Am25LS381/Am54LS381/Am74LS381
Am25LS2517

Arithmetic Logic Unit/Function Generator Low-Power Schottky Integrated Circuits

DISTINCTIVE CHARACTERISTICS

- Three arithmetic functions
- Three logic functions
- Preset and clear functions
- Carry output (C_{n+4}) and overflow (OVR) outputs on Am25LS2517
- Generate and propagate outputs for full lookahead carry on Am25LS381
- 8mA sink current over the military temperature range on Am25LS
- 50mV Improved V_{OL} on Am25LS compared to Am54LS/74LS
- 440μA source current at HIGH output.

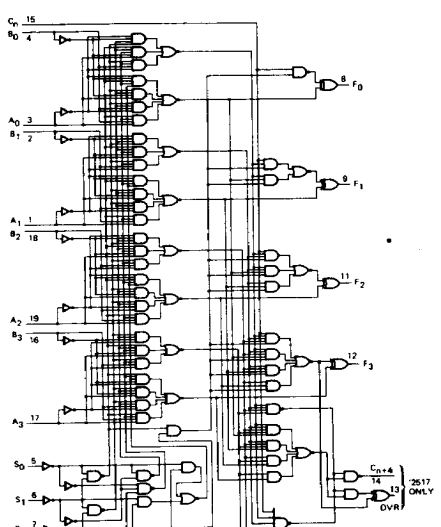
GENERAL DESCRIPTION

The Am25LS381 and Am54LS/74LS381 are arithmetic logic units (ALU)/function generators that perform three arithmetic operations and three logic operations on two 4-bit words. The device can also output forced 0000 (clear) or 1111 (preset). These eight operations are selected using three function select inputs S_0, S_1 and S_2 as shown in the function table. Full carry lookahead is used over the four-bit field within the device. When devices are cascaded, multi-level full carry lookahead is implemented using a '182 carry lookahead generator and the $\overline{G}$ and $\overline{P}$ outputs on the Am25LS381 or Am54LS/74LS381. The device is packaged in a space-saving (0.3-inch row spacing) 20-pin package. If the C_{n+4} carry output function is required, the Am25LS2517 should be used.

The Am25LS381 is a high-performance version of the Am54LS/74LS381. Improvements include faster A.C. specifications, higher noise margin and twice the fan-out over the military temperature range.

The Am25LS2517 is an arithmetic logic unit (ALU)/function generator that performs three arithmetic operations and three logic operations on two 4-bit words. The device can also force output 0000 (clear) or 1111 (preset). These eight operations are selected using three function select inputs S_0, S_1 and S_2 as shown in the function table. Full carry lookahead is used over the four-bit field within the device. When devices are cascaded, the carry output (C_{n+4}) is connected to the carry input (C_n) of the next device. The Am25LS2517 can also detect two's complement overflow. The overflow output (OVR) is defined logically as $C_{n+3} \oplus C_{n+4}$.

BLOCK DIAGRAM



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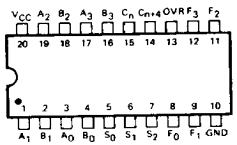
Refer to Page 13-1 for Essential Information on Military Devices

RELATED PRODUCTS

Part No.	Description
Am2901	Bit Slice
Am2903	Bit Slice
Am29203	Super Slice
Am29501	Multiport Pipeline Processor

CONNECTION DIAGRAM
Top View

Am25LS2517



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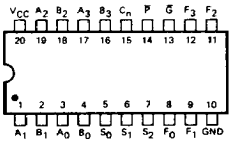
Am25LS381
Am54LS/74LS381



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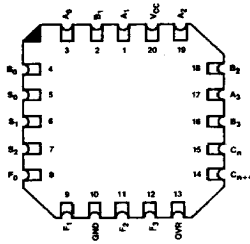
Leadless Chip Carriers
L-20-1



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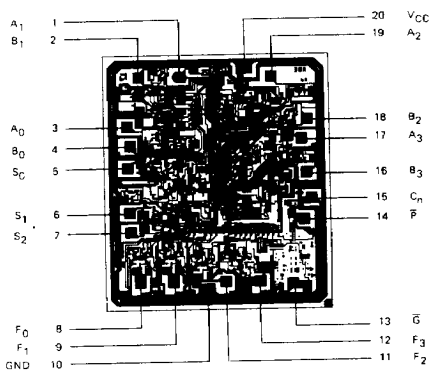
Note: Pin 1 is marked for orientation

METALLIZATION AND PAD LAYOUT



DIE SIZE 0.091" x 0.108"

ORDERING INFORMATION

AMD products are available in several packages and operating ranges. The order number is formed by a combination of the following: Device number, speed option (if applicable), package type, operating range and screening option (if desired).

Am25LS381
Am25LS2517 **D** **C** **B**

- **B** — Screening Option
  - Blank – Standard processing
  - B – Burn-in
- **C** — Temperature (See Operating Range)
  - C – Commercial (0°C to +70°C)
  - M – Military (–55°C to +125°C)
- **D** — Package
  - D – 20-pin CERDIP
  - F – 20-pin flatpak
  - L – 20-pin leadless Chip-Pak
  - P – 20-pin plastic DIP
  - X – Dice
- **Am25LS381 / Am25LS2517** — Device type
  - ALU Function Generators

Valid Combinations	
Am25LS381	PC, PCB DC, DCB, DM, DMB FM, FMB XC, XM
Am25LS2517	PC, PCB DC, DCB, DM, DMB FM, FMB LC, LM, LMB XC, XM

Valid Combinations

Consult the AMD sales office in your area to determine if a device is currently available in the combination you wish.

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Refer to Page 13-1 for Essential Information on Military Devices

PIN DESCRIPTION

Pin No.	Name	I/O	Description
3, 1, 19, 17	A_0, A_1, A_2, A_3	I	The A data inputs.
4, 2, 18, 16	B_0, B_1, B_2, B_3	I	The B data inputs.
	S_0, S_1, S_2, S_3	I	The control inputs used to determine the arithmetic or logic function performed.
	F_0, F_1, F_2, F_3	O	The data outputs of the ALU.
16	C_n	I	The carry-in input of the ALU.
	C_{n+4}	O	The carry-lookahead output of the four-bit input field.
13	$\overline{G}$	O	The carry-generate output for use in multi-level lookahead schemes.
14	$\overline{P}$	O	The carry-propagate output for use in multi-level lookahead schemes.
13	OVR		Overflow. This pin is logically the Exclusive-OR of the carry-in and carry-out of the MSB of the ALU. At the most significant end of the word, this pin indicates that the result of an arithmetic two's complement operation has overflowed into the sign-bit.

FUNCTION TABLE

Selection			Arithmetic/Logic Operation
S_2	S_1	S_0	
L	L	L	Clear
L	L	H	B Minus A
L	H	L	A Minus B
L	H	H	A Plus B
H	L	L	A⊕B
H	L	H	A + B
H	H	L	AB
H	H	H	Preset

H = High Level, L = Low Level
See Truth Table for full description.

GUARANTEED LOADING RULES OVER OPERATING RANGE
(In Unit Loads)

A Low-Power Schottky TTL Unit Load is defined as 20μA measured at 2.7V HIGH and −0.36mA measured at 0.4V LOW.

		Am25LS				Am54LS/74LS			
			Output HIGH	Output LOW			Output HIGH	Output LOW	
Pin Nos.	Input/Output	Input Load	−440μA	MIL	COM'L	Input Load	−440μA	MIL	COM'L
1	A_1	4.0	–	–	–	4.4	–	–	–
2	B_1	4.0	–	–	–	4.4	–	–	–
3	A_0	4.0	–	–	–	4.4	–	–	–
4	B_0	4.0	–	–	–	4.4	–	–	–
5	S_0	1.0	–	–	–	1.1	–	–	–
6	S_1	1.0	–	–	–	1.1	–	–	–
7	S_2	1.0	–	–	–	1.1	–	–	–
8	F_0	–	22	22	22	–	20	11	22
9	F_1	–	22	22	22	–	20	11	22
10	GND	–	–	–	–	–	–	–	–
11	F_2	–	22	22	22	–	20	11	22
12	F_3	–	22	22	22	–	20	11	22
13	$\overline{G}$ or OVR*	–	22	44	44	–	20	44	44
14	$\overline{P}$ or C_{n+4}	–	22	22	22	–	20	11	22
15	C_n	3.0**	–	–	–	4.4	–	–	–
16	B_3	4.0	–	–	–	4.4	–	–	–
17	A_3	4.0	–	–	–	4.4	–	–	–
18	B_2	4.0	–	–	–	4.4	–	–	–
19	A_2	4.0	–	–	–	4.4	–	–	–
20	V_{CC}	–	–	–	–	–	–	–	–

*OVR Drive is 22 Unit Loads.

**4.0 for Am25LS2517.

Am25LS/54LS/74LS381
TEST TABLE

Path						Same Bit		Other Data Bits		Output
In	Out	S_0	S_1	S_2	C_n	4.5V	GND	4.5V	GND	Waveform
C_n	Any F	1	0	0	–	–	–	All A's & B's	–	out-of-phase
C_n	F_i	1	0	0	–	B_i	A_i	All A's & B's	–	in-phase
A_i	$\overline{G}$	1	1	0	X	B_i	–	All B's	All A's	out-of-phase
B_i	$\overline{G}$	1	1	0	X	A_i	–	All B's	All A's	out-of-phase
A_i	$\overline{P}$	X	X	1	X	B_i	–	All A's & B's	–	out-of-phase
B_i	$\overline{P}$	1	1	0	X	–	A_i	All B's	All A's	out-of-phase
A_i	F_i	0	1	0	0	–	B_i	–	A's & B's	out-of-phase
A_i	F_i	0	1	0	1	–	B_i	–	A's & B's	in-phase
B_i	F_i	0	1	0	0	–	A_i	–	A's & B's	out-of-phase
B_i	F_i	0	1	0	1	–	A_i	–	A's & B's	in-phase
A_i	F_{i+1}	0	1	0	1	B_i	–	A's & B's	–	out-of-phase
B_i	F_{i+1}	1	0	0	1	A_i	–	A's & B's	–	out-of-phase
S_0	F_i	–	0	0	1	B_i	A_i	All B's	All A's	in-phase
S_0	$\overline{G}$	–	1	0	X	–	–	A's & B's	–	out-of-phase
S_0	$\overline{P}$	–	1	0	X	–	–	All B's	All A's	out-of-phase
S_1	F_i	0	–	0	1	A_i	B_i	All A's	All B's	in-phase
S_1	$\overline{G}$	1	–	0	X	–	–	A's & B's	–	out-of-phase
S_1	$\overline{P}$	1	–	0	X	–	–	All A's	All B's	out-of-phase
S_2	F_i	0	1	–	1	A_i	B_i	All A's	All B's	out-of-phase
S_2	$\overline{G}$	1	1	–	X	–	–	A's & B's	–	in-phase
S_2	$\overline{P}$	1	1	–	X	–	–	All A's	All B's	in-phase

X = Don't care

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Refer to Page 13-1 for Essential Information on Military Devices

Am25LS/54LS/74LS381
TRUTH TABLE

FUNCTION	INPUTS						OUTPUTS					
	S_0	S_1	S_2	C_n	A_n	B_n	F_0	F_1	F_2	F_3	$\overline{G}$	$\overline{P}$
CLEAR	0	0	0	X	X	X	0	0	0	0	0	0
B MINUS A	1	0	0	0	0	0	1	1	1	1	1	0
				0	0	1	0	1	1	1	0	0
				0	1	0	0	0	0	0	1	1
				0	1	1	1	1	1	1	1	0
				1	0	0	0	0	0	0	1	0
				1	0	1	1	1	1	1	0	0
				1	1	0	1	0	0	0	1	1
				1	1	1	0	0	0	0	1	0
A MINUS B	0	1	0	0	0	0	1	1	1	1	1	0
				0	0	1	0	0	0	0	1	1
				0	1	0	0	1	1	1	0	0
				0	1	1	1	1	1	1	1	0
				1	0	0	0	0	0	0	1	0
				1	0	1	1	0	0	0	1	1
				1	1	0	1	1	1	1	0	0
				1	1	1	0	0	0	0	1	0
A PLUS B	1	1	0	0	0	0	0	0	0	0	1	1
				0	0	1	1	1	1	1	1	0
				0	1	0	1	1	1	1	1	0
				0	1	1	0	1	1	1	0	0
				1	0	0	1	0	0	0	1	1
				1	0	1	0	0	0	0	1	0
				1	1	0	0	0	0	0	1	0
				1	1	1	1	1	1	1	0	0
A ⊕ B	0	0	1	X	0	0	0	0	0	0	1	1
				X	0	1	1	1	1	1	1	1
				X	1	0	1	1	1	1	1	0
				X	1	1	0	0	0	0	0	0
A + B	1	0	1	X	0	0	0	0	0	0	1	1
				X	0	1	1	1	1	1	1	1
				X	1	0	1	1	1	1	1	1
				X	1	1	1	1	1	1	1	0
AB	0	1	1	X	0	0	0	0	0	0	0	0
				X	0	1	0	0	0	0	1	1
				X	1	0	0	0	0	0	0	0
				X	1	1	1	1	1	1	1	0
PRESET	1	1	1	X	0	0	1	1	1	1	1	1
				X	0	1	1	1	1	1	1	1
				X	1	0	1	1	1	1	1	1
				X	1	1	1	1	1	1	1	0

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Refer to Page 13-1 for Essential Information on Military Devices

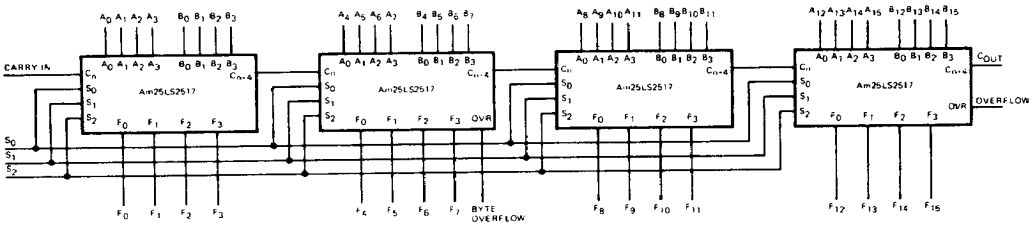
Am25LS2517
TEST TABLE

Path						Same Bit		Other Data Bits		Output
In	Out	S_0	S_1	S_2	C_n	4.5V	GND	4.5V	GND	Waveform
C_n	Any F	1	0	0	–	–	–	A's & B's	None	out-of-phase
C_n	F_i	1	0	0	–	B_i	A_i	A's & B's	None	in-phase
A_i	F_i	0	1	0	0	–	B_i	None	A's & B's	out-of-phase
A_i	F_i	0	1	0	1	–	B_i	None	A's & B's	in-phase
A_i	OVRF	0	1	1	1	B_i	–	A's & B's	None	in-phase
A_i	C_{n+4}	0	1	1	1	B_i	–	A's & B's	None	in-phase
B_i	F_i	0	1	0	0	–	A_i	None	A's & B's	out-of-phase
B_i	F_i	0	1	0	1	–	A_i	–	A's & B's	in-phase
B_i	OVRF	0	1	1	0	A_i	–	A's & B's	None	out-of-phase
B_i	C_{n+4}	0	1	1	0	A_i	–	A's & B's	None	out-of-phase
A_i	F_{i+1}	0	1	0	1	B_i	–	A's & B's	None	out-of-phase
B_i	F_{i+1}	1	0	0	1	A_i	–	A's & B's	None	out-of-phase
S_0	F_i	–	0	0	1	B_i	A_i	All B's	All A's	in-phase
S_0	OVRF	–	1	1	0	–	–	None	A's & B's	out-of-phase
S_0	C_{n+4}	–	1	1	0	–	–	None	A's & B's	out-of-phase
S_1	F_i	0	–	0	1	A_i	B_i	All A's	All B's	in-phase
S_1	OVRF	0	–	1	X	–	–	None	A's & B's	in-phase
S_1	C_{n+4}	0	–	1	X	–	–	None	A's & B's	in-phase
S_2	F_i	0	1	–	1	A_i	B_i	All A's	All B's	in-phase
S_2	OVRF	0	1	–	0	–	–	None	A's & B's	out-of-phase
S_2	C_{n+4}	0	1	–	0	–	–	None	A's & B's	in-phase

Am25LS2517
TRUTH TABLE

FUNCTION	INPUTS						OUTPUTS					
	S_0	S_1	S_2	C_n	A_n	B_n	F_0	F_1	F_2	F_3	$\overline{G}$	$\overline{P}$
CLEAR	0	0	0	0	X	X	0	0	0	0	1	1
				1	X	X	0	0	0	0	1	1
B MINUS A	1	0	0	0	0	0	1	1	1	1	0	0
				0	0	1	0	1	1	1	0	1
				0	1	0	0	0	0	0	0	0
				0	1	1	1	1	1	1	0	0
				1	0	0	0	0	0	0	0	1
				1	0	1	1	1	1	1	0	1
				1	1	0	1	0	0	0	0	0
				1	1	1	0	0	0	0	0	1
A MINUS B	0	1	0	0	0	0	1	1	1	1	0	0
				0	0	1	0	0	0	0	0	0
				0	1	0	0	1	1	1	0	1
				0	1	1	1	1	1	1	0	0
				1	0	0	0	0	0	0	0	1
				1	0	1	1	0	0	0	0	0
				1	1	0	1	1	1	1	0	1
				1	1	1	0	0	0	0	0	1
A PLUS B	1	1	0	0	0	0	0	0	0	0	0	0
				0	0	1	1	1	1	1	0	0
				0	1	0	1	1	1	1	0	0
				0	1	1	0	1	1	1	0	1
				1	0	0	1	0	0	0	0	0
				1	0	1	0	0	0	0	0	1
				1	1	0	0	0	0	0	0	1
				1	1	1	1	1	1	1	0	1
A ⊕ B	0	0	1	0	0	0	0	0	0	0	1	1
				0	0	1	1	1	1	1	0	0
				0	1	0	1	1	1	1	0	0
				0	1	1	0	0	0	0	1	1
				1	0	0	0	0	0	0	0	0
				1	0	1	1	1	1	1	0	0
				1	1	0	1	1	1	1	1	1
				1	1	1	0	0	0	0	1	1
A + B	1	0	1	0	0	0	0	0	0	0	1	1
				0	0	1	1	1	1	1	0	0
				0	1	0	1	1	1	1	0	0
				0	1	1	1	1	1	1	0	0
				1	0	0	0	0	0	0	0	0
				1	0	1	1	1	1	1	0	0
				1	1	0	1	1	1	1	0	0
				1	1	1	1	1	1	1	1	1
AB	0	1	1	0	0	0	0	0	0	0	1	1
				0	0	1	0	0	0	0	0	0
				0	1	0	0	0	0	0	1	1
				0	1	1	1	1	1	1	0	0
				1	0	0	0	0	0	0	1	1
				1	0	1	0	0	0	0	0	0
				1	1	0	0	0	0	0	1	1
				1	1	1	1	1	1	1	1	1
PRESET	1	1	1	0	0	0	1	1	1	1	0	0
				0	0	1	1	1	1	1	0	0
				0	1	0	1	1	1	1	0	0
				0	1	1	1	1	1	1	0	0
				1	0	0	1	1	1	1	0	0
				1	0	1	1	1	1	1	0	0
				1	1	0	1	1	1	1	0	0
				1	1	1	1	1	1	1	1	1

APPLICATIONS



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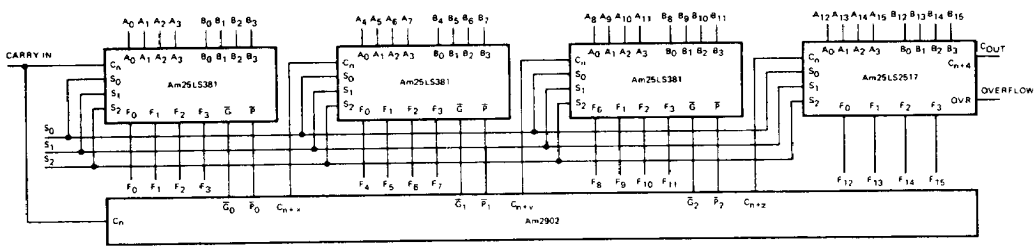
TYPICAL SPEED CALCULATIONS

Path	Output	
	F	$C_n + 4$, OVR
A_i or B_i to $C_n + 4$	24 ns	24 ns
C_n to $C_n + 4$	15 ns	15 ns
C_n to $C_n + 4$	15 ns	15 ns
C_n to F_i	16 ns	–
C_n to $C_n + 4$, OVR	–	15 ns
16-Bit Speed	70 ns	69 ns

The Am25LS2517 in a 16-Bit Ripple Carry ALU Connection.



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TYPICAL SPEED CALCULATIONS

Path	Output	
	F	$C_n + 4$, OVR
A_i or B_i to $\overline{G}$ or $\overline{P}$	20 ns*	20 ns*
$\overline{G}_i$ or $\overline{P}_i$ to C_{i+j} (Am2902)	8 ns	8 ns
C_n to F	16 ns	–
C_n to $C_n + 4$, OVR	–	15 ns
16-Bit Speed	44 ns	43 ns

* Note that S_i to G or P may be longer path.

The Am25LS2517 and Am25LS381 in a 16-Bit Carry Lookahead ALU Connection.

USER NOTES

1. Throughout this data sheet, the active HIGH input and output terminology has been used.
2. Arithmetic operations are performed on a word basis.
3. Logic operations are performed on a bit basis.
4. Arithmetic in 1's complement notation requires an end around carry.
5. Subtraction in 2's complement notation requires a carry in (C_n = HIGH) for the active HIGH case.

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Refer to Page 13-1 for Essential Information on Military Devices

ABSOLUTE MAXIMUM RATINGS

Storage Temperature ..... −65°C to +150°C
(Ambient) Temperature Under Bias ..... −55°C to +125°C
Supply Voltage to Ground Potential
Continuous ..... −0.5V to +7.0V
DC Voltage Applied to Outputs For
High Output State ..... −0.5V to +V_{CC} max
DC Input Voltage (Except Am25LS2517,
C_N input = 5.5V) ..... −0.5V to +7.0V
DC Output Current, Into Outputs 30mA
DC Input Current ..... −30mA to +5.0mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices
Temperature ..... 0°C to +70°C
Supply Voltage ..... +4.75V to +5.25V

Military (M) Devices
Temperature ..... −55°C to +125°C
Supply Voltage ..... +4.5V to +5.5V

Operating ranges define those limits over which the functionality of the device is guaranteed.

DC CHARACTERISTICS over operating range unless otherwise specified

Am25LS381 • Am25LS2517

Parameters	Description	Test Conditions (Note 2)			Min	Typ (Note 1)	Max	Units
V_{OH}	Output HIGH Voltage	V_{CC} = MIN, I_{OH} = −440μA, V_{IN} = V_{IH} or V_{IL}		MIL	2.5	3.4		Volts
				COM'L	2.7	3.4		
V_{OL}	Output LOW Voltage	V_{CC} = MIN, V_{IN} = V_{IH} or V_{IL}	I_{OL} = 4.0 mA				0.4	Volts
			I_{OL} = 8.0mA				0.45	
			$\overline{G}$, I_{OL} = 16mA				0.55	
V_{IH}	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs			2.0			Volts
V_{IL}	Input LOW Level	Guaranteed input logical LOW voltage for all inputs.		MIL			0.7	Volts
				COM'L			0.8	
V_I	Input Clamp Voltage	V_{CC} = MIN, I_{IN} = −18mA					−1.5	Volts
I_{IL}	Input LOW Current	V_{CC} = MAX, V_{IN} = 0.4V		Any S			−0.36	mA
				Any A or B			−1.44	
				'LS381, C_n			−1.08	
				'LS2517, C_n			−1.44	
I_{IH}	Input HIGH Current	V_{CC} = MAX, V_{IN} = 2.7V		Any S			20	μA
				Any A or B			80	
				'LS381, C_n			60	
				'LS2517, C_n			80	
I_I	Input HIGH Current	V_{CC} = MAX, V_{IN} = 7.0V		Any S			0.1	mA
				Any A or B			0.4	
				'LS381, C_n			0.3	
		V_{CC} = MAX, V_{IN} = 5.5V		'LS2517, C_n			0.4	
I_{SC}	Output Short Circuit Current (Note 3)	V_{CC} = MAX			−15		−85	mA
I_{CC}	Power Supply Current (Note 4)	V_{CC} = MAX	MIL	Am25LS381			40	mA
				Am25LS2517			43	
			COM'L	Am25LS381		25	43	
				Am25LS2517		27	47	

Notes: 1. Typical limits are at V_{CC} = 5.0V, 25°C ambient and maximum loading.
2. For conditions shown as MIN or MAX, use the appropriate value specified under Operating Ranges for the applicable device type.
3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.
4. Test conditions: LS381: S_0 = S_1 = S_2 = GND, all other inputs open.
LS2517: S_0 = C_n = open, all other inputs = GND.

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Refer to Page 13-1 for Essential Information on Military Devices

DC CHARACTERISTICS over operating range unless otherwise specified

AM54LS/74LS381

Parameters	Description	Test Conditions (Note 2)		Min	Typ (Note 1)	Max	Units
V_{OH}	Output HIGH Voltage	V_{CC} = MIN, I_{OH} = −400μA, V_{IN} = V_{IH} or V_{IL}	MIL	2.5	3.4		Volts
			COM'L	2.7	3.4		
V_{OL}	Output LOW Voltage	V_{CC} = MIN, V_{IN} = V_{IH} or V_{IL}	I_{OL} = 4.0 mA			0.4	Volts
			74LS only, I_{OL} = 8mA			0.5	
			$\overline{P}$, I_{OL} = 8.0mA			0.5	
			$\overline{G}$, I_{OL} = 16mA			0.65	
V_{IH}	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs		2.0			Volts
V_{IL}	Input LOW Level	Guaranteed input logical LOW voltage for all inputs.	MIL			0.7	Volts
			COM'L			0.8	
V_I	Input Clamp Voltage	V_{CC} = MIN, I_{IN} = −18mA				−1.5	Volts
I_{IL}	Input LOW Current (Note 5)	V_{CC} = MAX, V_{IN} = 0.4V	Any S			−0.4	mA
			Others			−1.6	
I_{IH}	Input HIGH Current (Note 5)	V_{CC} = MAX, V_{IN} = 2.7V	Any S			20	μA
			Others			80	
I_I	Input HIGH Current (Note 5)	V_{CC} = MAX, V_{IN} = 7.0V	Any S			0.1	mA
			Others			0.4	
I_{SC}	Output Short Circuit Current (Note 3)	V_{CC} = MAX		−15		−100	mA
I_{CC}	Power Supply Current (Note 4)	V_{CC} = MAX			25	43	mA

Notes:
1. Typical limits are at V_{CC} = 5.0V, 25°C ambient and maximum loading.
2. For conditions shown as MIN or MAX, use the appropriate value specified under Operating Ranges for the applicable device type.
3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.
4. Test conditions: LS381: S_0 = S_1 = S_2 = GND, all other inputs open.
   LS2517: S_0 = C_n = open, all other inputs = GND.
5. Limits chosen by AMD based on SN545/74S381, T, I, LS data unavailable.

SWITCHING CHARACTERISTICS (T_A = +25°C, V_{CC} = 5.0V)

Parameters	Description	Test Conditions	Am25LS Min	Am25LS Typ	Am25LS Max	Am54LS/74LS Min	Am54LS/74LS Typ	Am54LS/74LS Max	Units
t_{PLH}	C_n to F_i	C_L = 15pF, R_L = 2.0kΩ		14	21			26	ns
t_{PHL}				16	24			30	
t_{PLH}	A_i to B_i to F_i			16	24			30	ns
t_{PHL}				23	35			40	
t_{PLH}	S_i to F_i			20	30			35	ns
t_{PHL}				25	37			40	
t_{PLH}	A_i or B_i to $\overline{G}$ ('LS381 Only)			20	30			35	ns
t_{PHL}				15	23			30	
t_{PLH}	A_i or B_i to $\overline{P}$ ('LS381 Only)			17	26			34	ns
t_{PHL}				15	23			30	
t_{PLH}	S_i to $\overline{G}$ or $\overline{P}$ ('LS381 Only)			32	48			55	ns
t_{PHL}				23	35			42	
t_{PLH}	A_i or B_i to OVR ('LS2517 Only)			23	34			–	ns
t_{PHL}				24	36			–	
t_{PLH}	A_i or B_i to C_{n+4} ('LS2517 Only)			21	32			–	ns
t_{PHL}				24	36			–	
t_{PLH}	S_i to OVR or C_{n+4} ('LS2517 Only)			27	41			–	ns
t_{PHL}				37	55			–	
t_{PLH}	C_n to C_{n+4} ('LS2517 Only)			14	21			–	ns
t_{PHL}				15	22			–	
t_{PLH}	C_n to OVR ('LS2517 Only)			15	22			–	ns
t_{PHL}				15	22			–	

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Refer to Page 13-1 for Essential Information on Military Devices

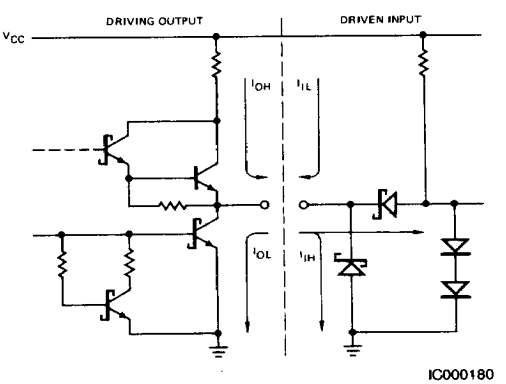
Am25LS only

SWITCHING CHARACTERISTICS over operating range unless otherwise specified*

Parameters	Description	Test Conditions	COMMERCIAL Am25LS Min	COMMERCIAL Am25LS Max	MILITARY Am25LS Min	MILITARY Am25LS Max	Units
t_{PLH}	C_n to F_i	C_L = 50pF, R_L = 2.0KΩ		27		30	ns
t_{PHL}				35		42	
t_{PLH}	A_i or B_i to F_i			32		36	ns
t_{PHL}				44		50	
t_{PLH}	S_i to F_i			38		42	ns
t_{PHL}				48		55	
t_{PLH}	A_i or B_i to $\overline{G}$ ('LS381 Only)			37		40	ns
t_{PHL}				31		36	
t_{PLH}	A_i or B_i to $\overline{P}$ ('LS381 Only)			34		39	ns
t_{PHL}				34		42	
t_{PLH}	S_i to $\overline{G}$ or $\overline{P}$ ('LS381 Only)			57		63	ns
t_{PHL}				47		55	
t_{PLH}	A_i or B_i to OVR ('LS2517 Only)			41		45	ns
t_{PHL}				47		55	
t_{PLH}	A_i or B_i to C_{n+4} ('LS2517 Only)			38		40	ns
t_{PHL}				46		52	
t_{PLH}	S_i to OVR or C_{n+4} ('LS2517 Only)			52		60	ns
t_{PHL}				66		75	
t_{PLH}	C_n to C_{n+4} ('LS2517 Only)			28		32	ns
t_{PHL}				28		30	
t_{PLH}	C_n to OVR ('LS2517 Only)			30		35	ns
t_{PHL}				28		30	

*AC performance over the operating temperature range is guaranteed by testing defined in Group A, Subgroup 9.

Am25LS/Am54LS/74LS LOW-POWER SCHOTTKY INPUT/OUTPUT CURRENT INTERFACE CONDITIONS



Note: Actual current flow direction shown.