

# MC10EP11DG Datasheet

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DiGi Electronics Part Number	MC10EP11DG-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	MC10EP11DG
Description	IC CLK BUFFER 1:2 3GHZ 8SOIC
Detailed Description	Clock Fanout Buffer (Distribution) IC 1:2 3 GHz 8-SO IC (0.154", 3.90mm Width)



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## Purchase and inquiry

Manufacturer Product Number:

MC10EP11DG

Series:

10EP

Type:

Fanout Buffer (Distribution)

Ratio - Input:Output:

1:2

Input:

ECL, PECL

Frequency - Max:

3 GHz

Operating Temperature:

-40°C ~ 85°C

Package / Case:

8-SOIC (0.154", 3.90mm Width)

Base Product Number:

MC10EP11

Manufacturer:

onsemi

Product Status:

Active

Number of Circuits:

1

Differential - Input:Output:

Yes/Yes

Output:

ECL, PECL

Voltage - Supply:

3V ~ 5.5V

Mounting Type:

Surface Mount

Supplier Device Package:

8-SOIC

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

# 3.3 V/5 V ECL 1:2 Differential Fanout Buffer

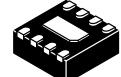
## MC10EP11, MC100EP11



SOIC-8 NB  
D SUFFIX  
CASE  
751-07



TSSOP-8  
DT SUFFIX  
CASE  
948R-02



DFN-8  
MN SUFFIX  
CASE 506AA

### Description

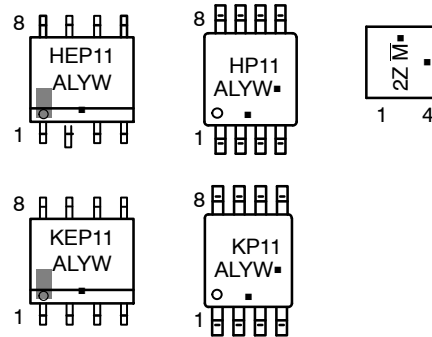
The MC10/100EP11 is a differential 1:2 fanout buffer. The device is pin and functionally equivalent to the LVEL11 device. With AC performance much faster than the LVEL11 device, the EP11 is ideal for applications requiring the fastest AC performance available.

The 100 Series contains temperature compensation.

### Features

- 220 ps Typical Propagation Delay
- Maximum Clock Frequency > 3 GHz Typical
- PECL Mode Operating Range:
  - ◆  $V_{CC} = 3.0\text{ V to }5.5\text{ V}$  with  $V_{EE} = 0\text{ V}$
- NECL Mode Operating Range:
  - ◆  $V_{CC} = 0\text{ V}$  with  $V_{EE} = -3.0\text{ V to }-5.5\text{ V}$
- Open Input Default State
- Safety Clamp on Inputs
- Q Outputs Will Default LOW with Inputs Open or at  $V_{EE}$
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

### MARKING DIAGRAM



H = MC10  
K = MC100  
2Z = MC100  
M̄ = Date Code  
A = Assembly Location  
L = Wafer Lot  
Y = Year  
W = Work Week  
▪ = Pb-Free Package

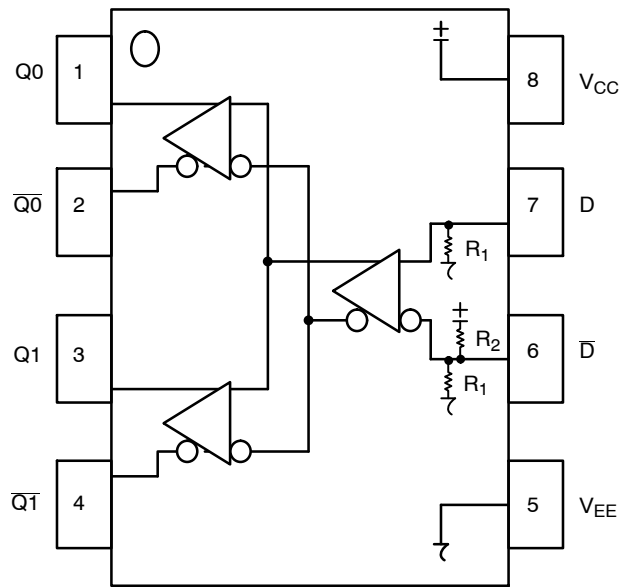
(Note: Microdot may be in either location)

\*For additional marking information, refer to Application Note [AND8002/D](#).

### ORDERING INFORMATION

See detailed ordering and shipping information on page 8 of this data sheet.

NOTE: Some of the device on this data sheet have been **DISCONTINUED**. Please refer to the table on page 8.

**MC10EP11, MC100EP11****Figure 1. 8-Lead Pinout (Top View) and Logic Diagram****Table 1. PIN DESCRIPTION**

PIN	FUNCTION
D*, $\bar{D}$ **	ECL Data Inputs
Q0, $\bar{Q}0$ , Q1, $\bar{Q}1$	ECL Data Outputs
V <sub>CC</sub>	Positive Supply
V <sub>EE</sub>	Negative Supply
EP	(DFN-8 only) Thermal exposed pad must be connected to a sufficient thermal conduit. Electrically connect to the most negative supply (GND) or leave unconnected, floating open.

\* Pins will default LOW when left open.

\*\* Pins will default to high when left open.

**Table 2. ATTRIBUTES**

Characteristics	Value
Internal Input Pulldown Resistor	75 k $\Omega$
Internal Input Pullup Resistor	37.5 k $\Omega$
ESD Protection Human Body Model Machine Model Charged Device Model	> 4 kV > 200 V > 2 kV
Moisture Sensitivity, Indefinite Time Out of Drypack (Note 1)	Pb-Free Pkg
SOIC-8 NB TSSOP-8 DFN-8	Level 1 Level 3 Level 1
Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in
Transistor Count	73 Devices
Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test	

1. For additional information, see Application Note [AND8003/D](#).

**MC10EP11, MC100EP11****Table 3. MAXIMUM RATINGS**

Symbol	Parameter	Condition 1	Condition 2	Rating	Unit
V <sub>CC</sub>	PECL Mode Power Supply	V <sub>EE</sub> = 0 V		6	V
V <sub>EE</sub>	NECL Mode Power Supply	V <sub>CC</sub> = 0 V		-6	V
V <sub>I</sub>	PECL Mode Input Voltage NECL Mode Input Voltage	V <sub>EE</sub> = 0 V V <sub>CC</sub> = 0 V	V <sub>I</sub> ≤ V <sub>CC</sub> V <sub>I</sub> ≥ V <sub>EE</sub>	6 -6	V
I <sub>out</sub>	Output Current	Continuous Surge		50 100	mA
T <sub>A</sub>	Operating Temperature Range			-40 to +85	°C
T <sub>stg</sub>	Storage Temperature Range			-65 to +150	°C
θ <sub>JA</sub>	Thermal Resistance (Junction-to-Ambient)	0 lfpm 500 lfpm	SOIC-8 NB	190 130	°C/W
θ <sub>JC</sub>	Thermal Resistance (Junction-to-Case)	Standard Board	SOIC-8 NB	41 to 44	°C/W
θ <sub>JA</sub>	Thermal Resistance (Junction-to-Ambient)	0 lfpm 500 lfpm	TSSOP-8	185 140	°C/W
θ <sub>JC</sub>	Thermal Resistance (Junction-to-Case)	Standard Board	TSSOP-8	41 to 44	°C/W
θ <sub>JA</sub>	Thermal Resistance (Junction-to-Ambient)	0 lfpm 500 lfpm	DFN-8	129 84	°C/W
θ <sub>JC</sub>	Thermal Resistance (Junction-to-Case)	(Note 1)	DFN-8	35 to 40	°C/W
T <sub>sol</sub>	Wave Solder (Pb-Free)	<2 to 3 sec @ 260°C		265	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. JEDEC standard multilayer board – 2S2P (2 signal, 2 power).

**Table 4. 10EP DC CHARACTERISTICS, PECL (V<sub>CC</sub> = 3.3 V, V<sub>EE</sub> = 0 V (Note 1))**

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I <sub>EE</sub>	Negative Power Supply Current	20	29	37	20	30	39	22	31	40	mA
V <sub>OH</sub>	Output HIGH Voltage (Note 2)	2165	2290	2415	2230	2355	2480	2290	2415	2540	mV
V <sub>OL</sub>	Output LOW Voltage (Note 2)	1365	1490	1615	1430	1555	1680	1490	1615	1740	mV
V <sub>IH</sub>	Input HIGH Voltage (Single-Ended)	2090		2415	2155		2480	2215		2540	mV
V <sub>IL</sub>	Input LOW Voltage (Single-Ended)	1365		1690	1430		1755	1490		1815	mV
V <sub>IHCMR</sub>	Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 3)	2.0		3.3	2.0		3.3	2.0		3.3	V
I <sub>IH</sub>	Input HIGH Current			150			150			150	μA
I <sub>IL</sub>	Input LOW Current D D	0.5 -150			0.5 -150			0.5 -150			μA

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm.

1. Input and output parameters vary 1:1 with V<sub>CC</sub>. V<sub>EE</sub> can vary +0.3 V to -2.2 V.
2. All loading with 50 Ω to V<sub>CC</sub> - 2.0 V.
3. V<sub>IHCMR</sub> min varies 1:1 with V<sub>EE</sub>, V<sub>IHCMR</sub> max varies 1:1 with V<sub>CC</sub>. The V<sub>IHCMR</sub> range is referenced to the most positive side of the differential input signal.

**MC10EP11, MC100EP11****Table 5. 10EP DC CHARACTERISTICS, PECL** ( $V_{CC} = 5.0\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 1))

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Unit
$I_{EE}$	Negative Power Supply Current	20	29	37	20	30	39	22	31	40	mA
$V_{OH}$	Output HIGH Voltage (Note 2)	3865	3990	4115	3930	4055	4180	3990	4115	4240	mV
$V_{OL}$	Output LOW Voltage (Note 2)	3065	3190	3315	3130	3255	3380	3190	3315	3440	mV
$V_{IH}$	Input HIGH Voltage (Single-Ended)	3790		4115	3855		4180	3915		4240	mV
$V_{IL}$	Input LOW Voltage (Single-Ended)	3065		3390	3130		3455	3190		3515	mV
$V_{IHCMR}$	Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 3)	2.0		5.0	2.0		5.0	2.0		5.0	V
$I_{IH}$	Input HIGH Current			150			150			150	$\mu\text{A}$
$I_{IL}$	Input LOW Current D $\bar{D}$	0.5 -150			0.5 -150			0.5 -150			$\mu\text{A}$

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lpm.

1. Input and output parameters vary 1:1 with  $V_{CC}$ .
2. All loading with  $50\ \Omega$  to  $V_{CC} - 2.0\text{ V}$ .
3.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**Table 6. 10EP DC CHARACTERISTICS, NECL** ( $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -5.5\text{ V}$  to  $-3.0\text{ V}$  (Note 1))

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Unit
$I_{EE}$	Negative Power Supply Current	20	29	37	20	30	39	22	31	40	mA
$V_{OH}$	Output HIGH Voltage (Note 2)	-1135	-1010	-885	-1070	-945	-820	-1010	-885	-760	mV
$V_{OL}$	Output LOW Voltage (Note 2)	-1935	-1810	-1685	-1870	-1745	-1620	-1810	-1685	-1560	mV
$V_{IH}$	Input HIGH Voltage (Single-Ended)	-1210		-885	-1145		-820	-1085		-760	mV
$V_{IL}$	Input LOW Voltage (Single-Ended)	-1935		-1610	-1870		-1545	-1810		-1485	mV
$V_{IHCMR}$	Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 3)	$V_{EE} + 2.0$		0.0	$V_{EE} + 2.0$		0.0	$V_{EE} + 2.0$		0.0	V
$I_{IH}$	Input HIGH Current			150			150			150	$\mu\text{A}$
$I_{IL}$	Input LOW Current D $\bar{D}$	0.5 -150			0.5 -150			0.5 -150			$\mu\text{A}$

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lpm.

1. Input and output parameters vary 1:1 with  $V_{CC}$ .
2. All loading with  $50\ \Omega$  to  $V_{CC} - 2.0\text{ V}$ .
3.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**MC10EP11, MC100EP11****Table 7. 100EP DC CHARACTERISTICS, PECL** ( $V_{CC} = 3.3\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 1))

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	Negative Power Supply Current	26	35	44	26	35	44	26	35	46	mA
$V_{OH}$	Output HIGH Voltage (Note 2)	2155	2280	2405	2155	2280	2405	2155	2280	2405	mV
$V_{OL}$	Output LOW Voltage (Note 2)	1355	1480	1605	1355	1480	1605	1355	1480	1605	mV
$V_{IH}$	Input HIGH Voltage (Single-Ended)	2075		2420	2075		2420	2075		2420	mV
$V_{IL}$	Input LOW Voltage (Single-Ended)	1355		1675	1355		1675	1355		1675	mV
$V_{IHCMR}$	Input HIGH Voltage Common Mode Range (Differential Configuration)(Note 3)	2.0		3.3	2.0		3.3	2.0		3.3	V
$I_{IH}$	Input HIGH Current			150			150			150	$\mu\text{A}$
$I_{IL}$	Input LOW Current D $\bar{D}$	0.5 -150			0.5 -150			0.5 -150			$\mu\text{A}$

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm.

1. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +0.3 V to -2.2 V.
2. All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .
3.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ .  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**Table 8. 100EP DC CHARACTERISTICS, PECL** ( $V_{CC} = 5.0\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 1))

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	Negative Power Supply Current	26	35	44	26	35	44	26	35	46	mA
$V_{OH}$	Output HIGH Voltage (Note 2)	3855	3980	4105	3855	3980	4105	3855	3980	4105	mV
$V_{OL}$	Output LOW Voltage (Note 2)	3055	3180	3305	3055	3180	3305	3055	3180	3305	mV
$V_{IH}$	Input HIGH Voltage (Single-Ended)	3775		4120	3775		4120	3775		4120	mV
$V_{IL}$	Input LOW Voltage (Single-Ended)	3055		3375	3055		3375	3055		3375	mV
$V_{IHCMR}$	Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 3)	2.0		5.0	2.0		5.0	2.0		5.0	V
$I_{IH}$	Input HIGH Current			150			150			150	$\mu\text{A}$
$I_{IL}$	Input LOW Current D $\bar{D}$	0.5 -150			0.5 -150			0.5 -150			$\mu\text{A}$

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm.

1. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +2.0 V to -0.5 V.
2. All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .
3.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ .  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**MC10EP11, MC100EP11****Table 9. 100EP DC CHARACTERISTICS, NECL** ( $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -5.5\text{ V}$  to  $-3.0\text{ V}$  (Note 1))

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	Negative Power Supply Current	26	35	44	26	35	44	26	35	46	mA
$V_{OH}$	Output HIGH Voltage (Note 2)	-1145	-1020	-895	-1145	-1020	-895	-1145	-1020	-895	mV
$V_{OL}$	Output LOW Voltage (Note 2)	-1945	-1820	-1695	-1945	-1820	-1695	-1945	-1820	-1695	mV
$V_{IH}$	Input HIGH Voltage (Single-Ended)	-1225		-880	-1225		-880	-1225		-880	mV
$V_{IL}$	Input LOW Voltage (Single-Ended)	-1945		-1625	-1945		-1625	-1945		-1625	mV
$V_{IHCMR}$	Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 3)	$V_{EE} + 2.0$		0.0	$V_{EE} + 2.0$		0.0	$V_{EE} + 2.0$		0.0	V
$I_{IH}$	Input HIGH Current			150			150			150	$\mu\text{A}$
$I_{IL}$	Input LOW Current D $\bar{D}$	0.5 -150			0.5 -150			0.5 -150			$\mu\text{A}$

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lpm.

1. Input and output parameters vary 1:1 with  $V_{CC}$ .
2. All loading with  $50\ \Omega$  to  $V_{CC} - 2.0\text{ V}$ .
3.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**Table 10. AC CHARACTERISTICS** ( $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -3.0\text{ V}$  to  $-5.5\text{ V}$  or  $V_{CC} = 3.0\text{ V}$  to  $5.5\text{ V}$ ;  $V_{EE} = 0\text{ V}$  (Note 1))

Symbol	Characteristic	-40°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{max}$	Maximum Frequency (Figure 2)		> 3			> 3			> 3		GHz
$t_{PLH}$ , $t_{PHL}$	Propagation Delay to Output Differential CLK to Q, $\bar{Q}$	140	200	250	160	220	270	180	240	300	ps
$t_{SKEW}$	Within Device Skew Q0, Q1 (Note 2) Device-to-Device Skew		10	15 110		15	20 110		20	25 120	ps
$t_{JITTER}$	Random Clock Jitter (RMS) (Figure 2)		0.2	< 1		0.2	< 1		0.2	< 1	ps
$V_{INPP}$	Input Voltage Swing Sensitivity (Differential Configuration)	150	800	1200	150	800	1200	150	800	1200	mV
$t_r$ $t_f$	Output Rise/Fall Times (20% – 80%) @ 1.0 GHz Q, $\bar{Q}$	70	120	170	80	130	180	90	150	200	ps

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lpm.

1. Measured using a 750 mV source, 50% duty cycle clock source. All loading with  $50\ \Omega$  to  $V_{CC} - 2.0\text{ V}$ .
2. Skew is measured between outputs under identical transitions. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.



### MC10EP11, MC100EP11

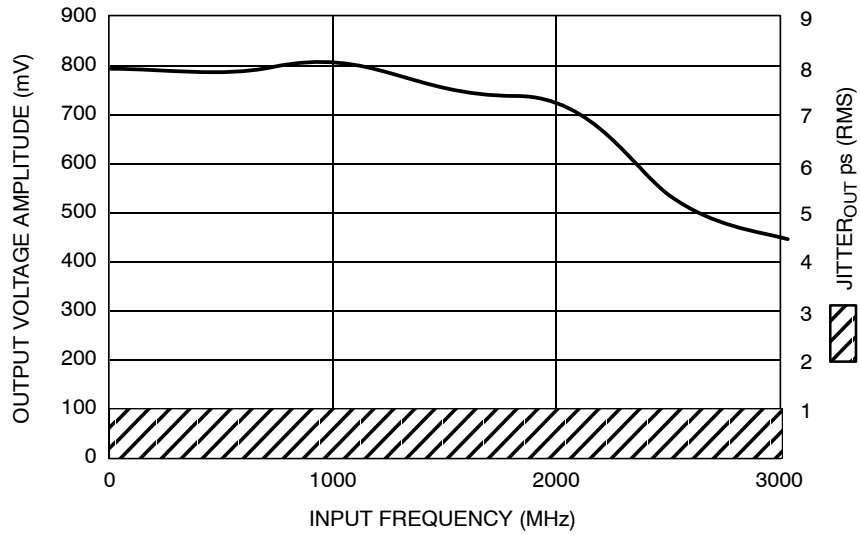


Figure 2. Output Voltage Amplitude ( $V_{OUTPP}$ ) RMS Jitter vs. Input Clock Frequency at Ambient Temperature

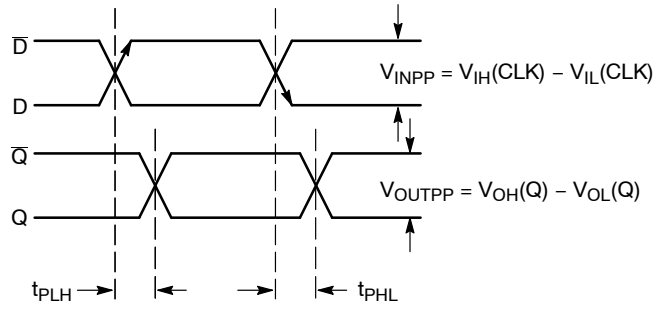


Figure 3. AC Reference Measurement

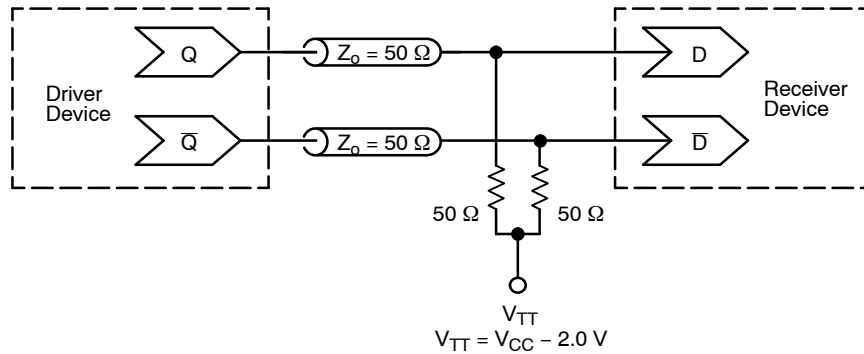


Figure 4. Typical Termination for Output Driver and Device Evaluation (See Application Note [AND8020/D](#) – Termination of ECL Logic Devices.)

**MC10EP11, MC100EP11****ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
MC10EP11DG	SOIC-8 NB (Pb-Free)	98 Units / Tube
MC10EP11DR2G	SOIC-8 NB (Pb-Free)	2500 / Tape & Reel
MC100EP11DG	SOIC-8 NB (Pb-Free)	98 Units / Tube
MC100EP11DR2G	SOIC-8 NB (Pb-Free)	2500 / Tape & Reel
MC100EP11DTG	TSSOP-8 (Pb-Free)	100 Units / Tube
MC100EP11DTR2G	TSSOP-8 (Pb-Free)	2500 / Tape & Reel
MC100EP11MNR4G	DFN-8 (Pb-Free)	1000 / Tape & Reel

**DISCONTINUED** (Note 3)

Device	Package	Shipping <sup>†</sup>
MC10EP11DTG	TSSOP-8 (Pb-Free)	100 Units / Tube

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

3. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).

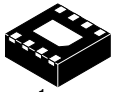
**Resource Reference of Application Notes**

- AN1405/D** – ECL Clock Distribution Techniques
- AN1406/D** – Designing with PECL (ECL at +5.0 V)
- AN1503/D** – ECLinPS™ I/O SPiCE Modeling Kit
- AN1504/D** – Metastability and the ECLinPS Family
- AN1568/D** – Interfacing Between LVDS and ECL
- AN1672/D** – The ECL Translator Guide
- AND8001/D** – Odd Number Counters Design
- AND8002/D** – Marking and Date Codes
- AND8020/D** – Termination of ECL Logic Devices
- AND8066/D** – Interfacing with ECLinPS
- AND8090/D** – AC Characteristics of ECL Devices

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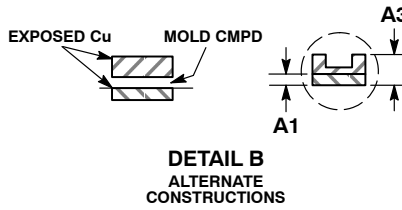
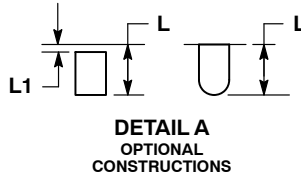
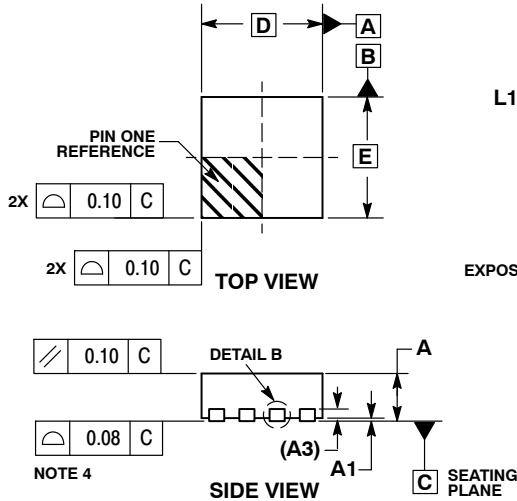
**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**



SCALE 4:1

**DFN8 2x2, 0.5P**  
CASE 506AA  
ISSUE F

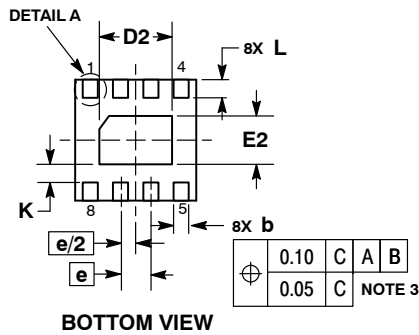
DATE 04 MAY 2016



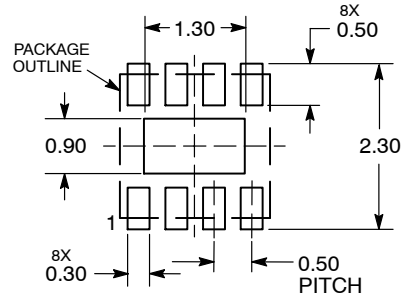
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994 .
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.20 MM FROM TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

DIM	MILLIMETERS	
	MIN	MAX
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.20	0.30
D	2.00 BSC	
D2	1.10	1.30
E	2.00 BSC	
E2	0.70	0.90
e	0.50 BSC	
K	0.30 REF	
L	0.25	0.35
L1	---	0.10

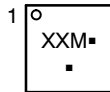


**RECOMMENDED  
SOLDERING FOOTPRINT\***



DIMENSIONS: MILLIMETERS

**GENERIC  
MARKING DIAGRAM\***



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Device

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

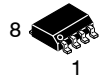
\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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<b>DESCRIPTION:</b>	<b>DFN8, 2.0X2.0, 0.5MM PITCH</b>	<b>PAGE 1 OF 1</b>

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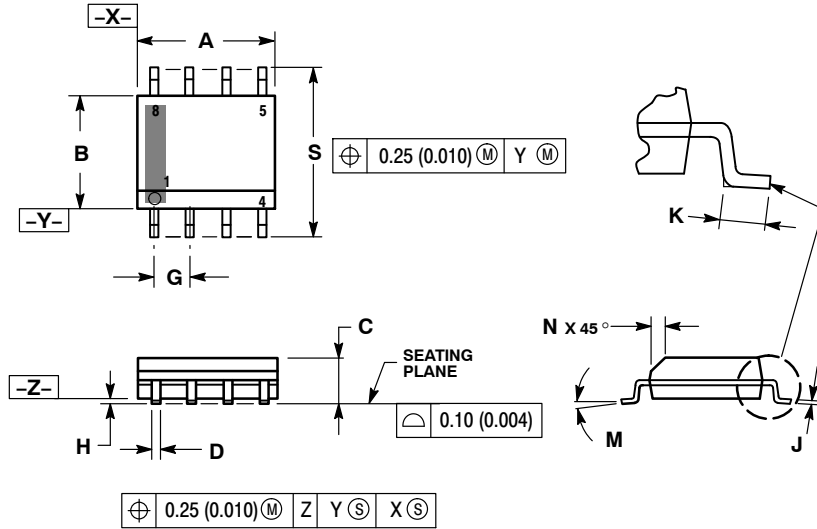
**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**



SCALE 1:1

**SOIC-8 NB  
CASE 751-07  
ISSUE AK**

DATE 16 FEB 2011



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
  5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
  6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

**SOLDERING FOOTPRINT\***



\*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**GENERIC MARKING DIAGRAM\***



XXXXXX = Specific Device Code  
 A = Assembly Location  
 L = Wafer Lot  
 Y = Year  
 W = Work Week  
 ■ = Pb-Free Package

XXXXXX = Specific Device Code  
 A = Assembly Location  
 Y = Year  
 WW = Work Week  
 ■ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

**STYLES ON PAGE 2**

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**SOIC-8 NB**  
**CASE 751-07**  
**ISSUE AK**

DATE 16 FEB 2011

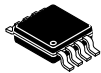
- STYLE 1:  
 PIN 1. EMITTER  
 2. COLLECTOR  
 3. COLLECTOR  
 4. EMITTER  
 5. EMITTER  
 6. BASE  
 7. BASE  
 8. EMITTER
- STYLE 2:  
 PIN 1. COLLECTOR, DIE, #1  
 2. COLLECTOR, #1  
 3. COLLECTOR, #2  
 4. COLLECTOR, #2  
 5. BASE, #2  
 6. EMITTER, #2  
 7. BASE, #1  
 8. EMITTER, #1
- STYLE 3:  
 PIN 1. DRAIN, DIE #1  
 2. DRAIN, #1  
 3. DRAIN, #2  
 4. DRAIN, #2  
 5. GATE, #2  
 6. SOURCE, #2  
 7. GATE, #1  
 8. SOURCE, #1
- STYLE 4:  
 PIN 1. ANODE  
 2. ANODE  
 3. ANODE  
 4. ANODE  
 5. ANODE  
 6. ANODE  
 7. ANODE  
 8. COMMON CATHODE
- STYLE 5:  
 PIN 1. DRAIN  
 2. DRAIN  
 3. DRAIN  
 4. DRAIN  
 5. GATE  
 6. GATE  
 7. SOURCE  
 8. SOURCE
- STYLE 6:  
 PIN 1. SOURCE  
 2. DRAIN  
 3. DRAIN  
 4. SOURCE  
 5. SOURCE  
 6. GATE  
 7. GATE  
 8. SOURCE
- STYLE 7:  
 PIN 1. INPUT  
 2. EXTERNAL BYPASS  
 3. THIRD STAGE SOURCE  
 4. GROUND  
 5. DRAIN  
 6. GATE 3  
 7. SECOND STAGE Vd  
 8. FIRST STAGE Vd
- STYLE 8:  
 PIN 1. COLLECTOR, DIE #1  
 2. BASE, #1  
 3. BASE, #2  
 4. COLLECTOR, #2  
 5. COLLECTOR, #2  
 6. EMITTER, #2  
 7. EMITTER, #1  
 8. COLLECTOR, #1
- STYLE 9:  
 PIN 1. EMITTER, COMMON  
 2. COLLECTOR, DIE #1  
 3. COLLECTOR, DIE #2  
 4. EMITTER, COMMON  
 5. EMITTER, COMMON  
 6. BASE, DIE #2  
 7. BASE, DIE #1  
 8. EMITTER, COMMON
- STYLE 10:  
 PIN 1. GROUND  
 2. BIAS 1  
 3. OUTPUT  
 4. GROUND  
 5. GROUND  
 6. BIAS 2  
 7. INPUT  
 8. GROUND
- STYLE 11:  
 PIN 1. SOURCE 1  
 2. GATE 1  
 3. SOURCE 2  
 4. GATE 2  
 5. DRAIN 2  
 6. DRAIN 2  
 7. DRAIN 1  
 8. DRAIN 1
- STYLE 12:  
 PIN 1. SOURCE  
 2. SOURCE  
 3. SOURCE  
 4. GATE  
 5. DRAIN  
 6. DRAIN  
 7. DRAIN  
 8. DRAIN
- STYLE 13:  
 PIN 1. N.C.  
 2. SOURCE  
 3. SOURCE  
 4. GATE  
 5. DRAIN  
 6. DRAIN  
 7. DRAIN  
 8. DRAIN
- STYLE 14:  
 PIN 1. N-SOURCE  
 2. N-GATE  
 3. P-SOURCE  
 4. P-GATE  
 5. P-DRAIN  
 6. P-DRAIN  
 7. N-DRAIN  
 8. N-DRAIN
- STYLE 15:  
 PIN 1. ANODE 1  
 2. ANODE 1  
 3. ANODE 1  
 4. ANODE 1  
 5. CATHODE, COMMON  
 6. CATHODE, COMMON  
 7. CATHODE, COMMON  
 8. CATHODE, COMMON
- STYLE 16:  
 PIN 1. EMITTER, DIE #1  
 2. BASE, DIE #1  
 3. EMITTER, DIE #2  
 4. BASE, DIE #2  
 5. COLLECTOR, DIE #2  
 6. COLLECTOR, DIE #2  
 7. COLLECTOR, DIE #1  
 8. COLLECTOR, DIE #1
- STYLE 17:  
 PIN 1. VCC  
 2. V2OUT  
 3. V1OUT  
 4. TXE  
 5. RXE  
 6. VEE  
 7. GND  
 8. ACC
- STYLE 18:  
 PIN 1. ANODE  
 2. ANODE  
 3. SOURCE  
 4. GATE  
 5. DRAIN  
 6. DRAIN  
 7. CATHODE  
 8. CATHODE
- STYLE 19:  
 PIN 1. SOURCE 1  
 2. GATE 1  
 3. SOURCE 2  
 4. GATE 2  
 5. DRAIN 2  
 6. MIRROR 2  
 7. DRAIN 1  
 8. MIRROR 1
- STYLE 20:  
 PIN 1. SOURCE (N)  
 2. GATE (N)  
 3. SOURCE (P)  
 4. GATE (P)  
 5. DRAIN  
 6. DRAIN  
 7. DRAIN  
 8. DRAIN
- STYLE 21:  
 PIN 1. CATHODE 1  
 2. CATHODE 2  
 3. CATHODE 3  
 4. CATHODE 4  
 5. CATHODE 5  
 6. COMMON ANODE  
 7. COMMON ANODE  
 8. CATHODE 6
- STYLE 22:  
 PIN 1. I/O LINE 1  
 2. COMMON CATHODE/VCC  
 3. COMMON CATHODE/VCC  
 4. I/O LINE 3  
 5. COMMON ANODE/GND  
 6. I/O LINE 4  
 7. I/O LINE 5  
 8. COMMON ANODE/GND
- STYLE 23:  
 PIN 1. LINE 1 IN  
 2. COMMON ANODE/GND  
 3. COMMON ANODE/GND  
 4. LINE 2 IN  
 5. LINE 2 OUT  
 6. COMMON ANODE/GND  
 7. COMMON ANODE/GND  
 8. LINE 1 OUT
- STYLE 24:  
 PIN 1. BASE  
 2. EMITTER  
 3. COLLECTOR/ANODE  
 4. COLLECTOR/ANODE  
 5. CATHODE  
 6. CATHODE  
 7. COLLECTOR/ANODE  
 8. COLLECTOR/ANODE
- STYLE 25:  
 PIN 1. VIN  
 2. N/C  
 3. REXT  
 4. GND  
 5. IOUT  
 6. IOUT  
 7. IOUT  
 8. IOUT
- STYLE 26:  
 PIN 1. GND  
 2. dv/dt  
 3. ENABLE  
 4. ILIMIT  
 5. SOURCE  
 6. SOURCE  
 7. SOURCE  
 8. VCC
- STYLE 27:  
 PIN 1. ILIMIT  
 2. OVLO  
 3. UVLO  
 4. INPUT+  
 5. SOURCE  
 6. SOURCE  
 7. SOURCE  
 8. DRAIN
- STYLE 28:  
 PIN 1. SW\_TO\_GND  
 2. DASIC OFF  
 3. DASIC\_SW\_DET  
 4. GND  
 5. V\_MON  
 6. VBULK  
 7. VBULK  
 8. VIN
- STYLE 29:  
 PIN 1. BASE, DIE #1  
 2. EMITTER, #1  
 3. BASE, #2  
 4. EMITTER, #2  
 5. COLLECTOR, #2  
 6. COLLECTOR, #2  
 7. COLLECTOR, #1  
 8. COLLECTOR, #1
- STYLE 30:  
 PIN 1. DRAIN 1  
 2. DRAIN 1  
 3. GATE 2  
 4. SOURCE 2  
 5. SOURCE 1/DRAIN 2  
 6. SOURCE 1/DRAIN 2  
 7. SOURCE 1/DRAIN 2  
 8. GATE 1

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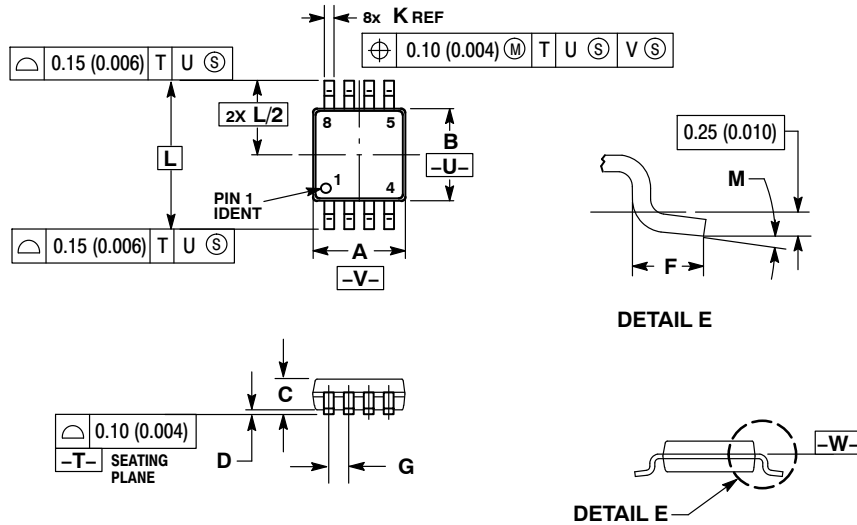
**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**



SCALE 2:1

**TSSOP-8 3.00x3.00x0.95**  
CASE 948R-02  
ISSUE A

DATE 07 APR 2000



**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
6. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.90	3.10	0.114	0.122
B	2.90	3.10	0.114	0.122
C	0.80	1.10	0.031	0.043
D	0.05	0.15	0.002	0.006
F	0.40	0.70	0.016	0.028
G	0.65 BSC		0.026 BSC	
K	0.25	0.40	0.010	0.016
L	4.90 BSC		0.193 BSC	
M	0°	6°	0°	6°

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<b>DESCRIPTION:</b>	<b>TSSOP-8 3.00x3.00x0.95</b>	<b>PAGE 1 OF 1</b>

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