DESCRIPTION

A6141 series is a group of positive voltage output, low power consumption, low dropout voltage regulator. It can provide 150mA output current when input / output voltage differential drops to 400mV (V_{OUT}= 5V), and it also provides foldback short-circuit protection, thermal protection and output current limit function. The very low power consumption of A6141 (Iq=2.5uA) can greatly improve natural life of batteries.

A6141 can provide output value in the range of 1.2V~5.0V in 0.1V steps. It also can customize on command.

A6141 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

A6141 has well load transient response and good temperature characteristic. A6141 uses trimming technique to guarantee output voltage accuracy within±2%.

The A6141 is available in SOT89-3 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT89-3 SPQ: 1,000pcs/Reel	K3	A6141K3R-XXZ
		A6141K3VR-XXZ
Note	XX: Output Voltage 12=1.2V, 50=5.0V Z: Pin Type A: Type A B: Type B V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

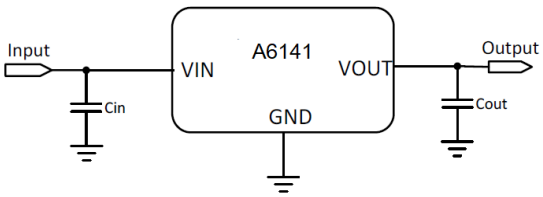
FEATURES

- Low Power Consumption: 2.5uA(Typ.)
- Maximum Output Current: 150mA
- Small Dropout Voltage
  400mV@100mA (V_{OUT}=5V)
- Input Voltage Range: 3V~40V
- Output Voltage Range: 1.2V~5.0V
  (V_{OUT}>5V customized)
- Highly Accurate:±2%(±1% customized)
- Output Current Limit: 180mA
- Available in SOT89-3 package

APPLICATION

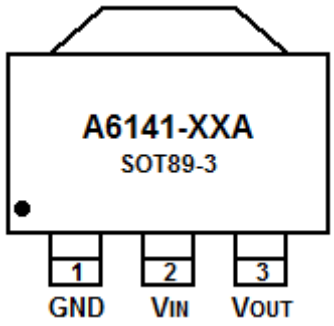
- Battery Powered equipment
- Power Management of MP3、PDA、DSC、Mouse、PS2 Games
- Reference Voltage Source Regulation after Switching Power

TYPICAL APPLICATION

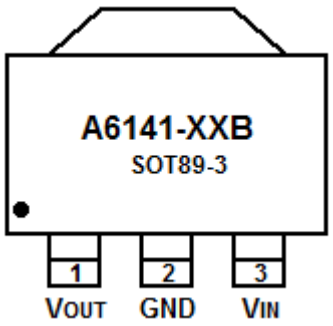


NOTE: Input capacitor (C_{IN}=1uF) and Output capacitor (C_{OUT}=1uF) are recommended in all application circuit. Ceramic capacitor is recommended.

PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	Function
SOT89-3-A	SOT89-3-B		
1	2	GND	Ground Pin
2	3	V_{IN}	Supply Voltage Input
3	1	V_{OUT}	Output Voltage

ABSOLUTE MAXIMUM RATINGS

Max Input Voltage		50V
T_J, Operating Junction Temperature		125°C
T_A, Ambient Temperature		-40°C ~85°C
Power Dissipation (P_D@T_A=25°C)	SOT89-3	500mW
T_S, Storage Temperature		-40°C ~150°C
Lead Temperature & Time		260°C,10s

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED WORK CONDITIONS

Parameter	Min	Recommended	Max.	Unit
Input Voltage Range	3	-	40	V
Ambient Temperature	-40	-	85	°C

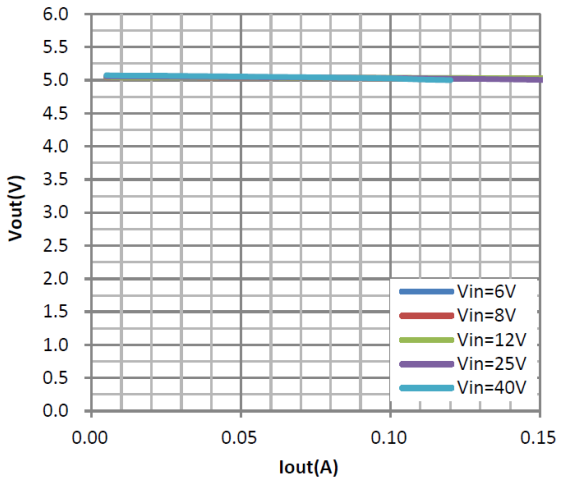
ELECTRICAL CHARACTERISTICS

Test Conditions: C_{IN}=1uF, C_{OUT}=1uF, T_A=25℃, unless Otherwise Specified

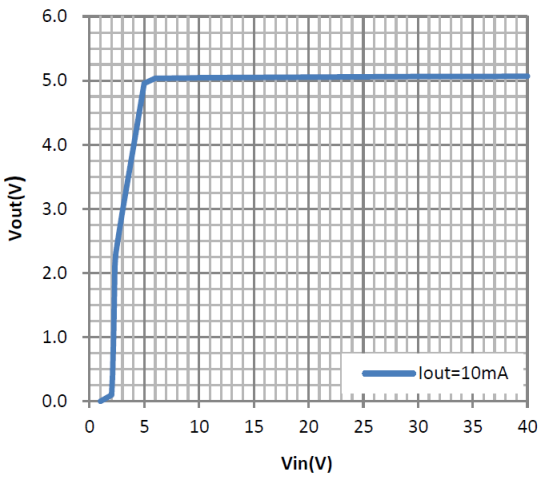
Parameter	Symbol	Conditions		Min	Typ.	Max	Unit
Input Voltage	V_{IN}			3	-	40	V
Output Voltage	V_{OUT}	V_{IN}-V_{OUT}=1V 1mA≤I_{OUT}≤30mA	V_{OUT}>1.5V	V_{OUT} x0.98	V_{OUT}	V_{OUT} X1.02	V
			V_{OUT}≤1.5V	V_{OUT} -0.03		V_{OUT} +0.03	
Maximum Output Current	I_{OUT} (Max.)	V_{IN}-V_{OUT}=1V		150	-	-	mA
Input-Output Voltage Differential	Dropout Voltage	I_{OUT}=100mA, V_{OUT} = 5V		-	400	-	mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT}=10mA, 4V≤V_{IN}≤40V		-	0.2	0.3	%/V
Load Regulation	ΔV_{OUT}	V_{IN}=Set V_{OUT}+1V 1mA≤I_{OUT}≤100mA		-	20	40	mV
Quiescent Current	Iq	V_{IN}=Set V_{OUT}+1V		-	2.5	5	μA
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT}=10mA		-	±100	-	ppm/℃
Thermal Shutdown				-	130	-	℃

TYPICAL PERFORMANCE CHARACTERISTIC

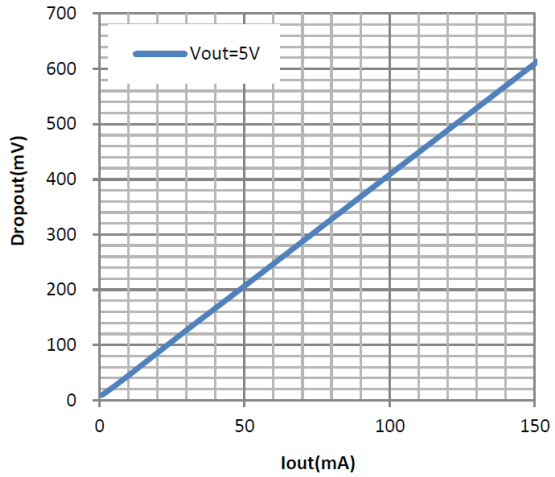
1. Load Regulation



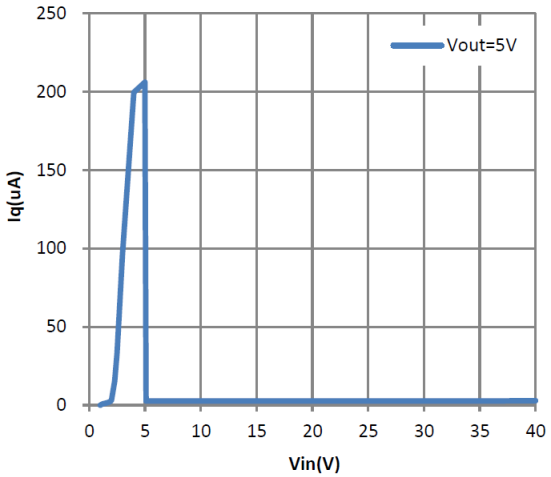
2. Line Regulation



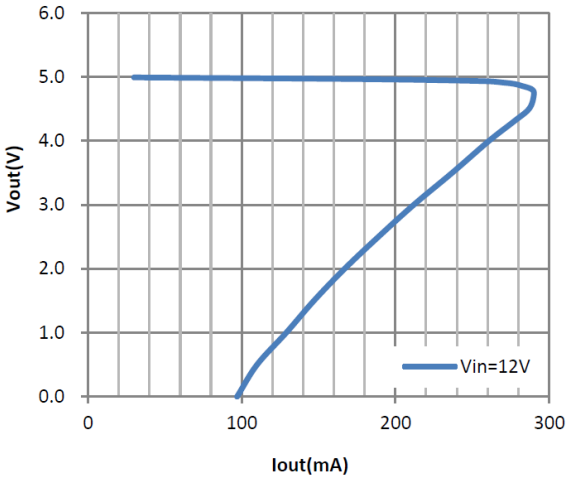
3. Dropout



4. Iq



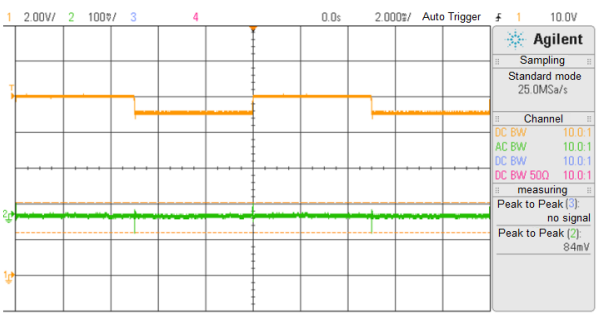
5. Current Limit



6. Line transient response

V_{IN}=6V~7V, I_{OUT}=10mA

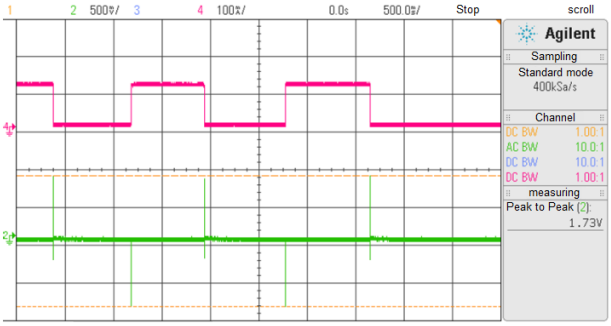
Ch1—V_{IN}, Ch2—V_{OUT}



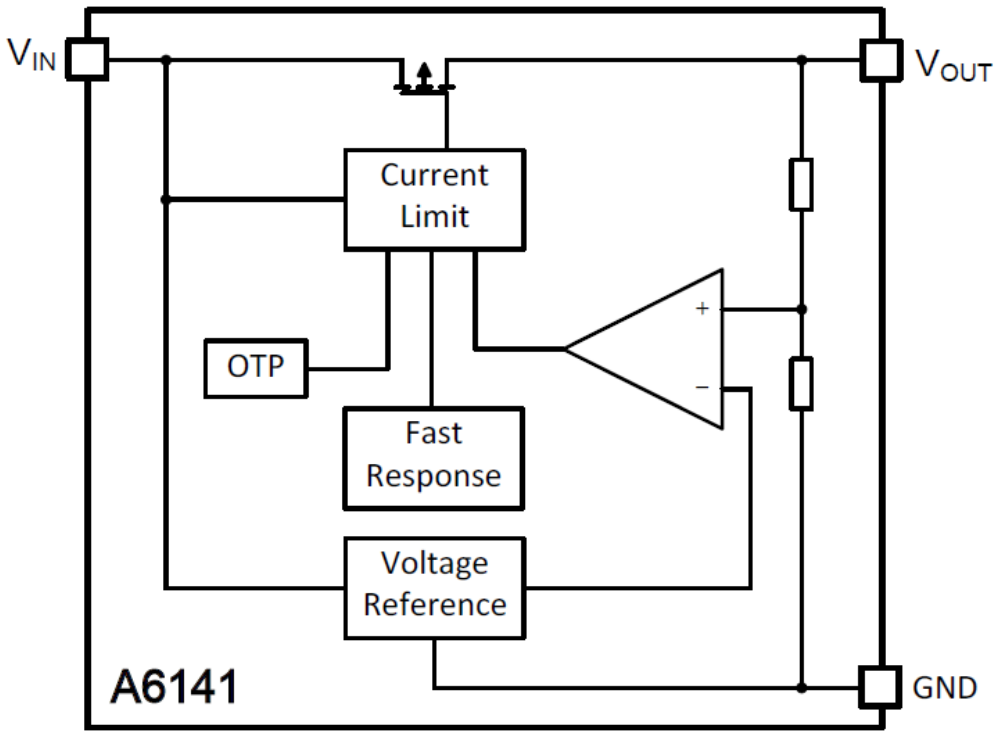
7. Load transient response

V_{IN}=12V, I_{OUT}=10mA~100mA

Ch2—V_{OUT}, Ch4—I_{OUT}



BLOCK DIAGRAM



EXPLANATION

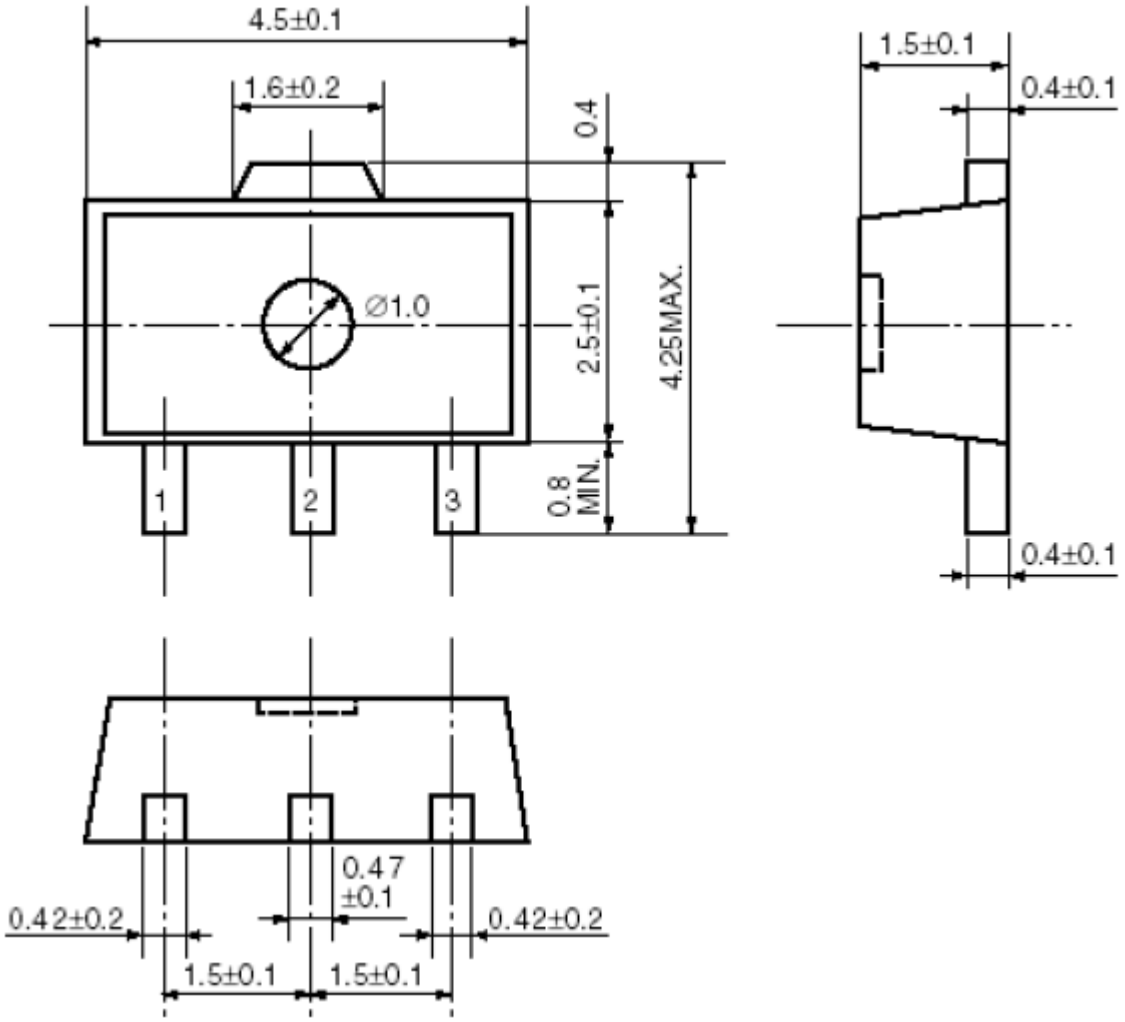
A6141 is a series of low dropout voltage and low power consumption regulator. Its application circuit is very simple, which only needs two outside capacitors. It is composed of these modules: high accuracy voltage reference, current limit circuit, error amplifier, output driver and power transistor.

Current Limit module can keep chip and power system away from danger when load current is more than 180mA.

A6141 uses trimming technique to assure the accuracy of output value within±2%, at the same time, temperature compensation is elaborately considered in this chip, which makes A6141's temperature coefficient within ±100ppm/℃。

PACKAGE INFORMATION

Dimension in SOT89-3 (Unit: mm)



IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or server property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.