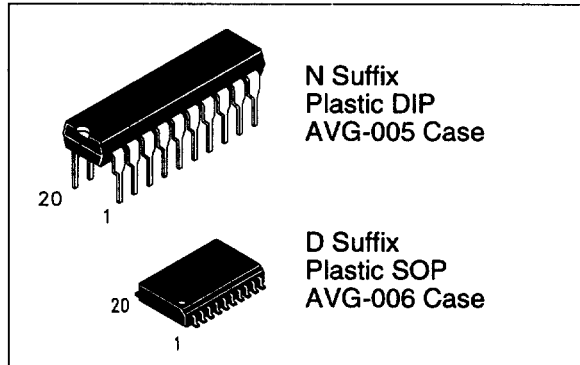


Available Q2, 1995

Octal Inverting Transparent Latch with 3-State Outputs

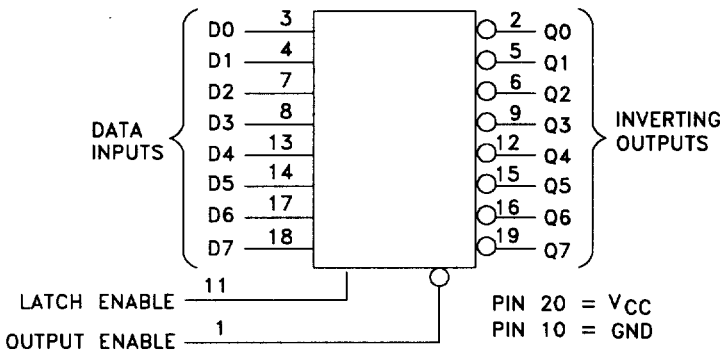
DV74AC533
DV74ACT533

This device consists of eight latches with 3-state outputs for bus organized system applications. The flip-flops appear transparent to the data when Latch Enable is HIGH. When Latch Enable is LOW, the data that meets the setup time is latched. Data appears on the bus when the Output Enable is LOW. When Output Enable is HIGH, the bus output is in the high impedance state. Data is presented to the output in inverted form.

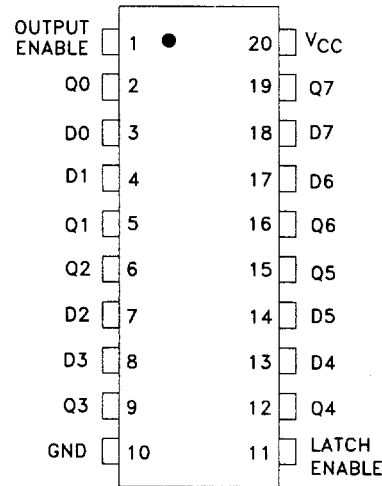


- Advanced very high speed CMOS
- Outputs source/sink 24 mA
- Transmission line driving 50 ohms
- ACT has TTL compatible inputs
- Operation from 2 to 6 volts guaranteed
- DC & AC Parameters guaranteed over -40 to +85°C

LOGIC DIAGRAM



PIN ASSIGNMENT



ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	AC533, ACT533	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	- 0.5 to +7.0	V
V _{IN}	DC Input Voltage (Referenced to GND)	- 0.5 to V _{CC} +0.5	V
V _{OUT}	DC Output Voltage (Referenced to GND)	- 0.5 to V _{CC} +0.5	V
I _{IN}	DC Input Current, per Pin	± 20	mA
I _{OUT}	DC Output Sink/Source Current, per Pin	± 50	mA
I _{CC}	DC V _{CC} or GND Current per Output Pin	± 50	mA
T _{STG}	Storage Temperature	- 65 to +150	°C

533

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit	
V _{CC}	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage, (Ref. to GND)	0		V _{CC}	V	
t _r , t _f	Input Rise and Fall Time (Note 1) 'AC Devices	V _{CC} @ 3.0 V			150	ns/V
		V _{CC} @ 4.5 V			40	ns/V
		V _{CC} @ 5.5 V			25	ns/V
t _r , t _f	Input Rise and Fall Time (Note 2) 'ACT Devices	V _{CC} @ 4.5 V			10	ns/V
		V _{CC} @ 5.5 V			8.0	ns/V
T _A	Operating Ambient Temperature Range	-40		85	°C	
C _{PD}	Power Dissipation Capacitance	V _{CC} = 5.0 V		40	pF	
C _{IN}	Input Capacitance V _{CC} = 5.0 V	V _{CC} = 5.0 V		4.5	pF	

1. V_{IN} from 30% to 70% V_{CC}

2. V_{IN} from 0.8 to 2.0 V

AC — 533

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	AC533			Unit
				T _A = +25°C		T _A = -40 to +85°C	
				Typ	Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	3.0	1.5	2.1	2.1	V
			4.5	2.25	3.15	3.15	
			5.5	2.75	3.85	3.85	
V _{IL}	Maximum Low Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	3.0	1.5	0.9	0.9	V
			4.5	2.25	1.35	1.35	
			5.5	2.75	1.65	1.65	
V _{OH}	Minimum High Level Output Voltage	I _{OUT} = -50 μA	3.0	2.99	2.9	2.9	V
			4.5	4.49	4.4	4.4	
			5.5	5.49	5.4	5.4	
V _{OL}	Maximum Low Level Output Voltage	I _{OUT} = 50 μA	3.0	0.002	0.1	0.1	V
			4.5	0.001	0.1	0.1	
			5.5	0.001	0.1	0.1	
V _{OL}	Maximum Low Level Output Voltage	V _{IN} = V _{IL} or V _{IH} 12mA I _{OH} 24mA 24 mA	3.0		0.36	0.44	V
			4.5		0.36	0.44	
			5.5		0.36	0.44	
I _{OZ}	Maximum 3-State Current	V _{OE} = V _{IH} V _{IN} = V _{CC} or GND V _{OUT} = V _{CC} or GND	5.5	±0.5		±5.0	μA
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} , GND	5.5		±0.1	±1.0	μA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5		8.0	80	μA

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AC CHARACTERISTICS

Symbol	Parameter ($C_L = 50 \text{ pF}$)	V_{CC} (V) $\pm 10\%$	ACT533				Unit
			$T_A = +25^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay D _n to Q _n	3.3	2.0	14.5	1.5	16	ns
		5.0	2.0	10	1.5	11	
t _{PHL}		3.3	2.0	13	1.5	14.5	
		5.0	2.0	9.5	1.5	10.5	
t _{PLH}	Propagation Delay Latch Enable to Q _n	3.3	2.0	14	1.5	16.5	ns
		5.0	2.0	10.5	1.5	11.5	
t _{PHL}		3.3	2.0	13	1.5	14.5	
		5.0	2.0	10	1.5	11	
t _{PZH}	Output Enable Time	3.3	2.0	12.5	1.5	14	ns
		5.0	2.0	9.5	1.5	10.5	
t _{PZL}		3.3	2.0	12.5	1.5	14	
		5.0	2.0	9.5	1.5	10.5	
t _{PHZ}	Output Disable Time	3.3	2.0	13	1.5	14.5	ns
		5.0	2.0	10	1.5	11	
t _{PLZ}		3.3	2.0	13	1.5	14.5	
		5.0	2.0	10	1.5	11	

AC OPERATING REQUIREMENTS

Symbol	Parameter ($C_L = 50 \text{ pF}$)	V_{CC} (V) $\pm 10\%$	ACT533		Unit
			$T_A = +25^\circ\text{C}$	$T_A = -40^\circ\text{C to } +85^\circ\text{C}$	
			Guaranteed Minimum		
t _s	Setup Time, HIGH or LOW, D _n to Latch Enable	3.3	5.0	6.0	ns
		5.0	4.0	4.5	
t _h	Hold Time, HIGH or LOW, D _n to Clock	3.3	1.5	1.0	ns
		5.0	1.5	1.0	
t _w	Clock Pulse Width, HIGH or LOW	3.3	6.0	6.5	ns
		5.0	4.5	5.0	

ACT — 533

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	ACT533			Unit
				$T_A = +25^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$	
				Typ	Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	4.5	1.5	2.0	2.0	V
			5.5	1.5	2.0	2.0	
V _{IL}	Maximum Low Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	4.5	1.5	0.8	0.8	V
			5.5	1.5	0.8	0.8	
V _{OH}	Minimum High Level Output Voltage	I _{OUT} = -50 μA	4.5	4.49	4.4	4.4	V
			5.5	5.49	5.4	5.4	
		V _{IN} = V _{IL} or V _{IH} I _{OH} = -24mA -24 mA	4.5		3.86	3.76	V
			5.5		4.86	4.76	
V _{OL}	Maximum Low Level Output Voltage	I _{OUT} = 50 μA	4.5	0.001	0.1	0.1	V
			5.5	0.001	0.1	0.1	
		V _{IN} = V _{IL} or V _{IH} I _{OL} = 24mA 24 mA	4.5		0.36	0.44	V
			5.5		0.36	0.44	
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} , GND	5.5		±0.1	±1.0	μA

533

Symbol	Parameter	Conditions	V _{CC} (V)	ACT533		Unit	
				TA = +25°C			TA = -40 to +85°C
				Typ	Guaranteed Limits		
I _{OZ}	Maximum 3-State Current	V _{IN(OE)} = V _{IL} , V _{IH} V _{IN} = V _{CC} , GND V _{OUT} = V _{CC} , GND			±0.5	±5.0	μA
ΔI _{CC} T	Additional Max I _{CC} /Input	V _{IN} = V _{CC} - 2.1 V	5.5	0.6		1.5	mA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5		8.0	80	μA

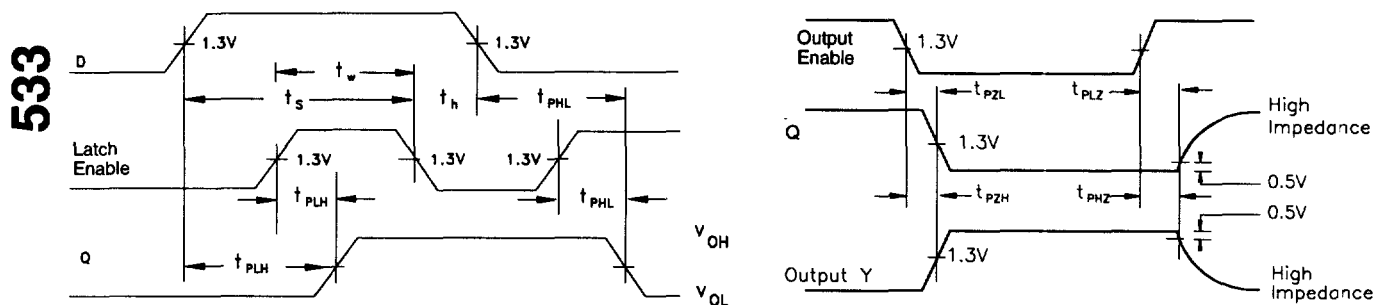
AC CHARACTERISTICS

Symbol	Parameter (C _L = 50 pF)	V _{CC} (V) ±10%	ACT533				Unit
			TA = +25°C		TA = -40°C to +85°C		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay Dn to Q _n	5.0	2.5	10.5	2.0	11.5	ns
t _{PHL}		5.0	2.5	10.0	2.0	11.0	
t _{PLH}	Propagation Delay Latch Enable to Q _n	5.0	2.5	10.5	2.0	11.5	ns
t _{PHL}		5.0	2.5	10.5	2.0	11.5	
t _{PZH}	Output Enable Time	5.0	2.0	10.0	1.5	11.0	ns
t _{PZL}		5.0	2.0	10.0	1.5	11.0	
t _{PHZ}	Output Disable Time	5.0	2.0	10.0	1.5	11.0	ns
t _{PLZ}		5.0	2.0	10.0	1.5	11.0	

AC OPERATING REQUIREMENTS

Symbol	Parameter (C _L = 50 pF)	V _{CC} (V) ±10%	ACT533		Unit	
			TA = +25°C			TA = -40°C to +85°C
			Guaranteed Minimum			
t _s	Setup Time, HIGH or LOW, Dn to Clock	5.0	3.0	4.0	ns	
t _h	Hold Time, HIGH or LOW, Dn to Clock	5.0	2.0	2.5	ns	
t _w	Clock Pulse Width, HIGH or LOW	5.0	5.0	6.0	ns	

SWITCHING WAVEFORMS



Input and output threshold voltage:
V_T = 50% V_{CC} for AC; 1.5V for ACT
V_H = V_{CC} for AC, 3V for ACT