TCAN1162-Q1 具有睡眠模式的汽车自供电 CAN FD 收发器

1 特性

- 符合面向汽车应用的 AEC Q100（1 级）标准
- 符合 ISO 11898-2:2016 的要求
- 宽工作输入电压范围：
  - V_{SUP} 范围：5.5V 至 28V
- 为 CAN 收发器供电的集成 LDO
- 支持高达 8Mbps 的传统 CAN 和 CAN FD
  - 具有较短的对称传播延迟时间和快速循环次数，可增加时序裕量
  - 在有负载 CAN 网络中实现更快的数据速率
- V_{IO} 电平转换支持：1.7V 至 5.5V
- 工作模式
  - 正常模式
  - 具有 INH 输出以及本地和远程唤醒请求功能的待机模式
  - 具有 INH 输出以及本地和远程唤醒请求的低功耗睡眠模式
- 优化了未上电时的性能
  - 总线和逻辑终端为高阻抗（运行总线或应用上无负载）
  - 支持热插拔：在总线和 RXD 输出上可实现上电/断电无干扰运行
- 保护特性：±58V 总线容错、V_{SUP} 上支持 42V 负载突降、IEC ESD 保护、欠压保护、过压保护、热关断保护、TXD 显性状态超时
- 结温范围：–40°C 至 150°C
- 采用 4.5mm x 3.0mm 无引线 VSON (14) 封装，具有改进的自动光学检查 (AOI) 功能

2 应用

- 高级驾驶辅助系统 (ADAS)
- 车身电子装置与照明
- 汽车信息娱乐系统与仪表组
- 混合动力、电动和动力总成系统

3 说明

TCAN1162-Q1 是一款高速控制器局域网 (CAN) 收发器，满足 ISO 11898-2:2016 高速 CAN 规范的物理层要求。TCAN1162-Q1 支持传统 CAN 和 CAN FD 网络（数据速率高达 8 兆位/秒 (Mbps)）。

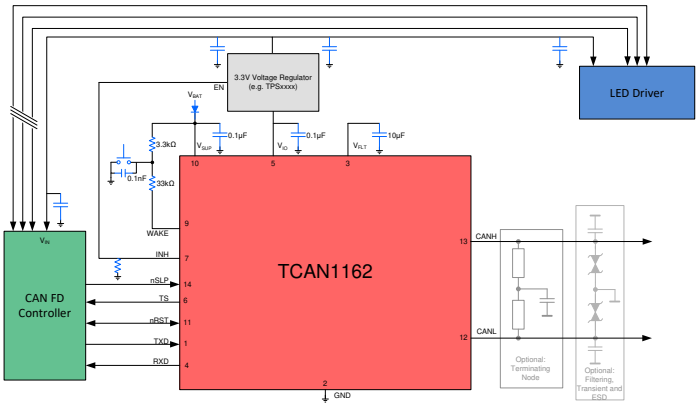
TCAN1162-Q1 集成了一个具有宽输入工作电压范围的 LDO，可为 CAN 收发器提供 5V 电压，从而无需由外部电压源提供 5V 电压。

TCAN1162-Q1 可通过 INH 输出引脚选择性启用节点上可能存在的各种电源，从而在整个系统级别减少电池电流消耗。这使得在超低电流睡眠模式中，功率传送到除 TCAN1162-Q1 以外的所有系统元件，而该器件则仍然处于低功耗状态，并对 CAN 总线进行监控。检测到唤醒事件时，TCAN1162-Q1 通过将 INH 输出驱动至高电平来启动节点。

器件信息

器件型号	封装(1)	封装尺寸（标称值）
TCAN1162-Q1	VSON (14)	4.5mm x 3.00mm

(1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。



简化版原理图

ADVANCE INFORMATION

4 说明（续）

TCAN1162-Q1 支持超低功耗待机模式；在该模式下，高速发送器和普通接收器均关闭，而低功耗唤醒接收器会通过 ISO 11898-2:2016 定义的唤醒模式 (WUP) 来实现远程唤醒。

TCAN1162-Q1 包括通过 V_{IO} 端子实现的内部逻辑电平转换功能，允许直接连接到 1.8V、2.5V、3.3V 或 5V 控制器。该收发器包括许多保护和诊断功能，如欠压检测、过压检测、热关断 (TSD)、驱动器显性超时 (TXD DTO) 和高达 ±58V 的总线故障保护。

TCAN1162-Q1 可通过 INH 输出引脚选择性启用节点上可能存在的各种电源，从而在整个系统级别减少电池电流消耗。这使得在超低电流睡眠状态中，功率传送到除 TCAN1162-Q1 以外的所有系统元件，而该器件则仍然处于低功耗状态，并对 CAN 总线进行监控。在总线上检测到唤醒模式或通过 WAKE 输入请求本地唤醒时，TCAN1162-Q1 通过将 INH 输出驱动至高电平来启动节点。

5 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

5.1 Documentation Support

5.1.1 Related Documentation

5.2 接收文档更新通知

要接收文档更新通知，请导航至 ti.com 上的器件产品文件夹。点击 *订阅更新* 进行注册，即可每周接收产品信息更改摘要。有关更改的详细信息，请查看任何已修订文档中包含的修订历史记录。

5.3 支持资源

TI E2E™ 支持论坛是工程师的重要参考资料，可直接从专家获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题可获得所需的快速设计帮助。

链接的内容由各个贡献者“按原样”提供。这些内容并不构成 TI 技术规范，并且不一定反映 TI 的观点；请参阅 TI 的《使用条款》。

5.4 Trademarks

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5.5 Electrostatic Discharge Caution

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.

5.6 Glossary

TI Glossary	This glossary lists and explains terms, acronyms, and definitions.

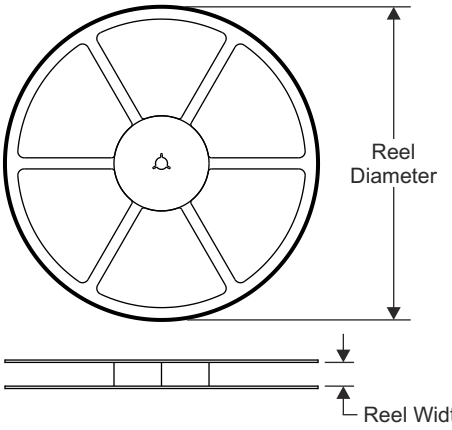
Mechanical, Packaging, and Orderable Information

The following pages include mechanical packaging and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

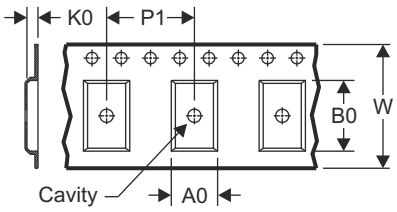
ADVANCE INFORMATION

6.1 Tape and Reel Information

REEL DIMENSIONS

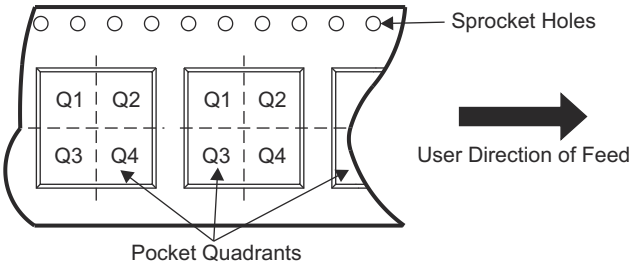


TAPE DIMENSIONS



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

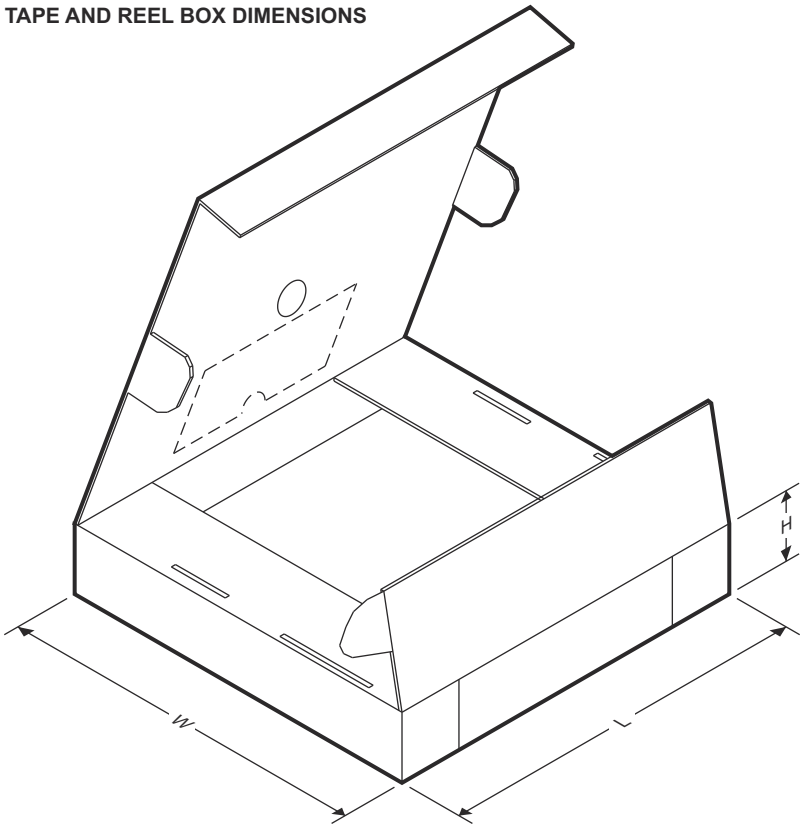
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



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
PTCAN1162DMTRQ1	VSON	DMT	14	3000	330.0	12.4	3.3	4.8	1.2	8.0	12.0	Q1

ADVANCE INFORMATION

TAPE AND REEL BOX DIMENSIONS



Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
PTCAN1162DMTRQ1	VSON	DMT	14	3000	367.0	367.0	35.0

ADVANCE INFORMATION

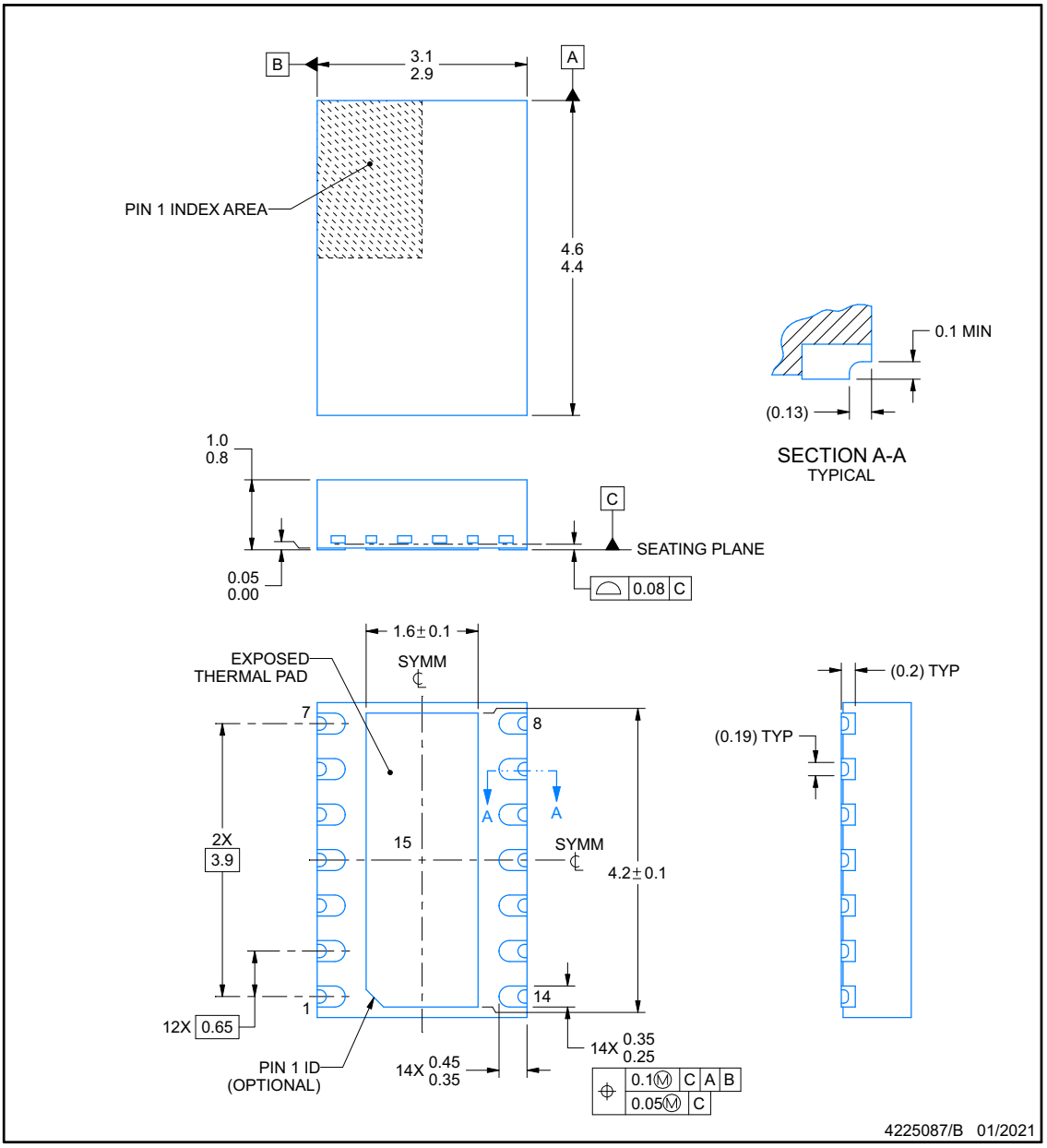
ADVANCE INFORMATION

6.2 Mechanical Data

PACKAGE OUTLINE

DMT0014B — **VSON - 1 mm max height**

PLASTIC SMALL OUTLINE - NO LEAD



NOTES:

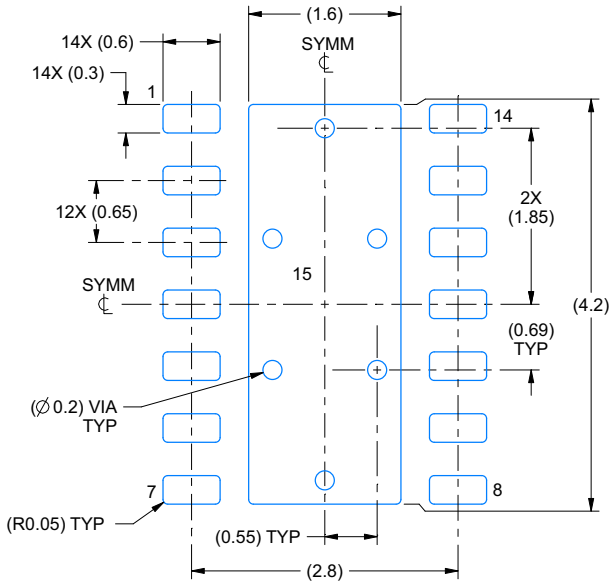
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

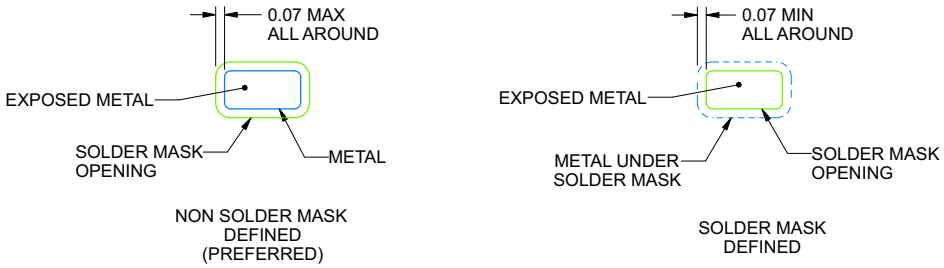
DMT0014B

VSON - 1 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:15X



SOLDER MASK DETAILS

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NOTES: (continued)

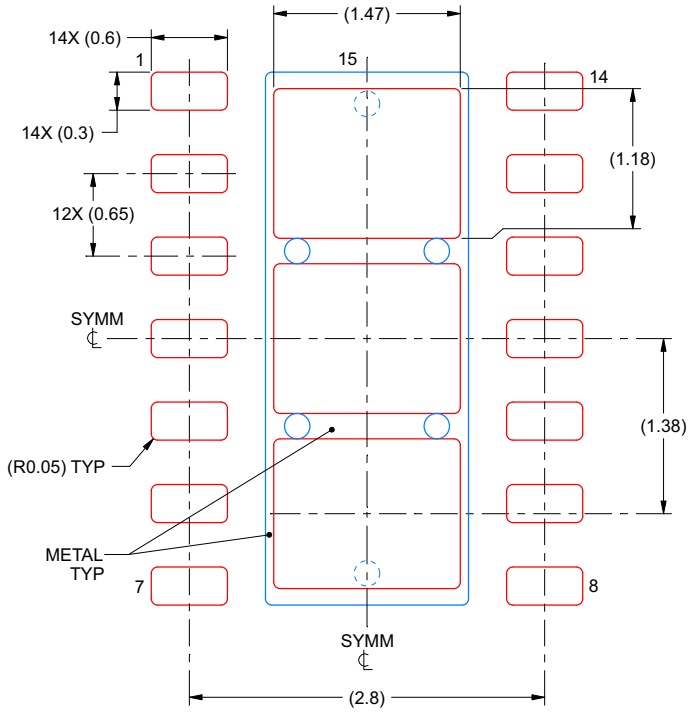
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
5. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

ADVANCE INFORMATION

EXAMPLE STENCIL DESIGN

DMT0014B — **VSON - 1 mm max height**

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD 15
77.4% PRINTED SOLDER COVERAGE BY AREA
SCALE:20X

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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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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
TCAN1162DMTRQ1	ACTIVE	VSON	DMT	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 150	1162	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.

GENERIC PACKAGE VIEW

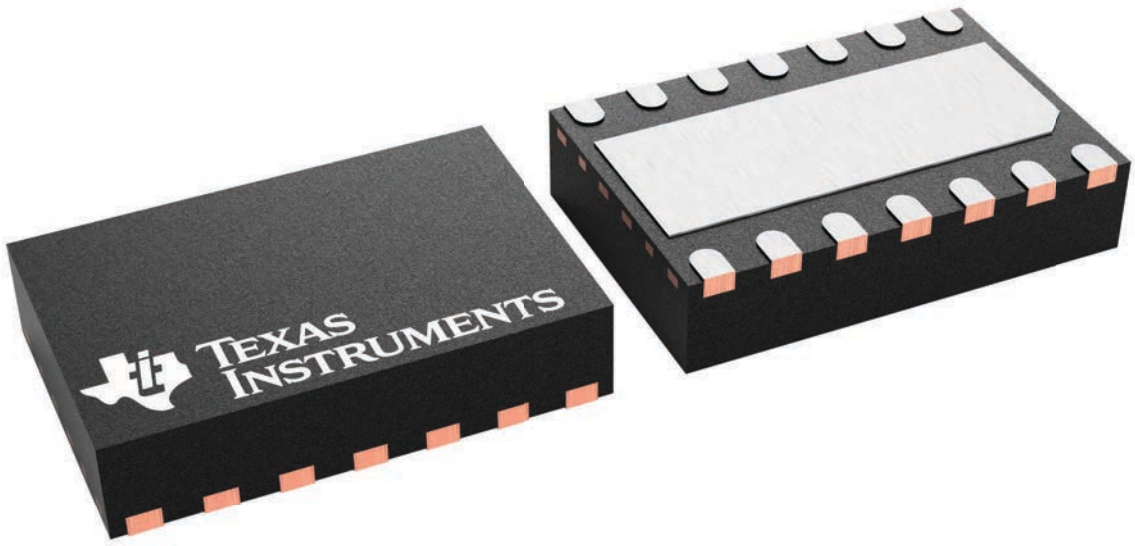
DMT 14

VSON - 0.9 mm max height

3 x 4.5, 0.65 mm pitch

PLASTIC SMALL OUTLINE - NO LEAD

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



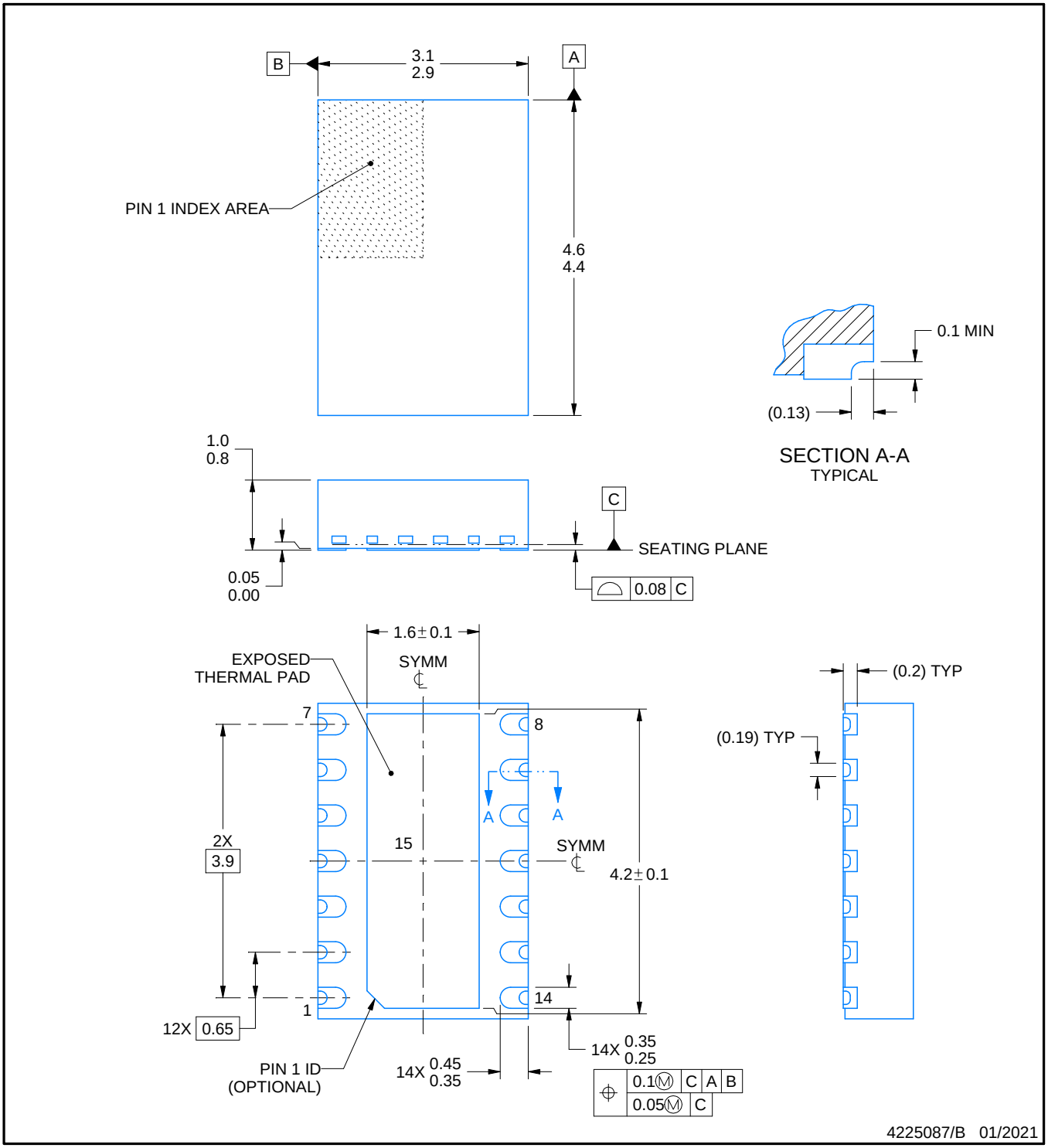
4225088/A

PACKAGE OUTLINE

DMT0014B

VSON - 1 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



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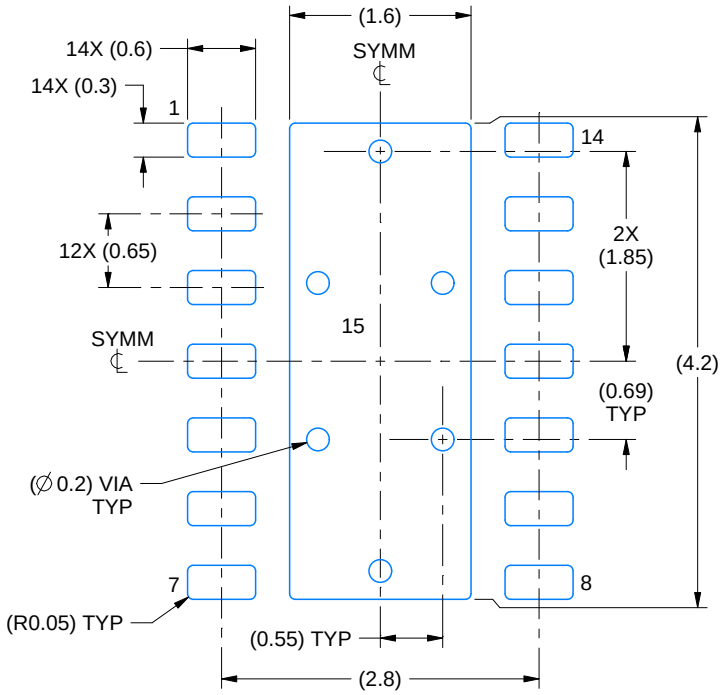
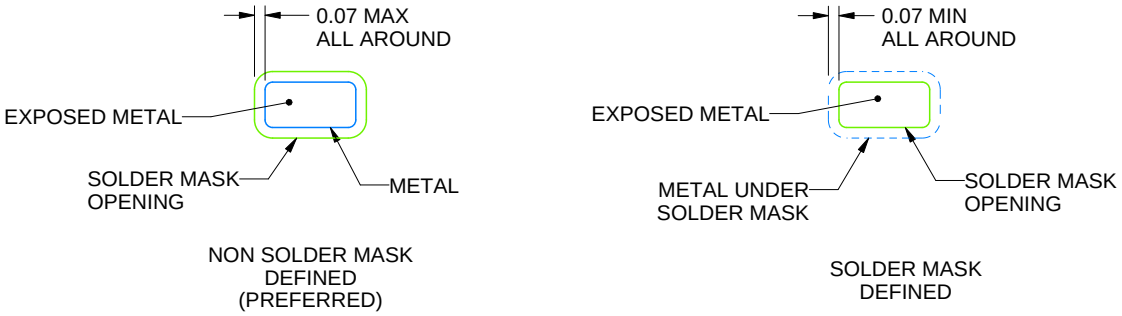


LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:15X



SOLDER MASK DETAILS

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NOTES: (continued)

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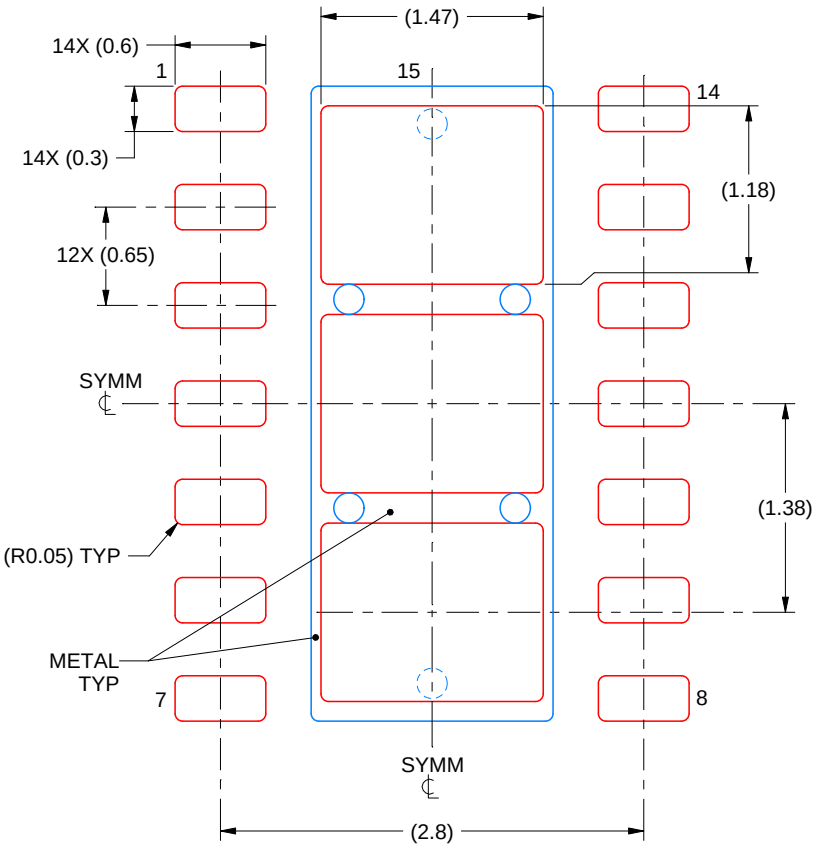

SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD 15
77.4% PRINTED SOLDER COVERAGE BY AREA
SCALE:20X

4225087/B 01/2021

NOTES: (continued)

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