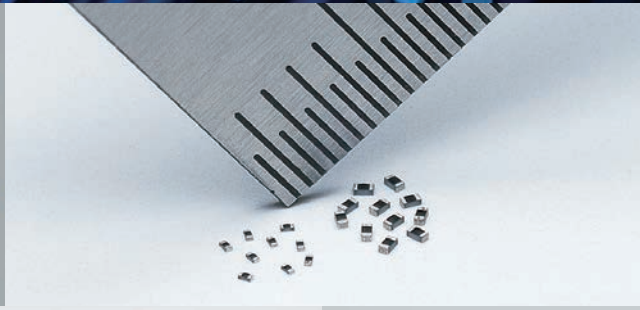
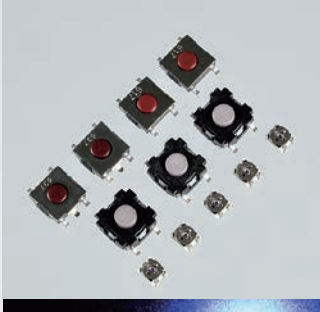
HOKURIKU ELECTRIC INDUSTRY CO.,LTD.

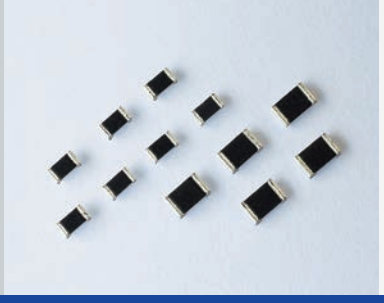
Creating for the Future

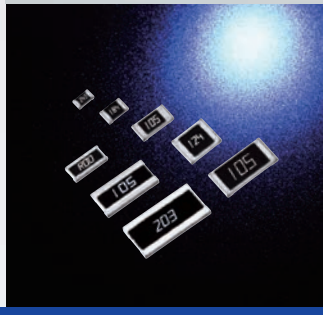
General Catalog 2026

https://www.hdk.co.jp/



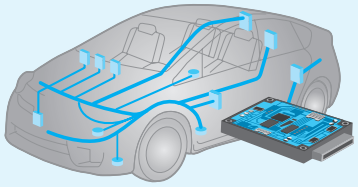




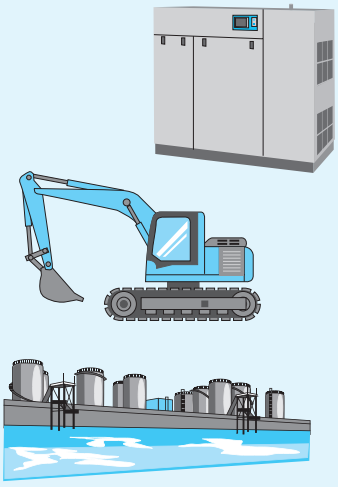


HDK Products

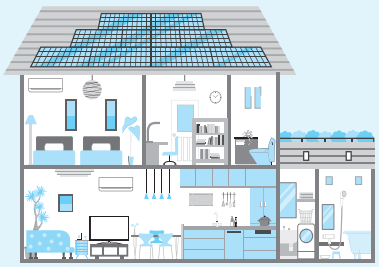
Mobility



Industry • Infrastructure

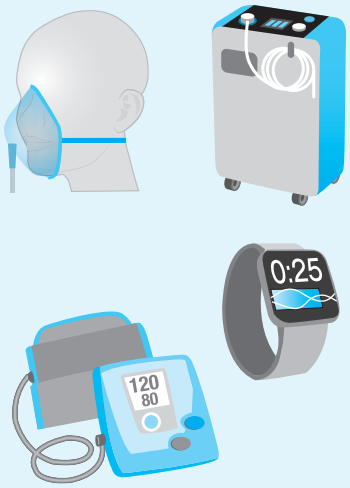


Smart Home Appliance



HDK Products

Medical (Wellness)



Information & Communication

Audio Visual

Creating for the Future

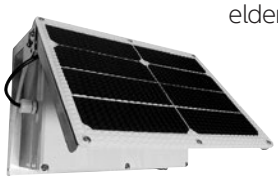
INDEX

IoT Related Products

Solar Energy, Wireless Networks and Sensor Solutions

Model No. SRPC2

This is an outdoor sensor network system that supports watching over (for children, mountain climbers, elderly people), weather observation, agriculture, etc.



Last Mile Communications & Power Supply.

It is a wireless solution with a compact design suitable for various sensing systems equipped with a solar cell system (8.5W solar panel and LiFePo4 battery) and various wireless interfaces.

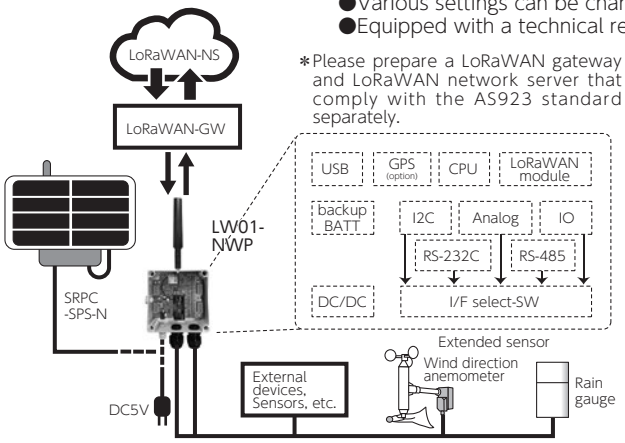
Solar cell system without need for power supply	A solar cell system with 8.5W solar panels, solar charger, and a safe 3.2V 10Ah LiFePo4 battery provides independent power for SRPC2 units and various sensor operations. In the case of an average current consumption of 40 mA, it can operate for 10 days even if left uncharged.
Wireless units without need for wiring	The SRPC2 unit is a wireless solution that operates autonomously using an independent power source by a solar cell system and LTE-M or specified low power radio. No power-supply installation or wiring is required. The communication distance (line of sight) of specified low power radio is over 2km. It is suitable for building outdoor sensor networks.
Compatible with various sensors	Various sensor devices for temperature, humidity, wind direction/velocity, rainfall, soil, solar radiation, CO2 and tags can be connected to the SRPC2 via the interface board. With a common wireless platform, various types of sensor data acquired by multiple SRPC2 child units can be aggregated to SRPC2 parent units while relaying wirelessly. It covers a wide range with a relay function.
Monitoring system on the web	The collected sensor data is transmitted to the set server via public network, etc. Depending on server customization, various operations such as log storage, analysis, visualization, and emergency notification are possible. It also supports cloud services such as Azure and AWS.

LoRaWAN Device

LoRaWAN end device with various external interfaces.

Model No. LW01-NWP

【Operation Diagram Example】



*Please prepare a LoRaWAN gateway and LoRaWAN network server that comply with the AS923 standard separately.

- ●Equipped with an interface that supports analog input, serial input, and contact input.
- ●Equipped with a backup power supply (2 AAA batteries), it can also send sudden power failure information.
- ●Various settings can be changed online on the device side. ●Can be linked with SRPC series.
- ●Equipped with a technical regulations conformity certified module.

Item	Rating	Unit
Dimensions (Excluding protrusions)	125×125×60	mm
Operating Temperature Range	−20~70 (No dew condensation)	℃
Supply Voltage	Main power supply(DC-JACKφ2.1mm (center+)) :5 Backup power supply (2 AAA batteries) :2.6~3.6	VDC VDC
Transmission Frequency	923.2~928.0	MHz
Transmission Frequency Channels	6	ch
Channel Spacing	125	kHz
Current Consumption	Standby Mode: Approximately 10 (5V)	mA
	Transmission Mode: Approximately 25 (5V)	mA
	Sleep Mode: Approximately 10 (3V)	μA
Transmission Output	20	mW
Transmission Speed	1760 (53 bytes max.)/3120 (125 bytes max.)/ 5470 (242 bytes max.)/11000 (242 bytes max.)	bps
LoRaWAN Standard	LoRaWAN ver1.1 for AS923MHz ISM Band	
I/O Terminal	1985234(Phoenix)<AWG16	
Maintenance Port	mini-USB-TYPE-B	

920MHz Specified Low Power RF Transceiver Module

This wireless module has a good balance of speed and communication distance, and the output power/transmission speed can be switched by command.

- ●Supports multi-channel communication
- ●Transmission output: 1mW/10mW/20mW.
- ●Transmission speed: 2.4k/4.8k/9.6k/50kbps.
- ●Lineup of switch formats with up to 4 contacts and modem formats for serial data. Also includes a no-protocol modem that allows data communication without commands.

Model No. TS92

Item	Rating	Unit
Dimensions (Excluding protrusions)	27×25×3.5	mm
Operating Temperature Range	−20~60 (No dew condensation)	℃
Supply Voltage	2.1~3.6 ※No reverse connection protection	V
Radio Frequency	920	MHz
Transmission Frequency Channnels	37	ch
Modulation Method	FSK, 4-GFSK	
Communication Distance (Line of sight)	Standard Type: Over 200	m
Current Consumption	Sleep Mode: Approximately 2 or less	μA
	Standby Mode: Approximately 1	mA
	Receiver Mode: Approximately 27	mA
	Transmission Mode : Approximately 37 (10mW),	mA
Transmission Output	1, 10, 20	mW
Transmission Speed	2.4k, 4.8k, 9.6k, 50k	bps
Receiver Sensitivity	−116 or less @1%BER(2.4kbps/FSK)	dBm
Interface Type	Serial communication (start-stop synchronous/CMOS level) SPI communication (slave)	
Antena	Printed or external antenna	
Remarks	Technically Regulations Conformity Certified	

IoT Related Products

2.4GHz Low Power RF Transceiver Module

Model No. TS2410

It is powered by a small battery and has a high output of 10 mW class.

- The communication distance is 150 m in line of sight.
- Supports dual mode of ARIB STD-T66 and RCR STD-33, and it is possible to communicate without interference from wireless LAN.
- In addition to chip antennas and dipole antennas, it supports 17 types of antennas such as metal surface mount type and Yagi type.

Item	Rating	Unit
Dimensions (Excluding protrusions)	31×25×3.1	mm
Operating Temperature Range	−20～70	℃
Supply Voltage	2.1～3.6	V
Radio Frequency	2401～2482 (66-mode: 82 ch in total) 2473～2495 (33-mode: Frequency Hopping)	MHz
Modulation Method	GFSK	

Item	Rating	Unit
Communication Distance (Line of sight)	150	m
Current Consumption	Approximately 38 (at the time of transmission, 25℃ , 3.0V, 10mW, 2Mbps)	mA
Transmission Output	0.01～10 (Switchable)	mW
Communication Speed (Wireless Section)	2M, 1M, 250k	bps
Receiver Sensitivity	−94 or less @0.1% BER (250kbps)	dBm
Remarks	Technical Regulations Conformity Certified ARIB STD-T66 compliant (66-mode), RCR STD-33 compliant (33-mode), RoHS	

315MHz Specified Low Power RF Transceiver Module / Wireless Remote Control

Low-cost and low power consumption of about 3mA during transmission.

- Communication distance: line of sight distance of 100 m max.
- It is suitable for on / off control of up to 4 contacts, and toggle operation with 2 buttons as a set is possible only with the solder jumper of the receiving module.
- The remote control type is a small and lightweight design with an outer size of 55 x 32 x 6.5 mm and a weight of about 12 g (including a coin battery), making it ideal for applications such as shutter opening and closing and gate control. Label production by original design is also possible.

Model No. TS03

Model No. TS03NKHA

Item	TS03		Unit
	Transmitter	Receiver	
Dimensions (Excluding protrusions)	29×40×3.5	29×40	mm
Operating Temperature Range	−10～60		℃
Supply Voltage	2.1～3.6	2.2～3.5	V
Radio Frequency	315		MHz
Modulation Method	ASK		
Communication Distance (Line of sight)	Approximately 50 (100 Max.)		m
Current Consumption	2.5	11	mA
Transmission Output	250		μW(eirp)
Response	ON:Approximately 80, OFF:240 or less		msec.
Remarks	Technical Regulations Conformity Certified ARB STD-T93 compliant		

429MHz Specified Low Power RF Transceiver Module / Wireless Remote Control

Long distance communication and stable response.

- Operates with low voltage from 2.1V and low power consumption,
- Selectable communication distance (standard mode: 800m, long distance mode: 2km) and 4 types of antennas.
- Various types of standard firmware and application boards are available for customization.
- Long distance and heavy duty models not affected by the noise, suitable for various tele-control and data communication for FA-related equipment, construction equipment, welfare equipment and agricultural equipment.
- The remote control type has an outer size of 129 × 44 ×15.5 mm and a splash-proof and dust-proof body (equivalent to IP54).

Model No. TS02E

Model No. TS02ENH

Item	TS02E		Unit
	Transmitter	Receiver	
Dimensions (Excluding protrusions)	53×30×6.5		mm
Operating Temperature Range	−20～70		℃
Supply Voltage	2.1～7.0		V
Radio Frequency	429		MHz
Modulation Method	FSK		
Communication Distance (Line of sight)	Standard type:800, Long Distance type:2k～3k		m
Current Consumption	Standard type:26 Long Distance type:26	Standard type:15 Long Distance type:18	mA
Transmission Output	10		mW
Communication Speed (Wireless Section)	Standard type:1,800, Long Distance type: 100～200		bps
Remarks	Technical Regulations Conformity Certified, ARIB STD-T67 compliant, RoHS, CE		

426MHz Specified Low Power RF Transceiver Module

27x17x3 mm surface mount small transmission module.

- Low power consumption type compatible with 3V power supply system that operates from 2.1V.
- Communication distance is line of sight distance of approximately100 m.
- The receiver can use the standard board of 8-contact system and modem system for TS02E as it is.
- Applications such as digital data transmission, general-purpose wireless remote control, security, moving object detection, markers, etc.

Model No. TS01

Item	TS01		Unit
	Transmitter	Receiver	
Dimensions (Excluding protrusions)	27×17×3	53×30×6.5	mm
Operating Temperature Range	−20～70		℃
Supply Voltage	2.1～3.6	2.1～7.0	V
Radio Frequency	426		MHz
Modulation Method	FSK		
Communication Distance (Line of sight)	Standard type:100		m
Current Consumption	Standard type:11	Standard type:15	mA
Transmission Output	1		mW
Communication Speed (Wireless Section)	Standard type:1,800		bps
Remarks	Technical Regulations Conformity Certified ARB STD-T67 compliant		

Sensors

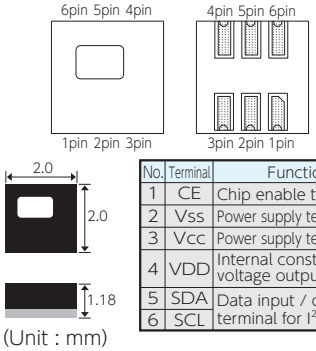
World's fastest

Capacitive Type Humidity Sensors

Humidity sensor which uses newly-developed humidity-sensitive film combined with dedicated IC realized high precision and high reliability.

- Response time is 10 times faster than the conventional product! Achieves world's fastest response speed! (according to our research)
- Supports a wide range of drive voltages (1.62 to 5.5V)
- Low current consumption (400nA (Max.) during sleep, 10μA (Max.) during temperature/humidity detection)

■ SMD Type
Model No. HSU-CHM-04A



(Unit : mm)

No.	Terminal	Function
1	CE	Chip enable terminal
2	Vss	Power supply terminal (−)
3	Vcc	Power supply terminal (+)
4	VDD	Internal constant voltage output terminal
5	SDA	Data input / output terminal for I²C-BUS.
6	SCL	

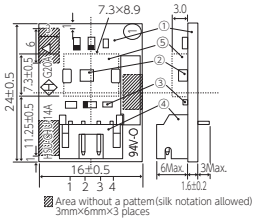
Absolute Maximum Ratings

Item	Specification		Unit	Remarks
	HSU-CHM-04A	HSU-CHU-41A		
Storage Temperature Range	−50～+125	−20～+105	℃	
Drive Voltage	−0.3～7.0		V	

Electrical Characteristics

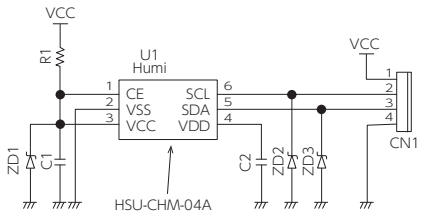
Item		Specification		Unit	Remarks
		HSU-CHM-04A	HSU-CHU-41A		
Operating Voltage		1.62～5.5		V	
Current Consumption		10 Max.	300 Max.	μA	
Humidity	Operating Range	0～100		%RH	
	Resolution	0.1		%RH	10bit
	Accuracy	±2 Typ.	±3 Typ.	%RH	25℃, 20～80%RH
	Response time	1 Typ.		sec.	τ 63% reaching
Temperature	Operating Range	−30～+100	−20～+100	℃	
	Resolution	0.1		℃	11bit
	Accuracy	±0.3 Typ.	±0.5 Typ.	℃	5～60℃

■ Connector Type
Model No. HSU-CHU-41A



(Unit : mm)

HSU-CHU-41A
Circuit Diagram

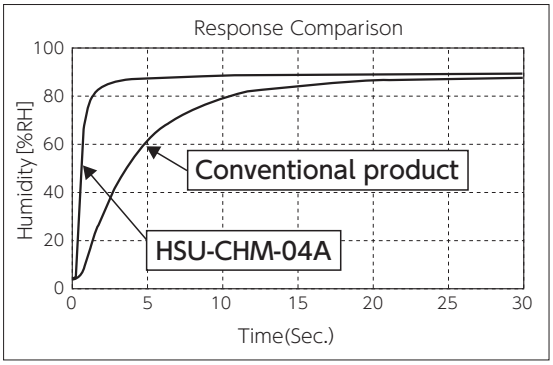


Pin No.	Terminal	Name
1	Vcc	Power terminal
2	SCL	I²C clock
3	SDA	I²C data
4	VSS	GND terminal

Parts No.	Name	Specification
①	Printed Circuit	CEM-3、1.6mm
②	Humidity & Temperature sensors	Capacitive Type Humidity Sensors HSU-CHM-04A
③	Mounted Parts	−
④	Connector	S4B-PH-K-S, Manufactured by JST, 2mm pitch

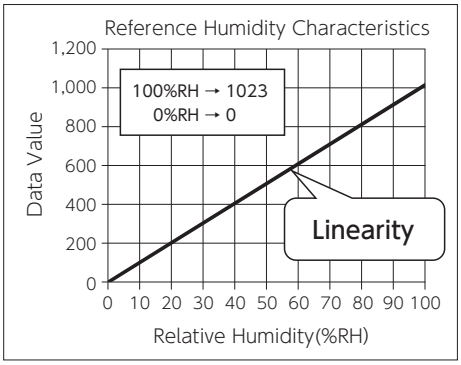
Humidity Responsiveness

HSU-CHM-04A has achieved ultra-high-speed response by reviewing its materials and structure.



Humidity Characteristics

Humidity detection is possible in low and high humidity environments.



Application

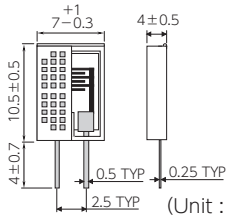
- General consumer products such as air conditioners and refrigerators
- Medical equipment (CPAP device (continuous positive airway pressure), ventilator)
- In-vehicle (fogging detection, energy saving measures)
- Thermo hygrometers

Sensors

Resistive Type Humidity Sensors

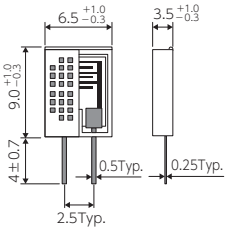
【Humidity Sensors】

Model No. HIS-06K-N



(Unit : mm)

Model No. HIS-08

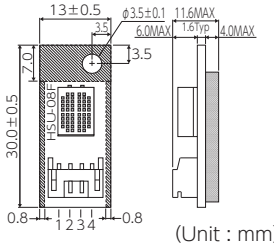


(Unit : mm)

Item		HIS-06K-N	HIS-08
Absolute Maximum Ratings	Rated Voltage	AC 5.5V Max.	
	Rated Wattage	1.0mW	
	Storage Temperature Range	−25℃～+70℃	
Operational Range	Operating Temperature Range	−20℃～+60℃	
	Recommended Operating Humidty Range	20%RH～90%RH	
Electrical Characteristics	Output	45.8kΩ (at 25℃ /50%RH)	57.0kΩ (at 25℃ /50%RH)
	Output Accuracy	±5%RH (at 25℃ /50%RH)	
	Hysteresis	±1%RH (at 30%RH～90%RH)	
	Response	3.5 minutes (at 30%RH⇔90%RH, 90% reaching, 1.2 cm/sec.)	

【Humidity Sensor Module】

Model No. HSU-08 Series

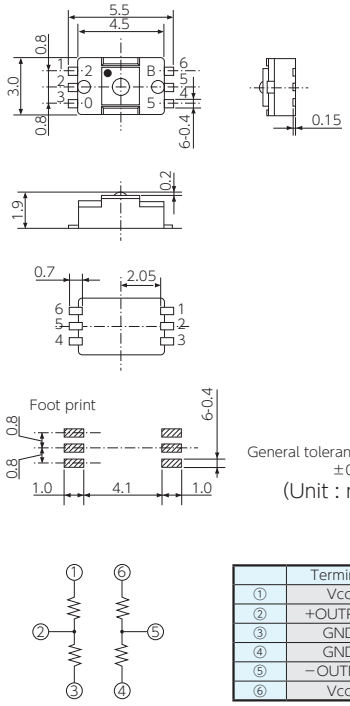


(Unit : mm)

Item		Model No. HSU-08F9C1A-D	HSU-08F9B2A
Absolute Maximum Ratings	Rated Voltage	DC 5.0V (4.75V～5.25V)	DC3.3V (3.135V～3.465V)
	Storage Humidity・Temperature Range	0%RH～90%RH / −25℃～+70℃	
Operational Range	Operating Temperature Range	−20℃～+60℃	
	Recommended Operating Humidty Range	10%RH～90%RH	
Electrical Characteristics	Output	1.386V (at 25℃ /60%RH)	1.550V (at 25℃ /60%RH)
	Output Accuracy	±5%RH (at 25℃ /40%RH・60%RH)	
	Current Consumption	1.3mA Typ.	
	Hysteresis	±1%RH (at 30%RH～90%RH)	
	Thermistor Characteristics	R25=10kΩ±3%, B25/50=3900±3%	
	Response	3.5 minutes (at 30%RH⇔90%RH, 90% reaching, 1.2 cm/sec.)	

Force Sensors

Model No. HFD-500S



(Unit : mm)

	Terminal
①	Vcc
②	+OUTPUT
③	GND
④	GND
⑤	−OUTPUT
⑥	Vcc

Maximum Absolute Ratings

Item	Ratings Min.	Ratings Typ.	Ratings Max.	Unit	Remarks
Drive Voltage	−	−	5.5	V	
Storage Temperature Range	−40	−	85	℃	
Operating Temperature Range	−20	−	60	℃	
Breaking Load	70	−	−	N	
Life	1000k	−	−	Cycles	5～10N 60Hz (Sine wave)
Reflow Temperature	−	−	250	℃	60 sec. or less at 230℃ or more, 2 times Max.
	−	−	10	sec.	

Rating (Vcc=2.8Vdc, Ta=25℃)

Item	Ratings Min.	Ratings Typ.	Ratings Max.	Unit	Remarks
Operating Force Range	0	−	10	N	
Drive Voltage	−	2.8	−	V	Usable at less than 5.5V ※1
Bridge Resistance	18	25	32	kΩ	
Offset Voltage	−10	−	10	mV	Output voltage when 0[N] is applied ※1, ※2
Full Scale Span	120	130	140	mV	(Output at 10[N] application) − (Output at 0[N] application)※1, ※2
Sensitivity	−	13	−	mV/N	
Output Linearity	−3	−	3	%FS	FS=Full scale span
Offset Temp. Characteristics	−5	−	5	mV	⊿from+25℃ at −20 ～ +60℃
Sensitivity Temp. Characteristics	−0.1	−	0	mV/N/℃	

※1 The sensor output (Output Voltage) is ratiometric to the drive voltage.
※2 OUTPUT Voltage = (+OUTPUT Voltage) − (−OUTPUT Voltage)

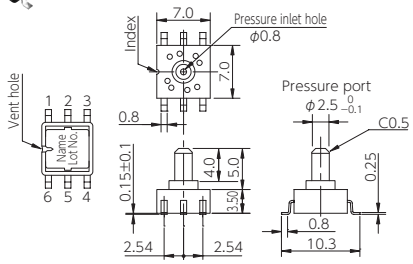
Sensors

Pressure Sensors

【Pressure Sensor】

■ Type R (With glass base)

Model No. HPD-＊＊＊ G-R03



(Unit : mm)

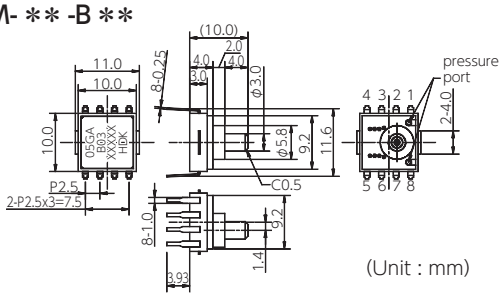
Standard Specifications

Item	Specification		Unit	Remark
Model No.	HPD-100G-R03	HPD-1000G-R03		
Maximum Rating				
Pressure Type	Gauge pressure			
Pressure Media	Non-corrosive gas			
Maximum Applicable Pressure	500	2000	kPa	
Maximum Drive Current	3		mA	DC
Storage Temperature Range	−40～+120		℃	
Operating Temperature Range	−20～+100		℃	
Electrical Characteristics (Ta =25 ℃)				
Rated Pressure	100	1000	kPa	
Drive Current	1.5		mA	
Bridge Resistance	5±1		kΩ	
Offset Voltage	±20		mV	
Span Voltage	100±40 (at 0～100kPa)	100±40 (at 0～1000kPa)	mV	
Pressure Linearity	±0.3	±0.6	% FS	
Pressure Hysteresis	±0.2	±0.4	% FS	
Offset Voltage TC	±5		% FS	0～50℃
Span Voltage TC	±2.5		% FS	0～50℃

【Pressure Sensor Modules】

■ Discrete Type

Model No. HPM-＊＊ -B＊＊



(Unit : mm)

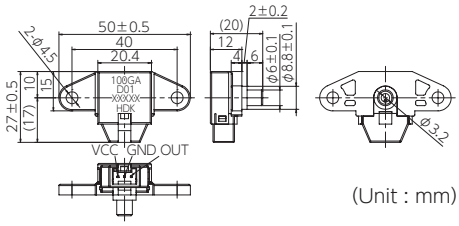
Standard Specifications

Item	Specification		Unit
Model No.	HPM-＊＊-B＊＊	HPM-＊＊-D＊＊	
Shape	Discrete type	Flange-mount connector type	
Output Form	DC		
Absolute Maximum Rating			
Pressure Type	Gauge pressure		
Pressure Medium	Water, Air, Other non-corrosive gas		
Maximum Applicable Pressure	2×Rated pressure		kPa
Storage Temperature Range	−40～85		℃
Accuracy guaranteed temperature range	−10～60		℃
Supply Voltage	5	5 or 12	V
Conditions/Electrical Characteristics			
Measurable Pressure Range	−90～1000 (Select from the range as above)		kPa
Output	0.5～4.5 (Basic range)		V
Output Accuracy	±2		%FS
Pressure Linearity	±0.5		%FS
Pressure Hysteresis	±0.3		%FS
Current Consumption	2.0 Max.		mA

※We correspond to custom specifications (for such as various pressure bands, etc.) with reference to the basic specification above.

■ Flange-mount Connector Type

Model No. HPM-＊＊ -D＊＊



(Unit : mm)

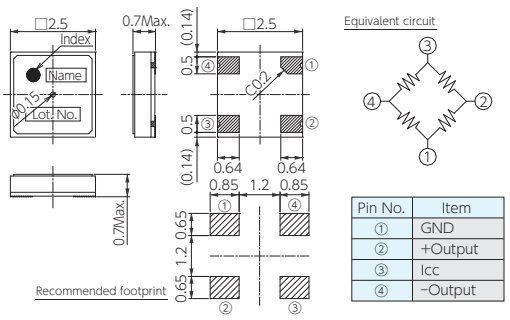
Model Number Designation

HPM − ＊＊ G A − B ＊＊

- Model type: HPM — Pressure sensor module
- Pressure full-scale span: ＊＊
- Pressure type: G — Gauge pressure
- A — Analog output
- Shape: B — Discrete type; D — Flange-mount connector type
- Custom No.

Barometric Pressure Sensor

Model No. HPD-100A-C05L



Pin No.	Item
①	GND
②	+Output
③	Icc
④	−Output

(Unit : mm)

Maximum Rating

Item	Specification	Unit	Remarks
Pressure Type	Absolute pressure	-	
Pressure Range	25～300	kPa	
Maximum Drive Current	3	mA	
Storage Temperature Range	-40～+150	℃	
Operating Temperature Range	-20～+85	℃	

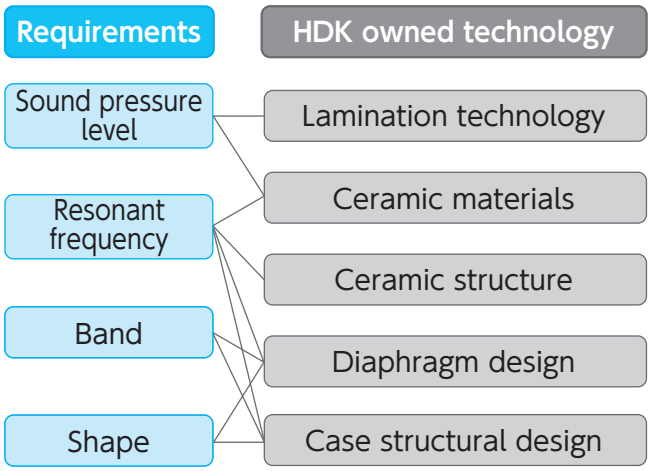
Electrical Characteristics (Icc=0.55mA, Ta=25℃)

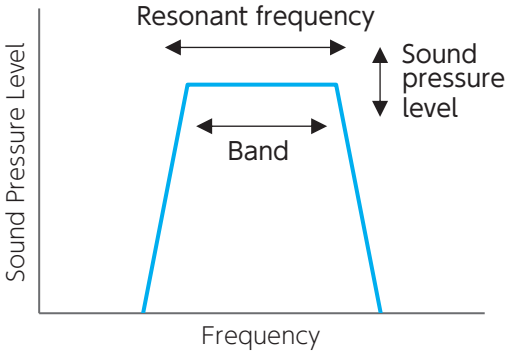
Item	Specification			Unit	Remarks
	Min.	Typ.	Max.		
Rated Pressure	50	–	110	kPa	
Drive Current	–	0.55	–	mA	
Bridge Resistance	4	6	8	kΩ	
Offset Voltage	60	80	100	mV	at110kPa
Span Voltage	30	45	60	mV	
Pressure Linearity	-1	0	1	%FS	
Offset Voltage Temperature Characteristics	-5	–	10	%FS	at110kPa
Span Voltage Temperature Characteristics	-4	–	8	%FS	

Piezoelectric Components

Piezoelectric Acoustic Components

- It is a component that produces a sound with an electric signal by attaching a piezoelectric element to a metal diaphragm and incorporating it in a case.
- Proprietary multilayering technology and electrode connecting technology make possible high sound pressure.
- Various custom designs and production with a variety of characteristics (sound pressure level, resonance frequency, band, etc.) are possible by using the plates from single to multilayer according to the required application.

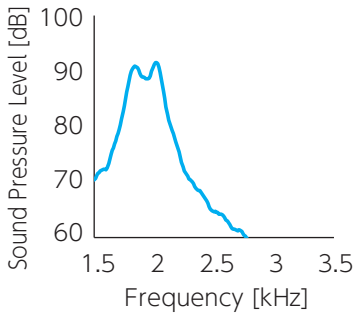
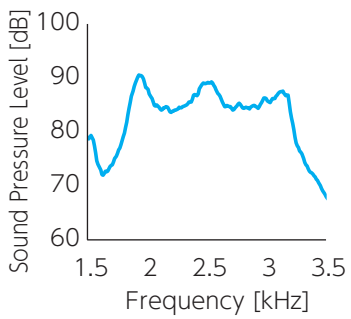
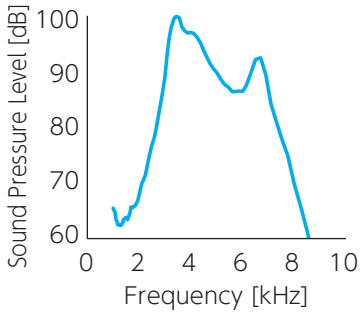




[Standard Specifications]

Sound Pressure Level	Resonant Frequency	Band	Input Voltage	Operating Temperature Range
60～100dB	2～4kHz	0.1～1kHz	Max.30V_{P-P}	−40～+85℃

[Example of Frequency vs. Sound Pressure Characteristics]

Standard Type	Sound Pressure Flat Type	High Sound Pressure Type
		

[Features]

- Proprietary multilayering technology and electrode connecting technology make possible high sound pressure.
- There is a high degree of freedom in product design due to the integrated design of product structure/mass production line.
- Simulation analysis design by CAE is possible.
- Small and light weight, low power consumption.
- Reliable, perpetual life.
- It is widely used as an in-vehicle buzzer.

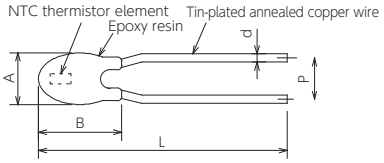
Thermistor

NTC Thermistor

■ Leaded Type

【Epoxy Resin Coated Radial Lead Thermistor】

Model No. HNT-EC



Model No.	Resistance R25℃ (Ω)	B-constant B25/50(K)	B-constant ※1 B25/85(K)	Dimensions (mm)				
				A	B	L	d	P
HNT-EC3	2K～200 k	3270～4400	3315～4450	3 Max.	6 Max.	10.5±1	0.4	1.8±0.3

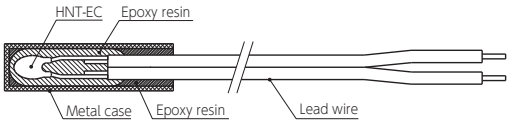
Operating Temperature Range： −40℃ ～ +125℃

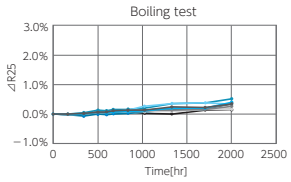
High moisture resistance (Boiling resistance)

Achieves high moisture resistance with a unique insulating coating agent.

Boiling test	100℃ (boiling water), 1000hr±24hr, DC5V	Rate of resistance change |⊿R|<3%

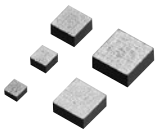
Boiling test is a test of the sensor structure as follows.

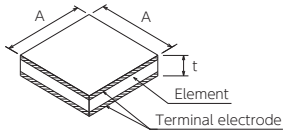




■ NTC Thermistor Elements

Model No. HST





Model No.	Resistance R25℃ (Ω)	Resistance Tolerance	B-constant B25/50(K)	B-constant Tolerance	B-constant ※1 B25/85(K)	Dimensions (mm)	
						A	t
HST12	2k～200 k	±0.5% ±1.0% ±2.0%	3270～4400	±0.5% ±1.0% ±2.0%	3315～4450	1.2±0.1	0.45±0.07
HST10						1.0±0.1	0.45±0.07
HST08						0.8±0.1	0.45±0.07
HST05						0.5±0.05	0.32±0.05
HST04						0.4±0.05	0.22±0.05

Operating Temperature Range： −40℃ ～ +125℃

※1：B25/85 is a representative value.

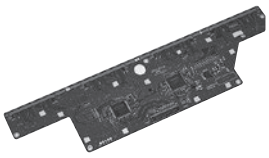
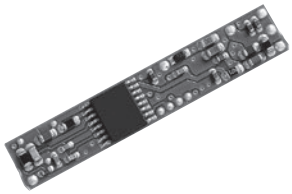
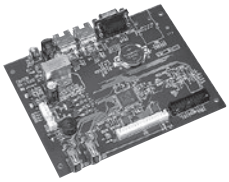
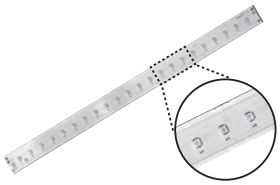
Please contact us for details of the above characteristics.

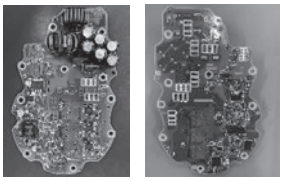
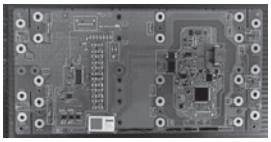
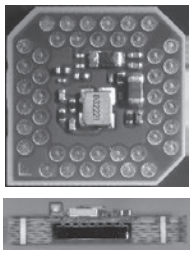
Circuit Modules

Electronic Circuit Function Module

Flexible Assembly Technology Covering Everything from Metric 0201 (0.25mm×0.125mm) Chip to Large Components

From ultra-small (Metric 0201) chips to large parts, we handle double-sided SMT, flow soldering, conformal coating, resin filling, and more.
Delivering advanced hybrid assembly with consistent quality.

Applications	Automotive LCD panels	Sensor modules	Wire harness assembly guidance equipment	LED modules
Appearance				
Size	272.8mm×72mm	31.5mm×5.6mm	145mm×113mm	294mm×20.5mm
Components	207	26	117	27
Features	12.3-inch LCD Driver Module for Automotive Displays	Engine-Mounted Sensor Module (Automotive Use)	Comprehensive support from SMT and DIP assembly to cable harnessing and finished unit production	LED module with high-brightness LEDs mounted on high-thermal-conductivity FR-4 boards, suitable for display backlights, plant growth lighting, and industrial light sources

Applications	Automotive LCD panels	Electric Compressor	Cell Monitoring Unit	<Prototype Introduction>
Appearance				
Size	192.5mm×73mm	175mm×58mm	241mm×119.5mm	
Components	387	295	407	
Features	12.0-inch LCD Driver Module for Automotive Displays	Comprehensive support from double-sided SMT and large-component flow soldering to conformal coating, case assembly, and resin filling inside enclosures—flexibly handling complex multi-process products	In addition to SMT assembly and conformal coating, insulation testing is performed during electrical inspection	With our proprietary materials, evaluation technologies, and manufacturing know-how, we achieve high-density mounting of Metric 0201 chips and transfer mounting of 0.3 mm pitch BGAs

High-Reliability Manufacturing — From Design to Inspection

From electronic circuit and PCB design, through component sourcing and assembly, to electrical inspection system development—
we deliver high-reliability, end-to-end solutions backed by proven automotive production results and comprehensive traceability.

Electronic Circuit Design
- Flexible electronic circuit design tailored to your requirements.

PCB Design
- High-precision samples delivered through optimized artwork design.

Component Procurement
- In-house procurement of approximately 300 million parts per month.

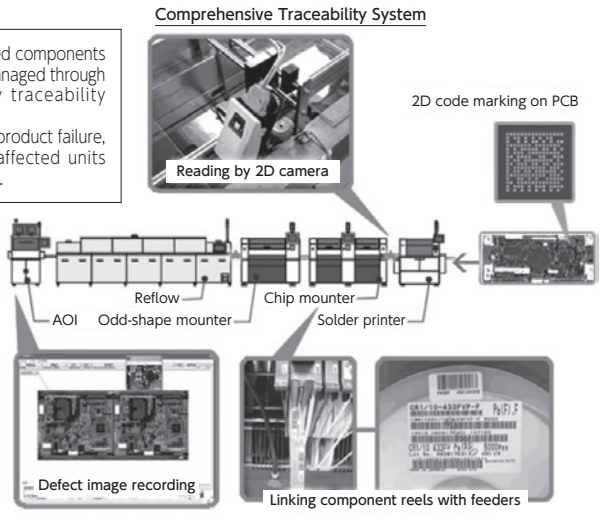
Mounting Technology
- High-precision mounting technology supporting miniature and densely packed components.

Measurement Systems
- Reliable inspection systems built in-house.

Quality Control
- Peace of mind ensured through our traceability system.

Unit-level traceability system with searchable production history

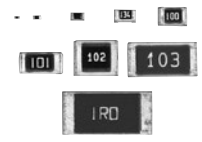
PCBs and mounted components are linked and managed through our proprietary traceability system.
In the event of a product failure, the number of affected units can be minimized.

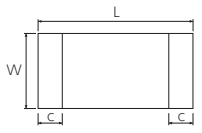


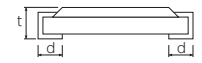
Chip Resistors

Chip Resistors

Model No. CR







Size Code inch(mm)	Model No.	Rated Wattage (W)	Tolerance (%)		Resistance (Ω)	T.C.R. (ppm/℃)	Max. Working Voltage (V)	Max. Overload Voltage (V)	Dimensions(mm)					0Ω type	
									L	W	c	d	t	Rated Current (A)	Resistance (mΩ)
01005 (0402)	CR04	0.03	F	±1	10~1M	±250	15	30	0.40±0.02	0.20±0.02	0.10±0.03	0.10±0.03	0.13±0.02	0.3	Max. 50mΩ
			G	±2	10~1M	±250									
			J	±5	10~1M	±250									
0201 (0603)	CR06	0.05	F	±1	10~1M	±200	25	50	0.60±0.03	0.30±0.03	0.12±0.05	0.15±0.05	0.23±0.03	0.5	
			G	±2	10~1M	±200									
			J	±5	1.0~9.1	±400									
			J	±5	10~10M	±200									
0402 (1005)	CR10 *2	0.10 *1	D	±0.5	10~97.6	±100	50	100	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05	1.0	
			D	±0.5	100~1M	±50									
			F	±1	10~1M	±100									
			G	±2	10~1M	±200									
			J	±5	1.0~9.1	±300									
			J	±5	10~10M	±200									
0603 (1608)	CR16 *2	0.125	D	±0.5	100~976	±100	50	100	1.60±0.15	0.80 +0.20 −0.10	0.25±0.20	0.25±0.20	0.45±0.10	1.0	
			D	±0.5	1K~100K	±50									
			F	±1	10~1M	±100									
			G	±2	10~1M	±200									
			J	±5	1~4.3	−100~+600									
			J	±5	4.7~3.3M	±200									
			J	±5	3.6M~10M	±300									
0805 (2012)	CR20 *2	0.25	D	±0.5	100~1K	±100	150	200	2.00 +0.20 −0.10	1.25 +0.20 −0.10	0.40±0.20	0.40±0.20	0.50±0.10	1.5	
			F	±1	10~1K	±100									
			G	±2	10~1K	±200									
			J	±5	1~4.3	−100~+600									
			J	±5	4.7~1K	±200									
		0.25 *1	D	±0.5	1.02K~100K	±100									
			F	±1	1.02K~1M	±100									
			G	±2	1.1K~1M	±200									
			J	±5	1.1K~3.3M	±200									
			J	±5	3.6M~10M	±300									
			K	±10	11M~22M	±300									
1206 (3216)	CR32 *2	0.25	D	±0.5	100~100K	±100	200	400	3.20 +0.10 −0.15	1.60 +0.10 −0.15	0.50±0.20	0.50±0.20	0.55 +0.15 −0.05	2.0	
			F	±1	10~1M	±100									
			G	±2	10~1M	±200									
			J	±5	1~4.3	−100~+600									
			J	±5	4.7~3.3M	±200									
			J	±5	3.6M~10M	±300									
			K	±10	11M~22M	±300									
1210 (3225)	CR35 *2	0.50	F	±1	10~1M	±100	200	400	3.20 +0.10 −0.15	2.60 +0.10 −0.15	0.50±0.20	0.50±0.20	0.55 +0.15 −0.05	2.0	
			G	±2	10~1M	±200									
			J	±5	1~4.3	−100~+600									
			J	±5	4.7~3.3M	±200									
			J	±5	3.6M~10M	±300									
2010 (5025)	CR50	0.75	F	±1	10~1M	±200	200	400	5.00±0.15	2.50±0.15	0.60±0.25	0.60±0.25	0.56±0.15	2.0	
			G	±2	10~1M	±300									
			J	±5	1.0~9.1	±500									
			J	±5	10~1M	±300									
2512 (6432)	CR64	1.00	J	±5	1.0~9.1	±500	200	400	6.30±0.15	3.20±0.15	0.60±0.25	0.60±0.25	0.56±0.15	2.0	
			J	±5	10~1M	±300									

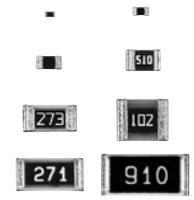
AEC-Q200 compliant (excluding CR04)

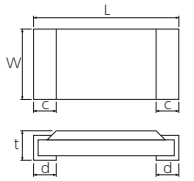
*1 Short-time overload test condition : Voltage equal to 2.5 times the rated voltage⇒ Voltage equal to 1.5 times the rated voltage
*2 Resistance value range : For F-class (±1%) from 1.0 Ω to 9.1 Ω, please contact us.
★ E-96 series resistance values are available for D class F class.
★ Please use voltage equal to or below the rated power. The rated voltage can be calculated by the formula on the right.
★ If the rated voltage exceeds the maximum operating voltage, please use a voltage equal to or below the maximum operating voltage.
★ Operating Temperature Range: −55℃~+155℃ (excluding CR04), −55℃~+125℃ (CR04)

$E=\sqrt{PR}$
E=Rated Voltage (V)
P=Rated Power (W)
R=Resistance (Ω)

Sulfurization-proof Chip Resistors

Model No. CRS, CRES





Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)		Resistance (Ω)*1	Max. Working Voltage (V)	Max. Overload Voltage (V)	Dimensions(mm)				
								L	W	c*2	d	t
0201 (0603)	CRES06	0.050	F	±1	10~1M	25	50	0.60±0.03	0.30±0.03	0.12±0.05	0.15±0.05	0.23±0.03
			G	±2								
			J	±5								
0402 (1005)	CRS10 CRES10	0.100 *3	F	±1	10~1M	50	100	1.00±0.05	0.50±0.05	0.30±0.10 0.20±0.10	0.25±0.10	0.35±0.05
			G	±2								
			J	±5								
0603 (1608)	CRS16 CRES16	0.125	F	±1	10~1M	50	100	1.60±0.15	0.80±0.15	0.40±0.20 0.25±0.20	0.25±0.20	0.50±0.10
			G	±2								
			J	±5								
0805 (2012)	CRS20 CRES20	0.250 *3	F	±1	10~1M	150	200	2.00±0.15	1.25±0.15	0.45±0.20 0.40±0.20	0.40±0.20	0.50±0.10
			G	±2								
			J	±5								
1206 (3216)	CRS32 CRES32	0.250	F	±1	10~1M	200	400	3.20±0.15	1.60±0.15	0.65±0.20 0.50±0.20	0.50±0.20	0.56±0.15
			G	±2								
			J	±5								
1210 (3225)	CRS35 CRES35	0.500	F	±1	10~1M	200	400	3.20±0.15	2.60±0.15	0.65±0.20 0.50±0.20	0.50±0.20	0.56±0.15
			G	±2								
			J	±5								
2010 (5025)	CRS50 CRES50	0.750	F	±1	10~1M	200	400	5.00±0.15	2.50±0.15	0.70±0.25 0.60±0.25	0.60±0.25	0.56±0.15
			G	±2								
			J	±5								
2512 (6432)	CRES64	1.000	G	±2	10~1M	200	400	6.30±0.15	3.20±0.15	0.60±0.25	0.60±0.25	0.56±0.15
			J	±5								

*1 Chip Jumper Resistors (0Ω Type) are also available.
*2 The upper row shows the CRS values and the lower row shows the CRES values.
*3 Short-time overload test condition: Voltage equal to 2.5 times the rated voltage ⇒ Voltage equal to 1.5 times the rated voltage.
★Resistance value range : For F-class(±1%) from 1.0 Ω to 9.1 Ω, please contact us.

Operating Temperature Range: −55℃~+155℃

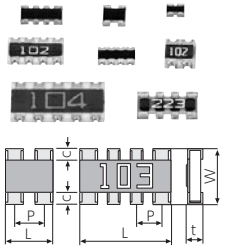
AEC-Q200 compliant

We also accept individual consultations regarding non-standard products, such as parts with custom resistance values.
Details are subject to change without notice.

Chip Resistors

Network Chip Resistors

Model No. ACR, NCR



Model No.	Rated Wattage /element (W)	Number of Resistors	Tolerance (%)		Resistance (Ω)	T.C.R. (ppm/℃)	Max. Working Voltage (V)	Max. Overload Voltage (V)	Dimensions (mm)					Electrode Shape
									L	W	P	c	t	
ACR062	0.0315	2	J	±5	10~1M	±200	12.5	25	0.85±0.10	0.65±0.10	0.5	0.15±0.10	0.35±0.05	Convex
ACR102	0.063	2	J	±5	10~1M	±200	50	100	1.0±0.20	1.0±0.20	0.65	0.20±0.15	0.35±0.05	Convex
ACR104	0.0315 *1)	4	J	±5	10~1M	±200	50	100	2.0±0.20	1.0±0.20	0.5	0.20±0.15	0.35±0.05	Convex
ACR164	0.063	4	J	±5	10~1M	±200	50	100	3.2±0.10	1.6±0.10	0.8	0.30±0.20	0.50±0.10	Convex
NCR104	0.0315 *1)	4	J	±5	10~1M	±200	50	100	2.0±0.10	1.0±0.10	0.5	0.20±0.10	0.35±0.05	Concave
NCR162	0.063	2	J	±5	10~1M	±200	50	100	1.6±0.15	1.6±0.15	0.8	0.35±0.15	0.45±0.10	Concave
NCR164	0.063	4	J	±5	10~1M	±200	50	100	3.2±0.15	1.6±0.15	0.8	0.35±0.15	0.45±0.10	Concave
NCR168	0.063	8	J	±5	10~1M	±200	50	100	6.4±0.20	1.6±0.20	0.8	0.35±0.15	0.45±0.10	Concave
NCR3A8 NCR3B8	0.063	8	J	±5	100~470k	±250	50	100	6.4±0.20	3.1±0.20	1.27	0.50±0.3	0.55±0.10	Concave

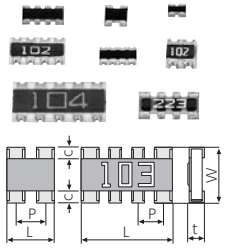
AEC-Q200 compliant (excluding ACR062)

*1) 0.063W/element is possible

Operating Temperature Range : −55℃~+155℃ ,
−55℃~+125℃ (ACR062)

Sulfurization-proof Network Chip Resistors

Model No. ACRES, NCRES



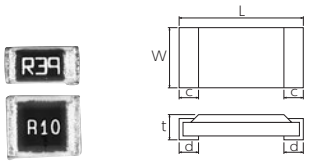
Model No.	Rated Wattage /element (W)	Number of Resistors	Tolerance (%)		Resistance (Ω)	T.C.R. (ppm/℃)	Max. Working Voltage (V)	Max. Overload Voltage (V)	Dimensions (mm)					Electrode Shape
									L	W	P	c	t	
ACRES062	0.0315	2	J	±5	10~1M	±200	12.5	25	0.85±0.10	0.65±0.10	0.5	0.15±0.10	0.35±0.05	Convex
ACRES102	0.063	2	J	±5	10~1M	±200	50	100	1.00±0.20	1.00±0.20	0.65	0.20±0.15	0.35±0.05	Convex
ACRES104	0.063	4	J	±5	10~1M	±200	50	100	2.00±0.20	1.00±0.20	0.5	0.20±0.15	0.35±0.05	Convex
ACRES164	0.063	4	J	±5	10~1M	±200	50	100	3.20±0.10	1.60±0.10	0.8	0.30±0.20	0.50±0.05	Convex
NCRES104	0.063	4	J	±5	10~1M	±200	50	100	2.00±0.10	1.00±0.10	0.5	0.20±0.10	0.35±0.05	Concave
NCRES162	0.063	2	J	±5	10~1M	±200	50	100	1.60±0.15	1.60±0.15	0.8	0.35±0.15	0.45±0.10	Concave
NCRES164	0.063	4	J	±5	10~1M	±200	50	100	3.20±0.15	1.60±0.15	0.8	0.35±0.15	0.45±0.10	Concave
NCRES168	0.063	8	J	±5	10~1M	±200	50	100	6.40±0.20	1.60±0.20	0.8	0.35±0.15	0.45±0.10	Concave

AEC-Q200 compliant (excluding ACRES062)

Operating Temperature Range : −55℃~+155℃ ,
−55℃~+125℃ (ACRES062)

Low Resistance Chip Resistors

Model No. LCR



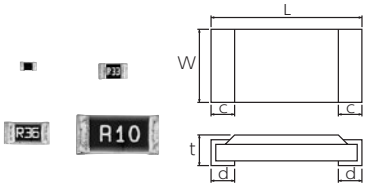
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)		Resistance (E-24) (Ω)	T.C.R. (ppm/℃)	Dimensions (mm)				
							L	W	c	d	t
0402 (1005)	LCR10	0.100	G	±2	0.20~0.91	±300	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
			J	±5							
0603 (1608)	LCR16	0.100	G	±2	0.20~0.91	±300	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.50^{+0.15}_{-0.05}$
			J	±5							
0805 (2012)	LCR20	0.125	F	±1	0.20~0.91	±200	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.20	0.40±0.20	$0.50^{+0.15}_{-0.05}$
			G	±2	0.10~0.91						
			J	±5							
1206 (3216)	LCR32	0.250	F	±1	0.20~0.91	±100	$3.20^{+0.10}_{-0.15}$	$1.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
			G	±2	0.10~0.91	±200					
			J	±5							
1210 (3225)	LCR35	0.500	F	±1	0.20~0.91	±100	$3.20^{+0.10}_{-0.15}$	$2.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
			G	±2	0.10~0.91	±200					
			J	±5							
2010 (5025)	LCR50	0.750	F	±1	0.20~0.91	±100	5.00±0.15	2.50±0.15	0.60±0.25	0.60±0.25	0.56±0.15
			G	±2	0.10~0.91	±200					
			J	±5							
2512 (6432)	LCR64	1.000	F	±1	0.20~0.91	±200	6.30±0.15	3.20±0.15	0.60±0.25	0.60±0.25	0.56±0.15
			G	±2	0.10~0.91	±200					
			J	±5							

AEC-Q200 compliant

Operating Temperature Range : −55℃~+155℃

Sulfurization-proof Low Resistance Chip Resistors

Model No. LCRS



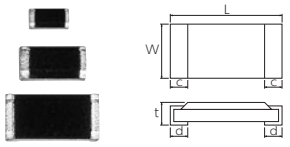
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)		Resistance (E-24) (Ω)	T.C.R. (ppm/℃)	Dimensions (mm)				
							L	W	c	d	t
0402 (1005)	LCRS10	0.100	G	±2	0.2~0.91	±300	1.00±0.05	0.50±0.05	0.30±0.10	0.25±0.10	0.35±0.05
			J	±5							
0603 (1608)	LCRS16	0.100	G	±2	0.2~0.91	±300	1.60±0.15	0.80±0.15	0.40±0.20	0.25±0.20	0.50±0.10
			J	±5							
0805 (2012)	LCRS20	0.125	F	±1	0.2~0.91	±100	2.00±0.15	1.25±0.15	0.45±0.20	0.40±0.20	0.50±0.10
			G	±2	0.1~0.91	±200					
			J	±5							
1206 (3216)	LCRS32	0.250	F	±1	0.2~0.91	±100	3.20±0.15	1.60±0.15	0.65±0.20	0.50±0.20	0.56±0.15
			G	±2	0.1~0.91	±200					
			J	±5							
1210 (3225)	LCRS35	0.500	F	±1	0.2~0.91	±100	3.20±0.15	2.60±0.15	0.65±0.20	0.50±0.20	0.56±0.15
			G	±2	0.1~0.91	±200					
			J	±5							
2010 (5025)	LCRS50	0.750	F	±1	0.2~0.91	±100	5.00±0.15	2.50±0.15	0.70±0.25	0.60±0.25	0.56±0.15
			G	±2	0.1~0.91	±200					
			J	±5							

AEC-Q200 compliant

Operating Temperature Range : −55℃~+155℃

Extremely-Low Resistance Chip Resistors

Model No. ECR



Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)		Resistance (E-24) (Ω)	T.C.R. (ppm/℃)	Dimensions (mm)				
							L	W	c	d	t
0805 (2012)	ECR20	0.25	F	±1	0.05~0.091	±100	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.2	0.40±0.20	$0.50^{+0.15}_{-0.05}$
			J	±5							
1206 (3216)	ECR32	0.50	F	±1	0.05~0.091	±100	3.1±0.15	1.6±0.10	0.40±0.2	0.50±0.20	0.56±0.15
			J	±5							
2010 (5025)	ECR50	1.00	F	±1	0.05~0.091	±100	5.0±0.15	2.5±0.15	0.25±0.2	0.60±0.25	0.56±0.15
			J	±5							

AEC-Q200 compliant

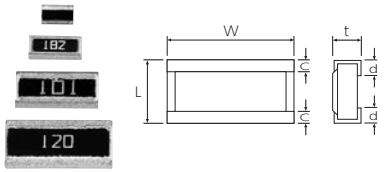
Operating Temperature Range : −55℃~+155℃

We also accept individual consultations regarding non-standard products, such as parts with custom resistance values.
Details are subject to change without notice.

Chip Resistors

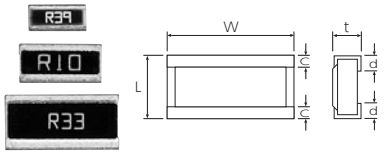
High Power (Wide Terminal Type) Chip Resistors

Model No. WCR



Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0508 (1220)	WCR20	0.50	F ±1	1~91	±200	200	400	1.25±0.15	2.00±0.15	0.30±0.20	0.35±0.20	0.55±0.10
				100~9.1k								
				10k~1M								
			J ±5	1~1M								
0612 (1632)	WCR32	0.75	F ±1	1~91	±200			1.60±0.15	3.20±0.15	0.30±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
				100~9.1k	±100							
				10k~1M	±200							
			J ±5	1~1M	±200							
1020 (2550)	WCR50	1.00	F ±1	10~91	±200			2.50±0.20	5.00±0.20	0.50±0.20	0.60±0.20	0.56±0.15
				100~9.1k	±100							
				10k~1M	±200							
			J ±5	1~1M	±200							
1225 (3264)	WCR64	2.00	F ±1	10~91	±200			3.20±0.20	6.30±0.20	0.50±0.20	0.90±0.20	0.56±0.15
				100~9.1k	±100							
				10k~1M	±200							
			J ±5	1~1M	±200							

■ Low Resistance Type, Ultralow Resistance Type Model No. WLCR, WECR



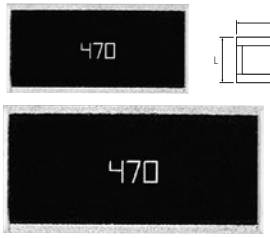
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (mΩ)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0612 (1632)	WLCR32	0.75	F ±1	100~976	±200	200	400	1.60±0.15	3.20±0.15	0.30±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
				10~33	±500							
1020 (2550)	WLCR50	1.0	J ±5	36~91	±350			2.50±0.20	5.00±0.20	0.50±0.20	0.60±0.20	0.56±0.15
1225 (3264)	WLCR64	2.0		100~910	±200			3.20±0.20	6.30±0.20	0.50±0.20	0.90±0.20	0.56±0.15

※Specification in bold lines is common to WLCR32, WLCR50, WLCR64. Operating Temperature Range : −55℃~+155℃

Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (mΩ)	T.C.R. (ppm/℃)	Dimensions (mm) L	W	c	d	t
0612 (1632)	WECR32	0.75	F ±1 J ±5	10~91	±100	1.60±0.15	3.20±0.15	0.30±0.20	0.30±0.20	$0.55^{+0.15}_{-0.05}$
1020 (2550)	WECR50	1.0				2.50±0.20	5.00±0.20	0.50±0.20	0.50±0.20	0.56±0.15
1225 (3264)	WECR64	2.0	J ±5	5~9 (1mΩstep)		3.20±0.20	6.30±0.20	0.60±0.20	0.60±0.20	0.56±0.15

※Specification in bold lines is common to WECR32, WECR50, WECR64. Operating Temperature Range : −55℃~+155℃

■ High Wattage Type Model No. WCR110, WCR160



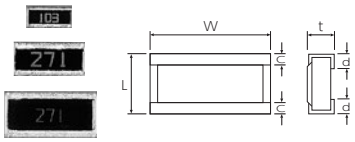
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
2043 (50110)	WCR110	3.0	F ±1	10~91	±200	200	400	5.0±0.20	11.0±0.20	0.60±0.20	1.50±0.20	0.56±0.15
				100~9.1k	±100							
				10k~1M	±200							
3060 (80160)	WCR160	5.0	J ±5	1~1M	±200	250	500	8.0±0.20	16.0±0.20	0.70±0.20	2.50±0.20	0.56±0.15

※Specification in bold lines is common to WCR110, WCR160. Operating Temperature Range : −55℃~+155℃

AEC-Q200 compliant (excluding WCR110 and WCR160)

Sulfurization-proof High Power (Wide Terminal Type) Chip Resistors

Model No. WCRES



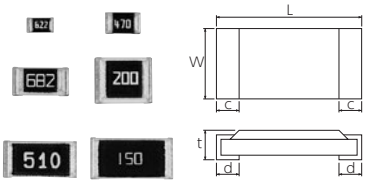
Size Code inch(mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0612 (1632)	WCRES32	0.75	F ±1	10~1M	±200	200	400	1.60±0.15	3.20±0.15	0.30±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
1020 (2550)	WCRES50	1.00	J ±5					2.50±0.20	5.00±0.20	0.50±0.20	0.60±0.20	0.56±0.15
1225 (3264)	WCRES64	2.00						3.20±0.15	6.30±0.15	0.50±0.20	0.90±0.20	0.56±0.15

※Specification in bold lines is common to WCRES32, WCRES50, WCRES64. Operating Temperature Range : −55℃~+155℃

AEC-Q200 compliant

Surge Current Chip Resistors

Model No. SCR



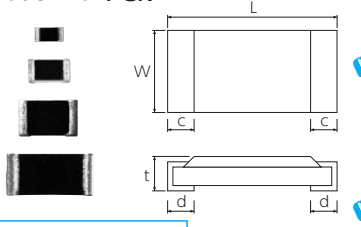
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0603 (1608)	SCR16	0.20	D ±0.5 F ±1 J ±5	100~100K 10~1M 10~10M	±100 ±200	50	100	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.5^{+0.15}_{-0.05}$
0805 (2012)	SCR20	0.25	D ±0.5 F ±1 J ±5	100~100K 10~1M 10~10M	±100 ±200	150	200	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.20	0.40±0.20	$0.5^{+0.15}_{-0.05}$
1206 (3216)	SCR32	0.33	D ±0.5 F ±1 J ±5	100~100K 10~1M 10~10M	±100 ±200	200	400	$3.20^{+0.10}_{-0.15}$	$1.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
1210 (3225)	SCR35	0.50	D ±0.5 F ±1 J ±5	100~100K 10~1M 10~10M	±100 ±200	200	400	$3.20^{+0.10}_{-0.15}$	$2.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
2010 (5025)	SCR50	0.75	D ±0.5 F ±1 J ±5	100~100K 10~1M 10~10M	±100 ±200	200	400	5.00±0.15	2.50±0.15	0.60±0.25	0.60±0.25	0.56±0.15
2512 (6432)	SCR64	1.00	F ±1 J ±5	10~1M	±300	200	400	6.30±0.15	3.20±0.15	0.60±0.25	0.60±0.25	0.56±0.15

★Resistance value range : For F-class(±1%) from 1.0 Ω to 9.1 Ω, please contact us. Operating Temperature Range : −55℃~+155℃

AEC-Q200 compliant

Surge Current High Power Chip Resistors

Model No. PCR



Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0402 (1005)	PCR10	0.20	D ±0.5 F ±1 J ±5	10~1M	±100 ±200	50	100	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
0603 (1608)	PCR16	0.30	D ±0.5 F ±1 J ±5	10~1M	±100 ±200	150	200	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.5^{+0.15}_{-0.05}$
0805 (2012)	PCR20	0.50	D ±0.5 F ±1 J ±5	10~1M	±100 ±200	150	200	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.20	0.40±0.20	$0.5^{+0.15}_{-0.05}$
1206 (3216)	PCR32	0.75	D ±0.5 F ±1.0 J ±5.0	10~1M	±100 ±200	200	400	$3.20^{+0.10}_{-0.15}$	$1.60^{+0.10}_{-0.15}$	0.40±0.20	0.50±0.20	0.55±0.15

New! New!

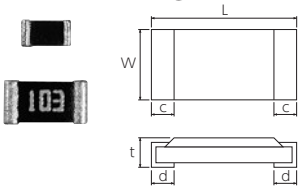
★Resistance value range : For F-class(±1%) from 1.0 Ω to 9.1 Ω, please contact us. Operating Temperature Range : −55℃~+155℃

AEC-Q200 compliant

Chip Resistors/Circuit Protections

High Precision Chip Resistors

Model No. HMCR



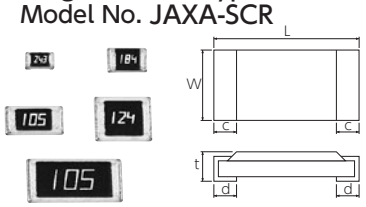
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max. Working Voltage (V)	Max. Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0402 (1005)	HMCR10	0.063	B(±0.1%) C(±0.25%)	100~1M	±50	50	100	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
0603 (1608)	HMCR16	0.100		1k~100k	±50	50	100	1.60±0.15	0.80±0.15	0.25±0.20	0.25±0.20	0.50±0.10

Operating Temperature Range : −55℃~+155℃

AEC-Q200 compliant

Space Development-aimed Reliability-guaranteed Chip Type Film Resistors

■ Surge Current Type
Model No. JAXA-SCR

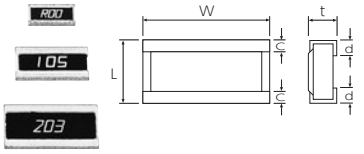


Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0603 (1608)	JAXA -SCR16	0.100	F:±1% G:±2% J :±5%	2~4.3	−100~+600	50	100	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.5^{+0.15}_{-0.05}$
0805 (2012)	JAXA -SCR20	0.125		4.7~9.1	±200	150	300	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.20	0.40±0.20	$0.5^{+0.15}_{-0.05}$
1206 (3216)	JAXA -SCR32	0.250		10~1M	±100	200	400	$3.20^{+0.10}_{-0.15}$	$1.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
1210 (3225)	JAXA -SCR35	0.333				200	400	$3.20^{+0.10}_{-0.15}$	$2.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
2010 (5025)	JAXA -SCR50	0.500		2~9.1	±500	200	400	5.00±0.15	2.50±0.15	0.60±0.25	0.60±0.25	0.56±0.15
				10~1M	±200							

※ Specification in bold lines is common to JAXA-SCR16,JAXA-SCR20,JAXA-SCR32,JAXA-SCR35

Operating Temperature Range : −55℃~+125℃

■ Wide Terminal Type
Model No. JAXA-WCR



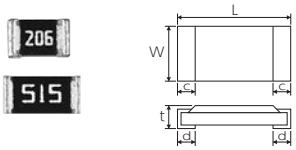
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0612 (1632)	JAXA -WCR32	0.5	F:±1% G:±2% J:±5%	0.1~91	±200	200	400	1.60±0.15	3.20±0.15	0.30±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
1020 (2550)	JAXA -WCR50	1.0		100~9.1k	±100			2.50±0.20	5.00±0.20	0.50±0.20	0.60±0.20	0.56±0.15
1225 (3264)	JAXA -WCR64	2.0		10k~1M	±200			3.20±0.15	6.30±0.15	0.50±0.20	0.90±0.20	0.56±0.15

※ Specification in bold lines is common to JAXA-WCR32,JAXA-WCR50,JAXA-WCR64

Operating Temperature Range : −55℃~+125℃

High Voltage Chip Resistors

Model No. HCR



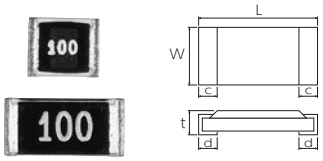
Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)	Resistance (Ω)	T.C.R. (ppm/℃)	Max.Working Voltage (V)	Max.Overload Voltage (V)	Dimensions (mm) L	W	c	d	t
0805 (2012)	HCR20	0.125	F ±1 J ±5	180k~20M	±250	400	800	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206 (3216)	HCR32	0.250	F ±1 J ±5	160k~20M	±200	500	1000	3.20±0.10	1.60±0.10	0.50±0.20	0.50±0.20	0.50±0.10

Operating Temperature Range : −55℃~+155℃

AEC-Q200 compliant

Fusible Chip Resistors

Model No. FCR



Size Code Inch (mm)	Model No.	Rated Wattage (W)	Tolerance (%)		Resistance (E-24) (Ω)	T.C.R. (ppm/℃)	Dimensions (mm) L	W	c	d	t
0603 (1608)	FCR16	0.063	J	±5	5.6~100	±500	1.6±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.50^{+0.15}_{-0.05}$
0805 (2012)	FCR20	0.100	J	±5	10~100	±500	$2.0^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.20	0.40±0.20	$0.50^{+0.15}_{-0.05}$
1206 (3216)	FCR32	0.125	J	±5	10~100	±500	$3.2^{+0.10}_{-0.15}$	$1.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
1210 (3225)	FCR35	0.250	J	±5	5.1~300	±500	$3.2^{+0.10}_{-0.15}$	$2.60^{+0.10}_{-0.15}$	0.50±0.20	0.50±0.20	$0.55^{+0.15}_{-0.05}$
2010 (5025)	FCR50	0.500	J	±5	10~100	±500	5.0±0.15	2.50±0.15	0.60±0.25	0.60±0.25	0.56±0.15

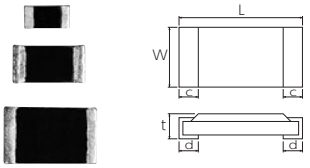
Operating Temperature Range : −55℃~+125℃

We also accept individual consultations regarding non-standard products, such as parts with custom resistance values. Details are subject to change without notice.

Circuit Protections/Metal Plate Resistors

ESD Protectors

Model No. EPP

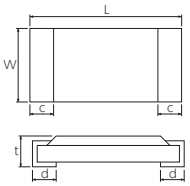


Size Code Inch (mm)	Model No.	Peak Voltage (V) ※	Peak Current (A)	Insulation Resistance (MΩ)	Rated Voltage (V)	Static Capacitance (pF)	Dimensions (mm)				
							L	W	c	d	t
0402 (1005)	EPP10	600 or less (900 or less)	20 or more	10 or more	15	0.3 or less	1.00±0.10	0.50±0.05	0.20±0.10	0.25±0.10	0.40±0.10
0603 (1608)	EPP16	700 or less (900 or less)	20 or more	10 or more	20	0.3 or less	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	0.55±0.10
0805 (2012)	EPP20	900 or less	20 or more	10 or more	25	0.3 or less	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	0.40±0.20	0.40±0.20	0.55±0.10

※( ) is when 2nd time or more applied.

Flat Chip Fuses

Model No. FCL

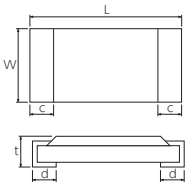


Size Code Inch (mm)	Model No.	Rated Current (A)	Rated Voltage (VDC)	Breaking current (A)	Dimensions (mm)				
					L	W	c	d	t
0402 (1005)	FCL10-＊＊＊	0.200~0.500	24	50	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.34±0.05
		0.630~5.000		35					
0603 (1608)	FCL16-＊＊＊	0.200~0.500	50	50	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.50^{+0.15}_{-0.05}$
		0.630~5.000	32						
0805 (2012)	FCL20-＊＊＊	0.200~2.500	50	50	$2.00^{+0.20}_{-0.10}$	$1.25^{+0.20}_{-0.10}$	$0.25^{+0.10}_{-0.15}$	$0.25^{+0.10}_{-0.15}$	0.45±0.05
		3.150~5.000	32						

Operating Temperature Range : −55℃~+125℃
Fusing performance: To be fused within 5 seconds when 200% of the rated current applied.

New Arc Resistant Chip Fuse

Model No. AFCL16

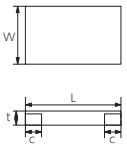


Size Code Inch (mm)	Model No.	Rated Current (A)	Rated Voltage (VDC)	Breaking current (A)	Dimensions (mm)				
					L	W	c	d	t
0603 (1608)	AFCL16-132	1.25	75	50	1.60±0.15	$0.80^{+0.20}_{-0.10}$	0.25±0.20	0.25±0.20	$0.55^{+0.15}_{-0.05}$

Operating Temperature Range : −55℃~+125℃
Fusing performance: To be fused within 5 seconds when 200% of the rated current applied.

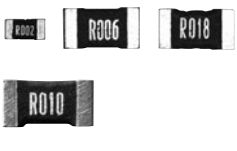
Metal Plate Resistors

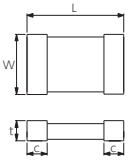
Model No. LR20



Size Code Inch (mm)	Model No.	Power Rating (W)	Tolerance (%)		Resistance (mΩ)	T.C.R. (ppm/℃)	Dimensions (mm)			
							L	W	t	c
0805 (2012)	LR20	0.5	F	±1%	3~15	±100	2.0±0.3	1.25±0.3	0.3±0.1	0.35±0.25

Model No. LR32, LR641, LR642, LR643





Size Code Inch (mm)	Model No.	Power Rating (W)	Tolerance (%)		Resistance (mΩ)	T.C.R. (ppm/℃)	Dimensions (mm)			
							L	W	t	c
1206 (3216)	LR32	1	F	±1%	1~9	±100	3.2±0.3	1.6±0.3	0.6±0.3	0.5±0.3
					10~50	±50				
2512 (6432)	LR641	1	F	±1%	1~4	±100	6.3±0.3	3.2±0.3	0.8±0.3	Since terminal dimension differs depending on resistance, please inquire us.
					4.1~9.5				0.6±0.3	
					10~100	±50				
					75.1~100					
2512 (6432)	LR642	2	F	±1%	0.5	±175	6.3±0.4	3.2±0.3	0.8±0.3	Since terminal dimension differs depending on resistance, please inquire us.
					1~4	±100			0.6±0.3	
					4.1~9.5					
					10~75	±50				
2512 (6432)	LR643	3	F	±1%	0.5	±175	6.3±0.4	3.2±0.3	0.8±0.3	Since terminal dimension differs depending on resistance, please inquire us.
					1~4	±100			0.6±0.3	
					5~10					
2725 (6865)	LR68	3	F	±1%	0.25、0.5	±200	6.8±0.3	6.5±0.3	1.3Max.	Since terminal dimension differs depending on resistance, please inquire us.
					1.0				1.4Max.	
					1.5	±100			1.3Max.	
					2.0、2.5、3.0				1.2Max.	
2728 (6772)	LR72	3	F	±1%	4~100	±50	6.7±0.3	7.2±0.3	1.3Max.	1.1±0.3
			G	±2%						
			J	±5%						
4527 (11469)	LR1145	5	F	±1%	1~9	±100	11.4±0.3	6.9±0.3	1.5±0.3	Since terminal dimension differs depending on resistance, please inquire us.
					10~120	±50				

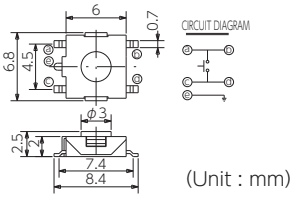
Model No. LR68, LR72

Model No. LR1145

Tactile Switches

Surface Mount Type Tactile Switches

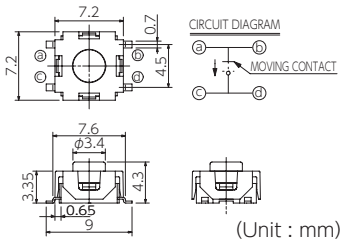
■ 6mm Size Type
Model No. KGS6N4＊＊○＃T



(Unit : mm)

Item		Specification	Unit
Size		8.4×6.8	mm
Height (＊＊)	25	2.5	mm
	31	3.1	mm
Ground Terminal (○)	1	No ground terminal	
	2	with ground terminal	
Operating Force (＃)	A	0.98±0.49	N
	B	1.57±0.49	N
	C	2.55±0.69	N
Rating		Max. 50mA 8VDC	

■ Water-proof Type
Model No. KSS7WE11AT

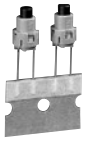


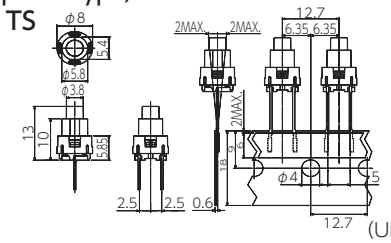
(Unit : mm)

Item	Specification	Unit
Contact Resistance	100 Max.	mΩ
Operating Force	1.08±0.49	N
Travel	0.25+0.2/−0.1	mm
Water Resistance	Immerse in 60±2℃ (10cm) water for 240 hours	

Tactile Switches

■ Taping Type (Water-proof Type)
Model No. KSM8W＊TS

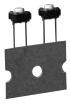


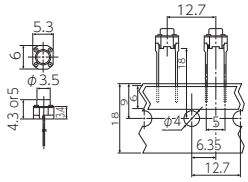


(Unit : mm)

Item		Specification	Unit
Contact Resistance		100Max.	mΩ
Operating Force	A Type	1.47±0.49	N
	B Type	1.96±0.49	
Travel		0.25+0.2/−0.1	mm
Water Resistance		Immerse in 60±2℃ (10cm) water for 240 hours	

■ Taping Type
Model No. KSHC61＊＊T

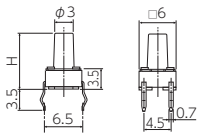




(Unit : mm)

Model No.	Size	Operating Force (N)	Remarks
KSHC61＊AT	6 mm	0.98	Top Push
KSHC61＊BT	6 mm	1.57	Top Push

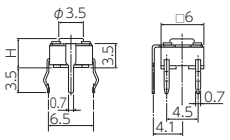
■ Bulk Type
Model No. KSMC61＊＊



(Unit : mm)

Model No.	Size	Operating Force (N)	Remarks
KSMC61＊A	6 mm	0.98	Top Push
KSMC61＊B	6 mm	1.57	Top Push

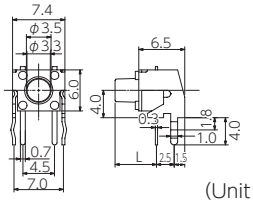
Model No. KSMC62＊＊



(Unit : mm)

Model No.	Size	Operating Force (N)	Remarks
KSMC62＊A	6 mm	0.98	Top Push with ground Terminal
KSMC62＊B	6 mm	1.57	Top Push with ground Terminal

Model No. KSMC63＊＊



(Unit : mm)

Model No.	Size	Operating Force (N)	Remarks
KSMC63＊A	6 mm	0.98	Side Push
KSMC63＊B	6 mm	1.57	Side Push

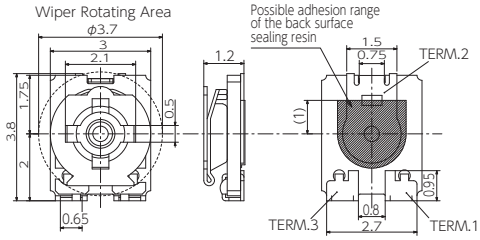
HOKURIKU

Details are subject to change without notice.

Trimmer Potentiometers/Printed Wiring Boards

Chip Trimmer Potentiometers (Lead-Free Products)

■ 3mm Size Type
Model No. VGF39NSN

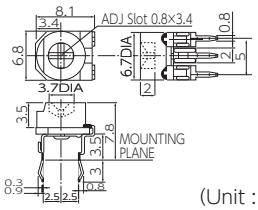


(Unit : mm)

Item	Specification
Power Rating	0.15W
Max.Working Voltage	DC50V
Resistance Range	100Ω～1MΩ
Resistance Tolerance	±25%
Resistance Taper	Linear
Rotation Torque	0.98～11.76mN·m
Resistance Film	Metal Glaza

Trimmer Potentiometers (Lead-Free Products)

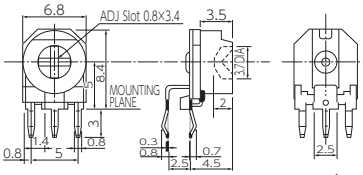
■ 6mm Size Series
Model No. VGF67TL1



(Unit : mm)

Model No.	Size	Power Rating	Resistance Range	Resistance Film
VGF67TL1	6 mm	0.2W	100Ω～1MΩ	Metal Glaze

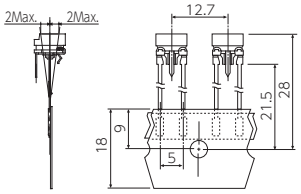
Model No. VGF67TH1



(Unit : mm)

Model No.	Size	Power Rating	Resistance Range	Resistance Film
VGF67TH1	6 mm	0.2W	100Ω～1MΩ	Metal Glaze

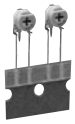
Model No. NVGF6TLTA

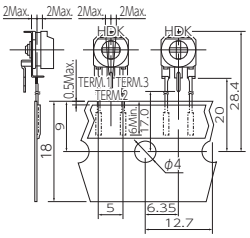


(Unit : mm)

Model No.	Size	Power Rating	Resistance Range	Resistance Film
NVGF6TLTA	6 mm	0.3W	100Ω～1MΩ	Metal Glaze

Model No. NVGF6THT

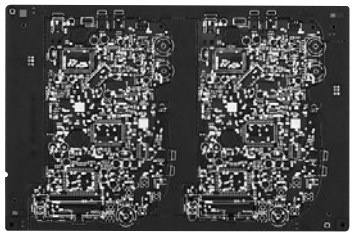


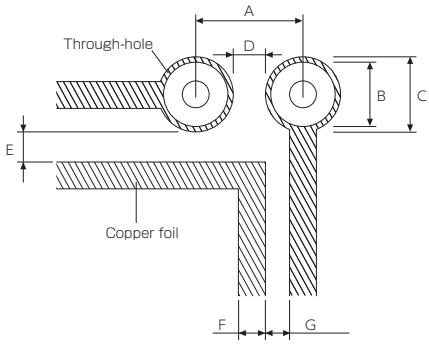


(Unit : mm)

Model No.	Size	Power Rating	Resistance Range	Resistance Film
NVGF6THT	6 mm	0.3W	100Ω～1MΩ	Metal Glaze

Silver & Copper Paste Through-hole P.W.B.

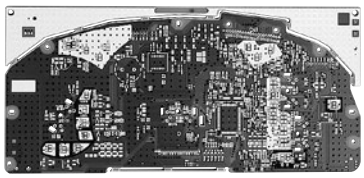




Design Rule

Mark	Item	Design Rule (mm)		
A	Through-hole Pitch	1.0	1.25	1.5
B	Through-hole Dia.	≦0.8	≦1.0	≦1.2
C	Copper Land Dia.	0.8	1.0	1.2
D	Space Between Copper Lands	0.20	0.25	0.30
E	Space Between Copper Land and Copper Pattern	≧0.2	≧0.25	≧0.3
F	Copper Pattern Width	≧0.15	≧0.20	≧0.20
G	Space Between Copper Patterns	≧0.20	≧0.20	≧0.20

※Copper Paste Through-hole Pitch shall be 1.25mm or higher.



Specifications

Item	Specifications
Material of Board	FR-1, CEM-3, FR-4 Environment-compliant P.W.B. or Paper-phenolic high heat resistant P.W.B. are also available.
Board Thickness	(0.8) 1.0～1.6mm (1.00mm pitch except 1.6mm)
Through-hole Resistance	≦100mΩ/hole
Rated Current	300mA/hole (1.00, 1.25mm pitch: ≦250mA/hole)
Insulation Resistance	≧100MΩ
Dielectric Withstanding Voltage	100V, >1 min

HOKURIKU ELECTRIC INDUSTRY CO.,LTD.

https://www.hdk.co.jp/top_e.htm

WORLDWIDE SALES CONTACTS

Japan

Overseas Sales Department.
Lexington Plaza Nishi Gotanda 8F
5-2-4, Nishi Gotanda, Shinagawa-ku, Tokyo,
141-0031, JAPAN
TEL (81) 3-5437-5661 FAX (81) 3-3495-0622
E-mail:intl_sales@hdk.co.jp

U.S.A.

HDK America Inc.
(Alabama office)
125 Electronics Blvd SW Ste G Huntsville, AL, 35824-2206, U.S.A.
TEL (1) 256-772-9620

Asia

China/ HDK China Ltd.
Room 701B, 7F., Eastmark, 21 Sheung Yuet Road,
Kowloon Bay, Kowloon, Hong Kong
TEL (852) 2-318-0997 FAX (852) 2-318-0932

China/ Hokuriku (Shanghai) International Trading Co.,Ltd.
(Headquarters)
Unit 17A1. No585, Hua Fu Building,
Long Hua West Road, Shanghai 200232, China
TEL (86) 21-6428-6448 FAX (86) 21-6469-4498

(Wuxi Office)
Room 1815, No.6 Tianshan Road, Xinwu District,
Wuxi, Jiangsu 214028, China
TEL (86) 510-8525-9973 FAX (86) 510-8525-9913

(Shenzhen Office)
2104, No.3005, Cunjin Bld., DongMen South Road, Shenzhen,
Guangdong, 518001, China
TEL (86) 755-2231-9083 FAX (86) 755-2221-7683

Singapore/ Hokuriku (Singapore) Pte.,Ltd.
2 Jurong East Street 21 #02-85,IMM Building
Singapore 609601
TEL (65) 6861-1677 FAX (65) 6861-4270

Thailand/ Hokuriku International (Thailand) Co., Ltd.
9/217 U.M.Tower, 21st Floor, Ramkhamhaeng Rd, Suanluang,
Bangkok 10250, Thailand
TEL (66) 2-369-3631 FAX (66) 2-369-3630

India/ Hokuriku (Singapore) India Rep Office
14th Floor,Tower 5B DLF Epitome,DLF Cyber City
Phase 3 Gurgaon,Haryana ,India 122002
TEL (91) 124-460-7777

NOTICE⚠

1. Please order in multiples of the minimum packaging unit.
2. This catalog does not fully cover all necessary information. Especially for safety concerns, please review HDK's detailed specifications. HDK cannot be held liable for the safety and integrity of your application.
3. For products which are described in this catalog and which are also controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

2025. 10. 1,000 Ⓢ