Am25LS07/Am25LS08

Hex/Quad Parallel D Registers with Register Enable

DISTINCTIVE CHARACTERISTICS

- 4-bit and 6-bit parallel registers
- Common Clock and Common Enable
- Positive edge triggered D flip flops
- Second sourced by TI as 54LS/74LS378 and 379
- Am25LS D.C. parameters including:
  V_{OL} = 0.45V at I_{OL} = 8mA
  Fan-out over military range = 22
  440μA source current

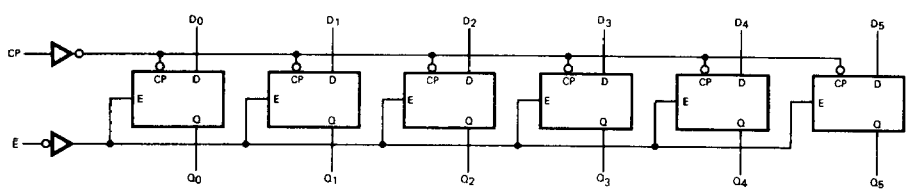
GENERAL DESCRIPTION

The Am25LS07 is a 6-bit Low Power Schottky register with a buffered common register enable. The Am25LS08 is a 4-bit register with a buffered common register enable. The devices are similar to the Am54LS/74LS174 and Am54LS/74LS175 but feature the common register enable rather than common clear.

Both registers will find application in digital systems where information is associated with a logic gating signal. When the enable is LOW, data on the D inputs is stored in the register on the positive going edge of the clock pulse. When the enable is HIGH, the register will not change state regardless of the clock or data input transitions.

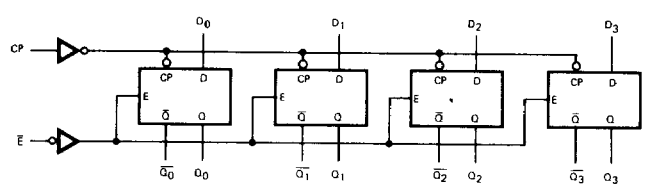
BLOCK DIAGRAM

Am25LS07



BD001450

Am25LS08



BD001520

RELATED PRODUCTS

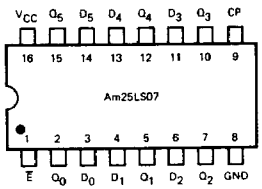
Part No.	Description
Am2918	Quad D Register
Am2919	Quad D Register

03699B

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

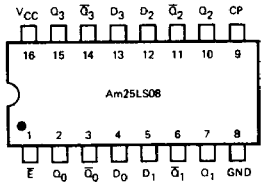
CONNECTION DIAGRAM
Top View

Am25LS07



CD001730

Am25LS08



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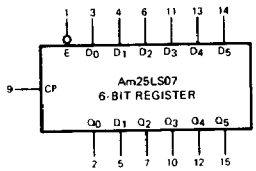
Note: Pin 1 is marked for orientation

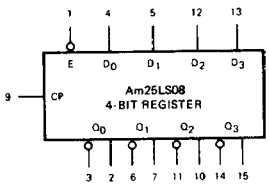
LOGIC SYMBOL

Am25LS07



LS000630

Am25LS08



LS000640

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).

Am25LS07/08 **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– 16-pin CERDIP
  - F– 16-pin flatpak
  - P– 16-pin plastic DIP
  - X– Dice
- **Am25LS07/08** — Device type
  - Hex/Quad Parallel D Registers

Valid Combinations	
Am25LS07/08	PC DC, DM FM 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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PIN DESCRIPTION

Pin No.	Name	I/O	Description
	D_i	I	The D flip-flop data inputs.
1	$\overline{E}$	I	Enable. When the enable is LOW, data on the D_i inputs is transferred to the Q_i outputs on the LOW-to-HIGH clock transition. When the enable is HIGH, the Q_i outputs do not change regardless of the data or clock input transitions.
9	CP	I	Clock. Pulse for the register. Enters data on the LOW-to-HIGH transition.
	Q_i	O	The TRUE register outputs.
	$\overline{Q}_i$	O	The complement register outputs.

FUNCTION TABLE

Inputs			Outputs	
$\overline{E}$	D_I	CP	Q_i	$\overline{Q}_I$
H	X	X	NC	NC
L	X	H	NC	NC
L	X	L	NC	NC
L	L	↑	L	H
L	H	↑	H	L

H = HIGH NC = No Change ↑ = LOW-to-HIGH Transition
L = LOW X = Don't Care $\overline{Q_1}$ on Am25LS08 Only

ABSOLUTE MAXIMUM RATINGS

Storage Temperature ..... −65°C to +150°C
Temperature (Ambient) Under Bias ..... −55°C to +125°C
Supply Voltage to Ground Potential
(Pin 16 to Pin 8) Continuous ..... −0.5V to +7.0V
DC Voltage Applied to Outputs For
HIGH Output State ..... −0.5V to +V_{CC} max
DC Input Voltage ..... −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

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}	COM'L	2.7	3.4		Volts
			MIL	2.5	3.4		
V_{OL}	Output LOW Voltage	V_{CC} = MIN. V_{IN} = V_{IH} or V_{IL}	I_{OL} = 4mA			0.4	Volts
			I_{OL} = 8mA			0.45	
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	COM'L			0.8	Volts
			MIL			0.7	
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	Clock, $\overline{E}$			−0.36	mA
			Others			−0.24	
I_{IH}	Input HIGH Current	V_{CC} = MAX., V_{IN} = 2.7V	Clock, $\overline{E}$			20	µA
			Others			14	
I_I	Input HIGH Current	V_{CC} = MAX., V_{IN} = 7.0V				0.1	mA
I_{SC}	Output Short Circuit Current (Note 3)	V_{CC} = MAX.		−15		−85	mA
I_{CC}	Power Supply Current	V_{CC} = MAX. (Note 4)	LS07		16	22	mA
			LS08		11	18	

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. Outputs open; enable grounded; data inputs at 4.5V, measured after a momentary ground, then 4.5V applied to the clock input.

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

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

Parameters	Description	Test Conditions	Min	Typ	Max	Units
t_{PLH}	Clock to Output	C_L = 15pF R_L = 2.0kΩ		13	20	ns
t_{PHL}	Clock to Output			13	20	ns
t_{pw}	Clock Pulse Width		17			ns
t_s	Data		20			ns
t_s	Enable		30			ns
t_h	Data		5.0			ns
t_h	Enable		5.0			ns
f_{max} (Note 1)	Maximum Clock Frequency		40	65		MHz

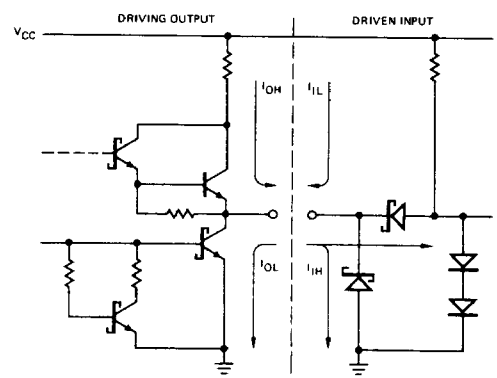
Note 1. Per industry convention, f_{max} is the worst case value of the maximum device operating frequency with no constraints on t_r, t_f, pulse width or duty cycle.

SWITCHING CHARACTERISTICS over operating range unless otherwise specified*

Parameters	Description	Test Conditions	COMMERCIAL Am25LS		MILITARY Am25LS		Units
			Min	Max	Min	Max	
t_{PLH}	Clock to Output	C_L = 50pF R_L = 2.0kΩ		30		35	ns
t_{PHL}	Clock to Output			30		35	ns
t_{pw}	Clock Pulse Width		26		30		ns
t_s	Data		30		35		ns
t_s	Enable		43		50		ns
t_h	Data		11		12		ns
t_h	Enable		11		12		ns
f_{max} (Note 1)	Maximum Clock Frequency		30		25		MHz

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

LOW-POWER SCHOTTKY INPUT/OUTPUT CURRENT INTERFACE CONDITIONS



IC000180

Note: Actual current flow direction shown.