

RS31313 • RS31314 • RS31317 4.5V to 16V, 20A eFuse with Current Monitoring

Features

Performance

- Wide 4.5V to 16V input voltage range
- Integrated 2.0mΩ pass MOSFET
- Adjustable 2A to 20A current limit
- Accurate current monitor ($\pm 1.5\%$ typical current-limit accuracy)

Protection Features

- Fast short-circuit protection (<400ns typical)
- Integrated over-temperature protection
- Configurable input over-voltage protection
- Fixed 7.6V (RS31313)
- Fixed 16.5V (RS31314)
- No OVP option (RS31317)
- Adjustable input under-voltage lockout (UVLO)

Fault Management

- Programmable over-current blanking timer
- Selectable latch-off or auto-retry operation
- Programmable retry count
- Adjustable retry delay

Control & Configuration

- Adjustable output slew rate
- Adjustable LOADEN detect and handshake timer

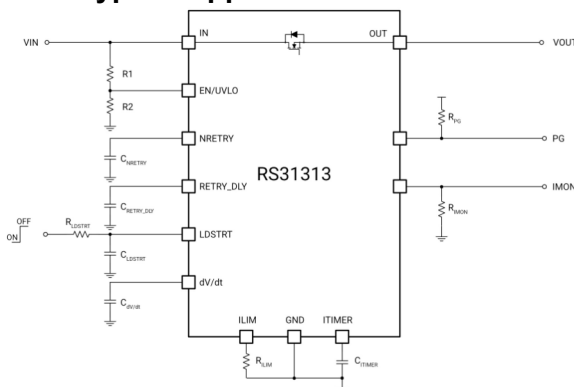
Compliance & Package

- ROHS compliant
- 4 mm × 4mm LGA-26 package

Applications

- Server and AUX supplies
- PCI and PCIe cards
- Router and switch optical modules

Typical Application Circuit



Description

The RS31313 family consists of highly integrated eFuse devices with an internal 2.0mΩ MOSFET that provide active circuit protection, inrush current control, and hot-swap functionality for systems operating from 4.5V to 16V. These devices protect both the power source and downstream circuitry by limiting current and responding rapidly to fault conditions.

The output current limit is programmable from 2A to 20A using a single external resistor. An integrated precision current monitor provides continuous load-current feedback, while the output slew rate can be adjusted with an external capacitor to control inrush current during startup.

To maximize system flexibility, the RS31313 family includes programmable fault management features, including an adjustable over-current blanking timer, selectable latch-off or auto-retry operation, programmable retry count, and adjustable retry delay. These features help prevent nuisance shutdowns caused by load transients while maintaining robust fault protection.

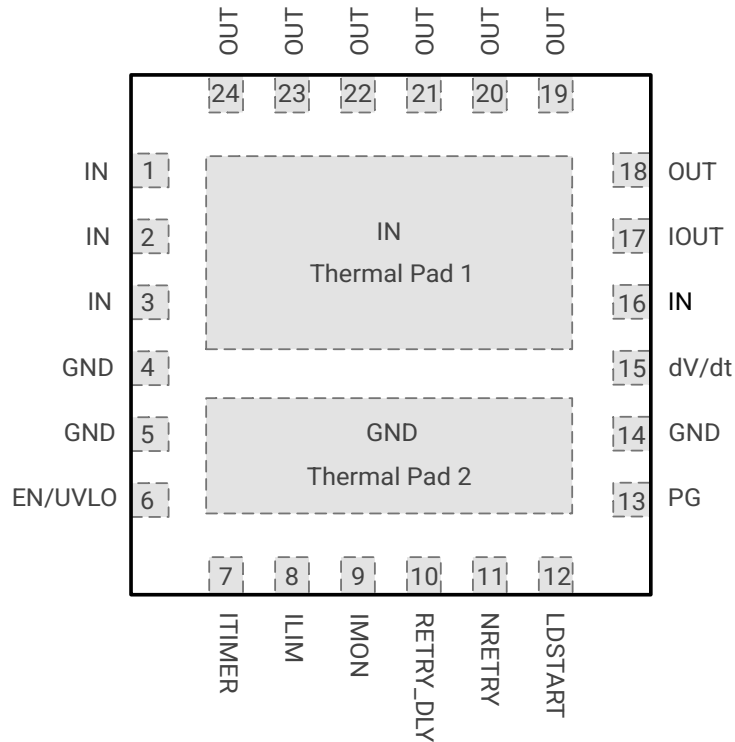
Input protection includes adjustable UVLO and configurable over-voltage protection, with device options offering 7.6V, 16.5V, or no OVP. A programmable LOADEN detection and handshake timer simplifies system sequencing and controlled power delivery.

The family is available in two protection architectures: A devices provide active current limiting, while B devices operate as circuit breakers. All devices integrate over-temperature protection and are offered in a compact 4mm × 4mm, 26-pin LGA package.

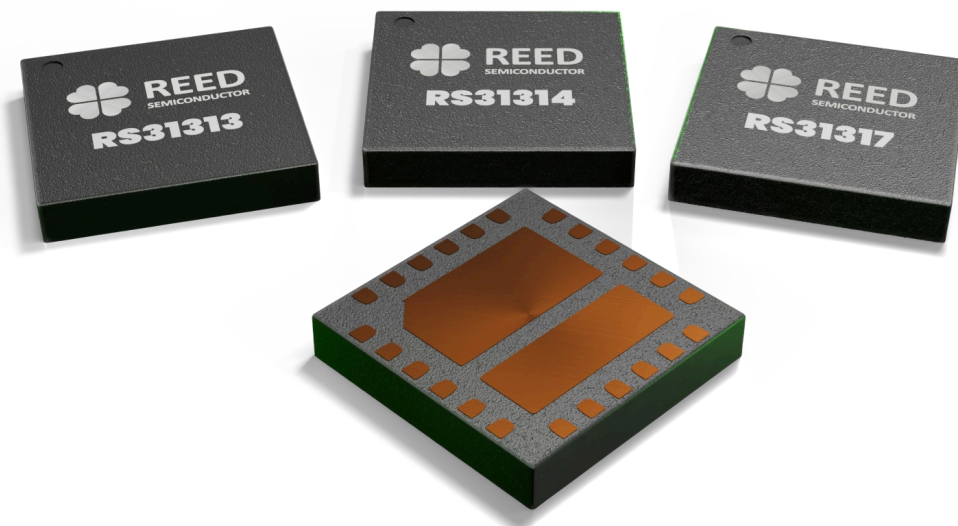
PART NUMBER	PACKAGE	BODY SIZE	Overcurrent Response
RS3131xA	LGA-26	4 × 4 mm	Current Limit
RS3131xB			Circuit Breaker

Package Reference

Top View



LGA-26 (4 × 4 mm)



Pin Descriptions

PIN	NAME	TYPE	DESCRIPTION
1 - 3, 16, Pad 1	IN	P	Input power. Connect the IN pins and thermal pad 1 to the input power plane using wide copper traces and multiple vias for low impedance and improved heat dissipation.
17 - 24	OUT	P	Power output. Connect the OUT pins to the load using a wide copper plane to minimize voltage drop and improve thermal performance.
4, 5, 14, Pad 2	GND	G	Device ground. Connect the GND pins and thermal pad 2 directly to the system ground plane using multiple vias for optimal electrical and thermal performance.
6	EN/UVLO	I	Enable / Undervoltage Lockout input. Pull high to enable the device and pull low to disable it. Connect to a resistor divider from VIN to GND to program the input UVLO threshold. Do not leave the pin floating.
7	ITIMER	I	Overcurrent blanking timer. Connect a capacitor from ITIMER to GND to program the over-current blanking time, allowing temporary current excursions above the programmed current limit. Leave the pin open for the fastest fault response.
8	ILIM	I	Current limit programming. Connect a resistor from ILIM to GND to set both the current-limit threshold and fast-trip threshold. Do not leave the pin floating.
9	IMON	O	Current monitor output. Sources a current proportional to the load current. Connect a resistor from IMON to GND to convert the output current into a proportional voltage.
10	RETRY_DLY	I	Retry delay programming. Connect a capacitor from RETRY_DLY to GND to set the delay between fault shutdown and the next restart attempt. Connect directly to GND to select latch-off operation (no automatic retry).
11	NRETRY	I	Retry count programming. Connect a capacitor from NRETRY to GND to program the number of automatic restart attempts following a fault. Connect directly to GND for unlimited retry attempts.
12	LDSTART	I	Load detect / handshake input. Connect a capacitor from LDSTART to GND to program the handshake timeout after PG is asserted. Pull LDSTRT low within the programmed time to keep the device enabled. Connect to GND if the load detect/handshake function is not used. Do not leave the pin floating.
13	PG	O	Power-good indicator. Open-drain output that asserts when the output voltage is in regulation. Requires an external pull-up resistor.
15	dV/dt	I	Output slew-rate control. Connect a capacitor from dV/dt to GND to program the output voltage rise time during turn-on, thereby controlling inrush current.

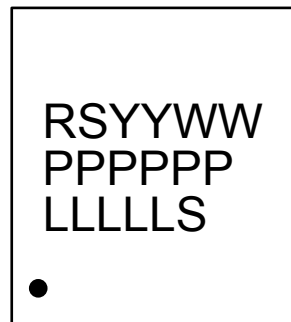
Device Comparison Table

PART NUMBER	OVERVOLTAGE THRESHOLD (V)	OVERCURRENT RESPONSE
RS31313A	7.6	Current Limiter
RS31314A	16.5	Current Limiter
RS31317A	—	Current Limiter
RS31313B	7.6	Circuit-Breaker
RS31314B	16.5	Circuit-Breaker
RS31317B	—	Circuit-Breaker

Ordering Information

PART NUMBER	PACKAGE	SIZE (mm)	MSL	SHIPPING METHOD	PACKAGE MARKING
RS31313A	LGA-26	4 × 4 mm	Level-3	5000u Tape & Reel	R1313A
RS31314A	LGA-26	4 × 4 mm	Level-3	5000u Tape & Reel	R1314A
RS31317A	LGA-26	4 × 4 mm	Level-3	5000u Tape & Reel	R1317A
RS31313B	LGA-26	4 × 4 mm	Level-3	5000u Tape & Reel	R1313B
RS31314B	LGA-26	4 × 4 mm	Level-3	5000u Tape & Reel	R1314B
RS31317B	LGA-26	4 × 4 mm	Level-3	5000u Tape & Reel	R1317B

Top Marking



Line 1

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

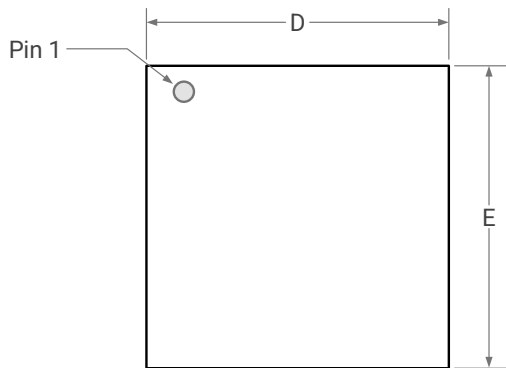
Line 2

- P P P P P P; Truncated part number

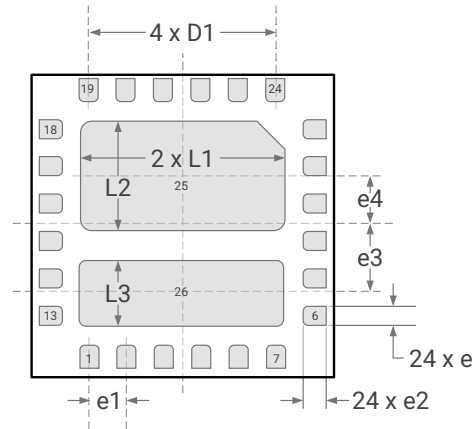
Line 3

- L L L L L L: Lot code
- S: Assembly site code

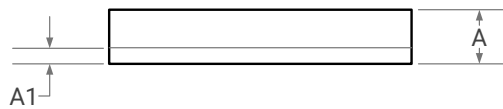
Package Dimensions



TOP VIEW



BOTTOM VIEW

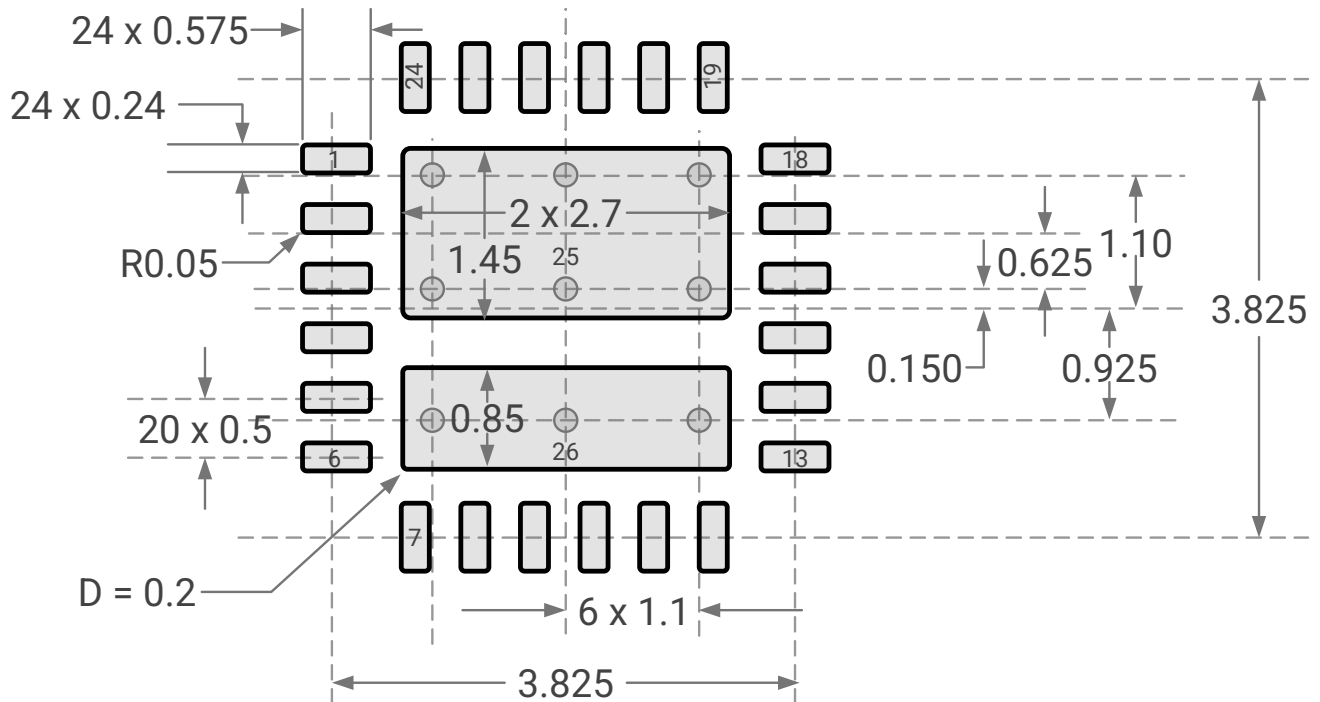


SIDE VIEW

Notes:

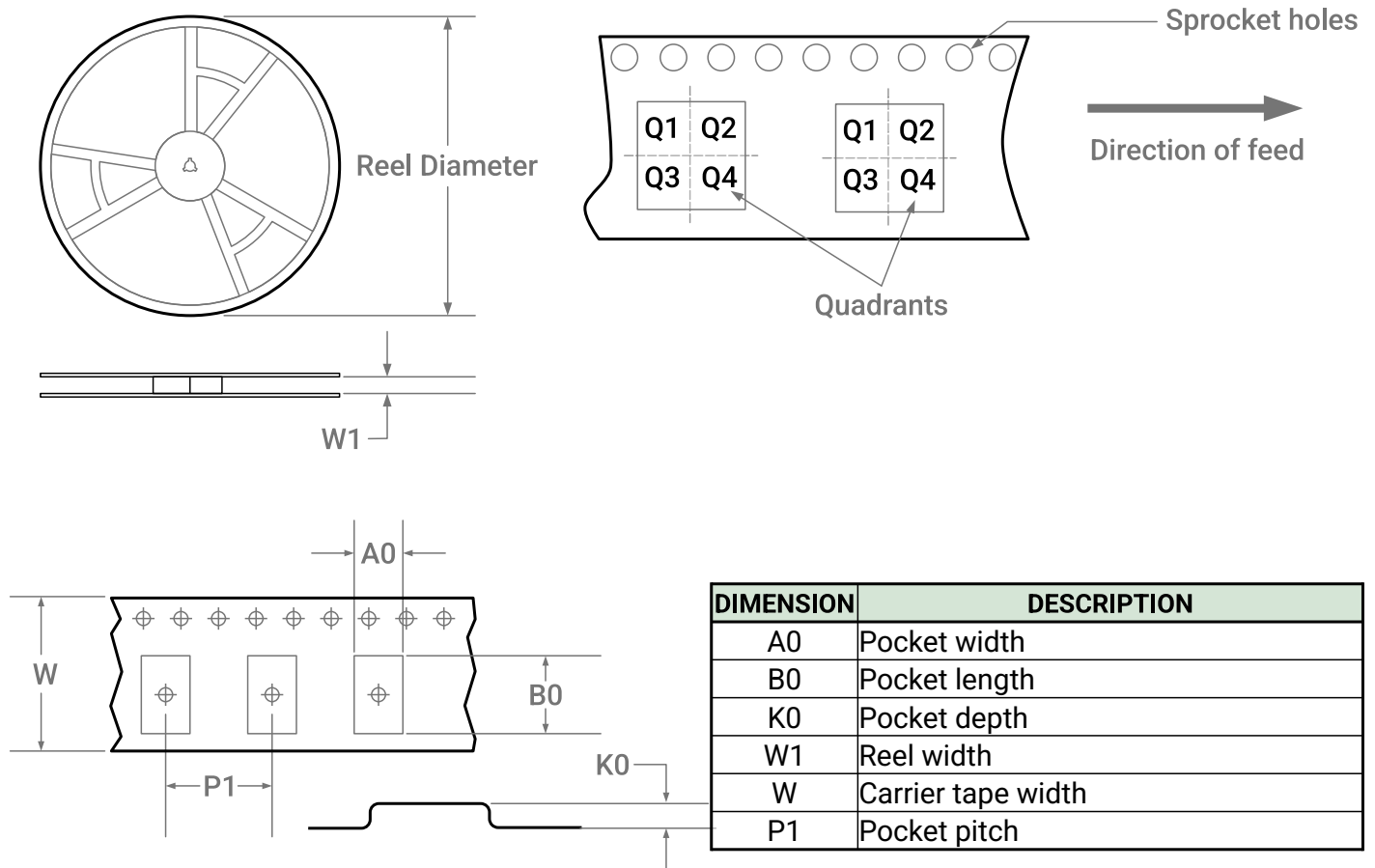
1. All dimensions are in millimeters.
2. Dimensions D and E are measured at the package body.
3. Drawing is not to scale.

REF	MIN	NOM	MAX
A	—	0.73	1.000
A1	0.203 Ref.		
D	3.900	4.000	4.100
E	3.900	4.000	4.100
D1	2.400	2.500	2.600
e1	0.500 BSC		
e2	0.375 BSC		
e3	0.925 BSC		
e4	0.625 BSC		
L1	2.60	2.70	2.80
L2	1.35	1.45	1.55
L3	0.84	0.85	0.86

RECOMMENDED LAND PATTERN


Note: All dimensions are in millimeters

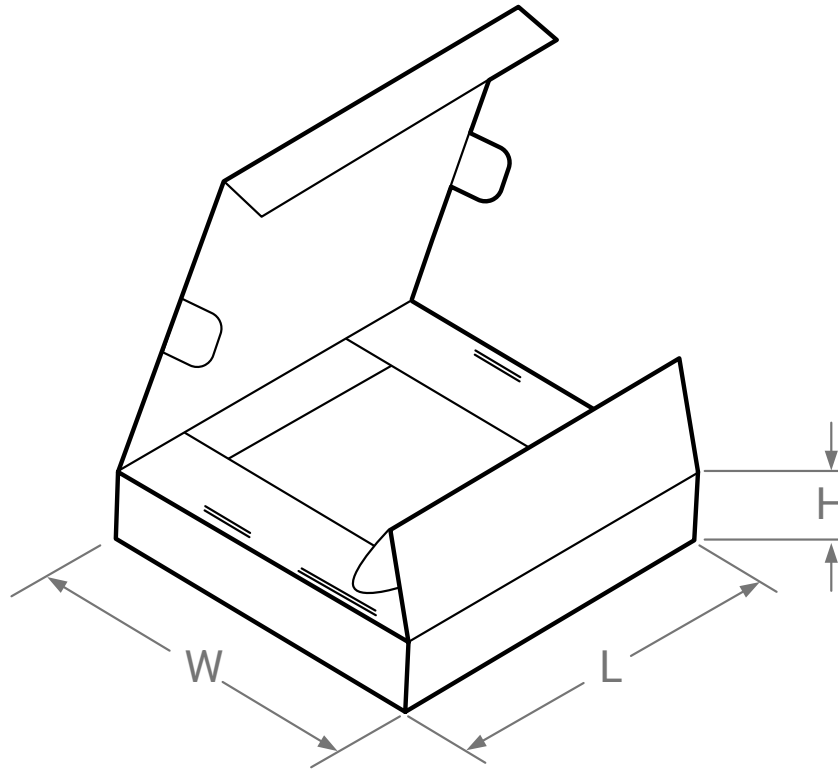
TAPE AND REEL INFORMATION



DEVICE SIZE	REEL DIAMETER	W1	A0	B0	K0	P1	W	QUAD
4 × 4	330	12.4	4.2	4.2	1.10	8.00	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 × 4	5000	358	341	50

Note: All measurements are nominal