

Low Drop Regulator with Signal Interface Logic Circuit

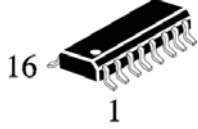
IK31001

DESCRIPTION

The IC is linear voltage regulator 5V with low dropout voltage typically 100mV at light loads and less than 500mV at full loads, with better than 4% output voltage accuracy. In addition, IC has logical blocks for additional functions.

FEATURES

- Voltage regulator 5V with 4% output voltage accuracy
- Low dropout voltage 0.7V Max
- Load current 200mA Max
- Low Standby Current Consumption : 500 μ A
- Logical blocks for internal back light control

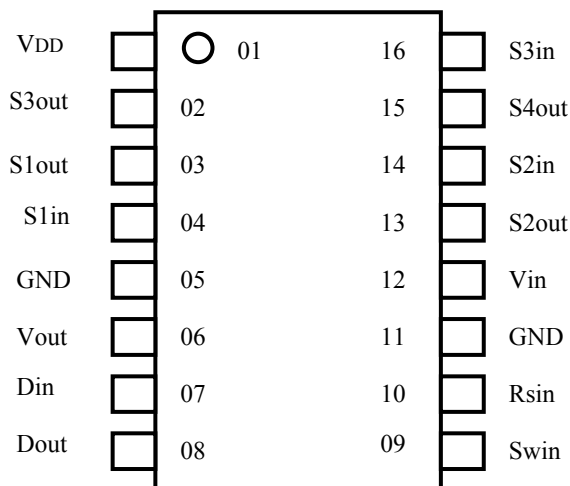


**D SUFFIX
SOIC**

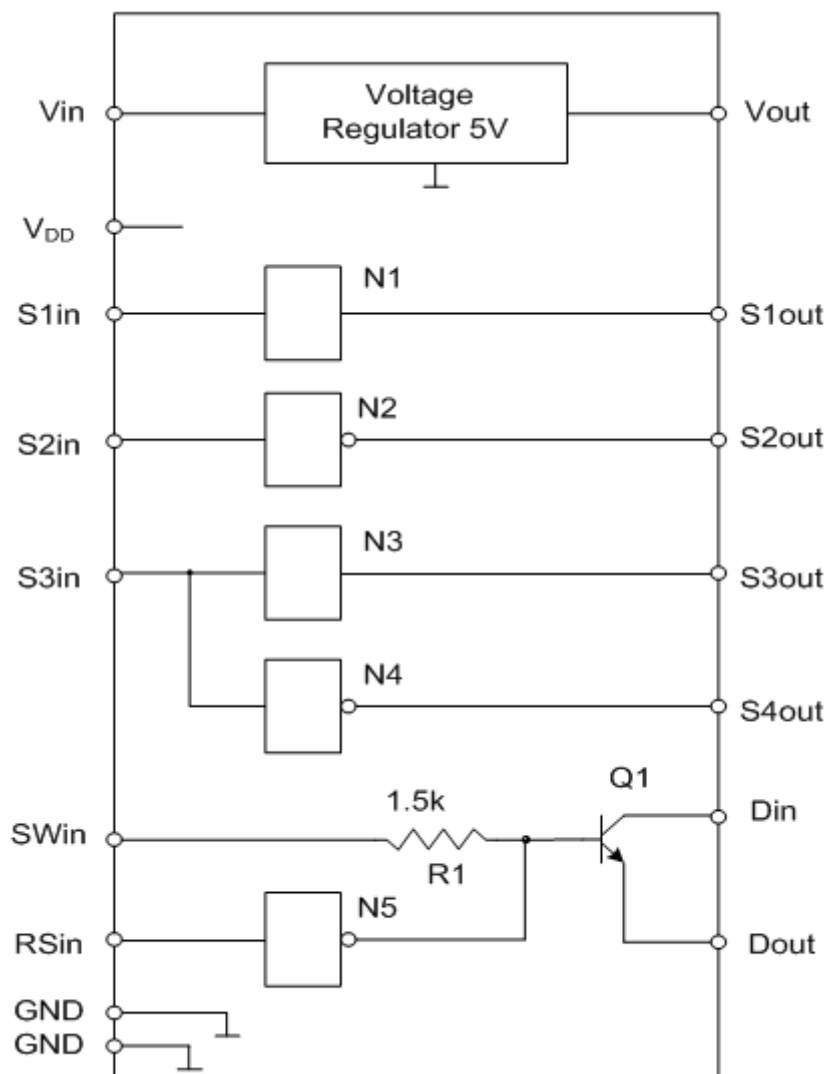
ORDERING INFORMATION
IK31001 SOIC

$T_A = -40^{\circ}$ to 85°C for package

PIN DIAGRAM



PIN	NAME	FUNCTION
01	VDD	Power supply logic blokes
02	S3out	Output S3out
03	S1out	Output S1out
04	S1in	Input S1in
05	GND	Ground
06	Vout	Output regulator voltage 5V
07	Din	Input Din
08	Dout	Output Dout
09	Swin	Input Swin
10	Rsin	Input Rsin
11	GND	Ground
12	Vin	Input voltage
13	S2out	Output S2out
14	S2in	Input S2in
15	S4out	Output S4out
16	S3in	Input S3in



Schematic Diagram

MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$)

Symbol	Characteristics	Rating	Units
Vin	Operating Input Voltage	29	V
Iout	Output Current	200	mA
S1in	Input Voltage	24	V
S2in	Input Voltage	24	V
S3in	Input Voltage	24	V
Swin	Input Voltage	5	V
Rsin	Input Voltage	24	V
Din	Input Voltage	5	V
Ta	Operating Temperature	From -40 to 85	$^{\circ}\text{C}$
Pd	Power Dissipation	500	mW
Tj	Junction Temperature	150	$^{\circ}\text{C}$

DC ELECTRICAL CHARACTERISTICS

(Unless otherwise specified $V_{in}=13V$, V_{out} connected to V_{DD} , $I_{out}=10mA$, $C_{out}=100\mu F$, $T_j=25^\circ C$)

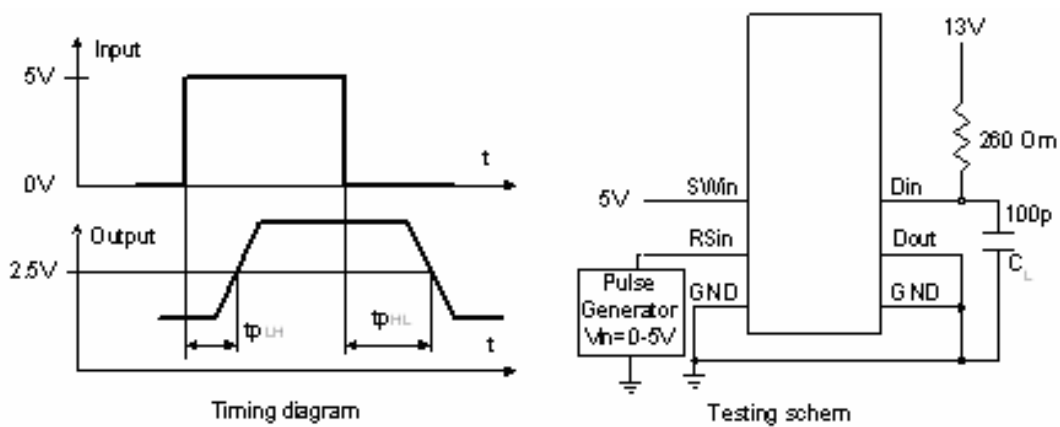
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Voltage regulator						
Output Voltage	V_{out}	$6V \leq V_{in} \leq 24V$	4.8	5.0	5.2	V
Voltage Regulation	Reg-Line	$6V \leq V_{in} \leq 16V$			30	mV
Load Regulation	Reg-Load	$10mA \leq I_{out} \leq 100mA$			50	mV
Dropout Voltage	V_d	$I_{out}=50mA$ $I_{out}=100mA$			0.5 0.7	V
Quiescent Current	I_q	$S1in, S2in, S3in, SWin,$ $RSin, Din - open$			1.0	mA
Logic blokes						
High Level Voltage	V_{OH}	$S1in=2 - 5V,$ $I_{load}= - 0.5mA$	$S1in$ - 1.2V			V
S2out		$S2in=3V,$ $I_{load}= - 0.5mA$	V_{DD} - 0.5V			
S3out		$S3in=2 - 5V,$ $I_{load}= - 0.5mA$	V_{DD} - 0.5V			
S4out		$S3in=0.2V$ $I_{load}= - 0.1mA$	V_{DD} - 1.5V			
Low Level Voltage	V_{OL}	$S1in=0.2V,$ $I_{load}=0.1mA$			1.5	V
S2out		$S2in= V_{DD}-0.2V,$ $I_{load}=0.1mA$			1.5	
S3out		$S3in=0.2V,$ $I_{load}=0.1mA$			1.5	
S4out		$S3in=2 - 5V,$ $I_{load}= 0.5mA$			0.5	
Input Current	I_{in}	$S1in=5V, S2in=0V,$ $S3in=5V, RSin=5V,$ $SWin=5V$			0.50	mA
Output Current	I_{Din}	$SWin=5V, RSin=0V,$ $Din=13V, Dout=0V$	100			mA
Leakage Current	$I_{leakage}$	$SWin=5V, RSin=5V,$ $Din=13V, Dout=0V$			10	μA
Saturation Voltage	V_{sat}	$SWin=5V, RSin=0V$ $Dout=0V$ $I_{out}=50mA$ $I_{out}=100mA$			0.5 0.7	V

AC ELECTRICAL CHARACTERISTICS ($C_L=15pF, V_{DD}=5V$)

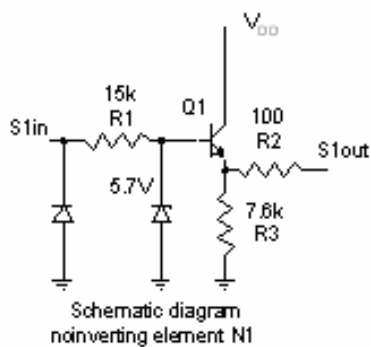
(Unless otherwise specified $V_{in}=13V, V_{out}$ connected to $V_{DD}, I_{out}=10mA, C_{out}=100\mu F, T_j=25^\circ C$)

Parameter	Sumbol	Conditions	Min	Typ	Max	Units
Propagation delay from S1in to S1out	tpLH	$C_L=100p$		65		ns
	tpHL			400		
Propagation delay from S2in to S2out	tpLH	$C_L=100p$		190		ns
	tpHL			720		
Propagation delay from S3in to S3out	tpLH	$C_L=100p$		240		ns
	tpHL			1250		
Propagation delay from S3in to S4out	tpLH	$C_L=100p$		550		ns
	tpHL			65		
Propagation delay (*1) from RSin to Din	tpLH	$S_{Win}=5V, D_{out}=0V, R_L=260\Omega, C_L=100p$		50		ns
	tpHL			75		

*1-See circuit in testing schema



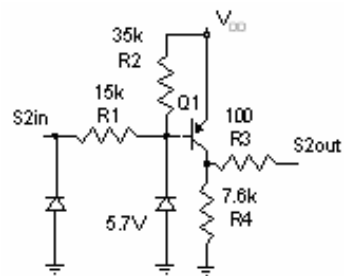
Logical blokes



Functional table

Input S1in	Output S1out
H	H
L	L
Open	L

- for MICOM Input
- IGN Sensing
- TAIL Light Sensing

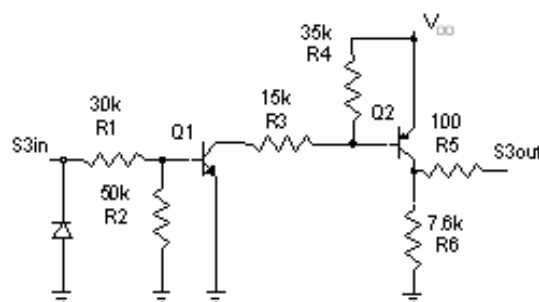


Schematic diagram inverting element N2

Functional table

Input S2in	Output S2out
H	L
L	H
Open	L

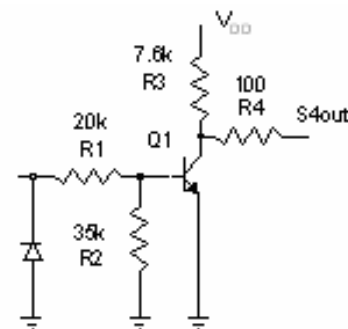
- for MICOM Input
- for (-) CONTROL



Schematic diagram noninverting element N3

Functional table

Input S3in	Output S3out
H	H
L	L
Open	L

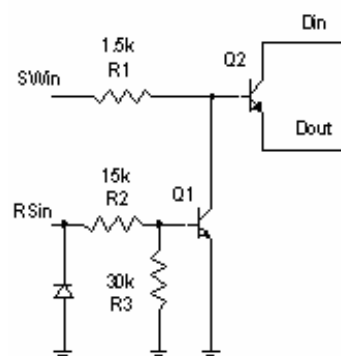


Schematic diagram inverting element N4

Functional table

Input S3in	Output S4out
H	L
L	H
Open	H

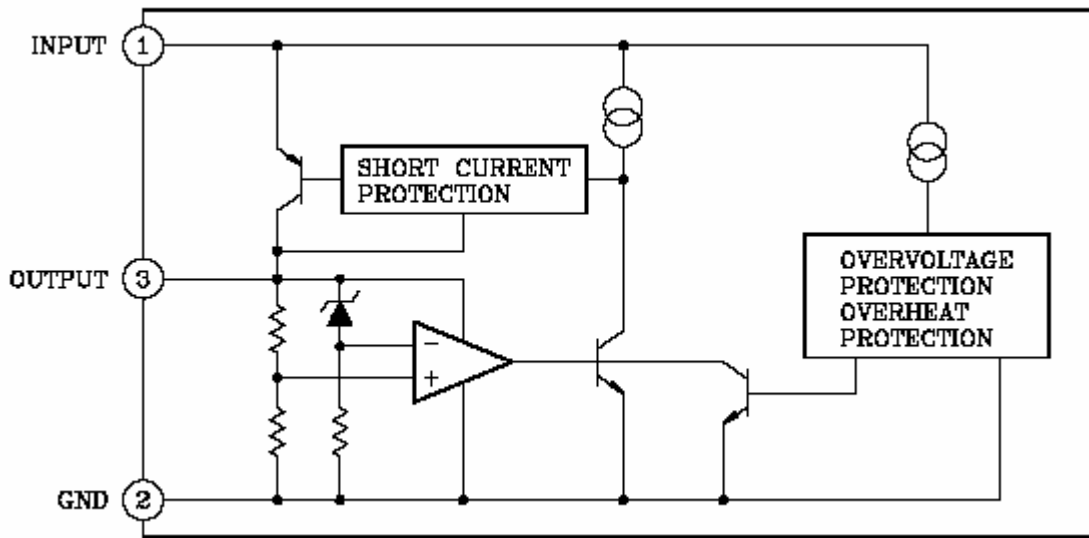
- for MICOM Input
- for SPEED Input



Schematic diagram modulation part

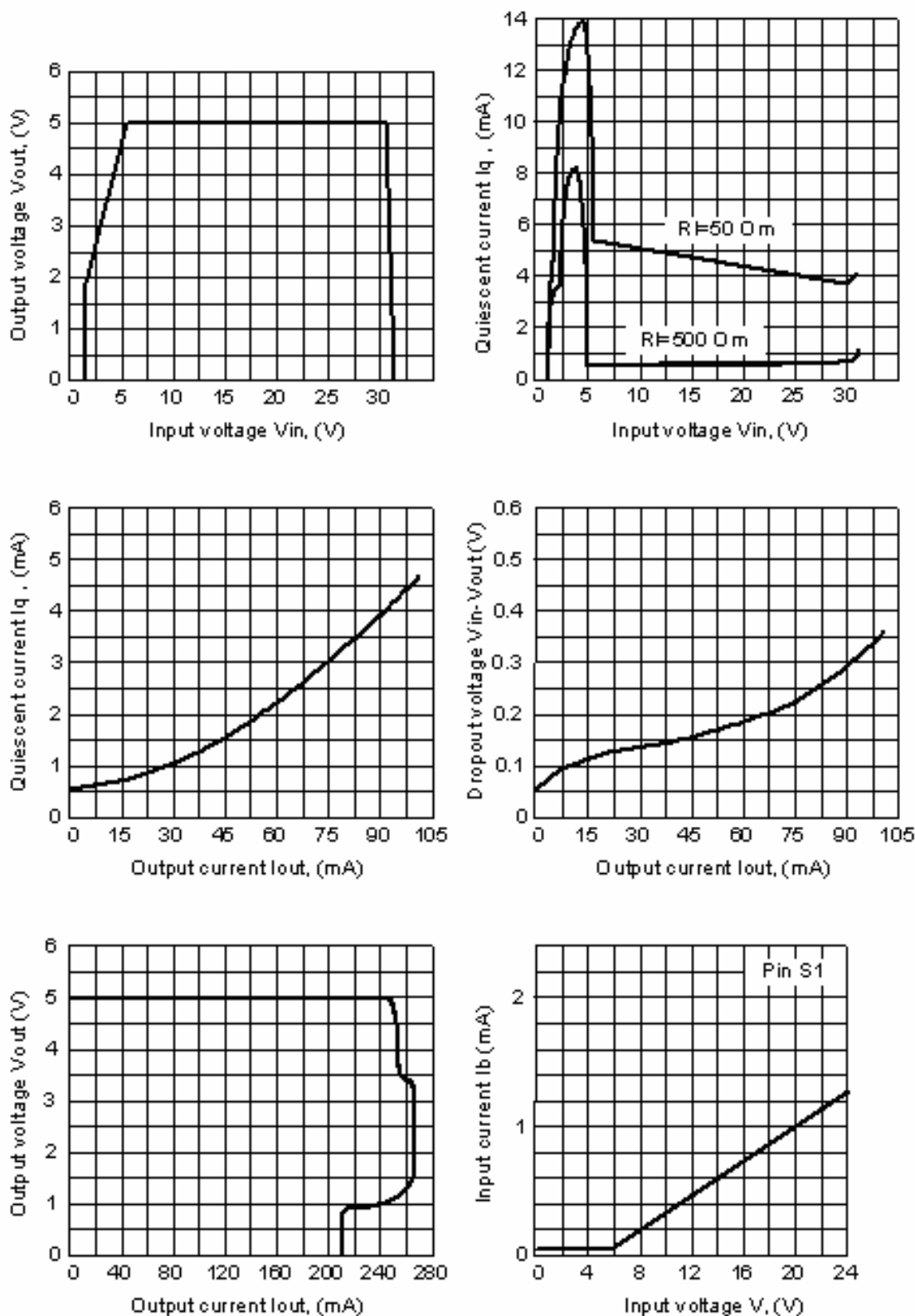
Functional table

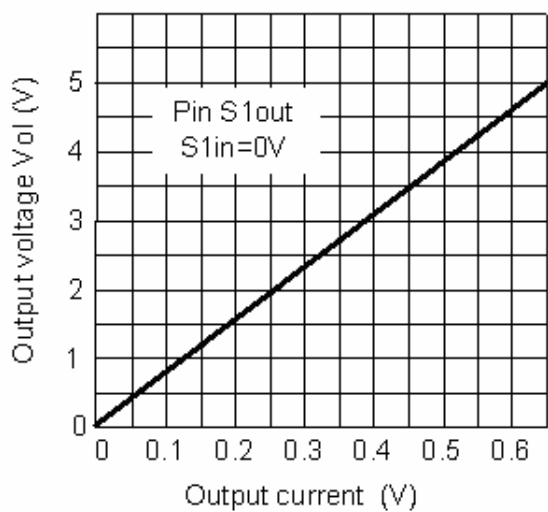
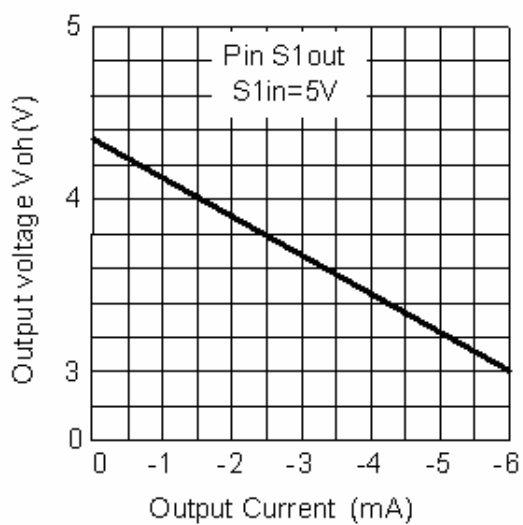
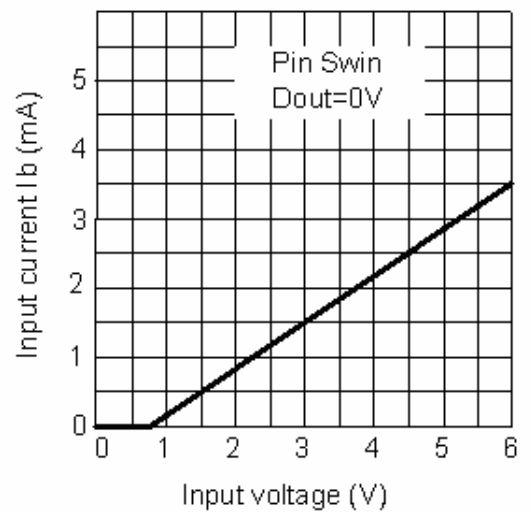
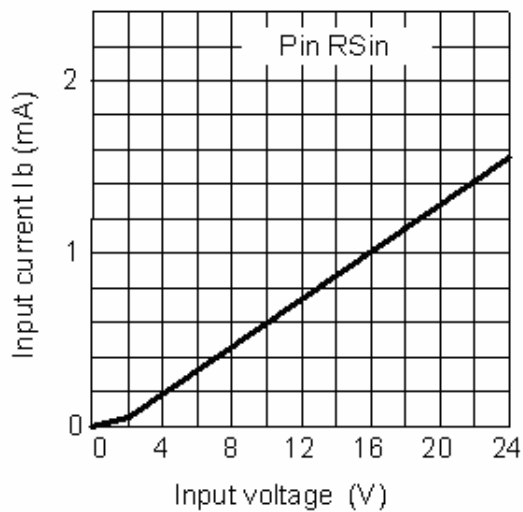
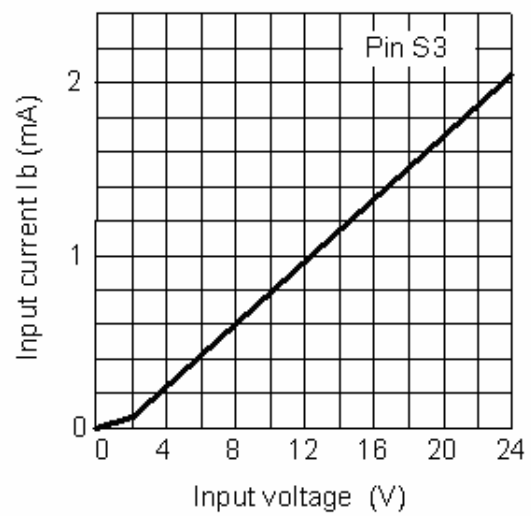
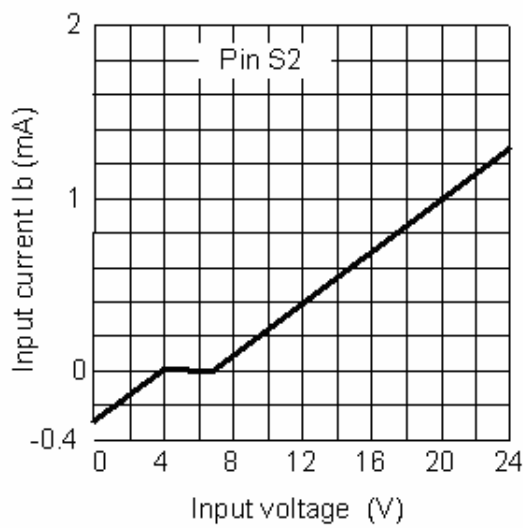
Input RSin	Input S'WIn	Output Dout	Output DIn
H	H	GND	H
L	H	GND	L
H	L	GND	H
L	L	GND	H
Open	H	GND	L
Open	L	GND	H

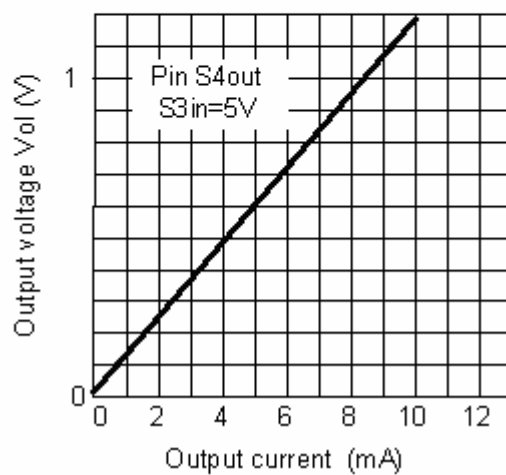
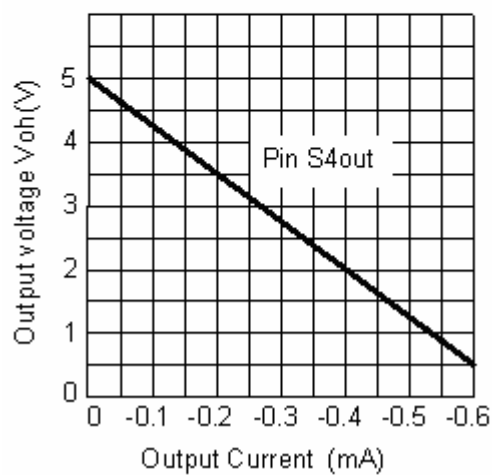
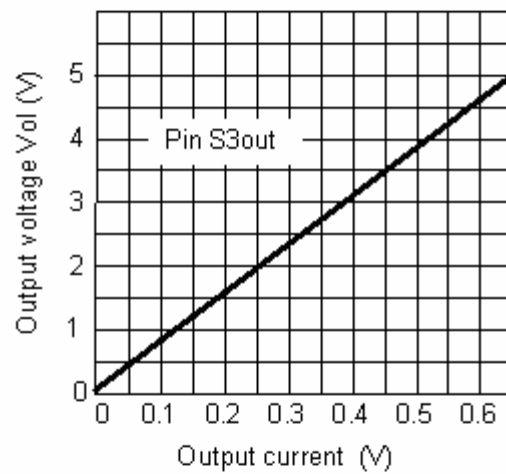
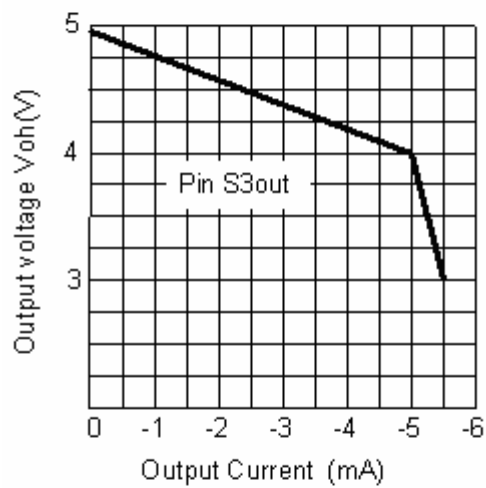
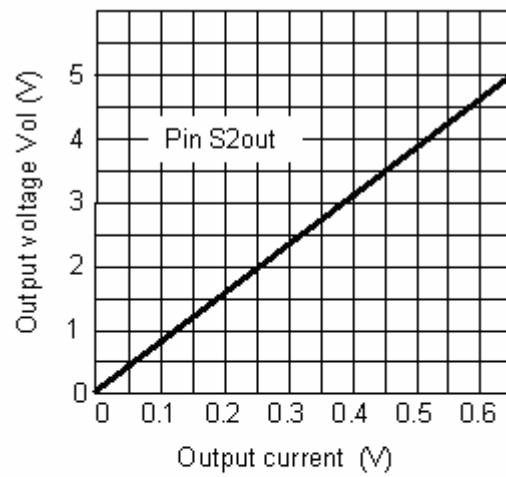
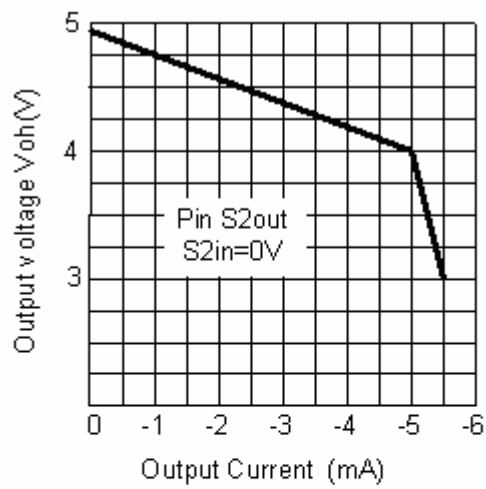


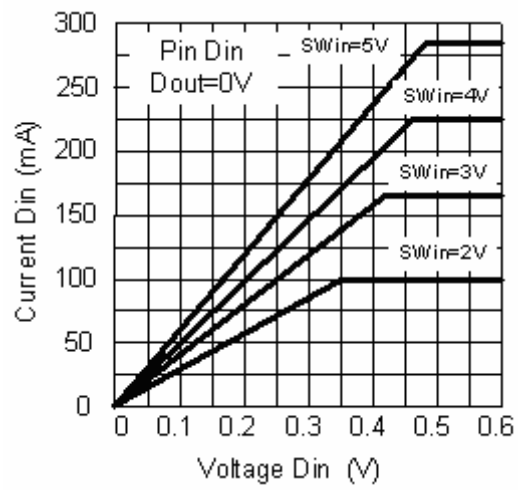
Voltage Regulator Schematic

Typical characteristics

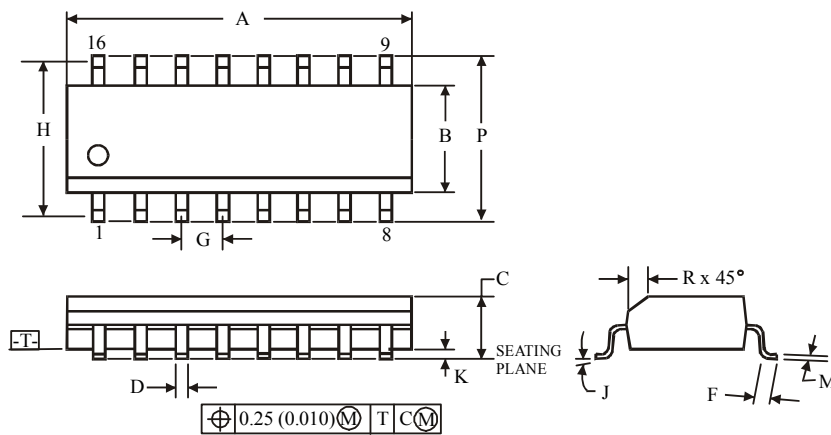
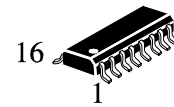








PKG DIMENSION

D SUFFIX SOIC
(MS - 012AC)

Symbol	Dimension, mm	
	MIN	MAX
A	9.80	10.00
B	3.80	4.00
C	1.35	1.75
D	0.33	0.51
F	0.40	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.10	0.25
M	0.19	0.25
P	5.80	6.20
R	0.25	0.50

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side for A; for B - 0.25 mm (0.010) per side.