



MxL8310x, MxL8311x: Half-Duplex, Low EMI
RS-485 Transceivers with EFT and ESD

MxL8310x, MxL8311x Summary



	MxL8310x	MxL8311x
VCC SUPPLY:	5V	3.3-5V
IEC ESD CONTACT:	±8kV	
EFT:	±2kV	
OPERATING RANGE:	-40 to 125°C	
COMMON MODE:	-7 to +12V	
PACKAGE:	SOIC	
SPEEDS (Kbps):	250, 500	

- ✓ Low-slew drivers for improved signal integrity, low EMI, low power
- ✓ IEC 61000-4-4 EFT protection against fast transient Voltages
- ✓ Wide supply for single SKU qualification and versatile operation
- ✓ Shutdown mode with 50nA of current

Designed for Demanding Industrial Applications



Industrial Sensors

- ✓ Operation at intermediate voltages (ie 4.0V)
- ✓ Low power
- ✓ 125°C operation



Industrial Motors

- ✓ Immunity to fast transient bursts
- ✓ IEC 61000-4-2 ESD protection during install/maintenance
- ✓ Leaded package for inspection/maintenance



EV Charging

- ✓ IEC 61000-4-2 ESD protection for cable connect
- ✓ Low EMI signature
- ✓ Exceptional Noise rejection



Building Automation (HVAC, elevators, security, fire)

- ✓ Reliable communication at 1.2Km (4K ft)
- ✓ Noise rejection
- ✓ Cost-effective

MaxLinear Portfolio Comparison – 3.3V/Wide Supply

Product Class:

- 3.3V/Wide Supply
- Half-duplex RS-485
- 250Kbps data rate
- Low power shutdown
- Std Common mode

Industry Standard P2P Package

NSOIC-8



6x5/5x4 body
1.7 mm Height

	MxL8311E	SP3072EMN	XR33032	SP3483EN
Ultra low slew	Y	Y	Y	Y
8kV IEC ESD contact, 15kV HBM	Y	Y	Y	-
Full Failsafe	Y	Y	Y	-
256 node bus	Y	Y	Y	-
Hot-Plug	Y	Y	Y	-
125°C operation	Y	Y	-	-
Wide supply (3.3-5V)	Y	-	Y+	-
EFT	Y	-	-	-
Multi-fab source	-	Y	-	-
18V Bus tolerance	-	-	Y	-

MaxLinear Portfolio Comparison – 5V

Product Class:

- 5V
- Half-duplex RS-485
- 250Kbps data rate
- Low power shutdown
- Std Common mode

Industry Standard P2P Package

NSOIC-8



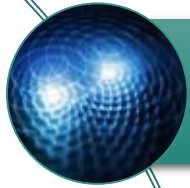
6x5/5x4 body
1.7 mm Height

	MxL83101E	SP3082EEN	XR3082X	SP483EN
Ultra low slew	Y	Y+	Y	Y
8kV IEC ESD contact, 15kV HBM	Y	Y	Y	Y
Full Failsafe	Y	Y	Y	-
256 node bus	Y	Y	Y	-
Hot-Plug	Y	Y	Y	-
125°C operation	Y	-	-	-
EFT	Y	-	-	-
Profibus 5V	Y	-	Y	-
Multi-fab source	-	Y	-	-
18V Bus tolerance	-	-	Y	-

MxL8310x, MxL8311x: Best-In-Class Performance

	MxL8310x MxL8311x	Comp A	Comp B	Comp C	Comp D	Comp E	Comp F
Data Rate (Mbps)	0.25/0.5	0.5	0.25/0.5	0.5	0.25/0.5	0.25/0.5	0.25
Supply (Vcc)	5V only 3.3-5V	5V only	3.3V only	3.3-5V	3.3V only	3.3V only 5V only	3.3-5V
Operating Temp	-40 to +125	-40 to +125	-40 to +125	-40 to +125	-40 to +85	-40 to +85	-40 to +125
IEC Contact	8kV	8kV	N/A	12kV	8kV	N/A	N/A
HBM ESD	15kV	16kV	15kV	30kV	15kV	15kV	12kV
EFT	2kV	2kV	N/A	N/A	3kV	N/A	N/A

Low-Slew Rate Drivers For Reliable System Performance



Reduced Electromagnetic Interference (EMI)

- Reduces high frequency spectrum of transmitted signal preventing interference with nearby equipment



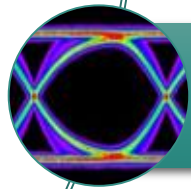
Longer Cable Runs

- Ensures less signal distortion and attenuation over long distances



Lower Power Consumption

- Reduces power by eliminating high frequency switching



Improved Signal Integrity

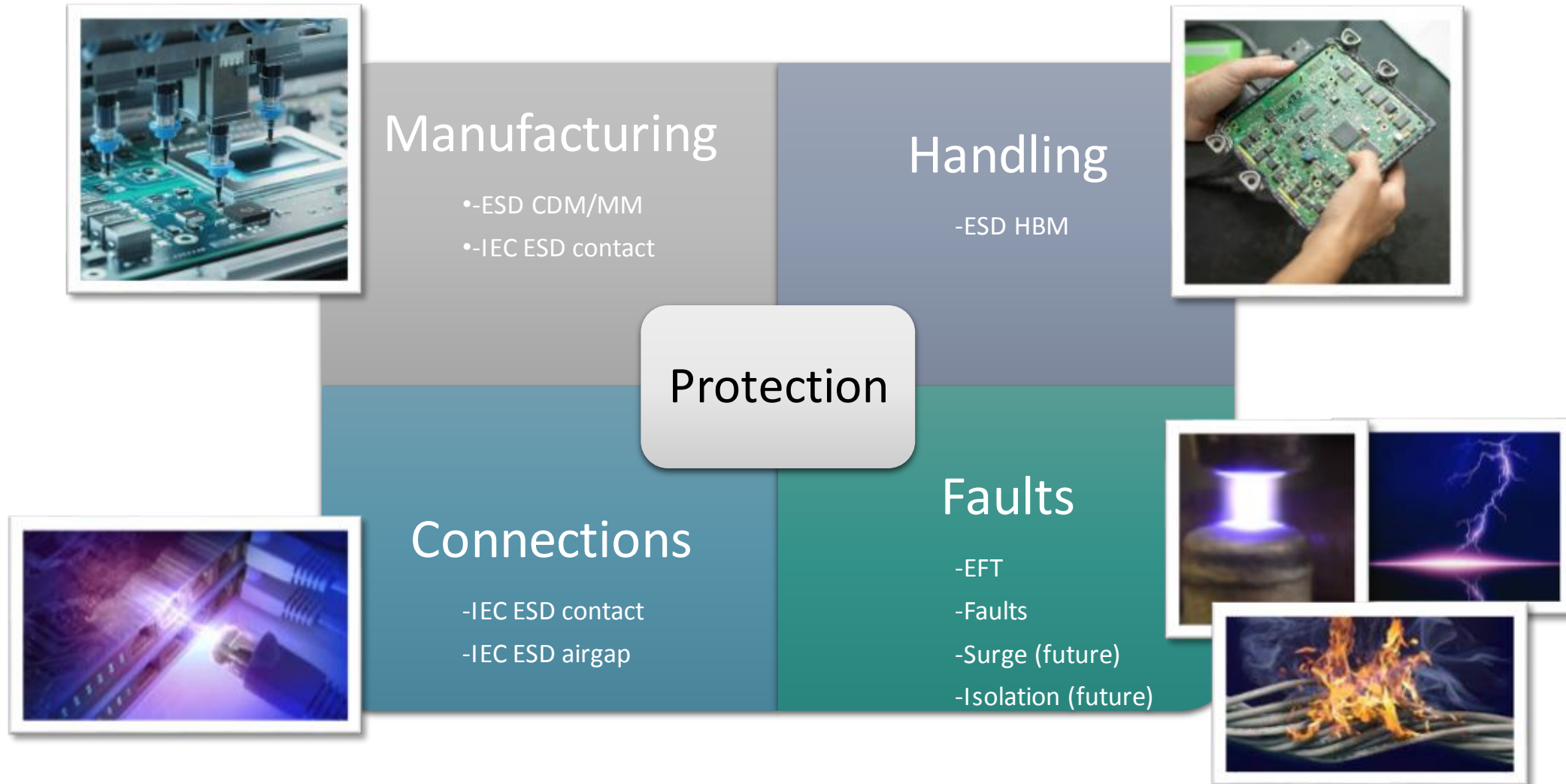
- Slow edge rates provide increased immunity to noise, resulting in less data errors



Minimizes Reflections

- Reduces ringing due to faulty cables, connectors, and improperly terminated busses

RS-485 Device and System Protection



EFT

- What is EFT

- › EFT: “Electrical Fast Transients” and refers to IEC 61000-4-4
- › High frequency pulses caused by sparking, arcing, or switch bouncing

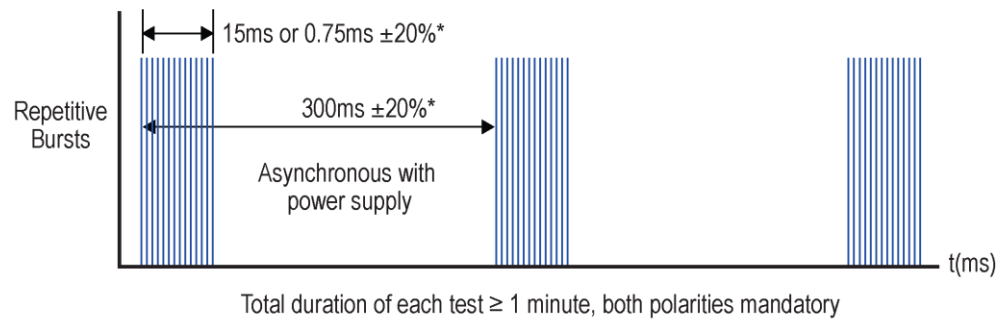
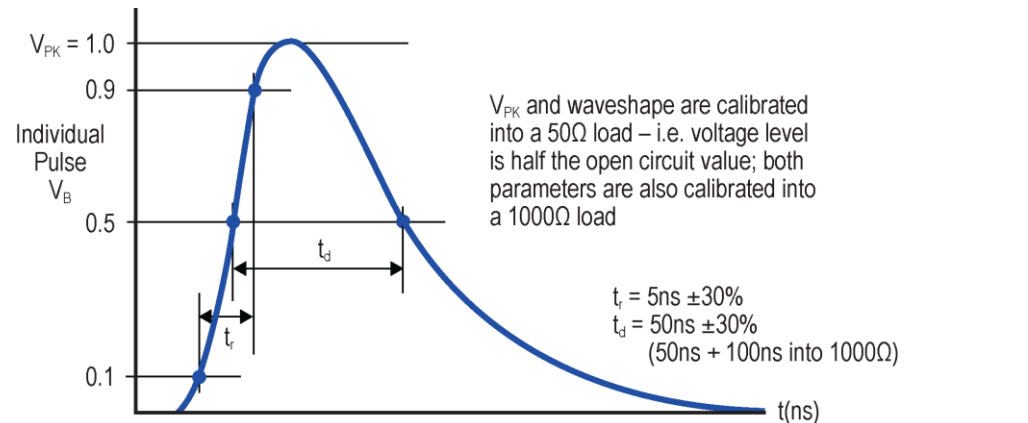
- Where can it occur

- › Relays
- › Switch contactors
- › Motors

- RS-485 Transceiver helps protect the system from EFTs

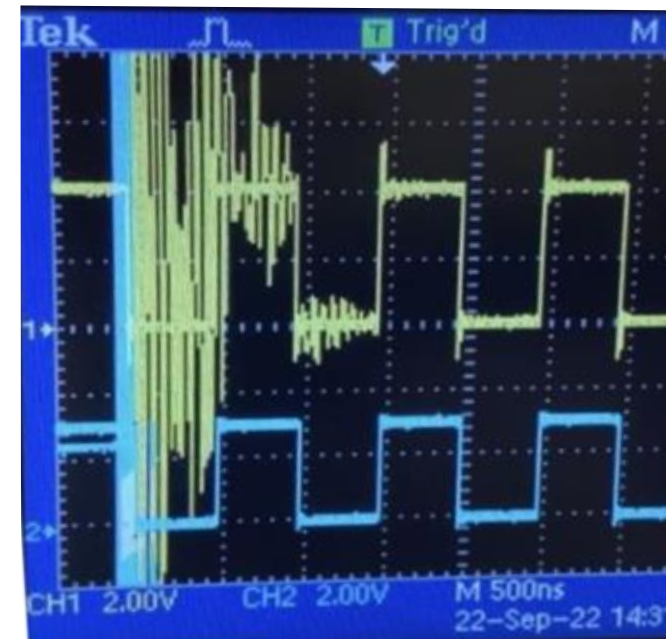
EFT – Electrical Fast Transient

- IEC 61000-4-4 system level specification
- Immunity to bursts of high energy fast transients produced by relays, switch contactors and motors



* these parameters are specified in the standard, but other values may be programmed for development testing

- **MxL8312x:** Minimal data loss at $\pm 2\text{kV}$
- **Passes Criteria B:** No damage, recovers without intervention



← Rx Output

↑ EFT Burst