

IH5003/IH5004 2-Channel Drivers with SPST FET Switches (Gate Available)

FEATURES

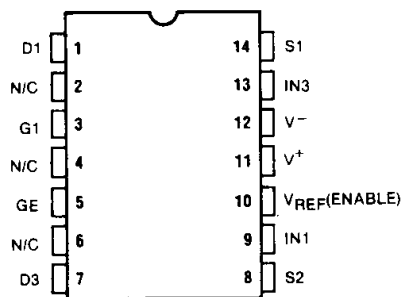
- Gate Lead Available for Nulling Charge Injection Voltage
- Each Channel Complete—Interfaces With Most Integrated Logic
- Low OFF Power Dissipation, ~ 1 mW
- Switches Analog Signals up to 20 Volts Peak-to-Peak
- Low $r_{DS(ON)}$, 30Ω Max on IH5003

GENERAL DESCRIPTION

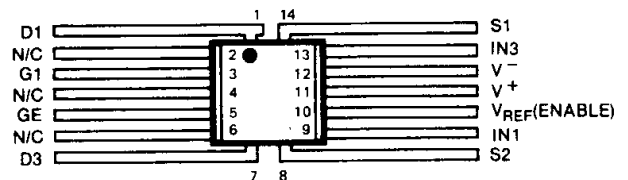
These switching circuits contain two channels in one package, each channel consisting of a driver circuit controlling a SPST junction FET switch. The driver interfaces DTL, TTL, or RTL logic signals for multiplexing, commutating,

and D/A converter applications, which permits logic design directly with the switch function. Logic "1" at the input turns the FET switch ON, and logic "0" turns it OFF. The gate lead of the FETs has been brought out to enable the application of a referral resistor for nulling out offset voltage due to charge injection.

PIN CONFIGURATIONS

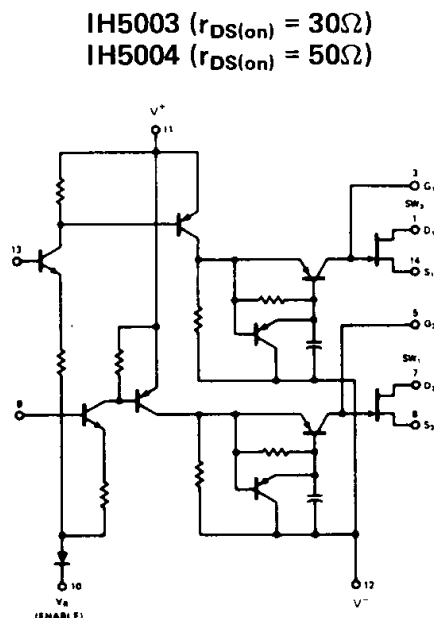


OUTLINE DWGS JD, DD, PD

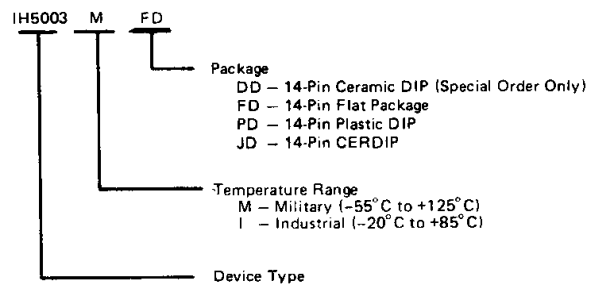


OUTLINE DWG FD-2

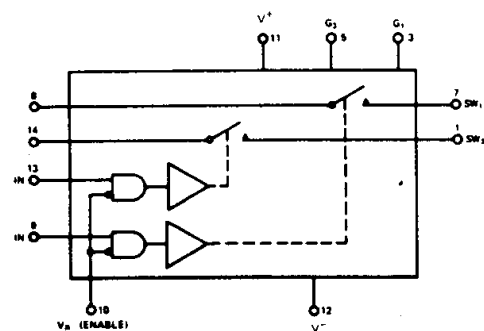
SCHEMATIC AND LOGIC DIAGRAMS



ORDERING INFORMATION



NOTE: Military temperature range not available in plastic package.



ABSOLUTE MAXIMUM RATINGS

| | |
|--|---------------|
| Analog Signal Voltage ($V_A - V^-$ or $V^+ - V_A$) | 30V |
| Total Supply Voltage ($V^+ - V^-$) | 36V |
| Pos. Supply Voltage to Ref. Voltage ($V^+ - V_R$) | 25V |
| Ref. Voltage to Neg. Supply Voltage ($V_R - V^-$) | 22V |
| Power Dissipation (Note) | 750 mW |
| Current (Any Terminal) | 30 mA |
| Storage Temperature | -65 to +150°C |
| Operating Temperature | -55 to +125°C |
| Lead Temperature (Soldering, 10 sec) | 300°C |

NOTE: Dissipation rating assumes device is mounted with all lead welded or soldered to printed circuit board in ambient temperature below 70°C. For higher temperature, derate at a rate of 10 mW/°C.

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these and any other conditions above those indicated in the operation sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

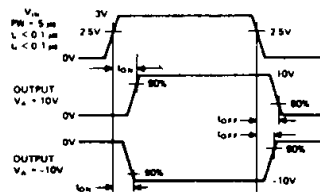
Applied Voltages for all tests: $V^+ = +12V$, $V^- = -18V$, GND = 0. Input test condition which guarantees FET switch ON or OFF as specified is used for output and power supply specifications.

3

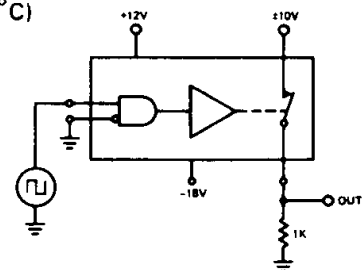
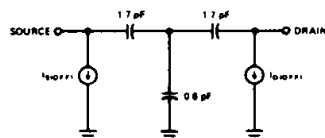
| | SYMBOL (NOTE) | CHARACTERISTIC | TYPE | ABSOLUTE MAX LIMIT | | | UNITS | TEST CONDITIONS |
|---------------|-------------------------|--|---------------|--------------------|---------|---------|-------------------------|-------------------------------------|
| | | | | -55° | 25° | 125° | | |
| INPUT | $V_{IN(ON)}$ | Input Voltage-ON | Both | 2.9 min | 2.5 min | 2.0 min | Volts | $V^- = -12V$ |
| | $V_{IN(OFF)}$ | Input Voltage-OFF | | 1.4 | 1.0 | 0.6 | Volts | $V^- = -12V$ |
| | $I_{IN(ON)}$ | Input Current | Circuits | 120 | 60 | 60 | μA | $V_{IN} = 2.5V$ |
| | $I_{IN(OFF)}$ | Input Leakage Current | | 0.1 | 0.1 | 2 | μA | $V_{IN} = 0.8V$ |
| SWITCH OUTPUT | $r_{DS(ON)}$ | Drain-Source ON Resistance | IH5003 | 30 | 30 | 50 | Ω | $V_D = 10V, I_S = 10 mA$ |
| | | | IH5004 | 50 | 50 | 85 | Ω | |
| | $I_{D(ON)} + I_{S(ON)}$ | Drive Leakage Current | Both Circuits | | 2 | 100 | nA | $V_D = V_S = -10V$ |
| | $I_{S(OFF)}$ | Source Leakage Current | | | 1 | 100 | nA | $V_S = 10V, V_D = -10V$ |
| $I_{D(OFF)}$ | Drain Leakage Current | | | 1 | 100 | nA | $V_D = 10V, V_S = -10V$ | |
| POWER SUPPLY | I^+ | Positive Power Supply Drain Current | Both Circuits | | 3 | | mA | One Driver ON, $V_{IN} = 2.5V$ |
| | I^- | Negative Power Supply Drain Current | | | -1.8 | | mA | |
| | I_{REF} | Reference Power Supply Drain Current | | | -1.4 | | mA | |
| | I^+_{LK} | Positive Power Supply Leakage Current | | | 25 | | μA | Both Drivers OFF $V_{IN} = 0.8V$ |
| | I^-_{LK} | Negative Power Supply Leakage Current | | | -25 | | μA | |
| | I_{RLK} | Reference Power Supply Leakage Current | | | -25 | | μA | |
| SWITCH | t_{on} | Turn-ON Time | Both Circuits | | 0.3 | 0.5 | μs | See Below |
| | t_{off} | Turn-OFF Time | | | 0.8 | 1.2 | μs | |
| POWER | P_{ON} | ON Driver Power | Both Circuits | | 175 | | mW | Both Inputs $V_{IN} = 2.5$ |
| | P_{OFF} | OFF Driver Power | | | 1 | | mW | Both Inputs $V_{IN} = 1V$ |
| FET | $V_{GS(I)}$ | Gate Source Forward Voltage | Both Circuits | | 1.5 | | Volts | $I_G = 1.0 mA, V_{DS} = 0$ |

NOTE: (OFF) and (ON) subscript notation refers to the conduction state of the FET switch for the given test.

SWITCHING TIMES (at 25°C)



OFF MODEL



ON MODEL

