

DESCRIPTION

The IP1621 is an integrated circuit that has triple LDO regulators and one reset circuit. All the LDO regulators have their own internal npn power transistors and their nominal output voltages are 2.67V and 3.4V, respectively. The reset circuit monitors the status of the regulator input voltage and outputs the RESET signal. RESET becomes high after the delay time that is determined by the external capacitor at Td pin. The delay time begins to start after the input voltage reaches above 4.2V.



14SOPH-8L

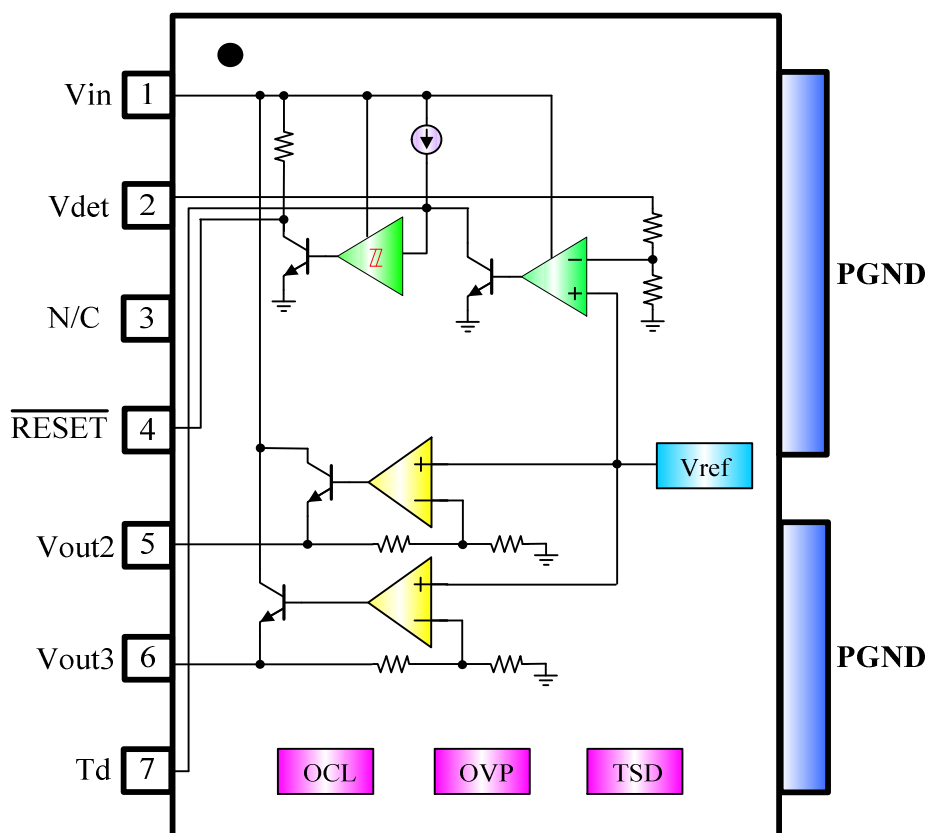
FEATURES

- 1-Fixed 3.4V LDO regulator with internal NPN TR.
- 1-Fixed 2.67V LDO regulator with internal NPN TR.
- Typical reset detection voltage of 4.2V.
- Built-in TSD circuit.
- Built-in current limit circuit.
- Built-in over voltage protection circuit.
- Output voltage trimmed to +/-3% tolerance.

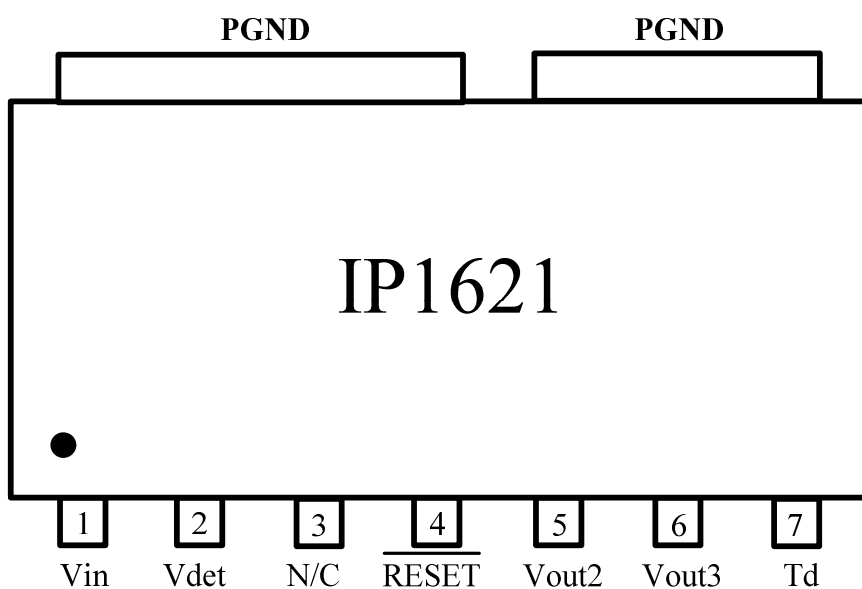
ORDERING INFORMATION

Device	Package	Operating Temp
IP1621	14SOPH-8L	-35°C ~ +85°C

BLOCK DIAGRAM



PIN CONNECTIONS



PIN DESCRIPTIONS

NO	SYMBOL	I/O	DESCRIPTION
1	Vin	I	Input Supply Voltage
2	Vdet	I	Detection voltage input
3	N/C	-	NO CONNECTION
4	RESET	O	RESET output pin
5	Vout1	O	Regulator2 3.4V Output
6	Vout2	O	Regulator3 2.67V Output
7	Cd	O	Delay time capacitor pin
8	PGND	-	Power Ground

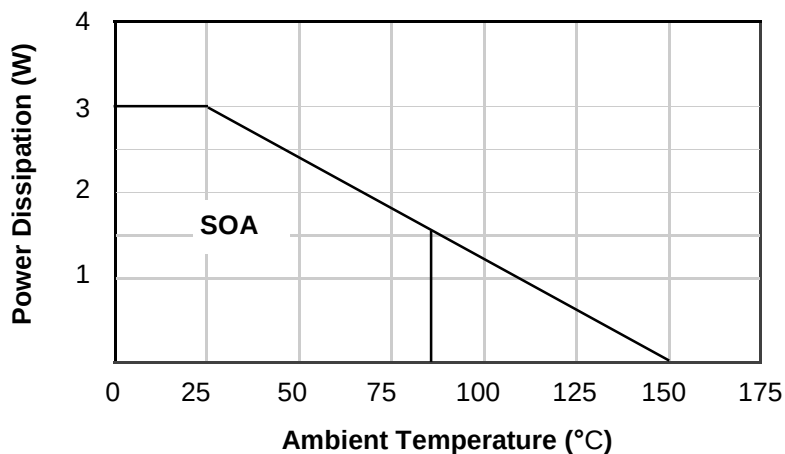
ABSOLUTE MAXIMUM RATINGS(TA=25°C)

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Maximum supply voltage	Vccmax	10	V
Input voltage	Vinmax	10	V
Power dissipation	Pd	3.0*	W
Operating temperature	Topr	-35 ~ +85	°C
Storage temperature	Tstr	-55 ~ +150	°C
Maximum output limit current	Io_limit	900	mA

Note>

1. When mounted on 100mm X 100mm X 1mm PCB (Phenolic resin material).
2. Power dissipation reduces 24mW/°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	VIN	4.5 ~ 6.0	V

ELECTRICAL CHARACTERISTICS

($V_{in}=5V$, $C_o=10\mu F$, $T_a=25^{\circ}C$, unless otherwise specified.)

Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Quiescent current	I _{cc}	V _{cc} =5V, No-Load	-	9	15	mA
OVP Detecting Voltage	V _{ovp}	V _{cc} =Variable	6.5	7.5	-	V
LDO REGULATOR 1 (3.4V FIXED TYPE)						
Output Voltage	V _{out1}	I _o =10mA	3.3	3.4	3.5	V
Line Regulation	dV _{line1}	V _{in} =4.5~6V, I _o =10mA	-	0.035	0.2	%
Load Regulation	dV _{load 1}	T _a =25°C V _{in} =5V, 10mA < I _o < 300mA	-	0.4	1	%
Dropout voltage	V _{drop1}	I _o =300mA	-	0.9	1.2	V
Ripple rejection ^{*Note1}	RR1	F=120Hz, C _o =10μF Tantalum V _{in} -V _{out} =2V, I _o =150mA	60	70	-	dB
Current limit ^{*Note2}	I _{limit1}	V _{in} =5V	300	-	-	mA
Temperature stability ^{*Note1}	Temp1	-	-	0.5	-	%
Noise Voltage	V _{n1}	f=10Hz~10kHz I _o =120mA	-	100	-	uV _{rms}
LDO REGULATOR 2 (2.67V FIXED TYPE)						
Output Voltage	V _{out2}	I _o =10mA	2.59	2.67	2.75	V
Line Regulation	dV _{line2}	V _{in} =4.5~6V, I _o =10mA	-	0.035	0.2	%
Load Regulation	dV _{load 2}	T _a =25°C V _{in} =5V, 10mA < I _o < 450mA	-	0.4	1	%
Dropout voltage	V _{drop2}	I _o =450mA	-	2.5	2.8	V
Ripple rejection ^{*Note1}	RR2	F=120Hz, C _o =10μF Tantalum V _{in} -V _{out} =3V, I _o =250mA	60	70	-	dB
Current limit ^{*Note2}	I _{limit2}	V _{in} =5V	450	-	-	mA
Temperature stability ^{*Note1}	Temp2	-	-	0.5	-	%
Noise Voltage	V _{n2}	f=10Hz~10kHz I _o =200mA	-	100	-	uV _{rms}

ELECTRICAL CHARACTERISTICS

($V_{in} = 5V$, $C_o = 10\mu F$, $T_a = 25^\circ C$, unless otherwise specified.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
RESET PART						
Detection voltage	V_d	$V_{in} = L/H/L$	4.0	4.2	4.4	V
Td threshold voltage	V_{td}	$R_L = 4.7K$, $V_{td} = \text{variable}$	1.5	1.65	1.8	V
Hysteresis voltage	V_{hys}	$R_L = 4.7K$, $V_{in} = L/H/L$	0.2	0.6	0.9	V
Detection reference voltage temperature coefficient *Note1	TCV_d	$T_a = -20^\circ C \sim +85^\circ C$	-	± 0.01	-	%/ $^\circ C$
$\overline{Reset}$ output current	$I_{\overline{RESET}}$	$V_d = 0V$, $V_{\overline{RESET}} = 0.4V$	3	-	-	mA
High level output voltage	V_{oh}	$R_L = 4.7K$	3.8	4.5	4.8	V
Low level output voltage	V_{ol}	$R_L = 4.7K$	-	0.1	0.4	V
"H" transport delay time	td_{LH}	$R_L = 4.7K$, $C_d = 0.22\mu F$	-	40	-	ms
"L" transport delay time	td_{HL}	$R_L = 4.7K$, $C_d = 0.22\mu F$	-	50	-	us

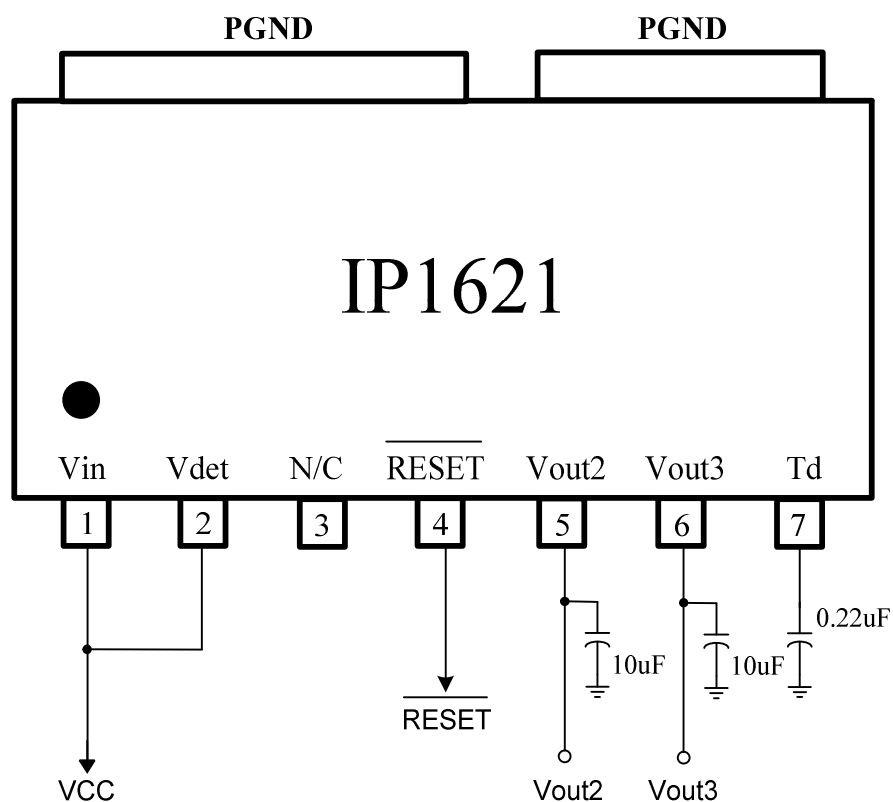
* Note1

These parameters are guaranteed, but not 100% tested in mass production.

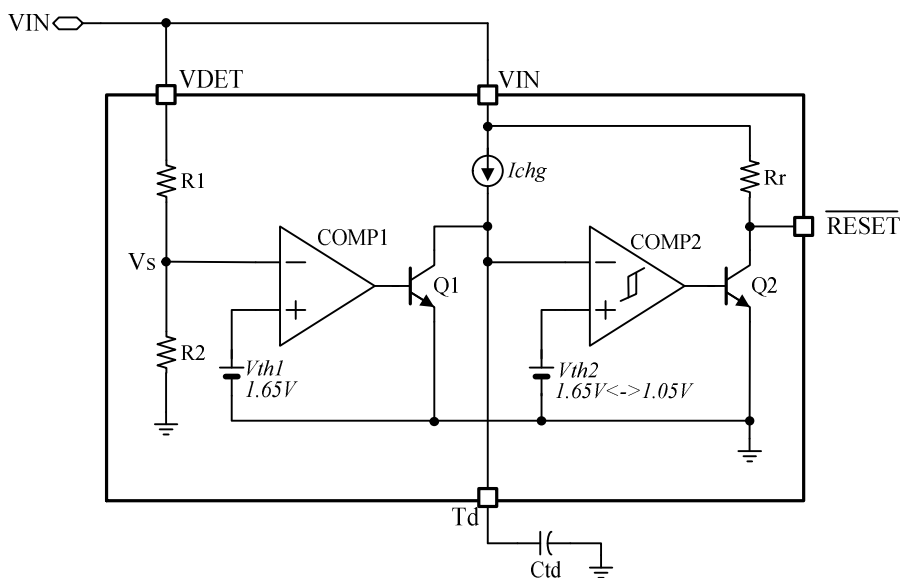
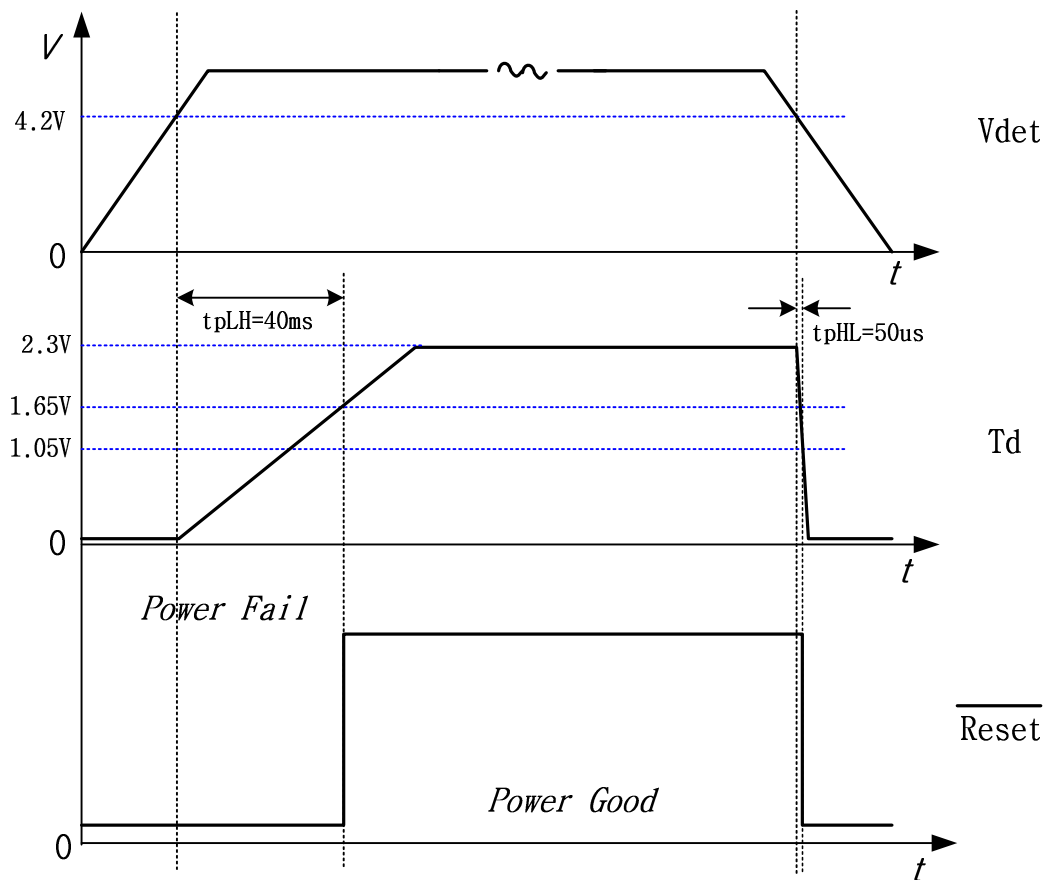
* Note2

Don't exceed the specified current limit in each output voltage.

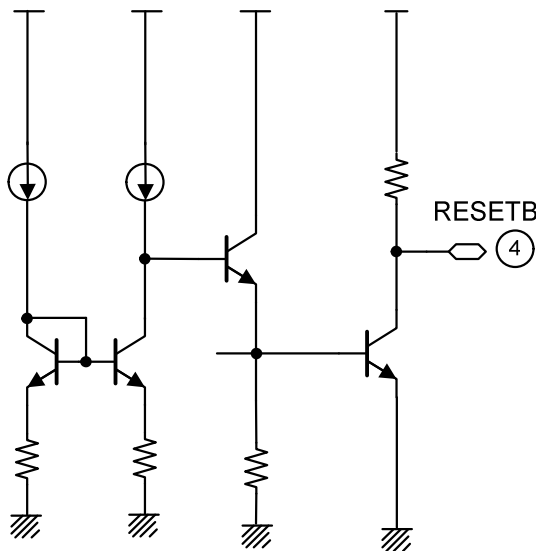
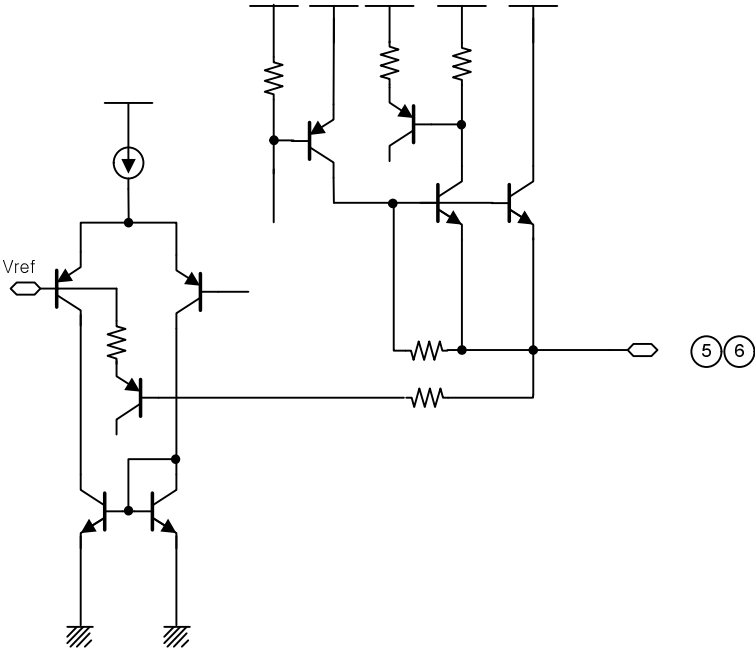
TYPICAL APPLICATION CIRCUIT



TIMING CHART FOR RESET CIRCUIT

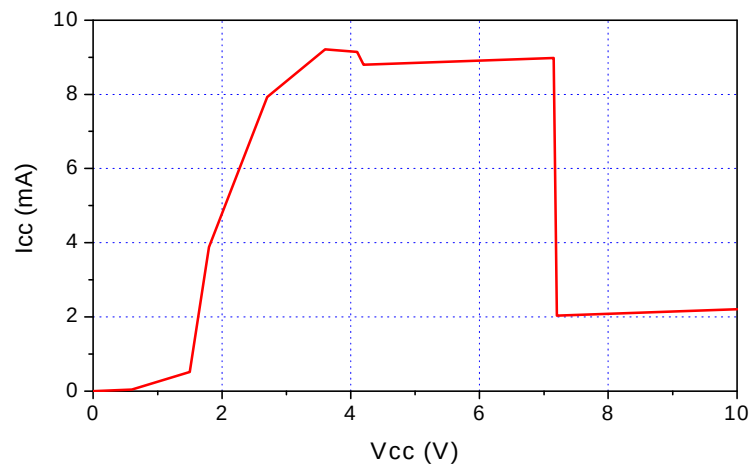


INTERNAL CIRCUIT

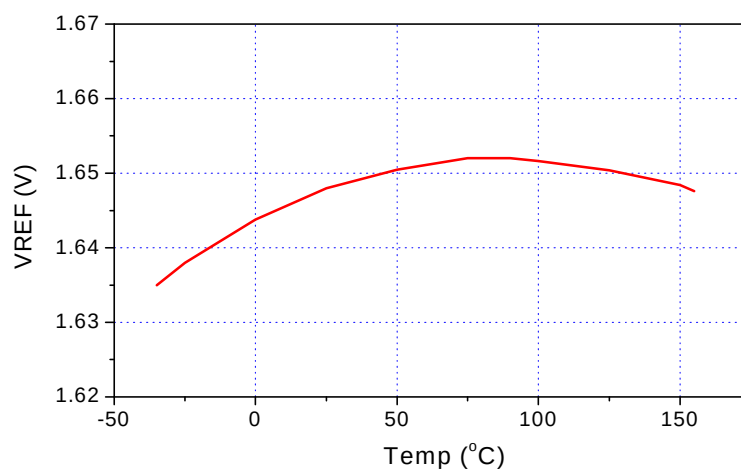
Pin no	Pin name	Internal circuit
4	RESET	
5,6	Regulator Output1,2	

ELECTRICAL CHARACTERISTICS CURVES

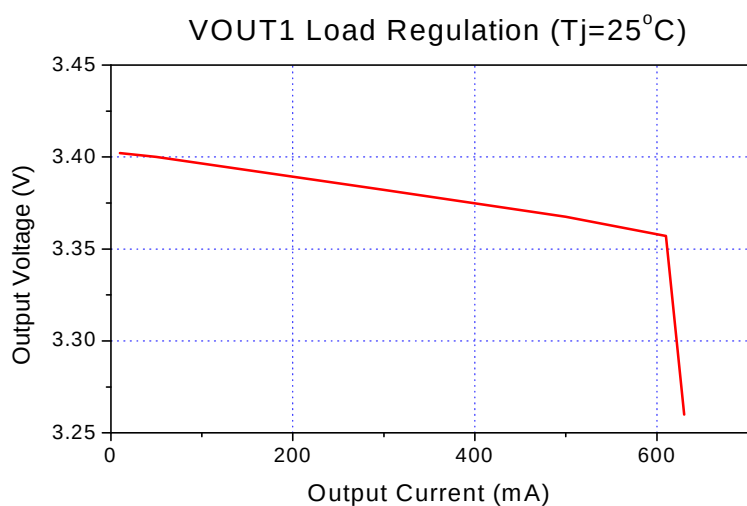
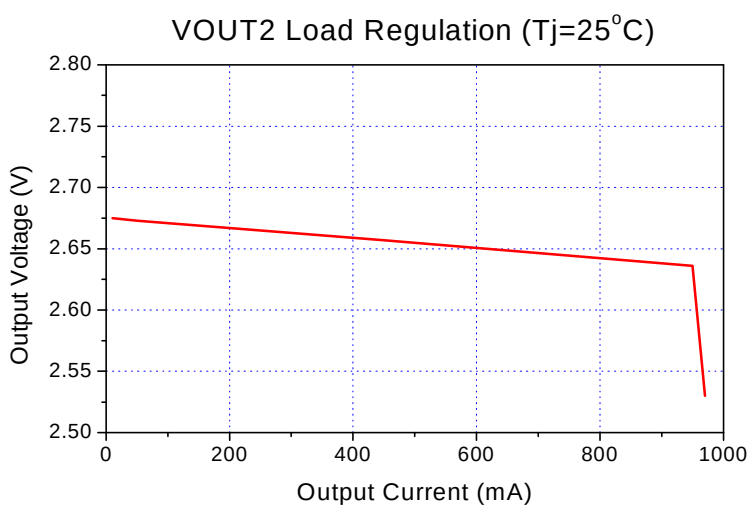
QUIESCENT CURRENT



VREF TEMPERATURE STABILITY

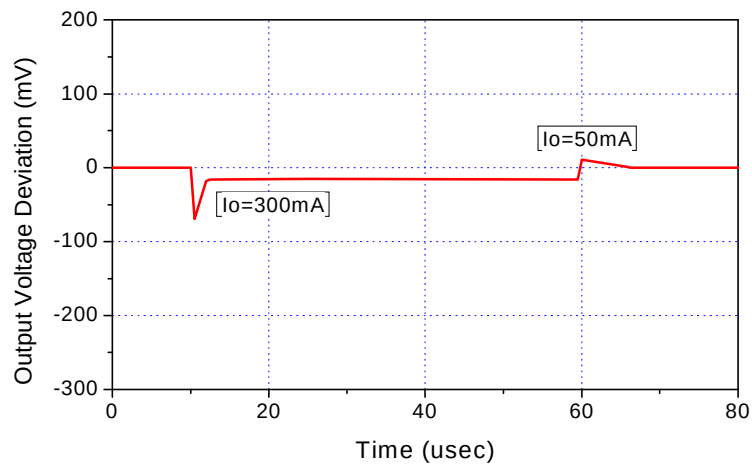


ELECTRICAL CHARACTERISTICS CURVES (Continued)

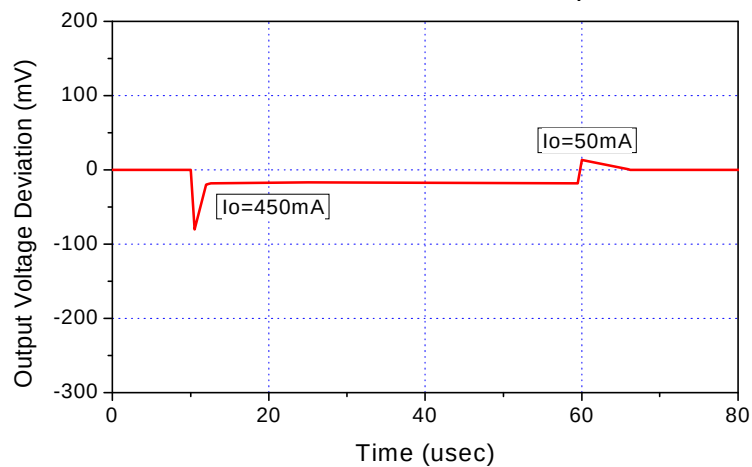


ELECTRICAL CHARACTERISTICS CURVES (Continued)

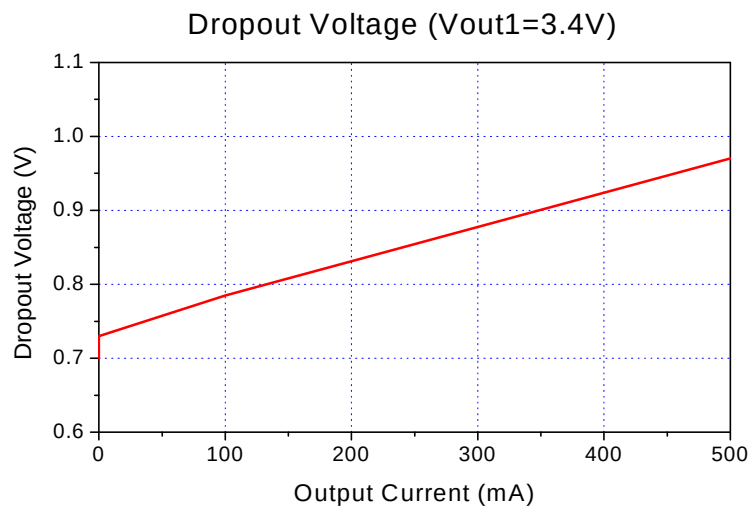
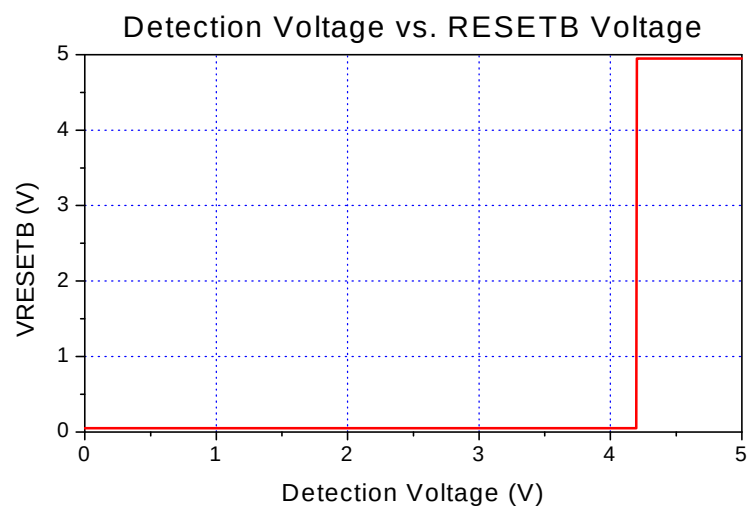
VOUT1 Load Transient Response



VOUT2 Load Transient Response

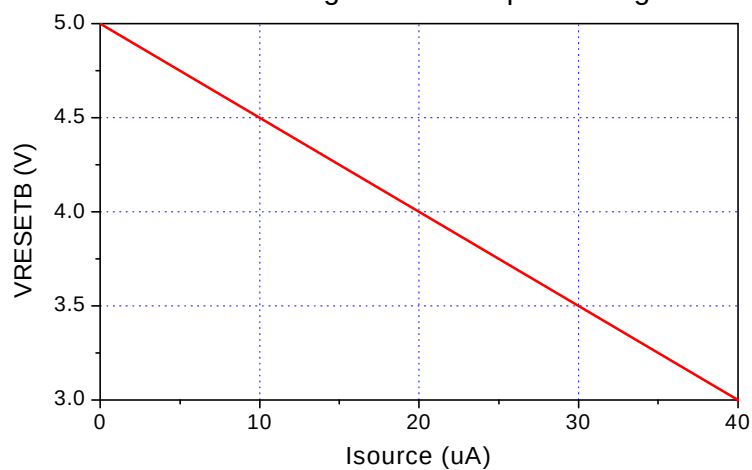


ELECTRICAL CHARACTERISTICS CURVES (Continued)

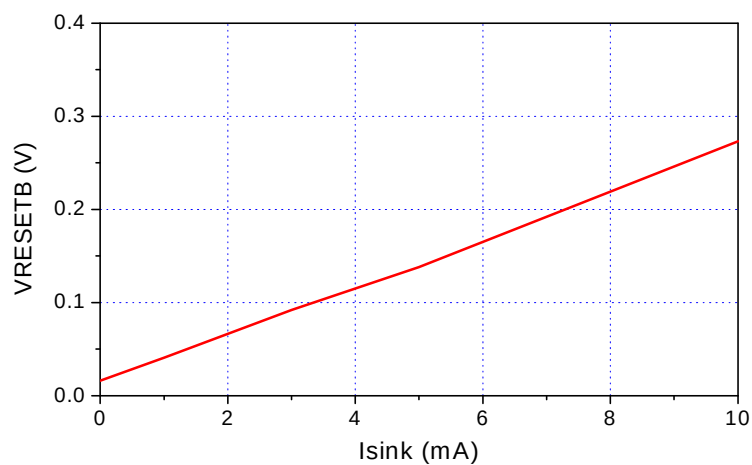


ELECTRICAL CHARACTERISTICS CURVES (Continued)

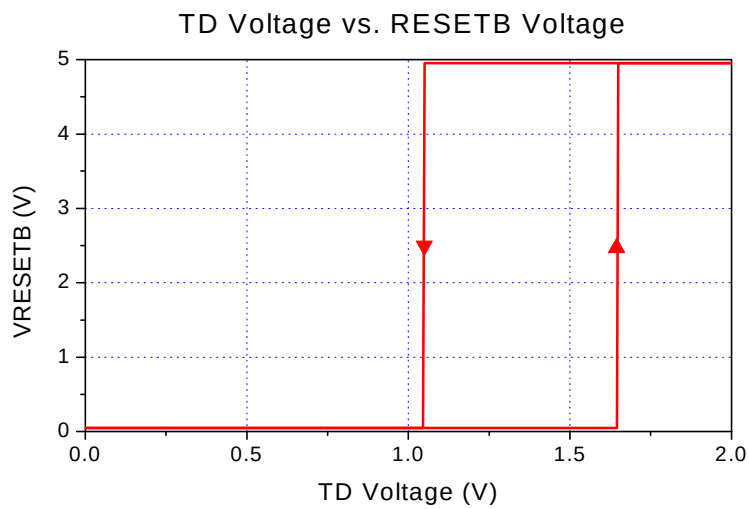
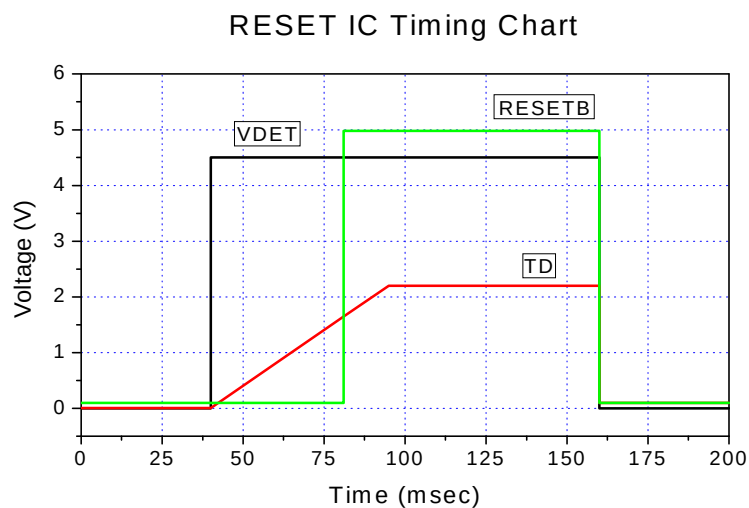
RESETB High Level Output Voltage



RESETB Low Level Output Voltage



ELECTRICAL CHARACTERISTICS CURVES (Continued)



PACKAGE DIMENSION

14SOPH-8L

