RS31386 4.5V to 16V, 50A Stackable eFuse with Current Monitoring

Features

Power Path & Performance

- Wide 4V to 16V input voltage range
- Integrated 0.8mΩ pass MOSFET
- Accurate current monitor output
- Adjustable output soft-start time

Scalability

- Standalone operation or parallel operation for higher-current applications
- Companion device for the RS31380 intelligent eFuse
- Active current sharing for scalable power protection

Protection & Control

- Adjustable current limit
- Adjustable short-circuit current limit
- Fast-trip short-circuit protection
- Input-to-output short-circuit detection
- Selectable latch-off or auto-retry response for input overvoltage, overcurrent, short-circuit, and overtemperature faults
- GOK and FLT_TYPE fault indication output

Package

- Compact 5mm × 5mm LGA-32 package
- RoHS compliant

Applications

- Server and AUX supplies
- PCI and PCIe cards
- Disk Drives
- Router and Networking
- Laptops

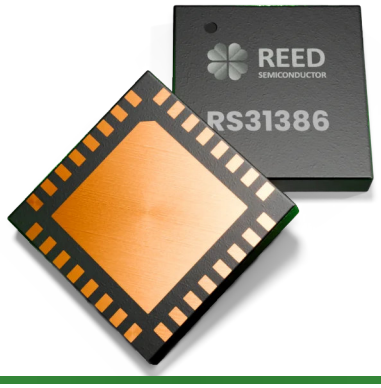
Description

The RS31386 is a 50A eFuse with an integrated 0.8mΩ MOSFET that provides programmable hot-swap protection, inrush current control, and accurate current monitoring for high-performance power systems. Designed for standalone operation or as a companion device to the RS31380 intelligent eFuse, the RS31386 enables scalable higher-current protection solutions while minimizing design complexity and external component count.

The device features programmable overcurrent and short-circuit current limits, adjustable soft-start timing, fast-trip short-circuit protection, and comprehensive fault reporting through GOK and FLT_TYPE outputs. An integrated current monitor provides accurate load current measurement for system monitoring and diagnostics.

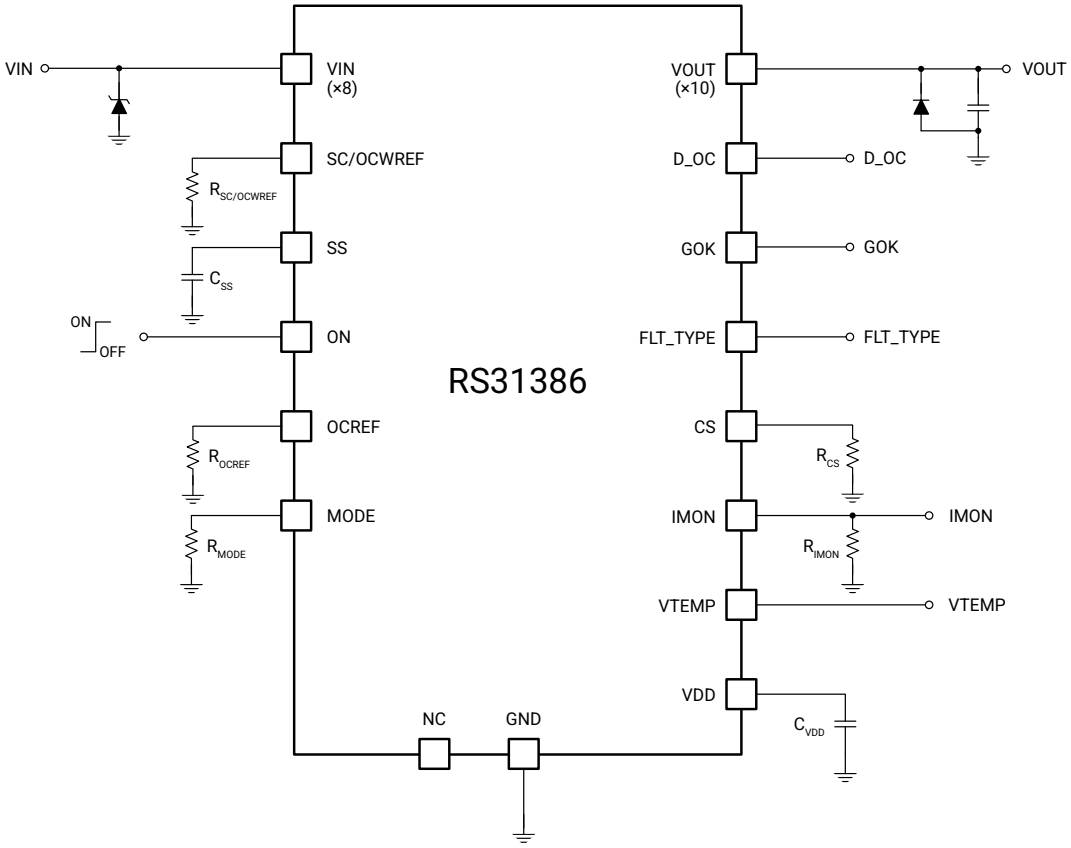
When paired with the RS31380, multiple RS31386 devices can be connected in parallel to create scalable eFuse solutions for applications requiring current levels beyond the capability of a single device. The RS31380 provides PMBus configuration, telemetry, and system-level control, while the RS31386 extends the available output current with integrated active protection, enabling flexible front-end power architectures for AI accelerators, servers, networking, storage, and industrial systems.

The RS31386 is available in a compact 5mm × 5mm LGA-32 package and is optimized for high-density designs requiring intelligent, scalable circuit protection.



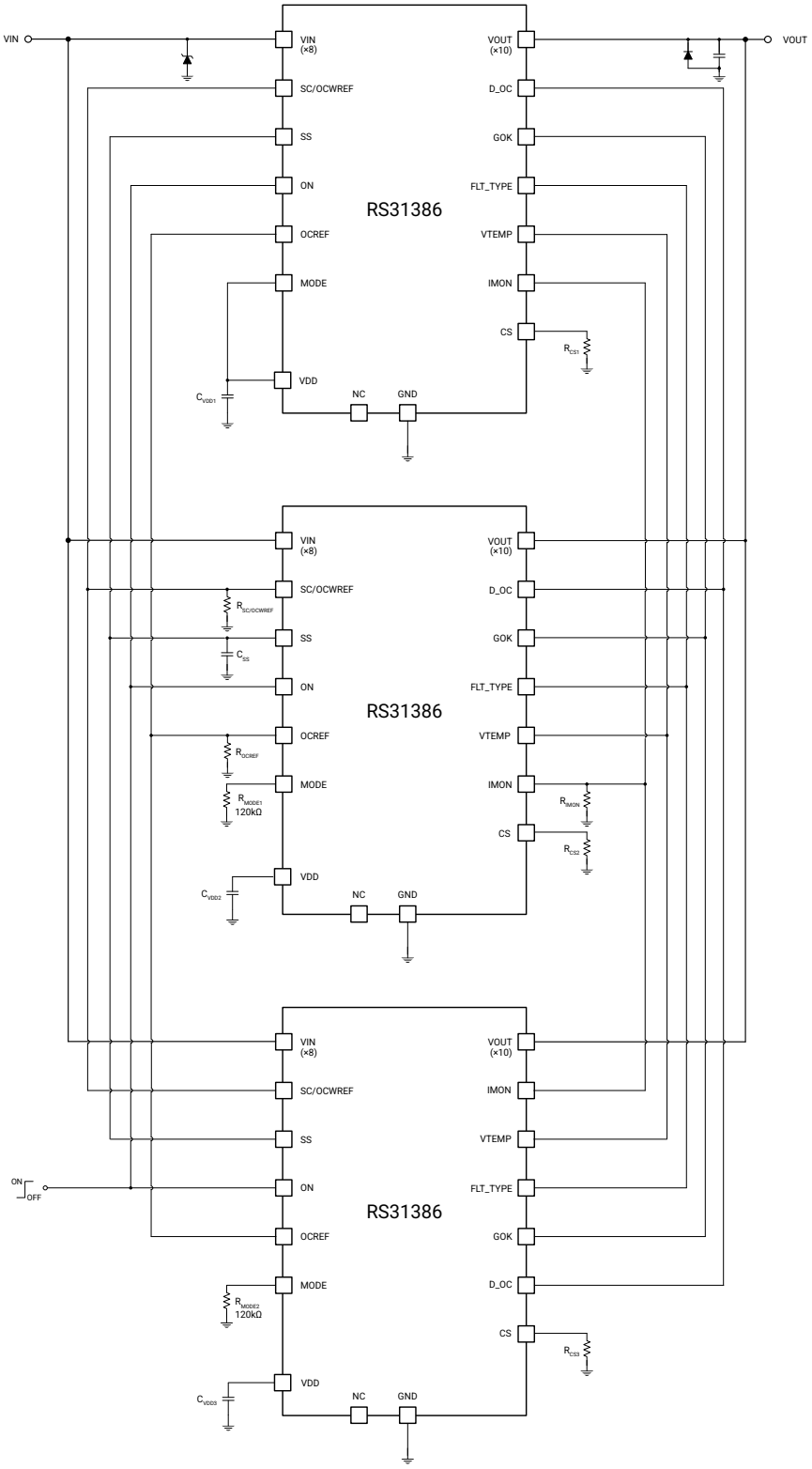
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Typical Application Circuit



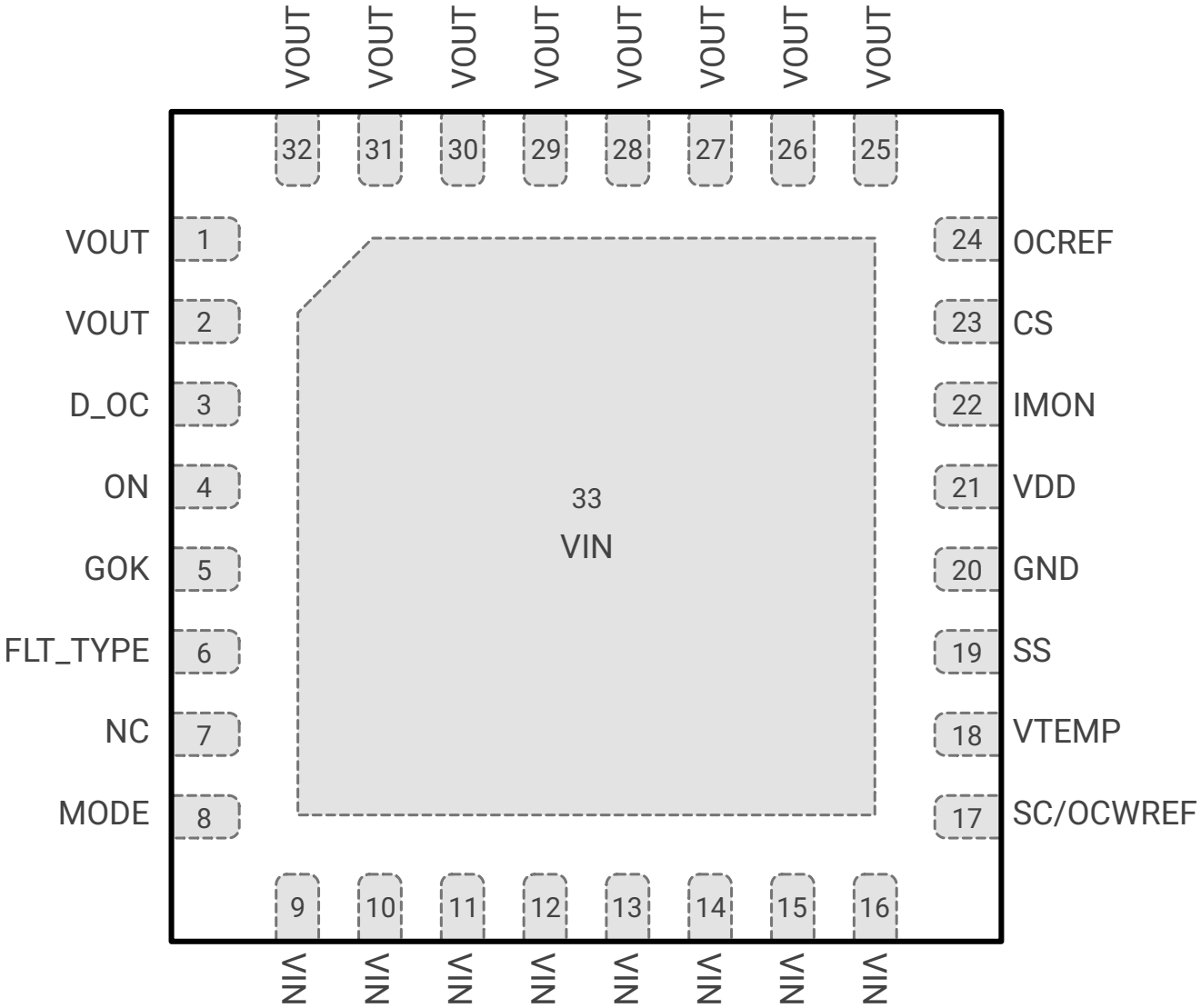
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Parallel Operation



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Package Reference



Top View

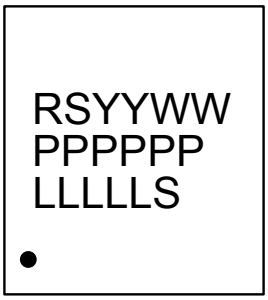
LGA-32 (5 × 5mm)

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Ordering Information

PART NUMBER	PACKAGE	SIZE (mm)	MSL RATING	SHIPPING METHOD	PACKAGE MARKING
RS31386T	LGA - 32	5 × 5	Level - 3	250u Tape & Reel	R31386
RS31386R	LGA - 32	5 × 5	Level - 3	3000u Tape & Reel	R31386

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

Note: To improve clarity, this datasheet explicitly identifies all configurable ordering options. Earlier part numbers that omitted default option designators remain valid and fully supported.

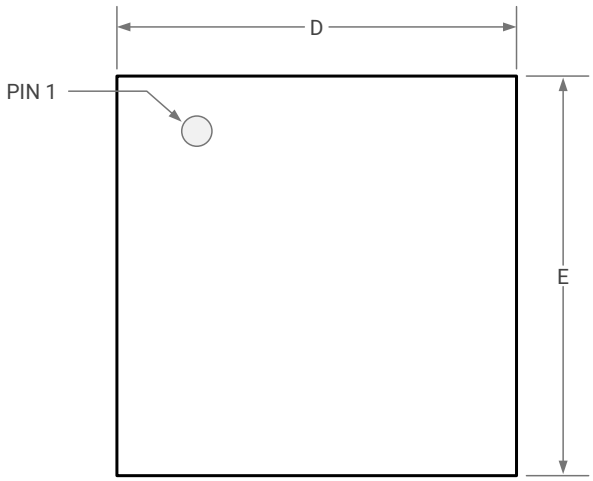
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Pin Descriptions

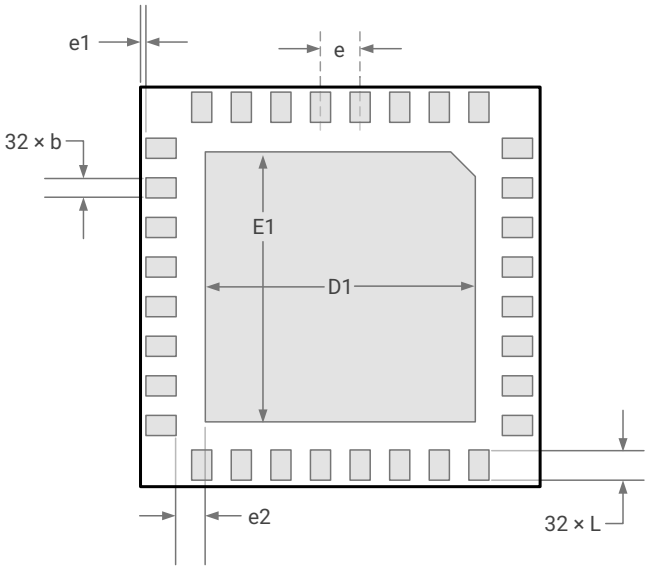
PIN	NAME	TYPE	DESCRIPTION
1, 2, 25 — 32	VOUT	P	Protected power output. A Schottky diode may be placed between VOUT and GND to clamp negative voltage transients.
3	D_OC	O	Open-drain overcurrent indication output.
4	ON	I	Power FET enable input. Drive high to turn on the power FET and low to turn it off.
5	GOK	O	Open-drain fault indication output. GOK asserts low and latches when a fault occurs.
6	FLT_TYPE	O	Fault type indication output.
7	NC	—	No connect. Leave unconnected.
8	MODE	I	Mode selection input. Connect a resistor from MODE to GND to set the operating mode.
9 — 16, 33	VIN	P	Power input.
17	SC/OCWREF	O	Short-circuit current limit and overcurrent warning reference output. Connect a resistor from this pin to GND to set the short-circuit current limit after VDD ramps. In follower mode, this pin also sets the overcurrent warning threshold.
18	VTEMP	O	Temperature sense output.
19	SS	I	Soft-start timing input. Connect a capacitor from SS to GND to set the soft-start time during power-up.
20	GND	G	Ground Reference.
21	VDD	P	Internal 3.3V LDO output. Bypass to GND with a 1μF decoupling capacitor placed close to the pin.
22	IMON	O	Current monitor output. The output current is proportional to the current flowing through the power FET. Connect a resistor from IMON to GND to generate the current monitor voltage.
23	CS	O	Current sense output. The CS voltage is compared with OCREF to determine the overcurrent limit.
24	OCREF	I	Overcurrent limit reference input. Connect a resistor from OCREF to GND to set the overcurrent limit comparator reference.

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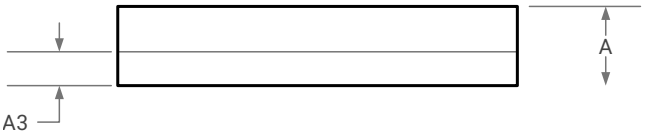
Package Dimensions



TOP VIEW



BOTTOM VIEW



SIDE VIEW

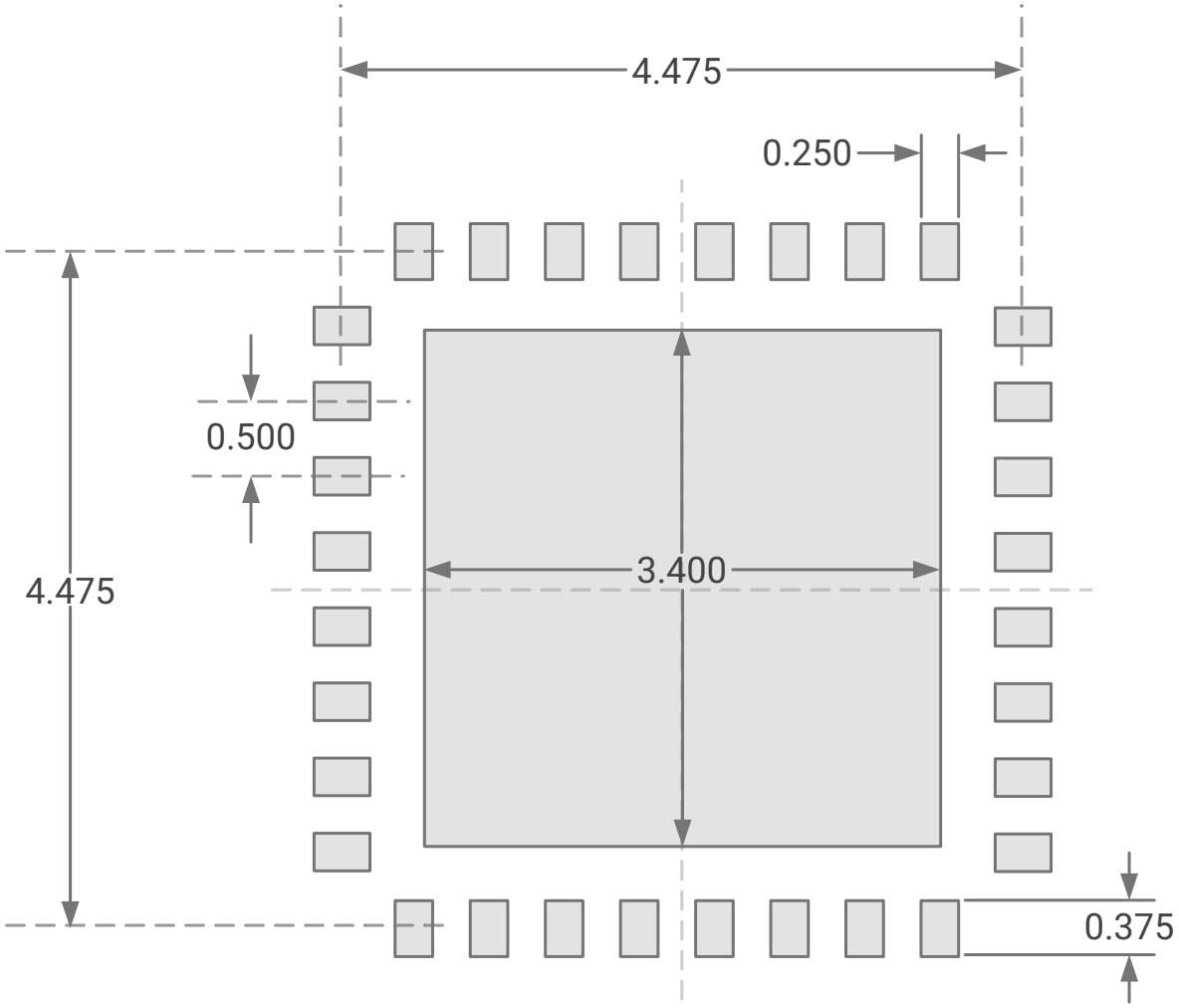
Notes

1. All dimensions are in millimeters.
2. Dimension *b* applies to the metallized terminal and is measured 0.15mm to 0.30mm from the terminal tip, excluding any optional terminal radius.
3. The coplanarity specification applies to the exposed thermal pad and all terminals.
4. Drawing is not to scale.

REF	MIN	NOM	MAX
A	0.80	0.90	1.00
A3	0.36	0.40	0.44
D	4.90	5.00	5.10
E	4.90	5.00	5.10
D1	3.30	3.40	3.50
E1	3.30	3.40	3.50
L	0.375 BSC		
e	0.5000 BSC		
b	0.250 BSC		
e1	0.075 BSC		
e2	0.350 BSC		

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Recommended Land Pattern

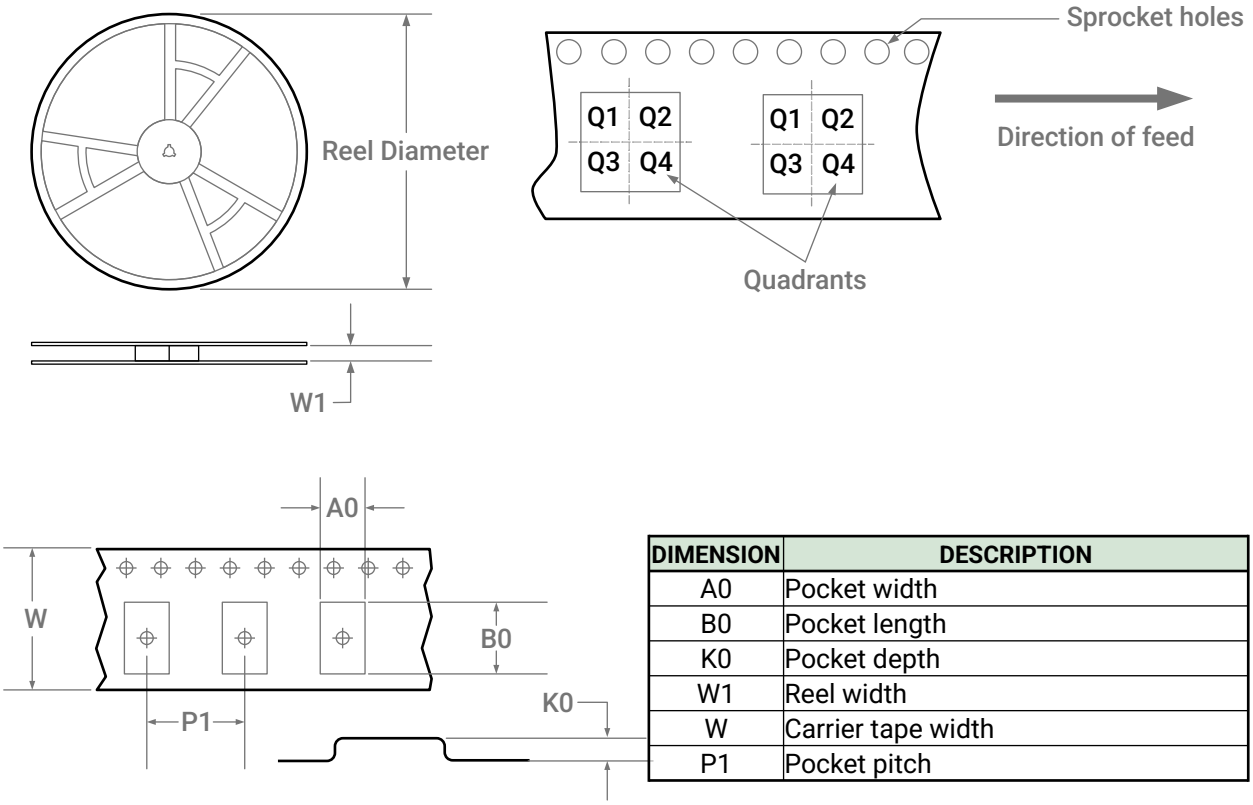


Notes:

1. All dimensions are in millimeters
2. Drawing is not to scale.

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Tape and Reel Information



DIMENSION	DESCRIPTION
A0	Pocket width
B0	Pocket length
K0	Pocket depth
W1	Reel width
W	Carrier tape width
P1	Pocket pitch

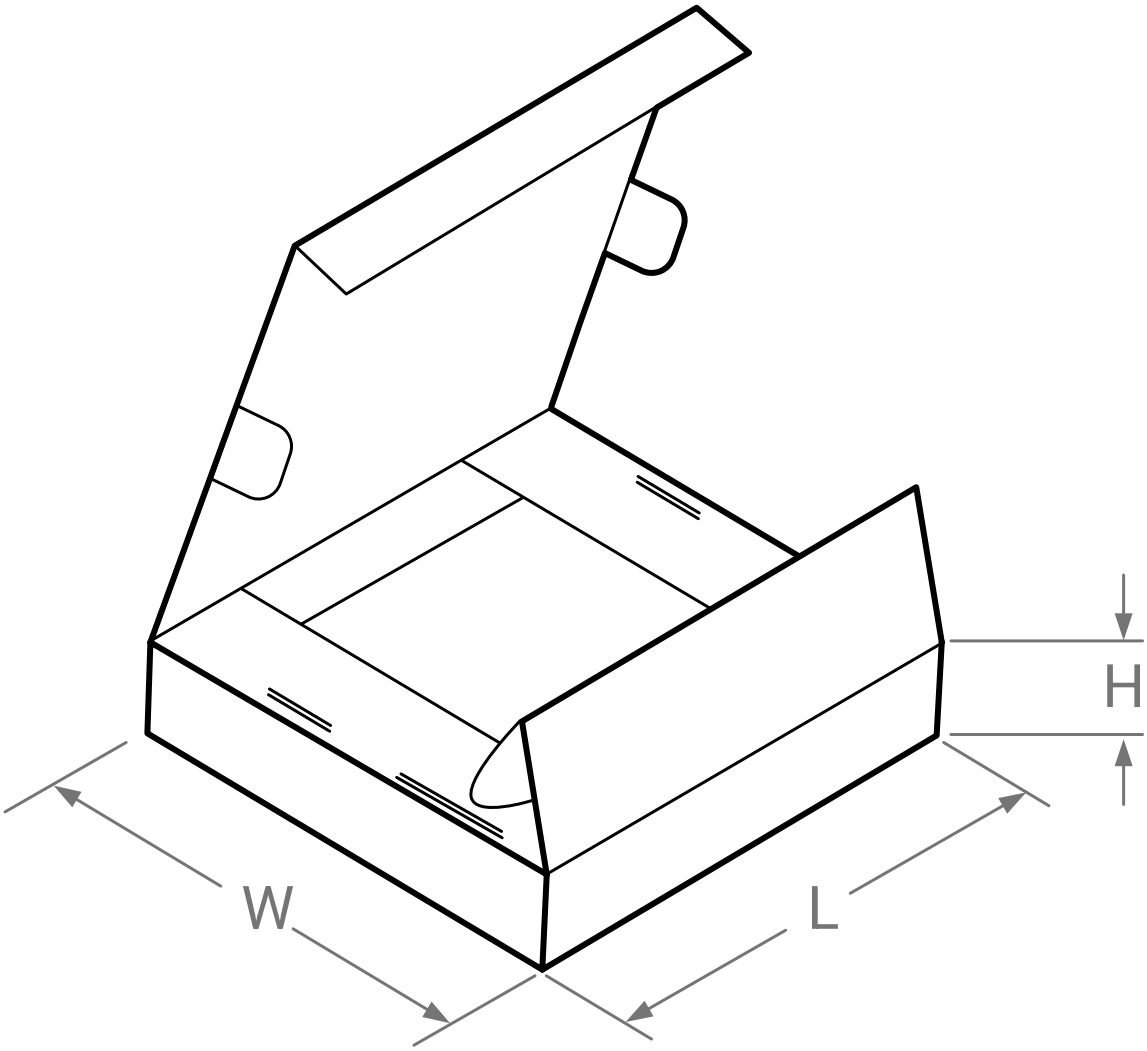
DEVICE SIZE	REEL DIAMETER	W1	A0	B0	K0	P1	W	PIN 1 QUADRANT
5 × 5	330	16.4	5.3	5.3	1.30	8.0	16.0	Q1

Notes:

1. All dimensions are in millimeters
2. All dimensions are nominal

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Pizza Box Dimensions



DEVICE SIZE	UNITS/BOX	L	W	H
5 × 5	3000	358	340	50

Notes:

1. All dimensions are in millimeters
2. All dimensions are nominal

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