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# 1.62V to 3.6V, 8-Channel, High-Speed LLT

## General Description

The MAX13055E–MAX13058E 8-channel, bidirectional level translators provide the level shifting necessary for 100Mbps data transfer in multivoltage systems. The MAX13055E–MAX13058E are ideal for level translation in systems with 8 channels. Externally applied voltages,  $V_{CC}$  and  $V_L$ , set the logic levels on either side of the device. Logic-high signals presented on the  $V_L$  side of the device appear as a logic-high signal on the  $V_{CC}$  side of the device and vice versa.

The MAX13055E–MAX13058E operate at full speed with external drivers that source as little as 4mA output current or larger. Each input/output (I/O) channel is pulled up to  $V_{CC}$  or  $V_L$  by an internal 40 $\mu$ A current source, allowing the MAX13055E–MAX13058E to be driven by either push-pull or open-drain drivers.

The MAX13055E–MAX13058E feature an enable (EN) input to place the device into a low-power shutdown mode when driven low. In addition, the MAX13055E–MAX13058E feature an automatic shutdown mode that disables the part when  $V_{CC}$  is less than  $V_L$ . Each device has a different I/O  $V_L$  and I/O  $V_{CC}$  state during shutdown mode (see the *Ordering Information/Selector Guide*).

The MAX13055E–MAX13058E operate with  $V_{CC}$  voltages from +2.2V to +3.6V and  $V_L$  voltages from +1.62V to +3.2V, making them ideal for data transfer between low-voltage ASIC/PLDs and higher voltage systems. The MAX13055E–MAX13058E are available in 0.4mm pitch, 24-bump WLP and 28-pin TQFN (3.5mm x 5.5mm) packages. The MAX13055E–MAX13058E operate over the extended -40°C to +85°C temperature range.

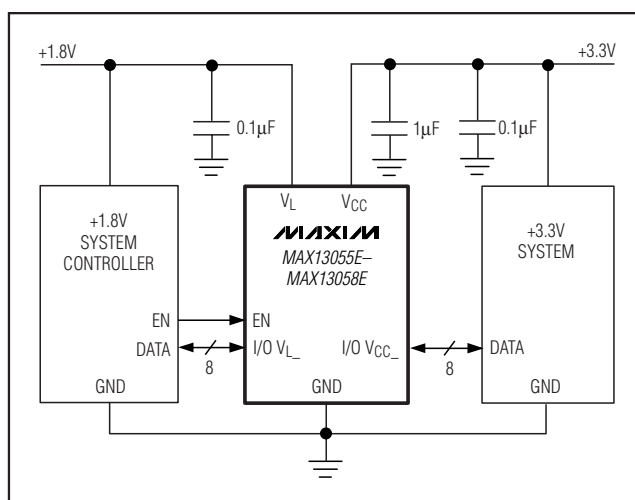
## Applications

Low-Voltage ASIC Level Translation	Portable Communication Devices
Smart Card Readers	Cell Phones
Camera Modules	GPS
Portable POS Systems	Telecomm Equipment

## Features

- ◆ Compatible with 4mA Input Drivers or Larger
- ◆ 100Mbps Guaranteed Data Rate
- ◆ 8 Bidirectional Channels
- ◆ +1.62V  $\leq V_L \leq$  +3.2V and +2.2V  $\leq V_{CC} \leq$  +3.6V Supply Voltage Range
- ◆ 24-Bump WLP (0.4mm Pitch) Lead-Free Package
- ◆ 28-Pin TQFN (3.5mm x 5.5mm) Lead-Free Package
- ◆ Extended ESD Protection on I/O  $V_{CC}$  Lines
  - ±15kV per Human Body Model
  - ±15kV IEC 61000-4-2 Air Discharge
  - ±8kV IEC 61000-4-2 Contact Discharge

## Typical Operating Circuit



Pin Configurations appear at end of data sheet.

## Ordering Information/Selector Guide

PART	I/O $V_L$ STATE DURING SHUTDOWN	I/O $V_{CC}$ STATE DURING SHUTDOWN	TEMP RANGE	PIN-PACKAGE
MAX13055E EWG+	Open Drain	Open Drain	-40°C to +85°C	24 WLP
MAX13055E ETI+	Open Drain	Open Drain	-40°C to +85°C	28 TQFN-EP*

Ordering Information/Selector Guide continued at end of data sheet.

+Denotes a lead(Pb)-free/RoHS-compliant package.

\*EP = Exposed pad.



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For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim's website at [www.maxim-ic.com](http://www.maxim-ic.com).

MAX13055E-MAX13058E

# 1.62V to 3.6V, 8-Channel, High-Speed LLT

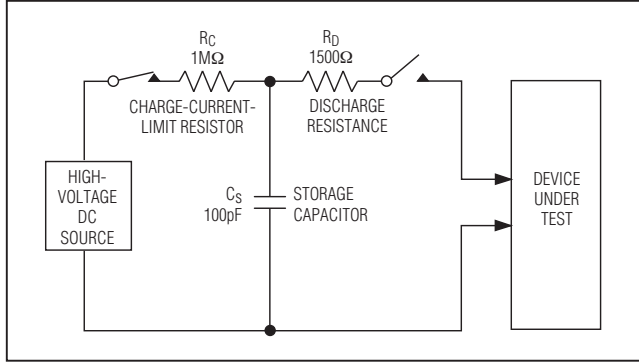


Figure 5a. Human Body ESD Test Model

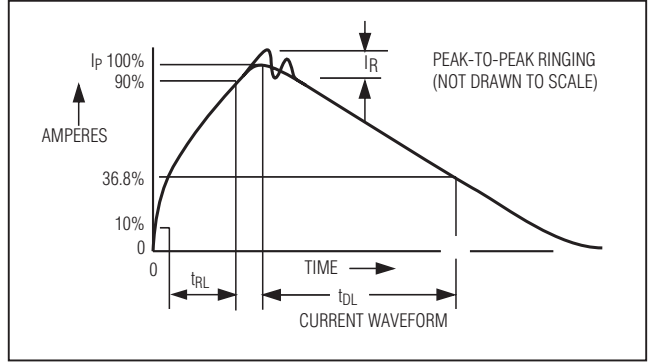


Figure 5b. Human Body Current Waveform

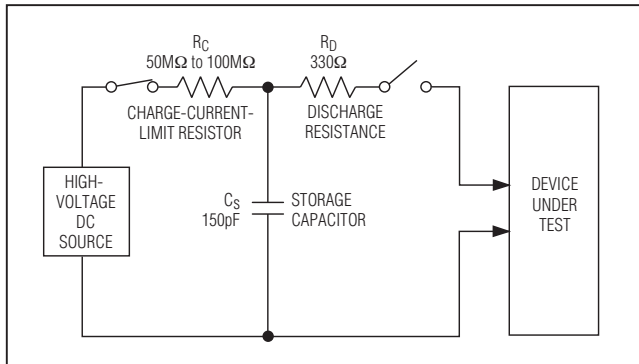


Figure 6a. IEC 61000-4-2 ESD Test Model

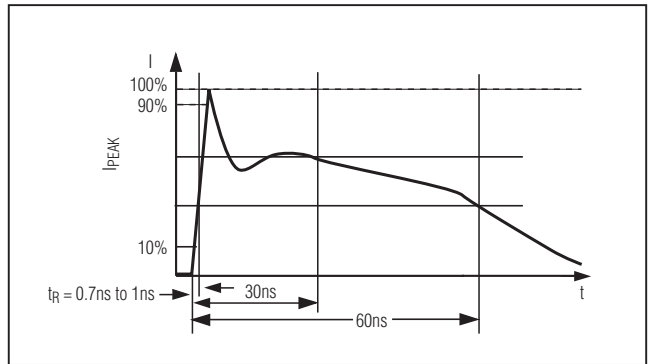


Figure 6b. IEC 61000-4-2 ESD Generator Current Waveform

## Ordering Information/Selector Guide (continued)

PART	I/O V <sub>L</sub> STATE DURING SHUTDOWN	I/O V <sub>CC</sub> STATE DURING SHUTDOWN	TEMP RANGE	PIN-PACKAGE
<b>MAX13056</b> EWG+**	Open Drain	10kΩ to GND	-40°C to +85°C	24 WLP
MAX13056EETI+**	Open Drain	10kΩ to GND	-40°C to +85°C	28 TQFN-EP*
<b>MAX13057</b> EWG+**	10kΩ to GND	Open Drain	-40°C to +85°C	24 WLP
MAX13057EETI+**	10kΩ to GND	Open Drain	-40°C to +85°C	28 TQFN-EP*
<b>MAX13058</b> EWG+	10kΩ to GND	10kΩ to GND	-40°C to +85°C	24 WLP
MAX13058EETI+	10kΩ to GND	10kΩ to GND	-40°C to +85°C	28 TQFN-EP*

+Denotes a lead(Pb)-free/RoHS-compliant package.

\*EP = Exposed pad.

\*\*Future product—contact factory for availability.

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**2** Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600