

## bq24715 2-3 节窄电压直流 (NVDC)-1 电池充电器控制器 具有超快速瞬态响应和高轻负载效率

### 1 特性

- 6-24V 输入系统管理总线 (SMBus) NVDC-1 2-3S 电池充电器控制器
- 无电池或深度放电电池工作时系统瞬时接通运行
- 100μs 的超快速瞬态响应
- 500μA 的超低静态电流, 以及 20mA 负载时高脉冲频率调制 (PFM) 轻负载效率, 以符合能源之星 (Energy Star) 和能源相关产品 (ErP) Lot6 规范
- 开关频率: 600kHz/800kHz/1MHz
- 具有高精度的可编程系统/充电电压 (每步长 16mV), 输入/充电电流 (每步长 64mA)
  - 充电电压稳压范围为 ±0.5%
  - ±3% 输入/充电电流调节
  - ±2% 40x 输入 / 16x 充电电流监控输出
- 支持电池 LEARN (学习) 功能
- 在深度放电电池或无电池时最大限度地提高 CPU 性能
- 集成 NMOS ACFET 和 RBFET 驱动器
- 20 引脚 3.5mm x 3.5mm<sup>2</sup> 四方扁平无引线 (QFN) Package

### 2 应用范围

- Ultrabook, 笔记本电脑和平板个人电脑
- 工业用和医疗用设备
- 便携式设备

### 3 说明

bq24715 是一款 NVDC-1 同步电池充电控制器, 此充电器具有针对 2S 或 3S 锂离子电池充电应用的低静态电流、高轻负载效率, 从而提供低组件数量。

电源路径管理可实现系统在电池电压上的电压调节, 但是不会下降到低于可编程系统最低电压以下。

bq24715 提供针对电源路径管理的 N 通道 ACFET 和 RBFET 驱动器。它还提供外部 P 通道电池 FET 的驱动器。环路补偿是完全集成的。

bq24715 通过 SMBus 通信接口提供具有极高稳压精度的可编程 11 位充电电压, 7 位输入/充电电流和 6 位最低系统电压。

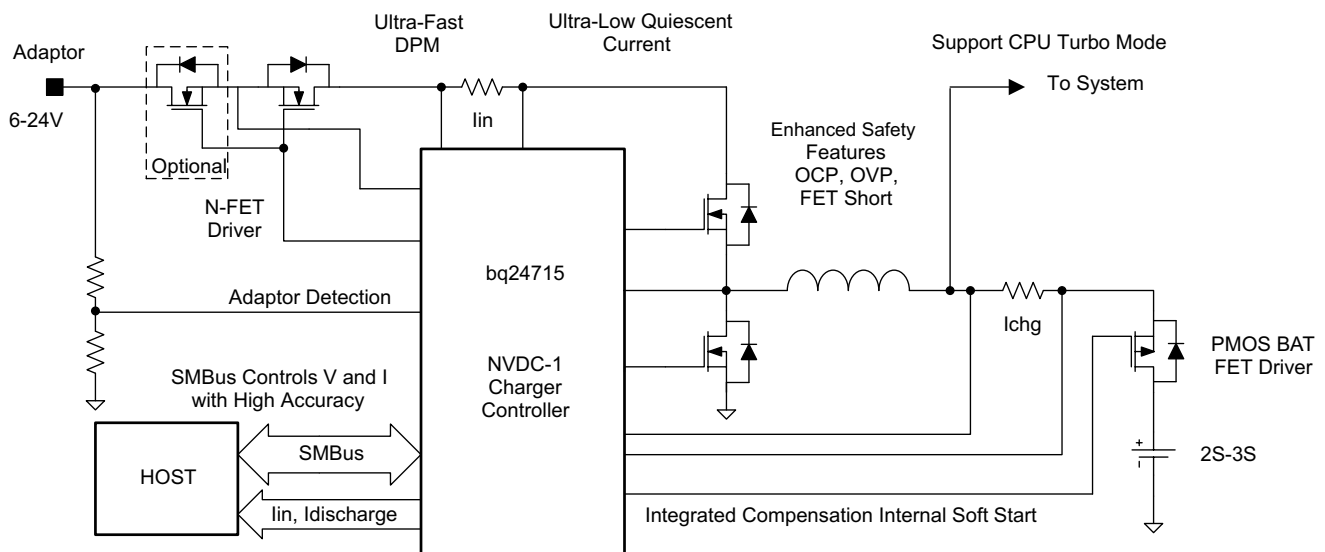
bq24715 通过 IOOUT 引脚监控适配器电流或电池放电电流, 从而使主机能够在需要时减低 CPU 速度。

bq24715 提供针对过流、过压和 MOSFET 短路的广泛安全特性。

#### 器件信息

器件名称	封装 (引脚)	封装尺寸
bq24715	超薄四方扁平无引线封装 (VQFN) (20)	3.5mm x 3.5mm

### Simplified Application Diagram



## 4 修订历史记录

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (March 2013) to Revision A	Page
• 已添加 器件型号至标题，并已按照全新的数据表模板添加器件信息表 .....	1

要获得完整数据表，请通过 [电子邮件](#) 与 TI 联系。

**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
BQ24715RGRR	ACTIVE	VQFN	RGR	20	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-20 to 125	BQ715	<a href="#">Samples</a>
BQ24715RGRT	ACTIVE	VQFN	RGR	20	250	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-20 to 125	BQ715	<a href="#">Samples</a>

(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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**TAPE AND REEL INFORMATION**

**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
BQ24715RGR	VQFN	RGR	20	3000	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q2
BQ24715RGR	VQFN	RGR	20	250	180.0	12.4	3.75	3.75	1.15	8.0	12.0	Q2

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
BQ24715RGRR	VQFN	RGR	20	3000	346.0	346.0	33.0
BQ24715RGRT	VQFN	RGR	20	250	182.0	182.0	20.0

## GENERIC PACKAGE VIEW

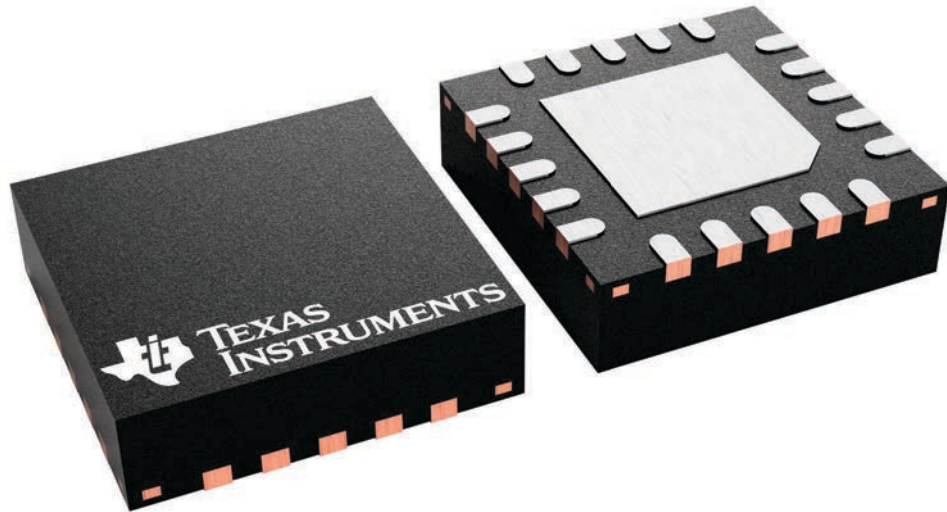
**RGR 20**

**VQFN - 1 mm max height**

3.5 x 3.5, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



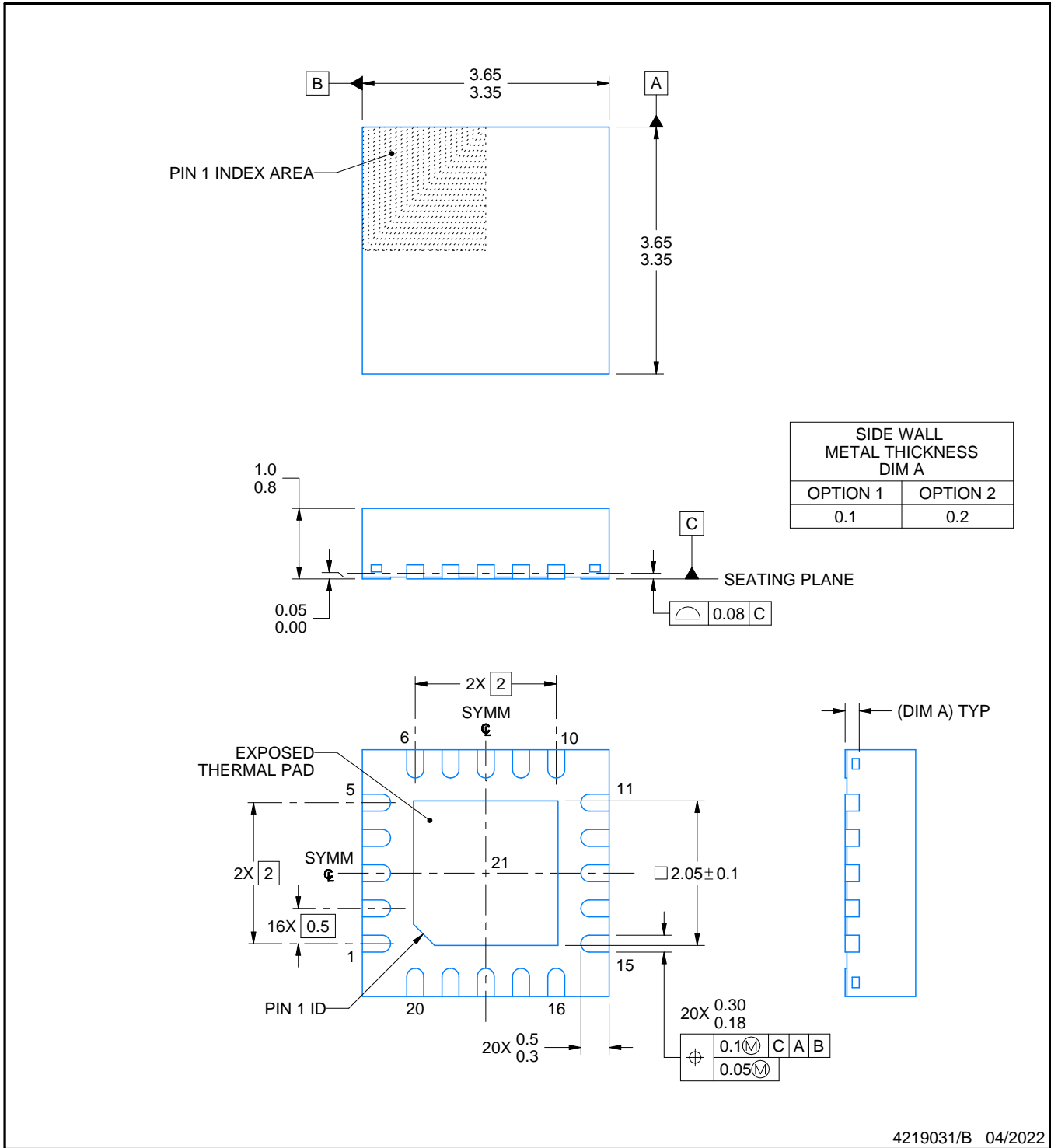
4228482/A

# RGR0020A

# PACKAGE OUTLINE

## VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



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### NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

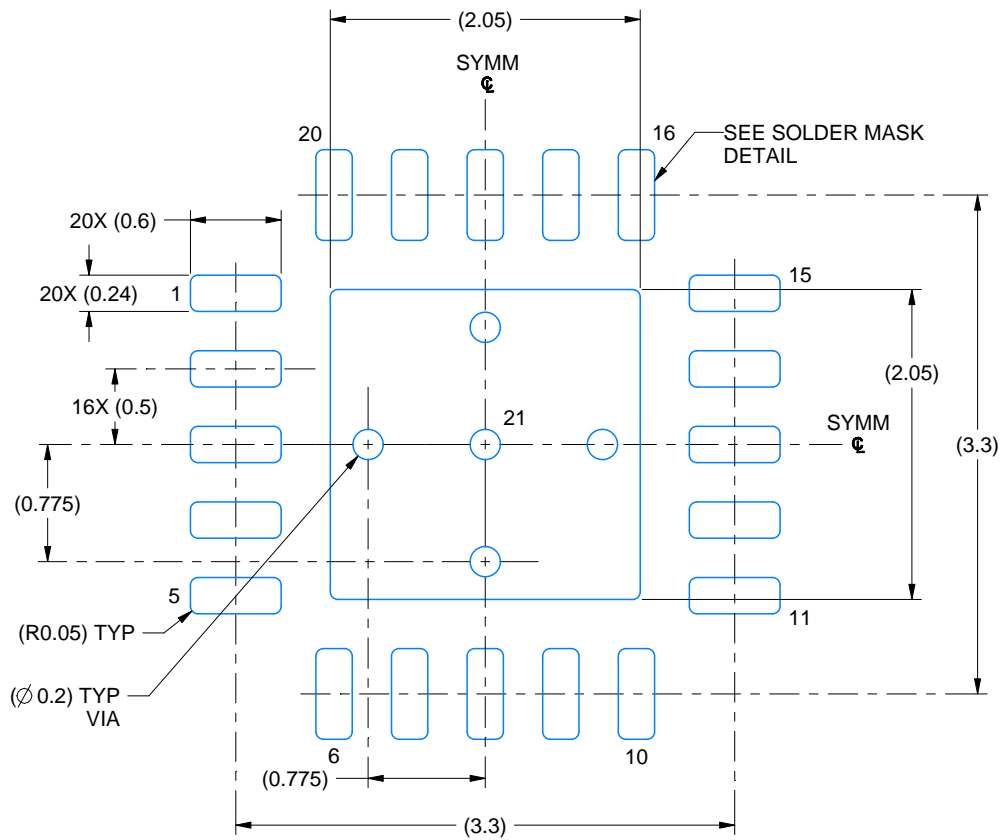


# EXAMPLE BOARD LAYOUT

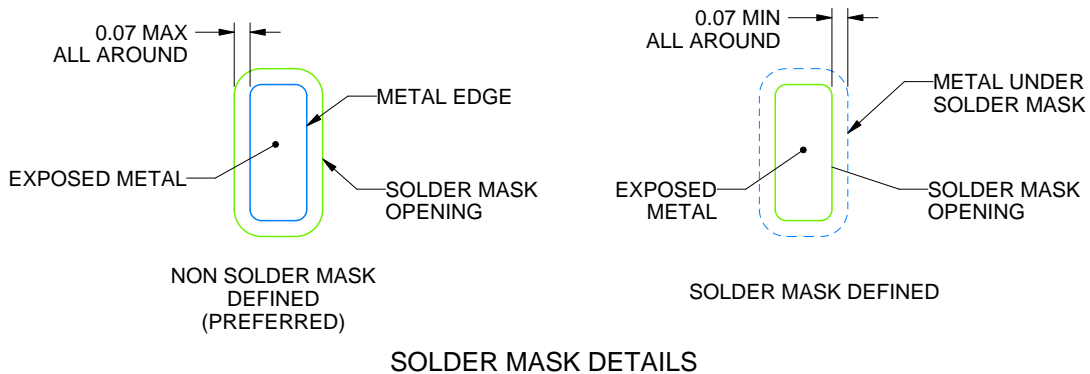
RGR0020A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 20X



SOLDER MASK DETAILS

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NOTES: (continued)

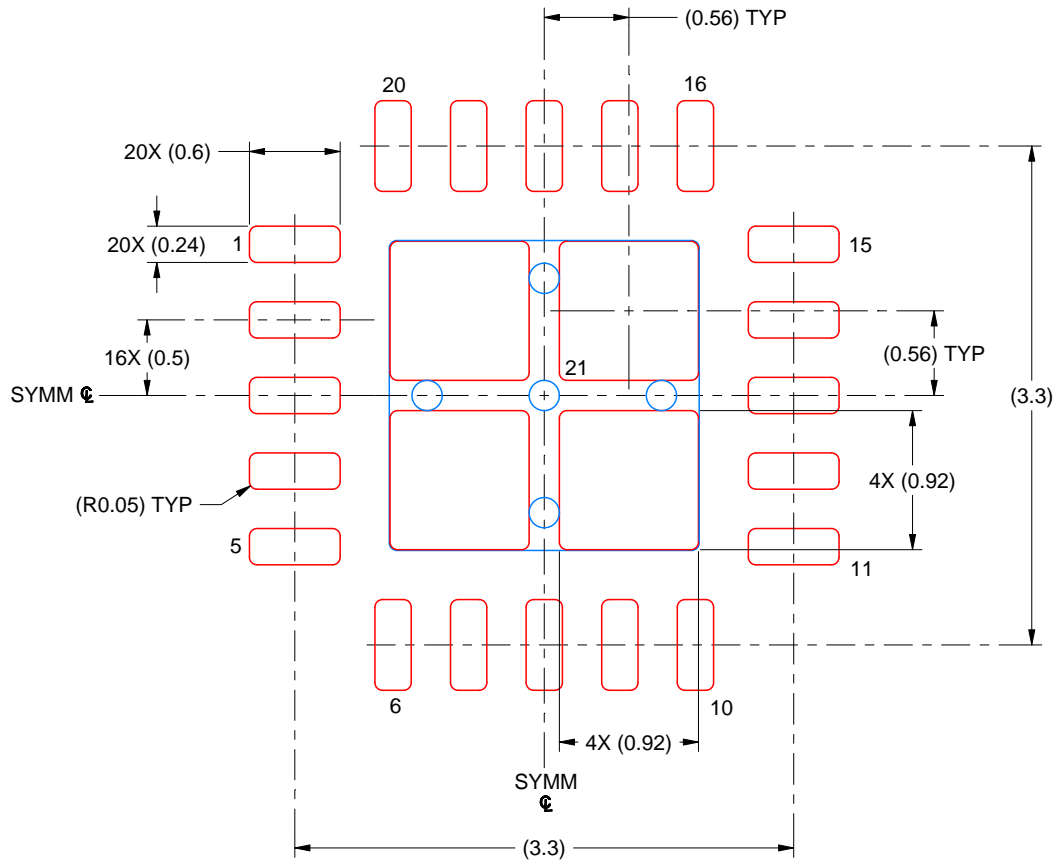
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 ([www.ti.com/lit/sluea271](http://www.ti.com/lit/sluea271)).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

# EXAMPLE STENCIL DESIGN

RGR0020A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



SOLDER PASTE EXAMPLE  
BASED ON 0.125 MM THICK STENCIL  
SCALE: 20X

EXPOSED PAD 21  
81% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE

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NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

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