Wide Input 2A Step-Down Converter

Features

- 2A Output Current
- 4.75V to 24V Input Range
- 8μA Shutdown Supply Current
- 390KHz to 2MHz Operating Switching Frequency
- Adjustable Output Voltage
- Cycle-by-Cycle Current Limit Protection
- Thermal Shutdown Protection
- Frequency Foldback at Short Circuit
- Stability with Wide Range of Capacitors, Including Low ESR Ceramic Capacitors

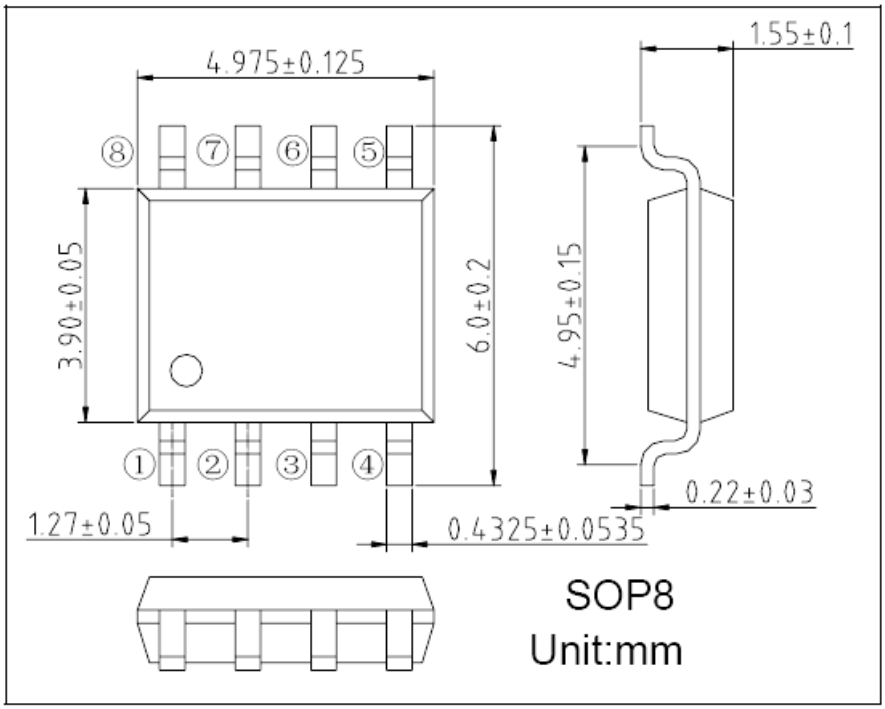
General Description

The TG1004B is a current-mode step-down DC/DC converter that generates up to 2A of output current at390KHz to 2MHz switching frequency. The device utilizes special process for operation with input voltages up to 24V. Consuming only 8μA in shutdown mode, the TG1004B is highly efficient with peak operating efficiency at 95%. Protection features include cycle-by-cycle current limit, thermal shutdown, and frequency foldback at short circuit. The TG1004B is available in a SOP-8 package and requires very few external devices for operation

Applications

- TFT LCD Monitors
- Portable DVDs
- Car-Powered or Battery-Powered Equipments
- Set-Top Boxes
- Telecom Power Supplies
- DSL and Cable Modems and Routers
- Termination Supplies

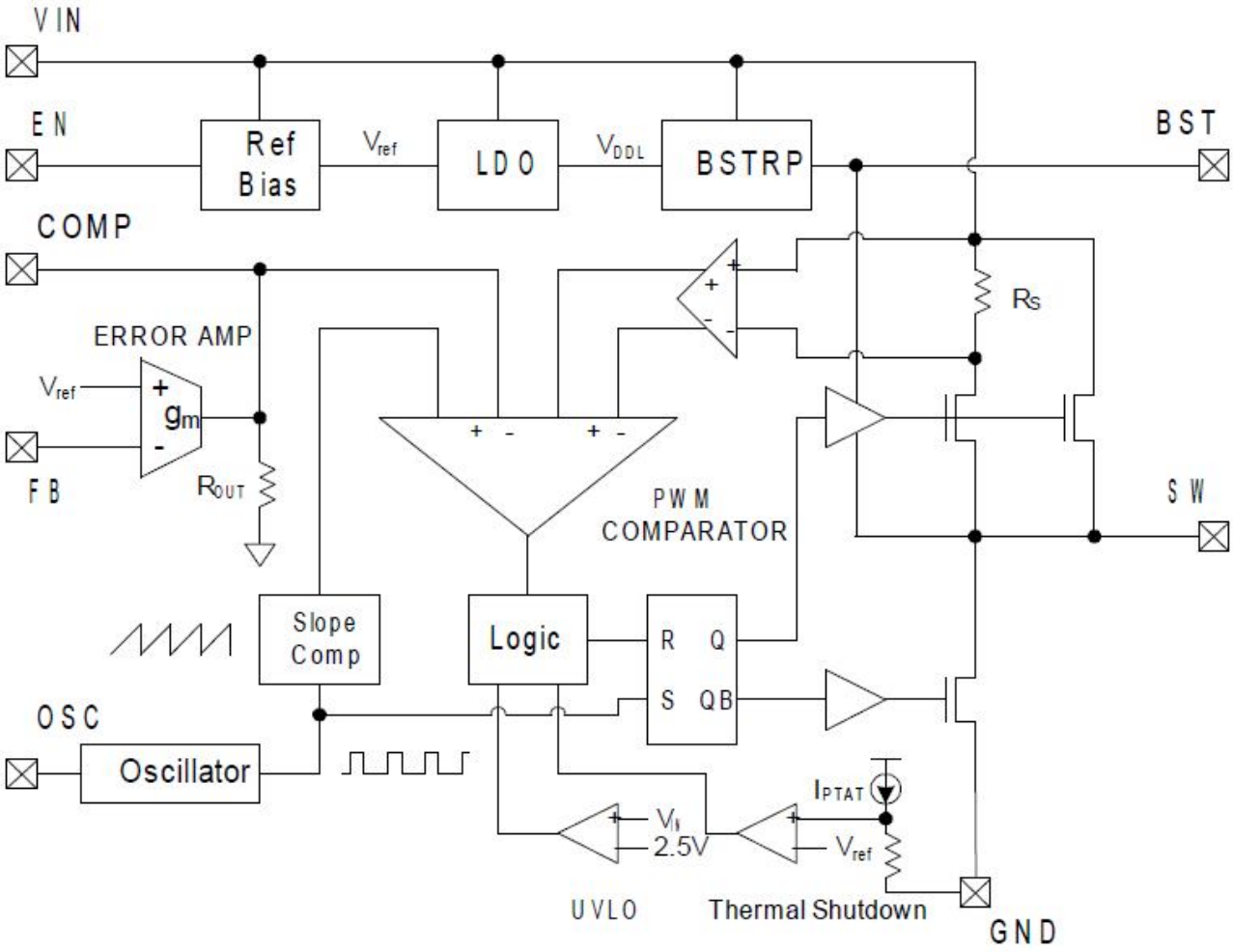
Package Information



- **Pin Configuration**

Pin No.	SOP8
①	BS
②	IN
③	SW
④	GND
⑤	FB
⑥	COMP
⑦	EN
⑧	REX

- **Functional Block Diagram**



- **Absolute Maximum Ratings** @T_A=25℃ unless otherwise noted

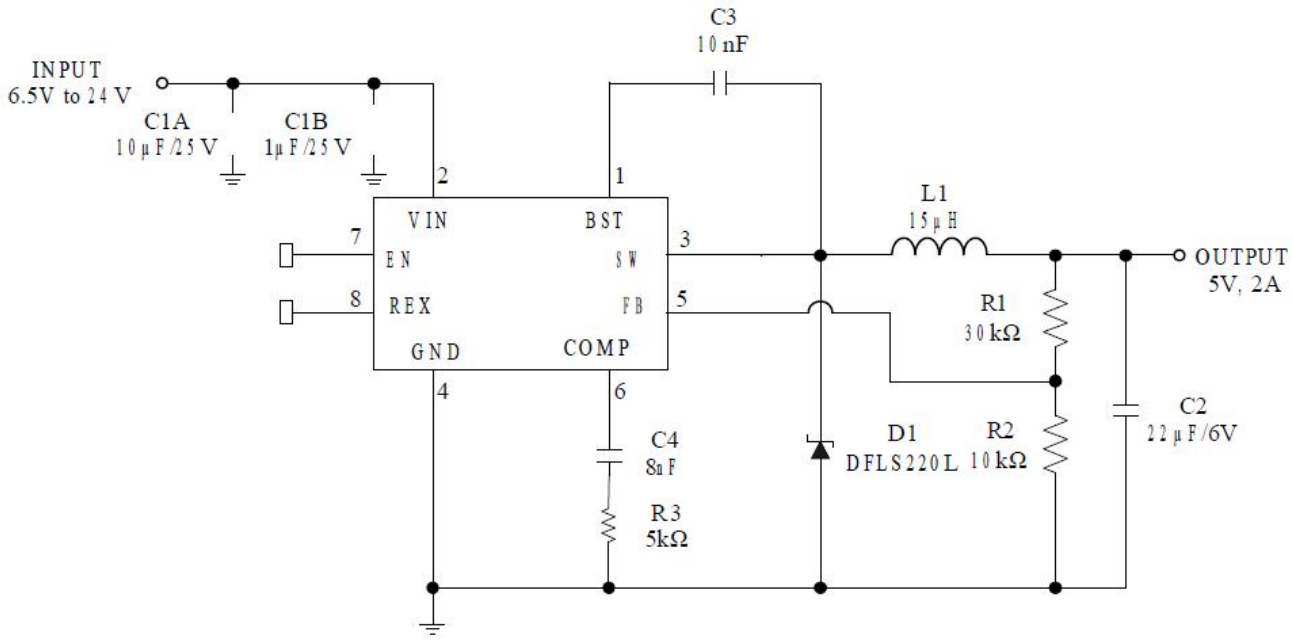
Parameter	Symbol	Ratings	Unit
VIN	VIN	32	V
SW Voltage	VSW	VIN+1	V
BS Voltage	VBS	VSW – 0.3 to VSW + 8	V
EN, FB, COMP Voltage	VEN, VFB, VCOMP	-0.3 to 6	V
Maximum Power Dissipation	PD	800	mW
Junction Temperature	TJ	125	℃
Operating Temperature Range (Note 2)	TOPR	–40 to 85	℃
Storage Temperature Range	TSTG	–65 to +150	℃
Lead Temperature (Soldering, 10 sec)	TLEAD	300	℃

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

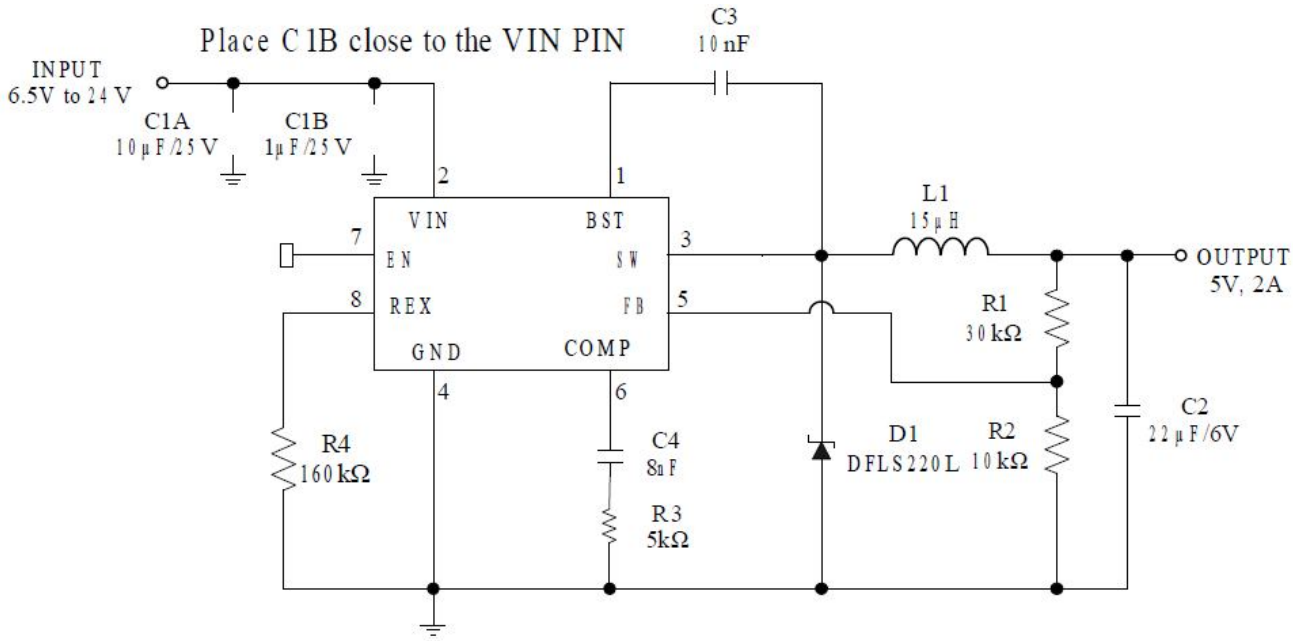
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage	VIN		4.75	--	24	V
Feedback Voltage	VFB	4.75V ≤ VIN ≤ 18V, VCOMP = 1.5V	1.225	1.25	1.275	V
IC Supply Current in Operation	ISTBB	VFB = 1.4V	--	0.8	--	mA
Supply Current in Shutdown	IOFF	VEN = 0V	--	8	35	uA
Switching Frequency(REX / NC)	FSW	IOUT = 1A	350	390	450	KHz
Short Circuit Switching Frequency		VFB = 0V	--	FSW / 8	--	
Maximum Duty Cycle	DMAX	VFB = 1.1V	--	90	--	%
Minimum Duty Cycle	DMIN	VFB = 1.4V	--	--	0	%
Switch Current Limit	ILIM	VFB = 0V	2.4	2.9	3.3	A
SW Leakage	ILEAK	VSW = 0V,VEN = 0V	--	300	--	uA
Enable Threshold Voltage	VEN	IOUT = 1A	2.0	--	3.0	V
High-Side Switch On Resistance	RDSONH	ID = 0.5A	--	0.2	--	Ω
Low-Side Switch On Resistance	RDSONL	ID = 0.1A	--	4.7	--	Ω
Maximum Enable Threshold Voltage	VENMAX	IOUT = 0.5A	--	6	--	V
Enable Pull Up Current	IEN	VEN=4.5V，left unconnected	--	2	--	uA
Thermal Shutdown Temperature				160		°C

- **Typical Application Circuit**

VOUT=5V, ILOAD=2A, FSW=390KHz



VOUT=5V, ILOAD=2A, FSW=1MHz



- **Typical Performance Characteristics**

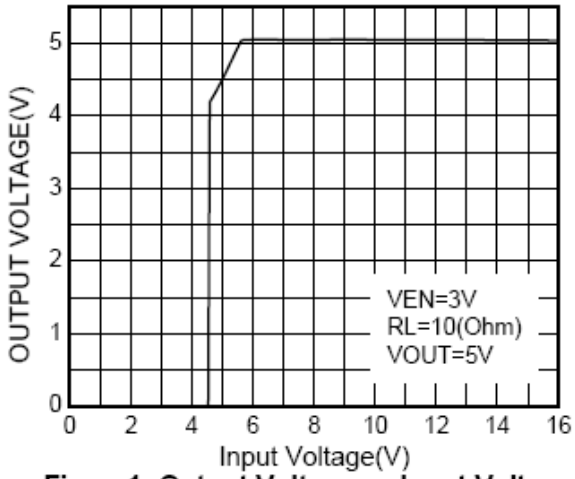


Figure1: Output Voltage vs Input Voltage

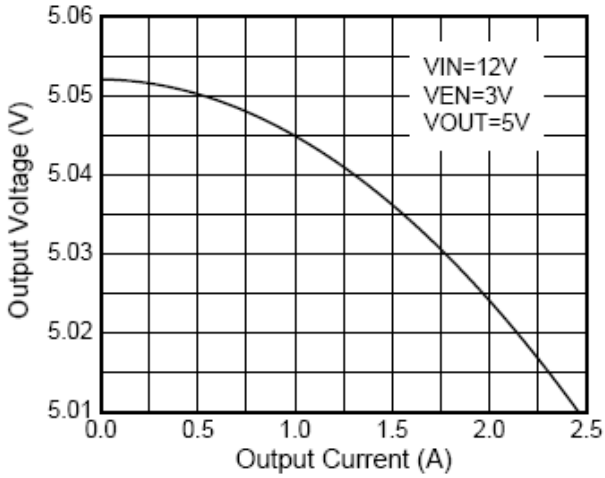


Figure2: Output Voltage vs Output Current

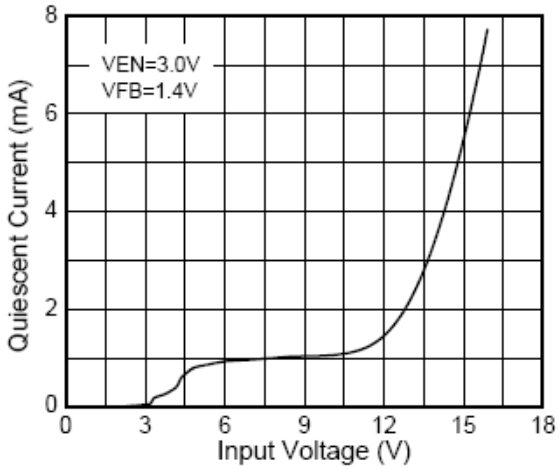


Figure3: Quiescent Current vs Input Voltage

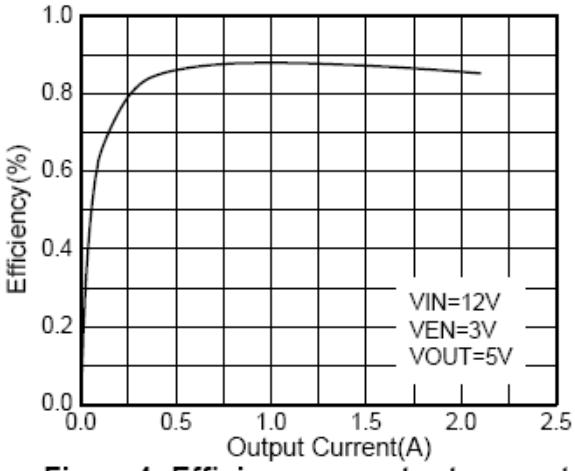


Figure4: Efficiency vs output current

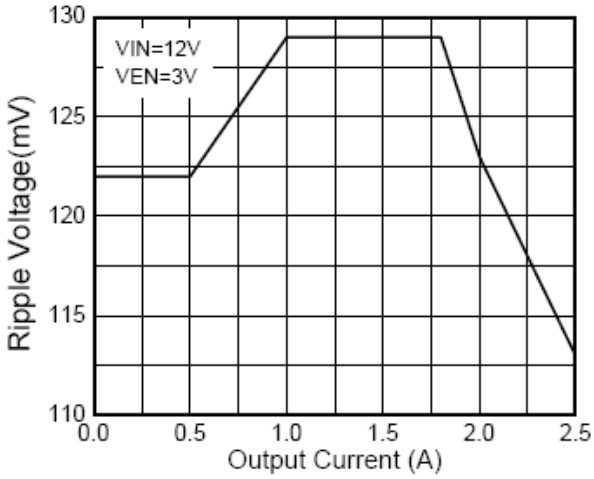


Figure5: Ripple Voltage vs Output Current

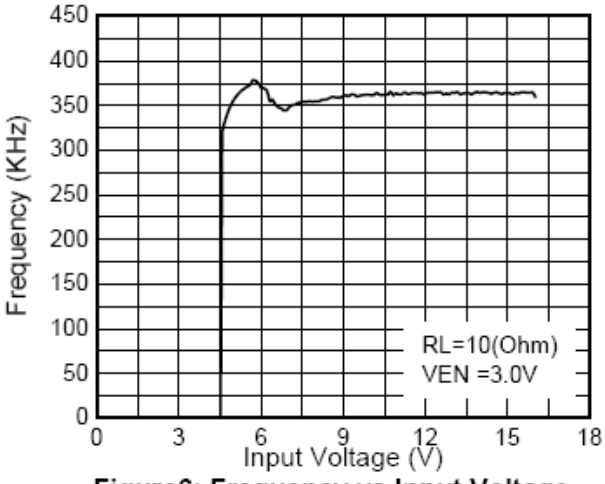


Figure6: Frequency vs Input Voltage

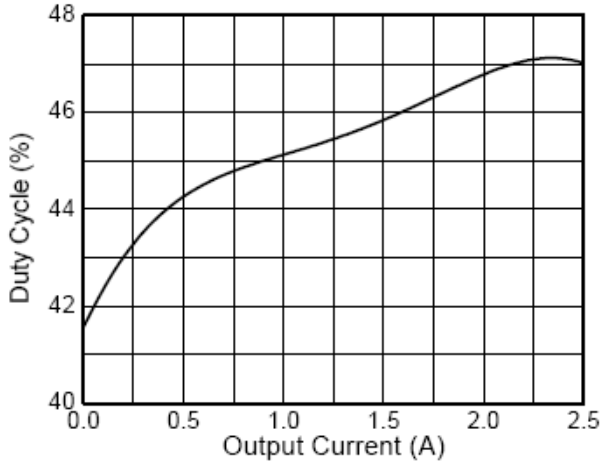


Figure7: Duty Cycle vs Output Current

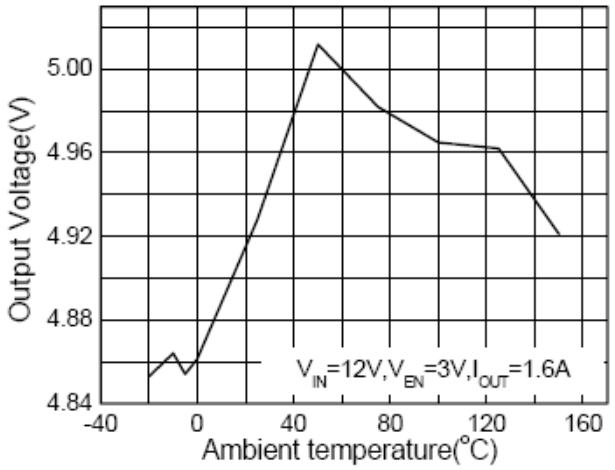


Figure8: Ripple Voltage vs Temperature

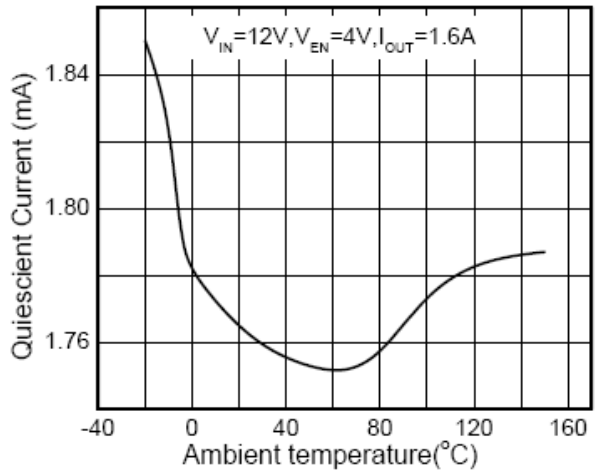
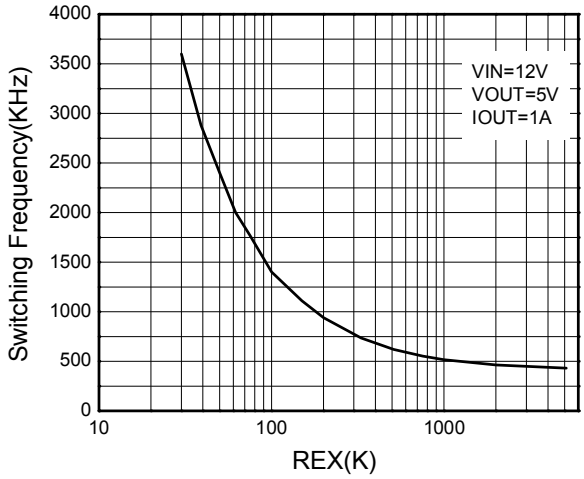


Figure9:Quiescient Current vs. Temperature



FIGuer10: REX VS. Switching Frequency

IMPORTANT NOTICE

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