

**4-Channel Current Limited Load Switch**

**General Description**

The AAT4644 is a four-channel resettable fuse. It utilizes independent current-limited and thermally-protected P-channel MOSFETs to protect against short circuits. Current limit is factory programmed at 1A. Additional protection is provided with under-voltage lockout. The switches are turned off when the input voltage drops below a preset level. The quiescent supply current is typically 20µA. The AAT4644 is a flexible solution, allowing system designers to gang outputs together for lower  $R_{DS(ON)}$  and higher current limit.

The AAT4644 is available in a Pb-free, 8-pin TSSOP or SOP package and is specified over the -40°C to +85°C temperature range.

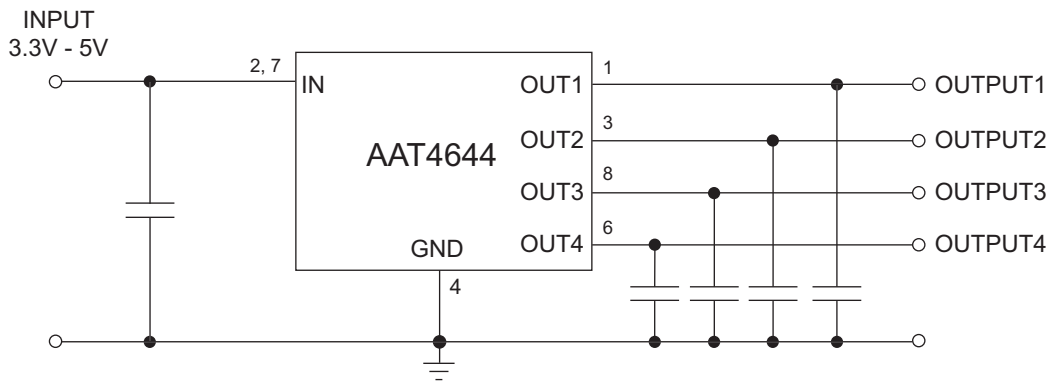
**Features**

- 500mA per Channel Steady State
- 4 x 1A Current Limit Trip Point
- Over-Temperature Protection
- Fast Transient Response:
  - 1µs (Typ) Response to Short Circuit
- 100mΩ Typical  $R_{DS(ON)}$
- Under-Voltage Lockout
- Temperature Range: -40°C to +85°C
- 8-Pin TSSOP or SOP Package

**Applications**

- Desktop PCs
- Peripheral Ports
- USB Ports

**Typical Application**



# AAT4644

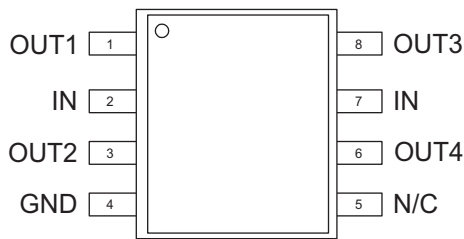
## 4-Channel Current Limited Load Switch

### Pin Descriptions

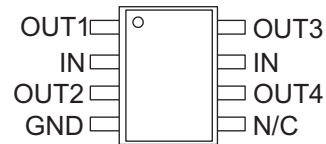
Pin #	Symbol	Function
1	OUT1	Channel 1 output.
2, 7	IN	These pins are the input supply to the circuit.
3	OUT2	Channel 2 output.
4	GND	Ground connection.
5	N/C	Not internally connected.
6	OUT4	Channel 4 output.
8	OUT3	Channel 3 output.

### Pin Configuration

SOP-8  
(Top View)



TSSOP-8  
(Top View)



**4-Channel Current Limited Load Switch****Absolute Maximum Ratings<sup>1</sup>**

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

Symbol	Description	Value	Units
$V_{IN}$	IN to GND	-0.3 to 6	V
$V_{OUT}$	OUT to GND	-0.3 to 6	V
$I_{OUT}$	Output Current	Internally Limited	A
$T_J$	Operating Junction Temperature Range	-40 to 85	$^\circ\text{C}$
$V_{ESD}$	ESD Rating <sup>2</sup> —HBM	4000	V
$T_{LEAD}$	Maximum Soldering Temperature (at Leads)	300	$^\circ\text{C}$

**Thermal Characteristics<sup>3</sup>**

Symbol	Description	Value	Units
$\Theta_{JA}$	Maximum Thermal Resistance	100	$^\circ\text{C}/\text{W}$
$P_D$	Maximum Power Dissipation	1.25	W

1. Stresses above those listed in Absolute Maximum Ratings may cause permanent damage to the device. Functional operation at conditions other than the operating conditions specified is not implied. Only one Absolute Maximum Rating should be applied at any one time.

2. Human body model is a 100pF capacitor discharged through a 1.5k $\Omega$  resistor into each pin.

3. Mounted on a demo board.

**4-Channel Current Limited Load Switch****Electrical Characteristics**

$V_{IN} = 5V$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless otherwise noted. Typical values are at  $T_A = 25^{\circ}C$ ; bold values designate full temperature range.

Symbol	Description	Conditions	Min	Typ	Max	Units
$V_{IN}$	Operation Voltage		2.7		5.5	V
$I_Q$	Quiescent Current	$V_{IN} = 5V, I_{OUT} = 0$		20	<b>40</b>	$\mu A$
$V_{UVLO}$	Under-Voltage Lockout	Rising Edge		1.75		V
$V_{UVLO(HYS)}$	Under-Voltage Lockout Hysteresis			0.3		V
$R_{DS(ON)}$	On Resistance	$V_{IN} = 5.0V, T_A = 25^{\circ}C$		100	125	$m\Omega$
$I_{LIM}$	Current Limit	Each Output OUT < IN to 1V	<b>0.6</b>	1.0	<b>1.5</b>	A
$t_{RESP}$	Current Loop Response	$V_{IN} = 5V$		1		$\mu s$
$T_{SD}$	Over-Temperature Threshold			125		$^{\circ}C$

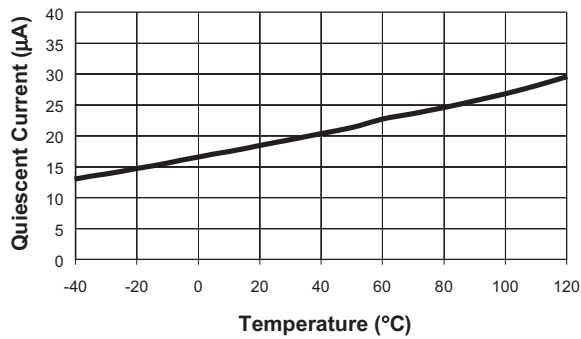
# AAT4644

## 4-Channel Current Limited Load Switch

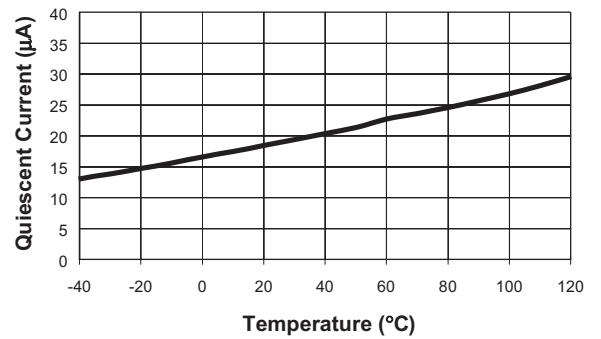
### Typical Characteristics

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

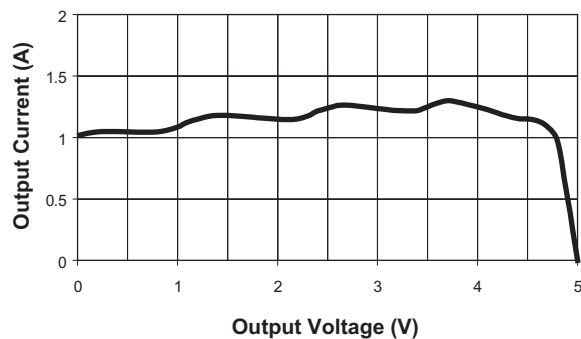
Quiescent Current vs. Temperature



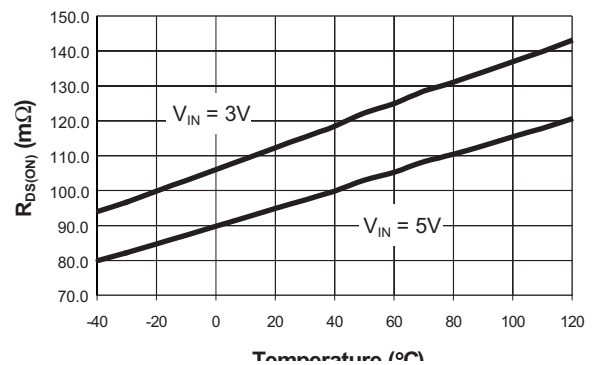
Quiescent Current vs. Temperature



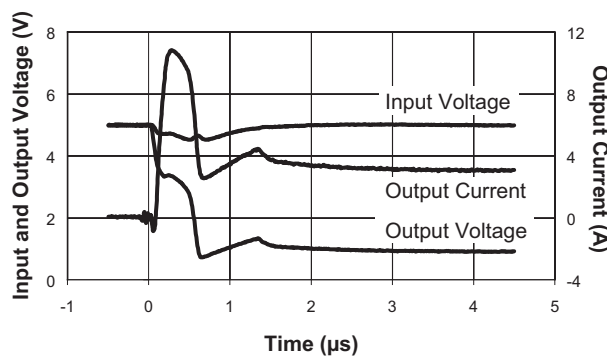
Current Limit



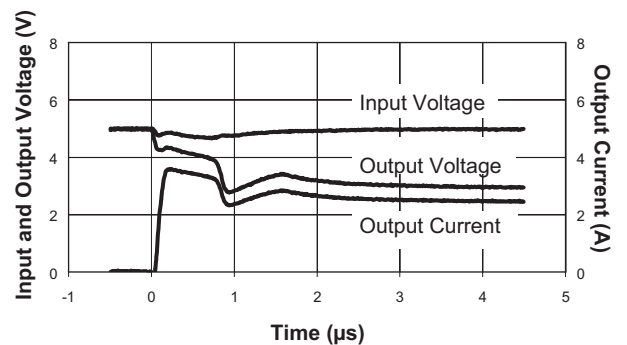
$R_{DS(ON)}$  vs. Temperature



Short Circuit Through 0.3Ω



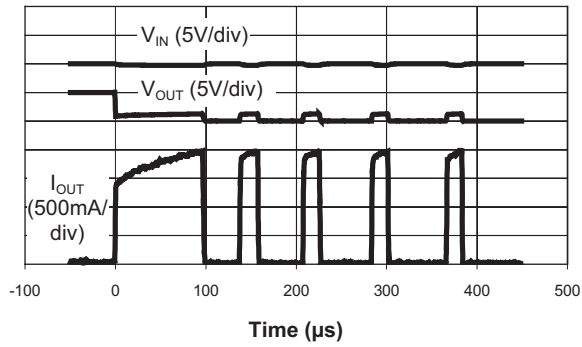
Short Circuit Through 0.6Ω



### Typical Characteristics

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

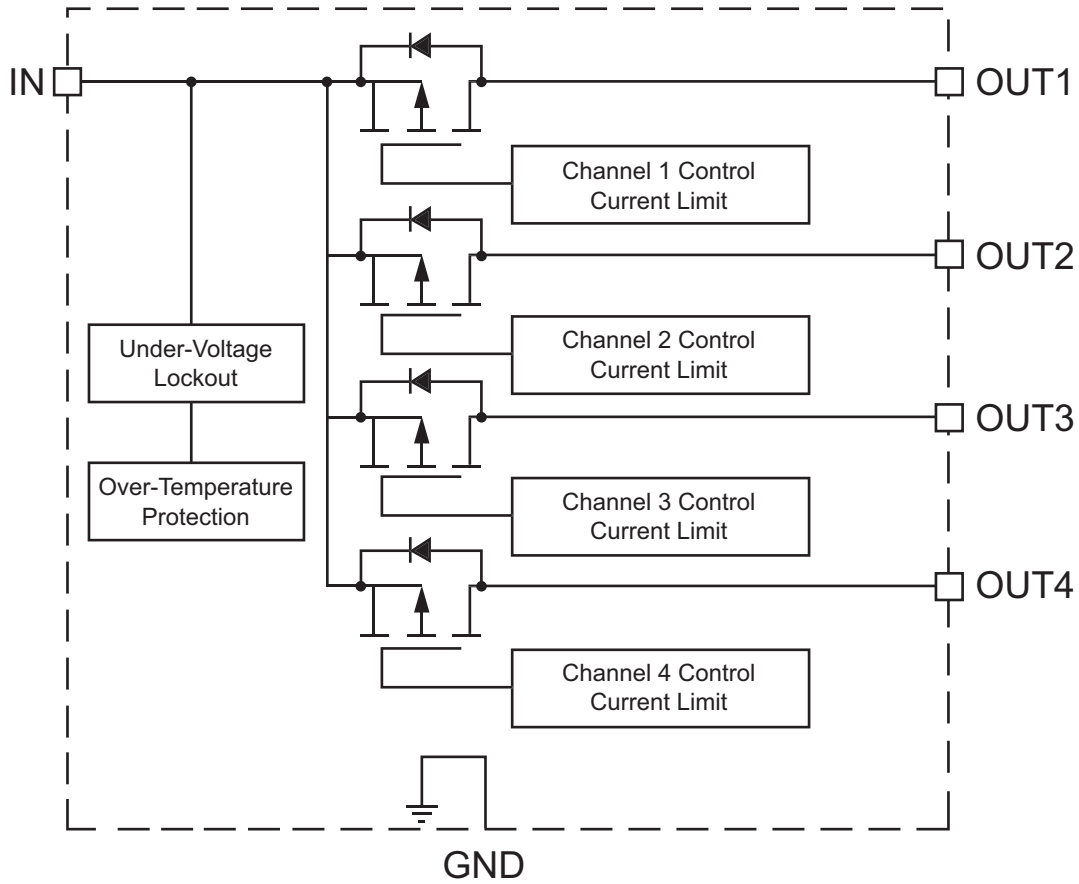
**Thermal Shutdown Response**  
(0.3Ω Load)



# AAT4644

## 4-Channel Current Limited Load Switch

### Functional Block Diagram



# AAT4644

## 4-Channel Current Limited Load Switch

### Ordering Information

Package	Marking	Part Number (Tape and Reel) <sup>1</sup>
SOP-8	4644	AAT4644IAS-T1
TSSOP-8	4644	AAT4644IHS-T1

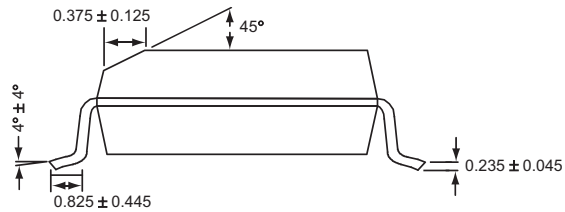
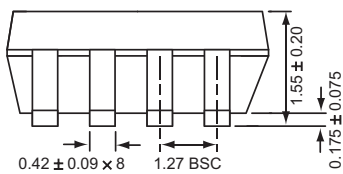
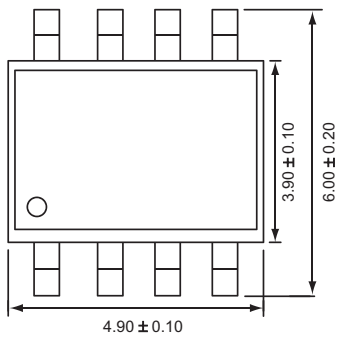


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For additional information, refer to *Skyworks Definition of Green™*, document number SQ04-0074.

### Package Information

#### SOP-8



All dimensions in millimeters.

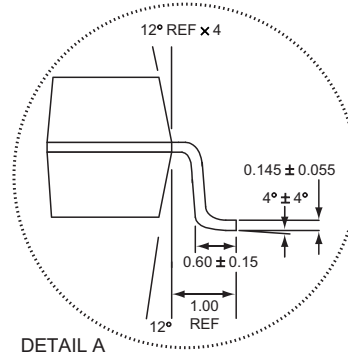
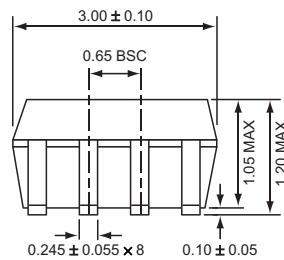
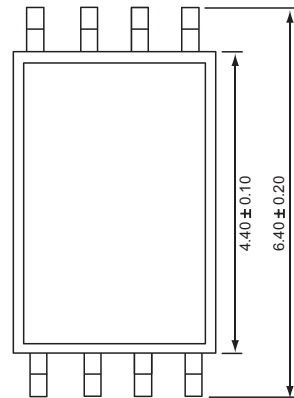
1. Sample stock is generally held on part numbers listed in **BOLD**.



# AAT4644

## 4-Channel Current Limited Load Switch

### TSSOP-8



DETAIL A

All dimensions in millimeters.

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