

## HIGH-EFFICIENCY, SOT23 STEP-DOWN, DC-DC CONVERTER

### FEATURES

- High Efficiency Synchronous Step-Down Converter With up to 95% Efficiency
- 2.5-V to 6-V Input Voltage Range
- Adjustable Output Voltage Range
- Fixed Output Voltage Options Available
- Output Current
- Fixed Frequency PWM Operation
- Highest Efficiency Over Wide Load Current Range Due to Power Save Mode
- Quiescent Current
- Soft Start

- 100% Duty Cycle Low-Dropout Operation
- Dynamic Output-Voltage Positioning

### APPLICATIONS

- PDAs and Pocket PC
- Cellular Phones, Smart Phones
- Low Power DSP Supply
- Digital Cameras
- Portable Media Players
- Portable Equipment

### DESCRIPTION

The TPS62203 is a high-efficiency synchronous step-down converter ideally suited for portable systems powered by 1-cell Li-Ion or 3-cell NiMH/NiCd batteries. The device is also suitable to operate at a standard voltage rail.

The device is ideal to power low voltage DSPs and processors used in PDAs, pocket PCs, and smart phones. Under nominal load current, the device operates with a fixed switching frequency. At light load currents, the part enters the power save mode operation and the switching frequency is reduced; therefore, it achieves the highest efficiency over the entire load current range. The TPS62203 needs only three small external components. An advanced fast response voltage mode control scheme achieves superior line and load regulation with small ceramic input and output capacitors.

### ORDERING INFORMATION<sup>(1)</sup>

PRODUCT	PACKAGE DESIGNATOR	PACKAGE	ORDERABLE PART NUMBER	PACKAGE QUANTITY
TPS62203	TD	Bare die in waffle pack <sup>(2)</sup>	TPS62203TDE1	252
			TPS62203TDE2	10

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at [www.ti.com](http://www.ti.com).

(2) Processing is per the Texas Instruments commercial production baseline and is in compliance with the Texas Instruments Quality Control System in effect at the time of manufacture. Electrical screening consists of DC parametric and functional testing at room temperature only. Unless otherwise specified by Texas Instruments AC performance and performance over temperature is not warranted. Visual Inspection is performed in accordance with MIL-STD-883 Test Method 2010 Condition B at 75X minimum.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

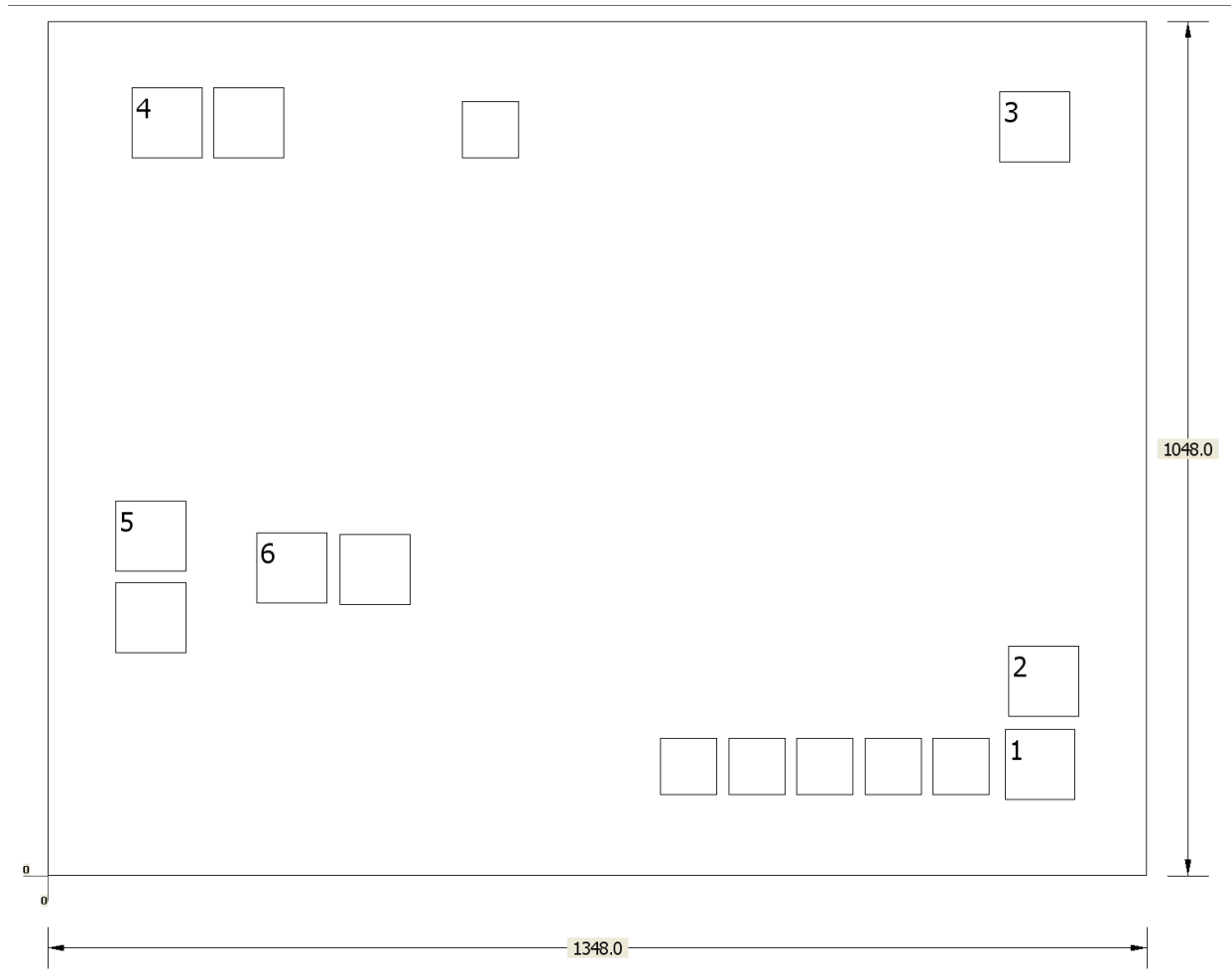


This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

**BARE DIE INFORMATION**

DIE THICKNESS	BACKSIDE FINISH	BACKSIDE POTENTIAL	BOND PAD METALLIZATION COMPOSITION	BOND PAD THICKNESS
11 mils.	Silicon with backgrind	Ground	Al5Cu	650 nm



**Table 1. Bond Pad Coordinates in Microns<sup>(1)</sup>**

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
FB	1	1173.51	92.97	1260.45	179.91
GND	2	1178.19	194.94	1265.13	281.88
EN	3	1167.21	874.62	1254.15	961.56
VI	4	102.87	880.38	189.81	967.32
GND	5	82.98	373.32	169.92	460.26
SW	6	256.05	334.08	342.99	421.02

(1) Substrate GND.

**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)
TPS62203TDE1	ACTIVE			0	252	TBD	Call TI	N / A for Pkg Type	
TPS62203TDE2	ACTIVE			0	10	TBD	Call TI	N / A for Pkg Type	

<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.

**OBSELETE:** 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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### Applications

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