

# Triple Differential 2:1 Multiplexer

The MC10E457/100E457 is a 3-bit differential 2:1 multiplexer. The fully differential data path makes the device ideal for multiplexing low skew clock or other skew sensitive signals. Multiple  $V_{BB}$  pins are provided to ease AC coupling input signals.

The higher frequency outputs provide the device with a >1.0GHz bandwidth to meet the needs of the most demanding system clock.

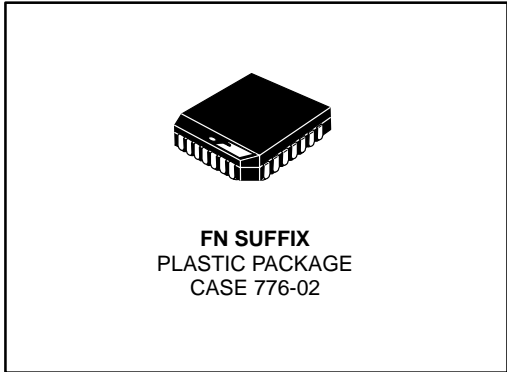
Both, separate selects and a common select, are provided to make the device well suited for both data path and random logic applications.

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
- 700ps Max. Propagation Delay
- High Frequency Outputs
- Separate and Common Select
- Extended 100E  $V_{EE}$  Range of -4.2V to -5.46V
- Internal 75k $\Omega$  Input Pulldown Resistors

**MC10E457**  
**MC100E457**

**TRIPLE DIFFERENTIAL**  
**2:1 MULTIPLEXER**

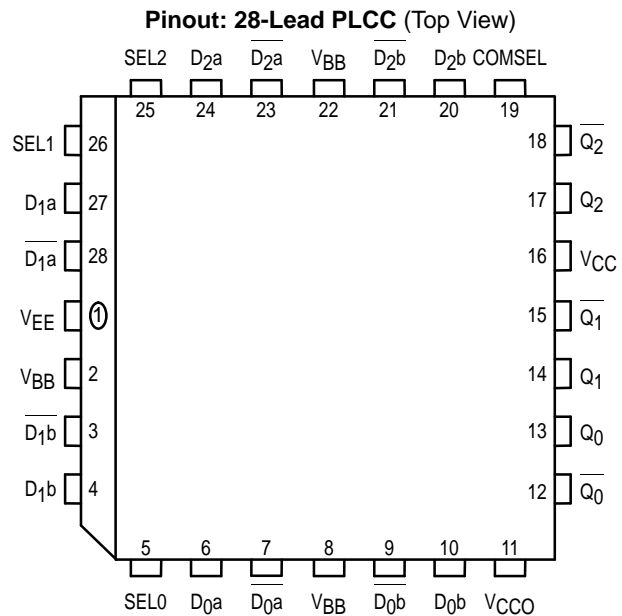


**PIN NAMES**

Pin	Function
$\overline{D_n[0:2]}$ ; $\overline{D_n[0:2]}$	Differential Data Inputs
SEL	Individual Select Input
COMSEL	Common Select Input
$V_{BB}$	$V_{BB}$ Reference Output
$\overline{Q[0:2]}$ , $\overline{Q[0:2]}$	Differential Data Outputs

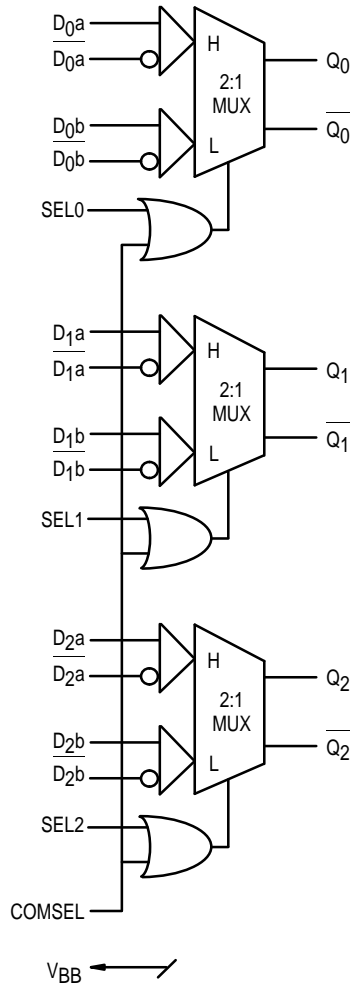
**FUNCTION TABLE**

SEL	Data
H	a
L	b



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

**LOGIC DIAGRAM**



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

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit	Cond	
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max			
$V_{BB}$	Output Reference Voltage	10E	-1.43	-1.30	-1.38	-1.27	-1.35	-1.25	-1.31	-1.19				V		
		100E	-1.38	-1.26	-1.38	-1.26	-1.38	-1.26	-1.38	-1.26						
$I_{IH}$	Input HIGH Current			150			150			150			150	$\mu A$		
$I_{EE}$	Power Supply Current	10E		92	110		92	110		92	110		92	110	mA	
		100E		92	110		92	110		92	110		106	127		
$V_{PP(DC)}$	Input Sensitivity		50			50			50			50		mV	1	
$V_{CMR}$	Common Mode Range		-1.5	0		-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 defined as the range within which the  $V_{IH}$  level may vary, with the device still meeting the propagation delay specification. The  $V_{IL}$  level must be such that the peak to peak voltage is less than 1.0 V and greater than or equal to  $V_{PP(min)}$ .

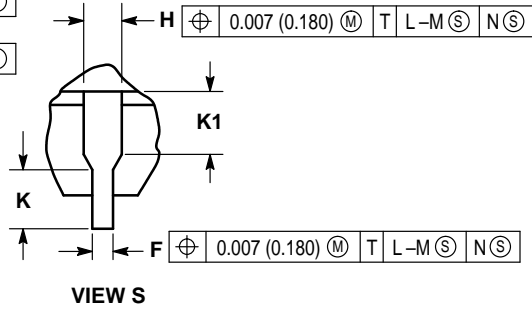
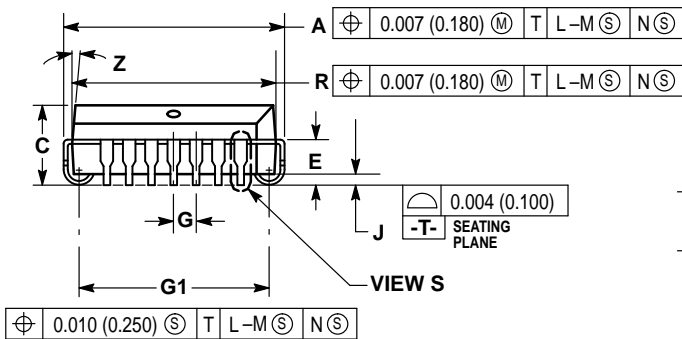
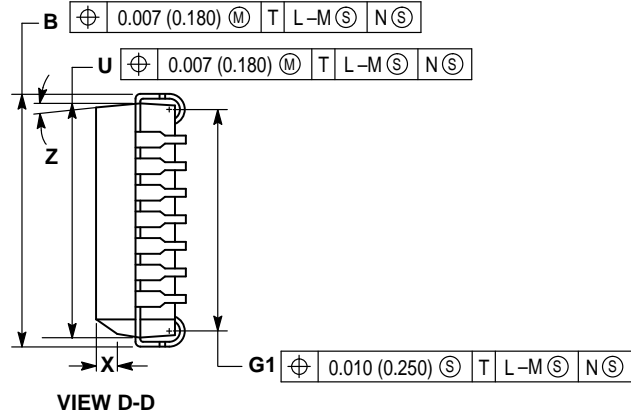
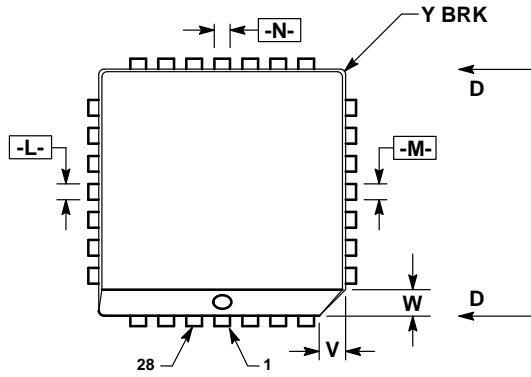
**AC CHARACTERISTICS** ( $V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ;  $V_{CC} = V_{CCO} = \text{GND}$ )

Symbol	Characteristic	0°C			0°C to 85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay to Output D (Differential) D (Single-Ended) SEL COMSEL	325 275 300 325	475 475 500 525	700 750 775 800	375 325 350 375	475 475 500 525	650 700 725 750	ps	
t <sub>skew</sub>	Within-Device Skew		40			40		ps	1
t <sub>skew</sub>	Duty Cycle Skew t <sub>PLH</sub> – t <sub>PHL</sub>		±10			±10		ps	2
V <sub>PP(AC)</sub>	Minimum Input Swing	150			150			mV	3
t <sub>r</sub> /t <sub>f</sub>	Rise/Fall Time	125	275	500	150	275	450	ps	20–80%

1. Within-device skew is defined as identical transitions on similar paths through a device.
2. 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.
3. Minimum input swing for which AC parameters are guaranteed.

OUTLINE DIMENSIONS


FN SUFFIX  
 PLASTIC PLCC PACKAGE  
 CASE 776-02  
 ISSUE D



NOTES:

- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIM G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIM R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- 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.
- 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).

DIM	INCHES		MILLIMETERS	
	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°	
G1	0.410	0.430	10.42	10.92
K1	0.040	—	1.02	—

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447 or 602-303-5454

**MFAX:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
**INTERNET:** <http://Design-NET.com>

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,  
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-81-3521-8315

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

