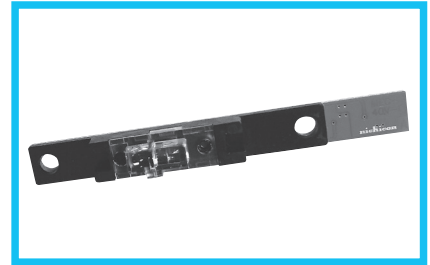


■ Standard Type Toner Quantity Sensor

The amount of attached toner above the detection was measured by this sensor. Useful for color copier and color laser printer.

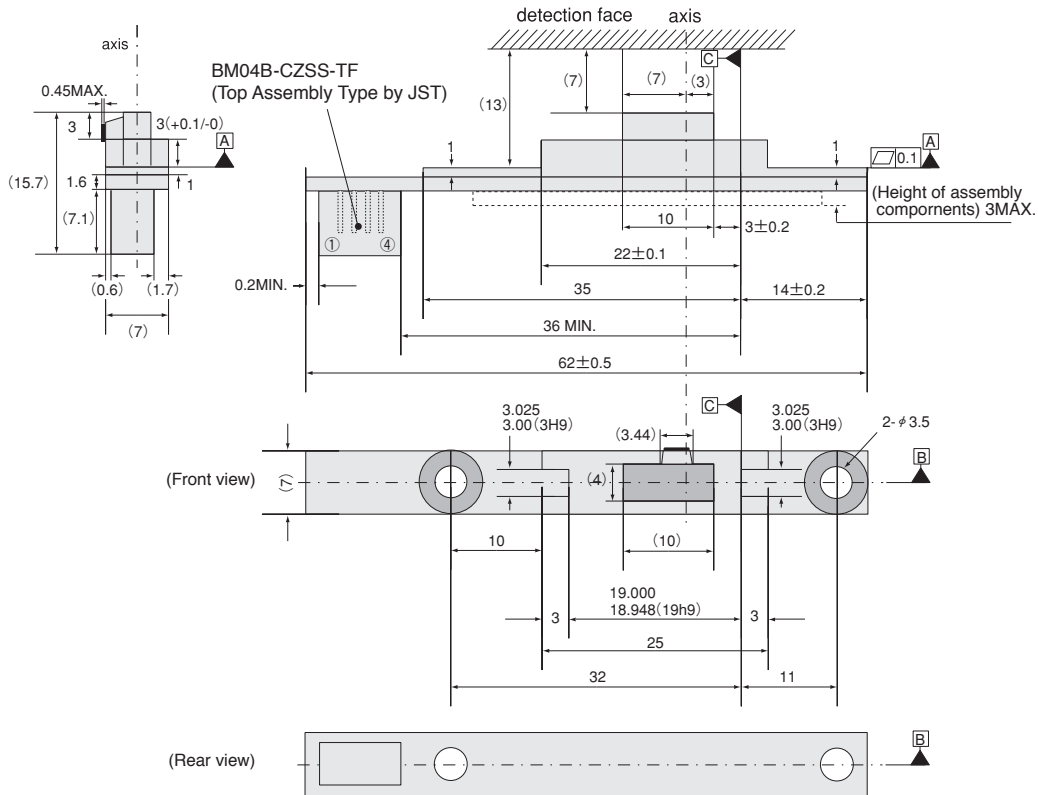


- Applications
  - For color copier
  - For color laser printer

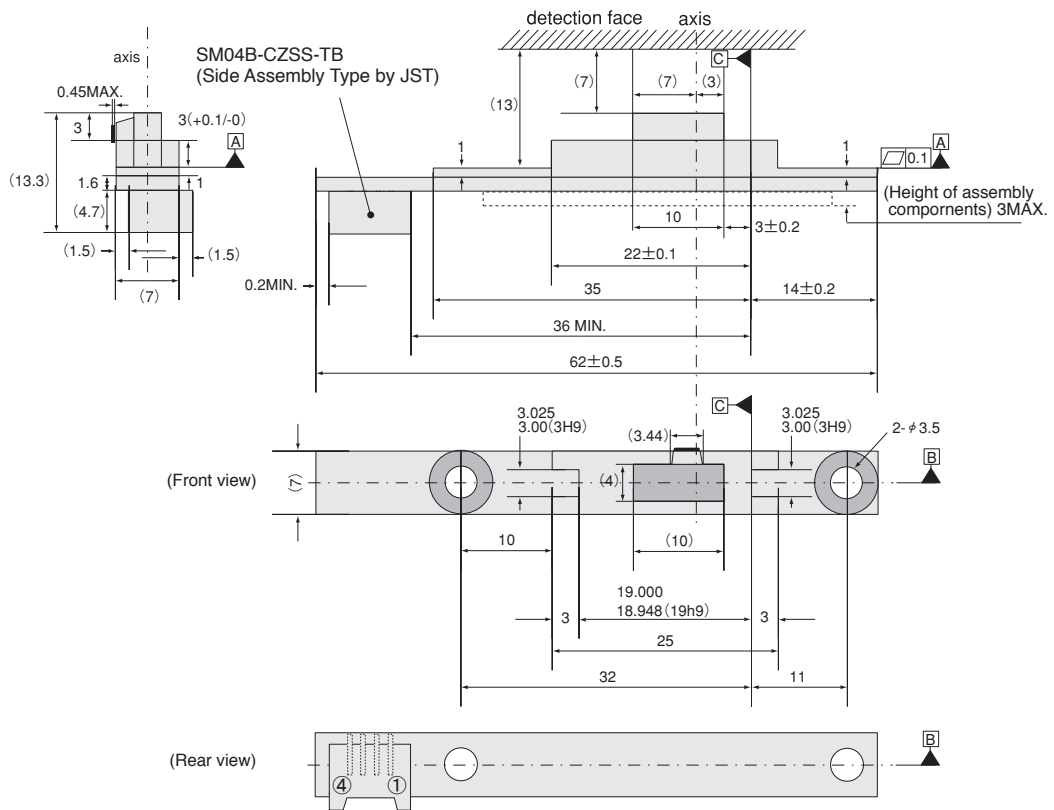
< Standard type >

- Part Number : ZHDA1319
- Characteristics
  - Sensor output is not influenced by a color of toner and quantity of toner was detected by this sensor stably.
  - Sensor output is analog voltage and can be gained in proportion of the toner unattached area.
  - Nichicon can design custom-made toner quantity sensor, based on the specific demand from the customer.
    - For example)
      - LED lights, the frequency and brightness can be adjusted
      - The supported sensor output rate can be changed
      - The sensor output values can be optionally configured
  - Miniaturized with high performance by COB technology.
  - The sensor has a structure to prevent stray light and reduces error of the output.
  - Adapted to the RoHS directive (2011/65/EU).

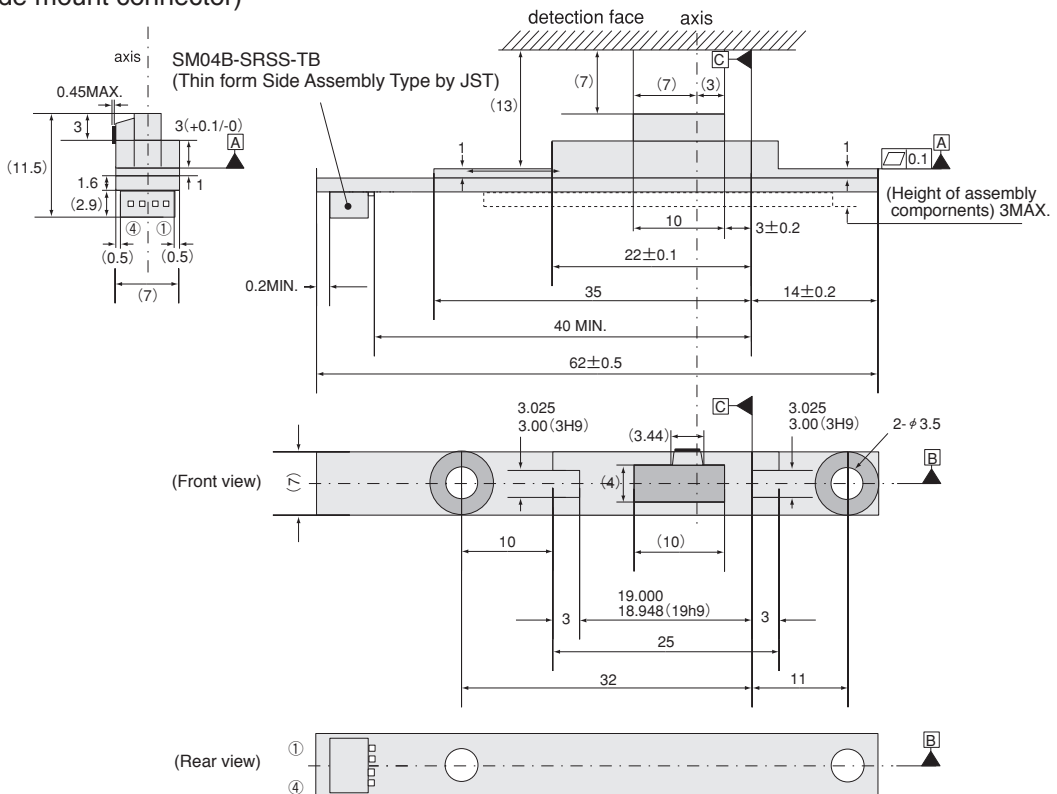
• Dimensions (Top mount connector)



(Side mount connector)



(Thin form side mount connector)

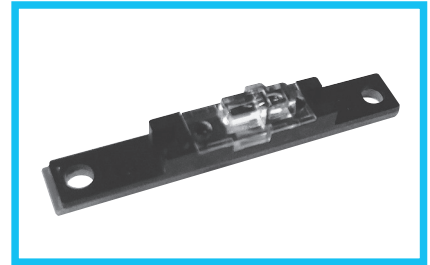


<Low price version>

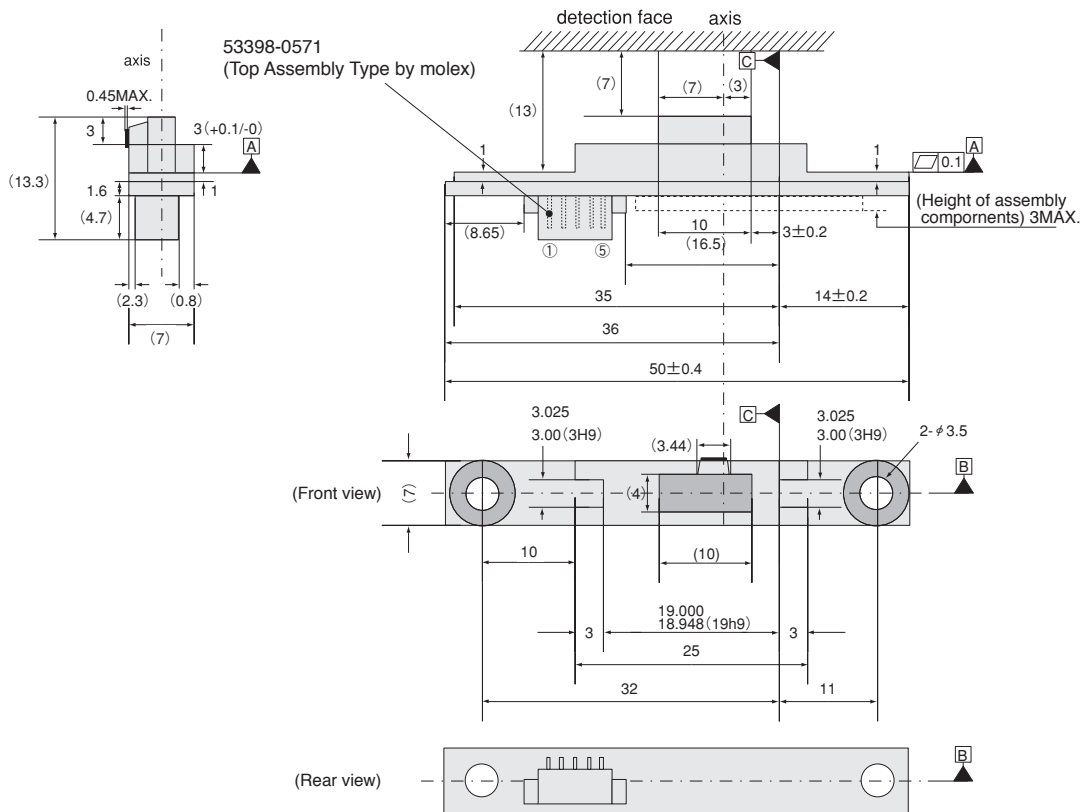
• Part Number : ZHDA1350R

• Characteristics

- Low price version has the same performance as Standard type, and the cost is low.
- Sensor outputs are analog voltage separates P-polarized and S-polarized.
- Sensor outputs are not influenced by a color of toner and quantity of toner was detected by this sensor stably.
  - ※By calculating sensor output P voltage and S voltage ,can be gained in proportion of the toner unattached area.
- Nichicon can design custom-made toner quantity sensor, based on the specific demand from the customer.
  - For example)
    - The supported sensor output rate can be changed
    - The sensor output values can be optionally configured
    - LED lights, the frequency and brightness can be adjusted
- Miniaturized with high performance by COB technology.
- The sensor has a structure to prevent stray light and reduces error of the output.
- Adapted to the RoHS directive (2011 /65/EU).



• Dimensions(Top mount connector)



• Absolute maximum ratings (Ta : 25°C)

Item	Symbol	Range	Unit
Supply voltage	Vcc	0 to + 5.5	V
Operating temperature	Topr	0 to + 55	°C
Storage temperature	Tstg	-20 to + 70	°C

• Recommendation operating conditions

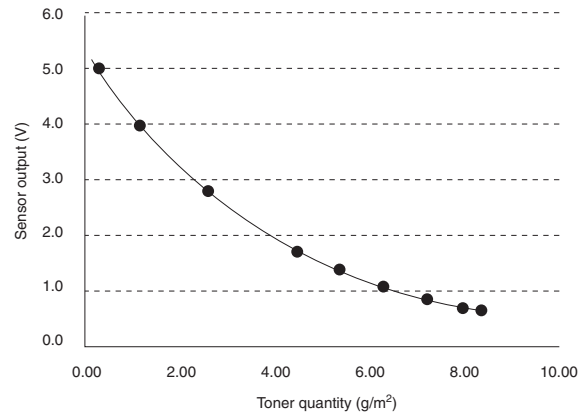
Item	Symbol	Range	Unit
Supply voltage	Vcc	+5.0 ± 0.1	V
Detection distance	Leng	6.5 to 7.5	mm

• LED properties

Item	Symbol	Range	Unit
Radiation frequency (If = 20mA)	$\lambda_d$	619 to 629	nm
Peak radiation frequency (If = 20mA)	$\lambda_p$	631	nm

※LED properties can be altered upon request.

Sensor output, toner quantity characteristics (example)



※When setting each color of toner, regardless of the color it is possible to adjust to closely similar properties.

※Low price version obtains the characteristics of the graph by calculating the output P voltage and the S voltage.

■ Standard Type DC-DC Converter  
(1.5W 3W)

SIP type is resin coating for small space, and DIP type is resin case, steer cover and resin coating for low profile application.

Characteristics

- (1) Thin and lightweight
- (2) Excellent heat radiation and miniaturization due to alumina substrate
- (3) Excellent isolation ability between input and output
- (4) No attachment necessary
- (5) Circuit with built-in excess current protection
- (6) Adapted to the RoHS directive (2011/65/EU)

■ Specification

Output Power	Input Voltage	Output Voltage	Output Current	Efficiency	Part Number	Style No.			
						B	C	D	E
1.5W	4.5 to 7.2V (5VTYP)	5V	300mA	68%	ZHRM1R50505 □ R				
		12V	125mA	70%	0512 □ R				
		15V	100mA	71%	0515 □ R				
	8 to 16.5V (12VTYP)	5V	300mA	72%	1205 □ R				
		12V	125mA	73%	1212 □ R				
		15V	100mA	74%	1215 □ R				
	18 to 32V (24VTYP)	5V	300mA	73%	2405 □ R				
		12V	125mA	76%	2412 □ R				
		15V	100mA	76%	2415 □ R				
	4.5 to 7.2V (5VTYP)	±12V	±63mA	70%	ZHRP1R50512 □ R				
			±50mA	68%	0515 □ R				
		±15V	±63mA	71%	1212 □ R				
±50mA			73%	1215 □ R					
±12V		±63mA	72%	2412 □ R					
		±50mA	74%	2415 □ R					
3W	4.5 to 7.2V (5VTYP)	5V	600mA	72%	ZHRM0300505 □ R				
		12V	250mA	77%	0512 □ R				
		15V	200mA	77%	0515 □ R				
	8 to 16.5V (12VTYP)	5V	600mA	74%	1205 □ R				
		12V	250mA	80%	1212 □ R				
		15V	200mA	80%	1215 □ R				
	18 to 32V (24VTYP)	5V	600mA	76%	2405 □ R				
		12V	250mA	81%	2412 □ R				
		15V	200mA	81%	2415 □ R				
	4.5 to 7.2V (5VTYP)	±12V	±125mA	72%	ZHRP0300512 □ R				
			±100mA	75%	0515 □ R				
		±15V	±125mA	74%	1212 □ R				
			±100mA	75%	1215 □ R				
		±12V	±125mA	74%	2412 □ R				
			±100mA	76%	2415 □ R				

□ : Style code    Except    ■ : Accept an order

Output Tolerance : ±5%  
Over Current Protection : Functions at 105% or more of the rated output current • Automatically restored  
Withstanding Voltage : Between input and output AC500V for 1minute 5mA

Output Power	Style No.	Measurement				
		L	W	H	S	
1.5W	B	26.5 <sup>±0.2</sup>	17.4 <sup>±0.2</sup>	8.1 <sup>MAX</sup>	24.95 <sup>±0.5</sup>	
		C	28.0 <sup>MAX</sup>	18.7 <sup>MAX</sup>	8.8 <sup>MAX</sup>	24.95 <sup>±0.5</sup>
			D	26.0 <sup>MAX</sup>	16.5 <sup>MAX</sup>	7.3 <sup>MAX</sup>
	E	—	26.5 <sup>MAX</sup>	18.0 <sup>MAX</sup>	—	
		T=10.5MAX. (Single Output) T=9.0MAX. (Double Output)				
3W	B	34.5 <sup>±0.2</sup>	24.7 <sup>±0.2</sup>	8.8 <sup>MAX</sup>	32.95 <sup>±0.5</sup>	
		C	36.0 <sup>MAX</sup>	26.0 <sup>MAX</sup>	9.5 <sup>MAX</sup>	32.95 <sup>±0.5</sup>
	D	34.0 <sup>MAX</sup>	23.5 <sup>MAX</sup>	7.5 <sup>MAX</sup>	32.95 <sup>±0.5</sup>	

Insulation Resistance : Between input and output terminals DC500V, more than 100MΩ(25°C 70%)  
Operating Temperature/Humidity : -10 to +71°C 20 to 95%RH (No dewdrops)  
Storage Temperature/Humidity : -40 to +85°C 20 to 95%RH (No dewdrops)

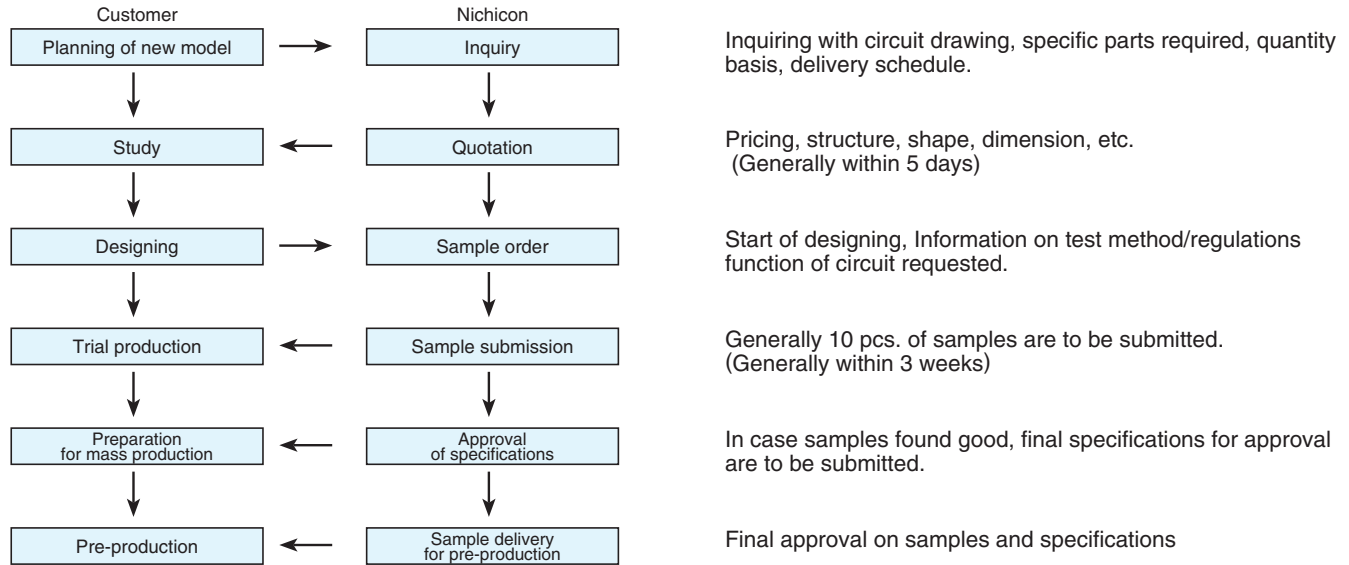
■ Exterior and Measurement Map (unit : mm)

	1.5W	3W	notes
SIP Type	<p>Phenol Resin Coating</p> <p>Enlarged figure of "A" part.</p>		<p>Style No.E</p> <p>Resin Coating</p> <ul style="list-style-type: none"> <li>•Horizontal Type,</li> <li>•Space Saver</li> </ul>
DIP Type	<p>Enlarged figure of "A" part.</p>	<p>Enlarged figure of "A" part.</p>	<p>Style No.B</p> <p>Resin Case</p> <ul style="list-style-type: none"> <li>•Standard Type</li> </ul> <p>Style No.C</p> <p>Steel Cover</p> <ul style="list-style-type: none"> <li>•Reduce Radiation Noise</li> </ul>
	<p>Enlarged figure of "A" part.</p>	<p>Enlarged figure of "A" part.</p>	<p>Style No.D</p> <p>Without Coating</p> <ul style="list-style-type: none"> <li>•DIP Style</li> </ul>

## ■ Custom-made Function Modules

Nichicon can design and manufacture custom-made Function Modules with special function, shape and rational design, based on the specific circuitry from the customer.  
 Function Modules is available with either miniature molded semiconductors or chip-bonded semiconductors for high density mounting.

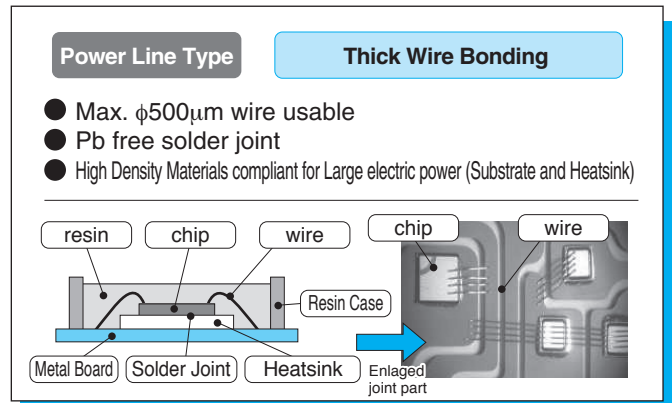
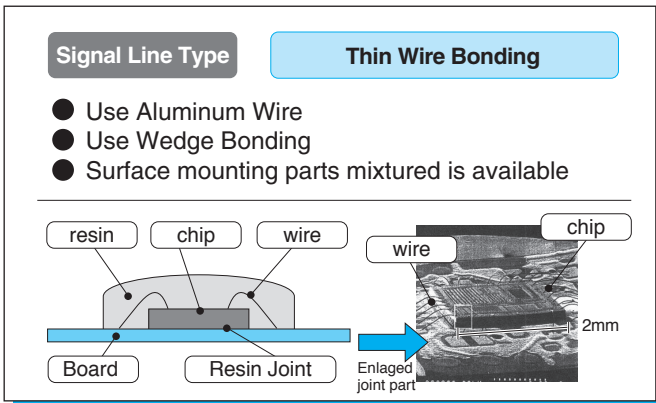
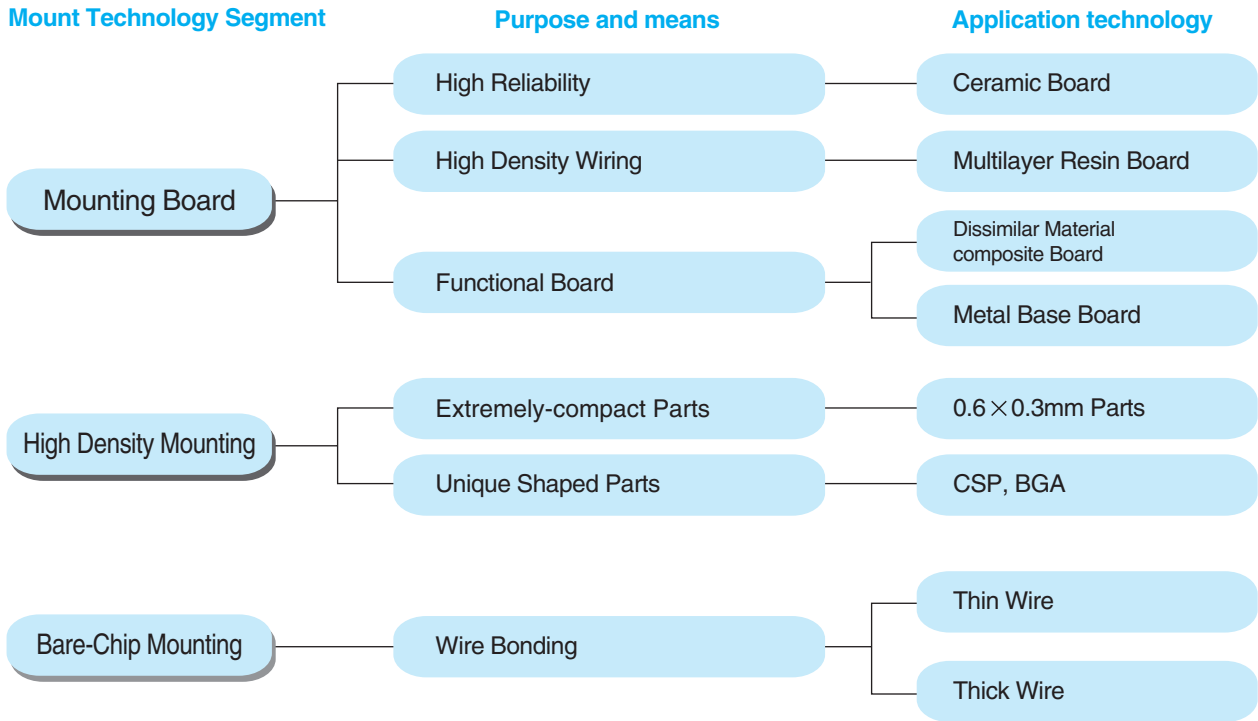
Custom-made "Function Modules" is to be designed and manufactured in the following stages:



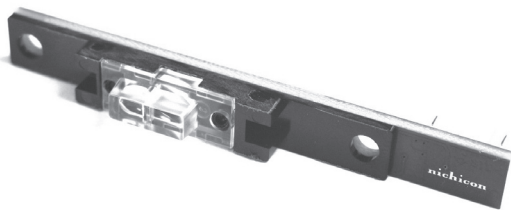
	INDISPENSABLE INFORMATION	NEEDFUL INFORMATION	INFORMATION FOR A MORE STRICT ESTIMATE
CIRCUIT INFORMATION	<ul style="list-style-type: none"> <li>• CIRCUIT DRAWING</li> <li>• SPECIFIC PARTS SHOULD BE USED</li> <li>• QUANTITY BASIS</li> </ul>	<ul style="list-style-type: none"> <li>• PART CAN BE SUBSTITUTE</li> <li>• DESCRIPTION OF CIRCUIT FUNCTION</li> <li>• TEST METHOD / REGULATION SPECIFICATION</li> </ul>	<ul style="list-style-type: none"> <li>• CIRCUIT DRAWING SURROUNDING TO THE SUBJECTED CIRCUIT</li> <li>• DESCRIPTION OF SYSTEM FUNCTION</li> </ul>
STRUCTURE INFORMATION	<ul style="list-style-type: none"> <li>• STRUCTURE, DIMENSION, SHAPE, REQUIREMENTS</li> </ul>	<ul style="list-style-type: none"> <li>• PIN LAYOUT</li> <li>• APPLICABLE SPECIFICATION (UL, ETC.)</li> <li>• MARKING REQUIREMENT</li> <li>• APPEARANCE REQUIREMENT</li> </ul>	<ul style="list-style-type: none"> <li>• INFORMATION OF SPACE SURROUNDING THE POSITION THAT HYBRID IC WILL BE INSTALLED</li> <li>• STRUCTURE INFORMATION OF THE WHOLE UNIT</li> </ul>
RELIABILITY REQUIREMENT INFORMATION	<ul style="list-style-type: none"> <li>• PURPOSE OF USE</li> </ul>	<ul style="list-style-type: none"> <li>• AMBIENT CONDITIONS INFORMATION</li> <li>• QUALITY ASSURANCE REQUIREMENT</li> <li>• SCREENING REQUIREMENT</li> </ul>	<ul style="list-style-type: none"> <li>• WHETHER SPECIAL CONTRACT IS REQUIRED</li> </ul>
PRODUCTION INFORMATION	<ul style="list-style-type: none"> <li>• ANNUAL USAGE</li> <li>• MASS-PRODUCTION STARTING DATE</li> </ul>	<ul style="list-style-type: none"> <li>• TARGET LIFE TIME</li> <li>• DEVELOPING SCHEDULE</li> <li>• NEW PROJECT OR CURRENT MODEL</li> </ul>	<ul style="list-style-type: none"> <li>• TOTAL USAGE OF OTHER UNIT INCLUDED</li> <li>• PAST USAGE</li> </ul>

Notice:  
 Confidential information given by the customer will be strictly kept secret without permission in writing.

■ Function Modules Technologies



application case : Toner Quantity Sensor



application case : Power Module

