

DESCRIPTION

The LX5245/5246/5247 ICs are Low Voltage Differential (LVD) Terminators designed to comply with the LVD termination specification in the SPI-2 document. The LX5245/5246/5247 are designed specifically for LVD applications. Because the LX5245/5246/5247 support only LVD, they have lower output capacitance than multimode terminators such as the LX5240.

The LX5245/5246/5247 Utilize Linfinity's UltraMAX Technology which delivers the ultimate in SCSI bus performance while saving component cost and board area. Elimination of the external capacitors also mitigates the need for a lengthy capacitor selection process. The individual high bandwidth drivers also maximize channel separation and reduces channel-to-channel noise and cross talk. The high-bandwidth UltraMAX architecture insures ULTRA-2 performance, while providing a clear migration path to ULTRA-3 and beyond.

When The LX5245/5246/5247 Are Enabled, The Differential Sense (DIFFSENSE) Pin Supplies A Voltage Between 1.2V And 1.4V. In application, the terminator DIFFSENSE output is connected to the system DIFFSENSE line. If there are no single ended or HVD devices attached to the system the LVD output will be enabled. If the DIFFSENSE line is LOW, indicating a single ended device, the LX5245/5246/5247 output will be HiZ. If the DIFFSENSE line is HIGH, indicating a high voltage differential device the LX5245/5246/5247 output will be HiZ.

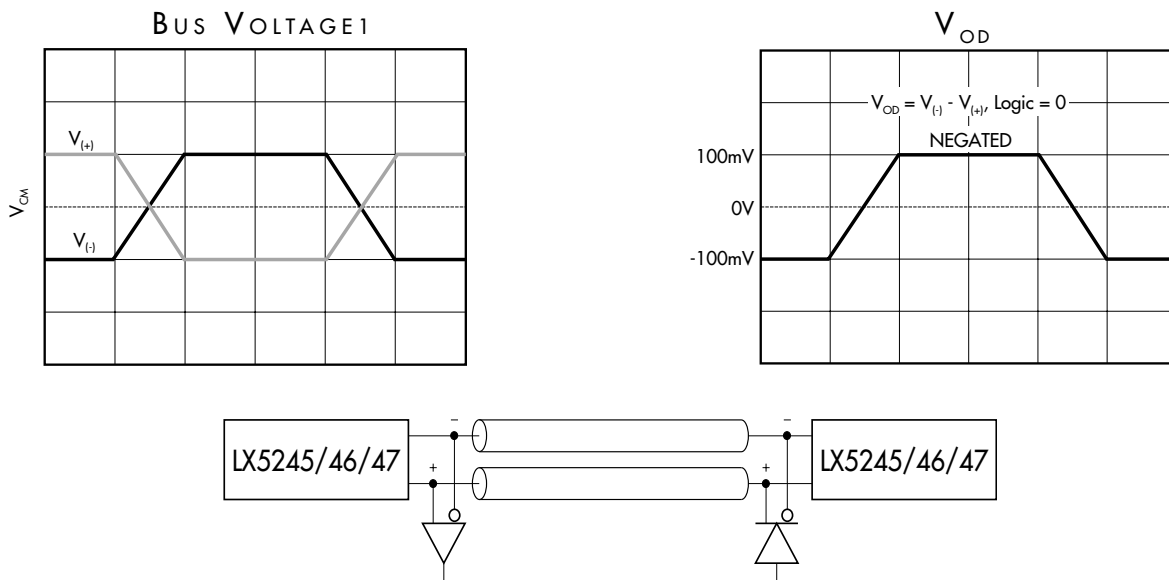
The LX5245/5246/5247 ICs Have A TTL Compatible DISCONNECT Pin. The LX5245/47 is active LOW and the LX5246 is active HIGH. During sleep mode, power dissipation is reduced to a meager 5µA, while also placing all outputs in a HI Z state. Also during sleep mode, the DIFFSENSE function is disabled and is placed in a HI Z state.

KEY FEATURES

- 2.5pF Typical Disabled Output Capacitance
- Fast Response, No External Capacitors Required
- 5µA Supply Current In Disconnect Mode
- 20mA Supply Current During Normal Operation
- Logic Command Disconnects All Termination Lines
- Diffsense Line Driver
- Current Limit And Thermal Protection
- Compatible With The Pending SPI-2 LVD Specification
- Mention 5249 as LVD only terminator with pinout compatible with industry standard multi-mode terminators
- Pin compatible with unirode UCC5640

NOTE: For current data & package dimensions, visit our web site: <http://www.linfinity.com>.

PRODUCT HIGHLIGHT



PACKAGE ORDER INFO

| | |
|------------|-------------------------|
| T_A (°C) | PW Plastic TSSOP |
| | 24-pin |
| 0 to 70 | LX5245CPW |
| | LX5246CPW |

Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number. (i.e. LX5245CPWT)

9-LINE LVD SCSI TERMINATOR

PRELIMINARY DATA SHEET

ABSOLUTE MAXIMUM RATINGS (Note 1)

| | |
|--|----------------|
| TermPwr Voltage | +6.5V |
| Signal Line Voltage | 0V to 6.5V |
| Differential Voltage | 0V to 6.5V |
| Operating Junction Temperature | |
| Plastic (PW Package) | 150°C |
| Storage Temperature Range | -65°C to 150°C |
| Lead Temperature (Soldering, 10 seconds) | 300°C |

Note 1. Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.

THERMAL DATA

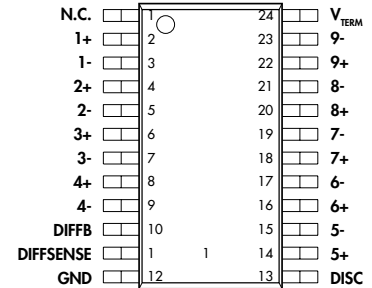
PW PACKAGE:

| | |
|---|----------------|
| THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA} | 100°C/W |
|---|----------------|

Junction Temperature Calculation: $T_j = T_A + (P_D \times \theta_{JA})$.
 The θ_{JA} numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

PACKAGE PIN OUTS

LX5245/46 CPW



24L PW PACKAGE (Top View)
 ("N.C." = No Internal Connections)

DIFFSENSE / POWER UP / POWER DOWN FUNCTION TABLE

| LX5245/LX5247 DISCONNECT | LX5246 DISCONNECT | DIFFSENSE | Outputs | | Quiescent Current |
|-----------------------------|----------------------|--------------|---------|------|----------------------|
| | | | Status | Type | |
| L | H | L < 0.5V | Disable | HiZ | 2mA |
| L | H | 0.7V to 1.9V | Enable | LVD | 21mA |
| L | H | H > 2.4V | Disable | HiZ | 2mA |
| H | L | X | Disable | HiZ | 10µA |
| Open | Open | X | Disable | HiZ | 10µA |

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RECOMMENDED OPERATING CONDITIONS (Note 2)

| Parameter | Symbol | Recommended Operating Conditions | | | Units |
|--|------------|----------------------------------|------|------------|-------|
| | | Min. | Typ. | Max. | |
| TermPwr Voltage | V_{TERM} | 3.0 | | 5.25 | V |
| Signal Line Voltage | | 0 | | 5.0 | V |
| Disconnect Input Voltage | | 0 | | V_{TERM} | V |
| Operating Junction Temperature Range LX5245 / 5246/5247 | | 0 | | 70 | °C |

Note 2. Range over which the device is functional.

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, these specifications apply over the operating ambient temperature range of $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$. TermPwr = 3.3V, DISCONNECT: LX5245/47 = L, LX5246 = H. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

| Parameter | Symbol | Test Conditions | LX5245 / 5246 | | | Units |
|---|------------------|---|---------------|---------|----------|--------------------------------|
| | | | Min. | Typ. | Max. | |
| LVD Terminator Section | | | | | | |
| TermPwr Supply Current | LVD I_{CC} | All term lines = Open DISCONNECT: LX5245/47 = H, LX5246 = L | | 21 5 | 25 10 | mA μA |
| Common Mode Voltage | V_{OM} | | 1.125 | 1.25 | 1.375 | V |
| Offset Voltage (fail safe bias voltage) | V_{OS} | Open circuit between - and + (see Note 3) | 100 | 112 | 125 | mV |
| Differential Terminator Impedance | Z_D | $V_{OD} = -1\text{V to }1\text{V}$ | 100 | 105 | 110 | Ω |
| Common Mode Impedance | Z_{CM} | 0V to 2.5V | 100 | 200 | 300 | Ω |
| Output Capacitance | C_o | DISCONNECT: LX5245/47 = H, LX5246 = L | | 2.5 | | pF |
| Output Leakage | I_{Leak} | DISCONNECT: LX5245/47 = H, LX5246 = L, $V_{LINE} = 0$ to 4V, $T_A = 25^{\circ}\text{C}$ DISCONNECT: LX5245/47 = H, LX5246 = L, $V_{TERM} = 0\text{V}$, $V_{LINE} = 2.7\text{V}$ | | 0 1 | 2 | μA μA |
| Mode Change Delay | t_{DF} | DIFFSENSE = 1.4V to 0V | 100 | 150 | | ms |
| DIFFSENSE Section | | | | | | |
| DIFFSENSE Output Voltage | V_{DIFF} | | 1.2 | 1.3 | 1.4 | V |
| DIFFSENSE Output Source Current | I_{DIFF} | DIFFSENSE = 0V | 5.0 | | 15.0 | mA |
| DIFFSENSE Sink Current | $I_{SINK(DIFF)}$ | $V_{IN} = 2.75\text{V}$ | | | 200 | μA |
| DIFFSENSE Output Leakage | $I_{LEAK(DIFF)}$ | DISCONNECT: LX5245/47 = H, LX5246 = L, $T_A = 25^{\circ}\text{C}$ | | | 10 | μA |
| DISCONNECT Section | | | | | | |
| DISCONNECT Threshold | V_{TH} | | 0.8 | | 2.0 | V |
| Input Current | I_{IH} | DISCONNECT: LX5245/47 = 0V DISCONNECT: LX5246 = 3.3V | | | 10 10 | μA μA |

Note 3. Open circuit failsafe voltage.

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PRELIMINARY DATA SHEET

BLOCK DIAGRAM

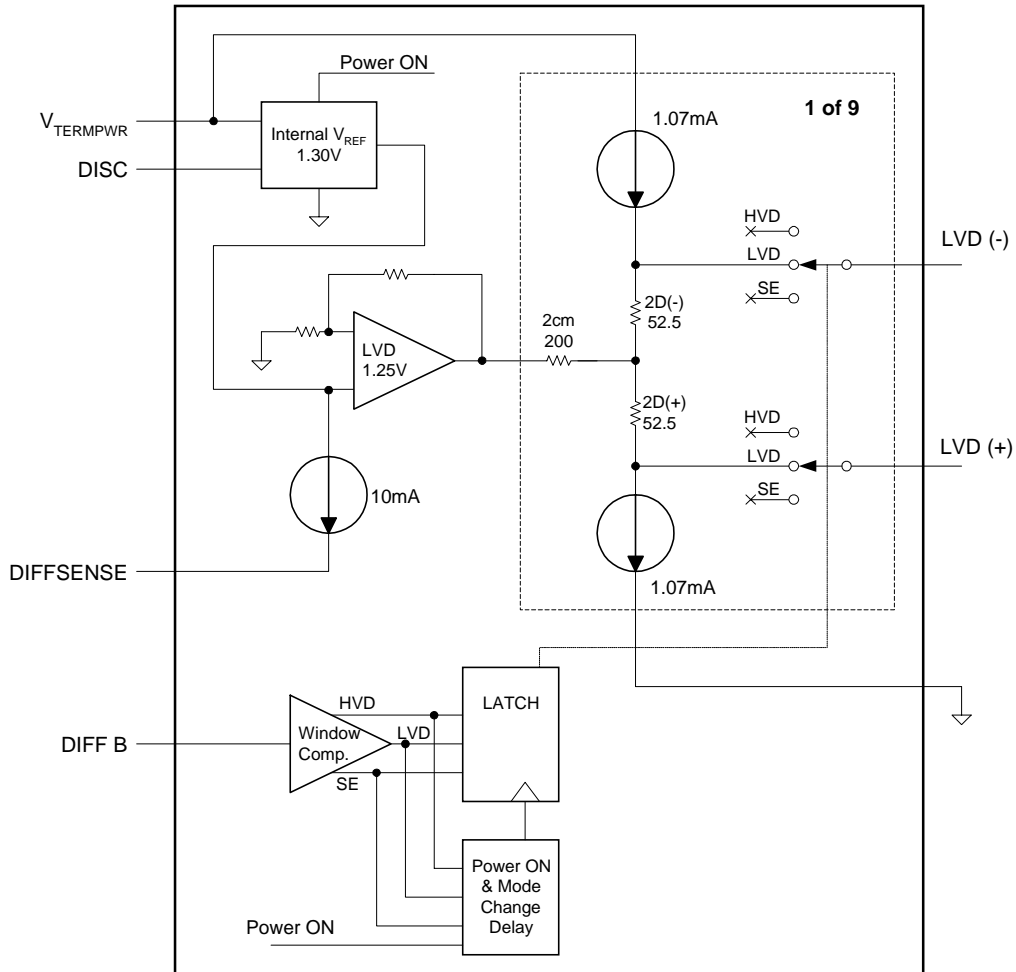


FIGURE 1 — LX5245 Block Diagram

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FUNCTIONAL PIN DESCRIPTION

| Pin Designator | Description |
|-------------------------------------|--|
| 1-, 2-, 3-, 4-, 5-, 6-, 7-, 8-, 9-1 | Negative signal termination lines. |
| 1+, 2+, 3+, 4+, 5+, 6+, 7+, 8+, 9+ | Positive signal termination lines. |
| V_{TERM} | Power supply pin for terminator. Connect to SCSI bus TERMPWR. Must be decoupled by one 4.7 μ F low-ESR capacitor for every three terminator devices. It is absolutely necessary to connect this pin to the decoupling capacitor through a very low impedance (big traces on PCB). Keeping distances very short from the decoupling capacitors to the V_{TERM} pin is also critical. The value of the decoupling capacitor is somewhat layout dependant and some applications may benefit from high-frequency decoupling with 0.1 μ F capacitors right at V_{TERM} pin. |
| DISC1 | Enables / disables terminator. See Power Down Function Table for logic levels per device. |
| GND1 | Terminator ground pin. Connect to ground. |
| DIFFSENSE1 | Used to drive DIFFSENS output 3V @ 10 mt. Usually connected through a 20kOhm resistor to DIFF B pin. |
| DIFFB1 | Used to detect the SCSI BUS mode (LUD, HUD, SE) |

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APPLICATION SCHEMATIC

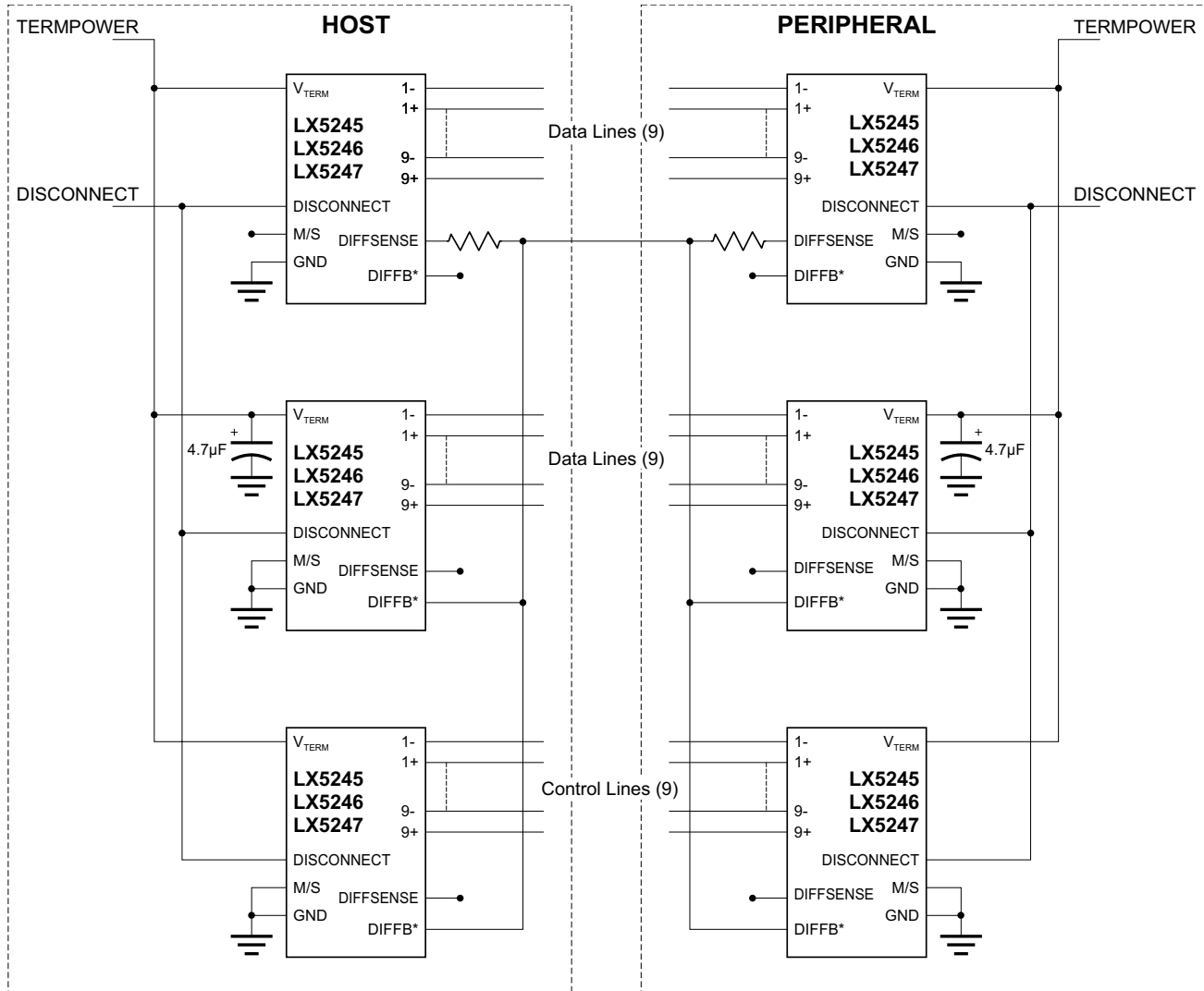
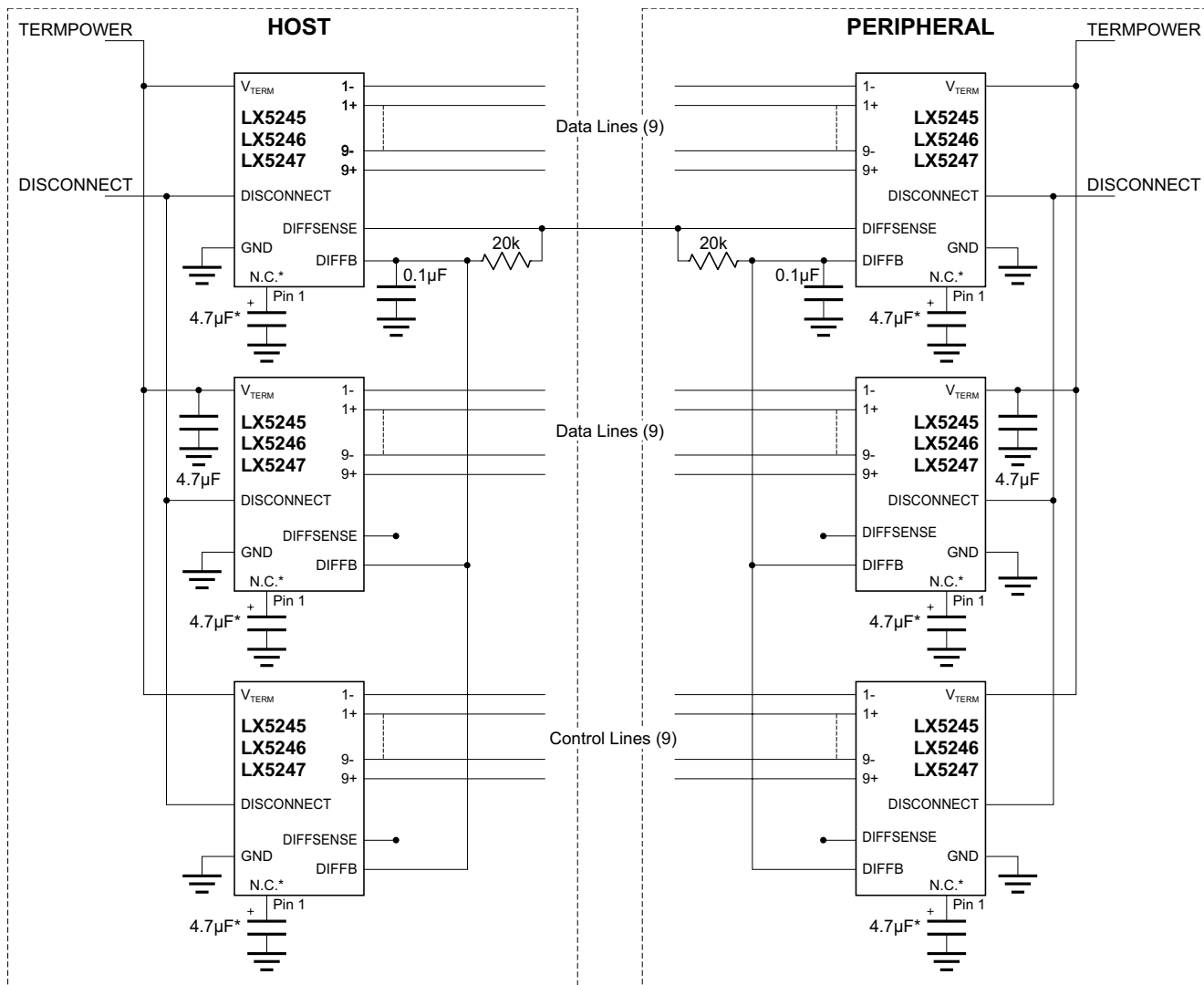


FIGURE 2 — Linfinity ONLY Application Schematic

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APPLICATION SCHEMATIC



* The capacitor on Pin 1 can be placed on the LX5245CPW, LX5246CPW or the LX5247CPW to be pin-compatible with other devices. This V_{REG}/REF capacitor is not required.

FIGURE 3 — Suggested Linfinity LX5245/5246/5247 Universal Application Schematic
(Please Reference Manufacturer's Current Data Sheet To Ensure Compatibility)

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