

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.

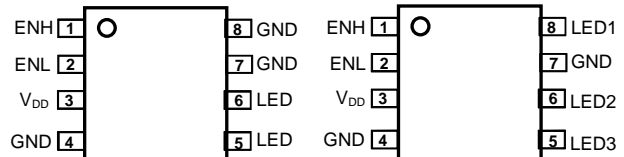
FEATURES

- 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



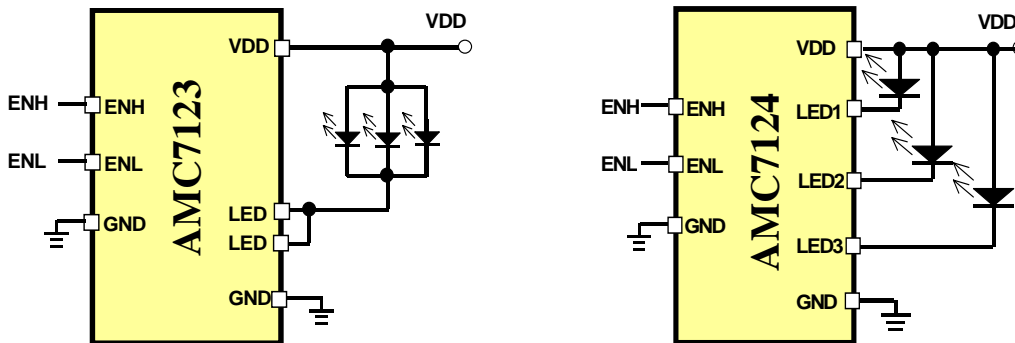
AMC7123DN

AMC7124DN

APPLICATIONS

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

TYPICAL APPLICATION



ORDER INFORMATION

| | | | |
|---------------------|-----------|------------------------|--|
| T _A (°C) | DN | Plastic MSOP-8 | |
| | | 8-pin | |
| 0 to 70 | AMC7123DN | AMC7123DNF (Lead Free) | |
| | AMC7124DN | AMC7124DNF (Lead Free) | |

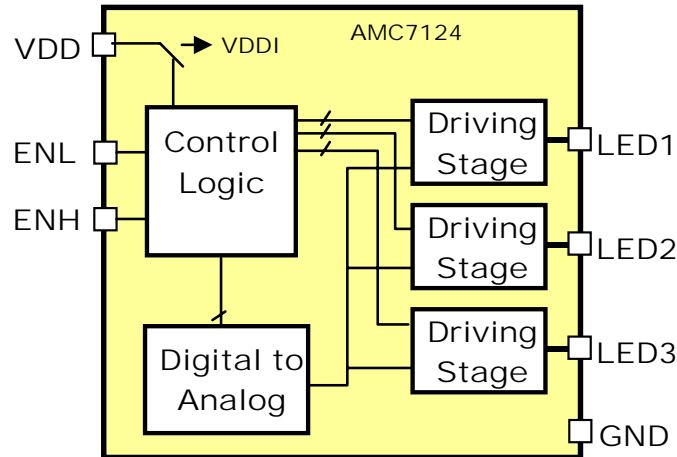
Note : 1. All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number (i.e. AMC7123/24).
 2. The letter "F" is marked for Lead Free process.

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 | θ_{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, θ_{JA} : Thermal Resistance-Junction to Ambient The θ_{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_{max}</td> </tr> <tr> <td>1</td> <td>0</td> <td>1/2 x I_{max}</td> </tr> <tr> <td>1</td> <td>1</td> <td>I_{max}</td> </tr> </tbody> </table> | ENH | ENL | LED, LED1, LED2, LED3 | 0 | 0 | Shut-Down | 0 | 1 | 1/6 x I _{max} | 1 | 0 | 1/2 x I _{max} | 1 | 1 | I _{max} |
| ENH | ENL | LED, LED1, LED2, LED3 | | | | | | | | | | | | | | |
| 0 | 0 | Shut-Down | | | | | | | | | | | | | | |
| 0 | 1 | 1/6 x I _{max} | | | | | | | | | | | | | | |
| 1 | 0 | 1/2 x I _{max} | | | | | | | | | | | | | | |
| 1 | 1 | I _{max} | | | | | | | | | | | | | | |
| V _{DD} | Power supply. | | | | | | | | | | | | | | | |
| GND | Ground | | | | | | | | | | | | | | | |

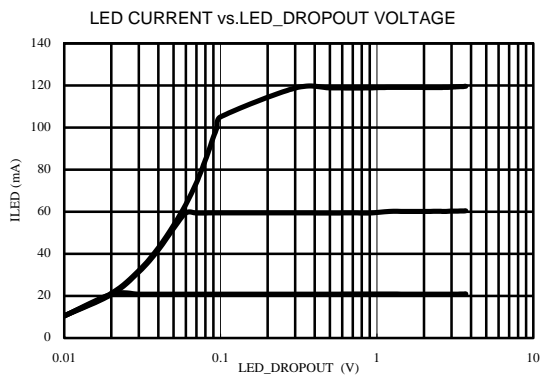
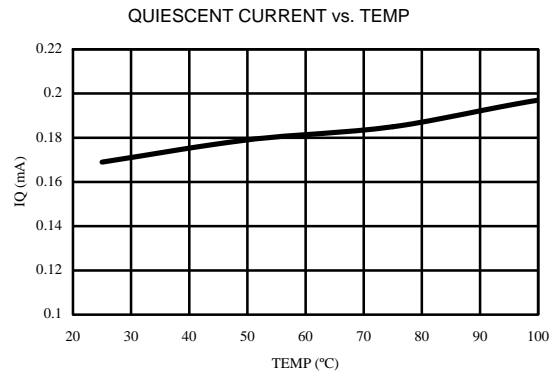
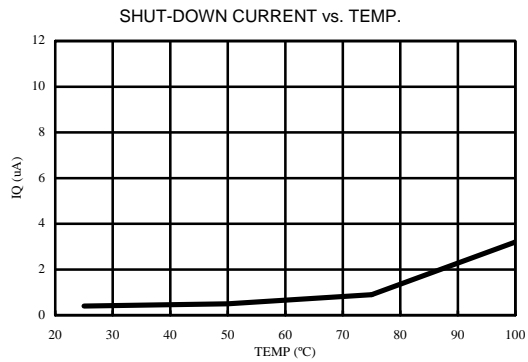
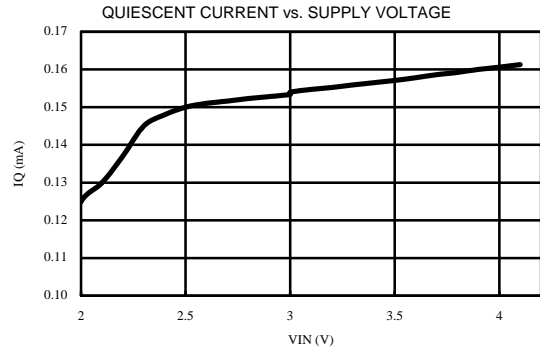
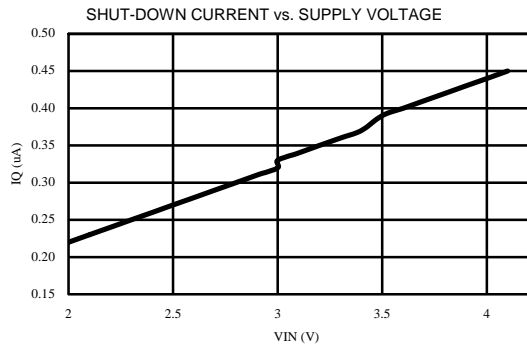
RECOMMENDED OPERATING CONDITIONS

| 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

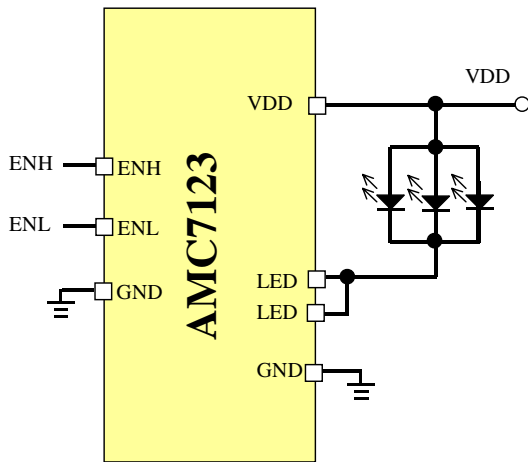
| $V_{DD}=3.7V$, $T_a=25^{\circ}C$, No Load, Input: $V_{IH}=3.3V$, $V_{IL}=GND$. (Unless otherwise noted) | | | | | | | |
|---|------------|-----------------------------|------------------|-----|------------------|------|-------------|
| Parameter | Symbol | Condition | Min | Typ | Max | Unit | Apply 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 | μA | |
| “High” Input Current | I_{IH} | | -5.0 | | +5.0 | μA | |
| 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 | | uA | V_{DD} |
| Shut-Down Current | I_{DSD} | | | 0.1 | | uA | |

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

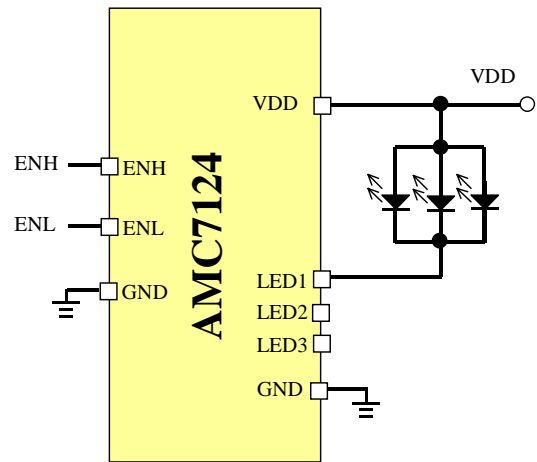
CHARACTERIZATION CURVES


APPLICATION INFORMATION

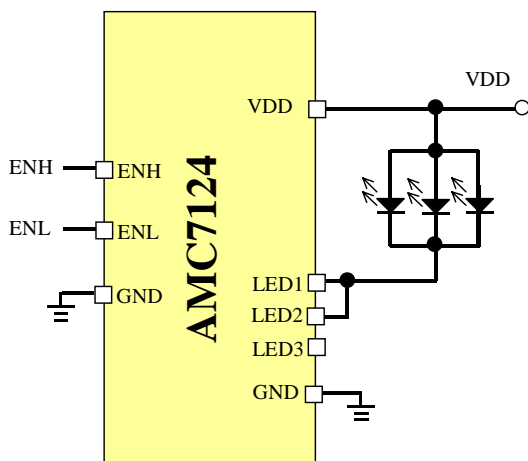
| ENH | ENL | Typical Flashlight Current |
|-----|-----|----------------------------|
| 0 | 0 | Shut-Down |
| 0 | 1 | 20mA |
| 1 | 0 | 60mA |
| 1 | 1 | 120mA |



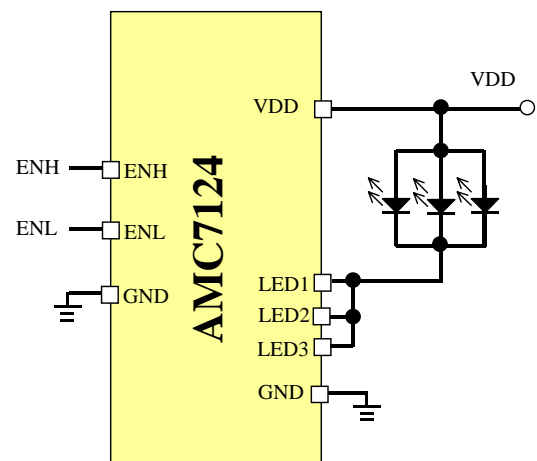
| ENH | ENL | Typical Flashlight Current |
|-----|-----|----------------------------|
| 0 | 0 | Shut-Down |
| 0 | 1 | 20mA |
| 1 | 0 | 60mA |
| 1 | 1 | 120mA |

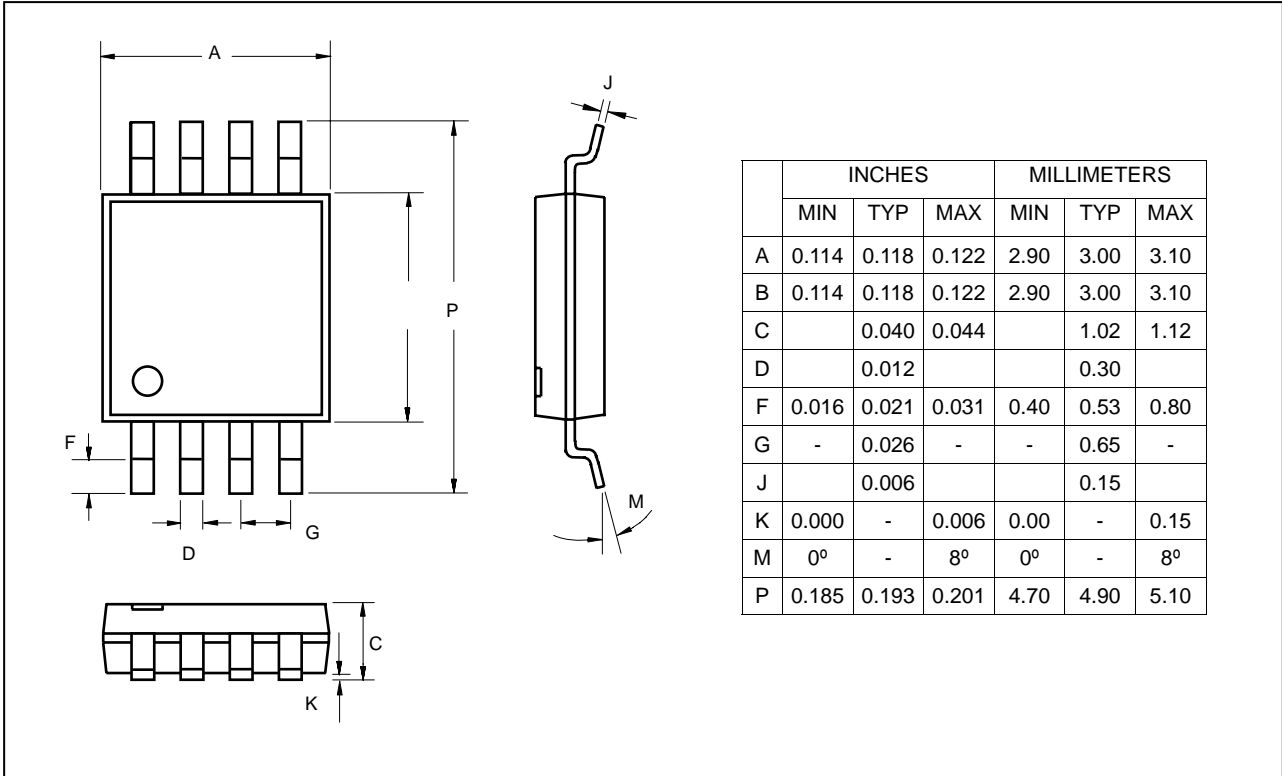


| ENH | ENL | Typical Flashlight Current |
|-----|-----|----------------------------|
| 0 | 0 | Shut-Down |
| 0 | 1 | 40mA |
| 1 | 0 | 120mA |
| 1 | 1 | 240mA |



| 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

ADDtek reserves the right to make changes to its products or to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

A few applications using integrated circuit products may involve potential risks of death, personal injury, or severe property or environmental damage. ADDtek integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life-support applications, devices or systems or other critical applications. Use of ADDtek products in such applications is understood to be fully at the risk of the customer. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

ADDtek assumes no liability to customer product design or application support. ADDtek warrants the performance of its products to the specifications applicable at the time of sale.

ADDtek Corp.

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

TEL: 2-25700299

FAX: 2-25700196
