# DRV5053-Q1 Automotive Analog-Bipolar Hall Effect Sensor

## 1 Features

- Linear Output Hall Sensor
- AEC-Q100 Qualified for Automotive Applications
  - Grade 1: $T_A$ = –40 to 125°C (Q, see Figure 17)
  - Grade 0: $T_A$ = –40 to 150°C (E, see Figure 17)
- Superior Temperature Stability
  - Sensitivity ±10% Over Temperature
- High Sensitivity Options:
  - –11 mV/mT (OA, See Figure 17)
  - –23 mV/mT (PA)
  - –45 mV/mT (RA)
  - –90 mV/mT (VA)
  - +23 mV/mT (CA)
  - +45 mV/mT (EA)
- Supports a Wide Voltage Range
  - 2.7 to 38 V
  - No External Regulator Required
- Amplified Output Stage
  - 2.3-mA Sink, 300 µA Source
- Output Voltage: 0.2 ~ 1.8 V
  - B = 0 mT, OUT = 1 V
- Fast Power-On: 35 µs
- Small Package and Footprint
  - Surface Mount 3-Pin SOT-23 (DBZ)
    - 2.92 mm × 2.37 mm
  - Through-Hole 3-Pin TO-92 (LPG)
    - 4.00 mm × 3.15 mm
- **Protection Features**
  - Reverse Supply Protection (up to –22 V)
  - Supports up to 40-V Load Dump
  - Output Short-Circuit Protection
  - Output Current Limitation
  - OUT Short to Battery Protection

## 2 Applications

- Flow Meters
- Docking Adjustment
- Vibration Correction
- Damper Controls

## 3 Description

The DRV5053-Q1 device is a chopper-stabilized Hall IC that offers a magnetic sensing solution with superior sensitivity stability over temperature and integrated protection features.

The 0- to 2-V analog output responds linearly to the applied magnetic flux density, and distinguishes the polarity of magnetic field direction. A wide operating voltage range from 2.7 to 38 V with reverse polarity protection up to –22 V makes the device suitable for a wide range of automotive and consumer applications.

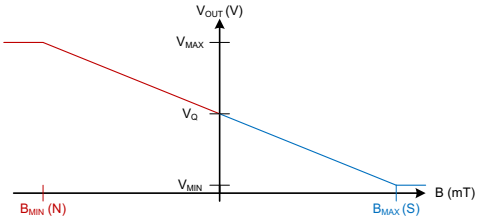
Internal protection functions are provided for reverse supply conditions, load dump, and output short circuit or overcurrent.

**Device Information(1)**

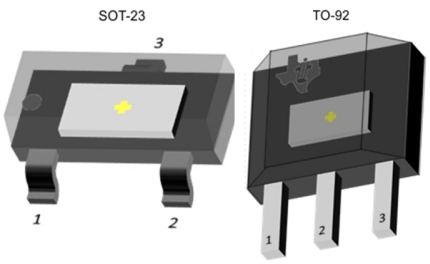
| PART NUMBER | PACKAGE | BODY SIZE (NOM) |
|---|---|---|
| DRV5053-Q1 | SOT-23 (3) | 2.92 mm × 1.30 mm |
| | TO-92 (3) | 4.00 mm × 3.15 mm |

(1) For all available packages, see the orderable addendum at the end of the data sheet.

**Output State**




**Device Packages**




An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. PRODUCTION DATA.

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## 4 Revision History

**Changes from Original (December 2014) to Revision A** **Page**

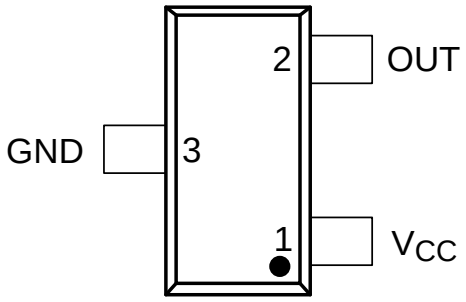
- Corrected body size of SOT-23 package and SIP package name to TO-92 ... 1
- Added $B_{MAX}$ to *Absolute Maximum Ratings* ... 4
- Removed table notes regarding testing for the operating junction temperature in *Absolute Maximum Ratings* ... 4
- Updated the typical value for $B_N$ and $V_N$ for each version ... 5
- Updated Figure 6 ... 7
- Updated the *Functional Block Diagram* ... 8
- Updated *Output Stage* ... 11
- Updated package tape and reel options for M and blank ... 15
- Added *Community Resources* ... 16


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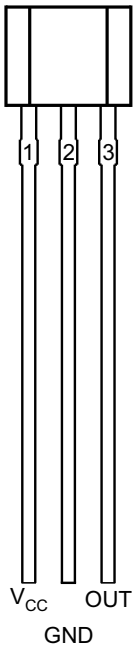
## 5 Pin Configuration and Functions

For additional configuration information, see *Device Markings* and *Mechanical, Packaging, and Orderable Information*.

**DBZ Package**
**3-Pin SOT-23**
**Top View**




**LPG Package**
**3-Pin TO-92**
**Top View**




**Pin Functions**

| PIN | | | TYPE | DESCRIPTION |
|---|---|---|---|---|
| NAME | DBZ | LPG | | |
| GND | 3 | 2 | GND | Ground pin |
| $V_{CC}$ | 1 | 1 | Power | 2.7 to 38 V power supply. Bypass this pin to the GND pin with a 0.01-μF (minimum) ceramic capacitor rated for $V_{CC}$. |
| OUT | 2 | 3 | Output | Hall sensor analog output. 1 V output corresponds to B = 0 mT |

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# 6 Specifications

## 6.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)(1)

| | | MIN | MAX | UNIT |
|---|---|---|---|---|
| Power supply voltage | $V_{CC}$ | –22(2) | 40 | V |
| | Voltage ramp rate ($V_{CC}$), $V_{CC}$ < 5 V | Unlimited | | V/µs |
| | Voltage ramp rate ($V_{CC}$), $V_{CC}$ > 5 V | 0 | 2 | |
| Output pin voltage | | –0.5 | 2.5 | V |
| Output pin reverse current during reverse supply condition | | 0 | –20 | mA |
| Magnetic flux density, $B_{MAX}$ | | Unlimited | | |
| Operating junction temperature, $T_J$ | Q, see Figure 17 | –40 | 150 | °C |
| | E, see Figure 17 | –40 | 175 | |
| Storage temperature, $T_{stg}$ | | –65 | 150 | °C |

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) Ensured by design. Only tested to –20 V.

## 6.2 ESD Ratings

| | | | VALUE | UNIT |
|---|---|---|---|---|
| $V_{(ESD)}$ | Electrostatic discharge | Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins(1) | ±2500 | V |
| | | Charged device model (CDM), per JEDEC specification JESD22-C101, all pins(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.

## 6.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Power supply voltage | | 2.7 | 38 | V |
| $V_{OUT}$ | Output pin voltage (OUT) | | 0 | 2 | V |
| $I_{SOURCE}$ | Output pin current source (OUT) | | 0 | 300 | µA |
| $I_{SINK}$ | Output pin current sink (OUT) | | 0 | 2.3 | mA |
| $T_A$ | Operating ambient temperature | Q, see Figure 17 | –40 | 125 | °C |
| | | E, see Figure 17 | –40 | 150 | |

## 6.4 Thermal Information

| THERMAL METRIC(1) | | DRV5053-Q1 | | UNIT |
|---|---|---|---|---|
| | | DBZ (SOT-23) | LPG (TO-92) | |
| | | 3 PINS | 3 PINS | |
| $R_{\theta JA}$ | Junction-to-ambient thermal resistance | 333.2 | 180 | °C/W |
| $R_{\theta JC(top)}$ | Junction-to-case (top) thermal resistance | 99.9 | 98.6 | °C/W |
| $R_{\theta JB}$ | Junction-to-board thermal resistance | 66.9 | 154.9 | °C/W |
| $\psi_{JT}$ | Junction-to-top characterization parameter | 4.9 | 40 | °C/W |
| $\psi_{JB}$ | Junction-to-board characterization parameter | 65.2 | 154.9 | °C/W |

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


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## 6.5 Electrical Characteristics

over operating free-air temperature range (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **POWER SUPPLIES ($V_{CC}$)** | | | | | | |
| $V_{CC}$ | $V_{CC}$ operating voltage | | 2.7 | | 38 | V |
| $I_{CC}$ | Operating supply current | $V_{CC}$ = 2.7 to 38 V, $T_A$ = 25°C | | 2.7 | | mA |
| | | $V_{CC}$ = 2.7 to 38 V, $T_A$ = $T_{A, MAX}$ (1) | | 3 | 3.6 | |
| $t_{on}$ | Power-on time | | | 35 | 50 | µs |
| **PROTECTION CIRCUITS** | | | | | | |
| $V_{CCR}$ | Reverse supply voltage | | –22 | | | V |
| $I_{OCP,SOURCE}$ | Overcurrent protection level | Sourcing current | | 300 | | µA |
| $I_{OCP,SINK}$ | Overcurrent protection level | Sinking current | | 2.3 | | mA |

(1) $T_{A, MAX}$ is 125°C for Q Grade 1 devices and 150°C for E Grade 0 devices (see Figure 17)

## 6.6 Switching Characteristics

over operating free-air temperature range (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **ANALOG OUTPUT (OUT)** | | | | | | |
| $t_d$ | Output delay time | $T_A$ = 25°C | | 13 | 25 | µs |

## 6.7 Magnetic Characteristics

over operating free-air temperature range (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT (1) |
|---|---|---|---|---|---|---|
| $V_Q$ | Quiescent output | B = 0 mT | 0.9 | 1.02 | 1.15 | V |
| $f_{BW}$ | Bandwidth (2) | | 20 | | | kHz |
| $B_N$ | Input-referred noise (3) | $C_{OUT}$ = 50 pF | 0.40 | 0.49 | 0.79 | $mT_{pp}$ |
| Le | Linearity (4) | $–B_{SAT}$ < B < $B_{SAT}$ | | 1% | | |
| $V_{OUT\ MIN}$ | Output saturation voltage (min) | B < $–B_{SAT}$ | | | 0.2 | V |
| $V_{OUT\ MAX}$ | Output saturation voltage (max) | B > $B_{SAT}$ | 1.8 | | | V |
| **DRV5053OA: –11 mV/mT** | | | | | | |
| S | Sensitivity | $V_{CC}$ = 3.3 V | –17.5 | –11 | –5 | mV/mT |
| $V_N$ | Output-referred noise | $V_{CC}$ = 3.3 V; $R_{OUT}$ = 10 kΩ; $C_{OUT}$ = 50 pF | | 5 | | $mV_{pp}$ |
| $B_{SAT}$ | Input saturation field | $V_{CC}$ = 3.3 V | | 73 | | mT |
| **DRV5053PA: –23 mV/mT** | | | | | | |
| S | Sensitivity | $V_{CC}$ = 3.3 V | –35 | –23 | –10 | mV/mT |
| $V_N$ | Output-referred noise | $V_{CC}$ = 3.3 V; $R_{OUT}$ = 10 kΩ; $C_{OUT}$ = 50 pF | | 11 | | $mV_{pp}$ |
| $B_{SAT}$ | Input saturation field | $V_{CC}$ = 3.3 V | | 35 | | mT |

(1) 1 mT = 10 Gauss
(2) Bandwidth describes the fastest changing magnetic field that can be detected and translated to the output.
(3) Not tested in production; limits are based on characterization data.
(4) Linearity describes the change in sensitivity across the B-range. The sensitivity near $B_{SAT}$ is typically within 1% of the sensitivity near B = 0.

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## Magnetic Characteristics (continued)

over operating free-air temperature range (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT(1) |
|---|---|---|---|---|---|---|
| **DRV5053RA: –45 mV/mT** | | | | | | |
| S | Sensitivity | $V_{CC}$ = 3.3 V | –70 | –45 | –20 | mV/mT |
| $V_N$ | Output-referred noise | $V_{CC}$ = 3.3 V; $R_{OUT}$ = 10 kΩ; $C_{OUT}$ = 50 pF | | 22 | | $mV_{pp}$ |
| $B_{SAT}$ | Input saturation field | $V_{CC}$ = 3.3 V | | 18 | | mT |
| **DRV5053VA: –90 mV/mT** | | | | | | |
| S | Sensitivity | $V_{CC}$ = 3.3 V | –140 | –90 | –45 | mV/mT |
| $V_N$ | Output-referred noise | $V_{CC}$ = 3.3 V; $R_{OUT}$ = 10 kΩ; $C_{OUT}$ = 50 pF | | 44 | | $mV_{pp}$ |
| $B_{SAT}$ | Input saturation field | $V_{CC}$ = 3.3 V | | 9 | | mT |
| **DRV5053CA: 23 mV/mT** | | | | | | |
| S | Sensitivity | $V_{CC}$ = 3.3 V | 10 | 23 | 35 | mV/mT |
| $V_N$ | Output-referred noise | $V_{CC}$ = 3.3 V; $R_{OUT}$ = 10 kΩ; $C_{OUT}$ = 50 pF | | 11 | | $mV_{pp}$ |
| $B_{SAT}$ | Input saturation field | $V_{CC}$ = 3.3 V | | 35 | | mT |
| **DRV5053EA: 45 mV/mT** | | | | | | |
| S | Sensitivity | $V_{CC}$ = 3.3 V | 20 | 45 | 70 | mV/mT |
| $V_N$ | Output-referred noise | $V_{CC}$ = 3.3 V; $R_{OUT}$ = 10 kΩ; $C_{OUT}$ = 50 pF | | 22 | | $mV_{pp}$ |
| $B_{SAT}$ | Input saturation field | $V_{CC}$ = 3.3 V | | 18 | | mT |


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## 6.8 Typical Characteristics

$T_A$ > 125°C data is valid for Grade 0 devices only (E, see Figure 17)

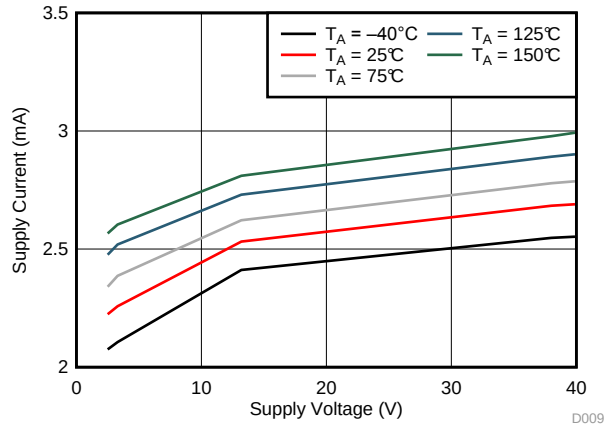



**Figure 1. $I_{CC}$ vs $V_{CC}$**

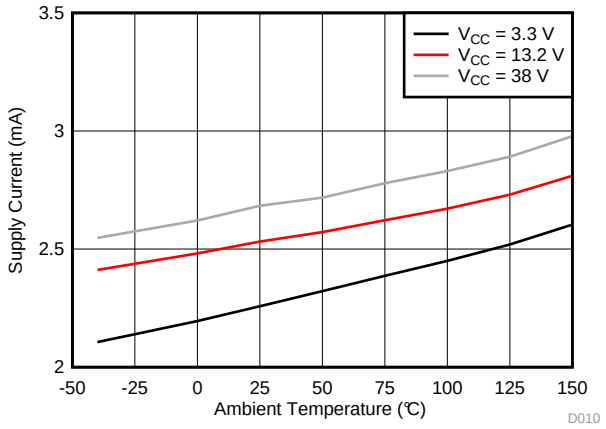
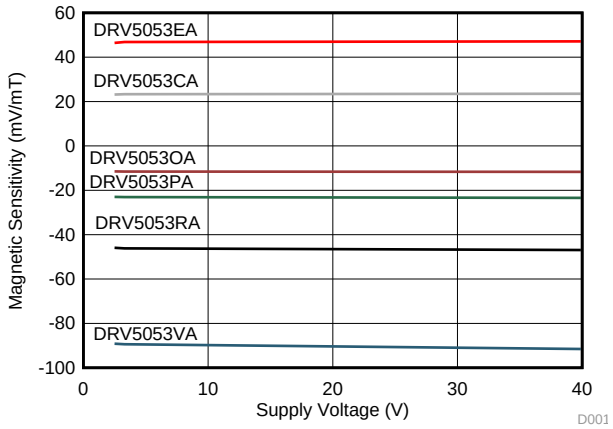
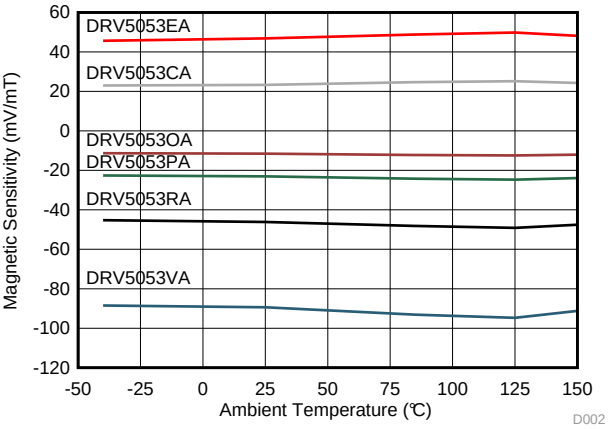



**Figure 2. $I_{CC}$ vs Temperature**



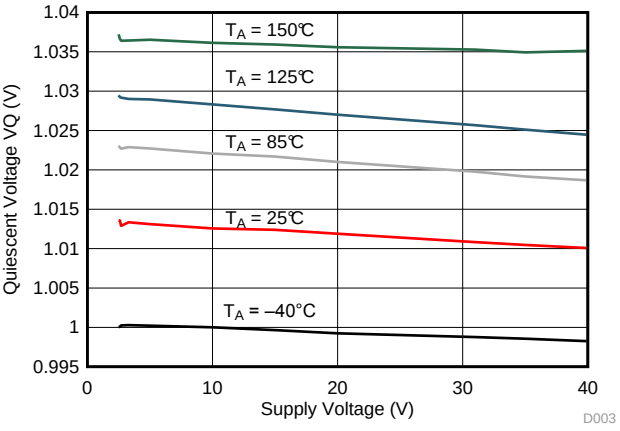

$T_A$ = 25°C

**Figure 3. Sensitivity vs $V_{CC}$**



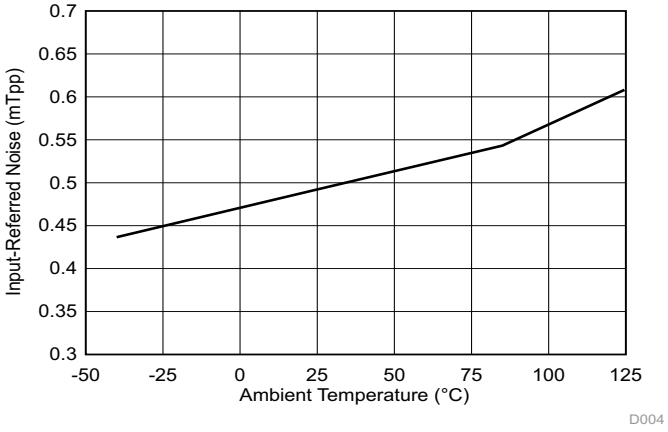

$V_{CC}$ = 3.3 V

**Figure 4. Sensitivity vs Temperature**




$T_A$ = 25°C

**Figure 5. $V_Q$ vs $V_{CC}$**




$V_{CC}$ = 3.3 V

**Figure 6. $B_N$ vs Temperature**

# 7 Detailed Description

## 7.1 Overview

The DRV5053-Q1 device is a chopper-stabilized Hall sensor with an analog output for magnetic sensing applications. The DRV5053-Q1 device can be powered with a supply voltage between 2.7 and 38 V, and will survive –22 V reverse battery conditions continuously. Note that the DRV5053-Q1 device will not be operating when approximately –22 to 2.4 V is applied to $V_{CC}$ (with respect to GND). In addition, the device can withstand supply voltages up to 40 V for transient durations.

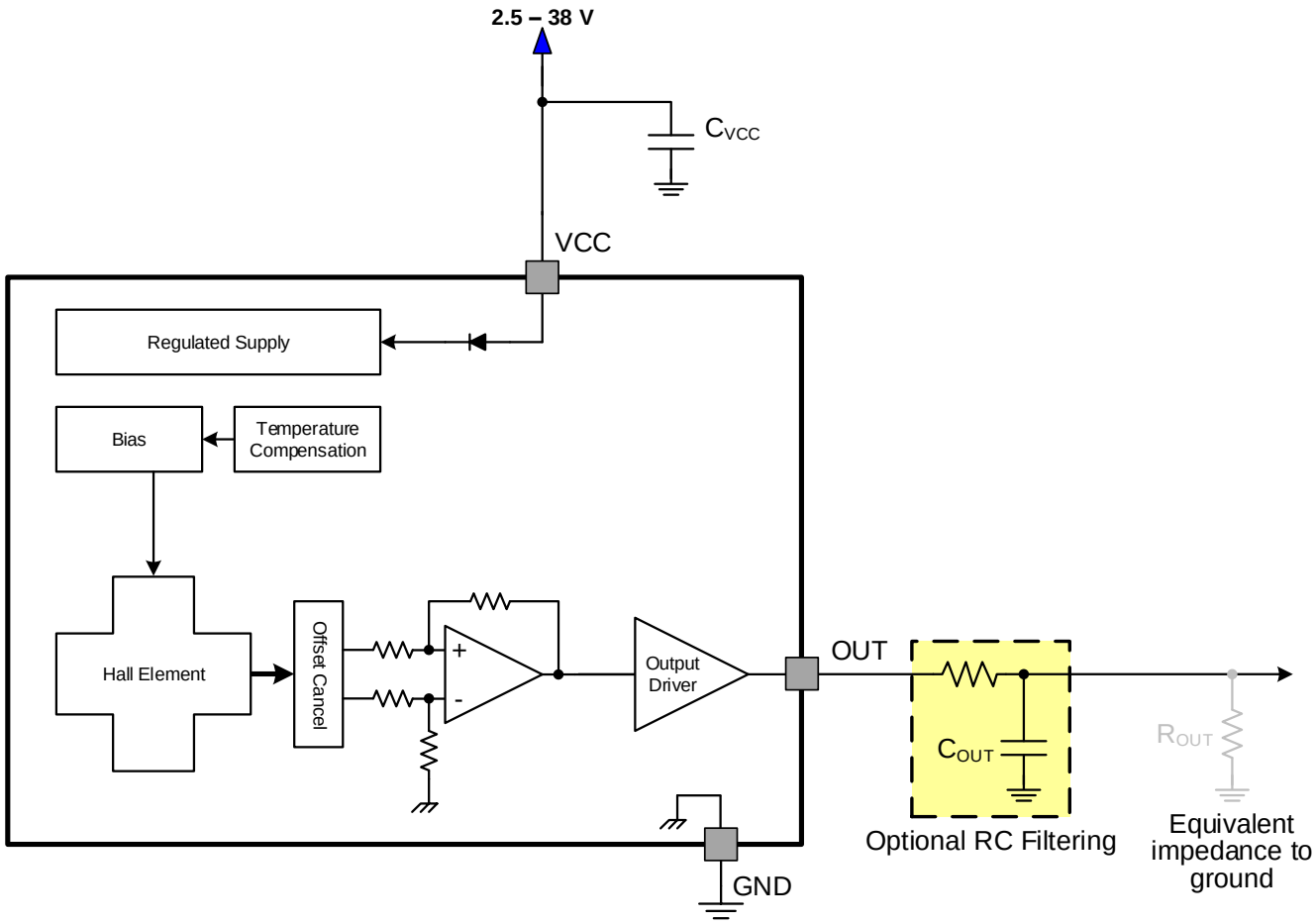
The output voltage is dependent on the magnetic field perpendicular to the package. The absence of a magnetic field will result in OUT = 1 V. A magnetic field will cause the output voltage to change linearly with the magnetic field.

The field polarity is defined as follows: a south pole near the marked side of the package is a positive magnetic field. A north pole near the marked side of the package is a negative magnetic field.

For devices with a negative sensitivity (that is, DRV5053RA: –40 mV/mT), a south pole will cause the output voltage to drop below 1 V, and a north pole will cause the output to rise above 1 V.

For devices with a positive sensitivity (that is, DRV5053EA: +40 mV/mT), a south pole will cause the output voltage to rise above 1 V, and a north pole will cause the output to drop below 1 V.

## 7.2 Functional Block Diagram





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## 7.3 Feature Description

### 7.3.1 Field Direction Definition

A positive magnetic field is defined as a south pole near the marked side of the package as shown in Figure 7.

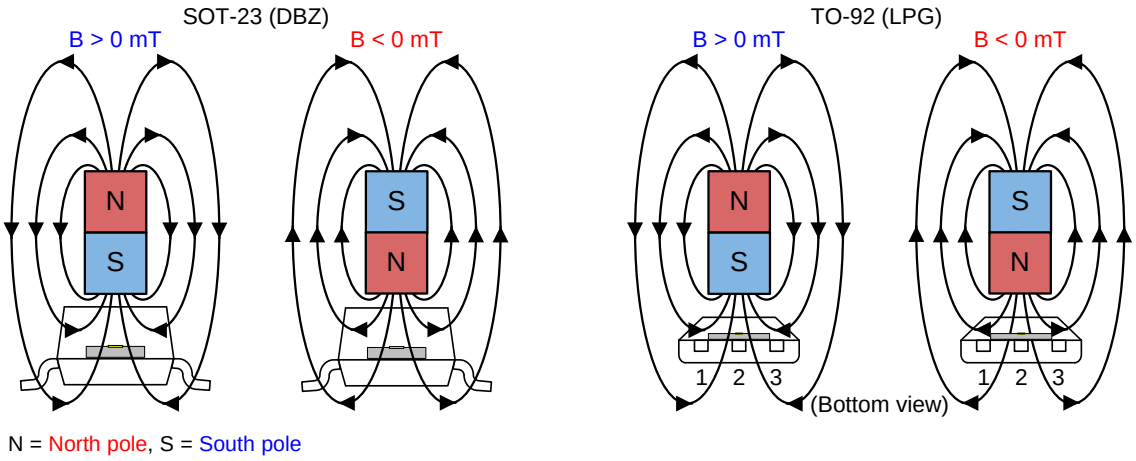



**Figure 7. Field Direction Definition**

### 7.3.2 Device Output

The DRV5053-Q1 device output is defined below for negative sensitivity (that is, –45 mV/mT, RA) and positive sensitivity (that is, +45 mV/mT, EA):

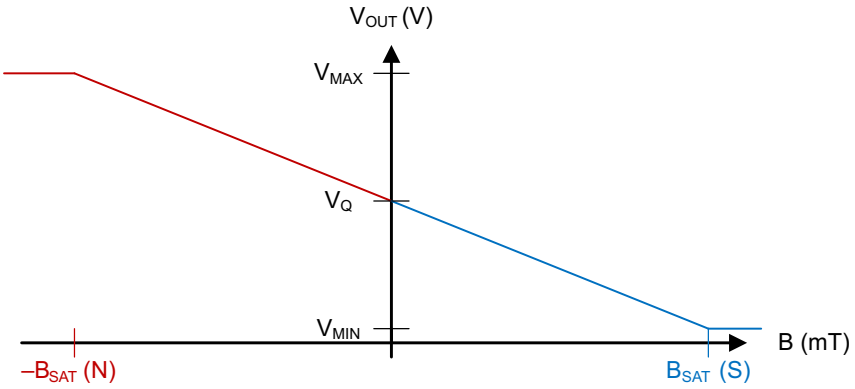



**Figure 8. DRV5053-Q1 – Negative Sensitivity**

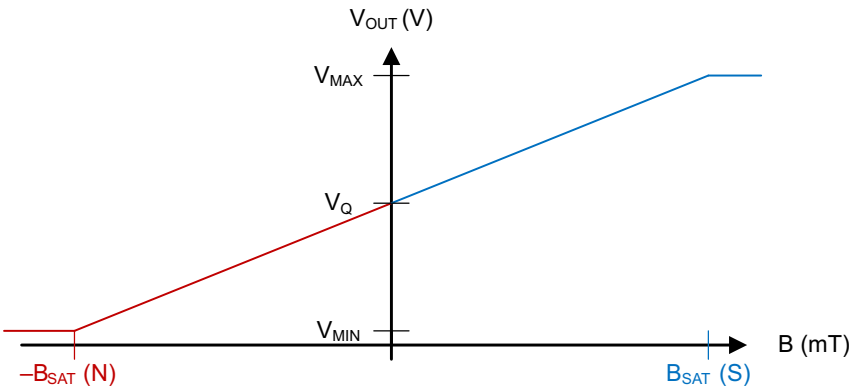



**Figure 9. DRV5053-Q1 – Positive Sensitivity**

## Feature Description (continued)

### 7.3.3 Power-On Time

After applying $V_{CC}$ to the DRV5053-Q1 device, $t_{on}$ must elapse before OUT is valid. Figure 10 shows Case 1 and Figure 11 shows case 2; the output is defined assuming a negative sensitivity device and a constant magnetic field $-B_{SAT} < B < B_{SAT}$.

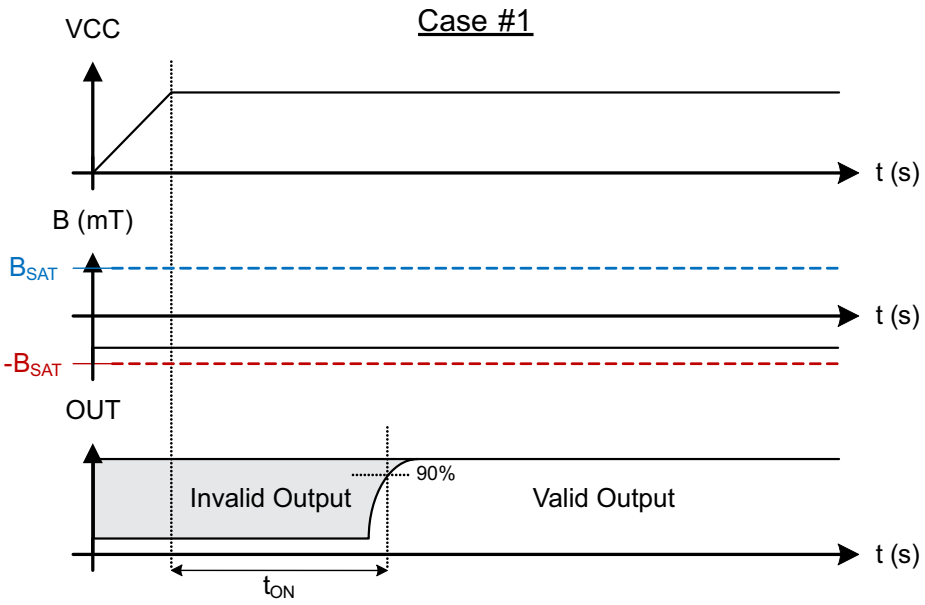



**Figure 10. Case 1: Power On When B < 0, North**

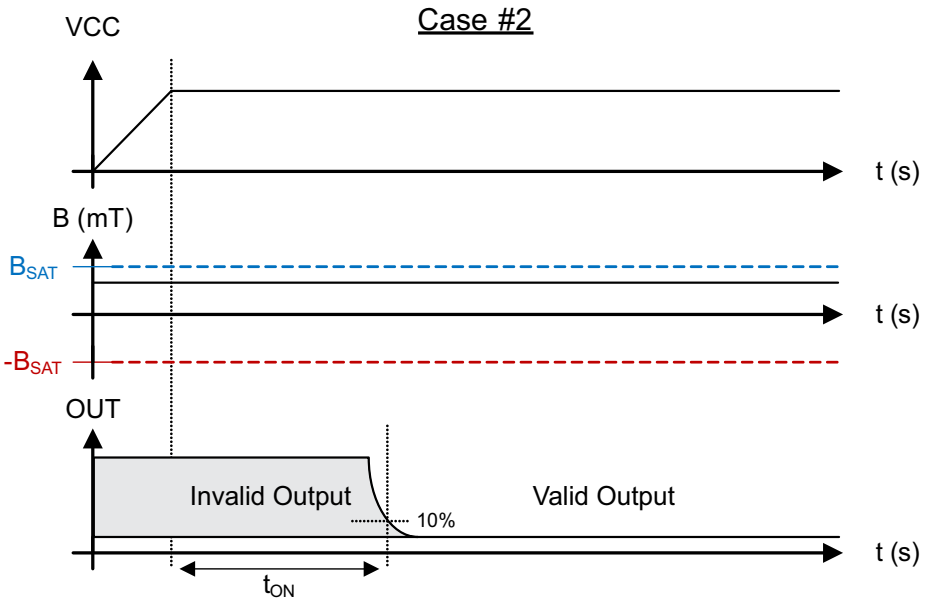



**Figure 11. Case 2: Power On When B > 0, South**


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## Feature Description (continued)

### 7.3.4 Output Stage

The DRV5053-Q1 output stage is capable of up to 300-µA of current source or 2.3-mA sink. For proper operation, ensure that equivalent output load $R_{OUT}$ > 10 kΩ.

The capacitive load directly present on the OUT pin should be less than 10 nF to ensure the internal operational amplifier is stable. If an external RC filter is added to reduce noise, it is acceptable to use a resistor ≥ 200 Ω with a capacitor ≤0.1 µF. For an application example, see *Filtered Typical Application*.

### 7.3.5 Protection Circuits

An analog current limit circuit limits the current through the output driver. The driver current will be clamped to $I_{OCP}$

#### *7.3.5.1 Overcurrent Protection (OCP)*

An analog current-limit circuit limits the current through the FET. The driver current is clamped to $I_{OCP}$. During this clamping, the $r_{DS(on)}$ of the output FET is increased from the nominal value.

#### *7.3.5.2 Load Dump Protection*

The DRV5053-Q1 device operates at DC $V_{CC}$ conditions up to 38 V nominally, and can additionally withstand $V_{CC}$ = 40 V. No current-limiting series resistor is required for this protection.

#### *7.3.5.3 Reverse Supply Protection*

The DRV5053-Q1 device is protected in the event that the $V_{CC}$ pin and the GND pin are reversed (up to –22 V).

**NOTE**

In a reverse supply condition, the OUT pin reverse-current must not exceed the ratings specified in the *Absolute Maximum Ratings*.

**Table 1.**

| FAULT | CONDITION | DEVICE | DESCRIPTION | RECOVERY |
|---|---|---|---|---|
| FET overload (OCP) | $I_{SINK} \geq I_{OCP}$ | Operating | Output current is clamped to $I_{OCP}$ | $I_O < I_{OCP}$ |
| Load Dump | 38 V < $V_{CC}$ < 40 V | Operating | Device will operate for a transient duration | $V_{CC} \leq$ 38 V |
| Reverse Supply | –22 V < $V_{CC}$ < 0 V | Disabled | Device will survive this condition | $V_{CC} \geq$ 2.7 V |

## 7.4 Device Functional Modes

The DRV5053-Q1 device is active only when $V_{CC}$ is between 2.7 and 38 V.

When a reverse supply condition exists, the device is inactive.

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# 8 Application and Implementation

**NOTE**

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes. Customers should validate and test their design implementation to confirm system functionality.

## 8.1 Application Information

The DRV5053-Q1 device is used in magnetic-field sensing applications.

## 8.2 Typical Applications

### 8.2.1 Typical Application With No Filter

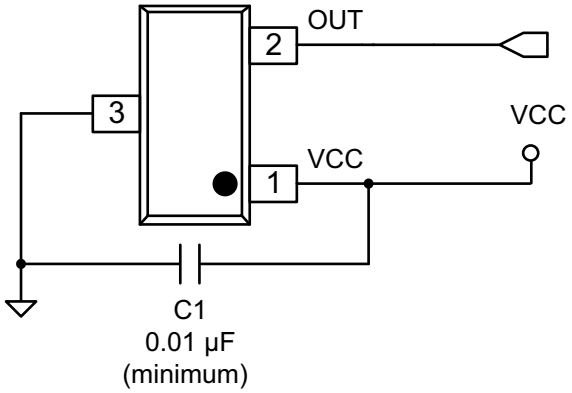



**Figure 12. Typical Application Schematic – No Filter**

#### *8.2.1.1 Design Requirements*

For this design example, use the parameters listed in Table 2 as the input parameters.

**Table 2. Design Parameters**

| DESIGN PARAMETER | REFERENCE | EXAMPLE VALUE |
|---|---|---|
| System bandwidth | $f_{BW}$ | 15 kHz |

#### *8.2.1.2 Detailed Design Procedure*

The DRV5053-Q1 has internal filtering that limits the bandwidth to at least 20 kHz. For this application no external components are required other than the C1 bypass capacitor, which is 0.01 µF minimum. If the analog output OUT is tied to a microcontroller ADC input, the equivalent load must be R > 10 kΩ and C < 10 nF.

**Table 3. External Components**

| COMPONENT | PIN 1 | PIN 2 | RECOMMENDED |
|---|---|---|---|
| C1 | $V_{CC}$ | GND | A 0.01-µF (minimum) ceramic capacitor rated for $V_{CC}$ |


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#### 8.2.1.3 Application Curve

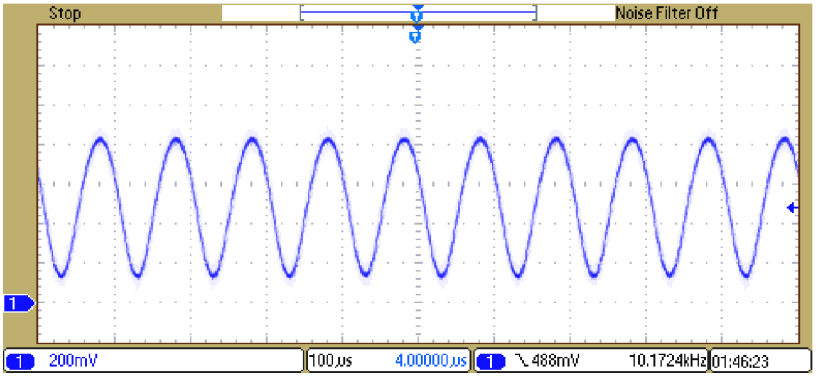



**Figure 13. 10-kHz Switching Magnetic Field**

### 8.2.2 Filtered Typical Application

For lower noise on the analog output OUT, additional RC filtering can be added to further reduce the bandwidth.

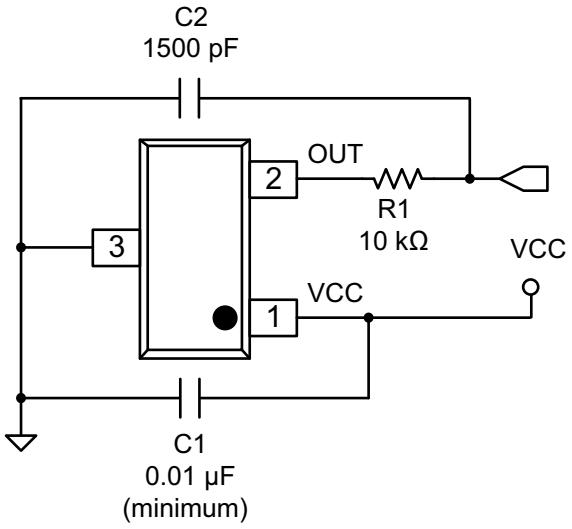



**Figure 14. Filtered Typical Application Schematic**

#### 8.2.2.1 Design Requirements

For this design example, use the parameters listed in Table 4 as the input parameters.

**Table 4. Design Parameters**

| DESIGN PARAMETER | REFERENCE | EXAMPLE VALUE |
|---|---|---|
| System bandwidth | $f_{BW}$ | 5 kHz |

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#### 8.2.2.2 Detailed Design Procedure

In this example we will add an external RC filter in order to reduce the output bandwidth.

In order to preserve the signal at the frequencies of interest, we will conservatively select a low-pass filter bandwidth (–3-dB point) at twice the system bandwidth (10 kHz).

$$10\ \text{kHz} < \frac{1}{2\pi \times R_1 \times C_2} \tag{1}$$

If we guess R1 = 10 kΩ, then C2 < 1590 pF. So we select C2 = 1500 pF.

##### 8.2.2.2.1 Typical Noise Versus Cutoff Frequency

RC filters are an effective way to reduce the noise present on OUT. The following shows typical noise measurements for different cutoff frequencies using the DRV5053VA.

**Table 5. DRV5053VA Typical Noise Data**

| R (Ω) | C (µF) | $f_{CUTOFF}$ (kHz) | NOISE (mVpp) |
|---|---|---|---|
| 163 | 0.1 | 9.8 | 30.4 |
| 349 | 0.1 | 4.6 | 22.8 |
| 750 | 0.1 | 2.1 | 15.2 |
| 1505 | 0.1 | 1.1 | 9.7 |
| 3322 | 0.1 | 0.5 | 5.3 |
| 7510 | 0.1 | 0.2 | 2.5 |

#### 8.2.2.3 Application Curves

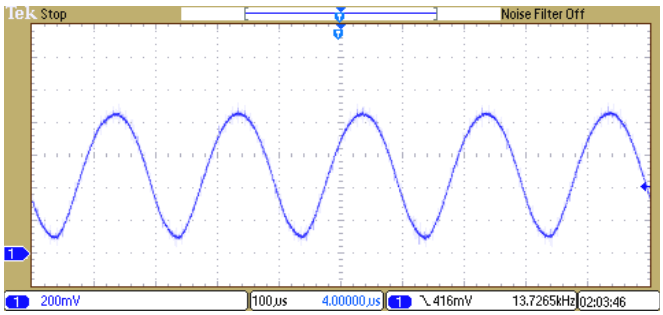



**Figure 15. 5-kHz Switching Magnetic Field**

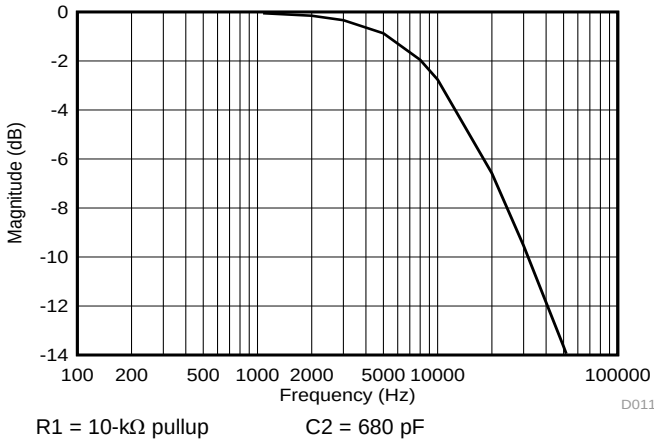



**Figure 16. Low-Pass Filtering**

## 9 Power Supply Recommendations

The DRV5053-Q1 device is designed to operate from an input voltage supply (VM) range between 2.7 and 38 V. A 0.01-µF (minimum) ceramic capacitor rated for $V_{CC}$ must be placed as close to the DRV5053-Q1 device as possible.


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# 10 Device and Documentation Support

## 10.1 Device Support

### 10.1.1 Device Nomenclature

Figure 17 shows a legend for reading the complete device name for the DRV5053-Q1 device.

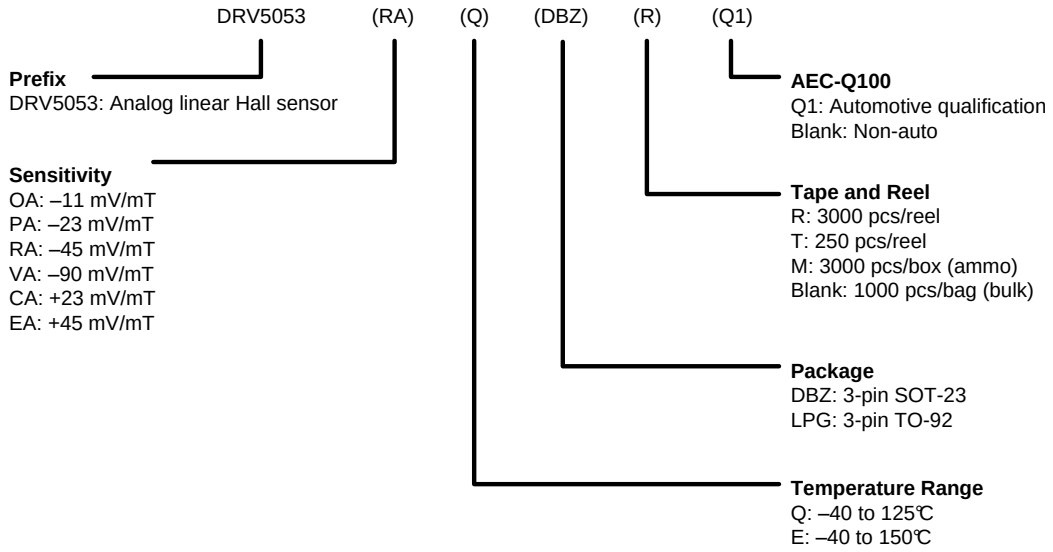



**Figure 17. Device Nomenclature**

### 10.1.2 Device Markings

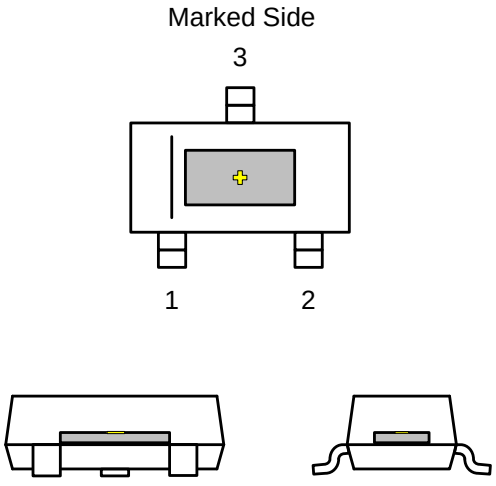



**Figure 18. SOT-23 (DBZ) Package**

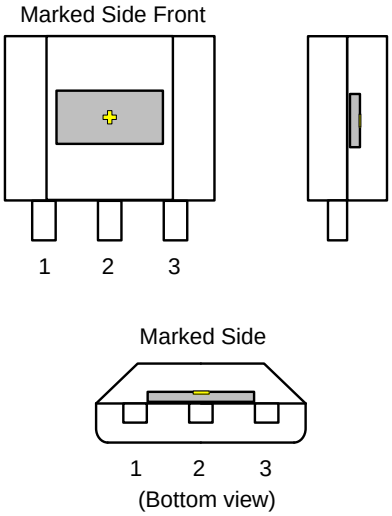



**Figure 19. TO-92 (LPG) Package**

✚ indicates the Hall effect sensor (not to scale). The Hall element is located in the center of the package with a tolerance of ±100 µm. The height of the Hall element from the bottom of the package is 0.7 mm ±50 µm in the DBZ package and 0.987 mm ±50 µm in the LPG package.

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## 10.2 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

**TI E2E™ Online Community** ***TI's Engineer-to-Engineer (E2E) Community.*** Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

**Design Support** ***TI's Design Support*** Quickly find helpful E2E forums along with design support tools and contact information for technical support.

## 10.3 Trademarks

E2E is a trademark of Texas Instruments.
All other trademarks are the property of their respective owners.

## 10.4 Electrostatic Discharge Caution



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

## 10.5 Glossary

SLYZ022 — *TI Glossary*.

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

# 11 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) |
|---|---|---|---|---|---|---|---|---|---|
| DRV5053CAEDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJCA |
| DRV5053CAEDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJCA |
| DRV5053CAEDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AJCA |
| DRV5053CAELPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJCA |
| DRV5053CAELPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJCA |
| DRV5053CAELPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJCA |
| DRV5053CAELPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJCA |
| DRV5053CAQDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKCA |
| DRV5053CAQDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKCA |
| DRV5053CAQDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 125 | +AKCA |
| DRV5053CAQLPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKCA |
| DRV5053CAQLPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKCA |
| DRV5053CAQLPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKCA |
| DRV5053CAQLPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKCA |
| DRV5053EAEDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJEA |
| DRV5053EAEDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJEA |
| DRV5053EAEDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AJEA |
| DRV5053EAELPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJEA |
| DRV5053EAELPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJEA |
| DRV5053EAELPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJEA |
| DRV5053EAELPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJEA |
| DRV5053EAQDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AKEA |
| DRV5053EAQDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AKEA |
| DRV5053EAQDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AKEA |
| DRV5053EAQLPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AKEA |
| DRV5053EAQLPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AKEA |
| DRV5053EAQLPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKEA |
| DRV5053EAQLPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKEA |
| DRV5053OAEDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJOA |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| DRV5053OAEDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJOA |
| DRV5053OAEDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AJOA |
| DRV5053OAELPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJOA |
| DRV5053OAELPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJOA |
| DRV5053OAELPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJOA |
| DRV5053OAELPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJOA |
| DRV5053OAQDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKOA |
| DRV5053OAQDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKOA |
| DRV5053OAQDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 125 | +AKOA |
| DRV5053OAQLPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKOA |
| DRV5053OAQLPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKOA |
| DRV5053OAQLPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKOA |
| DRV5053OAQLPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKOA |
| DRV5053PAEDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJPA |
| DRV5053PAEDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJPA |
| DRV5053PAEDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AJPA |
| DRV5053PAELPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJPA |
| DRV5053PAELPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJPA |
| DRV5053PAELPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJPA |
| DRV5053PAELPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJPA |
| DRV5053PAQDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKPA |
| DRV5053PAQDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKPA |
| DRV5053PAQDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 125 | +AKPA |
| DRV5053PAQLPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKPA |
| DRV5053PAQLPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKPA |
| DRV5053PAQLPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKPA |
| DRV5053PAQLPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKPA |
| DRV5053RAEDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJRA |
| DRV5053RAEDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJRA |
| DRV5053RAEDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AJRA |
| DRV5053RAELPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJRA |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| DRV5053RAELPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJRA |
| DRV5053RAELPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJRA |
| DRV5053RAELPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJRA |
| DRV5053RAQDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKRA |
| DRV5053RAQDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKRA |
| DRV5053RAQDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 125 | +AKRA |
| DRV5053RAQLPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKRA |
| DRV5053RAQLPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKRA |
| DRV5053RAQLPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | - | +AKRA |
| DRV5053RAQLPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AKRA |
| DRV5053VAEDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJVA |
| DRV5053VAEDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 150 | +AJVA |
| DRV5053VAEDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 150 | +AJVA |
| DRV5053VAELPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJVA |
| DRV5053VAELPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJVA |
| DRV5053VAELPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJVA |
| DRV5053VAELPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 150 | +AJVA |
| DRV5053VAQDBZRQ1 | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKVA |
| DRV5053VAQDBZRQ1.A | Active | Production | SOT-23 (DBZ) \| 3 | 3000 \| LARGE T&R | Yes | NIPDAUAG | Level-1-260C-UNLIM | -40 to 125 | +AKVA |
| DRV5053VAQDBZTQ1 | Obsolete | Production | SOT-23 (DBZ) \| 3 | - | - | Call TI | Call TI | -40 to 125 | +AKVA |
| DRV5053VAQLPGMQ1 | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKVA |
| DRV5053VAQLPGMQ1.A | Active | Production | TO-92 (LPG) \| 3 | 3000 \| AMMO | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKVA |
| DRV5053VAQLPGQ1 | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKVA |
| DRV5053VAQLPGQ1.A | Active | Production | TO-92 (LPG) \| 3 | 1000 \| BULK | Yes | SN | N/A for Pkg Type | -40 to 125 | +AKVA |

(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.

**Important Information and Disclaimer:**The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF DRV5053-Q1 :**

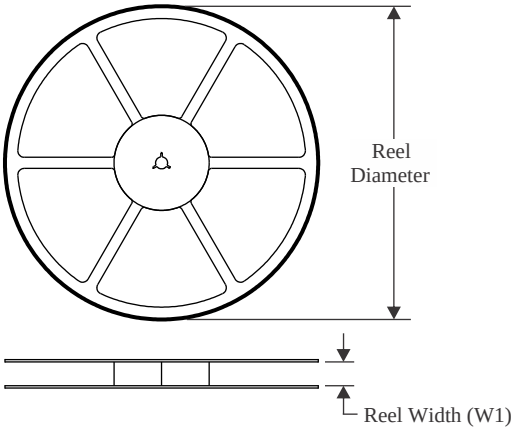
- Catalog : DRV5053

NOTE: Qualified Version Definitions:

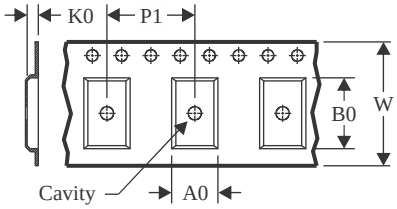
- Catalog - TI's standard catalog product

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

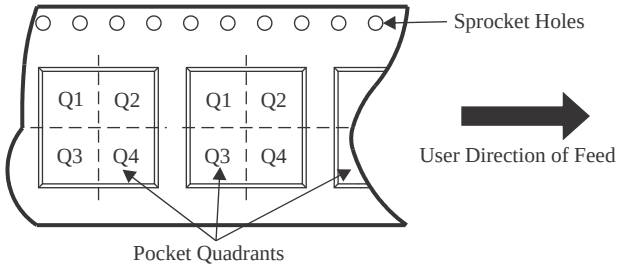



**TAPE DIMENSIONS**




| | |
|---|---|
| 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 |

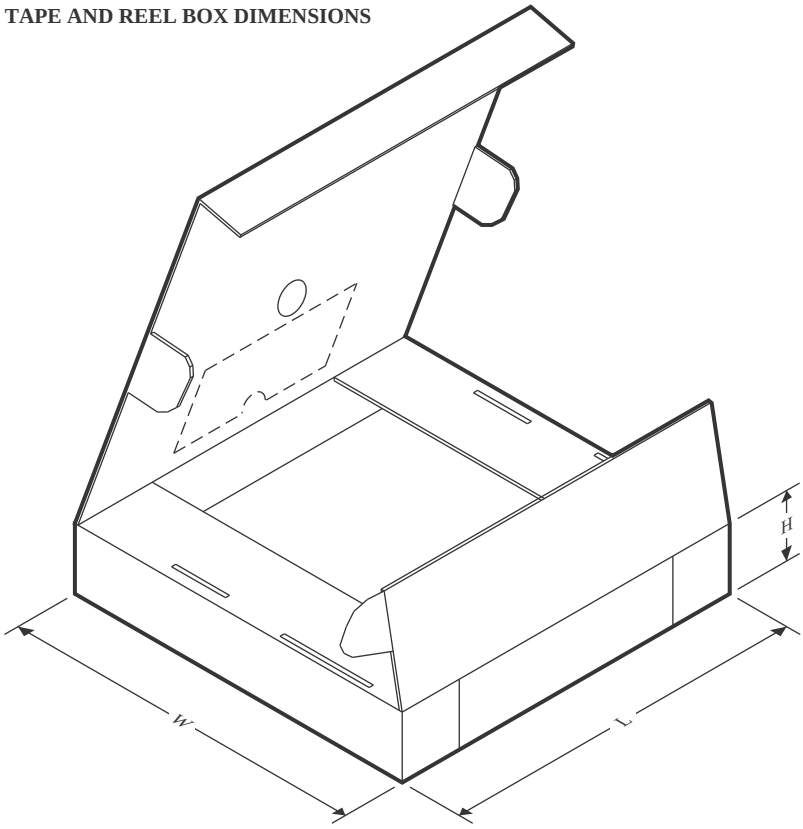
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DRV5053CAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053CAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053EAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053EAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053OAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053OAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053PAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053PAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053RAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053RAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053VAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 4.0 | 8.0 | Q3 |
| DRV5053VAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 180.0 | 8.4 | 3.15 | 2.77 | 1.22 | 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) |
|---|---|---|---|---|---|---|---|
| DRV5053CAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053CAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053EAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053EAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053OAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053OAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053PAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053PAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053RAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053RAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053VAEDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |
| DRV5053VAQDBZRQ1 | SOT-23 | DBZ | 3 | 3000 | 202.0 | 201.0 | 28.0 |

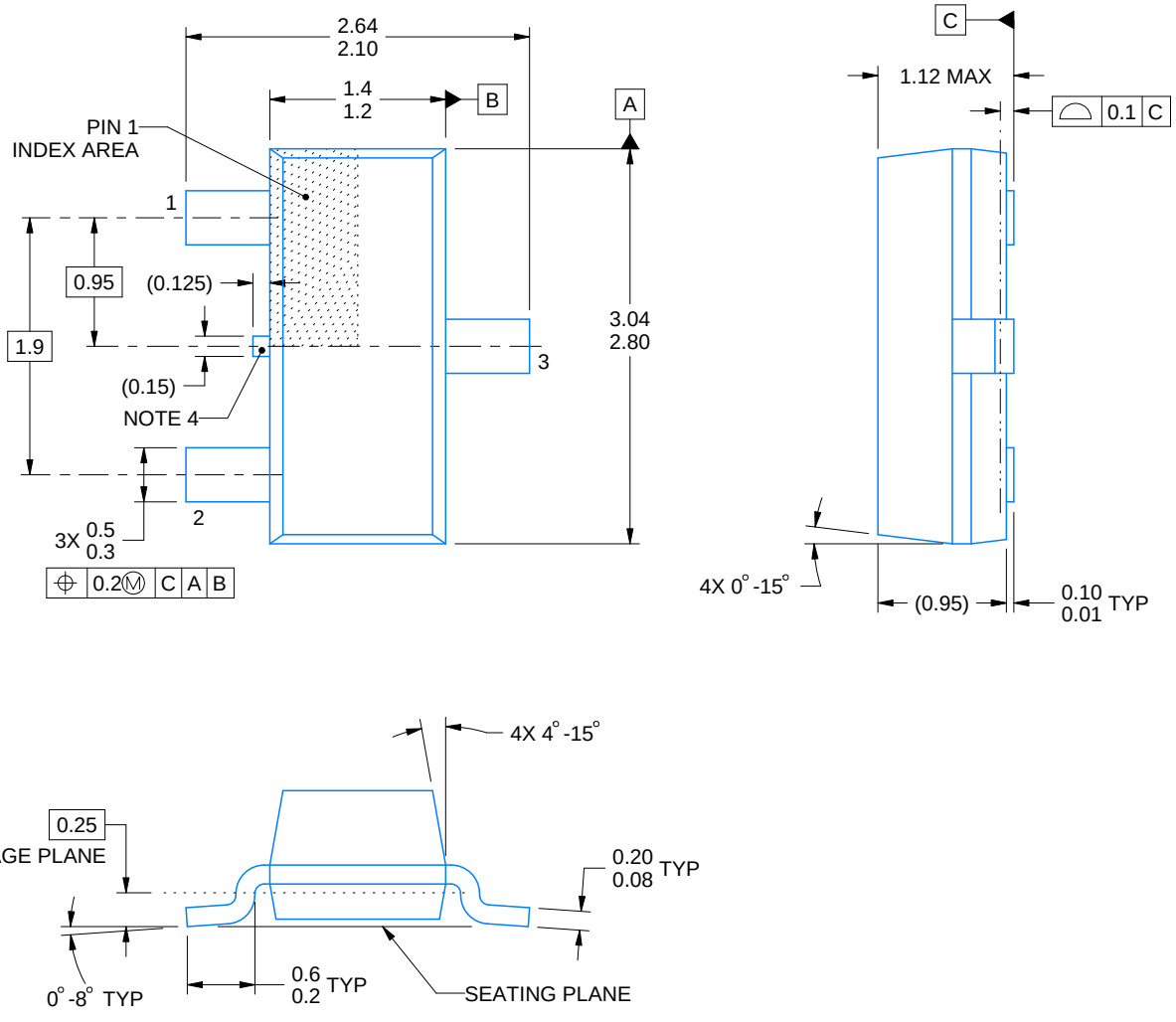
# PACKAGE OUTLINE

## DBZ0003A



## SOT-23 - 1.12 mm max height

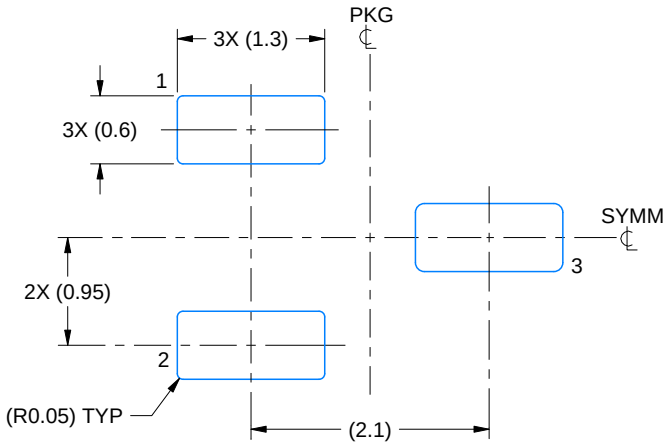
SMALL OUTLINE TRANSISTOR



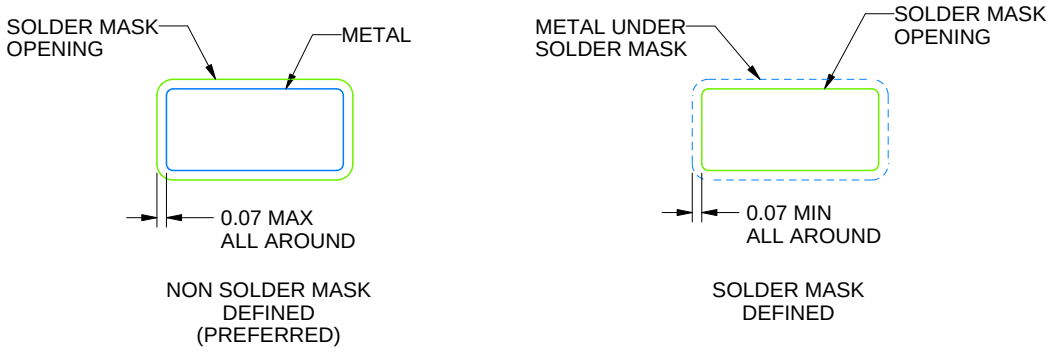

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NOTES:

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. 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

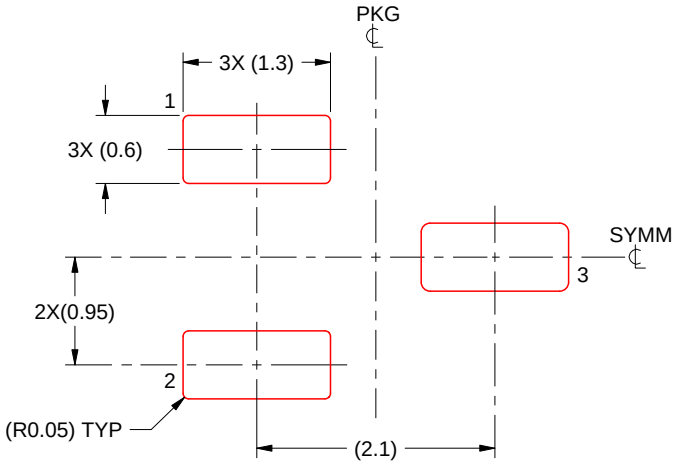



SOLDER MASK DETAILS

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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

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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.

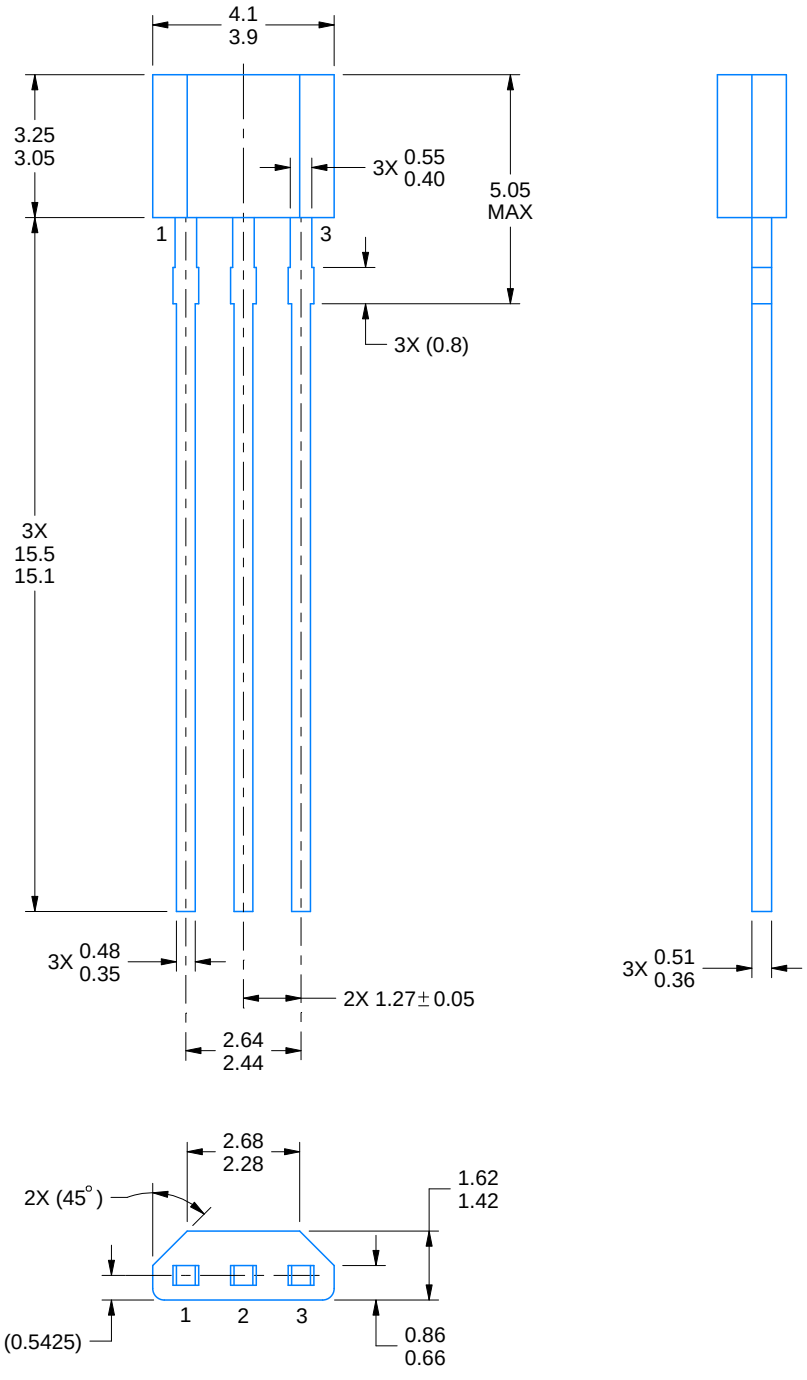


# PACKAGE OUTLINE

## LPG0003A

## TO-92 - 5.05 mm max height

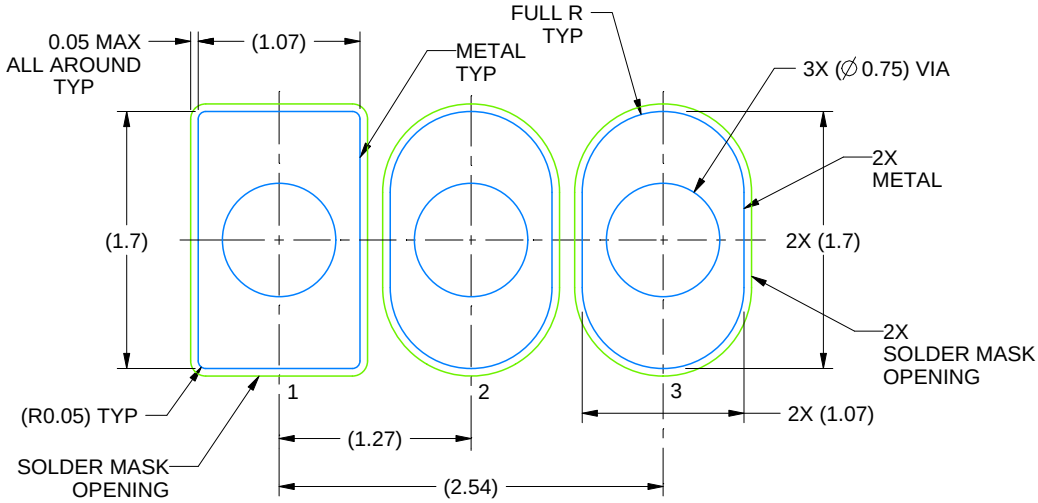
TRANSISTOR OUTLINE




4221343/C 01/2018

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.




LAND PATTERN EXAMPLE
NON-SOLDER MASK DEFINED
SCALE:20X

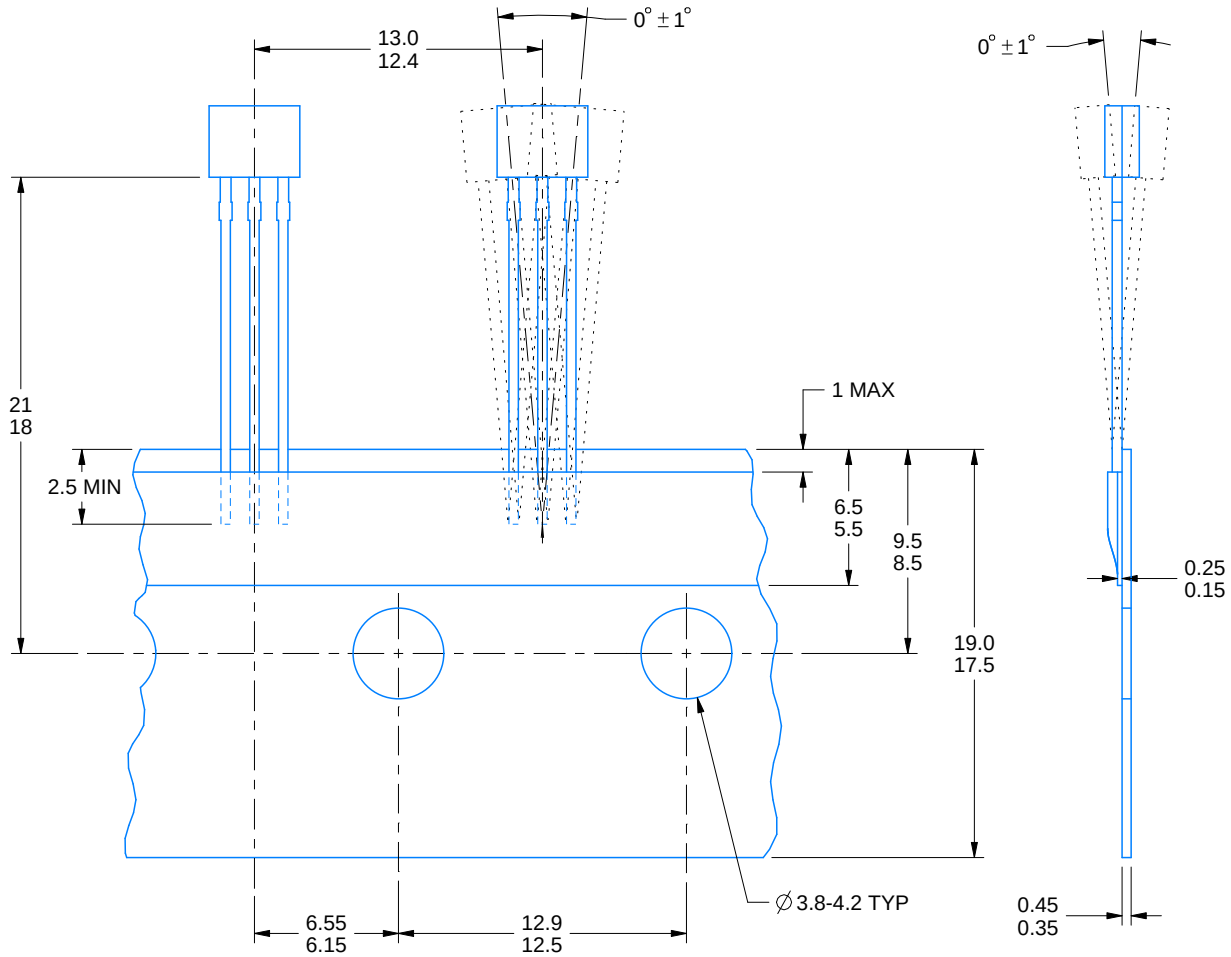
4221343/C 01/2018

# TAPE SPECIFICATIONS

## LPG0003A

## TO-92 - 5.05 mm max height

TRANSISTOR OUTLINE




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