RS31512 Stackable 20A eFuse with PMBus Digital Telemetry

Features

- Wide input voltage range: 9V to 80V
- Integrated 4.3mΩ Pass MOSFET
- Support 20A DC current and 24A peak current
- Standalone mode or primary mode in parallel application
- PMBus interface for configuration and telemetry
- Accurate current monitor
- Adjustable output soft start time
- Adjustable current limit during soft start and steady state
- Adjustable short circuit current limit
- Fast trip short-circuit protection
- Fault indication and power good indication
- Latch-off or auto-retry option for protections
- Input to output short circuit detection
- RoHS compliant and Green

Applications

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

Description

The RS31512 is an active circuit protection device with integrated MOSFET used to limit current and voltage to safe levels during fault conditions.

The current limit level during startup and steady state can be set separately. Also, the device has integrated current sense to provide current monitor signal.

With PMBus interface, it allows user to configure and monitor the device.

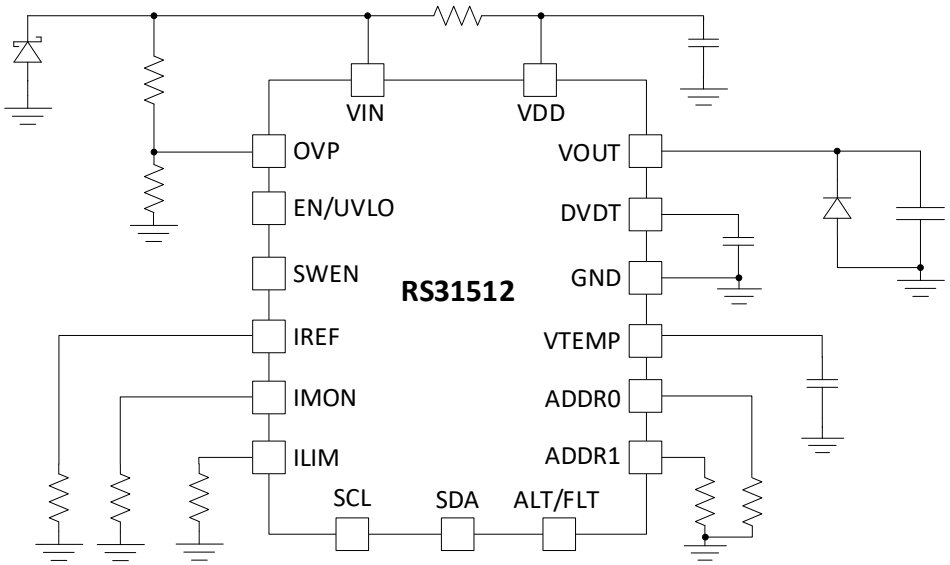
In addition, the device provides fault indication to the system for monitoring and control.

RS31512 can be connected in parallel for higher current applications.

The device is available in LGA-24, 5x6 mm package.

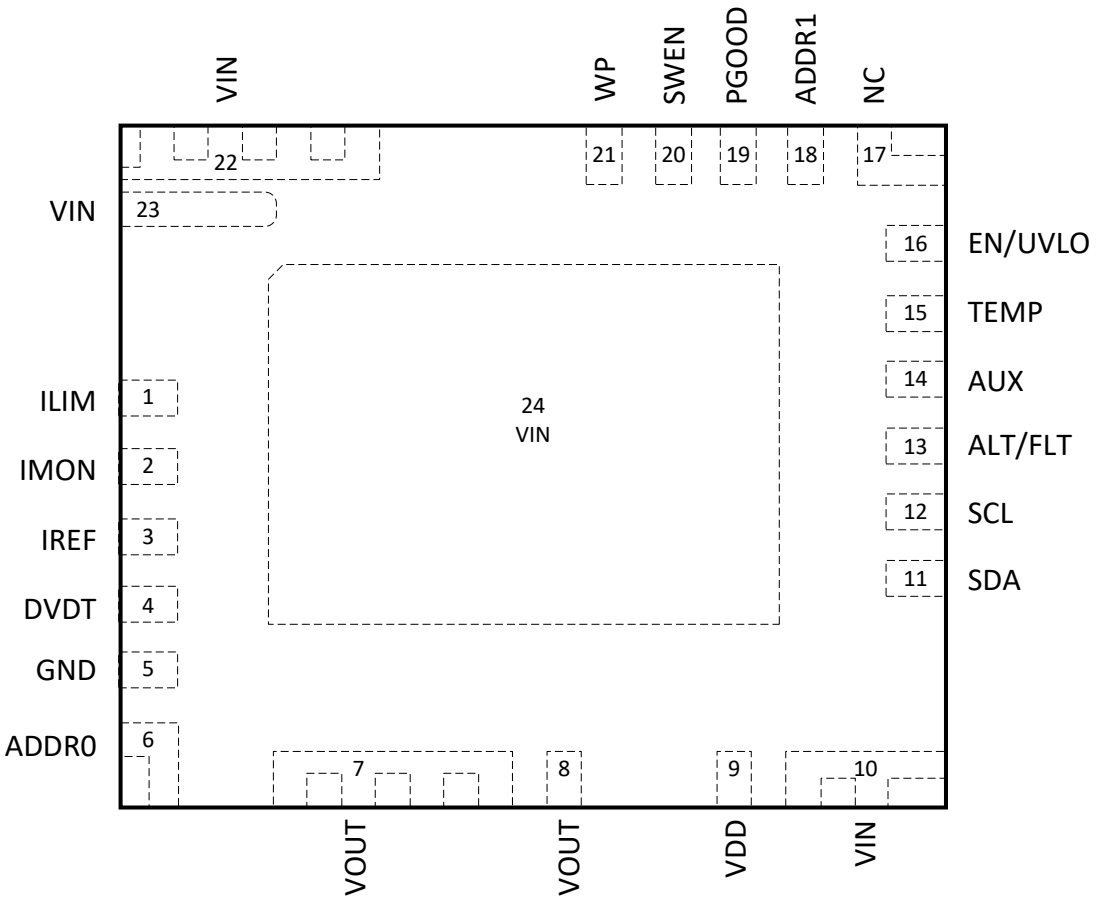
PART NUMBER	PACKAGE	BODY SIZE
RS31512	LGA-24	5x6 mm

Typical Application Circuit



Package Reference

Top View



LGA-24 (5x6 mm)

Order Information

Part Number	Protection	Package	Size	MSL	Shipping Method	Package Marking
RS31512R	Latch	LGA-24	5x6 mm	Level-3	3000u Tape & Reel	R31512

Top Marking

Line 1

- RS: Prefix of Reed Semiconductor (RS is 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

Absolute Maximum Ratings

	Min	Max	Unit
V_{IN}, V_{DD}	-0.3	90	V
V_{OUT}	-0.3	90	V
Other pins	-0.3	5.5	V
Junction Temperature	-40	150	°C
Storage Temperature	-65	150	°C
Lead Temperature		260	°C

Note. Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Recommended Operating Conditions

	Min	Typ	Max	Unit
Input voltage operating range	9		80	V
Output DC current	0		20	A
Output peak current	0		24	A
SWEN, EN/UVLO, PG, TEMP, DVDT, IMON, ILIM, IREF, SCL, SDA, ALT/FLT, ADDR0, ADDR1			5	V
Operating junction temperature	-40		125	°C

Note. The device is not guaranteed to function outside of its operating conditions.

Thermal Ratings

Thermal Metric	LGA-24	Unit
Junction to top characterization, Ψ_{JT}	TBD	°C/W
Junction to Ambient, Θ_{JA}	TBD	°C/W

ESD Ratings

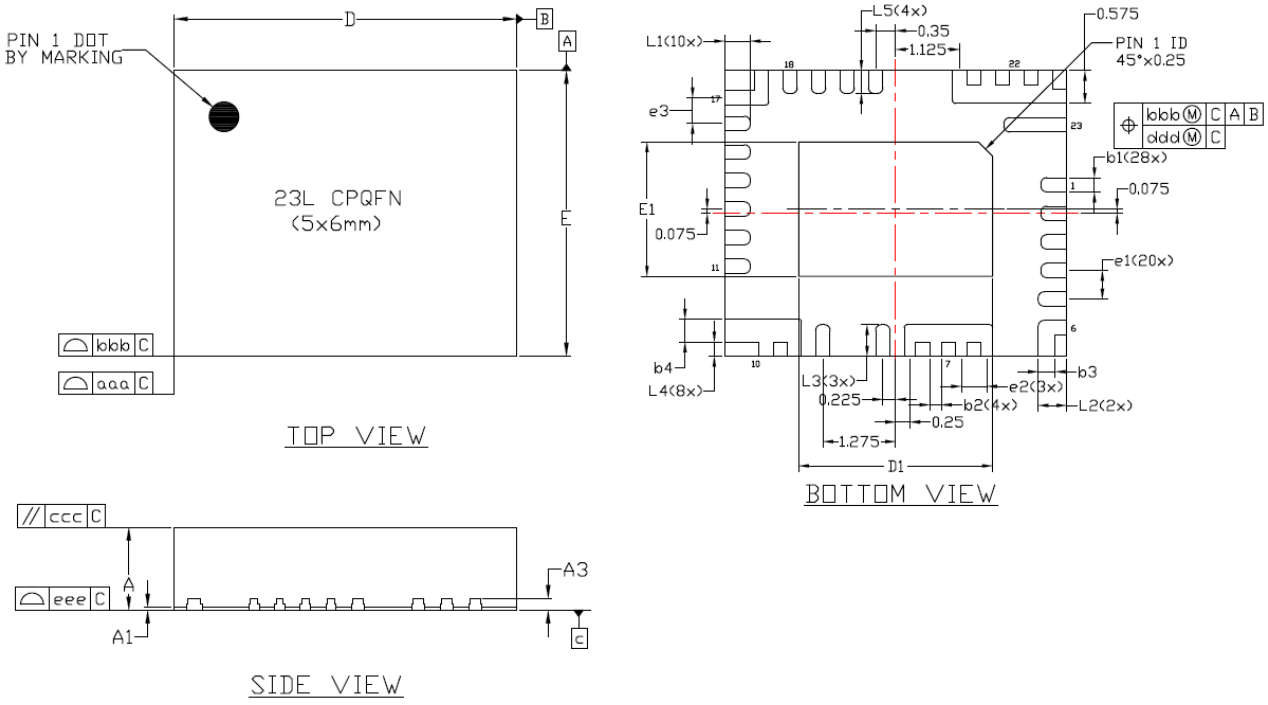
Electrostatic Discharge	Standard	Value
Human Body Mode (HBM)	ANSI/ESDA/JEDEC JS-001(1)	±2000V
Charge Device Mode (CDM)	JEDEC JESD22-101(2)	±1000V

(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 Description

No.	NAME	TYPE	Description
1	ILIM	O	A resistor from this pin to GND sets the overcurrent protection threshold and the fast-trip threshold during start-up. This pin also sets the active current sharing threshold during steady state in parallel operation.
2	IMON	O	A resistor from this pin to GND sets the overcurrent protection threshold and the fast-trip threshold during steady state. This pin can also be used as the current monitoring pin. The voltage on this pin is proportional to the load current.
3	IREF	O	A resistor from this pin to GND sets the reference voltage for over-current, short circuit protection and active current circuit.
4	DVDT	O	Vout slew rate setting pin. A capacitor to GND sets the Vout slew rate during power up.
5	GND	G	Signal ground
6	ADDR0	O	PMBus address pin.
7,8	VOUT	O	Power output. A Schottky diode can be placed between VOUT and GND to clamp negative voltage spike.
9	VDD	O	Power input pin for the internal control circuit. Connect this pin to VIN through a resistor to filter noise. Place a decoupling capacitor between this pin and GND.
10, 22, 23, 24	VIN	I	Power input pin.
11	SDA	I/O	PMBus data line
12	SCL	I/O	PMBus clock line
13	ALT/FLT	O	PMBus Alert signal or fault pin. It is configured as FLT pin in default.
14	AUX	I	Auxiliary ADC input which can be used to convert external analog to digital through PMBus interface.
15	TEMP	O	Temperature sense output.
16	EN/UVLO	I	Enable input. Pull high to turn on the power FET and pull low to turn off the power FET. Connect the pin to VIN through resistor divider to set VIN ULVO threshold.
18	ADDR1	O	PMBus address pin.
19	PGOOD	O	Power good output. Open drain pin.
20	SWEN	I/O	Open-drain pin to indicate and control power MOSFET ON/OFF. This pin is used to synchronize ON/OFF in parallel application.
21	WP	I	Write Protect: Connect this pin to GND to disable PMBus write access. When this pin is floating, PMBus write access is controlled by the MFR_WRITE_PROTECT command.

PACKAGE DIMENSION

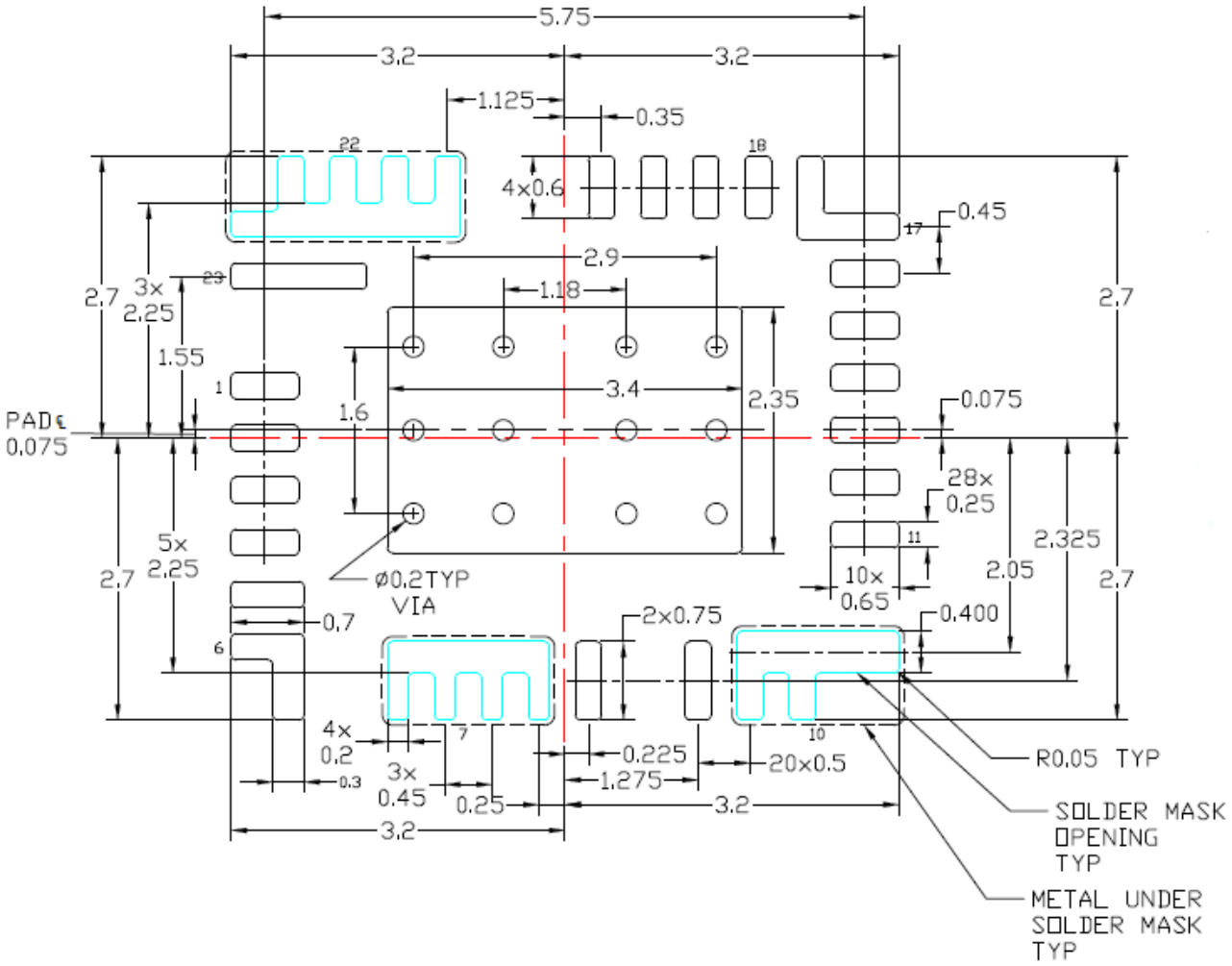


Dimensional Ref.			
REF.	Min.	Nom.	Max.
A	1.30	1.40	1.50
A1	---	---	0.05
A3	0.203 Ref.		
D	5.90	6.00	6.10
E	4.90	5.00	5.10
D1	3.30	3.40	3.50
E1	2.25	2.35	2.45
b1	0.20	0.25	0.30
b2	0.15	0.20	0.25
b3	0.25	0.30	0.35
b4	0.35	0.40	0.45
e1	0.50 BSC		
e2	0.45BSC		
e3	0.45BSC		
L1	0.35	0.45	0.55
L2	0.40	0.50	0.60
L3	0.45	0.55	0.65
L4	0.20	0.25	0.30
L5	0.30	0.40	0.50
Tol. of Form&Position			
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		

Notes

1. All DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER JEDEC MO-220.
3. DRAWING IS NOT TO SCALE.

RECOMMENDED LAND PATTERN



Note:

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