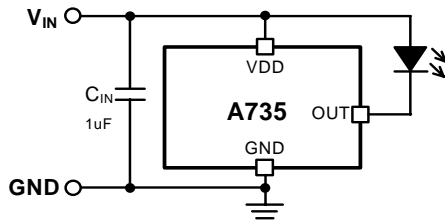


DESCRIPTION

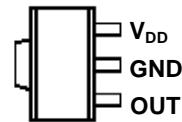
The A735 is a low dropout current regulator rated for 110mA, 130mA, 150mA, 170mA, 190mA, 210mA, 230mA, 250mA, 270mA, 290mA, 310mA, 330mA, and 350mA constant sink current. The low quiescent current and low dropout voltage are achieved by advanced Bi-CMOS process.

APPLICATIONS

- Power LED Driver
- LED Miner's Lamp

TYPICAL APPLICATION CIRCUIT

FEATURES

- **110/130/150/170/190/210/230/250/270/290/310/330/350mA ± 10mA constant sink current.**
- **Output short / open circuit protection.**
- **Low dropout voltage.**
- **Low quiescent current.**
- **Supply voltage range 2.7V ~ 6V.**
- **Advanced Bi-CMOS process.**
- **SOT-89 package available.**
- **Compatible with AMC7135.**

PACKAGE PIN OUT

SOT-89
ORDER INFORMATION (Note 1)

Output Current (Note 2)	N	SOT-89
		3-pin
100mA ~ 120mA		A735NGT-110
120mA ~ 140mA		A735NGT-130
140mA ~ 160mA		A735NGT-150
160mA ~ 180mA		A735NGT-170
180mA ~ 200mA		A735NGT-190
200mA ~ 220mA		A735NGT-210
220mA ~ 240mA		A735NGT-230
240mA ~ 260mA		A735NGT-250
260mA ~ 280mA		A735NGT-270
280mA ~ 300mA		A735NGT-290
300mA ~ 320mA		A735NGT-310
320mA ~ 340mA		A735NGT-330
340mA ~ 360mA		A735NGT-350

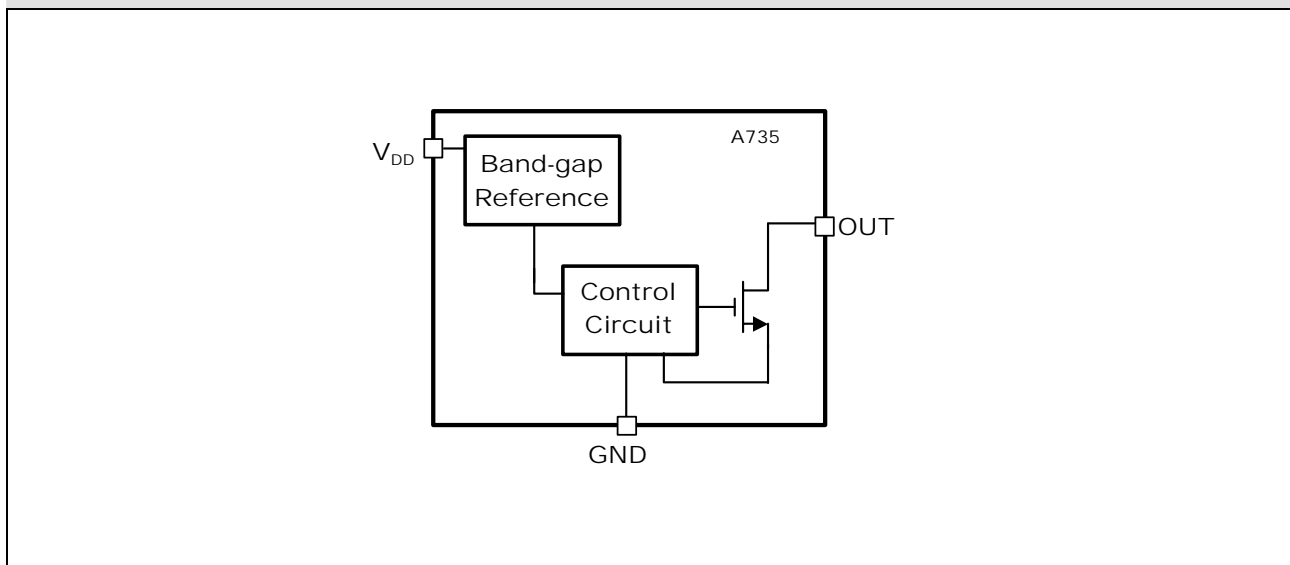
Note 1: The letter "G" is marked for Green process, and letter "T" is marked for Tape & Reel.

2: For other output current ranking, please consult sales or FAEs.

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 pin.
OUT	Output pin. Connected to load.
GND	Ground pin.

THERMAL RESISTANCE

Package	SOT-89	Note: $T_J = P_D \times \theta_{JA} + T_A = P_D \times \theta_{JT} + T_C$ θ_{JA} : Thermal Resistance - Junction to Ambience. θ_{JT} : Thermal Resistance - Junction to Tab. T_J : Junction Temperature. T_A : Ambient Temperature. P_D : Power Consumption. T_C : Case (Tab) Temperature.
θ_{JT} (°C/W)	35	
θ_{JA} (°C/W)	72	

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_{OUT}	$V_{OUT}=0.2V$	A735J	100	110	120	mA	OUT
			A735K	120	130	140		
			A735L	140	150	160		
			A735M	160	170	180		
			A735N	180	190	200		
			A735P	200	210	220		
			A735Q	220	230	240		
			A735R	240	250	260		
			A735S	260	270	280		
			A735T	280	290	300		
			A735V	300	310	320		
			A735W	320	330	340		
A735X	340	350	360					
Load Regulation		$V_{OUT}=0.2V$ to 3V			2	mA/V		
Line Regulation		$V_{DD}=3V$ to 6V, $V_{OUT}=0.2V$			2	mA/V		
Output Dropout Voltage ^(Note)	V_{OUTL}			120		mV		
Supply Current Consumption	I_{DD}			200		uA	VDD	
Over Temperature Protection	T_X			160		°C		

 Note: Output dropout voltage: $90\% \times I_{OUT}$ @ $V_{OUT}=200mV$

TYPICAL OPERATION CHARACTERISTICS

APPLICATION INFORMATION
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 A735 should not be exceeded under continuous normal load conditions. When power consumption is over about 700mW (SOT-89 package, at $T_A=70^\circ\text{C}$), additional heat sink is required to control the junction temperature below 120°C .

The junction temperature is:

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

P_D : Dissipated power.

θ_{JT} : Thermal resistance from the junction to the mounting tab of the package.

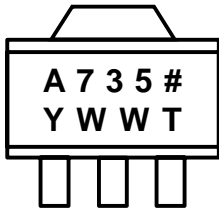
For SOT-89 package, $\theta_{JT} = 35.0^\circ\text{C/W}$.

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

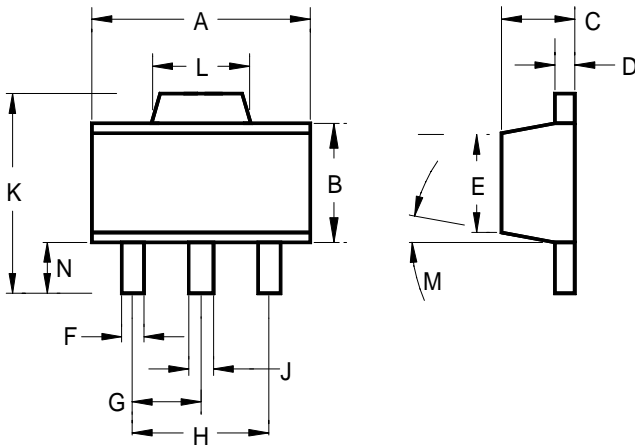
θ_{SA} : Thermal resistance from the mounting surface to ambient (thermal resistance of the heat sink).

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

PACKAGE
Top Marking

: Output Current Options

J = 110mA; K = 130mA; L = 150mA; M = 170mA; N = 190mA;
 P = 210mA; Q = 230mA; R = 250mA; S = 270mA; T = 290mA;
 V = 310mA; W = 330mA; X = 350mA

Y : Year Code
WW : Week Code
T : Trace Code
3-Pin Surface Mount SOT-89


	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.173	-	0.181	4.39	-	4.59
B	0.090	-	0.102	2.28	-	2.59
C	0.055	-	0.063	1.39	-	1.60
D	0.015	-	0.017	0.38	-	0.43
E	0.084	-	0.090	2.13	-	2.28
F	0.016	-	0.019	0.33	-	0.48
G	0.059 BSC			1.49 BSC		
H	0.118 BSC			2.99 BSC		
J	0.018	-	0.022	0.45	-	0.55
K	0.155	-	0.167	3.94	-	4.24
L	0.067	-	0.072	1.70	-	1.82
M	0°	-	8°	0°	-	8°
N	0.035	-	0.047	0.89	-	1.19

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