



# Quint Differential Line Receiver

## Product Preview

**ELECTRICALLY TESTED PER:  
100E516**

The 100E516 is a quint differential line receiver with emitter-follower outputs. An internally generated reference supply ( $V_{BB}$ ) is available for single-ended reception.

Active current sources plus a deep collector feature of the MOSAIC III process provide the receivers with excellent common-mode noise rejection. Each receiver has a dedicated  $V_{CCO}$  supply lead, providing optimum symmetry and stability.

The receiver design features clamp circuitry to cause a defined state if both the inverting and non-inverting inputs are left open; in this case the Q output goes LOW, while the  $\bar{Q}$  output goes HIGH. This feature makes the device ideal for twisted pair applications.

If both inverting and non-inverting inputs are at equal potential  $> -2.5$  V, the receiver does not go to a defined state, but rather current-shares in normal differential amplifier fashion, producing output voltage levels midway between HIGH and LOW, or the device may even oscillate.

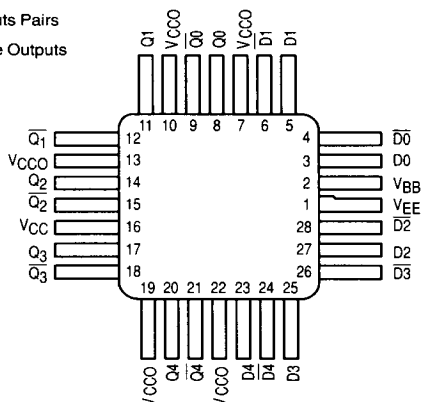
The device  $V_{BB}$  output is intended for use as a reference voltage for single-ended reception of ECL signals to that device only. When using for this purpose, it is recommended that  $V_{BB}$  is decoupled to  $V_{CC}$  via a  $0.01\mu F$  capacitor.

The 100E516 features input pull-down resistors, as does the rest of the ECLinPS family.

- 500 ps Max. Propagation Delay
- $V_{BB}$  Supply Output
- Dedicated  $V_{CCO}$  Pin for Each Receiver
- Extended 100E  $V_{EE}$  Range of - 4.2 V to - 5.46 V
- 75 k $\Omega$  Input Pulldown Resistors

### PIN NAME

Pin	Function
$D_0, \bar{D}_0 - D_4, \bar{D}_4$	Differential Inputs Pairs
$Q_0, \bar{Q}_0 - Q_4, \bar{Q}_4$	Differential Outputs Pairs
$V_{BB}$	Reference Voltage Outputs



**Military 100E516**

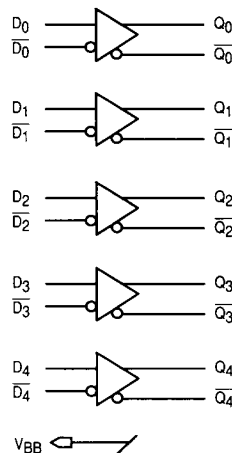


**AVAILABLE AS**

- 1) JAN: N/A
  - 2) SMD: N/A
  - 3) 883: Planned
- X = CASE OUTLINE AS FOLLOWS:**

**PACKAGE: NON-Compliant  
QFP: X**

### LOGIC DIAGRAM



This document contains information on a product under development. Motorola reserves the right to change or discontinue this product without notice.

MOTOROLA MILITARY MECL DATA  
5-52

**100E Series DC CHARACTERISTICS:**  $V_{EE} = -4.2 \text{ V to } -5.46 \text{ V}$ ,  $V_{CC} = V_{CCO} = \text{GND}$ ;  $-55^\circ\text{C to } +125^\circ\text{C}$ 

Symbol	Parameter	Min	Max	Units	TEST CONDITION APPLIED:	
$V_{OH}$	Output HIGH Voltage	-1025	-880	mV	$V_{IN} = V_{IH}(\text{max})$	Loading with
$V_{OL}$	Output LOW Voltage	-1810	-1620	mV	or $V_{IN} = V_{IL}(\text{min})$	$50\Omega$ to $-2.0 \text{ V}$
$V_{OHA}$	Output HIGH Voltage	-1035		mV	$V_{IN} = V_{IH}(\text{min})$	Loading with
$V_{OLA}$	Output LOW Voltage		-1610	mV	or $V_{IN} = V_{IL}(\text{max})$	$50\Omega$ to $-2.0 \text{ V}$
$V_{IH}$	Input HIGH Voltage	-1165	-880	mV	Guaranteed HIGH Signal for All Inputs	
$V_{IL}$	Input LOW Voltage	-1810	-1475	mV	Guaranteed LOW Signal for All Inputs	
$I_{IL}$	Input LOW Current	0.5		$\mu\text{A}$	$V_{IN} = V_{IL}(\text{min})$	

**DC CHARACTERISTICS:**  $V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ,  $V_{CC} = V_{CCO} = \text{GND}$ 

Symbol	Parameter	Limits						Units	TEST CONDITION APPLIED:
	Functional Parameters:	+ 25° C		+ 125° C		- 55° C			
		Min	Max	Min	Max	Min	Max		
$V_{BB}$	Output Reference Voltage	-1.38	-1.26	-1.38	-1.26	-1.38	-1.26	V	
$I_{IH}$	Input High Current		200		200		200	$\mu\text{A}$	
$I_{EE}$	Power Supply Current	29	35	33	40	29	35	mA	
$V_{PP}(\text{DC})$	Input Sensitivity	150		150		150		mV	(Note 1)
$V_{CMR}$	Common Mode Range	-2.0	-0.6	-2.0	-0.6	-2.0	-0.6	V	(Note 2)

1.  $V_{PP}$  is the minimum differential input voltage required to assure full ECL levels are present at the outputs.

2.  $V_{CMR}$  is referenced to the most positive side of the differential input signal. Normal operation is obtained when the "HIGH" input is within the  $V_{CMR}$  range and the input swing is greater than  $V_{PPMIN}$  and  $< 1.0 \text{ V}$ .

**AC CHARACTERISTICS:**  $V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ,  $V_{CC} = V_{CCO} = \text{GND}$ 

Symbol	Parameter	Limits						Units	TEST CONDITION APPLIED:
	Functional Parameters:	+ 25° C		+ 125° C		- 55° C			
		Min	Max	Min	Max	Min	Max		
$t_{PLH}$ $t_{PHL}$	Propagation Delay to Output								
	D	200	450	200	450	200	450	ps	
	D (SE)	150	500	150	500	150	500	ps	
$V_{PP}(\text{AC})$	Minimum Input Swing	150		150		150		mV	(Note 1)
$t_{Skew}$	Within-device Skew								
	$D_n$ to $Q_n$ , $\bar{Q}_n$	50		50		50		ps	(Note 2)
$t_{Skew}$	Duty Cycle Skew								
	$t_{PLH} - t_{PHL}$	$\pm 10$		$\pm 10$		$\pm 10$		ps	(Note 3)
$t_r$ $t_f$	Rise/Fall Times 20 - 80%	275	575	275	575	275	575	ps	

1. Minimum input swing for which AC parameters are guaranteed.

2. Within-device skew is defined as identical transitions on similar paths through a device.

3. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross points of the outputs.