USB PD3, QC4+ Controller

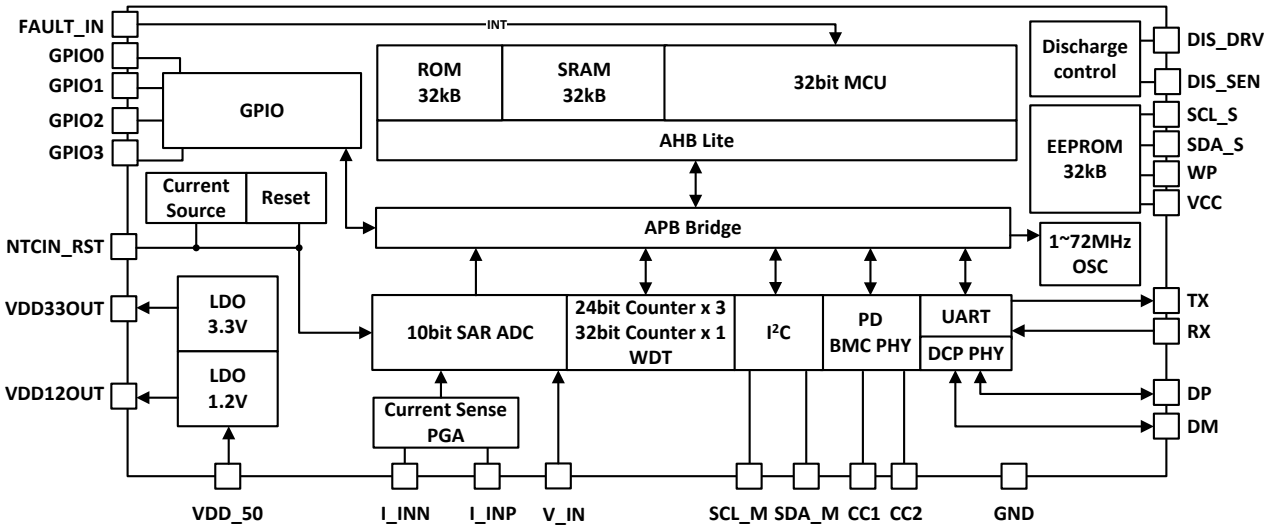
❖ FEATURES

- Supporting Multiple Charging Protocols:
  - USB Type-C CC Logic, Power Delivery v3.0 DFP or DRP (with battery powered), Qualcomm Quick Charge 4 (CC1 or CC2 pins)
  - USB Battery Charging v1.2, Apple 2.4A Charging, AFC, FCP, SCP and Qualcomm Quick Charge 3 and 2 (DP & DM pins)
- Control Interfaces
  - 2-wire: UART Tx/ Rx
  - 2-wire: 400kHz I²C Host (SCL_M & SDA_M)
  - 3V GPIO: GPIO3:0 (with 7bit PWM), RST for reset input, DIS_DRV & DIS_SEN for Discharge MOS control
  - 5V GPIO: FAULT_IN for fault interrupt input
- Timer controlled 10bit 3V SAR ADC with 3:1 Mux: V_IN (Voltage sense), I_IN (Current sense) & NTCIN (for NTC thermistor)
- On-chip Quad Timer (32bit counter x 1, 24bit counter x 3) and a Watch Dog Timer
- On-chip 5V to 3.3V LDO (VDD33OUT) and 3.3V to 1.2V LDO (VDD12OUT)
- On-chip 12MHz oscillator (1~72MHz programmable)
- On-chip 32kB I²C EEPROM (come with TQFN-28L package), WP for write protect, SCL_S & SDA_S for I²C slave
- Package: TQFN-28L 4x4mm (pitch 0.4mm), SOP-16L 150mil (pitch 1.27mm)
- RoHS and Halogen free compliance

❖ Application

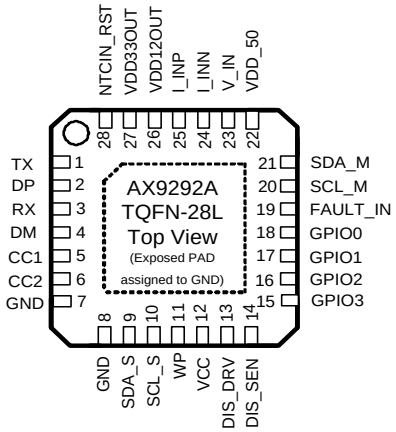
- USB Type-C AC to DC Power Adapter/ Charger
- USB Type-C Car Charger
- USB Type-C Power Bank

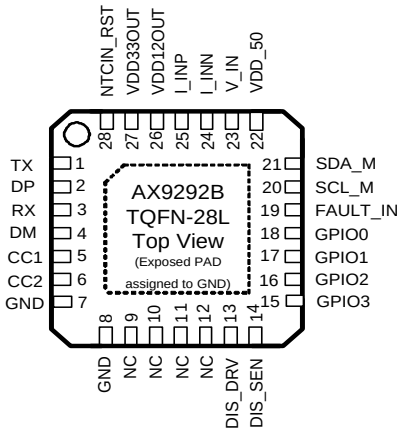
❖ BLOCK DIAGRAM

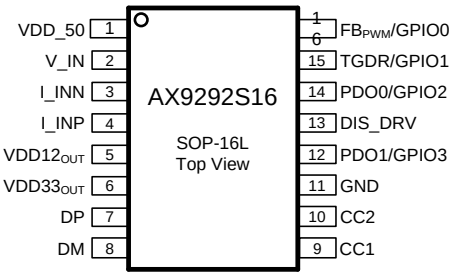


❖ Pinout

The package of AX9292 are SOP-16L and TQFN-28L; the pin assignment is given by:







❖ Pin Descriptons

Pin Name	AX9292A	AX9292B	AX9292S16	Descriptons
TX	1	1	-	GPIO/ UART_TX
DP	2	2	7	USB D+ Channel;
RX	3	3	-	GPIO/ UART_RX
DM	4	4	8	USB D- Channel
CC1	5	5	9	Configuration Channel 1 of USB-C
CC2	6	6	10	Configuration Channel 2 of USB-C
GND	7	7	11	Ground
GND	8	8	11	Ground
SDA_S	9	9 (NC)	-	NVM I²C: Serial Address and Data input and Data output
SCL_S	10	10 (NC)	-	NVM Slave I²C: Serial Clock Input
WP	11	11 (NC)	-	NVM Write Protect Input (Low Enable Write, Default Pull LOW)
VCC	12	12 (NC)	-	NVM 3.3V Power in
DIS_DRV	13	13	13	V_{BUS} Discharge Function: NMOS Drive
DIS_SEN	14	14	-	V_{BUS} Dischrage Function: NMOS Source/ VBUS Monitor
GPIO3	15	15	12 (PDO1)	General Purpose IO/ PDO Selection Pin 1
GPIO2	16	16	14 (PDO0)	General Purpose IO/ PDO Selection Pin 0
GPIO1	17	17	15 (TGDR)	General Purpose IO/ Transmission Gate Driver
GPIO0	18	18	16 (FB_{PWM})	General Purpose IO/ PWM current drive (need ext. RC filter)
FAULT_IN	19	19	-	Fault Interrupt Input Channel
SCL_M	20	20	-	Master I²C: Serial Clock Input
SDA_M	21	21	-	Master I²C: Serial Address and Data input and Data output
VDD_50	22	22	1	Chip 5V Power Input
V_IN	23	23	2	V_{BUS} Output Voltage detection
I_INN	24	24	3	Low-side Current Sense Input Negative
I_INP	25	25	4	Low-side Current Sense Input Positive
VDD12OUT	26	26	5	On Chip 1.2V LDO output
VDD33OUT	27	27	6	On Chip 3.3V LDO output
NTCIN_RST	28	28	-	Temperature Sense for NTC thermistor & RESET input
Thermal Pad			-	Ground

USB Power Delivery Fixed PDO Selection Table (For AX9292S16 Only)

Pin PDO1	Pin PDO0	Rated Power Output (Peak Output)	5V OCP Limit	9V OCP Limit	12V OCP Limit	15V OCP Limit	20V OCP Limit
Open	Open	18W (19.8W)	3.3A	2.2A	1.65A	1.32A (1)	N/A
Open	Tight L	30W (33.0W)	3.3A	3.3A	2.75A	2.2A	1.65A
Tight L	Open	45W (49.5W)	3.3A	3.3A	3.3A	3.3A	2.475A
Tight L	Tight L	65W (71.5W)	3.3A	3.3A	3.3A	3.3A	3.575A

(1): If V_IN sense much lower than 15V ouput (≤12V) in this setting may auto remove this PDO and inform host

(2): 18W for Qualcomm Quick Charge follow v3.0 and 30W follow Quick Charge 4 Class-A Current/ Level Capability

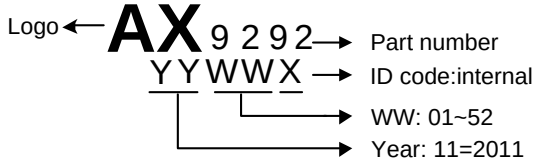
❖ ORDER/MARKING INFORMATION

Order Information

AX9292 X XXX X

- Pin Type: A: A Type; B: B Type (For TQFN-28L Only)
- Package Type: S16 : SOP-16L; TQ28 :TQFN-28L(4x4)
- Packing: A : Taping

Top Marking (SOP-16L)



Top Marking (TQFN 4*4-28L)