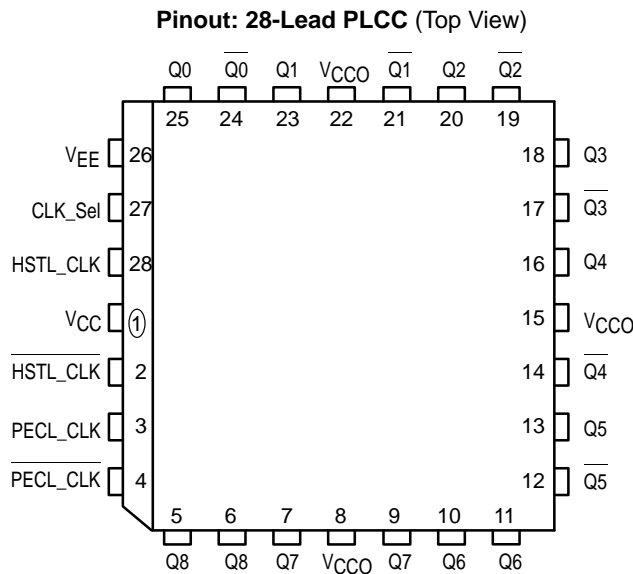


## Low-Voltage 1:9 Differential ECL/HSTL to HSTL Clock Driver

The MPC9111 is a low skew 1-to-9 differential HSTL compatible output fanout buffer. The device is functionally equivalent to the MC100LVE111 device. The device accepts either LVPECL or HSTL compatible input levels and provides 9 low skew differential HSTL compatible outputs. The device operates from a single 3.3V V<sub>CC</sub> supply.

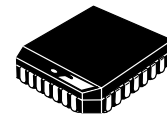
- 800ps Part-to-Part Skew
- 250ps Output-to-Output Skew
- Open Emitter HSTL Compatible Outputs
- Differential Design
- 28-Lead PLCC
- 3.3V V<sub>CC</sub>

The MPC911 HSTL outputs are not realized in the conventional manner. To minimize part-to-part and output-to-output skew the HSTL compatible output levels are generated with an open emitter architecture. The outputs are pulled down with 50Ω to ground rather than the typical 50Ω to V<sub>DDQ</sub> pullup of a “standard” HSTL output. Because the HSTL outputs are pulled to ground the MPC911 does not utilize the V<sub>DDQ</sub> supply of the HSTL standard. The output levels are derived from V<sub>CC</sub>, an internal regulator minimizes the output level variation with V<sub>CC</sub> variations.



# MPC911

## LOW-VOLTAGE 1:9 DIFFERENTIAL ECL/HSTL TO HSTL CLOCK DRIVER



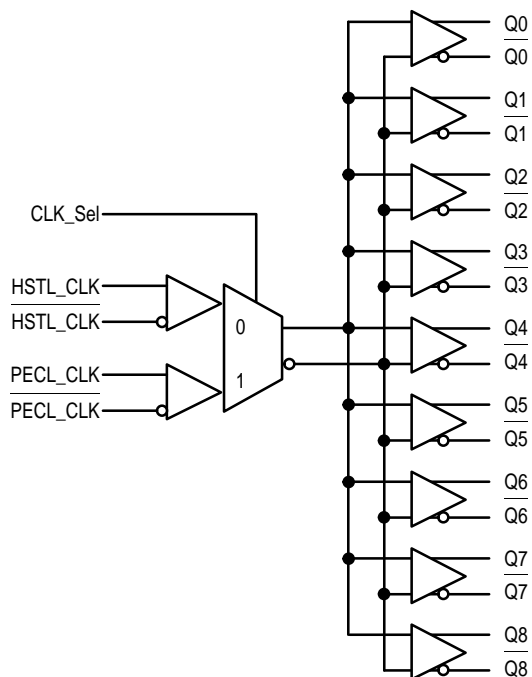
**FN SUFFIX**  
PLASTIC PACKAGE  
CASE 776-02

### PIN NAMES

Pins	Function
HSTL_CLK, HSTL_CLK	Differential HSTL Input
PECL_CLK, PECL_CLK	Differential PECL Input
Q0-Q8, Q0-Q8	Differential Outputs



LOGIC SYMBOL



HSTL DC CHARACTERISTICS

Symbol	Characteristic	0°C			25°C			70°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V <sub>OH</sub>	Output HIGH Voltage	0.9			0.9			0.9			V
V <sub>OL</sub>	Output LOW Voltage			0.5			0.5			0.5	V
V <sub>IH</sub>	Input HIGH Voltage	V <sub>ref</sub> + 0.10		1.9	V <sub>ref</sub> + 0.10		1.9	V <sub>ref</sub> + 0.10		1.9	V
V <sub>IL</sub>	Input LOW Voltage	-0.3		V <sub>ref</sub> - 0.10	-0.3		V <sub>ref</sub> - 0.10	-0.3		V <sub>ref</sub> - 0.10	V
V <sub>X</sub>	Input Crossover Volt	0.68		0.9	0.68		0.9	0.68		0.9	V
V <sub>ref</sub>	Input Reference Volt	0.68		0.9	0.68	0.75	0.9	0.68		0.9	

LV PECL DC CHARACTERISTICS


Symbol	Characteristic	0°C			25°C			70°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V <sub>IH</sub>	Input HIGH Voltage <sup>1</sup>	2.135		2.420	2.135		2.420	2.135		2.420	V
V <sub>IL</sub>	Input LOW Voltage <sup>1</sup>	1.490		1.825	1.490		1.825	1.490		1.825	V
V <sub>CC</sub>	Power Supply Voltage	3.0		3.6	3.0		3.6	3.0		3.6	V
I <sub>IH</sub>	Input HIGH Current			150			150			150	μA
I <sub>CC</sub>	Power Supply Current			100			100			110	mA

1. These values are for V<sub>CC</sub> = 3.3V. Level Specifications will vary 1:1 with V<sub>CC</sub>.

## AC CHARACTERISTICS

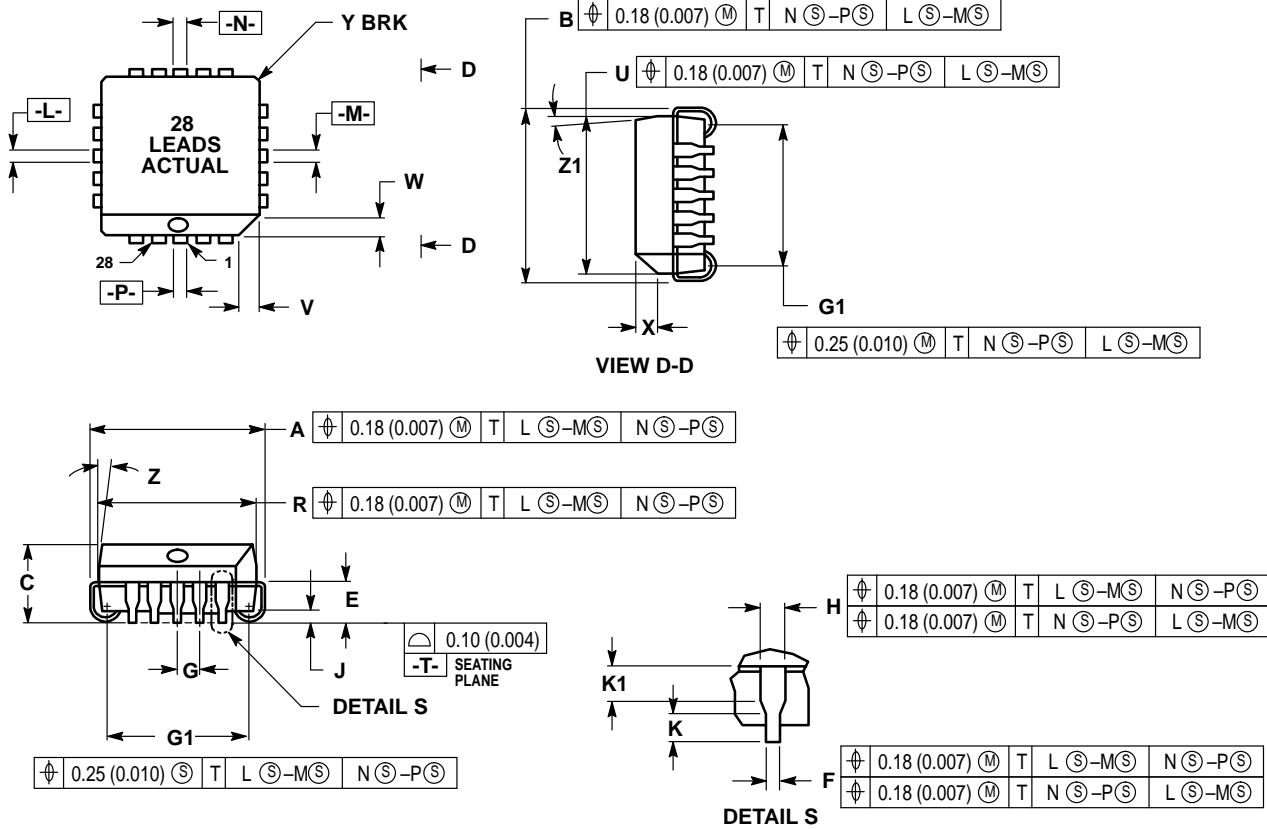
Symbol	Characteristic	0°C			25°C			70°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay to Output IN (differential)	HSTL 1.4 PECL 1.3	2.0 1.9	2.3 2.0	1.6 1.4	1.9 1.9	2.4 2.1	1.8 1.5	2.3 2.0	2.6 2.3	ns	Note 1
t <sub>skew</sub>	Within-Device Skew Part-to-Part Skew (Diff)			250 900			250 800			250 800	ps	Note 2
V <sub>PP</sub>	Minimum Input Swing PECL_CLK	600			600			600			mV	Note 3
V <sub>CMR</sub>	Common Mode Range PECL_CLK	V <sub>CC</sub> -1.5		V <sub>CC</sub> -0.8	V <sub>CC</sub> -1.5		V <sub>CC</sub> -0.8	V <sub>CC</sub> -1.5		V <sub>CC</sub> -0.8	V	Note 4
t <sub>r</sub> /t <sub>f</sub>	Output Rise/Fall Time	500 600	800 1200	1200 1800	500 600	800 1200	1200 1800	500 600	800 1200	1200 1800	ps	20%–80%

1. The differential propagation delay is defined as the delay from the crossing points of the differential input signals to the crossing point of the differential output signals.
2. The within-device skew is defined as the worst case difference between any two similar delay paths within a single device.
3. V<sub>PP(min)</sub> is defined as the minimum input differential voltage which will cause no increase in the propagation delay. The V<sub>PP(min)</sub> is AC limited for the MPC911 as a differential input as low as 50 mV will still produce full HSTL levels at the output.
4. V<sub>CMR</sub> is defined as the range within which the V<sub>IH</sub> level may vary, with the device still meeting the propagation delay specification. The V<sub>IL</sub> level must be such that the peak to peak voltage is less than 1.0 V and greater than or equal to V<sub>PP(min)</sub>.

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OUTLINE DIMENSIONS

FN SUFFIX  
 PLASTIC PACKAGE  
 CASE 776-02  
 ISSUE D



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	12.32	12.57	0.485	0.495
B	12.32	12.57	0.485	0.495
C	4.20	4.57	0.165	0.180
E	2.29	2.79	0.090	0.110
F	0.33	0.48	0.013	0.019
G	1.27 BSC		0.050 BSC	
H	0.66	0.81	0.026	0.032
J	0.51	—	0.020	—
K	0.64	—	0.025	—
R	11.43	11.58	0.450	0.456
U	11.43	11.58	0.450	0.456
V	1.07	1.21	0.042	0.048
W	1.07	1.21	0.042	0.048
X	1.07	1.42	0.042	0.056
Y	—	0.50	—	0.020
Z	2°	10°	2°	10°
G1	10.42	10.92	0.410	0.430
K1	1.02	—	0.040	—
Z1	2°	10°	2°	10°

- NOTES:
1. DUE TO SPACE LIMITATION, CASE 776-02 SHALL BE REPRESENTED BY A GENERAL (SMALLER) CASE OUTLINE DRAWING RATHER THAN SHOWING ALL 28 LEADS.
  2. DATUMS -L-, -M-, -N-, AND -P- DETERMINED WHERE TOP OF LEAD SHOULDER EXIT PLASTIC BODY AT MOLD PARTING LINE.
  3. DIM G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
  4. DIM R AND U DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE MOLD PROTRUSION IS 0.25 (0.010) PER SIDE.
  5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  6. CONTROLLING DIMENSION: INCH.
  7. 776-01 IS OBSOLETE, NEW STANDARD 776-02.

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