DESCRIPTION

The A4102 is Li+ charger IC with integrated P-MOSFET. The device is fabricated with advanced CMOS technology to achieve maintaining low static power dissipation over a very broad V_{CC} operating range.

The A4102 integrates a P-MOSFET and Schottky diode which is normally a discrete device employed for conventional battery charging design of mobile phone system. In addition to that, A4102 works like a LDO mode to keep CHRIN voltage stable when ACIN goes high. And thus it will not trigger the CHRIN pin over-voltage protection when ACIN voltage increased to as high as 15V.

The A4102 provides complete Li+ charger protections and saves the external MOSFET and Schottky diode for the charger of cell phone's PMIC. It is available in a DFN8(2x2) package.

The above features and small package make the A4102 an ideal part for cell phones applications.

The A4102 is available in DFN8(2x2) Package.

ORDERING INFORMATION

Package Type	Part Number	
DFN8 (2x2)	J8	A4102J8R
		A4102J8VR
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

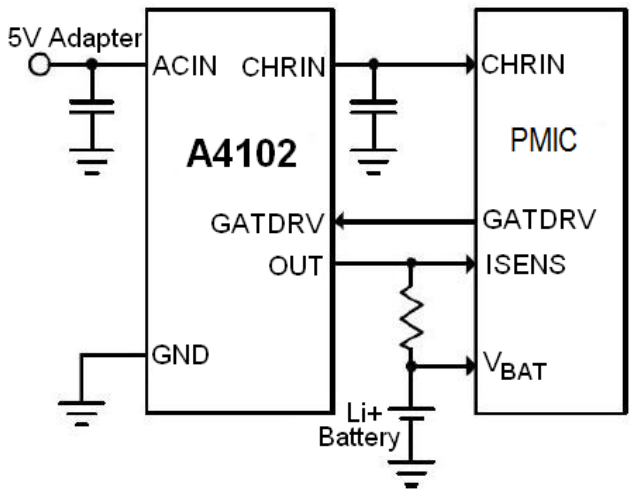
FEATURES

- A Built-In P-MOSFET
- LDO mode makes CHRIN voltage stable around 5.5V
- Range of operation input voltage: Max 15V
- Charging current up to 1A
- Environment Temperature: -20℃ ~ 85℃
- Available in DFN8(2x2) Package

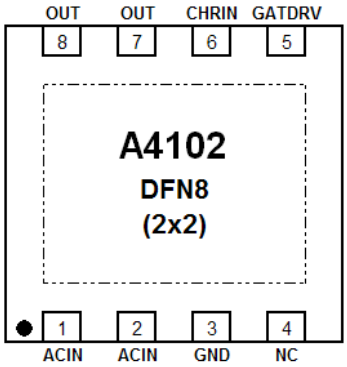
APPLICATION

- Cell phone and other portable device

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1, 2	ACIN	Input
3	GND	Ground
4	NC	No Connected
5	GATDRV	Gate Driver
6	CHRIN	Charge
7, 8	OUT	Output

THERMAL RESISTANCE RATING

Parameter	Package	Symbol	Typical	Unit
Junction-to-Ambient Resistance in Free Air NOTE	DFN8(2x2)	θ_{JA}	80	°C/W

NOTE: θ_{JA} is measured with the component mounted on a high effective thermal conductivity test board in free air. The exposed pad of DFN8(2x2) is soldered directly on the PCB.

ABSOLUTE MAXIMUM RATINGS

V_{ACIN}, ACIN Input Voltage (ACIN to GND)	-0.3V ~ 15V
V_{CHRIN}, CHRIN to GND Voltage	-0.3V ~ 6V
V_{GATDRV}, GATDRV to GND Voltage	-0.3V ~ V_{CHRIN}
V_{OUT}, OUT to GND Voltage	-0.3V ~ 6V
P_D, Output power limit, I_{OUT} x (V_{ACIN} - V_{OUT})	0.75W
T_J, Maximum Junction Temperature	150℃
T_{STG}, Storage Temperature	-40℃ ~ +150℃
T_{SDR}, Maximum Lead Soldering Temperature, 10 Seconds	260℃

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATION CONDITIONS

Parameter	Symbol	Range
ACIN Input Voltage (ACIN to GND)	V_{ACIN}	4.5V ~ 10V
Output Current	I_{OUT}	0mA ~ 700mA
Ambient Temperature	T_A	-40℃ ~ 85℃
Junction Temperature	T_J	-40℃ ~ 125℃

ELECTRICAL CHARACTERISTICS

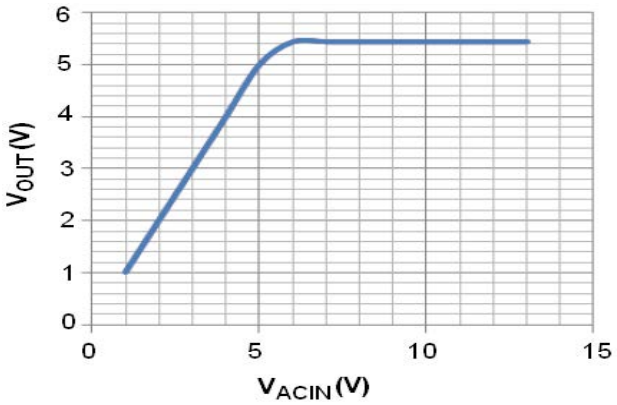
T_J = 25℃

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Threshold Voltage	Vth	Ids = -1uA, Vds = Vgs	-1.0	-0.7	-0.4	V
CHRIN Voltage	V_{CHRIN2}	V_{IN} = 6.0V, I_{CHRIN} = 50mA	5.0	5.5	6.0	V
Off-State Leakage	IDss1	V_{OUT} = 0, V_{IN} = 10V, V_{GATDRV} = V_{CHRIN1}	-	-	1	uA
Reverse Block Leakage	IDss2	V_{OUT} = 5V, V_{IN} = 0, V_{GATDRV} = V_{CHRIN1} = 0V	-	2	5	uA
On –State Drain Current	Idson	V_{IN} = 5V, V_{OUT} = 4V,V_{GATDRV} = 1V	0.9	1.2	1.5	A
Vds/Idson	Rdson	Vs = 5V, Vg = 1V, Vd = 4V	0.5	0.75	1	Ω

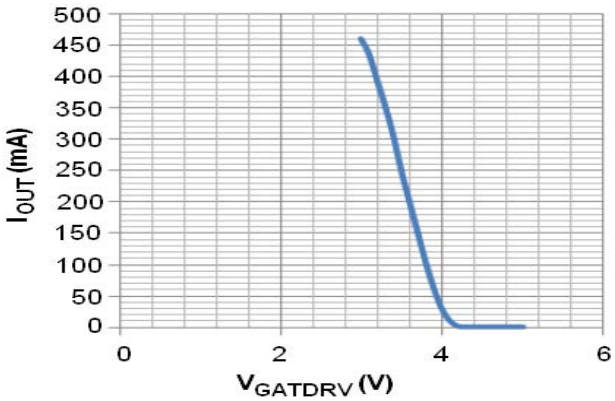
TYPICAL PERFORMANCE CHARACTERISTICS

T = 25°C unless specified.

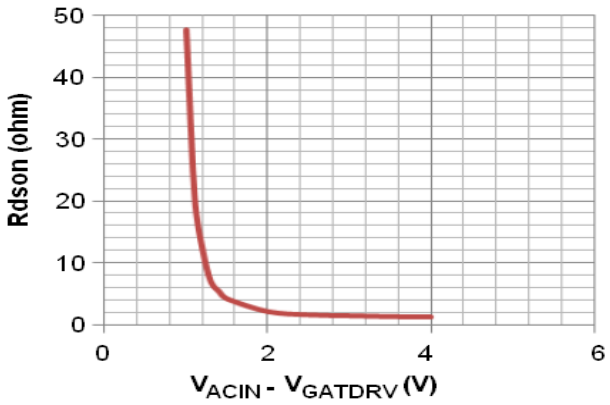
1. Line Regulation



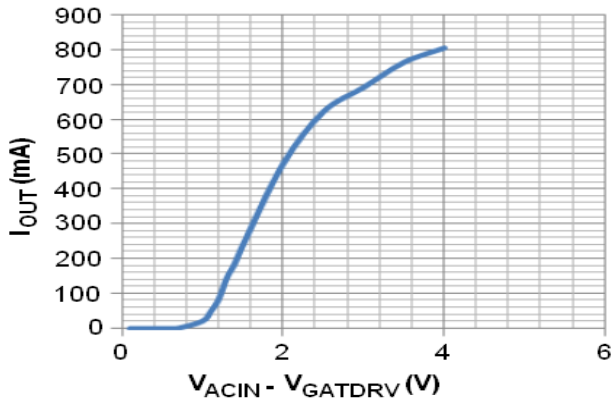
2. Charger Current VS V_{GATDRV}



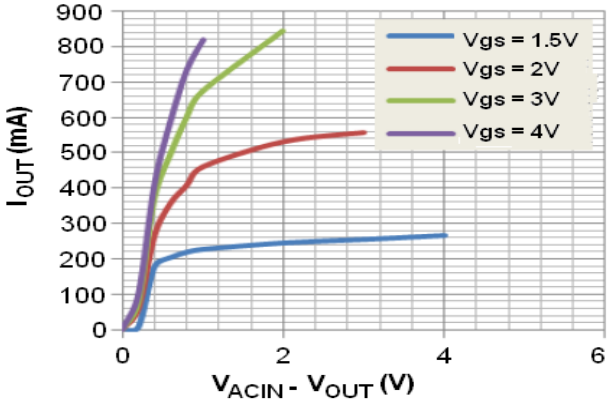
3. On Resistance



4. Transfer Character



5. Output Character

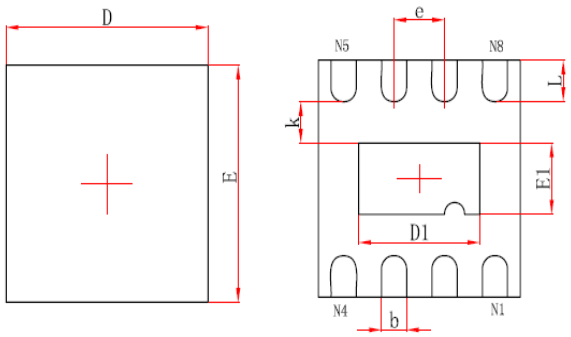


DETAILED INFORMATION

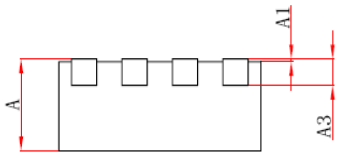
Even though A4102 can handle charge current larger than 1A, it is also limited by the power dissipation of the package DFN8(2x2). The DFN8(2x2) package has a thermal pad exposed, and it should be tightly soldered to bottom PCB with a large coil area to dissipate the heat. In general, to have the A4102 to work under a safe condition, one should take DFN8(2x2) power limit as 0.75W, and if the dropout voltage is 1.5V, one is suggested to set the charging current to be less than 500mA.

PACKAGE INFORMATION

Dimension in DFN8(2x2) (Unit: mm)



Top View Bottom View



Side View

Symbol	Min	Max
A	0.700/0.800	0.800/0.900
A1	0.000	0.050
A3	0.203REF.	
D	1.900	2.100
E	1.900	2.100
D1	1.100	1.300
E1	0.500	0.700
k	0.200MIN.	
b	0.180	0.300
e	0.500TYP.	
L	0.250	0.450

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