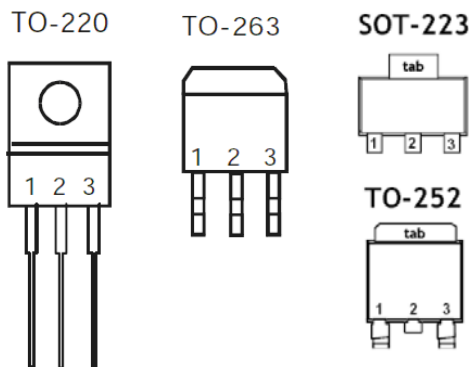# 亮芯科技股份有限公司
Lighting Device Tech.

Features

- Adjustable or fixed output
- Output current of 1A
- Low dropout - 1.3V typ. at 1A output current
- 0.04% line regulation
- 0.2 % load regulation
- 100% thermal limit burn-in
- Fast transient response

Applications

- High efficiency linear regulators
- Post regulators for switching supplies
- Adjustable power supply

General Description

The LD6351 series of positive adjustable and fixed regulators is designed to provide 1A with high efficiency. All the internal circuitry is designed to operate down to 1.4V input-to-output differential.

On-chip trimming adjusts the reference voltage to 1%. The typical current limit value of 1.5A allows the stress on both the regulator and the power source circuitry to be minimized under overload conditions.

LD6351 can operate using MLCCs in the capacitance range of 2µF to 10µF.

Package Pin Out

TO-220   TO-263   SOT-223

TO-252

Pin	Function
1	ADJ/GND
2/ tab	OUT
3	IN

Ordering Information

Part No.	Package	Packing Options	
		Tube (TU)	Tape & Reel (TR)
LD6351	SOT223	–	LD6351L8-TRX
	TO220	LD6351T3-TUX	LD6351T3-TRX
	TO252	LD6351T6-TUX	LD6351T6-TRX
	TO263	LD6351T8-TUX	LD6351T8-TRX

Voltage Selection

Part Number	Output Voltage
LD6351L8-TRX	Adjustable
LD6351L8-TRA	1.2V
LD6351L8-TRB	1.5V
LD6351L8-TRC	1.8V
LD6351L8-TRD	2.5V
LD6351L8-TRE	2.85V
LD6351L8-TRF	3.0V
LD6351L8-TRG	3.3V
LD6351L8-TRH	3.5V
LD6351L8-TRI	5.0V

- Package material default is "Green" package.

Product Marking

LD8888
SSSSS…
●

✧ Line 1 – "LD" is a fixed character
   8888: product name
✧ Line 2 – SSSSS…: lot number

Absolute Maximum Ratings

Parameter	Maximum	Unit
Power dissipation	Internally limited	W
Input voltage	20	V
Operating junction temperature range	-40 to 125	°C
Storage temperature	-65 to 150	°C
Lead temperature (soldering, 10 sec)	300	°C

The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

Electrical Characteristics

I_{LOAD} = 0mA and T_J=25°C unless specified, otherwise minimum and maximum values are guaranteed by production testing requirements.

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Reference voltage [2]	V_{REF}	V_{IN} = 5V, I_{LOAD} = 10mA [6]	1.232	1.250	1.268	V
		1.5V ≤ V_{IN} - V_{OUT} ≤ 10V, I_{LOAD} = 10 mA to 1A, [1,6]	1.225	1.250	1.275	V
Accuracy of output voltage [2]	$A_{CCVOUTF}$	V_{IN} = V_{OUT} +1.5V, Varied from nominal V_{OUT} [5]	-1.5	–	+1.5	%
		1.5V≤V_{IN}-V_{OUT}≤10V, I_{LOAD}=0mA to 1A, [1,5]	-2	–	+2	%
		V_{OUT} =1.2V, [1]	-3	–	+2	%
Accuracy of output voltage at wafer testing	$A_{CCVOUTW}$	V_{IN} = V_{OUT} +1.5V I_{LOAD} = 10mA	-0.6	0	+0.6	%
Line regulation	R_{LINE}	I_{LOAD} = 10mA, 1.5V ≤ V_{IN} - V_{OUT} ≤ 10V, [1]	–	0.04	0.20	%
Load regulation [2]	R_{LOAD}	V_{IN} = V_{OUT} + 1.5V, I_{LOAD} = 10mA to 1A, [1]	–	0.2	0.40	%
Minimum load current	I_{LOAD}	V_{IN} = 5V, V_{ADJ} = 0V, [1,6]	–	2	7	mA
GND pin current	I_{GND}	V_{IN} = V_{OUT} +1.5V, I_{LOAD} = 10mA to 1A, [1,5]	–	3.5	10	mA
ADJ pin current	I_{ADJ}	1.5V ≤ V_{IN} - V_{OUT} ≤ 10V, I_{LOAD} =10mA, [1,6]	–	35	60	μA
Current limit	I_{LIMIT}	V_{IN} - V_{OUT} = 1.5V, [1]	1	1.5	2	A
Ripple rejection [3]	R_{RIPPLE}	V_{IN} - V_{OUT} = 2.5V I_{LOAD} = 1A	60	–	–	dB
Dropout voltage [2,4]	V_{DROPUT}	I_{LOAD} = 1A, [1]	–	1.20	1.40	V
Temperature coefficient	T_{COEF}	V_{IN} - V_{OUT} = 1.5V, I_{LOAD} = 10mA, [1]	–	–	0.015	%/°C

1. Denotes "apply over the full temperature range" – 40°C ≤ T_J ≤ 125°C
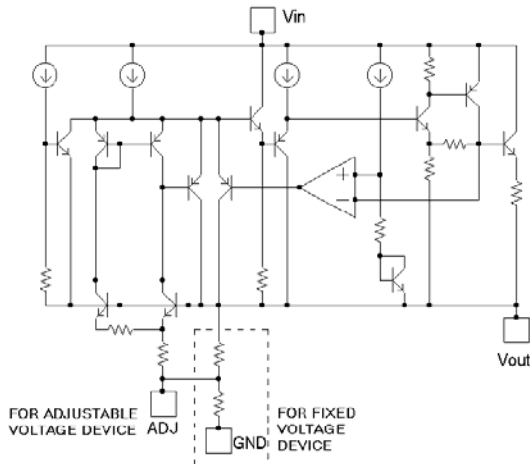2. Low duty pulse testing with Kelvin connections is required
3. 120Hz input ripple (C_{ADJ} = 25μF for the ADJ version)
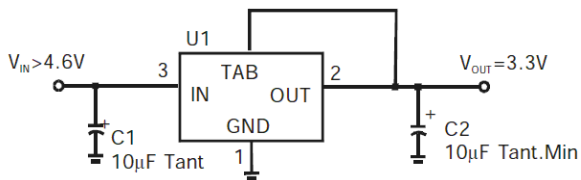4. V_{OUT}, V_{REF} = 1%
5. V_{OUT} output fixed version only
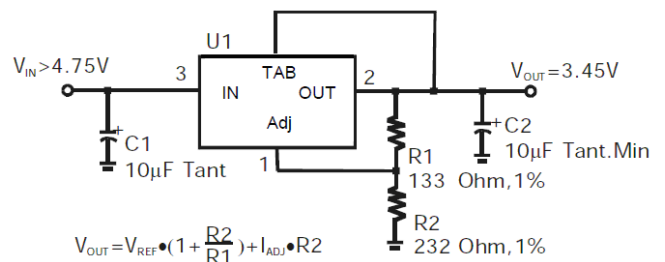6. V_{OUT} adjustable version only

Block Diagram

Typical Application Circuit and OTP Function Chart
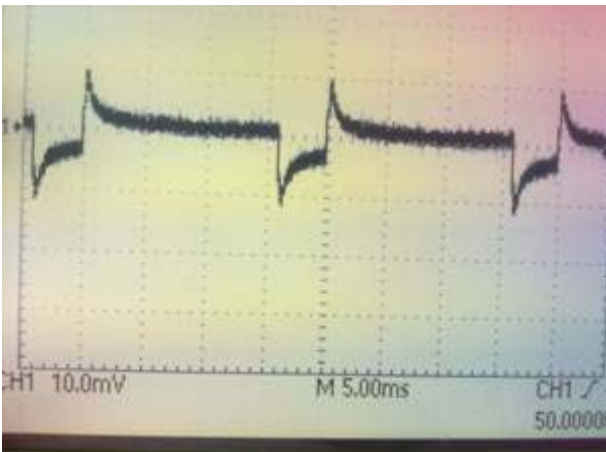
Fixed Voltage Regulator

$V_{IN} > 4.6V$ ... U1 ... TAB, IN, OUT, GND ... $V_{OUT} = 3.3V$
C1 10µF Tant, C2 10µF Tant.Min

Adjustable Voltage Regulator

$V_{IN} > 4.75V$ ... U1 ... TAB, IN, OUT, Adj ... $V_{OUT} = 3.45V$
C1 10µF Tant, C2 10µF Tant.Min
R1 133 Ohm, 1%
R2 232 Ohm, 1%

$$V_{OUT} = V_{REF} \cdot (1 + \frac{R2}{R1}) + I_{ADJ} \cdot R2$$
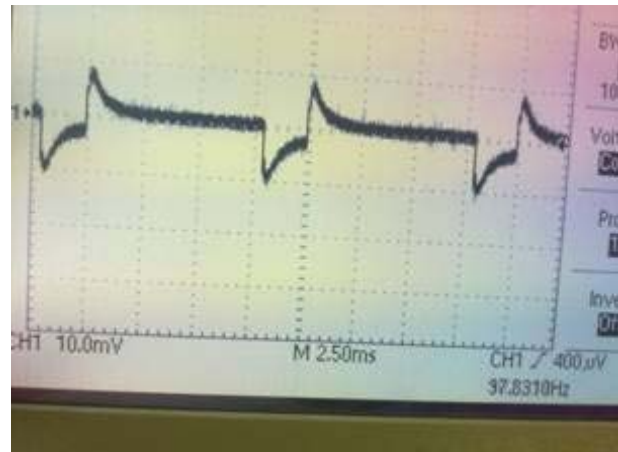
Notes:
1) C1 needed if device is far from filter capacitors
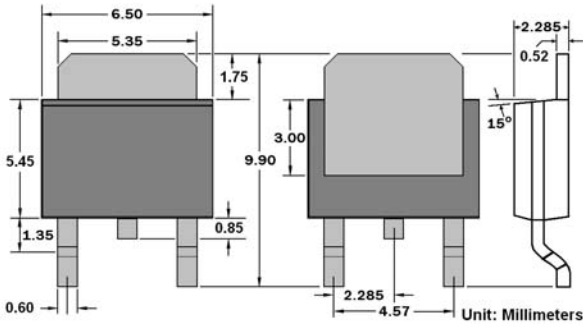2) C2 minimum value required for stability

$C_{OUT} = 10µF$, $V_{IN} = 5V$, $I_{OUT} = 10mA$ to 1A, $V_{OUT} = 3.3V$

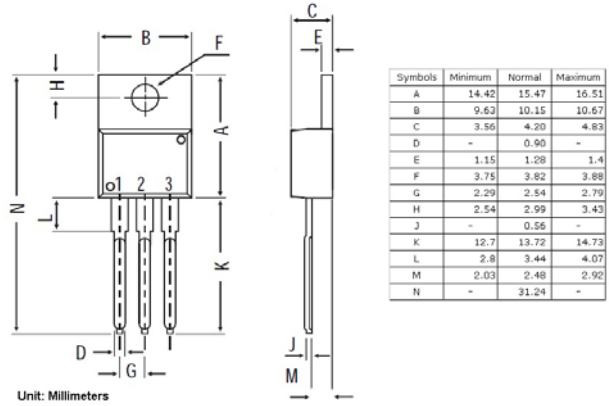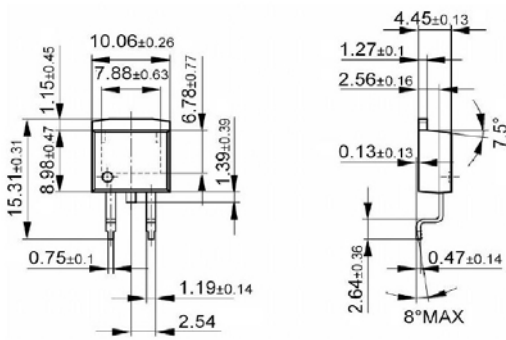$C_{OUT} = 2.2µF$, $V_{IN} = 5V$, $I_{OUT} = 10mA$ to 1A, $V_{OUT} = 3.3V$

Package Outline

TO-252:

TO-220:

Symbols	Minimum	Normal	Maximum
A	14.42	15.47	16.51
B	9.63	10.15	10.67
C	3.56	4.20	4.83
D	-	0.90	-
E	1.15	1.28	1.4
F	3.75	3.82	3.88
G	2.29	2.54	2.79
H	2.54	2.99	3.43
J	-	0.56	-
K	12.7	13.72	14.73
L	2.8	3.44	4.07
M	2.03	2.48	2.92
N	-	31.24	-

Unit: Millimeters

TO-263:

SOT-223:

SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.52	1.80	0.061	0.071
A1	0.02	0.10	0.0008	0.0040
A2	1.50	1.70	0.059	0.067
b	0.60	0.80	0.024	0.031
b1	2.90	3.10	0.114	0.122
c	0.24	0.32	0.009	0.013
D	6.30	6.80	0.248	0.268
E1	3.30	3.70	0.130	0.146
e	2.30 BSC		0.090 BSC	
e1	4.60 BSC		0.181 BSC	
E	6.70	7.30	0.264	0.287
L	0.90 MIN		0.036 MIN	
L2	0.06 BSC		0.0024 BSC	
α	0°	10°	0°	10°

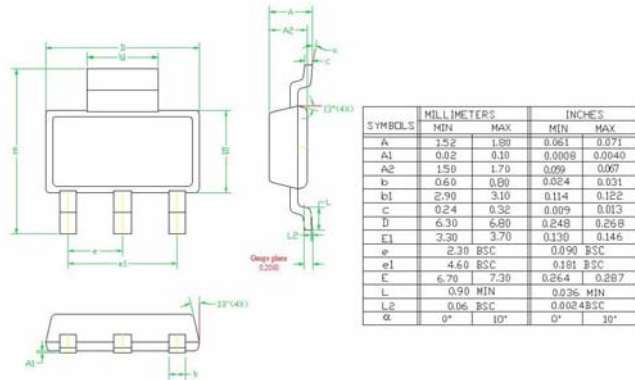# **LD Tech Corporation**

Tel:　　+886-3-567-8806
Fax:　　+886-3-567-8706
E-mail:　sales@ldtech.com.tw
Website:　www.ldtech.com.tw