DD231

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3-CHANNEL CONSTANT CURRENT LED DRIVERS

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DD231

3-CHANNEL CONSTANT CURRENT LED DRIVERS

DESCRIPTION

The DD231 is a 3-channel constant current LED driver. It's designed to operate as a constant-current sink to drive the LEDs with an external resistance in low power environment. Because the DD231 directly determines output current by each channel in low Bit-to-Bit skew, it is ideal for driving LED whose light intensity is proportional to the current passing through them, not the voltage across their terminals.

This configuration eliminates the need of external capacitors and inductances. With an input voltage range of 3V to 5V, so the device can work in general battery system. The value of constant current can be varied using an external resistor (I_{out} = 5 ~30mA).

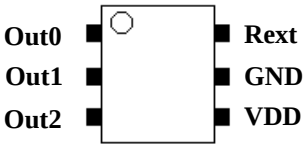
GENERAL FEATURES

- Constant Current Output, 5~30mA.
- Supply Voltage VDD is 3V to 5V.
- Bit-to-Bit : ± 3.0% (Max) @ I_{OUT} = 5 ~ 30mA.
- Only Need One External Resistor, No Other External Parts.
- Small 6-Pin SOT26 Package.

APPLICATIONS

- White LED Display Backlighting
- Cellular Telephones
- Handheld Computers
- Digital Cameras
- Portable MP3 Players
- Pagers
- Personal Digital Assistant
- E-Books and Sub Notebooks

Pin Description



PIN NAME	DESCRIPTION
VDD	Power supply terminal
Rext	Input terminal of an external resistor
GND	Ground terminal
Out0 to Out2	Output terminal

Maximum Ratings (Ta = 25°C, $Tj_{(max)}$ = 140°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	7	V
Output Current	I_{OUT}	30	mA
Output Voltage	V_{OUT}	~17	V
GND Terminal Current	I_{GND}	90	mA
Power Dissipation	P_D	0.35	W
Operating Temperature	T_{op}	-40 ~ 85	°C
Storage Temperature	T_{stg}	-55 ~ 150	°C

Recommended Operating Condition

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	—	2.7	3.3	6	V
Output Voltage	V_{OUT}	—	0.2	0.6	5.0	V
Output Current	I_O	Outn	5	—	30	mA
Operating temperature	T_{OPR}	—	-40	—	85	°C

Electrical Characteristics **(Typ:VDD = 3.3 V, Ta = 25°C unless otherwise noted)**

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Output Current (Bit-Bit)	IOL1	VOUT = 1 V REXT = 12kΩ	—	±1.5	±3	%
	IOL2	VOUT = 0.5 REXT = 60kΩ	—	±1.5	±3	%
Output Current (Chip-Chip)	IOL3	VOUT = 1.0V, REXT = 12kΩ	26.3	29.2	32.1	mA

Detailed Description

1) Constant Current Output Value Setting

The output current is determined by the resistance connected between REXT pin and GND. The approximate relation between the resistance value and the base current value is shown in Fig1, the approximate equation presented in (Eq.1).

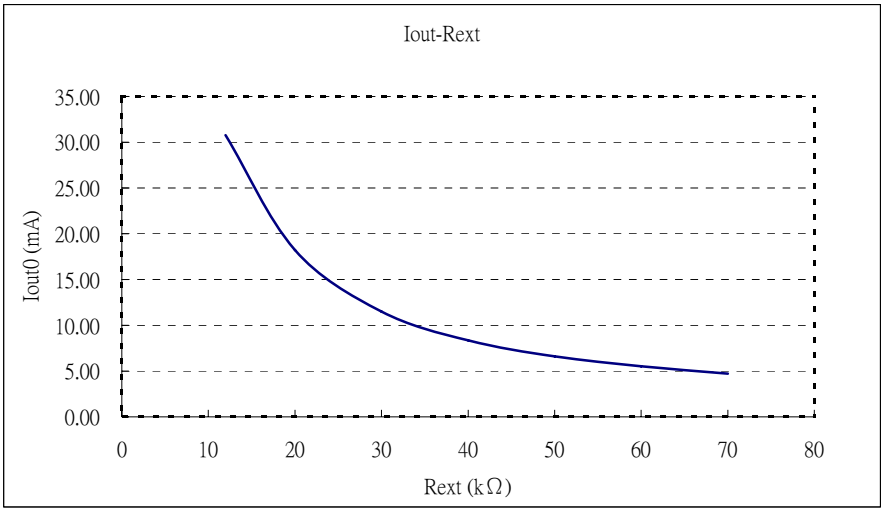


Fig 1

$$I_{out} \cong 350.4/R_{ext} \qquad \text{(Eq.1)}$$

2) Constant Current Output Value and Output Voltage

In order to obtain a good constant current output, a suitable output voltage is necessary. Users can get related information about the minimum output voltage from Fig 2.

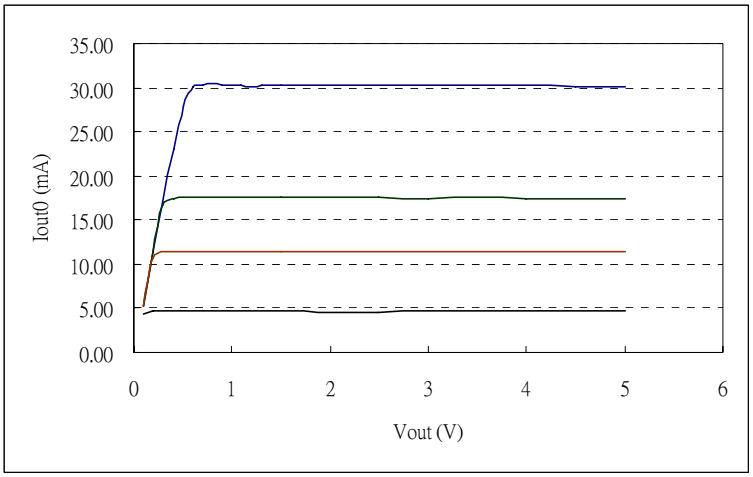


Fig 2

TYPICAL APPLICATION

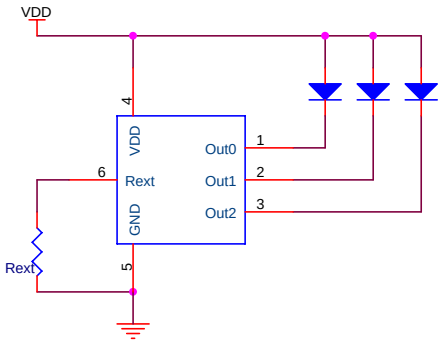
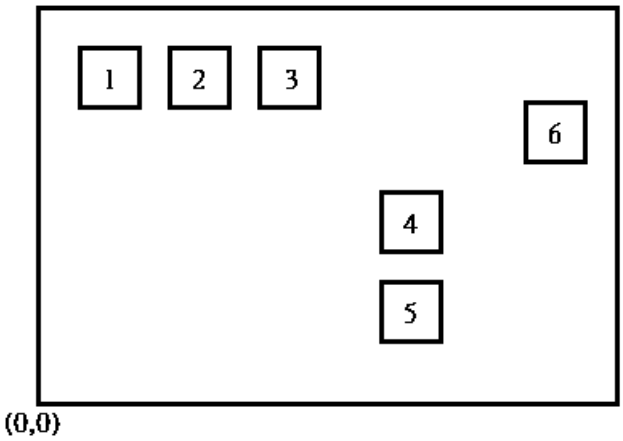


Fig 3

DIE CONFIGURATION (UNIT: μM)



Die Size: 984.3X643.8

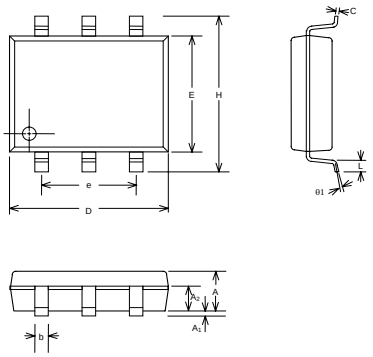
Die Thickness: 300

Pad Size: 80X80

Pin NO.	PAD Name	Center Coordinate (X,Y)	
1	Out0	80.5	564.1
2	Out1	202.1	564.1
3	Out2	323.7	564.1
4	Rext	581.3	391.5
5	GND	586.5	224.9
6	VDD	913.9	419.25

Package Outline (SOT26)

(6-pin SOT-26)



SYMBOL	Dimensions in Millimeters		
	MIN	NOM	MAX
A	1.00	1.10	1.30
A_1	0.00	—	0.10
A_2	0.70	0.80	0.90
b	0.35	0.40	0.50
C	0.10	0.15	0.25
D	2.70	2.90	3.10
E	1.40	1.60	1.90
e	—	1.90(TYP)	—
H	2.60	2.80	3.00
L	0.37	—	—
θ1	1°	5°	9°