48V Input DC/DC Converters

Equivalent Module Solutions – InfoCard 25

Linear Technology Corporation, a Leader in DC/DC Controller ICs, Presents Proven "Drop-In" Designs for –48V Input Converters in Popular Power Ranges

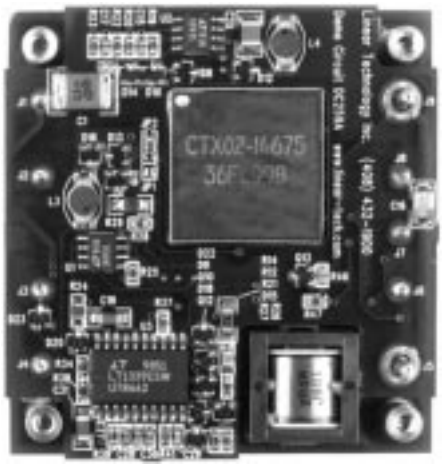
Production Ready Circuits:

- High Efficiency
- Latest IC Design Innovations
- Design May Be Optimized for Your System
- In-House Design Flexibility and Control
- Low System Cost

Design and Support Tools:

- Demonstration Boards That Fit Module Footprints
- Gerber Files and Bill of Materials
- Local Application Engineer Support Worldwide
- EMI Test Results (Conducted Emissions)

DC259: 50W Design Replaces Half-Bricks (See Page 4)



Isolated 48V Step-Down Module Equivalent Circuits

Power Level	Output Voltage*	Output Current	LTC Circuit	Demo Board	Input Voltage	Isolation Voltage	Comments
10W	5V ±5V 12V	2A 2A 1A	LT1425 LT1425 LT1425	DC211A-A DC211A-B DC211A-C	36V to 72V 36V to 72V 36V to 72V	1500V DC 1500V DC 1500V DC	Pin Compatible with Standard 10W Modules
35W	5V or 3.3V	7A	LT1247 LT1431	DC227A-A	36V to 72V	500V DC	Pin Compatible with Standard 35W (Half-Brick) Modules
	5V or 3.3V	7A	LT1247 LT1431	DC227A-B	36V to 72V	1500V DC	1500V Isolation Version
	5V or 3.3V	7A	LT1247 LT1431	DC227A-C	36V to 72V	500V DC	Highest Efficiency Version
50W	5V or 3.3V	10A	LT1339 LT1431	DC259A	36V to 72V	1500V DC	Pin Compatible with Standard (Half-Brick) Modules

Nonisolated 12V, 24V and 48V Step-Down Module Equivalent Circuits

Power Level	Output Voltage*	Output Current	LTC Circuit	Demo Board	Input Voltage	Isolation Voltage	Comments
Up to 36W	3.3V, 5V 7V, 12V	3A	LT1339	DC224	4V to 60V	Nonisolated	3A Output Evaluation Board, Device Controls Up to 50A

*Call factory for other voltage requirements

Proven Designs Built Onto Your PCB for Cost Savings and Performance Enhancements

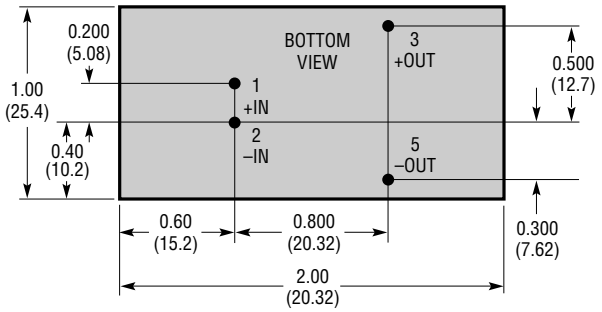
DC211

10W

Description:

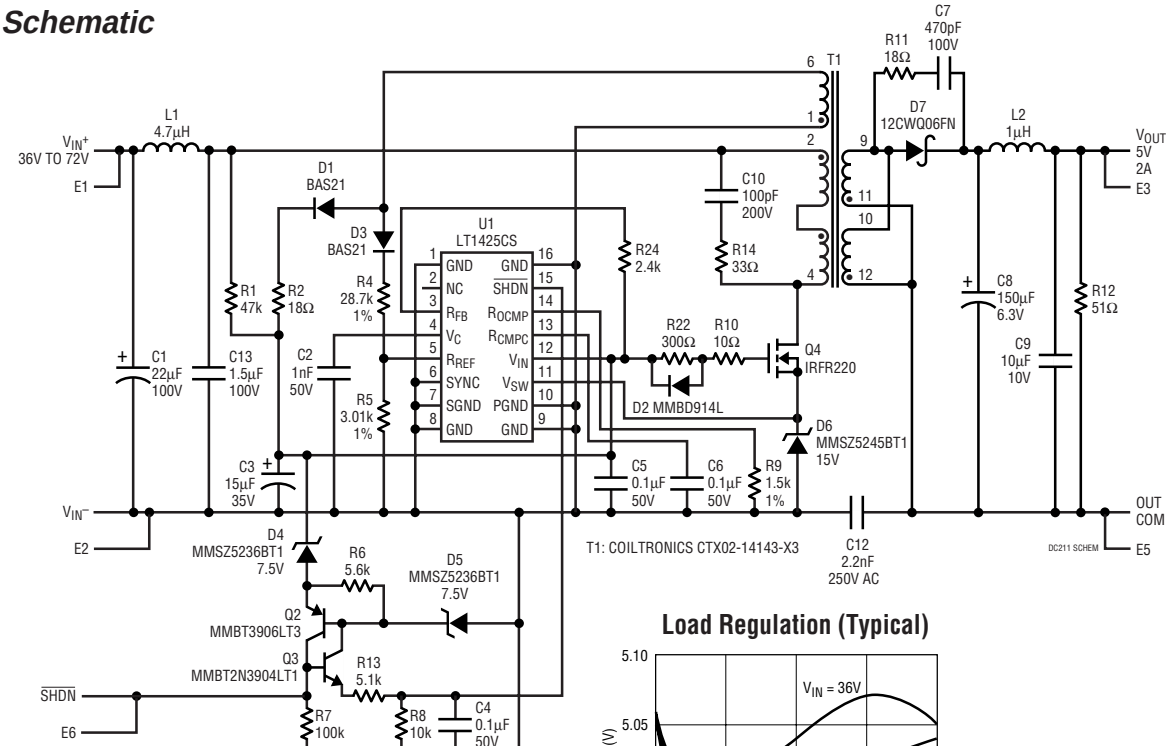
- Board Level Replacement for "10W" DC/DC Converters
- Isolated 5V, ±5V or 12V Output from 36V to 72V DC Inputs
- No Optoisolator Required (See Below)
- Load Compensation Allows Excellent Load Regulation

Typical 10W Footprint

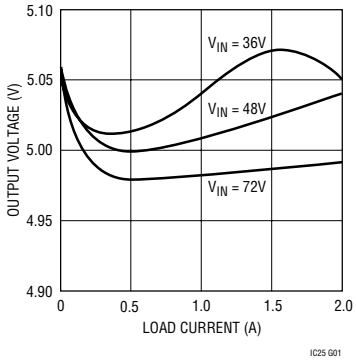


DC211 in Same Footprint

DC211 Schematic



Load Regulation (Typical)



Isolation Without Optoisolators

The LT1425 senses the isolated output voltage directly from the primary flyback waveform, improving regulation and dynamic response and saving space, power and cost. The designer may directly program the output voltage and the load compensation by setting resistor values.

Efficiency (Including Preload Resistor R12)

Input/Output	1A	1.5A	2A
$36V_{IN}$	75%	77%	78%
$48V_{IN}$	74%	77%	79%
$72V_{IN}$	72%	76%	78%

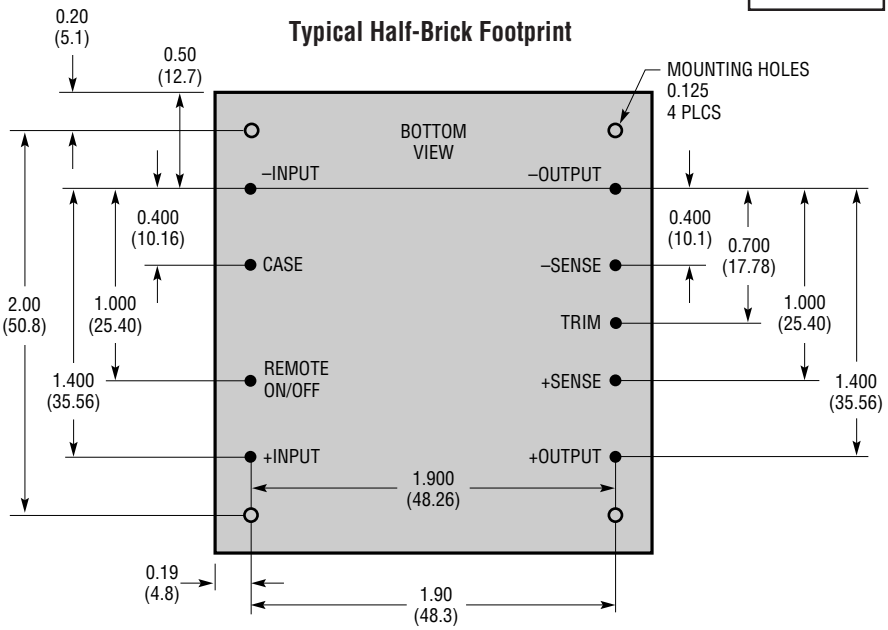
DC227

35W

Description:

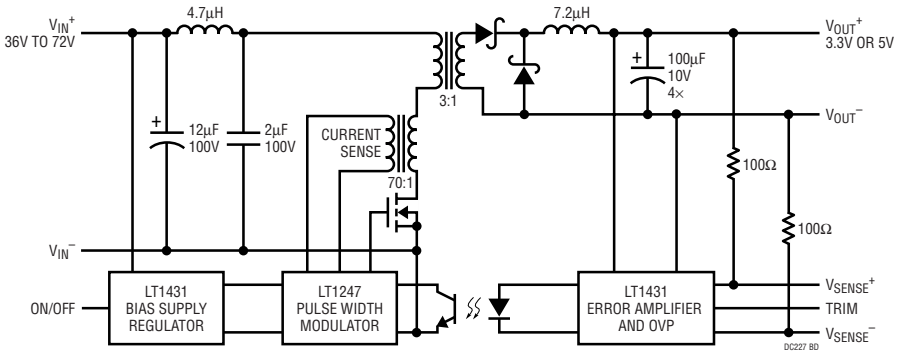
- Board Level Replacement for “Half-Brick” DC/DC Converters
- Isolated 5V or 3.3V Output at Up to 7A from 36V to 72V DC
- Low Input Capacitance
- Fast Turn-On Time
- Low Shutdown Power Consumption
- Continuous Short-Circuit Protection
- Overtemperature Protection
- Output Overvoltage Protection

Typical Half-Brick Footprint



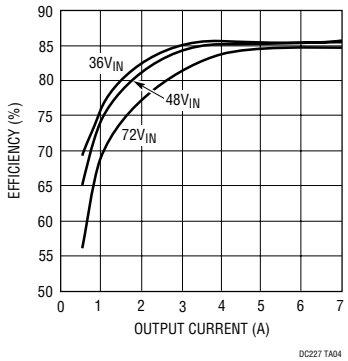
DC227 Fits Standard Footprint

DC227 Simplified Schematic

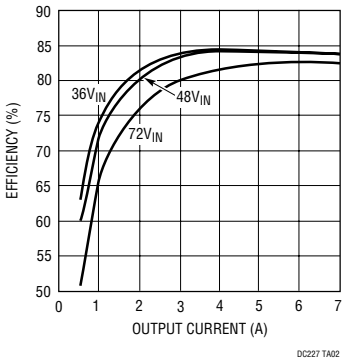


Efficiency

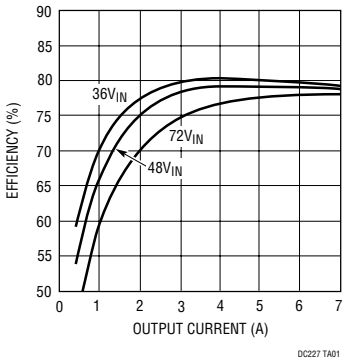
DC227A-C 5V Output Typical Efficiency



DC227A-A/B 5V Output Typical Efficiency



DC227A-A/B 3.3V Output Typical Efficiency



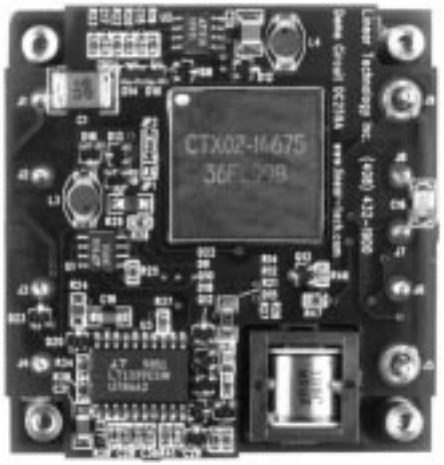
DC259

50W

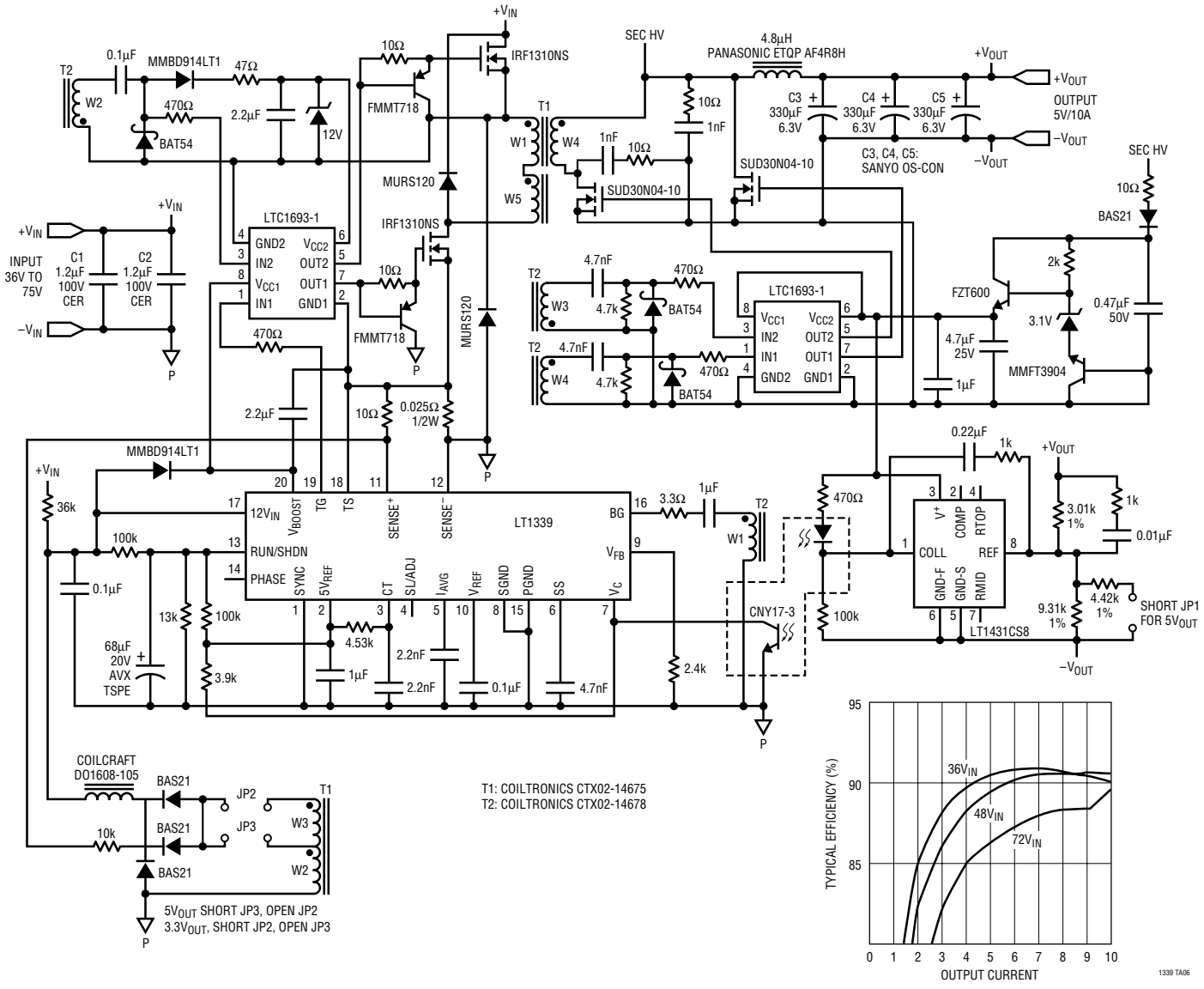
Description:

- Board Level Replacement for "Half-Brick" DC/DC Converters
- Isolated 3.3V or 5V at 10A Output from 36V to 72V DC
- High Efficiency Eliminates Heat Sinks in Many Systems
- Fast Turn-On Time
- Undervoltage Lockout with Hysteresis
- Continuous Short-Circuit Protection
- Overvoltage Protection

DC259 Fits Half-Brick Footprint



DC259 Basic Schematic and Efficiency



Example Module Equivalents

"10W" (1" × 2") Size Package

Vendor	Part Numbers	Isolated (V)	V_{IN} (V)	I_{OUT} (A)	Efficiency (%)	Comments
5V Output, Isolated						
Artesyn	LPD10-48S05C	500	20 to 75	0.267	78 Typ	Wider Body
IPS	WB301, WH301	500	36 to 72	1, 1.5	75 Typ	Wider Body
Datel	UWR-5/1800-D48A	1500	18 to 72	1.8	77 Min	
Power One	DFC10E48S5	1544	36 to 72	2	81 Typ	
Lucent	LW010A	1500	36 to 75	2	81 Typ	
Astec	AA10B-048L-050S, AA10U-048L-050S	1500	36 to 75	2	83, 82 Typ	
IPD	IAS010ZG	1500	34 to 75	2	78 Typ	
Artesyn	CXA10-48S3V3, BXA10-48S05	1500	18 to 75	2	81, 82 Typ	
Linear Technology	DC211A-A	500	36 to 72	2	79 Typ	10W
Datel	UWR-5/3000-D48A	1500	36 to 72	3	81 Min	
IPS	WC301	500	36 to 72	3	84 Typ	Wider Body
12V Output, Isolated						
Artesyn	LPD10-48S12C	500	20 to 75	0.253	79 Typ	Wider Body
IPS	WB302, WH302	500	36 to 72	0.47, 0.625	76, 79 Typ	Wider Body
Datel	UWR-12/750-D48A	1500	18 to 72	0.75	80 Min	
Lucent	LW010B	1500	36 to 75	0.83	81 Typ	
Astec	AA10B-048L-012S, AA10U-048L-012S	1500	36 to 75	0.83	83, 82 Typ	
Artesyn	CXA10-48S3V3, BXA10-48S12W	1500	18 to 75, 36 to 75	0.83	83, 85 Typ	
Power One	DFC10E48S12	1544	36 to 72	0.9	83 Typ	
IPD	IAS012ZH	1500	34 to 75	1	82 Typ	
Linear Technology	DC211A-C	1500	36 to 72	1	80 Typ	12W
Datel	UWR-12/1250-D48A	1500	36 to 72	1.25	81 Min	
Lucent	LW015B	1500	36 to 75	1.25	78 Typ	
IPS	WB302	500	36 to 72	1.25	84 Typ	Wider Body
±5V Output, Isolated						
Datel	BWR-5/500-D48A, BWR-5/700-D48A	1000	36 to 72, 18 to 72	0.5, 0.7	75, 79 Min	
Artesyn	LPD10-48D05C	500	20 to 75	0.6	79 Typ	Wider Body
Astec	AA10B-048L-050D, AA10U-048L-050D	1500	36 to 75	0.75	83, 82 Typ	
Power One	DFC10U48D5	700	18 to 72	0.8	79 Typ	
Lucent	LW010AJ	1500	36 to 75	1	77 Typ	
Artesyn	CXA10-48S3V3, BXA10-48D05	1500	18 to 75	1	81, 82 Typ	
Linear Technology	DC211A-B	1500	36 to 72	1	77 Typ	10W

Half-Brick Package

Vendor	Part Numbers	Isolated (V)	V_{IN} (V)	I_{OUT} (A)	Efficiency (%)	Comments
3.3V Output, Isolated						
Vicor	VI-J3Y-EZ, VI-JNY-EZ	1500	42 to 60, 36 to 72	5	78, 88 Typ	
IPD	HAS020ZE-A	1500	34 to 75	6	79 Typ	
Lucent	JW030F-M	1050	36 to 75	6.5	75 Typ	
Linear Technology	DC227A	500, 1500	36 to 72	7	80 Typ	23W
PICO Elect.	LPB3.3S	1000	36 to 72	9.1	74 Typ	
Lucent	JW050F1, JAW050F	1500	36 to 75	10	82, Typ	
IPD	HBS033ZE-A, HES033ZE-A	1500	34 to 75	10	80, 87 Typ	
Vicor	VI-J3Y-EY, VI-JNY-EY	1500	42 to 60, 36 to 72	10	78, 88 Typ	
Artesyn	BXB50-48S3V3FLT	1500	36 to 75	10	77 Typ	
Linear Technology	DC259A	1500	36 to 72	10	86 Typ	33W
5V Output, Isolated						
Vicor	VI-J30-EZ, VI-JN0-EZ	1500	42 to 60, 36 to 72	5	78, 88 Typ	
Lucent	JW030A-M	1050	36 to 75	6	81 Typ	
IPD	HAS030ZG-A	1500	34 to 75	6	84 Typ	
Linear Technology	DC227A	500, 1500	36 to 72	7	85 Typ	35W
Lucent	JW050A1, JAW050A	1500	36 to 75	10	84, Typ	
Pico Verter	pV48-5	1500	36 to 72	10	83 Typ	
IPD	HBS050ZG-A, HES050ZG-A	1500	34 to 75, 36 to 72	10	84, 90 Typ	
Vicor	VI-J30-EY, VI-JN0-EY	1500	42 to 60, 36 to 72	10	78, 88 Typ	
Artesyn	BXB50-48S05FLT	1500	36 to 75	10	82 Typ	
PICO Elect.	LPB5S	1000	36 to 72	10	80 Typ	
Linear Technology	DC259A	1500	36 to 72	10	88 Typ	50W
Datel	UCP-5/12-D48	1500	36 to 75	12	84 Min	
3.3V, 5V, 7V or 12V Outputs, Nonisolated						
Linear Technology	DC224A	Non	4 to 60	3	88 Typ	

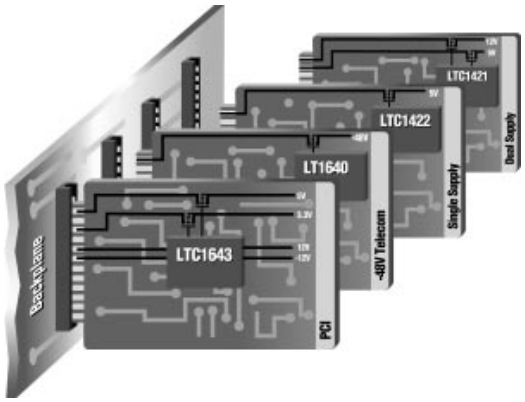
48V Input DC/DC Converters

Equivalent Module Solutions – InfoCard 25

Hot Swap™ Circuits

Features:

- Allows Boards to be Inserted Into Live Backplanes
- Controlled Inrush Current
- Short-Circuit Current Protection
- Voltage Monitoring
- Overvoltage Protection
- Microprocessor RESET
- Programmable Voltage Ramp Rate
- Foldback Current Limiting
- Power Supply Sequencing
- No Floating Grounds or Level Shifting of Logic Signals



Device	# Supplies	Supplies	Features
LTC1421	2	3V to 12V	Controls 3rd Rail to –12V
LTC1422	1	3V to 12V	SO-8
LT1640	1	–10V to –80V	–48V Supplies in SO-8
LT1641	1	9V to 80V	48V Supplies, SO-8, Foldback I_{LIMIT}
LTC1642	1	3V to 16.5V	Fault Protected to 33V, 16-Pin SSOP
LTC1643	4	3V, 5V, ±12V	Four Supplies, Tiny 16-Pin SSOP, CompactPCI™
LTC1645	2	1.2V to 12V	Also for Power Sequencing, 16-Pin SSOP
LTC1647	2	2.7V to 16.5V	Device Bay; Sequencing, SO-8 and 16-Pin SSOP

Other Circuits for Isolated Power and Telecommunications

Function	LTC Circuits	Comments	More Information
SLIC Power Supply	LT1171, LT1006	With On-Chip Ringing, Multiple Outputs	DN130, AN25
Ring Tone Generator	LT1684, LT1166	Software Variable PWM Control, Low THD and Protected from Transients	LT Magazine, 6/99
–48V Supplies from 4V to 20V Sources	LT1171, LTC1624	From 3W to 24W Output Power, Efficiency to 91%, Off-the-Shelf Magnetics	LT Magazine, 5/98 EDN, 11/24/99, p168
–48V to 5V Converters	LT1680 LT1316	Forward Converter Produces 5V at 6A Flyback Converter: 5V at 3.4mA; Low Power	LT Magazine, 8/97 LT Magazine, 5/97
24V and 48V Step-Down Conversion	LT1676, LT1776 LT1072/74/76HV LT1170/71/72 LT1339	7.4V to 60V Inputs, 100/200kHz, 500mA Out 8V to 64V Inputs, 1A to 5A Outputs 3V to 60V Inputs, 100kHz, 1A to 5A Outputs 10V to 60V Input, to 50A Output	LT Magazine, 11/98; DN202 LT Magazine, 2/93; AN31; AN32; AN44 LT Magazine, 6/93, 10/94; DN130 LT Magazine, 11/97; DN156; AN73
High Current Step-Down Conversion	LTC1628 LTC1629 LTC1929	PolyPhase™ Operation Dramatically Reduces Input and Output Ripple, Reduces Inductor Size, Improves Transient Response; Input Voltage to 36V; up to 200A Using All Surface Mount	LT Magazine, 11/99 AN77
Battery Chargers	Many Devices	Linear and Switching Chargers, Terminators; All Battery Types	Power Management Solutions AN68
Isolation Circuits	LTC1531, LTC1145, LTC1146 LT1177	Self-Powered Comparator, $3000V_{RMS}$ Isolation $2500V_{RMS}$ Digital Isolators $2500V_{RMS}$ Isolated MOSFET Drivers	DN204 LT Magazine, 2/93
Hot Swap Circuits	(See Above, Hot Swap Circuits)	For Positive and Negative Voltages to 80V, PCI, Single and Dual Supplies. Control Power Modules	InfoCard 23; New Products Catalog, Volume 2, 1999

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