

## 4.7A / 6.8A / 8.2A Application Processor Supply with I<sup>2</sup>C Compatible Interface

Check for Samples: [TPS623850](#), [TPS623860](#), [TPS62387A](#)

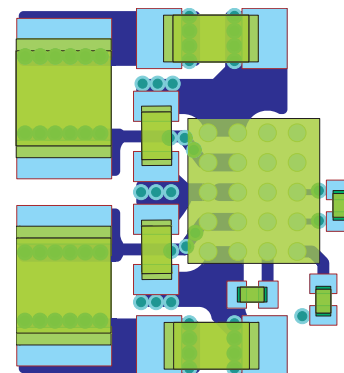
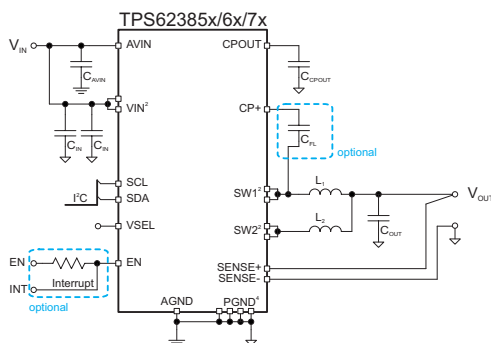
### FEATURES

- **2 Phase Step-Down Converter with 10-mV Steps Programmable Output Voltage for Dynamic Voltage Scaling (DVS)**
  - 4.7A (TPS62385x – Preview)
  - 6.8A (TPS62386x – Preview)
  - 8.2A (TPS62387x – Preview)
- **Highest Efficiency:**
  - Reduced Inductor and On-Chip Losses by Dual Phase Design
  - Automatic Dual-to-Single Phase Operation Transition (Phase Shedding)
  - Active Current Balancing between Phases
  - Highest Efficiency over the Whole Load Range
  - Prepared for Integrated Charge Pump for Efficiency Boosting
  - Low  $R_{DS,on}$  Switches and Active Rectifiers
  - Power Save Mode for Light Load Efficiency
- **I<sup>2</sup>C High Speed Compatible Interface**
- **Excellent DC and AC Output Voltage Regulation**
  - Differential, Remote Load Sensing
  - Precise DC Output Voltage Accuracy
  - Double Regulation Bandwidth by Dual-Phase Design
  - Reduced Output Voltage Ripple by 180° Phase-Shifted Operation

- **Multiple Robust Operation and Protection Features:**
  - Soft Start and Rapid Startup Time
  - Power Good Indication
  - Programmable Slew Rate at Voltage Transition
  - Low Battery Voltage Ripple by Phase-Shifted Operation
  - Over Temperature Monitoring and Protection with Programmable Thresholds
  - Input Under Voltage Detection and Lockout
  - Output Current Limit and Protection
  - 7-bit SAR ADC for Output Current Monitoring
  - Interrupt Signal for Exception Handling
- **Available in 20-Bump, 2.32 x 2.46 mm<sup>2</sup> NanoFree™ Package**
- **Tiny Solution Size: 31 mm<sup>2</sup>**
  - Low External Component Count
  - Dual-Phase Design and 3 Output Current Versions for Tiny Inductors

### APPLICATIONS

- Application Processors
- Dynamic Voltage Scale Compliant Processors and DSPs
- SmartReflex™ Compliant Power Supply
- Memory
- Cell Phones, Smart Phones, Feature Phones
- Tablet PCs, Clamshells, Netbooks



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**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/ Ball Finish	MSL Peak Temp <sup>(3)</sup>	Samples (Requires Login)
TPS623850YZJR	PREVIEW	DSBGA	YZJ	20	3000	TBD	Call TI	Call TI	
TPS623850YZJT	PREVIEW	DSBGA	YZJ	20	3000	TBD	Call TI	Call TI	
TPS623860YZJR	PREVIEW	DSBGA	YZJ	20	3000	TBD	Call TI	Call TI	
TPS623860YZJT	PREVIEW	DSBGA	YZJ	20	250	TBD	Call TI	Call TI	
TPS62387AYZJR	PREVIEW	DSBGA	YZJ	20		Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	
TPS62387AYZJT	PREVIEW	DSBGA	YZJ	20		Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

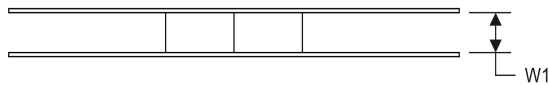
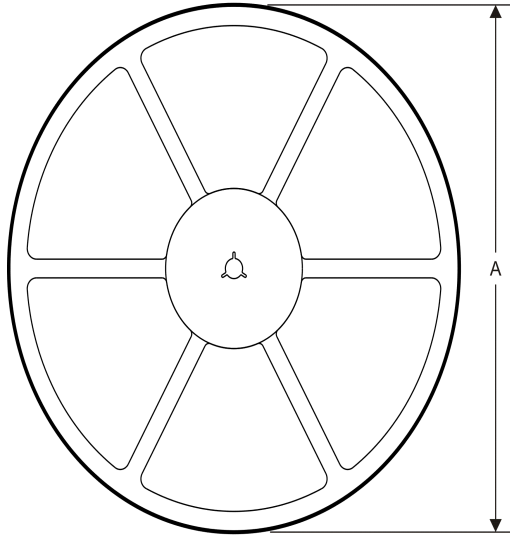
<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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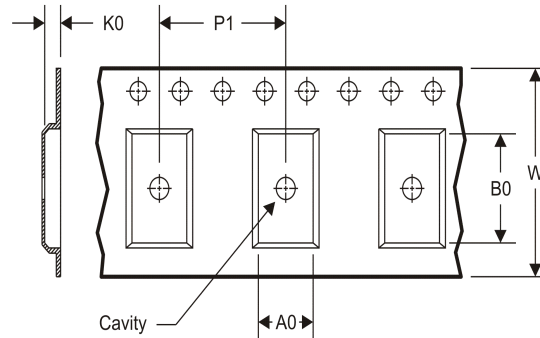
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TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

TAPE AND REEL INFORMATION

\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TPS62387AYZJR	DSBGA	YZJ	20	0	180.0	8.4	2.54	2.54	0.76	4.0	8.0	Q1
TPS62387AYZJT	DSBGA	YZJ	20	0	180.0	8.4	2.54	2.54	0.76	4.0	8.0	Q1

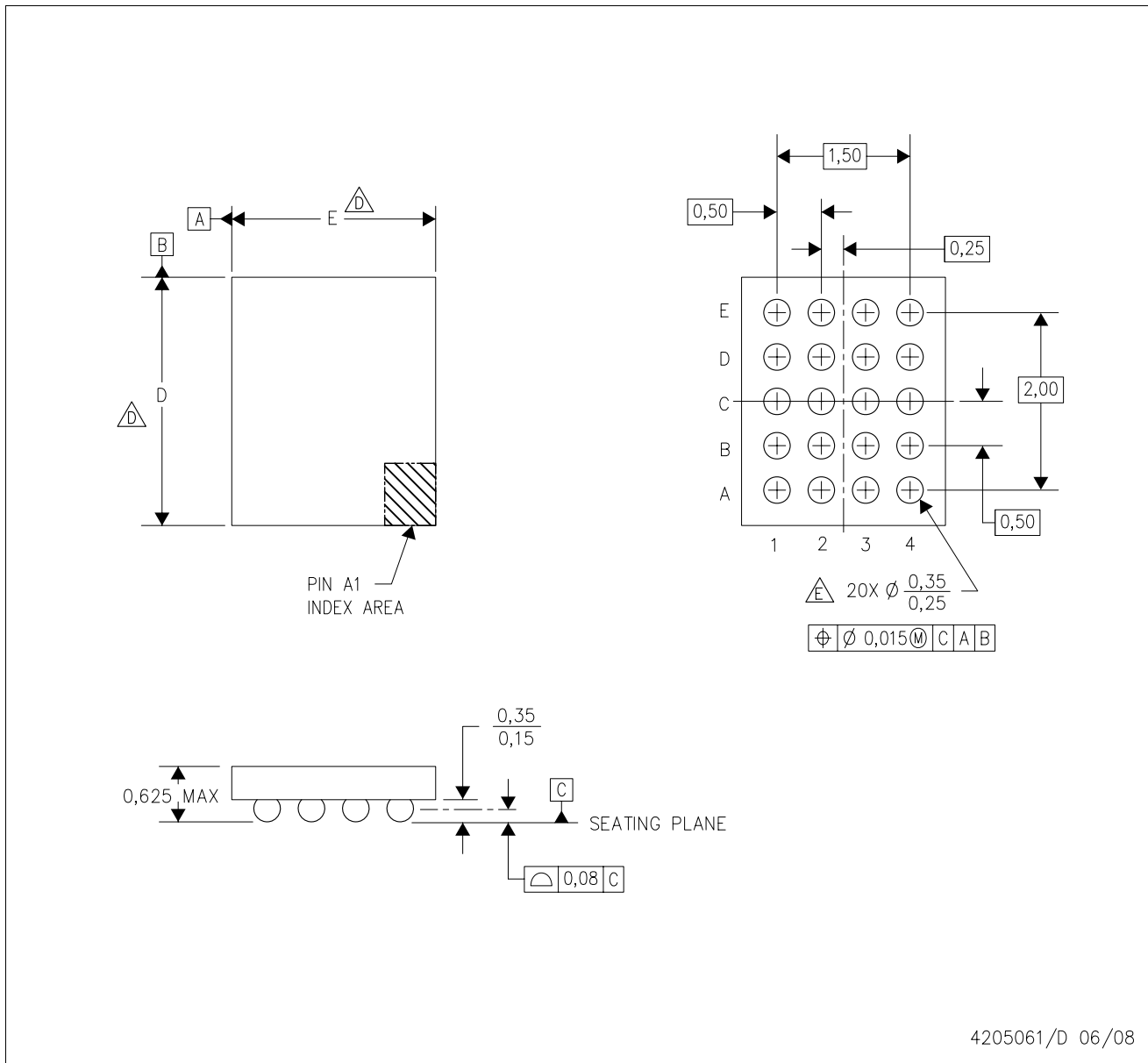
**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS62387AYZJR	DSBGA	YZJ	20	0	210.0	185.0	35.0
TPS62387AYZJT	DSBGA	YZJ	20	0	210.0	185.0	35.0

YZJ (R-XBGA-N20)

DIE-SIZE BALL GRID ARRAY



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. NanoFree™ package configuration.
  - $\triangle D$  Devices in YZJ package can have dimension D ranging from 2.44 to 3.15 mm and dimension E ranging from 1.94 to 2.65 mm. To determine the exact package size of a particular device, refer to the device datasheet or contact a local TI representative.
  - E. Reference Product Data Sheet for array population.  
5 x 4 matrix pattern is shown for illustration only.
  - F. This package contains lead-free balls.  
Refer to YEJ (Drawing #4204184) for tin-lead (SnPb) balls.

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