

RS31512 Stackable 9V to 80V, 20A eFuse with PMBus

Features

Protection & Reliability

- Wide 9V to 80V operating input voltage
- Integrated ultra-low 4.3mΩ power MOSFET
- 20A continuous and 24A peak output current capability
- Independent startup and steady-state current limit control
- Adjustable short-circuit current limit
- Fast short-circuit protection
- Selectable latch-off or auto-retry protection
- Input-to-output short-circuit detection

PMBus & System Management

- PMBus interface for configuration and telemetry
- Integrated precision current monitoring
- Fault indication and power-good indication

Scalability & Control

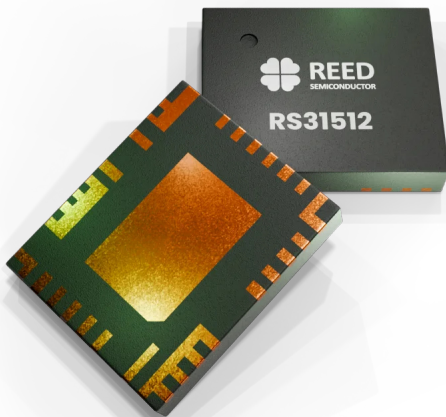
- Standalone or leader operation in parallel applications
- Adjustable output soft-start time
- Parallel operation for higher-current applications

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



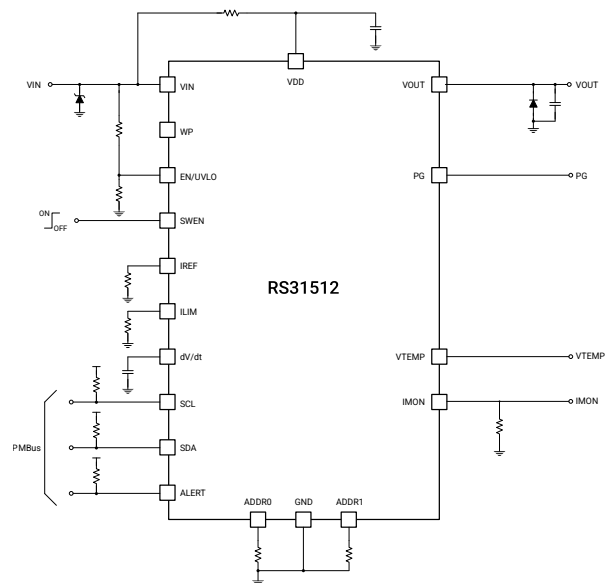
Description

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.

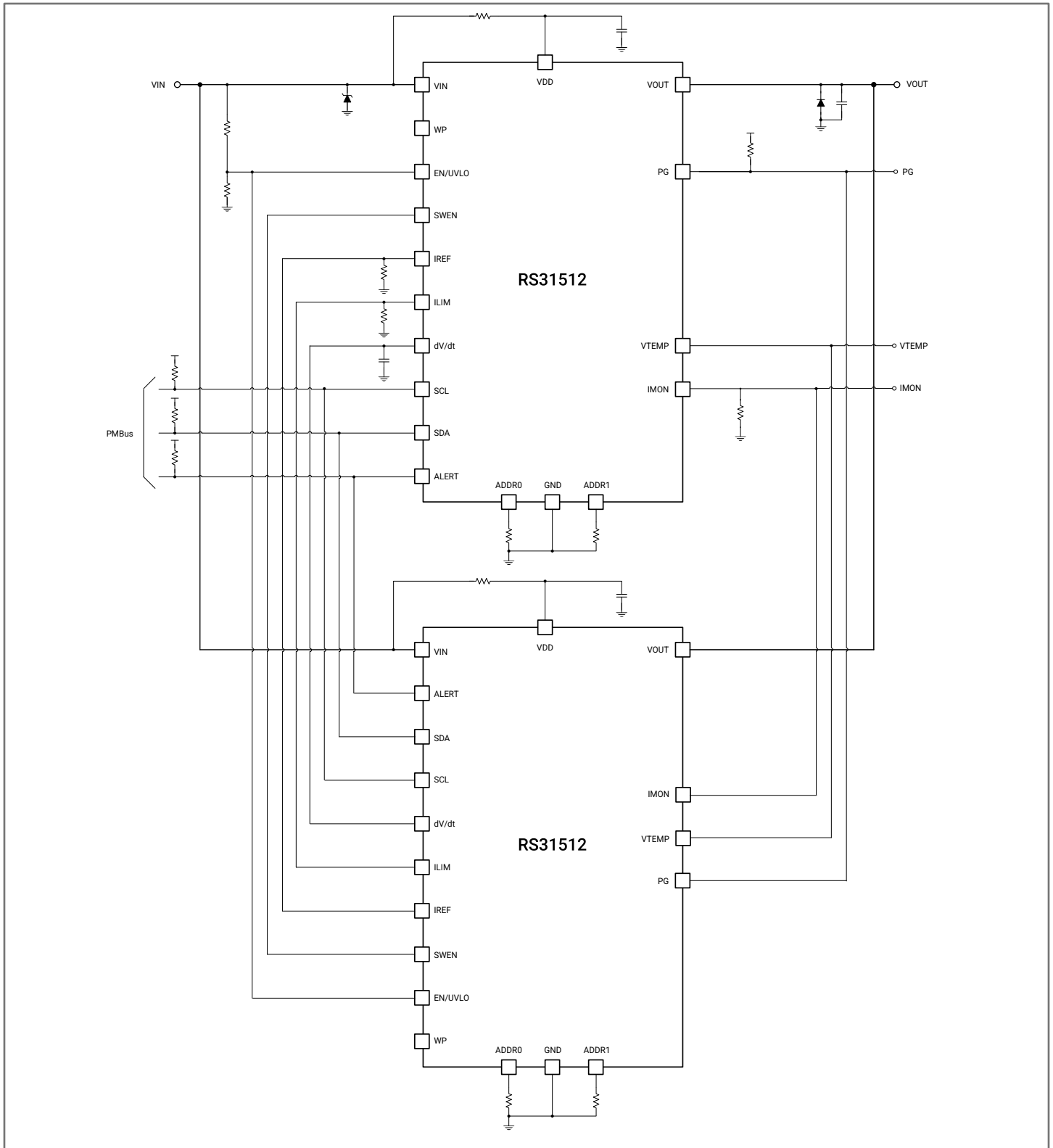
The integrated PMBus interface enables remote configuration, monitoring, and telemetry, including current reporting and fault status, simplifying system management and diagnostics. Multiple RS31512 devices can be connected in parallel using a leader-follower architecture to increase system current capability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

PART NUMBER	PACKAGE	SIZE
RS31512	LGA - 24	5 × 6 mm

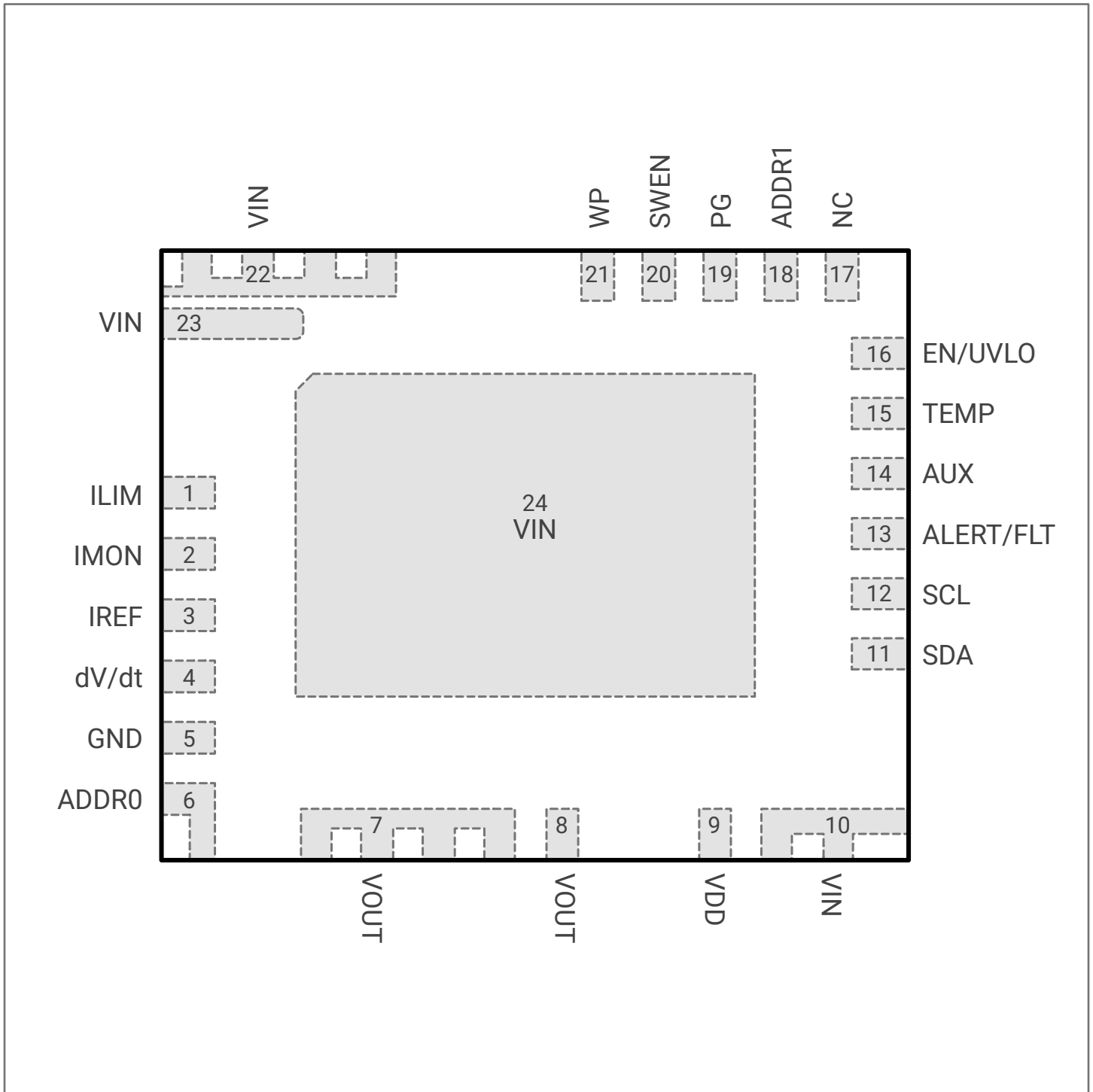


Typical Application Schematic

Parallel Operation



Package Reference



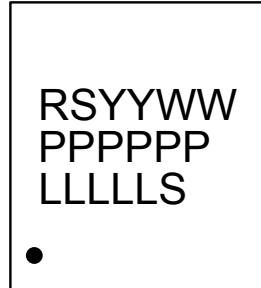
Top View

LGA-24 (5 × 6 mm)

Ordering Information

PART NUMBER	PACKAGE	SIZE	MSL RATING	SHIPPING METHOD	PACKAGE MARKING
RS31512R	LGA - 24	5 × 6	Level - 3	3000u Tape & Reel	R31512

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
OtherPins	-0.3	5.5	V
Junction Temperature	-40	150	°C
StorageTemperature	-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 JunctionTemperature	-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.

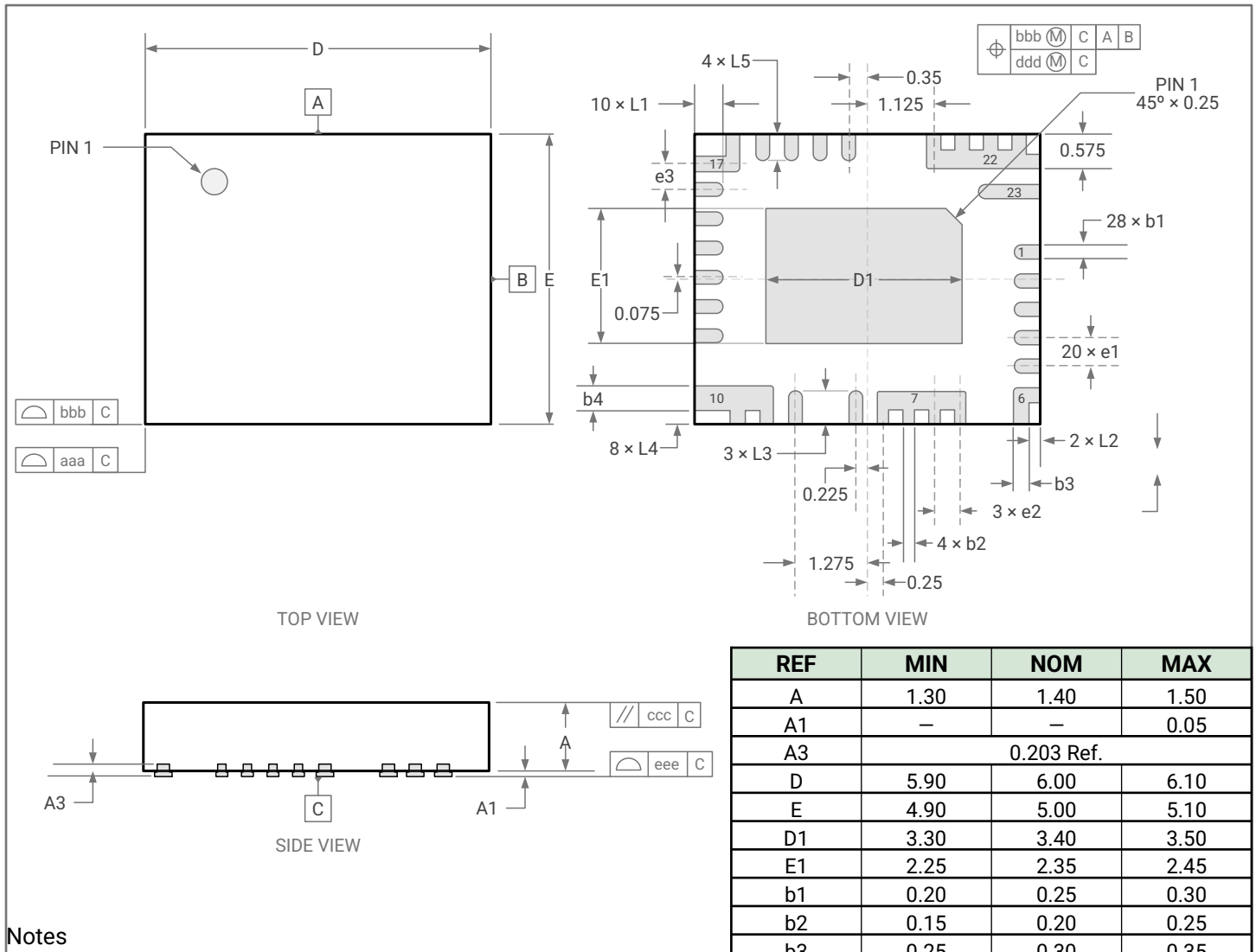
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

Pin Descriptions

PIN	NAME	TYPE	DESCRIPTION
1	ILIM	I	Startup current-limit programming input. Connect a resistor from ILIM to GND to set the startup overcurrent and fast-trip thresholds. During parallel operation, this pin also sets the active current-sharing threshold during steady-state operation.
2	IMON	I/O	Steady-state current-limit programming and current monitor pin. Connect a resistor from IMON to GND to set the steady-state overcurrent and fast-trip thresholds. The IMON voltage is proportional to output current and can be used for current monitoring.
3	IREF	I	Current-reference programming input. Connect a resistor from IREF to GND to set the reference thresholds for overcurrent protection, short-circuit protection, and active current-sharing control.
4	dV/dt	I	Output slew-rate programming input. Connect a capacitor from dV/dt to GND to set the output rise time during startup.
5	GND	G	Ground reference.
6	ADDR0	I	PMBus address selection input. Configure ADDR0 using the recommended resistor connection to set the PMBus address.
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 control supply input. Connect VDD to VIN through the recommended filter resistor and bypass VDD to GND with a local decoupling capacitor.
10, 22 – 24	VIN	P	Power input.
11	SDA	I/O	PMBus bidirectional serial data line.
12	SCL	I	PMBus serial clock input.
13	ALERT/FLT	O	Open-drain PMBus ALERT or fault output. Defaults to the FLT function after reset.
14	AUX	I	Auxiliary ADC input. Connect an external analog signal for digitization and reporting through the PMBus interface.
15	TEMP	O	Temperature monitor output. Provides the measured device junction temperature for system monitoring.
16	EN/UVLO	I	Enable and input undervoltage lockout input. Drive high to enable the power MOSFET and drive low to disable it. Connect to VIN through a resistor divider to program the VIN UVLO threshold.
17	NC	—	No connect. Leave this pin unconnected.
18	ADDR1	I	PMBus address selection input. Configure ADDR1 using the recommended resistor connection to set the PMBus address.
19	PG	O	Open-drain power-good output. Asserts when VOUT is within regulation.
20	SWEN	I/O	Parallel-operation synchronization pin. Open-drain I/O used to coordinate power MOSFET turn-on and turn-off between devices operating in parallel.
21	WP	I	PMBus write-protect input. Connect WP to GND to disable PMBus write access. When left floating, write protection is controlled by the MFR_WRITE_PROTECT command.

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

Package Dimensions



Notes

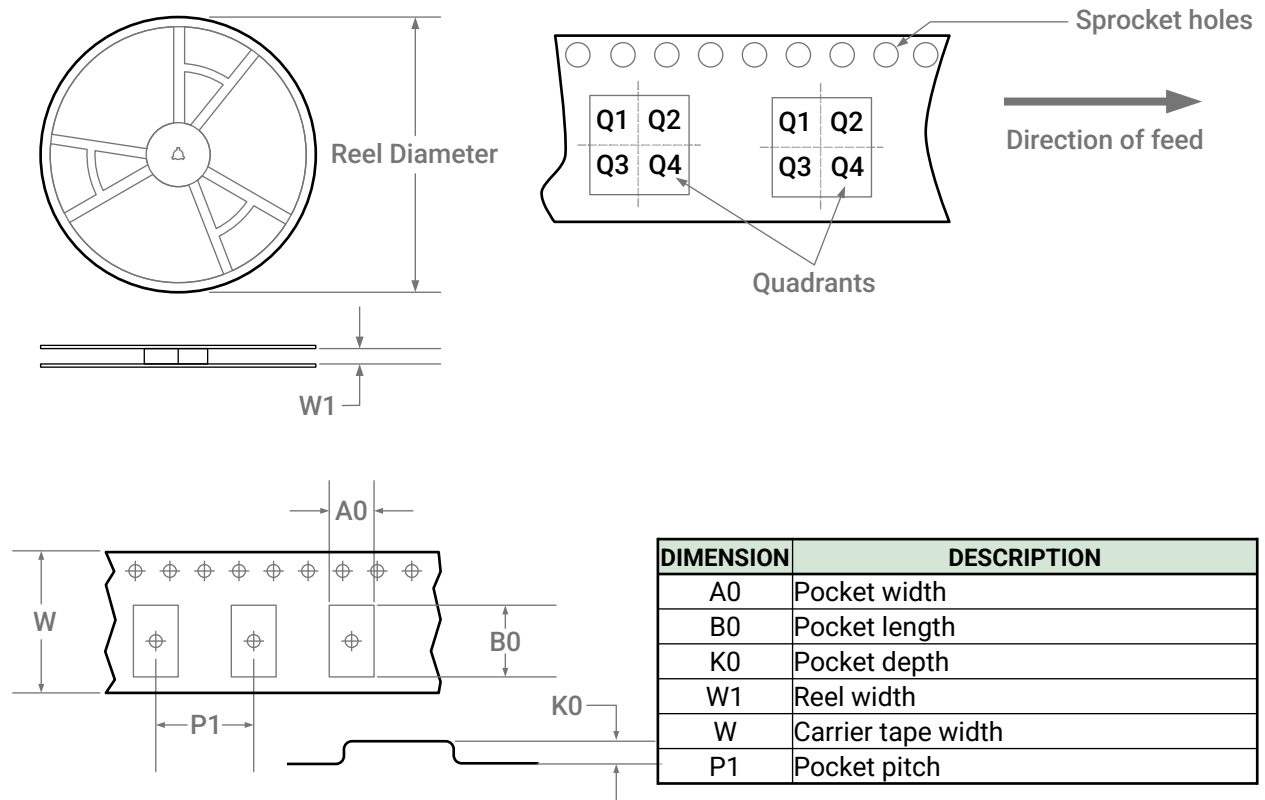
1. All dimensions are in millimeters.
2. Dimensioning and tolerancing per JEDEC MO-220.
3. Drawing is not to scale.

This detailed mechanical drawing illustrates the PCB layout for a 28-pin package. The layout is symmetrical about a central vertical axis (indicated by a dashed line with a center mark). Key dimensions and features include:

- Overall Dimensions:** The total width is 5.75 units, and the total height is 2.325 units. The central area has a width of 3.2 units and a height of 2.05 units.
- Pin Locations:** The 28 pins are arranged in two rows of 14 pins each. The pin pitch is 0.25 units. The pins are numbered 1 through 28, with 14 pins on the left and 14 pins on the right.
- Component Locations:** The components are located in the center of the layout. The central component is a square with a width of 3.4 units and a height of 1.18 units. It has a central hole with a diameter of $\phi 0.2$ units. The component is surrounded by a solder mask opening (Typ.) with a width of 1.125 units and a height of 0.35 units. The component is also surrounded by a metal under solder mask (Typ.) with a width of 0.45 units and a height of 0.075 units.
- Other Dimensions:** The drawing includes numerous other dimensions for various features, such as the width of the solder mask opening (1.125), the width of the metal under solder mask (0.45), the width of the central component (3.4), and the width of the central hole ($\phi 0.2$).

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

Tape and Reel Information

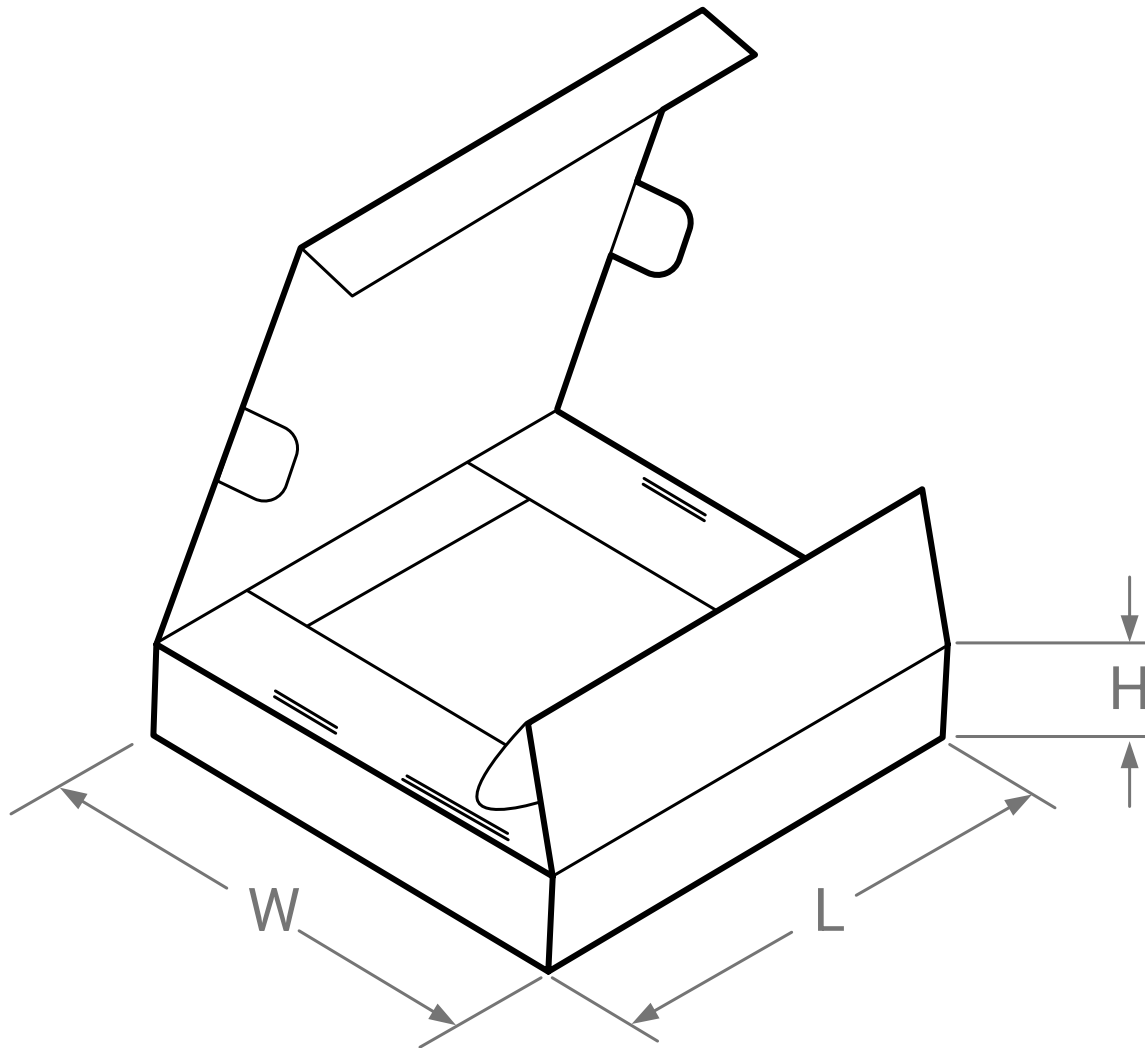


DEVICE SIZE	REEL DIAMETER	W1	A0	B0	K0	P1	W	QUAD
5 × 6	330	16.4	6.3	5.3	1.50	8.0	16.0	Q1

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