Product Preview

Low Voltage CMOS 1:18 Clock Distribution Chip

MPC909

LOW VOLTAGE CMOS 1:18 CLOCK DISTRIBUTION CHIP

The MPC909 is a 1:18 low voltage clock distribution chip. The 18 outputs are LVCMOS or LVTTL compatible and feature the drive strength to drive 50Ω series or parallel terminated transmission lines. With output–to–output skews of 250ps, the MPC909 is ideal as a clock distribution chip for the cost sensitive, high performance designs. With low cost as one of the critical parameters, technology, design and test choices were made which adversely affect part–to–part skew performance. For very high performance applications, where part–to–part skew is critical, please refer to the MPC940 datasheet.

- LVCMOS/LVTTL Clock Inputs and Outputs
- 250ps Maximum Targeted Output–to–Output Skew
- Drives Up to 36 Independent Clock Lines
- Maximum Output Frequency of 100MHz
- High Impedance Output Enable
- 32–Lead TQFP Packaging
- 3.3V V_{CC} Supply Voltage

FA SUFFIX
32–LEAD TQFP PACKAGE
CASE 873A–02

With a low output impedance, in both the HIGH and LOW logic states, the output buffers of the MPC909 are ideal for driving series terminated transmission lines. More specifically, each of the 18 MPC909 outputs can drive two series terminated 50Ω transmission lines. With this capability, the MPC909 has an effective fanout of 1:36 in applications where each line drives a single load. With this level of fanout, the MPC909 provides enough copies of low skew clocks for many high performance synchronous systems.

The MPC909 is fully 3.3V compatible. The 32–lead TQFP package was chosen to optimize performance, board space and cost of the device. The 32–lead TQFP has a 7x7mm body size with a conservative 0.8mm pin spacing.

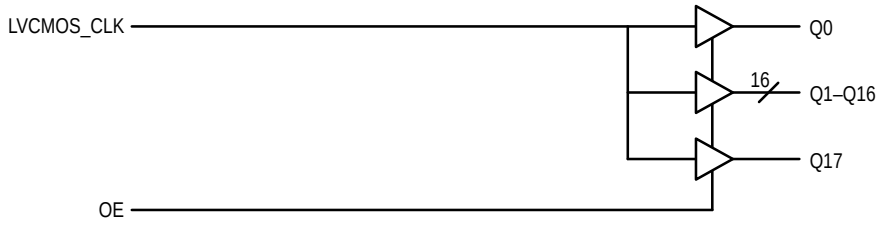


Figure 1. Logic Diagram

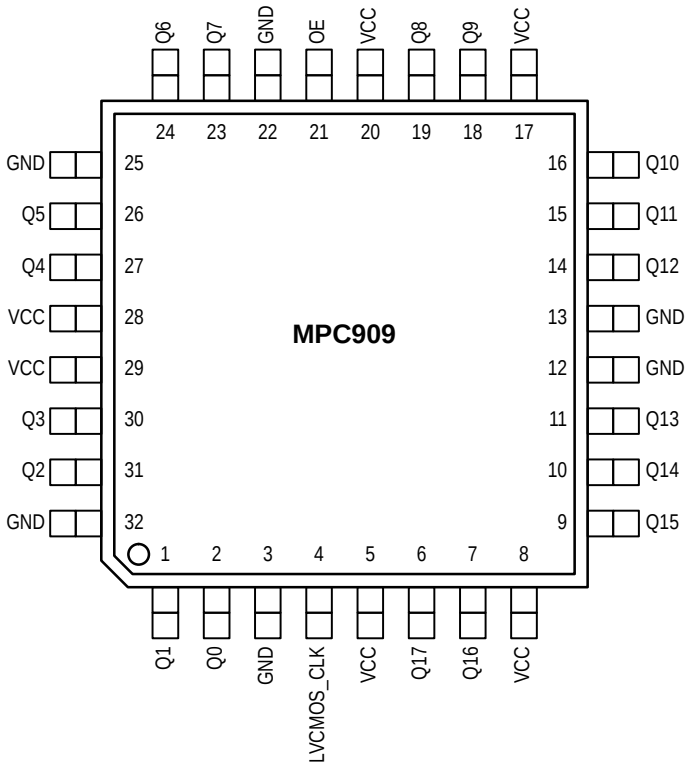


Figure 2. 32–Lead Pinout (Top View)

FUNCTION TABLE

OE	Output
0	High–Z
1	Enabled

ABSOLUTE MAXIMUM RATINGS*

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	–0.3	3.6	V
V_I	Input Voltage	–0.3	V_{DD} + 0.3	V
I_{IN}	Input Current		±20	mA
T_{Stor}	Storage Temperature Range	–40	125	°C

* Absolute maximum continuous ratings are those values beyond which damage to the device may occur. Exposure to these conditions or conditions beyond those indicated may adversely affect device reliability. Functional operation under absolute–maximum–rated conditions is not implied.

DC CHARACTERISTICS (T_A = 0° to 70°C, V_{CC} = 3.3V ±5%, or 2.5V ±5%)

Symbol	Characteristic	Min	Typ	Max	Unit	Condition
V_{IH}	Input HIGH Voltage	2.0		3.6	V	
V_{IL}	Input LOW Voltage			0.8	V	
V_{OH}	Output HIGH Voltage	2.4			V	Note 1., I_{OH} = –20MA
V_{OL}	Output LOW Voltage			0.5	V	Note 1., I_{OL} = 20MA
I_{IN}	Input Current			TBD	µA	
C_{IN}	Input Capacitance			TBD	pF	
C_{pd}	Power Dissipation Capacitance			TBD	pF	
I_{CC}	Maximum Quiescent Supply Current			TBD	mA	

1. The MPC909 outputs can drive series or parallel terminated 50Ω (or 50Ω to V_{CC}/2) transmission lines on the incident edge.

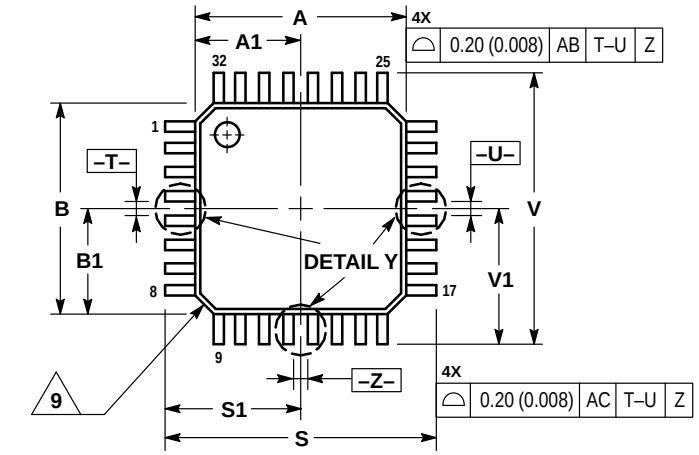
AC CHARACTERISTICS (T_A = 0° to 70°C, V_{CC} = 3.3V ±5%, or 2.5V ±5%)

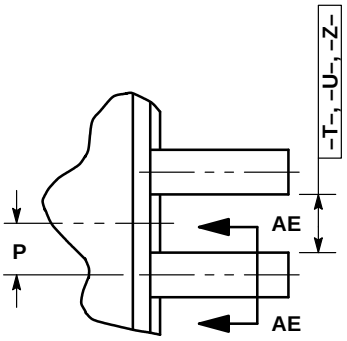
Symbol	Characteristic	Min	Typ	Max	Unit	Condition
F_{max}	Maximum Input Frequency			100	MHz	Note 2.
t_{pd}	Propagation Delay LVCMOS_CLK to Q OE to Q	1.0 1.0		5.0 8.0	ns	Note 2.
$t_{sk(o)}$	Output–to–Output Skew			250	ps	Note 2.
t_{pwo}	Output Pulse Width	45		55	%	Note 2., Measured at V_{CC}/2
t_r, t_f	Output Rise/Fall Time	0.20		1.0	ns	0.8V to 2.0V

2. Driving 50Ω transmission lines

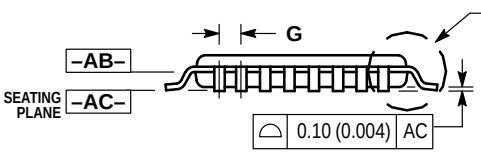
OUTLINE DIMENSIONS

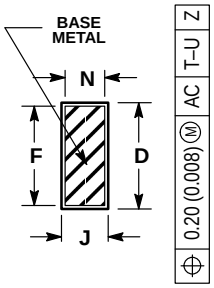
FA SUFFIX
TQFP PACKAGE
CASE 873A–02
ISSUE A



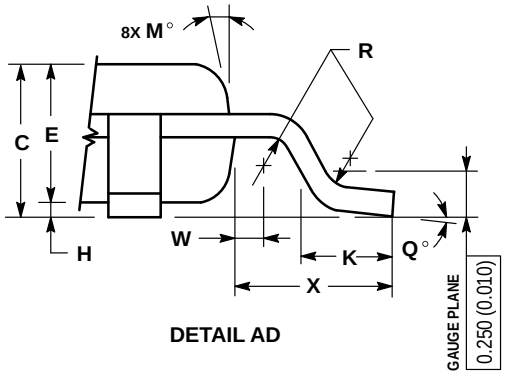


DETAIL Y





SECTION AE–AE



DETAIL AD

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DATUM PLANE –AB– IS LOCATED AT BOTTOM OF LEAD AND IS COINCIDENT WITH THE LEAD WHERE THE LEAD EXITS THE PLASTIC BODY AT THE BOTTOM OF THE PARTING LINE.
4. DATUMS –T–, –U–, AND –Z– TO BE DETERMINED AT DATUM PLANE –AB–.
5. DIMENSIONS S AND V TO BE DETERMINED AT SEATING PLANE –AC–.
6. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS 0.250 (0.010) PER SIDE. DIMENSIONS A AND B DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE –AB–.
7. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. DAMBAR PROTRUSION SHALL NOT CAUSE THE D DIMENSION TO EXCEED 0.520 (0.020).
8. MINIMUM SOLDER PLATE THICKNESS SHALL BE 0.0076 (0.0003).
9. EXACT SHAPE OF EACH CORNER MAY VARY FROM DEPICTION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	7.000 BSC		0.276 BSC	
A1	3.500 BSC		0.138 BSC	
B	7.000 BSC		0.276 BSC	
B1	3.500 BSC		0.138 BSC	
C	1.400	1.600	0.055	0.063
D	0.300	0.450	0.012	0.018
E	1.350	1.450	0.053	0.057
F	0.300	0.400	0.012	0.016
G	0.800 BSC		0.031 BSC	
H	0.050	0.150	0.002	0.006
J	0.090	0.200	0.004	0.008
K	0.500	0.700	0.020	0.028
M	12° REF		12° REF	
N	0.090	0.160	0.004	0.006
P	0.400 BSC		0.016 BSC	
Q	1°	5°	1°	5°
R	0.150	0.250	0.006	0.010
S	9.000 BSC		0.354 BSC	
S1	4.500 BSC		0.177 BSC	
V	9.000 BSC		0.354 BSC	
V1	4.500 BSC		0.177 BSC	
W	0.200 REF		0.008 REF	
X	1.000 REF		0.039 REF	

How to reach us:

USA / EUROPE / Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303–675–2140 or 1–800–441–2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
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INTERNET: http://motorola.com/sps

JAPAN: Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4–32–1,
Nishi–Gotanda, Shinagawa–ku, Tokyo 141, Japan. 81–3–5487–8488

ASIA / PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298