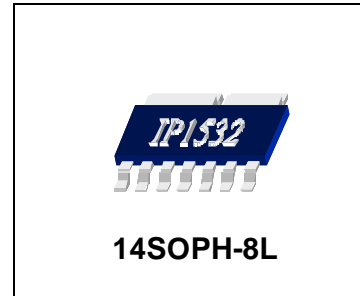


**DESCRIPTION**

The IP1532 is a triple output voltage series regulator which can provide up to 500mA of output current. The IP1532 consists of 1-fixed 3.3V, 1-fixed 2.55V and 1-fixed 1.65V regulators.



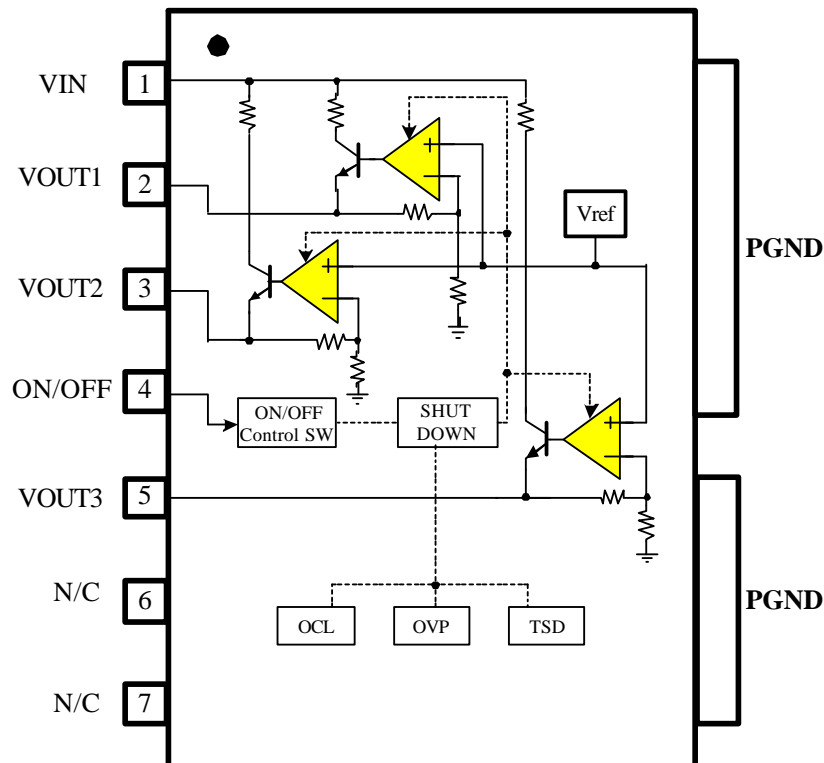
**FEATURES**

- 1-Fixed 3.3V Regulator with Internal NPN TR.
- 1-Fixed 2.55V Regulator with Internal NPN TR.
- 1-Fixed 1.65V Regulator with Internal NPN TR.
- Built-in TSD circuit.
- Built-in Current Limit Circuit.
- Built-in ON/OFF Control Circuit.
- Built-in Over Voltage Protection Circuit.
- Output Trimmed to +/-3% Tolerance

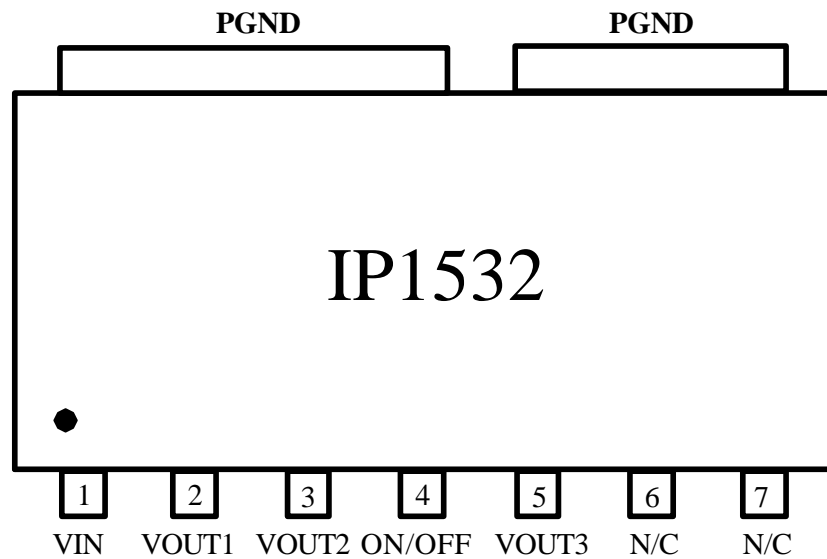
**ORDERING INFORMATION**

Device	Package	Operating Temp
IP1532	14SOPH-8L	-35°C ~ +85°C

**BLOCK DIAGRAM**



**PIN CONNECTIONS**



**PIN DESCRIPTIONS**

NO	SYMBOL	I/O	DESCRIPTION
1	VIN	I	Input Supply Voltage
2	VOUT1	O	Reg +3.3V Output
3	VOUT2	O	Reg +1.65V Output
4	ON/OFF	I	ON/OFF Control
5	VOUT3	O	Reg +2.55V Output
6	N/C	-	No Connection
7	N/C	-	No Connection
8	PGND	-	Power Ground

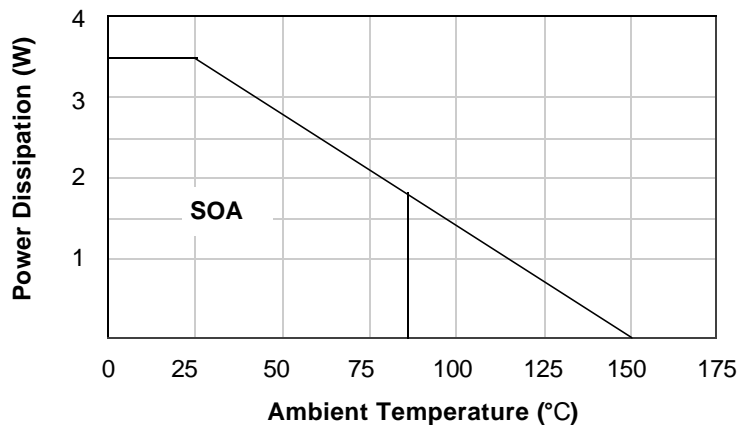
**ABSOLUTE MAXIMUM RATINGS(TA=25°C)**

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Maximum supply voltage	Vinmax	10	V
ON/OFF voltage	Vonoff	10	V
Power dissipation	Pd	3.5*	W
Operating temperature	Topr	-35 ~ +85	°C
Storage temperature	Tstr	-55 ~ +150	°C
Maximum output current	Iomax	700	mA

Note>

1. When mounted on 100mm X 100mm X 1mm PCB (Phenolic resin material).
2. Power dissipation reduces 28mW/°C for using above Ta=25°C
3. Do not exceed Pd and SOA.

**POWER DISSIPATION CURVE**



**RECOMMENDED OPERATING CONDITIONS**

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Supply voltage	Vcc	4.5 ~ 6.0	V
Input voltage	Vin	4.5 ~ 6.0	V

**ELECTRICAL CHARACTERISTICS**

( $V_{in}=5.25V$ ,  $C_o=10\mu F$ ,  $T_a=25^{\circ}C$ , unless otherwise specified.)

Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Quiescent current	I <sub>cc</sub>	V <sub>cc</sub> =5.25V, No-Load	-	9	14	mA
OVP Detecting Voltage	V <sub>ovp</sub>	V <sub>cc</sub> =Variable	6.5	-	-	V
<b>3.3V REGULATOR PART</b>						
Output Voltage	V <sub>out1</sub>	I <sub>o</sub> =10mA	3.2	3.3	3.4	V
Line Regulation	dV <sub>line1</sub>	V <sub>in</sub> =4.5~6V, I <sub>o</sub> =10mA	-	0.035	0.2	%
Load Regulation	dV <sub>load 1</sub>	V <sub>in</sub> =5.25V, 10mA < I <sub>o</sub> < 500mA	-	0.4	0.8	%
Dropout voltage	V <sub>drop1</sub>	I <sub>o</sub> =500mA	-	1.1	1.3	V
Ripple rejection	RR1	F=120Hz, C <sub>o</sub> =10 $\mu$ F Tantalum (V <sub>in</sub> -V <sub>out</sub> )=3V, I <sub>o</sub> =200mA	60	70	-	dB
Current limit <sup>*Note</sup>	I <sub>limit1</sub>	V <sub>in</sub> -V <sub>out</sub> =2.5V	550	-	-	mA
Temperature stability	Temp1	-	-	0.5	-	%
Output noise voltage 1	V <sub>n1</sub>	I <sub>o</sub> =300mA	-	100	-	$\mu$ V
<b>1.65V REGULATOR PART</b>						
Output Voltage	V <sub>out2</sub>	I <sub>o</sub> =10mA	1.6	1.65	1.7	V
Line Regulation	dV <sub>line2</sub>	V <sub>in</sub> =4.5~6V, I <sub>o</sub> =10mA	-	0.035	0.2	%
Load Regulation	dV <sub>load2</sub>	V <sub>in</sub> =5.25V, 10mA < I <sub>o</sub> < 100mA	-	0.4	0.8	%
Dropout voltage	V <sub>drop2</sub>	I <sub>o</sub> =100mA	-	2.5	2.8	V
Ripple rejection	RR2	F=120Hz, C <sub>o</sub> =10 $\mu$ F Tantalum (V <sub>in</sub> -V <sub>out</sub> )=3V, I <sub>o</sub> =50mA	60	70	-	dB
Current limit <sup>*Note</sup>	I <sub>limit2</sub>	V <sub>in</sub> -V <sub>out</sub> =4V	120	-	-	mA
Temperature stability	Temp2	-	-	0.5	-	%
Output noise voltage 2	V <sub>n2</sub>	I <sub>o</sub> =60mA	-	100	-	$\mu$ V

**ELECTRICAL CHARACTERISTICS (Continued)**

( $V_{in}=5.25V$ ,  $C_o=10\mu F$ ,  $T_a=25^{\circ}C$ , unless otherwise specified.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
<b>2.55V REGULATOR PART</b>						
Output Voltage	Vout3	$I_o=10mA$	2.473	2.55	2.626	V
Line Regulation	dVline3	$V_{in}=4.5\sim 6V$ , $I_o=10mA$	-	0.035	0.2	%
Load Regulation	dVload3	$V_{in}=5.25V$ , $10mA < I_o < 300mA$	-	0.4	0.8	%
Dropout voltage	Vdrop3	$I_o=300mA$		1.7	2.1	V
Ripple rejection	RR3	$F=120Hz$ , $C_o=10\mu F$ Tantalum ( $V_{in}-V_{out}=3V$ , $I_o=100mA$ )	60	70		dB
Current limit *Note	Ilimit3	$V_{in}-V_{out}=3.0V$	500	-	-	mA
Temperature stability	Temp3	-	-	0.5	-	%
Output noise voltage 3	Vn3	$I_o=150mA$	-	100	-	$\mu V$
<b>ON/OFF CONTROL PART</b>						
On voltage	Von	Vout=Enabled	-	-	0.8	V
Off voltage	Voff	Vout=Disabled	2.0	-	-	V

\* Note

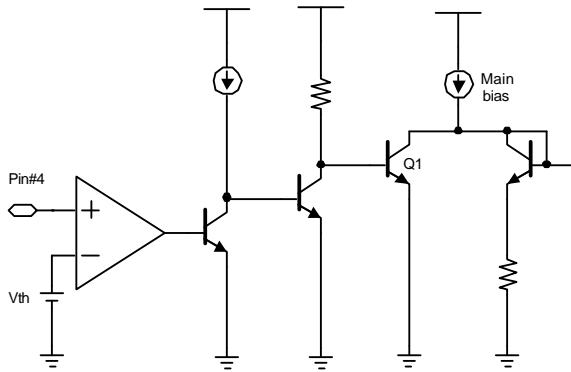
Don't exceed following current limit.

( Iout1 : 550 mA, Iout2 : 120 mA, Iout3 : 500 mA )

**APPLICATION SUMMARY**

**- ON / OFF**

When you want to control output of the IP1532, use pin #4 as follows

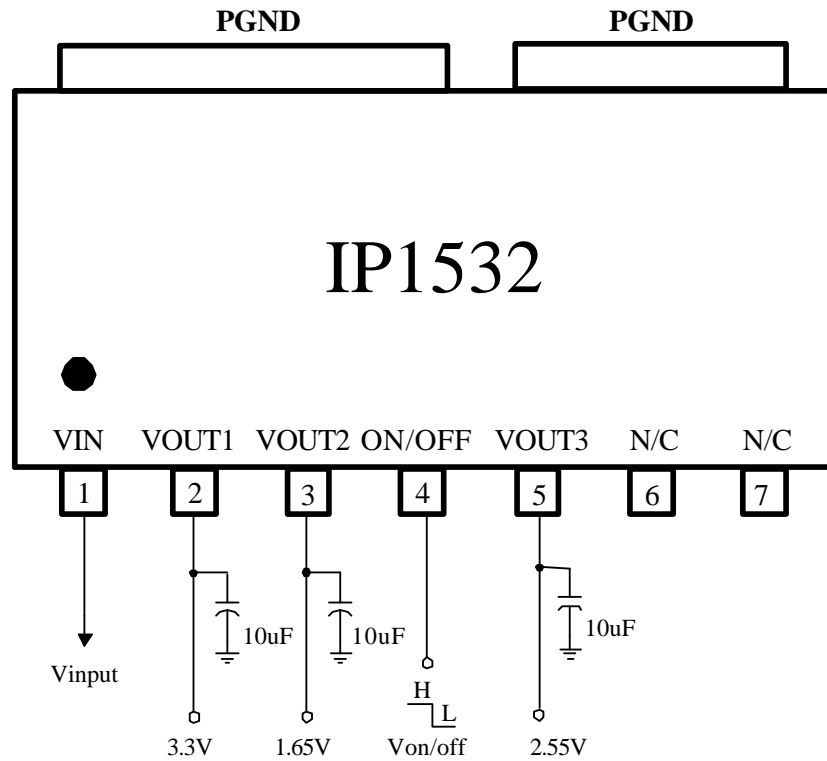


on/off function

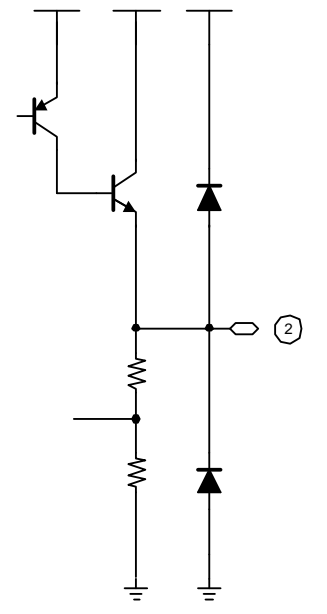
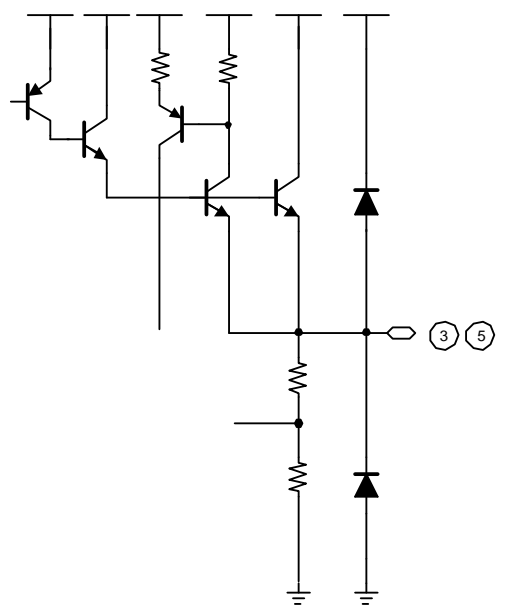
Pin#4	IP1532
HIGH	off
LOW	on

As shown in figure Pin#4 is positive input of the comparator, and the other Input is threshold voltage. If the voltage of the pin#4 rises above threshold voltage, then TR Q1 will be saturated and the main bias current will be shut down.

**TYPICAL APPLICATION CIRCUIT**

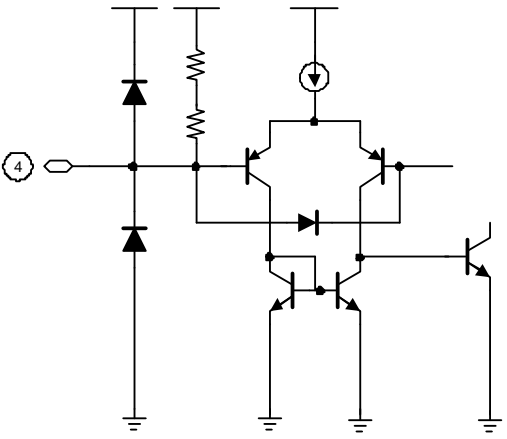


**INTERNAL CIRCUIT**

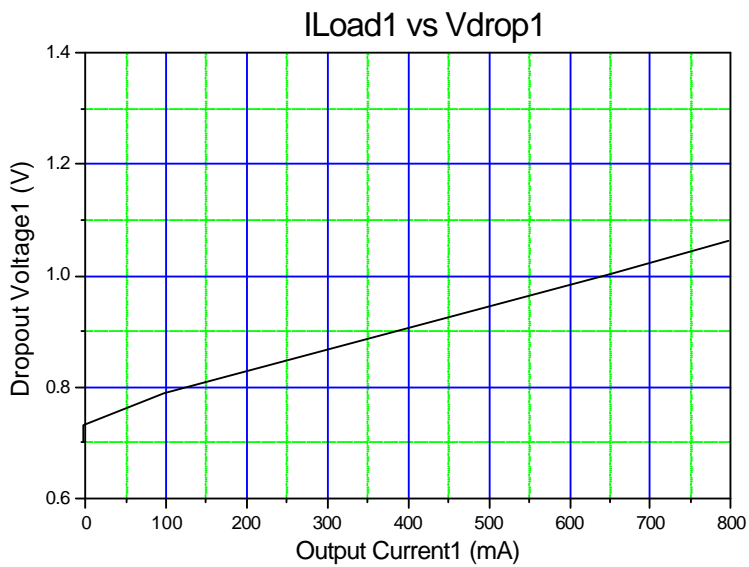
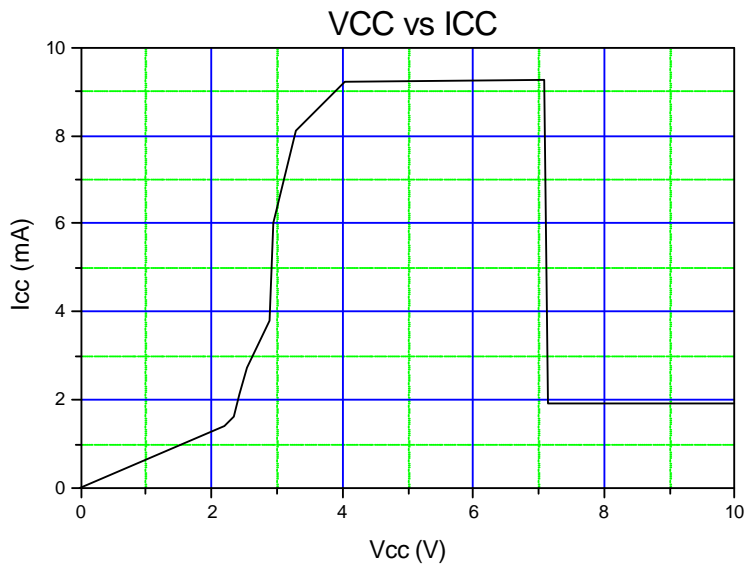
Pin no	Pin name	Internal circuit
2	Regulator output1	
3,5	Regulator Output2,3	



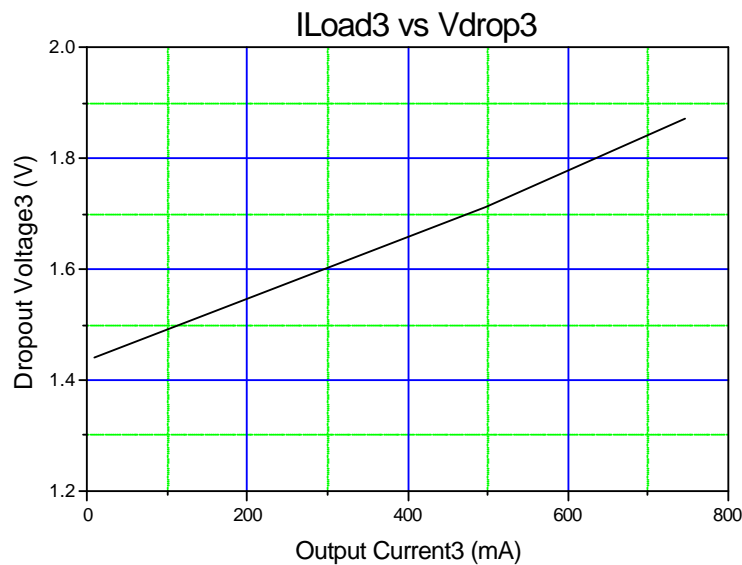
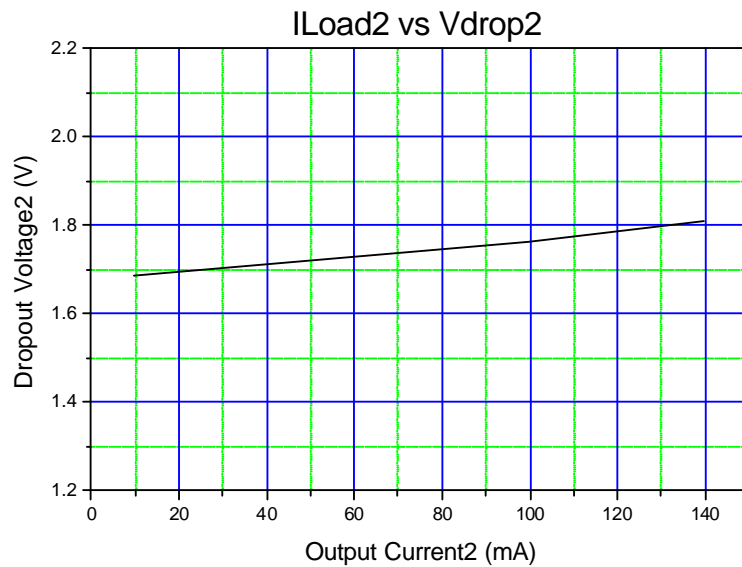
**INTERNAL CIRCUIT (Continued)**

Pin no	Pin name	Internal circuit
4	ON / OFF	

**ELECTRICAL CHARACTERISTICS CURVES**

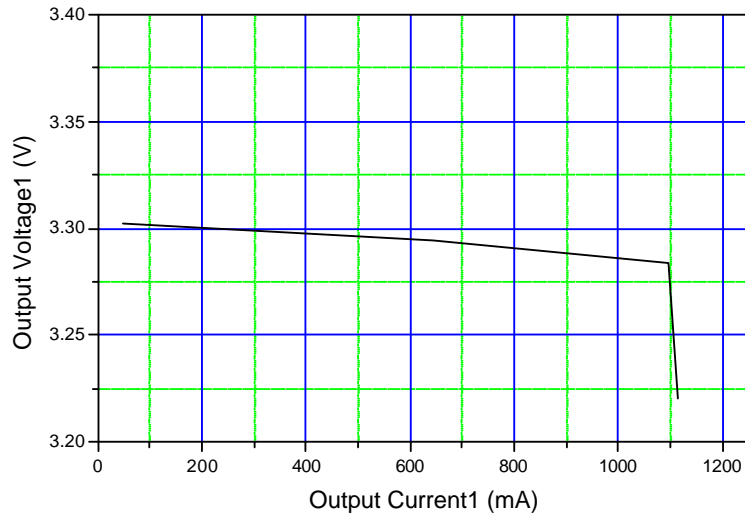


**ELECTRICAL CHARACTERISTICS CURVES (Continued)**

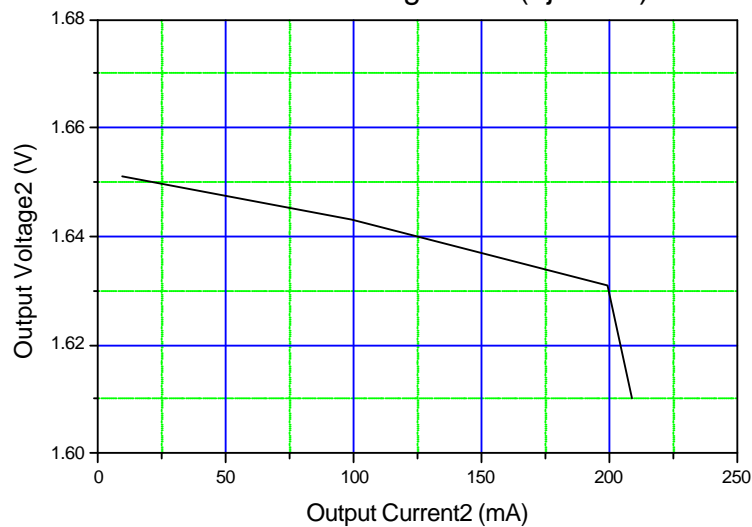


ELECTRICAL CHARACTERISTICS CURVES (Continued)

VOUT1 Load Regulation ( $T_j=25^{\circ}\text{C}$ )

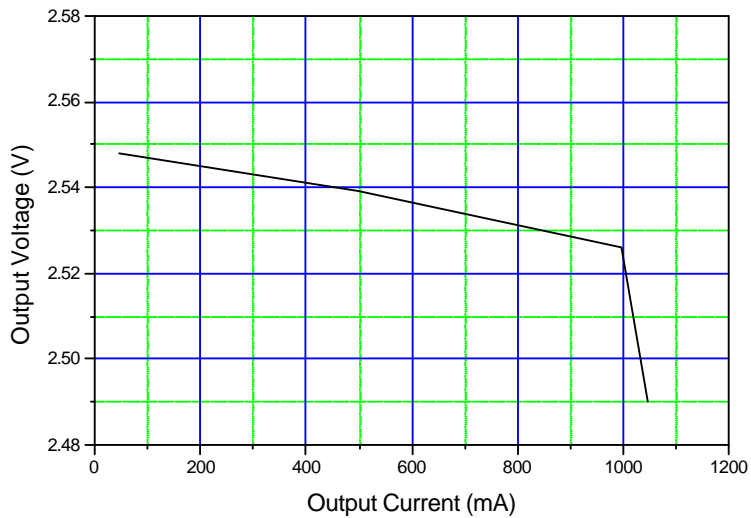


VOUT2 Load Regulation ( $T_j=25^{\circ}\text{C}$ )

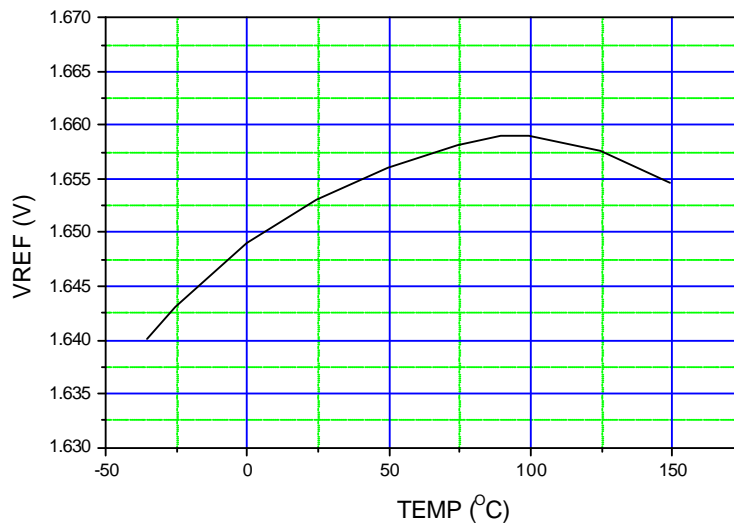


**ELECTRICAL CHARACTERISTICS CURVES (Continued)**

**VOUT3 Load Regulation ( $T_j=25^{\circ}\text{C}$ )**

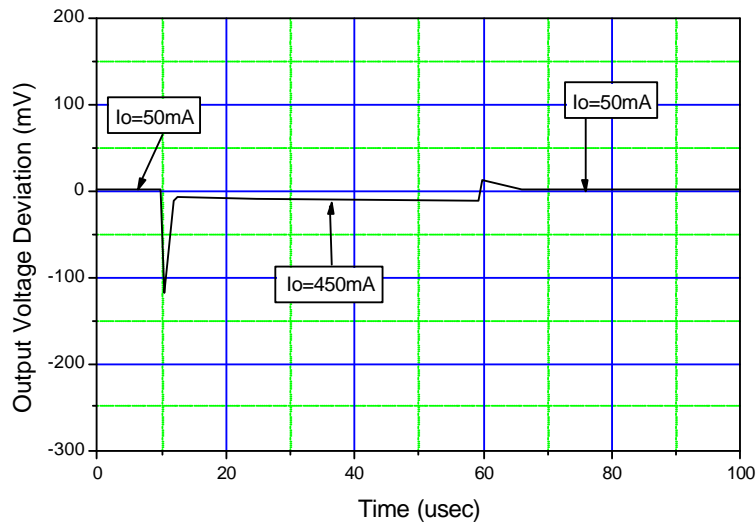


**VREF TEMPERATURE STABILITY**

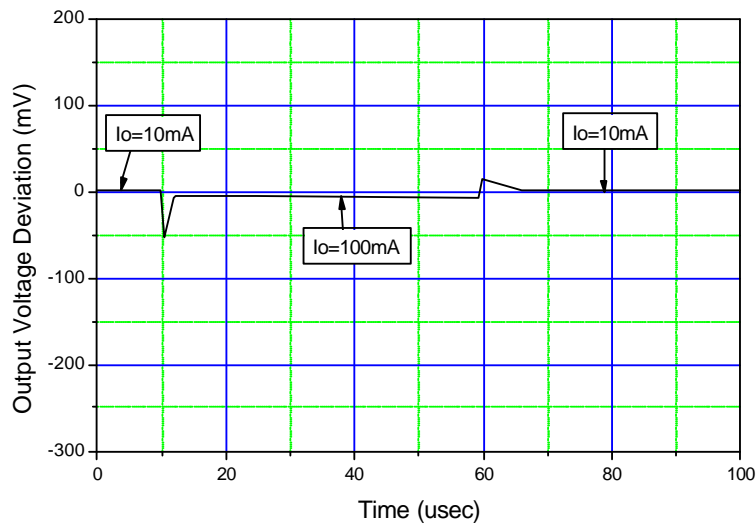


ELECTRICAL CHARACTERISTICS CURVES (Continued)

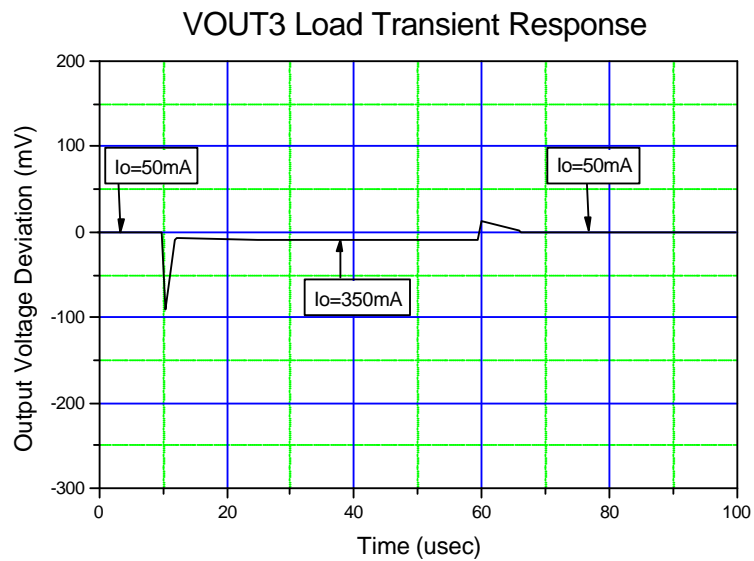
VOUT1 Load Transient Response



VOUT2 Load Transient Response



ELECTRICAL CHARACTERISTICS CURVES (Continued)



**PACKAGE DIMENSION**

**14SOPH-8L**

