



DESCRIPTION

A2610 is based on interface controller IC for Quick Charge 2.0 (QC 2.0) specification. It automatically detects charging device, by charging device handshake protocol to obtain maximum power safety equipment, charging time savings while protecting the charging device. Support Quick Charge 2.0, Turbo Charge 2.0, Rapid Charge 2.0 and BC1.2.

The A2610 is available in SOP8 and SOT-26 packages.

ORDERING INFORMATION

Package Type	Part Number	
SOP8	M8	A2610M8R
		A2610M8VR
SOT-26	E6	A2610E6R
		A2610E6VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

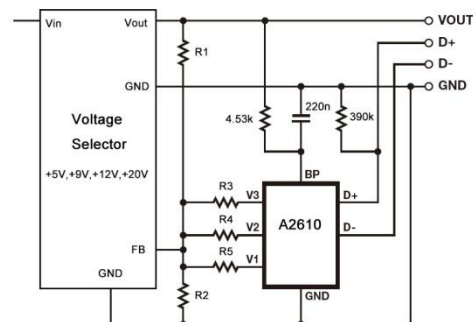
FEATURES

- Fully supports QC 2.0 Quick Charge specification
Class A : 5V、 9V and 12V output voltage
Class B : 5V、 9V、 12V and 20V output voltage
Can selection 12V or 20V output inhibit
- USB charging specification BC1.2 compatible
Support USB charging specification DCP mode
Default 5V mode operation
- Very low power consumption
Below 350uW at 5V output
- Reliability protection function
Adjacent pin-to-pin short-circuit protection
Open circuit pin protection
- Available in SOP8 and SOT-26 Packages

APPLICATION

- mobile power
- Portable Charger
- Car Charger etc

TYPICAL APPLICATION



R1~R5 according to Output Voltage Lookup Table calculate value



PIN DESCRIPTION

<p style="text-align: center;">Top View</p>		<p style="text-align: center;">Top View</p>		
Pin #		Symbol	I/O	Function
SOP8	SOT-26			
1	2	GND	P	Ground
2	1	V1	O	Voltage control 1
3	6	V2	O	Voltage control 2
4	-	V3	O	Voltage control 3
5	5	D-	I/O	Connect to USB port D-
6	4	D+	I/O	Connect to USB port D+
7	-	NC	-	No Connect
8	3	BP	P	BYPASS connect to positive power supply

NOTE: I: CMOS Input O: Push-Pull type CMOS Output I/O: CMOS Input/Output P: Power Supply/Ground

ABSOLUTE MAXIMUM RATINGS

V _{BP} , BYPASS Voltage	-0.3V ~ +5.5V
V _I /V _O , Input/Output Voltage	-0.5V ~ V _{BP} +0.5V
T _{OPR} , Operating Temperature	-20°C ~ +85°C
T _{STG} , Storage Temperature	-50°C ~ +125°C
V _{ESD} , ESD level (HBM)	>4kV

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



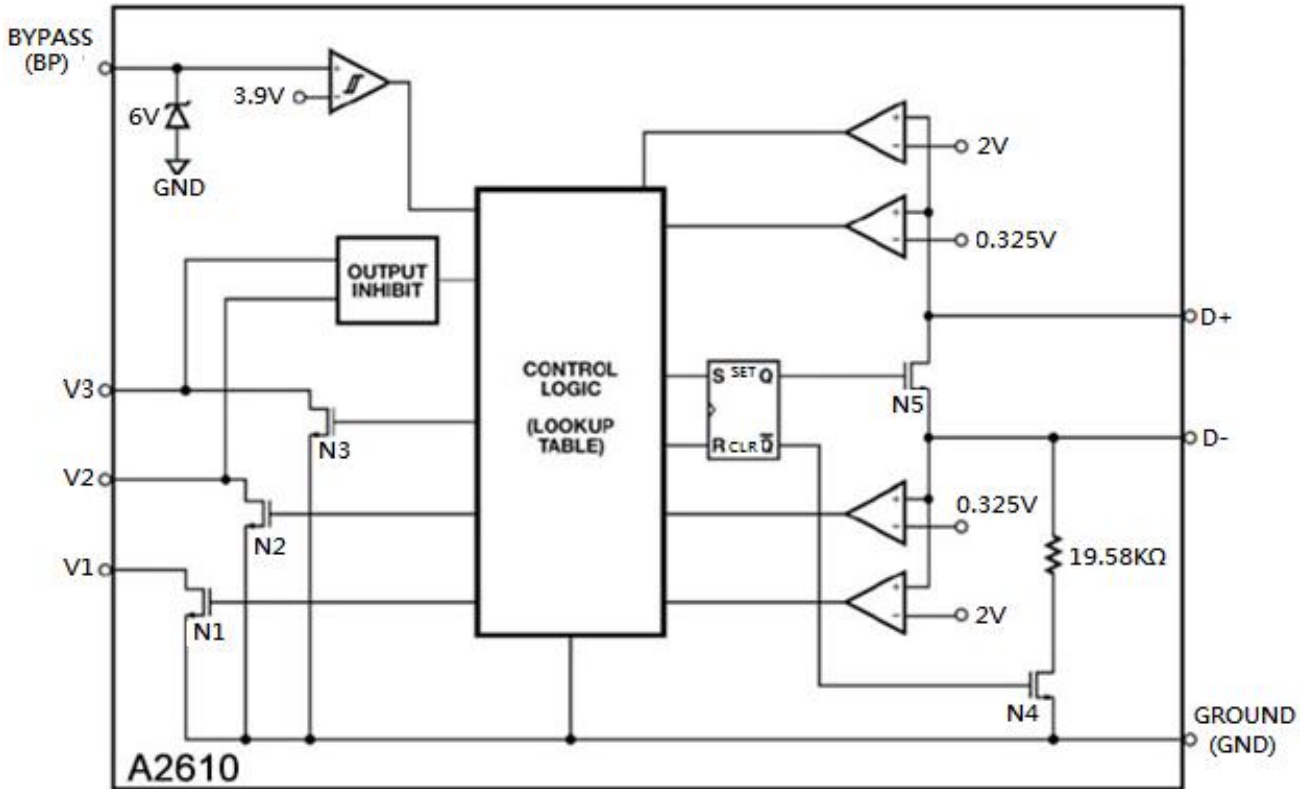
ELECTRICAL CHARACTERISTICS

T_A=25°C , No Load, unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
BYPASS Voltage	V _{BP}		4.0	5.0	5.5	V
BYPASS Current	I _{BP}	V _{BP} =4.5V		65	100	μA
Power-on Reset Threshold Voltage	V _{BP(RESET)}		2.0		3.9	V
Shunt voltage	V _{BP(SHUNT)}	I _{BP} =3mA	5.7	6.0	6.3	V
Data detect voltage	V _{DAT(REF)}		0.250	0.325	0.400	V
Output voltage selection reference	V _{SEL(REF)}		1.8	2.0	2.2	V
12V/20V Output Inhibit Threshold	V _{INH}		V _{BP} -1.0			V
Data line short-circuit delay	T _{DAT(SHORT)}	V _{OUT} ≥0.8V		10	20	ms
D+ High glitch filter time	T _{GLITCH(BC) DONE}		1000	1250	1500	ms
Output voltage glitch filter time	T _{GLITCH(V) CHANGE}		20	40	60	ms
D- Pull-down resistor	R _{DM(DWN)}		14.25	19.53	24.50	kΩ
N1 On-resistance	R _{DS(ON)N1}	I _{N1} =200μA			300	Ω
N2 On-resistance	R _{DS(ON)N2}	I _{N2} =200μA			300	Ω
N3 On-resistance	R _{DS(ON)N3}	I _{N3} =200μA			300	Ω
N4 On-resistance	R _{DS(ON)N4}	I _{N4} =200μA			300	Ω
N5 On-resistance	R _{DS(ON)N5}	I _{N5} =200μA V _(D+) ≤3.6V		20	40	Ω



BLOCK DIAGRAM





Output voltage

Quick Charge 2.0 Interface

At power-up A2610 turns on switch N5 (see BLOCK DIAGRAM) in 20 ms or less after the BP pin voltage has reached 4V. Switch N4 and output switches N1 to N3 remain off. This sets the default 5V output voltage level. With D+ and D- short-circuited the normal handshake between the AC-DC adapter and powered devices as described in the USB Battery Charging Specification 1.2 can commence. After switch N5 has been turned on A2610 starts monitoring the voltage level at D+. If it continuously stays above $V_{DAT(REF)}$ (typ. 0.325V) and below $V_{SEL(REF)}$ (typ. 2V) for at least 1.25 seconds, A2610 will enter Quick Charge 2.0 operation mode. If the voltage at D+ drops any time below 0.325V, A2610 resets the 1.25 seconds timer and stays in USB Battery Charging Specification 1.2 compatibility mode with a default output voltage of 5V

Once A2610 has entered Quick Charge 2.0 operation mode switch N5 will be turned off. Additionally switch N4 is turned on connecting a 19.53k Ω pull-down resistor to D-. As soon as the voltage at D- has dropped low (<0.325V) for at least 1 ms, A2610 starts accepting requests for different AC-DC adapter output voltages by means of applied voltage levels at data lines D+ and D- through the powered device.

A2610 output voltage (see Table 1) corresponding AC-DC adapter output voltages and status of switches N1 to N3.

Connect pin V3 (SOP8) to BP the output voltage can be limited under 12V (include 12V). Connect pin V2 to BP output voltage can be limited under 9V.

At USB cable disconnect the voltage level at D+ is pulled down by resistor. Once it drops below 0.325V, A2610 will turn on switch N5 (thereby short-circuiting D+ and D-) and turns off switches N1 to N4. This sets the default output voltage of 5V. The recommended value for resistor = 390k Ω .

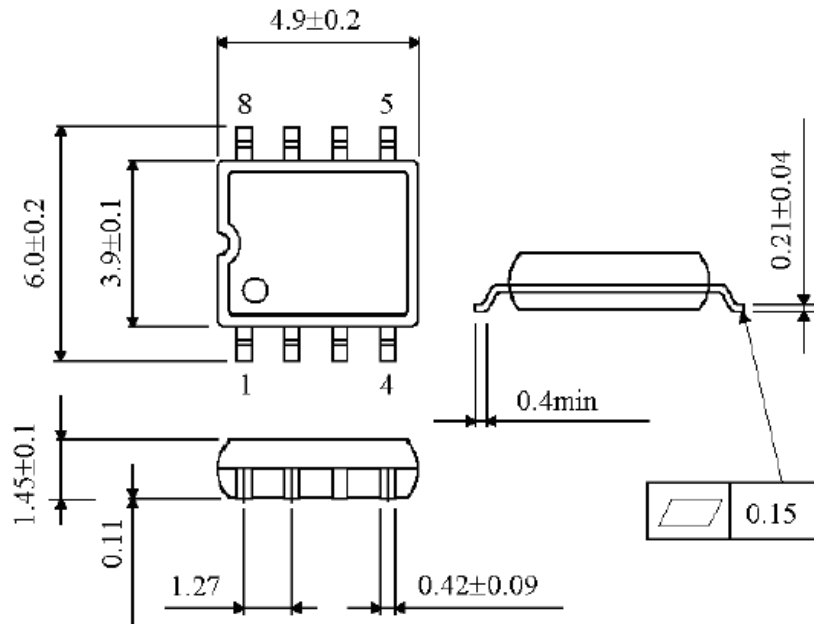
Table 1 A2610 Output Voltage setting mode

No.	USB D+(V)	USB D-(V)	Output VBUS (V)	V1	V2	V3
1	3.3	0.6	9	ON	OFF	OFF
2	0.6	0.6	12	ON	ON	OFF
3	3.3	3.3	20	ON	ON	ON
4	0.6	GND	5V (default)	OFF	OFF	OFF

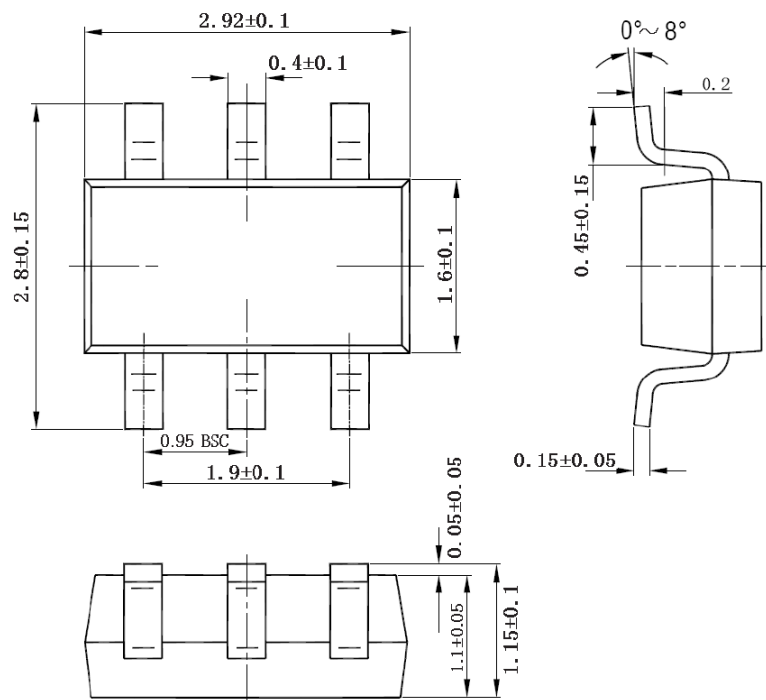


PACKAGE INFORMATION

Dimension in SOP8 (Unit: mm)



Dimension in SOT-26 (Unit: mm)





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