

USB-C and USB-A Dual Port Charger Controller

Feature

- USB-C and USB-A dual port operation with cost effective single power source
- USB-C Charging Standard Identification:
 - USB Power Delivery 3.0 Fix PDO
 - USB Power Delivery 3.0 PPS 3.3-11V
 - USB Type C CC-logic 5V 3A
 - BC 1.2 & YD/T 1591-2009
 - Qualcomm QC2 and QC3
 - Apple 12W
 - AFC/FCP
 - Private Low Voltage Charging
- USB-A Charging Standard Identification:
 - BC 1.2 & YD/T 1591-2009
 - Qualcomm QC2 and QC3
 - Apple 12W
 - AFC/FCP
 - Private Low Voltage Charging
- CC pins HV protection up to 12V
- 2kV HBM and 1KV CDM ESD Level
- -40°C ~ +125°C Operating Temperature
- Package:TSSOP-16L,QFN-16L
- RoHS compliant and Halogen free

Applications

- Wall Adapter
- Car Charger
- USB Power Plugs

Function Block Diagram (Ref.)

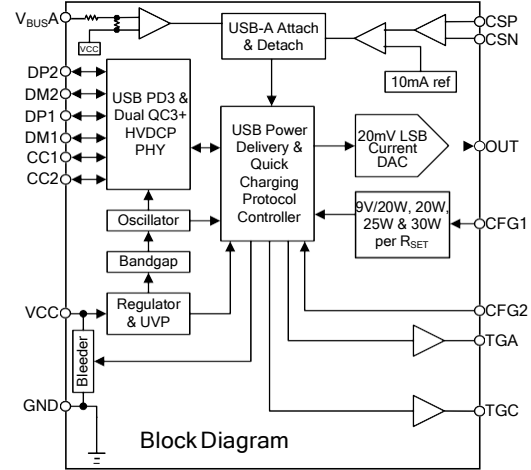


Fig.1 Function Block

Pin Definition

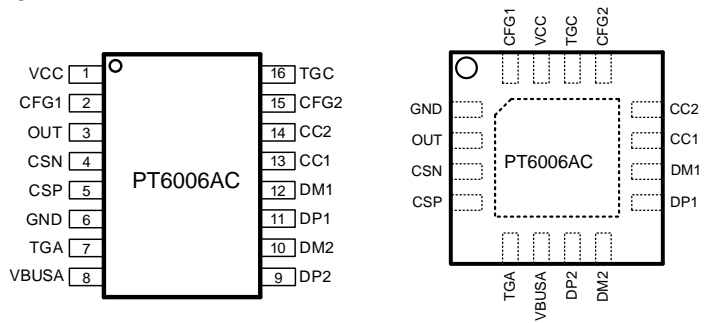


Fig.2 TSSOP -16L

QFN -16L

Ordering Information

Part No.	Package	Quantity
PT6006AC-SP	TSSOP16-L	3,000
PT6006AC-QN	QFN -16L	3,000

1. Information

1.1 Pin Description

SSOP Pin Number	Pin Name	Description
1	VCC	Supply input voltage pin
2	CFG1	USB-C PDO configuration:
3	OUT	Feedback output
4	CSN	USB-A current sensing 10m
5	CSP	USB-A current sensing 10m
6	GND	Ground
7	TGA	USB-A VBUS PMOS driver
8	VBUSA	USB-A plug-in detection
9	DP2	USB-A HVDCP PHY positive line
10	DM2	USB-A HVDCP PHY negative line
11	DP1	USB-C HVDCP PHY positive line
12	DM1	USB-C HVDCP PHY negative line
13	CC1	USB-C Type-C configuration channel signal2
14	CC2	USB-C Type-C configuration channel signal
15	CFG2	5V 4A protocol selection, tight low enable
16	TGC	USB-C VBUS PMOS driver

1.2 Recommended Application Circuit

Wall Charger Simple Application Circuit

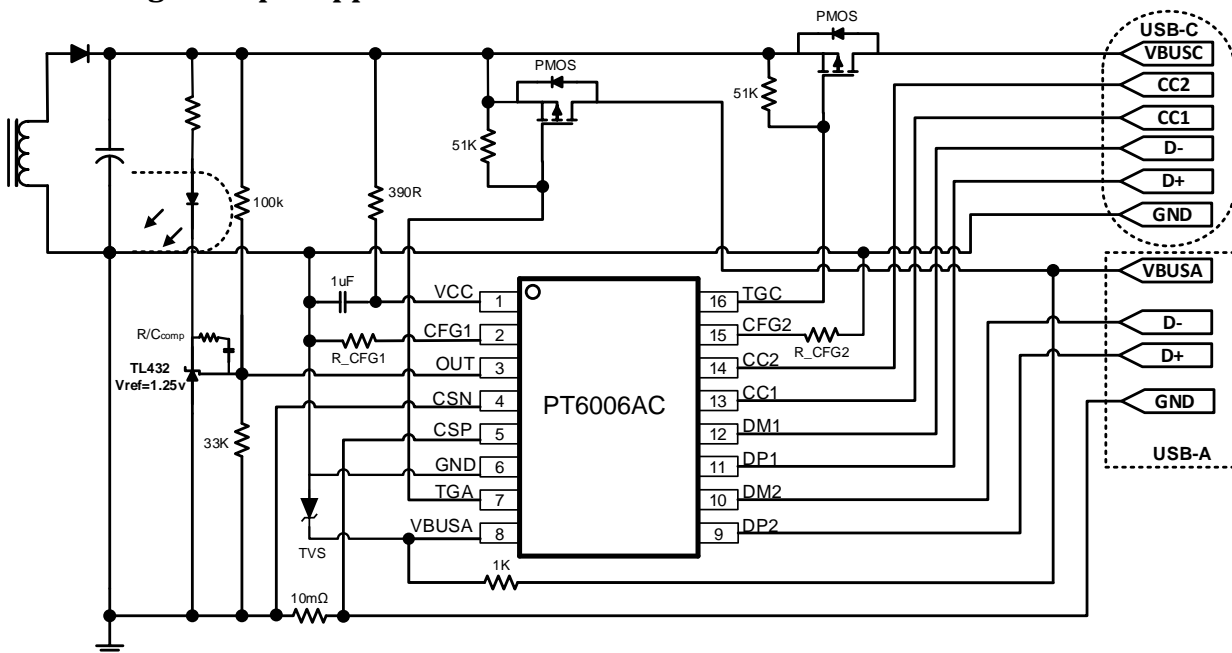


Fig.3 Typical Application Circuit

PDO configuration

The PDO configuration is set by external pull-down resistor attached on pin “CFG1”.

R_CFG1	PDO configuration
NC	30W (3.3v-11V/3A, 5V3A, 9V3A, 12V2.5A)
620K	25W (3.3v-5.9v/3A, 3.3v-11v/2.75A, 5V3A, 9V2.77A)
390K	20W (5V3A, 9V2.2A)
160K	18W (5V3A, 9V2.0A, 12V1.5A)
0R	20W (3.3v-5.9v/3A, 3.3v-11v/2.25A, 5V3A, 9V2.22A, 12V1.67A)

2. Specification

2.1 Absolute Maximum Rating

Exceeding these ratings could cause damage to the device. All voltages are with respect to ground. Currents are positive into and negative out of the specified terminal. This is a mechanical shock sensitive and an ESD sensitive device, and improper handling can cause permanent damages to the IC.

Symbol	Parameter	Min.	Typ.	Max.	Unit	Comments
V _{CC}	Supply Voltage	-0.3		6.0	V	
V _{IH} , V _{IL}	Other Pins Input Level	-0.3		6.0	V	
T _{GDRIVE}	External PMOS Driver High	-0.3		12	V	
CC1, CC2	CC Pins Short to V _{BUS} protection	-0.3		12	V	Period < 1sec
T _{OPE}	Operation Temperature	-40		125	°C	
T _{STG}	Storage Temperature	-60		150	°C	
-	Lead Temperature (Soldering, 10 sec.)			260	°C	
ESD _{HBM}	ESD Rating – HBM (Human Body Mode)			2000	V	
ESD _{CDM}	ESD Rating – CDM (Socket Charge Device Mode)			1000	V	

Notes:

1. Exceeding the absolute maximum ratings may damage the device.

2.2 Recommended Operation Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit	Comments
V _{CC}	Supply Voltage	3.3		5.7	V	(1)
-	Other pins	0		5.0	V	Include CC1, CC2, OUT
T _{OPE}	Operating Temperature	-40		+125	°C	
I _{OPE}	Operating current			<2	mA	

Notes:

2. The device is not guaranteed to operate beyond the Maximum Recommended Operation Conditions.

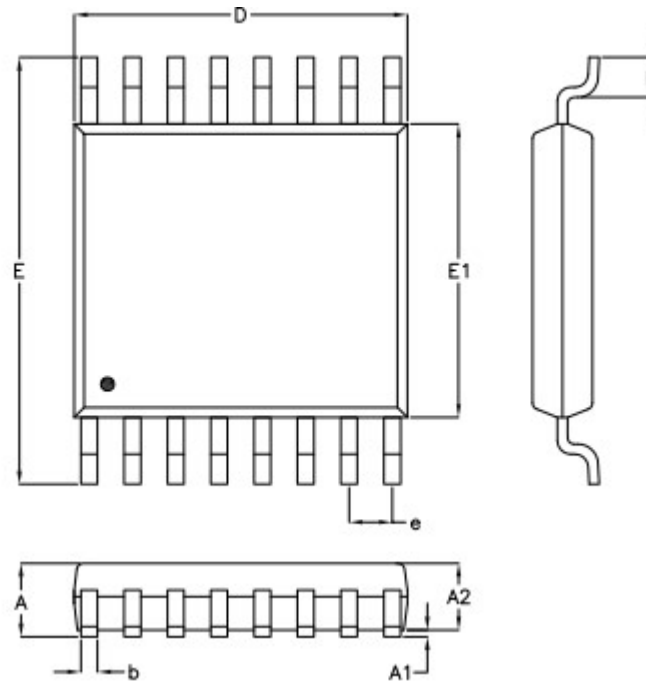
2.3 Electrical Specifications

(VDD=5V, TA=25°C and the recommended supply voltage range, unless otherwise specified.)

Characteristics	Symbol	Conditions	MIN	TYP	MAX	Unit
Supply Input						
Supply Voltage Range	V _{DD}		3.2		5.7	V
Input UVP Threshold	V _{UVLO}	V _{DD} rising.		2.7		V
Input UVP Hysteresis		V _{DD} falling.		0.2		V
VDD Supply Current	I _{DD}			1.7		mA
PMOS Driver						
PMOS Driver pull-down resistance				1		kΩ
DCP PHY						
DP DM OV Threshold		In QC Mode		4		V
CCOV Rising				1.04* V _{DD}		V
CCOV Falling				V _{DD}		V
High Voltage Dedicated Charging Port (HVDCP)						
Data Detect Voltage			0.25	0.325	0.4	V
Output Voltage Selection Reference			1.8	2.0	2.2	V
DP Pin High Glitch Filter Time			1000	1250	1500	ms
DP Pin Low Glitch Filter Time				1		ms
Output Voltage Glitch Filter Time			20	40	60	ms
DM Pin Pull-Down Resistance				20		kΩ
Continuous Mode Glitch Filter Time			100		200	μs
DP Pin Leakage Resistance			300	500	800	kΩ
Switch SW1 On-Resistance					40	Ω
UP/Down Current Step				2		μA

3. Package Information

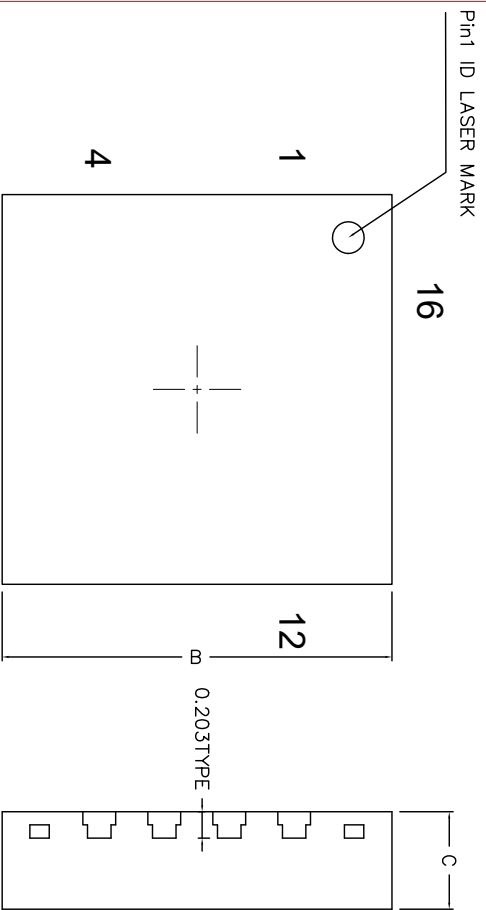
TSSOP-16L



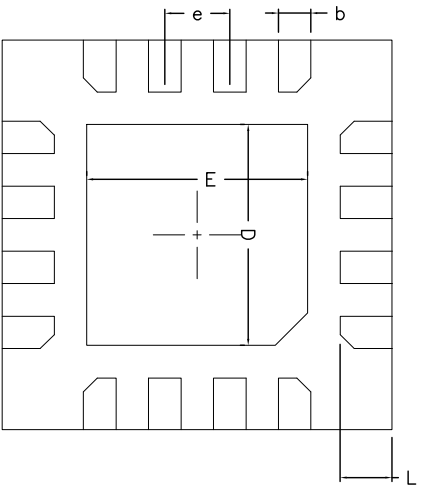
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.000	1.200	0.039	0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.012
D	4.900	5.100	0.193	0.201
e	0.650		0.026	
E	6.300	6.500	0.248	0.256
E1	4.300	4.500	0.169	0.177
L	0.450	0.750	0.018	0.030

REVISION RECORD		
REVISION	NEW DRAW	2021.06.21
A		Chen YJ

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.900	3.000	3.100
B	2.900	3.000	3.100
C	0.700	0.750	0.800
D	1.650	1.700	1.750
E	1.650	1.700	1.750
L	0.350	0.400	0.450
b	0.200	0.250	0.300
e	0.500 TYPE		

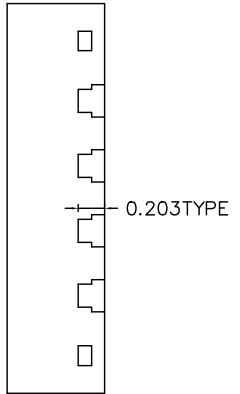


TOP VIEW



SIDE VIEW

BOTTEM VIEW



SIDE VIEW

THIRD ANGLE PROJECTION		SCALE	1:1	UNIT	mm	DATE		
TOLERANCE		APPROVALS		DATE		DESIGNER		
0.0	0.00	0.000				Chen YJ	2021.09.26	DRG NO.
			CHECKER			XieWH	2021.09.26	JY-POD-45
			APPROVER			LinHB	2021.09.26	JY-RE-022-45
								REV: A
								SHEET: 1 OF 1

QFN3x3-16L 0.75T
0.50 PITCH