

# RS31312 4.5V to 16V, 15A eFuse with Hot Swap Protection and Current Monitoring

## Features

- Wide input voltage range: 4.5V to 16V
- Integrated 2.7mΩ Pass MOSFET
- Adjustable current limit
- Adjustable hog-plug insertion time delay and fault delay time
- Accurate current monitor
- Fast trip short-circuit protection: <200ns typical
- Adjustable output soft start time
- Configurable input over-voltage protection
- Load enable function and programmable LOADEN blanking time
- Integrated over-temperature protection
- Input to output short circuit detection
- 3x5mm QFN package
- RoHS compliant and Green

## Applications

- Server and AUX supplies
- PCI and PCIe cards
- Router and switch optical module
- Digital TV

## Description

The RS31312 is active circuit protection device with integrated MOSFET used to limit current and voltage to safe levels during fault conditions.

The current limit level can be set with a resistor between ISET and ground. Also, the device provides current monitor signal.

The device has input over voltage protection feature to protect output load in the event of input over voltage fault.

To limit the inrush current during device turn-on, the output soft start time can be set by a capacitor between SS and ground.

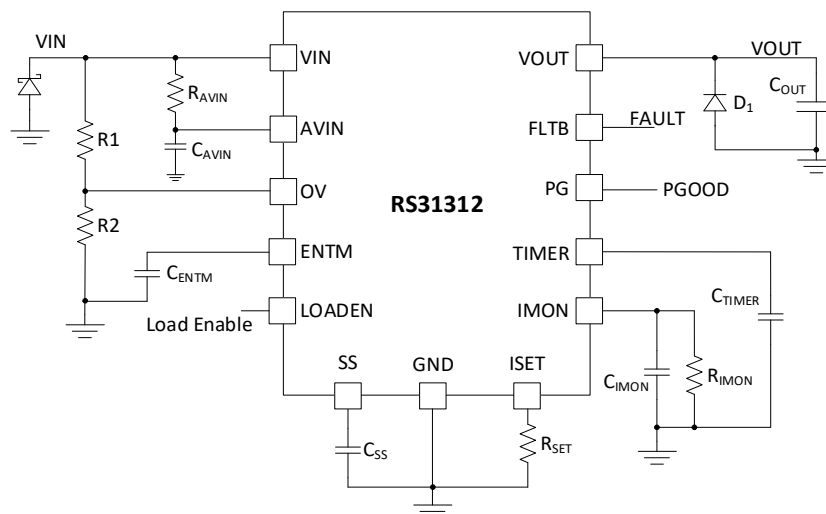
In addition, the device has adjustable fault blanking timer to avoid over-current tripping during output load transient.

The device also has load enable function and programmable LOADEN blanking time.

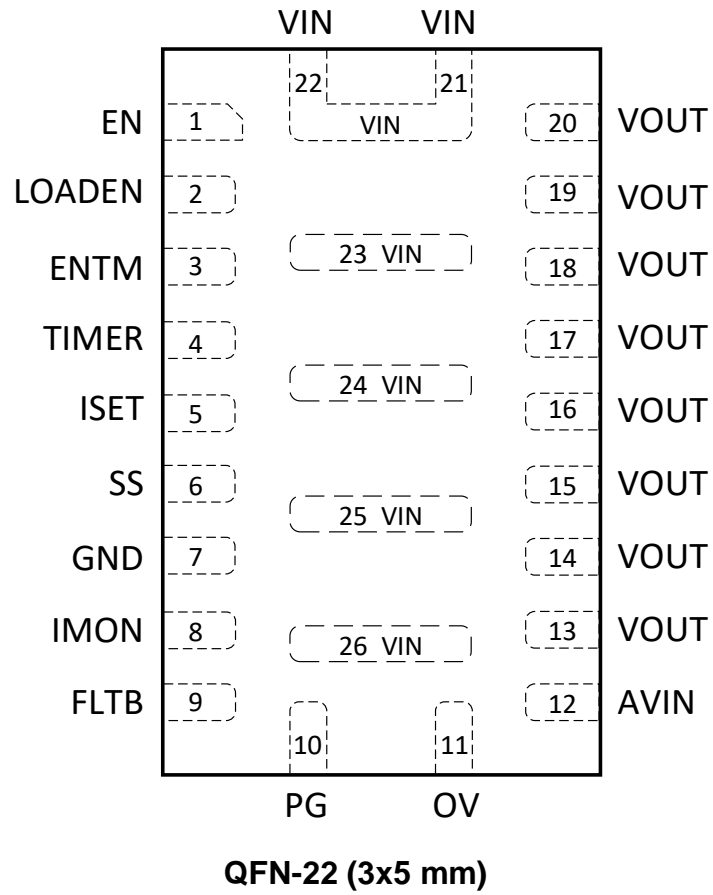
The device is available in QFN-22, 3x5 mm package.

PART NUMBER	PACKAGE	BODY SIZE
RS31312	QFN-22	3x5 mm

## Typical Application Circuit



**Package Reference  
Top View**



### Part number and Order Information

Part Number	Package	Size	MSL	Shipping Method	Package Marking
RS31312T	QFN-22	3x5 mm	Level-1	250u Tape & Reel	R31312
RS31312R	QFN-22	3x5 mm	Level-1	5000u Tape & Reel	R31312

### Top Marking

RSYYWW
PPPPPP
● LLLLLS

#### Line 1

- RS: Prefix of Reed Semiconductor (RS is replaced by RE for engineering lot)
- YY: Year code
- WW: Week code

#### Line 2

- PPPPPP: Truncated part number

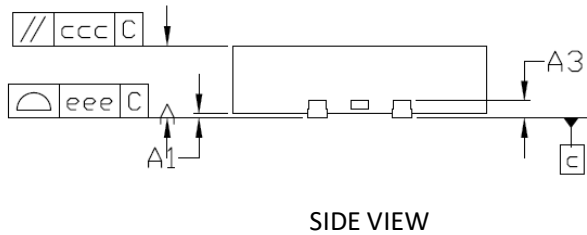
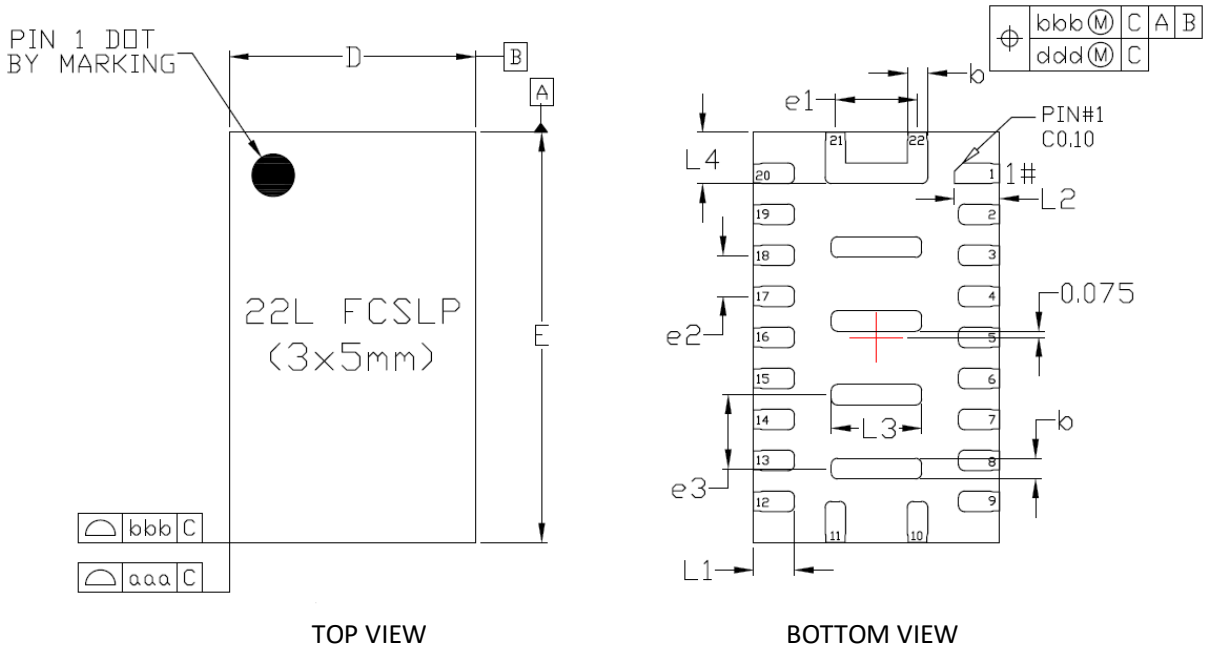
#### Line 3

- LLLLL: Lot code
- S: Assembly site code

## Pin Description

No.	NAME	TYPE	Description
1	EN	I	Enable input. Pull high to enable the device, and pull low to disable the device. EN is pulled high internally.
2	LOADEN	I	Load enable input. LOADEN is used in conjunction with EN to turn on or off the power device. During LOADEN blanking time, the power device is controlled by EN only. After LOADEN blanking time expires, LOADEN can turn off the power device, but can not turn it back on by recycling LOADEN only.
3	ENTM	I	Connect an external capacitor to set the LOADEN blanking time. During LOADEN blanking time, the power device is controlled by EN only.
4	TIMER	I	Connect an external capacitor from the pin to the ground to set the hot-plug insertion time delay and fault time-out period.
5	ISET	I	Current limit set. Place a resistor from the pin to the ground to set the over-current limit threshold.
6	SS	I	Soft start time set. Connect an external capacitor from the pin to the ground to set soft-start time of output voltage.
7	GND	G	Ground
8	IMON	O	Output current monitor. IMON provides a current source proportional to power device current. The current sense gain is 10uA/A. Place a 10kΩ resistor from the pin to the ground to set the IMON voltage from 0V to 1.5V when the current is from 0A to 15A. Place a 10nF or larger value capacitor in parallel with IMON resistor to smooth the IMON voltage.
9	FLTB	O	Fault indicator. Open drain pin, pull FLTB up to an external voltage through a 10-100kΩ resistor. The device pulls FLTB low internally when over-current or thermal shutdown occurs.
10	PG	O	Power good indicator. Open drain pin, pull PG up to an external voltage through a 10-100kΩ resistor.
11	OV	I	Over-voltage input. Pull OV high to turn off the power MOSFET. Connect the pin to an external resistor divider to set the input over-voltage threshold.
12	AVIN	I	Input power supply for VCC regulator. Connect a 49.9Ω, 0603 package resistor from VIN to AVIN and a 2.2uF bypass capacitor from AVIN to GND to guarantee full operation in the event of VIN collapses during output short.
13-20	VOUT	O	Power output. A Schottky diode should be place between VOUT and GND to clamp negative voltage spike.
21-26	VIN	I	Power input.

**PACKAGE DIMENSION**



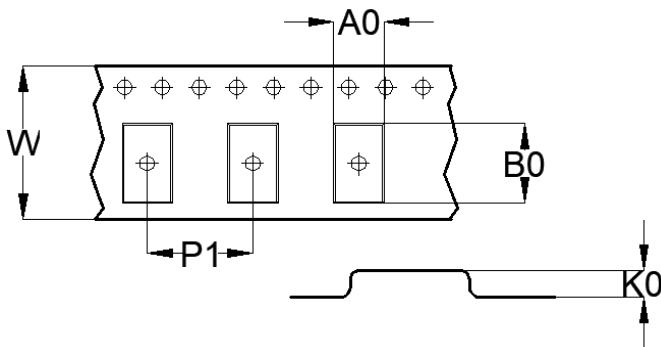
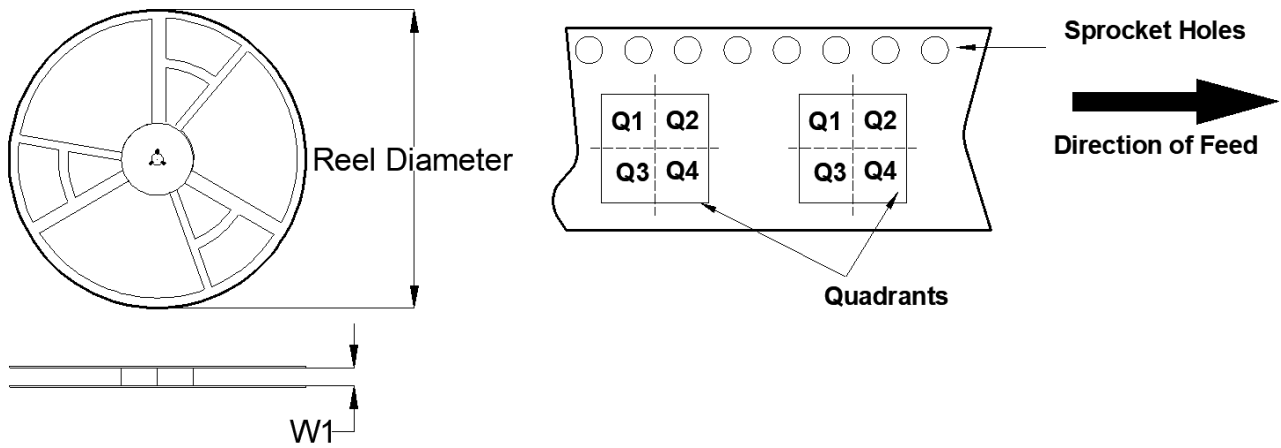
SYMBOLS	MIN	NOM	MAX
A	0.800	-	1.000
A1	-	-	0.050
A3	0.203 REF		
D	2.900	3.000	3.100
E	4.900	5.000	5.100
b	0.200	0.250	0.300
e1	1.000 BSC		
e2	0.500 BSC		
e3	0.900 BSC		
L1	0.450	0.500	0.550
L2	0.500	0.550	0.600
L3	1.050	1.100	1.150
L4	0.575	0.625	0.675
Tol. of Form & Position			
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		

**NOTE:**

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15mm AND 0.30mm FROM THE TERMINAL TIP. IF THE TERMINAL HAS THE OPTIONAL RADIUS ON THE OTHER END OF THE TERMINAL, THE DEMENSION b SHOULD NOT BE MEASURED IN THAT RADIUS AREA.
3. BILATERAL COPLANARITY ZONE APPLIES TO THE EXPOSED HEAT SINK SLUG AS WELL AS THE TERMINALS.



**TAPE AND REEL INFORMATION**

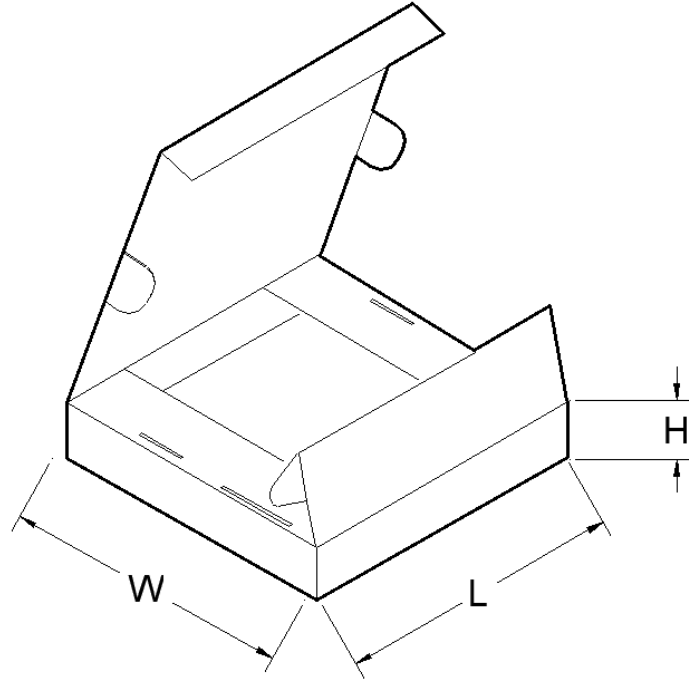


A0	Pocket width
B0	Pocket length
K0	Pocket thickness
W1	Reel Width
W	Inner width of the carrier tape
P1	Pitch between pocket centers

PKG type (mm)	Reel Diameter (mm)	Reel Width W1(mm)	A0(mm)	B0(mm)	K0(mm)	P1(mm)	W(mm)	Quad
3x5	330	12.8	3.25	5.25	0.80	8.00	12.0	Q1

Note: All the data is nominal

**PIZZA BOX DIMENSION**



PKG type (mm)	Units/box	Length(mm)	Width(mm)	Height(mm)
3x5	5000	355	340	50

Note: All the data is nominal