



USB Host Charger Identification Analog Switches

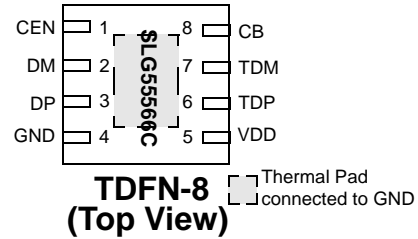
General Description

The SLG55566C is a USB device that combines high speed USB switches with a USB host charger (dedicated charger) identification circuit. The device supports both the latest USB Battery Charging Specification Revision 1.2 including data contact detection and a set resistor bias for Apple compliant devices as well as legacy USB D+/D- short detection using data line pull-up.

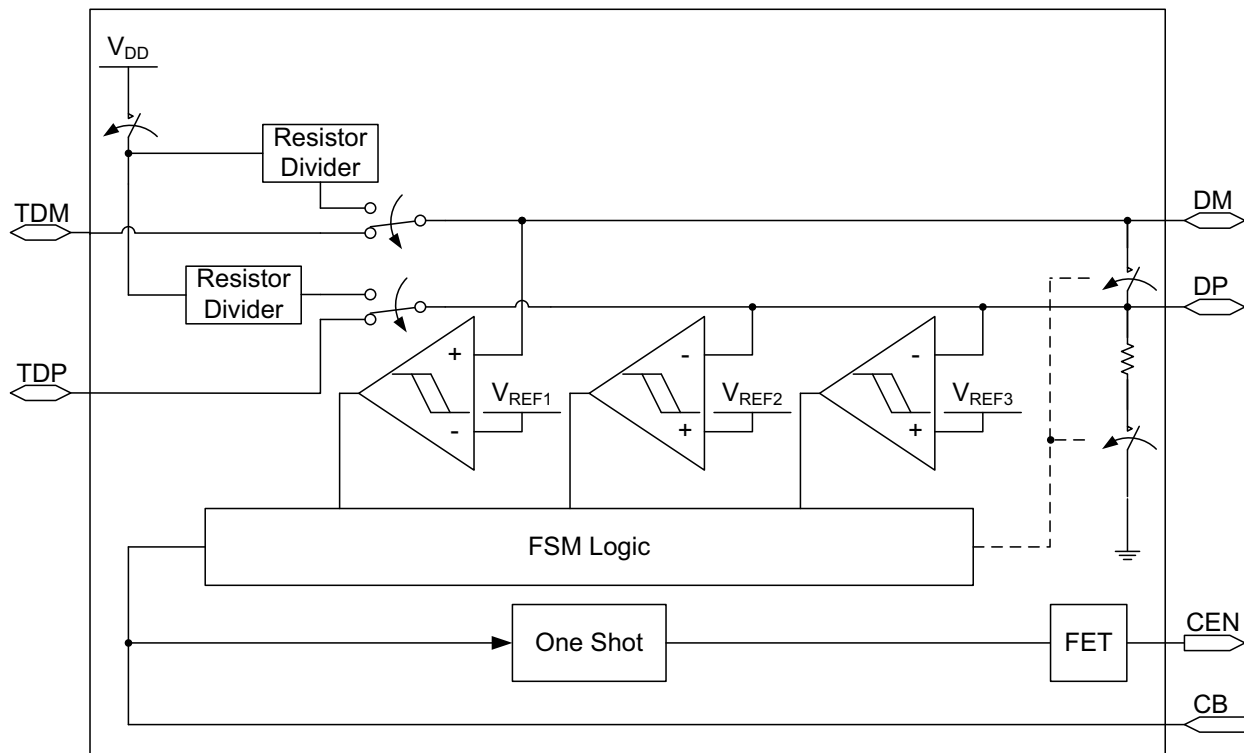
Features

- High Speed USB Switching
- Low 4.0pF (typ) On Capacitance
- Low 4.0Ω (typ) On Resistance
- Low 0.5Ω (typ) On Resistance Flatness
- 4.5V to 5.5V Supply Range
- Low 8μA (typ) Supply Current
- Automatic Current-Limit Switch Control
- Automatic USB Charger Identification Circuit
- USB Battery Charging Specification 1.2 compliant
- Pb-Free / RoHS Compliant
- Halogen-Free
- TDFN-8 Package

Pin Configuration - SLG55566C



Block Diagram





Pin Description - SLG55566C

Pin #	Name	Type	Description
1	CEN	Output	N-FET Open Drain Output. Current Limit Switch (CLS) Control Output. CB changes from 0 to 1 or 1 to 0. CEN will be low for 1 second (typ)
2	DM	Input/Output	USB Connector D-
3	DP	Input/Output	USB Connector D+
4	GND	GND	Ground
5	VDD	PWR	Power Supply. Connect a 0.1 μ F capacitor between VDD and GND as close as possible to the device.
6	TDP	Input/Output	Host USB Transceiver D+ Connection
7	TDM	Input/Output	Host USB Transceiver D- Connection
8	CB	Input	Switch Control Bit 0 = autodetection charger identification active 1 = pass-through mode active, DP/DM connected to TDP/TDM
9	Thermal Pad	GND	Ground

Ordering Information

Part Number	Type
SLG55566CV	TDFN-8
SLG55566CVTR	TDFN-8 - Tape and Reel

**Absolute Maximum Conditions**

Parameter	Min.	Max.	Unit
Supply Voltage	-0.3	6.0	V
Continuous Current into any terminal	-30	+30	mA
Continuous Power Dissipation	--	954	mW
Operating Temperature Range	-40	85	°C
Junction Temperature		150	°C
Storage Temperature Range	-65	150	°C
Lead Temperature (Soldering, 10s)		260	°C

Electrical Characteristics - Power Supply

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
V_{DD}	Power Supply Range	$V_{CB} > V_{IH}$	4.5	5.0	5.5	V
		$V_{CB} = 0V$	4.75	--	5.25	V
I_{DD}	Supply Current	$V_{CB} = V_{DD}$, $V_{DD} = 4.5V$	--	--	7	μA
		$V_{CB} = V_{DD}$, $V_{DD} = 5.5V$	--	--	8	μA
		$V_{CB} = 0V$, $V_{DD} = 4.75$	--	110	145	μA
		$V_{CB} = 0V$, $V_{DD} = 5.25V$	--	120	160	μA
ΔI_{DD}	Supply Current Increase	$0 \leq V_{CB} \leq V_{IL}$ or $V_{IH} \leq V_{CB} \leq V_{DD}$	--	--	2	μA

Electrical Characteristics - Analog Switch

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
V_{DP} , V_{DM}	Analog signal Range		0	--	V_{DD}	V
R_{ON}	On Resistance TDP/TDM Switch	$V_{DP} = V_{DM} = -0.4V$ to $0.4V$ $I = 10mA$	--	3.5	--	Ω
		$V_{DP} = V_{DM} = 0V$ to $3.3V$ $I = 10mA$	--	4.0	7	Ω
ΔR_{ON}	On Resistance Match between channels TDP/TDM Switch	$V_{DP} = V_{DM} = 400mV$ $I = 10mA$	--	0.1	--	Ω
R_{FLAT}	On Resistance flatness TDP/TDM Switch	$V_{DP} = V_{DM} = 0V$ to $1.0V$ $I = 10mA$	--	0.5	--	Ω
R_{SHORT}	On Resistance of TDP/TDM Short	$V_{CB} = 0V$ $V_{DP} = 1V$ $I_{DP} = I_{DM} = 10mA$	--	50	80	Ω
I_{TDPOFF} , I_{TDMOFF}	Off-Leakage Current	$V_{DP} = V_{DM} = 0.3V$ to $3.3V$ $V_{TDP} = V_{TDM} = 3.3V$ to $0.3V$ $V_{CB} = 0V$	-250	--	250	nA
I_{DPON} , I_{DMON}	Off-Leakage Current	$V_{DP} = V_{DM} = 3.3V$ to $0.3V$ $V_{CB} = V_{DD}$	-250	--	250	nA



Electrical Characteristics - Dynamic Performance

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
T_{ON}	Turn On Time	V_{TDP} or $V_{TDM} = 1.5V$ $R_L = 300\Omega$ $C_L = 35pF$	--'	20	100	μs
T_{OFF}	Turn Off Time	V_{TDP} or $V_{TDM} = 1.5V$ $R_L = 300\Omega$ $C_L = 35pF$	--'	1	5	μs
T_{PLH}, T_{PHL}	TDP/TDM Switch Propagation Delay	$R_L = R_S = 50\Omega$	--	60	--	ps
T_{SKEW}	Output Skew	Skew between DP and DM when connected to TDP and TDM $R_L = R_S = 50\Omega$	--	40	--	ps
C_{OFF}	TDP/TDM Off-Capacitance	$f = 1MHz$	--'	2.0	--	pF
C_{ON}	DP/DM On-Capacitance	$f = 240MHz$	--'	4.0	5.5	pF
BW	-3dB Bandwidth	$R_L = R_S = 50\Omega$	--	950	--	MHz
V_{ISO}	Off-Isolation	$V_{TDP}, V_{DP} = 0dBm$ $R_L = R_S = 50\Omega$ $f = 250MHz$	--	-19.5	--	dB
V_{CT}	Crosstalk	$V_{TDP}, V_{DP} = 0dBm$ $R_L = R_S = 50\Omega$ $f = 250MHz$	--	-24.9	--	dB

Electrical Characteristics - Internal Resistors

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
R_{PD}	DP/DM Short Pull-down		350	500	700	$k\Omega$
RT_{RP}	RP1/RP2 Ratio		1.485	1.5	1.515	Ratio
R_{RP}	RP1 + RP2 Resistance		93.75	125.0	156.25	$k\Omega$
RT_{RM}	RM1/RM2 Ratio		0.8544	0.863	0.872	Ratio
R_{RM}	RM1 + RM2 Resistance		69.75	93.0	115.18	$k\Omega$

Electrical Characteristics - Logic Input

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
V_{IH}	CB Input Logic High		1.4	--	--	V
V_{IL}	CB Input Logic Low		--	--	0.4	V
I_{IN}	CB Input Leakage Current	$V_{DD} = 5.5V$ $0 \leq V_{CB} \leq V_{IL}$ or $V_{IH} \leq V_{CB} \leq V_{DD}$	-1	--	1	μA



Electrical Characteristics - CEN Output

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
T_{VBT}	V_{BUS} Toggle Time	CB = Logic 0 to Logic 1 or Logic 1 to Logic 0	0.5	1	1.5	s
V_{OL_CEN}	CEN Output Logic Low Voltage	CB = Logic 0 to Logic 1 $I_{SINK} = 2mA$	--	--	0.4V	V
I_{OUT_CEN}	CEN Output Leakage Current	$V_{DD} = 5.5V$ $V_{CEN} = 5.5V$ or CEN deasserted	--	--	1	μA

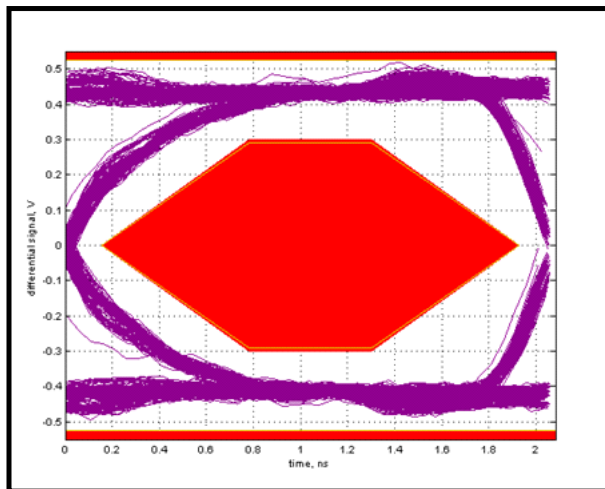
Electrical Characteristics - ESD Protection

$V_{DD} = 4.5V$ to $5.5V$, $T_A = 25^\circ C$ (unless specified otherwise)

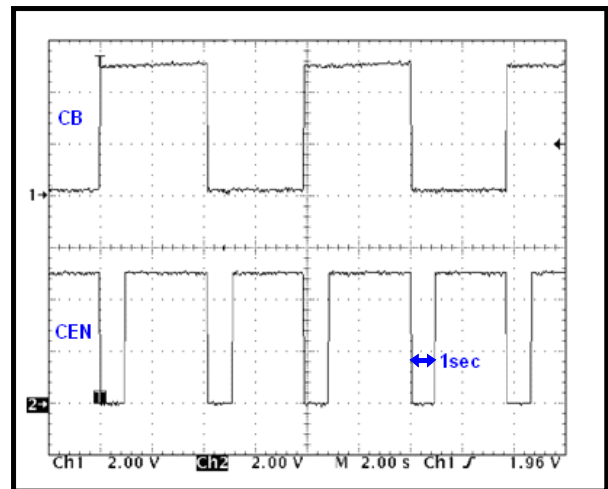
Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
V_{ESD}	ESD Protection Level (DP and DM Only)	Human Body Model	--	± 8	--	kV
V_{ESD}	ESD Protection Level (All other pins)	Human Body Model	--	± 2	--	kV

High Speed USB EYE Diagram & CEN Function Waveform

High Speed USB EYE diagram

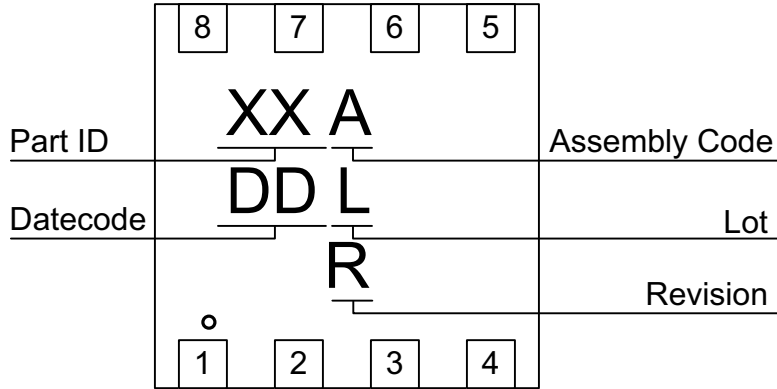


Auto-Reset Control for Current Limiter





Package Top Marking System Definition



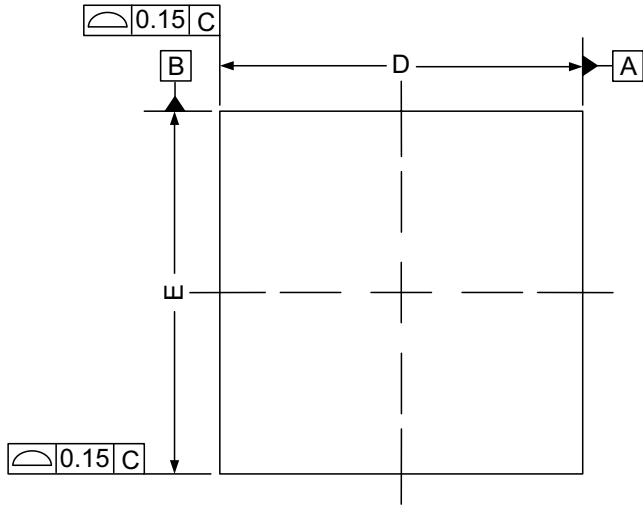
- XX – Part ID Field: identifies the specific device configuration
- A – Assembly Code Field: Assembly Location of the device.
- DD – Date Code Field: Coded date of manufacture
- L – Lot Code: Designates Lot #
- R – Revision Code: Device Revision

Top Marking Assignment for SLG55566C

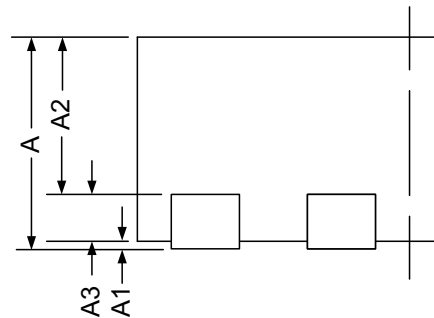
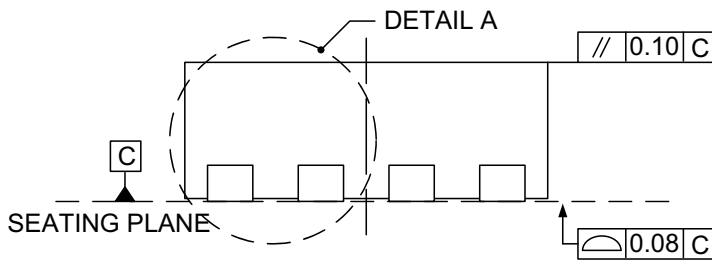
Part Number	Part ID	Revision Code
SLG55566C	GE	A



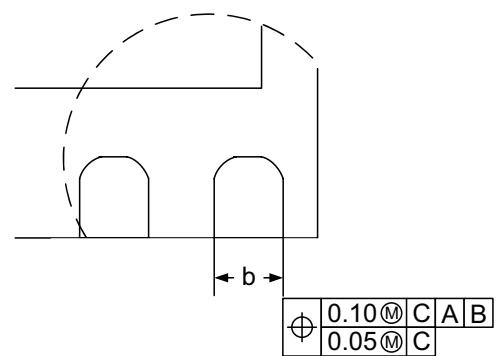
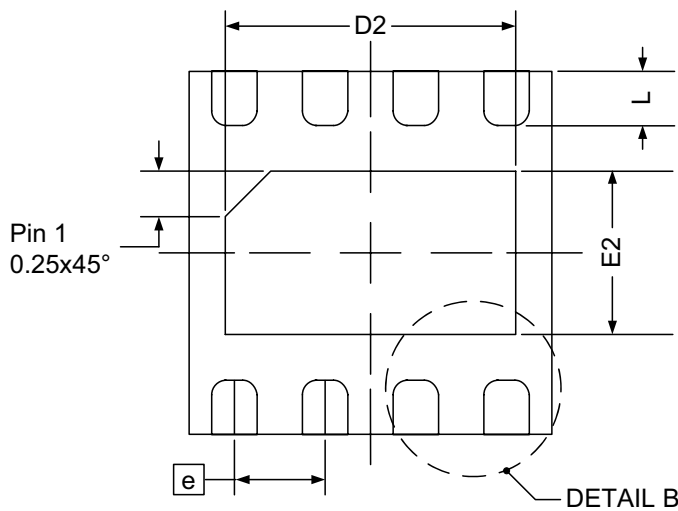
Package Drawing and Dimensions
8 Lead TDFN Package



Symbol	Min (mm)	NOM (mm)	Max (mm)
A	0.70	0.75	0.80
A1	0.00	--	0.05
A2	--	0.55	--
A3	--	0.20	--
b	0.20	0.25	0.30
D	1.90	2.00	2.10
D2	1.50	1.60	1.70
E	1.90	2.00	2.10
E2	0.80	0.90	1.00
e	0.50 BSC		
L	0.20	0.30	0.40



DETAIL A



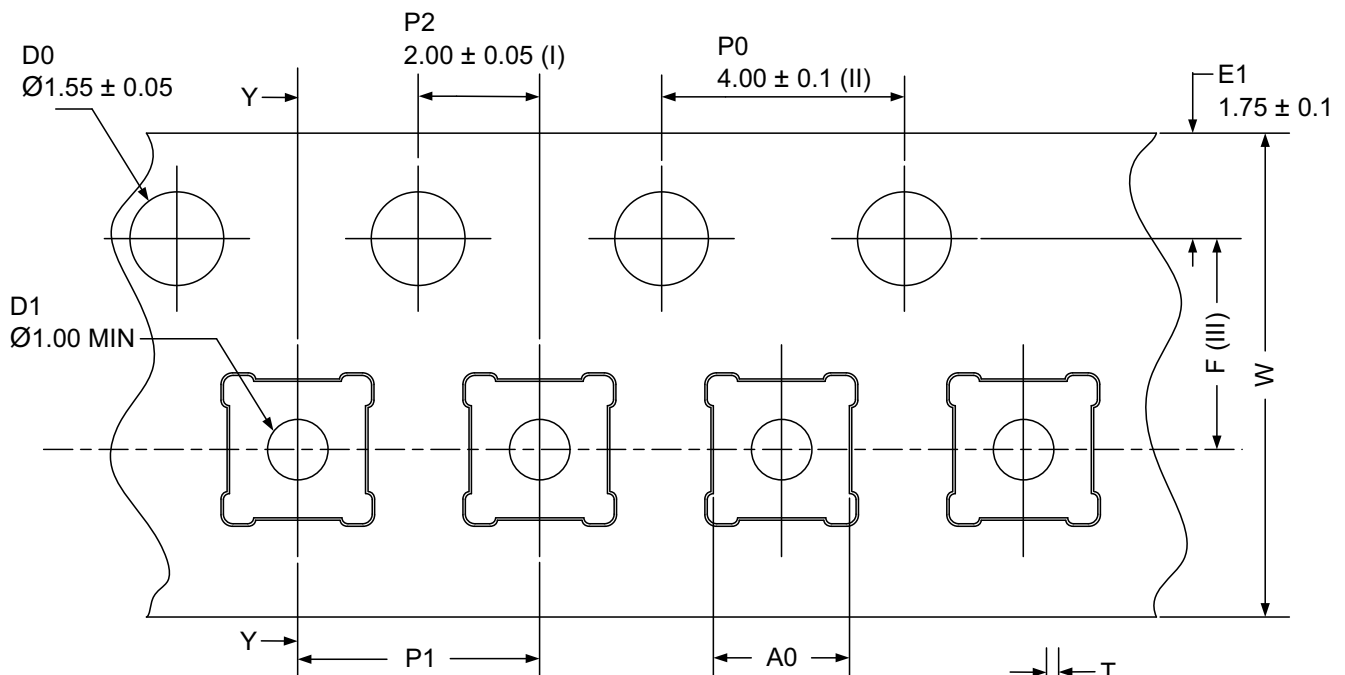
DETAIL B



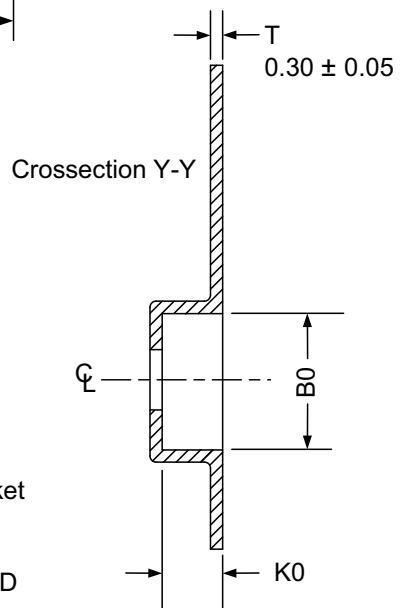
Tape and Reel Specifications

Package Type	# of Pins	Nominal Package Size	Units per Reel	Trailer A		Leader B		Pocket Tape (mm)		Reel Diameter (mm)
				Pockets	Length (mm)	Pockets	Length (mm)	Width	Pitch	
8TDFN	8	2x2mm	3,000	42	168	42	168	8	4	178

Tape and Reel Drawing



Symbol	(mm)
A0	2.25 ± 0.1
B0	2.25 ± 0.1
K0	1.00 ± 0.1
F	3.50 ± 0.1
P1	4.00 ± 0.1
W	8.00 ± 0.1



- (I) Measured from centerline of sprocket hole
- (II) Cumulative tolerance of 10 sprocket holes is ± 0.20
- (III) Measured from centerline of sprocket hole to centerline of pocket
- (IV) Other material available

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED



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