

DATASHEET
ALPS P/N: HGDVST021A

DATASHEET
HGDVST021A



~ Revision 01-2 ~

Precautions when handling our products

- 1) For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.
- 2) Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.
- 3) Unless provided for otherwise, the products have been designed and manufactured for application in equipment and devices which are sold to end users in the market, including audio-visual (AV) equipment, electrical home appliances, office machines, information and communication equipment, and amusement equipment. The products are not intended for use in, and must not be used for, any application for nuclear equipment, driving equipment for aerospace or any other unauthorized use.
With the exception of the abovementioned prohibited applications, please contact an Alps sales representative and/or evaluate the total system regarding applicability for applications involving high levels of safety and liability such as medical equipment, burglar alarm equipment, disaster prevention equipment and undersea equipment. Please also incorporate fail-safe design, protection and redundant circuitry, malfunction protection, and/or fire protection into the complete system to ensure safety and reliability of the total system.
- 4) Before using products which were not specifically designed for use in automotive applications, please contact an Alps sales representative.

Cautions regarding this document

- 1) The specifications herein are an overview of the specifications. Obtain official specifications before use.
- 2) The external appearance, functions and other specifications herein may be discontinued without prior notice.

						<i>ALPS ELECTRIC CO., LTD.</i>	
						DSGD.	2015-07-19 Y.SUDA
						CHKD.	2015-07-19 T.NAKAMURA
		2017-06-28	KS	TN	YS	APPD.	2015-07-19 K.SEJIMO
		2016-09-14	KS	TN	YS	DOCUMENT No.	
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1 Product Description 製品説明

1.1 Overview 概要

ALPS Product No.	HGDVST021A
Characteristic	Magnetic Switch
Package type	SOT-23
Supply Voltage	3.0 to 30 V
Supply Current	1mA 
Interface	Open Drain Output
Temperature	-40 to 140 deg.C

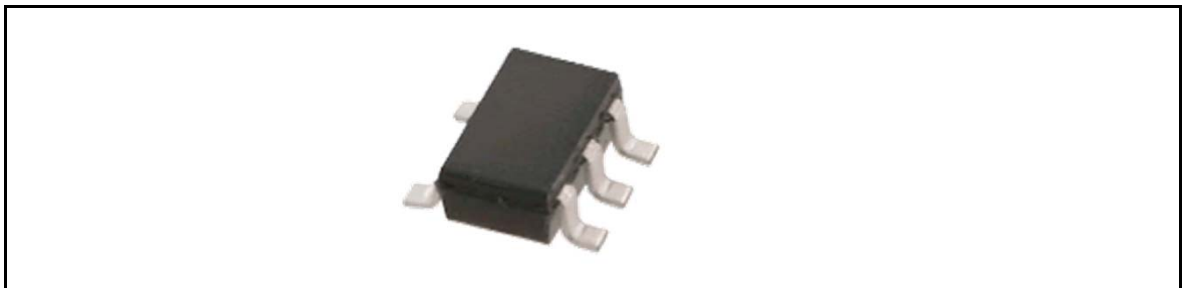


Figure 1-1 Image of HGDVST021A in the SOT-23-5 Package

1.2 Target Applications ターゲットアプリケーション

Automotive
Industrial
Building Automation
Office Automation
Home Appliance

2 Functional Description 機能説明

2.1 Pin Configuration ピン配置

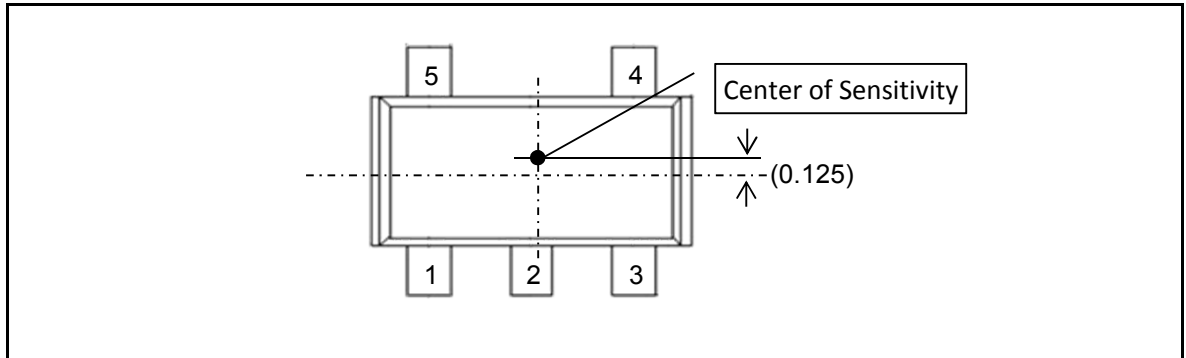


Figure 2-1 Pin Configuration and Center of Sensitive Area

2.2 Pin Description ピン機能

Table2-1 Pin Description

Pin No.	Symbol	Function
1	NC	No Connection
2	GND	Ground
3	NC	No Connection
4	VDD	Supply voltage
5	OUT	Output

2.3 Block Diagram ブロックダイアグラム

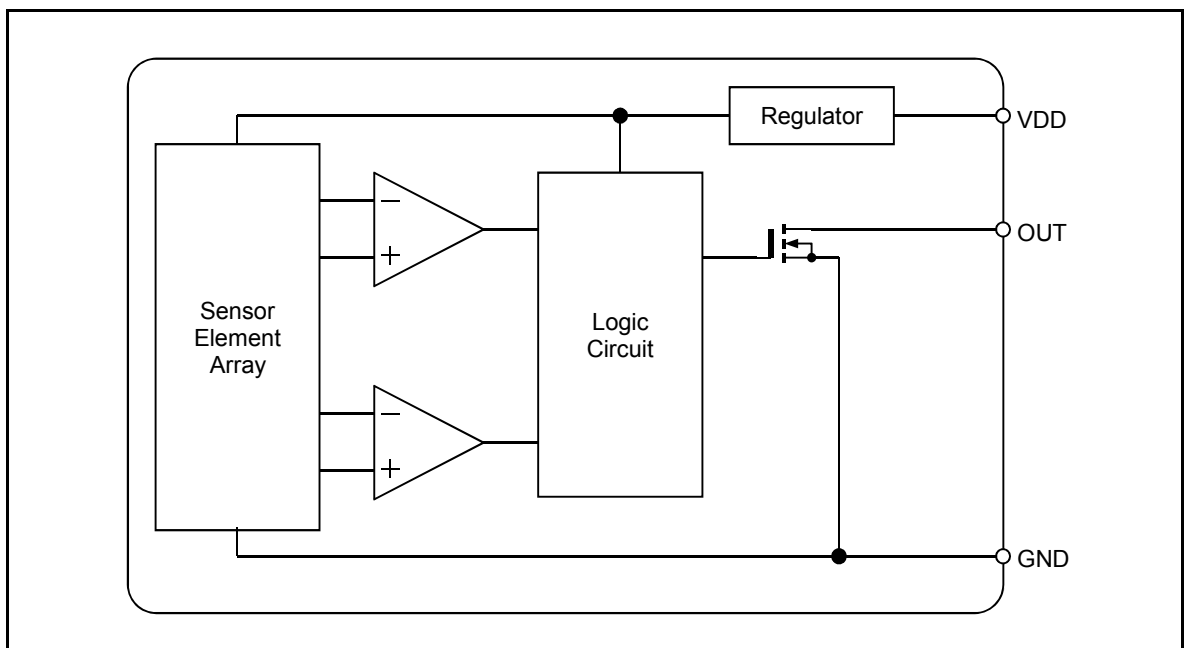


Figure 2-2 Functional Block Diagram

3 Specifications 仕様

3.1 Application Circuit アプリケーション回路

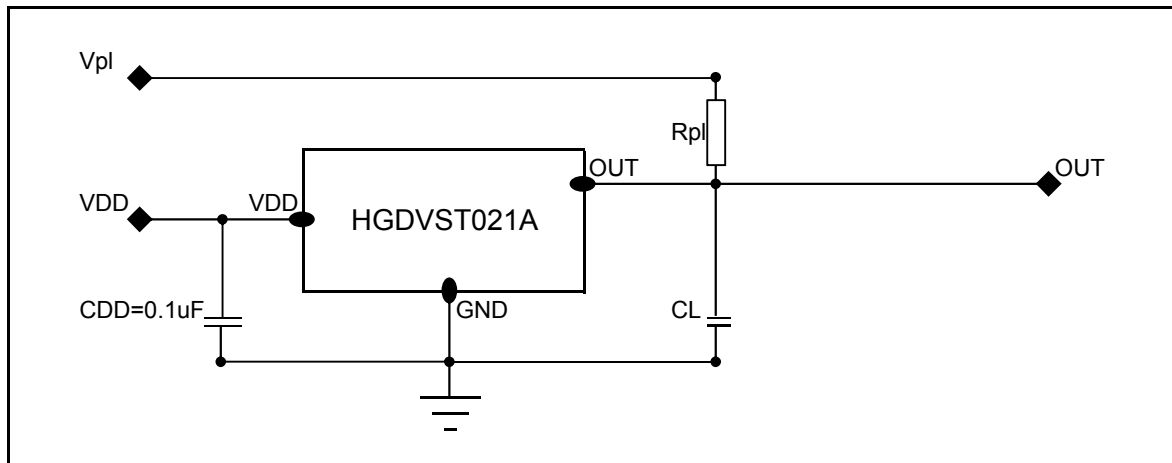


Figure 3-1 Application Circuit Example

3.2 Absolute Maximum Ratings 絶対最大定格

Table3-1 Absolute Maximum Rating Parameters

Parameter	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Supply Voltage	VDD	-0.3	-	40	V	
Pull-up Voltage	Vpl	-0.3	-	40	V	
Output Current	Isink	-	-	30	mA	
Operating Temperature	Top	-40	-	120	deg.C	VDD =30V
		-40	-	140	deg.C	VDD =9V
Storage Temperature	Tst	-40	-	150	deg.C	

[note]

The maximum rating is the value that must not be exceeded it even if it is momentary. There is a possibility of the breakdown and/or destruction when this value is exceeded.

最大定格とは、たとえ瞬間的であっても超えてはならない値であり、この値を超えた場合、故障・破壊の可能性がります。

Even if it is use within the maximum rating, continuous use on a high stress (high temperature and high superimposed voltage/large current drive, etc.) might spoil the product reliability.

最大定格内の使用であっても高負荷(高温および高電圧印加／大電流駆動etc.での連続使用は製品の信頼性を低下させる恐れがります。

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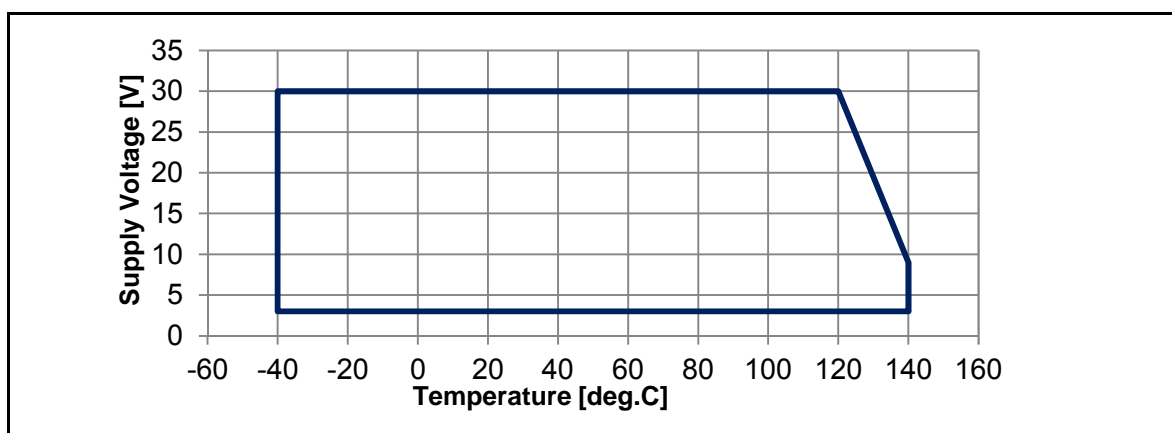


Figure 3-2 Operating Range about Supply Voltage and Temperature

3.3 Recommended Operating Conditions 推奨動作条件

Table3-2 Recommended Operating Conditions Parameters

Parameter	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Supply Voltage	VDD	3	12	30	V	see Figure3-1
Pull-up Voltage	Vpl	3	5	30	V	
Output Current	Isink	-	-	10	mA	
Pull-up Resistance	Rpl	3	3.3	30	kOhm	
Load Capacitance	CL	10	30	1000	pF	
Bypass capacitor	CDD	0.1	-	-	μ F	Required

3.4 Basic Characteristics 基本特性

Table3-3 General Electrical Characteristics

Parameter	Symbol	Values			Unit	Note	
		Min.	Typ.	Max.			
Supply Current	IDD	-	1	5	mA		
Output Saturation Voltage	Vsat	-	-	0.4	V	VDD=12V Isink=10mA	
Output Voltage	Vout	VOH	Vpl-0.1	-	Vpl	V	"Hi" Level
		VOL	-	-	Vsat	V	"Lo" Level

[note]

Unless otherwise specified, measurement condition is as follows.

VDD=12V、Vpl=5V、Rpl=3.3k Ω 、CL=30pF、T=25deg.C with application circuit described in Figure3-1.

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3.5 Magnetic Characteristics 磁気特性

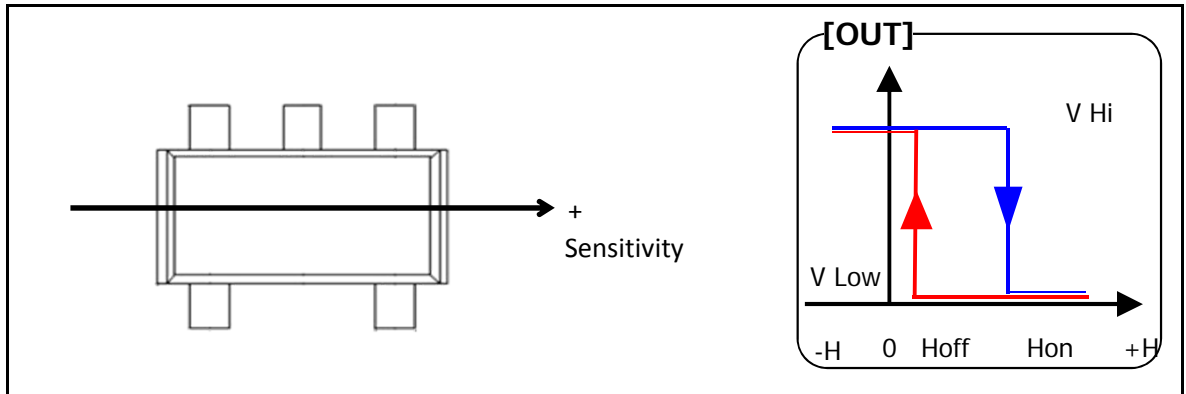


Figure 3-4 Definition of Sensitivity Direction

Table3-4 Operating Magnetic Field

Parameter	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Operating Magnetic Field	Hon	-	2.0	(2.7)	mT	25deg.C
	Hoff	(0.7)	1.4	-	mT	
	Hhys	-	(0.6)	-	mT	

[note]

In case of applying magnetic field only sensor sensitivity direction.

4 Package Information パッケージ情報

4.1 Package Outline 外形図

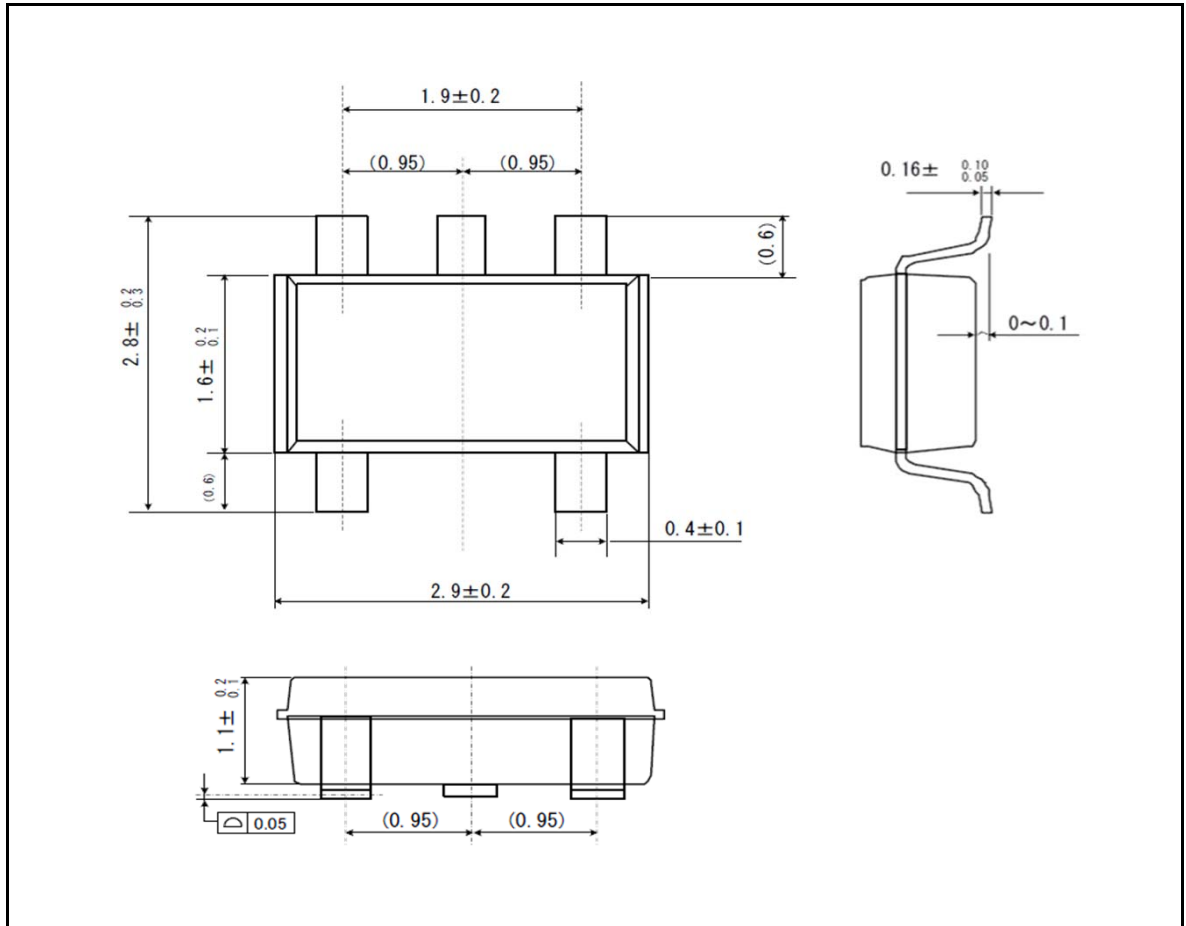


Figure 4-1 Package Outline (All dimensions in mm)

4.2 Footprint フットプリント

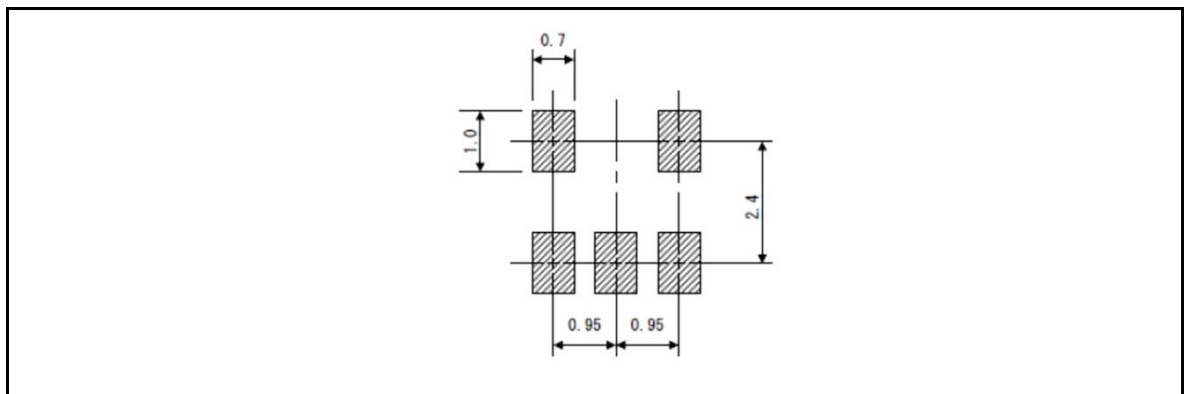


Figure 4-2 Footprint

4.3 Distance between Chip and Package チップ/パッケージ間距離

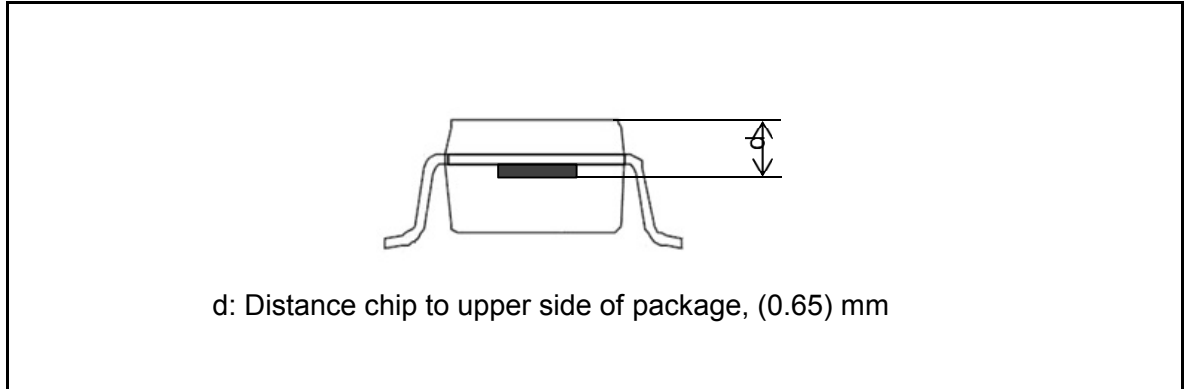


Figure 4-3 Distance between chip and package

4.4 Package Marking 捺印

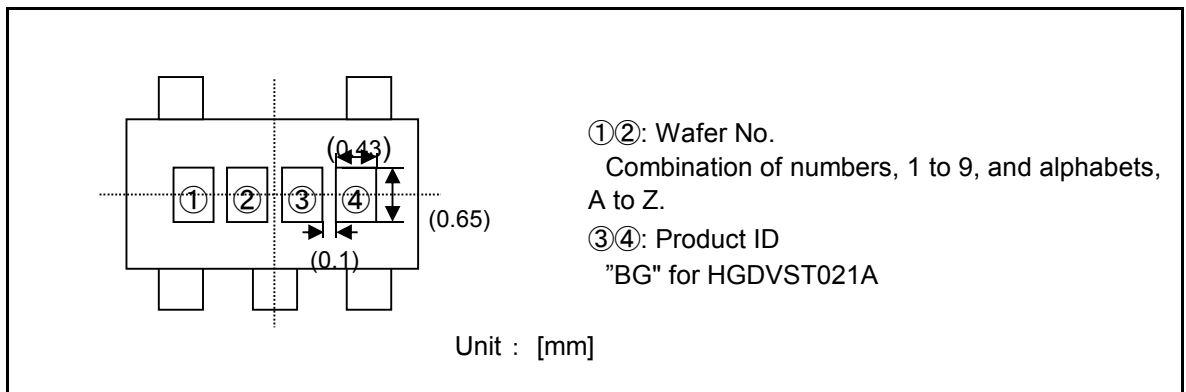


Figure 4-4 Marking of HGDVST021A

4.5 Structure 構造

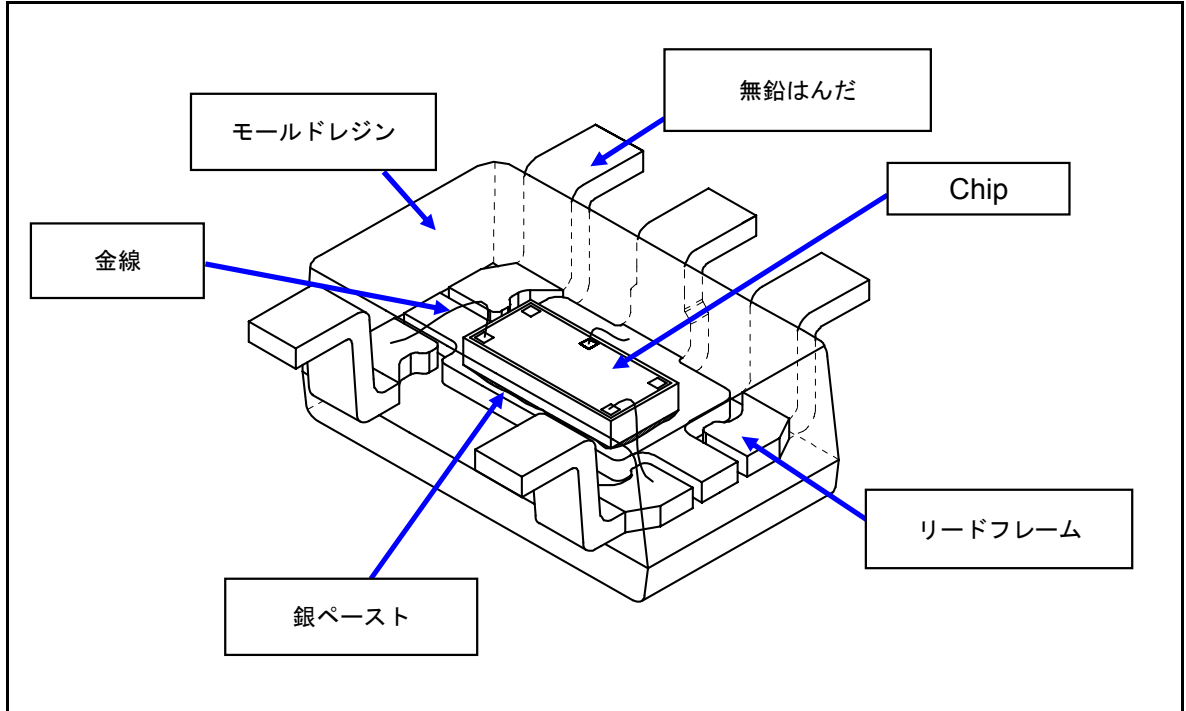


Figure 4-5 Internal Structure

Table 4-1 Components

Process	Parts Name	Materials
Die Mount	Sensor Chip	Si
	Adhesive for Die Bonding	Silver Paste
	Lead Frame	Cu, Ag-Plating
Wire Bonding	Wire	Au
Molding	Mold Resin	Epoxy Resin
Terminal Plating	Outer Terminal Plating	Sn-Bi

5 Packing Specifications 梱包仕様

5.1 Packing Information

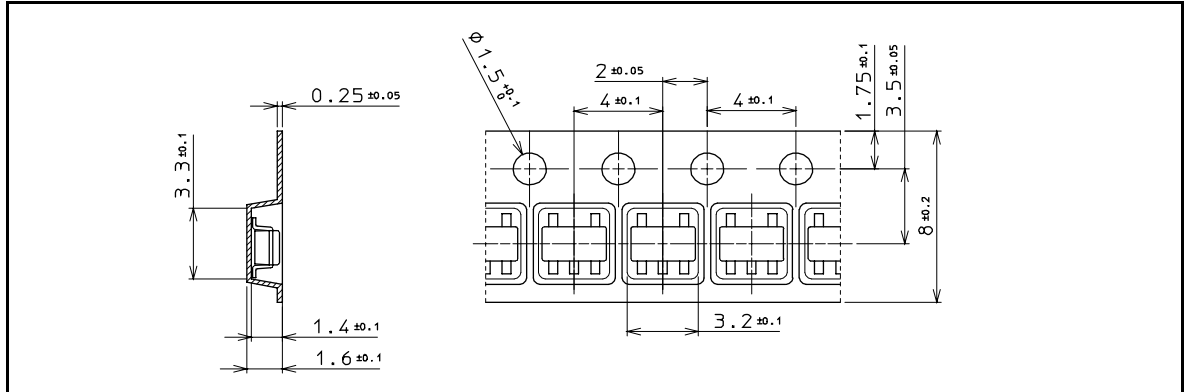


Figure 5-1 Packing of the HGDVST021A in a tape

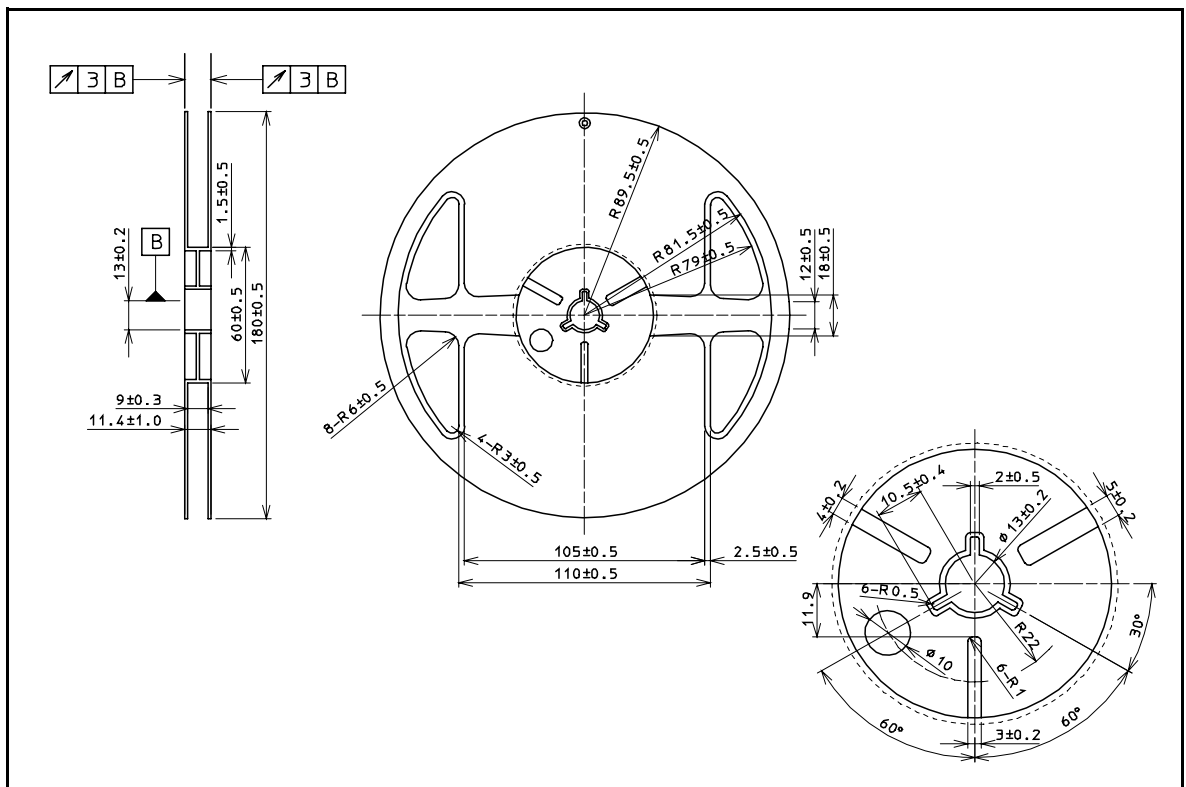


Figure 5-2 Reel Dimensions

6 Precautions When Handling Magnetic Sensor 製品お取り扱い時の注意

6.1 Storage Environment 保管環境

Products should be stored at an appropriate temperature and humidity (Recommended storage condition). Keep products away from chlorine and corrosive gas. There is a thing that influences product features when keeping it in an improper environment.

適切な温度・湿度環境(推奨保管条件)で保管していただけるようお願いいたします。また、塩素や腐食性のあるガスも避けるようお願いします。不適切な環境で保管した場合は、製品特性に影響する事があります。

6.2 Long-term Storage 長期保管

Long-term storage may result in poor lead solder ability and degraded electrical performance even under proper conditions. For those part that stored more than 1 year, solder ability should be checked before use. For storage longer than 1 year, it is recommended to store in nitrogen atmosphere. Oxygen in atmosphere oxidant leads of products and lead solder ability get worse.

適切な保管環境でも長期に保管した場合は、リード端子の半田付け性が悪くなったり、電気特性が不良になる場合がありますので、長期保管した場合は、半田付け性や電気特性をご確認の上、ご使用下さい。保管が長期(1年以上)に及ぶ場合は、窒素雰囲気中での保管をお勧めします。大気中で保管されますと、大気中の酸素により素子のリード部分が酸化され、リード端子の半田付け性が悪くなります。

6.3 ESD 静電気ESD

Every products has built in ESD protect circuit, however it may break if over ESD applied to this circuit. Please take measure for ESD when handle the products. Conducted container is recommended for product conveyance and packing instead of plastic container. Please connect ground line and use non high voltage leakage, when using soldering iron or external measurement circuit.

全ての端子に接続されたICについて静電気保護回路を内蔵していますが、その能力を超える静電気が加わった場合には破壊されることがありますので、製品を取り扱う場合には十分な静電気対策を実施してください。包装・運搬容器はプラスチック製を極力避け、導電容器をご使用ください。また製品のハンドリングについても十分に考慮してください。(リストストラップの使用等)はんだごてや測定回路などは高電圧リークのないものを、必ずアースを取ってご使用ください。

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Appendix

A3 Document Revision History 改定履歴

Revision	Date	Description
01	Jul.19, 2016	First release
01-1	Sep.14, 2016	Revised "Supply Current" from typ.3mA to typ.1mA.
01-2	Jun.28, 2017	Revised "Supply Current" from typ.3mA to typ.1mA.