Power Management Unit

1 Introduction

1.1 Features

- **Power Management Core**
  - **Dual Input Power Path**
  - **Switch Mode Charger**
  - **Integrated Charge Current Sense FET**
  - **Automatic Battery Supplement Mode**
  - **2 Boost Converters**
    - **1 Boost supports 2 strings of up to 6 LEDs with Internal and External Dimming Control**
    - **1 Boost supports 1 string of 6 LEDs**
    - **Boost Converters can also be used in Constant Voltage Mode**
  - **LED Matrix Controller**
  - **RGB Controller**
  - **I²C™ Interface to Device for Low Latency Communication**

1.2 Applications

- **Portable Applications**

1.3 Description

The TPS658310 Power Management Unit is a broad use, multi-channel device, for portable applications. The device consists of an Integrated Power Path Management and Switch Mode Li-Ion Battery Charger that provides system power from a regulated wall adapter or a USB port. It also handles lighting management with integrated Backlight Boosts, LED Matrix Controller for keypad, Camera Flash LED Controller, Current Source and RGB channels.

To request a full data sheet, please send an email to:

pmu_contact@list.ti.com

1.4 Block Diagram

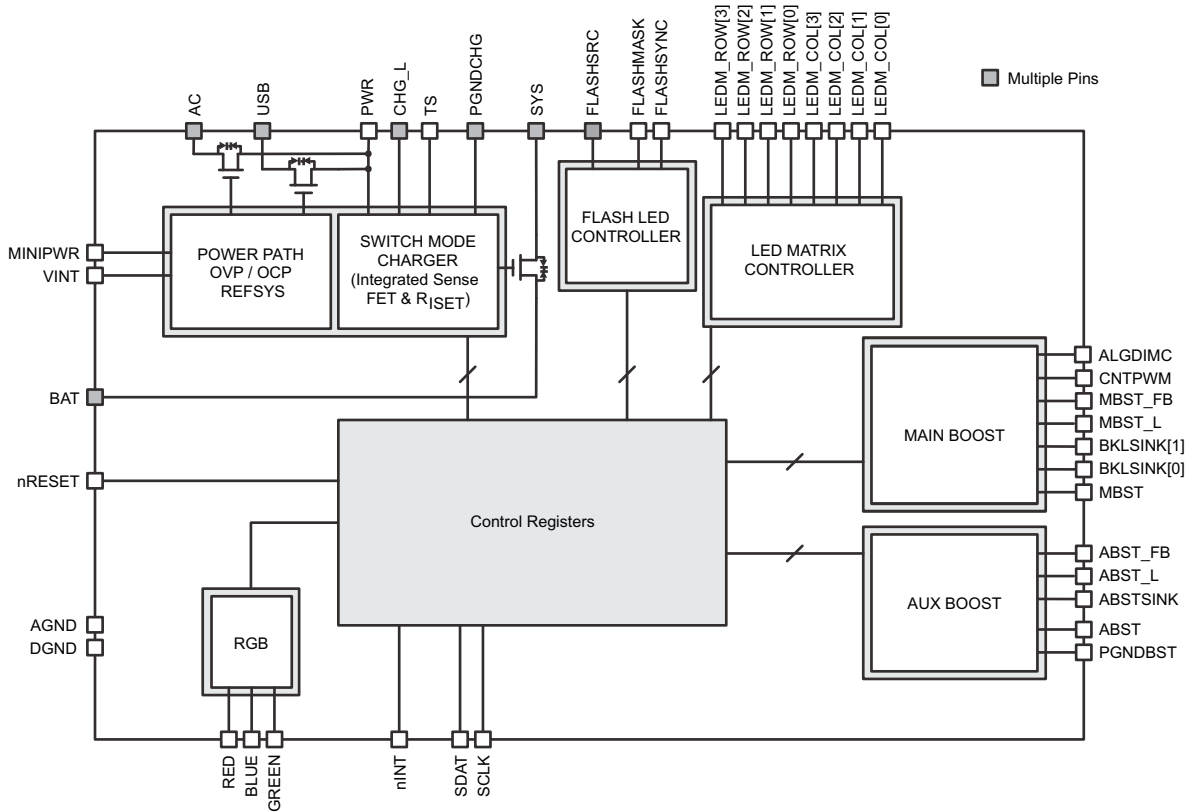The simplified TPS658310 system diagram is shown in Figure 1-1.
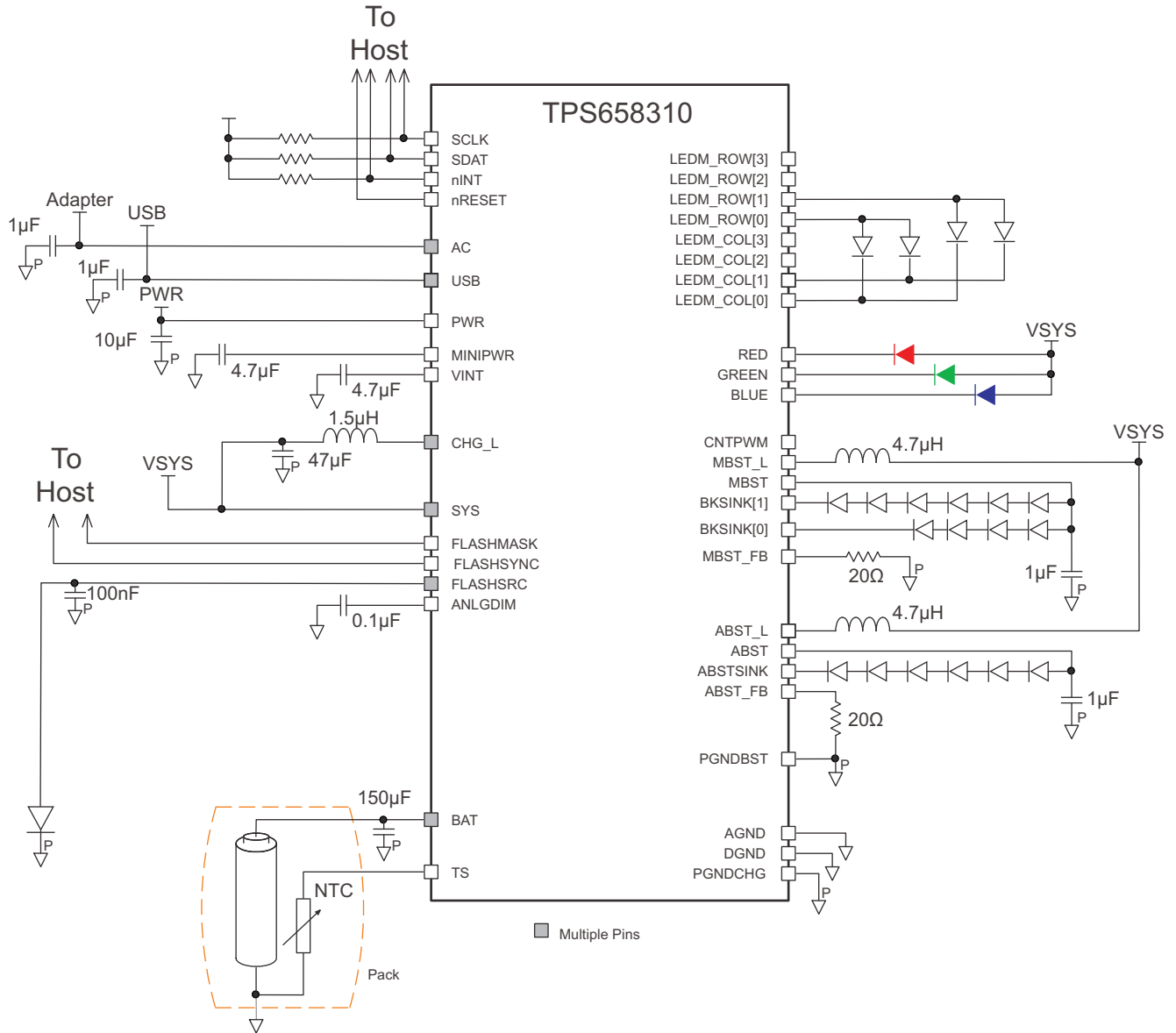

Figure 1-1. Simplified System Diagram

2 Application Schematic

NOTE: Component values shown are the minimum required.

Figure 2-1. Application Schematic

![Texas Instruments logo]

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TPS658310YFFR	ACTIVE	DSBGA	YFF	49	1500	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	TPS658310	Samples

(1) 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.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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PACKAGE MATERIALS INFORMATION

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	

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

*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
TPS658310YFFR	DSBGA	YFF	49	1500	180.0	12.4	3.5	3.7	0.81	8.0	12.0	Q1

PACKAGE MATERIALS INFORMATION

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TAPE AND REEL BOX DIMENSIONS

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS658310YFFR	DSBGA	YFF	49	1500	182.0	182.0	20.0

YFF (R-XBGA-N49)   DIE-SIZE BALL GRID ARRAY

B ← E →

A

D

PIN A1
INDEX AREA

2,40

0,40

G
F
E
D
C
B
A

1   2   3   4   5   6   7

Bottom View

2,40

0,40

49X Ø $\frac{0,30}{0,20}$

⊕ | Ø 0,015 Ⓜ | C | A | B

$\frac{0,30}{0,12}$

0,625 MAX

C

SEATING PLANE

⌒ 0,05 C

D: Max = 3.416 mm, Min = 3.356 mm

E: Max = 3.19 mm, Min = 3.13 mm

4207625-16/AO 12/13
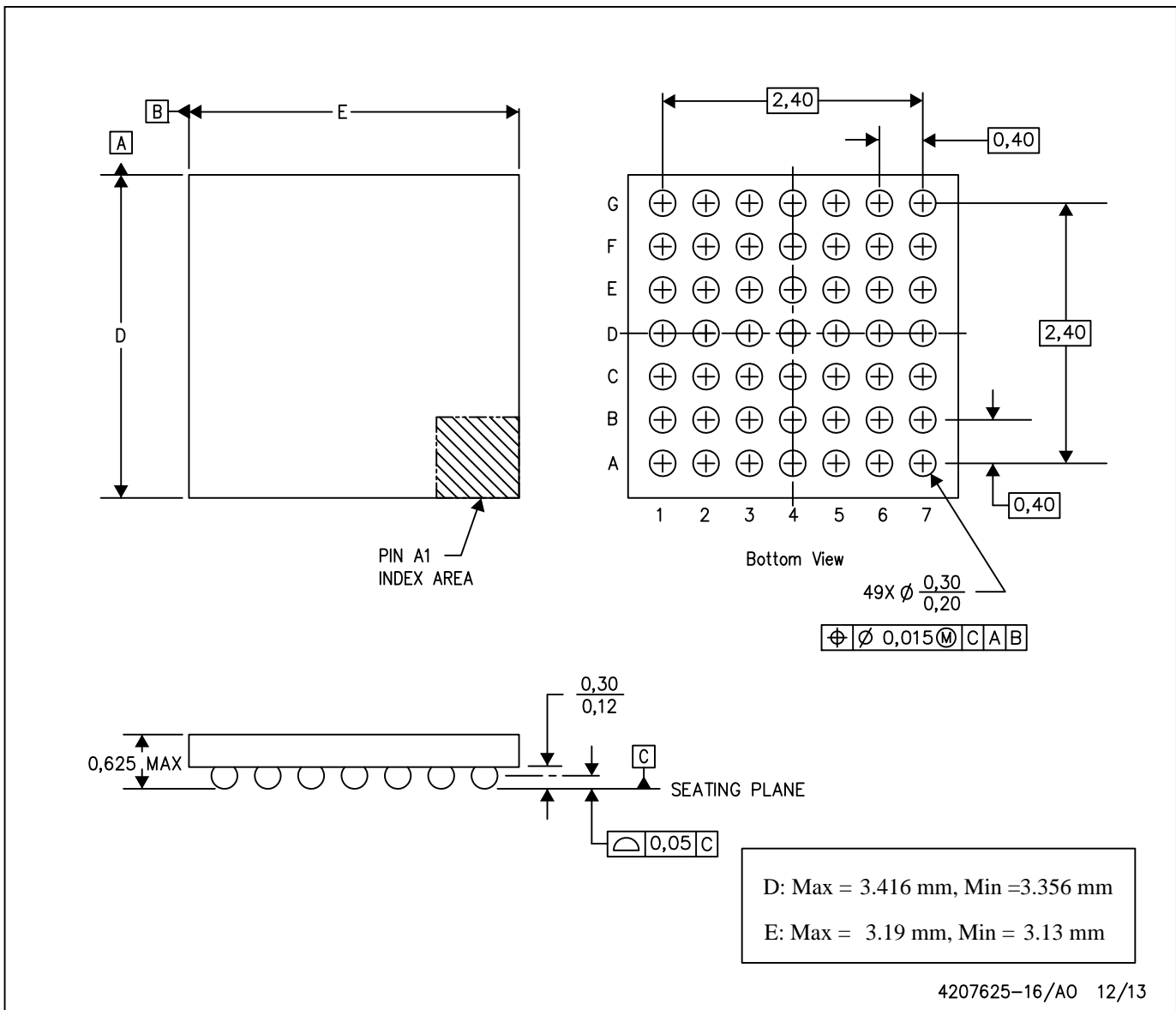
NOTES: A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
        B. This drawing is subject to change without notice.
        C. NanoFree™ package configuration.

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