

PROXIMITY DETECTOR ELECTRO-MAGNETIC PROXIMITY SENSING ICs

DESCRIPTION

The CS 191 and CS 209 are Bipolar Monolithic Integrated Circuits for Proximity sensing applications. The circuit (see Figure 1) contains an on-chip regulated supply, oscillator, demodulator, level detector, and output stages.

The Oscillator, together with an external LC network, provides controlled oscillations where the amplitude is highly dependant on the Q of the LC network. During low Q conditions, a variable low level feedback is applied to maintain oscillation. The peak demodulator detects the negative portion of the oscillator envelope and the demodulated waveform is then compared to an internal reference by the level detector.

The CS 191 has four outputs; two high level, with external loads and two low level with internal loads.

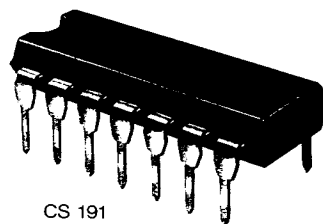
The CS 209 has two high level outputs with external loads.

A non-inverting amplifier is provided in the CS 191 for a high level buffered output. The current sink circuit provides a constant discharge current at the input of the amplifier.

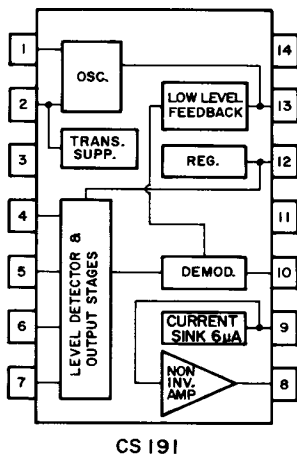
Both the CS 191 and CS 209 contain transient suppression circuits which absorb negative transients at the tank circuit terminal.



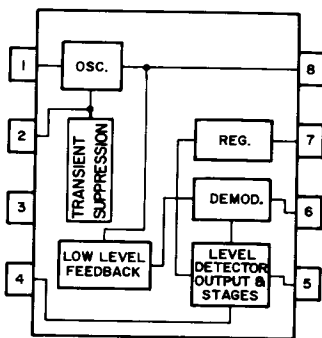
CS 209



CS 191



CS 191



CS 209

Figure 1. Block Diagrams

FEATURES

- Regulated Supply
- Negative Transient Suppression
- Variable Low Level Feedback

APPLICATIONS

- Ignitions
- Coin Sensors
- Metal Detectors
- Proximity Switches

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	24 V
Power Dissipation ($T_A = 125^{\circ}\text{C}$)	200 mW
Storage Temperature Range	-55°C to $+150^{\circ}\text{C}$
Operating Temperature Range	-40°C to $+125^{\circ}\text{C}$
Junction Temperature	150°C

SPECIFICATIONS ($T_A = 25^\circ\text{C}$ and $V_{CC} = 20\text{V}$ unless otherwise noted)

PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Operating Voltage	V_7/V_{12} CS 209/CS 191	4		24	V
Supply Current	I_7/I_{12} $V_{CC} = 4.0V$. CS 209/CS 191		4.5	6	mA
Sink Current	I_9 CS 191	4	6	9	μA
Output Saturation Voltage:					
CS 209	V_4 $I_4 = 124 \text{ mA}$		0.2	0.5	V
CS 209	V_5 $I_5 = 124 \text{ mA}$		0.2	0.5	V
CS 191	V_4 $I_4 = 124 \text{ mA}$		0.2	0.5	V
CS 191	V_5 $I_5 = 2 \text{ mA}$		0.03	0.5	V
CS 191	V_6 $I_6 = 124 \text{ mA}$		0.2	0.5	V
CS 191	V_7 $I_7 = 2 \text{ mA}$		0.03	0.5	V
Charge Current	I_6 (CS 209), I_{10} (CS 191)	20	30	40	μA
Leakage Current:					
CS 209/CS 191	I_4 $V_4 = 24V$			100	μA
CS 209	I_5 $V_5 = 24V$			100	μA
CS 191	I_6 $V_6 = 24V$			100	μA
CS 191	I_8 $V_8 = 24V$			100	μA
High State Output Voltage	$V_{12}-V_5$ CS 191			0.5	V
High State Output Voltage	$V_{12}-V_7$ CS 191			0.5	V
Non-Inverting Amp. Trip Point	V_9 CS 191	1.3	1.42	1.55	V

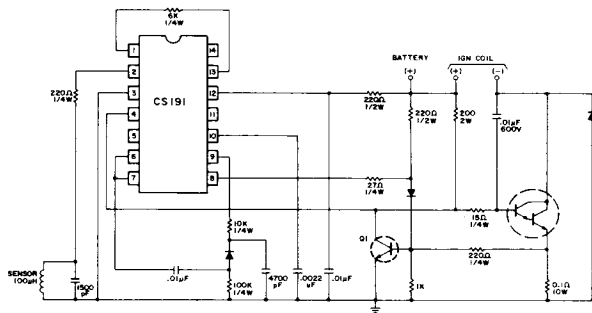


Figure 2. Typical Ignition Circuit

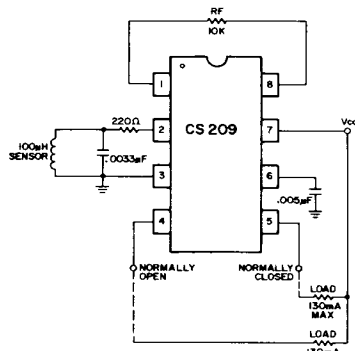


Figure 3. Proximity Switch

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