

OTP-20 oBank - Notes

Part Numbers

- Spule: Würth 74437324033
- Buck: TI TPS54295

Supported PD Standard

PD	Voltage	Current	Power
1 + 2 + 3 + 4 + 5	5 V	2 A	10 W
2 + 3 + 4 + 5	12 V	1.5 A	18 W
3 + 4 + 5	12 V	3 A	36 W
4 + 5	20 V	3 A	60 W
5	20 V	5 A	100 W

Resolution Gauge

$R_{Sense} = 5\text{ m}\Omega$

Value	LSB Size	Minimum Value	Maximum Value
Capacity	1.0 mAh	-	65535 mAh
Voltage	0.078125 mV	-	5.11992 V
Current	0.3125 mA	-10.24 A	+10.23968 A

I2C Addresses

Device	Part Number	Address 0b	Address 0x
PD Controller	TPS65987	0b01000000	0x40
Charger	BQ25700	0b00010010	0x12
Balancer Config 1	MAX17205	0b01101100	0x6C
Balancer Config 2	MAX17205	0b00010110	0x16

Pin Assignment Microcontroller

Designator	Target	Type	GPIO	AF
SCL	<i>mult.</i>	OUT	PA9	I2C1_SCL → AF6
SDA	<i>mult.</i>	I/O	PA10	I2C1_SDA → AF6
PD_IRQ	PD Controller	IN?	PA14	-
PD_GPIO0	PD Controller		PA11	-
PD_GPIO1	PD Controller		PA12	-
PD_GPIO2	PD Controller		PA13	-
ALRT1	Balancer		PA3	-
EN_OTG	Charger		PB7	-
CHRG_OK	Charger		PA2	-
PROCHOT	Charger		PA1	-
LED0	Front Panel	OUT	PB0	-
LED1	Front Panel	OUT	PB1	-
LED2	Front Panel	OUT	PB2	-
LED3	Front Panel	OUT	PB3	-
LED4	Front Panel	OUT	PB4	-
BUTTON	Front Panel	IN	PA0	-
SCK	Front Panel	OUT	PA5	SPI1_SCK → AF0
SDO	Front Panel	OUT	PA7	SPI1_SDO → AF0
CD	Front Panel	OUT	PA6	-
CS	Front Panel	OUT	PA4	SPI1_NSS → AF0
RST_DISP	Front Panel	OUT	PA8	-
FLT	USB IO	IN	PC15	-

BOM

Designator	Value	Alt. Value
C1, C2, C24	470 nF	
C3, C29, C38, C40, C41, C42, C43, C53, C59, C60, C61, C77	100 nF	
C4, C5	1 nF	
C6, C7, C8, C10, C11, C12, C13, C14, C15, C16, C17, C18, C28, C47, C48, C50, C51, C52, C55, C56, C57, C58, C64, C65, C66, C67	10 µF	
C9	47 µF	
C19, C73, C74, C75, C76, C79, C80	10 nF	
C20, C21	47 nF	
C22, C23	15 nF	
C25, C26	150 pF	
C27, C30	1 µF	
C31	33 pF	
C32	680 pF	
C33, C69	2.2 µF	10 µF
C34	1.8 nF	1.5 nF
C35	15 pF	
C36	100 pF	
C37	22 pF	
C39, C46, C62, C68, C70, C72, C78	1.0 µF	
C44, C45	220 pF	
C49, C71	4.7 µF	
C54, C63	10 pF	
K1	22-05-7065	22-03-5065
K1 B	55-37-5063	

Designator	Value	Alt. Value
K5	22-03-5045	
K5 B	55-37-5043	
LED1	150060GS750	
LED2	150060RS750	
Q6, Q7	IRLML2502TRPBF	
R1, R2	3.3 k Ω	
R3, R5	20.0 Ω	
R4, R19, R32, R39, R40	10 k Ω	
R6, R7	200.0 Ω	
R10, R11, R14, R15, R17, R24	10 Ω	
R12	1.0 Ω	
R16	270 k Ω	
R18	390 k Ω	
R20	40.2 k Ω	39 k Ω
R21	137 k Ω	180 k Ω
R22	120 k Ω	
R23, R27, R33, R41	100 k Ω	
R25	68 Ω	
R28, R29, R35, R36, R37, R38	100 Ω	
R30, R42, R43, R45, R46, R47, R48, R55, R56	0.0 Ω	
R26, R31	1 k Ω	
R44	16 k Ω	
R49, R51	124 k Ω	120 k Ω
R50, R52	22.1 k Ω	22 k Ω
R53	110 k Ω	

Designator	Value	Alt. Value
R54	360 kΩ	
R34, R57	2.2 Ω	
K2	632723300011	
K3, K4	USB-A	
L1	2.2 μH	3.3 μH
L2, L3	3.3 μH	
Q1, Q2, Q3, Q4	CSD17551Q3A	CSD17579Q3A
Q5	CSD25402Q3A	CSD25404Q3
R8	5 mΩ	
R9, R13	10 mΩ	
SW1		
U1	MAX17205G+	
U2	BQ25700ARSNR	
U4	TPS65987DDHRSHT	
U5	TPS54295PWPR	
U6	LDL212DR	
U7	LDF33DT	
U8	TPD6S300RUKR	
U3	STM32L071KZU6	