AMC7123/4

Flash Light LED Driver

ADD MICROTECH CORP.

DESCRIPTION

The AMC7123/4 is member of ADDM North Star White/Blue LED driver family. No external component is required. Especially good for use flash light 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.

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

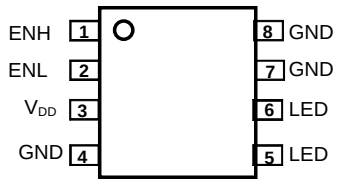
FEATURES

- **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 Shut-Down protection.**
- **Supply voltage range 2.7V ~ 6V**
- **0.1uA Shut-Down current**

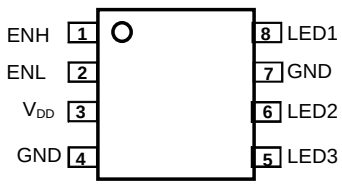
APPLICATIONS

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

PACKAGE PIN OUT

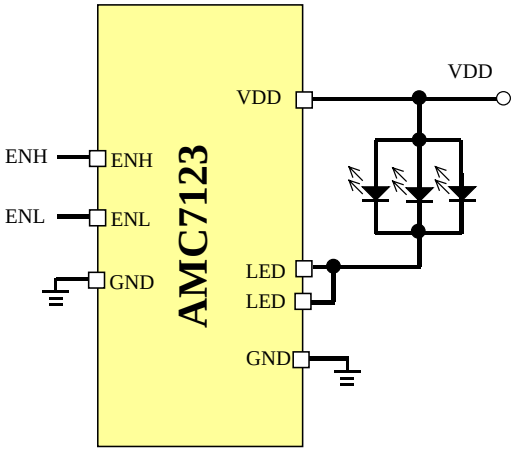


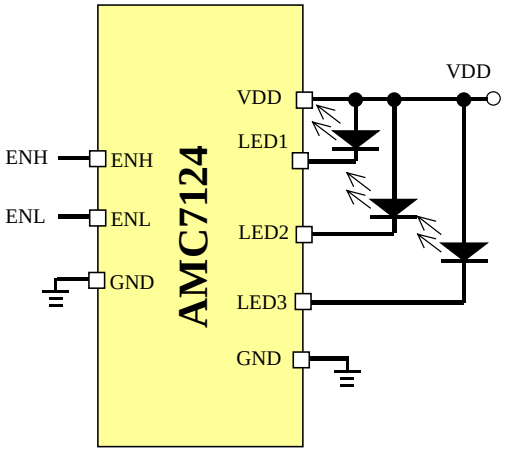
AMC7123DN



AMC7124DN

TYPICAL APPLICATION





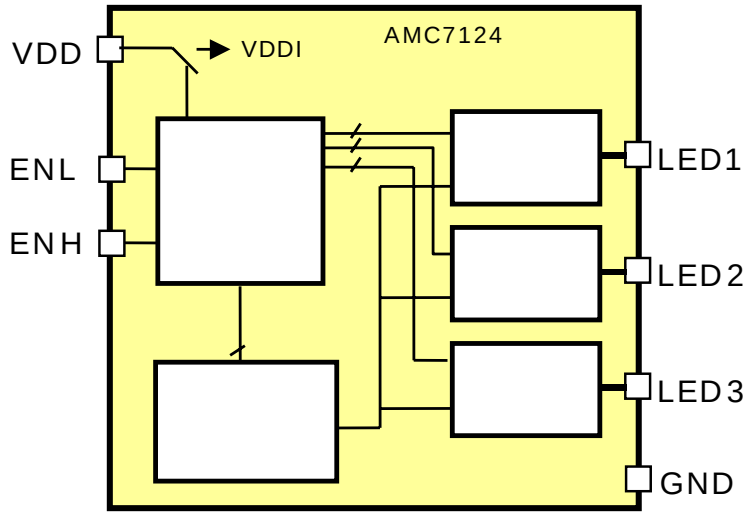
ABSOLUTE MAXIMUM RATINGS	
Input Voltage, V_{DD}	-0.3V to 7V
Output Voltage, V_{LEDn}	-0.3V to 7V
Voltage at all other pins	-0.3V to 5.5V
Maximum Junction Temperature , T_J	150°C
Storage Temperature Range	-40°C to 150°C
Lead Temperature (soldering, 10 seconds)	260°C

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) $T_A \geqq 25$ °C	$T_A \leqq 25$ °C Power rating (mW)	T_A=70 °C Power rating (mW)	T_A= 85°C Power rating (mW)
DN	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	This pin combined enable and output sink current programming function.

ENH	ENL	LED, LED1, LED2, LED3
0	0	Shut-Down
0	1	1/6 x Imax
1	0	1/2 x Imax
1	1	Imax

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	Ta	-40		+85	℃

DC ELECTRICAL CHARACTERISTICS

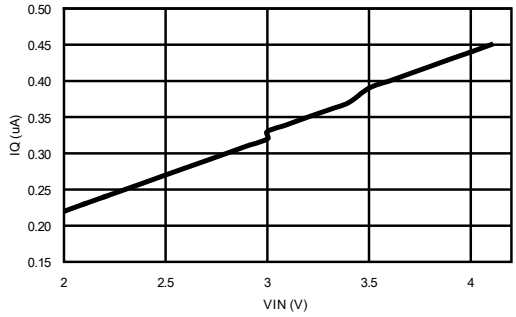
V_{DD}=3.7V, Ta=25°C, No Load, Input: V_{IH}=3.3V, V_{IL}=GND. (Unless otherwise noted)

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_{hlf}	ENH="1", ENL="0"	45%* I_{max}		55%* I_{max}	mA	
LED Low sink current	I_{LEDmin}	ENH="0", ENL="1"	13%* I_{max}		19%* 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_{DDSD}			0.1		uA	

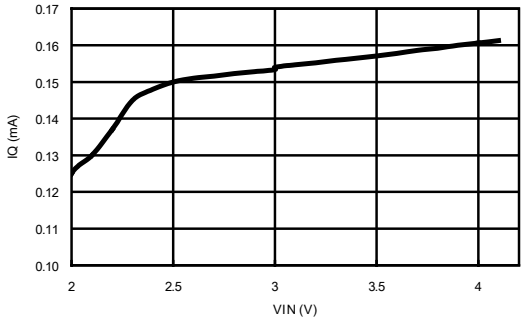
Note1: LED dropout voltage: 90% x I_{LEDn} @ V_{LEDn}=200mV

TYPICAL OPERATION CHRACTERISTICS

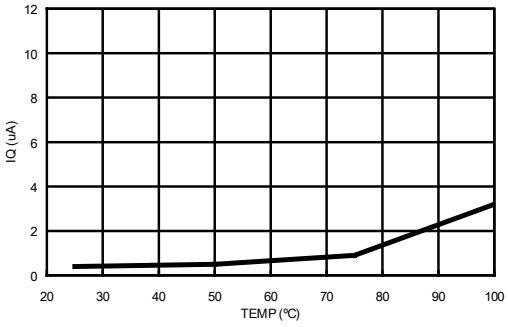
SHUT-DOWN CURRENT vs. SUPPLY VOLTAGE



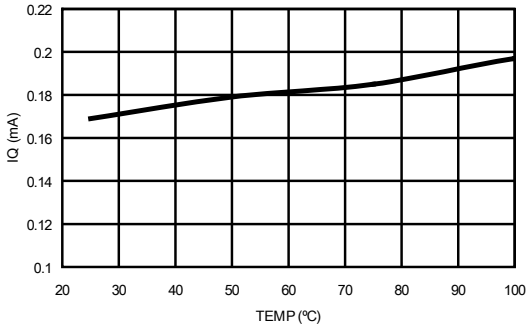
QUIESCENT CURRENT vs. SUPPLY VOLTAGE



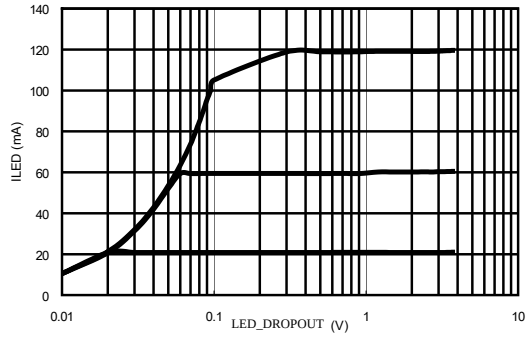
SHUT-DOWN CURRENT vs. TEMP.



QUIESCENT CURRENT vs. TEMP

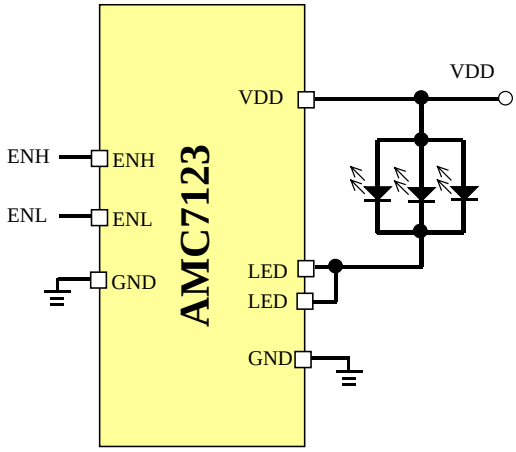


LED CURRENT vs.LED_DROPOUT VOLTAGE

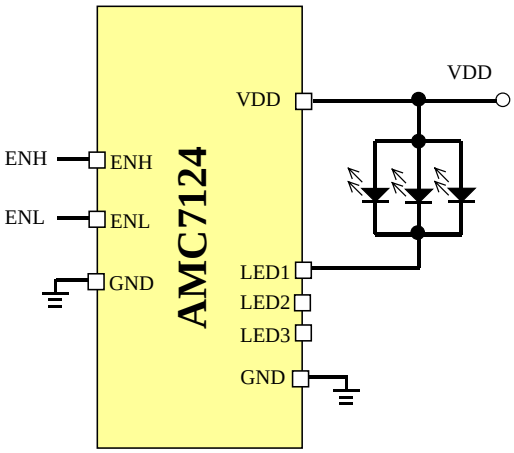


APPLICATION CIRCUITS

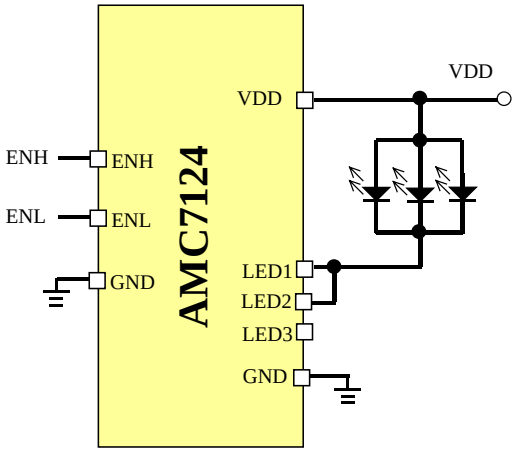
ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	20mA
1	0	60mA
1	1	120mA



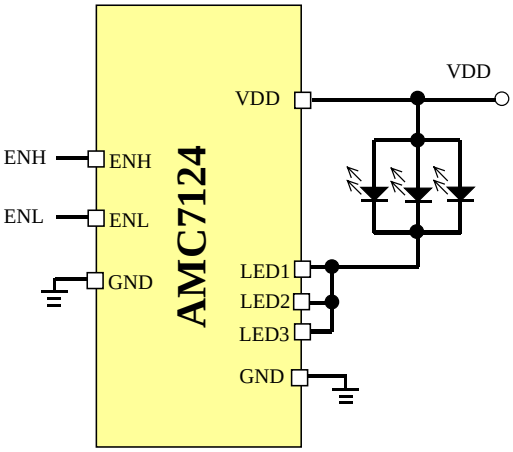
ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	20mA
1	0	60mA
1	1	120mA



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

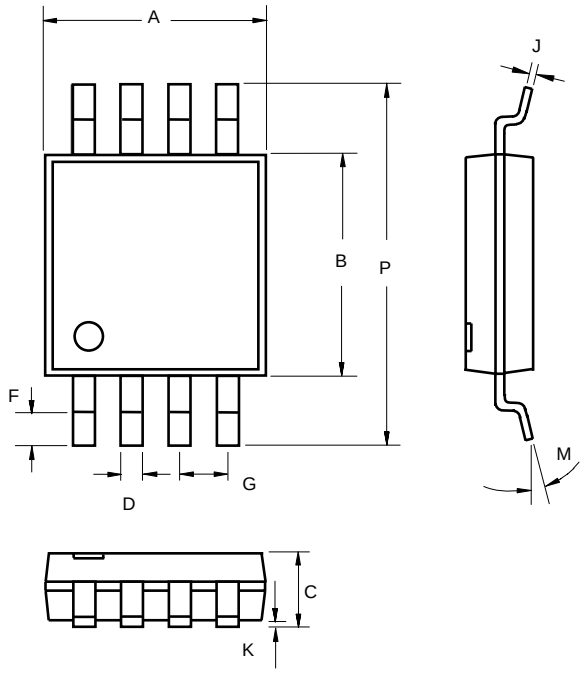


ENH	ENL	Typical Flashlight Current
0	0	Shut-Down
0	1	60mA
1	0	180mA
1	1	360mA



PACKAGE

8-Pin Plastic MSOP(DN)



	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.114	0.118	0.122	2.90	3.00	3.10
B	0.114	0.118	0.122	2.90	3.00	3.10
C		0.040	0.044		1.02	1.12
D		0.012			0.30	
F	0.016	0.021	0.031	0.40	0.53	0.80
G	-	0.026	-	-	0.65	-
J		0.006			0.15	
K	0.000	-	0.006	0.00	-	0.15
M	0º	-	8º	0º	-	8º
P	0.185	0.193	0.201	4.70	4.90	5.10