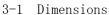
1. SCOPE

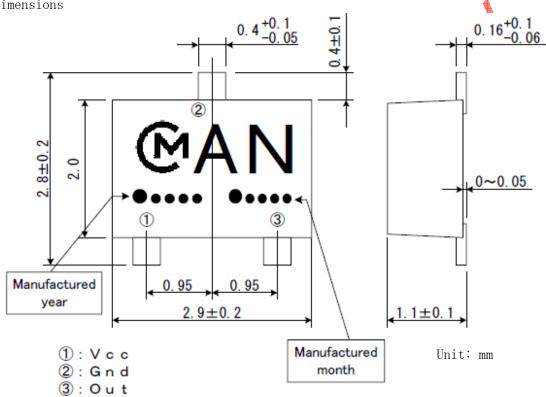
This product specification is applied to the magnetic switch AS-V20TA-R.

2. MURATA PART NUMBER

- 2-1 Part Description
 Magnetic Switch
- 2-2 Murata Part Number AS-V20TA-R

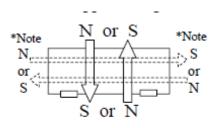
3. DIMENSIONS AND SCEMATICS





*Coplanarity: 0.1 mm or less (flatness applies to reflow process as well)

Fig. 1 Dimension



[Side View]
*Note: The product senses horizontal field
above certain level

Fig. 2 Direction of magnetic field

Murata Manufacturing Co., LTD.

Start dot Binary number 1 2 4 8

[Manufactured year The last digit of year]

ex 2010 :
1 2 4

[Manufactured month Jan~Dec 1~12]

ex March : • • • 1 2 4 8

ex September:

Fig. 3 Marking

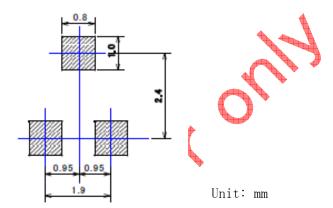
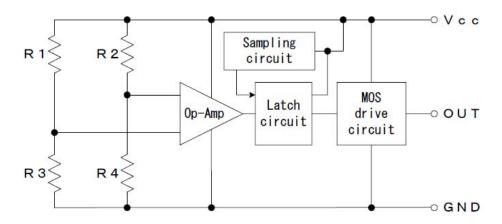
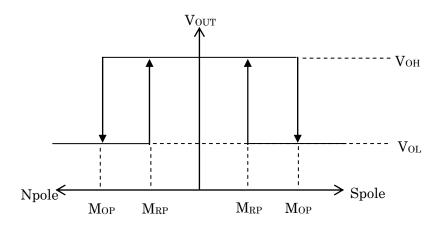


Fig. 4 Mount pad for reference

3-2 Block wiring diagram



3-3 Magnetic electric conversion characteristic



3-4 Electric Characteristics / Absolute Maximum Rating ($Ta=25\pm3^{\circ}C$, $V_{cc}=30^{\circ}V$)

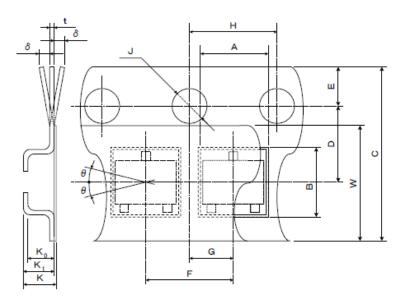
No.	Item	Sign	Conditions	Min.	Typ.	Max.	Unit
1	Supply voltage	V_{CC}	-	2.5	3.0	5.5	V
2	Absolute max. supply voltage		_	_		6.0	V
3	Current consumption	$I_{ ext{AVE}}$	V _{CC} =3. 0V	_	12	μΑ	
	Operating magnetic	M_{OP}	H→L V _{CC} =3.0V	KO)		4. 0	mT
4	field	${ m M}_{ m RP}$	$L \rightarrow H$ $V_{cc} = 3.0V$	0.8	_	-	mT
(5)	High level output	V_{OH}	Iout = 2mA	2. 7		_	V
6	Low level output	V _{OL}	Tout = -2mA	_	_	0.3	V
7	Operating temp.	-	<u> </u>	-40	_	+85	$^{\circ}$ C
8	Storage temp.		_	-40	_	+125	$^{\circ}$

- *1) Each item are specifications derived from individual testing.
- *2) When you shift the sensor from H to L, please make sure to exceed the above operating magnetic field (M_{OP}) through your designing.
- *3) When you shift the sensor from L to H, please make sure to exceed the above operating magnetic field (M_{RP}) through your designing.

3-5 Taping Method

Package	Reel	Quantity
Tape&Reel	180mm Embossed Tape	3000pcs

3-6 Taping Method 3-6-1 Taping

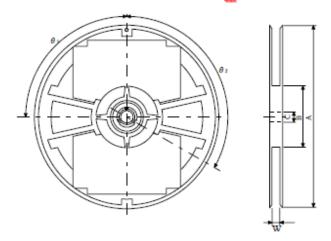


Unit: mm

Unit: mm

Item		Symbol	SIZE	Item		Symbol	SIZE
	Length	A	3.2±0.1	Distance between Center-lines	Length direction	G	2.0±0.05
Pocket	Width	В	3.2±0.1		Width direction	D	3.5±0.05
Tocker	Depth	K_0	1.2±0.1	Cover Tape	Width	W	5.5 ^{+0.3} -0
	Pitch	F	4.0±0.1		Width	С	8.0±0.2
	Diameter	J	Φ1.55±0.05	Carrier Tape	Thickness	t	0.2±0.05
Perforation	Pitch	H	4.0±0.1		Depth	K_1	1.4±0.1
	Position	E	1.75±0.1	Device	Tilt	θ	30°MAX
Overall Thikness		K	1.45±0.1	Device	1111	9	JU MAA

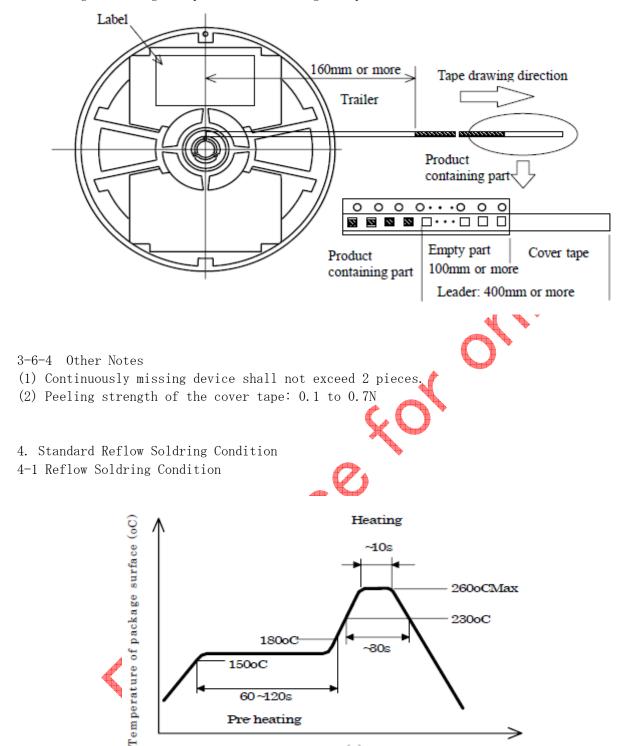
3-6-2 Taping Reel Size · · · Conformity: EIAJ RRV08B



SYMBOL ITEM SIZE Diameter Α φ 178±2 Flange Space Between Flanges W 9 ± 0.5 Diameter В φ 60±1 Hub Slit Location 90° θ 1 Hub Spindle Hole Diameter C φ 13±0.5 Key Slit Location $\theta 2$ 120° Labeled on one side Marking of Flange

Quantity: 3000p / Reel

3-6-3 begin winding it up / finish winding it up



Times of Reflow: 3 or less Hand Soldering Condition: 350±5°C, 3 seconds or less/each terminal

Time(s)

60~120s Pre heating

4-2 MSL Moisture Sensitivity Level (MSL)... equal to MSL 1

5. Reliabilty test

No. Reliability test 125°C > 500 h		Poliobilty test	Tost conditions	Critorio			
Low Temperature	No.	Reliabilty test	Test conditions	Criteria			
High Temperature and Humidity							
SSC, SSMMH×SOON, V _C =3V	2		-40°C×500 h				
apply vibration (maximum amplitude:1.5mm, frequency: 10-55Hz, lcycle minute) to X, Y, and Z direction for 2 h (in each direction). 5 Thermal shock 55°C/30min⇔+125°C/30min 500Cycle(Gaseous) Pre Treatment:: +85°C, 85%RH, 168h Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3 Solder ability 50der temperature: 230°C Time: 3s Dipping 50der temperature: 230°C Time: 3s Dipping 60der temperature: 230°C When satisfying the electrical condition of 3-45°® 60der temperature: 230°C BESD (MM) 200pF, 0.2, ±200V (HBM) 100pF, 1.5kΩ, ±2kV (HB	3		85℃、85%RH×500h、V _{cc} =3V				
Vibration Examination Examination Examination Frequency: 10-55Hz, lcycle minute) to X, Y, and Z direction for 2 h (in each direction).			Fix the product on a vibrator and				
Examination frequency: 10-55Hz, 1cycle minute) to X, Y, and Z direction for 2 h (in each direction).			apply vibration (maximum				
Examination frequency: 10-55Hz, lcycle minute) to X, Y, and Z direction for 2 h (in each direction). 5 Thermal shock	1		amplitude:1.5mm,				
minute to X, Y, and Z direction for 2 h (in each direction).	1		frequency: 10-55Hz, 1cycle	When satisfying the			
for 2 h (in each direction). -55°C/30min⇔+125°C/30min 500Cycle (Gaseous) Pre Treatment:: +85°C, 85%RH, 168h Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3 Solder ability Solder temperature: 230°C Time: 3s Dipping (MM) 200pF, 0Ω, ±200V (HBM) 100pF, 1.5kΩ, ±2kV Belectrode Sticking Tendency Solder temperature: 230°C Time: 3s Dipping When satisfying the electrical condition of 3-4⑤⑥ and no external abnormality should be found. 10 Drop Test Condition: Max +260°C & 230°C, 30s Times of reflow: 3 Solder temperature: 230°C Time: 3s Dipping When satisfying the electrical condition of 3-4⑤⑥ and no external abnormality should be found. When satisfying the electrical condition of 3-4⑥⑥ and no external abnormality should be found. Impact Resistance Solder, 10times Condition: Glass Intimes Bending Cycle Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side found after 7mm bending to +side			minute) to X, Y, and Z direction				
Solder Heat Resistance Pre Treatment:: +85°C, 85%RH, 168h Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3			for 2 h (in each direction).	e rectificat condition of 3 400			
Solder Heat Resistance Pre Treatment:: +85°C, 85%RH, 168h Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3	5	Thorong Laborate	-55°C/30min⇔+125°C/30min				
Solder Heat Resistance 168h Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3		Thermal Shock	500Cycle(Gaseous)				
Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3			Pre Treatment∷ +85℃, 85%RH,				
Heat Resistance Reflow Condition: Max +260°C & 230°C, 30s Times of reflow: 3			168h				
230°C, 30s Times of reflow: 3	6		Reflow Condition: Max +260℃ &				
Solder ability Solder temperature: 230°C Time: 3s Dipping When satisfying the electrical condition of 3-4⑤⑥ When satisfying the electrical condition of 3-4⑤⑥ When satisfying the electrical condition of 3-4⑤⑥ and no external abnormality should be found. 10 Drop Test Impact Resistance Mount the product on a shock tester and apply shock (1470m/s²) of times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side and side.			230℃, 30s				
Time: 3s Dipping (MM) 200pF, 0Ω, ±200V (HBM) 100pF, 1.5kΩ, ±2kV Belectrode Sticking Tendency Time: 3s Dipping (MM) 200pF, 0Ω, ±200V (HBM) 100pF, 1.5kΩ, ±2kV When satisfying the electrical condition of 3-4⑤⑥ and no external abnormality should be found. 10 Drop Test Impact Resistance Mont the product on a shock tester and apply shock (1470m/s²) 5 times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side			Times of reflow: 3				
Time: 3s Dipping (MM) 200pF, 0Ω, ±200V (HBM) 100pF, 1.5kΩ, ±2kV Belectrode Sticking Tendency Time: 3s Dipping (MM) 200pF, 0Ω, ±200V (HBM) 100pF, 1.5kΩ, ±2kV Belectrical condition of 3-4⑤⑥ When satisfying the electrical condition of 3-4⑤⑥ and no external abnormality should be found. 10 Drop Test Timpact Resistance Mount the product on a shock tester and apply shock (1470m/s²) 5 times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy FOB (FR-4), t=1.0, 50mm span When satisfying the electrical condition of 3-4⑤⑥ When satisfying the electrical condition of 3-4⑤⑥ No terminal fracture, loosening found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side	7	Solder ability	Solder temperature : 230℃	Marra 00%			
8 ESD (HBM) 100pF, 1. 5kΩ, ±2kV electrical condition of 3-4⑤⑥ When satisfying the electrical condition of 3-4⑤⑥ and no external abnormality should be found. 10 Drop Test 10 Drop Test 11 Impact Resistance 12 Bending Cycle Bending Cycle Bending Cycle Bending Condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span found after 7mm bending to +side and reside. Bending to +side and reside.	,		Time: 3s Dipping	above 90%			
Sticking Tendency Electrode Sticking Tendency 5N (510gf) to 4 directions. 10s When satisfying the electrical condition of 3-4(5)(6) and no external abnormality should be found.	Q	FCD	(MM) 200pF, 0 Ω , \pm 200V	When satisfying the			
Bending Cycle Electrode Sticking Tendency 5N (510gf) to 4 directions. 10s and no external abnormality should be found. 10 Drop Test 100g dummy load, 1.5m, on the concrete, 6 sides, 10times Momat the product on a shock tester and apply shock (1470m/s²) 5 times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending to +side and - side. No terminal fracture, loosening found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side No terminal fracture, loosening found after 7mm bending to +side		EOD	(HBM) 100pF, 1.5k Ω , ± 2 kV	electrical condition of 3-456			
Sticking Tendency Should be found. When satisfying the electrical condition of 3-4566 Stimes to each of X, Y, and Z direction. Sending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side No terminal fracture, loosening found after 7mm bending to +side				When satisfying the			
Bending Cycle Bending Cycle Bending Limit Sticking lendency 100 Drop Test 110 Drop Test 11	0		EN (510of) to dimentions 10o	electrical condition of 3-456			
10 Drop Test 100g dummy load, 1.5m, on the concrete, 6 sides, 10times Mount the product on a shock tester and apply shock (1470m/s²) 5 times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span No terminal fracture, loosening found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side found after 7mm bending to +side	9		5N (510g1) to 4 diffections. Tos	and no external abnormality			
10 Drop Test concrete, 6 sides, 10times Mount the product on a shock tester and apply shock (1470m/s²) 5 times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span No terminal fracture, loosening found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side			4	should be found.			
Impact Resistance 11 Impact Resistance Mount the product on a shock tester and apply shock (1470m/s²) 5 times to each of X, Y, and Z direction. 12 Bending Cycle Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Somm span S	10	Drop Tog+	100g dummy load, 1.5m, on the				
Impact Resistance tester and apply shock (1470m/s²) times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side found after 7mm bending to +side	10	DIOD Lest	concrete, 6 sides, 10times				
Impact Resistance 5 times to each of X, Y, and Z direction. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending Limit Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side	11	Impact Resistance	Mount the product on a shock	When satisfying the			
Bending Cycle Bending Cycle Bending Cycle Bending Cycle Bending Cycle Bending Cycle Bending Condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, 50mm span. Bending Condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending Condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending Cycle Bending Cycle Bending Cycle Bending Condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending Cycle B			tester and apply shock (1470m/s²)	electrical condition of 3-456			
Bending Cycle Bending Cycle Bending Cycle Bending condition: Glass Epoxy PCB (FR-4), t=1.0, Speed 5mm/min, found after 1500 cycle of 1mm bending to +side and - side. Bending Limit Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span			5 times to each of X, Y, and Z				
Bending Cycle PCB (FR-4), t=1.0, Speed 5mm/min, found after 1500 cycle of 1mm bending to +side and - side. Bending Limit Bending Cycle PCB (FR-4), t=1.0, Speed 5mm/min, found after 1500 cycle of 1mm bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side			direction.				
50mm span. bending to +side and - side. Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending to +side and - side. No terminal fracture, loosening found after 7mm bending to +side		Bending Cycle	Bending condition: Glass Epoxy	No terminal fracture, loosening			
Bending Limit Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span No terminal fracture, loosening found after 7mm bending to +side	12		PCB (FR-4), t=1.0, Speed 5mm/min,	found after 1500 cycle of 1mm			
Bending Limit Bending condition: Glass Epoxy PCB (FR-4), t=1.0, 50mm span Bending to +side			50mm span.	bending to +side and - side.			
13 Bending Limit PCB (FR-4), t=1.0, 50mm span found after 7mm bending to +side		Bending Limit	Ronding condition: Class Frame	No terminal fracture, loosening			
and -side.	13						
			100 (FR 4), t-1.0, 30mm span				

6. ACAUTION

6-1 Limitation of Applications

Please avoid using this product for the applications listed below which require especially high reliability for the prevention of defects that might directly cause damage to the third party's life, body or property.

When this product is used for the applications listed below, we shall not be liable for any claims on the product.

- ① Aircraft equipment
- 2 Aerospace equipment
- 3 Undersea equipment
- 4 Generating plant equipment
- (5) Medical equipment
- 6 Transportation equipment (vehicles, trains, ships, etc.)
- 7 Traffic signal equipment
- 8 Disaster prevention / crime prevention equipment
- Data-processing equipment
- (1) Application of similar complexity and or reliability requirements to the applications listed in the above.

6-2 FAIL-SAFE

Be sure to provide as appropriate fall-safe function on your product to prevent a second damage that may be caused by the approximal function or the failure of our product.

7. CAUTION FOR USE

7-1 HANDLING

• This product may be degraded by electrostatic discharge. It is necessary to take anti-static precautions when handling.

7-2 Design

- Please thoroughly evaluate this product for the magneto-variation of the magnet used along with this product, otherwise this product may result in the miss-operation or the non-operation.
- Please be careful about a magnetic body (Iron, Nickel, etc.) and a magnetic noise immunity that may affect the magnetism of a magnet.
- Please don't supply inverse voltage or excess voltage to this product. If applied, this product may be damaged and electrically destroyed.
- Please design your product not to be affected by stress of the resin due to heat shrink.

7-3 Mounting

- Please mount this product under our standard reflow condition. Otherwise this product may be damaged.
- · Terminal should be avoided to apply excessive force or to bend.
- Please don't apply excessive bending stress to this product in the board otherwise this product may be damaged.

7-4 Storage condition

• We would suggest to store this product under the condition.

Temperature: +5 to $+30^{\circ}$ C

Humidity: 85%RH max

*Stored this product in desiccator or in N₂ atmosphere is recommended.

- Storage period is within 6 month under above mentioned the condition. Please mount it as soon as possible once unpacked because solder ability may be degraded.
- · Please avoid the water, chemical solvent or oil.
- Please avoid the corrosive gas (Cl₂, H₂S, MH₃, NO₂, NO₃ etc.).
- · Please avoid the strong vibration or shock

8. ANOTE

- Make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
- · Not to use our product deviating from the agreed specifications.
- We consider it not to appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.