General Description

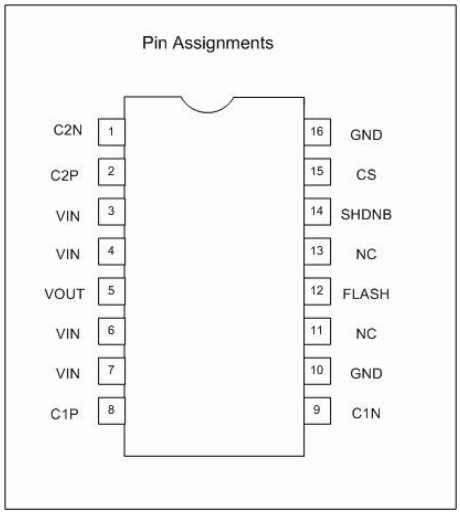
The BCT3211S is a constant frequency charge pump DC/DC Converter designed for white LED driver with high driving current capability up to 200mA. The BCT3211S has wide input voltage range from 1.6V to 3.6V is designed for use in low cost application where standard batteries are preferred.

Features

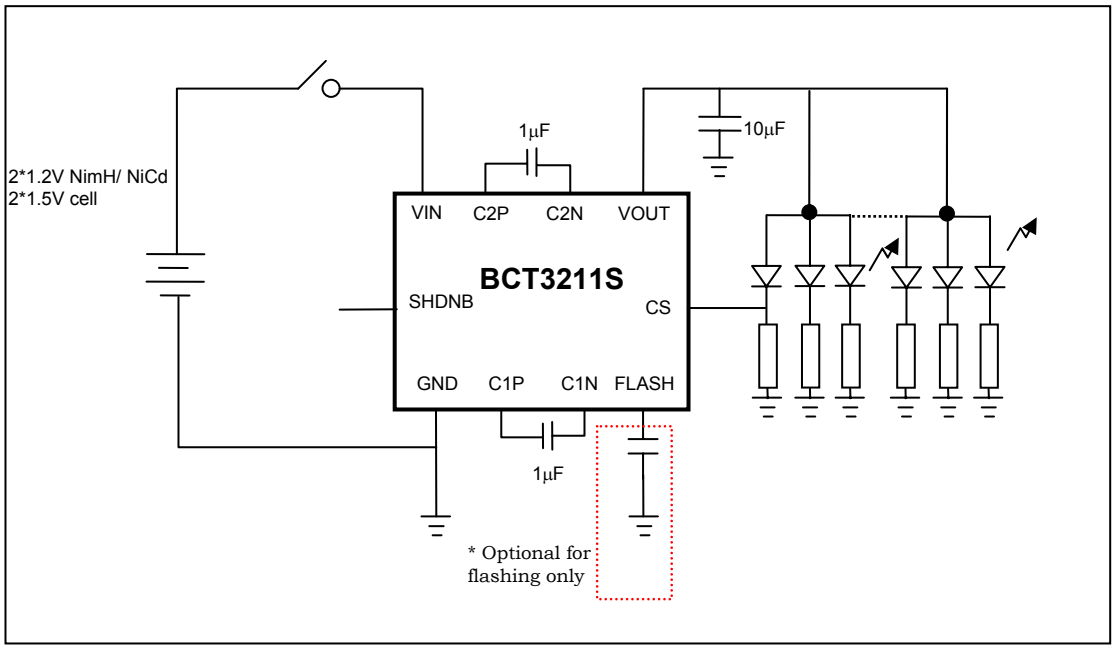
- On chip DC/DC converter
- Wide input voltage range: 1.6V to 3.6V
- Enter flash mode without hardware switch:
  Flash mode is enabled by power switch ON, then OFF → ON within ~1 Second
- Maximum output current: 200mA
- On Chip Oscillator
- Low power consumption
- Wide operation temperature:
  -20^{0}C to 70^{0}C
- Output current adjustable by external resistor at pin CS
- Shutdown control pin
- Available in Pb-free SOP16 package

Applications

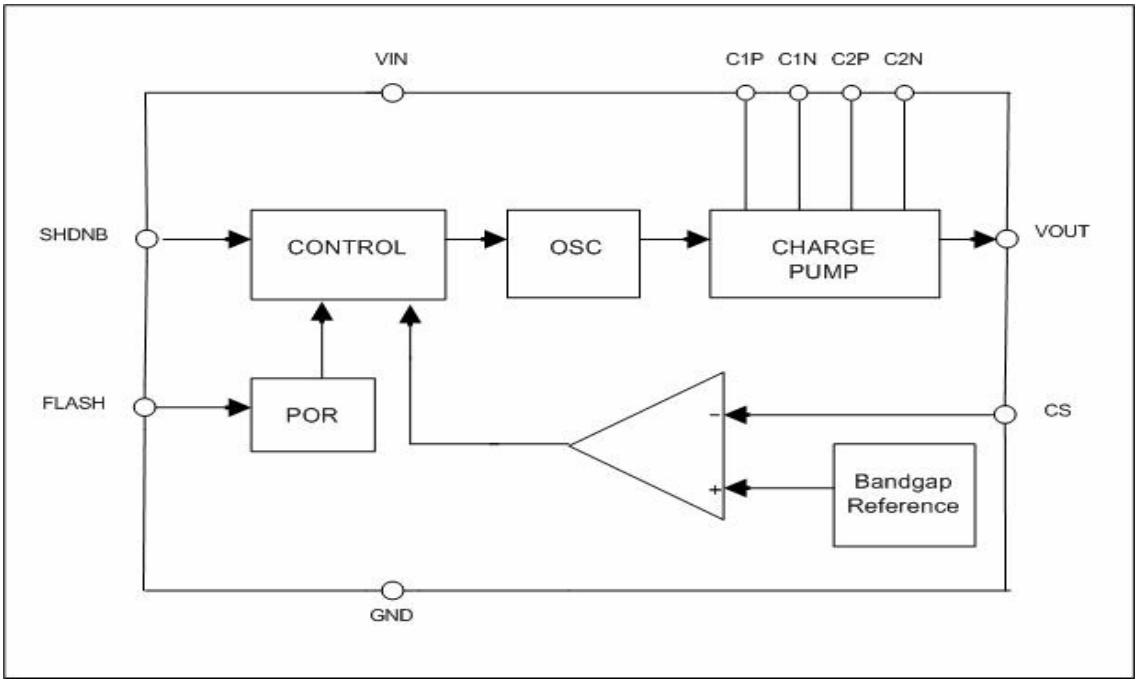
- White LED Torch / Head Lamp
- Handheld Electronics
- Lighting Equipments



Typical Application Circuit



Block Diagram



Pin Descriptions

Pin Number	Pin Name	I/O	Description
3,4,6,7	VIN	Power	Input Supply 1.6 – 3.6V
10,16	GND	Power	Ground 0V
14	SHDNB	Input	Chip reset or shutdown (Active Low)
12	FLASH	I/O	Capacitor pin for Flash Mode. To connect a 0.033μF ~ 0.1μF capacitor from FLASH to GND The flash mode will only operate when VIN > 1.8V
8,9	C1P, C1N	I/O	Charge Pump Flying Capacitor 1 Pins. To connect a 1μF capacitor between C1P and C1N
1,2	C2P, C2N	I/O	Charge Pump Flying Capacitor 2 Pins. To connect a 1μF capacitor between C2P and C2N
5	VOUT	Output	Charge Pump Output. To connect a 10μF ~ 100 μF capacitor from VOUT to GND
15	CS	Input	Current sense feedback for Regulation Control Loop, feedback voltage = 0.1V

Absolute Maximum Specifications

Rating	Symbol	Value	Unit
Supply voltage range	V_{IN}	-0.3 to 4.3	V
Input voltage range	SHDNB	-0.3 to V_{IN}+0.3	V
Output current Range	I_{OUT}	0 to 200	mA
Output voltage range	V_{OUT}	-0.3 to 8	V
Operating temperature range	T_{OPR}	-20 to 70	^{0}C
Storage temperature range	T_{STR}	-20 to 100	^{0}C

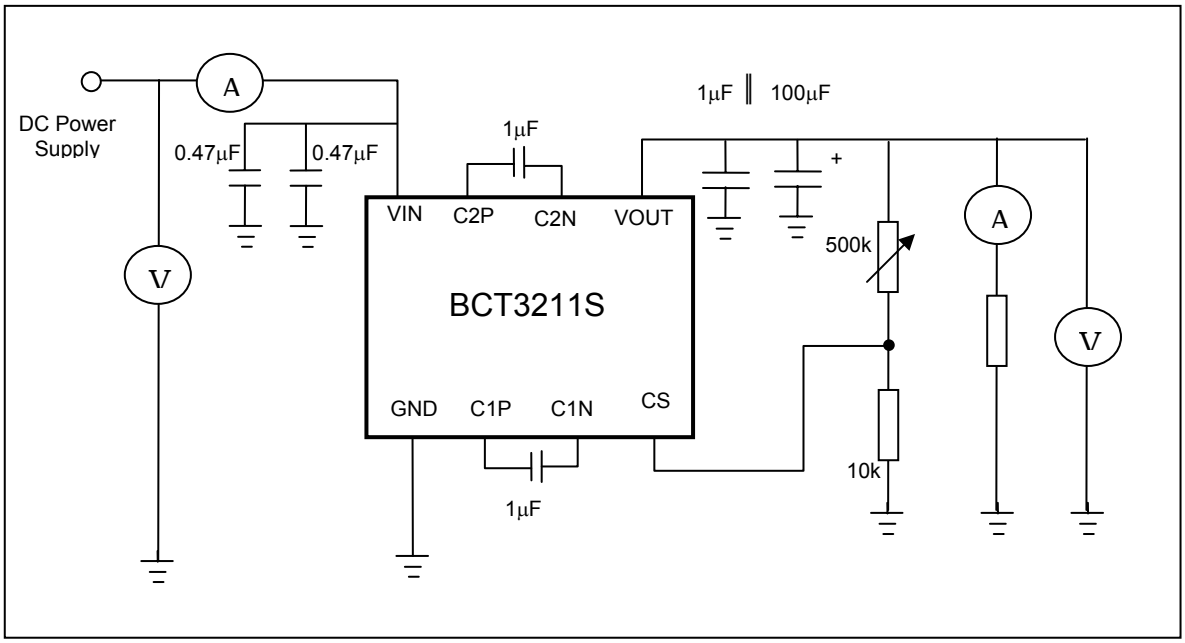
Electrical Specifications

All electrical specifications are specified at $T_{AMBIENT}$ from -20 ^{O}C to 70 ^{O}C, V_{IN} from 1.6V to 3.6V, unless otherwise specified.

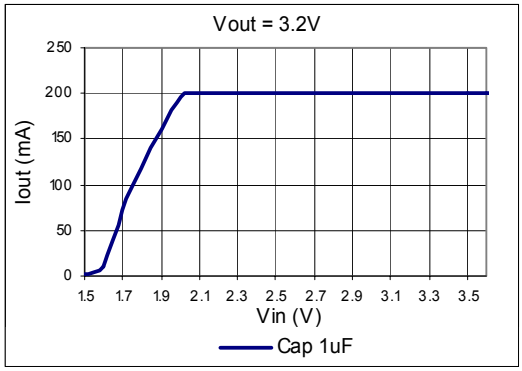
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{IN}	Input Power Supply		1.6	2.4	3.6	V
I_{CC}	Operating Current	I_{OUT} = 0mA V_{OUT} =3.6Volts		1.1		mA
I_{SHDN}	Shutdown Current	SHDNB= Low V_{OUT} = 0V		30		µA
V_{CS}	Feedback Voltage at CS			100		mV
F_{OSC}	Internal Oscillator Frequency			1.0		MHz
V_{IL}	Input Voltage Low for SHDNB		0		0.3	V
V_{IH}	Input Voltage High for SHDNB		V_{IN}-0.3		V_{IN}	V

Typical Characteristics

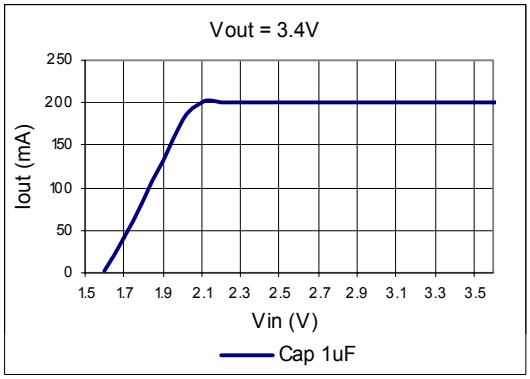
C1 = C2 = 1µF, C(VIN)= 0.47µF ‖ 0.47µF, C(VOUT) = 1µF ‖ 100µF
T_A = 25 ^{0}C, unless otherwise noted



Max Output Current vs. Supply Voltage At Vout = 3.2V

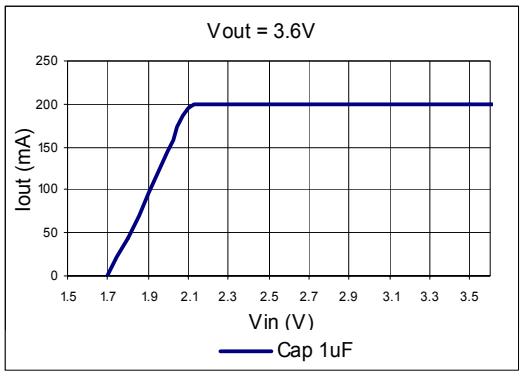


Max Output Current vs. Supply Voltage At Vout = 3.4V

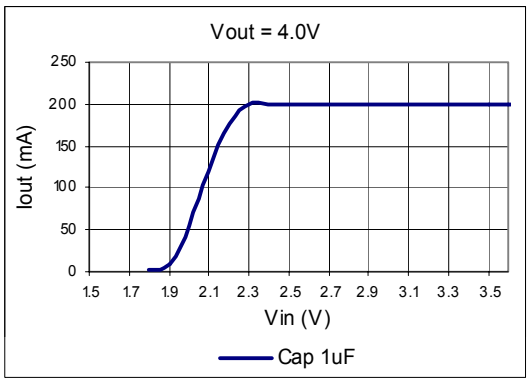


Typical Characteristics (continued)

Max Output Current vs. Supply Voltage At Vout = 3.6V



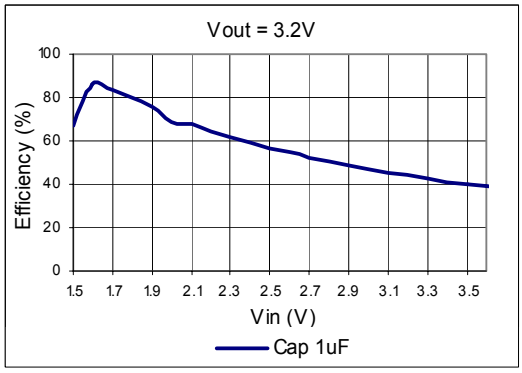
Max Output Current vs. Supply Voltage At Vout = 4.0V



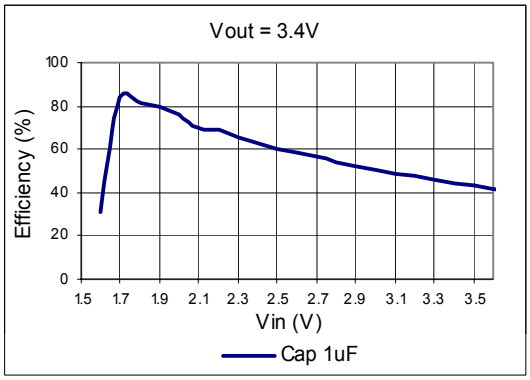
Performance Curves

T_A = 25 ^{0}C, unless otherwise noted

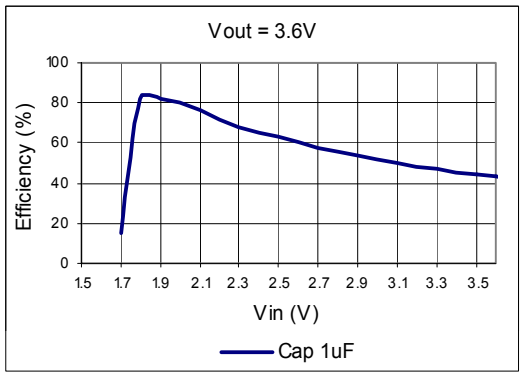
Power Efficiency vs. Supply Voltage At Vout = 3.2V



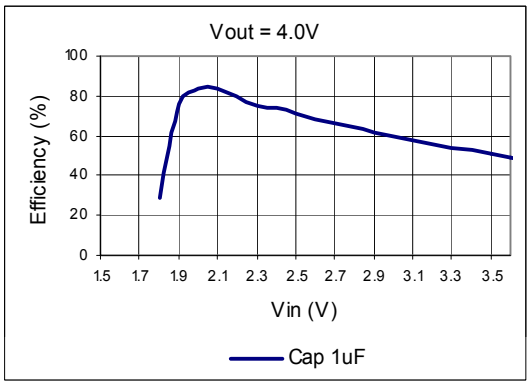
Power Efficiency vs. Supply Voltage At Vout = 3.4V



Power Efficiency vs. Supply Voltage At Vout = 3.6V



Power Efficiency vs. Supply Voltage At Vout = 4.0V

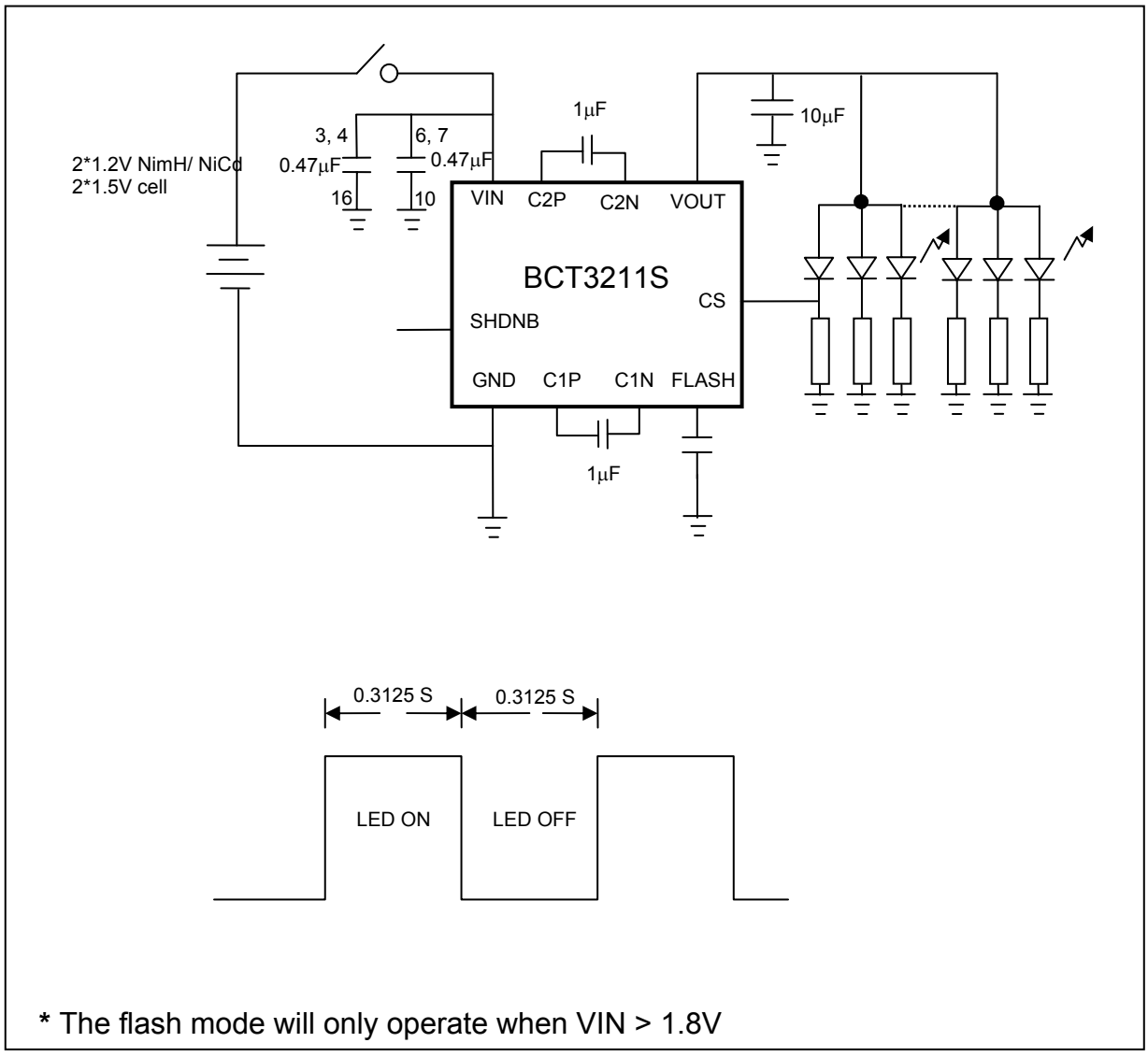


Applications

Care should be taken when batteries are connected to the chip. It will damage the chip when batteries are connected with reverse polarity.

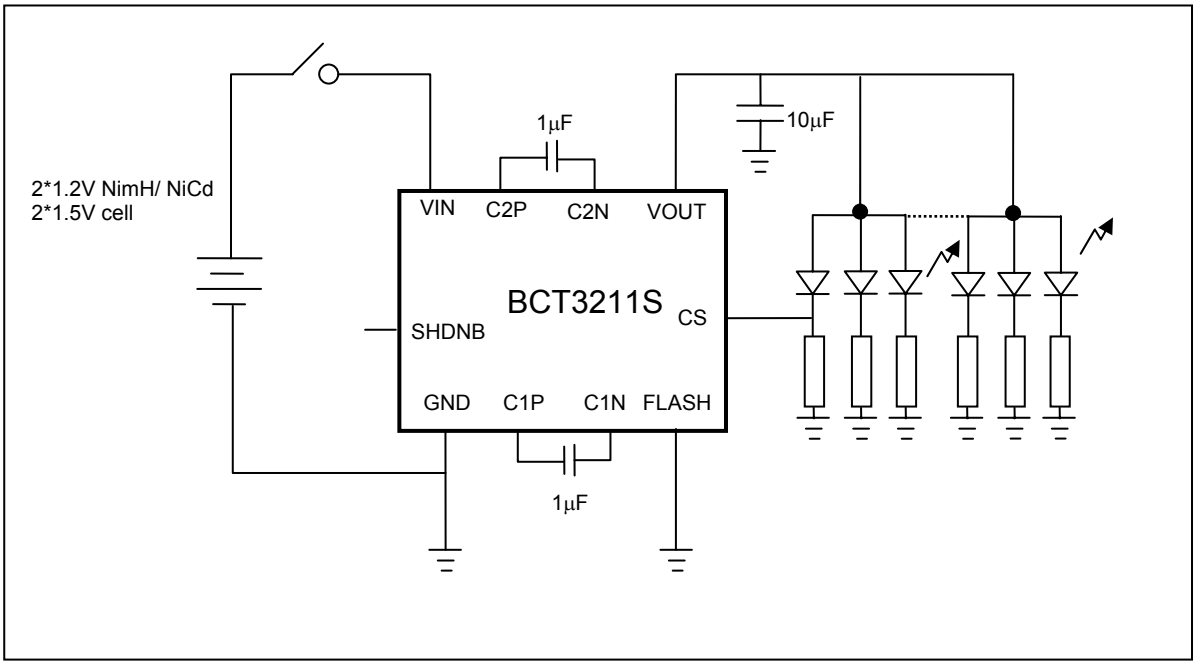
1. White LED Torch with Digital Timer Flash

The flash mode is enabled by power switch ON, then OFF → ON within ~1 second. The flash mode is only operate when VIN > 1.8V. The switching frequency is fixed at 1.6Hz with 50% duty cycle as shown in follow diagram:

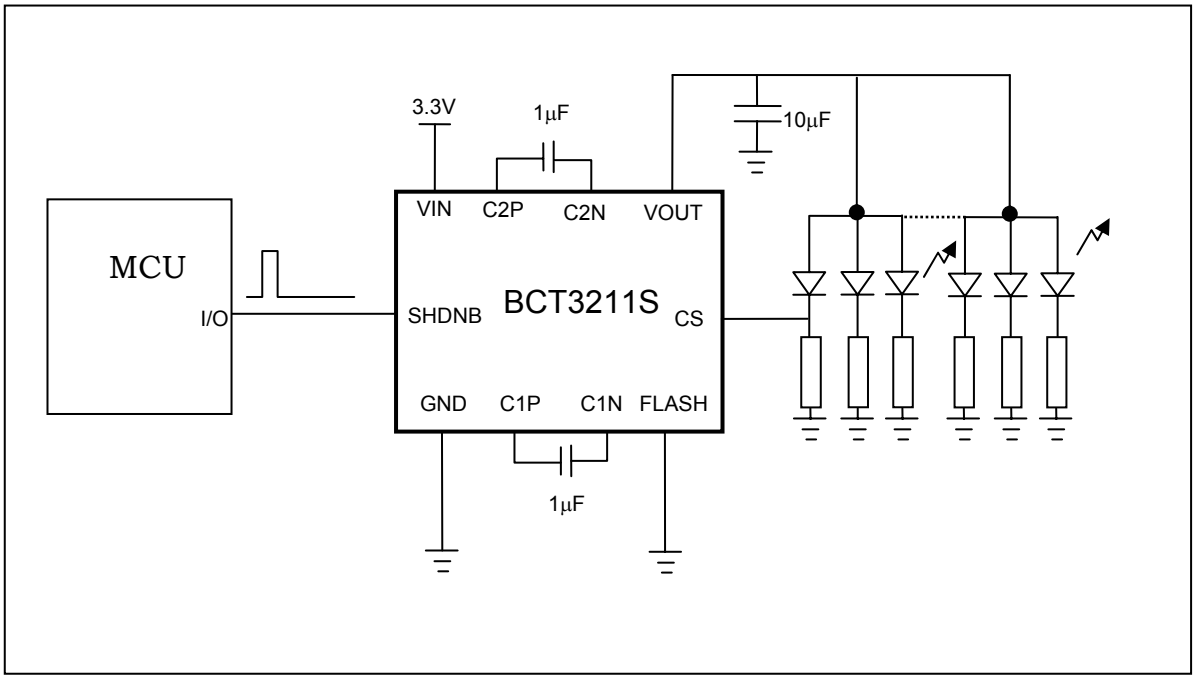


* The flash mode will only operate when VIN > 1.8V

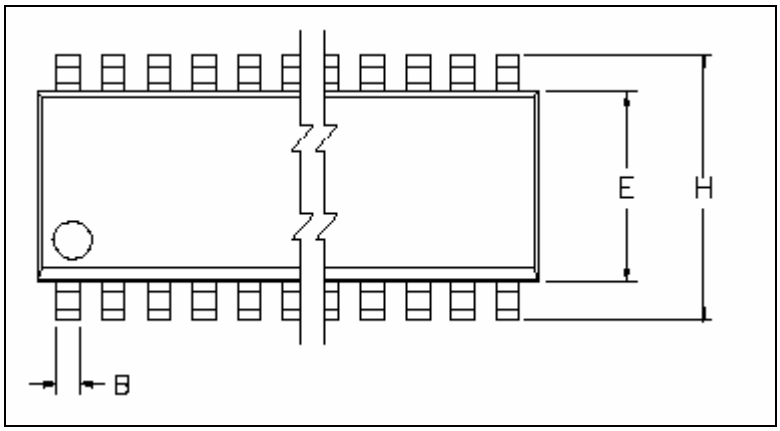
2. White LED Torch without Flash

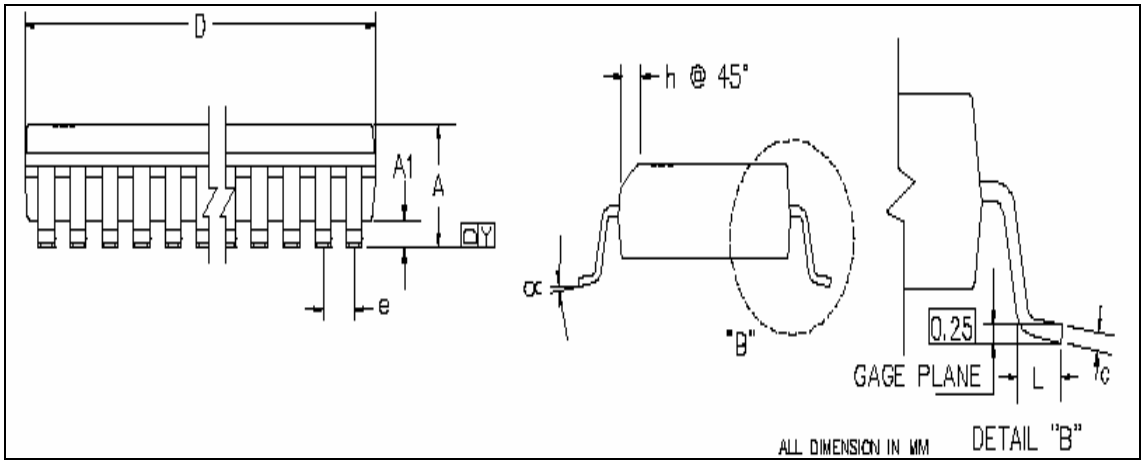


3. White LED Backlight Interface with MCU



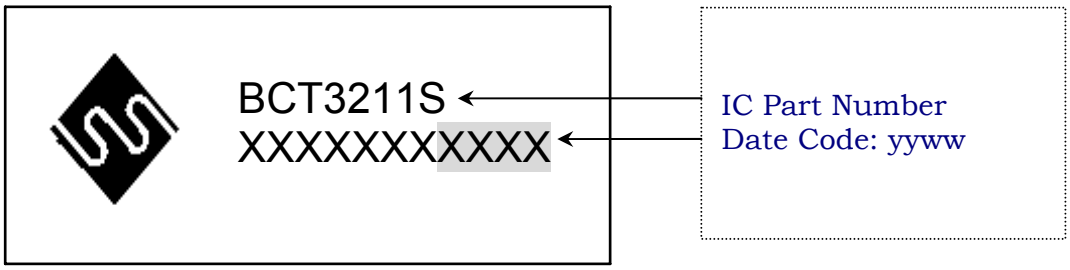
SO16 Dimensions





CONTROL DIMENSIONS ARE IN MM						
SYMBOL	MILLIMETER			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.55	1.75	0.053	0.061	0.069
A1	0.10	0.15	0.25	0.004	0.006	0.010
B	0.33	0.42	0.51	0.013	0.016	0.020
C	0.19	0.22	0.25	0.007	0.008	0.010
D16	9.80	9.90	10.00	0.386	0.390	0.394
E	3.80	3.90	4.00	0.150	0.153	0.157
e	1.27 BSC			0.050 BSC		
H	5.80	6.00	6.20	0.228	0.236	0.244
h	0.25	0.40	0.50	0.010	0.016	0.020
L	0.40	0.70	1.27	0.016	0.028	0.050
∝	0 °	-	8 °	0 °	-	8 °
Y	0	-	0.10	0	-	0.004

Marking Notation / Ordering Information



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