

## Power Management Solutions for Lattice Programmable Logic Devices

Lattice® ECP4, ECP3, ECP2(M)						Core Voltage: 1.2V
Input Supply	<0.5A	0.5A – 1A	1A – 2A	2A – 3A	3A – 5A	5A – 10A
1.8V	LT®3020 Linear <b>LT3029 Dual Linear</b> LTC®3409A Monolithic	LT3022 Linear LT3085 Linear <b>LT3029 Dual Linear</b>	LT3080 Linear LTC3026 Linear	<b>LT3083 Linear</b> 2 × LT3080-1 Linear	LT3070 Linear LT3071 Linear	LTM4611 µModule
≤5V	LTC3409 Monolithic LTC3419A Dual Monolithic	LTC3569 Triple Monolithic LTC3417A Dual Monolithic LTC3564 Monolithic	LTC3411A Monolithic LTC3417A Monolithic LTC3569 Monolithic	LTC3412A Monolithic LTC3612 Monolithic LTC3615 Dual Monolithic	LTC3616 Monolithic LTM4604A µModule LTM4614 Dual µModule	LTC3418 Monolithic LTC3713 Controller <b>LTC3855 Controller</b>
12V to 24V	<b>LTC3645 Dual Monolithic</b> <b>LTC3688 Dual Monolithic</b> LTM8021 µModule®	<b>LT3507A Triple Monolithic</b> LT3694 Triple Monolithic LTM8022 µModule	LT3503 Monolithic <b>LTC3601 Monolithic</b>	LT3501 Dual Monolithic LT3690 Monolithic LT3972 Monolithic	LTC3609 Monolithic LTC3680 Monolithic <b>LTM4618 µModule</b>	LTC3855 Controller <b>LTC3880 Controller</b> <b>LTM4627 µModule</b>

LatticeSC®						Core Voltage: 1.2V
Input Supply	<0.5A	0.5A – 1A	1A – 3A	3A – 5A	5A – 10A	10A – 15A
1.8V	LT3020 Linear <b>LT3029 Dual Linear</b> LTC3409A Monolithic	LT3022 Linear LT3085 Linear <b>LT3029 Dual Linear</b>	LT3080 Linear LTC3026 Linear 2 × LT3080-1 Linear,	<b>LT3083 Linear</b> LT3070 Linear LT3071 Linear	2 × LT3070 Linear 2 × LT3071 Linear	LTM4611 µModule
2.5V to 5V	LTC3409 Monolithic LTC3419A Dual Monolithic	LTC3569 Triple Monolithic LTC3417A Dual Monolithic LTC3564 Monolithic	LTC3411A Monolithic LTC3417A Monolithic LTC3569 Monolithic	LTC3546 Monolithic LTC3612 Monolithic LTM4604A µModule	LTC3418 Monolithic LTC3616 Monolithic LTM4608A µModule	LTC3869 Controller LTC3610 Monolithic LTM4616 µModule
12V to 24V	<b>LTC3645 Dual Monolithic</b> <b>LTC3688 Dual Monolithic</b> LTM8021 µModule	<b>LT3507A Triple Monolithic</b> <b>LT3694 Triple Monolithic</b> LTM8022 µModule	LT3501 Dual Monolithic LT3503 Monolithic LTC3601 Monolithic	LTC3605 Monolithic <b>LTC3633 Dual Monolithic</b> <b>LTM4618 µModule</b>	LTC3611 Monolithic LTC3855 Monolithic LTM4601A µModule	LTC3855 Controller <b>LTC3880 Controller</b> <b>LTM4628 Dual µModule</b>

Lattice XP2, XP, Mach®XO2, MachXO						Core Voltage: 1.2V, 2.5V or 3.3V
Input Supply	<0.2A	0.2A – 0.5A	0.5A – 1A	1A – 2A	2A – 3A	3A – 5A
1.8V	LT3082 Linear LTC3549 Monolithic LTC3100 Triple Monolithic	LT3085 Linear LT3024 Dual Linear LTC3409A Monolithic	LT3029 Dual Linear LT3022 Linear	LT3080 Linear LT3026 Linear	2 × LT3080-1 Linear LT3083 Linear	LT3070 Linear LT3071 Linear
2.5V to 5V	LT3020 Linear LTC3544 Quad Monolithic LTC3547 Dual Monolithic	LTC3448 Monolithic LTC3407A Dual Monolithic LTC3445 Triple Monolithic	LTC3569 Triple Monolithic LTC3564 Monolithic LTC3520 Monolithic	LTC3546 Dual Monolithic LTC3412A Monolithic	LTC3615 Dual Monolithic LTC3612 Monolithic LTM4604A µModule	LTC3414 Monolithic LTC3616 Monolithic LTM4608A µModule
12V to 24V	LT3502 Monolithic <b>LT3645 Dual Monolithic</b>	LT3509 Dual Monolithic LT3689 Monolithic LTM8021 µModule	<b>LT3694 Triple Monolithic</b> LT3507A Triple Monolithic LT3480 Monolithic	LT3510 Dual Monolithic LT3685 Monolithic LTM8032 µModule	<b>LT3690 Monolithic</b> LT3501 Dual Monolithic LT3692 Dual Monolithic	LTC3609 Monolithic LT3972 Monolithic LTM4618 µModule

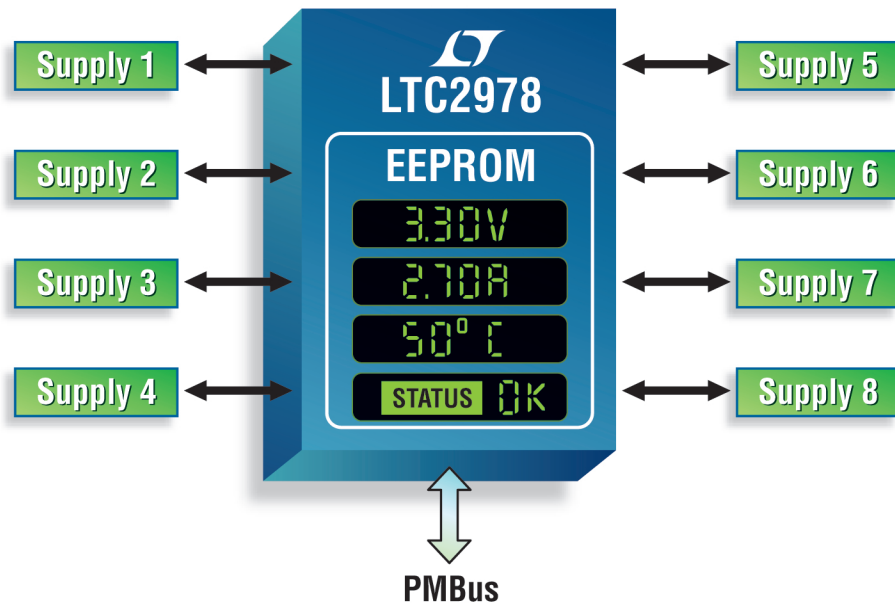
ispMACH® 4000ZE/Z, ispMACH 4000V/B/C				Core Voltage: 1.8V, 2.5V, 3.3V	
Input Supply	<0.2A	0.2A – 0.3A	0.3A – 0.5A	0.5A – 1A	1A – 2A
1.8V	LT3082 Linear LTC3549 Monolithic LTC3100 Triple Monolithic	LT3082 Linear LTC3025 Linear LTC3035 Linear	LT3021 Linear LTC3025-1 Linear	LT3022 Linear LT3029 Dual Linear	LT3083 Linear LTC3026 Linear 2 × LT3080 Linear
2.5V to 5V	LT3020 Linear LTC3544 Quad Monolithic LTC3547 Dual Monolithic	LTC3410 Monolithic LTC3547 Dual Monolithic LTC3544 Quad Monolithic	LTC3406A Monolithic LTC3447 Monolithic LTC3670 Triple Monolithic	LTC3561A Monolithic LTC3417A Dual Monolithic LTC3569 Triple Monolithic	LT3546 Dual Monolithic LTC3412A Monolithic LTC3612 Monolithic
12V to 24V	LT3502 Monolithic LT3645 Dual Monolithic	LT3502 Monolithic LT3645 Dual Monolithic	LT3688 Dual Monolithic LT3689 Monolithic LTM8021 µModule	LT3695 Monolithic LT3506 Dual Monolithic LTM8022 µModule	LT3480 Monolithic LT3500 Dual Monolithic LTM8023 µModule

DDR/Active Bus Termination				
Input Supply	<±1.5A	<±3.0A	<±6.0A	>±6.0A
2.25V to 5.5V	LTC3612 Monolithic LTC3615 Dual Monolithic	LTC3614 Monolithic LTC3616 Monolithic <b>LTC3618 Monolithic</b>	<b>LTC3617 Monolithic</b>	LTC3718 Controller
>5.5V		<b>LTC3634 Monolithic</b>		LTC3718 Controller <b>LTC3876 Controller</b>

New products highlighted in bold.

# PMBus Digital Power Management

To Monitor and Sequence Multiple Rails on **LATTICE™** Based Systems



## Eight Channels of Power Supply Monitoring & Control

The LTC<sup>®</sup>2978 digital power manager offers accurate fault monitoring thresholds and adjustments, along with a wide array of supervisory features. The PMBus and GUI accesses an onboard EEPROM where user settings, measurements and faults are stored, and later interrogated for diagnostic purposes. With just two connections, the LTC2978 can be cascaded for systems that monitor more than eight supply voltages. A multitude of built-in functions makes the LTC2978 a convenient all-in-one solution for CPUs, FPGAs or ASICs that require uncompromised sequencing and monitoring over up to eight voltage rails.

### ▼ Features

- PMBus Compliant Interface and Command Set
- Configuration and Fault Logging to Internal EEPROM
- Fast Supervisor Control of  $V_{IN}$  for POL Overvoltage Protection
- 15-bit  $\Delta\Sigma$  ADC with Less Than  $\pm 0.25\%$  of Total Unadjusted Error Using On-Chip Reference
- Programmable Watchdog Timer
- Voltage Servo Adjusts Supply Voltages by Ramping IDAC Outputs Up/Down
- Support for Autonomous, Multichannel Fault Management
- On-Chip Digital Temperature Sensor
- 64-lead 9mm x 9mm QFN Package

### User Configurations

File	Edit	User Configurations	Help
		Undervoltage Setting	
		Overvoltage Setting	
		Supervising	
		Sequencing	
		Margining	
		Voltage Programming	
		Voltage Measurement	
		Current Measurement	
		Temperature Measurement	
		Fault Recording & Response	

### ▼ Info & Samples

[www.linear.com/2978](http://www.linear.com/2978)

1-800-4-LINEAR



Telecom,  
Datacom and  
Industrial Brochure

[www.linear.com/48vsolutions](http://www.linear.com/48vsolutions)



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LTspice<sup>®</sup> is a SPICE simulator for power supply, amplifier and filter designs

