AT7316

700mA High Voltage Adjustable Current Regulator
With Enable Control

Immense Advance Tech.

FEATURES

- Wide Supply Voltage Range: 5V~50V.
- Output Voltage Surge Ratings Up To 75V
- 0.5V Output Drop-out Voltage at 0.7A
- 3us Fast Response Output Stage Enable Control
- Output Current Controlled by External Resistor
- Internal Thermal Protection
- PWM Dimming via OE Pin

APPLICATION

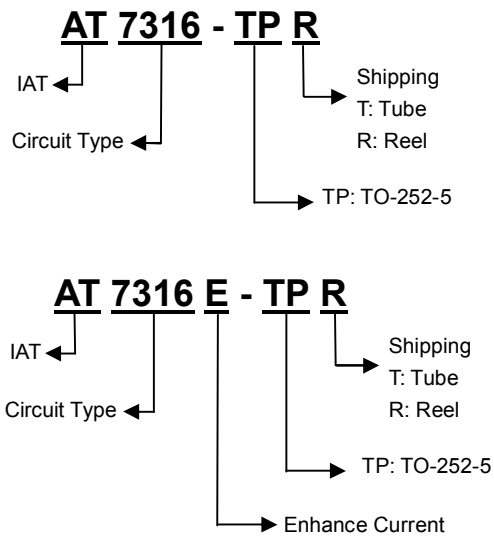
- DC/DC LED Driver Applications
- RGB Full Color Power LED Driver
- Back Lighting of Flat Panel Displays
- LED Table Lamp

DESCRIPTION

The AT7316 is a high voltage, low dropout current regulator. The output current can be programmed by an external resistor which sets the full scale LED string current up to 700mA and the output sink current could be disabled via OE pin.

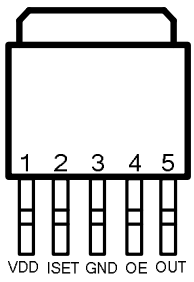
Additional feature includes thermal protection function to ensure the system reliability. Therefore, a large amount of current can be handled safely in one package. The device is available in TO-252-5L package.

ORDER INFORMATION



PIN CONFIGURATIONS

TO-252-5L



(TOP VIEW)

PIN DESCRIPTIONS

Symbol	Description
OUT	Output pin. Sink current it decided by the current on R_{SET} connected to I_{SET} pin. $I_{OUT} = 1.2 \times \frac{500}{R_{CS}}$
OE	Output Stage Enable Control pin. High enables the OUT pin. It can be left floating for normally on.
I_{SET}	Output Current Setting pin. Connect a resistor from I_{SET} to GND to set the LED bias current. $I_{SET} = 0.002 \times I_{OUT} = 1.2 / R_{CS}$
VDD	Power Supply pin.
GND	Ground pin.

TYPICAL APPLICATION CIRCUITS

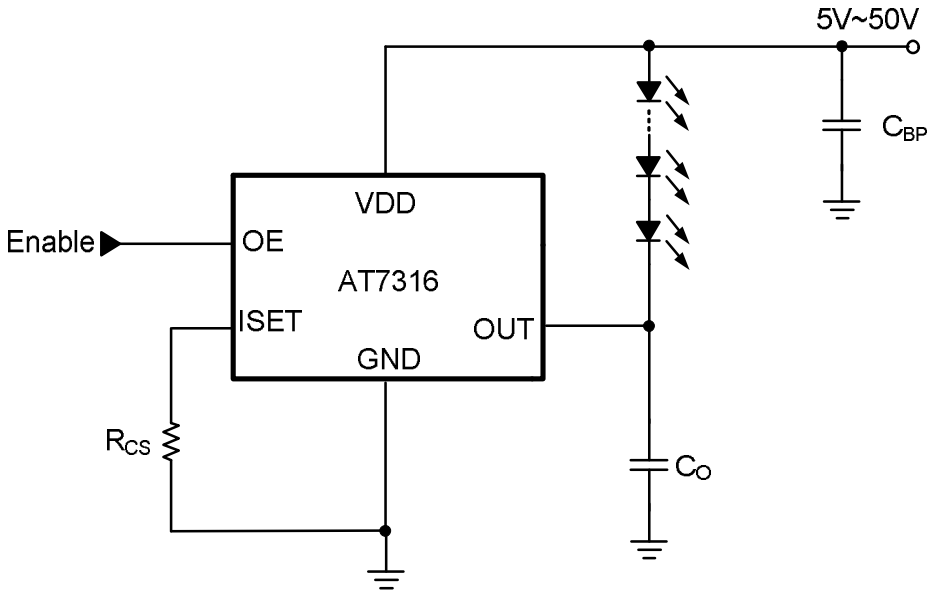


Figure 1

ABSOLUTE MAXIMUM RATINGS (Note 1)

Parameter	Symbol	Range	Unit
Input Voltage	V_{DD}	55	V
Output Sustaining Voltage	V_{OUT}	75	V
Output Sink Current	I_{OUT}	700	mA
Output Enable Voltage	V_{OE}	13.2	V
Maximum Operating Junction Temperature	T_J	150	°C
Lead Temperature (Soldering 10 sec)	T_{LEAD}	260	°C
Storage Temperature rang	T_{STG}	-65 to +150	°C
Thermal Resistance Junction to Ambient (Note 2)	θ_{JA}	80	°C/W

RECOMMENDED OPERATING CONDITIONS (Note 3)

Parameter		Symbol	Operation Conditions	Unit
Supply Voltage		V_{DD}	5 ~ 50	V
Output Enable Voltage		V_{OE}	0 ~ 12	V
Output Sink Current	AT7316	I_{OUT}	200 ~ 355	mA
	AT7316E		350 ~ 600	
Operating free-air temperature range		T_A	-40 to +85	°C

Note 1: Stresses listed as the above “Absolute Maximum Ratings” may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2: 2 square inch of FR-4, double sided, 1 oz. minimum copper weight.

Note 3: The device is not guaranteed to function outside its operating conditions

ELECTRICAL CHARACTERISTICS

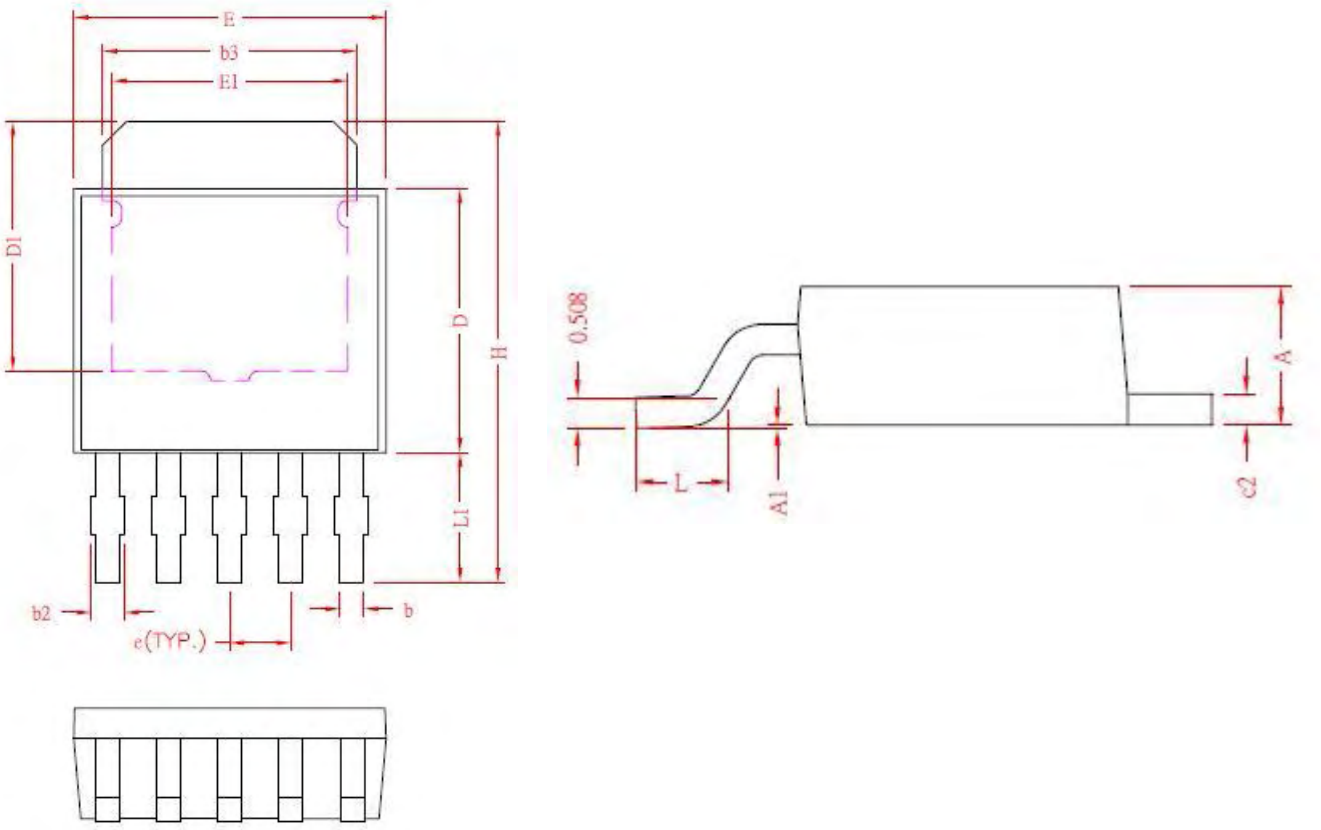
V_{DD}=24V, T_A= 25°C, No Load, unless otherwise specified.

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Output Current	I_{OUT}	V_{OUT}=0.5V, R_{SET}=3KΩ			200		mA
		V_{OUT}=0.5V, R_{SET}=1.71KΩ			350		
		V_{OUT}=0.5V, R_{SET}=1KΩ			600		
Output Current Deviation	ΔI_{OUT}	AT7316	V_{OUT}=0.5V, I_{OUT}=200~350mA			±5	%
		AT7316E	V_{OUT}=0.5V, I_{OUT}=350~600mA			±5	
SET Current Range	I_{SET}			200		1400	μA
Minimum Output Current	$I_{OUT(min)}$	I_{SET}=200μA			100		mA
Maximum Output Current	$I_{OUT(max)}$	I_{SET}=1400μA			700		mA
Output Dropout Voltage	V_{DROP}	I_{SET}=1000μA (Note 1)			0.35		V
Load Regulation	Reg_Load	V_{OUT}=0.5V to 3V				3	mA/V
Line Regulation	Reg_Line	V_{OUT}=0.5V, I_{OUT}=350mA, V_{DD}=5V to 50V			0.08	0.15	%/V
Thermal Shutdown Junction Temperature	T_{HI}	Hysteresis=20°C			160		°C
“Low” Input Voltage	V_{OEL}			0		0.8	V
“High” Input Voltage	V_{OEH}	Should lower than V_{DD}		2		Min｛VDD,12｝	V
“Low” Input Current	I_{OEL}	V_{OE}=0V		-20		+20	μA
“High” Input Current	I_{OEH}	V_{OE}=5V		-5.0		+5.0	μA
Output Enable Delay Time	T_{DLH}	OE from Low to High, V_{OUT}=0.5V, I_{OUT}=350mA, 50%			3		μS
Output Disable Delay Time	T_{DHL}	OE from High to Low, V_{OUT}=0.5V, I_{OUT}=350mA, 50%			3		μS
Supply Current Consumption	I_{SS}					5	mA

Note 1: Output dropout voltage: 90% x I_{OUT} @ V_{OUT}=500mV

PACKAGE OUTLINE DIMENSIONS

TO-252-5L PACKAGE OUTLINE DIMENSIONS



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.20	2.40	D1	4.57	---
A1	0	0.15	E	6.35	6.73
b	0.45	0.60	E1	3.81	---
b2	0.50	0.80	e	1.27 REF.	
b3	5.21	5.46	H	9.40	10.20
c2	0.46	0.58	L	1.40	1.77
D	5.40	5.59	L1	2.40	3.00

Note:

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