Enhanced Ethernet Transceiver

MC68160FB, CFB

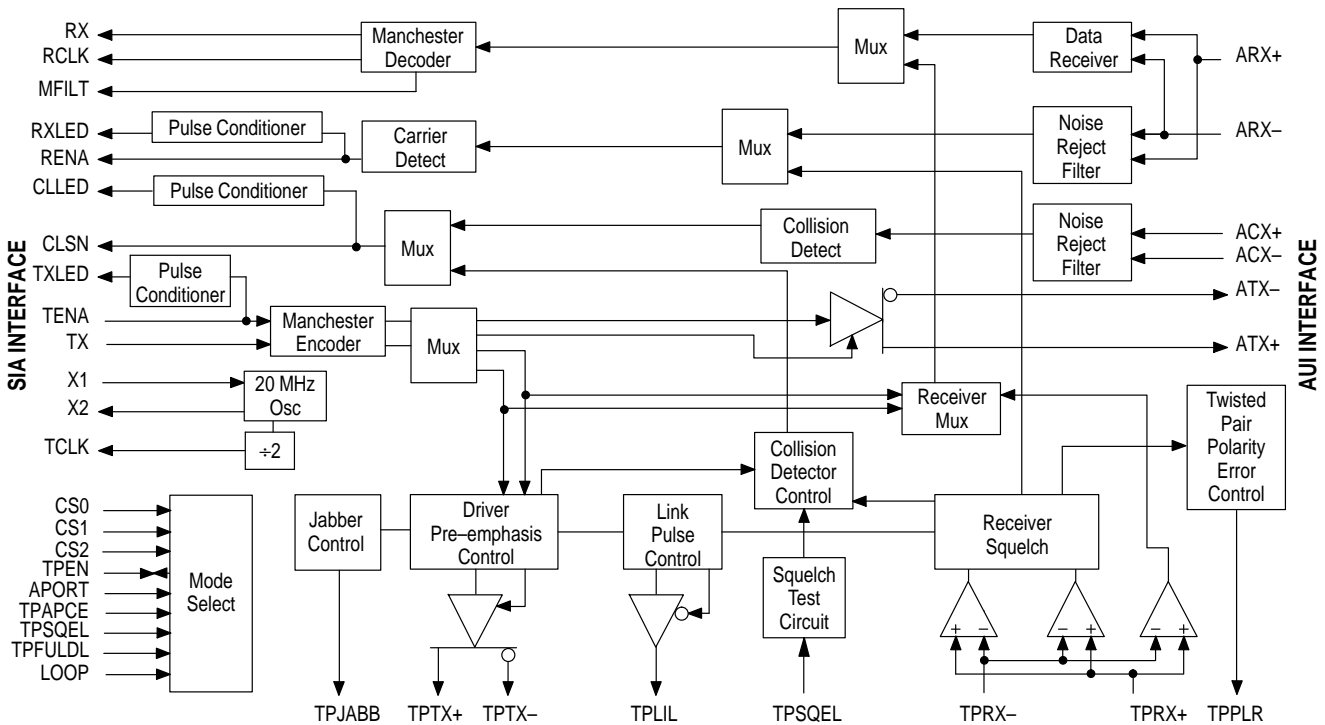T_A = 0° to +70°C, Case 848D

MC68160BFB

T_A = −40° to +85°C, Case 848D

The MC68160, B and C Enhanced Ethernet Interface Circuit is a BiCMOS device which supports both IEEE 802.3* Access Unit Interface (AUI) and 10BASE–T Twisted Pair (TP) Interface media connections through external isolation transformers. It encodes NRZ data to Manchester data and supplies the signals which are required for data communication via 10BASE–T or AUI interfaces. The MC68160, B and C gluelessly interface to the Ethernet controller contained in the MC68360 Quad Integrated Communications Controller (QUICC) device. The MC68160 also interfaces easily to most other industry–standard IEEE 802.3 LAN controllers.** Prior to twisted pair data reception, Smart Squelch circuitry qualifies input signals for correct amplitude, pulse width, and sequence requirements.

* MC68160B does not support all IEEE 802.3 specifications over extended temperature range. Exceptions noted in specifications.

** MC68160B, C only support Motorola controllers

ISO 8802–3[IEEE 802.3] 10BASE–T Transceiver

MC34055DW

T_A = 0° to +70°C, Case 751E

The Motorola 10BASE–T transceiver, designed to comply with the ISO 8802–3[IEEE 802.3] 10BASE–T specification, will support a Medium Dependent Interface (MDI) in an embedded Media Attachment Unit (MAU). The interface supporting the Data Terminal Equipment (DTE) is TTL, CMOS, and raised ECL compatible, and the interface to the

Twisted Pair (TP) media is supported through standard 10BASE–T filters and transformers. Differential data intended for the TP media is provided a 50 ns pre–emphasis. Data at the TP receiver is screened by Smart Squelch circuitry for specific threshold, pulse width, and sequence requirements.
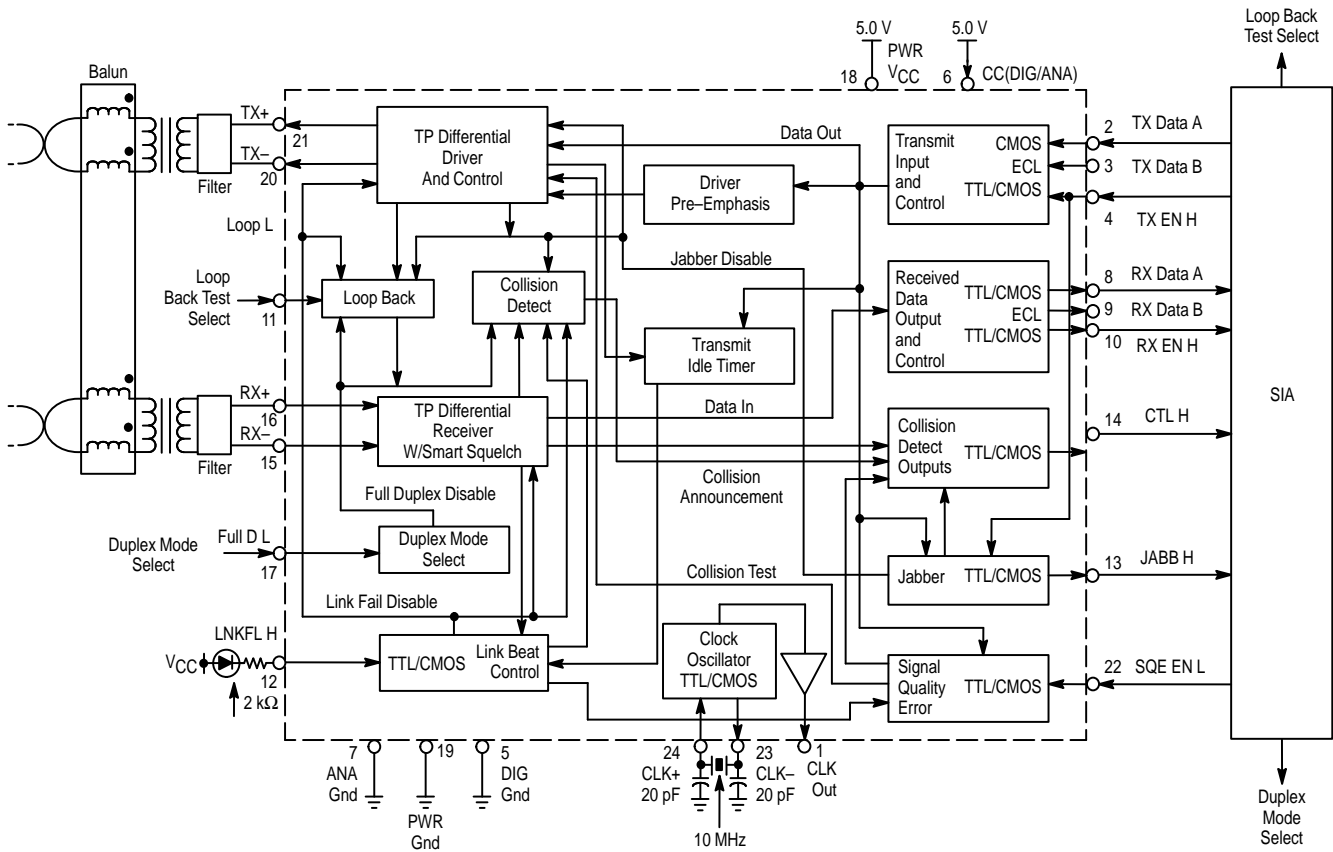
# Hex EIA–485 Transceiver with Three–State Outputs

MC34058/59FTA

$T_A = 0°$ to $+70°C$, Case 932

The Motorola MC34058/9 Hex Transceiver is composed of six driver/receiver combinations designed to comply with the EIA–485 standard. Features include three–state outputs, thermal shutdown for each driver, and current limiting in both directions. This device also complies with EIA–422 and CCITT Recommendations V.11 and X.27.

The devices are optimized for balanced multipoint bus transmission at rates to 20 MBPS (MC34059). The driver outputs/receiver inputs feature a wide common mode voltage range, allowing for their use in noisy environments. The current limit and thermal shutdown features protect the devices from line fault conditions.

The MC34058/9 is available in a space saving 7.0 mm 48 lead surface mount quad package designed for optimal heat dissipation.

- Meets EIA–485 Standard for Party Line Operation
- Meets EIA–422A and CCITT Recommendations V.11 and X.27
- Operating Ambient Temperature: 0°C to +70°C
- Common Mode Driver Output/Receiver Input Range: –7.0 to +12 V
- Positive and Negative Current Limiting
- Transmission Rates to 14 MBPS (MC34058) and 20 MBPS (MC34059)
- Driver Thermal Shutdown at 150°C Junction Temperature
- Thermal Shutdown Active Low Output
- Single +5.0 V Supply, ±10%
- Low Supply Current
- Compact 7.0 mm 48 Lead TQFP Plastic Package
- Skew Specified for MC34059
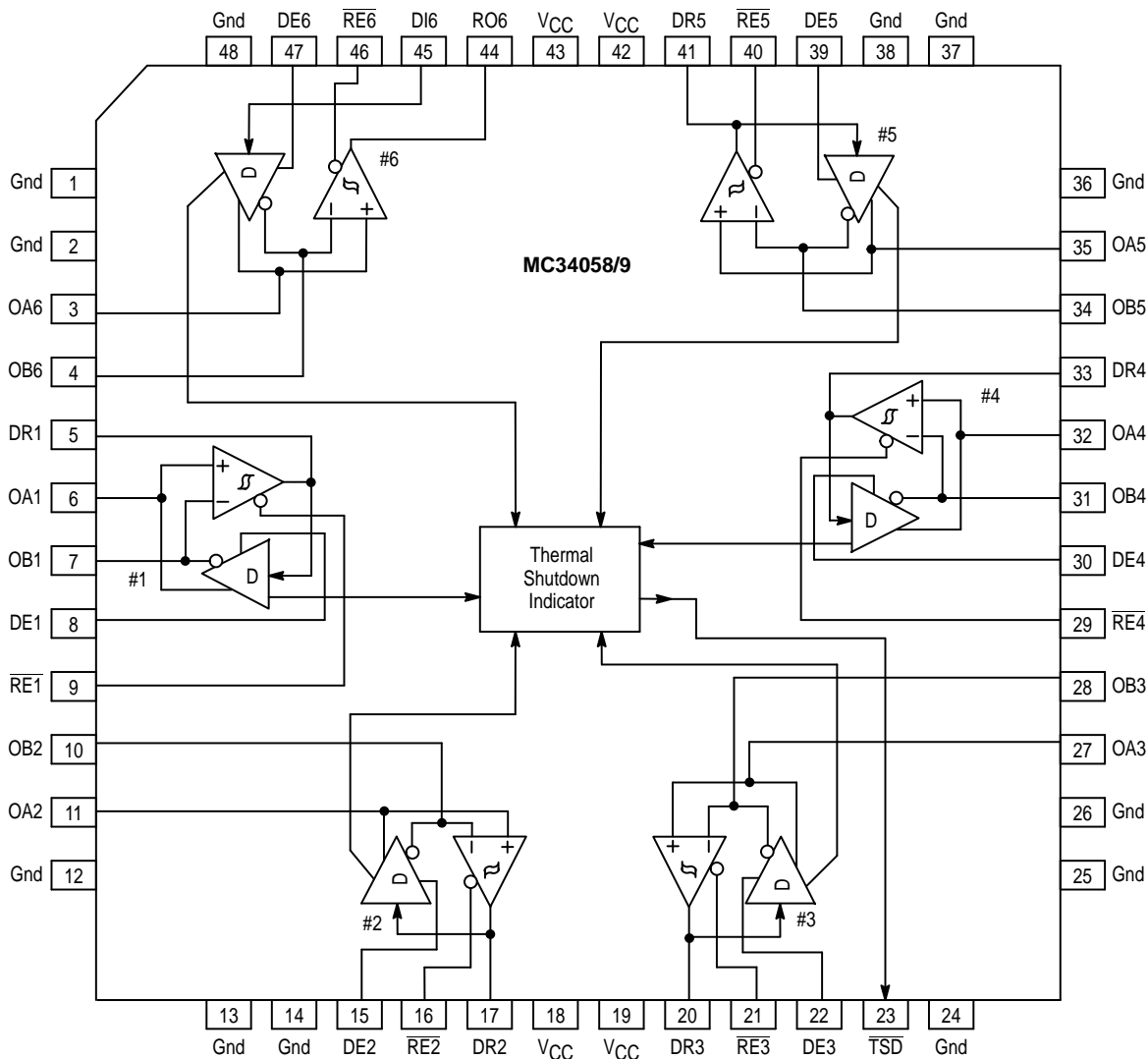
Line Receivers

Table 1. EIA Standard

S = Single Ended D = Differential	Type of Output	t_{prop} Delay Time Max (ns)	Party Line Operation	Strobe or Enable	Power Supplies (V)	Device	Suffix/ Package	Receivers Per Package	Companion Drivers	Comments
S	TP	4000	–	–	+5.0	MC14C89B, AB	P/646, D/751A	4	MC1488 MC14C88B	EIA–232–D/ EIA–562
	R[1]	85	–	–		MC1489 MC1489A				EIA–232–D

[1] R = Resistor Pull–up, TP = Totem–pole output.

Line Drivers

Table 2. EIA Standard

Output Current Capability (mA)	t_{prop} Delay Time Max (ns)	S = Single Ended D = Differential	Party Line Operation	Strobe or Enable	Power Supplies (V)	Device	Suffix/ Package	Drivers Per Package	Companion Receivers	Comments
85	35	D	✓	✓	+5.0	MC75174B MC75172B	P/648	4	–	EIA–485
15	3500	S	–		±7.0 to ±12	MC14C88B	P/646, D/751A		MC14C89B MC14C89AB	EIA–232–D/ EIA–562
10	350				±9.0 to ±12	MC1488			MC1489 MC1489A	EIA–232–D
60	300	S/D	EIA–422 ✓ EIA–423 –		±5.0	AM26LS30	PC/648	2 (422) 4 (423)	–	EIA–422 or EIA–423 Switchable
						MC26LS30	D/751B			

Table 3. Line Transceivers

Driver Prop Delay (Max ns)	Receiver Prop Delay Max (ns)	DE =Driver Enable RE =Receiver Enable	Party Line Operation	Power Supplies (V)	Device	Suffix/ Package	Drivers Per Package	Receivers Per Package	EIA Standard
23	23	DE, RE	✓	+5.0	MC34058	FTA/932	6	6	EIA–485 to 14 MBPS
					MC34059	FTA/932	6	6	EIA–485 to 20 MBPS

Table 4. EIA–232–E/V.28 CMOS Drivers/Receivers

Device	Suffix/ Package	Pins	Drivers	Receivers	Power Supplies (V)	Features
MC145403	P/738, DW/751D	20	3	5	±5.0 to ±12	
MC145404			4	4		
MC145405			5	3		
MC145406	P/648, DW/751G, SD/940B	16	3			
MC145407	P/738, DW/751D	20			+5.0	Charge Pump
MC145408	P/724, DW/751E, SD/940B	24	5	5	±5.0 to ±12	
MC145583	DW/751F, VF/940J	28	3	5	+3.3 to +5.0	On–board ring monitor circuit; charge pump, power down

Table 4. EIA–232–E/V.28 CMOS Drivers/Receivers (continued)

Device	Suffix/ Package	Pins	Drivers	Receivers	Power Supplies (V)	Features
MC145705	P/738, DW/751D	20	2	3	+5.0	Charge Pump, Power Down
MC145706			3	2		
MC145707	P/724, DW/751E	24		3		

Table 5. Peripheral Drivers

Output Current Capability (mA)	Input Capability	Propagation Delay Time Max (μs)	Output Clamp Diode	Off State Voltage Max (V)	Device	Drivers Per Package	Suffix/ Package	Logic Function
500	TTL, CMOS	1.0	✓	50	ULN2803	8	A/707	Invert
	6.0 V to 15 V MOS				ULN2804			
	TTL, 5.0 V CMOS				MC1413, B (ULN2003A)	7	P/648, D/751B	
	8.0 V to 18 V MOS				MC1416, B (ULN2004A)		P/648, D/751B	

Table 6. IEEE 802.3 Transceivers

Device	Power Supply	10 BaseT	NRZ	IEEE	Comments	Suffix/ Package
MC34055	+5.0 Vdc	Transmit and Receive over 4 Pins	Raised ECL, CMOS	802.3 Type 10BaseT	Transceiver with non–return to zero (NRZ) interface. Intended for but not restricted to concentrators and repeater applications.	DW/751E
MC68160			TTL, CMOS	802.3 Type 10BaseT/ AUI/NRZ	Interfaces gluelessly to Motorola's MC68360 communications controller.	FB/848D

Inkjet Drivers

Table 7. 28–Channel Inkjet Driver

Device	Power Supply	Comments	T_A ($^\circ$C)	Suffix/ Package
MC34156	5.0 V	A 4 to 14 line decoder determines the selected output driver in each of two 14 driver banks. Two independent output enable lines permit 1 or 2 of 28 outputs. Outputs are open collector 30 V Darlington drivers capable of sinking 500 mA.	0 to +70	FN/777

CMOS Display Drivers

These CMOS devices include digit as well as matrix drivers for LEDs, LCDs, and VFDs. They find applications over a wide range of end equipment such as instruments, automotive dashboards, home computers, appliances, radios and clocks.

Table 8. Display Drivers

Display Type	Input Format	Drive Capability Per Package	On–Chip Latch	Display Control	Segment Drive Current	Device
LCD (Direct Drive)	Parallel BCD	7 Segments	✓	Blank	≈ 1.0 mA	MC14543B
				Blank, Ripple Blank		MC14544B
Muxed LCD (1/4 Mux)	Serial Binary [Compatible with the Serial Peripheral Interface (SPI) on CMOS MCUs]	33 Segments or Dots			20 µA	MC145453
		48 Segments or Dots			≈ 200 µA	MC145000
		44 Segments or Dots				MC145001
LED, Incandescent, Fluorescent[1]	Parallel BCD	7 Segments		Blank, Lamp Test	25 mA	MC14511B
				Blank, Ripple Blank, Lamp Test		MC14513B
			–	Blank	65 mA	MC14547B
Muxed LED (1/5 Mux)	Serial Binary [Compatible with the Serial Peripheral Interface (SPI) on CMOS MCUs]	5 Characters + Decimals or 25 Lamps	✓	Oscillator (Scanner), Low Power Mode, Dimming	0 to 35 mA (Peak) Adjustable	MC14489
LED (Direct Drive)	Parallel Hex	7 Segments + A thru F Indicator			10 mA[2]	MC14495–1
(Interfaces to Display Drivers)	Parallel BCD	7 Segments	–	Ripple Blank, Enable	–	MC14558B

[1] Absolute maximum working voltage = 18 V.
[2] On–chip current–limiting resistor.

Table 9. Functions

| Device	Function	Package
MC14489	Multi–Character LED Display/Lamp Driver	738, 751D
MC14495–1	Hexadecimal–to–7 Segment Latch/Decoder ROM/Driver	648, 751G
MC14511B	BCD–to–7–Segment Latch/Decoder/Driver	648, 751G
MC14513B	BCD–to–7–Segment Latch/Decoder/Driver with Ripple Blanking	726, 707
MC14543B	BCD–to–7–Segment Latch/Decoder/Driver for Liquid Crystals	620, 648
MC14544B	BCD–to–7–Segment Latch/Decoder/Driver with Ripple Blanking	726, 707
MC14547B	High–Current BCD–to–7–Segment Decoder/Driver	620, 648
MC14558B	BCD–to–7–Segment Decoder	620, 648
MC145000	48–Segment Serial Input Multiplexed LCD Driver (Master)	709, 776
MC145001	44–Segment Serial Input Multiplexed LCD Driver (Slave)	707, 776
MC145453	33–Segment, Non–Multiplexed LCD Driver with Serial Interface	711, 777

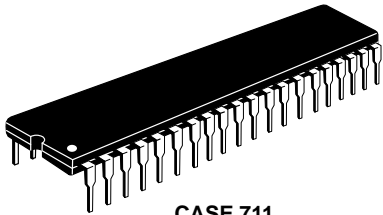# Interface Circuits Package Overview
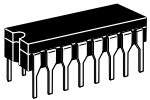
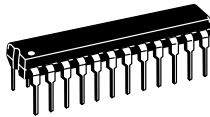CASE 620
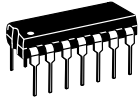
CASE 646
P SUFFIX
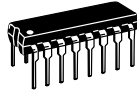
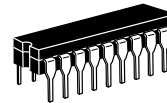CASE 648
P, PC SUFFIX
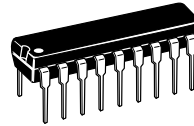
CASE 707
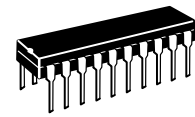A SUFFIX
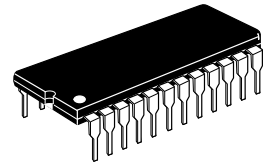
CASE 709
P SUFFIX

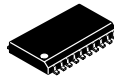CASE 711
P SUFFIX

CASE 724
P SUFFIX

CASE 726

CASE 738
P SUFFIX

CASE 751A
D SUFFIX

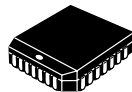CASE 751B
D SUFFIX
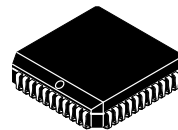
CASE 751D
DW SUFFIX

CASE 751E
DW SUFFIX

CASE 751F
DW SUFFIX

CASE 751G
DW SUFFIX

CASE 776
FN SUFFIX

CASE 777
FN SUFFIX

CASE 848D
FB SUFFIX

CASE 932
FTA SUFFIX

CASE 940B
SD SUFFIX

CASE 940J
VF SUFFIX