

MN54AC2525-X REV 1B0

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Minimum Skew Clock Driver

General Description

The AC2525 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 TPHL and TPLH transitions.

Industry Part Number

54AC2525

NS Part Numbers

54AC2525DMQB
54AC2525FMQB
54AC2525LMQB

Prime Die

Z2525

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL STD 883, Method 5005

Subgrp	Description	Temp (°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 2000V minimum ESD protection
- 24 mA output drive capability

(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)	175 C
CDIP	

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, output/input loading variables. National does not recommend operation of FACT™ circuits outside databook specifications.

Recommended Operating Conditions

Supply Voltage (Vcc)	2.0V to 6.0V
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)	
AC Devices	
Vin from 30% to 70% of Vcc	
Vcc @ 3.0V, 4.5V, 5.5V	125mV/ns

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
 DC: VCC 3.0V to 5.5V, Temp. Range: -55 C to 125 C. 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, VM=5.5V	1, 2	INPUTS		0.1	uA	1
			1, 2	INPUTS		1.0	uA	2, 3
IIL	Low level input Current	VCC=5.5V, VM=0.0V	1, 2	INPUTS		-0.1	uA	1
			1, 2	INPUTS		-1.0	uA	2, 3
VOL	Low level Output Voltage	VCC=3.0V, VIL=0.9V, VINH=3.0V, IOL=50.0uA	1, 2	OUTPUTS		.10	V	1, 2, 3
		VCC=4.5V, VIL=1.35V, VINH=4.5V, IOL=50.0uA	1, 2	OUTPUTS		.10	V	1, 2, 3
		VCC=5.5V, VIL=1.65V, VINH=5.5V, IOL=50.0uA	1, 2	OUTPUTS		.10	V	1, 2, 3
		VCC=3.0V, VIL=0.9V, VINH=3.0V, IOL=12.0mA	1, 2	OUTPUTS		.32	V	1
			1, 2	OUTPUTS		.40	V	2, 3
		VCC=4.5V, VIL=1.35V, VINH=4.5V, IOL=24.0mA	1, 2	OUTPUTS		.36	V	1
			1, 2	OUTPUTS		.50	V	2, 3
		VCC=5.5V, VIL=1.65V, VINH=5.5V, IOL=24.0mA	1, 2	OUTPUTS		.36	V	1
1, 2	OUTPUTS			.50	V	2, 3		
VIOLOW	Dynamic Output Current LOW	VCC=5.5V, VIL=1.65V, VIH=3.85V, IOL=50.0mA, VINH=5.5V	1, 2, 5	OUTPUTS		1.65	V	1, 2, 3
VOH	High Level Output Voltage	VCC=3.0V, VINL=0.0V, VIH=2.1V, IOH=-50uA	1, 2	OUTPUTS	2.90		V	1, 2, 3
		VCC=4.5V, VINL=0.0V, VIH=3.15V, IOH=-50.0uA	1, 2	OUTPUTS	4.40		V	1, 2, 3
		VCC=5.5V, VINL=0.0V, VIH=3.85V, IOH=-50.0uA	1, 2	OUTPUTS	5.40		V	1, 2, 3
		VCC=3.0V, VIH=2.1V, IOH=-12.0mA	1, 2	OUTPUTS	2.56		V	1
			1, 2	OUTPUTS	2.40		V	2, 3
		VCC=4.5V, VIH=3.15V, IOH=-24.0mA	1, 2	OUTPUTS	3.86		V	1
			1, 2	OUTPUTS	3.70		V	2, 3
		VCC=5.5V, VIH=3.85V, IOH=-24.0mA	1, 2	OUTPUTS	4.86		V	1
1, 2	OUTPUTS		4.70		V	2, 3		
VIOHIGH	Dynamic Output Current HIGH	VCC=5.5V, VIH=3.85V, IOH=-50.0mA, VINH=5.5V,	1, 2, 5	OUTPUTS	3.85		V	1, 2, 3
ICCH	Supply Current Outputs HIGH	VCC=5.5V, VINH=5.5V	1, 2	VCC		8.0	uA	1
			1, 2	VCC		80	uA	2, 3

Electrical Characteristics

DC PARAMETERS (Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC: VCC 3.0V to 5.5V, Temp. Range: -55 C to 125 C. NOTE: -55C TEMPERATURE, SUBGROUP 3 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
ICCL	Supply Current Outputs LOW	VCC=5.5V, VINH=5.5V, VINL=0.0V	1, 2	VCC		8.0	uA	1
			1, 2	VCC		80	uA	2, 3

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)

AC: CL=50pF, Rl=500 Ohms, TR=3.0V, TF=3.0V, Temp Range:-55C to 125C. NOTE: -55C TEMPERATURE, SUBGROUP 11 IS GUARANTEED BUT NOT TESTED.

TPLH(1)	Propagation Delay	VCC=4.5V	3, 4, 7	CKIN-On	3.0	7.0	ns	9
			3, 4, 7	CKIN-On	4.2	8.2	ns	10
			3, 4, 7	CKIN-On	2.5	6.5	ns	11
TPHL(1)	Propagation Delay	VCC=4.5V	3, 4, 7	CKIN-On	3.0	7.0	ns	9
			3, 4, 7	CKIN-On	4.2	8.2	ns	10
			3, 4, 7	CKIN-On	2.5	6.5	ns	11
tosHL(1)	Maximum Skew Common Edge Output to Output	VCC=4.5V	6	On-On Skew		1.0	ns	9, 10, 11
tosLH(1)	Maximum Skew Common Edge Output to Output	VCC=4.5V	6	On-On Skew		1.0	ns	9, 10, 11
tpV	Maximum Skew Part to Part	VCC=4.5V	6	Max Skew Part/Part		4.0	ns	9, 10, 11
tost(1)	Maximum Skew Opposite Edge Output to Output	VCC=4.5V	6	Opposite Edge Skew		1.0	ns	9, 10, 11
tRISE, tFALL	Max Rise/Fall Time	VCC=4.5V	6			3.0	ns	9
			6			4.0	ns	10, 11
tpHL(2)	Propagation Delay	VCC=3.0V	3, 4, 7	CKIN-On	4.0	9.5	ns	9
			3, 4, 7	CKIN-On	5.0	11.0	ns	10
			3, 4, 7	CKIN-On	3.0	8.5	ns	11

Electrical Characteristics

AC PARAMETERS (Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: CL=50pf, Rl=500 Ohms, TR=3.0V, TF=3.0V, 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(2)	Propagation Delay	VCC=3.0V	3, 4, 7	CKIN-On	4.0	9.5	ns	9
			3, 4, 7	CKIN-On	5.0	11.0	ns	10
			3, 4, 7	CKIN-On	3.0	8.5	ns	11
tosHL(2)	Maximum Skew Common Edge Output to Output	VCC=3.0V	6	On-On Skew		1.5	ns	9, 10, 11
tosLH(2)	Maximum Skew Common Edge Output to Output	VCC=3.0V	6	On-On Skew		1.5	ns	9, 10, 11
tost(2)	Maximum Skew Opposite Edge Output to Output	VCC=3.0V	6	Opposit e Skew Edge		1.5	ns	9, 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, GUARDBAND LIMITS SET FOR +25C, 2 MSEC DURATION MAX.

Note 6: DESIGN CHARACTERIZATION DATA ONLY

Note 7: +25C & +125C MIN LIMITS GUARANTEED FOR 5.5V BY GUARDBANDING 4.5V MIN. LIMITS.