

## 350mA ADVANCED CURRENT REGULATOR

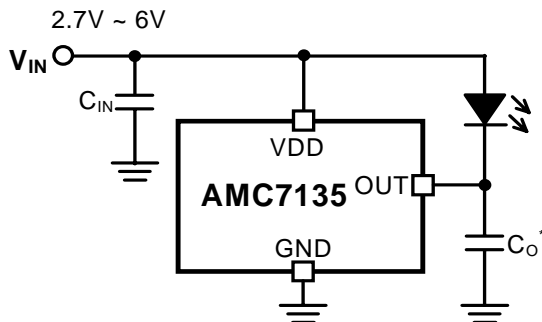
### DESCRIPTION

The AMC7135 is a low dropout current regulator rated for 350mA constant sink current. The low quiescent current and low dropout voltage are achieved by advanced Bi-CMOS process.

### FEATURES

- 350mA constant sink current.
- Output short / open circuit protection.
- Low dropout voltage.
- Low quiescent current
- Supply voltage range 2.7V ~ 6V
- 2KV HBM ESD protection
- Advanced Bi-CMOS process.
- SOT-89 and TO-252 package

### TYPICAL APPLICATION CIRCUIT

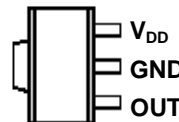


\* C<sub>O</sub> is strongly recommended.

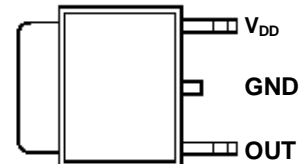
### APPLICATIONS

- Power LED driver
- Cap Lamp
- Refrigerator Lighting

### PACKAGE PIN OUT



SOT-89



TO-252

(Top View)

### ORDER INFORMATION

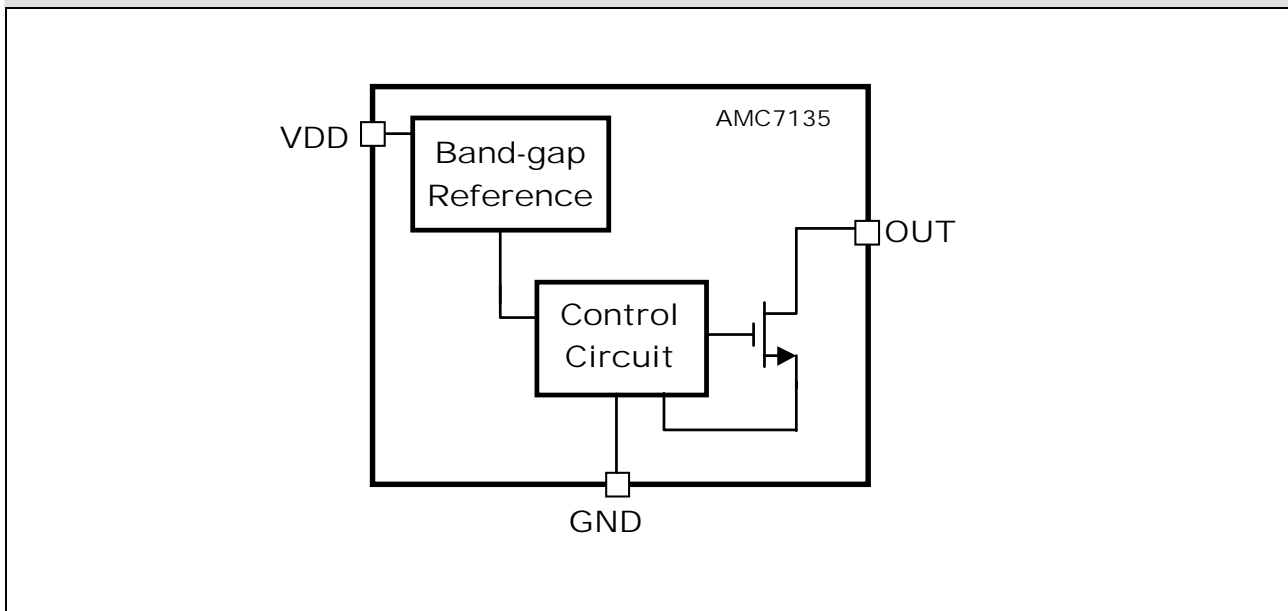
I <sub>OUT</sub>	PK	SOT-89	SJ	TO-252
		3-pin		3-pin
340-380mA		AMC7135PKF		AMC7135SJF
300-340mA		AMC7135PKFA		AMC7135SJFA

Note: 1. All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number (i.e. AMC7135PKFAT).  
 2. The letter "F" is marked for Lead Free process.  
 3. The letter "A" is marked for current ranking.

**ABSOLUTE MAXIMUM RATINGS** (Note)

Input Voltage, $V_{DD}$	-0.3V to 7V
Output Voltage, $V_{OUT}$	-0.3V to 7V
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.

**BLOCK DIAGRAM**

**PIN DESCRIPTION**

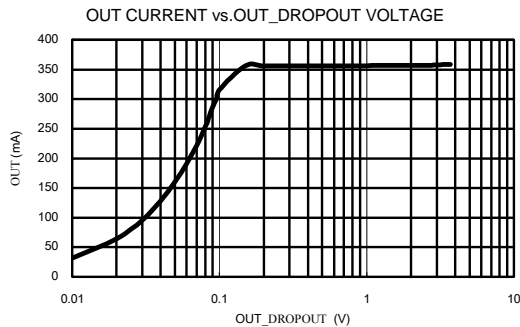
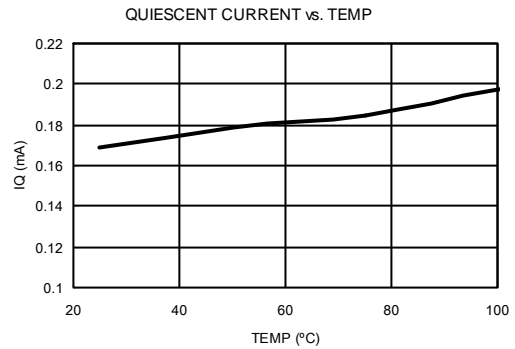
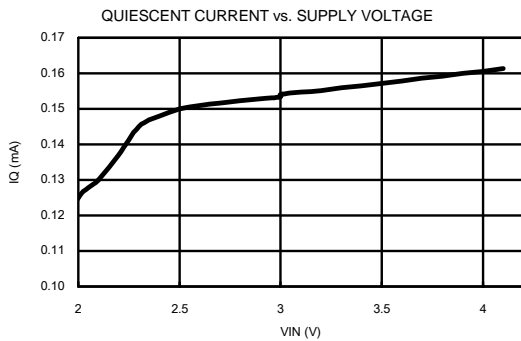
Pin Name	Pin Function
$V_{DD}$	Power supply.
OUT	Output pins. Connected to load.
GND	Ground.

**RECOMMENDED OPERATING CONDITIONS**

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{DD}$	2.7		6	V
Output Sink Current	$I_{OUT}$			400	mA
Operating Free-air Temperature Range	$T_A$	-40		+85	°C

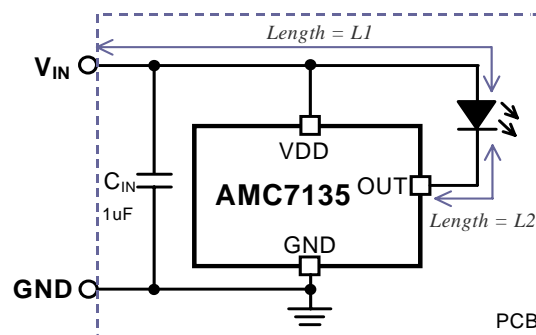
**DC ELECTRICAL CHARACTERISTICS**
 $V_{DD}=3.7V$ ,  $T_A=25^{\circ}C$ , No Load, ( Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Apply Pin
Output Sink Current	$I_{SINK}$	$V_{OUT}=0.2V$	340	360	380	mA	OUT
		$V_{OUT}=0.2V$ , Rank A	300	320	340	mA	
Load Regulation		$V_{OUT}=0.2V$ to 3V			3	mA/V	
Line Regulation		$V_{DD}=3V$ to 6V, $V_{OUT}=0.2V$			3	mA/V	
Output Dropout Voltage	$V_{OUTL}$			120		mV	
Supply Current Consumption	$I_{DD}$			200		uA	VDD

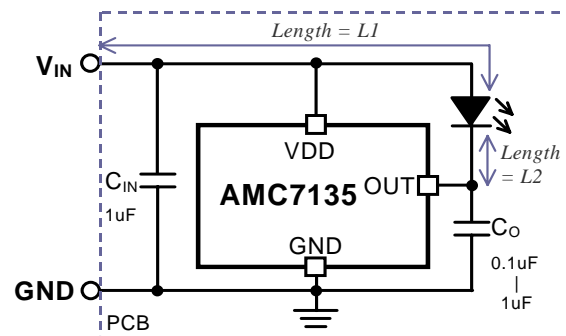
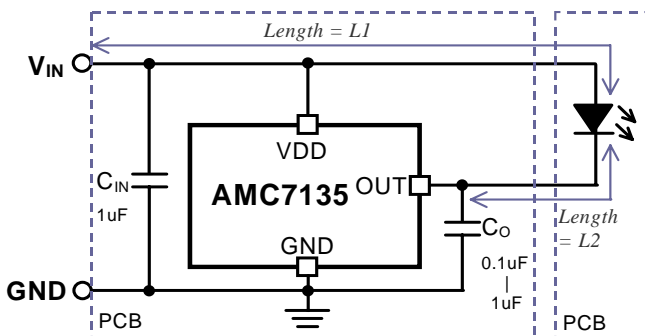
 Note 1: Output dropout voltage:  $90\% \times I_{OUT} @ V_{OUT}=200mV$ 
**TYPICAL OPERATION CHARACTERISTICS**


**APPLICATION INFORMATION**
**Output Capacitor  $C_O$  and PCB layout:**

The output capacitor  $C_O$  may be removed under certain condition. Please refer to the following figure. If LED and AMC7135 is located in the same PCB, and the length of the routing path  $L1 < 10\text{cm}$  &  $L2 < 3\text{cm}$ , the output capacitor  $C_O$  can be neglected.



If LED and AMC7135 is located in separate PCBs, or the length of the routing path  $L1 > 10\text{cm}$  or  $L2 > 3\text{cm}$ , the output capacitor  $C_O$  should be added. Typically, capacitance of  $0.1\mu\text{F} \sim 1\mu\text{F}$  is recommended and  $1\mu\text{F}$  is needed when  $L2$  is much longer than  $3\text{cm}$ .



**The Maximum Power Dissipation on Regulator:**

$$P_{D(MAX)} = V_{OUT(MAX)} \times I_{OUT(NOM)} + V_{IN(MAX)} \times I_Q$$

$V_{OUT(MAX)}$  = the maximum voltage on output pin;

$I_{OUT(NOM)}$  = the nominal output current;

$I_Q$  = the quiescent current the regulator consumes at  $I_{OUT(MAX)}$ ;

$V_{IN(MAX)}$  = the maximum input voltage.

**Thermal Consideration:**

The maximum junction temperature ratings of AMC7135 should not be exceeded under continuous normal load conditions. When power consumption is over about 700mW (SOT-89 package, at  $T_A=70^\circ\text{C}$ ) or 1000mW (TO-252 package, at  $T_A=70^\circ\text{C}$ ), additional heat sink is required to control the junction temperature below  $120^\circ\text{C}$ .

The junction temperature is:

$$T_J = P_D (\theta_{JT} + \theta_{CS} + \theta_{SA}) + T_A$$

$P_D$  : Dissipated power.

$\theta_{JT}$ : Thermal resistance from the junction to the mounting tab of the package.

For SOT-89 package,  $\theta_{JT} = 35.0^\circ\text{C/W}$ . For TO-252 package,  $\theta_{JT} = 7.0^\circ\text{C/W}$ .

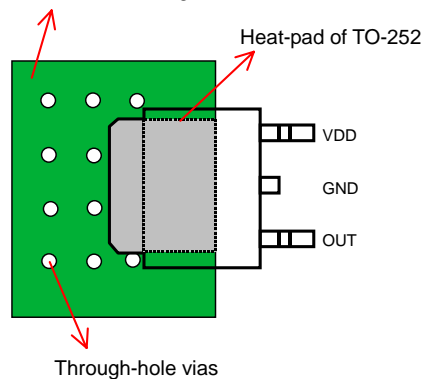
$\theta_{CS}$ : Thermal resistance through the interface between the IC and the surface on which it is mounted.  
(typically,  $\theta_{CS} < 1.0^\circ\text{C/W}$ )

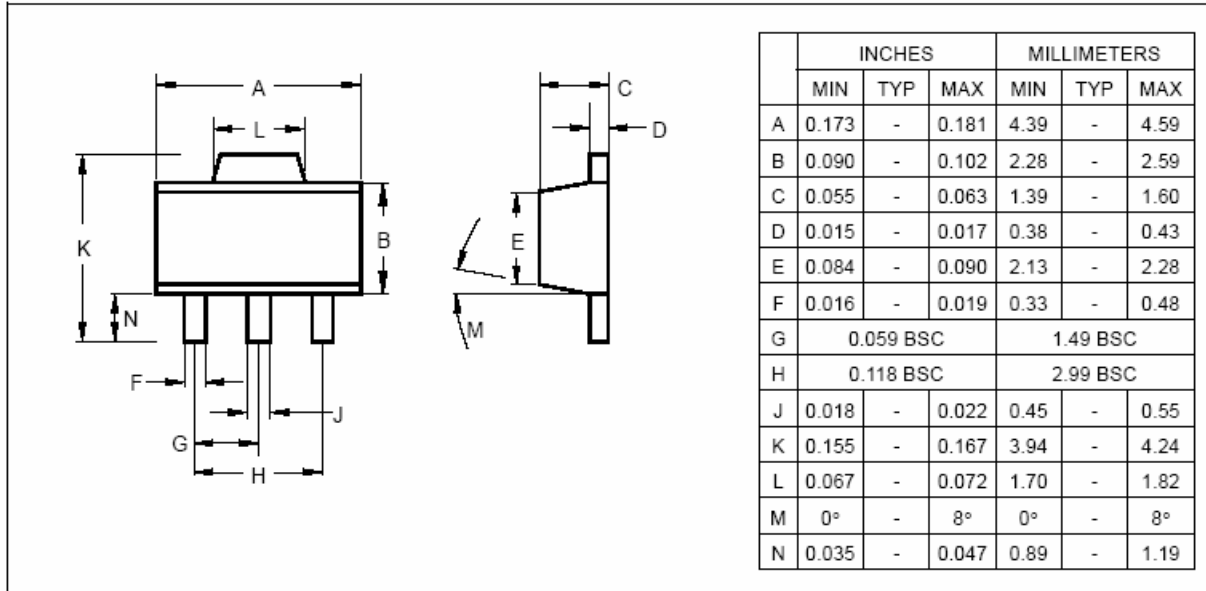
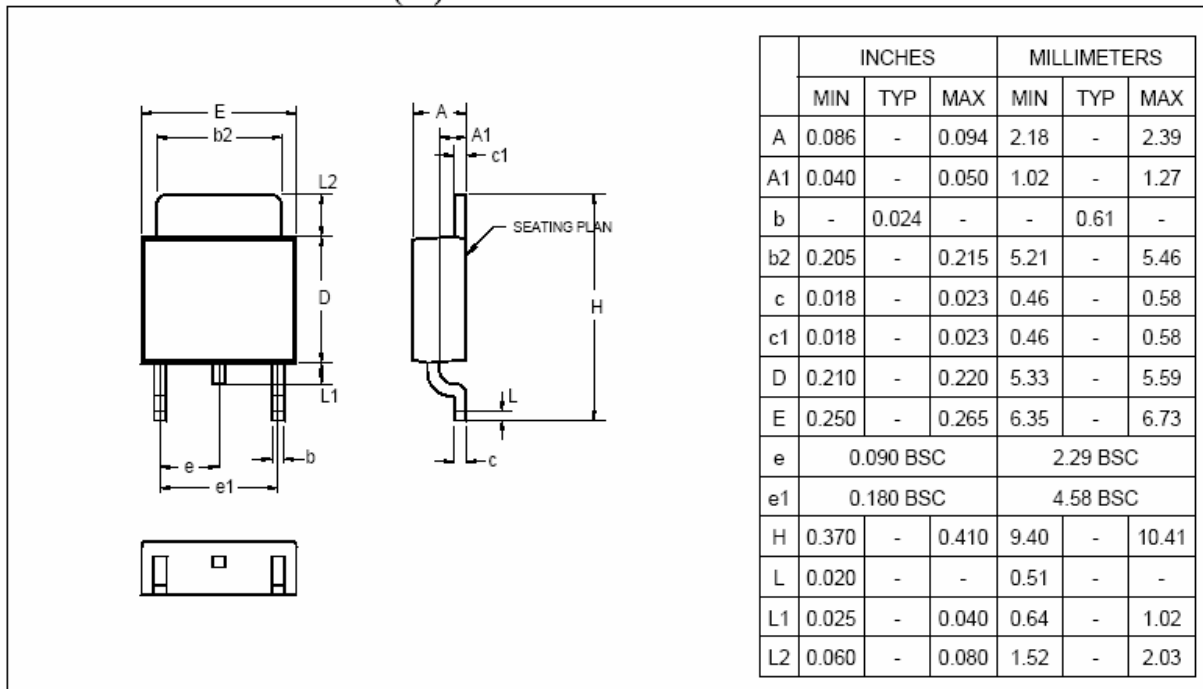
$\theta_{SA}$ : Thermal resistance from the mounting surface to ambient (thermal resistance of the heat sink).

If PC Board copper is going to be used as a heat sink, below table can be used to determine the appropriate size of copper foil required. For multi-layered PCB, these layers can also be used as a heat sink. They can be connected with several through-hole vias.

PCB $\theta_{SA}$ ( $^\circ\text{C/W}$ )	59	45	38	33	27	24	21
PCB heat sink size ( $\text{mm}^2$ )	500	1000	1500	2000	3000	4000	5000

Recommended figure of PCB area used as a heat sink.



**PACKAGE**
**3-Pin Surface Mount SOT-89**

**3-Pin Surface Mount TO-252 (SJ)**


**IMPORTANT NOTICE**

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