KTF28-2 2A HIGH FREQUENCY SYNCHRONOUS STEP DOWN CONVERTER

Description

KTF28-2 is a 2A synchronous buck converter based on original Texas Instrument TPS54202 4.5V to 28V input, 2A output, EMI Friendly synchronous step down converter. This converter utilizes two internal MOSFETs with ultra low on resistance, excellent internal loop compensation based on input and output voltage, a 5ms internal soft start to ensure smooth start up without a huge inrush current at powerups.

This converter has been designed with space in mind and it's small foot print ensure the best use of space with highest power density possible. The frequency spread spectrum operation is introduced to reduce EMI emission while operating under different conditions.

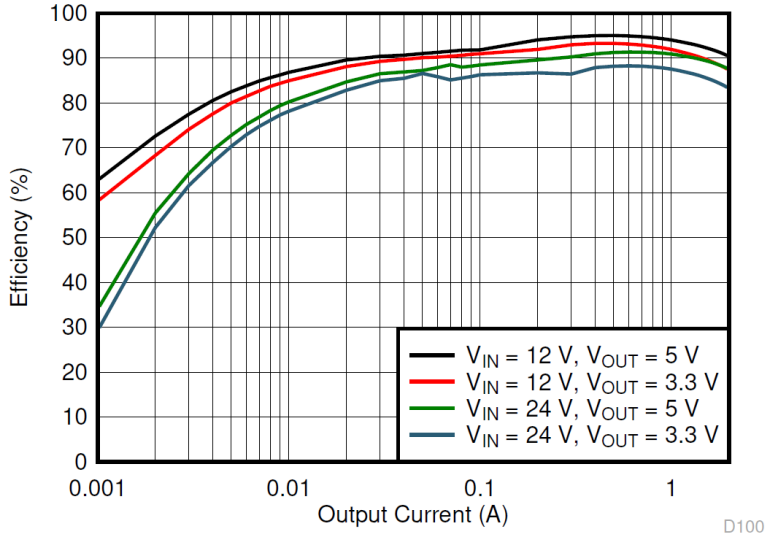
Cycle by Cycle current limiting on both high-side MOSFET protects the converter in an overload condition and enhanced by a low-side MOSFET freewheeling current limit which prevents current runaway and hiccup protection mode is triggered if the overcurrent condition has persisted for longer than the present time.

Features

- 4.5V to 28V wide input voltage range
- 1.8V to input-V wide output voltage range
- Integrated 148-mΩ and 78-mΩ MOSFETs for 2-A,
- continuous output current
- Low 2-µA shutdown, 45-µA quiescent current
- Internal 5-mS soft start
- Fixed 500-kHz switching frequency
- Frequency spread spectrum to reduce EMI
- Advanced Eco-mode™ pulse skip
- Peak current mode control
- Internal loop compensation
- Overcurrent protection for both MOSFETs with
- hiccup mode protection
- Overvoltage protection
- Thermal shutdown
- Small foot print

Applications

- 12-V, 24-V distributed power-bus supply
- Industry application
- White goods
- Consumer application
- Audio
- STB, DTV
- Printer



Efficiency vs Output Current

*TJ = –40°C to +125°C, VIN = 4.5 V to 28 V

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Electrical Characteristics

The electrical ratings specified in this section apply to all specifications in this document, unless otherwise noted. These specifications are interpreted as conditions that do not degrade the device parametric or functional specifications for the life of the product containing it. TJ = –40°C to +125°C, VIN = 4.5 V to 28 V, (unless otherwise noted).

	PARATMETER	MIN	TYP	MAX	UNIT
INPUT SUPPLY					
V_{in}	Input voltage range	4.5	-	25	V
I_Q	Non switching quiescent current		45		µA
I_{OFF}	Shut down current		2		µA
V_{UVLO}	VIN under voltage lockout	3.4	-	4.4	V
FEEDBACK AND ERROR AMPLIFIER					
V_{FB}	Feedback Voltage	0.581	0.596	0.611	V
OUTPUT VOLTAGE					
V_{out}	Output Voltage	1.8	-	V_{in}	V
I_{out}	Output Current	0	-	2	A
R_{HSD}	High-side FET on resistance		148		mΩ
R_{LSD}	Low-side FET on resistance		78		mΩ
CURRENT LIMIT					
V_{LIM}	Output Current Limit	2	-	4.3	A

*All values are production tested.

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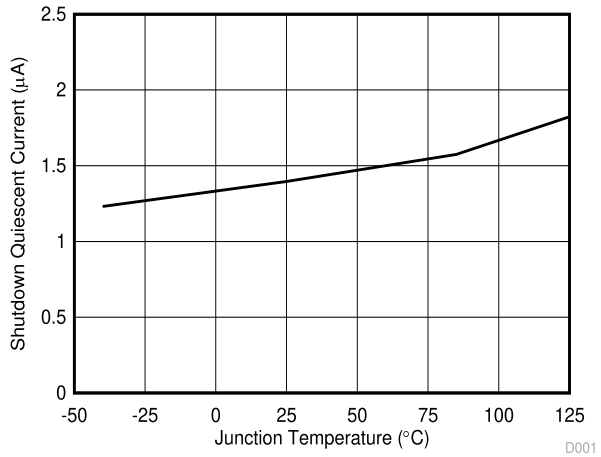
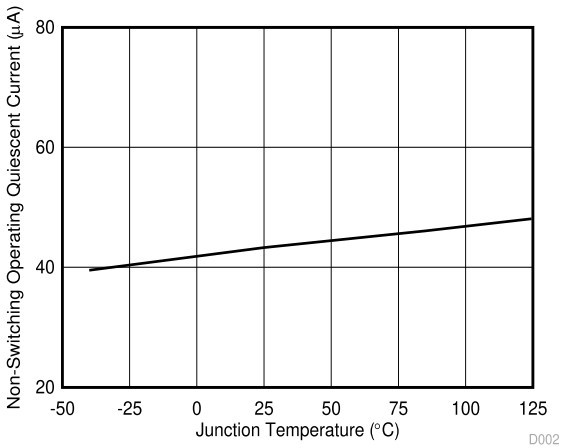
Typical Characteristics

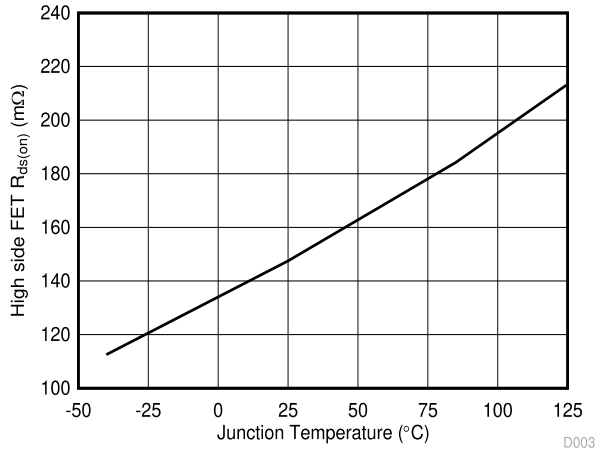
VIN = 12, unless otherwise specified



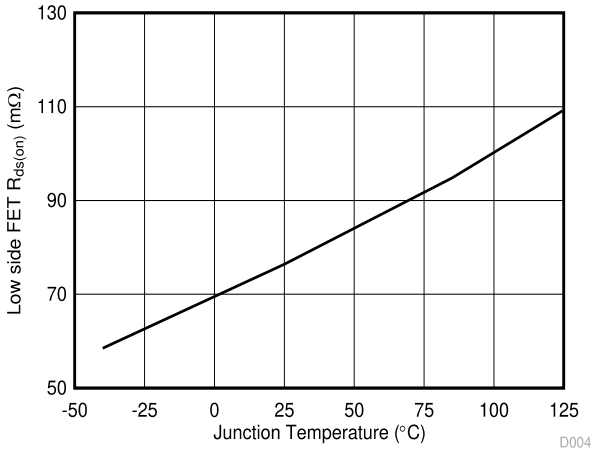
Shutdown Quiescent Current vs Junction Temperature



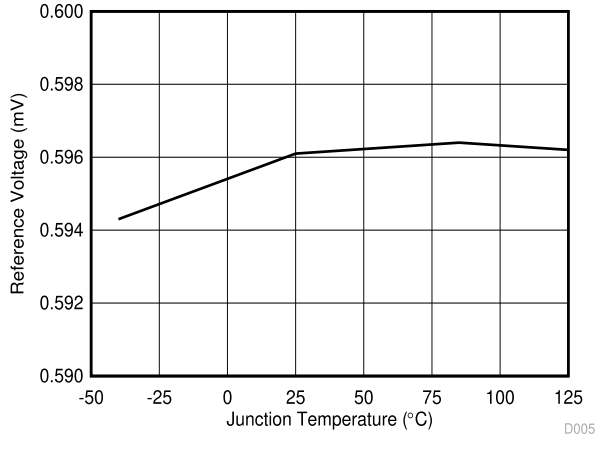
Non-Switching Operating Quiescent Current vs Junction Temperature



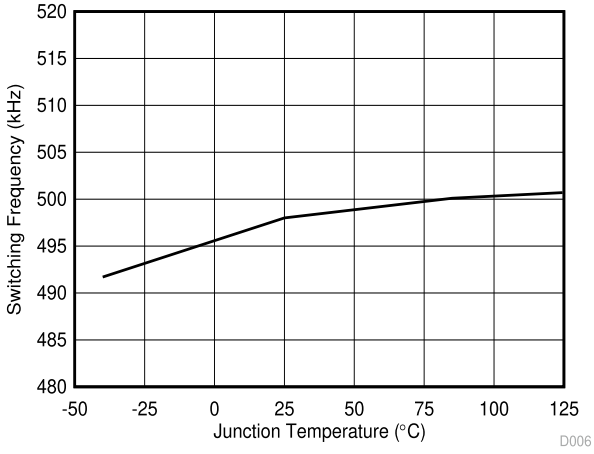
High-Side Resistance vs Junction Temperature



Low-Side FET On Resistance vs Junction Temperature



Reference Voltage vs Junction Temperature



Centre Switching Frequency vs Junction Temperature

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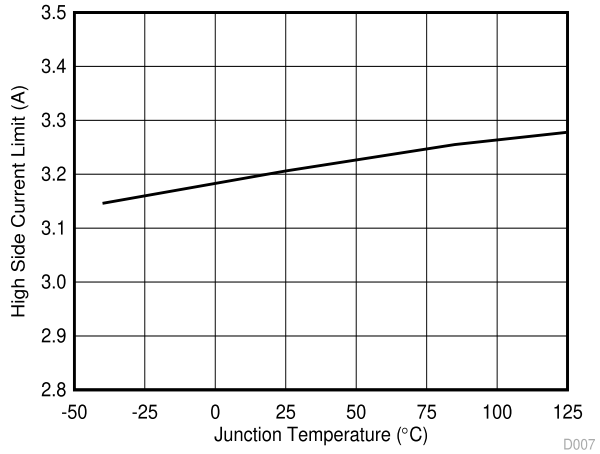
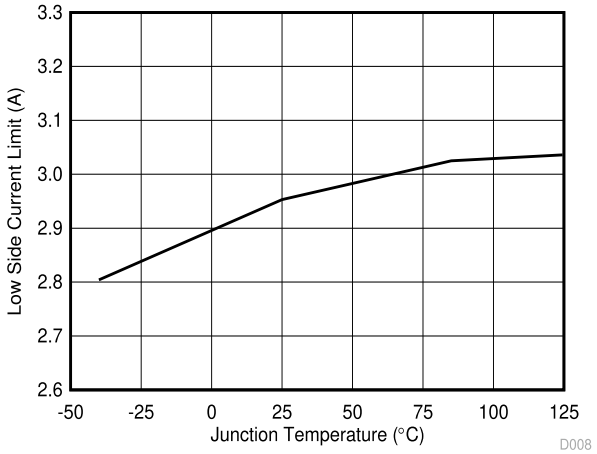
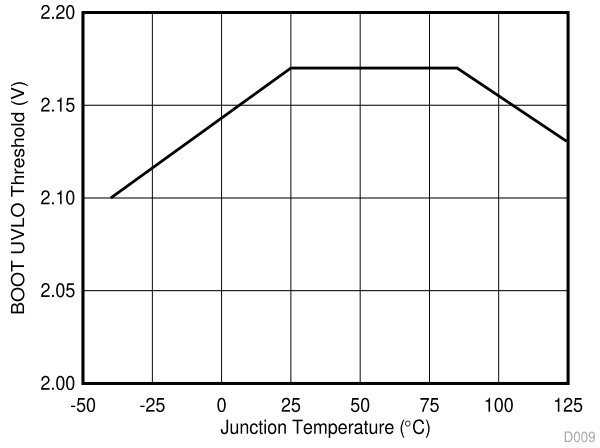


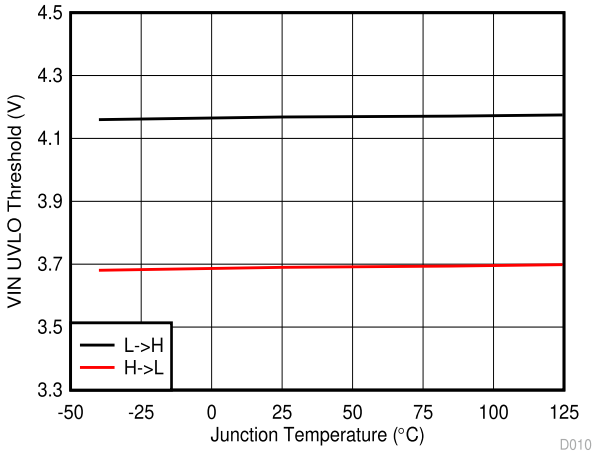
High-Side Current Limit Threshold vs Junction Temperature



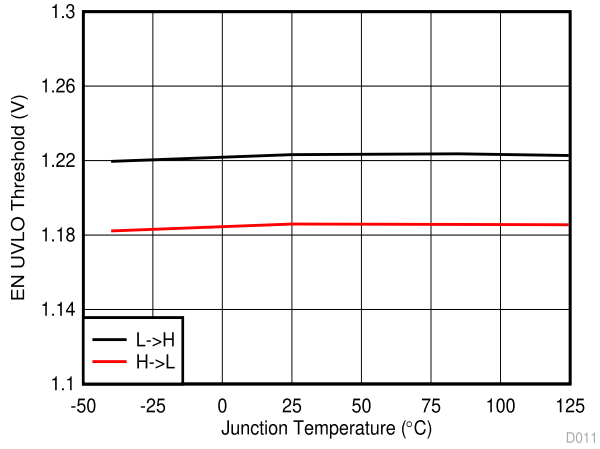
Low-Side Current Limit Threshold vs Junction Temperature



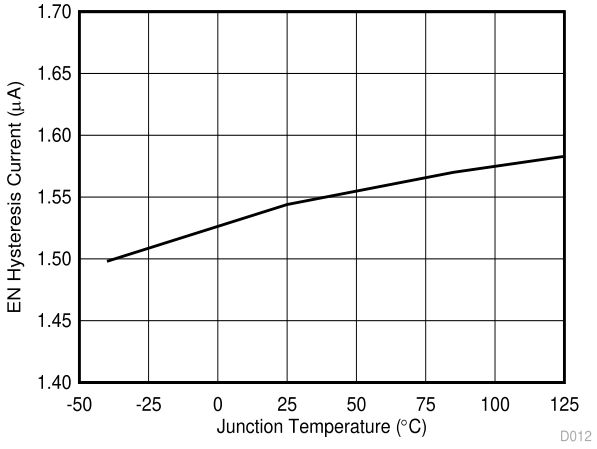
BOOT-SW UVLO Threshold vs Junction Temperature



VIN UVLO Threshold vs Junction Temperature



EN Threshold vs Junction Temperature



EN Hysteresis Current vs Junction Temperature

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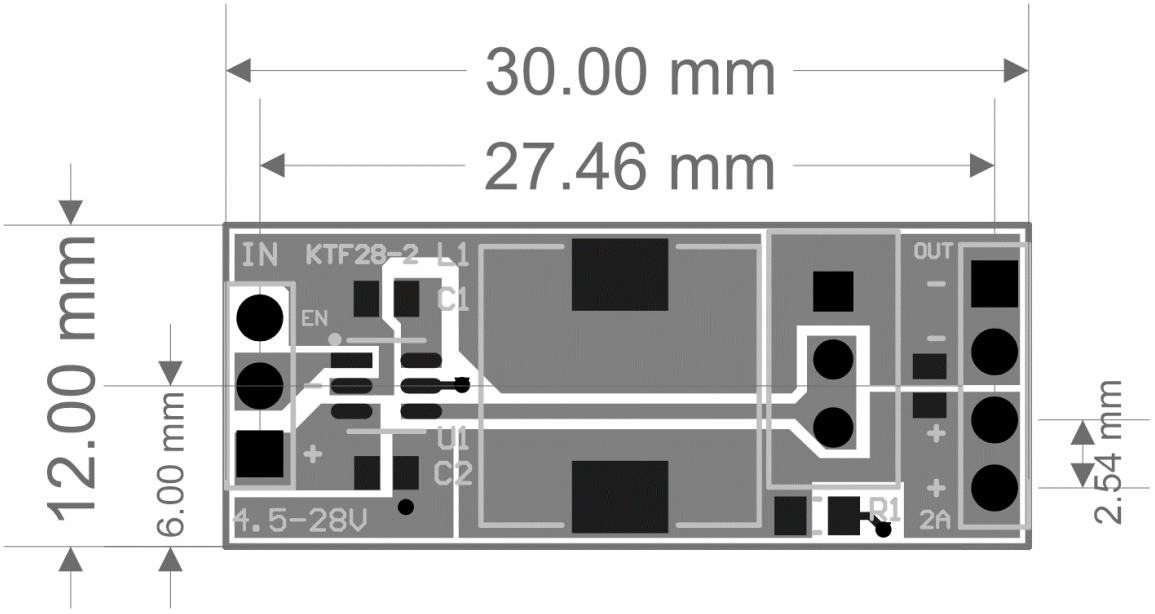
Typical Dimensions

Add 0.5% tolerance to all dimensions for easier designing.



	PARATMETER	VALUE	UNIT
L	Length	30	mm
W	Width	12	mm
H	Height	12	mm
W	Weight	١٥٥	gr
P	Input-Output Pins Pitch	2.54	mm
D	Input-Output Pins Distance	27.46	mm

* Drawings are not to scale.