DESCRIPTION

The A8280 is a CMOS based White/Blue LED driver with stand-alone capability. The driver is primarily designed for LED backlighting of LCD display powered by Li-ion battery. With its high efficiency, low standby current and wide range of input supply voltage, the A8280 is suitable for applications such as portable device display and keypad backlighting. There are eight identical channels in A8280, each of which can drive one LED by current rating of 20mA.

The A8280 is available in QFN16(3x3) package.

ORDERING INFORMATION

Package Type	Part Number	
QFN16 (3x3)	Q16	A8280Q16R
		A8280Q16VR
Note	R: Tape & Reel V: Green Package	
AiT provides all Pb free products Suffix " V " means Green Package		

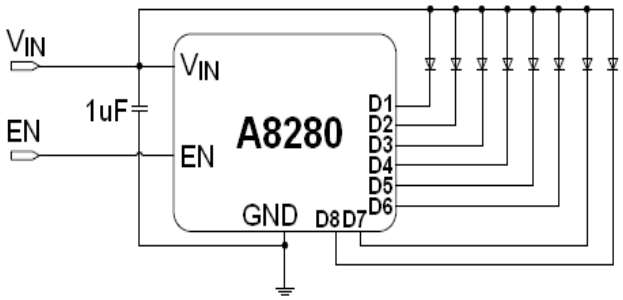
FEATURES

- 8-channel output
- 2.7 to 5.5V input range
- PWM dimming control, suggested 1KHz
- LED sink current of 20mA
- Independent current sink circuit for each LED output
- Low standby current
- High accuracy current match on each channel
- Available in QFN16(3x3) Package

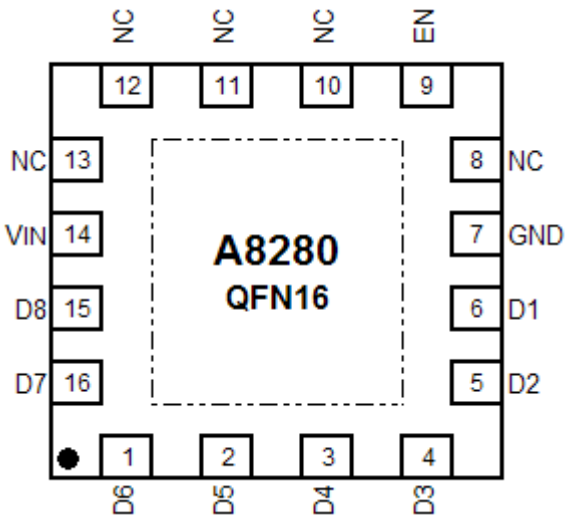
APPLICATION

- LCD screen backlights driver
- Mobile phone, portable device keypad backlights driver

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	D6	RGB or WLED Cathode Connection Pin
2	D5	RGB or WLED Cathode Connection Pin
3	D4	RGB or WLED Cathode Connection Pin
4	D3	RGB or WLED Cathode Connection Pin
5	D2	RGB or WLED Cathode Connection Pin
6	D1	RGB or WLED Cathode Connection Pin
7	GND	Ground
8, 10, 11, 12, 13	NC	No connect
9	EN	Chip Enable and Dimming Control
14	V_{IN}	Power supply
15	D8	RGB or WLED Cathode Connection Pin
16	D7	RGB or WLED Cathode Connection Pin

ABSOLUTE MAXIMUM RATINGS

Supply voltage	-0.3V to 7V
Voltage of LEDn, EN pin	-0.3V to 7V
Maximum Junction Temperature	125°C
Operating Ambient Temperature Range	-40°C to 85°C
Storage Temperature	-40°C to 150°C
Lead Temperature (Soldering, 10 sec)	260°C

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 OPERATING CONDITIONS

Parameter	MIN	MAX	Units
Supply Voltage Range	2.7	5.5	V
Operating Temperature	-25	85	°C

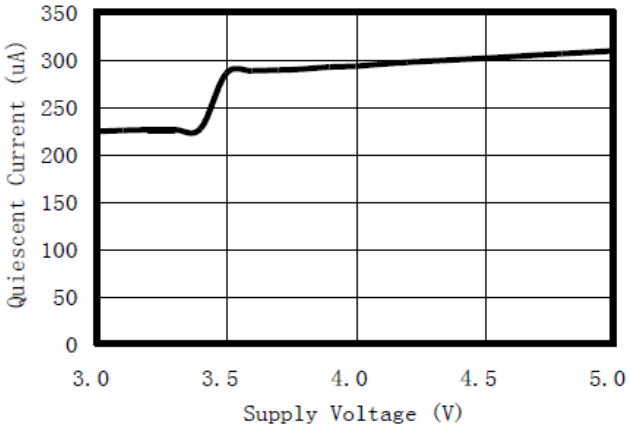
ELECTRICAL CHARACTERISTICS

V_{CC} = 3.7V, T_A = 25°C, No Load, Input: V_{EN} = 3.7V. (Unless otherwise noted)

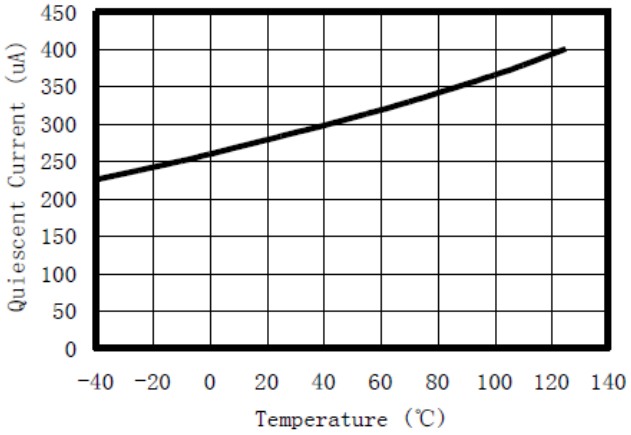
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
EN Pin “Low” Logic	V_{IL}		-	-	0.4	V
EN Pin “High” Logic	V_{IH}		1.7	-	-	V
EN Pin “Low” Input Current	I_{IL}		-1	-	-	uA
EN Pin “High” Input Current	I_{IH}		-	-	1	uA
LEDn Dropout Voltage	V_{LEDL}		-	100	-	mV
LEDn Sink Current	I_{LED}		18	20	22	mA
LEDn Sink Current Deviation	I_{LEDn}		-5	-	5	%
Quiescent Current	I_Q		-	500	800	uA
Standby Supply Current	I_{STBY}	V_{EN} = ”0”	-	0.5	-	uA

TYPICAL PERFORMANCE CHARACTERISTICS

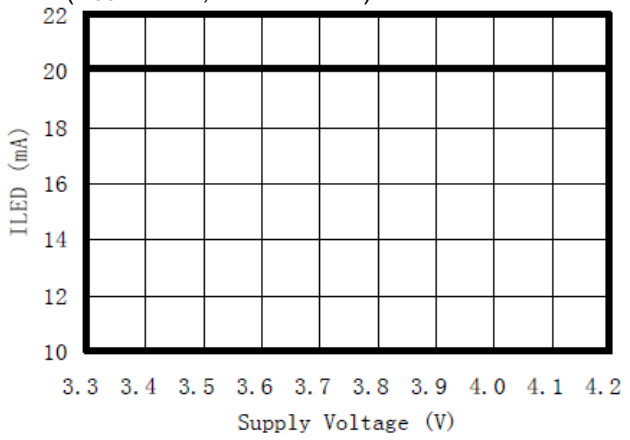
1. Quiescent Current vs Supply Current (T_A=25℃)



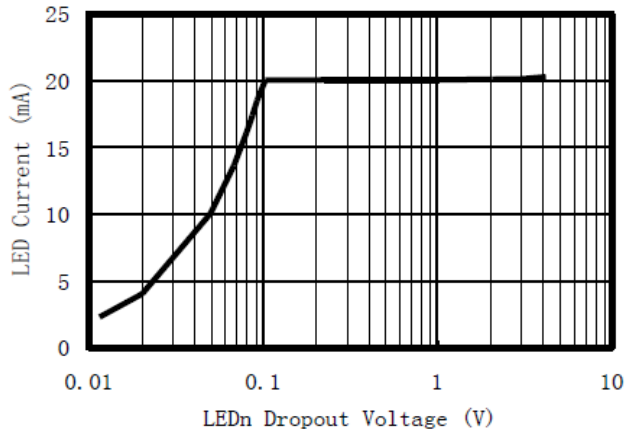
2. Quiescent Current vs Temperature (V_{CC}=3.7V)



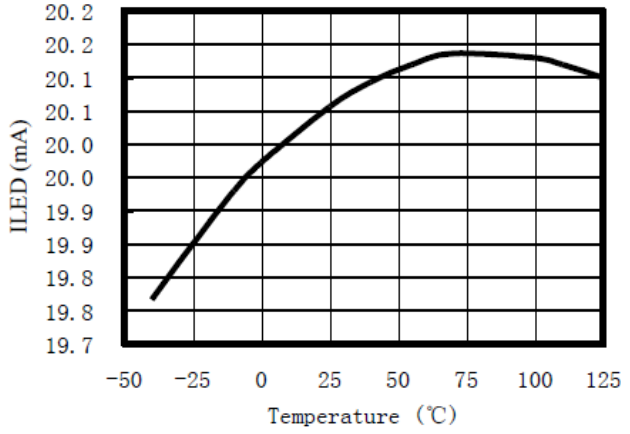
3. I_{LED} vs Supply Voltage (V_{CC} = 3.7V, V_{LEDn} = 3.2V)



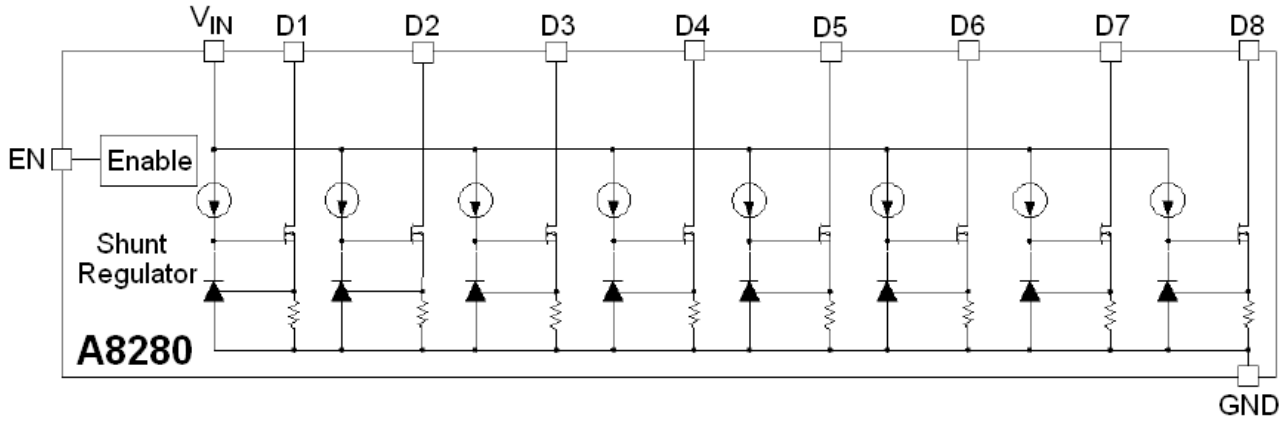
4. I_{LED} vs LEDn Dropout Voltage (V_{CC} = 3.7V)



5. I_{LED} vs Temperature (V_{CC} = 3.7V)



BLOCK DIAGRAM



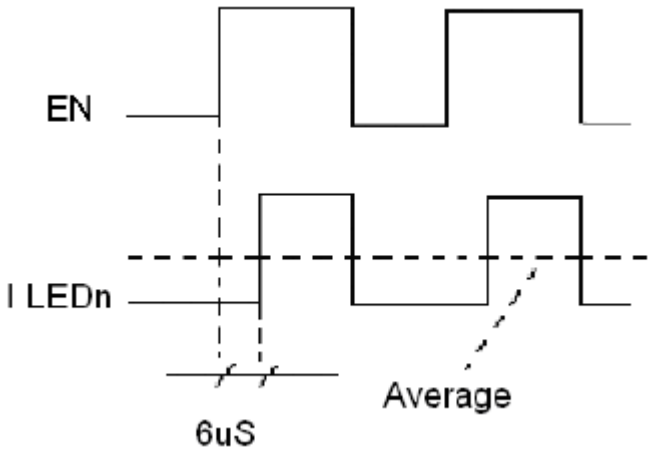
DETAILED INFORMATION

A8280 works with a wide range of supply voltage, from 2.7V to 6V. The forward voltage of commercial white/blue LED is in the range of 2.9V to 3.5V at a current level of 20mA. Proper selection of the LED to match the supply voltage can fully utilize the Li-ion battery. For example, there is 1% ~ 3 % power left in the Li-ion battery when its voltage reaches 3.275V. So a LED with a forward voltage value of 3.2V can use up to 99% of the battery power under normal working condition. When the voltage of the battery drops below 3.2V, the current through the LED (hence the brightness) starts to decrease.

Due to its uniquely designed current regulator, A8280 offers low output dropout and provide superior efficiency performance over standard Inductive boost type and capacitive charge pump type LED driver.

The EN pin controls the on/off state of the device. A high level state turns on the device and a low level turns off the device, results in the low off state current. This pin needs to be terminated since a floating level of the EN pin will cause the instability of the device.

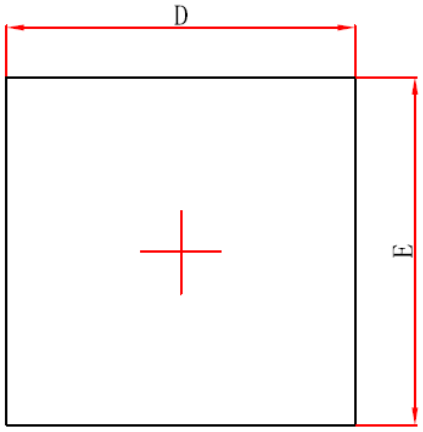
The sink current has a constant value of 20mA. The brightness of the LED can be adjusted by controlling the duty cycle of the A8280's LEDn output. This can be accomplished by applying a PWM signal to the EN pin. In A8280, the internal power on sequence presents a delay time of 6us from EN pin to LEDn pin. Hence, in order to modulate the output of LEDn in every cycle normally, the width of dimming signal applied EN pin have to be no less than 6us. For example, when a dimming signal of 20KHz is applied, the minimum range of dimming is about 12%, that is, the average output current on each channel is 2.4mA.



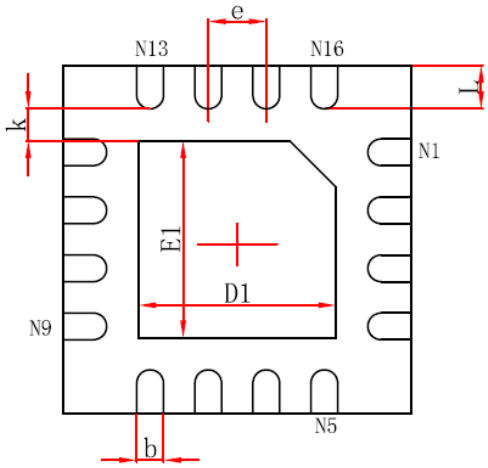
Dimming Control Waveform

PACKAGE INFORMATION

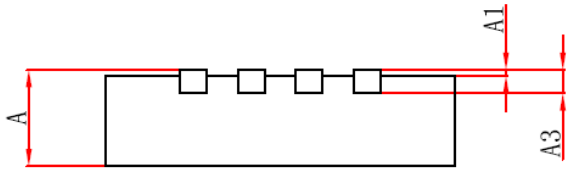
Dimension in QFN16(3x3) (Unit: mm)



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	2.900	3.100
E	2.900	3.100
D1	1.600	1.800
E1	1.600	1.800
k	0.200MIN	
b	0.180	0.300
e	0.500TYP	
L	0.300	0.500

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