Description
The ISL80030xDEMO1Z and ISL80031xDEMO1Z boards are intended for use by individuals with requirements for point-of-load applications sourcing from 2.7V to 5.5V. The ISL8003xDEMO1Z boards are used to demonstrate the performance of the ISL80030, ISL80031, ISL80030A, and ISL80031A low quiescent current mode converters.
These devices are offered in an 8 Ld 2mm x 2mm DFN package with 1mm maximum height. The complete converter occupies less than 64mm² area.

Specifications
These boards have been configured and optimized for the following operating conditions:
• $V_{IN} = 2.7V$ to $5.5V$
• $V_{OUT} = 1.8V$
• $I_{OUT} = 3A$ (maximum)
• Up to 95% peak efficiency

Key Features
• Small, compact design
• $V_{IN}$ range of 2.7V to 5.5V
• $I_{OUT}$ maximum is 3A
• Negative current protection
• Internal soft-start and soft-stop
• Overcurrent and short-circuit protection
• Over-temperature/thermal protection

References
ISL80030, ISL80030A, ISL80031, ISL80031A Datasheet

Ordering Information

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<th>PART NUMBER</th>
<th>DESCRIPTION</th>
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<td>ISL80030DEMO1Z</td>
<td>3A, PWM, 1MHz demonstration board</td>
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<td>ISL80031DEMO1Z</td>
<td>3A, PFM, 1MHz demonstration board</td>
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FIGURE 1. BLOCK DIAGRAM
Test Steps
1. Ensure that the circuit is correctly connected to the supply and loads prior to applying any power.
2. Connect the bias supply to VIN, the plus terminal to VIN (TP1) and negative return to PGND (TP2).
3. Connect the output load to VO (TP3) and the negative return to PGND (TP4).
4. Turn on the power supply.
5. Verify the output voltage is 1.8V for $V_{OUT}$.

Functional Description
The ISL8003xDEMO1Z boards provide a simple platform to evaluate performance of the ISL80030, ISL80031, ISL80030A and ISL80031A.

These devices are highly efficient, monolithic, synchronous step-down DC/DC converters that can deliver up to 3A of continuous output current from a 2.7V to 5.5V input supply. They use peak current mode control architecture to allow very low duty cycle operation. The devices operate at 1MHz (ISL80030, ISL80031) and 2MHz (ISL80030A and ISL80031A) switching frequency, thereby providing superior transient response and allowing for the use of a small inductor.

PCB Layout Guidelines
The PCB layout is a very important converter design step to make sure the designed converter works well. The power loop is composed of the output inductor L’s, the output capacitor $C_{OUT}$, the PHASE pins and the PGND pin. It is necessary to make the power loop as small as possible and the connecting traces among them should be direct, short and wide. The switching node of the converter, the PHASE pins and the traces connected to the node are very noisy, so keep the voltage feedback trace away from these noisy traces. The input capacitor should be placed as close as possible to the VIN pin and the ground of the input and output capacitors should be connected as close as possible. The heat of the IC is mainly dissipated through the thermal pad. Maximizing the copper area connected to the thermal pad is preferable. In addition, a solid ground plane is helpful for better EMI performance. It is recommended to add at least 4 vias ground connection within the pad for the best thermal relief.
FIGURE 6. ISL80030ADEMO1Z TOP SIDE

FIGURE 7. ISL80030ADEMO1Z BOTTOM SIDE

FIGURE 8. ISL80031ADEMO1Z TOP SIDE

FIGURE 9. ISL80031ADEMO1Z BOTTOM SIDE

ISL8003xDEMO1Z Schematic

FIGURE 10. ISL8003xDEMO1Z SCHEMATIC
## Bill of Materials

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<th>QTY</th>
<th>UNITS</th>
<th>REFERENCE DESIGNATOR</th>
<th>DESCRIPTION</th>
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**NOTE:**
1. Two manufacturers are provided as options for the inductor.
Board Layout

FIGURE 11. SILKSCREEN TOP

FIGURE 12. LAYER 1

FIGURE 13. LAYER 2

FIGURE 14. LAYER 3

FIGURE 15. LAYER 4

FIGURE 16. SILKSCREEN BOTTOM
Typical Performance Curves

FIGURE 17. EFFICIENCY vs LOAD
fSW = 1MHz, VIN = 5V, PFM, TA = +25°C

FIGURE 18. START-UP AT 3A LOAD
VIN = 5V, PWM, TA = +25°C

FIGURE 19. SHUTDOWN AT 3A LOAD
VIN = 5V, PWM, TA = +25°C

FIGURE 20. OVERCURRENT PROTECTION
VIN = 5V, PWM, TA = +25°C