

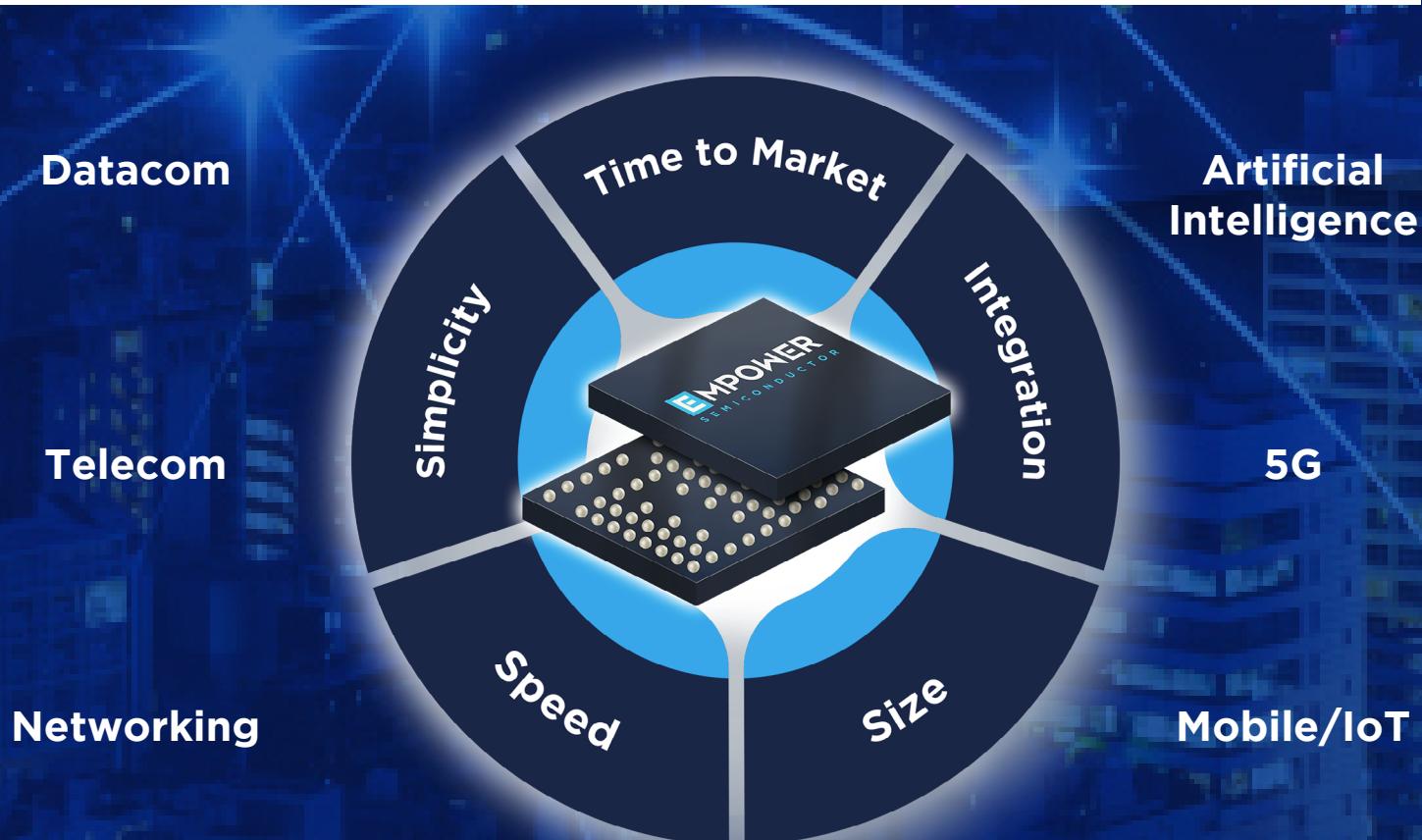
We Minimize the Energy Footprint of the Digital Economy

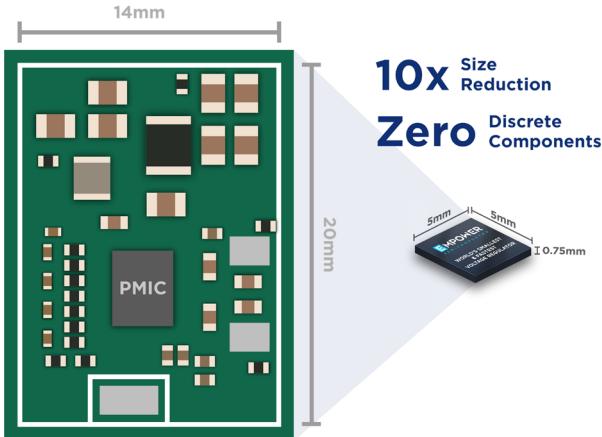


EMPOWER
SEMICONDUCTOR

Power Management Solutions for High Density Data Intensive Applications

- Industry's smallest and fastest step-down converters
 - 10x smaller, 1,000x faster, 30% more energy efficient
 - Single chip Integrated Voltage Regulator (IVR)
 - High frequency - Zero external discrete component
- Smallest and highest performance silicon capacitor
- World class wafer foundry, assembly and test
- Headquartered in San Jose, California
 - Worldwide Sales Representatives and Distributors





Empowering Density

10x Smaller...

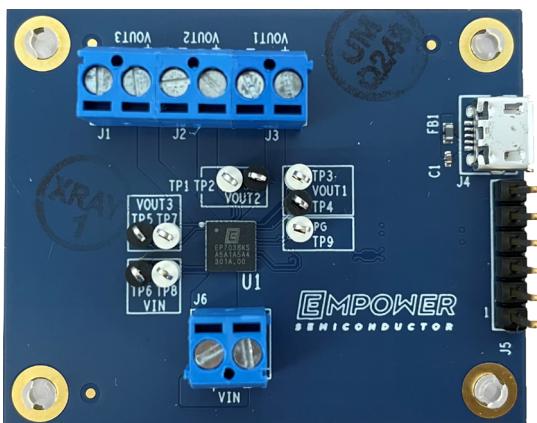
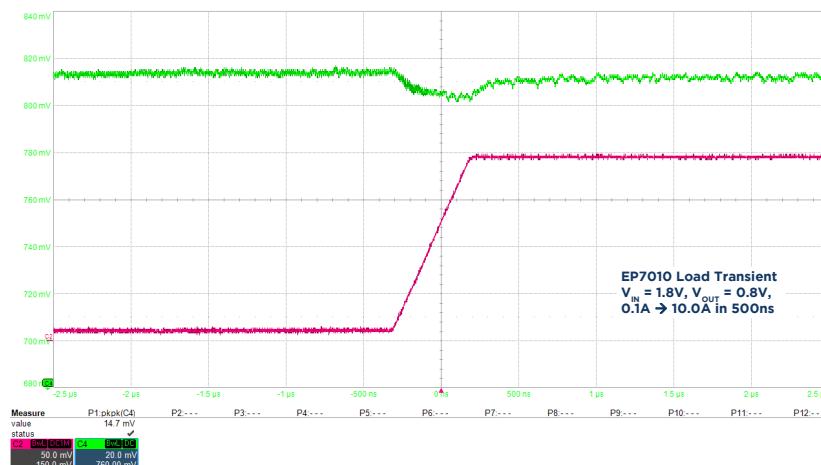
- Industry's smallest step-down regulator packs the highest power in the smallest footprint.
- High density E-CAP™ shrinks banks of high-speed decoupling MLCC capacitors.

Empowering Performance

1000x Faster

World's fastest regulator with 15mV droop in 500ns full load step and ExpressV™ DVS up to 5mV/ns provide less commutation losses for greater system efficiency.

EP7010 - Output Voltage Transient Load Response, 0.8V Output, 1.8V Input, 100mA to 10A Load in 500ns



EP7038 Demo Board

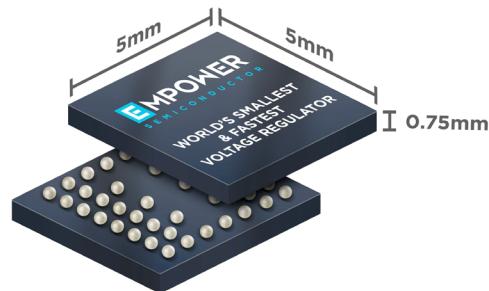
Empowering Simplicity

Place One and Done!

- Single component Bill-of-Material
- I²C field re-configuration
- Fastest time to market design
- Increased reliability



Industry's Smallest and Fastest Integrated Voltage Regulator



Empower's patented IVR™ technology eliminates dozens of discrete components. The result is power delivery with unprecedented simplicity, speed, accuracy, and no discrete components!

EP70xx

EP71xx

10A total current

12A total current

1-3 outputs

1-4 outputs

1.8V_{IN} optimized

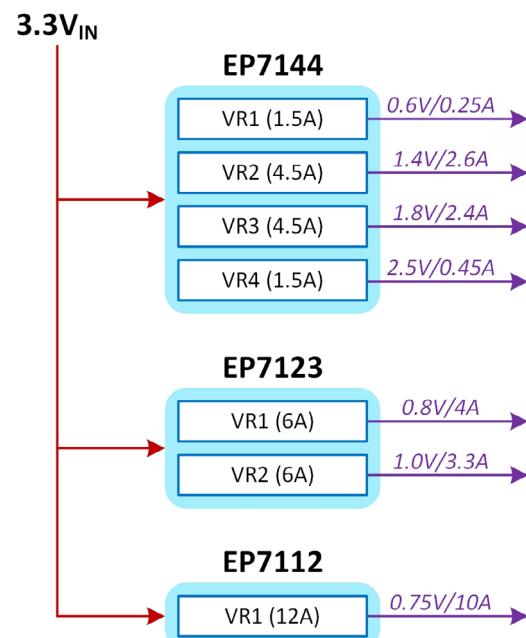
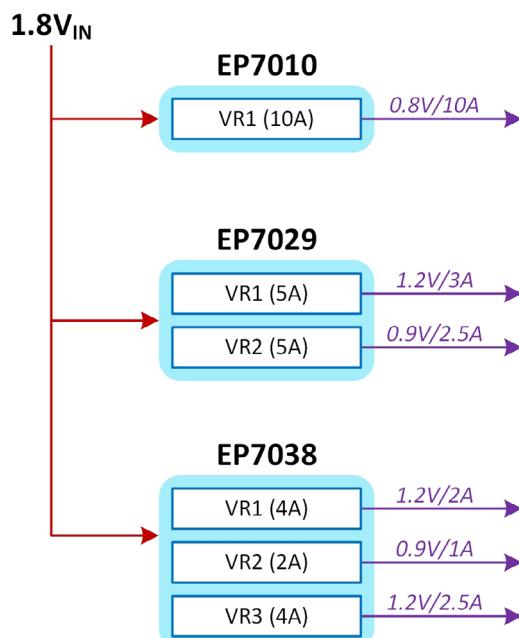
3.3V_{IN} optimized

I²C interface

I²C interface

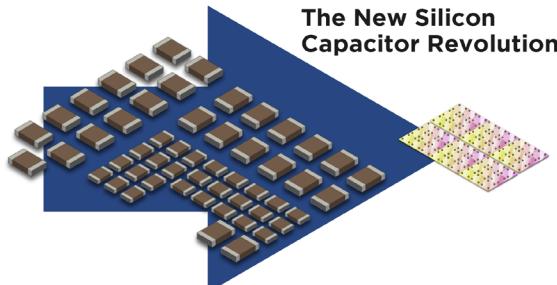
5mm x 5mm package

5mm x 7mm package



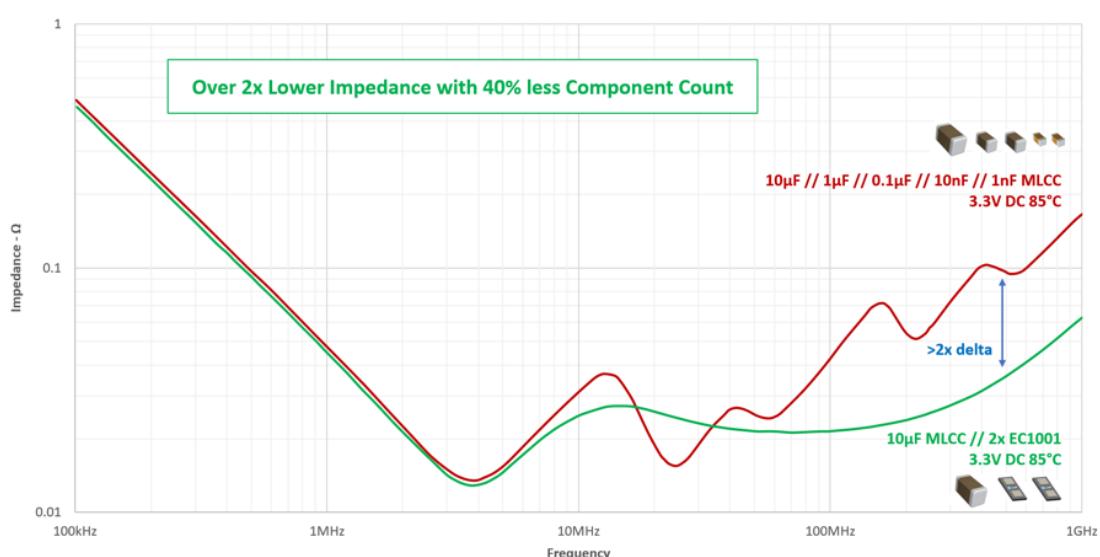
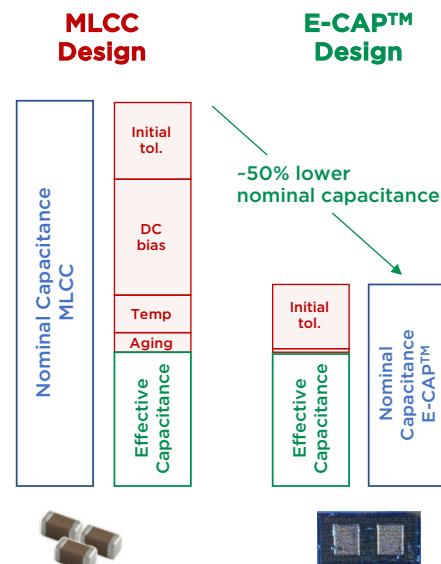


Enabling New Levels of Power and Signal Integrity!



Empower's E-CAP™ is a revolutionary capacitor platform enabling higher performance and density than traditional MLCC.

- 1.1 $\mu\text{F}/\text{mm}^2$ high capacitance density
- Superior stability
 - No DC or AC bias derating
 - No temperature derating
 - No aging derating
- 15pH ultra low ESL
- As low as 50 μm thickness
- No audible noise susceptibility



Characteristics of local de-coupling of MLCC combo vs E-CAP™

12V_{IN} Solutions – Intermediate Bus Architecture

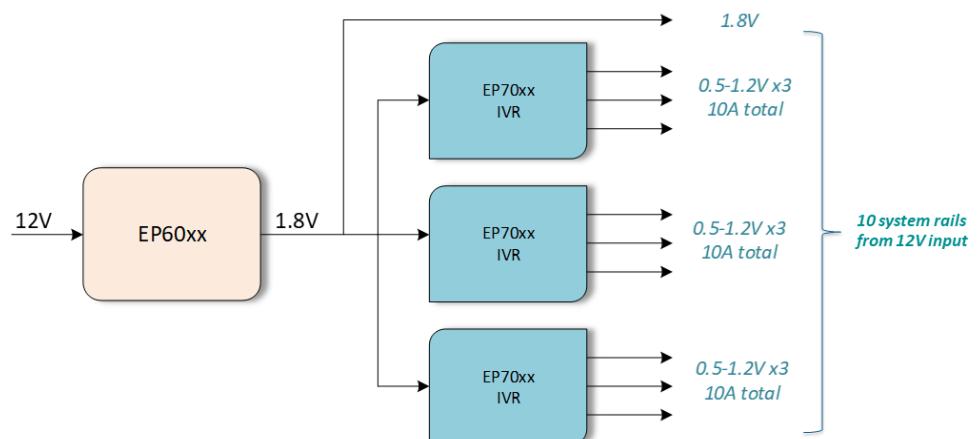
EP60xx

15A/30A total current

1 output

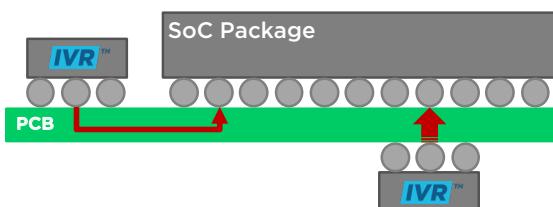
12V_{IN} optimized

5mm x 5mm package

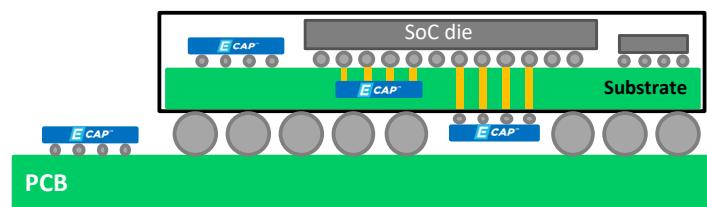


Integration for Improved Performance

Empower's IVR™ and E-CAP™ solutions thinness allow for components to be placed as close as possible to the load. Shortening the distance between the decoupling capacitors or the power converter to the active load improves performance and reliability.



IVR™ can be mounted on back side of PCB to deliver low loss efficient vertical current to the SoC



E-CAP™ can be mounted in-package for best-in-class bypass and filtering

Empower Product Families

IVR and Power Converters

Part Number	Outputs	Output 1	Output 2	Output 3	Output 4	VIN	Package Size (mm ²)	Solution Size (mm ²)	Type
EP7112	2	1	12A	-	-	3.3V	5 x 7	35	IVR
EP7122		9A	3A	-	-				
EP7123		6A	6A	-	-				
EP7139		9A	1.5A	1.5A	-				
EP7136		6A	3A	3A	-				
EP7133		3A	3A	3A	-				
EP7144		4.5A	4.5A	1.5A	1.5A				
EP7143		3A	3A	3A	3A				
EP7142		1.5A	1.5A	1.5A	1.5A				
EP7010	1	10A	-	-	-	1.8V	5 x 5	25	IVR
EP7015		5A	-	-	-				
EP7027	2	8A	2A	-	-				
EP7028		6A	4A	-	-				
EP7029		5A	5A	-	-				
EP7024		3A	3A	-	-				
EP7037	3	6A	2A	2A	-				
EP7038		4A	4A	2A	-				
EP7032		2A	2A	2A	-				
EP6069	1	30A	-	-	-	4.5V-24V	5 x 5	~350	Buck
EP6070		15A	-	-	-	6.5V-28V	4 x 4	~250	

E-CAP™

Part Number	# Capacitors	Capacitance	Operating Voltage	Package Size (mm ²)	Package Thickness (mm)
EC1001P	1	220nF	4.0V	1.0 x 0.5 (0402)	0.150
EC1100P	5	3x 110nF 1x 145nF 1x 200nF	4.0V	2.5 x 0.6	0.150
EC2047B	17	1x 600nF 11x 200nF 5x 400nF	2.0V	2.3 x 1.9	0.200

Empower's E-CAP™ technology can be customized to fit specific design requirements: capacitance, form factor, pitch, configuration, etc. Contact us for more information



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