AM2009/AM2009C, MM4504/MM5504
6-Channel MOS Multiplex Switches

General Description

The AM2009/AM2009C/MM4504/MM5504 are six channel multiplex switches constructed on a single silicon chip using low threshold P-channel MOS process. The gate of each MOS device is protected by a diode circuit.

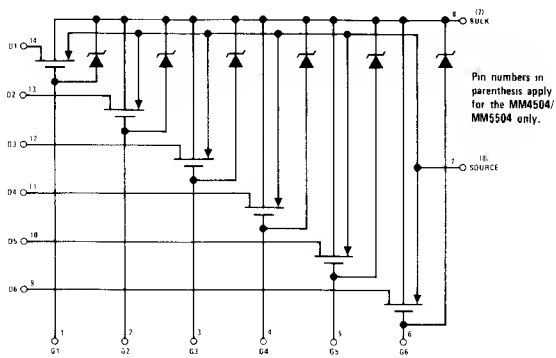
The AM2009/AM2009C/MM4504/MM5504 are designed for applications such as time division multiplexing of analog or digital signals. Switching speeds are primarily determined by conditions external to the device such as signal source impedance, capacitive loading and the total number of channels used in parallel.

The AM2009/MM4504 are specified for operation over the -55°C to +125°C military temperature range. The AM2009C/MM5504 are specified for operation over the -25°C to +85°C temperature range.

Features

- Typical low "on" resistance 150Ω
- Typical low "off" leakage 100 pA
- Typical large analog voltage range ±10V
- Zero inherent offset voltage
- Normally off with zero gate voltage

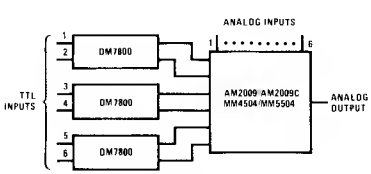
Schematic Diagrams



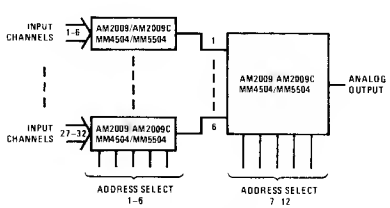
Order Number
AM2009F or AM2009CF
MM4504F or MM5540F
See Package 23

Order Number
AM2009D or AM2009CD
MM4504D or MM5504D
See Package 14

Typical Applications



TTL Compatible 6 Channel MUX



32 Channel MUX

Absolute Maximum Ratings (V_{BULK} = 0V)

Voltage on Any Source or Drain	-30V	Total Power Dissipation (at T_A = 25°C)	900 mW
Voltage on Any Gate	-35V	Power Dissipation — each gate circuit	150 mW
Positive Voltage on Any Pin	+0.3V	Operating Temperature Range AM2009	-55°C to +125°C
Source or Drain Current	50 mA	AM2009C	-25°C to +85°C
Gate Current (forward direction of zener clamp)	0 1 mA	Storage Temperature Range	-65°C to +150°C
		Lead Temperature (Soldering, 10 sec)	300°C

Electrical Characteristics (Note 1)

PARAMETER	CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNITS
Threshold Voltage	$V_{GS} = V_{DS}$, $I_{DS} = -1\ \mu A$	-1 0		-3.0	V
DC ON Resistance	$V_{GS} = -20V$, $I_{DS} = -100\ \mu A$, $T_A = 25$ C		150	250	Ω
DC ON Resistance	V_{GS} -10V V_{SB} = -20V, I_{DS} = -100 μA, T_A = 25°C		500	1250	Ω
DC ON Resistance	$V_{GS} = -20V$, $I_{DS} = -100\ \mu A$			325	Ω
DC ON Resistance	$V_{GS} = -10V$, $V_{SB} = -20V$, $I_{DS} = -100\ \mu A$			1500	Ω
Gate Leakage	V_{GS} -20V Note 2 $V_{GS} = -20V$, Note 2, T_A 25°C		100	1 0	μA pA
Input Leakage	$V_{DS} = -20V$, Note 2 $V_{DS} = -20V$ Note 2, $T_A = 25$ C		100	1 0	μA pA
Output Leakage	V_{SD} -20V Note 2 $V_{SD} = -20V$, Note 2, $T_A = 25$ C		500	3.0	μA pA
Gate Bulk Breakdown Voltage	I_{GB} -10 μA, Note 2	-35			V
Source Drain Breakdown Voltage	I_{SD} -10 μA V_{GD} = 0, Note 2	-30			V
Drain Source Breakdown Voltage	I_{DS} = -10 μA, V_{GS} = 0, Note 2	-30			V
Transconductance			4000		mhos
Gate Capacitance	Note 3, f = 1 MHz		4 7	8	pF
Input Capacitance	Note 3, f 1 MHz		4 6	8	pF
Output Capacitance	Note 3, f = 1 MHz		16	20	pF

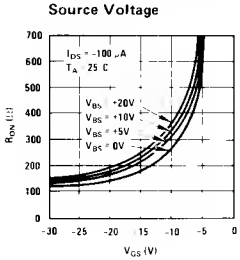
Note 1: Ratings apply over the specified temperature range and V_{BULK} = 0, unless otherwise specified.

Note 2: All other pins grounded.

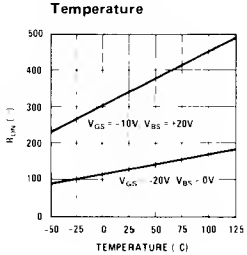
Note 3: Capacitance measured on dual-in-line package between pin under measurement to all other pins. Capacitances are guaranteed by design.

Typical Performance Characteristics

"ON" Resistance vs Gate-to-Source Voltage



"ON" Resistance vs T Temperature



Input Leakage Current vs Temperature