DD212

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HIGH POWER CHARGE PUMP FOR WHITE LEDS WITH LOW SUPPLY VOLTAGE

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DD212

HIGH POWER CHARGE PUMP FOR WHITE LEDS WITH LOW SUPPLY VOLTAGE

General Description

DD212 is designed specifically for driving a white LED as a light source with low supply voltage. Like a charge pump, DD212 doubles the supply voltage, but only requires one external component, a capacitor. The built-in oscillator generates a 50% duty-cycle and 350kHz-frequency clock. DD211 also consumes little power with CMOS integrated circuits. DD212 comes in a small die that makes packaging it within a LED module be easy. DD212's small package, SOT25 occupies only little area for portable device, such as a handset. DD212 also has an EN pin to enable the chip, shutdown the DD212, the operation current is lower than 0.1uA.

Features

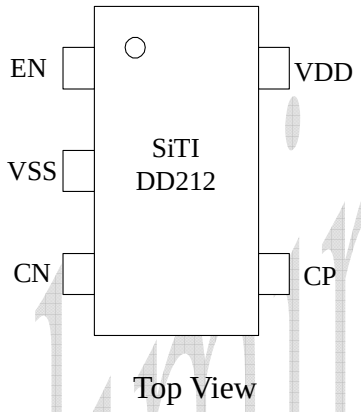
- Low supply voltage, 1.5V~5.5V
- Only one external component, a capacitor needed
- High power output 400mA@VDD=3V
- Low shutdown supply current
- It is easy to package DD212 within a LED module

Applications

- White LED Indicators' drivers
- White LED Back lighters for low-voltage wireless handsets

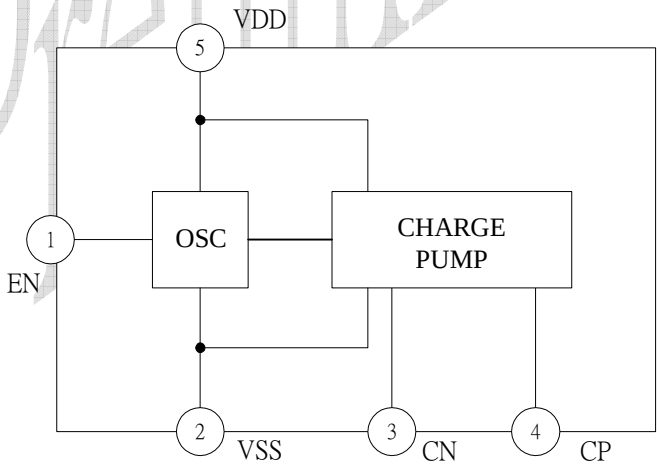
Pin Descriptions

PIN NAME	DESCRIPTIONS
EN	Chip Enable
VSS	Ground
CN	Negative Node of the External Capacitor
CP	Positive Node of the External Capacitor
VDD	Power



Top View

Block Diagram



Absolute Maximum Ratings (Unless otherwise noted, T_A = 25 °C)

Characteristic	Symbol	Rating	Unit
Supply Voltage	VDD - VSS	-0.3 ~5.5	V
Output Sourcing Current	IDD	700	mA
Power Dissipation	P_d	4.5	mW
Operating Temperature Range	T_{OPR}	-40 ~ 85	°C
Storage Temperature Range	T_{STG}	-55 ~ 150	°C
Junction Temperature	T_J	160	°C

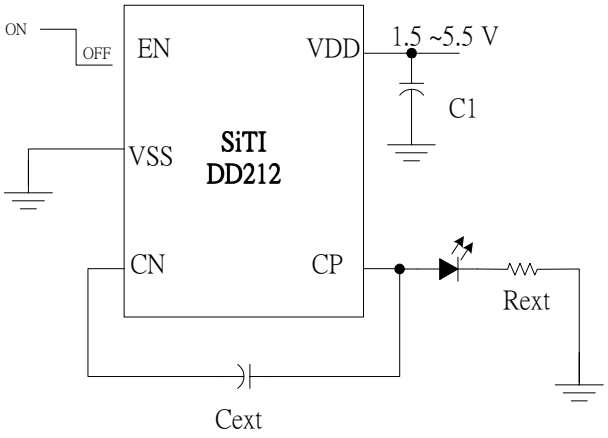
Recommended Operating Conditions

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	VDD - VSS	1.5	2.5	5.5	V
External Capacitance	Cext	-	1	-	uF

Electrical Characteristics (Cext=1uF, T_A= 25°C, V_{DD}= 2.5V)

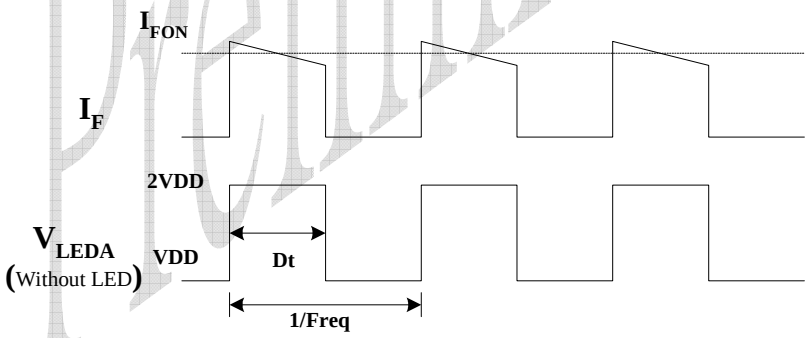
Characteristic	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating Current	I_{DD}	No external LED, Cext=0.1uF	-	-	0.75	mA
Output Current for 'ON' Cycle	I_{FON}	V_F of external LED=3.2V	480	500	520	mA
Time-Average Output Current	I_{FAVG}	V_F of external LED=3.2V	240	250	260	mA
Output Voltage for 'ON' Cycle	V_{LEDAON}	No external LED	-	5.0 (x2VDD)	-	V
Output Voltage for 'OFF' Cycle	$V_{LEDAOFF}$	No external LED	-	2.5 (x1VDD)	-	V
Frequency of the Internal Oscillator	Freq		-	350	-	kHz
Duty Cycle of the Internal Oscillator	Dt		-	50	-	%
Output Resistance	Ro			4	5	Ω

Typical Application

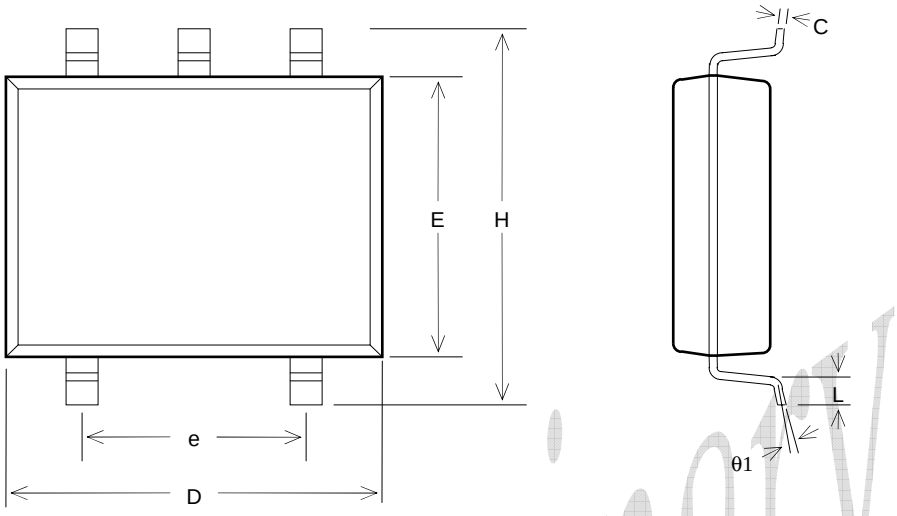


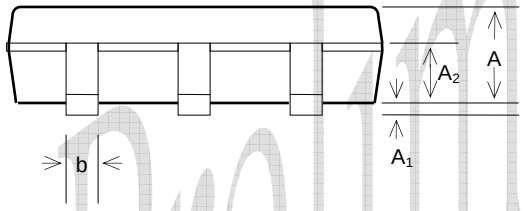
Functional Descriptions

DD212 is designed to drive a White LED as a light source with low supply voltage. As typical application circuit shown, when the EN is on, DD212 will double the supply voltage to drive the external LED with 50% duty cycle. The resistor Rext is used to limit the driving current.



Package Specifications (SOT-25)





SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	1.00	1.10	1.30
A_1	0.00	—	0.10
A_2	0.70	0.80	0.90
b	0.35	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	1.40	1.60	1.80
e	—	1.90(TYP)	—
H	2.60	2.80	3.00
L	0.37	—	—
θ1	1°	5°	9°

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