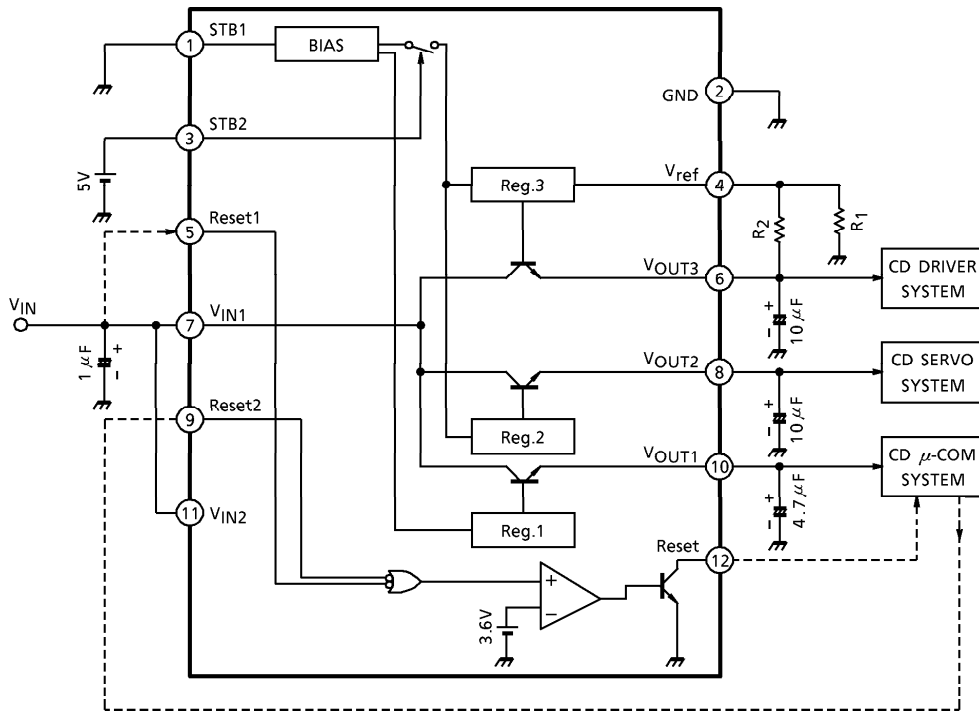






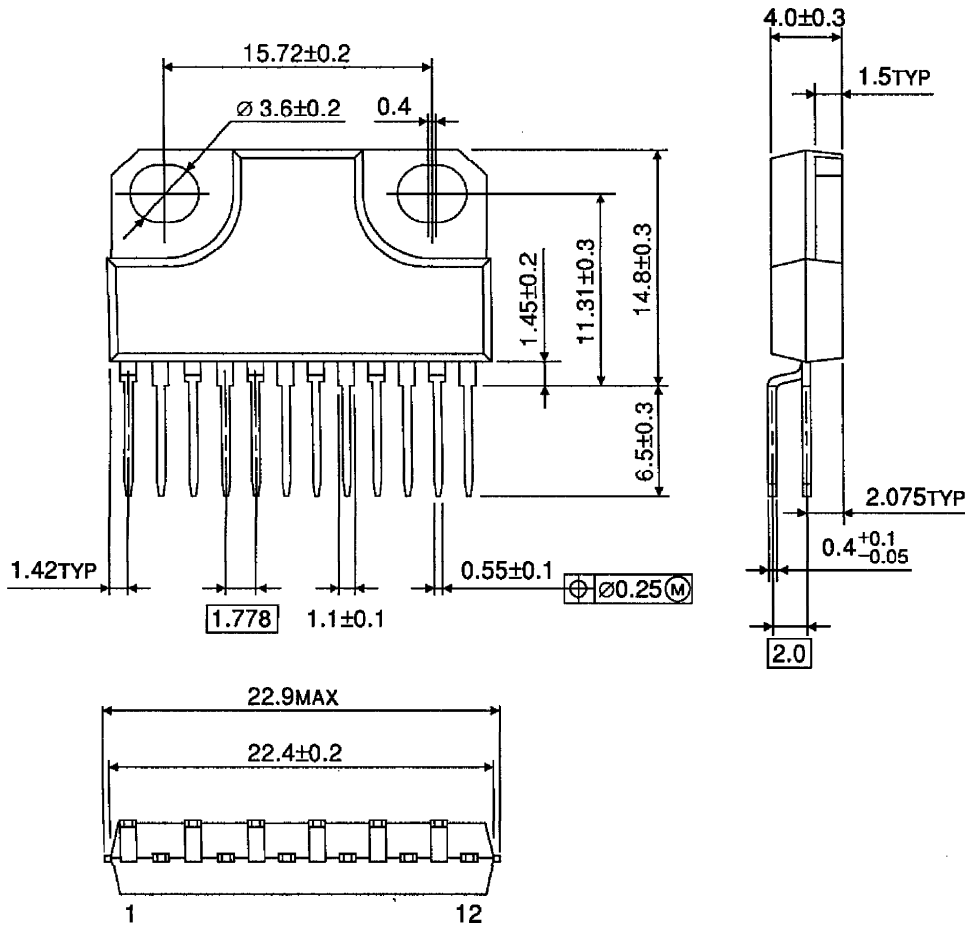


APPLICATION CIRCUIT



OUTLINE DRAWING
HZIP12-P-1.78B

Unit : mm



Weight : 4.04 g (Typ.)