



Photoelectric Smoke Detector IC with I/O

The CMOS MC145010 is an advanced smoke detector component containing sophisticated very-low-power analog and digital circuitry. The IC is used with an infrared photoelectric chamber. Detection is accomplished by sensing scattered light from minute smoke particles or other aerosols. When detection occurs, a pulsating alarm is sounded via on-chip push-pull drivers and an external piezoelectric transducer.

The variable-gain photo amplifier allows direct interface to IR detectors (photodiodes). Two external capacitors, C1 and C2, C1 being the larger, determine the gain settings. Low gain is selected by the IC during most of the standby state. Medium gain is selected during a local-smoke condition. High gain is used during pushbutton test. During standby, the special monitor circuit which periodically checks for degraded chamber sensitivity uses high gain, also.

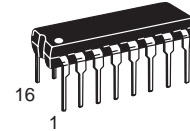
The I/O pin, in combination with V_{SS} , can be used to interconnect up to 40 units for common signaling. An on-chip current sink provides noise immunity when the I/O is an input. A local-smoke condition activates the short-circuit-protected I/O driver, thereby signaling remote smoke to the interconnected units. Additionally, the I/O pin can be used to activate escape lights, enable auxiliary or remote alarms, and/or initiate auto-dialers.

While in standby, the low-supply detection circuitry conducts periodic checks using a pulsed load current from the LED pin. The trip point is set using two external resistors. The supply for the MC145010 can be a 9 V battery.

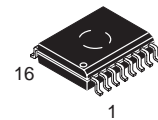
A visible LED flash accompanying a pulsating audible alarm indicates a local-smoke condition. A pulsating audible alarm with no LED flash indicates a remote-smoke condition. A beep or chirp occurring virtually simultaneously with an LED flash indicates a low-supply condition. A beep occurring half-way between LED flashes indicates degraded chamber sensitivity. A low-supply condition does not affect the smoke detection capability if $V_{DD} \geq 6$ V. Therefore, the low-supply condition and degraded chamber sensitivity can be further distinguished by performing a pushbutton (chamber) test.

- Circuit is designed to operate in smoke detector systems that comply with UL217 and UL268 Specifications
- Operating Voltage Range: 6 to 12 V
- Operating Temperature Range: - 10 to 60°C
- Average Supply Current: 12 μ A
- Power-On Reset Places IC in Standby Mode (Non-Alarm State)
- Electrostatic Discharge (ESD) and Latch Up Protection Circuitry on All Pins
- Chip Complexity: 2000 FETs, 12 NPNs, 16 Resistors, and 10 Capacitors
- Ideal for battery powered applications.

MC145010



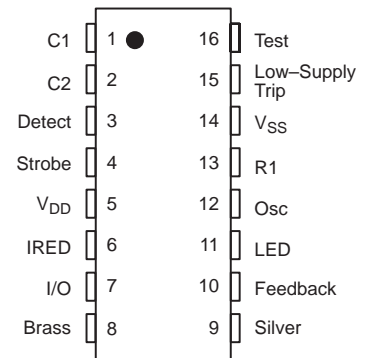
**P SUFFIX
PLASTIC DIP
CASE 648-08**



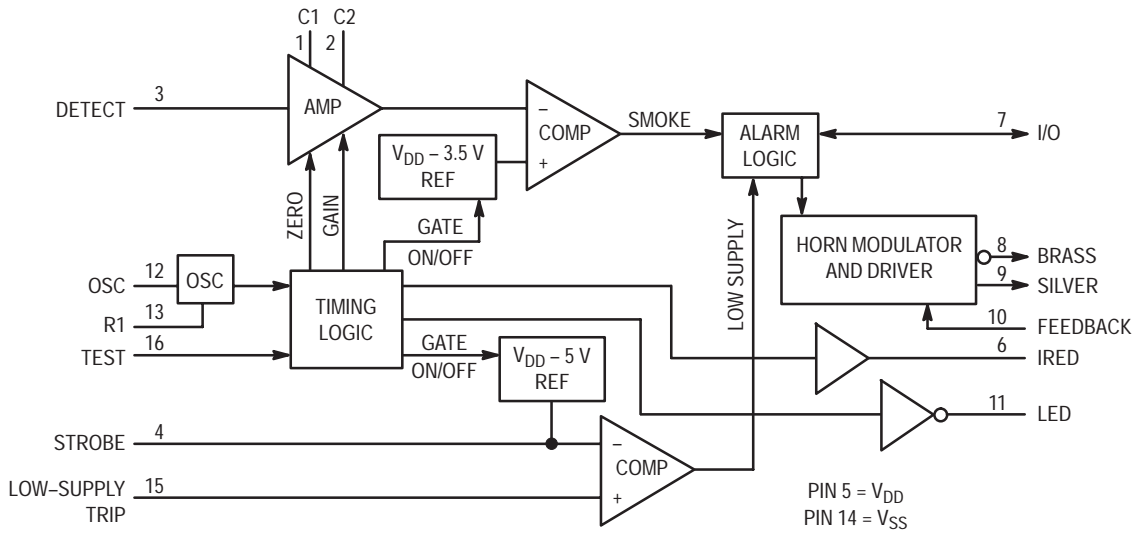
**DW SUFFIX
SOG PACKAGE
CASE 751G-03**

ORDERING INFORMATION
MC145010P PLASTIC DIP
MC145010DW SOG PACKAGE

PIN ASSIGNMENT



BLOCK DIAGRAM



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

Symbol	Parameter	Value	Unit
V_{DD}	DC Supply Voltage	-0.5 to +12	V
V_{in}	DC Input Voltage C1, C2, Detect Osc, Low-Supply Trip I/O Feedback Test	-0.25 to $V_{DD} + 0.25$ -0.25 to $V_{DD} + 0.25$ -0.25 to $V_{DD} + 10$ -15 to +25 -1.0 to $V_{DD} + 0.25$	V
I_{in}	DC Input Current, per Pin	± 10	mA
I_{out}	DC Output Current, per Pin	± 25	mA
I_{DD}	DC Supply Current, V_{DD} and V_{SS} Pins	+25 / -150	mA
P_D	Power Dissipation in Still Air, 5 Seconds Continuous	1200** 350***	mW
T_{stg}	Storage Temperature	-55 to +125	$^{\circ}C$
T_L	Lead Temperature, 1 mm from Case for 10 Seconds	260	$^{\circ}C$

*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics tables.

** Derating: -12 mW/ $^{\circ}C$ from 25 $^{\circ}$ to 60 $^{\circ}C$.

*** Derating: -3.5 mW/ $^{\circ}C$ from 25 $^{\circ}$ to 60 $^{\circ}C$.

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation, V_{in} and V_{out} should be constrained to the range $V_{SS} \leq (V_{in} \text{ or } V_{out}) \leq V_{DD}$ except for the I/O, which can exceed V_{DD} , and the Test input, which can go below V_{SS} .

Unused inputs must always be tied to an appropriate logic voltage level (e.g., either V_{SS} or V_{DD}). Unused outputs and/or an unused I/O must be left open.

ELECTRICAL CHARACTERISTICS ($T_A = -10$ to 60°C Unless Otherwise Indicated, Voltages Referenced to V_{SS})

Symbol	Parameter	Test Condition	V_{DD} V	Min	Max	Unit	
V_{DD}	Power Supply Voltage Range		—	6.0	12	V	
V_{TH}	Supply Threshold Voltage, Low-Supply Alarm	Low-Supply Trip: $V_{in} = V_{DD}/3$	—	6.5	7.8	V	
I_{DD}	Average Operating Supply Current (per Package)	Standby Configured per Figure 5	12.0	—	12	μA	
i_{DD}	Peak Supply Current (per Package)	During Strobe On, IRED Off Configured per Figure 5	12.0	—	2.0	mA	
		During Strobe On, IRED On Configured per Figure 5	12.0	—	3.0		
V_{IL}	Low-Level Input Voltage	I/O	9.0	—	1.5	V	
		Feedback	9.0	—	2.7		
		Test	9.0	—	7.0		
V_{IH}	High-Level Input Voltage	I/O	9.0	3.2	—	V	
		Feedback	9.0	6.3	—		
		Test	9.0	8.5	—		
I_{in}	Input Current	OSC, Detect	$V_{in} = V_{SS}$ or V_{DD}	12.0	—	± 100	nA
		Low-Supply Trip	$V_{in} = V_{SS}$ or V_{DD}	12.0	—	± 100	
		Feedback	$V_{in} = V_{SS}$ or V_{DD}	12.0	—	± 100	
I_{IL}	Low-Level Input Current	Test	$V_{in} = V_{SS}$	12.0	—	-1	μA
I_{IH}	Pull-Down Current	Test	$V_{in} = V_{DD}$	9.0	0.5	10	μA
		I/O	No Local Smoke, $V_{in} = V_{DD}$	9.0	25	100	
			No Local Smoke, $V_{in} = 17\text{ V}$	12.0	—	140	
V_{OL}	Low-Level Output Voltage	LED	$I_{out} = 10\text{ mA}$	6.5	—	0.6	V
		Silver, Brass	$I_{out} = 16\text{ mA}$	6.5	—	1.0	
V_{OH}	High-Level Output Voltage	Silver, Brass	$I_{out} = -16\text{ mA}$	6.5	5.5	—	V
V_{out}	Output Voltage (For Line Regulation, See Pin Descriptions)	Strobe	Inactive, $I_{out} = -1\text{ }\mu\text{A}$ Active, $I_{out} = 100\text{ }\mu\text{A}$ to $500\text{ }\mu\text{A}$ (Load Regulation)	— 9.0	$V_{DD} - 0.1$ $V_{DD} - 4.4$	— $V_{DD} - 5.6$	V
		IRED	Inactive, $I_{out} = 1\text{ }\mu\text{A}$ Active, $I_{out} = 6\text{ mA}$ (Load Regulation)	— 9.0	— 2.25*	0.1 3.75*	
I_{OH}	High-Level Output Current	I/O	Local Smoke, $V_{out} = 4.5\text{ V}$	6.5	-4	—	mA
			Local Smoke, $V_{out} = V_{SS}$ (Short Circuit Current)	12.0	—	-16	
I_{OZ}	Off-State Output Leakage Current	LED	$V_{out} = V_{SS}$ or V_{DD}	12.0	—	± 1	μA
V_{IC}	Common Mode Voltage Range	C1, C2, Detect	Local Smoke, Pushbutton Test, or Chamber Sensitivity Test	—	$V_{DD} - 4$	$V_{DD} - 2$	V
V_{ref}	Smoke Comparator Reference Voltage	Internal	Local Smoke, Pushbutton Test, or Chamber Sensitivity Test	—	$V_{DD} - 3.08$	$V_{DD} - 3.92$	V

* $T_A = 25^\circ\text{C}$ only.

AC ELECTRICAL CHARACTERISTICS (Reference Timing Diagram Figures 3 and 4)

(T_A = 25°C, V_{DD} = 9.0 V, Component Values from Figure 5: R1 = 100.0 KΩ, C3 = 1500.0 pF, R2 = 10.0 MΩ)

No.	Symbol	Parameter	Test Condition	Clocks	Min	Max	Unit
1	1/f _{osc}	Oscillator Period*	Free-Running Sawtooth Measured at Pin 12	1	9.5	11.5	ms
2	t _{LED}	LED Pulse Period	No Local Smoke, and No Remote Smoke	4096	38.9	47.1	s
3			Remote Smoke, but No Local Smoke	—	None		
4			Local Smoke or Pushbutton Test	64	0.60	0.74	
5	t _{w(LED)} , t _{w(stb)}	LED Pulse Width and Strobe Pulse Width		1	9.5	11.5	ms
6	t _{IREd}	IRED Pulse Period	Smoke Test	1024	9.67	11.83	s
7			Chamber Sensitivity Test, without Local Smoke	4096	38.9	47.1	
8			Pushbutton Test	32	0.302	0.370	
9	t _{w(IRED)}	IRED Pulse Width		T _f *	94	116	μs
10	t _r	IRED Rise Time		—	—	30	μs
	t _f	IRED Fall Time		—	—	200	
11	t _{mod}	Silver and Brass Modulation Period	Local or Remote Smoke	—	297	363	ms
11,12	t _{on} /t _{mod}	Silver and Brass Duty Cycle	Local or Remote Smoke	—	73	77	%
13	t _{CH}	Silver and Brass Chirp Pulse Period	Low Supply or Degraded Chamber Sensitivity	4096	38.9	47.1	s
14	t _{w(CH)}	Silver and Brass Chirp Pulse Width	Low Supply or Degraded Chamber Sensitivity	1	9.5	11.5	ms
15	t _{RR}	Rising Edge on I/O to Smoke Alarm Response Time	Remote Smoke, No Local Smoke	—	—	800	ms
16	t _{stb}	Strobe Out Pulse Period	Smoke Test	1024	9.67	11.83	s
17			Chamber Sensitivity Test, without Local Smoke	4096	38.9	47.1	
18			Low Supply Test, without Local Smoke	4096	38.9	47.1	
19			Pushbutton Test	—	0.302	0.370	

*Oscillator period T (= T_r + T_f) is determined by the external components R1, R2, and C3 where T_r = (0.6931) R₂ * C₃ and T_f = (0.6931) R₁ * C₃. The other timing characteristics are some multiple of the oscillator timing as shown in the table.

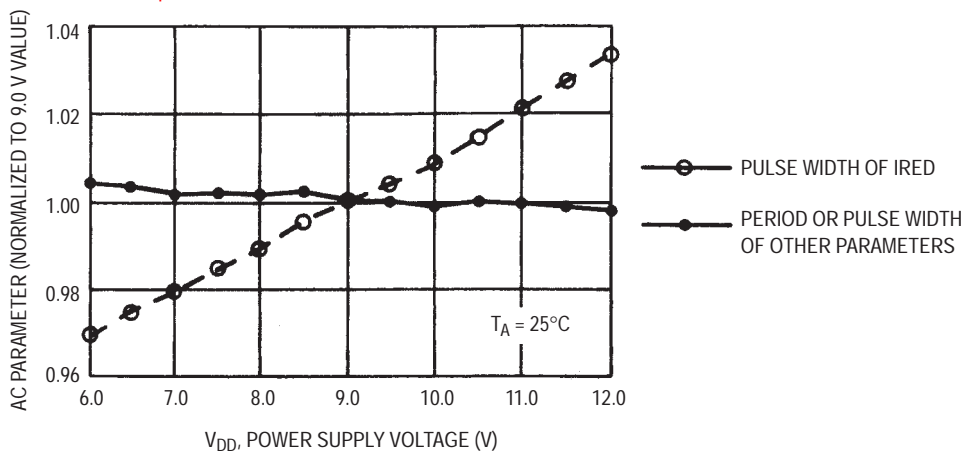
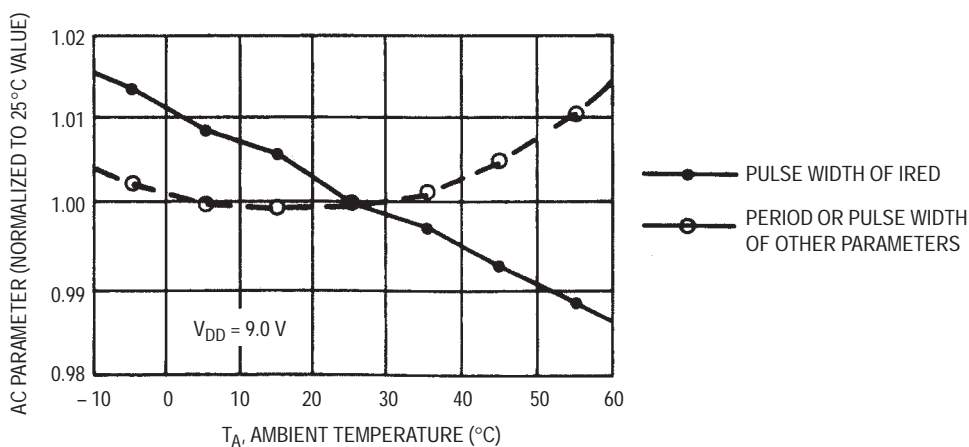
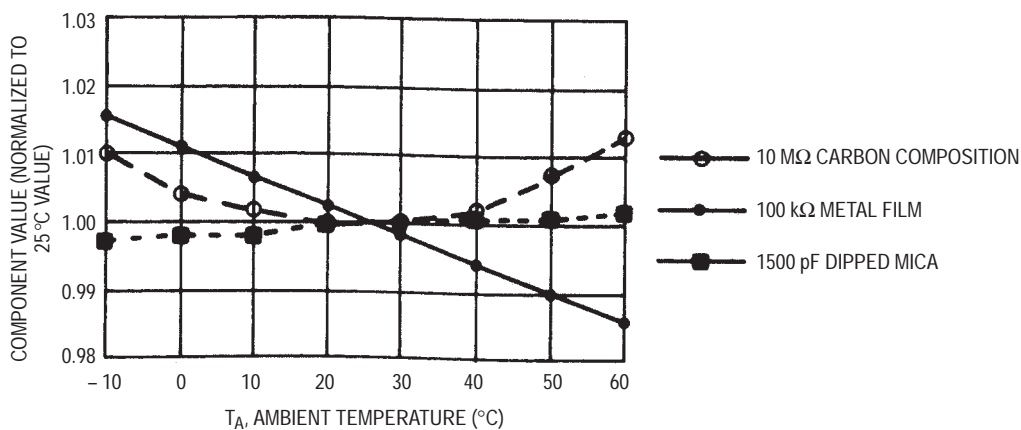


Figure 1. AC Characteristics versus Supply



NOTE: Includes external component variations. See Figure 2B.

Figure 2A. AC Characteristics versus Temperature



NOTE: These components were used to generate Figure 2A.

Figure 2B. RC Component Variation Over Temperature

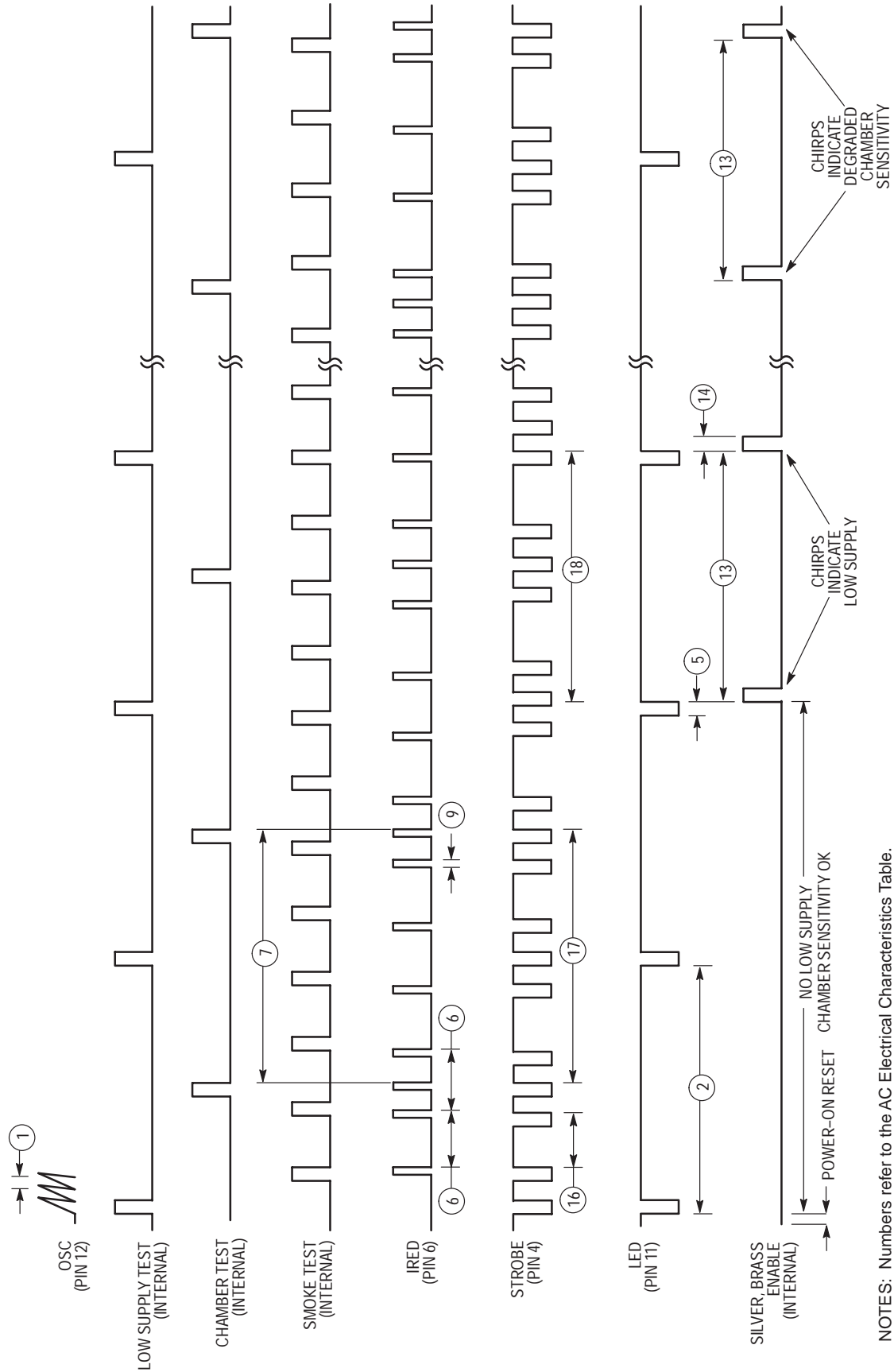


Figure 3. Standby Timing Diagram

NOTES: Numbers refer to the AC Electrical Characteristics Table.
Illustration is not to scale.

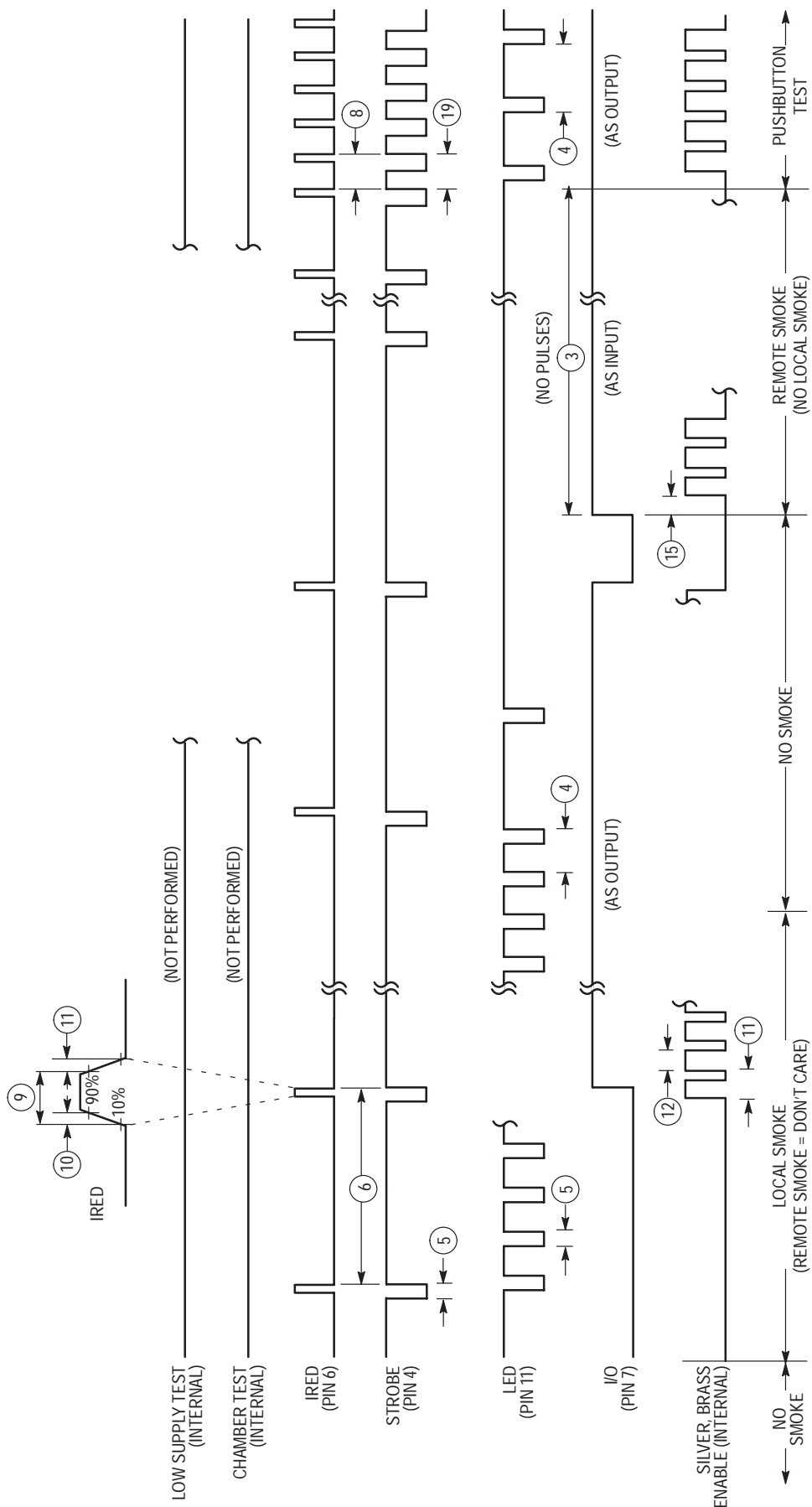
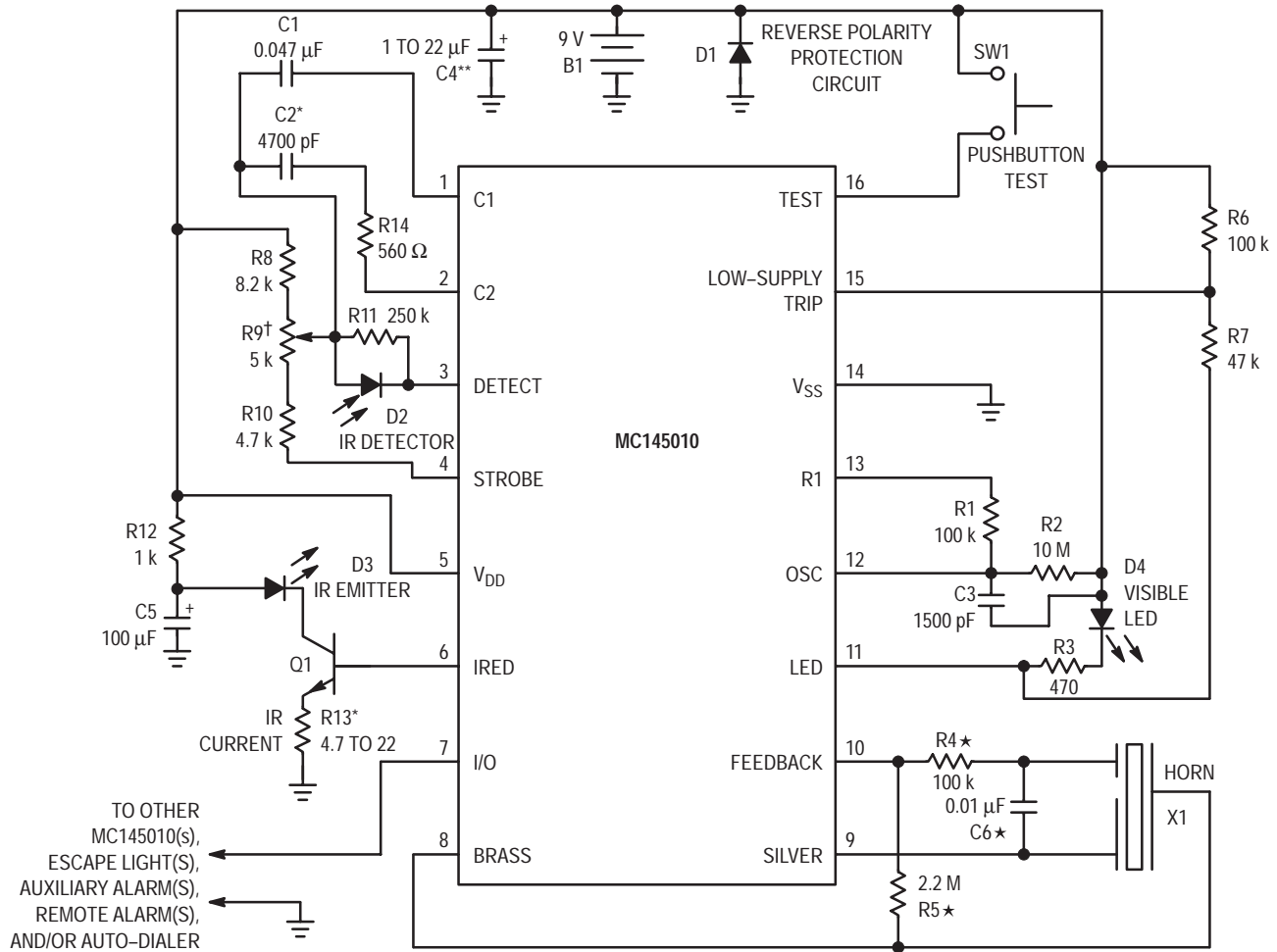


Figure 4. Smoke Timing Diagram

NOTES: Numbers refer to the AC Electrical Characteristics Table. Illustration is not to scale.



*Values for R4, R5, and C6 may differ depending on type of piezoelectric horn used.
 * C2 and R13 are used for coarse sensitivity adjustment. Typical values are shown.
 †R9 is for fine sensitivity adjustment (optional). If fixed resistors are used, R8 = 12 k, R10 is 5.6 k to 10 k, and R9 is eliminated.
 When R9 is used, noise pickup is increased due to antenna effects. Shielding may be required.
 **C4 should be 22 μF if B1 is a carbon battery. C4 could be reduced to 1 μF when an alkaline battery is used.

Figure 5. Typical Battery-Powered Application

PIN DESCRIPTIONS

C1 (Pin 1)

A capacitor connected to this pin as shown in Figure 5 determines the gain of the on-chip photo amplifier during pushbutton test and chamber sensitivity test (high gain). The capacitor value is chosen such that the alarm is tripped from background reflections in the chamber during pushbutton test.

$A_v \approx 1 + (C1/10)$ where C1 is in pF. CAUTION: The value of the closed-loop gain should not exceed 10,000.

C2 (Pin 2)

A capacitor connected to this pin as shown in Figure 5 determines the gain of the on-chip photo amplifier except during pushbutton or chamber sensitivity tests.

$A_v \approx 1 + (C2/10)$ where C2 is in pF. This gain increases about 10% during the IRED pulse, after two consecutive local smoke detections.

Resistor R14 must be installed in series with C2. $R14 \approx [1/(12\sqrt{C2})] - 680$ where R14 is in ohms and C2 is in farads.

DETECT (Pin 3)

This input to the high-gain pulse amplifier is tied to the cathode of an external photodiode. The photodiode should have low capacitance and low dark leakage current. The diode must be shunted by a load resistor and is operated at zero bias.

The Detect input must be ac/dc decoupled from all other signals, V_{DD}, and V_{SS}. Lead length and/or foil traces to this pin must be minimized, also. See Figure 6.

STROBE (Pin 4)

This output provides a strobed, regulated voltage referenced to V_{DD}. The temperature coefficient of this voltage is $\pm 0.2\%/^{\circ}\text{C}$ maximum from -10° to 60°C . The supply-voltage coefficient (line regulation) is $\pm 0.2\%/V$ maximum from 6 to 12 V. Strobe is tied to external resistor string R8, R9, and R10.

V_{DD} (Pin 5)

This pin is connected to the positive supply potential and may range from +6 to +12 V with respect to V_{SS}. CAUTION: In battery-powered applications, reverse-polarity protection must be provided externally.

IRED (Pin 6)

This output provides pulsed base current for external NPN transistor Q1 used as the infrared emitter driver. Q1 must have $\beta \geq 100$. At 10 mA, the temperature coefficient of the output voltage is typically +0.5%/°C from -10° to 60°C. The supply-voltage coefficient (line regulation) is $\pm 0.2\%/V$ maximum from 6 to 12 V. The IRED pulse width (active-high) is determined by external components R1 and C3. With a 100 k Ω /1500 pF combination, the nominal width is 105 μ s.

To minimize noise impact, IRED is not active when the visible LED and horn outputs are active. IRED is active near the end of Strobe pulses for Smoke Tests, Chamber Sensitivity Test, and Pushbutton Test.

I/O (Pin 7)

This pin can be used to connect up to 40 units together in a wired-OR configuration for common signaling. V_{SS} is used as the return. An on-chip current sink minimizes noise pick up during non-smoke conditions and eliminates the need for an external pull-down resistor to complete the wired-OR. Remote units at lower supply voltages do not draw excessive current from a sending unit at a higher supply voltage.

I/O can also be used to activate escape lights, auxiliary alarms, remote alarms, and/or auto-dialers.

As an input, this pin feeds a positive-edge-triggered flip-flop whose output is sampled nominally every 625 ms during standby (using the recommended component values). A local-smoke condition or the pushbutton-test mode forces this current-limited output to source current. All input signals are ignored when I/O is sourcing current.

I/O is disabled by the on-chip power-on reset to eliminate nuisance signaling during battery changes or system power-up.

If unused, I/O must be left unconnected.

BRASS (Pin 8)

This half of the push-pull driver output is connected to the metal support electrode of a piezoelectric audio transducer and to the horn-starting resistor. A continuous modulated tone from the transducer is a smoke alarm indicating either local or remote smoke. A short beep or chirp is a trouble alarm indicating a low supply or degraded chamber sensitivity.

SILVER (Pin 9)

This half of the push-pull driver output is connected to the ceramic electrode of a piezoelectric transducer and to the horn-starting capacitor.

FEEDBACK (Pin 10)

This input is connected to both the feedback electrode of a self-resonating piezoelectric transducer and the horn-starting resistor and capacitor through current-limiting resistor R4. If unused, this pin must be tied to V_{SS} or V_{DD}.

LED (Pin 11)

This active-low open-drain output directly drives an external visible LED at the pulse rates indicated below. The pulse width is equal to the OSC period.

The load for the low-supply test is applied by this output. This low-supply test is non-coincident with the smoke tests, chamber sensitivity test, pushbutton test, or any alarm signals.

The LED also provides a visual indication of the detector status as follows, assuming the component values shown in Figure 5:

Standby (includes low-supply and chamber sensitivity tests) — Pulses every 43 seconds (nominal)

Local Smoke — Pulses every 0.67 seconds (nominal)

Remote Smoke — No pulses

Pushbutton Test — Pulses every 0.67 seconds (nominal)

OSC (Pin 12)

This pin is used in conjunction with external resistor R2 (10 M Ω) to V_{DD} and external capacitor C3 (1500 pF) to V_{DD} to form an oscillator with a nominal period of 10.5 ms.

R1 (Pin 13)

This pin is used in conjunction with resistor R1 (100 k Ω) to pin 12 and C3 (1500 pF, see pin 12 description) to determine the IRED pulse width. With this RC combination, the nominal pulse width is 105 μ s.

V_{SS} (Pin 14)

This pin is the negative supply potential and the return for the I/O pin. Pin 14 is usually tied to ground.

LOW-SUPPLY TRIP (Pin 15)

This pin is connected to an external voltage which determines the low-supply alarm threshold. The trip voltage is obtained through a resistor divider connected between the V_{DD} and LED pins. The low-supply alarm threshold voltage (in volts) $\approx (5R7/R6) + 5$ where R6 and R7 are in the same units.

TEST (Pin 16)

This input has an on-chip pull-down device and is used to manually invoke a test mode.

The *Pushbutton Test* mode is initiated by a high level at pin 16 (usually depression of a S.P.S.T. normally-open pushbutton switch to V_{DD}). After one oscillator cycle, IRED pulses approximately every 336 ms, regardless of the presence of smoke. Additionally, the amplifier gain is increased by automatic selection of C1. Therefore, the background reflections in the smoke chamber may be interpreted as smoke, generating a simulated-smoke condition. After the second IRED pulse, a successful test activates the horn-driver and I/O circuits. The active I/O allows remote signaling for system testing. When the Pushbutton Test switch is released, the Test input returns to V_{SS} due to the on-chip pull-down device. After one oscillator cycle, the amplifier gain returns to normal, thereby removing the simulated-smoke condition. After two additional IRED pulses, less than a second, the IC exits the alarm mode and returns to standby timing.

CALIBRATION

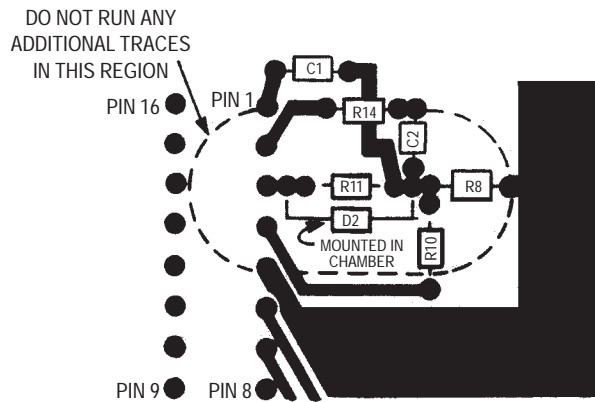
To facilitate checking the sensitivity and calibrating smoke detectors, the MC145010 can be placed in a calibration mode. In this mode, certain device pins are controlled/reconfigured as shown in Table 1. To place the part in the calibration mode, pin 16 (Test) must be pulled below the V_{SS} pin

with 100 μ A continuously drawn out of the pin for at least one cycle on the OSC pin. To exit this mode, the Test pin is floated for at least one OSC cycle.

In the calibration mode, the IRED pulse happens at every clock cycle and strobe is always on (active low). Also, Low Battery and supervisory tests are disabled in this mode.

Table 1. Configuration of Pins in the Calibration Mode

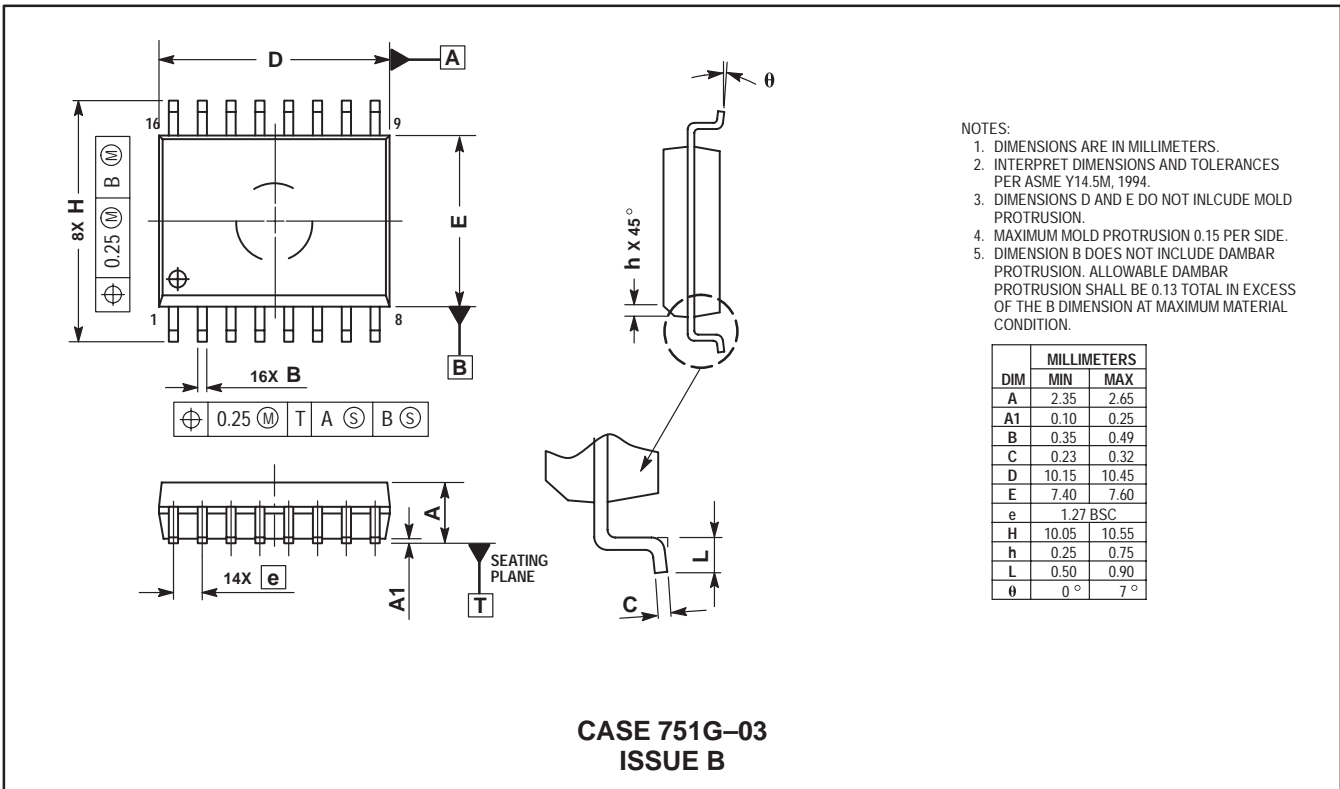
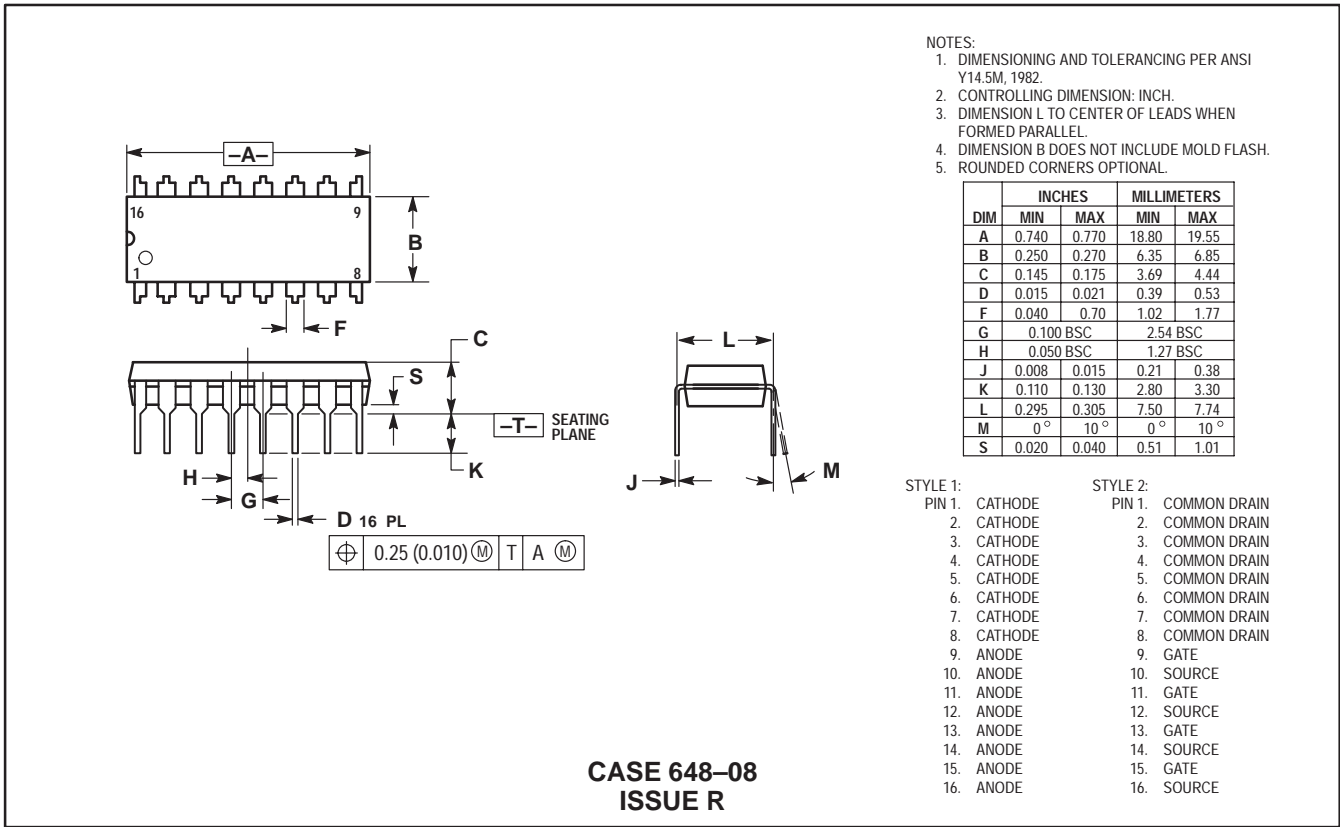
Description	Pin	Comment
I/O	7	Disabled as an output. Forcing this pin high places the photo amp output on pin 1 or 2, as determined by Low-Supply Trip. The amp's output appears as pulses and is referenced to V_{DD} .
Low-Supply Trip	15	If the I/O pin is high, pin 15 controls which gain capacitor is used. Low: normal gain, amp output on pin 1. High: supervisory gain, amp output on pin 2.
Feedback	10	Driving this input high enables hysteresis (10% gain increase) in the photo amp; pin 15 must be low.
OSC	12	Driving this input high brings the internal clock high. Driving the input low brings the internal clock low. If desired, the RC network for the oscillator may be left intact; this allows the oscillator to run similar to the normal mode of operation.
Silver	9	This pin becomes the smoke comparator output. When the OSC pin is toggling, positive pulses indicate that smoke has been detected. A static low level indicates no smoke.
Brass	8	This pin becomes the smoke integrator output. That is, 2 consecutive smoke detections are required for "on" (static high level) and 2 consecutive no-detections for "off" (static low level).




- NOTES: Illustration is bottom view of layout using a DIP. Top view for SOIC layout is mirror image.
 Optional potentiometer R9 is not included.
 Drawing is not to scale.
 Leads on D2, R11, R8, and R10 and their associated traces must be kept as short as possible.
 This practice minimizes noise pick up.
 Pin 3 must be decoupled from all other traces.

Figure 6. Recommended PCB Layout

PACKAGE DIMENSIONS



Mfax is a trademark of Motorola, Inc.

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution; P.O. Box 5405, Denver, Colorado 80217.
1-303-675-2140 or 1-800-441-2447

JAPAN: Motorola Japan Ltd.; SPS, Technical Information Center, 3-20-1, Minami-Azabu, Minato-ku, Tokyo 106-8573 Japan.
81-3-3440-3569

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Centre, 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong. 852-26668334

Customer Focus Center: 1-800-521-6274

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 1-602-244-6609
Motorola Fax Back System – US & Canada ONLY 1-800-774-1848
– <http://sps.motorola.com/mfax/>

HOME PAGE: <http://motorola.com/sps/>



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：专门从事设计、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。

更多产品请看本公司产品专用销售网站：

商斯达中国传感器科技信息网：<http://www.sensor-ic.com/>

商斯达工控安防网：<http://www.pc-ps.net/>

商斯达电子元器件网：<http://www.sunstare.com/>

商斯达微波光电产品网：[HTTP://www.rfoe.net/](http://www.rfoe.net/)

商斯达消费电子产品网：<http://www.icasic.com/>

商斯达军工产品网：<http://www.junpinic.com/>

商斯达实业科技产品网：<http://www.sunstars.cn/> 传感器销售热线：

地址：深圳市福田区福华路福庆街鸿图大厦 1602 室

电话：0755-83607652 83376489 83376549 83370250 83370251 82500323

传真：0755-83376182 (0) 13902971329 MSN: SUNS888@hotmail.com

邮编：518033 E-mail: szss20@163.com QQ: 195847376

深圳赛格展销部：深圳华强北路赛格电子市场 2583 号 电话：0755-83665529 25059422

技术支持：0755-83394033 13501568376

欢迎索取免费详细资料、设计指南和光盘；产品凡多，未能尽录，欢迎来电查询。

北京分公司：北京海淀区知春路 132 号中发电子大厦 3097 号

TEL: 010-81159046 82615020 13501189838 FAX: 010-62543996

上海分公司：上海市北京东路 668 号上海赛格电子市场 D125 号

TEL: 021-28311762 56703037 13701955389 FAX: 021-56703037

西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL: 029-81022619 13072977981 FAX:029-88789382

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：专门从事设计、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。

更多产品请看本公司产品专用销售网站：

商斯达中国传感器科技信息网：<http://www.sensor-ic.com/>

商斯达工控安防网：<http://www.pc-ps.net/>

商斯达电子元器件网：<http://www.sunstare.com/>

商斯达微波光电产品网：[HTTP://www.rfoe.net/](http://www.rfoe.net/)

商斯达消费电子产品网：<http://www.icasic.com/>

商斯达军工产品网：<http://www.junpinic.com/>

商斯达实业科技产品网：<http://www.sunstars.cn/> 传感器销售热线：

地址：深圳市福田区福华路福庆街鸿图大厦 1602 室

电话：0755-83607652 83376489 83376549 83370250 83370251 82500323

传真：0755-83376182 (0) 13902971329 MSN: SUNS888@hotmail.com

邮编：518033 E-mail: szss20@163.com QQ: 195847376

深圳赛格展销部：深圳华强北路赛格电子市场 2583 号 电话：0755-83665529 25059422

技术支持：0755-83394033 13501568376

欢迎索取免费详细资料、设计指南和光盘；产品凡多，未能尽录，欢迎来电查询。

北京分公司：北京海淀区知春路 132 号中发电子大厦 3097 号

TEL: 010-81159046 82615020 13501189838 FAX: 010-62543996

上海分公司：上海市北京东路 668 号上海赛格电子市场 D125 号

TEL: 021-28311762 56703037 13701955389 FAX: 021-56703037

西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL: 029-81022619 13072977981 FAX: 029-88789382