Monolithic N-Channel Junction FET Switches With High Speed Drivers

AM181/AM281, AM182/AM282 dual driver with SPST switches
AM184/AM284, AM185/AM285 dual driver with DPST switches
AM187/AM287, AM188/AM288 single driver with SPDT switches
AM190/AM290, AM191/AM291 dual driver with SPDT switches

General Description

These devices combine N-channel junction FETs and bipolar transistors on a single chip for the first time in a new N-channel Bi-FET process.

This technology provides the industry's only low "ON" resistance, high speed, monolithic N-channel junction FET analog switch. Unique circuit techniques are employed to achieve break-before-make switching action and constant "ON" resistance over the analog voltage range. The switch can block 20V peak-to-peak signals, and because of the driver design, an "OFF" isolation greater than 60 dB is achieved at 10 MHz.

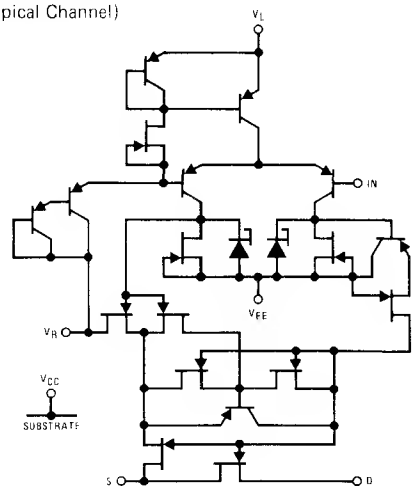
Features

- Interfaces with standard DTL, TTL and CMOS
- Constant "ON" resistance with signals to ±10V
- "ON" resistance match 2 Ω typ
- "OFF" isolation and crosstalk less than −60 dB at 10 MHz (typ)
- t_{ON}/t_{OFF} = 105 ns/95 ns typ
- Break-before-make action

Applications

- A-to-D/D-to-A converters
- Data acquisition
- Signal multiplexers
- Sample and hold
- Video switch

Schematic Diagram (Typical Channel)



Application Hints*

V_{CC} Positive Supply Voltage (V)	V_{EE} Negative Supply Voltage (V)	V_L Logic Supply Voltage (V)	V_R Reference Supply Voltage (V)	V_{IN} Logic Input Voltage V_{INH} Min/ V_{INL} Max− (V)	100 Series V_S Analog Voltage Range (V)	200 Series V_S Analog Signal Range (V)
+15**	−15	+5	Gnd	2.0/0.8	−7.5 to +15	10 to +15
+10	−20	+5	Gnd	2.0/0.8	−12.5 to +10	−15 to +10
+12	−12	+5	Gnd	2.0/0.8	-4.5 to +12	−7 to +12

*Applications Hints are for design aid only, not guaranteed and not subject to production testing

**Electrical Parameter Chart based on V_{CC} + 15V, V_{EE} = −15V, V_L = 5V, V_R = Gnd

Absolute Maximum Ratings

$V_{CC} - V_{EE}$	36V
$V_{CC} - V_D$	33V
$V_D - V_{EE}$	33V
$V_D - V_S$	±22V
$V_L - V_{EE}$	36V
$V_L - V_{IN}$	8V
$V_L - V_R$	8V
$V_{IN} - V_R$	8V
$V_R - V_{EE}$	27V
$V_R - V_{IN}$	2V
Current (Any Terminal)	30 mA

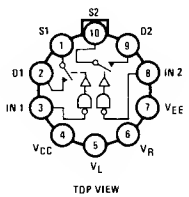
Storage Temperature	−65°C to +150°C
Operating Temperature	−55°C to +125°C
Power Dissipation*	
Metal Can**	450 mW
14-Pin DIP***	825 mW
16-Pin DIP****	900 mW

* All leads soldered to PC board
** Derate 6 mW/°C above 75°C
*** Derate 11 mW/°C above 75°C
**** Derate 12 mW/°C above 75°C

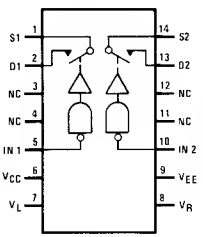
Connection Diagrams

AM181/AM281, AM182/AM282▲

Metal Can Package
See Package 1
Order by Part Number
Followed by H Suffix



TOP VIEW

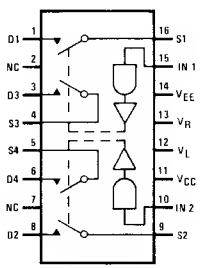


TOP VIEW

Dual-In-Line Package
See Package 16
Order by Part Number
Followed by D Suffix

Switch states are for logical "1" input

AM184/AM284, AM185/AM285▲



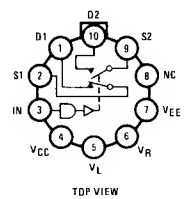
TOP VIEW

Dual-In-Line Package
See Package 17
Order by Part Number
Followed by D Suffix

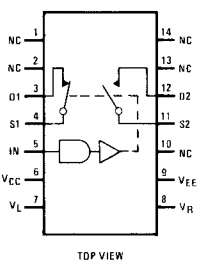
Switch states are for logical "0" input

AM187/AM287, AM188/AM288▲

Metal Can Package
See Package 1
Order by Part Number
Followed by H Suffix



TOP VIEW

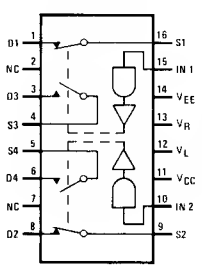


TOP VIEW

Dual-In-Line Package
See Package 16
Order by Part Number
Followed by D Suffix

Switch states are for logical "1" input

AM190/AM290, AM191/AM291▲



TOP VIEW

Dual-In-Line Package
See Package 17
Order by Part Number
Followed by D Suffix

Switch states are for logical "1" input

▲Consult local sales representative or factory for information concerning the 14-pin flat package

Electrical Characteristics AM181/AM281, AM182/AM282

dc parameters are 100% tested at 25°C; ac parameters, high and low temperatures, and t_{ON}, t_{OFF} are sampled to ensure conformance with specifications.

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM181 −55°C	AM181 25°C	AM181 125°C	AM281 −20°C	AM281 25°C	AM281 85°C	UNITS
$r_{OS(ON)}$	Drain-Source "ON" Resistance	I_S = −10 mA, V_{IN} = 0.8V	V_D = −7.5V	30	30	60	50	50	75	Ω
$I_{S(OFF)}$	Source "OFF" Leakage Current	V_{IN} = 2V	V_S = 10V, V_D = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	nA
			V_S = 7.5V, V_D = −7.5V		1	100		5	100	
$I_{D(OFF)}$	Drain "OFF" Leakage Current		V_D = 10V, V_S = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	
			V_D = 7.5V, V_S = −7.5V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel "ON" Leakage Current	V_{IN} = 0.8V	$V_D = V_S$ = −7.5V		−2	−200		−10	−200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		250	−250	−250	−250	−250	−250	μA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn "ON" Time	See Switching Time Test Circuit			150			180		ns
t_{OFF}	Turn "OFF" Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM182 −55°C	AM182 25°C	AM182 125°C	AM282 −20°C	AM282 25°C	AM282 85°C	UNITS
$r_{DS(ON)}$	Drain-Source "ON" Resistance	I_S = −10 mA, V_{IN} = 0.8V	V_D = −10V	75	75	100	100	100	150	Ω
$I_{S(OFF)}$	Source "OFF" Leakage Current	V_{IN} = 2V	V_S = 10V, V_D = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	nA
			V_S = 10V, V_D = −10V		1	100		5	100	
$I_{D(OFF)}$	Drain "OFF" Leakage Current		V_D = 10V, V_S = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	
			V_D = 10V, V_S = −10V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel "ON" Leakage Current	V_{IN} = 0.8V	$V_D = V_S$ = −10V		-2	−200		−10	−200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		-250	−250	−250	−250	−250	-250	μA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn "ON" Time	See Switching Time Test Circuit			250			300		ns
t_{OFF}	Turn "OFF" Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM181, AM182 −55°C	AM181, AM182 25°C	AM181, AM182 125°C	AM281, AM282 −20°C	AM281, AM282 25°C	AM281, AM282 85°C	UNITS
$C_{S(OFF)}$	Source "OFF" Capacitance	f = 1 MHz	V_S = −5V, I_D = 0	9 Typical, (Note 1)						pF
$C_{D(OFF)}$	Drain "OFF" Capacitance		V_D = −5V, I_S = 0	6 Typical, (Note 1)						
$C_{O(ON)} + C_{S(ON)}$	Channel "ON" Capacitance		$V_D = V_S$ = 0	14 Typical, (Note 1)						
	"OFF" Isolation	R_L = 75 Ω		> 60 dB at 10 MHz Typical, (Note 1)						
I_{CC}	Positive Supply Current	Both V_{IN} = 0, All Channels "ON"			0.1			0.1		mA
I_{EE}	Negative Supply Current				-5			−5		
I_L	Logic Supply Current				4.5			4.5		
I_R	Reference Supply Current				−2			−2		
I_{CC}	Positive Supply Current	Both V_{IN} = 5V, All Channels "OFF"			0.1			0.1		
I_{EE}	Negative Supply Current				−5			−5		
I_L	Logic Supply Current				4.5			4.5		
I_R	Reference Supply Current				−2			−2		

Note 1: Typical values are for Design Aid *only*, not guaranteed and not subject to production testing.

Electrical Characteristics AM184/AM284, AM185/AM285

dc parameters are 100% tested at 25°C; ac parameters, high and low temperatures, and t_{ON}, t_{OFF} are sampled to ensure conformance with specifications.

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = -15V, V_L = 5V, V_R = 0		MAX LIMITS AM184 55°C	AM184 25°C	AM184 125°C	AM284 -20°C	AM284 25°C	AM284 85°C	UNITS
$r_{DS(ON)}$	Drain-Source ON Resistance	I_S = 10 mA, V_{IN} = 2V	V_D = -7.5V	30	30	60	50	50	75	Ω
$I_{S(OFF)}$	Source OFF Leakage Current	V_{IN} = 0.8V	V_S = 10V, V_D = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	nA
			V_S = 7.5V, V_D = -7.5V		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current		V_D = 10V, V_S = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	
			V_D = 7.5V, V_S = -7.5V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel ON Leakage Current	V_{IN} = 2V	V_D = V_S = -7.5V		-2	200		-10	-200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		-250	-250	250	-250	-250	250	μA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn ON Time	See Switching Time Test Circuit			150			180		ns
t_{OFF}	Turn OFF Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = -15V, V_L = 5V, V_R = 0		MAX LIMITS AM185 55°C	AM185 25°C	AM185 125°C	AM285 -20°C	AM285 25°C	AM285 85°C	UNITS
$r_{DS(ON)}$	Drain-Source ON Resistance	I_S = -10V, V_{IN} = 2V	V_D = -10V	75	75	150	100	100	150	Ω
$I_{S(OFF)}$	Source OFF Leakage Current	V_{IN} = 0.8V	V_S = 10V, V_D = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	nA
			V_S = 10V, V_D = -10V		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current		V_D = 10V, V_S = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	
			V_D = 10V, V_S = 10V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel ON Leakage Current	V_{IN} = 2V	V_D = V_S = 10V		2	200		10	200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		250	250	250	250	250	250	μA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn ON Time	See Switching Time Test Circuit			250			300		ns
t_{OFF}	Turn OFF Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = -15V, V_L = 5V, V_R = 0		MAX LIMITS AM184, AM185 -55°C	AM184, AM185 25°C	AM184, AM185 125°C	AM284, AM285 -20°C	AM284, AM285 25°C	AM284, AM285 85°C	UNITS
$C_{S(OFF)}$	Source OFF Capacitance	f = 1 MHz	V_S = 5V, I_D = 0	9 Typical, (Note 1)						pF
$C_{D(OFF)}$	Drain OFF Capacitance		V_D = 5V, I_S = 0	6 Typical, (Note 1)						
$C_{D(ON)} + C_{S(ON)}$	Channel ON Capacitance		V_D = V_S = 0	11 Typical (Note 1)						
	"OFF" Isolation	R_L = 75 Ω		> 60 dB at 10 MHz Typical, (Note 1)						
I_{CC}	Positive Supply Current	Both V_{IN} = 5V, All Channels "ON"			0.1			0.1		mA
I_{EE}	Negative Supply Current				4			-4		
I_L	Logic Supply Current				4.5			4.5		
I_R	Reference Supply Current				2			-2		
I_{CC}	Positive Supply Current	Both V_{IN} = 0, All Channels "OFF"			0.1			0.1		
I_{EE}	Negative Supply Current				5.5			5.5		
I_L	Logic Supply Current				4.5			4.5		
I_R	Reference Supply Current				2			-2		

Note 1: Typical values are for Design Aid *only*, not guaranteed and not subject to production testing.

Electrical Characteristics AM187/AM287, AM188/AM288

dc parameters are 100% tested at 25°C; ac parameters, high and low temperatures, and t_{ON}, t_{OFF} are sampled to ensure conformance with specifications.

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM187 −55°C	AM187 25°C	AM187 125°C	AM287 20°C	AM287 25°C	AM287 85°C	UNITS
$r_{DS(ON)}$	Drain Source "ON" Resistance	I_S = −10 mA, V_{IN} = 2V, Ch 1 "ON", V_{IN} = 0.8V, Ch 2 "ON"	V_D = −7.5V	30	30	60	50	50	75	Ω
$I_{S(OFF)}$	Source "OFF" Leakage Current	V_{IN} = 2V, Ch 2 "OFF", V_{IN} = 0.8V, Ch 1 "OFF"	V_S = 10V, V_D = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	nA
			V_S = 7.5V, V_D = −7.5V		1	100		5	100	
$I_{D(OFF)}$	Drain "OFF" Leakage Current		V_D = 10V, V_S = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	
			V_D = 7.5V, V_S = −7.5V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel "ON" Leakage Current	V_{IN} = 2V, Ch 1 "ON", V_{IN} = 0.8V, Ch 2 "ON"	V_D = V_S = 7.5V		−2	−200		10	200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		250	250	250	250	250	−250	µA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn "ON" Time	See Switching Time Test Circuit			150			180		ns
t_{OFF}	Turn "OFF" Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM188 −55°C	AM188 25°C	AM188 125°C	AM288 20°C	AM288 25°C	AM288 85°C	UNITS
$r_{DS(ON)}$	Drain Source "ON" Resistance	I_S = −10 mA, V_{IN} = 0.8V, Ch 2 "ON", V_{IN} = 2V, Ch 1 "ON"	V_D = −10V	75	75	150	100	100	150	Ω
$I_{S(OFF)}$	Source "OFF" Leakage Current	V_{IN} = 0.8V, Ch 1 "OFF", V_{IN} = 2V, Ch 2 "OFF"	V_S = 10V, V_D = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	nA
			V_S = 10V, V_D = −10V		1	100		5	100	
$I_{D(OFF)}$	Drain "OFF" Leakage Current		V_D = 10V, V_S = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	
			V_D = 10V, V_S = −10V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel "ON" Leakage Current	V_{IN} = 2V, Ch 1 "ON", V_{IN} = 0.8V, Ch 2 "ON"	V_D = V_S = −10V		−2	−200		10	200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		250	−250	−250	250	250	250	µA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn "ON" Time	See Switching Time Test Circuit			250			300		ns
t_{OFF}	Turn "OFF" Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM187, AM188 −55°C	AM187, AM188 25°C	AM187, AM188 125°C	AM287, AM288 20°C	AM287, AM288 25°C	AM287, AM288 85°C	UNITS
$C_{S(OFF)}$	Source "OFF" Capacitance	f = 1 MHz	V_S = −5V, I_D = 0	9 Typical, (Note 1)						pF
$C_{D(OFF)}$	Drain "OFF" Capacitance		V_D = −5V, I_S = 0	6 Typical, (Note 1)						
$C_{D(ON)} + C_{S(ON)}$	Channel "ON" Capacitance		V_D = V_S = 0	14 Typical, (Note 1)						
	"OFF" Isolation	R_L = 75Ω		−60 dB at 10 MHz Typical, (Note 1)						
I_{CC}	Positive Supply Current	V_{IN} = 0, Ch 2 "ON", Ch 1 "OFF"			0.1			0.1		mA
I_{EE}	Negative Supply Current				−3			−3		
I_L	Logic Supply Current				3.2			3.2		
I_R	Reference Supply Current				−2			−2		
I_{CC}	Positive Supply Current	V_{IN} = 5V, Ch 2 "OFF", Ch 1 "ON"			0.1			0.1		
I_{EE}	Negative Supply Current				−3			−3		
I_L	Logic Supply Current				3.2			3.2		
I_R	Reference Supply Current				−2			2		

Note 1: Typical values are for Design Aid *only*, not guaranteed and not subject to production testing.

Electrical Characteristics AM190/AM290, AM191/AM291

dc parameters are 100% tested at 25°C; ac parameters, high and low temperatures, and t_{ON}, t_{OFF} are sampled to ensure conformance with specifications.

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM190 −55°C	AM190 25°C	AM190 125°C	AM290 20°C	AM290 25°C	AM290 85°C	UNITS
$r_{DS(ON)}$	Drain-Source ON Resistance	I_S = −10 mA, V_{IN} = 2V, Ch. 1 and 2 "ON", V_{IN} = 0.8V, Ch. 3 and 4 "ON"	V_D = −7.5V	30	30	60	50	50	75	Ω
$I_{S(OFF)}$	Source OFF Leakage Current	V_{IN} = 2V, Ch. 3 and 4 "OFF" V_{IN} = 0.8V, Ch. 1 and 2 "OFF"	V_S = 10V, V_D = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	nA
			V_S = 7.5V, V_D = −7.5V		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current		V_D = 10V, V_S = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	
			V_D = 7.5V, V_S = −7.5V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel ON Leakage Current	V_{IN} = 2V, Ch. 1 and 2 "ON" V_{IN} = 0.8V, Ch. 3 and 4 "ON"	$V_D = V_S$ = −7.5V		2	200		−10	−200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		250	250	250	250	−250	−250	µA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn ON Time	See Switching Time Test Circuit			150			180		ns
t_{OFF}	Turn OFF Time				130			150		

PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM191 −55°C	AM191 25°C	AM191 125°C	AM291 20°C	AM291 25°C	AM291 85°C	UNITS
$r_{DS(ON)}$	Drain-Source ON Resistance	I_S = −10 mA, V_{IN} = 0.8V, Ch. 3 and 4 "ON", V_{IN} = 2V, Ch. 1 and 2 "ON"	V_D = −10V	75	75	150	100	100	150	Ω
$I_{S(OFF)}$	Source OFF Leakage Current	V_{IN} = −0.8V, Ch. 1 and 2 "OFF" V_{IN} = 2V, Ch. 3 and 4 "OFF"	V_S = 10V, V_D = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	nA
			V_S = −10V, V_D = −10V		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current		V_D = 10V, V_S = −10V, V_{CC} = 10V, V_{EE} = −20V		1	100		5	100	
			V_D = 10V, V_S = −10V		1	100		5	100	
$I_{D(ON)} + I_{S(ON)}$	Channel ON Leakage Current	V_{IN} = 0.8V, Ch. 3 and 4 "ON" V_{IN} = 2V, Ch. 1 and 2 "ON"	$V_D = V_S$ = −10V		−2	200		−10	−200	
I_{INL}	Input Current, Input Voltage Low	V_{IN} = 0		−250	−250	250	−250	−250	−250	µA
I_{INH}	Input Current, Input Voltage High	V_{IN} = 5V			10	20		10	20	
t_{ON}	Turn ON Time	See Switching Time Test Circuit			250			300		ns
t_{OFF}	Turn OFF Time				130			150		

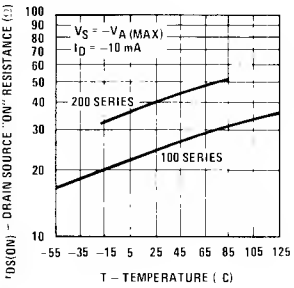
PARAMETER		TEST CONDITIONS, UNLESS NOTED: V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0		MAX LIMITS AM190, AM191	AM290, AM291	UNITS
$C_{S(OFF)}$	Source OFF Capacitance	f = 1 MHz	V_S = −5V, I_D = 0	9 Typical, (Note 1)		pF
$C_{D(OFF)}$	Drain OFF Capacitance		V_D = 5V, I_S = 0	6 Typical, (Note 1)		
$C_{D(ON)} + C_{S(ON)}$	Channel ON Capacitance		$V_D = V_S$ = 0	14 Typical, (Note 1)		
	"OFF" Isolation	R_L = 75 Ω		> 60 dB at 10 MHz Typical, (Note 1)		

			MAX LIMITS AM190, AM191 −55°C	AM190, AM191 25°C	AM190, AM191 125°C	AM290, AM291 20°C	AM290, AM291 25°C	AM290, AM291 85°C	UNITS
I_{CC}	Positive Supply Current	V_{IN} = 0, Ch. 3 and 4 "ON", Ch. 1 and 2 "OFF"		0.1			0.1		mA
I_{EE}	Negative Supply Current			−5			5		
I_L	Logic Supply Current			4.5			4.5		
I_R	Reference Supply Current			−2			2		
I_{CC}	Positive Supply Current	V_{IN} = 5V, Ch. 3 and 4 "OFF", Ch. 1 and 2 "ON"		0.1			0.1		
I_{EE}	Negative Supply Current			−5			−5		
I_L	Logic Supply Current			4.5			4.5		
I_R	Reference Supply Current			−2			−2		

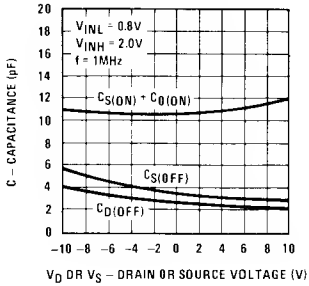
Note 1: Typical values are for Design Aid *only*, not guaranteed and not subject to production testing.

Typical Performance Characteristics V_{CC} = 15V, V_{EE} = −15V, V_L = 5V, V_R = 0 unless otherwise noted.

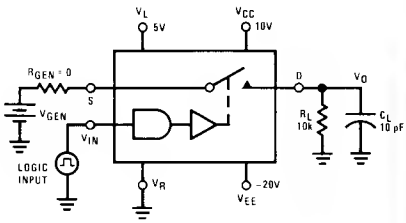
$r_{DS(ON)}$ vs V_D and Temperature



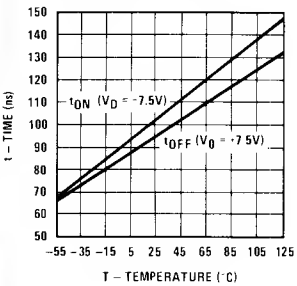
Capacitance vs V_D or V_S



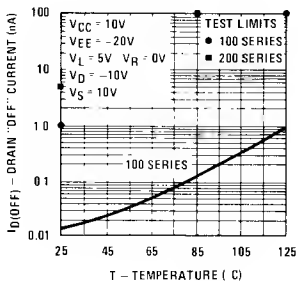
Typical delay, rise, fall, settling times, and switching transients in this circuit.



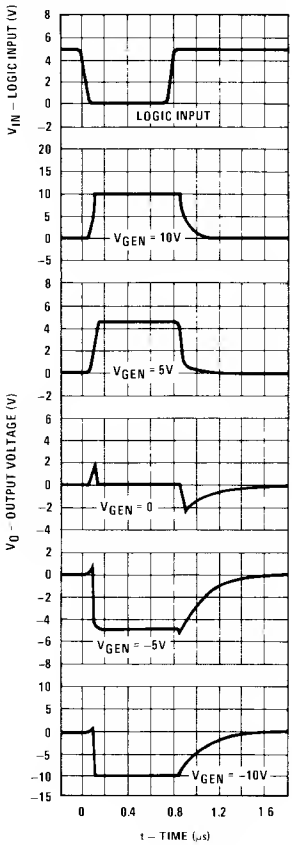
Switching Time vs V_D and Temperature



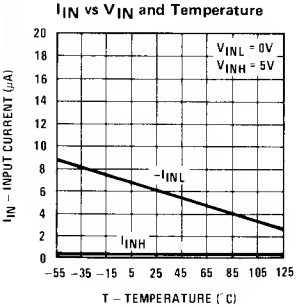
$I_{D(OFF)}$ vs Temperature



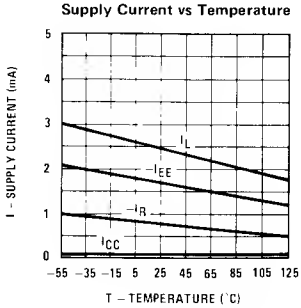
If R_{GEN}, R_L or C_L is increased there will be proportional increases in rise and/or fall RC times.



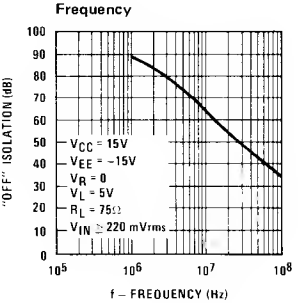
I_{IN} vs V_{IN} and Temperature



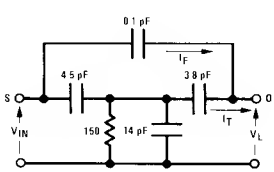
Supply Current vs Temperature



"OFF" Isolation vs Frequency

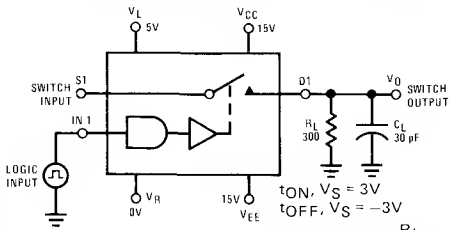


Equivalent "OFF" Circuit



Switching Time Test Circuit

Switch output waveform shown for V_S = constant with logic input waveform as shown. Note that V_S may be + or − as per switching time test circuit. V_O is the steady state output with switch "ON". Feedthrough via gate capacitance may result in spikes at leading and trailing edge of output waveform.

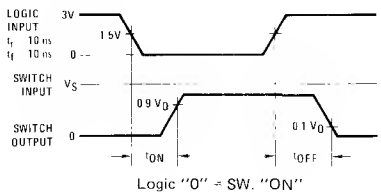


t_{ON}, V_S = 3V

t_{OFF}, V_S = −3V

$$V_O = V_S \frac{R_L}{R_L + r_{DS(ON)}}$$

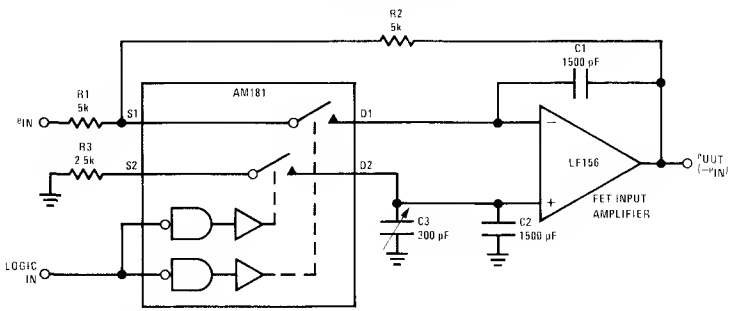
(Repeat test for IN2 and S2)



Logic "0" = SW. "ON"

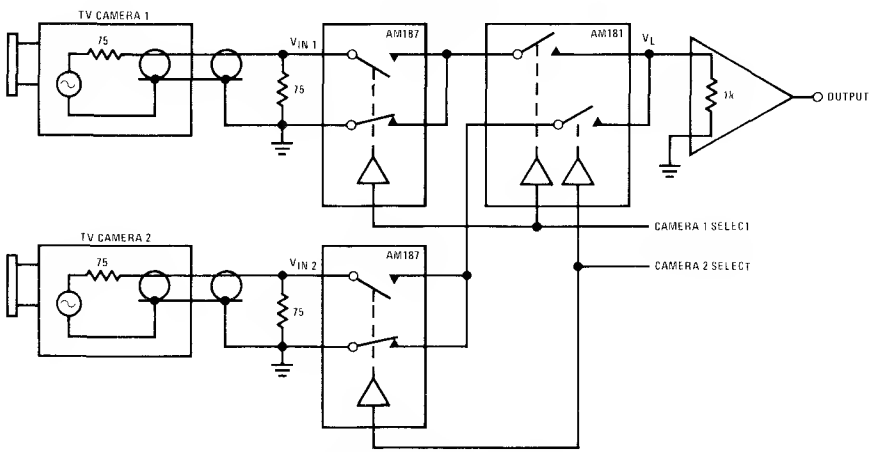
Typical Applications

Low Drift-Compensated Sample and Hold



- Input impedance 5 kΩ
- Slew rate limiting and 3 dB point: 20V swing: 3.2K C; 5V swing: 12K C; small signal: 21K C
- Droop rate @ 25°C 0.5 nV per μs
- Sample to hold offset adjustable to zero
- Acquisition time—98 μs
- Aperture time—80 ns
- Aperture uncertainty—2 ns

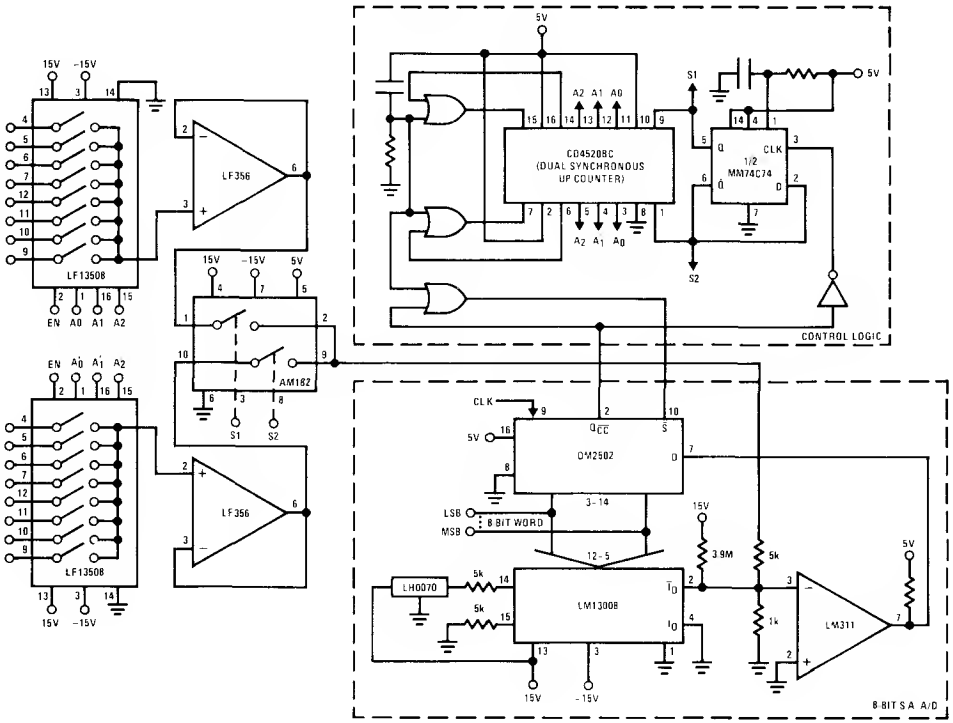
Video Switch with Very High "OFF" Isolation (f = dc to 10 MHz)



- 116 dB isolation at 10 MHz, "OFF" camera to "ON" camera
- 98 dB isolation at 10 MHz, load from each camera when both cameras are "OFF"
- < 1 dB on insertion loss

Typical Applications (Continued)

A 16-Channel Data Acquisition Unit with Second Level Multiplexing



- Maximum A/D clock frequency: 4.5 MHz
- Maximum throughput rate: 31.25k samples/sec
- Minimum switch "ON" time for the 2-channel MUX: $t_{ON(min)} \leq 1/4.5$ MHz
- Maximum input signal bandwidth 15.6 kHz
- Maximum input signal variation during conversion for 8-bit accuracy and 10V full scale: $\Delta V_{IN}/\Delta T = 19.5\ mV/\mu s$

Timing Diagram