

### DESCRIPTION

The AMC7123/4 is member of ADDM North Star White/Blue LED driver family. No external component is required. Especially good for use flashlight LED driver. The special circuit design provides over 90% efficiency in low noise. The AMC7123/4 is Integrated with 2 control pins for LEDs driving current control.

Target end applications are camera flash light LCD driver for mobile phone, smart phone, PDA, Digital Still Camera, etc.

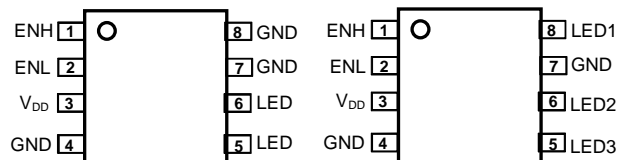
### FEATURES

- No external component required.
- Programmable output current control by ENL, ENH.
- 120mA LED driving capability.
- Output short / open circuit protection.
- 1 channel, 3 channels available in MSOP-8 package.
- High efficiency.
- Thermal Shutdown protection.
- Supply voltage range 2.7V ~ 6V
- 0.1uA Shut-Down current
- Advanced Bi-CMOS process.

### OPTIONS

Device Name	Maximum LED Drive Current	Minimum LED Drive Current	LED Channel
AMC7123DN	120mA	20mA	1
AMC7124DN	120mA	20mA	3

### PACKAGE PIN OUT



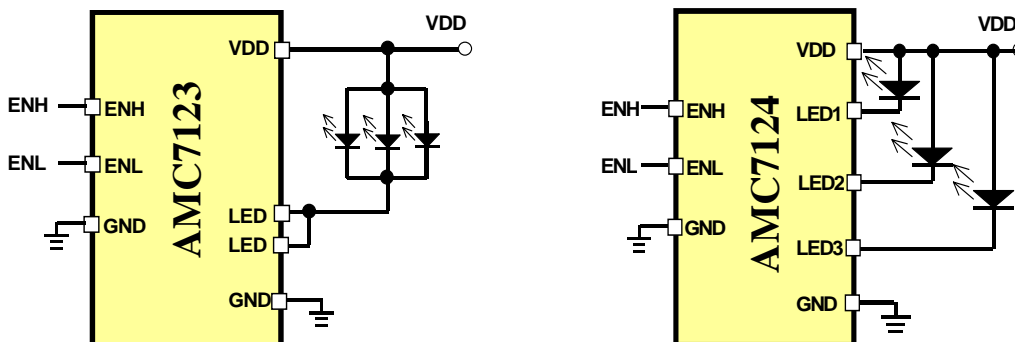
AMC7123DN

AMC7124DN

### APPLICATIONS

- Mobile Phone, Smart Phone Camera LED Flash Light.
- Digital Still Camera LED Flash Light.

### TYPICAL APPLICATION



### ORDER INFORMATION

T <sub>A</sub> (°C)	DN	Plastic MSOP-8	
		8-pin	
0 to 70	AMC7123DN	AMC7123DNF (Lead Free)	
	AMC7124DN	AMC7124DNF (Lead Free)	

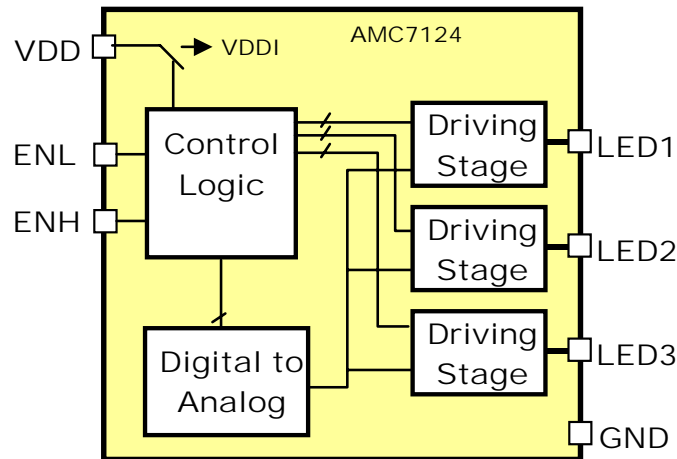
Note : 1. All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number (i.e. AMC7123/24).  
 2. The letter "F" is marked for Lead Free process.

**ABSOLUTE MAXIMUM RATINGS** (Note)

Input Voltage, $V_{DD}$	-0.3V to 7V
Output Voltage, $V_{LEDn}$	-0.3V to 7V
Voltage at all other pins	-0.3V to 5.5V
Maximum Junction Temperature, $T_J$	150 °C
Storage Temperature Range	-40 °C to 150 °C
Lead Temperature (soldering, 10 seconds)	260 °C
Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.	

**POWER DISSIPATION TABLE**

Package	$\theta_{JA}$ ( °C/W )	Derating factor (mW/°C ) $T_A \geq 25^\circ\text{C}$	$T_A \leq 25^\circ\text{C}$ Power rating (mW)	$T_A = 70^\circ\text{C}$ Power rating (mW)	$T_A = 85^\circ\text{C}$ Power rating (mW)
DN	180	5.56	695	444	361
DNF	180	5.56	695	444	361
Note: Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$ . $P_D$ : Power Dissipation, $T_A$ : Ambient temperature, $\theta_{JA}$ : Thermal Resistance-Junction to Ambient The $\theta_{JA}$ numbers are guidelines for the thermal performance of the device/PC-board system. All of the above assume no ambient airflow.					

**BLOCK DIAGRAM**

**PIN DESCRIPTION**

Pin Name	Pin Function															
LED. LED1~3	Output pins; connect to LED's cathode.															
ENL, ENH	<p>This pin combined enable and output sink current programming function.</p> <table border="1"> <thead> <tr> <th>ENH</th> <th>ENL</th> <th>LED, LED1, LED2, LED3</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>Shut-Down</td> </tr> <tr> <td>0</td> <td>1</td> <td>1/6 x I<sub>max</sub></td> </tr> <tr> <td>1</td> <td>0</td> <td>1/2 x I<sub>max</sub></td> </tr> <tr> <td>1</td> <td>1</td> <td>I<sub>max</sub></td> </tr> </tbody> </table>	ENH	ENL	LED, LED1, LED2, LED3	0	0	Shut-Down	0	1	1/6 x I <sub>max</sub>	1	0	1/2 x I <sub>max</sub>	1	1	I <sub>max</sub>
ENH	ENL	LED, LED1, LED2, LED3														
0	0	Shut-Down														
0	1	1/6 x I <sub>max</sub>														
1	0	1/2 x I <sub>max</sub>														
1	1	I <sub>max</sub>														
V <sub>DD</sub>	Power supply.															
GND	Ground															

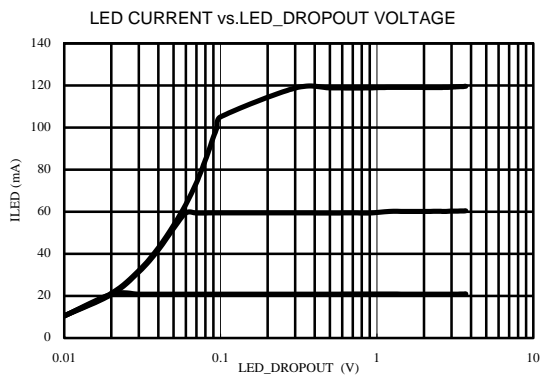
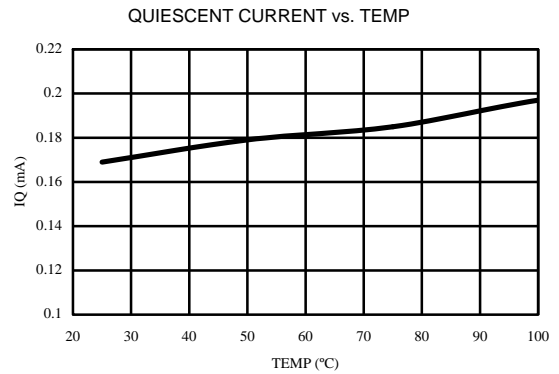
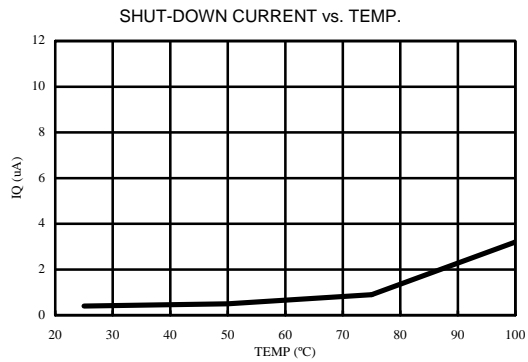
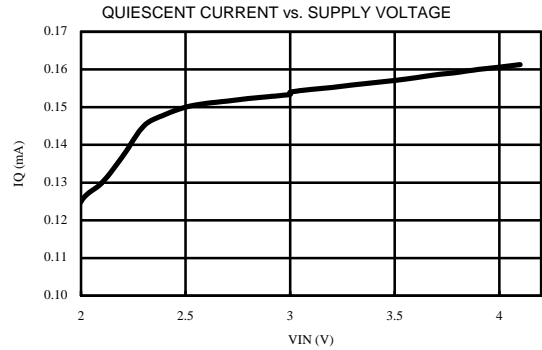
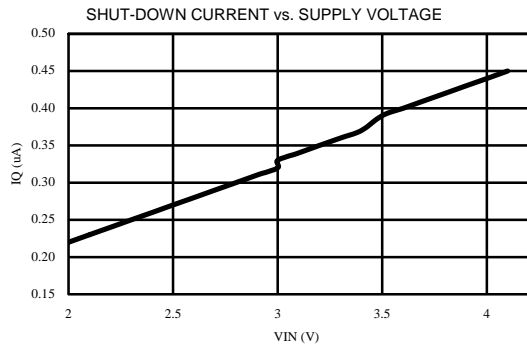
**RECOMMENDED OPERATING CONDITIONS**

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{DD}$	2.7		6	V
Output Sink current	$I_{LED}$			130	mA
Operating free-air temperature range	$T_a$	-40		+85	°C

**ELECTRICAL CHARACTERISTICS**

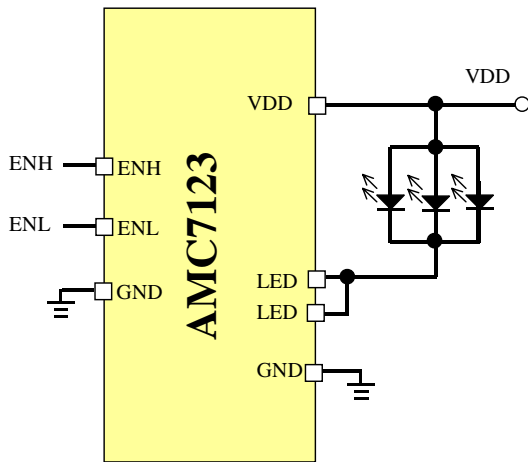
$V_{DD}=3.7V$ , $T_a=25^{\circ}C$ , No Load, Input: $V_{IH}=3.3V$ , $V_{IL}=GND$ . (Unless otherwise noted)							
Parameter	Symbol	Condition	Min	Typ	Max	Unit	Apply Pin
“Low” Input Voltage	$V_{IL}$				0.8	V	ENL, ENH
“High” Input Voltage	$V_{IH}$		2			V	
“Low” Input Current	$I_{IL}$		-5.0		+5.0	$\mu A$	
“High” Input Current	$I_{IH}$		-5.0		+5.0	$\mu A$	
LED Maximum Sink Current	$I_{max}$	ENH=ENL=“1”, All outputs	114	120	126	mA	LEDn
LED Half Sink Current	$I_{half}$	ENH=“1”, ENL=“0”	$45\% * I_{max}$		$55\% * I_{max}$	mA	
LED Low sink current	$I_{min}$	ENH=“0”, ENL=“1”	$9\% * I_{max}$		$25\% * I_{max}$	mA	
LED Dropout Voltage	$V_{LEDL}$	$I_{LEDn} = 120mA$ , Note 1		120		mV	
Supply Current Consumption	$I_{DD}$			200		$\mu A$	$V_{DD}$
Shut-Down Current	$I_{DSD}$			0.1		$\mu A$	

Note 1: LED dropout voltage:  $90\% * I_{LEDn}$  @  $V_{LEDn}=200mV$

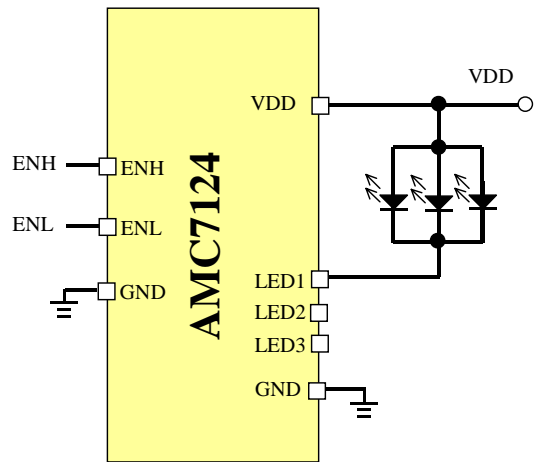
**CHARACTERIZATION CURVES**


**APPLICATION INFORMATION**

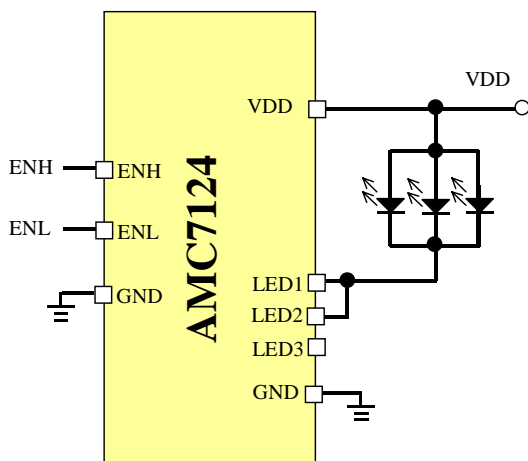
ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	20mA
1	0	60mA
1	1	120mA



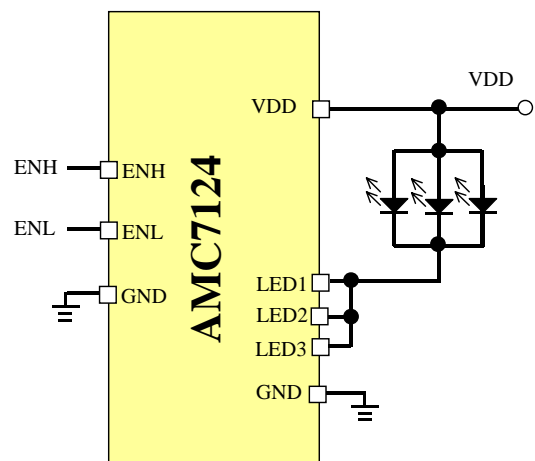
ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	20mA
1	0	60mA
1	1	120mA

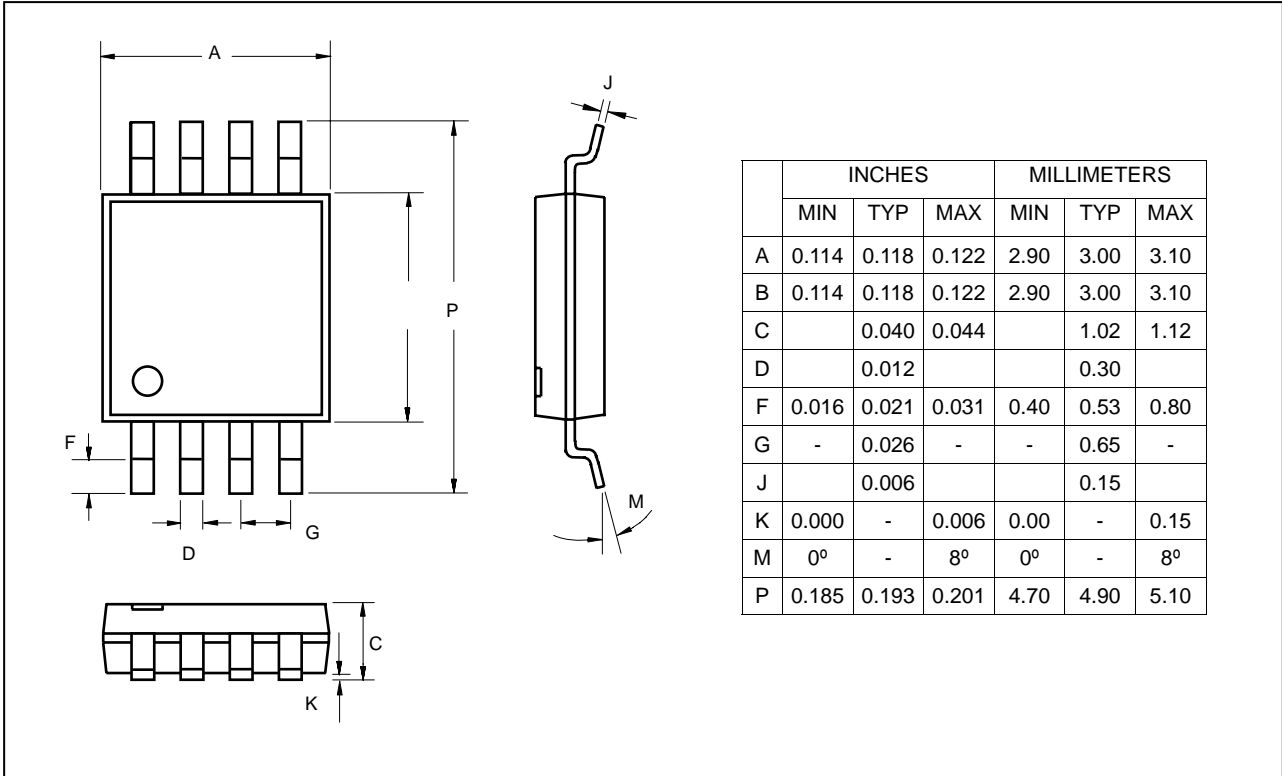


ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	40mA
1	0	120mA
1	1	240mA



ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	60mA
1	0	180mA
1	1	360mA



**PACKAGE**
**8-Pin Plastic MSOP (DN)**


**IMPORTANT NOTICE**

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**ADDtek Corp.**

9F, No. 20, Sec. 3, Bade Rd., Taipei, Taiwan, 105

TEL: 2-25700299

FAX: 2-25700196

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