

# 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, VCC and VL, set the logic levels on either side of the device. Logic-high signals presented on the VL side of the device appear as a logic-high signal on the V<sub>CC</sub> 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<sub>CC</sub> or V<sub>L</sub> by an internal 40µA 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 VL and I/O VCC state during shutdown mode (see the Ordering Information/Selector Guide).

The MAX13055E–MAX13058E operate with V<sub>CC</sub> voltages from +2.2V to +3.6V and V<sub>1</sub> voltages from +1.62V to +3.2V, making them ideal for data transfer between lowvoltage 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  $\leq$  VL  $\leq$  +3.2V and +2.2V  $\leq$  VCC  $\leq$  +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<sub>CC</sub> 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**

I/O VL_ STATE DURING SHUTDOWN	I/O V <sub>CC</sub> _STATE DURING SHUTDOWN	TEMP RANGE	PIN-PACKAGE
Open Drain	Open Drain	-40°C to +85°C	24 WLP
Open Drain	Open Drain	-40°C to +85°C	28 TQFN-EP*
	DURING SHUTDOWN Open Drain	DURING SHUTDOWNDURING SHUTDOWNOpen DrainOpen Drain	DURING SHUTDOWN DURING SHUTDOWN TEMP RANGE   Open Drain Open Drain -40°C to +85°C

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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Figure 5a. Human Body ESD Test Model

MAX13055E-MAX13058E



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



Figure 5b. Human Body Current Waveform



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

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PART	I∕O VL_ STATE DURING SHUTDOWN	I/O V <sub>CC</sub> _STATE DURING SHUTDOWN	TEMP RANGE	PIN-PACKAGE
MAX13056EEWG+**	Open Drain	10k $\Omega$ to GND	-40°C to +85°C	24 WLP
MAX13056EETI+**	Open Drain	10k $\Omega$ to GND	-40°C to +85°C	28 TQFN-EP*
MAX13057EEWG+**	10k $\Omega$ to GND	Open Drain	-40°C to +85°C	24 WLP
MAX13057EETI+**	10k $\Omega$ to GND	Open Drain	-40°C to +85°C	28 TQFN-EP*
MAX13058EEWG+	10k $\Omega$ to GND	10k $\Omega$ to GND	-40°C to +85°C	24 WLP
MAX13058EETI+	10k $\Omega$ to GND	10k $\Omega$ to GND	-40°C to +85°C	28 TQFN-EP*

#### Ordering Information/Selector Guide (continued)

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

\*EP = Exposed pad.

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

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