

RS31390 Stackable 16V, 60A eFuse with PMBus

Features

Power Path & Performance

- Wide input voltage range: 2.97V to 16V
- Integrated 0.8mΩ pass MOSFET
- Supports 50A continuous current and 60A peak current
- Standalone operation or primary device in parallel applications

PMBus Telemetry & Control

- Accurate current monitoring
- Adjustable output soft-start time
- Adjustable current limit during soft-start and steady-state operation

Protection Features

- Adjustable short-circuit current limit
- Fast-trip short circuit protection
- Input-to-output short-circuit detection
- Programmable latch-off or auto-retry operation for:
 - Input overvoltage protection (OVP)
 - Overcurrent protection (OCP)
 - Short-circuit protection (SCP)
 - Overtemperature protection (OTP)

Status & Diagnostics

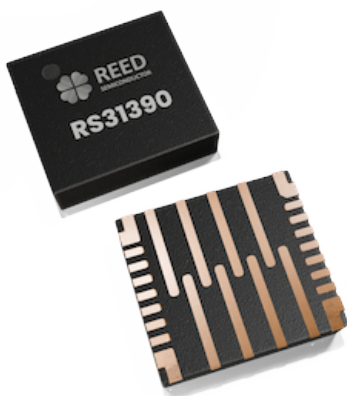
- Fault indication and Power-Good reporting

Compliance & Package

- ROHS compliant
- 4.5mm × 5mm QFN package

Applications

- Graphics and accelerator cards
- Servers and high-performance computing
- Networking cards



Description

The RS31390 is a high-current eFuse protection device with an integrated low $R_{DS(on)}$ MOSFET, designed to deliver up to 50 A continuous and 60 A peak current in 2.97 V to 16 V systems. It provides robust protection by limiting current and voltage during fault conditions while maintaining efficient power delivery.

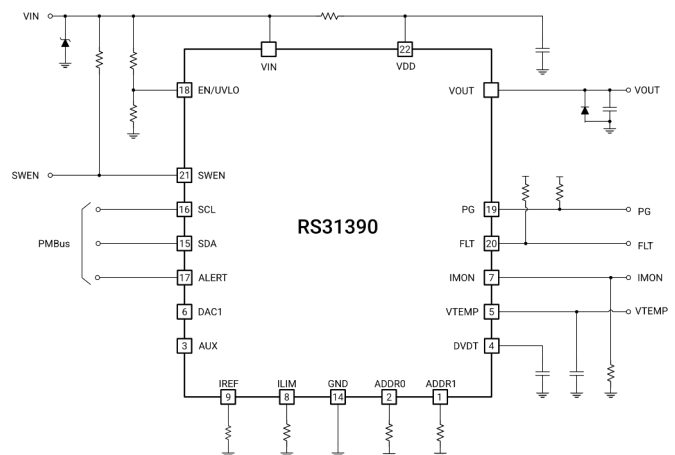
The device supports independent adjustment of current limits for startup and steady-state operation, enabling optimized system performance under dynamic load conditions. Programmable soft-start control allows precise management of inrush current during startup.

An integrated PMBus interface enables configuration, control, and real-time telemetry, including accurate current monitoring for enhanced system visibility. Flexible protection modes, including latch-off or auto-retry, provide robust response to over-voltage, over-current, short-circuit, and over-temperature events.

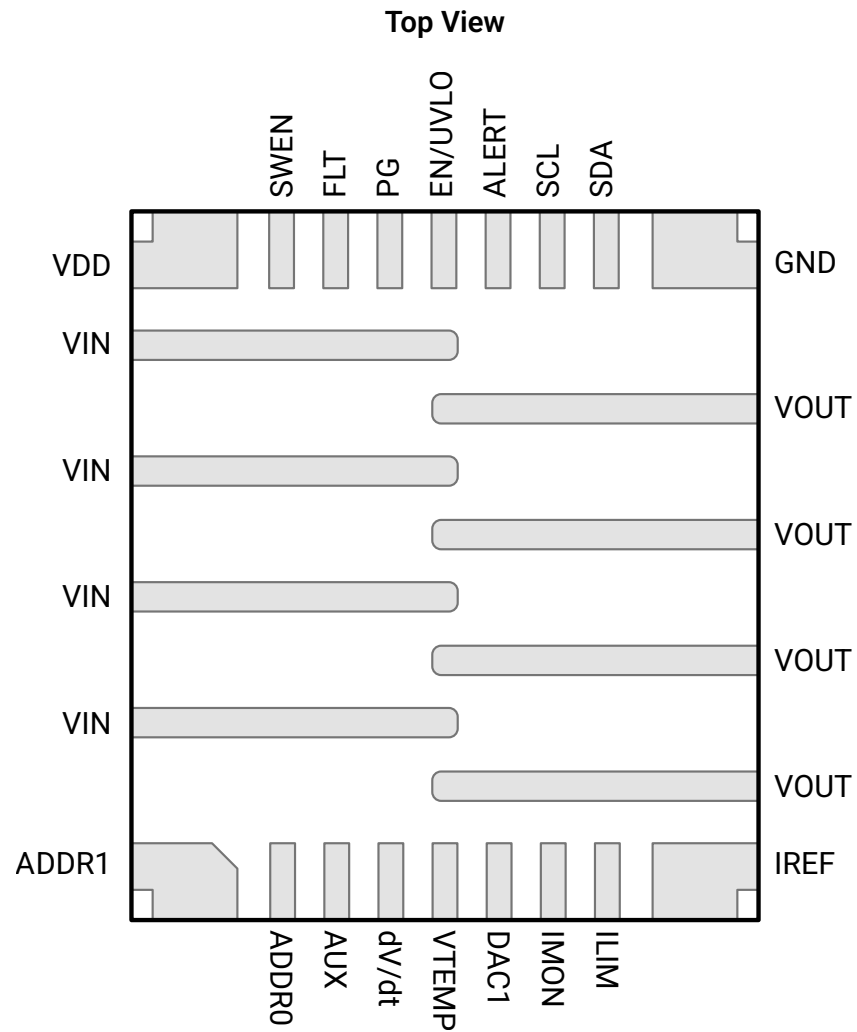
The RS31390 can operate standalone or as a primary device in parallel configurations with the RS31389 for higher current applications. It is offered in a compact 4.5 mm × 5 mm QFN package.

PART NUMBER	PACKAGE	BODY SIZE
RS31390	QFN-25	4.5 × 5 mm

Typical Application Circuit



Package Reference



QFN-26 (4.5 × 5mm)

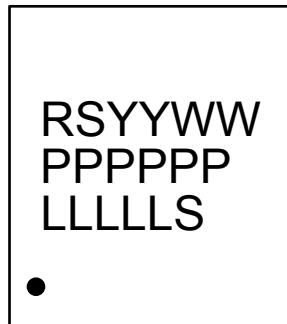
Pin Descriptions

PIN #	NAME	TYPE	DESCRIPTION
1	ADDR1	I	PMBus address pin. Connect a resistor from this pin to GND to set the device address as defined in the PMBus Address Programming Table .
2	ADDR0	I	PMBus address pin. Connect a resistor from this pin to GND to set the device address as defined in the PMBus Address Programming Table .
3	AUX	I	Auxiliary ADC input for external analog signal monitoring
4	dV/dt	i	An external capacitor connected to GND configures the slew rate according to Equation (2) in the dV/dt description.
5	VTEMP	O	Temperature monitor output. Connect a 22pF capacitor to GND for filtering.
6	DAC1	O	Analog current output of the general purpose DAC.
7	IMON	O	Current monitor output. The voltage on this pin is proportional to the load current. Connect a resistor between IMON and GND to scale the IMON voltage. See Current Limit at Startup for more details.
8	ILIM	I	A resistor to GND sets the current limit threshold during startup. See Current Limit In Startup for more details.
9	IREF	O	Programmable reference voltage for the overcurrent, short-circuit protection and active current limiting. The reference voltage can be programmed in VIREF .
10 – 13	VOUT	O	Power output. Recommend connecting to Schottky diode between VOUT and GND to clamp negative voltage spikes.
14	GND	G	Device ground.
15	SDA	I/O	PMBus data
16	SCL	I	PMBus clock
17	ALERT	O	PMBus alert signal by default. This pin can be configured as GPIO3 using the GPIO CONFIG 34 register. This is an open-drain output.
18	EN/UVLO	I	Enable input. Drive $EN \geq V_{EN,R}$ to enable the device or below $V_{EN,F}$ to disable the device. A resistor divider between VIN and GND sets a programmable UVLO threshold according to Equation x
19	PG	O	Power good output by default. This pin can be configured as GPIO1 using the GPIO CONFIG 12 register. This is an open-drain output.
20	FLT	O	Active low fault indicator by default. This pin can be configured as GPIO1 using the GPIO CONFIG 12 register. This is an open-drain output
21	SWEN	I/O	Switch (power MOSFET) enable by default. Drive $\geq V_{SWEN,R}$ to enable the internal power MOSFET. In parallel configurations tie SWEN pins together to synchronize ON/OFF control. See SWEN section for more details. This pin can be configured as GPIO3 using the GPIO CONFIG 34 register.
22	VDD	I	This is the supply input for the internal circuitry. Connect an RC filter from VIN to GND to filter noise on this pin according to ppppp
23 – 26	VIN	I	Power input pin. A TVS diode connected between VIN and GND can protect against line input transients

Ordering Information

PART NUMBER	PACKAGE	SIZE	MSL	SHIPPING METHOD	PACKAGE MARKING
RS31390R	QFN-26	4.5 × 5 mm	Level-1	5ku Tape & Reel	R31390

Top Marking



Line 1

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

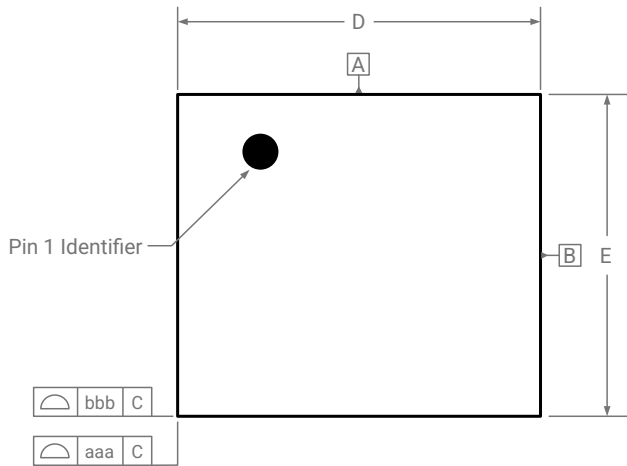
Line 2

- PPPPPP; Truncated part number

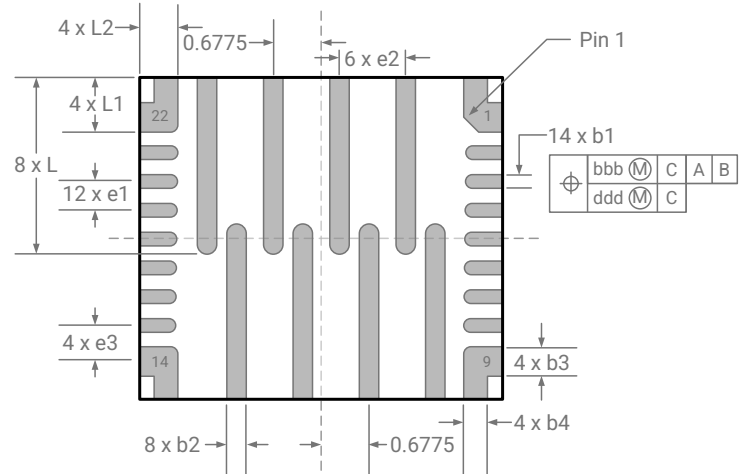
Line 3

- LLLLL: Lot code
- S: Assembly site code
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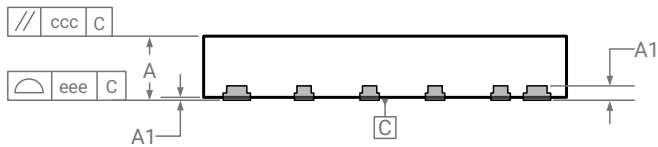
PACKAGE DIMENSIONS



TOP VIEW



BOTTOM VIEW



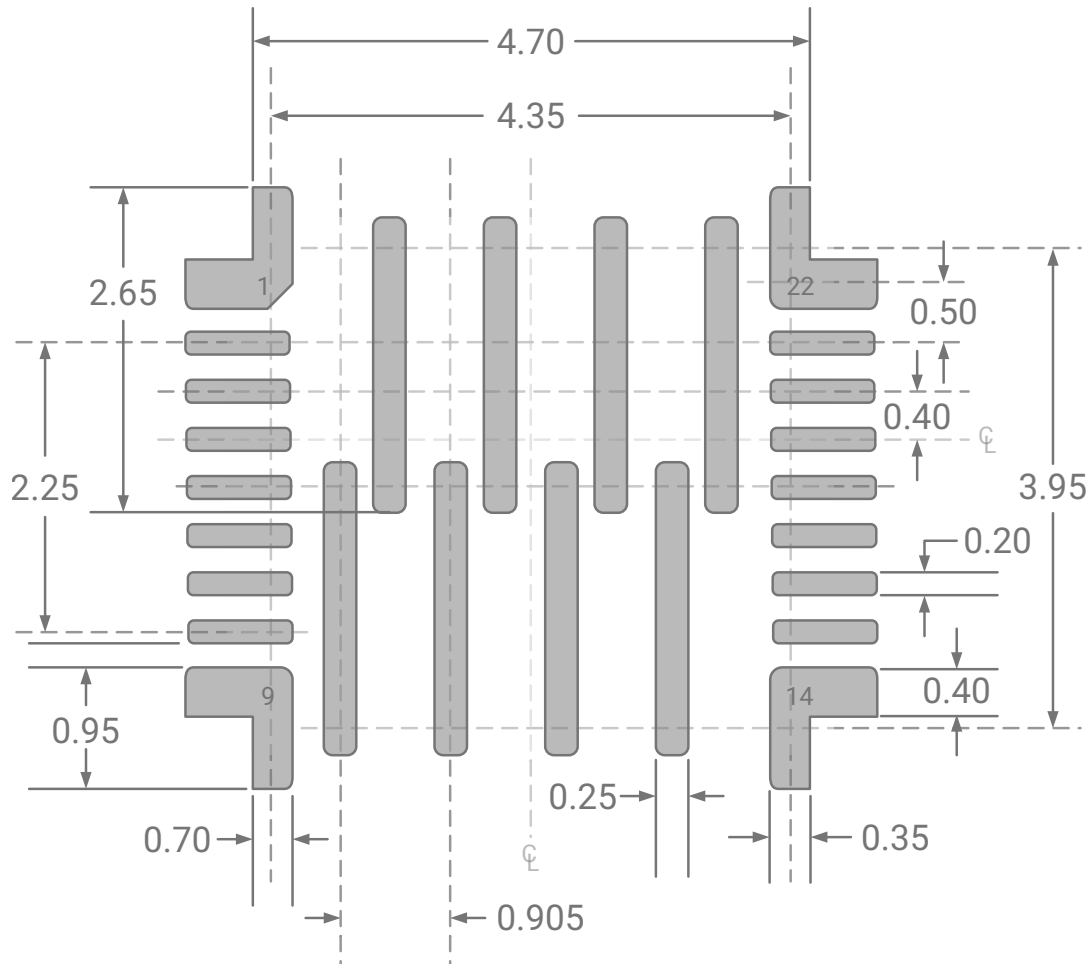
DATUM LEGEND	
A	Top Surface
B	Right Side Surface
C	Bottom Surface (Seating Plane)

REF	MIN	NOM	MAX
A	0.800	0.850	0.900
A1	—	—	0.050
A3	0.203 Ref.		
D	4.900	5.000	5.100
E	4.400	4.500	4.600
b1	0.150	0.200	0.250
b2	0.200	0.250	0.300
b3	0.350	0.400	0.450
b4	0.300	0.350	0.400
e1	0.400 BSC		
e2	0.905 BSC		
e3	0.500 BSC		
L	2.35	2.45	2.55
L1	0.65	0.75	0.85
L2	0.40	0.50	0.60
Geometric Dimensioning & Tolerancing			
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		

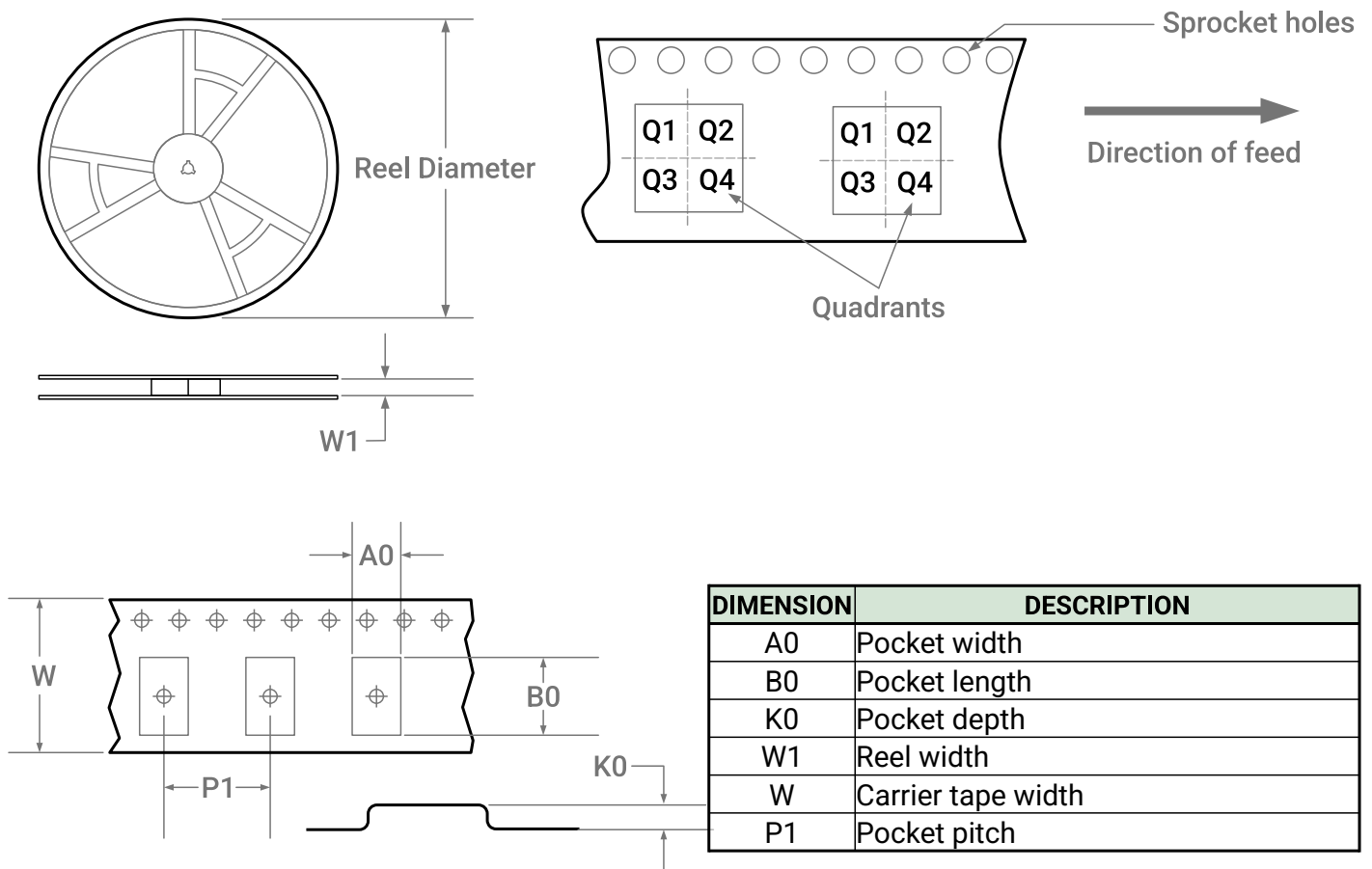
NOTE:

1. All dimensions are in millimeters.
2. Dimension and tolerancing conform to JEDEC MO-220.
3. Drawing is not to scale.

RECOMMENDED LAND PATTERN



TAPE AND REEL INFORMATION

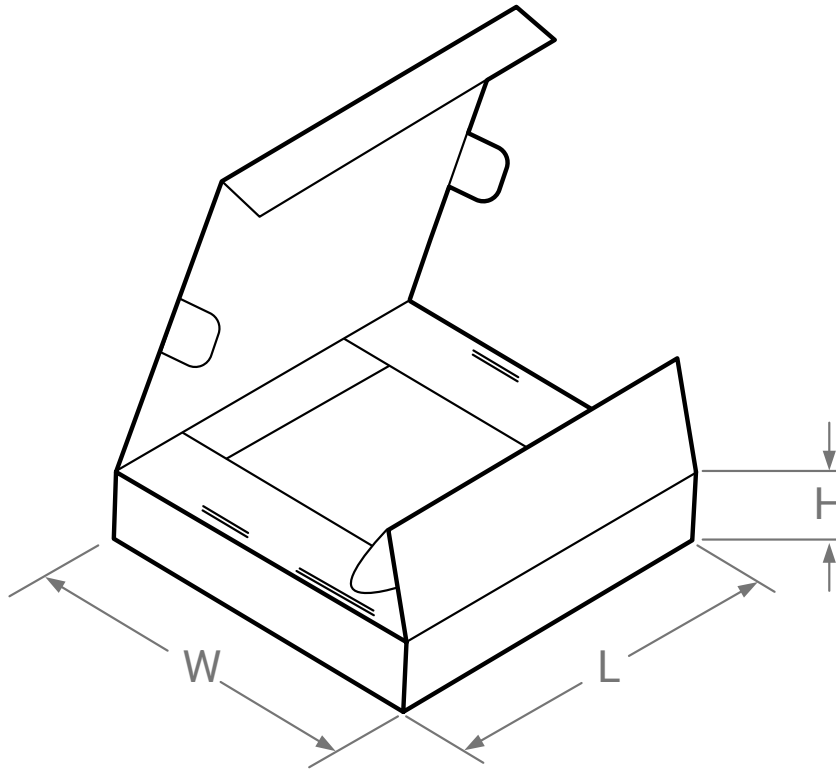


DEVICE ,SIZE	REEL DIAMETER	W1	A0	B0	K0	P1	W	QUAD
4.5 × 5	330	12.4	4.8	5.3	1.10	8.0	12.0	Q2

Note:

1. All dimensions are nominal
2. All dimensions are in millimeters (mm)

PIZZA BOX DIMENSIONS



DEVICE DIM (mm)	UNITS / BOX	L (mm)	W (mm)	H (mm)
4.5 × 5	5000	354	340	55

Note: All measurements are nominal