TLV803, TLV853, TLV863
JAJSK01E – APRIL 2011 – REVISED DECEMBER 2020

TLV8x3 アクティブ・ロー / オープン・ドレイン・リセット搭載、3 ピン電圧スーパーバイザ

1 特長

- 3 ピン SOT23 パッケージ
- 消費電流:9μA (標準値)
- 高精度電源電圧モニタ:
  2.5V、3V、3.3V、5V
- 200ms の固定遅延時間を持つパワー・オン・リセット・ジェネレータ
- MAX803 とピン互換
- 温度範囲:-40℃～+125℃
- オープン・ドレインの $\overline{\text{RESET}}$ 出力

2 アプリケーション

- ファクトリ・オートメーション
- 携帯用およびバッテリ駆動の機器
- セットトップ・ボックス
- サーバー
- 家電製品
- 電気メーター
- ビル・オートメーション

3 概要

TLV8x3 ファミリの監視回路は、主に DSP およびプロセッサ・ベースのシステムの回路の初期化とタイミングの監視を行います。

TLV803、TLV853、TLV863 は機能的に同等です。TLV853 と TLV863 は、TLV803 の代替ピン配置を提供します。新しい TLV803E デバイスは、これら 3 つすべてのデバイスに代わるピン互換品です。

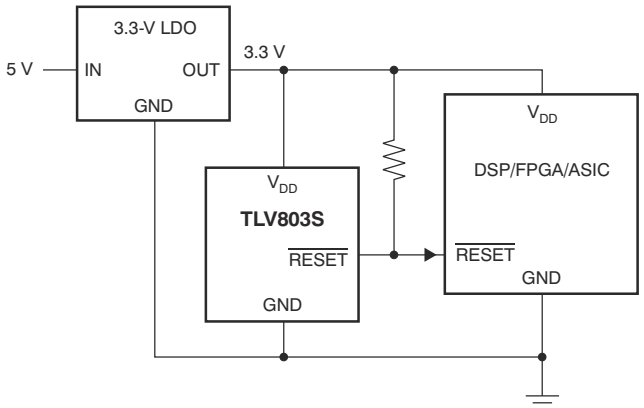
起動中に電源電圧 (V_{DD}) が 1.1V を超えると、$\overline{\text{RESET}}$ ピンがアサートされます。その後、監視回路は V_{DD} を監視し、V_{DD} がスレッショルド電圧 V_{IT} を下回っている限り、$\overline{\text{RESET}}$ ピンをアクティブに維持します。内蔵のタイマは、システムを確実に正しくリセットさせるため、出力が非アクティブ状態 (HIGH) に戻るのを遅らせます。遅延時間 ($t_{d(typ)}$ = 200ms) は、V_{DD} がスレッショルド電圧 V_{IT} を超えると開始します。電源電圧がスレッショルド電圧 V_{IT} を下回ると、出力は再びアクティブ (Low) になります。このファミリの全デバイスは、内蔵分圧器で設定した固定検出スレッショルド電圧 (V_{IT}) を持っています。

この製品ファミリは、2.5V、3V、3.3V、5V の電源電圧用に設計されています。これらのデバイスは 3 ピンの SOT-23 パッケージで供給されます。TLV803 デバイスは、-40℃～+125℃の温度範囲で動作が規定されています。

デバイス情報(1)

部品番号	パッケージ	本体サイズ (公称)
TLV8x3	SOT-23 (3)	2.92mm × 1.30mm

(1) 利用可能なパッケージについては、データシートの末尾にあるパッケージ・オプションについての付録を参照してください。



代表的なアプリケーション

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4 Revision History

資料番号末尾の英字は改訂を表しています。その改訂履歴は英語版に準じています。

Changes from Revision D (November 2020) to Revision E (December 2020) — **Page**

- Corrected missed VDD change from 7 to 6.5 in *Absolute Maximum Ratings* in note 2 ... 5

Changes from Revision C (September 2015) to Revision D (November 2020) — **Page**

- 文書全体にわたって表、図、相互参照の採番方法を更新 ... 1
- 「概要」セクションに TLV803E に関する新しい文章を追加 ... 1
- Changed VDD from 7 to 6.5 in *Absolute Maximum Ratings* ... 5
- Changed V_{OL}@ 500µA from 0.2 to 0.3 in *Electrical Characteristics* ... 6
- Changed I_{OH} from 100 nA to 350 nA in *Electrical Characteristics* ... 6
- Changed t_w from 1 to 10 µs in *Switching Characteristics* ... 6
- Deleted figure Minimum Pulse Duration At V_{DD} vs Overdrive Voltage in Typical Characteristics ... 7
- Changed figure from Pulse Duration to V_{OL}, I_{OL} in the Typical Application Section ... 12

Changes from Revision B (August 2011) to Revision C (September 2015) — **Page**

- データシートに TLV853 デバイスを追加 ... 1
- ページのヘッダーに表示されているデバイスの型番を、デバイスに記されているバージョンではなく、単一の TLV803 デバイスに変更 ... 1
- 「デバイス情報」表、「ESD 定格」表を追加 ... 1
- 「詳細説明」セクション、「アプリケーションと実装」セクション、「電源に関する推奨事項」セクション、「レイアウト」セクション、「デバイスおよびドキュメントのサポート」セクション、「メカニカル、パッケージ、および注文情報」セクションを追加 1
- 「アプリケーション」セクションの箇条書を変更 ... 1
- トップ・ページからピン配置を削除し、「ピン構成および機能」セクションに移動 ... 1
- Changed "free-air temperature" to "junction temperature" in *Absolute Maximum Ratings* condition statement ... 5
- Deleted *Soldering temperature* from *Absolute Maximum Ratings* table ... 5
- Changed *Thermal Information* table; updated thermal resistance values for all parameters ... 5
- Changed "free-air temperature" to "junction temperature" in *Electrical Characteristics* condition statement ... 6
- Changed temperature noted in *Switching Characteristics* condition statement ... 6

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Changes from Revision A (June 2011) to Revision B (August 2011) **Page**

- 「概要」セクションに TLV863 に関する新しい段落を追加 1
- TLV863 のピン配置をトップ・ページに追加..... 1
- Added TLV863 to Thermal Information..... 5
- Added TLV863M to Negative-Going Input Threshold Voltage parameter..... 6
- Added TLV863M to Hysteresis parameter..... 6
- Added TLV863 to Functional Block Diagram..... 8

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5 Device Comparison

表 5-1. Device Threshold Options

DEVICE	THRESHOLD VOLTAGE
TLV803Z	2.25 V
TLV803R	2.64 V
TLV803S	2.93 V
TLV803M	4.38 V
TLV853M	4.38 V
TLV863M	4.38 V

表 5-2. Device Family Comparison

DEVICE	FUNCTION
TLV803	Open-Drain, $\overline{\text{RESET}}$ Output
TLV809	Push-Pull, $\overline{\text{RESET}}$ Output
TLV810	Push-Pull, RESET Output

6 Pin Configuration and Functions

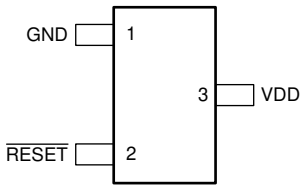


図 6-1. TLV803: DBZ Package 3-Pin SOT-23 Top View

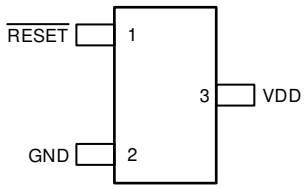


図 6-2. TLV853: DBZ Package 3-Pin SOT-23 Top View

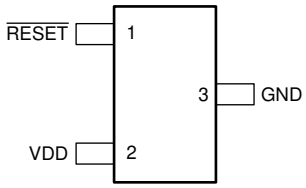


図 6-3. TLV863: DBZ Package 3-Pin SOT-23 Top View

Pin Functions

PIN				I/O	DESCRIPTION
NAME	TLV803	TLV853	TLV863		
GND	1	2	3	—	Ground pin.
$\overline{\text{RESET}}$	2	1	1	O	$\overline{\text{RESET}}$ is an open-drain output that is driven to a low impedance state when $\overline{\text{RESET}}$ is asserted. $\overline{\text{RESET}}$ remains low (asserted) for the delay time (t_d) after V_{DD} exceeds V_{IT-}. Use a 10-kΩ to 1-MΩ pullup resistor on this pin. The pullup voltage is not limited by V_{DD}.
VDD	3	3	2	I	Supply voltage pin. It is good analog design practice to place a 0.1-µF ceramic capacitor close to this pin.

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7 Specifications

7.1 Absolute Maximum Ratings(1)

over operating junction temperature range (unless otherwise noted)

		MIN	MAX	UNIT
Voltage	VDD(2)	0	6.5	V
	All other pins(2)	–0.3	+6.5	
Current	Maximum low output current, I_{OL}		5	mA
	Maximum high output current, I_{OH}		–5	
	Input clamp current, I_{IK} (V_I < 0 or V_I > V_{DD})		±20	
	Output clamp current, I_{OK} (V_O < 0 or V_O > V_{DD})		±20	
Temperature	Operating junction temperature range, T_J	–40	125	°C
	Storage temperature range, T_{stg}	–65	150	

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) All voltage values are with respect to GND. For reliable operation the device should not be operated at 6.5 V for more than t = 1000h continuously

7.2 ESD Ratings

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001(1)	±2000	V
		Charged-device model (CDM), per JEDEC specification JESD22-C101(2)	±500	

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

7.3 Thermal Information

THERMAL METRIC(1)		TLV8x3 DBZ (SOT-23) 3 PINS	UNITS
$R_{\theta JA}$	Junction-to-ambient thermal resistance	328.5	°C/W
$R_{\theta JC(top)}$	Junction-to-case (top) thermal resistance	135.4	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	58.3	°C/W
ψ_{JT}	Junction-to-top characterization parameter	5.2	°C/W
ψ_{JB}	Junction-to-board characterization parameter	59.6	°C/W
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	N/A	°C/W

(1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report, SPRA953.

7.4 Recommended Operating Conditions

at specified temperature range (unless otherwise noted)

		MIN	MAX	UNIT
V_{DD}	Supply voltage	1.1	6	V
T_J	Operating junction temperature	–40	125	°C

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7.5 Electrical Characteristics

over recommended operating junction temperature range (unless otherwise noted)

PARAMETER			TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{OL}	Low-level output voltage		V_{DD} = 2 V to 6 V, I_{OL} = 500 µA			0.3	V
			V_{DD} = 3.3 V, I_{OL} = 2 mA			0.4	
			V_{DD} = 6 V, I_{OL} = 4 mA			0.4	
	Power-up reset voltage(1)		I_{OL} = 50 µA, V_{OL} < 0.2 V	1.1			V
V_{IT-}	Negative-going input threshold voltage(2)	TLV803Z	T_J = – 40°C to +125°C	2.20	2.25	2.30	V
		TLV803R		2.58	2.64	2.70	
		TLV803S		2.87	2.93	2.99	
		TLV8x3M		4.28	4.38	4.48	
V_{hys}	Hysteresis	TLV803Z	T_J = 25°C, I_{OL} = 50 µA		30		mV
		TLV803R			35		
		TLV803S			40		
		TLV8x3M			60		
I_{DD}	Supply current		V_{DD} = 2 V, output unconnected		9	15	µA
			V_{DD} = 6 V, output unconnected		20	30	
I_{OH}	Output leakage current		V_{DD} = 6 V			350	nA

(1) The lowest supply voltage at which $\overline{\text{RESET}}$ becomes valid. $t_{r,VDD} \leq 66.7$ V/ms.
(2) To ensure best stability of the threshold voltage, place a bypass capacitor (0.1-µF ceramic) near the supply terminals.

7.6 Switching Characteristics

over operating temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_w	Pulse duration at V_{DD}	V_{DD} = 1.08 V_{IT-} to 0.92 V_{IT-}		10		µs
t_d	Delay time	$V_{DD} \geq V_{IT-}$ + 0.2 V; see Timing Diagram	120	200	280	ms

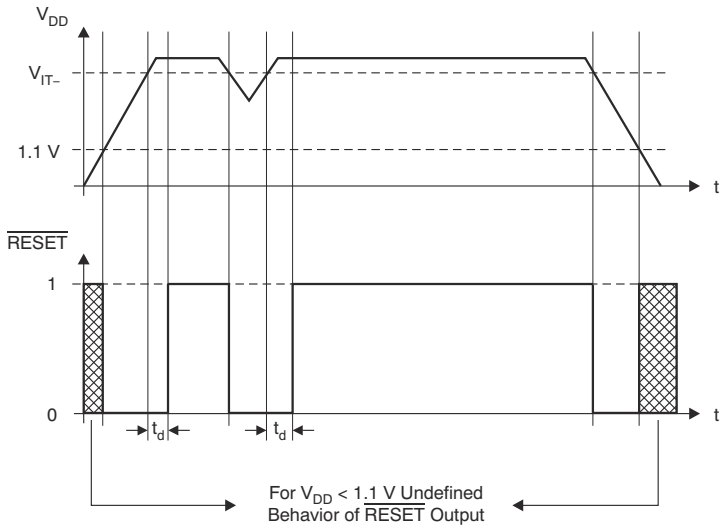


図 7-1. Timing Diagram

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7.7 Typical Characteristics

at T_J = 25°C, V_{IT-} = 4.38 V, and V_{DD} = 5.0 V (unless otherwise noted)

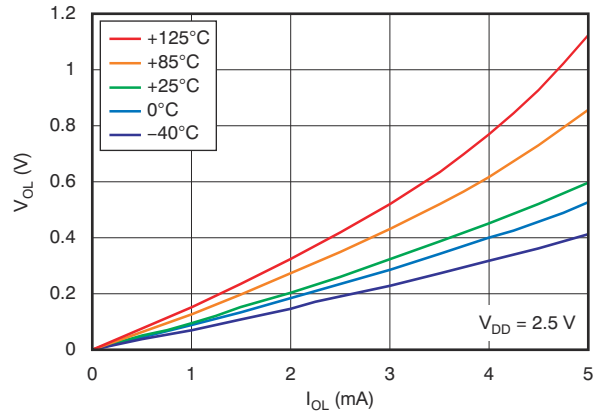


図 7-2. Low-Level Output Voltage vs Low-Level Output Current

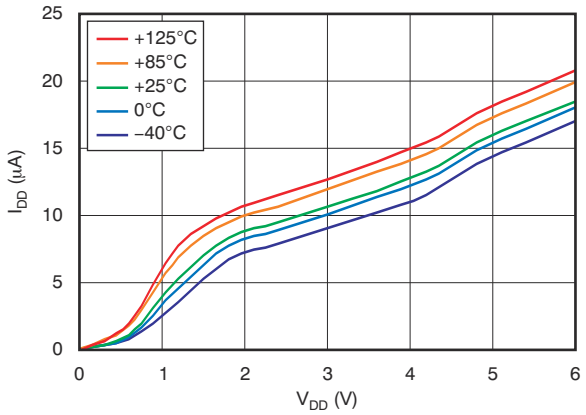


図 7-3. Supply Current vs Supply Voltage

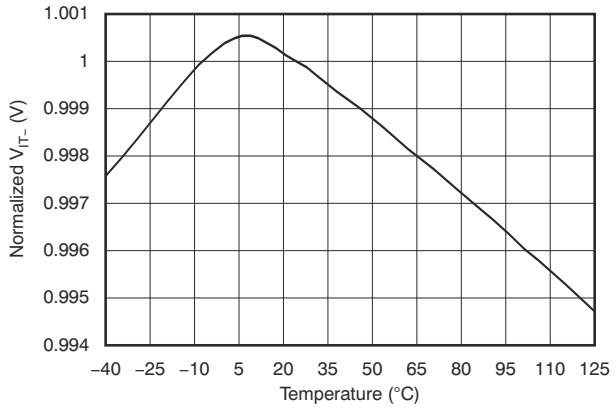


図 7-4. Normalized to 25°C Negative-Going Input Threshold Voltage vs Temperature

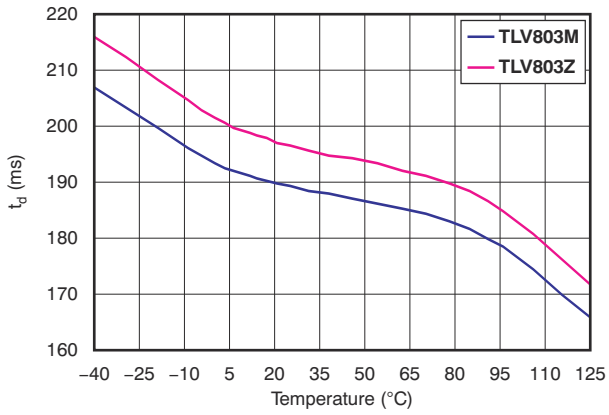


図 7-5. Delay Time vs Temperature

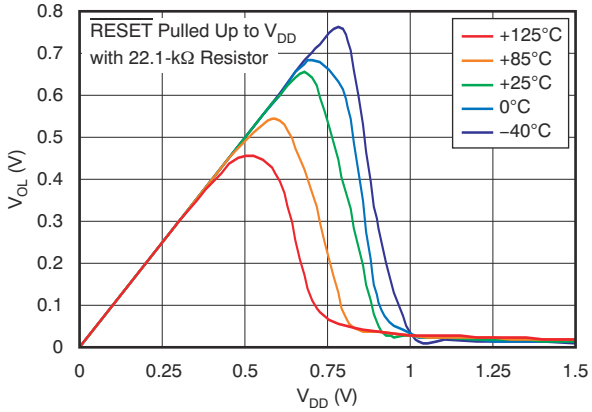


図 7-6. Power-Up Low-Level Output Voltage vs Supply Voltage

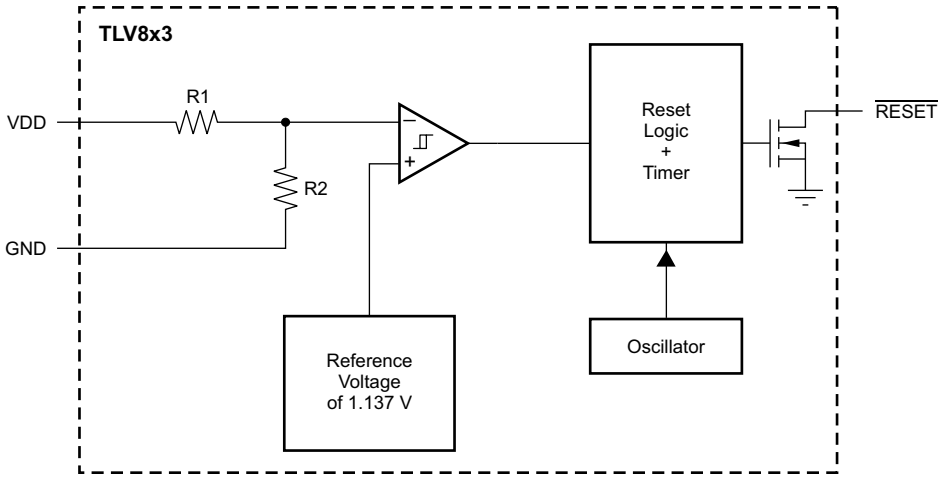
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8 Detailed Description

8.1 Overview

The TLV803 family of supervisory circuits provides circuit initialization and timing supervision. The TLV853 and TLV863 are both functionally equivalent to the TLV803. These devices output a logic low whenever V_{DD} drops below the negative-going threshold voltage (V_{IT-}). The output, $\overline{RESET}$, remains low for approximately 200 ms after the V_{DD} voltage exceeds the positive-going threshold voltage ($V_{IT-} + V_{hys}$). These devices are designed to ignore fast transients on the V_{DD} pin.

8.2 Functional Block Diagram



8.3 Feature Description

8.3.1 V_{DD} Transient Rejection

The TLV803 has built-in rejection of fast transients on the V_{DD} pin. The rejection of transients depends on both the duration and the amplitude of the transient. The amplitude of the transient is measured from the bottom of the transient to the negative threshold voltage of the TLV803, as shown in 図 8-1.

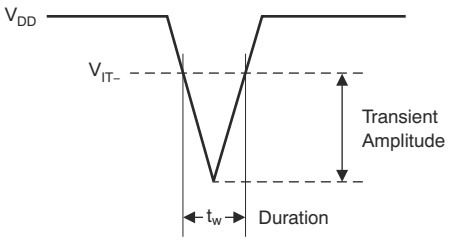


図 8-1. Voltage Transient Measurement

The TLV803 does not respond to transients that are fast duration/low amplitude or long duration/small amplitude. Transients meeting or longer than the t_w specified in the switching characteristics section triggers a reset.

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8.3.2 Reset During Power Up and Power Down

The TLV803 output is valid when V_{DD} is greater than 1.1 V. When V_{DD} is less than 1.1 V, the output transistor turns off and becomes high impedance. The voltage on the $\overline{\text{RESET}}$ pin rises to the voltage level connected to the pull-up resistor. 図 8-2 shows a typical waveform for power-up, assuming the $\overline{\text{RESET}}$ pin has a pull-up resistor connected to the V_{DD} pin.

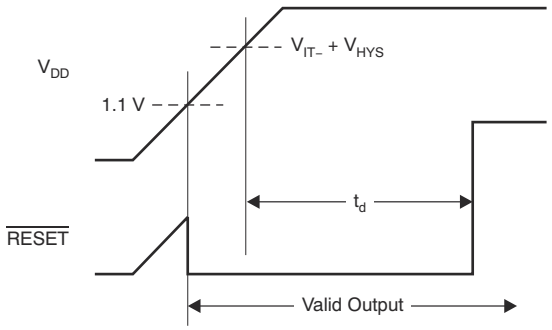


図 8-2. Power-Up Response

8.3.3 Bidirectional Reset Pins

Some microcontrollers have bidirectional reset pins that act as both inputs and outputs. In a situation where the TLV803 is pulling the $\overline{\text{RESET}}$ line low while the microcontroller is trying the force the $\overline{\text{RESET}}$ line high, a series resistor should be placed between the output of the TLV803 and the $\overline{\text{RESET}}$ pin of the microcontroller to protect against excessive current flow. 図 8-3 shows the connection of the TLV803 to a microcontroller using a series resistor to drive a bidirectional $\overline{\text{RESET}}$ line.

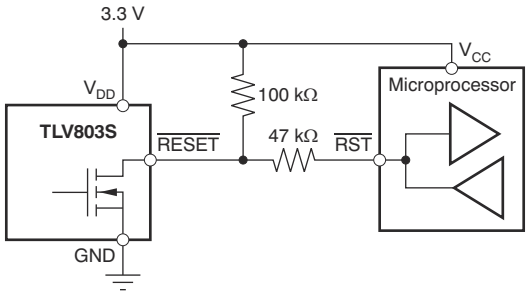


図 8-3. Connection To Bidirectional Reset Pin

8.4 Device Functional Modes

8.4.1 Normal Operation (VDD > Power-Up Reset Voltage)

When the voltage on VDD is greater than 1.1 V, the $\overline{\text{RESET}}$ signal asserts when V_{DD} is less than V_{IT-} and deasserts when V_{DD} is greater thanV_{IT-}.

8.4.2 Power On Reset (VDD < Power-Up Reset Voltage)

When the voltage on VDD is lower than the required voltage to internally pull the asserted output to GND (power-up reset voltage), both outputs are in a high-impedance state.

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9 Application and Implementation

注

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9.1 Application Information

9.1.1 Monitoring Multiple Supplies

Because the TLV803 has an open-drain output, multiple TLV803 outputs can be directly tied together to form a logical OR-ing function for the $\overline{\text{RESET}}$ line. Only one pull-up resistor is required for this configuration. 図 9-1 shows two TLV803s connected together to provide monitoring of a 3.3-V power rail and a 5.0-V power rail. A reset is generated if either power rail falls below the threshold voltage of its corresponding TLV803.

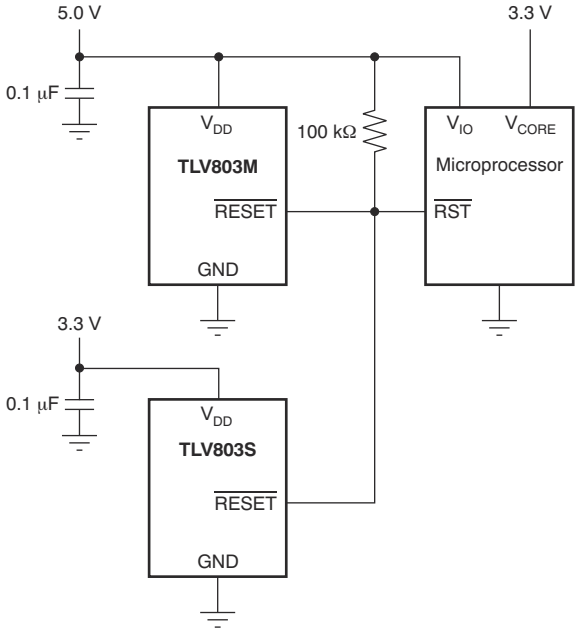


図 9-1. Multiple Voltage Rail Monitoring

9.1.2 Output Level Shifting

The $\overline{\text{RESET}}$ output of the TLV803 can be pulled to a maximum voltage of 6 V and can be pulled higher in voltage than V_{DD}. It is useful to provide level shifting of the output for cases where the monitored voltage is less than the useful logic levels of the load. 図 9-2 shows the TLV803Z used to monitor a 2.5-V power rail, with a logic $\overline{\text{RESET}}$ input to a microprocessor that is connected to 5.0 V and has 5.0-V logic levels.

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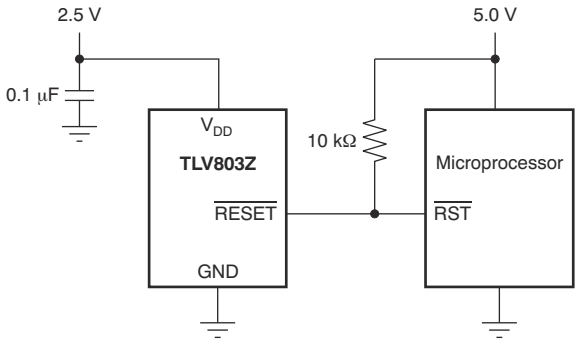


図 9-2. Output Voltage Level Shifting

9.2 Typical Application

図 9-3 shows TLV803S being used to monitor the supply rail for a DSP, FPGA, or ASIC.

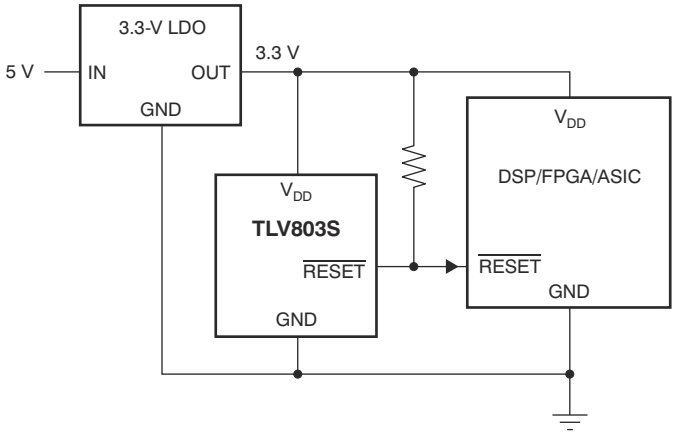


図 9-3. Typical Application

9.2.1 Design Requirements

This design calls for a 3.3-V rail to be monitored. The design resets if the supply rail falls below 2.93 V. The output must satisfy 3.3-V CMOS logic.

9.2.2 Detailed Design Procedure

Select the TLV803S to satisfy the voltage threshold requirement.

Place a pullup resistor on $\overline{\text{RESET}}$ to VDD in order to satisfy the output logic requirement.

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9.2.3 Application Curves

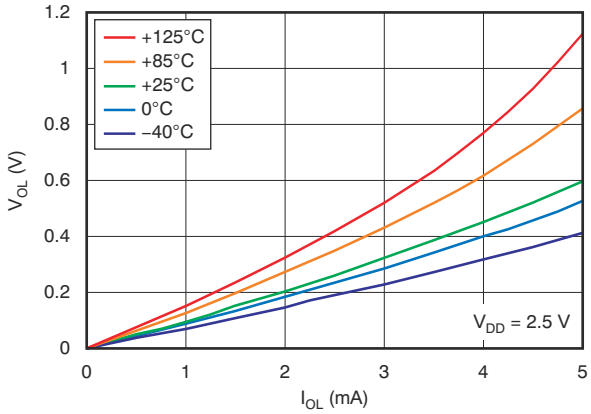


図 9-4. Low-Level Output Voltage vs Low-Level Output Current

10 Power Supply Recommendations

These devices are designed to operate from an input voltage supply range between 1.1 V and 6 V.

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11 Layout

11.1 Layout Guidelines

Place the C_{IN} decoupling capacitor close to the device.

11.2 Layout Example

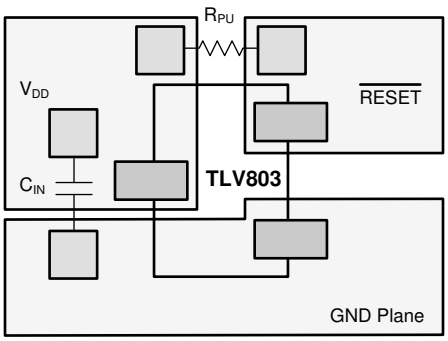


図 11-1. Layout Example (DBZ Package)

12 Device and Documentation Support

12.1 Device Support

12.1.1 Development Support

12.1.1.1 Evaluation Modules

An evaluation module (EVM) is available to assist in the initial circuit performance evaluation using the TLV803. The TLV803SEVM-019 evaluation module (and related user guide) can be requested at the Texas Instruments website through the product folders or purchased directly from the TI eStore.

12.1.1.2 Spice Models

Computer simulation of circuit performance using SPICE is often useful when analyzing the performance of analog circuits and systems. SPICE models for the TLV803, TLV853, and TLV863 are available through the respective device product folders under *Tools & Software*.

12.2 Documentation Support

12.2.1 Related Documentation

- TLV803SEVM-019 User's Guide. Literature number SLVU461.

12.3 Related Links

表 12-1 lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

表 12-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
TLV803	Click here	Click here	Click here	Click here	Click here
TLV853	Click here	Click here	Click here	Click here	Click here
TLV863	Click here	Click here	Click here	Click here	Click here

12.4 サポート・リソース

TI E2E™ サポート・フォーラムは、エンジニアが検証済みの回答と設計に関するヒントをエキスパートから迅速かつ直接得ることができる場所です。既存の回答を検索したり、独自の質問をしたりすることで、設計で必要な支援を迅速に得ることができます。

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12.5 Trademarks

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12.6 静電気放電に関する注意事項



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ESD による破損は、わずかな性能低下からデバイスの完全な故障まで多岐にわたります。精密な IC の場合、パラメータがわずかに変化するだけで公表されている仕様から外れる可能性があるため、破損が発生しやすくなっています。

12.7 用語集

TI 用語集　　この用語集には、用語や略語の一覧および定義が記載されています。

13 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.

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PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
TLV803MDBZR	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VOUQ
TLV803MDBZR.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOUQ
TLV803MDBZT	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VOUQ
TLV803MDBZT.A	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOUQ
TLV803RDBZR	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VOSQ
TLV803RDBZR.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOSQ
TLV803RDBZRG4	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOSQ
TLV803RDBZRG4.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOSQ
TLV803RDBZT	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VOSQ
TLV803RDBZT.A	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOSQ
TLV803SDBZR	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VOTQ
TLV803SDBZR.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOTQ
TLV803SDBZRG4	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOTQ
TLV803SDBZRG4.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOTQ
TLV803SDBZT	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VOTQ
TLV803SDBZT.A	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VOTQ
TLV803ZDBZR	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VORQ
TLV803ZDBZR.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VORQ
TLV803ZDBZT	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VORQ
TLV803ZDBZT.A	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VORQ
TLV853MDBZR	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	ZGM4
TLV853MDBZR.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	ZGM4
TLV853MDBZT	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 125	ZGM4

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
TLV853MDBZT.A	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	ZGM4
TLV863MDBZR	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VTWM
TLV863MDBZR.A	Active	Production	SOT-23 (DBZ) | 3	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VTWM
TLV863MDBZT	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU | SN | NIPDAUAG	Level-1-260C-UNLIM	-40 to 125	VTWM
TLV863MDBZT.A	Active	Production	SOT-23 (DBZ) | 3	250 | SMALL T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	VTWM

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts 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.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

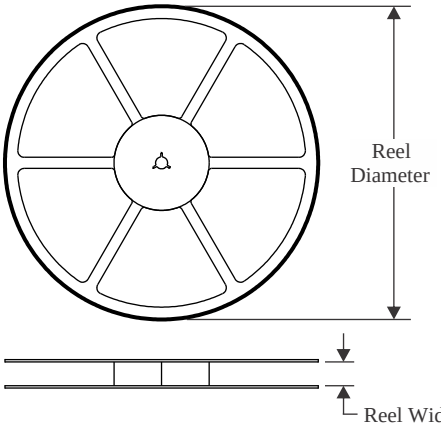
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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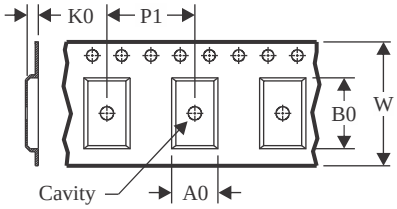
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TAPE AND REEL INFORMATION

REEL DIMENSIONS

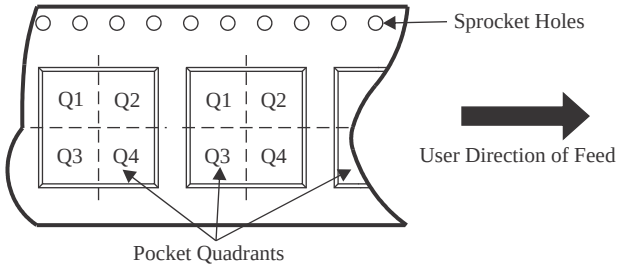


TAPE DIMENSIONS



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

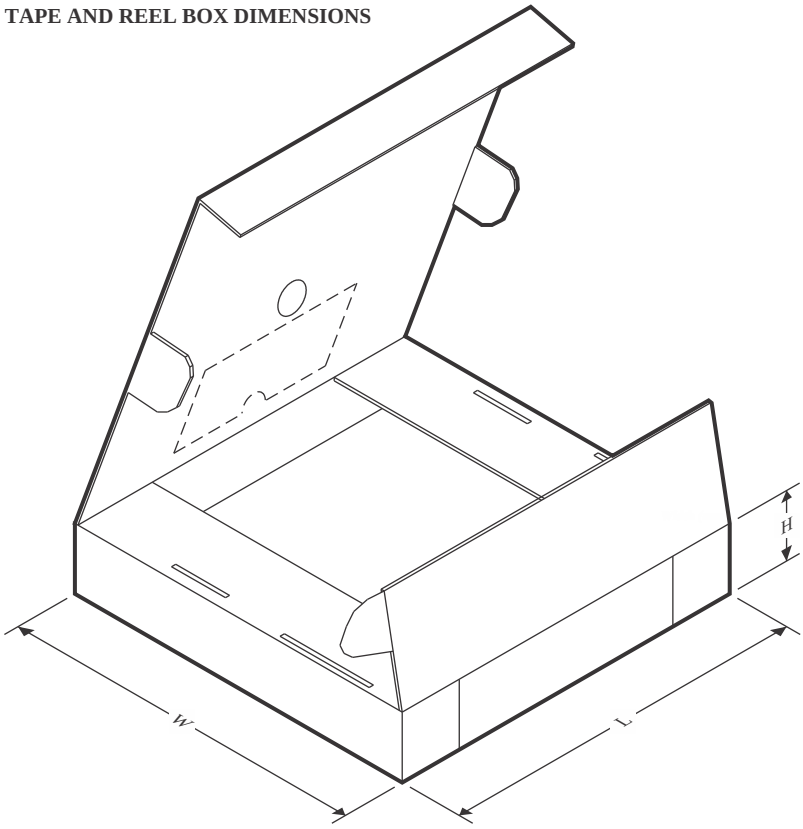


*All dimensions are nominal

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
TLV803MDBZR	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803MDBZR	SOT-23	DBZ	3	3000	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV803MDBZT	SOT-23	DBZ	3	250	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803MDBZT	SOT-23	DBZ	3	250	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV803RDBZR	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803RDBZRG4	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803RDBZT	SOT-23	DBZ	3	250	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV803RDBZT	SOT-23	DBZ	3	250	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803SDBZR	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803SDBZRG4	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803SDBZT	SOT-23	DBZ	3	250	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803SDBZT	SOT-23	DBZ	3	250	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV803ZDBZR	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV803ZDBZT	SOT-23	DBZ	3	250	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV803ZDBZT	SOT-23	DBZ	3	250	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV853MDBZR	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3

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
TLV853MDBZR	SOT-23	DBZ	3	3000	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV853MDBZT	SOT-23	DBZ	3	250	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV853MDBZT	SOT-23	DBZ	3	250	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV863MDBZR	SOT-23	DBZ	3	3000	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV863MDBZR	SOT-23	DBZ	3	3000	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3
TLV863MDBZT	SOT-23	DBZ	3	250	178.0	9.0	3.15	2.77	1.22	4.0	8.0	Q3
TLV863MDBZT	SOT-23	DBZ	3	250	180.0	8.4	2.9	3.35	1.35	4.0	8.0	Q3

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TLV803MDBZR	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV803MDBZR	SOT-23	DBZ	3	3000	180.0	180.0	18.0
TLV803MDBZT	SOT-23	DBZ	3	250	210.0	185.0	35.0
TLV803MDBZT	SOT-23	DBZ	3	250	180.0	180.0	18.0
TLV803RDBZR	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV803RDBZRG4	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV803RDBZT	SOT-23	DBZ	3	250	180.0	180.0	18.0
TLV803RDBZT	SOT-23	DBZ	3	250	210.0	185.0	35.0
TLV803SDBZR	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV803SDBZRG4	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV803SDBZT	SOT-23	DBZ	3	250	210.0	185.0	35.0
TLV803SDBZT	SOT-23	DBZ	3	250	180.0	180.0	18.0
TLV803ZDBZR	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV803ZDBZT	SOT-23	DBZ	3	250	180.0	180.0	18.0
TLV803ZDBZT	SOT-23	DBZ	3	250	210.0	185.0	35.0
TLV853MDBZR	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV853MDBZR	SOT-23	DBZ	3	3000	180.0	180.0	18.0
TLV853MDBZT	SOT-23	DBZ	3	250	180.0	180.0	18.0

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TLV853MDBZT	SOT-23	DBZ	3	250	210.0	185.0	35.0
TLV863MDBZR	SOT-23	DBZ	3	3000	180.0	180.0	18.0
TLV863MDBZR	SOT-23	DBZ	3	3000	210.0	185.0	35.0
TLV863MDBZT	SOT-23	DBZ	3	250	180.0	180.0	18.0
TLV863MDBZT	SOT-23	DBZ	3	250	210.0	185.0	35.0

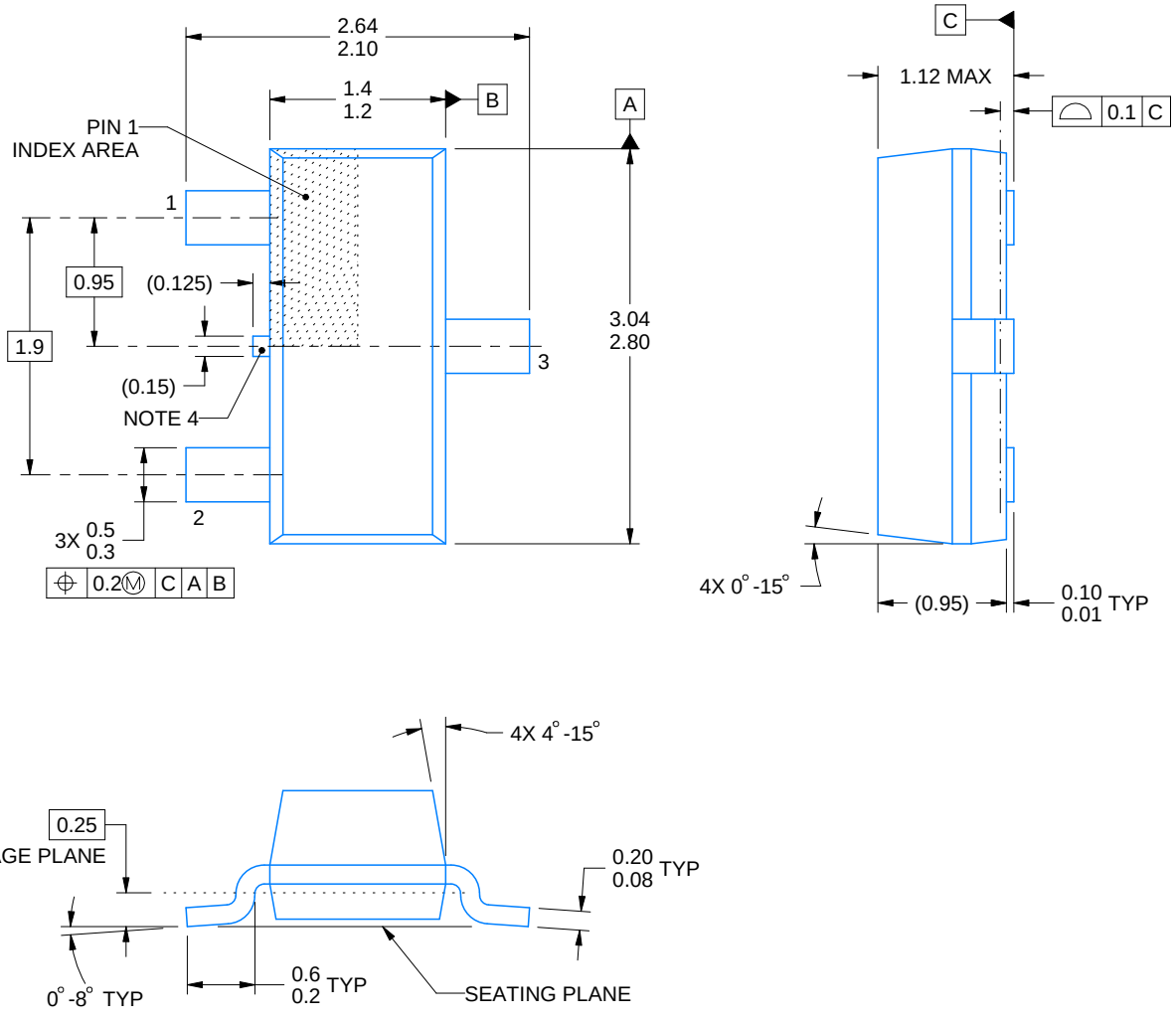
PACKAGE OUTLINE

DBZ0003A



SOT-23 - 1.12 mm max height

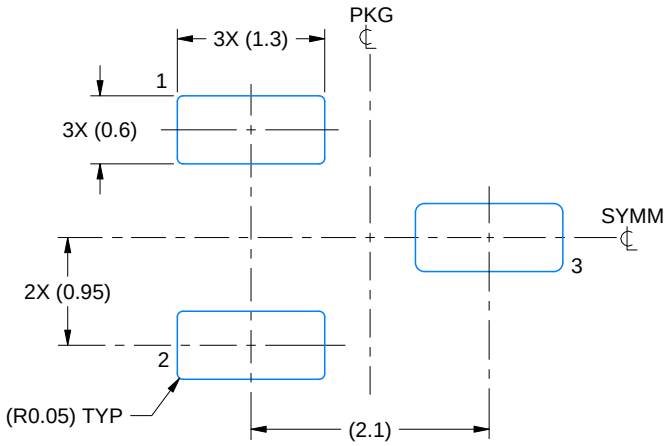
SMALL OUTLINE TRANSISTOR



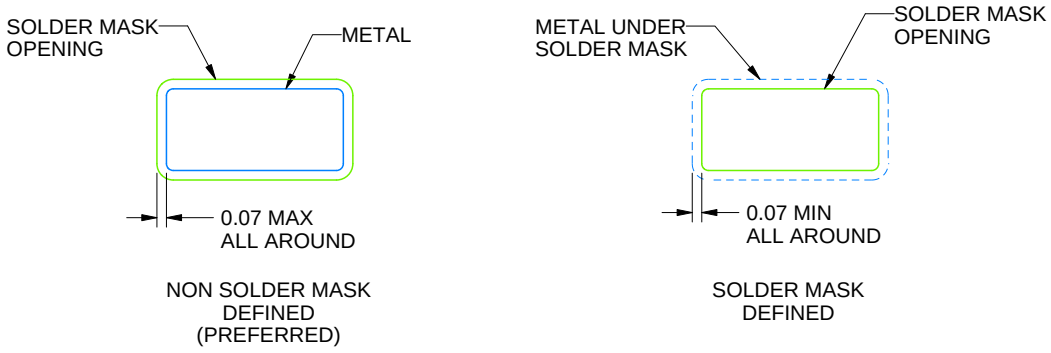
4214838/F 08/2024

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. Reference JEDEC registration TO-236, except minimum foot length.
4. Support pin may differ or may not be present.
5. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25mm per side



LAND PATTERN EXAMPLE
SCALE:15X

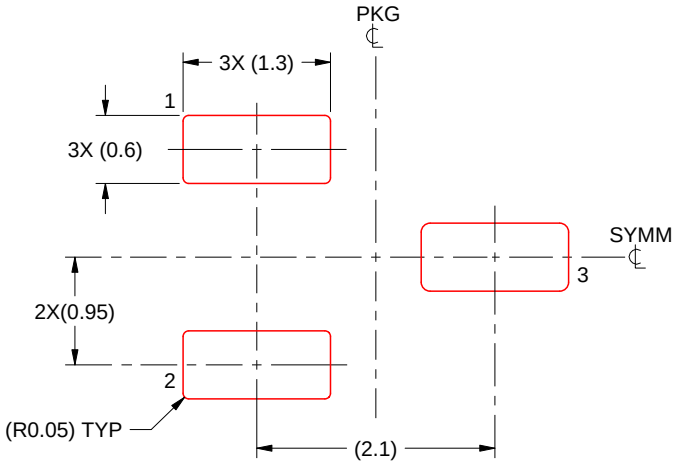


SOLDER MASK DETAILS

4214838/F 08/2024

NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



SOLDER PASTE EXAMPLE
BASED ON 0.125 THICK STENCIL
SCALE:15X

4214838/F 08/2024

NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

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