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)
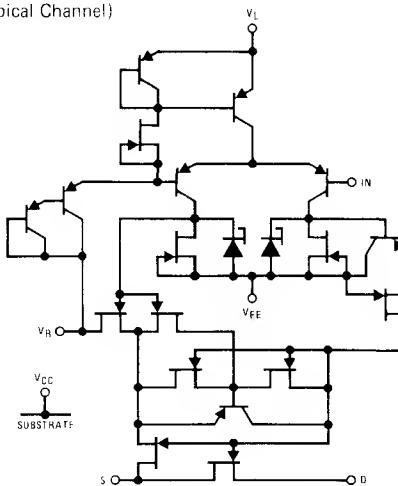
Application Hints*

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, $V_{EE} = −15$V, $V_L = 5$V, $V_R =$ Gnd

Absolute Maximum Ratings

|			
$V_{CC} - V_{EE}$	36V	Storage Temperature	-65°C to +150°C
$V_{CC} - V_D$	33V	Operating Temperature	-55°C to +125°C
$V_D - V_{EE}$	33V	Power Dissipation*	
$V_D - V_S$	±22V	Metal Can**	450 mW
$V_L - V_{EE}$	36V	14-Pin DIP***	825 mW
$V_L - V_{IN}$	8V	16-Pin DIP****	900 mW
$V_L - V_R$	8V		
$V_{IN} - V_R$	8V	* All leads soldered to PC board	
$V_R - V_{EE}$	27V	** Derate 6 mW/$^{\circ}$C above 75°C	
$V_R - V_{IN}$	2V	*** Derate 11 mW/$^{\circ}$C above 75°C	
Current (Any Terminal)	30 mA	**** Derate 12 mW/$^{\circ}$C above 75°C	

Connection Diagrams

AM181/AM281, AM182/AM282▲

Metal Can Package
See Package 1
Order by Part Number
Followed by H Suffix
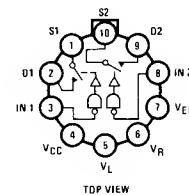
Dual-In-Line Package
See Package 16
Order by Part Number
Followed by D Suffix

Switch states are for logical "1" input

TOP VIEW
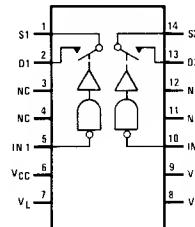
**AM184/AM284, AM185/AM285▲**

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

Switch states are for logical "0" input
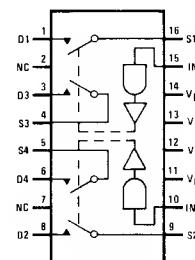
TOP VIEW

AM187/AM287, AM188/AM288▲

Metal Can Package
See Package 1
Order by Part Number
Followed by H Suffix
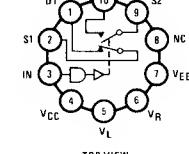
Dual-In-Line Package
See Package 16
Order by Part Number
Followed by D Suffix

Switch states are for logical "1" input

TOP VIEW

AM190/AM290, AM191/AM291▲

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

Switch states are for logical "1" input

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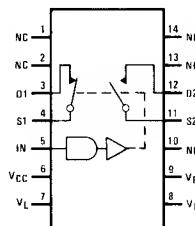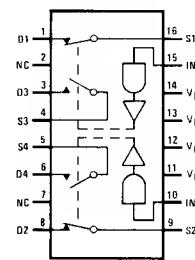
▲Consult local sales representative or factory for information concerning the 14-pin flat package

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						UNITS
				AM181			AM281			
				−55°C	25°C	125°C	−20°C	25°C	85°C	
$r_{DS(ON)}$	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						UNITS
				AM182			AM282			
				−55°C	25°C	125°C	−20°C	25°C	85°C	
$r_{DS(ON)}$	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						UNITS
				AM181, AM182			AM281, AM282			
				−55°C	25°C	125°C	−20°C	25°C	85°C	
$C_{S(OFF)}$	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)						
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						UNITS
				AM184			AM284			
				55°C	25°C	125°C	20°C	25°C	85°C	
$r_{DS(ON)}$	Drain-Source ON Resistance	$I_S = 10mA$, $V_{IN} = 2V$	V_D $-7.5V$	30	30	60	50	50	75	Ω
$I_{S(OFF)}$	Source OFF Leakage Current		$V_S = 10V$, V_D $-10V$, $V_{CC} = 10V$, $V_{EE} = -20V$		1	100		5	100	
			$V_S = 7.5V$, V_D $7.5V$		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current	$V_{IN} = 0.8V$	$V_D = 10V$, V_S $-10V$, $V_{CC} = 10V$, V_{EE} $-20V$		1	100		5	100	nA
			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						UNITS
				AM185			AM285			
				55°C	25°C	125°C	20°C	25°C	85°C	
$r_{DS(ON)}$	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_S $10V$, V_D $-10V$, $V_{CC} = 10V$, $V_{EE} = -20V$		1	100		5	100	
			V_S $10V$, V_D $-10V$		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current	V_{IN} $0.8V$	$V_D = 10V$, V_S $-10V$, V_{CC} $10V$, V_{EE} $20V$		1	100		5	100	nA
			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						UNITS
				AM184, AM185			AM284, AM285			
				-55C	25C	125C	-20C	25C	85°C	
$C_{S(OFF)}$	Source OFF Capacitance		V_S $5V$, I_D 0	9 Typical, (Note 1)						
$C_{D(OFF)}$	Drain OFF Capacitance	$f = 1 MHz$	$V_D = 5V$, I_S 0	6 Typical, (Note 1)						pF
$C_{D(ON)} + C_{S(ON)}$	Channel ON Capacitance		$V_D = V_S$ 0	11 Typical (Note 1)						
	"OFF" Isolation	R_L 75Ω		> 60 dB at 10 MHz Typical, (Note 1)						
I_{CC}	Positive Supply Current				0.1			0.1		
I_{EE}	Negative Supply Current				4			-4		
I_L	Logic Supply Current	Both $V_{IN} = 5V$, All Channels "ON"			4.5			4.5		
I_R	Reference Supply Current				2			-2		mA
I_{CC}	Positive Supply Current				0.1			0.1		
I_{EE}	Negative Supply Current				5.5			5.5		
I_L	Logic Supply Current	Both V_{IN} 0, All Channels "OFF"			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: $V_{CC} = 15V$, $V_{EE} = 15V$, $V_L = 5V$, $V_R = 0$		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: $V_{CC} = 15V$, $V_{EE} = 15V$, $V_L = 5V$, $V_R = 0$		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: $V_{CC} = 15V$, $V_{EE} = 15V$, $V_L = 5V$, $V_R = 0$		AM187, AM188 −55°C	25°C	125°C	AM287, AM288 20°C	25°C	85°C	UNITS
$C_{S(OFF)}$	Source "OFF" Capacitance		$V_S = 5V$ $I_D = 0$	9 Typical, (Note 1)						pF
$C_{D(OFF)}$	Drain "OFF" Capacitance	$f = 1$ MHz	$V_D = 5V$ $I_S = 0$	6 Typical, (Note 1)						
$C_{D(ON)} + C_{S(ON)}$	Channel "ON" Capacitance		$V_D = V_S = 0$	14 Typical, (Note 1)						
	"OFF" Isolation	$R_L = 75\Omega$		−60 dB at 10 MHz Typical, (Note 1)						
I_{CC}	Positive Supply Current				0.1			0.1		
I_{EE}	Negative Supply Current	$V_{IN} = 0$, Ch 2 "ON", Ch 1 "OFF"			−3			−3		
I_L	Logic Supply Current				3.2			3.2		
I_R	Reference Supply Current				−2			2		mA
I_{CC}	Positive Supply Current				0.1			0.1		
I_{EE}	Negative Supply Current	$V_{IN} = 5V$, Ch 2 "OFF", Ch 1 "ON"			−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						UNITS
				AM190			AM290			
				-55°C	25°C	125°C	20°C	25°C	85°C	
$r_{DS(ON)}$	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_S = 10V, V_D = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	
			V_S = 7.5V, V_D = -7.5V		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current	V_{IN} = 0.8V, Ch 1 and 2 "OFF"	V_D = 10V, V_S = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	nA
			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						UNITS
				AM191			AM291			
				-55°C	25°C	125°C	20°C	25 C	85°C	
$r_{DS(ON)}$	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_S = 10V, V_D = -10V, V_{CC} = 10V, V_{EE} = 20V		1	100		5	100	
			V_S = 10V, V_D = -10V		1	100		5	100	
$I_{D(OFF)}$	Drain OFF Leakage Current	V_{IN} = 2V, Ch 3 and 4 "OFF"	V_D = 10V, V_S = -10V, V_{CC} = 10V, V_{EE} = -20V		1	100		5	100	nA
			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						UNITS
				AM190, AM191			AM290, AM291			
				55°C	25°C	125°C	20°C	25°C	85°C	
$C_{S(OFF)}$	Source OFF Capacitance		V_S = -5V, I_D = 0	9 Typical, (Note 1)						
$C_{D(OFF)}$	Drain OFF Capacitance	f = 1 MHz	V_D = 5V, I_S = 0	6 Typical, (Note 1)						pF
$C_{D(ON)}$ + $C_{S(ON)}$	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)						
I_{CC}	Positive Supply Current				0.1			0.1		
I_{EE}	Negative Supply Current				-5			5		
I_L	Logic Supply Current	V_{IN} = 0, Ch 3 and 4 "ON", Ch 1 and 2 "OFF"			4.5			4.5		
I_R	Reference Supply Current				-2			2		
I_{CC}	Positive Supply Current				0.1			0.1		mA
I_{EE}	Negative Supply Current				-5			-5		
I_L	Logic Supply Current	V_{IN} = 5V, Ch 3 and 4 "OFF", Ch 1 and 2 "ON"			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.

AM181, AM182, AM184, AM185, AM187, AM188, AM190, AM191 Series

rDS(ON) vs VD and Temperature


Capacitance vs VD or VS
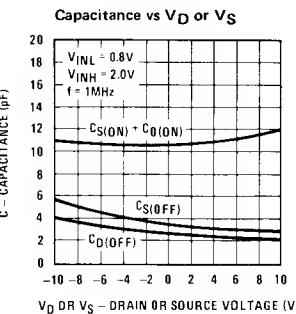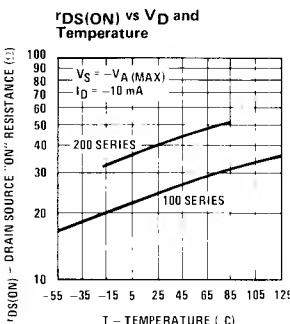
Typical delay, rise, fall, settling times, and switching transients in this circuit.
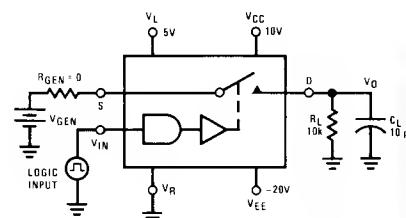
Switching Time vs VD and Temperature
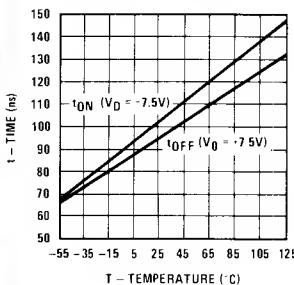
ID(OFF) vs Temperature
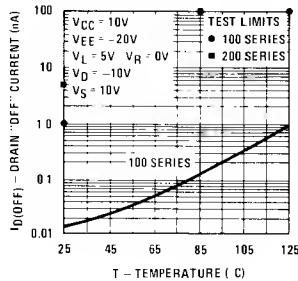
If R_{GEN}, R_L or C_L is increased there will be proportional increases in rise and/or fall RC times.
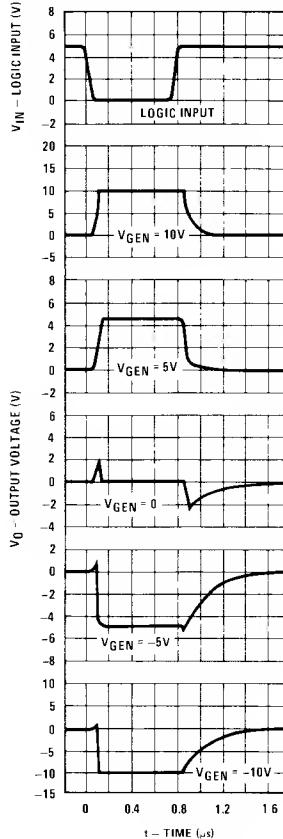
IIN vs VIN and Temperature
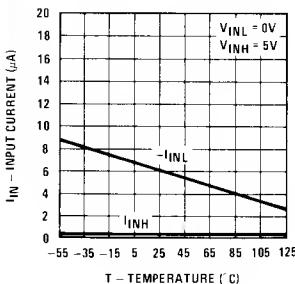
Supply Current vs Temperature
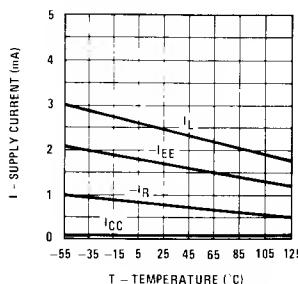

"OFF" Isolation vs Frequency
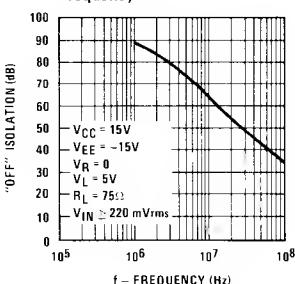
Equivalent "OFF" Circuit


5-23
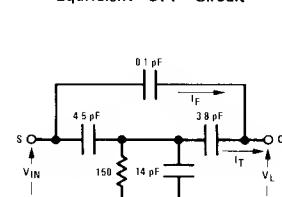
Switching Time Test Circuit

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.


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

(Repeat test for IN2 and S2)

t_{ON}, V_S = 3V
t_{OFF}, V_S = −3V

Logic "0" = SW. "ON"
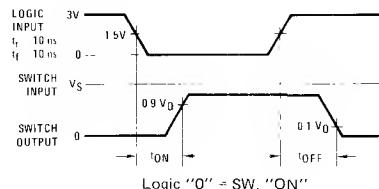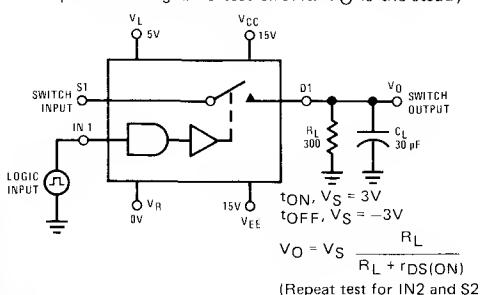
Typical Applications

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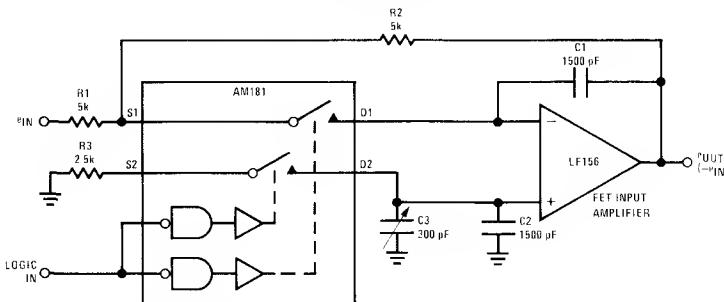
- Input impedance 5 kΩ
- Slew rate limiting and 3 dB point: 20V swing: 3.2K C; 5V swing: 12K C; small signal: 21K C
- Droop rate @ 25°C 0.5 nV per μs
- Sample to hold offset adjustable to zero
- Acquisition time—98 μs
- Aperture time—80 ns
- Aperture uncertainty—2 ns

Video Switch with Very High "OFF" Isolation
(f = dc to 10 MHz)
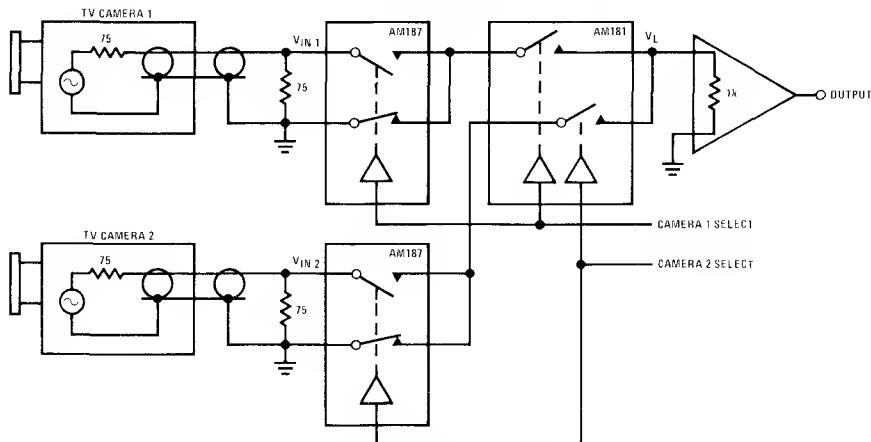
- 116 dB isolation at 10 MHz, "OFF" camera to "ON" camera
- 98 dB isolation at 10 MHz, load from each camera when both cameras are "OFF"
- < 1 dB on insertion loss

Typical Applications (Continued)

A 16-Channel Data Acquisition Unit with Second Level Multiplexing
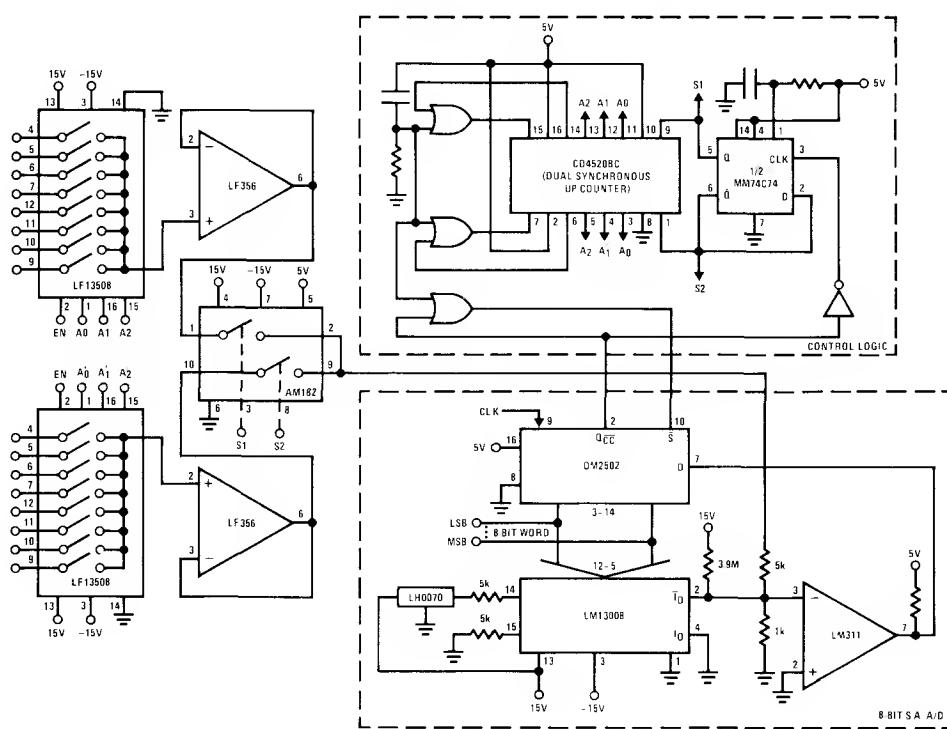
- Maximum A/D clock frequency: 4.5 MHz
- Maximum throughput rate: 31.25k samples/sec
- Minimum switch "ON" time for the 2-channel MUX: $t_{ON(min)} \leq 1/4.5$ MHz
- Maximum input signal bandwidth 15.6 kHz
- Maximum input signal variation during conversion for 8-bit accuracy and 10V full scale: $\Delta V_{IN}/\Delta T = 19.5$ mV/μs

Timing Diagram