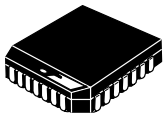
Quint Differential Line Receiver

MC10E416
MC100E416

QUINT DIFFERENTIAL LINE RECEIVER



FN SUFFIX
PLASTIC PACKAGE
CASE 776-02

The MC10E416/100E416 is a 5-bit differential line receiving device. The 2.0GHz of bandwidth provided by the high frequency outputs makes the device ideal for buffering of very high speed oscillators.

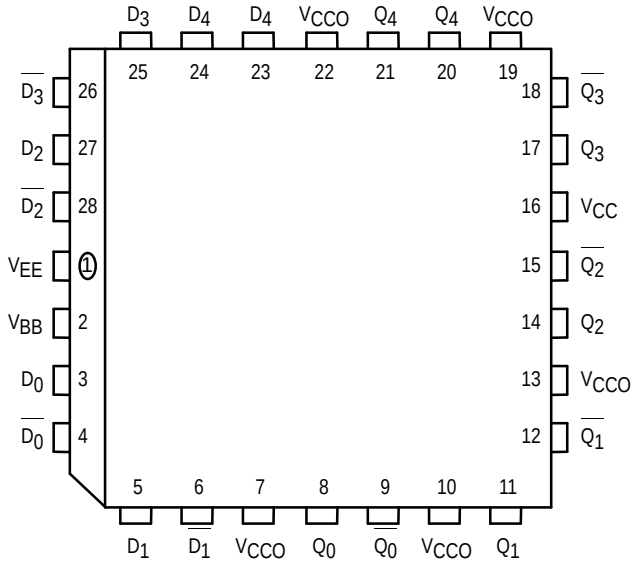
A V_{BB} pin is available to AC couple an input signal to the device. More information on AC coupling can be found in the design handbook section of this data book.

The design incorporates two stages of gain, internal to the device, making it an excellent choice for use in high bandwidth amplifier applications.

The differential inputs have internal clamp structures which will force the Q output of a gate in an open input condition to go to a LOW state. Thus, inputs of unused gates can be left open and will not affect the operation of the rest of the device. Note that the input clamp will take affect only if both inputs fall 2.5V below V_{CC}.

- Differential D and Q; V_{BB} available
- 600ps Max. Propagation Delay
- High Frequency Outputs
- 2 Stages of Gain
- Extended 100E V_{EE} Range of – 4.2V to – 5.46V
- Internal 75kΩ Input Pulldown Resistors

Pinout: 28-Lead PLCC (Top View)

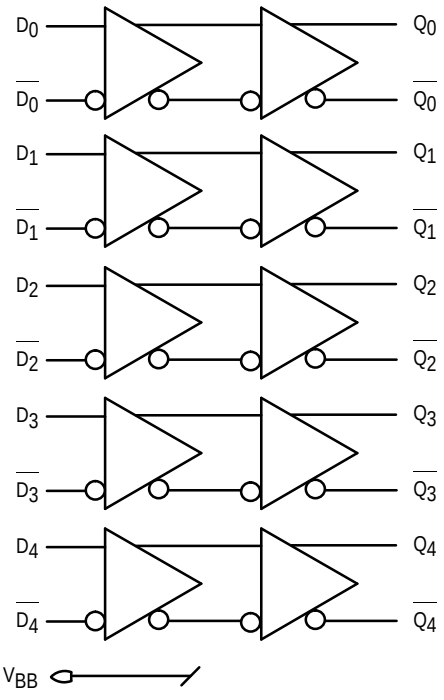


* All V_{CC} and V_{CCO} pins are tied together on the die.

PIN NAMES

Pin	Function
D[0:4], $\overline{D}$[0:4]	Differential Data Inputs
Q[0:4], $\overline{Q}$[0:4]	Differential Data Outputs

LOGIC DIAGRAM



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MOTOROLA

DC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = V_{CCO} = GND)

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		min	typ	max	min	typ	max	min	typ	max		
V_{BB}	Output Reference Voltage										V	
	10E	–1.38		–1.27	–1.35		–1.25	–1.31		–1.19		
	100E	–1.38		–1.26	–1.38		–1.26	–1.38		–1.26		
I_{IH}	Input HIGH Current			150			150			150	µA	
I_{EE}	Power Supply Current										mA	
	10E		135	162		135	162		135	162		
	100E		135	162		135	162		155	186		
V_{PP}(DC)	Input Sensitivity	50			50			50			mV	1
V_{CMR}	Common Mode Range	–1.5		0	–1.5		0	–1.5		0	V	2

1. Differential input voltage required to obtain a full ECL swing on the outputs.
2. V_{CMR} is referenced to the most positive side of the differential input signal. Normal operation is obtained when the input signal are within the V_{CMR} range and the input swing is greater than $V_{PP\ MIN}$ and < 1.0V

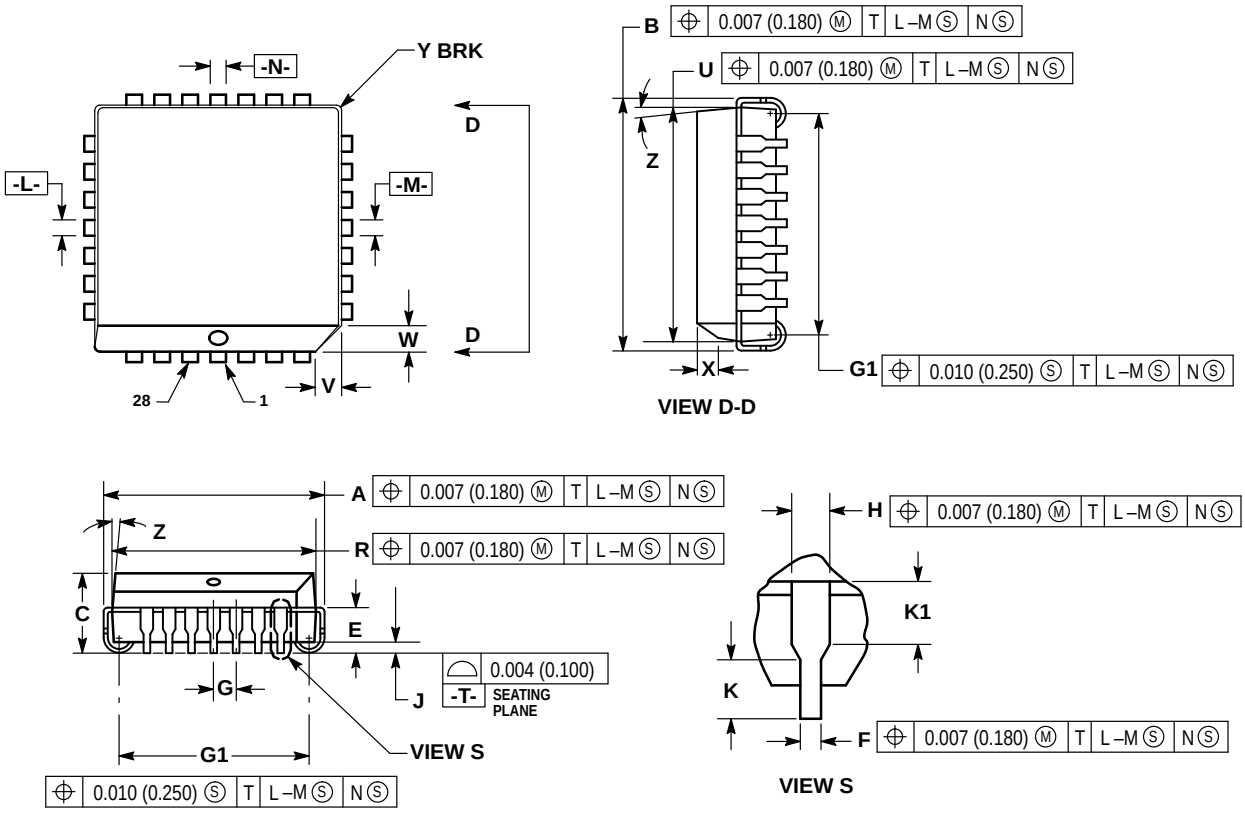
AC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = V_{CCO} = GND)

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		min	typ	max	min	typ	max	min	typ	max		
t_{PLH}	Propagation Delay to Output										ps	
t_{PHL}	d(Diff)	250	350	500	250	350	500	250	350	500		
	D(SE)	200	350	550	200	350	550	200	350	550		
t_{SKEW}	Within-Device Skew		50			50			50		ps	1
t_{SKEW}	Duty Cycle Skew											
	t_{PLH}-t_{PHL}		±10			±10			±10		ps	2
V_{PP}(AC)	Minimum Input Swing	150			150			150			mV	3
t_r	Rise/Fall Time											
t_f	20 - 80%	100	200	350	100	200	350	100	200	350	ps	

1. Within-device skew is defined as identical transitions on similar paths through a device.
2. Duty cycle skew defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.
3. Minimum input swing for which AC parameters are guaranteed.

OUTLINE DIMENSIONS

FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 776–02
ISSUE D



NOTES:
1. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIM G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
3. DIM R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

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

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