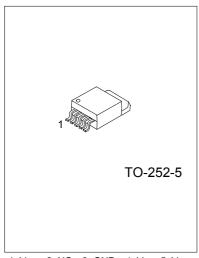
### 2 CHANNEL LOW-DROPOUT **VOLTAGE REGULATOR**

### **FEATURES**

- \*Dual Output: 5.0V/1A, 2.5V/1A.
- \*Output Voltage Precision of  $\pm 2\%$ .
- \*Output consists of PNP power transistor with low-dropout voltage.
- \*Built-in over current protection circuit (OCP).
- \*Built-in Thermal Shut Down Circuit (TSD).
- \*Ideal for Hard Disk Drives applications.



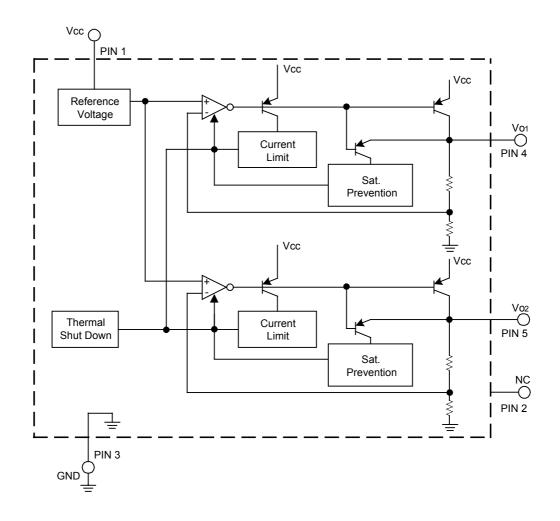
1: Vcc 2: NC 3: GND 4: Vo1 5: Vo2

\*Pb-free plating product number: UR5025L

### PIN DISCRIPTION

PIN NO.	PIN NAME	FUNCTION			
1	Vcc	Power Supply			
2	N.C.	lot internally connected			
3	GND	Ground			
4	Vo <sub>1</sub>	5.0V Output			
5	Vo <sub>2</sub>	2.5V Output			

**BLOCK DIAGRAM** 



## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT	
Supply Voltage	Vcc	18	V	
Power dissipation	Po	1000*	mV	
Operating temperature range	Topr	-40 ~ +85	°C	
Storage temperature range	Tstg	-55 ~ +150	°C	
Junction temperature	Tj	150	°C	

<sup>\*</sup> PD derated at 8mW/°C for temperatures above Ta=25°C

### OPERATING RATINGS(Ta=25°C)

PARAMETER	SYMBOL	MIN	MAX	UNIT	
Input Voltage	Vcc	4.0	16.0	V	
5.0V Output current	lo <sub>1</sub>		1	Α	
2.5V Output current	lo <sub>2</sub>		1	Α	

### **ELECTRICAL CHARACTERISTICS**

(Refer to the test circuit, Ta=25°C, V<sub>CC</sub>=6V unless otherwise specified.)

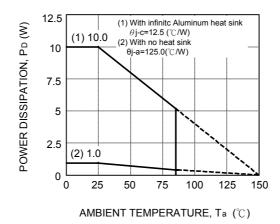
(Note: to the test circuit, Ta-25 C, V)	CC-04 unica	3 Otherwise specificu.)				
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Bias Current	lв	Io1=0mA, Io2=0mA		0.8	1.5	mA
5.0V Output				-		
Output Voltage 1	Vo <sub>1</sub>	Io1=500mA	4.9	5.0	5.1	V
Dropout Voltage 1	$\triangle V$ D1	lo1=500mA		0.25	0.5	V
Peak Output Current 1	<b>l</b> 01		1.0	1.7		Α
Ripple Rejection 1	R.R.1	f=120Hz, ein=1Vrms Io <sub>1</sub> =200mA	50	58		dB
Line Regulation 1	$\triangle V$ LINE1	Vcc=6V ~ 16V, Io1=500mA		5	30	mV
Load Regulation 1	$\triangle V$ load1	Io1=0mA ~ 1A		30	75	mV
Temperature Coefficient of Output Voltage 1*	Tcvo1	Io₁=5mA, Tյ=0 ~ 125°C		±0.01		%/℃
Short circuit Output Current 1	los1	Vcc=16V		270		mA
2.5V Output			_	_		
Output Voltage 2	Vo <sub>2</sub>	lo2=500mA	2.450	2.50	2.550	V
Peak Output Current 2	lo <sub>2</sub>		1.0	1.7		Α
Ripple Rejection 2	R.R.2	f=120Hz, ein=1Vrms lo2=200mA	50	58		dB
Line Regulation 2	$\triangle V$ LINE2	Vcc=6V ~ 16V, Io1=500mA		5	30	mV
Load Regulation 2	$\triangle V$ LOAD2	lo2=0mA ~ 1A		30	75	mV
Temperature Coefficient of Output Voltage 2*	Tcvo2	lo2=5mA, TJ=0 ~ 125℃		±0.01		%/℃
Short circuit Output Current 2	los2	Vcc=16V		270		mA

<sup>\*</sup> Design Guarantee. (Outgoing inspection is not done on all products.)

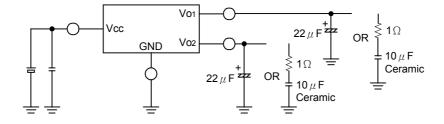
Note: All characteristic are measured with a capacity across the input (0.33  $\mu$  F) and the output (22  $\mu$  F). Measurement is done at TA = TJ, and variations in the parameter of all measurement (except for Temperature Coefficient of Output Voltage)caused by temperature change are not considered.

O This product is not designed for protection against radioactive rays.

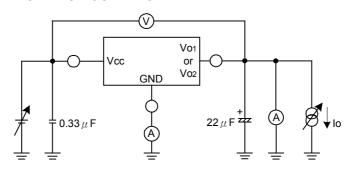
#### POWER DISSIPATION



## STANDARD APPLICATION CIRCUIT



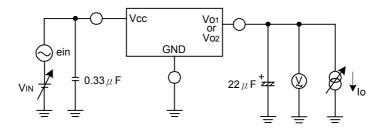
### TEST CIRCUIT FOR EACH CONDITION



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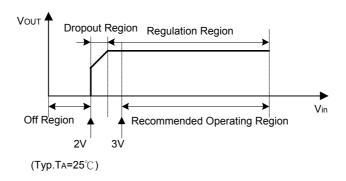
TEST CIRCUIT FOR RIPPLE REJECTION RATIO



# APPLICATION INFORMATION Operation Supply Voltage Range

The circuit functionality is guaranteed within operation of ambient temperature range, as long as it is within operation supply voltage range. The standard electrical characteristic values are guaranteed at the test circuit voltage of Vcc=6V. The cannot be guaranteed at other voltages in the operating range of  $4.0V \sim 16.0V$ , homever, the variation will be small.

### Input /Output characteristic



For proper regulation, this device must be operated in the Recommended Operating Region shown above.

### **Power Dissipation**

Refer to the thermal duration characteristics shown in Fig.3. Also, be sure to use this IC within a power dissipation rage allowing enough margins.

### **Output and Bypass Capacitor**

To prevent oscillations, place the output capacitor between the output pin and GND for both channel. There is a possibility for oscillation if capacitor's value changes due to temperature, voltage, etc. More than 22  $\mu$  F electrolytic capacitor is recommended. If an extremely large value of (over 1000  $\mu$  F) is used, it may cause oscillations at low frequency. In case of using ceramic capacitor (it is recommended more than 10  $\mu$  F) connect with 1 $\Omega$  resistance

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serially as ESR. For the bypass capacitor, a  $0.33\,\mu$ F capacitor placed as close to Vcc pin and GND pin as possible is recommended.

### **Over- current Protection Circuit**

The over-current protection circuits are built in at the outputs. They protect the IC from being damaged when the load is short-circuited or subjected to an over current condition. This protection circuits perform holdback current limiting.

### **Thermal Protection Circuit**

A thermal shut down circuit (T.S.D.) is built into the IC to prevent damage due to overheating, Therefore, all the outputs are turned off when the T.S.D. circuit is activated and are turned on when the temperature recedes to the specified level. However, the T.S.D. circuit is only for extreme conditions and the regulator circuit should still be designed for the IC not to exceed  $T_J(max)=150^{\circ}C$ .

### Grounding

It is recommended that every capacitor (bypass and output capacitors) is grounded to PIN3 using single-point connections.

### **Electromagnetic Fields**

The IC is susceptible to strong electromagnetic fields and may cause malfunction. Therefore, caution should be used when placing it on the PCB.

#### **Protection Diodes**

It is recommended that protection diodes be used when the output is connected to an inductive load.

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