

RS31511 Stackable 9V to 80V, 20A eFuse with Current Monitoring

Features

Protection & Reliability

- Wide input voltage range: 9V to 80V
- Supports 20A continuous and 24A peak output current
- Standalone operation or parallel operation for higher-current applications
- Integrated 3.6mΩ pass MOSFET
- Adjustable output soft-start time

Monitoring & Control

- Accurate current monitor
- Adjustable current limit during startup and steady-state
- Adjustable short-circuit current limit
- Fault indication and Power Good outputs

Protection Feature

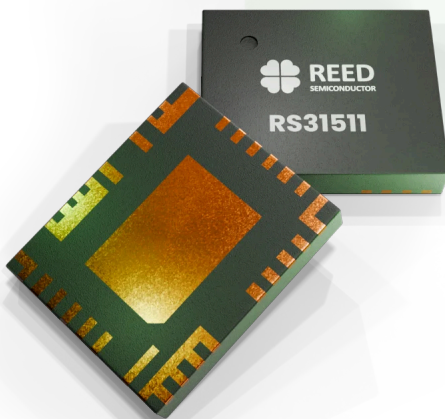
- Fast-trip short-circuit protection
- Input overvoltage, overcurrent, short-circuit, and overtemperature protection
- Selectable latch-off or auto-retry protection mode
- Input-to-output short-circuit detection

Package & Compliance

- Compact 5mm × 6mm LGA-24 package
- RoHS compliant

Applications

- AI accelerator and graphics cards
- Servers and high-performance computing
- Networking equipment
- Telecom power systems



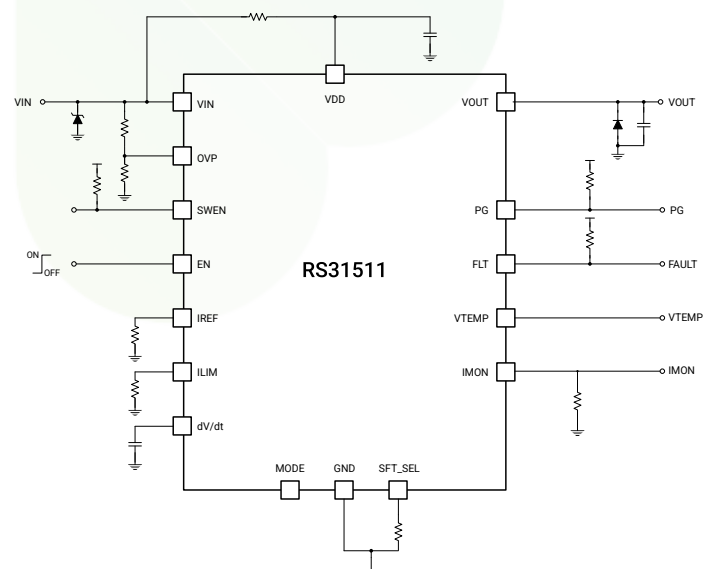
Description

The RS31512 is a stackable 20A intelligent eFuse featuring an integrated 4.3mΩ MOSFET, PMBus digital interface, and comprehensive circuit protection for high-performance power systems. Designed for 9V to 80V applications, it combines precise protection, system telemetry, and digital configurability in a compact LGA-24 package.

Independent startup and steady-state current limit settings allow designers to optimize inrush control while maximizing available load current during normal operation. Adjustable short-circuit current limiting, programmable soft-start, and selectable latch-off or auto-retry protection provide the flexibility to meet a wide range of system requirements.

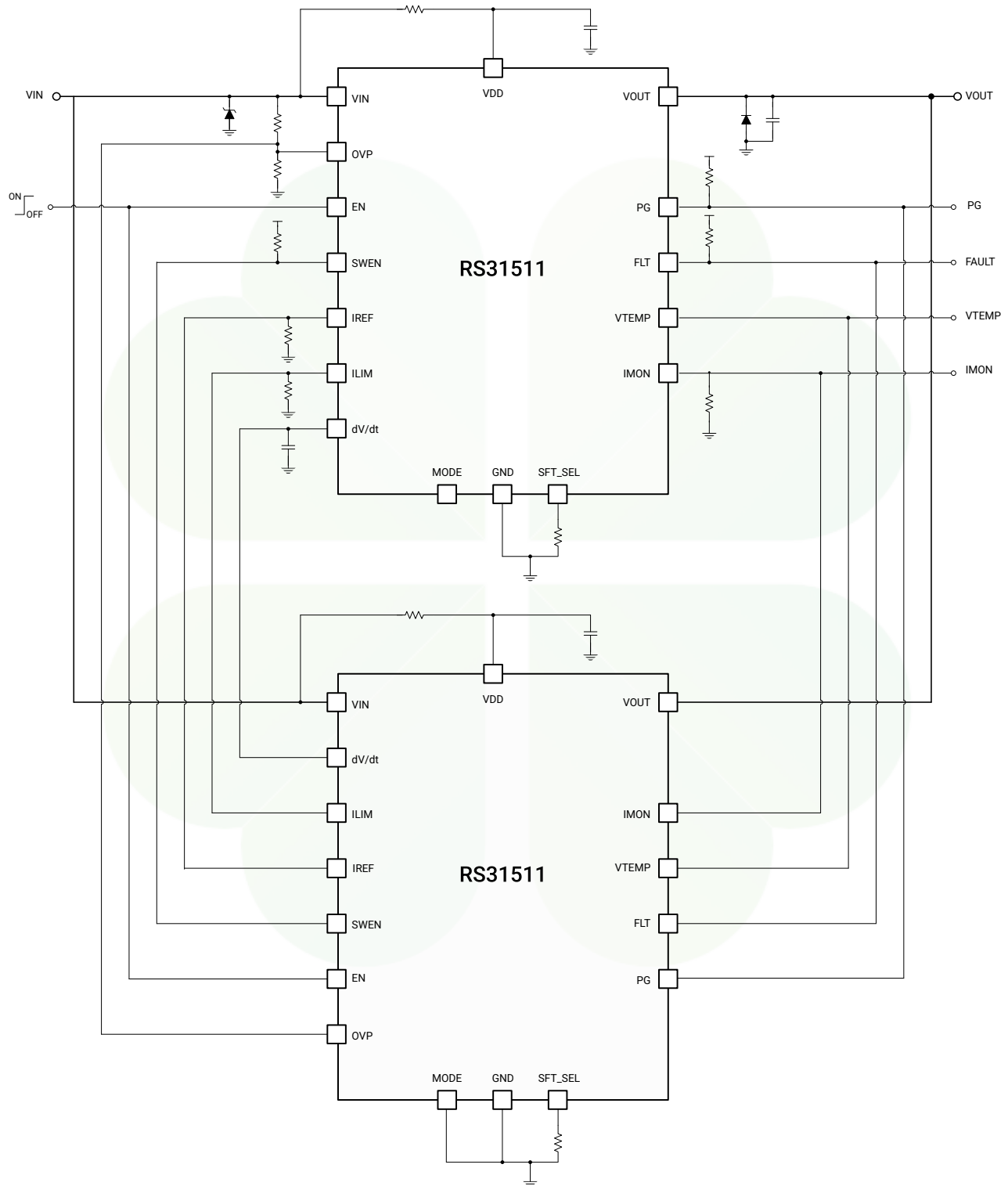
The integrated PMBus interface enables remote configuration, monitoring, and telemetry, including current reporting and fault status, simplifying system management and diagnostics. Multiple RS31512 devices can be connected in parallel using a leader-follower architecture to increase system current capability while maintaining coordinated operation.

PART NUMBER	PACKAGE	SIZE	FAULT RESPONSE
RS31511A	LGA - 24	5 × 6 mm	Latch-off
RS31511B	LGA - 24	5 × 6 mm	Auto-Retry

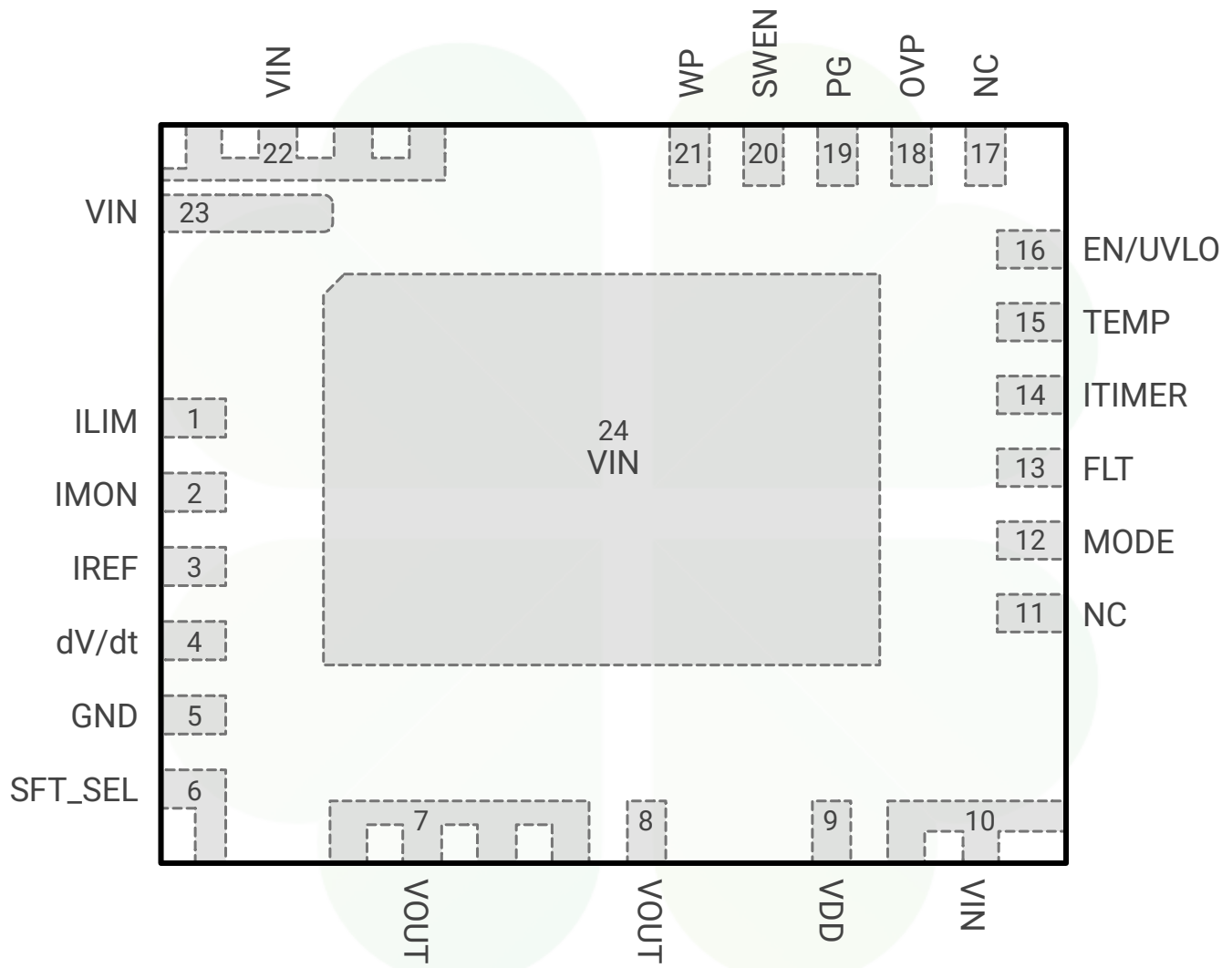


Typical Application Schematic

Parallel Operation



Package Reference



Top View

LGA-24 (5 × 6 mm)

Ordering Information

PART NUMBER	PACKAGE	SIZE	MSL RATING	SHIPPING METHOD	PACKAGE MARKING
RS31511AR	LGA - 24	5 × 6 mm	Level - 3	3000u Tape & Reel	R1511A
RS31511BR	LGA - 24	5 × 6 mm	Level - 3	3000u Tape & Reel	R1511B

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.

Absolute Maximum Ratings

	MIN	MAX	UNIT
VDD, VIN, VOUT	-0.3	90	V
Other Pins	-0.3	5.5	V
Junction Temperature	-40	150	°C
Storage Temperature	-65	150	°C
Lead Soldering Temperature		260	°C

Note: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These ratings are stress limits only and do not imply functional operation. Prolonged exposure to absolute maximum rating conditions may affect device reliability.

Recommended Operating Conditions

	MIN	MAX	UNIT
VIN	9	80	V
I_{OUT}	0	20	A
Peak Output Current (I_{OUT})		24	A
Other Pins		5	V
Operating Junction Temperature	-40	125	°C

Note: Operation outside the recommended operating conditions is not guaranteed.

Thermal Ratings

THERMAL METRIC	LGA-24	UNIT
Junction to Top Characterization, Ψ_{JT}	1.1	°C/W
Junction to Ambient, Θ_{JA}	22	°C/W

ESD Ratings

ELECTROSTATIC DISCHARGE	STANDARD	RATING	UNIT
Human Body Model (HBM)	ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	±2000	V
Charge Device Model (CDM)	JEDEC JESD22-101 ⁽²⁾	±500	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

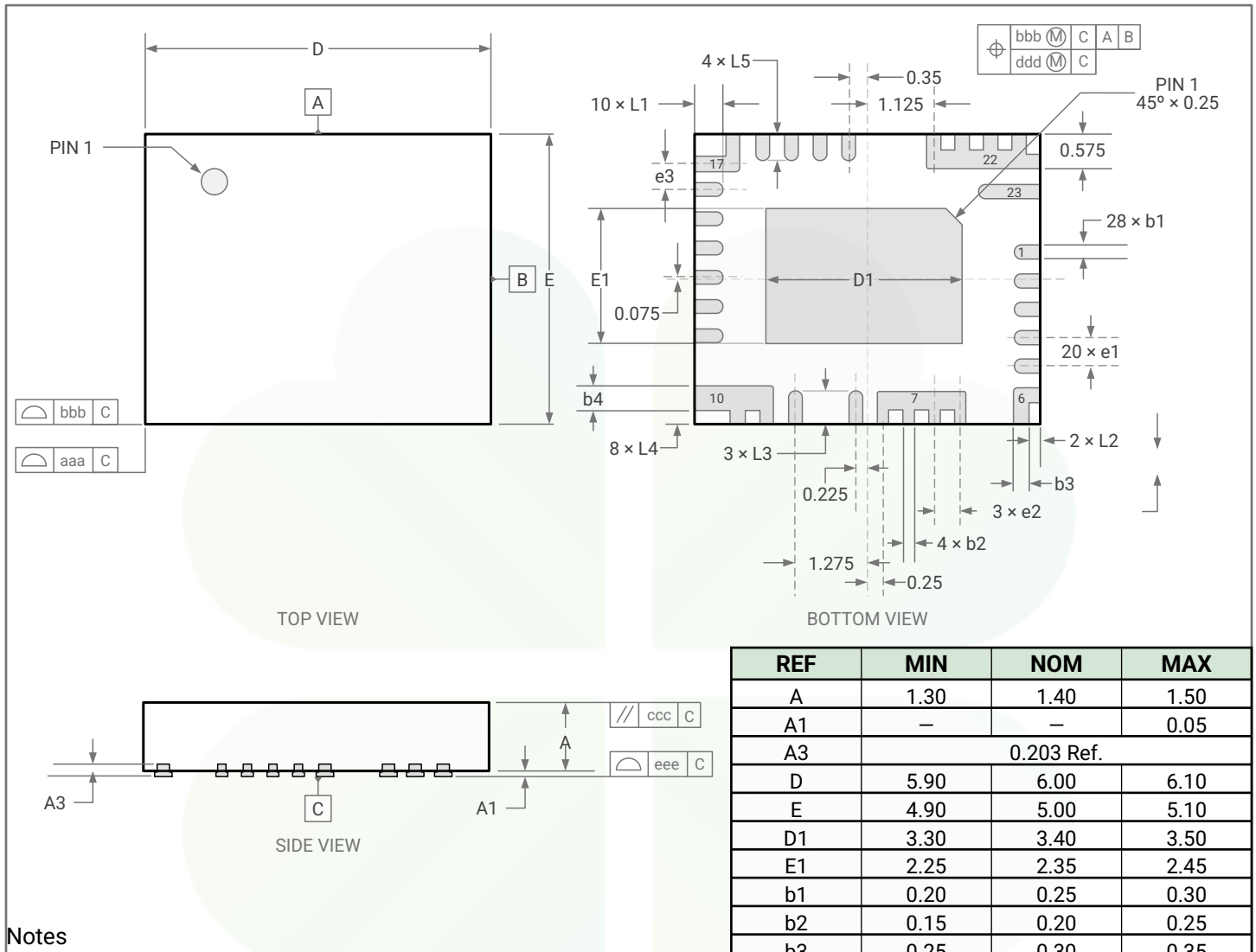
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

Pin Descriptions

PIN	NAME	TYPE	DESCRIPTION
1	ILIM	I	Startup current-limit programming input. Connect a resistor from this pin to GND to set the startup overcurrent threshold and fast-trip threshold. This resistor also sets the active current-sharing threshold during parallel operation.
2	IMON	I/O	Sets the steady-state overcurrent threshold and fast-trip threshold using a resistor to GND. This pin also provides an analog current monitor output proportional to load current.
3	IREF	I	Current-reference programming input. Connect a resistor from this pin to GND to program the reference for overcurrent protection, short-circuit protection, and active current sharing.
4	dV/dt	I	Output slew-rate programming input. Connect a capacitor from this pin to GND to program the output voltage slew rate during startup.
5	GND	G	Ground reference.
6	SFT_SEL	I	Scalable fast-trip threshold selection input. Connect a resistor from SFT_SEL to GND to program the steady-state fast-trip threshold multiplier.
7, 8	VOUT	P	Protected power output. An optional Schottky diode between VOUT and GND may be used to clamp negative voltage transients.
9	VDD	P	Internal bias supply input. Connect to VIN through a resistor and bypass to GND with a local decoupling capacitor.
10, 22 – 24	VIN	P	Power input.
11, 17, 21	NC	—	No connect. Leave this pin unconnected..
12	MODE	I	Mode selection pin. Leave floating for standalone operation or leader mode during parallel operation. Connect to GND for follower mode.
13	FLT	O	Open-drain fault output. Pulls low to indicate a fault condition.
14	ITIMER	I	Auxiliary ADC input. Connect a capacitor from this pin to GND to program the overcurrent blanking time.
15	TEMP	O	Temperature monitor output. Provides the measured device junction temperature for system monitoring.
16	EN/UVLO	I	Enable input. Pull high to enable the power MOSFET and pull low to disable it. Connect to VIN through a resistor divider to program the input UVLO threshold.
18	OVP	I	Connect a resistor divider from VIN to this pin to program the input overvoltage protection threshold.
19	PG	O	Open-drain power-good output. Asserts when VOUT is within regulation.
20	SWEN	I/O	Parallel-operation synchronization I/O. Open-drain pin used to coordinate power MOSFET turn-on and turn-off between devices operating in parallel. Connect an external pull-up resistor to the recommended supply. The pin includes a weak internal pull-up.

Type: I = Input, O = Output, I/O = Bidirectional, P = Power, G = Ground, — = No Connect.

Package Dimensions



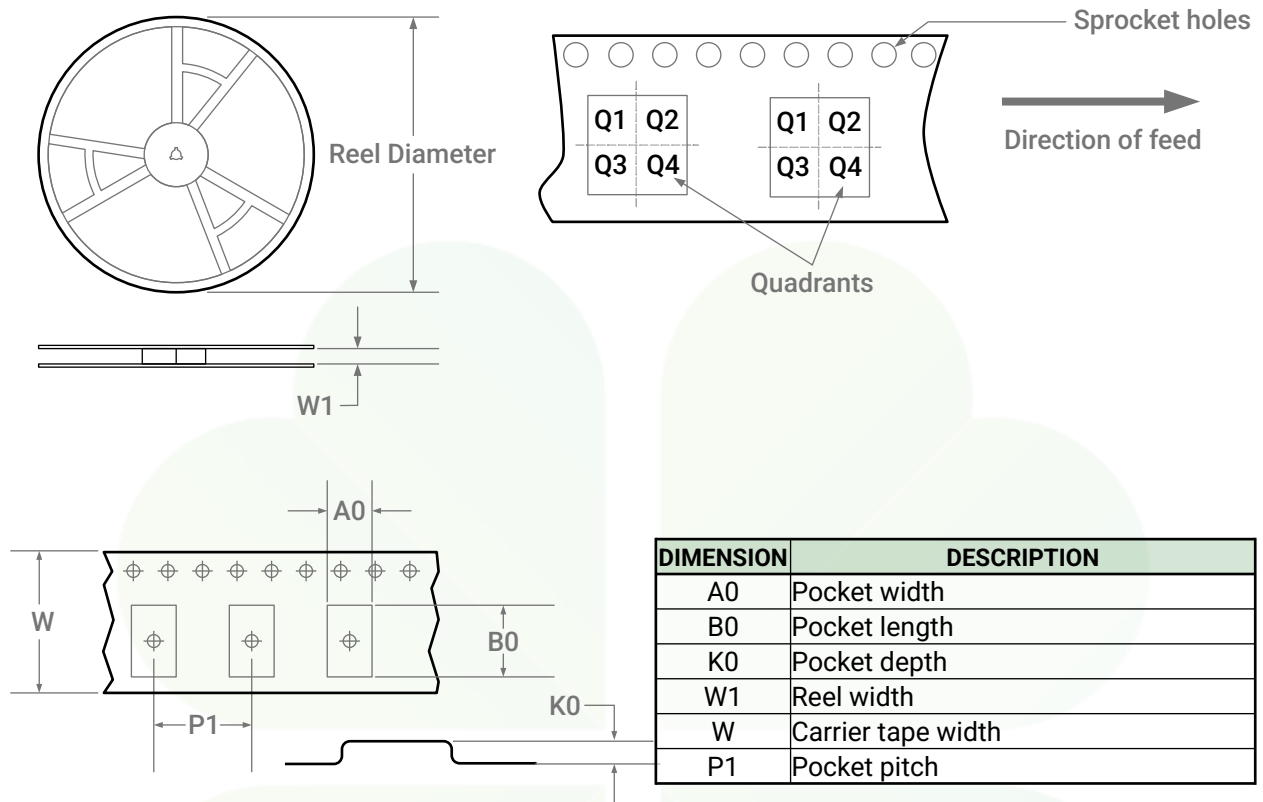
Notes

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

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Tape and Reel Information

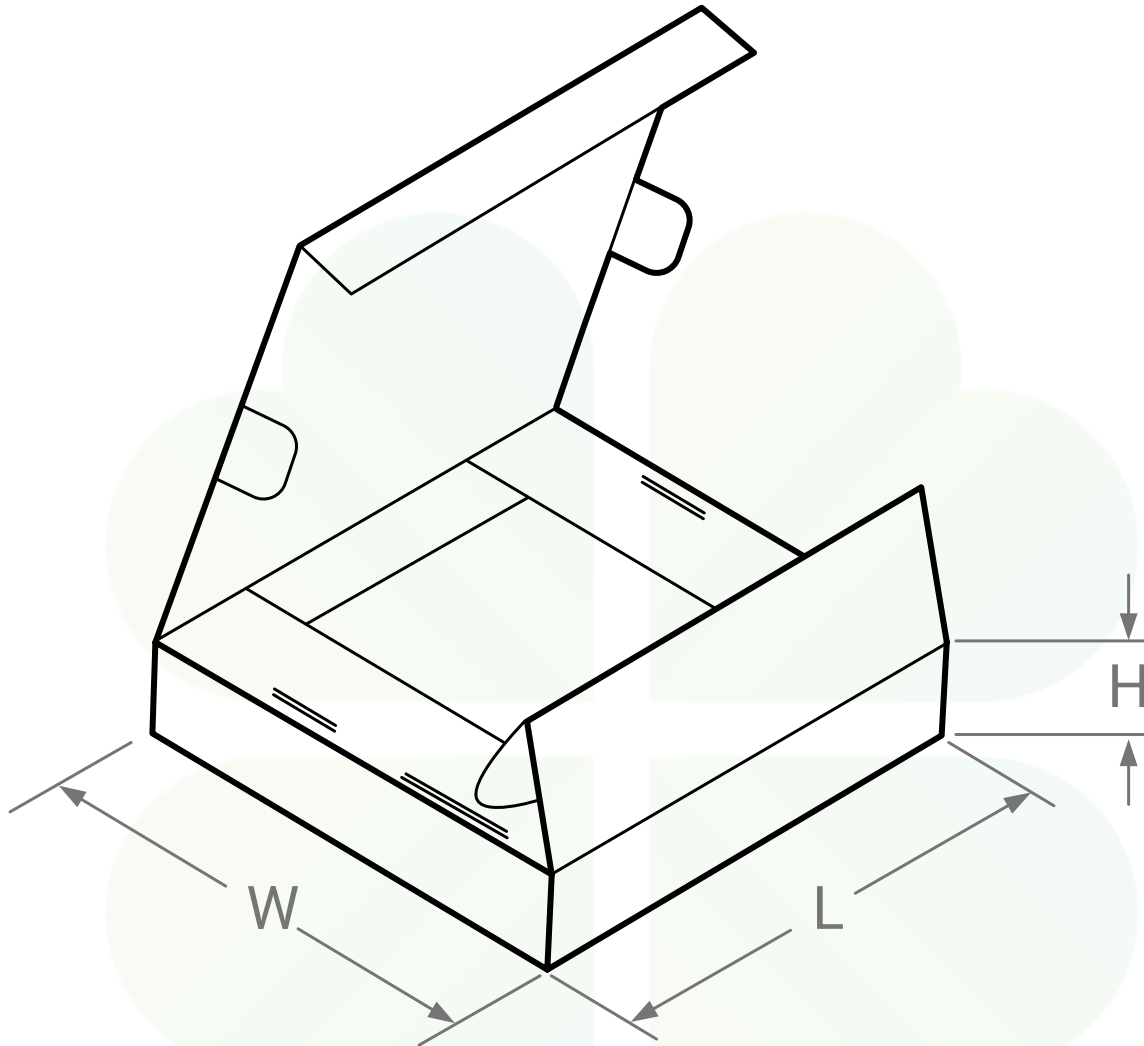


DEVICE SIZE	REEL DIAMETER	W1	A0	B0	K0	P1	W	QUAD
5 × 6	330	16.4	6.3	5.3	1.50	8.0	16.0	Q1

Notes:

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

Pizza Box Dimensions



DEVICE SIZE	UNITS/BOX	L	W	H
5 × 6	3000	357	340	51