

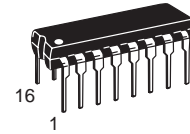


Low-Power CMOS Ionization Smoke Detector IC with Interconnect

The MC14468, when used with an ionization chamber and a small number of external components, will detect smoke. When smoke is sensed, an alarm is sounded via an external piezoelectric transducer and internal drivers. This circuit is designed to operate in smoke detector systems that comply with UL217 and UL268 specifications.

- Ionization Type with On-Chip FET Input Comparator
- Piezoelectric Horn Driver
- Guard Outputs on Both Sides of Detect Input
- Input-Production Diodes on the Detect Input
- Low-Battery Trip Point, Internally Set, can be Altered Via External Resistor
- Detect Threshold, Internally Set, can be Altered Via External Resistor
- Pulse Testing for Low Battery Uses LED for Battery Loading
- Comparator Output for Detect
- Internal Reverse Battery Protection
- Strobe Output for External Trim Resistors
- I/O Pin Allows Up to 40 Units to be Connected for Common Signaling
- Power-On Reset Prevents False Alarms on Battery Change

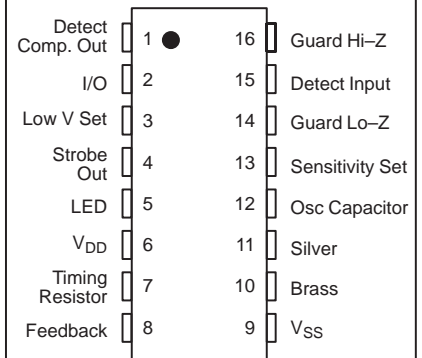
MC14468



**P SUFFIX
PLASTIC DIP
CASE 648-08**

**ORDERING INFORMATION
MC14468P PLASTIC DIP**

PIN ASSIGNMENT (16 PIN DIP)



MAXIMUM RATINGS* (Voltages referenced to V_{SS})

Rating	Symbol	Value	Unit
DC Supply Voltage	V _{DD}	-0.5 to +15	V
Input Voltage, All Inputs Except Pin 8	V _{in}	-0.25 to V _{DD} + 0.25	V
DC Current Drain per Input Pin, Except Pin 15 = 1 mA	I	10	mA
DC Current Drain per Output Pin	I	30	mA
Operating Temperature Range	T _A	-10 to +60	°C
Storage Temperature Range	T _{stg}	-55 to +125	°C
Reverse Battery Time	t _{RB}	5.0	s

* Maximum Ratings are those values beyond which damage to the device may occur.

This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields; however, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit. For proper operation it is recommended that V_{in} and V_{out} be constrained to the range V_{SS} ≤ (V_{in} or V_{out}) ≤ V_{DD}.



RECOMMENDED OPERATING CONDITIONS (Voltages referenced to V_{SS})

Parameter	Symbol	Value	Unit
Supply Voltage	V _{DD}	9.0	V
Timing Capacitor	—	0.1	μF
Timing Resistor	—	8.2	MΩ
Battery Load (Resistor or LED)	—	10	mA

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Characteristic	Symbol	V _{DD} V _{dc}	Min	Typ#	Max	Unit
Operating Voltage	V _{DD}	—	6.0	—	12	V
Output Voltage	V _{OH}	7.2	6.3	—	—	V
Piezoelectric Horn Drivers (I _{OH} = -16 mA)		9.0	8.5	8.8	—	
Comparators (I _{OH} = -30 μA)		—	—	—	—	
Piezoelectric Horn Drivers (I _{OL} = +16 mA)	V _{OL}	7.2	—	—	0.9	V
Comparators (I _{OL} = +30 μA)		9.0	—	0.1	0.5	
Output Voltage — LED Driver, I _{OL} = 10 mA	V _{OL}	7.2	—	—	3.0	V
Output Impedance, Active Guard						kΩ
Pin 14	Lo-Z	9.0	—	—	10	
Pin 16	Hi-Z	9.0	—	—	1000	
Operating Current (R _{bias} = 8.2 MΩ)	I _{DD}	9.0	—	5.0	9.0	μA
		12.0	—	—	12.0	
Input Current — Detect (40% R.H.)	I _{in}	9.0	—	—	±1.0	pA
Input Current, Pin 8	I _{in}	9.0	—	—	±0.1	μA
Input Current @ 50°C, Pin 15	I _{in}	—	—	—	±6.0	pA
Internal Set Voltage						
Low Battery	V _{low}	9.0	7.2	—	7.8	V
Sensitivity	V _{set}	—	47	50	53	%V _{DD}
Hysteresis	v _{hys}	9.0	75	100	150	mV
Offset Voltage (measured at Vin = VDD/2)	V _{OS}					mV
Active Guard		9.0	—	—	±100	
Detect Comparator		9.0	—	—	±50	
Input Voltage Range, Pin 8	V _{in}	—	V _{SS} - 10	—	V _{DD} + 10	V
Input Capacitance	C _{in}	—	—	5.0	—	pF
Common Mode Voltage Range, Pin 15	V _{cm}	—	0.6	—	V _{DD} - 2	V
I/O Current, Pin 2						
Input, V _{IH} = V _{DD} - 2	I _{IH}	—	25	—	100	μA
Output, V _{OH} = V _{DD} - 2	I _{OH}	—	-4.0	—	-16	mA

Data labelled "Typ" is not to be used for design purposes but is intended as an indication of the IC's potential performance.

TIMING PARAMETERS (C = 0.1 μ F, R_{bias} = 8.2 M Ω , V_{DD} = 9.0 V, T_A = 25°C, See Figure 6)

Characteristics		Symbol	Min	Typ#	Max	Units
Oscillator Period	No Smoke	t _{Cl}	1.34	1.67	2.0	s
	Smoke		32	40	48	ms
Oscillator Rise Time		t _r	8.0	10	12	ms
Horn Output (During Smoke)	On Time	PW _{on}	120	160	208	ms
	Off Time	PW _{off}	60	80	104	ms
LED Output	Between Pulses	t _{LED}	32	40	48	s
	On Time	PW _{on}	8.0	10	12	ms
Horn Output (During Low Battery)	On Time	t _{on}	8.0	10	12	ms
	Between Pulses	t _{off}	32	40	48	s

Data labelled "Typ" is not to be used for design purposes but is intended as an indication of the IC's potential performance.

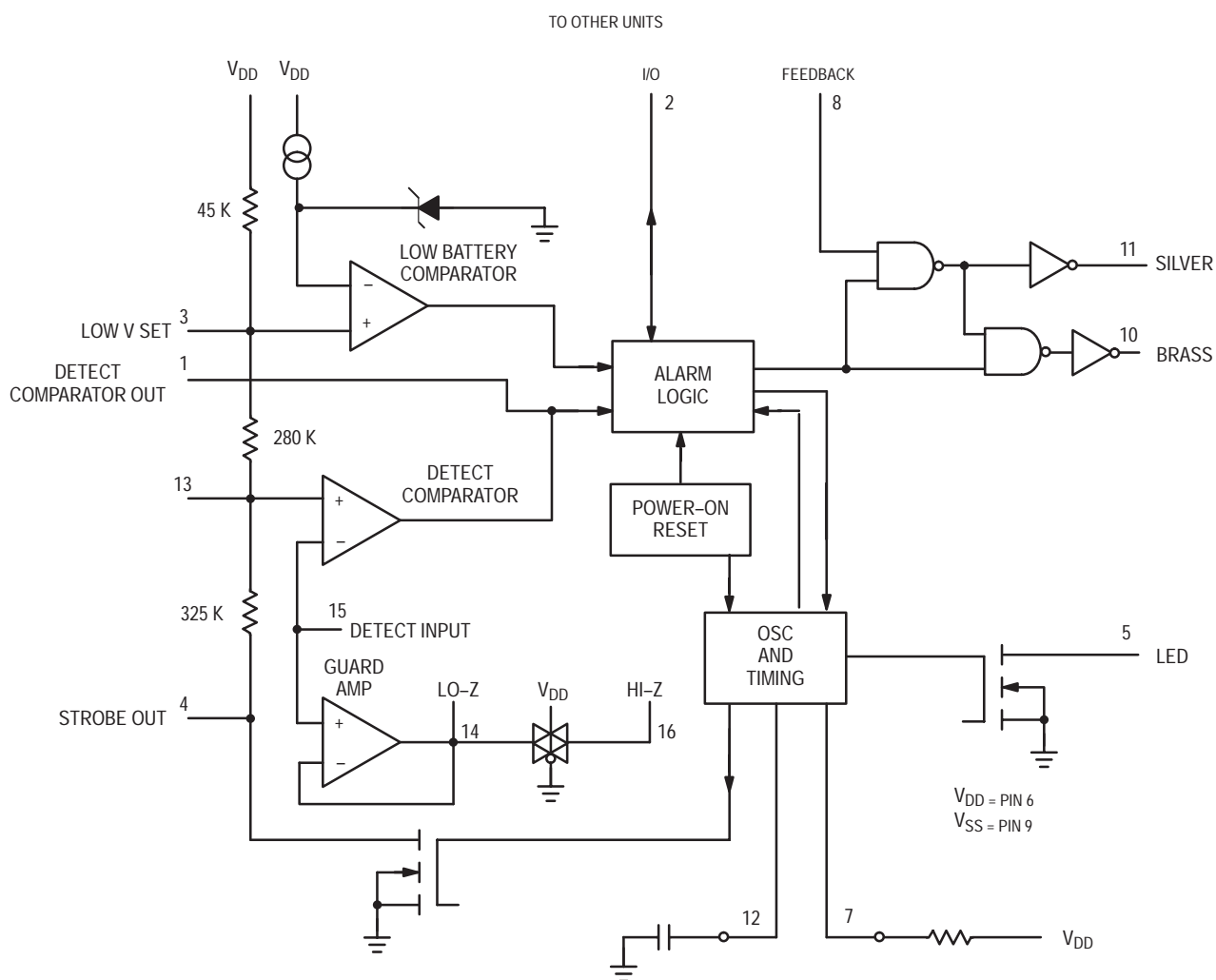


Figure 1. Block Diagram

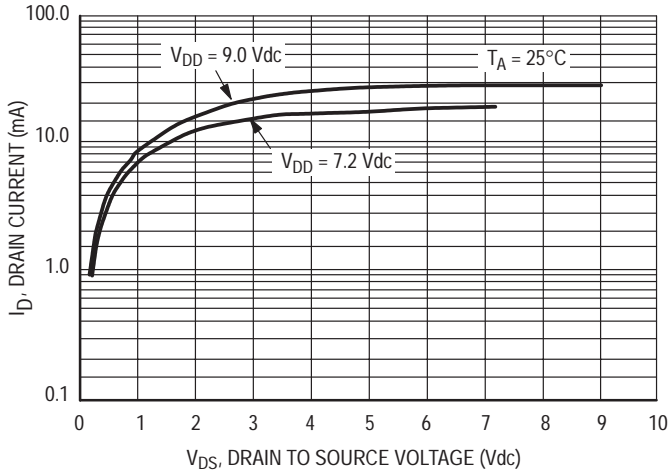


Figure 2. Typical LED Output I-V Characteristic

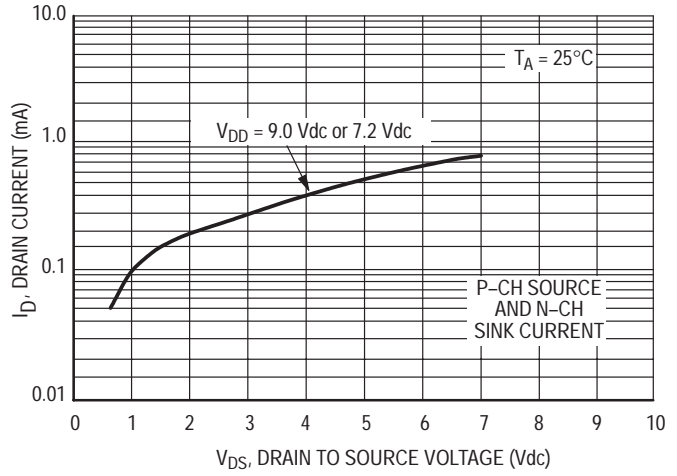


Figure 3. Typical Comparator Output I-V Characteristic

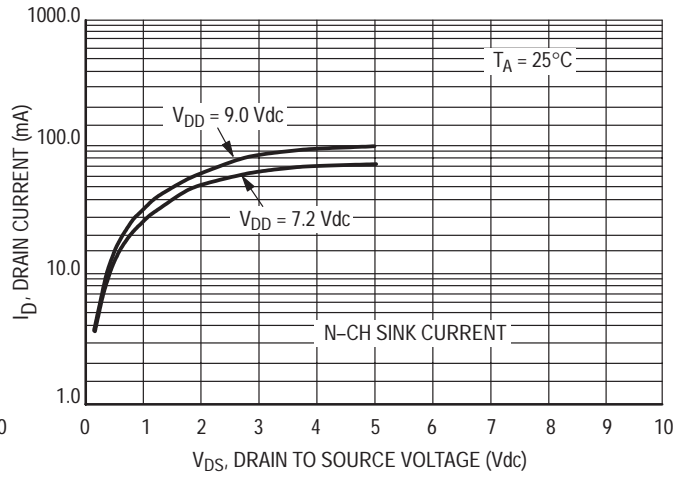
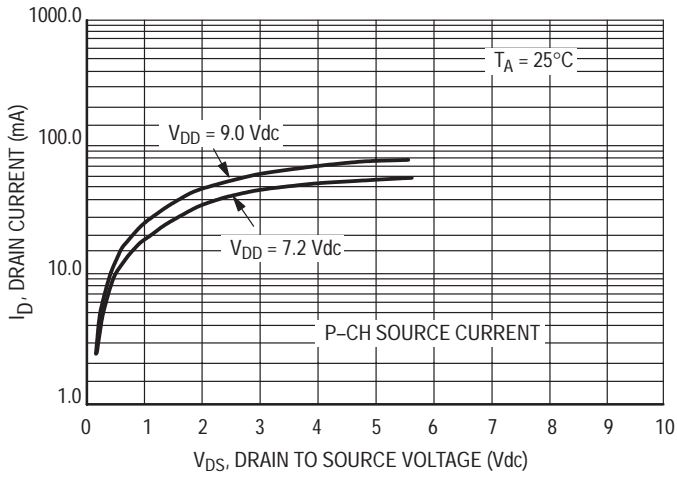


Figure 4. Typical P Horn Driver Output I-V Characteristic

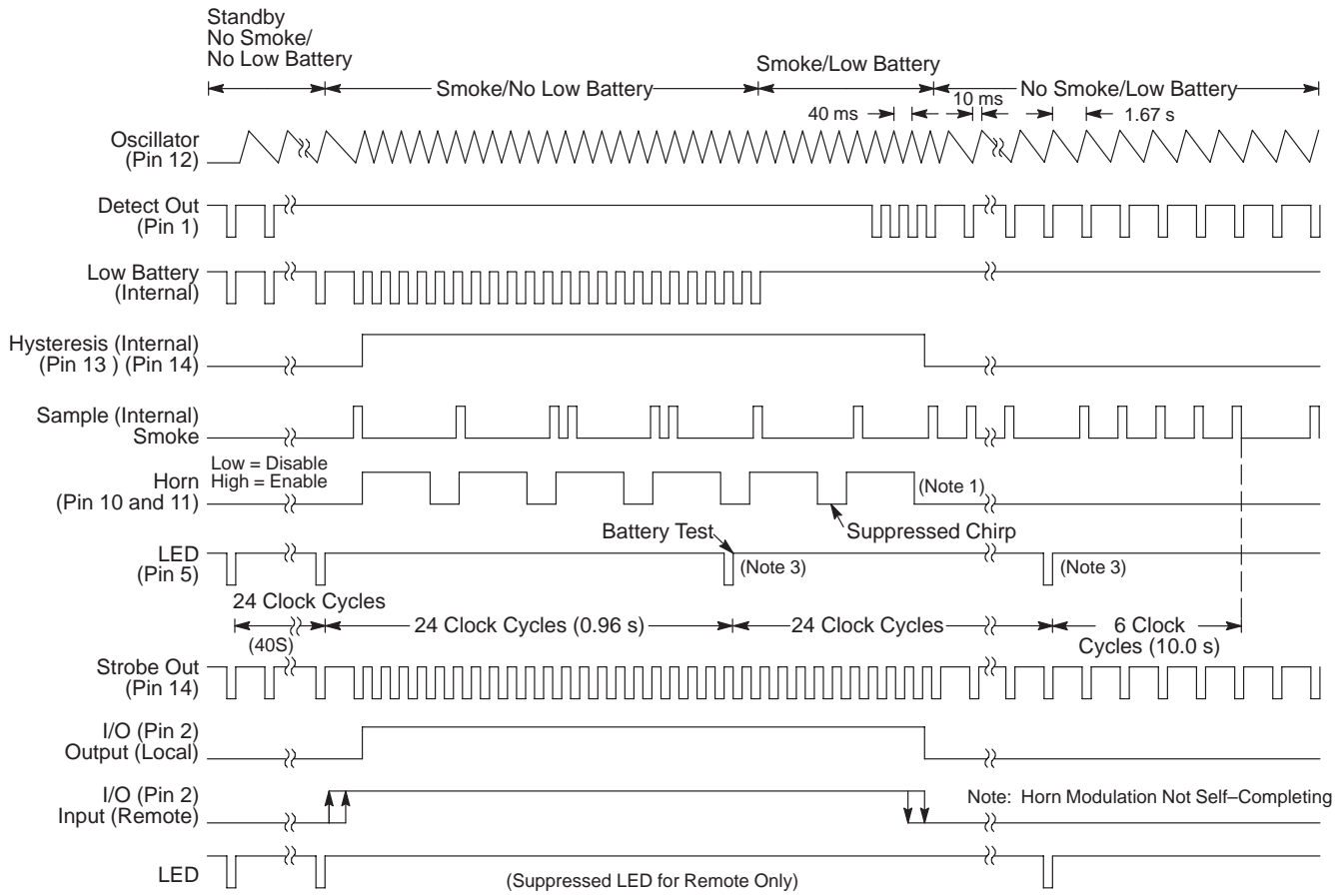
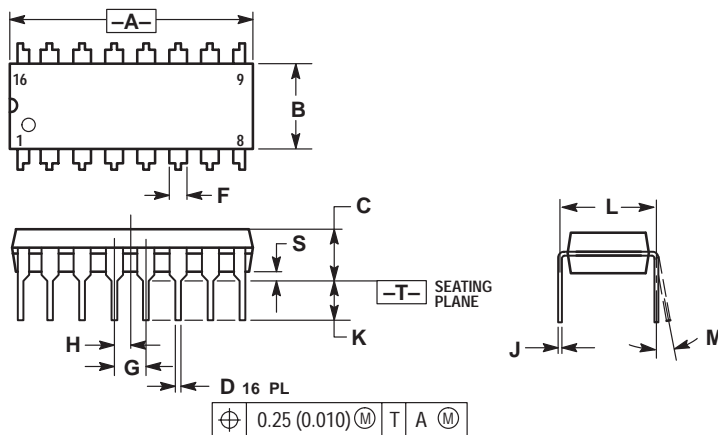


Figure 6. Timing Diagram

NOTES:

1. Horn modulation is self-completing. When going from smoke to no smoke, the alarm condition will terminate only when horn is off.
2. Comparators are strobed on once per clock cycle (1.67 s for no smoke, 40 ms for smoke).
3. Low battery comparator information is latched only during LED pulse.
4. ~ 100 mV p-p swing.

PACKAGE DIMENSIONS




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
 4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
 5. ROUNDED CORNERS OPTIONAL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0°	10°	0°	10°
S	0.020	0.040	0.51	1.01

- | | |
|---|---|
| <p>STYLE 1:</p> <ul style="list-style-type: none"> PIN 1. CATHODE 2. CATHODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE 7. CATHODE 8. CATHODE 9. ANODE 10. ANODE 11. ANODE 12. ANODE 13. ANODE 14. ANODE 15. ANODE 16. ANODE | <p>STYLE 2:</p> <ul style="list-style-type: none"> PIN 1. COMMON DRAIN 2. COMMON DRAIN 3. COMMON DRAIN 4. COMMON DRAIN 5. COMMON DRAIN 6. COMMON DRAIN 7. COMMON DRAIN 8. COMMON DRAIN 9. GATE 10. SOURCE 11. GATE 12. SOURCE 13. GATE 14. SOURCE 15. GATE 16. SOURCE |
|---|---|

**CASE 648-08
ISSUE R**

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SUNSTAR商斯达实业集团是集研发、生产、工程、销售、代理经销、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有10多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一，是一家专业代理和分销世界各大品牌IC芯片和电子元器件的连锁经营综合性国际公司。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商，已在全国范围内建成强大统一的供货和代理分销网络。我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。专业以现代信息产业（计算机、通讯及传感器）三大支柱之一的传感器为主营业务，专业经营各类传感器的代理、销售生产、网络信息、科技图书资料及配套产品设计、工程开发。我们的专业网站——中国传感器科技信息网（全球传感器数据库）www.SENSOR-IC.COM 服务于全球高科技生产商及贸易商，为企业科技产品开发提供技术交流平台。欢迎各厂商互通有无、交换信息、交换链接、发布寻求代理信息。欢迎国外高科技传感器、变送器、执行器、自动控制产品厂商介绍产品到中国，共同开拓市场。本网站是关于各种传感器-变送器-仪器仪表及工业自动化大型专业网站，深入到工业控制、系统工程计 测量、自动化、安防报警、消费电子等众多领域，把最新的传感器-变送器-仪器仪表买卖信息，最新技术供求，最新采购商，行业动态，发展方向，最新的技术应用和市场资讯及时的传递给广大科技开发、科学研究、产品设计人员。本网站已成功为石油、化工、电力、医药、生物、航空、航天、国防、能源、冶金、电子、工业、农业、交通、汽车、矿山、煤炭、纺织、信息、通信、IT、安防、环保、印刷、科研、气象、仪器仪表等领域从事科学研究、产品设计、开发、生产制造的科技人员、管理人员、和采购人员提供满意服务。我们公司专业生产、代理、经销、销售各种传感器、变送器、敏感元器件、开关、执行器、仪器仪表、自动化控制系统：专业从事设计、生产、销售各种传感器、变送器、各种测控仪表、热工仪表、现场控制器、计算机控制系统、数据采集系统、各类环境监控系统、专用控制系统应用软件以及嵌入式系统开发及应用等工作。如热敏电阻、压敏电阻、温度传感器、温度变送器、湿度传感器、湿度变送器、气体传感器、气体变送器、压力传感器、压力变送、称重传感器、物（液）位传感器、物（液）位变送器、流量传感器、流量变送器、电流（压）传感器、溶氧传感器、霍尔传感器、图像传感器、超声波传感器、位移传感器、速度传感器、加速度传感器、扭距传感器、红外传感器、紫外传感器、火焰传感器、激光传感器、振动传感器、轴角传感器、光电传感器、接近传感器、干簧管传感器、继电器传感器、微型电泵、磁敏（阻）传感器、压力开关、接近开关、光电开关、色标传感器、光纤传感器、齿轮测速传感器、时间继电器、计数器、计米器、温控仪、固态继电器、调压模块、电磁铁、电压表、电流表等特殊传感器。同时承接传感器应用电路、产品设计和自动化工程项目。

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