

# Low Drop Regulator with Signal Interface Logic Circuit

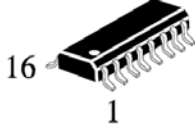
**IK3101**

## 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, the 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 : 500µA
- Logical blocks for internal back light control
- Over Voltage & Over Temperature Protection
- Short Current Protection
- 60V Load Dump Protection

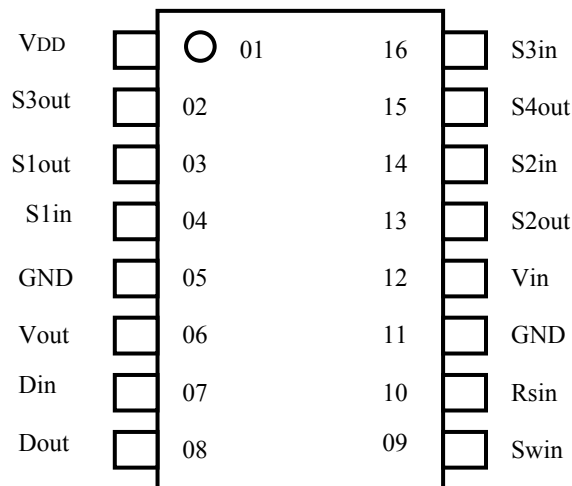


**D SUFFIX SOIC**

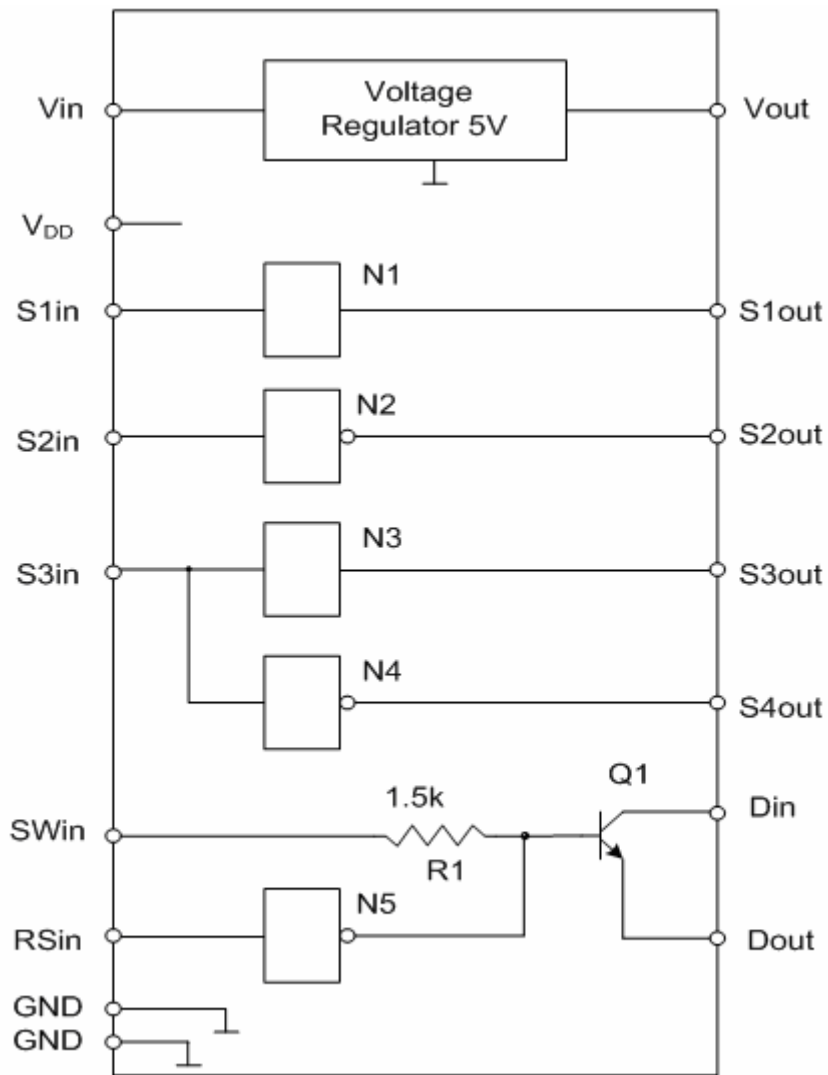
**ORDERING INFORMATION**  
IK3101 SOIC

T<sub>A</sub> = -40° to 85°C for package

## PIN DIAGRAM



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



Schematic Diagram

**MAXIMUM RATINGS** (Ta=25°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	°C
Pd	Power Dissipation	500	mW
Tj	Junction Temperature	-50 ~ 150	°C
Ts	Storage Temperature	-55 ~ 155	°C

**DC ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified Vin=13V, Vout connected to VDD, Iout=10mA, Cout=100µF, Tj=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Voltage regulator</b>						
Output Voltage	Vout	6V ≤ Vin ≤ 24V	4.8	5.0	5.2	V
Voltage Regulation	Reg-Line	6V ≤ Vin ≤ 16V			30	mV
Load Regulation	Reg-Load	10mA ≤ Iout ≤ 100mA			50	mV
Dropout Voltage	Vd	Iout=50mA			0.5	V
		Iout=100mA			0.7	
Quiescent Current	Iq	S1in, S2in, S3in, SWin, RSin, Din – open			500	µA
<b>Logic blokes</b>						
High Level Voltage S1out S2out S3out S4out	VOH	S1in=2 - 5V, Iload= - 0.5mA	S1in - 1.2V			V
		S2in=3V, Iload= - 0.5mA	VDD - 0.5V			
		S3in=2 - 5V, Iload= - 0.5mA	VDD - 0.5V			
		S3in=0.2V Iload= - 0.1mA	VDD - 1.5V			
Low Level Voltage S1out S2out S3out S4out	VOL	S1in=0.2V, Iload=0.1mA			1.5	V
		S2in= VDD-0.2V, Iload=0.1mA			1.5	
		S3in=0.2V, Iload=0.1mA			1.5	
		S3in=2 - 5V, Iload= 0.5mA			0.5	
Input Current S1in, S2in, S3in, RSin SWin	Iin	S1in=5V, S2in=0V, S3in=5V, RSin=5V, SWin=5V			0.50	mA
					3.5	mA
Output Current Din	IDin -	SWin=5V, RSin=0V, Din=13V, Dout=0V	100			mA
Leakage Current Din	I leakage	SWin=5V, RSin=5V, Din=13V, Dout=0V			10	µA
Saturation Voltage D	Vsat	SWin=5V, RSin=0V Dout=0V Iout=50mA			0.5	V
		Iout=100mA			0.7	

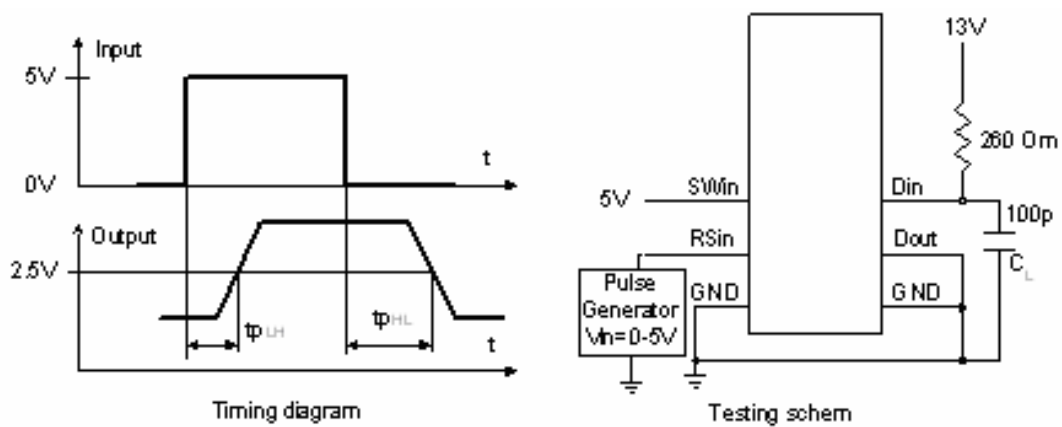
**AC ELECTRICAL CHARACTERISTICS** ( $C_L=15pF, V_{DD}=5V$ )

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

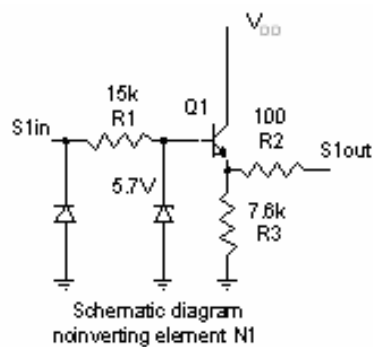
Parameter	Sumbol	Conditions	Min	Typ	Max	Units
Propagation delay from S1in to S1out	tpLH	$C_L=100p$		65		ns
	tpHL					
Propagation delay from S2in to S2out	tpLH	$C_L=100p$		190		ns
	tpHL					
Propagation delay from S3in to S3out	tpLH	$C_L=100p$		240		ns
	tpHL					
Propagation delay from S3in to S4out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

\*1-See circuit in testing schema

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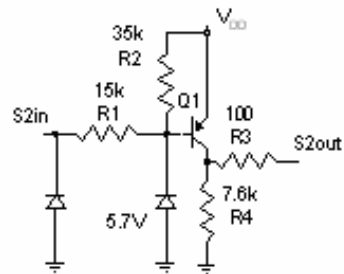
**Logical blokes**



Functional table

Input S1in	Output S1out
H	H
L	L
Open	L

- for MICOM Input
- IGN Sensing
- TAIL Light Sensing



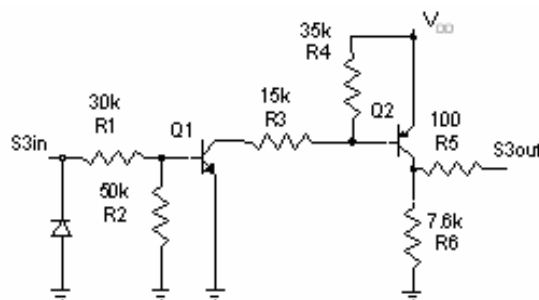
Schematic diagram inverting element N2

Functional table

Input S2in	Output S2out
H	L
L	H
Open	L

- for MICOM Input
- for (-) CONTROL

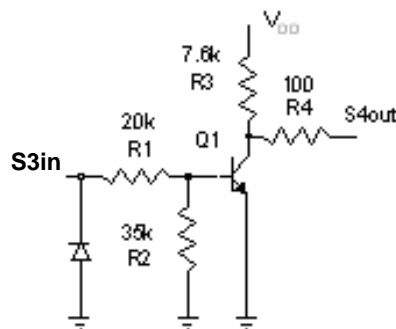
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Schematic diagram noninverting element N3

Functional table

Input S3in	Output S3out
H	H
L	L
Open	L

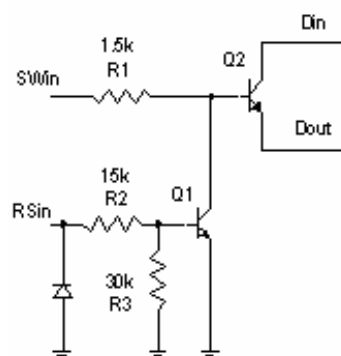


Schematic diagram inverting element N4

Functional table

Input S3in	Output S4out
H	L
L	H
Open	H

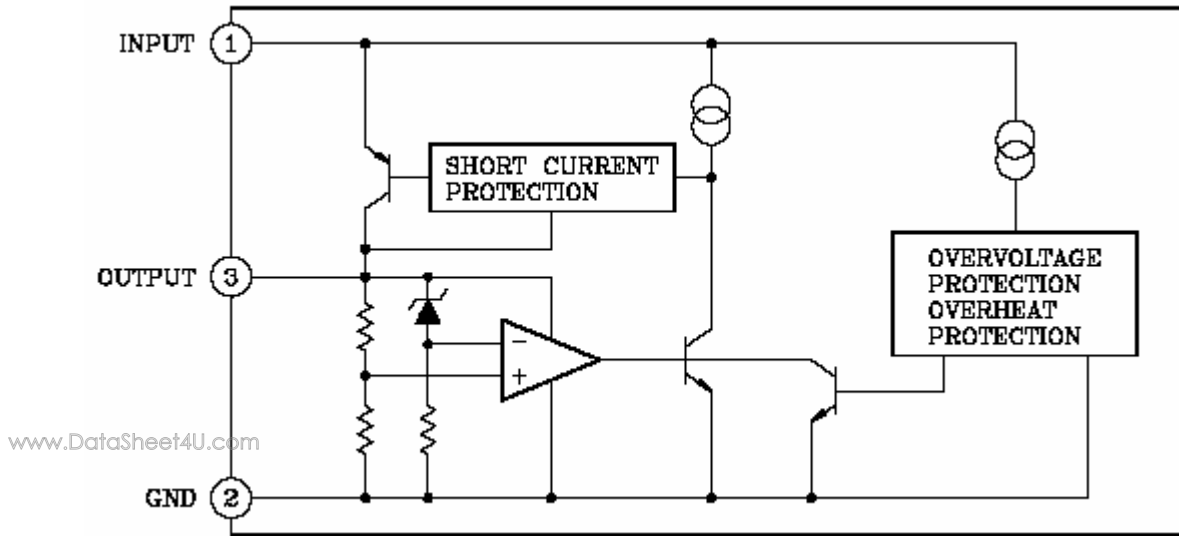
- for MICOM Input
- for SPEED Input



Schematic diagram modulation part

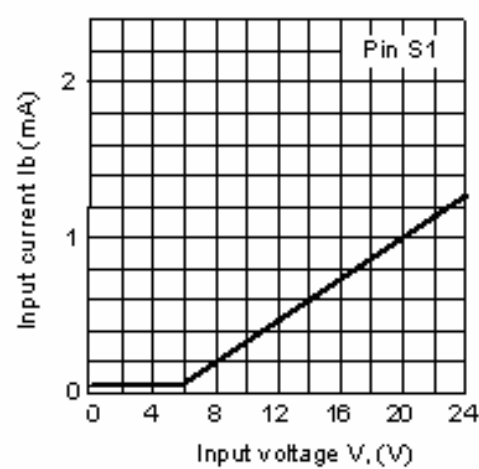
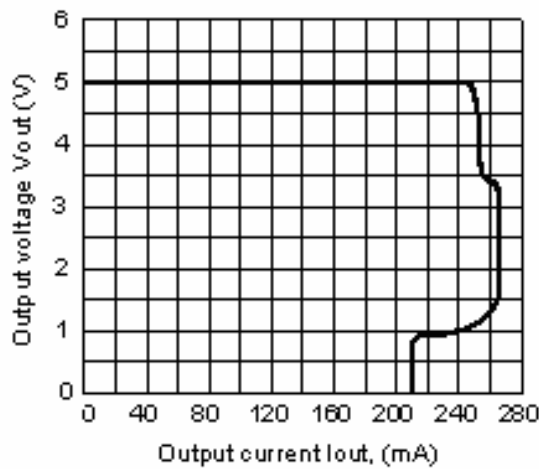
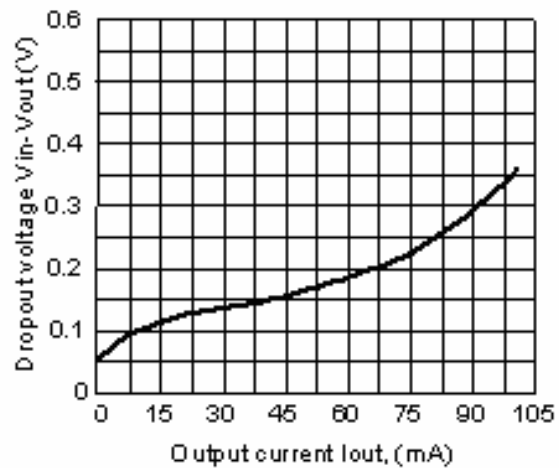
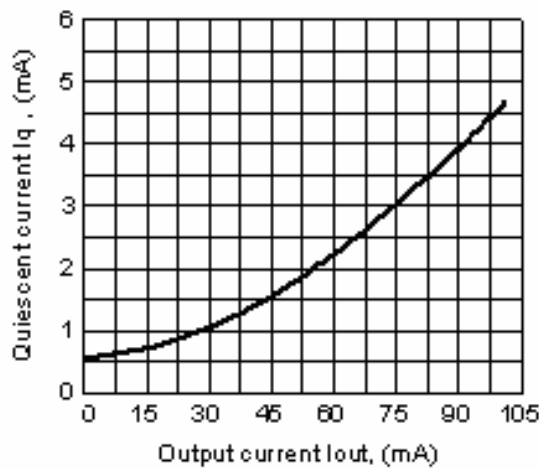
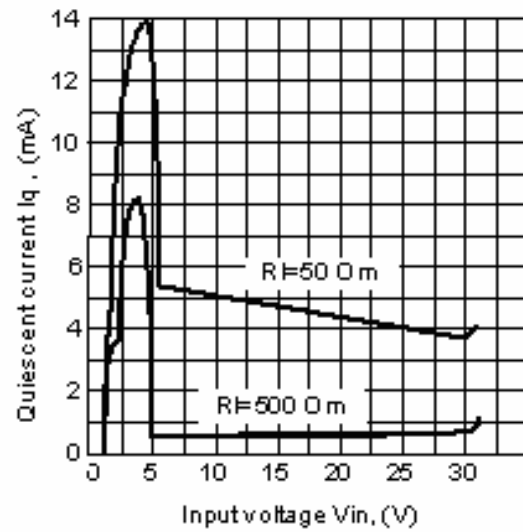
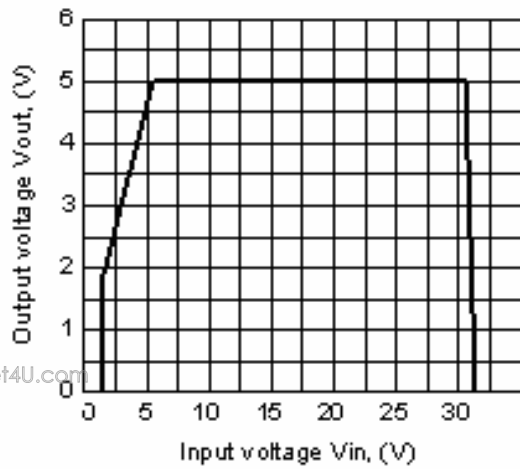
Functional table

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

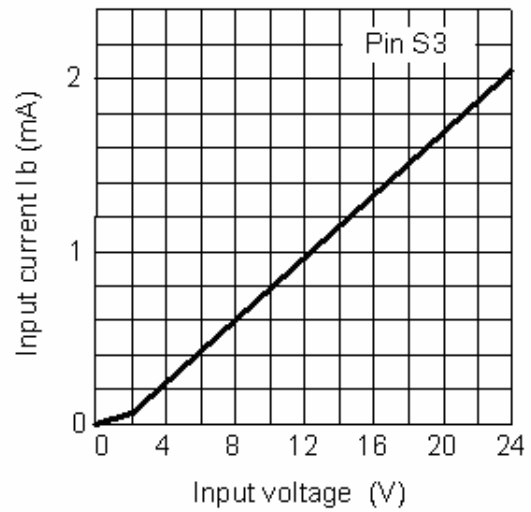
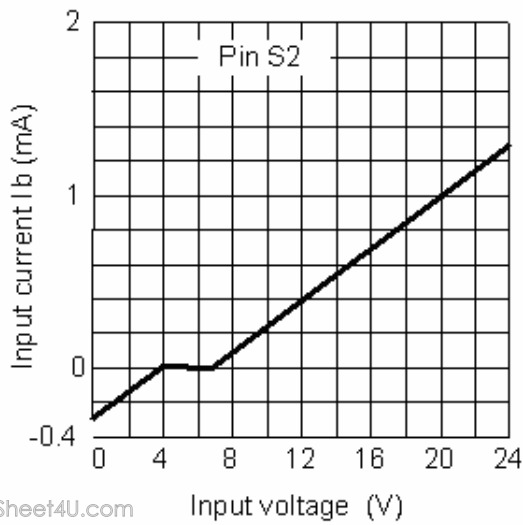


Voltage Regulator Schematic

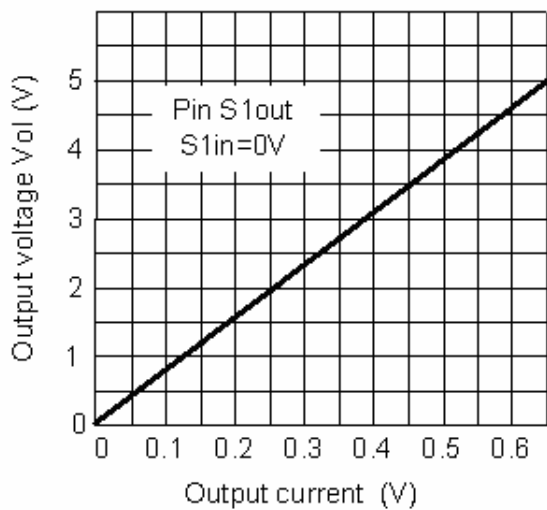
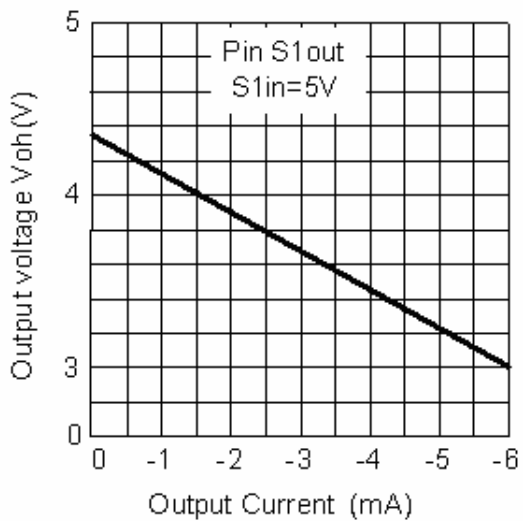
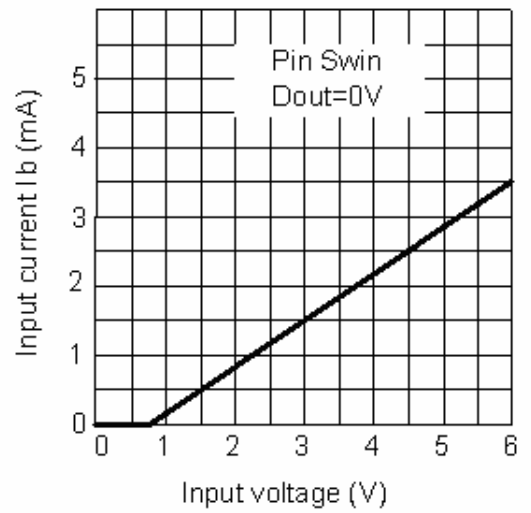
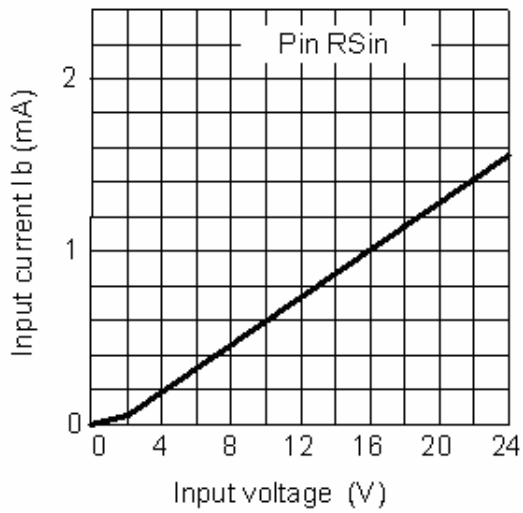
Typical characteristics



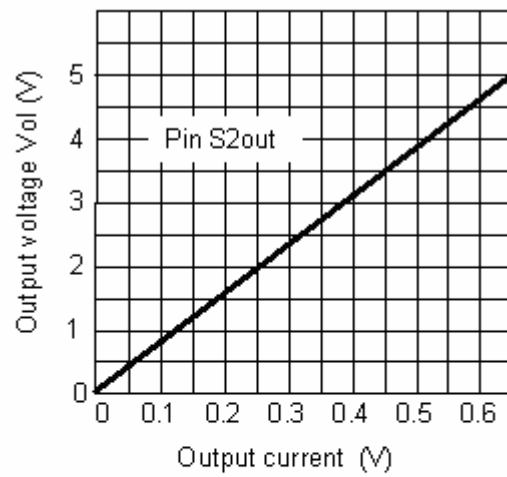
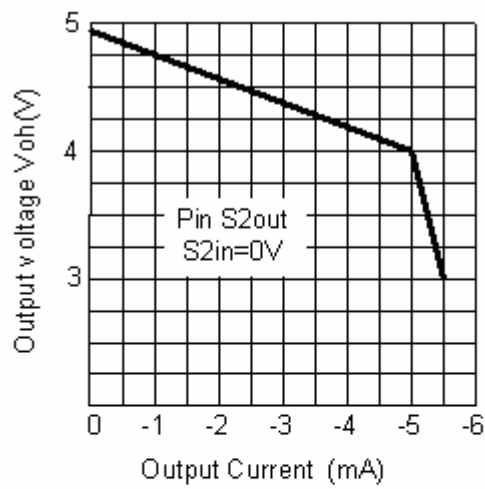
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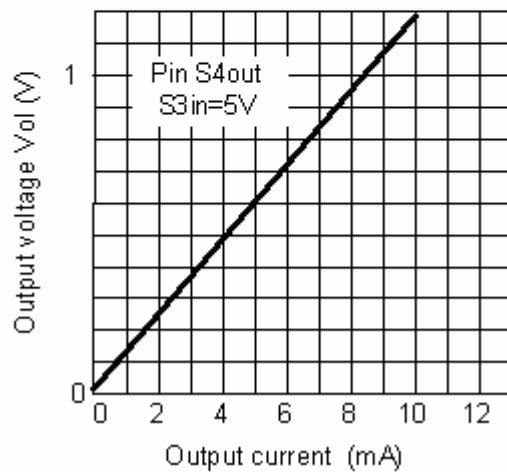
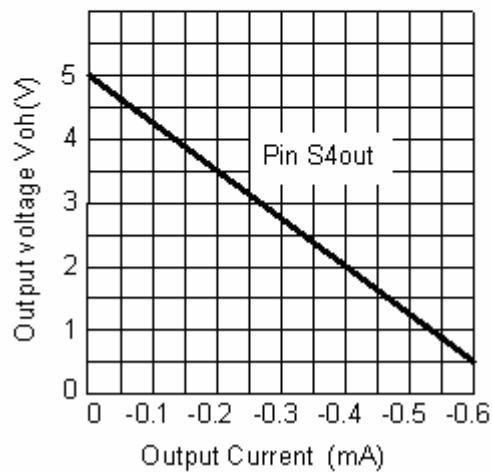
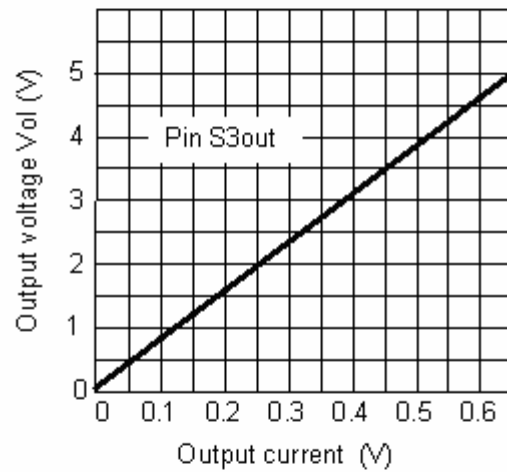
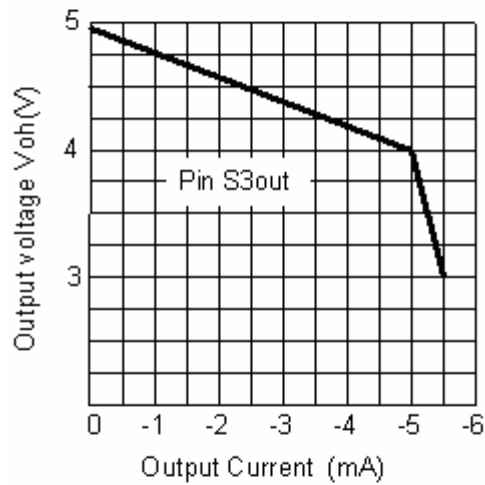
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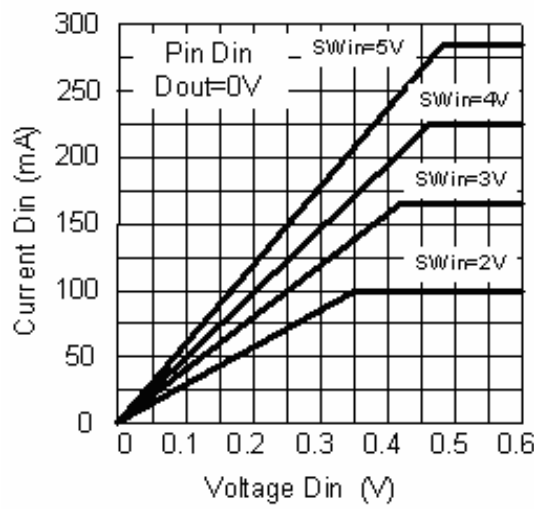






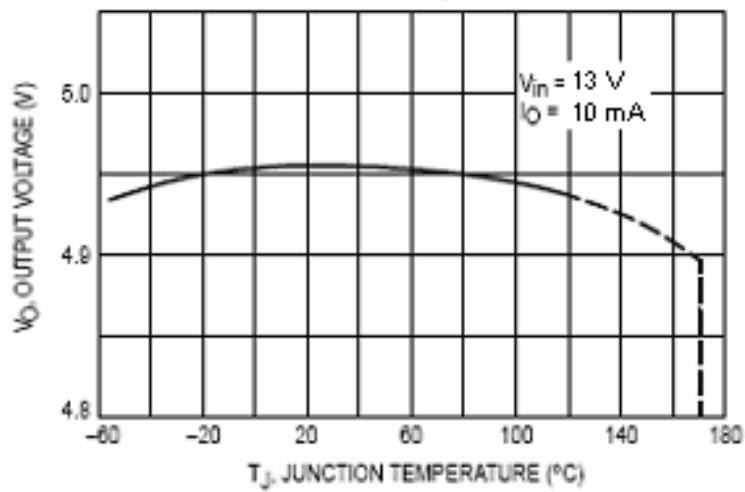
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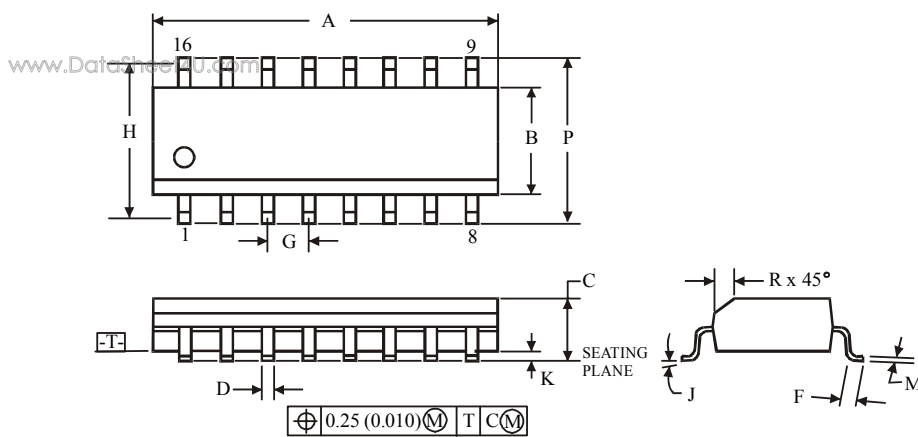
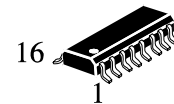
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**Output Voltage as a Function of Junction Temperature**



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.