

CSD96497Q5MC 同步降压 NexFET™ 智能功率级

1 特性

- 具有 65A 持续工作电流能力
- 30A 电流下系统效率超过 93.5%
- 工作频率高（高达 1.25MHz）
- 支持 FCCM 的二极管仿真模式
- 温度补偿双向电流感应
- 模拟温度输出
- 故障监控 - OTP、HS OCP 和短路保护
- 兼容 3.3V 和 5V PWM 信号
- 三态 PWM 输入
- 集成自举开关
- 用于击穿保护的经优化死区时间
- 高密度 5mm x 6mm QFN 封装
- 超低电感封装
- 系统已优化的 PCB 空间占用
- DualCool™ 封装
- 符合 RoHS 标准、无铅端子镀层
- 无卤素

2 应用

- 多相同步降压转换器
 - 高频率应用
 - 高电流、低占空比应用
- POL 直流/直流转换器
- 存储器和显卡
- 台式机和服务器 VR12.x 和 VR13.x V-core 同步降压转换器
- 用于网络通信的大电流 POL

3 说明

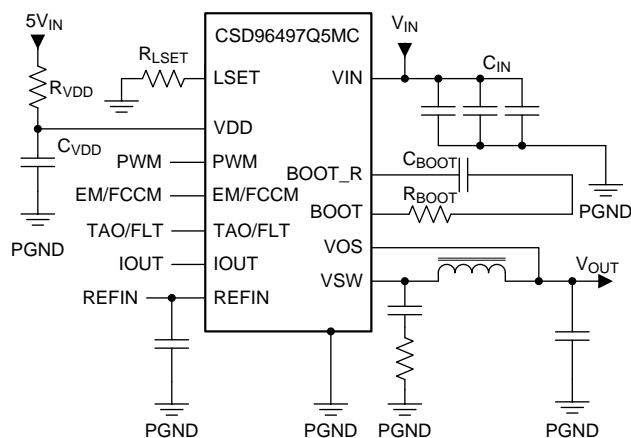
CSD96497 NexFET™ power stage 是经过高度优化的设计，用于高功率、高功率密度场合的同步降压转换器。这款产品集成了驱动器 IC 和功率 MOSFET 来完善功率级开关功能。该组合可在 5mm x 6mm 小型封装中实现高电流、高效率以及高速切换功能。它还集成了精确的电流检测和温度检测功能，可以简化系统设计以及提高精度。此外，PCB 封装已经过优化，可帮助减少设计时间并轻松完成总体系统设计。

器件信息(1)

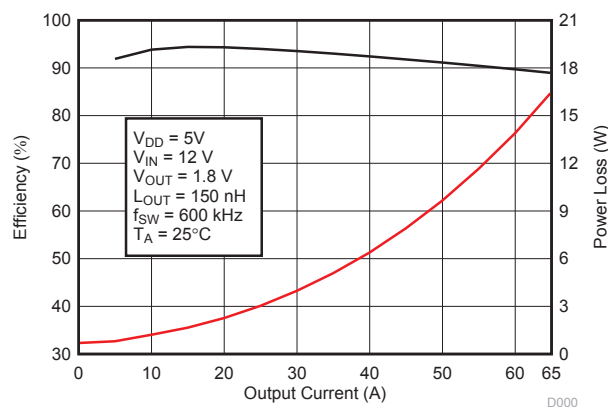
器件	介质	数量	封装	配送
CSD96497Q5MC	13 英寸卷带	2500	QFN 5.00mm x 6.00mm	卷带封装
CSD96497Q5MCT	7 英寸卷带	250		

(1) 如需了解所有可用封装，请参阅产品说明书末尾的可订购产品附录。

简化应用



典型功率级效率



4 修订历史记录

Changes from Original (January 2019) to Revision A

Page

-
- 更正了简化应用 原理图..... 1
-

5 器件和文档支持

5.1 商标

DualCool, NexFET are trademarks of Texas Instruments.

All other trademarks are the property of their respective owners.

5.2 静电放电警告



这些装置包含有限的内置 ESD 保护。存储或装卸时，应将导线一起截短或将装置放置于导电泡棉中，以防止 MOS 门极遭受静电损伤。

5.3 术语表

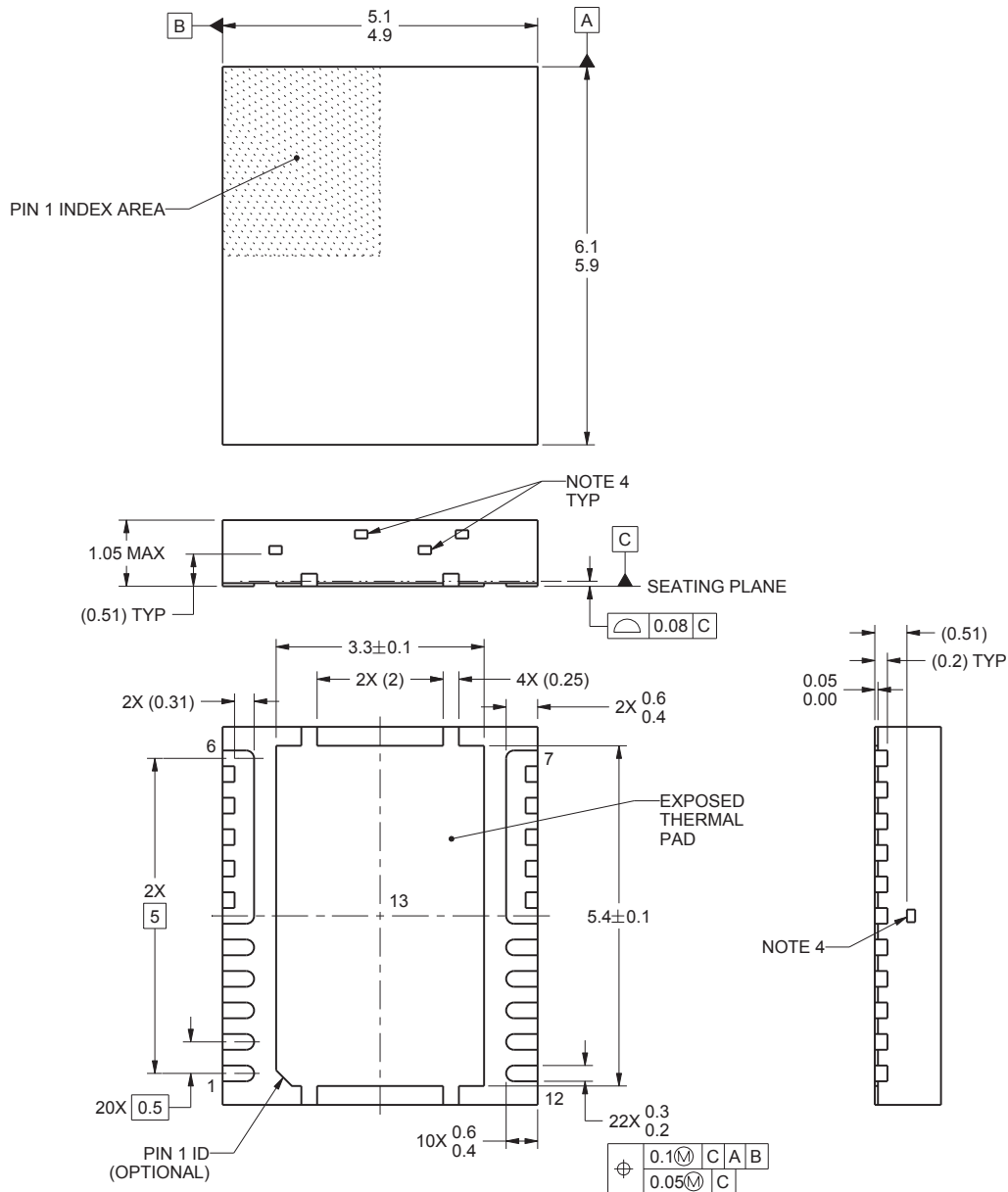
[SLYZ022](#) — TI 术语表。

这份术语表列出并解释术语、缩写和定义。

6 机械、封装和可订购信息

以下页面包含机械、封装和可订购信息。这些信息是指定器件的最新可用数据。数据如有变更，恕不另行通知，且不会对此文档进行修订。如需获取此数据表的浏览器版本，请查阅左侧的导航栏。

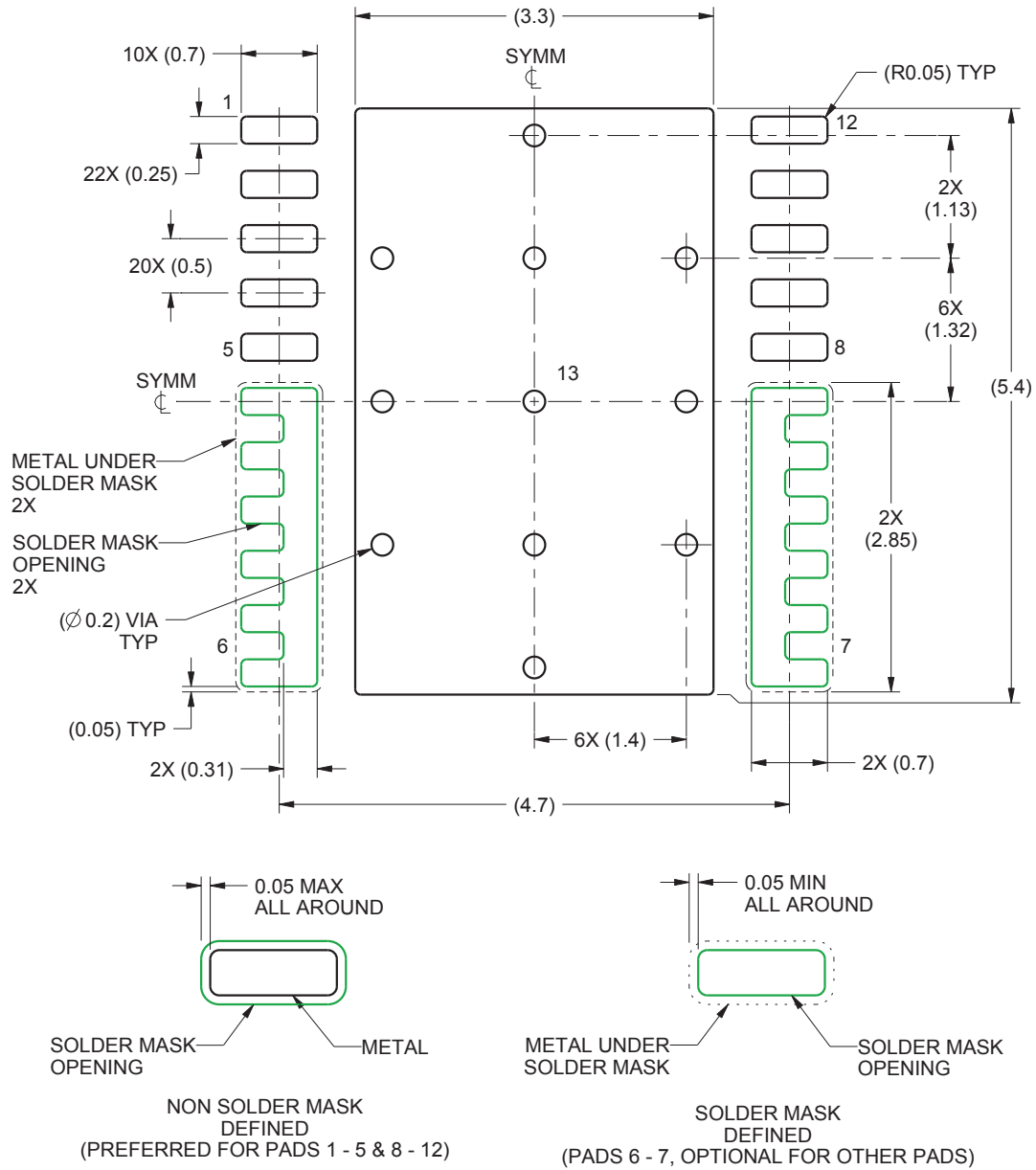
6.1 机械制图



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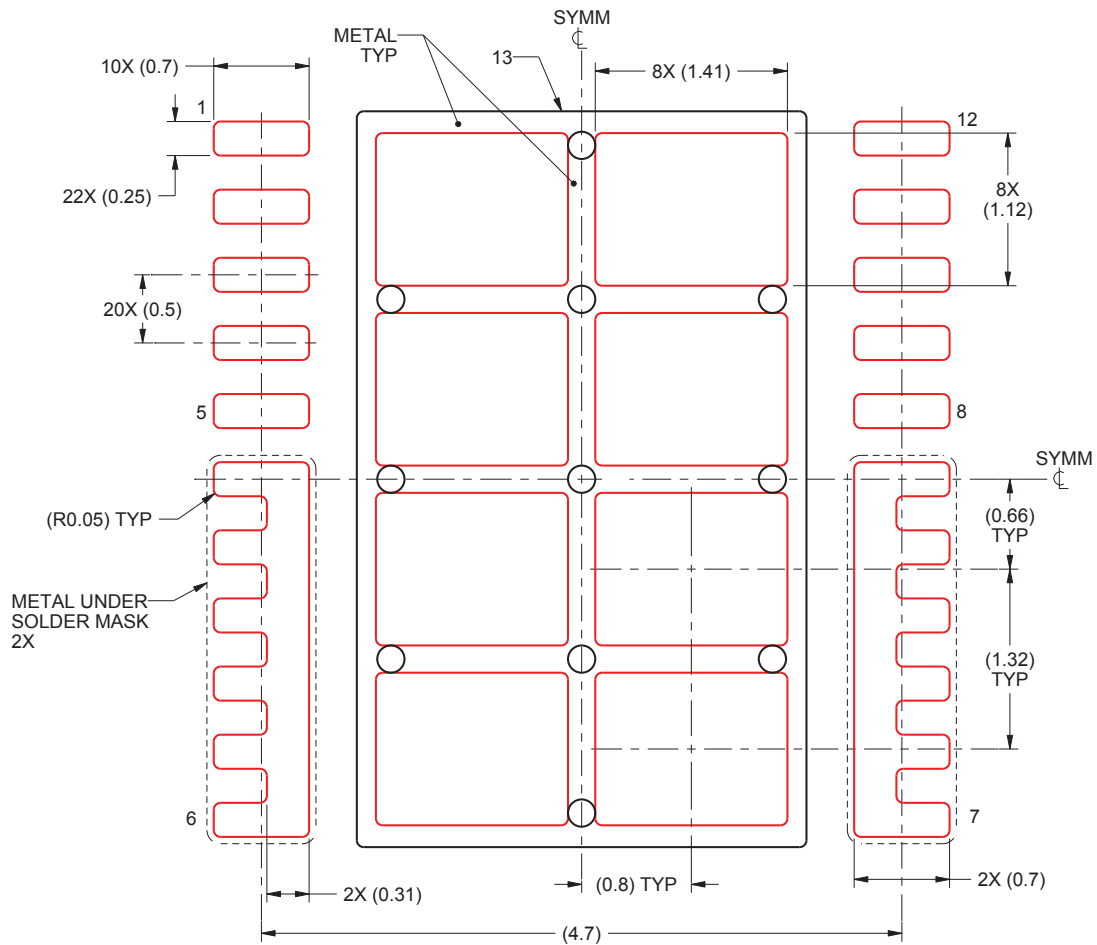
1. 所有线性尺寸的单位均为毫米。括号中的任何尺寸仅供参考。尺寸和公差值符合 ASME Y14.5M 标准。
2. 本图如有变更，恕不另行通知。
3. 封装散热盘必须在印刷电路板上焊接，包装散热和机械性能。
4. 外露的连接杆 特性 可能会有所不同。

6.2 推荐 PCB 焊盘图案



1. 所有线性尺寸的单位均为毫米。括号中的任何尺寸仅供参考。尺寸和公差值符合 ASME Y14.5M 标准。
2. 本图如有变更，恕不另行通知。
3. 此封装设计用于焊接到电路板的散热焊盘上。有关更多信息，请参阅《QFN/SON PCB 连接》(SLUA271)。
4. 根据具体应用决定是否选用通孔，请参见器件数据表。如需实施任意通孔，请参见此视图上的通孔位置。建议对焊锡膏下方的通孔进行填充、堵塞或包覆。

6.3 建议模版开孔



1. 所有线性尺寸的单位均为毫米。括号中的任何尺寸仅供参考。尺寸和公差值符合 ASME Y14.5M 标准。
2. 本图如有变更，恕不另行通知。
3. 具有漏斗形壁和圆角的激光切割孔可提供更佳的锡膏脱离。IPC-7525 可能提供替代设计建议。

6.4 Package Option Addendum

6.4.1 Packaging Information

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾	Op Temp (°C)	Device Marking ⁽⁴⁾⁽⁵⁾
CSD96497	Active	VSON-CLIP	DMC	12	2500	PB-Free (RoHS Exempt)	CU SN	Level-2-260C-1 YEAR	-55 to 150	96497MC

- (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.
PRE_PROD Unannounced device, not in production, not available for mass market, nor on the web, samples not available.
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) 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)
- (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 on 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.

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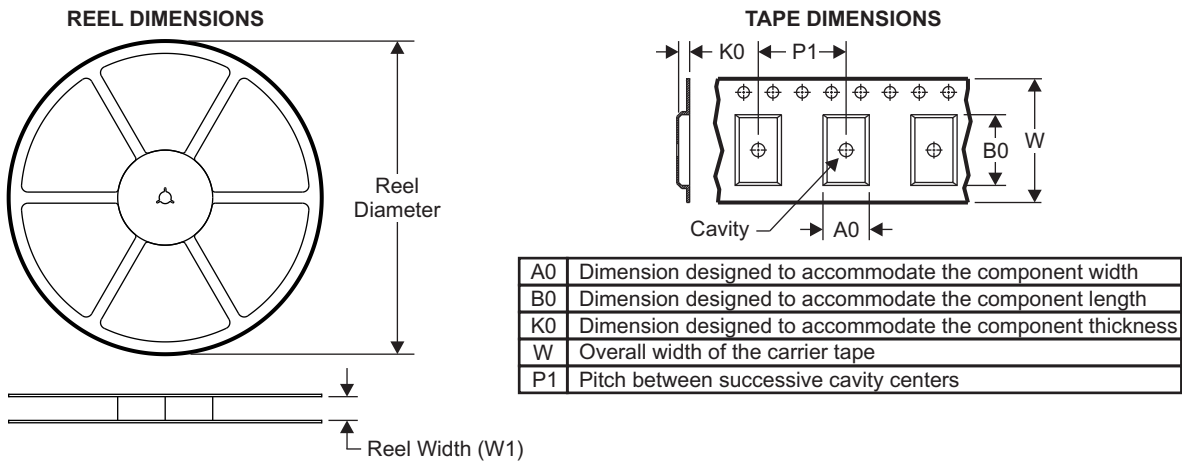
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CSD96497Q5MC

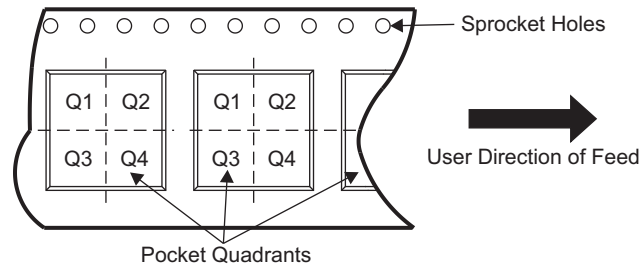
ZHCSJC2A – JANUARY 2019 – REVISED MARCH 2019

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6.4.2 Tape and Reel Information



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
CSD96497	VSON-CLIP	DMC	12	2500	330	12.4	5.30	6.30	1.20	8.00	12.00	Q1

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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
CSD96497Q5MC	ACTIVE	VSON-CLIP	DMC	12	2500	RoHS-Exempt & Green	SN	Level-2-260C-1 YEAR	-55 to 150	96497MC	
CSD96497Q5MCT	ACTIVE	VSON-CLIP	DMC	12	250	RoHS-Exempt & Green	SN	Level-2-260C-1 YEAR	-55 to 150	96497MC	

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

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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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