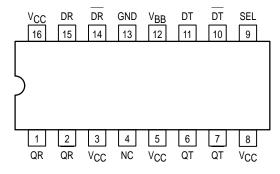
# Fibre Channel Coaxial Cable Driver and Loop Resiliency Circuit

The MC10SX1189 is a differential receiver, differential transmitter specifically designed to drive coaxial cables. It incorporates the output cable drive capability of the MC10EL89 Coaxial Cable Driver with additional circuitry to multiplex the output cable drive source between the cable receiver or the local transmitter inputs. The multiplexer control circuitry is TTL compatible for ease of operation.

- 425ps Propagation Delay
- 1.6V Output Swing on the Cable Driving Output
- Single +5V operation
- 75kΩ Internal Input Pull Down Resistors
- >1000 Volt ESD Protection

The MC10SX1189 is useful as a bypass element for Fibre Channel-Arbitrated Loop (FC-AL) or Serial Storage Architecture (SSA) applications, to create loop style interconnects with fault tolerant, active switches at each device node. This device is particularly useful for back panel applications where small size is desirable.

The EL89 style drive circuitry produces swings twice as large as a standard PECL output. When driving a coaxial cable, proper termination is required at both ends of the line to minimize reflections. The 1.6V output swings allow for proper termination at both ends of the cable, while maintaining the required swing at the receiving end of the cable. Because of the larger output swings, the QT, QT outputs are terminated into the thevenin equivalent of  $50\Omega$  to  $V_{CC} - 3.0V$  instead of  $50\Omega$  to  $V_{CC} - 2.0V$ .



Pinout: 16-Lead SOIC (Top View)

# MC10SX1189

FIBRE CHANNEL COAXIAL
CABLE DRIVER AND LOOP
RESILIENCY CIRCUIT



**D SUFFIX**PLASTIC SOIC PACKAGE
CASE 751B-05

#### **TRUTH TABLE**

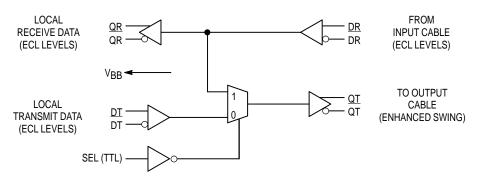
SEL	Function
L H	$\begin{array}{c} DR \to QT \\ DT \to QT \end{array}$

#### **PIN NAMES**

Pins	Function
DR/ <u>DR</u>	Differential Input from Receive Cable
QR/QR	Buffered Differential Output from Receive Cable
DT/DT	Differential Input to Transmit Cable
QT/QT	Buffered Differential Output to
	Transmit Cable
SEL	Multiplexer Control Signal (TTL)
Vcc	Positive Power Supply
GND	Ground
V <sub>BB</sub>	Reference Voltage Output



# **LOGIC DIAGRAM**



### **ABSOLUTE MAXIMUM RATINGS\***

Symbol	Parameter		Value	Unit
Vcc	Power Supply Voltage (Referenced to GND)		0 to +7.0	Vdc
VIN	Input Voltage (Referenced to GND)		0 to +6.0	Vdc
lout	Output Current Cor	ntinuous Surge	50 100	mA
TA	Operating Temperature Range		-40 to +85	°C
TSTG	Storage Temperature Range		−50 to +150	°C
V <sub>CC</sub>	Operating Voltage Range <sup>1</sup>		4.5 to 5.5	Vdc

<sup>\*</sup> Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

# DC CHARACTERISTICS<sup>1</sup>

			-40°C			0°C		25°C		85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
VOH	Output Voltage High (QR,QR) V <sub>CC</sub> = 5.0V, GND = 0V (Notes 2,3)	3.92	4.05	4.11	3.98	4.09	4.16	4.02	4.11	4.19	4.09	4.16	4.28	٧
VOL	Output Voltage Low (QR,QR) VCC = 5.0V, GND = 0V (Notes 2,3)	3.05	3.23	3.35	3.05	3.24	3.37	3.05	3.24	3.37	3.05	3.25	3.41	٧
Vон	Output Voltage High (QT,QT) VCC = 5.0V, GND = 0V (Notes 2,4)	3.71	3.89	4.08	3.79	3.98	4.17	3.83	4.02	4.20	3.90	4.09	4.28	V
VOL	Output Voltage Low (QT,QT) VCC = 5.0V, GND = 0V (Notes 2,4)	1.94	2.22	2.50	1.83	2.12	2.41	1.80	2.10	2.39	1.77	2.06	2.35	٧
Icc	Quiescent Supply Current (Note 5)	20	25	42	22	26	47	23	27	47	25	28	47	mA
VIH	Input Voltage High (DR,DR & DT,DT) VCC = 5.0V, GND = 0V (Note 2)	3.77		4.11	3.83		4.16	3.87		4.19	3.94		4.28	٧
VIL	Input Voltage Low (DR,DR & DT,DT)  VCC = 5.0V, GND = 0V (Note 2)	3.05		3.50	3.05		3.52	3.05		3.52	3.05		3.56	V
V <sub>IH</sub>	Input Voltage High SEL	2.0			2.0			2.0			2.0			٧
VIL	Input Voltage Low SEL			0.8			0.8			0.8			0.8	٧
V <sub>BB</sub>	Output Reference Voltage V <sub>CC</sub> = 5.0V, GND = 0V (Note 2)	3.57	3.63	3.70	3.62	3.67	3.73	3.65	3.70	3.75	3.69	3.75	3.81	V

<sup>1. 10</sup>SX circuits are designed to meet the DC specifications shown in the table after thermal equilibrium has been established. The circuit is mounted in a test socket or mounted on a printed circuit board and transverse air greater than 500lfm is maintained.

<sup>1.</sup> Parametric values specified at 4.75 to 5.25V.

<sup>2.</sup> Values will track 1:1 with the V<sub>CC</sub> supply.

<sup>3.</sup> Outputs loaded with  $50\Omega$  to +3.0V

<sup>4.</sup> Outputs loaded with  $50\Omega$  to +2.0V

<sup>5.</sup> Outputs open circuited.

# AC CHARACTERISTICS<sup>1</sup> (V<sub>CC</sub> = 4.75 to 5.25V)

				–40°C		0 to 85°C				
Symbol	Characte	eristic	Min	Тур	Max	Min	Тур	Max	Unit	Condition
tPLH, tPHL	Propagation Delay to Output	$\begin{array}{c} DR \to QR \; (Diff) \\ (SE) \end{array}$	175 150	300 300	450 500	225 175	325 325	500 550	ps	Note 2 Note 3
		$\begin{array}{c} DR \to QT \; (Diff) \\ (SE) \end{array}$	250 225	425 425	650 700	300 250	450 450	650 700		
		$DT \to QT \; (Diff) \\ (SE)$	225 200	400 400	650 725	275 225	425 425	650 725		
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay	$SEL \to QT, \overline{QT}$	450	600	850	500	650	800	ps	1.5V to 50% Pt
t <sub>r</sub> , t <sub>f</sub>	Rise Time Fall Time	QR,QR	100 100	275 275	400 400	125 125	275 275	400 400	ps	20% to 80% 80% to 20%
t <sub>r</sub> , t <sub>f</sub>	Rise Time Fall Time	QT,QT	150 150	300 300	550 550	150 150	300 300	550 550	ps	20% to 80% 80% to 20%
tskew	Within Device Skew			15			15		ps	Note 4
VPP	Minimum Input Swin	g	200			200			mV	Note 5
VCMR	Common Mode Ran	ge	3.00		4.35	3.00		4.35	V	Note 6

<sup>1. 10</sup>SX circuits are designed to meet the AC specifications shown in the table after thermal equilibrium has been established. The circuit is mounted in a test socket or mounted on a printed circuit board and transverse air greater than 500lfm is maintained.

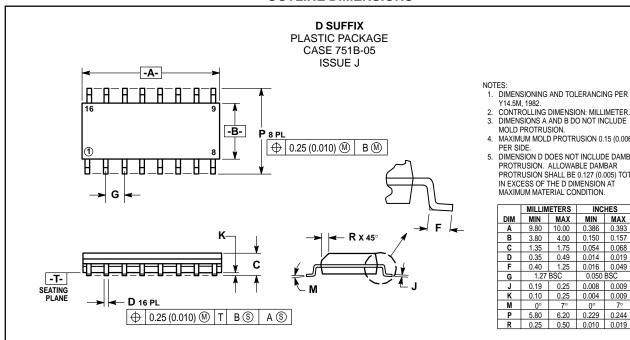
<sup>2.</sup> The differential propagation delay is defined as the delay from the crossing points of the differential input signals to the crossing point of the differential output signals.

<sup>3.</sup> The single-ended propagation delay is defined as the delay from the 50% point of the input signal to the 50% point of the output signal.

Duty cycle skew is the difference between t<sub>PLH</sub> and t<sub>PHL</sub> propagation delay through a device, Stretch input is left open.
 Minimum input swing for which AC parameters are guaranteed.

<sup>6.</sup> The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between VPP Min and 1.0V.

### **OUTLINE DIMENSIONS**



- 1. DIMENSIONING AND TOLERANCING PER ANSI
- DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
- MAXIMUM MOLD PROTRUSION 0.15 (0.006)
- 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.

	MILLIM	ETERS	INC	HES		
DIM	MIN	MAX	MIN	MAX		
Α	9.80	10.00	0.386	0.393		
В	3.80	4.00	0.150	0.157		
C	1.35	1.75	0.054	0.068		
D	0.35	0.49	0.014	0.019		
F	0.40	1.25	0.016	0.049		
G	1.27	BSC	0.050	50 BSC		
J	0.19	0.25	0.008	0.009		
K	0.10	0.25	0.004	0.009		
M	0°	7°	0°	7∘		
Р	5.80	6.20	0.229	0.244		
R	0.25	0.50	0.010	0.019		

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