

Adjustable Constant Current LED Driver MEL7136

General Description

The MEL7136 is a constant current regulator for driving LEDs with low quiescent current and low dropout voltage. The current is adjustable from 10mA to 1A with an external resistor.

Only one external resistor is required to achieve a constant current LED driver. Soft start, thermal protection and low voltage protection are also provided.

The driver pin EXT is provided for current and voltage extension. Adding an external NMOS or NPN transistor to this pin can extend current and voltage range.

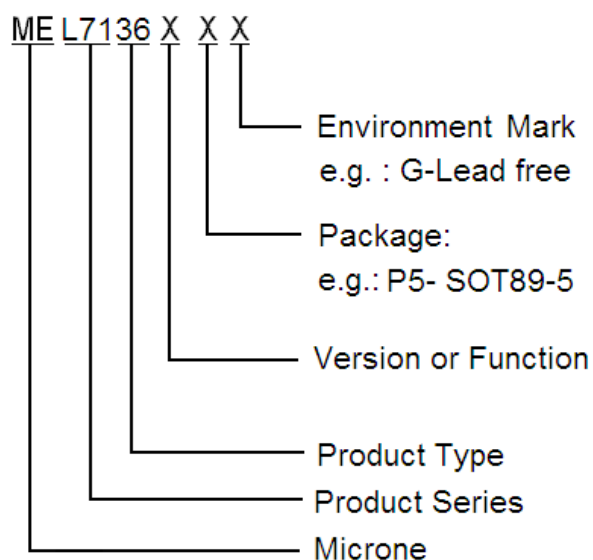
Features

- Sink current: 10mA to 1A adjustable with an external resistor
- Current and voltage range extendable by adding an external NMOS or NPN transistor
- Power supply voltage: 2.7-18V
- Low drop out voltage: 50mV@1A
- Low quiescent current: 80uA
- Thermal Shutdown protection: 165°C
- Soft start
- Low voltage protection: 2.5V
- SOT-89-5 package

Selection Guide

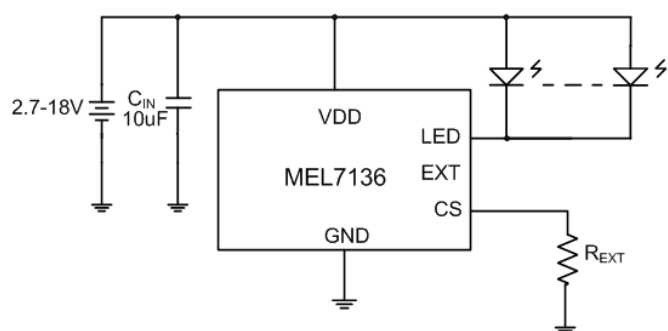
Typical Application

- Power Led driver

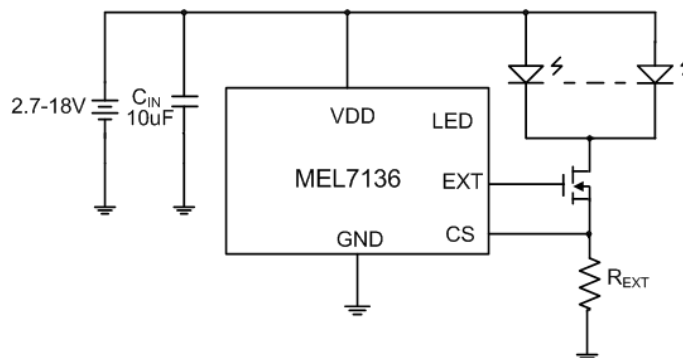


Typical Application Circuit

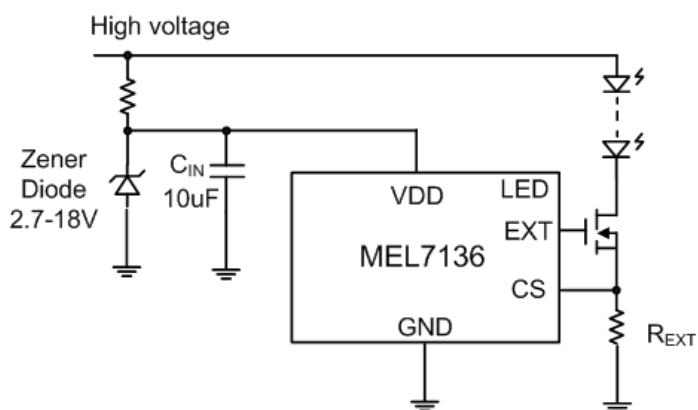
Low Voltage And Light Load (Under 1A)



Low Voltage And Heavy Load (Exceed 1A)



High Voltage Application

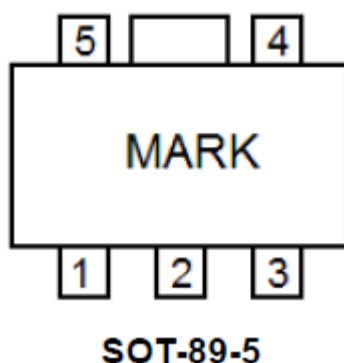


R_{EXT} Resistor Value selection:

R _{EXT} (Ω)	I _{LED} (mA)
10	10
1	100
0.286	350
0.1	1000

$$I_{LED} = \frac{V_{CS}}{R_{EXT}}$$

Pin Configuration



Pin Assignment

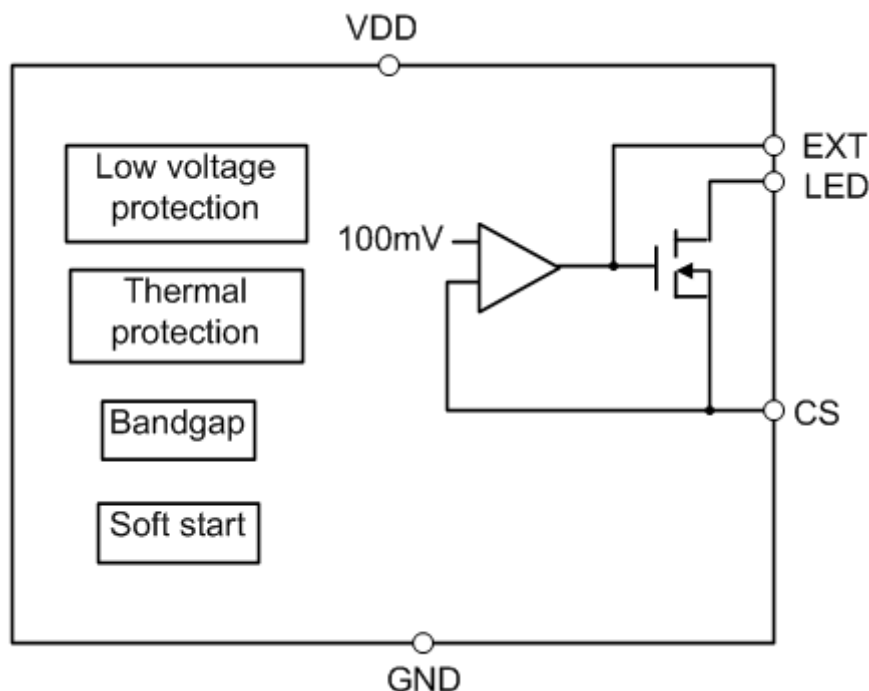
MEL7136

Pin Number	Pin Name	Functions
SOT89-5		
1	CS	Output current detection
2	D(LED)	The negative input feet of LED
3	VDD	Power Input
4	GND	Ground
5	EXT	Driving external NMOS

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units	
Input Voltage	V_{DD}	18	V	
Voltage on LED,CS	V_{LED}, V_{CS}	$-0.3 \sim V_{DD} + 0.3$	V	
Voltage on EXT	V_{EXT}	6	V	
Output Current	I_{OUT}	1.5	A	
Power Dissipation	SOT89-5	P_D	500	mW
Operating Temperature Range	T_{OPR}	$-40 \sim +125$	$^{\circ}C$	
Storage Temperature Range	T_{STG}	$-40 \sim +150$	$^{\circ}C$	
Lead Temperature		$260^{\circ}C, 4sec$		
ESD(ESD voltage for human body model)	V_{ESD}	2000	V	

Block Diagram



Electrical Characteristics

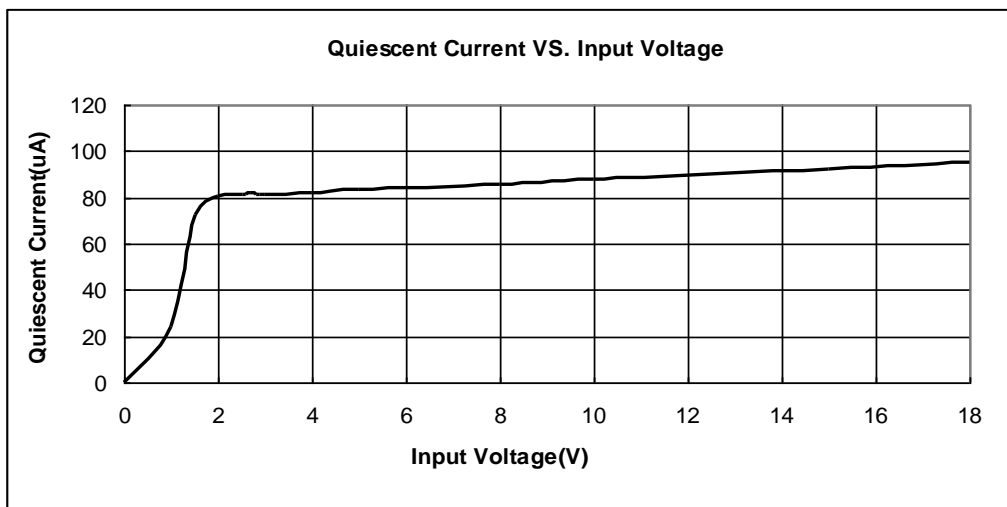
MEL7136

($V_{DD}=3.6V$, $T_a=25^{\circ}C$, unless otherwise noted)

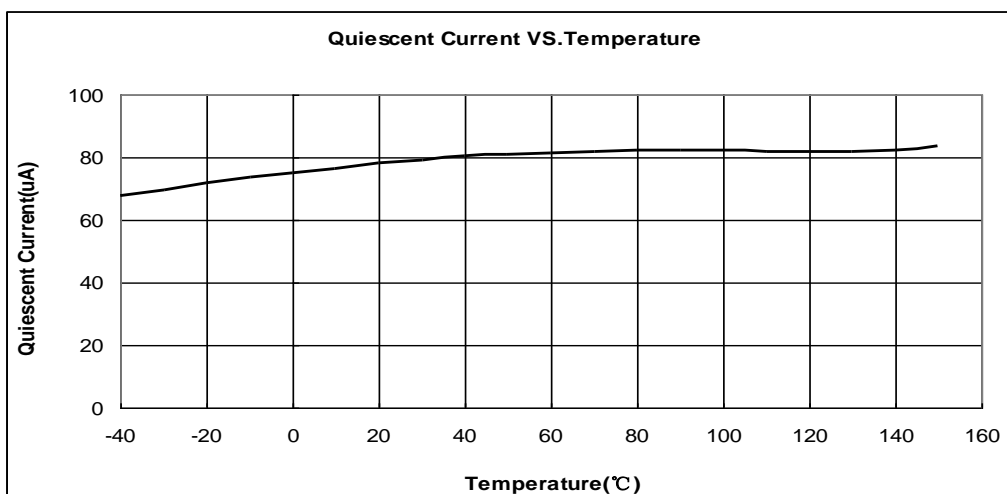
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Sink Current	I_{sink}	$V_{DD}=3.6V$	10		1000	mA
Input Voltage	V_{DD}	$I_{sink}=1A$	2.7		18	V
CS Voltage	V_{CS}		95	100	105	mV
Sink current accuracy	$\Delta I_{LED}/I_{LED}$	$I_{sink}=1A$	-5	-2.5	5	%
Load Regulation	LDR	$V_{LED}=0.2V$ to $3V$ $V_{DD}=3.6V$		0.1	2	mA/V
Line Regulation	LNR	$V_{LED}=3V$ $3.6V \leq V_{DD} \leq 18V$		0.4	2	mA/V
Output dropout voltage	V drop	$V_{DD}=3.6V$, $V_{LED}=0.5V$		50	100	mV
Quiescent Current	I_{SS}	$V_{DD}=3.6V$		80	100	μA
Low Voltage Protection			2.3	2.5	2.7	V
Low voltage hysteresis	V_{hys}			0.15		V
Thermal Shutdown protection:	T_{sd}			165		$^{\circ}C$

Type Characteristics

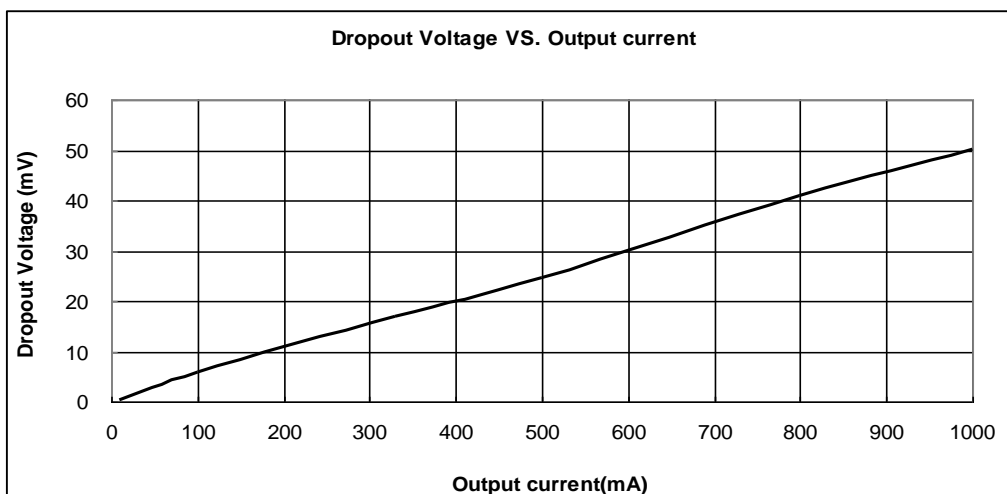
- (1) Quiescent Current VS. Input Voltage (No external component)



- (2) Quiescent Current VS. Temperature ($V_{DD}=3.6V$)

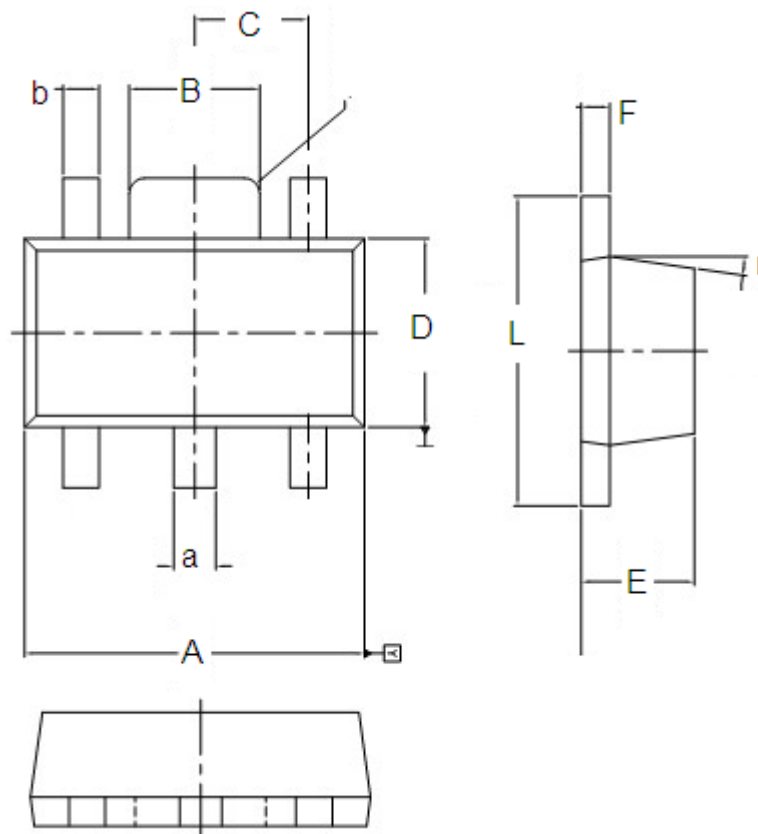


- (3) Dropout Voltage VS. Output Current ($V_{DD}=3.6V$)



Packaging Information

● SOT89-5



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.4	4.6	0.173	0.181
a	0.5	0.62	0.02	0.024
B	1.63	1.83	0.064	0.072
b	0.44	0.54	0.017	0.021
C	Type:1.5		Type:0.059	
D	2.4	2.6	0.094	0.102
E	1.4	1.6	0.054	0.063
F	0.35	0.43	0.013	0.017
L	3.95	4.25	0.155	0.167
r	Type:8 ⁰		Type:8 ⁰	

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