LC6006

LDO mode OVP with Integrated P-MOSFET

DESCRIPTION

The LC6006 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 VCC operating range.

The LC6006 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, LC6006 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 LC6006 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 DFN2x2-8L package.

The above features and small package make the LC6006 an ideal part for cell phones applications.

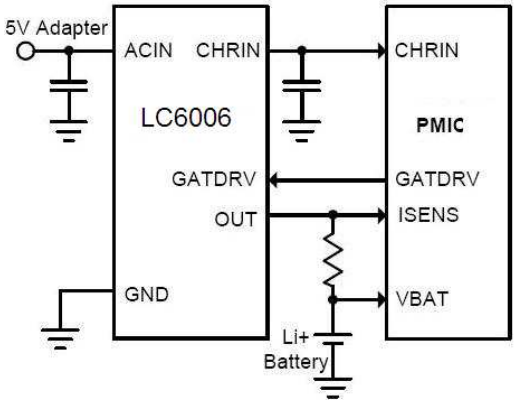
FEATURES

- 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°C~85°C

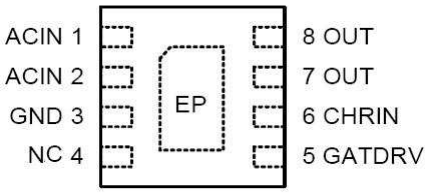
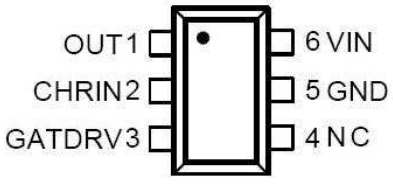
APPLICATIONS

- Cell phone and other portable device

APPLICATION CIRCUIT



ORDERING INFORMATION / PIN CONFIGURATION / MARKING

LC6006CKBTR DFN2x2-8L	**LC6006CB6TR** SOT23-6L	**Top Marking**
		OBYW

YW means the year and week parts being manufactured, subjected to change. OB is the code of the product; it will not be changed on any part.

ABSOLUTE MAXIMUM RATING (Note1)

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

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired. Exposure to absolute maximum rating conditions for extended periods may destroy the device.

THERMAL RESISTANCE RATING

Parameter	Device	Symbol	Typical	Unit
Junction-to-Ambient Resistance in Free Air(Note2)	DFN2x2-8	θ_{JA}	80	°C /W
	SOT23-6	θ_{JA}	235	°C /W

Note 2: θ_{JA} is measured with the component mounted on a high effective thermal conductivity test board in free air. The exposed pad of DFN2x2-8 is soldered directly on the PCB.

THERMAL CONSIDERATION

Even though LC6006 can handle charge current larger than 1A, it is also limited by the power dissipation of the package DFN2x2-8L. The DFN2x2 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 LC6006 to work under a safe condition, one should take DFN2x2 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.

RECOMMENDED OPERATION CONDITIONS

Symbol	Parameter	Range	Unit
V_{ACIN}	ACIN Input Voltage (ACIN to GND)	4.5~10	V
Iout	Ooutput Current	0~700	mA
T_A	Ambient Temperature	-40~85	°C
T_J	Junction Temperature	-40~125	°C

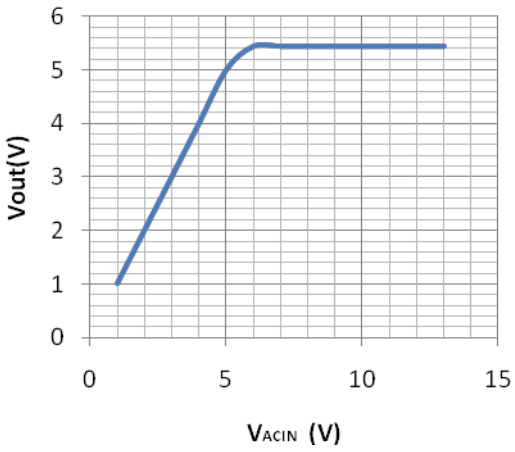
ELECTRICAL CHARACTERISTICS

Tj=25°C

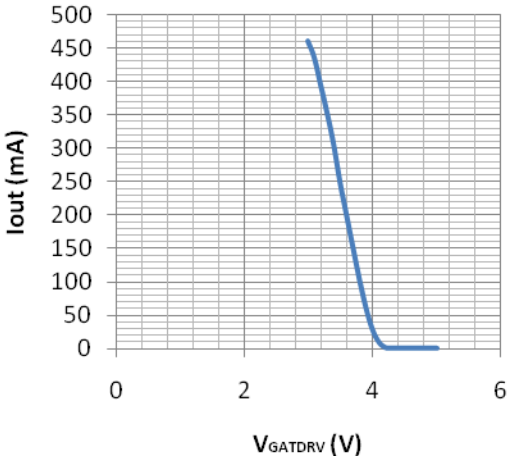
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Vth	Threshold Voltage	Ids=-1uA, Vds=Vgs	-1.0	-0.7	-0.4	V
V_{CHRIN2}	CHRIN Voltage	V_{IN} = 6.0 V, I_{CHRIN}=50mA	5.0	5.5	6.0	V
IDss1	off-state leakage	V_{OUT}=0, V_{IN}=10V, V_{GATDRV}=V_{CHRIN1}	-	-	1	uA
IDss2	reverse block leakage	V_{OUT}=5V, V_{IN}=0, V_{GATDRV}=V_{CHRIN1}=0V		2	5	uA
Idson	On –state drain current	V_{IN}=5V, V_{OUT}=4V, V_{GATDRV}=1V	0.9	1.2	1.5	A
Rdson	Vds/Idson	Vs=5V, Vg=1V, Vd=4V	0.5	0.75	1	ohm

TYPICAL PERFORMANCE CHARACTERISTICS *T=25°C unless specified.*

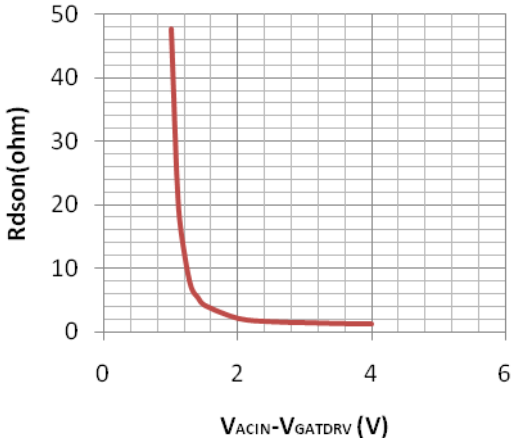
Line Regulation



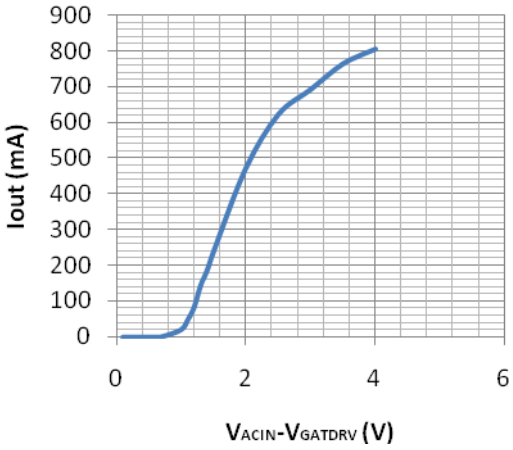
Charger Current Vs VGATDRV



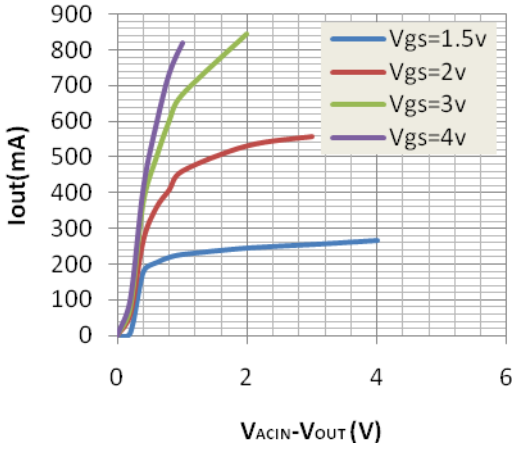
On Resistance



Transfer Character



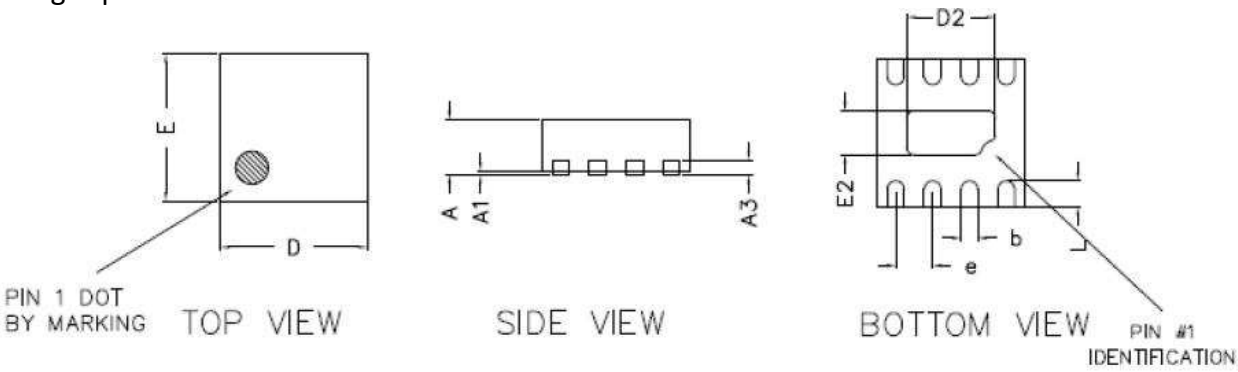
Output Character



PACKAGE OUTLINE

Package	DFN2x2-8	Devices per reel	3000	Unit	mm

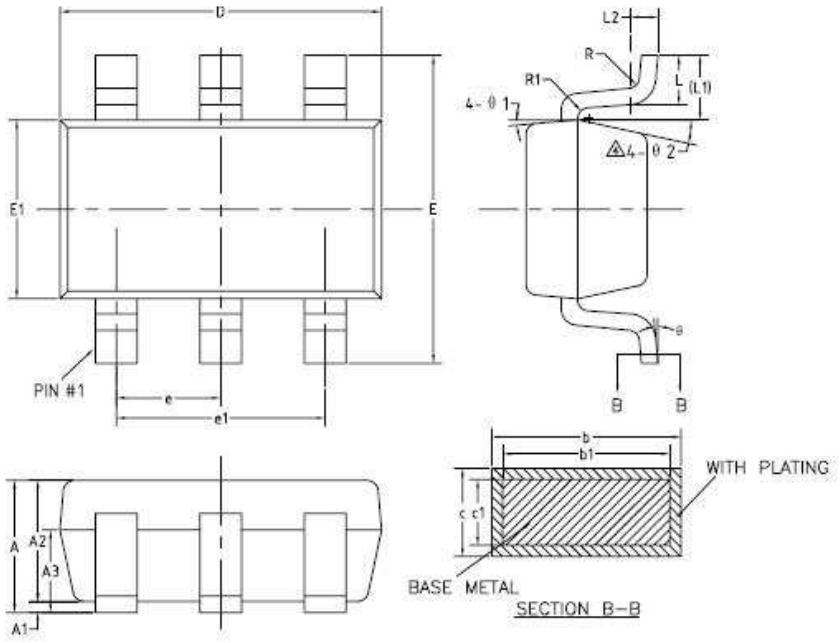
Package specification：



COMMON DIMENSIONS(MM)			
PKG.	W: VERY VERY THIN		
REF.	MIN.	NOM.	MAX
A	0.70	0.75	0.80
A1	0.00	–	0.05
A3	0.2 REF.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
b	0.18	0.23	0.30
L	0.25	0.35	0.45
D2	1.05	1.20	1.30
E2	0.45	0.60	0.70
e	0.50 BSC		

Package	SOT23-6	Devices per reel	3000	Unit	mm

Package specification：



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	–	–	1.25
A1	0	–	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	–	0.50
b1	0.36	0.38	0.45
c	0.14	–	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
④ e	0.90	0.95	1.00
④ e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
③ R	0.10	–	–
③ R1	0.10	–	0.20
θ	0°	–	8°
θ1	3°	5°	7°
④ θ2	6°	–	14°