BA6149LS

Regulator, switching, 6 outputs

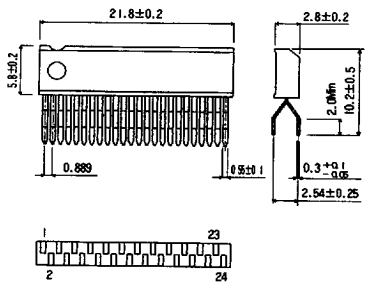
The BA6149LS is an IC that consists of six switching regulator circuits

Features

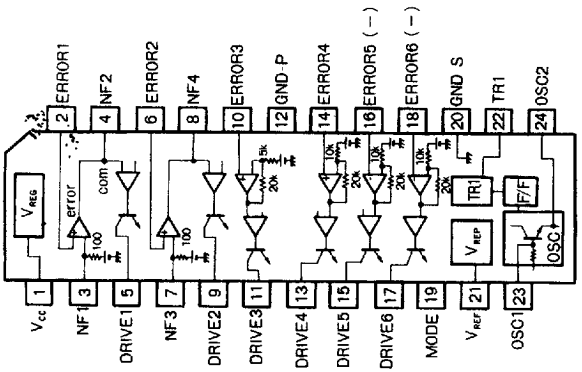
- available in an SZIP24 package
- control circuits for all regulator circuits are contained in the IC
- high efficiency pulse width modulation system is used
- triangular wave generator produces a very clean stable output
- six output voltages
- output voltages can be switched on and off (except 5 V output)

Dimensions (Units : mm)

BA6149LS (SZIP24)



Block diagram



Absolute maximum ratings (T_a = 25°C)

Parameter	Symbol	Limits	Unit	Conditions
Power supply voltage	V_{CC}	20	V	
Power dissipation	P_d	500	mW	Reduce power by 5 mW/°C for each degree above 25°C.
Drive current	I_d	30	mA	
Operational temperature	T_{opr}	−10 ~ +70	°C	
Storage temperature	T_{stg}	−25 ~ +125	°C	

Electrical characteristics (T_a = 25°C, V_{CC} = 12 V) (Sheet 1 of 2)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Power supply voltage	V_{CC}	8		18	V	
Circuit current	I_{CC}		7	11	mA	
Reference voltage	V_{ref}	2.38	2.53	2.68	V	
Triangular wave oscillation frequency	f_T	100.88	101.88	102.88	kHz	f_0 = 815 kHz
5 V system output voltage	V_{05}	4.7	5.0	5.3	V	I_L = 227 mA
9 V system output voltage	V_{09}	8.60	9.15	9.70	V	I_L = 100 mA
M1 system output voltage	V_{CY}	4.5	5	5.5	V	I_L = 100 mA
M2 system output voltage	V_{CA}	3.0	3.5	4.0	V	I_L = 50 mA
M3 system output voltage	V_{SR}	3.0	3.5	4.0	V	I_L = 55 mA
M4 system output voltage	V_{TR}	3.0	3.5	4.0	V	I_L = 200 mA
M1 input regulation	V_{r1}	40	80	160	mV	I_L = 100 mA, 10 ≤ V_{CC} ≤ 16
M2 input regulation	V_{r2}	30	60	120	mV	I_L = 50 mA, 10 ≤ V_{CC} ≤ 16
M3 input regulation	V_{r3}	30	60	120	mV	I_L = 55 mA, 10 ≤ V_{CC} ≤ 16
M4 input regulation	V_{r4}	30	60	120	mV	I_L = 200 mA, 10 ≤ V_{CC} ≤ 16
Low level power-saving mode	V_L	0		1.5	V	
High level power-saving mode	V_H	3.5		6	V	All output voltage < 0.5 V except for V_{O5}
9 V system error amplifier open loop gain	G_{O9}	70			dB	
5 V system error amplifier open loop gain	V_{O5}	70			dB	
9 V system ripple	R_{P9}		2	5	mV_{pk-pk}	I_L = 100 mA
5 V system ripple	R_{P5}		2	5	mV_{pk-pk}	I_L = 227 mA
M system ripple	R_{PM}		30	50	mV_{pk-pk}	I_L = 100 mA

Electrical characteristics (T_a = 25°C, V_{CC} = 12 V) (Sheet 2 of 2)

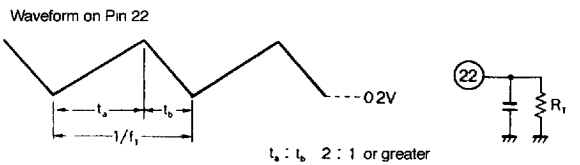
Parameter	Symbol	Min	Typical	Max	Unit	Conditions
9 V system error amplifier closed loop gain	G_{V9}	35	38	41	dB	R_N = 10 kΩ, f = 100 kHz
5 V system error amplifier closed loop gain	G_{V5}	34.5	37.5	40.5	dB	R_N = 10 kΩ, f = 100 kHz
9 V system error amplifier phase characteristics	ϕ_9		55	70	deg	f = 100 kHz
5 V system error amplifier phase characteristics	ϕ_5		55	70	deg	f = 100 kHz

Precautions for use

Oscillation frequency

The maximum oscillation frequency (f_{OMax}) is about 850 kHz. The actual triangular frequency (f_T) is $f_O/8$.

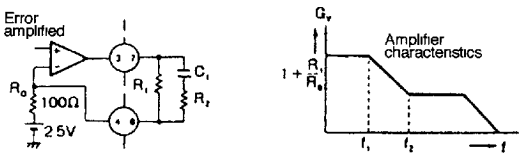
Make sure to set the resistance R_T such that in the triangular wave, $t_a \geq 67\%$, as shown in the figure below.



DC gain

The 5 V and 9 V system error amplifier DC gain is determined by the feedback resistor (R_1).

Make sure to use a resistor such that 10 kΩ ≤ R_1 ≤ 100 kΩ .



Error amplifier

The motor system error amplifier DC gain is set internally as follows:

$G_{OM1} \cong 14$ dB, $G_{OM2} \cong 10$ dB, $G_{OM3} = G_{OM4} \cong 10$ dB,

For the M3 and M4 systems, the input/output phase characteristics run in reverse.

Figure 1 Test circuit