

Low Drop Regulator with Signal Interface Logic Circuit for Automotive

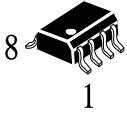
IK1101

Description

The IC is linear voltage regulator 5V with low dropout voltage typically 80mV at light loads and less then 400mV at full loads, with better then 4% output voltage accuracy. In additional IC have logical blokes for additional functions.

Feature

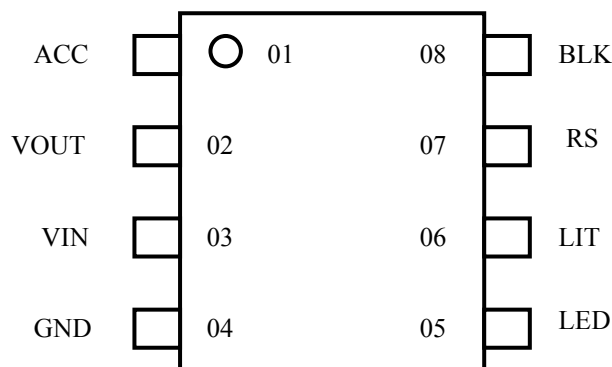
- Voltage regulator 5V with 4% output voltage accuracy
- Low dropout voltage 0.4V Max
- Load current 150mA Max
- Logical blokes for internal back light control
- Over Voltage & Over Temperature Protection
- Short Current Protection
- 60V Load Dump Protection
- Satisfied with AEC-Q100 Standard



ORDERING INFORMATION
IK1101 8SOP

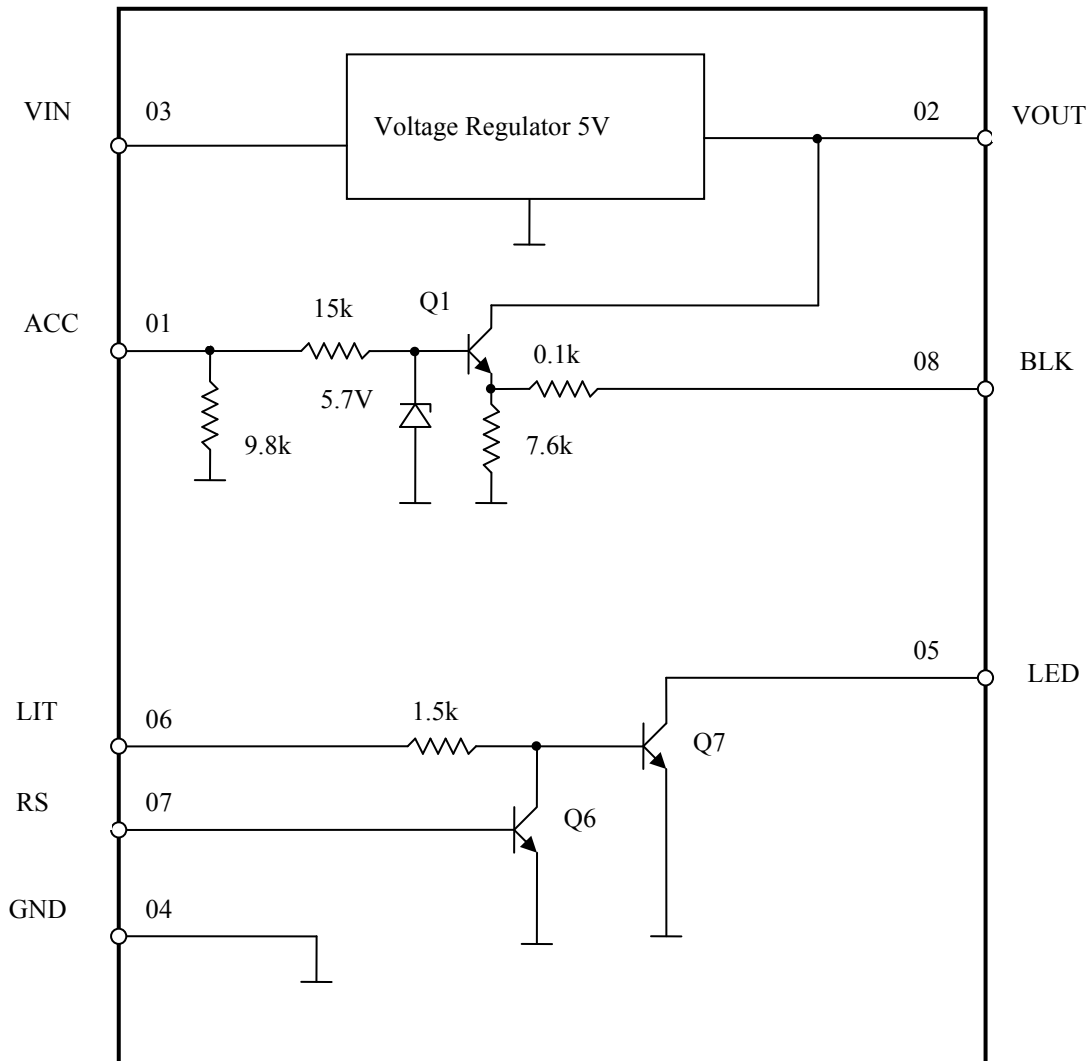
T_A = -40° to 125°C for package

Pin Description



PIN	NAME	FUNCTION
01	ACC	Input ACC
02	VOUT	Output regulator voltage 5 V and power supply logic block
03	VIN	Input voltage
04	GND	Ground
05	LED	Output LED
06	LIT	Input LIT
07	RS	Input RS
08	BLK	Output BLK

Functional Diagram



MAXIMUM RATINGS (Ta=25°C)

Symbol	Characteristics	Rating	Units
Vin	Operating Input Voltage	29	V
Iout	Output Current	150	mA
ACC	Input Voltage	-3.0 24	V
LIT	Input Voltage	5	V
RS	Input Current	5	mA
LED	Output Voltage	24	V
Ta	Operating Temperature	from -40 to 85	°C
Pd	Power Dissipation	500	mW
Tj	Junction Temperature	150	°C

DC ELECTRICAL CHARACTERISTICS(Unless otherwise specified $V_{in}=14V$, $I_{out}=10mA$, $C_{out}=47\mu F$, $T_j=25^{\circ}C$)

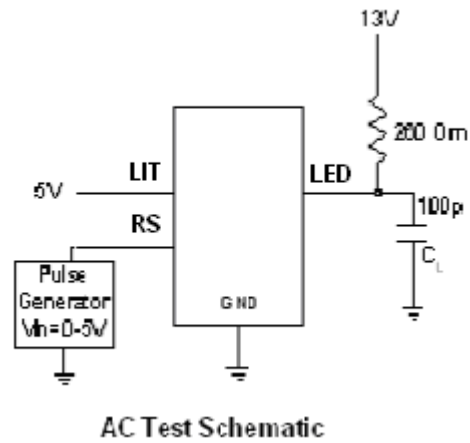
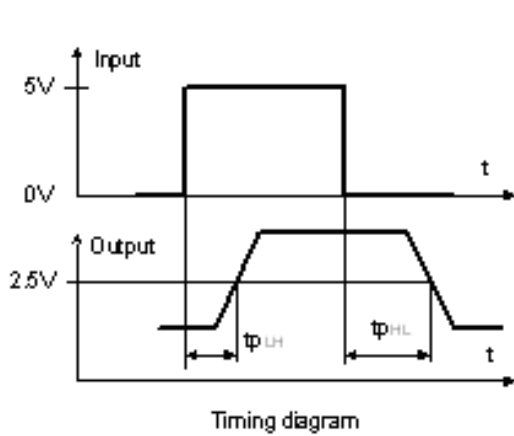
Parameter	Symbol	Conditions	Min	Type	Max	Units
Voltage regulator						
Output Voltage	V_{out}	$5.35V \leq V_{in} \leq 26V$ $10mA \leq I_{out} \leq 100mA$	4.8	5.0	5.2	V
Voltage Regulation	Reg-Line	$5.35V \leq V_{in} \leq 26V$			15	mV
Load Regulation	Reg-Load	$10mA \leq I_{out} \leq 100mA$			100	mV
Dropout Voltage	V_d	$I_{out} = 50mA$ $I_{out} = 100mA$			0.2 0.4	V
Quiescent Current	I_q	ACC, LIT, RS, LED, BLK – open $I_{out} = 0 A$			1.0	mA
Logic blokes						
High Level Output Voltage BLK	V_{OH}	ACC=2 ~ 5V, $I_{load} = - 0.5mA$	V_{CC} - 1.2V			V
Low Level Output Voltage BLK	V_{OL}	ACC=0.2V, $I_{load}=0.1mA$			1.5	V
Input Current	I_{in}	ACC=5V			1.0	mA
LIT		LIT=5V, RS=0.1 mA			4.0	mA
Input Leakage Current LED	$I_{leakage}$	LIT=5V, RS=0.1 mA LED=24V			10	μA
Saturation Voltage	LED	LIT=5V				V
		$I_{load} = 50mA$			0.5	
		$I_{load} = 100mA$			0.7	

AC ELECTRICAL CHARACTERISTICS

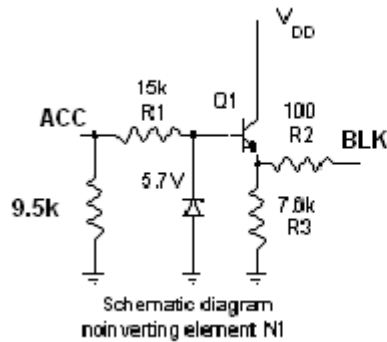
(Unless otherwise specified $V_{in}=13V$, $I_{out}=10mA$, $C_{out}=47\mu F$, $T_j=25^\circ C$)

Parameter	Sumbol	Conditions	Min	Typ	Max	Units
Propagation delay from ACC in to BLK	t_{pLH}	$C_L = 100pF$		65		ns
	t_{pHL}			400		
Propagation delay (*1) from RS to LED	t_{pLH}	$LIT = 5V$		50		ns
	t_{pHL}			$R_L=260\text{ Om}$, $C_L=100pF$		

*1-See circuit in AC Test Schematic

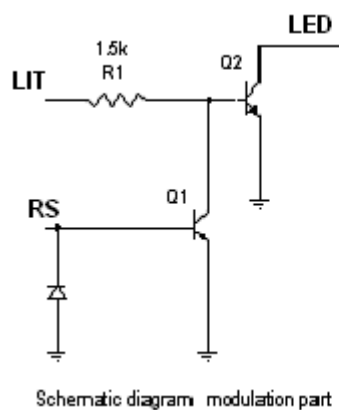


Logical bloks



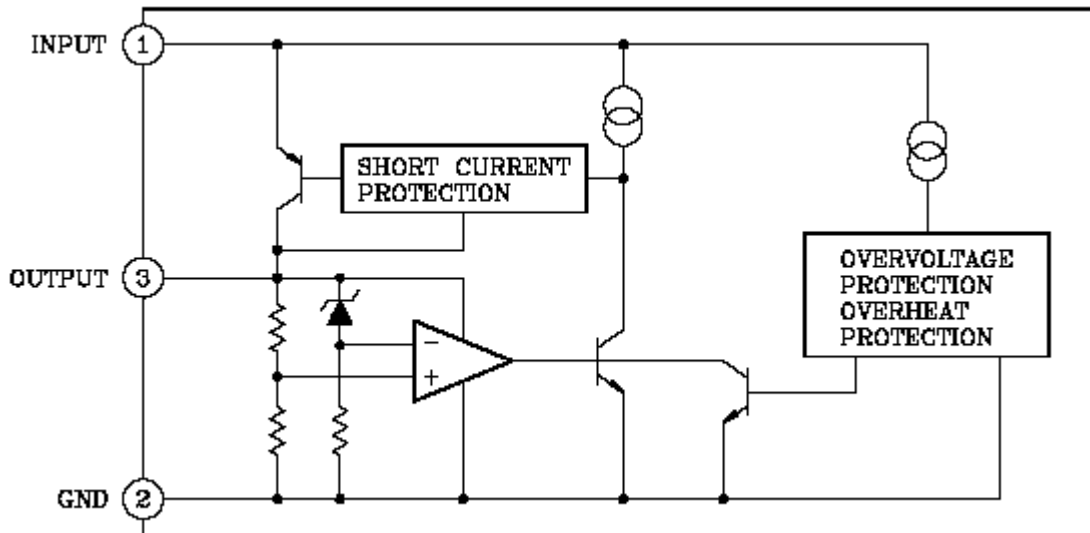
Functional table

Input S _{fin}	Output S _{1out}
H	H
L	L
Open	L



Functional table

Input RS in	Input S _{WIn}	Output D _{in}
H	H	H
L	H	L
H	L	H
L	L	H
Open	H	L
Open	L	H

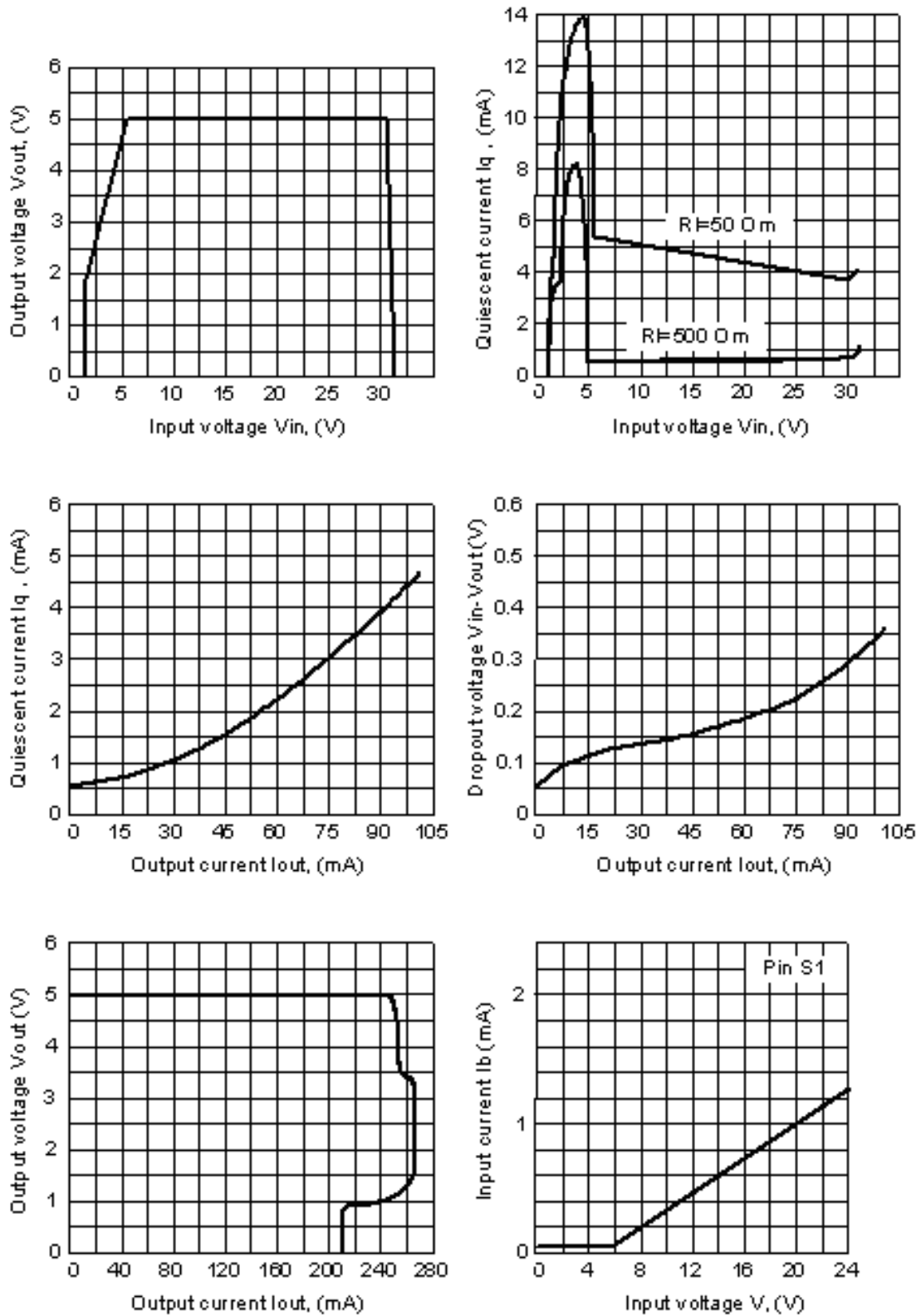


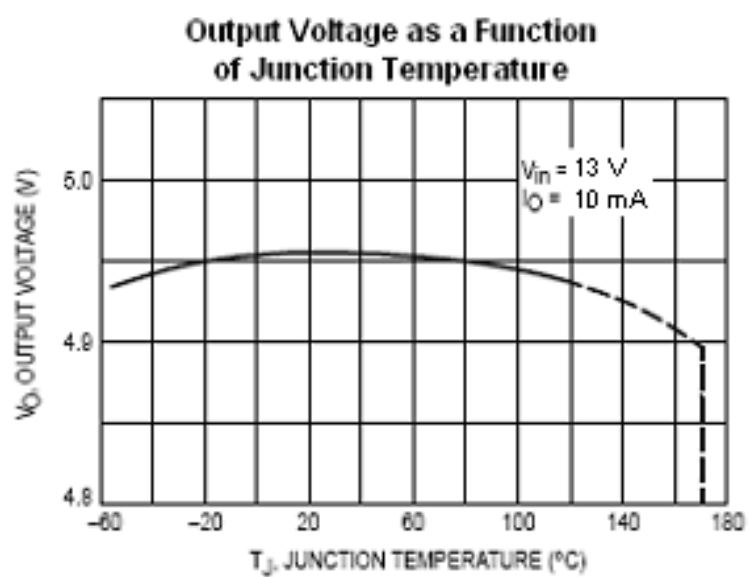
Voltage Regulator Schematic

Dimensioning Information on External Components

The input capacitor C_i is necessary for compensating line influences. The output capacitor C_o is necessary for the stability of the regulating circuit. Stability is guaranteed at values $C_o \geq 10\mu\text{F}$ and an $\text{ESR} \leq 10\Omega$ within the operating temperature range.

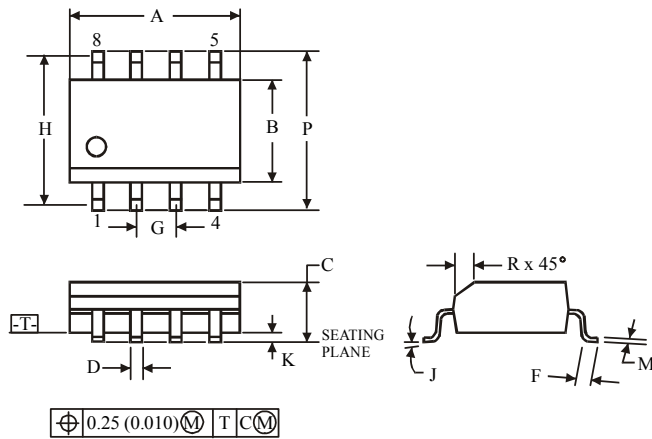
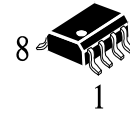
Typical characteristics





PKG DIMENSION

D SUFFIX SOIC
(MS - 012AA)



Symbol	Dimension, mm	
	MIN	MAX
A	4.80	5.00
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.