

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.

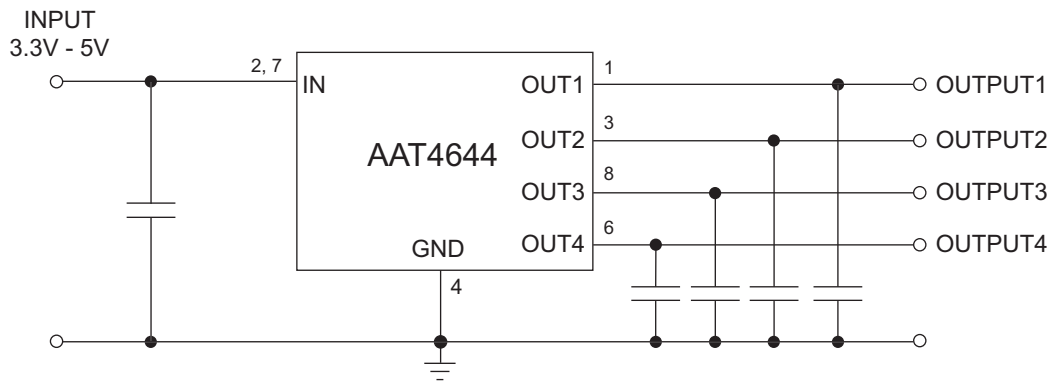
Features

- 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

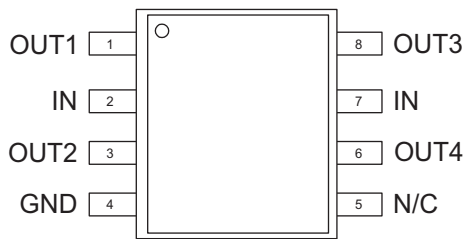
4-Channel Current Limited Load Switch

Pin Descriptions

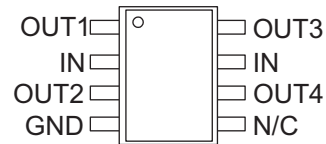
Pin #	Symbol	Function
1	OUT1	Channel 1 output.
2, 7	IN	These pins are the input supply to the circuit.
3	OUT2	Channel 2 output.
4	GND	Ground connection.
5	N/C	Not internally connected.
6	OUT4	Channel 4 output.
8	OUT3	Channel 3 output.

Pin Configuration

**SOP-8
(Top View)**



**TSSOP-8
(Top View)**



4-Channel Current Limited Load Switch**Absolute Maximum Ratings¹**

$T_A = 25^\circ\text{C}$, 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 ² —HBM	4000	V
T_{LEAD}	Maximum Soldering Temperature (at Leads)	300	$^\circ\text{C}$

Thermal Characteristics³

Symbol	Description	Value	Units
Θ_{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 Ω 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	40	μA
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	0.6	1.0	1.5	A
t_{RESP}	Current Loop Response	$V_{IN} = 5V$		1		μs
T_{SD}	Over-Temperature Threshold			125		$^{\circ}C$

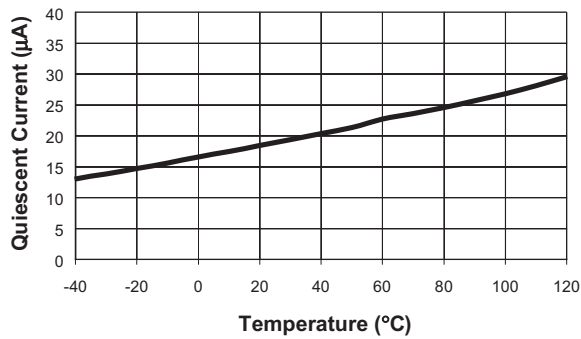
AAT4644

4-Channel Current Limited Load Switch

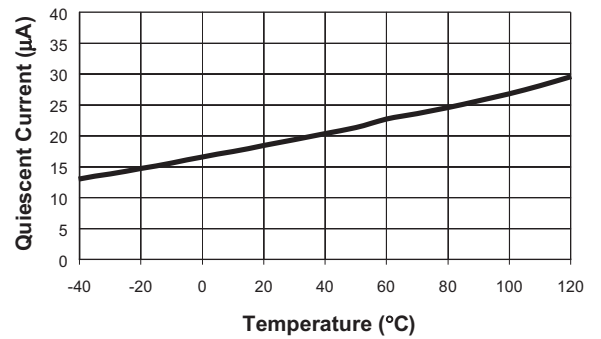
Typical Characteristics

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

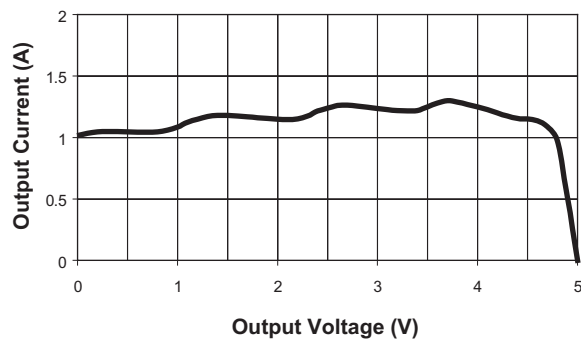
Quiescent Current vs. Temperature



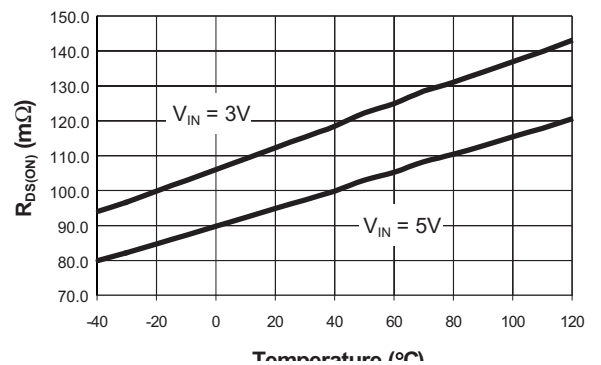
Quiescent Current vs. Temperature



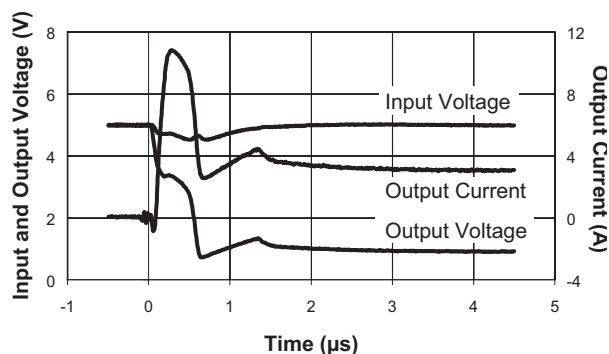
Current Limit



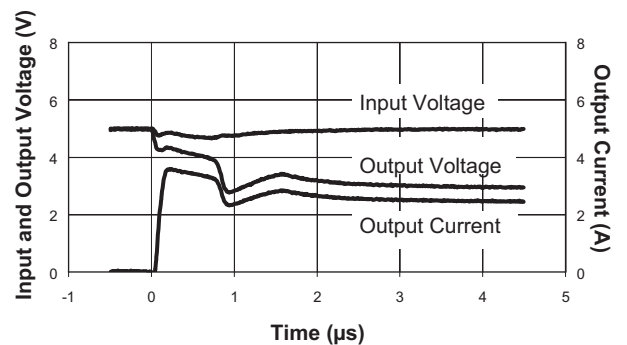
$R_{DS(ON)}$ vs. Temperature



Short Circuit Through 0.3Ω



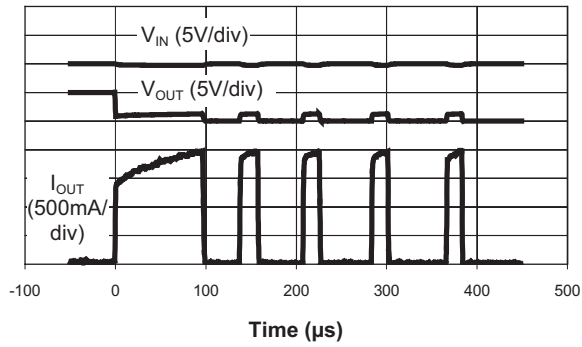
Short Circuit Through 0.6Ω



Typical Characteristics

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

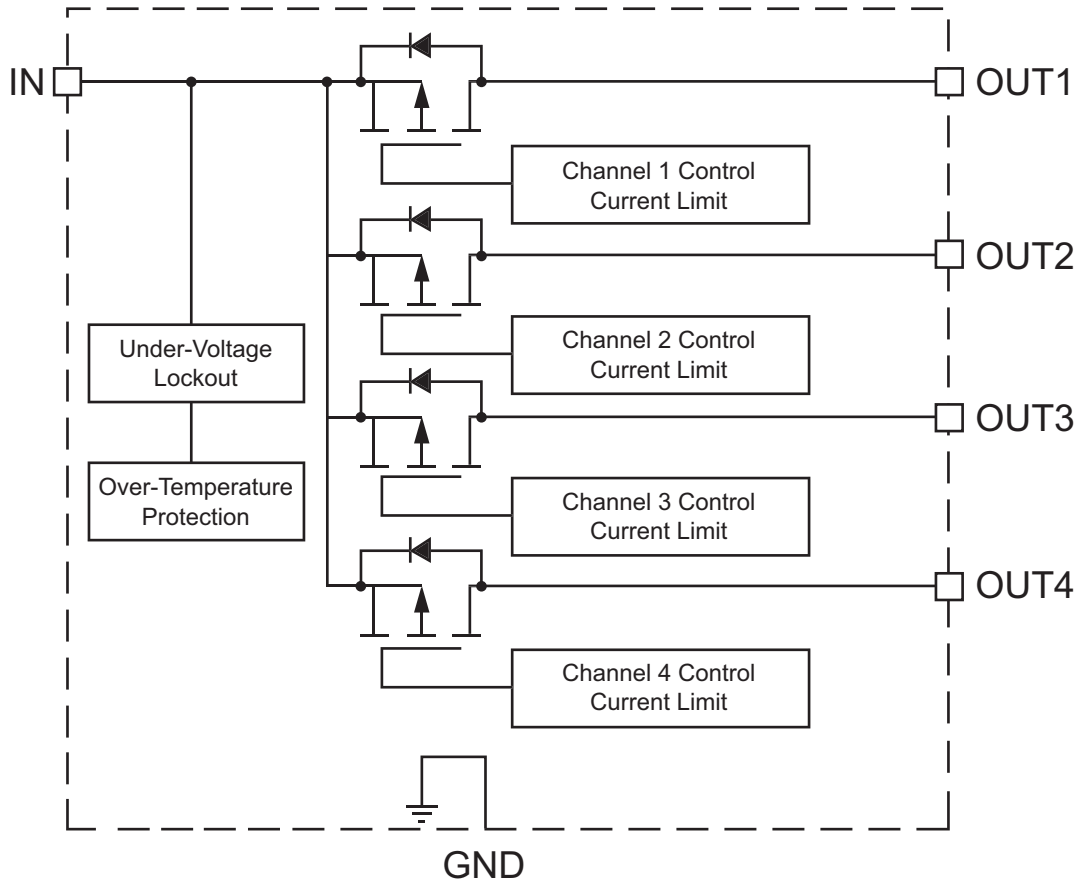
Thermal Shutdown Response
(0.3Ω Load)



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) ¹
SOP-8	4644	AAT4644IAS-T1
TSSOP-8	4644	AAT4644IHS-T1



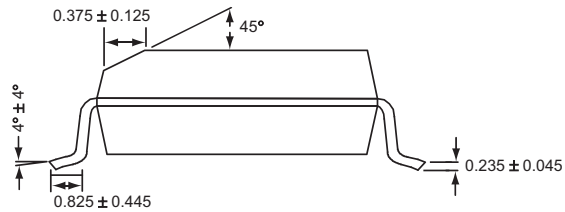
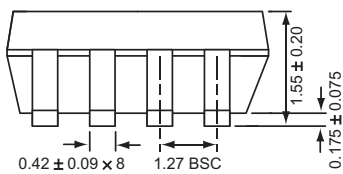
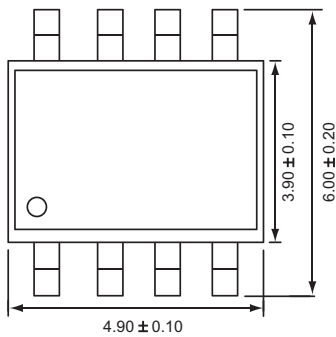
Skyworks Green™ products are compliant with all applicable legislation and are halogen-free.



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

Package Information

SOP-8



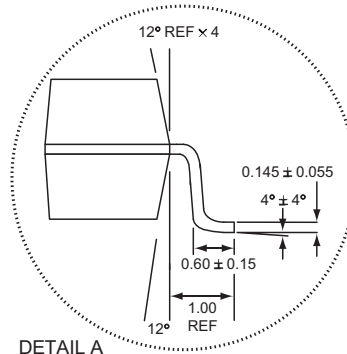
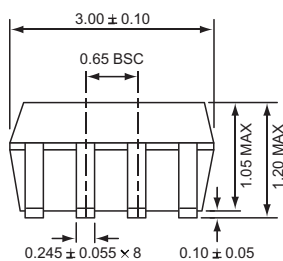
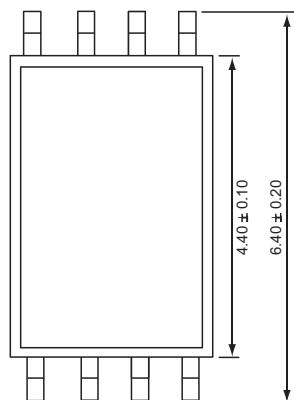
All dimensions in millimeters.

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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