Triple Output, Low-Noise LDO Regulator with Integrated Reset Circuit

The ISL6416 is an ultra low noise triple output LDO regulator with microprocessor reset circuit and is optimized for powering wireless chip sets. The IC accepts an input voltage range of 3.0V to 3.6V and provides three regulated output voltages: 1.8V (LDO1), 2.8V (LDO2), and another ultra-clean 2.8V (LDO3). On chip logic provides sequencing between LDO1 and LDO2 for the BBP/MAC and the I/O supply voltage outputs. LDO3 features ultra low noise that does not exceed $30\mu V_{RMS}$ (typical) to aid VCO stability. High integration makes the ISL6416 an ideal choice to power many of today's small form factor industry standard wireless cards such as PCMCIA, mini-PCI and Cardbus-32.

The ISL6416 uses an internal PMOS transistor as the pass device. The ISL6416 also integrates a reset function, which eliminates the need for the additional reset IC required in WLAN applications. The IC asserts a $\overline{\text{RESET}}$ signal whenever the VIN supply voltage drops below a preset threshold, keeping it asserted for at least 25ms after Vin has risen above the reset threshold. FAULT indicates the loss of regulation on LDO1.

Ordering Information

PART NUMBER	TEMP. RANGE (°C)	PACKAGE	PKG. DWG. #
ISL6416IA	-40 to +85	16 Ld QSOP	M16.15A
ISL6416IAZ (Note 1)	-40 to +85	16 Ld QSOP (Pb-free)	M16.15A

NOTES:

1. Tape and Reel available. Add "-T" suffix for Tape and Reel Packing Option.

2. Intersil Pb-free products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020C.
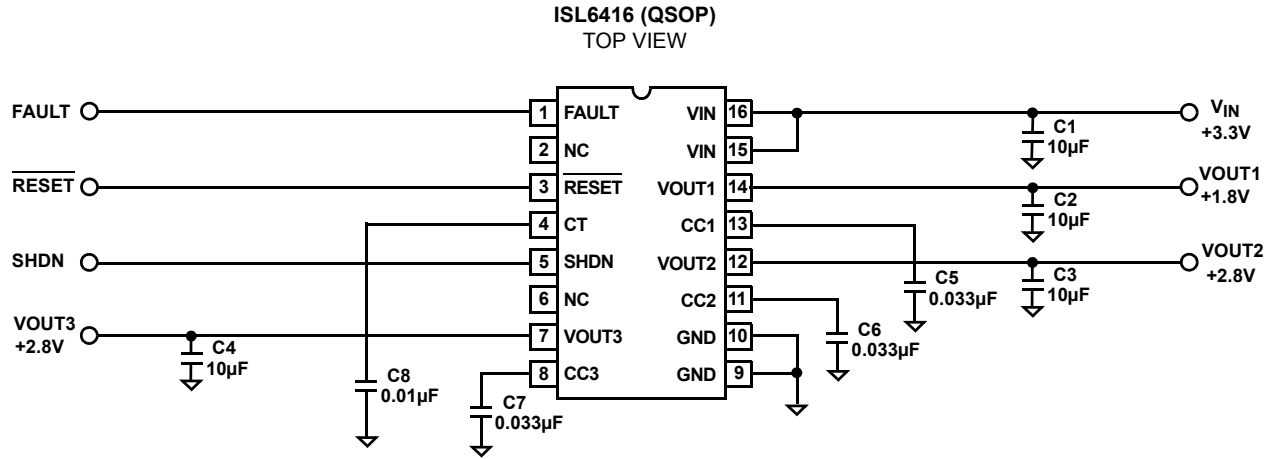
Features

- Three LDOs and a RESET circuit

- High Output Current
  - LDO1, 1.8V 330mA
  - LDO2, 2.8V 225mA
  - LDO3, 2.8V 125mA

- Low Output Voltage Noise
  - $<30\mu V_{RMS}$ (typical) for LDO3 (VCO Supply)

- Stable with Small Ceramic Output Capacitors

- Extensive Protection and Monitoring Features
  - Overcurrent protection
  - Short circuit protection
  - Thermal shutdown
  - FAULT indicator

- Logic-Controlled Shutdown Pin

- Integrated Microprocessor Reset Circuit
  - Programmable Reset Delay

- Proven Reference Design for a Total WLAN System Solution

- Pb-Free Available (RoHS Compliant)

Applications

- WLAN Cards
  - PCMCIA, Cardbus32, MiniPCI Cards
  - Compact Flash Cards

- Hand-Held Instruments

Pinout and Typical Application Schematic

ISL6416 (QSOP)
TOP VIEW

Pin	Name		Pin	Name
1	FAULT		16	VIN
2	NC		15	VIN
3	RESET		14	VOUT1
4	CT		13	CC1
5	SHDN		12	VOUT2
6	NC		11	CC2
7	VOUT3		10	GND
8	CC3		9	GND

FAULT

RESET

SHDN

VOUT3 +2.8V

C4 10µF

C8 0.01µF

C7 0.033µF

V_IN +3.3V

C1 10µF

VOUT1 +1.8V

C2 10µF

VOUT2 +2.8V

C5 0.033µF

C3 10µF

C6 0.033µF

Typical Bill Of Materials

REFERENCE DESIGNATOR	VALUE	PACKAGE	MANUFACTURER	MANUFACTURER'S PART NUMBER
C1, C2, C3, C4	10µF, X7R	1206	TDK	C3216X7R1A106M
C5, C6, C7	0.033µF, X7R	0603	TDK/ANY	C1608X7R1A333K
C8	0.01µF, X7R	0603	TDK/ANY	C1608X7R1A103K
U1	ISL6416IA	QSOP16	Intersil	ISL6416IA

Shrink Small Outline Plastic Packages (SSOP)
Quarter Size Outline Plastic Packages (QSOP)
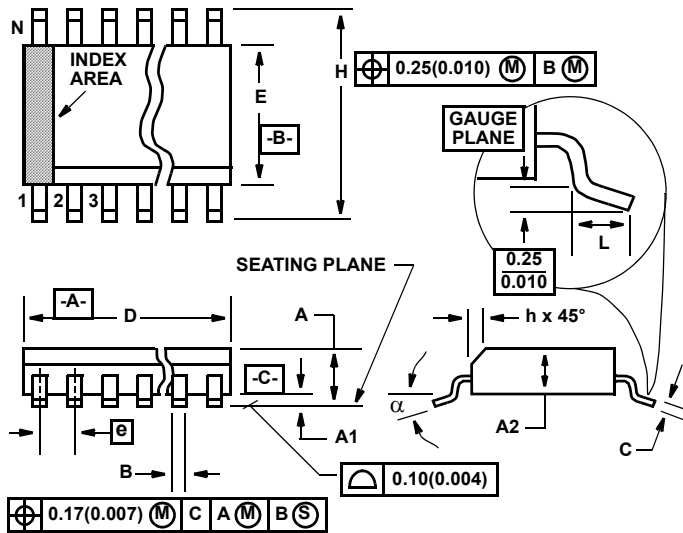
M16.15A
16 LEAD SHRINK SMALL OUTLINE PLASTIC PACKAGE
(0.150" WIDE BODY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.061	0.068	1.55	1.73	-
A1	0.004	0.0098	0.102	0.249	-
A2	0.055	0.061	1.40	1.55	-
B	0.008	0.012	0.20	0.31	9
C	0.0075	0.0098	0.191	0.249	-
D	0.189	0.196	4.80	4.98	3
E	0.150	0.157	3.81	3.99	4
e	0.025 BSC		0.635 BSC		-
H	0.230	0.244	5.84	6.20	-
h	0.010	0.016	0.25	0.41	5
L	0.016	0.035	0.41	0.89	6
N	16		16		7
α	0°	8°	0°	8°	-

Rev. 2 6/04

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.

2. Dimensioning and tolerancing per ANSI Y14.5M-1982.

3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.

4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.

5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.

6. "L" is the length of terminal for soldering to a substrate.

7. "N" is the number of terminal positions.

8. Terminal numbers are shown for reference only.

9. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall be 0.10mm (0.004 inch) total in excess of "B" dimension at maximum material condition.

10. Controlling dimension: INCHES. Converted millimeter dimensions are not necessarily exact.

ISL6416

Triple Output, Low-Noise LDO Regulator with Integrated Reset Circuit

| DS Datasheets, Related Docs & Simulations | ■ Description | Key Features | PT Parametric Data | Application Diagrams | Related Devices |

Ordering Information

Pb **RoHS/Pb-Free/Green Device**

Part No.	Design-In Status	Temp.	Package	MSL	Price US $		
ISL6416IA	Active	Ind	16 Ld QSOP	2	1.36	Buy	Sample
ISL6416IA-TK	Active	Ind	16 Ld QSOP T+R	2	1.36	Buy	
ISL6416IAZ Pb	Active	Ind	16 Ld QSOP	2	1.36	Buy	Sample
ISL6416IAZ-TK Pb	Active	Ind	16 Ld QSOP T+R	2	1.36	Buy	

The price listed is the manufacturer's suggested retail price for quantities between 100 and 999 units. However, prices in today's market are fluid and may change without notice.

MSL = Moisture Sensitivity Level - per IPC/JEDEC J-STD-020

SMD = Standard Microcircuit Drawing

■ Description

The ISL6416 is an ultra low noise triple output LDO regulator with microprocessor reset circuit and is optimized for powering wireless chip sets. The IC accepts an input voltage range of 3.0V to 3.6V and provides three regulated output voltages: 1.8V (LDO1), 2.8V (LDO2), and another ultra-clean 2.8V (LDO3). On chip logic provides sequencing between LDO1 and LDO2 for the BBP/MAC and the I/O supply voltage outputs. LDO3 features ultra low noise that does not exceed 30µVRMS (typical) to aid VCO stability. High integration makes the ISL6416 an ideal choice to power many of today's small form factor industry standard wireless cards such as PCMCIA, mini-PCI and Cardbus-32.

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■ Key Features

- Three LDOs and a RESET circuit
- High Output Current
    - LDO1, 1.8V 330mA
    - LDO2, 2.8V 225mA
    - LDO3, 2.8V 125mA
- Low Output Voltage Noise
    - <30µVRMS (typical) for LDO3 (VCO Supply)
- Stable with Small Ceramic Output Capacitors
- Extensive Protection and Monitoring Features
    - Overcurrent protection
    - Short circuit protection
    - Thermal shutdown
    - FAULT indicator
- Logic-Controlled Shutdown Pin
- Integrated Microprocessor Reset Circuit
    - Programmable Reset Delay
- Proven Reference Design for a Total WLAN System Solution
- Pb-Free Available (RoHS Compliant)

Related Documentation

DS Datasheet(s):

- [Triple Output, Low-Noise LDO Regulator with Integrated Reset Circuit](#)

PT **Parametric Data**

V_{IN} (min) (V)	3
V_{IN} (max) (V)	3.6
V_{OUT} (min) (V)	1.8
V_{OUT} (max) (V)	2.8
I_{OUT} (max) (mA)	500

Application Block Diagrams

- [DSL Modem (CPE)](#)
- [Desktop Computers](#)
- [E-Power Meter](#)
- [Fingerprint Biometrics](#)
- [GPS Handheld](#)
- [Game Console](#)
- [IPTV Set-Top Box](#)
- [Keyboard Video Mouse (KVM)](#)
- [Medical Telemetry](#)
- [Notebook Computers](#)
- [Portable Digital Assistant (PDA)](#)
- [Voice over IP (VoIP) Phone](#)

Applications

- WLAN Cards
  - PCMCIA, Cardbus32, MiniPCI Cards
  - Compact Flash Cards
- Hand-Held Instruments

Related Devices   **PT** [Parametric Table](#)

[EL7530](#)	Monolithic 600mA Step-Down Regulator with Low Quiescent Current
[EL7531](#)	Monolithic 1A Step-Down Regulator with Low Quiescent Current
[EL7534](#)	Monolithic 600mA Step-Down Regulator
[EL7536](#)	Monolithic 1A Step-Down Regulator
[ICL7663S](#)	CMOS Programmable Micropower Positive Voltage Regulator
[ISL6410](#)	Single Synchronous Buck Regulator with Integrated FET for WLAN Chipsets
[ISL6410A](#)	Single Synchronous Buck Regulator with Integrated FET for WLAN Chipsets
[ISL6412](#)	Triple Output, Low-Noise LDO Regulator with Integrated Reset Circuit
[ISL6413](#)	Triple Output Regulator with Single Synchronous Buck and Dual LDO
[ISL6414](#)	Triple Output, Low-Noise LDO Regulator with Integrated Reset Circuit
[ISL6455](#)	0.6A PWM Regulator and Dual 0.3A LDOs and Reset
[ISL6455A](#)	0.6A PWM Regulator and Dual 0.3A LDOs and Reset
[ISL6719](#)	100V Linear Bias Supply
[ISL6720A](#)	100V Triple Linear Bias Supply
[ISL9000](#)	Dual LDO with Low Noise, Very High PSRR, and Low I_Q
[ISL9000A](#)	Dual LDO with Low Noise, Very High PSRR, and Low I_Q
[ISL9001](#)	LDO with Low I_{SUPPLY}, High PSRR
[ISL9001A](#)	LDO with Low I_{SUPPLY}, High PSRR
[ISL9003A](#)	Low Noise LDO with Low I_Q, High PSRR
[ISL9005](#)	LDO with Low I_{SUPPLY}, High PSRR
[ISL9005A](#)	LDO with Low I_{SUPPLY}, High PSRR
[ISL9007](#)	High Current LDO with Low I_Q and High PSRR
[ISL9008A](#)	Low Noise LDO with Low I_Q, High PSRR

[ISL9011](#)	Dual LDO with Low Noise, Low I_Q, and High PSRR
[ISL9011A](#)	Dual LDO with Low Noise, Low IQ, and High PSRR
[ISL9012](#)	Dual LDO with Low Noise, Low I_Q, and High PSRR
[ISL9014](#)	Dual LDO with Low Noise, Low I_Q, and High PSRR
[ISL9014A](#)	Dual LDO with Low Noise, Low IQ, and High PSRR

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