National Semiconductor

MICROCIRCUIT DATA SHEET

MN54ACT2525-X REV 2A0

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1-to-8 Minimum Skew Clock Driver

General Description

The ACT2525 is a minimum skew clock driver with one input driving eight outputs specifically designed for signal generation and clock distribution applications. The 2525 is designed to distribute a single clock to eight separate receivers with low skew across all outputs during both the TPLH and TPHL transitions.

Industry Part Number

54ACT2525

NS Part Numbers

54ACT2525DMQB
54ACT2525FMQB
54ACT2525LMQB

Prime Die

J2525

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{O}C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

Features

- Ideal for signal generation and clock distribution
- Guaranteed pin to pin and part to part skew
- Guaranteed 4000V minimum ESD protection
- 24mA output drive capability
- CT has TTL-compatible inputs

(Absolute Maximum Ratings)

(Note 1)

Supply Voltage (Vcc)	-0.5V to +7.0V
DC Input Diode Current (Iik)	
Vi = -0.5V	-20 mA
Vi = Vcc +0.5V	+20 mA
DC Input Voltage (Vi)	-0.5V to Vcc +0.5V
DC Output Diode Current (Iok)	
Vo = -0.5V	-20 mA
Vo = Vcc +0.5V	+20 mA
DC Output Voltage (Vo)	-0.5V to Vcc +0.5V
DC Output Source or Sink Current (Io)	±50 mA
DC Vcc or Ground Current per Output Pin (Icc or Ignd)	±50 mA
Storage Temperature (Tstg)	-65 C to +150 C
Junction Temperature (Tj)	
CDIP	175 C

Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. National does not recommend operation of CGS circuits outside databook specifications.

Recommended Operating Conditions

Supply Voltage (Vcc)	4.5V to 5.5V
Input Voltage (Vi)	0V to Vcc
Output Voltage (Vo)	0V to Vcc
Operating Temperature (Ta)	-55 C to +125 C
Minimum Input Edge Rate (Delta V/Delta t)	
ACT Devices	
Vin from 0.8V to 2.0V	
Vcc @ 4.5V, 5.5V	125 mV/ns

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: VCC 4.5V to 5.5V, Temperature Range: -55C to 125C. NOTE: -55C TEMPERATURE, SUBGROUP 3 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IIH	High Level Input Current	VCC=5.5V, VIH=5.5V	1, 2	INPUT		0.1	uA	1
			1, 2	INPUT		1.0	uA	2, 3
IIL	Low Level Input Current	VCC=5.5V, VIL=0.0V	1, 2	INPUT		-0.1	uA	1
			1, 2	INPUT		-1.0	uA	2, 3
VOL	Low Level Output Voltage	VCC=4.5V, VIH=2.0V, VIL=0.8V, IOL=50.0uA	1, 2	OUTPUT		.10	V	1, 2, 3
		VCC=5.5V, VIH=2.0V, VIL=0.8V, IOL=50.0uA	1, 2	OUTPUT		.10	V	1, 2, 3
		VCC=4.5V, VIH=2.0V, VIL=0.8V, IOL=24.0mA	1, 2	OUTPUT		.36	V	1
			1, 2	OUTPUT		.50	V	2, 3
		VCC=5.5V, VIH=2.0V, VIL=0.8V, IOL=24.0mA	1, 2	OUTPUT		.36	V	1
			1, 2	OUTPUT		.50	V	2, 3
VIOL	Dynamic output current Low	VCC=5.5V, IOL=50.0mA, VIL=0.0V, VIH=5.5V	1, 2, 5	OUTPUT		1.65	V	1, 2, 3
VOH	Low Level Output Voltage	VCC=5.5V, IOH=-50.0uA, VIL=0.8V, VIH=2.0V	1, 2	OUTPUT	5.40		V	1, 2, 3
		VCC=4.5V, IOH=-50.0uA, VIL=0.8V, VIH=2.0V	1, 2	OUTPUT	4.40		V	1, 2, 3
		VCC=4.5V, IOH=-24.0mA, VIL=0.8V, VIH=2.0V	1, 2	OUTPUT	3.86		V	1
			1, 2	OUTPUT	3.70		V	2, 3
		VCC=5.5V, IOH=-24.0mA, VIL=0.8V, VIH=2.0V	1, 2	OUTPUT	4.86		V	1
			1, 2	OUTPUT	4.70		V	2, 3
VIOH	Dynamic output current High	VCC=5.5V, IOH=-50.0mA, VIL=0.0V, VIH=5.5V	1, 2, 5	OUTPUT	3.85		V	1, 2, 3
ICCH	Supply Current Outputs HIGH	VCC=5.5V, VIH=5.5V	1, 2	VCC		8.0	uA	1
			1, 2	VCC		160	uA	2, 3
ICCL	Supply Current Outputs LOW	VCC=5.5V, VIL=0.0V	1, 2	VCC		8.0	uA	1
			1, 2	VCC		160	uA	2, 3
ICCT	Supply Current per Input	VCC=5.5V, VINH=3.4V	1, 2	VCC		1.0	mA	1
			1, 2	VCC		1.6	mA	2, 3

Electrical Characteristics

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: CL=50pF, RL=500 OHMS, TR/TF=3.0ns, Temp range: -55C to +125C. NOTE: -55C TEMPERATURE, SUBGROUP 11 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpLH	Propagation Delay	VCC=4.5V	3, 4, 7	CKIN-On	5.5	10.0	ns	9
			3, 4, 7	CKIN-On	7.0	11.5	ns	10
			3, 4, 7	CKIN-On	4.0	8.5	ns	11
tpHL	Propagation Delay	VCC=4.5V	3, 4, 7	CKIN-On	1.5	10.0	ns	9
			3, 4, 7	CKIN-On	7.0	11.5	ns	10
			3, 4, 7	CKIN-On	4.0	8.5	ns	11
tosHL	Maximum Skew Common Edge	VCC=4.5V	6	On - On Skew		1.0	ns	9, 10, 11
tosLH	Maximum Skew Common Edge	VCC=4.5V	6	On - On Skew		1.0	ns	9, 10, 11
tpV	Maximum Skew Part/Part	VCC=4.5V	6	Maximum Skew		4.0	ns	9, 10, 11
tost	Maximum Skew Opposite Edge	VCC=4.5V	6	Maximum Skew		1.5	ns	9, 10, 11
tR/tF	Maximum Rise/Fall Time	VCC=4.5V	6			3.0	ns	9
			6			4.0	ns	10, 11
Fmax	Maximum Clock Frequency	VCC=4.5V	6	CP	80		Mhz	9
			6	CP	75		Mhz	10, 11

Note 1: SCREEN TESTED 100% ON EACH DEVICE AT +25C & +125C TEMPERATURE, SUBGROUPS 1, 2, 7 & 8.

Note 2: SAMPLE TESTED (METHOD 5005, TABLE 1) ON EACH MFG. LOT AT +25C & +125C TEMPERATURE, SUBGROUPS A1, 2, 7 & 8.
Note 3: SCREEN TESTED 100% ON EACH DEVICE AT +25C TEMPERATURE ONLY, SUBGROUP A9.
Note 4: SAMPLE TESTED (METHOD 5005, TABLE 1) ON EACH MFG. LOT AT +25C & +125C TEMPERATURE, SUBGROUPS A9 & 10.
Note 5: TRANSMISSION LINE DRIVING TEST, GUARDBANDED LIMITS SET FOR +25C, 2 MSEC DURATION MAX.
Note 6: DESIGN CHARACTERIZATION DATA.
Note 7: +25C & +125C MIN LIMITS GUARANTEED FOR 5.5V BY GUARDBANDING 4.5V MINIMUM LIMITS.