

## Conv DC-DC 2.95V to 6V Synchronous Step Down Single-Out 0.6V to 4.5V 1A Automotive 24-Pin WQFN EP T/R

<b>Manufacturer:</b>	<a href="#">Texas Instruments, Inc</a>	<a href="#">TPS54116QRTWRQ1 Image</a>
<b>Package/Case:</b>	WQFN-24	Images are for reference only
<b>Product Type:</b>	Power Management ICs	<a href="#">Inquiry</a>
<b>RoHS:</b>	RoHS Compliant/Lead free 	
<b>Lifecycle:</b>	Active	

### General Description

The TPS54116-Q1 device is a full featured 6-V, 4-A, synchronous step down converter with two integrated MOSFETs and 1-A sink/source double data rate (DDR) VTT termination regulator with VTTREF buffered reference output.

The TPS54116-Q1 buck regulator minimizes solution size by integrating the MOSFETs and reducing inductor size with up to 2.5-MHz switching frequency.

The switching frequency can be set above the medium wave radio band for noise sensitive applications and is synchronizable to an external clock.

Synchronous rectification keeps the frequency fixed across the entire output load range. Efficiency is maximized through integrated 25-mΩ low-side and 33-mΩ high-side MOSFETs. Cycle-by-cycle peak current limit protects the device during an overcurrent condition and is adjustable with a resistor at the ILIM pin to optimize for smaller inductors.

The VTT termination regulator maintains fast transient response with only  $2 \times 10\text{-}\mu\text{F}$  ceramic output capacitance reducing external component count. The TPS54116-Q1 uses remote sensing of VTT for best regulation.

Using the enable pins to enter a shutdown mode reduces supply current to 1-μA. Under voltage lockout thresholds can be set with a resistor network on either enable pin. The VTT and VTTREF outputs are discharged when disabled with ENLDO.

Full integration minimizes the IC footprint with a small 4 mm × 4 mm thermally enhanced WQFN package.

## Key Features

AEC-Q100 Qualified With the Following Results:

Device Temperature Grade 1:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  Ambient Operating Temperature Range

Device HBM ESD Classification Level 2

Device CDM ESD Classification Level C6

Single-chip DDR2, DDR3 and DDR3L Memory Power Solution

4-A Synchronous Buck Converter

Integrated 33-m $\Omega$  High-side and 25-m $\Omega$  Low-side MOSFETs

Fixed Frequency Current-mode Control

Adjustable Frequency from 100 kHz to 2.5 MHz

Synchronizable to an External Clock

0.6-V  $\pm 1\%$  Voltage Reference Over Temperature

Adjustable Cycle-by-Cycle Peak Current Limit

Monotonic Start-up Into Pre-biased Outputs

1-A Source/Sink Termination LDO with  $\pm 20\text{-mV}$  DC Accuracy

Stable with  $2 \times 10\text{-}\mu\text{F}$  MLCC Capacitor

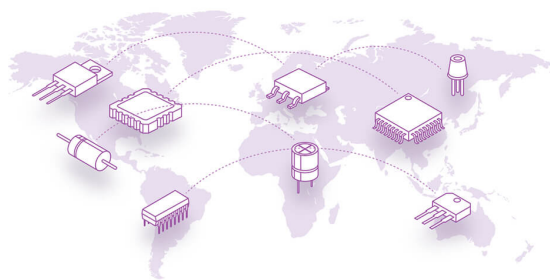
10-mA Source/Sink Buffered Reference Output Regulated to Within 49% to 51% of VDDQ

Independent Enable Pins with Adjustable UVLO and Hysteresis

Thermal Shutdown

$-40^{\circ}\text{C}$  to  $150^{\circ}\text{C}$  Operating  $T_J$

24-pin, 4-mm  $\times$  4-mm WQFN Package



## Recommended For You

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### **TPD3S014DBVR**

Texas Instruments, Inc  
SOT23-6

### **TPS2065CDBVR**

Texas Instruments, Inc  
SOT23-5

### **TPS2557DRBT**

Texas Instruments, Inc  
SON8

### **TPS2042BDR**

Texas Instruments, Inc  
SOP8

### **TPS2051BDR**

Texas Instruments, Inc  
SOP8

### **TPL7407LPWR**

Texas Instruments, Inc  
TSSOP16

### **TPS23753APWR**

Texas Instruments, Inc  
TSSOP14

### **TPS2116DRLR**

Texas Instruments, Inc  
SOT5X3-8

### **TPS259460ARPWR**

Texas Instruments, Inc  
VQFN-10

### **TPS23751PWPR**

Texas Instruments, Inc  
HTSSOP16

### **TPS65150QPWPRQ1**

Texas Instruments, Inc  
HTSSOP-24

### **TPS2410PWR**

Texas Instruments, Inc  
TSSOP-14

### **TPS22914BYFPR**

Texas Instruments, Inc  
DSBGA4

### **TPS2115ADRBR**

Texas Instruments, Inc  
VSON8

### **TPS2113ADRBR**

Texas Instruments, Inc  
SON8