

SPECIFICATIONS

TO:

広州市威亦旺

TYPE NO.	CODE NO.	PRODUCT NAME
	AQV258HAX	PhotoMOS

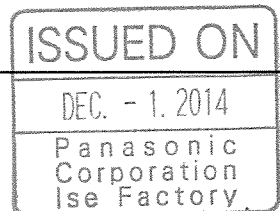
REMARKS :

ACCEPTABILITY OF SPECIFICATIONS :

Accepted by :

On :

PLEASE CONTACT.....



Panasonic Corporation
Automation Controls Business Division

DATE :

Nov.25.2014

PREPARED BY

S. V. K.

APPROVED BY

CHECKED BY

Y. Fujimori

Order Placement Recommendations and Considerations

The Products and Specifications listed in this document are subject to change (including specifications, manufacturing facility and discontinuing the Products) as occasioned by the improvements of Products. Consequently, when you review the mass-production design for the Products listed or when you place orders for these Products, Panasonic Corporation asks you to contact one of our customer service representatives and check that the details listed in the document are commensurate with the most up-to-date information.

[Safety precautions]

Panasonic Corporation is consistently striving to improve quality and reliability. However, the fact remains that electrical components and devices generally cause failures at a given statistical probability. Furthermore, their durability varies with use environments or use conditions. In this respect, please check for actual electrical components and devices under actual conditions before use without fail. Continued usage in a state of degraded condition may cause the deteriorated insulation, thus result in abnormal heat, smoke or firing. Please carry out safety design and periodic maintenance including redundancy design, design for fire spread prevention, and design for malfunction prevention so that no accidents resulting in injury or death, fire accidents, or social damage will be caused as a result of failure of the Products or ending life of the Products.

As scope of warranty changes in accordance with your application, quality standards of Products fall into the following three categories depending on the applications of the products: Reference Standards, Special Standards, and Specified Standards that meet the quality assurance program designated by the customer. These quality standards have been established so that our products will be used for the applications listed below.

Reference Standards: Computers, office automation equipment, communications equipment, audio-video products, home electrical appliances, machine tools, personal devices, industrial robots

Special Standards: Transportation equipment (automobiles, trains, ships, etc.), traffic signal equipment, crime and disaster prevention devices, electric power equipment, various safety devices, and medical equipment not directly targeted for life support

Specified Standards: Aircraft equipment, aeronautical and space equipment, seabed relay equipment, nuclear power control systems, and medical equipment, devices and systems for life support

In the case that your usage is under the following conditions without exchanging the new specifications, Panasonic Corporation shall not warrant the quality of the Products. Panasonic Corporation asks you to contact one of our customer service representatives before exchange written in specifications.

- (1) When our products are to be used in any of the applications listed for the Special Standards or Specified Standards
- (2) When, even for any of the applications listed for the Reference Standards, our products may possibly be used beyond the range of the specifications, environment or conditions listed in the document or when you are considering the use of our products in any conditions or an environment that is not listed in the document
- (3) When you change to other equipment that have different usage condition after exchange the specifications in the usage above condition (1).

[Acceptance inspection]

In connection with the products you have purchased from us or with the products delivered to your premises, please perform an acceptance inspection with all due speed and, in connection with the handling of our products both before and during the acceptance inspection, please give full consideration to the control and preservation of our products.

[Warranty period]

Unless otherwise stipulated by both parties, the warranty period of our products is one year after their purchase by you or after their delivery to the location specified by you.

[Scope of warranty]

In the event that Panasonic Corporation confirms any failures or defects of the Products by reasons solely attributable to Panasonic Corporation during the warranty period, Panasonic Corporation shall supply the replacements of the Products, parts or replace and/or repair the defective portion by free of charge at the location where the Products were purchased or delivered to your premises as soon as possible.

However, the following failures and defects are not covered by the warranty:

- (1) When the failure or defect was caused by a specification, standard, handling method, etc. which was specified by you
- (2) When the failure or defect was caused after purchase or delivery to your premises by an alteration in construction, performance, specification, etc. which did not involve us
- (3) When the failure or defect was caused by a phenomenon that could not be predicted by the technology at purchasing or contracted time
- (4) When the use of our Products deviated from the scope of the conditions and environment set forth in the catalog and specifications
- (5) When, after our Products were incorporated into your Products or equipment for use, damage resulted which could have been avoided if your Products or equipment had been equipped with the functions, construction, etc. the provision of which is accepted practice in the industry
- (6) When the failure or defect was caused by a natural disaster or other force majeure

The terms and conditions of the warranty set forth in this Order Placement Recommendations and Consideration shall apply to the Products purchased or delivered to your premises. And the above terms and conditions shall not cover any induced damages by the failure or defects of the Products.

Panasonic Corporation
Automation Controls Business Division

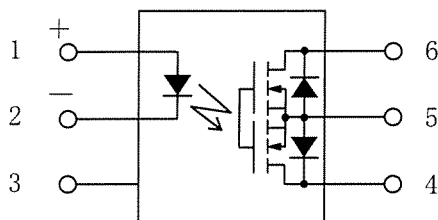
TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE 1/7
NAME	PhotoMOS	AQV258HAX

1. TYPE ; AQV258HAX HE 1 Form A SMD type

2. DRAWING NO. ; AQV258HAX

3. CHARACTERISTICS

3- 1 Equivalent circuit



3- 2 Absolute maximum ratings (Ta=25°C)




Item		Symbol	Type of connection	Value	Unit
Input	LED forward current	I_F		50	mA
	LED reverse voltage	V_R		5	V
	Peak forward current *1	I_{FP}		1	A
	Power dissipation	P_{in}		75	mW
Output	Load voltage (Peak AC)	V_L		1500	V
	Continuous load current *2	I_L	A B C	0.02 0.025 0.04	A
	Peak load current *3	I_{peak}		0.06	A
	Power dissipation	P_{out}		360	mW
Total power dissipation		P_T		410	mW
I/O isolation voltage		V_{iso}		5000 (AC)	V
Temperature Limits	Operating *4	T_{opr}		-40 to 85	°C
	Storage	T_{stg}		-40 to 100	°C

*1 f=100Hz, Duty factor=0.1%

*2 A connection: Peak AC/DC, B,C connection: DC

*3 100ms (1 shot), V_L =DC

*4 Non-condensing at low temperatures

TO: 広州市威亦旺	DESIGNED 	DATE: Nov. 25. '14
Panasonic Corporation Automation Controls Business Division	CHECKED 	
	ENACTED 	

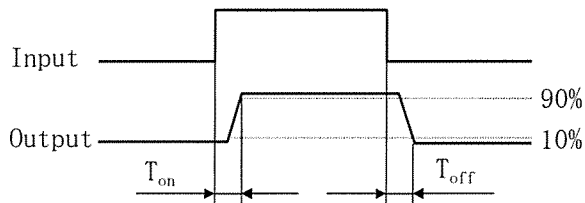
TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE	2/7
NAME	PhotoMOS		AQV258HAX

3- 3 Electrical characteristics (Ta=25°C)

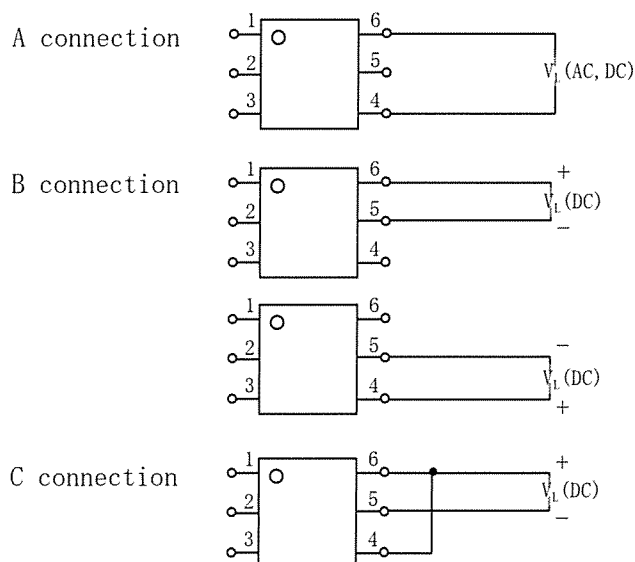
Item			Symbol	Type of connection	Test conditions	Min.	Typ.	Max.	Unit
Input	LED operate current		I _{Fon}		I _L =Max.	—	1.6	3	mA
	LED turn off current		I _{Foff}		I _L =Max.	0.4	1.5	—	mA
	LED dropout voltage *1		V _F		I _F =50mA	—	1.25	1.5	V
Output	On resistance		R _{on}	A	I _F =5mA, I _L =Max.	—	345	500	Ω
				B			345	500	
				C			160	250	
	Off state leakage current		I _{Leak}		I _F =0mA, V _L =Max.	—	—	10	μA
					I _F =0mA, V _L =100V	—	—	1	μA
Transfer characteristics	Switching speed	Turn on time *2	T _{on}		I _F =5mA, I _L =Max.	—	1.5	3	ms
		Turn off time *2	T _{off}		I _F =5mA, I _L =Max.	—	0.05	0.2	ms
	I/O capacitance		C _{iso}		f=1MHz, V _B =0V	—	0.8	1.5	pF
	Initial I/O isolation resistance		R _{iso}		DC500V	1000	—	—	MΩ

*1 Typ. 1.14V at $I_F=5mA$

*2 Turn on/Turn off time



3- 4 Method of connecting the load at the output is divided into 3 types.



3- 5 The terminal leads receive solder plating or solder dip plating.

T0: 広州市威亦旺

DATE: Nov. 25. '14

Panasonic Corporation Automation Controls Business Division

TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE	3/7
NAME	PhotoMOS	AQV258HAX	

4. LOAD CURRENT VS. AMBIENT TEMPERATURE CHARACTERISTICS

→ Load current (mA)

→ Ambient temperature (°C)

Ambient temperature (°C)	C connection (mA)	B connection (mA)	A connection (mA)
-40	40	25	20
0	40	25	20
20	40	25	20
40	35	22	18
60	25	15	12
80	10	5	2
85	0	0	0

5. USING METHODS

5- 1 Wiring diagram

PhotoMOS

E : Power source at input side
 I_F : LED forward current
 V_L : Load voltage
 I_L : Load current

5- 2 Examples of each input power supply and current limit resistors

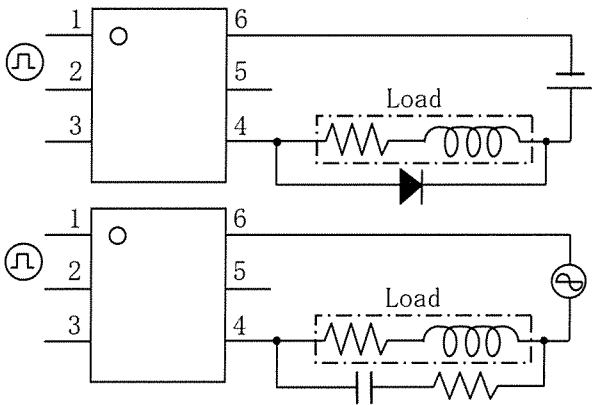
PhotoMOS

E	R ($I_F=5\text{mA}$)	R ($I_F=10\text{mA}$)
5V	Approx. 700 Ω	Approx. 350 Ω
15V	Approx. 2.7k Ω	Approx. 1.4k Ω
24V	Approx. 4.5k Ω	Approx. 2.3k Ω

T0: 広州市威亦旺

DATE: Nov. 25.'14

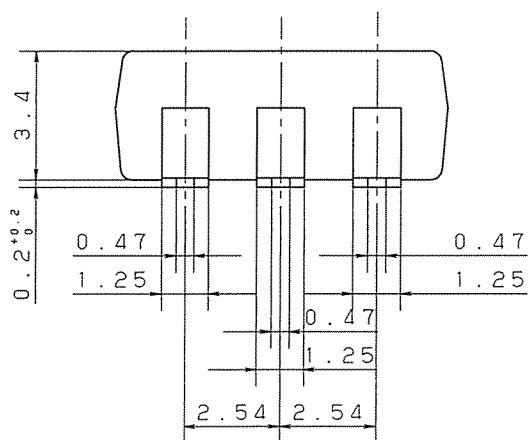
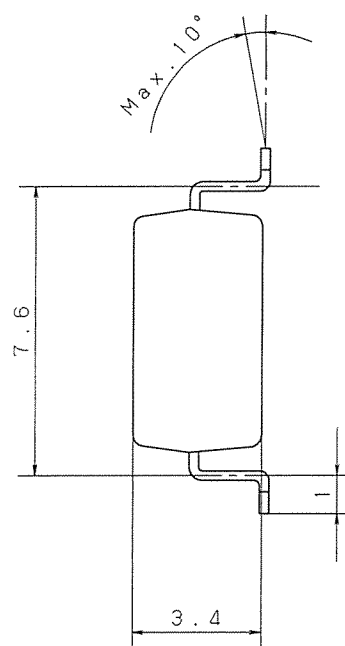
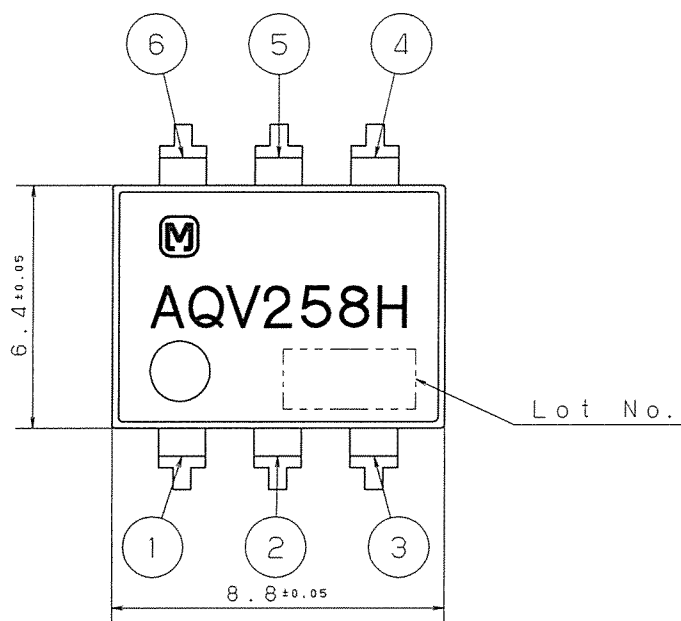
Panasonic Corporation Automation Controls Business Division

TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE 4/7
NAME	PhotoMOS	AQV258HAX
<p>6. NOTE</p> <p>6- 1 Regarding cautions for use and explanation of technical terms, please refer to our web site.</p> <p>6- 2 About derating design Derating is essential in any reliable design and is a significant factor for product life. Even if the conditions of use (temperature, current, voltage, etc.) of the product fall within the absolute maximum ratings, reliability can be reduced remarkably when used under high load (high temperature, high humidity, high current, high voltage, etc.). Therefore, please derate sufficiently below the absolute maximum rating and verify operation of the actual design before using.</p> <p>6- 3 Unused terminals The No.3 terminal is used with the circuit inside the PhotoMOS. Therefore, do not connect it to the external circuitry with either connection method A, B, or C.</p> <p>6- 4 Short across terminals Do not short circuit between terminals when PhotoMOS is energized, since there is possibility of breaking of the internal IC.</p> <p>6- 5 Output spike voltages (1) If an inductive load generates spike voltages which exceed the absolute maximum rating, the spike voltage must be limited. Typical circuits are shown below.</p> <div style="text-align: center;">  <p style="text-align: right;">Add a clamp diode to the load</p> <p style="text-align: right;">Add a CR Snubber circuit to the load</p> </div> <p>(2) Even if spike voltages generated at the load are limited with a clamp diode if the circuit wires are long, spike voltages will occur by inductance. Keep wires as short as possible to minimize inductance.</p>		
TO: 広州市威亦旺		DATE: Nov. 25.'14
Panasonic Corporation Automation Controls Business Division		

TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE 5/7
NAME	PhotoMOS	AQV258HAX
<p>6- 6 Continual DC bias</p> <p>In cases in which a continual DC bias is applied between the input and output, the output-side MOSFET may deteriorate due to the voltage. Therefore, please verify operation of the actual design before using. An example of a circuit that might undergo MOSFET deterioration due to voltage is given below.</p> <div data-bbox="399 490 1083 745" data-label="Diagram"> </div> <p>6- 7 Ripple in the input power supply</p> <p>If ripple is present in the input power supply, observe the following:</p> <ol style="list-style-type: none"> (1) For LED forward current at E_{min}, maintain min. 5mA (2) Keep the LED forward current at 50mA or less at E_{max}. <div data-bbox="614 990 1080 1113" data-label="Figure"> </div> <p>6- 8 Soldering condition</p> <ol style="list-style-type: none"> (1) IR (Infrared reflow) soldering method <div data-bbox="477 1261 1026 1563" data-label="Figure"> </div> <div data-bbox="1080 1249 1394 1429" data-label="Text"> <p> $T_1=150$ to 180°C $T_2=230^{\circ}\text{C}$ $T_3=250^{\circ}\text{C}$ or less $t_1=60$ to 120s or less $t_2=30\text{s}$ or less </p> </div> <ol style="list-style-type: none"> (2) Soldering iron method <p>Tip temperature : 350 to 400°C Wattage : 30 to 60W Soldering time : Within 3s</p> <ol style="list-style-type: none"> (3) Others <ul style="list-style-type: none"> • Check mounting conditions before using other soldering methods (DWS, VPS, hot-air, hot plate, pulse heater, etc.) • The temperature profile indicates the temperature of the soldered terminal on the surface of the PC board. The ambient temperature may increase excessively. Check the temperature under mounting conditions. 		
TO: 広州市威亦旺		DATE: Nov. 25. '14
Panasonic Corporation Automation Controls Business Division		

TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE	6/7
NAME	PhotoMOS	AQV258HAX	
6- 9 Cleaning solvents compatibility			
The PhotoMOS forms an optical path by coupling a light-emitting diode (LED) and photodiode via light transmissive resin. For this reason, unlike other directory element molded resin products (e.g., MOS transistors and bipolar transistors), avoid ultrasonic cleansing if at all possible. We recommend cleaning with an organic solvent. If you cannot avoid using ultrasonic cleansing, please ensure that the following conditions are met, and check beforehand for defects.			
<ul style="list-style-type: none">• Frequency : 27 to 29kHz• Ultrasonic output: No greater than 0.25W/cm²• Cleaning time : No longer than 30s• Cleanser used : Asahiklin AK-225• Others : Submerge in solvent in order to prevent the PCB and elements from being contacted directly by the ultrasonic vibrations.			
Note; Applies to unit area ultrasonic output for ultrasonic baths.			
6- 10 Transportation and storage			
(1) Extreme vibration during transport will warp the lead or damage the PhotoMOS. Handle the outer and inner boxes with care.			
(2) Storage under extreme conditions will cause soldering degradation, external appearance defects, and deterioration of the characteristics. The following storage conditions are recommended:			
<ul style="list-style-type: none">• Temperature : 0 to 45°C• Humidity : Less than 70%R. H.• Atmosphere : No harmful gasses such as sulfurous acid gas, minimal dust.			
TO: 広州市威亦旺			DATE: Nov. 25.'14
Panasonic Corporation Automation Controls Business Division			

TITLE	SPECIFICATIONS FOR PHOTOMOS	PAGE	7/7
NAME	PhotoMOS	AQV258HAX	
<p>7. WARRANTY</p> <p>Panasonic Corporation will do our utmost to keep our product to be free from defects. However:</p> <p>(1) To avoid uses of the product not in accordance with its specifications, Panasonic Corporation asks the purchaser to present the purchaser's specification, the final destination, application of the final product and the method of installation of the product.</p> <p>(2) If the purchaser believes that the possibility exists that the installation or anticipated use of the product may cause personal injury, death or property damage, Panasonic Corporation advises the purchaser to be broad-minded about conditions and performance requirements listed on this specification and to take precautions such as applying a double-circuit.</p> <p>(3) The warranty period of this product is one year from the date of arrival of the product at the location of the purchaser, and is limited to the listed items on this specification. If upon arrival any defect due to Panasonic Corporation's failure to perform becomes apparent, Panasonic Corporation will replace exchange or repair the defective product on the site where it was received.</p> <p>The following are excluded from the warranty conditions:</p> <p>① Any consequential damages or loss of profits are resulting from malfunctions or defects of the product.</p> <p>② The product is affected by the use, the storage and the transport after the delivery.</p> <p>③ An unforeseen situation arises which was unable to be predicted by the technology level at the time of shipment.</p> <p>④ A natural or man-made disaster which is outside of Panasonic Corporation's control occurs such as earthquake, flood, fire or social strife.</p>			
TO: 広州市威亦旺			DATE: Nov. 25.'14
Panasonic Corporation Automation Controls Business Division			



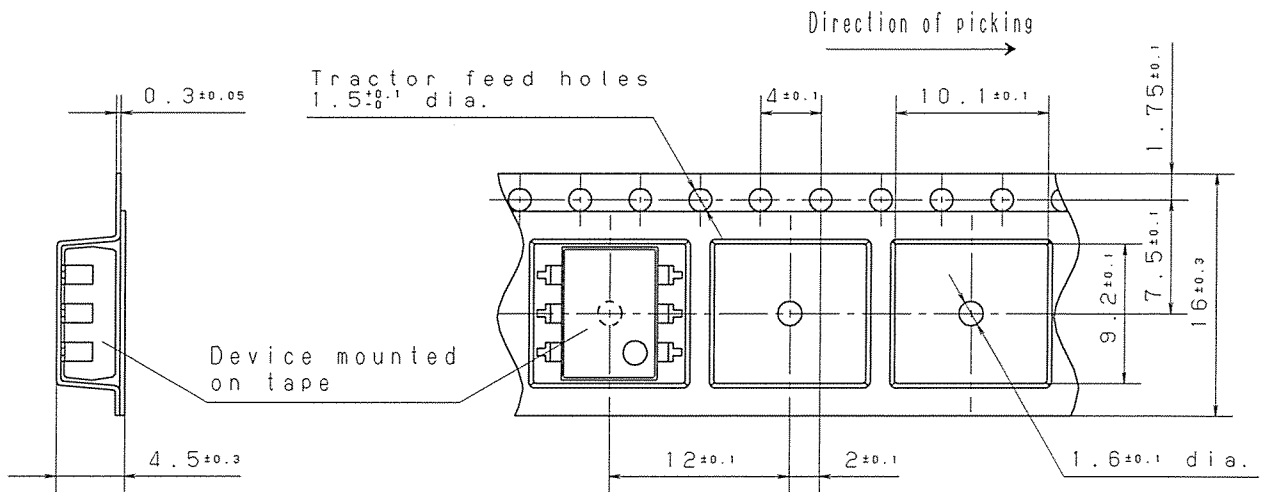
- ① INPUT:DC+
- ② INPUT:DC-
- ③ NO CONNECTION
- ④ OUTPUT:AC/DC+
- ⑤ OUTPUT:
NO CONNECTION/DC-
- ⑥ OUTPUT:AC/DC+

t = 0.25

General tolerance: ± 0.1

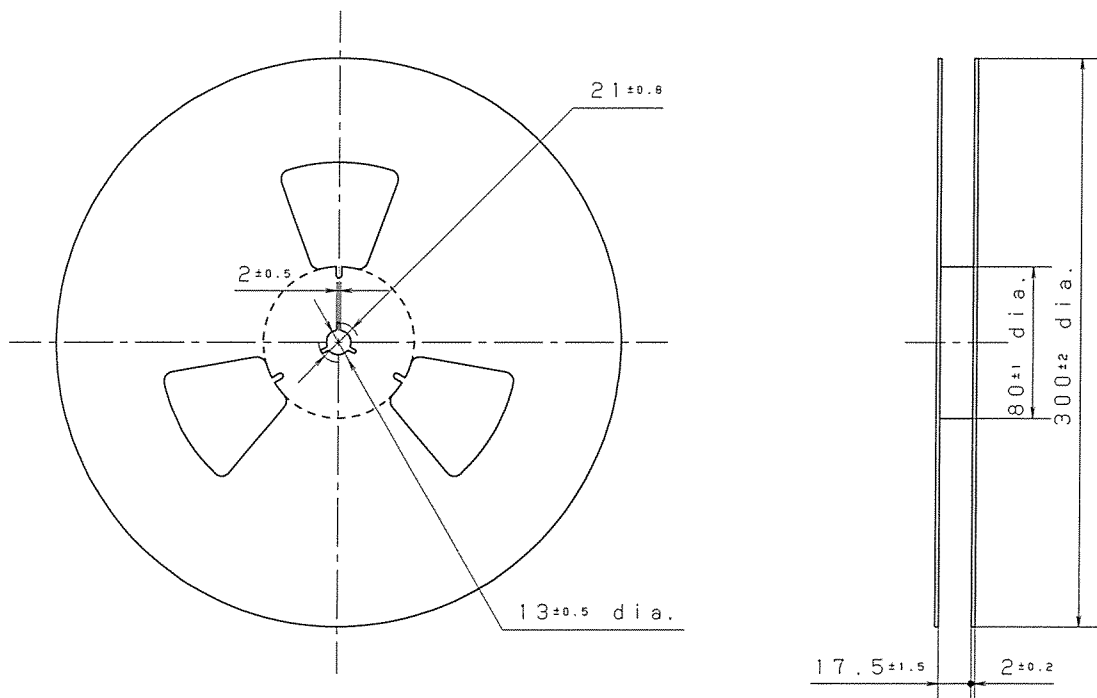
sym	Item or Code No.	Material & Size	qt.	Process	Remark
Catalog No. AQV258HAX			Drawing Name DIMENSIONS		
Name PhotoMOS			Drawing No. AQV258HAX		
Remark TO: 広州市威亦旺			Scale 5:1	Unit: mm	Date Nov.25.'14
Drawn <i>B. Imoue</i>	Checked <i>Y. Fujimaru</i>		Panasonic Corporation Automation Controls Business Division		
Designed <i>S. Tak</i>					
	Enacted <i>A. Kato</i>				

(1) Tape dimensions




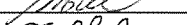


Note) Direction of picking: 1, 2, 3-pin side.

(2) Reel dimensions



Tape and reel: 1000 pcs/reel

sym	Item or Code No.	Material & Size	qt.	Process	Remark
Catalog No. AQV***AX			Drawing Name TAPE AND REEL DIMENSIONS		
Name PhotoMOS			Drawing No. AQV***AX		
Remark			Scale 	Unit: mm	Date Sep. 6.'93
Drawn 	Checked 		Panasonic Corporation Automation Controls Business Division		
Designed 	Enacted 