

KA7630/7631

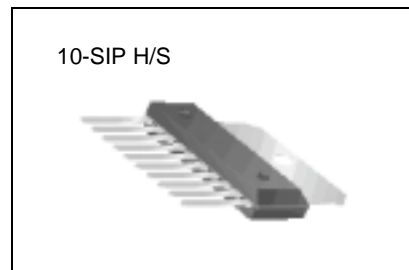
Fixed Multi-output Regulator

Features

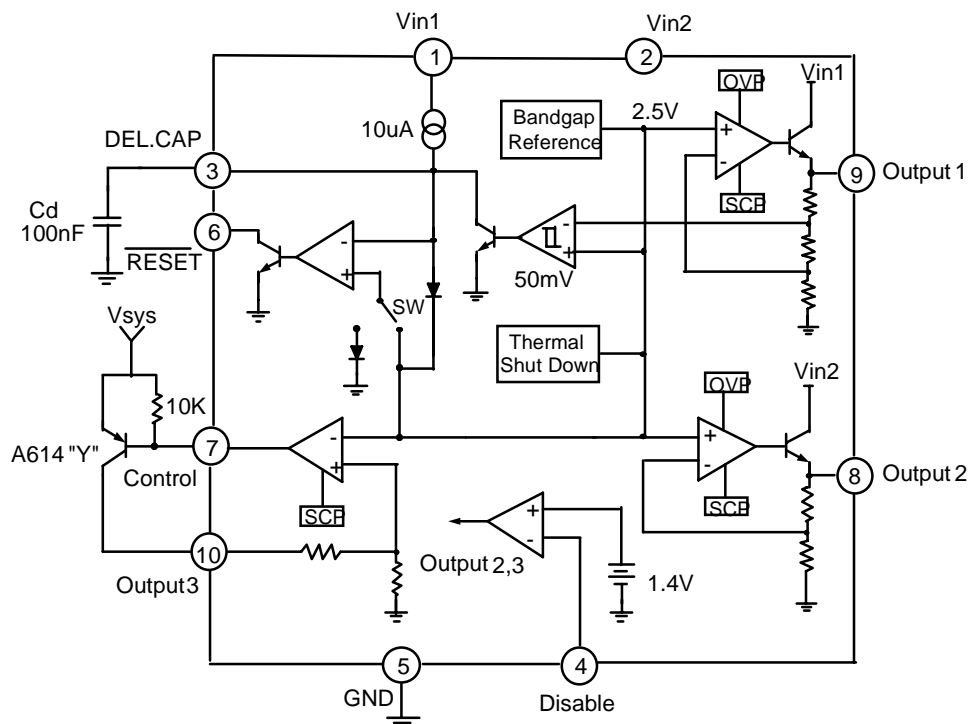
- Output Currents up to 0.5A (output1 & 2)
- Output Current up to 1A with External Transistor (output3)
- Fixed Precision Output 1 voltage $5.1V \pm 2\%$
- Fixed Precision Output 2 voltage $8V \pm 2\%$ (KA7630)
- Fixed Precision Output 2 voltage $9V \pm 2\%$ (KA7631)
- Control Signal Generator for Output 3 voltage ($12V \pm 2\%$)
- Reset Facility for Output Voltage1
- Output 2,3 with Disable by TTL Input
- Current Limit Protection at Each Output
- Thermal Shut Down

Description

The KA7630/KA7631 is a multi-output positive voltage regulator designed to provide fixed precision output voltages of 5.1V, 8V (7630) / 9V (7631) at current up to 0.5A and 12V at current up to 1A with external PNP transistor. An internal reset circuit generates a reset pulse when the output 1 decrease below the regulated value. Output2 & 3 can be disabled by TTL input. Protection features include over voltage protection, short circuit protection and thermal shutdown.



Internal Block Diagram



Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit | Remark |
|-----------------------|--------|--------|------|-------------|
| DC Input Voltage | Vin | 20 | V | - |
| Disable Input Voltage | Vc | 20 | V | - |
| Output Current | Io | 0.5 | A | - |
| Power Dissipation | Pd | 1.5 | W | No Heatsink |
| Junction Temperature | Tj | +150 | °C | - |
| Operating Temperature | Topr | 0~+125 | °C | - |

Electrical Characteristics(KA7630)

(Refer to test circuit Vin1=7.5V ,Vin2=10.5V ,Tj = +25 °C, unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------------|---------|--|-------------|------------|-------------|--------|
| Output Voltage 1 | Vo1 | Io1=10mA 7.5V<Vin1<14V 5mA<Io1<500mA | 5 4.9 | 5.1 5.1 | 5.2 5.3 | V |
| Output Voltage 2 | Vo2 | Io2=10mA 10.5V<Vin2<18V 5mA<Io2<500mA | 7.84 7.7 | 8 8 | 8.16 8.3 | V |
| Dropout Output Voltage 1,2 | Vd1,2 | Io1,2=500mA | - | - | 2.5 | V |
| Line Regulation 1,2 | ΔVo 1,2 | 7.5V <Vin1<14V 10.5V <Vin2<18V Io1,2 = 200mA | - | - | 50 80 | mV |
| Load Regulation 1,2 | ΔVo 1,2 | 5mA < Io1 < 500mA 5mA < Io2 < 500mA | - | - | 100 160 | mV |
| Output Voltage 3 | Vo3 | Vsys=13V, Io3=100mA | 11.7 | 12 | 12.3 | V |
| Line Regulation 3 | ΔVo3 | 13V< Vin2 <18V, Io3 =100mA | - | - | 120 | mV |
| Load Regulation 3 | ΔVo3 | 5mA < Io3 < 1A | - | - | 250 | mV |
| Reset Pulse Delay | Trd | Cd=100nF, Note1 | - | 25 | - | ms |
| Saturation Voltage in Reset Condition | VrL | I6=5mA | - | - | 0.4 | V |
| Leakage Current at Pin 6 | IrH | V6=10V | - | - | 10 | μA |
| Output Voltage Thermal Drift | STt | 0 °C <Tj < +125 °C , Note 2 | - | 100 | | ppm/°C |
| Short Circuit Output Current | Isc1,2 | Vin1=7.5V ,Vin2 =10.5V | - | - | 1.6 | A |
| Disable Voltage High | VdisH | Output 2 Active | 2 | - | | V |
| Disable Voltage Low | VdisL | Output 2 Disabled | - | - | 0.8 | V |
| Disable Bias Current | Idis | 0V < Vdis < 7V | -100 | - | 2 | μA |
| Junction Temperature for TSD | Ttsd | Note 2 | - | 145 | - | °C |
| Quiescent Current | Iq | Io1=10mA, Output2 Disabled | - | - | 2 | mA |
| Reset Threshold Voltage | Vr | K=Vo1 | K-0.4 | K-0.25 | K-0.1 | V |
| Reset Threshold Hysteresis | Vrth | Note 1 | 20 | 50 | 100 | mA |

Notes:

- To check the reset circuit ,the reset output is low to discharge the delay capacitor(=Cd). if it's less than Vo1-0.25V. And the reset output is high when the delay capacitor voltage linearly increased by the internal current source(10μA) if it's more than Vo1- 0.2V. The equations of delay time is same as below. $Trd = (Cd \times 2.5) / 10\mu A$
- These parameters, although guaranteed, are not 100% tested in production.

Electrical Characteristics(KA7631)

(Refer to test circuit $V_{in1}=7.5V$, $V_{in2}=11.5V$, $T_j = +25^\circ C$, unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------------|------------------|---|--------------|------------|--------------|-----------------|
| Output Voltage 1 | Vo1 | $I_{o1}=10mA$ $7.5V < V_{in1} < 14V$ $5mA < I_{o1} < 500mA$ | 5 4.9 | 5.1 5.1 | 5.2 5.3 | V |
| Output Voltage 2 | Vo2 | $I_{o2}=10mA$ $11.5V < V_{in2} < 18V$ $5mA < I_{o2} < 500mA$ | 8.82 8.65 | 9 9 | 9.18 9.35 | V |
| Dropout Output Voltage 1,2 | Vd1,2 | $I_{o1,2}=500mA$ | - | - | 2.5 | V |
| Line Regulation 1,2 | ΔV_o 1,2 | $7.5V < V_{in1} < 14V$ $11.5V < V_{in2} < 18V$ $I_{o1,2} = 200mA$ | - | - | 50 80 | mV |
| Load Regulation 1,2 | ΔV_o 1,2 | $5mA < I_{o1} < 500mA$ $5mA < I_{o2} < 500mA$ | - | - | 100 160 | mV |
| Output Voltage 3 | Vo3 | $V_{sys}=13V$, $I_{o3}=100mA$ | 11.7 | 12 | 12.3 | V |
| Line Regulation 3 | ΔV_o3 | $13V < V_{in2} < 18V$, $I_{o3} = 100mA$ | - | - | 120 | mV |
| Load Regulation 3 | ΔV_o3 | $5mA < I_{o3} < 1A$ | - | - | 250 | mV |
| Reset Pulse Delay | Trd | $C_d=100nF$, Note1 | - | 25 | - | ms |
| Saturation Voltage in Reset Condition | VrL | $I_6=5mA$ | - | - | 0.4 | V |
| Leakage Current at Pin 6 | IrH | $V_6=10V$ | - | - | 10 | μA |
| Output Voltage Thermal Drift | STt | $0^\circ C < T_j < +125^\circ C$, Note 2 | - | 100 | - | ppm/ $^\circ C$ |
| Short Circuit Output Current | Isc1,2 | $V_{in1}=7.5V$, $V_{in2} = 11.5V$ | - | - | 1.6 | A |
| Disable Voltage High | VdisH | Output 2 Active | 2 | - | - | V |
| Disable Voltage Low | VdisL | Output 2 Disabled | - | - | 0.8 | V |
| Disable Bias Current | I _{dis} | $0V < V_{dis} < 7V$ | -100 | - | 2 | μA |
| Junction Temperature for TSD | Ttsd | Note 2 | - | 145 | - | $^\circ C$ |
| Quiescent Current | I _q | $I_{o1}=10mA$, Output2 Disabled | - | - | 2 | mA |
| Reset Threshold Voltage | Vr | $K=V_{o1}$ | K-0.4 | K-0.25 | K-0.1 | V |
| Reset Threshold Hysteresis | Vrth | Note 1 | 20 | 50 | 100 | mA |

Notes:

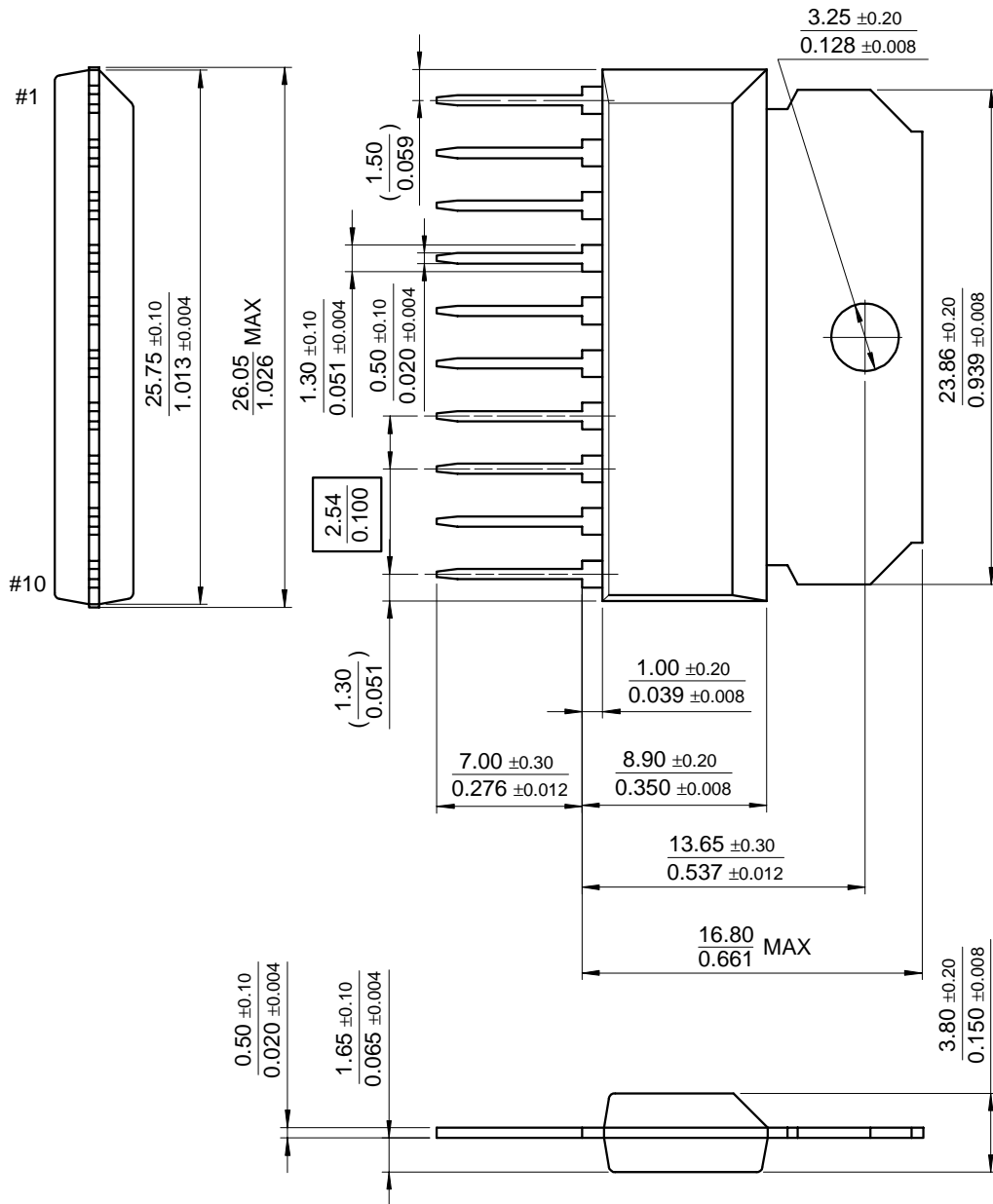
- To check the reset circuit ,the reset output is low to discharge the delay capacitor(=Cd). if it's less than $V_{o1}-0.25V$. And the reset output is high when the delay capacitor voltage linearly increased by the internal current source($10\mu A$) if it's more than $V_{o1}-0.2V$. The equations of delay time is same as below. $Trd = (Cd \times 2.5) / 10\mu A$
- These parameters, although guaranteed, are not 100% tested in production.

Mechanical Dimensions

Package

Dimensions in millimeters

10-SIP H/S



Ordering Information

| Product Number | Package | Operating Temperature |
|----------------|------------|-----------------------|
| KA7630 | 10-SIP H/S | 0°C to +125°C |
| KA7631 | | |

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