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

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- 3 regulated voltage outputs
 VOUT1 (for μ-com system) fixed voltage output
 : VOUT1 = 5V (typ.) / 100mA (max.)
 - VOUT2 (for servo system) fixed voltage output

 $: V_{OUT2} = 5V (typ.) / 300mA (max.)$

- VOUT3 (for driver) adjustable voltage output
- : V_{OUT3} = 8V (typ.) / 1.2A (max.) Built-in reset circuit 2 input, 1 output
 - : Reset sense voltage $V_R \le 3.4V$ (Ta = 25°C)
- Built-in stand-by circuit
 - STB1 for VOUT1, VOUT2, VOUT3
 - STB2 for VOUT2, VOUT3
- Built-in various protection circuits
 - : Over voltage, output to GND short, thermal shut down
 - Input operating voltage range

: VIN (opr) = $7.5 \sim 24V$ (operating VOUT1 only)



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) \rightarrow GND: On, (1) \rightarrow open: Off			
2	GND	GND	GND is except for bias circuit.			
3	STB2	Stand-by switch	$V_{STB2} \ge 3.0V$: On, $V_{STB2} \le 1.2V$: Off			
4	V _{ref}	Reference for VOUT3	V_{OUT3} is decide a ratio of R_1 to R_2 .			
5	Reset1	Reset input 1	V _{R1} ≥ 3.75V: Off, V _{R1} ≤ 3.4V: 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}	5V output	Output fixed 5V.			
9	Reset2	Reset input 2	V _{R2} ≥ 3.75V: Off, V _{R2} ≤ 3.4V: Reset			
10	V _{OUT1}	5V output	Output fixed 5V.			
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 proportion of 200mW / °C

Electrical Characteristics (unless otherwise specified, V_{IN}=12V, I_{OUT1}=100mA, I_{OUT2}=300mA, I_{OUT3}=300mA, Ta=25°C)

Characteristic		Symbol	Test Cir- cuit	Test Condition		Min.	Тур.	Max.	Unit	
Output voltage		V _{OUT1}	_	_		4.8	5.0	5.3	V	
		V _{OUT2}	_	—		4.8	5.0	5.3		
		V _{OUT3}	_	$R_1 = 18k\Omega, R_2 = 39k\Omega$		7.7	8.0	8.3		
		Reg1. line	_	$7.5V \le V_{IN} \le 24V$		_	20	100		
Input regulation		Reg2. line	_	$7.5V \le V_{IN} \le 20V$		_	20	100	mV	
		Reg3. line	_	$10.3V \le V_{IN} \le 20V$		_	20	150		
		Reg1. load	_	0mA ≤ I _{OUT1} ≤ 100mA		_	20	100		
	l regulation	Reg2. load	_	5mA ≤ I _{OUT2} ≤ 300mA		_	20	100	mV	
LUat	regulation	Developed		5mA ≤ I _{OUT3} ≤ 300mA		_	20	100		
		Reg3. load	_	5mA ≤ I _{OUT3} ≤ 1.2A		_	50	_		
		R.R.1	_		$10V \le V_{IN} \le 24V$	60	70	_	dB	
Ripp	le rejection ratio	R.R.2	_	V _{in} = 1V _{rms} f = 120Hz	11V ≤ V _{IN} ≤ 20V	60	70	_		
		R.R.3	—		$12V \le V_{IN} \le 20V$	52	64	_		
		V _{D1}	—	V _{IN} = 6V		_	1.8	_		
Drop	oout voltage	V _{D2}	—	V _{IN} = 6V		_	1.8	_	V	
		V _{D3}	_	V _{IN} = 8V		_	1.5	_		
		I _{MAX1}	_			100	200	_		
Maxi	imum output ent	I _{MAX2}	_	1 –		300	400	_	mΑ	
ount		I _{MAX3}	_			1.2	1.5	_	А	
Output short current		I _{SC1}	_			_	250	_	mA	
		I _{SC2}	_			_	400	_		
		I _{SC3}	_			_	1.0	_	А	
Output noise voltage		V _{no1}	_			_	180	—	μV	
		V _{no2}	_			_	230	—		
		V _{no3}	_			_	260	—		
Outent unter		T _{CVO1}	_			_	0.5	—		
temp	perature	T _{CVO2}	_			_	-1.1	_	mV / °C	
coef	ficient	T _{CVO3}	_			_	-1.2	—		
Bias current		Ι _Β	_	I _{OUT1} -0mA, V _{OUT2} , ₃ -off		_	0.6	1.2	mA	
	Reset sense voltage	ense voltage V _R —		-		3.4	_	3.75	V	
Reset	Hysteresis voltage ΔV_H		_	_		_	60	—	mV	
	Output saturation voltage	V _{sat}	_	R ₃ = 510Ω		_	0.3	1.0	V	
	Sensing Voltage temperature coefficient	Tc VO4	_	_		_	0.5	_	mV / °C	
Stand-by current		I _{Istb}	—	V ₁ = 0V, V _{OUT2} , ₃ -off		-	180	300	μA	
Threshold voltage		V _{Sstb2}	_	—		1.2	_	3.0	V	

Test Circuit













Application Circuit



Package Dimensions



Weight: 4.04g (typ.)

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