RS17G22 — 16-Phase Dual-Rail TLVR Controller with PWMVID/AVSBus and PMBus

Features

Flexible 16-Phase Dual-RailArchitecture

- Up to 16 phases with flexible N + M ≤ 16 allocation
  - Configurations from 16 + 0 to 8 + 8
- Flexible phase-order assignment

Native TLVR & Fast Transient Performance

- Native Trans-Inductor Voltage Regulator (TLVR) support
  - No additional external passive components required
  - Integrated 1kΩ current-sense resistor
- Programmable overshoot and undershoot reduction
- Automatic phase add/drop with programmable thresholds
- Thermal phase balancing
- Up to 4MHz switching frequency
- Constant-on-time control
- Programmable DC load line

Wide operating range and high-accuracy regulation

- 4.5V to 16V input; 0.2V to 2.8V output
- ±0.5% output-voltage accuracy with differential sensing
- Programmable load-line control

Integrated telemetry

- ±1.5% voltage and current accuracy
- ±2°C temperature accuracy

Comprehensive protection

- UVLO, UVP, OVP, OCP, and OTP
- Cycle-by-cycle per-phase current limiting
- Programmable latch-off or auto-retry fault response

Digital Configuration & Diagnostics

- NVIDIA PWMVID compliant
- AVSBus compliant
- PMBus v1.41 compliant
- MTP with up to 32 writes for field programmability
- Black-box registers for fault recording

Package

- 7mm × 7mm, 56-pin QFN
- RoHS compliant and green

Applications

- AI Accelerators and GPU Core Power
- Server and HPC Processor Core Power
- Graphics Cards
- High-Current Multiphase Voltage Regulators
- Telecom Power Systems

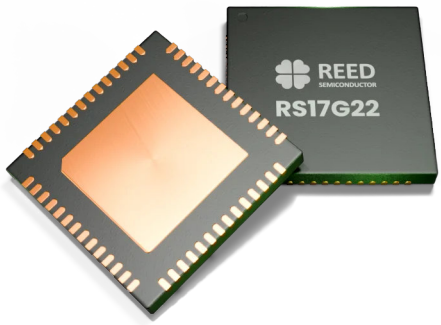
Description

The RS17G22 is a high-performance, dual-rail digital multiphase controller supporting up to 16 phases with flexible N + M ≤ 16 phase allocation. Designed for high-current server, computing, graphics, and telecom power applications, the device operates from 4.5V to 16V and supports output voltages from 0.2V to 2.8V with ±0.5% output-voltage accuracy.

Native TLVR support, constant-on-time control, programmable DC load-line regulation, and automatic phase add/drop provide fast transient response and efficient operation across changing load conditions. Switching frequencies up to 4MHz enable high-density power conversion, while programmable overshoot and undershoot reduction and thermal phase balancing further optimize transient and thermal performance.

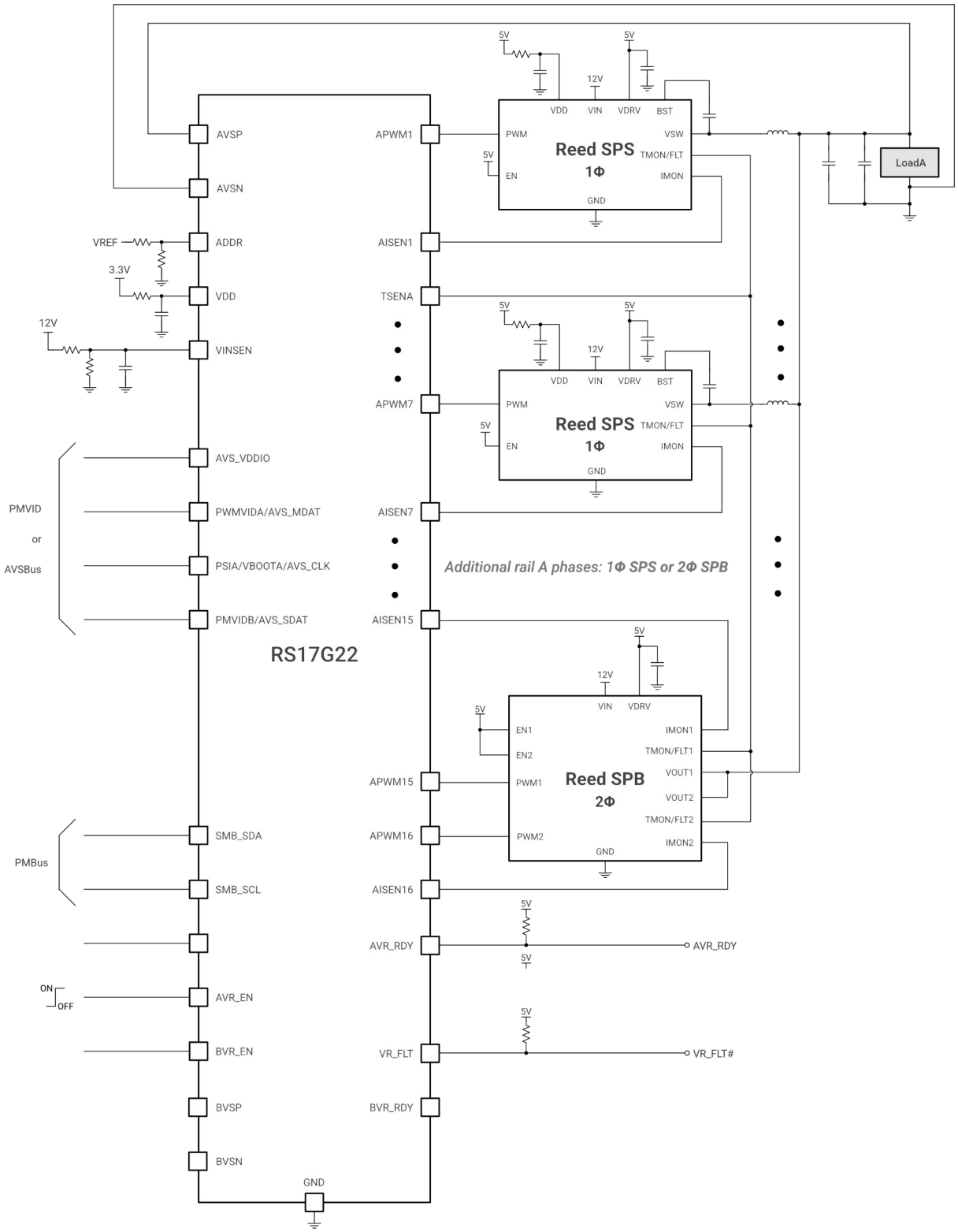
Integrated voltage, current, and temperature telemetry provides real-time system monitoring. The RS17G22 supports NVIDIA PWMVID, AVSBus, and PMBus v1.4.1, with MTP configuration and black-box fault recording for system configuration and diagnostics. Integrated protection includes UVLO, UVP, OVP, OCP, OTP, cycle-by-cycle per-phase current limiting, and programmable latch-off or auto-retry fault response.

When paired with Reed Smart Power Stages or Smart Power Blocks, the RS17G22 provides a scalable, high-density multiphase power solution for high-current processor and accelerator rails. The device is offered in a 7mm × 7mm, 56-pin QFN package and operates from −40°C to 125°C.



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Typical Application Schematic (16 + 0)



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Ordering Information

PART NUMBER	PACKAGE	SIZE	MSL RATING	SHIPPING METHOD	PACKAGE MARKING
RS17G22R	QFN-56	7 × 7mm	Level-3	3000u Tape & Reel	R17G22

Top Marking



Line 1

- RS: Prefix of Reed Semiconductor (R is replaced by E for engineering lots)
- YY: Year code
- WW: Week code

Line 2

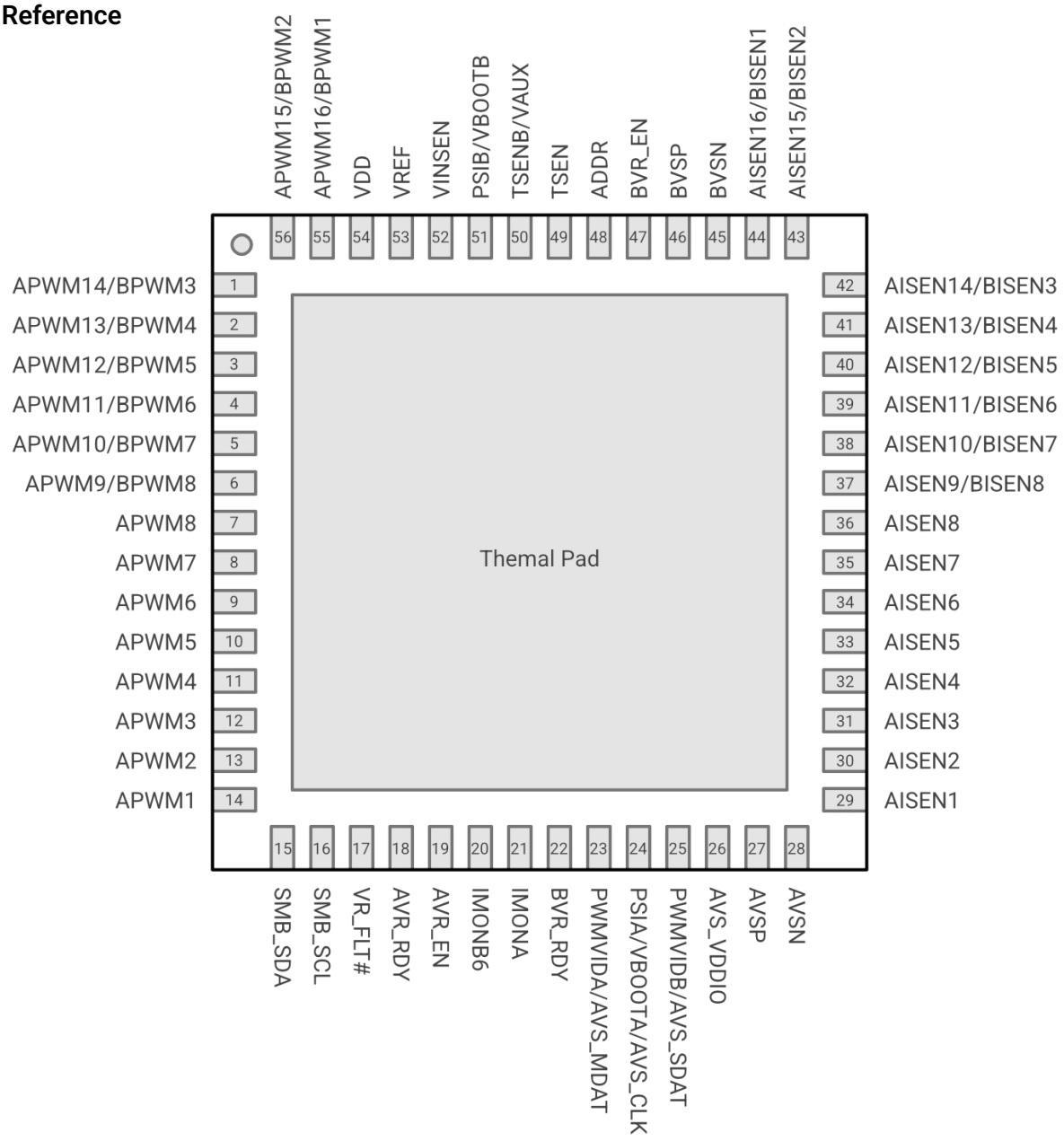
- PPPPP: Truncated part number

Line 3

- LLLLL: Lot code
- S: Assembly site code

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Package Reference



QFN-56 (7 × 7mm)

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Pin Descriptions

PIN	NAME	TYPE	DESCRIPTION
1	APWM14/ BPWM3	O	PWM output for Rail A Phase 14 or Rail B Phase 3.
2	APWM13/ BPWM4	O	PWM output for Rail A Phase 13 or Rail B Phase 4.
3	APWM12/ BPWM5	O	PWM output for Rail A Phase 12 or Rail B Phase 5.
4	APWM11/ BPWM6	O	PWM output for Rail A Phase 11 or Rail B Phase 6.
5	APWM10/ BPWM7	O	PWM output for Rail A Phase 10 or Rail B Phase 7.
6	APWM9/ BPWM8	O	PWM output for Rail A Phase 9 or Rail B Phase 8.
7	APWM8	O	PWM output for Rail A Phase 8.
8	APWM7	O	PWM output for Rail A Phase 7.
9	APWM6	O	PWM output for Rail A Phase 6.
10	APWM5	O	PWM output for Rail A Phase 5.
11	APWM4	O	PWM output for Rail A Phase 4.
12	APWM3	O	PWM output for Rail A Phase 3.
13	APWM2	O	PWM output for Rail A Phase 2.
14	APWM1	O	PWM output for Rail A Phase 1.
15	SMB_SDA	I/O	Open-drain PMBus bidirectional serial data.
16	SMB_SCL	I	PMBus serial clock input.
17	VR_FLT#	O	Active-low, open-drain catastrophic-fault output.
18	AVR_RDY	O	Active-high, open-drain Power Good output for Rail A.
19	AVR_EN	I	Active-high Rail A enable input.
20	IMONB	O	Rail B total output-current monitor.
21	IMONA	O	Rail A total output-current monitor.
22	BVR_RDY	O	Active-high, open-drain Power Good output for Rail B.
23	PWMVIDA/ AVS_MDAT	I	Configurable PWMVIDA or AVSBus command-data input.
24	PSIA/ VBOOTA/ AVS_CLK	I	Configurable PSIA, VBOOTA, or AVSBus clock input.
25	PWMVIDB/ AVS_SDAT	I/O	Configurable PWMVIDB or AVSBus response-data signal.

PWM outputs (Pins 1–14): 3.3V CMOS tri-state outputs. Low: low-side FET ON; High: high-side FET ON; Tri-state: both FETs OFF. If unused, leave floating.

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

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Pin Descriptions

PIN	NAME	TYPE	DESCRIPTION
26	VDDIO	P	AVSBus interface supply and I/O reference voltage.
27	AVSP	I	Rail A positive remote-sense input. Connect to the output-voltage sense point at the load.
28	AVSN	I	Rail A negative remote-sense input. Connect to load ground.
29	AISEN1	I	Rail A Phase 1 current-sense input.
30	AISEN2	I	Rail A Phase 2 current-sense input.
31	AISEN3	I	Rail A Phase 3 current-sense input.
32	AISEN4	I	Rail A Phase 4 current-sense input.
33	AISEN5	I	Rail A Phase 5 current-sense input.
34	AISEN6	I	Rail A Phase 6 current-sense input.
35	AISEN7	I	Rail A Phase 7 current-sense input.
36	AISEN8	I	Rail A Phase 8 current-sense input.
37	AISEN9/ BISEN8	I	Current-sense input for Rail A Phase 9 or Rail B Phase 8.
38	AISEN10/ BISEN7	I	Current-sense input for Rail A Phase 10 or Rail B Phase 7.
39	AISEN11/ BISEN6	I	Current-sense input for Rail A Phase 11 or Rail B Phase 6.
40	AISEN12/ BISEN5	I	Current-sense input for Rail A Phase 12 or Rail B Phase 5.
41	AISEN13/ BISEN4	I	Current-sense input for Rail A Phase 13 or Rail B Phase 4.
42	AISEN14/ BISEN3	I	Current-sense input for Rail A Phase 14 or Rail B Phase 3.
43	AISEN15/ BISEN2	I	Current-sense input for Rail A Phase 15 or Rail B Phase 2.
44	AISEN16/ BISEN1	I	Current-sense input for Rail A Phase 16 or Rail B Phase 1.
45	BVSN	I	Rail B negative remote-sense input. Connect to load ground.
46	BVSP	I	Rail B positive remote-sense input. Connect to the output-voltage sense point at the load.
47	BVR_EN	I	Active-high Rail B enable input.
48	ADDR	I	PMBus address-select input.
49	TSEN	I	Temperature-sense input for Rails A and B.
50	TSENB/VAUX	I	Configurable Rail B temperature-sense or auxiliary-voltage sense input.

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

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Pin Descriptions

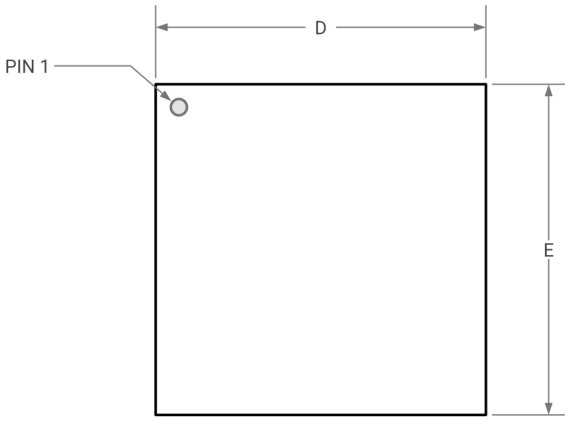
PIN	NAME	TYPE	DESCRIPTION
51	PSIB/ VBOOTB	I	Configurable PSIB or VBOOTB input. See Applications section for configuration details.
52	VINSEN	I	Power-stage input-voltage sense input.
53	VREF	O	1.5V reference output. Connect a 1.5V reference decoupling capacitor to GND.
54	VDD	P	3.3V supply input. Connect a ≥1μF decoupling capacitor to GND.
55	APWM16/ BPWM1	O	PWM output for Rail A Phase 16 or Rail B Phase 1.
56	APWM15/ BPWM2	O	PWM output for Rail A Phase 15 or Rail B Phase 2.
—	Themal Pad	G	Exposed thermal pad. Connect to the GND plane with multiple thermal vias.

PWM outputs (Pins 55 & 56): 3.3V CMOS tri-state outputs. Low: low-side FET ON; High: high-side FET ON; Tri-state: both FETs OFF. If unused, leave floating.

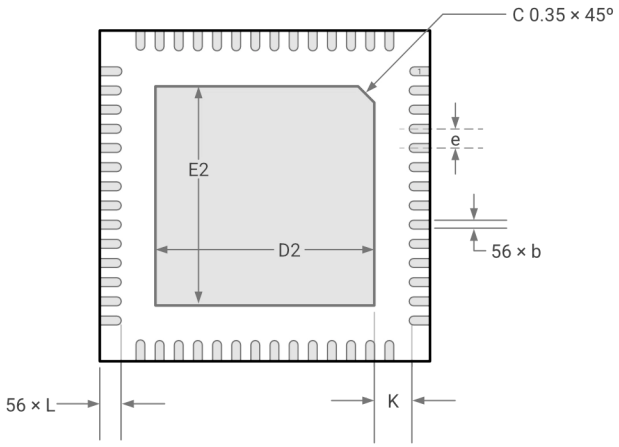
Type: I = Input, O = Output, I/O = Bidirectional, P = Power, G = Ground, — = No Connect.

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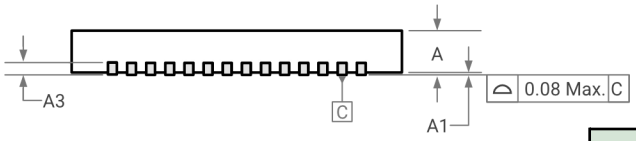
Package Dimensions



TOP VIEW



BOTTOM VIEW



SIDE VIEW

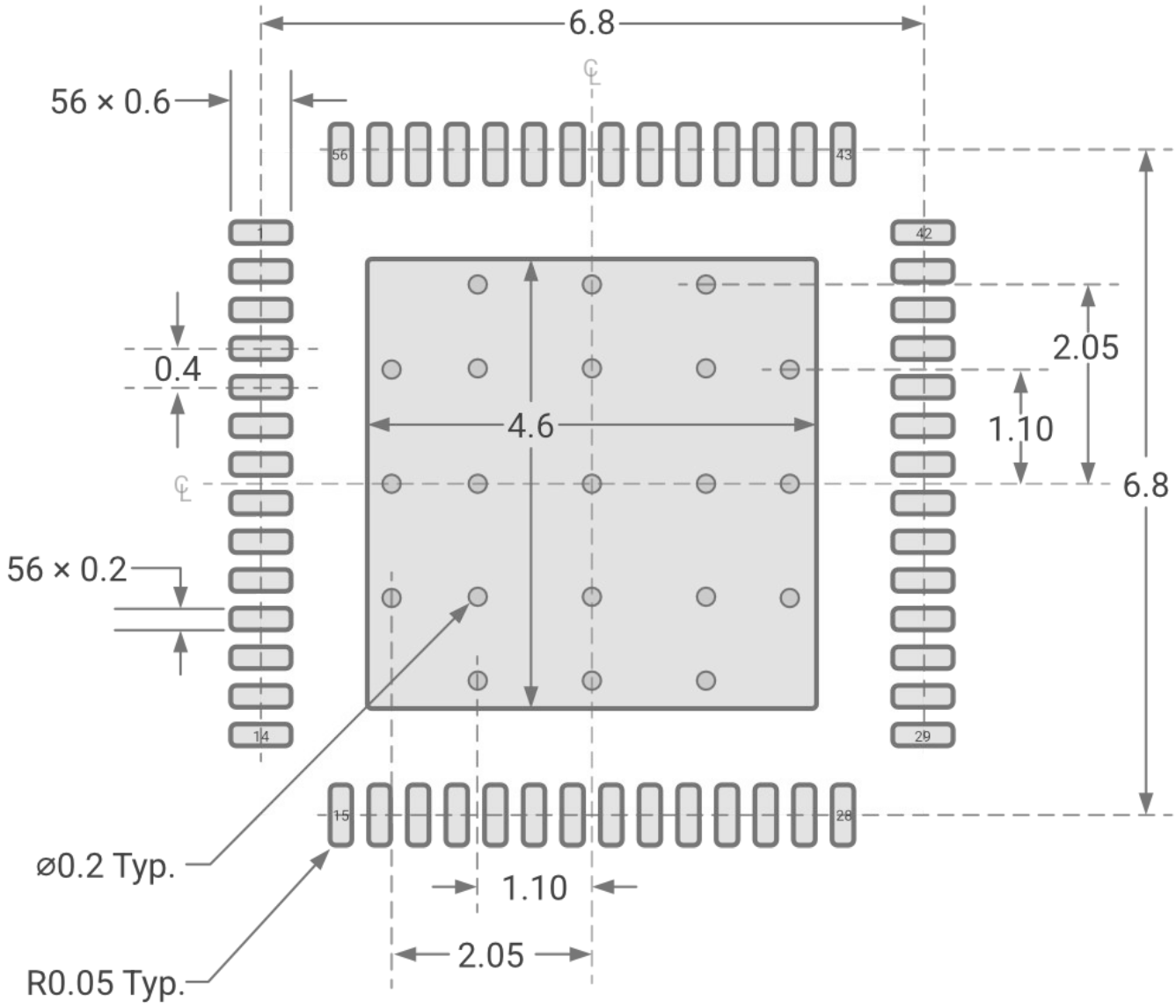
REF	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	—	0.05
A3		0.203 Ref.	
D	6.90	7.00	7.10
E	6.90	7.00	7.10
D2	4.55	4.60	4.65
E2	4.55	4.60	4.65
b	0.15	0.20	0.25
e		0.40 BSC	
L	0.35	0.40	0.45
K	0.20	—	—

Notes

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

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Recommended Land Pattern

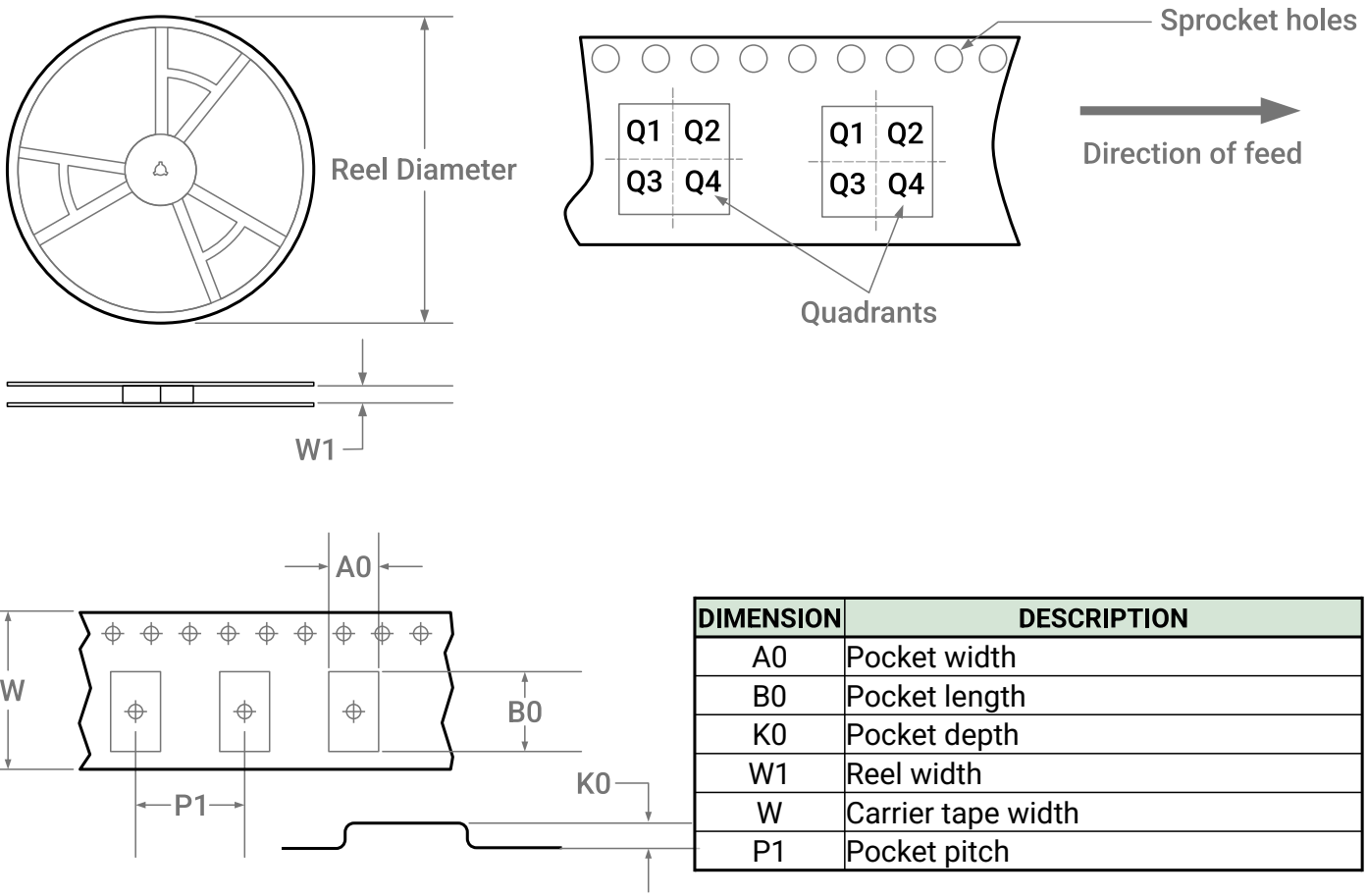


Notes:

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

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Tape and Reel Information



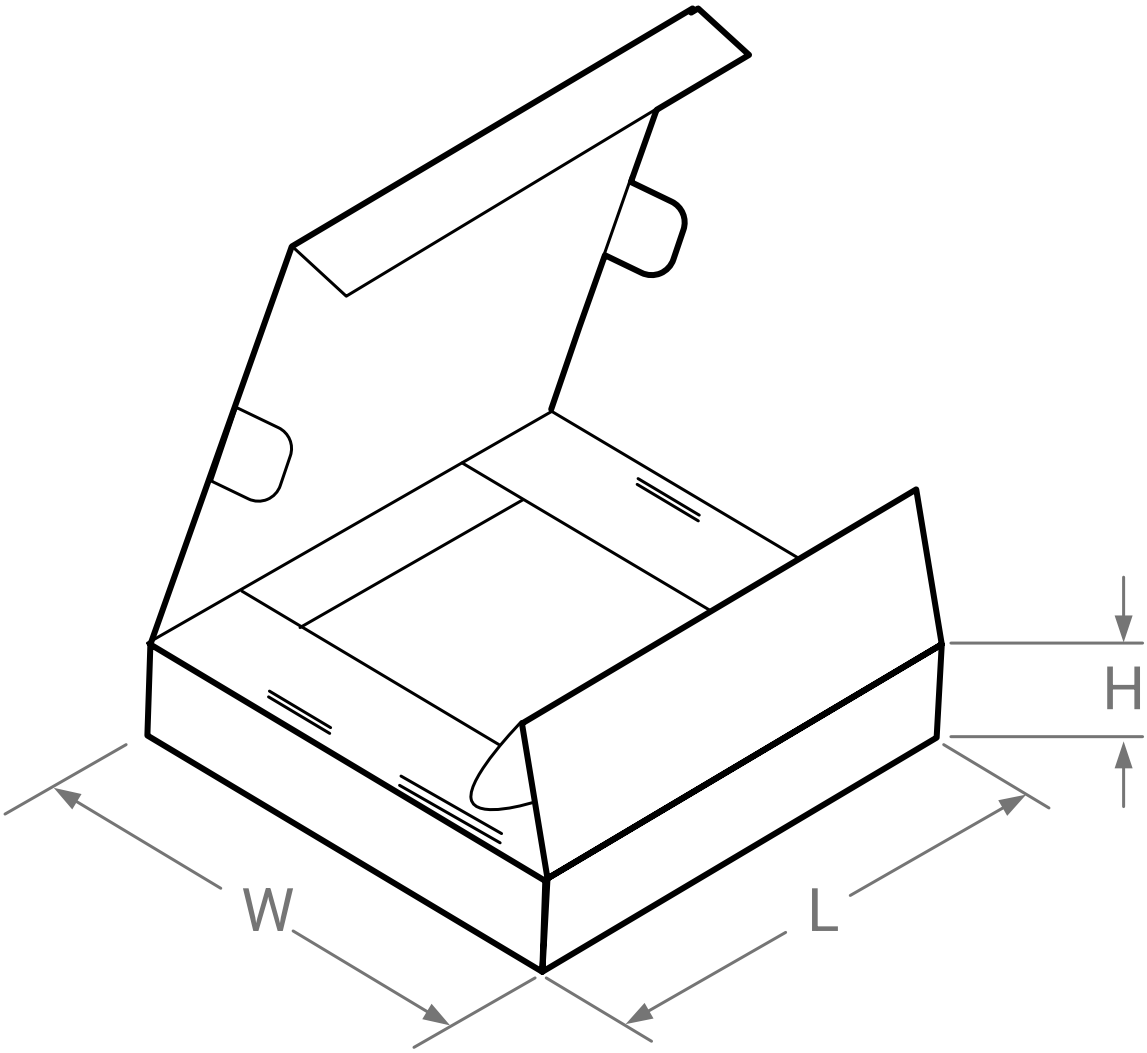
DIMENSION	DESCRIPTION
A0	Pocket width
B0	Pocket length
K0	Pocket depth
W1	Reel width
W	Carrier tape width
P1	Pocket pitch

PACKAGE SIZE	REEL DIAMETER	W1	A0	B0	K0	P1	W	QUADRANT
7 × 7	330	16.8	7.25	7.25	1.0	12	16	Q2

Note:
1. All dimensions are nominal
2. All dimensions are in millimeters (mm)

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Pizza Box Dimensions



PACKAGE SIZE	UNITS / BOX	LENGTH	WIDTH	HEIGHT
7 × 7	3000	367	367	38

Notes:

1. All measurements are in millimeters;
2. All measurements are nominal.

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