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Our Product of the Month
Hall Effect Switch HAL®15xy

- New hall effect switch in tiny SOT-23 package
- JEDEC TO-236 compliant package
- Power-on self test possible
- The decrease of magnetic flux density caused by rising temperature in the sensor system is compensated by a built-in negative temperature coefficient of the magnetic characteristics
- Qualified according to AEC-Q100 test standard for automotive electronics industry to provide the highest quality expectation
- ASIL-A ready

MICRONAS

Sensor Components – Support for Customers

Panasonic

BLUETOOTH®-SMART/SMART READY-TECHNOLOGY WIRELESS MODULES

The Panasonic wireless products are used in a variety of wireless applications: Mobile measuring devices, PC/Notebook, car infotainment, wireless meter reading/AMR, data acquisition, security technology, access control, medical, and industrial/ home/building automation. The inclusion of Panasonic products in the Endrich assortment of goods we can support customers with radio technology for the ISM band frequency 315 MHz, 433 MHz, 868 MHz, 915 MHz and 2.4 GHz/ Bluetooth®. Endrich offers Wi-Fi modules, proprietary protocols and networks.

BLUETOOTH®-SMART READY-TECHNOLOGY
(Classic Bluetooth® and Bluetooth® low energy)
Bluetooth® Smart Ready devices receive data sent from Classic Bluetooth® devices and Bluetooth® Smart devices (Bluetooth® Low Energy). It can easily be added to gateway/host devices, e.g. for industrial, automation, medical and fitness products.

FEATURES
- The centre of the Bluetooth® eco-system
- Classic Bluetooth® and Bluetooth® Low energy via time shifting

BLUETOOTH®-SMART-TECHNOLOGY (Bluetooth® low energy)
Bluetooth® Low Energy technology reduces power consumption down to a tenth of a Classic Bluetooth® device. It is only activated for events such as sending files, and otherwise stays in sleep mode. Bluetooth® Smart devices are designed to gather a specific type of information and send it to a Bluetooth® Smart Ready device.

FEATURES
- Rapid connection and disconnection (few ms), which allows to build multiple connections even so scatternet is not supported
- For small, discrete data transfer

ITEM		PAN13×6B SERIES	PAN1026 SERIES	PAN17×× SERIES
Picture				
Status		Mass Production	Mass Production	Mass Production
Part Number		ENW8982 3×3KF	ENW89837A3KF	ENW898××××KF
RF Category		**Bluetooth® Smart Ready Bluetooth® v4.0 class 1.5**	**Bluetooth® Smart Ready Bluetooth® v4.0 class 2**	**Bluetooth® Smart Bluetooth® v4.0**
Software/Profile		HCI	SPP+GATT	nBlue™ by BlueRadios, Inc./TI SW stack
Used ICs		CC2564B	TC35661-501	CC2540/CC2541
Dimensions [mm]	w/o antenna with antenna	9.0×6.5×1.8 9.0×9.5×1.8	15.6×8.7×1.8	11.6×8.7×1.8 15.6×8.7×1.8
Rx Sensitivity [dBm]		-93 @ BER 10^{-3}	-88 @ BER 10^{-3}	-94 @ BER 1%
Tx Power, max. [dBm]		+10.5	+4	+4/0
Power supply [V]		1.8 to 4.8	1.8 to 3.3	2.0 to 3.6
Current consumption		Tx, EDR: 40 mA Sleep mode: 135 µA	ACL, DH1: 46 mA Sleep mode: <100 µA	Tx: 23 mA @ -6 dBm, Rx: 18 mA Sleep mode: <1 µA
Interfaces		GPIO, PCM, UART	GPIO, UART	GPIO, UART, USB only PAN17×0 series

new

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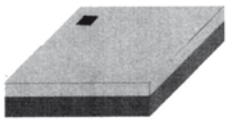
GPS AND GLONASS FRONT-END MODULE NJG1157PCD



The **NJG1157PCD** is a frontend module (FEM) designed for GPS and GLONASS applications. The NJG1157PCD offers high gain, low noise figure, high linearity and very high outband rejection characteristics brought by included high performance pre SAW filter, low noise amplifier (LNA) and post SAW filter. The NJG1157PCD can be operated from 1.5 V to 3.3 V single voltage. The NJG1157PCD offers very small mounting area by included two SAW filters, only two external components and very small HFFP10CD package that is 2.5×2.5mm.

FEATURES

- Available for GPS and GLONASS
- Low supply voltage 1.8/ 2.8 V typ.
- Low current consumption
  2.6/3.3 mA typ.@V_{DD}=1.8/ 2.8 V, V_{CTL}=1.8 V
  0.1 µA typ. @V_{DD}=1.8/ 2.8 V, V_{CTL}=0 V (Standby mode)
- High gain 17.5/18.5dB typ. @V_{DD}=1.8/ 2.8 V, V_{CTL}=1.8 V, f=1575 MHz, 1597~1606 MHz
- Low noise figure
  1.65/1.60 dB typ. @V_{DD}=1.8/ 2.8 V, V_{CTL}=1.8 V, f=1575 MHz
  1.75/1.70 dB typ. @V_{DD}=1.8/ 2.8 V, V_{CTL}=1.8 V, f=1597~1606 MHz @V_{DD}=1.8/ 2.8 V, V_{CTL}=1.8 V,
- High out band rejection
  85 dBc typ. f=704~915 MHz, relative to 1575 MHz
  75 dBc typ. f=1710~1980 MHz, relative to 1575 MHz
- Small package size HFFP10CD:
  2.5 mm×2.5 mm×0.63 mm max.
- RoHS compliant and Halogen free, MSL1

APPLICATIONS

- GPS
- GLONASS

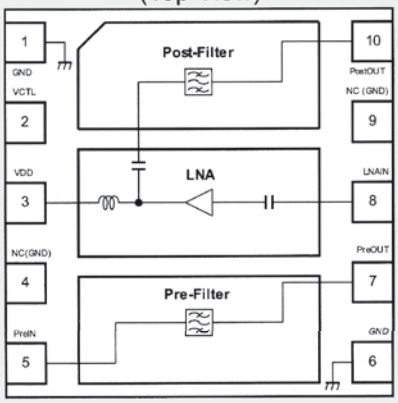
ABSOLUTE MAXIMUM RATINGS

» Supply voltage V_{DD}:	5.0 V
» Control voltage V_{CTL}:	5.0 V
» Input power P_{IN} (inband): (V_{DD}=2.8 V, f=1575, 1597~1606 MHz)	+15 dBm
» Input power P_{IN} (outband): (V_{DD}=2.8 V, f=50~1460, 1710~4000 MHz)	+27 dBm
» Power dissipation P_D:	510 mW
» Operating temperature T_{OPR}:	-40°C ... +85°C
» Storage temperature T_{STG}:	-40°C ... +100°C

BLOCK DIAGRAM / PIN CONFIGURATION

■ **PIN CONFIGURATION**

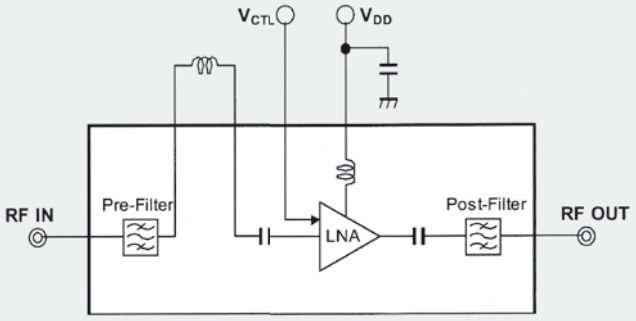
(Top View)



Pin connection
1. GND
2. VCTL
3. VDD
4. NC(GND)
5. PreIN
6. GND
7. PreOUT
8. LNAIN
9. NC(GND)
10. PostOUT

Exposed pad: GND

■ **BLOCK DIAGRAM**



new

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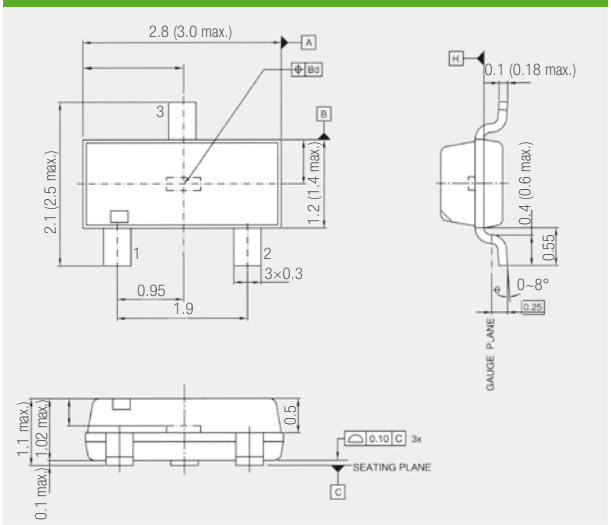
HALL EFFECT SWITCH HAL® 15xy IN SMD PACKAGE SOT23-3L

The **HAL15xy family** consists of different Hall switches produced in CMOS technology. All sensors include a temperature-compensated Hall plate with active offset compensation, a comparator, and an out-put stage. The family consists of 3-wire and 2-wire devices, the corresponding output stage being an open-drain out-put transistor and a current source respectively. The comparator compares the actual magnetic flux through the Hall plate (Hall voltage) with the fixed reference values (switching points). Accordingly the output transistor is switched on or off in 3-wire versions, and the current source is switched on (high current consumption) or off (low current consumption) in 2-wire versions. Family HAL15xy is available in SMD-package SOT23-3L JEDEC TO236 compliant.

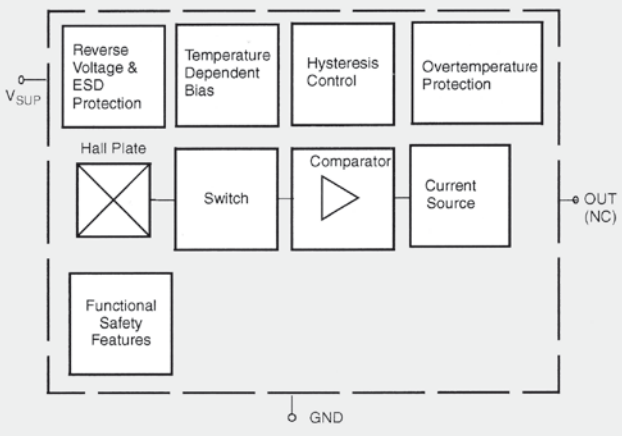
FEATURES

- Tiny SOT23-3L JEDEC TO236 compliant package
- Operates from 3.0 V to 24 V supply voltage
- Power-on self test is possible
- Operates with static magnetic fields and dynamic magnetic fields up to 12 kHz
- Maximum sample frequency at 500 kHz, 2 µs output refresh time
- Constant switching points over a wide supply voltage and temperature range
- The decrease of magnetic flux density caused by rising temperature in the sensor system is compensated by a built-in negative temperature coefficient of the magnetic characteristics
- Qualified according to AEC-Q100 test standard for automotive electronics industry to provide the highest quality expectation
- ASIL-A ready

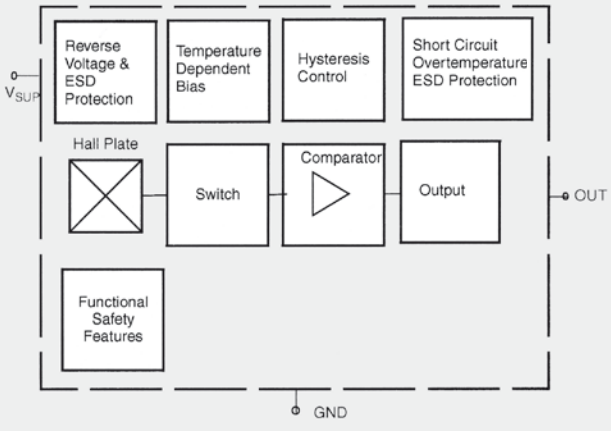
DIMENSIONS (mm)



BLOCK DIAGRAM



HAL 15xy - 2-wire Block diagram



HAL 15xy - 3-wire Block diagram

new

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HALL EFFECT SWITCH HAL® 15xy IN SMD PACKAGE SOT23-3L

POWER-ON SELF-TEST

The power-on self-test allows the customer to execute a functional check of the device, as well as to detect wire breaks as long as the host controls the power supply of the device. The self-test can be enabled only once after power-on.

CHARACTERISTICS

SYMBOL	PARAMETER	PIN NO.	MIN.	TYP.	MAX.	CONDITIONS
I_{SUP} [mA]	Supply current	1	-	1.6	5	3-wire
I_{SUPlo} [mA]	Low supply current	1	2	-	5	2-wire – HAL1564, HAL1565
I_{SUPlo} [mA]	Low supply current	1	5	-	7	2-wire – HAL1561/62/63/66
I_{SUPhi} [mA]	High supply current	1	12	-	17	2-wire

at T_J=-40°C to +170°C, V_{SUP}=3.0 V to 24 V, if not otherwise specified, typical characteristics for T_J=25°C and V_{SUP}=12 V.

CHARACTERISTICS

SOT-23 package, T_J=-40°C to +170°C, V_{SUP}=3.0 V to 24 V, if not otherwise specified, typical characteristics for T_J=25°C and V_{SUP}=12 V.
Magnetic flux density values of switching points. Positive flux density values refer to the magnetic south pole at the branded side of the package.

	SENSOR	SWITCHING TYPE	TEMP.COEFF. OF MAGNETIC THRESHOLD T_C [ppm/K]	ON POINT B_{ON} [mT]			OFF POINT B_{OFF} [mT]		
				Min.	Typ.	Max.	Min.	Typ.	Max.
3-wire									
HAL 1501	bipolar		tbd	tbd	0,5	tdb	tbd	-0,5	tbd
HAL 1502	bipolar		-1000	tbd	2.5	tdb	tbd	-2.5	tbd
HAL 1503	unipolar		-1000	tbd	5.5	tdb	tbd	3.5	tbd
HAL 1504*	latching		-1000	tbd	tbd	tdb	tbd	-8.0	tbd
HAL 1505*	latching		-1000	tbd	tbd	tdb	tbd	-13.5	tbd
HAL 1506	unipolar		-1000	tbd	18.0	tdb	tbd	16.0	tbd
HAL 1507	unipolar		-300	tbd	27.0	tdb	tbd	23.0	tbd
HAL 1508	unipolar		-1000	tbd	-5.5	tdb	tbd	-3.5	tbd
HAL 1509	unipolar		-1000	tbd	3.5	tdb	tbd	5.5	tbd
2-wire									
HAL 1561	latching		tbd	tbd	4.0	tdb	tbd	-4.0	tbd
HAL 1562	latching		tbd	tbd	12.0	tdb	tbd	-12.0	tbd
HAL 1563	unipolar inverted		tbd	tbd	7.0	tdb	tbd	9.0	tbd
HAL 1564	unipolar inverted		tbd	tbd	4.0	tdb	tbd	6.0	tbd
HAL 1565	unipolar		tbd	tbd	6.0	tdb	tbd	4.0	tbd
HAL 1566	unipolar		tbd	tbd	9.0	tdb	tbd	7.0	tbd

* Currently not planned for start-up portfolio, please contact us!

new

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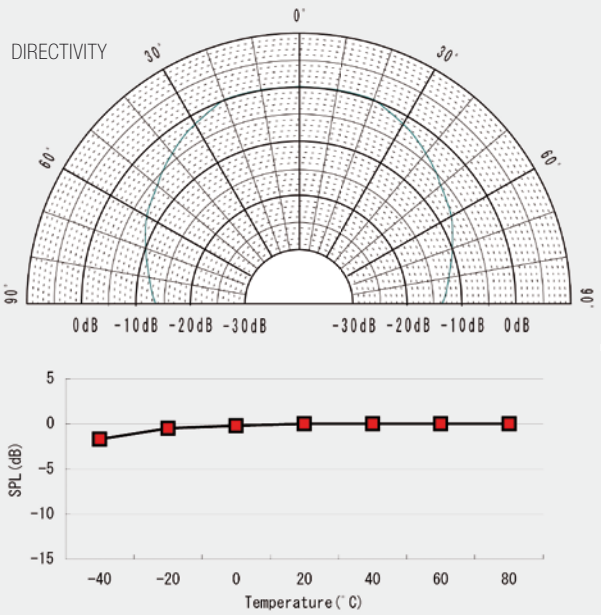
ULTRA SMALL ULTRASONIC SENSORS

NICERA offers a new series T/R4008A1 of ultra small ultrasonic sensors at frequency 40 kHz. The diameter is 8 mm only at similar sound pressure level as sensors with larger diameter. This allows miniaturization of ultrasonic applications.

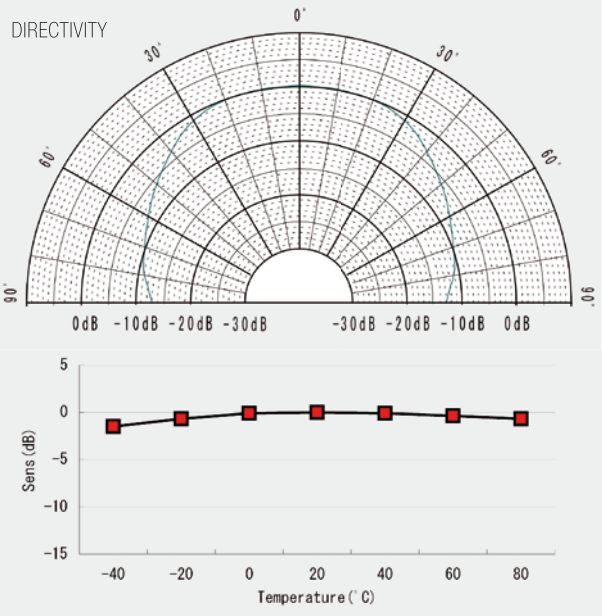
APPLICATIONS

- Car alarm system
- Lighting control
- Automatic door control
- Liquid level measurement
- Distance measurement

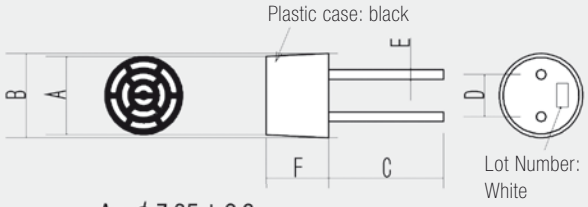
CHARACTERISTICS – TRANSMITTER T4008A1



CHARACTERISTICS – RECEIVER R4008A1



DIMENSIONS (mm)



A= ϕ 7.85±0.3
B= ϕ 7.95±0.3
C= 11.0±1
D= 4.0±0.5
E= ϕ 0.9±0.1
F= 6.0±0.3

SPECIFICATIONS

PARAMETER	TRANSMITT. T4008A1	RECEIVER R4008A1
Center frequency [kHz] (0 dB=0.0002 µbar, 10 Vrms, 30 cm)	40.0 ± 1.0	40.0 ± 1.0
Sound pressure level [dB] (0 dB=1V/ µbar, R_L=3.9 kΩ, 30 cm)	117 min.	–
Sensitivity [dB/V/µbar]	–	-67 min.
Maximum input voltage [Vp-p]	30	–
Resonant impedance [Ω]	809 typ.	–
Anti-resonant impedance [Ω]	–	2890
Capacitance at 1 kHz [pF]	2830	2780
Operating temperature [°C]	-40 ... +85	-40 ... +85

new

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URG SERIES – ULTRA PRECISION THIN FILM CHIP RESISTORS

The SUSUMU's new **URG series** are ultra precision thin film chip resistors up to ±0.01 % resistance tolerances and a temperature coefficient of ±2 ppm/°C. They are highly suited for applications in instrumentation and medical technology, but also in the automotive industry or in optical devices.

ELECTRICAL SPECIFICATIONS

PART NUMBER	SMD SIZE [INCH]	POWER RATING @70°C	RESISTANCE TOL.	RESISTANCE RANGE	TEMP. COEFF. [ppm/°C][1)]	MAX. OP. VOLTAGE	RES. VALUES (E-SER.)	PACKAGING
URG1608	0603	1/16 W	±0.01% (L) ±0.02% (P)	100 Ω...7.5 kΩ	±2 (L)	100 V	E-24, E-96	Tape & Reel, T1=1000 pcs., Cut & Tape, 100/200/300pcs. in bag
URG2012	0805	1/10 W	±0.01% (L) ±0.02% (P)	100 Ω...36 kΩ	±2 (L)	150 V	E-24, E-96	Tape & Reel, T1=1000 pcs., Cut & Tape, 100/200/300pcs. in bag
URG3216	1206	1/4 W	±0.01% (L) ±0.02% (P)	100 Ω...68 kΩ	±2 (L)	200 V	E-24, E-96	Tape & Reel, T1=1000 pcs., Cut & Tape, 100/200/300pcs. in bag
URG6432[2)]	2512	1 W	±0.01% (L) ±0.02% (P)	250 Ω...200 kΩ	±2 (L)	300 V	E-24, E-96	Tape & Reel, T1=1000 pcs., Cut & Tape, 100/200/300pcs. in bag

[1)] Temperature coefficient is based on temperature range -20°C to +125°C [2)] coming soon

RELIABILITY TEST DATA

Item (Test Method)	**ΔR Limits**
Short Time Overload (2.5 times of rated load, 5s)	**±0.02 %**
Load Life (70°C rated load 90min. on/30 min. off per cycle × 2000)	**±0.02 %**
Temp. Hum. Bias (85°C 85% RH 1/10 power loaded 90 min./30 min. off per cycle × 2000)	**±0.05 %**
Thermal Shock (-65°C, 30 min./room temp. 2 min. +150°C,30 min./room temp. 2 min., 100 cycles, no bias	**±0.02 %**
High Temperature (+155°C for 100h, no bias)	**±0.02 %**

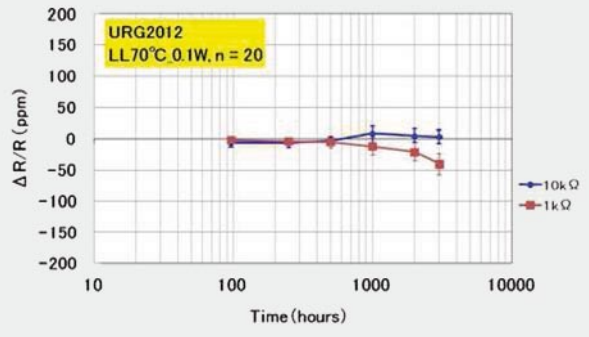
FEATURES

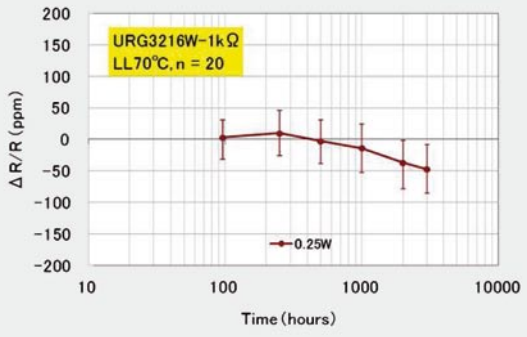
- Unmatched reliability and excellent stability at different environmental conditions
- Low noise, thin film (NiCr) construction
- EIA standard case size 0603 to 2512
- RoHS compliance and 100% lead-free (Matte Sn termination finished)

APPLICATIONS

- Automotive
- Scale, test & measurement
- Optical & telecommunication
- Medical and industrial equipment

LOAD LIFE TEST DATA FOR 3,000 HOURS @ 70°C AT RATED POWER





new

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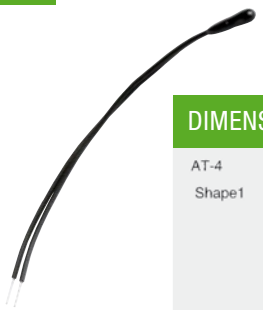
HIGH PRECISION THERMSTORS

SEMICONDUCTING CERAMIC THERMISTOR – AT-4 SERIES



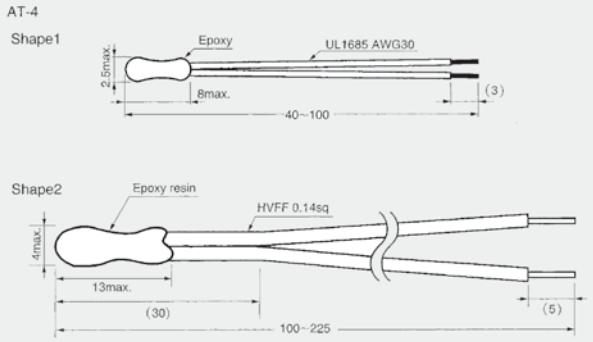
FEATURES

- High-precision thermal sensing device
- Extremely small tolerances of R_{25} and B-value
- Insures temperature precision of ±0.3°C
- Category temperature range: -30°C ... +90°C
- Excellent long-term stability
- Low time constants
- Samples available ex stock

APPLICATIONS

- Battery packs, heat meters
- Precision temperature measuring and compensation
- Temperature monitoring, medical equipment

DIMENSIONS AT-4 SERIES (mm)



SPECIFICATIONS

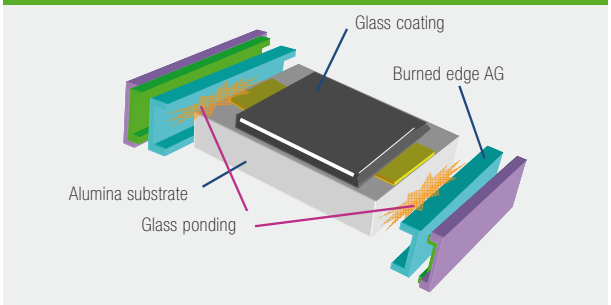
- 103AT-4 - R_{25}: 10 kΩ±1%, B-value: 3435K±1% (Shape 1)
- 103AT-4 - R_{25}: 10 kΩ±1%, B-value: 3435K±1% (Shape 2)
- 682AT-4 - R_{25}: 6.8 kΩ±1%, B-value: 3975K±1%

THICK FILM CHIP THERMISTOR – TFT SERIES

FEATURES

- High mechanical strength by alumina base & glass coating
- Superior thermal responsiveness
- Thin structure by thick film element & constant thickness with any resistance value
- High quality and high reliability by TS 16949 certification

THICK FILM CHIP CONSTRUCTION



APPLICATIONS

- Various temperature compensation
- Printer, digital camera, battery pack, fuel cell
- Air conditioner (room, car), information appliance

PARAMETER	SPECIFICATION
Chip type size	0201, 0402, 0603, 0805
Resistance value range	100 Ω ... 2 MΩ
Resistance value tolerance	±1%...±10%
B constant value range	2700 K ... 4800 K
B value tolerance	±1%...±5%
Power rating	5 mW
Dissipation constant (in air)	δ ≤ 1.1 ... 1.3 mW/°C
Thermal constant time (in air)	τ ≤ 1.5 ... 2.5 s

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HEADQUARTERS

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