

ISL65426

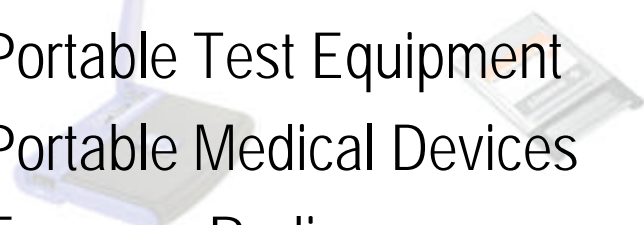
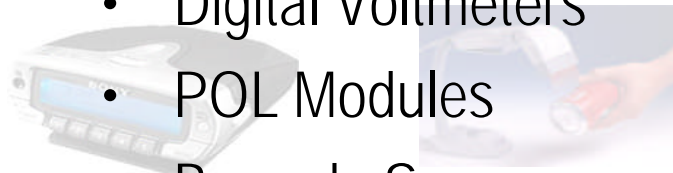
Industrial & Communication Product Line

# Intersil's Integrated FET Value Proposition

- High level of integration
  - Internal MOSFETs (synchronous buck regulators)
  - Some include PGood (power OK) function
  - Newer generation devices include up to three outputs
- Various switching frequency choices
  - Up to 1.5MHz for smaller BOM components
  - Programmable down to 200kHz for high efficiency (up to 95%)
- Various output current choices
  - 600mA to 6A - can support several applications
- Additional features
  - OC, UVLO and temperature shutdown protection features
  - External SYNC function
  - Voltage tracking and sequencing capability
- Various package options
  - QFN, HTSSOP, MSOP, DFN

# ISL65426: Typical Applications

- Digital Voltmeters
- POL Modules
- Barcode Scanners
- Portable Test Equipment
- Portable Medical Devices
- Two-way Radios
- SFP (Networking)
- Spectrum Analyzers
- Oscilloscopes
- GPS Navigators
- FPGA/CPLD Power Solutions
- Learning Language Machine
- Integrated Gear Motors
- Copy Machines
- Server Blades

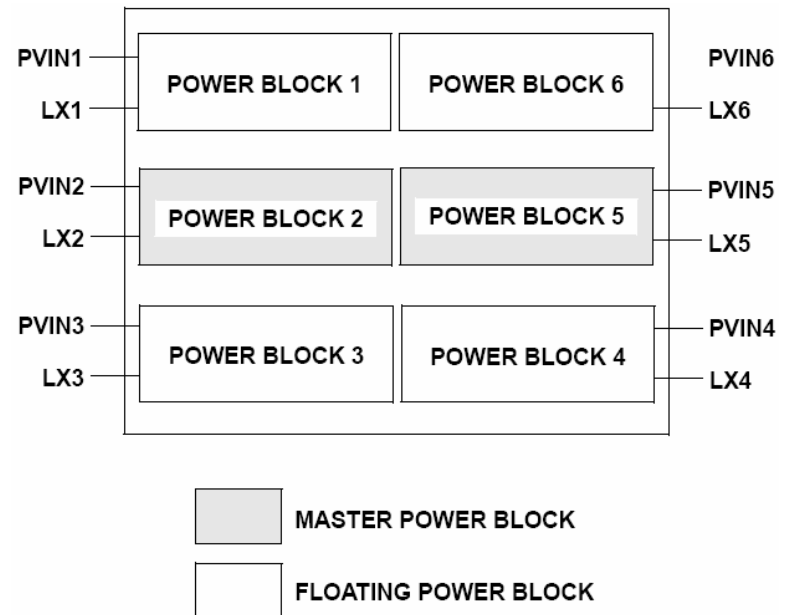


# Selling Points

- “One-chip” power solution vs discrete solution
  - The flexible dual output architecture can support multi-rail power requirements with one IC
    - Provides a cost-effective and compact solution as opposed to using discrete solutions for each output rail
- Complete programmability of output power
  - Service all your current requirements (up to 6A) with one IC
    - Option of using a single part across the board for different current requirements
  - Supports all the output voltage requirements with a single IC
- High switching frequency and high efficiency
  - Smaller external BOM components
- Current mode control
  - Provides better transient response

# ISL65426: 6A Dual Synchronous Regulator

- $V_{IN}$  2.375V to 5.5V
  - 6A combined  $I_{OUT}$
- PWM fixed and adjustable output voltage options
  - PWM1: 1.8V, 1.5V, 1.2V or 0.6V
  - PWM2: 3.3V ( $V_{IN}=5V$ ), 2.5V, 1.8V or 0.6V
- Key features
  - User-partitioned power blocks
  - 180° out-of-phase operation
  - Startup in a pre-biased load
  - Independent output Soft-start and enable
  - Stable all-ceramic solutions
  - High efficiency: 95%
  - $\pm 1\%$  system accuracy over temperature
- Package: 5x10 QFN





# Configuring the Output Voltage and Current

$V_{1SET2}$	$V_{1SET1}$	Channel 1 $V_{OUT}$	$V_{2SET2}$	$V_{2SET1}$	Channel 2 $V_{OUT}$
low	low	0.6V	low	low	0.6V
low	high	1.2V	low	high	1.8V
high	low	1.5V	high	low	2.5V
high	high	1.8V	high	high	3.3V

## Output Voltage Configurations

$I_{1SET}$	$I_{2SET}$	$I_{OUT1}$	Channel 1 Connections	$I_{OUT2}$	Channel 2 Connections
1	1	3A	LX1, LX2, LX3	3A	LX4, LX5, LX6
1	0	4A	LX1, LX2, LX3, LX4	2A	LX5, LX6
0	1	5A	LX1, LX2, LX3, LX4, LX6	1A	LX5
0	0	2A	LX1, LX2	4A	LX3, LX4, LX5, LX6

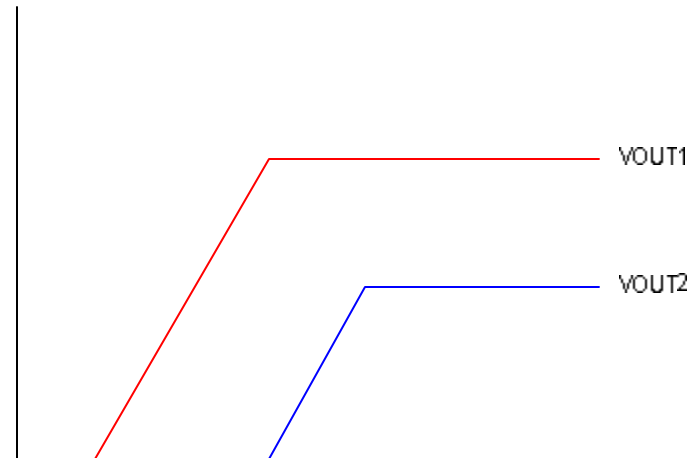
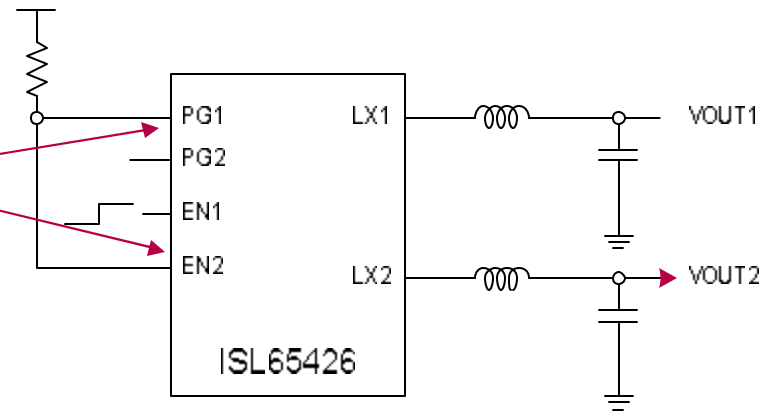
## Output Current Configurations

### Invalid LX Configurations: SS Prevented

x	x	1A	LX2	5A	LX1, LX3, LX4, LX5, LX6
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# Voltage Monitoring and Supply Sequencing

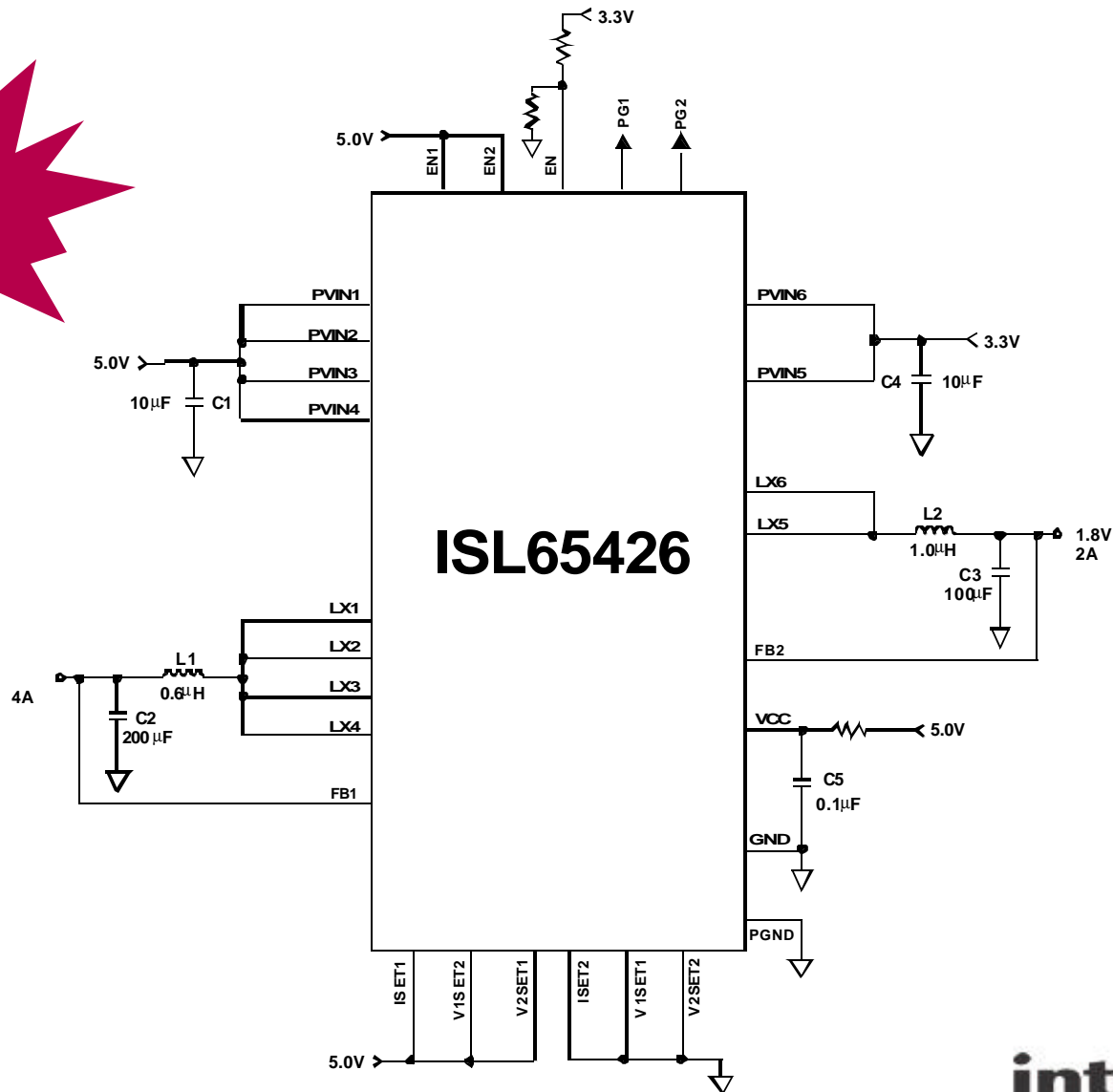
Separate Enable and PGOOD signals allows individual control and monitoring



# Typical Circuit

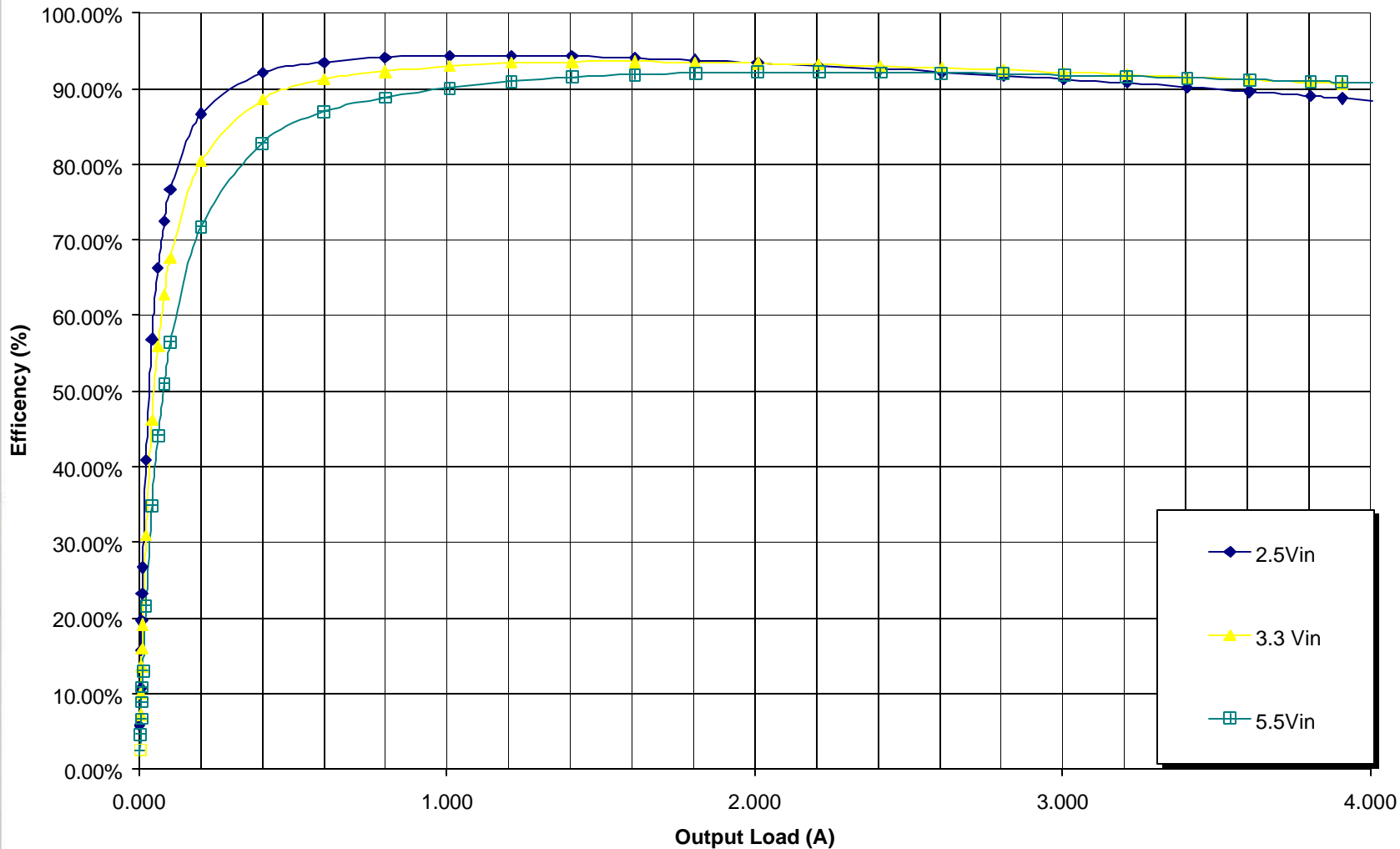
Dual Input Supply  
4A:2A Configuration

Low component count!!!



# High Efficiency – System Runs Cooler

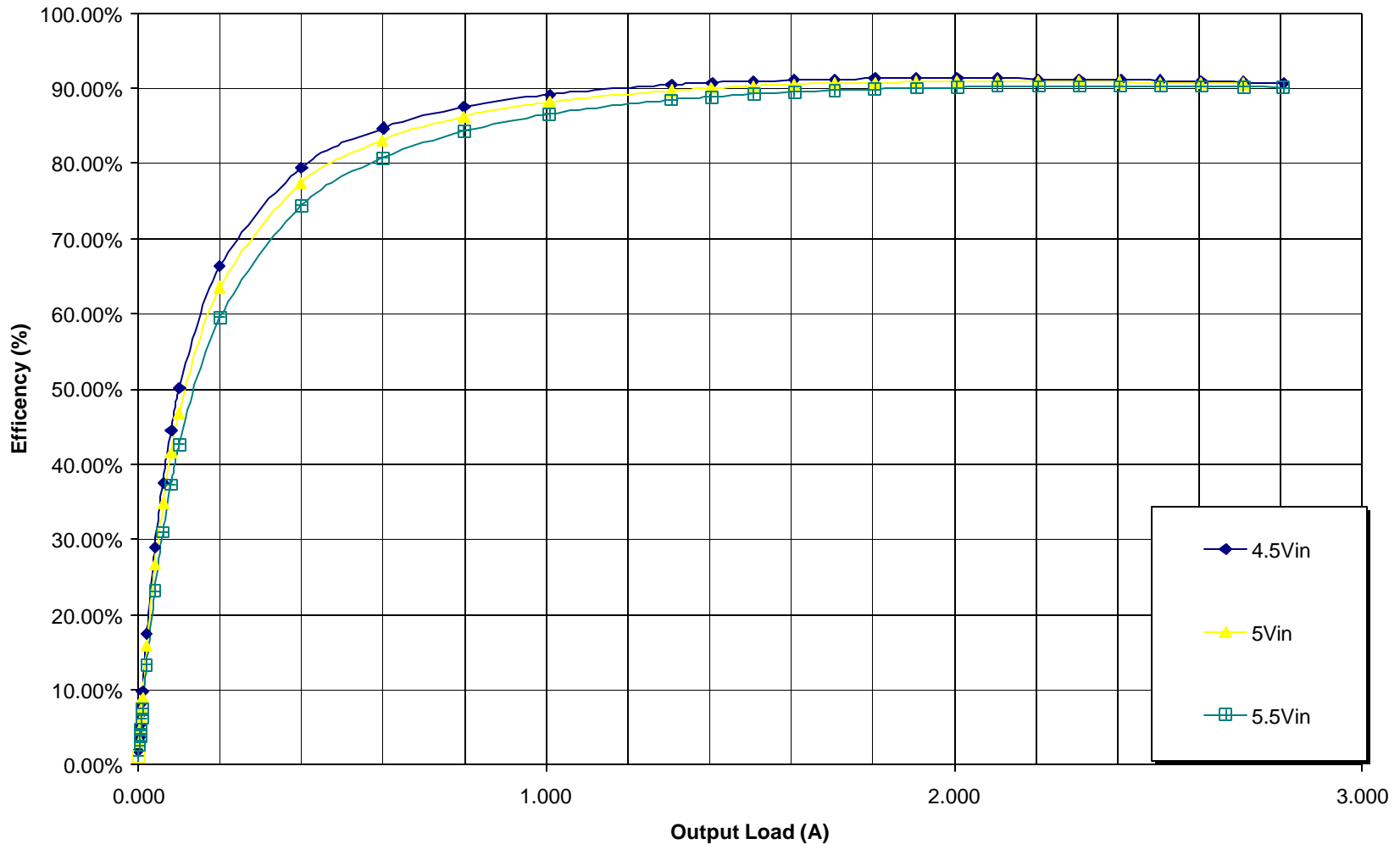
EFFICIENCY VS LOAD  
1MHz VOUT1=1.8V ISL65426



Low Vin=2.5V, Nominal Vin=3.3V, High Vin=5.5V

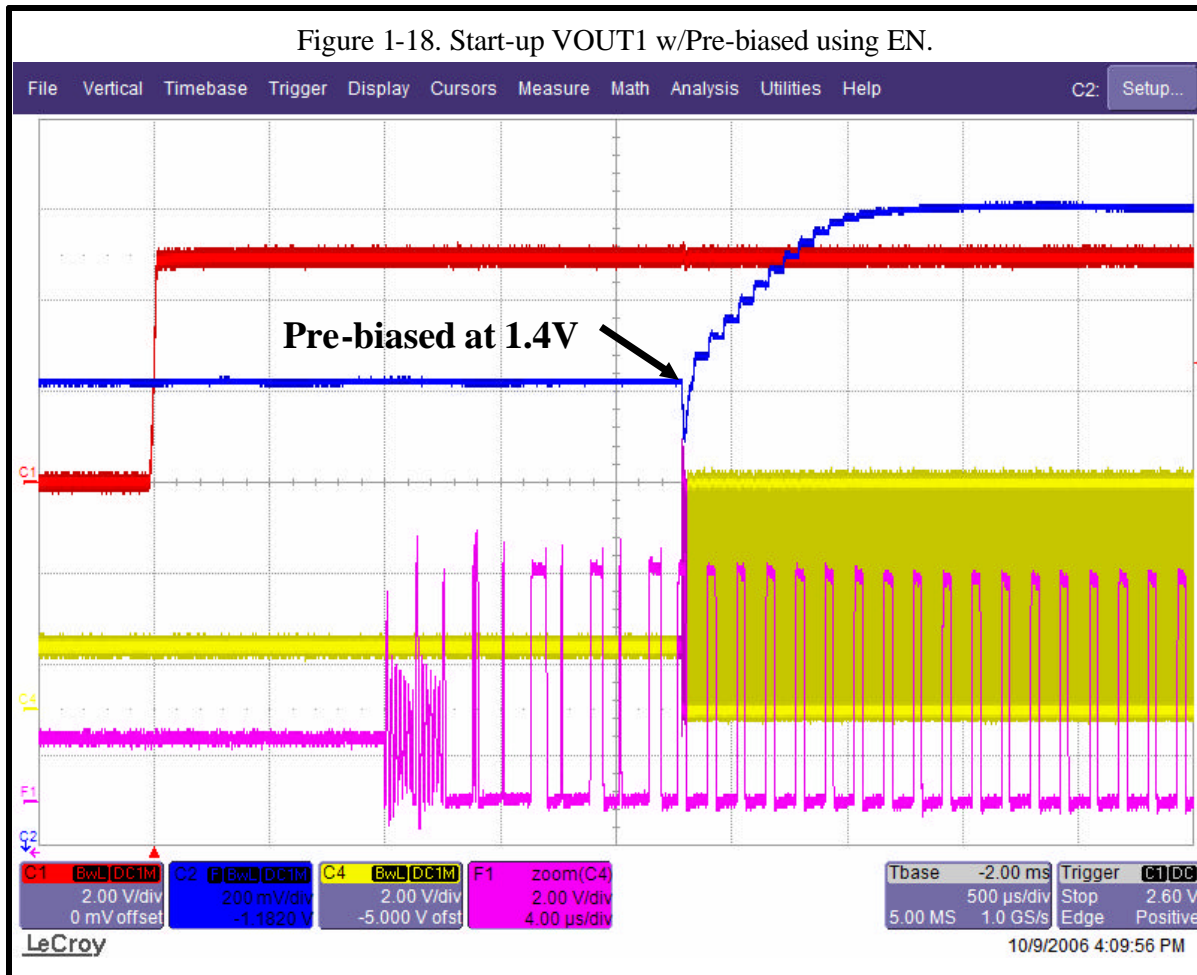
# High Efficiency – System Runs Cooler

EFFICIENCY VS LOAD  
1MHz VOUT2=3.3V ISL65426



Low Vin=4.5V, Nominal Vin=5V, High Vin=5.5V

# Startup with Pre-Biased Output

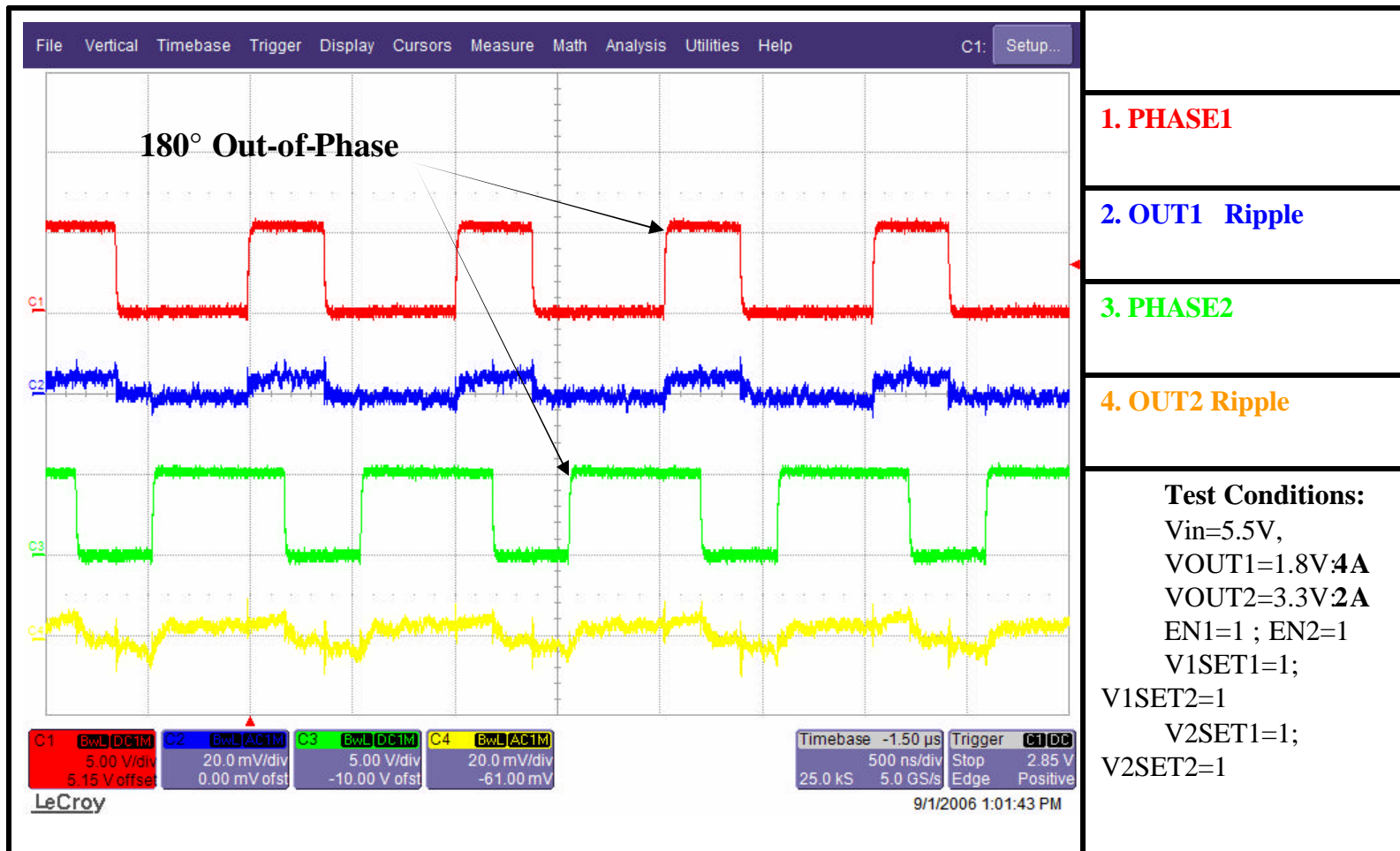


1. EN1
2. VOUT1
- 3.
4. PHASE1, M1-Zoom-in of the PHASE1

**Test Conditions:**  
 Vin=5V,  
 VOUT1=1.80V:0A  
 EN1=1

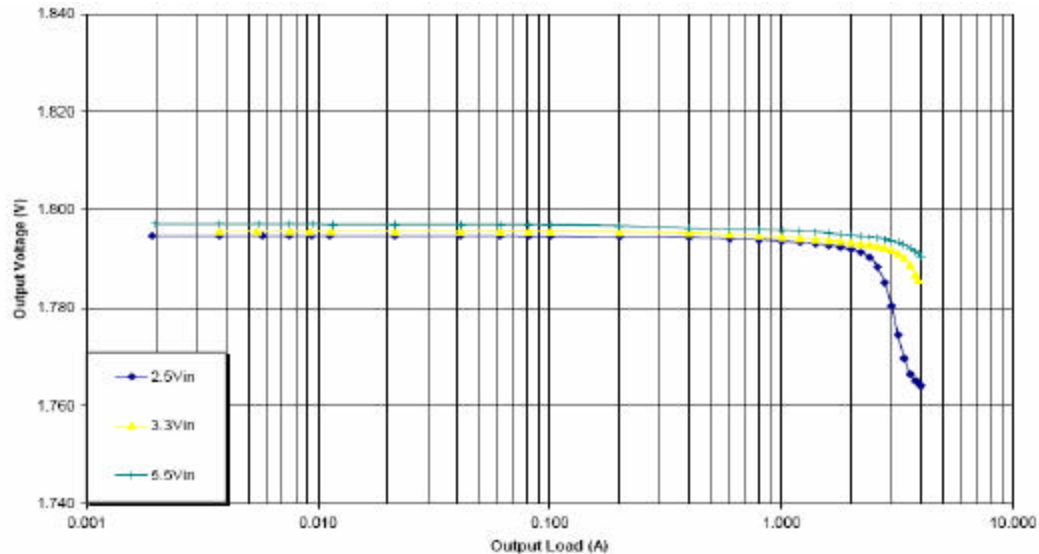
There are 64 digital soft-start steps. Once in regulation, IC operates in CCM.

# Output Ripple – 1.8V and 3.3V Output

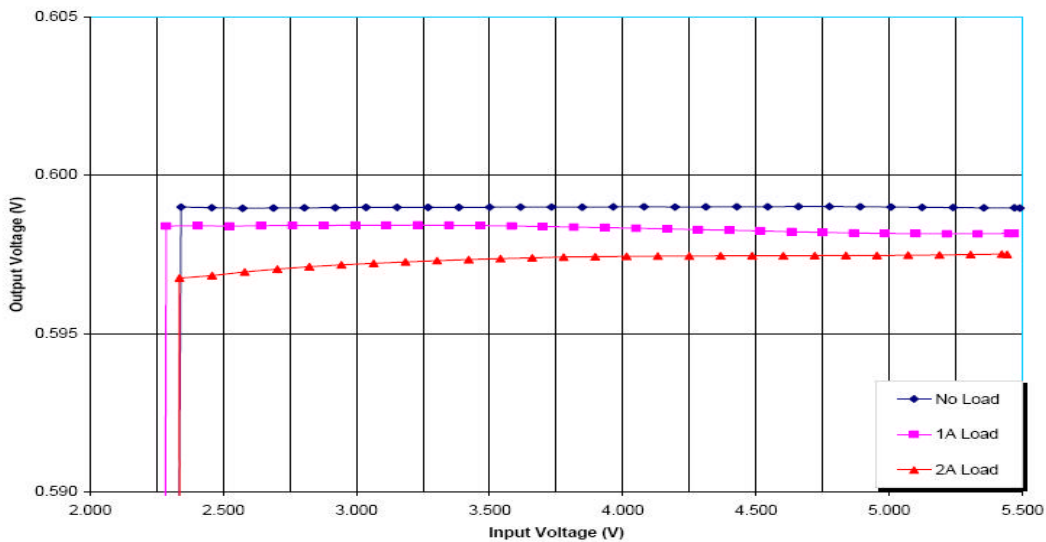


The 180° Out-of-Phase Operation of the two regulators reduce Output Ripple and EMI

# Output Regulation

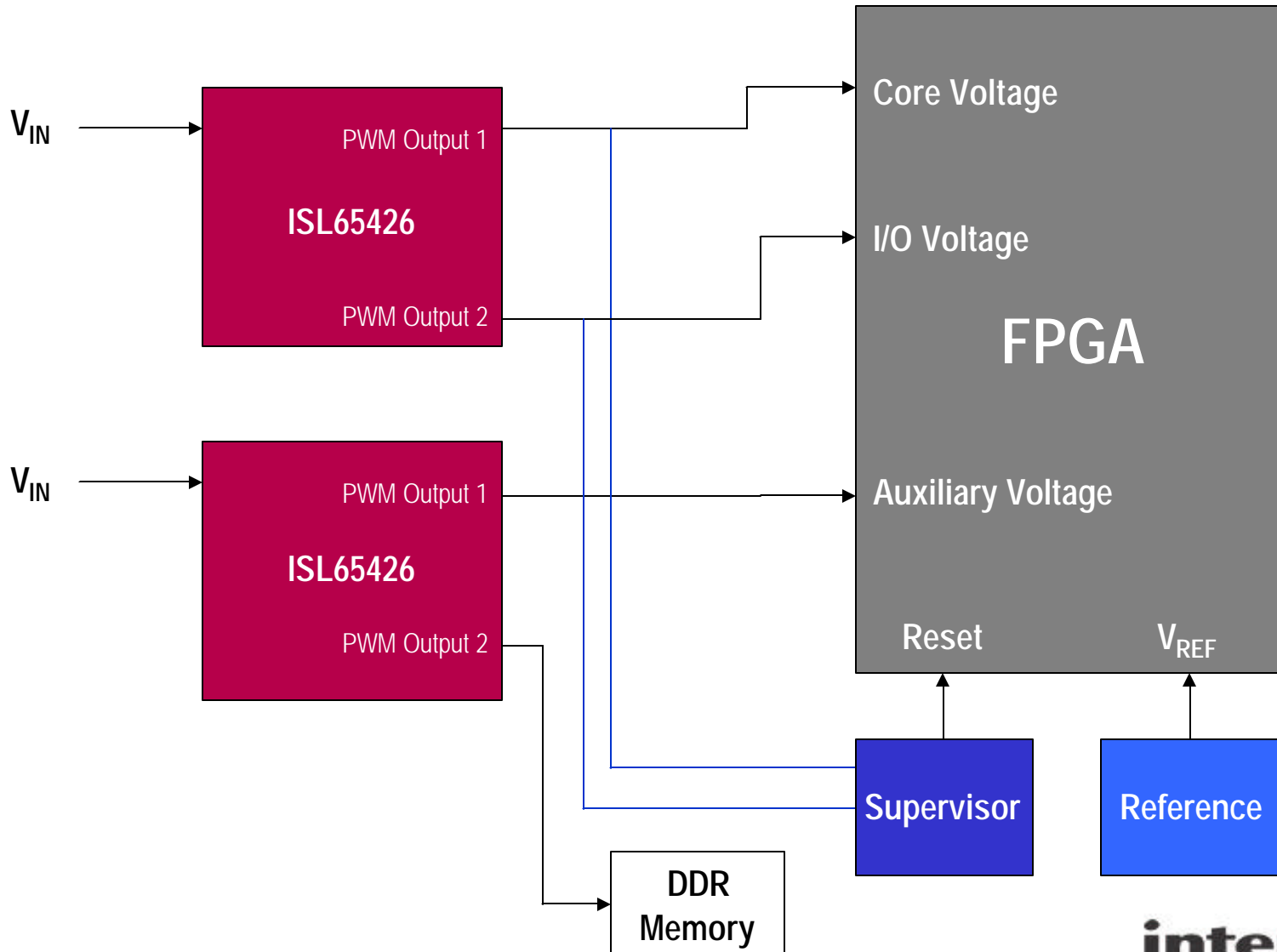


Output Regulation vs Load Current



Output Regulation vs Input Voltage

# Powering an FPGA/CPLD with ISL65426



# Tools and Links

- **Parametric Tables** [www.intersil.com/products/pt/parametric\\_table\\_510.asp](http://www.intersil.com/products/pt/parametric_table_510.asp)
  - Complete parametric data for all devices – sort, download, search with parameters you define
- **Samples** [www.intersil.com/samples](http://www.intersil.com/samples)
  - Order directly from our website or through your local sales rep
- **Online Cross Reference** [www.intersil.com/products/xref/index.asp](http://www.intersil.com/products/xref/index.asp)
  - Competitors' devices are crossed to help you find the right replacement
- **Block Diagrams** [www.intersil.com/applications](http://www.intersil.com/applications)
  - Integrated FETs can be found in many applications – find them in these design solutions
- **Engineering Support** [www.intersil.com/design](http://www.intersil.com/design)
  - Applications support, online FAQs, design models, document library