Description

ICNE2521DE/DS/DT is a single channel high voltage linear constant current LED driver, which integrates 500V high voltage MOS.

ICNE2521DE/DS/DT output current can be set through an external resistor between 3mA and 100mA, the current precision can reach ±3%.

ICNE2521DE/DS/DT built-in negative temperature compensation function, help to improve the source regulation of the linear power supply system, the built-in negative temperature compensation function can effectively prevent damage to the system caused by sudden temperature changes.

ICNE2521DE/DS/DT system has simple peripherals, flexible application, high reliability, small volume, low system BOM cost, adjustable packaging technology can be applied to all kinds of LED lamps.

Features

- Constant current control technology.
- System efficiency up to 93%.
- Programmable output current.
- ±3% LED current accuracy.
- Temperature compensation improves the source regulation.
- NO EMI issue.
- eSOP-8L, SOT-89-3L, and TO-252 packages available.

Applications

- LED T8/T10 Tube
- LED Bulb, Candle Light
- LED Ceiling Light
- Landscape lamp
- LED Down light
- Other LED lighting

Typical applications

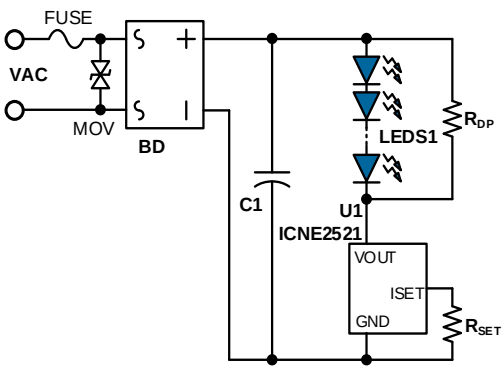


Fig. 1 Low Power Application.

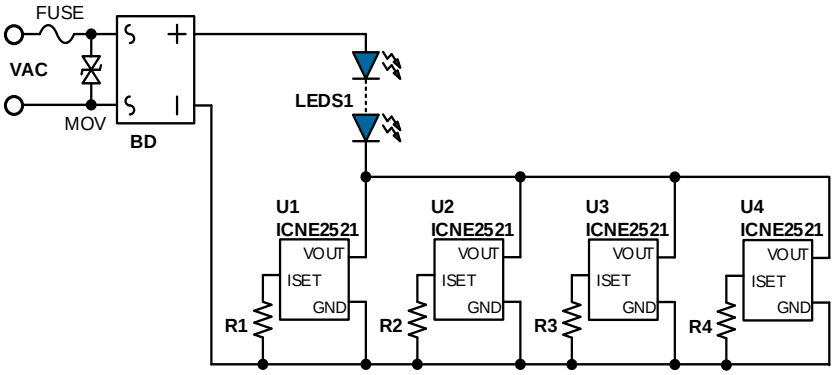


Fig. 2 High Power Application

Ordering Information

Part Number (Note)	Package	Packing	Thermal Protection		Marking
			Trip Temperature	Current @ 165°C	
ICNE2521DE	eSOP-8L	4000 pcs/Reel	TREG=130℃	92%	Line1-line3: ICNE2521DE/Lot No./Date code
ICNE2521DS	SOT-89-3L	4000 pcs/Reel	TREG=130℃	92%	Line1-line2: 2521DS/Lot No.
ICNE2521DT	TO-252-2L	2500 pcs/Reel	TREG=130℃	92%	Line1-line3: ICNE2521DT/Lot No./Date code

Note: Select Part Number for proper package type and thermal protection feature depending on applications and PCB design.

Block Diagram

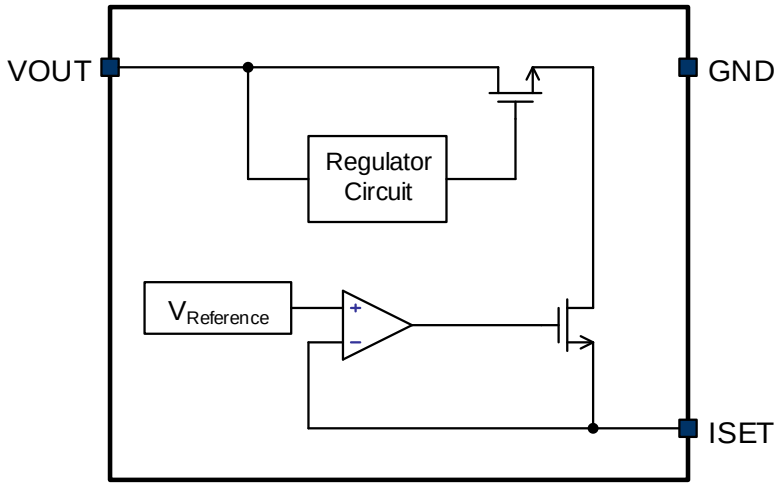
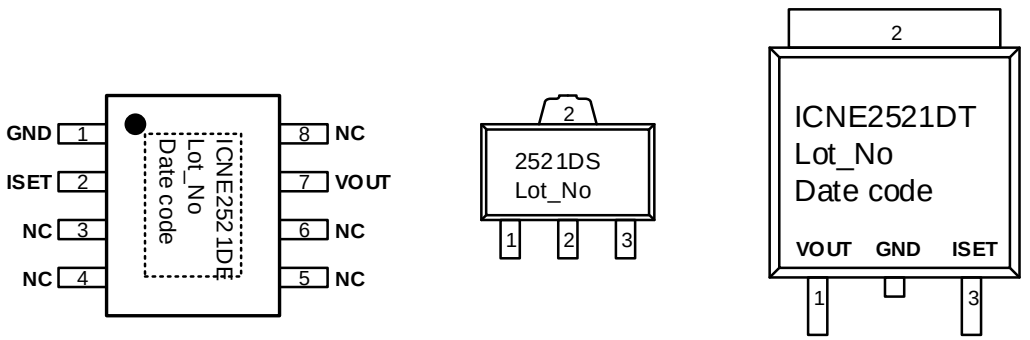


Fig.3 ICNE2521DE/DS/DT Functional Block Diagram

Pin Configuration



eSOP - 8L SOT-89 TO-252

Pin Descriptions

Symbol	Pin No.			Function
	eSOP-8L	SOT-89-3L	TO-252-2L	
GND	1	2	2	Ground Pin
ISET	2	3	3	The output current setting pin
NC	3、4、5、6、8	-	-	NC
VOUT	7	1	1	Constant current output pin

Absolute Maximum Ratings

Parameter	MIN	MAX	Unit
VOUT Sustain Voltage	-0.3	500	V
ESD HBM	2K		V
Operating Junction Temperature T_J	-40	150	℃
Storage Temperature	-55	150	℃
Thermal Resistance $R_{\theta JA}$	—	90 (eSOP-8L)	℃/W
	—	125(SOT-89-3L)	
	—	75(TO-252-2L)	

Electrical Characteristics

(T_A=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
VOUT Input Voltage	V_{OUT}	I=30mA	6	-	-	V
Output Current	I		3		100	mA
ISET Pin Voltage	V_{ISET}		0.580	0.600	0.620	V
Static Current		ISET floating		115		uA
Chip Current Accuracy					±3	%
Temperature Compensation/ Thermal Protection Temperature	T_{REG}			130		℃
V_{ISET} at Thermal Protection Mode	$V_{ISET,OTP}$	T_J=165℃		92		%

Application Information:

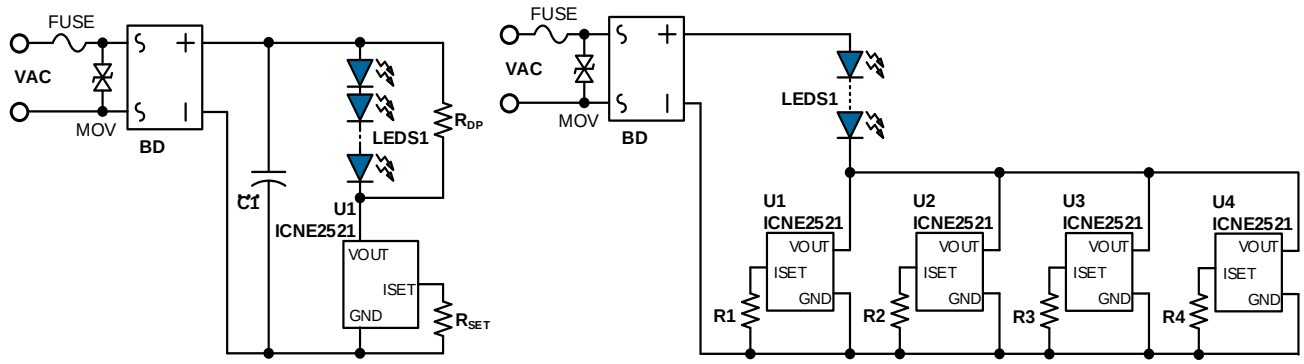


Fig. 4 ICNE2521DE/DS/DT typical application circuit

Output Current Setting

ICNE2521DE/DS/DT is a high efficiency linear LED driver. The LED current can be adjusted by the external resistor programming by:

$$Iout = \frac{V_{ISET}}{Rext}$$

Where,

Iout: LED current

V_{ISET}: ISET pin reference voltage

Rext: External resistance for setting the driving current of the LED

Negative Temperature Compensation / Thermal Regulation Function:

When the junction temperature is higher than the thermal regulation temperature (T_{REG}), the output current starts to decrease and system power and temperature stop increasing. The function ensures that the LED and peripheral devices will not be damaged by the over voltage stress and over temperature stress.

PCB Layout Design:

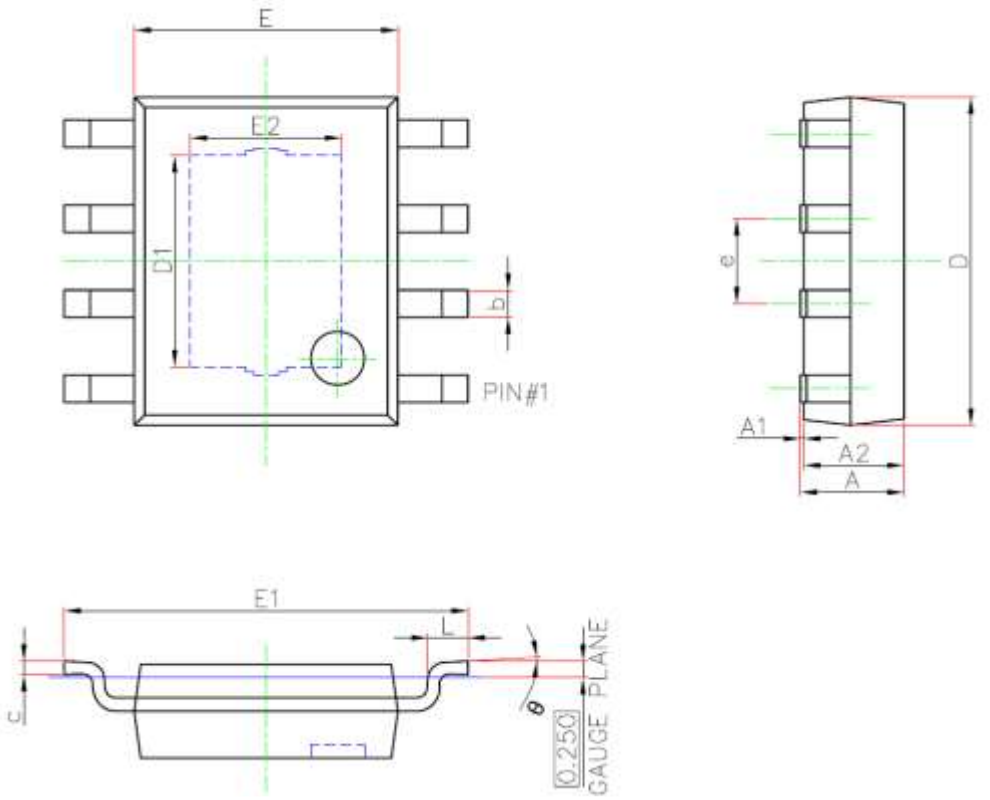
In the design of ICNE2521DE/DS/DT PCB, please follow the following guidelines:

1、The exposed thermal pad under the ESOP8L package is used to enhance the power dissipation capability. The thermal conductivity will be improved if a copper foil on PCB soldered with the thermal pad can be as large as possible. It is strongly recommended to connect the GND pin to the exposed thermal pad.

2、The current sense resistor connected between the ISET pin and GND pin should be placed as close as to the ISET pin and GND pin.

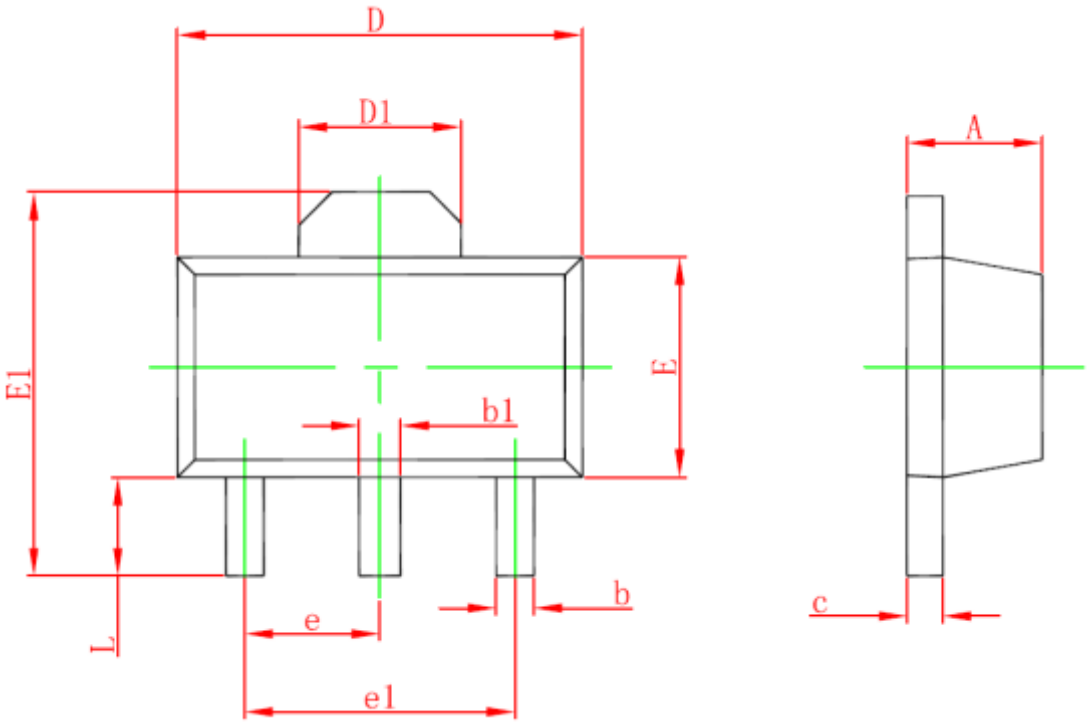
Package Dimensions

1、eSOP-8L/Package dimension for ICNE2521DE



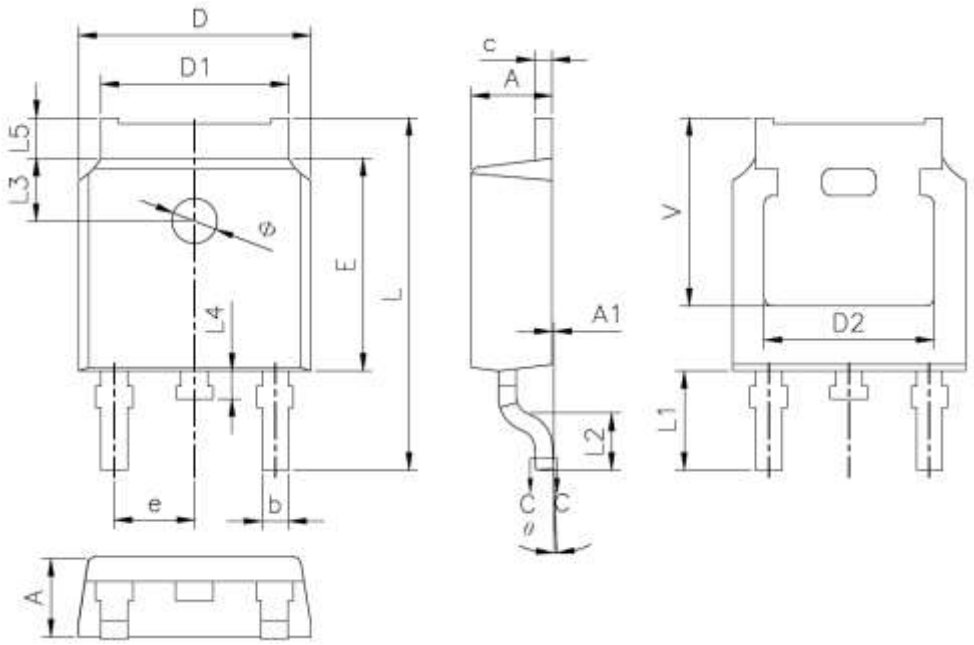
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.300	1.750	0.051	0.069
A1	0.000	0.150	0.000	0.006
A2	1.300	1.600	0.051	0.063
b	0.300	0.500	0.012	0.020
c	0.180	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
D1	3.000	3.450	0.118	0.136
E	3.800	4.040	0.150	0.159
E1	5.790	6.200	0.228	0.244
E2	2.100	2.550	0.083	0.100
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

2、SOT-89-3L / Package dimension for ICNE2521DS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.450	0.014	0.018
D	4.400	4.600	0.173	0.181
D1	1.600REF		0.063REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	3.000TYP		0.118TYP	
L	0.900	1.200	0.035	0.047

3、TO-252-2L/Package dimension for ICNE2521DT



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	2.20	2.30	2.40
A1	0.00	-	0.127
b	0.66	0.76	0.86
C	0.46	0.51	0.58
D	6.50	6.60	6.70
D1	5.10	5.33	5.46
c	0.47	-	0.60
c1	0.46	0.51	0.56
c2	0.47	-	0.60
D2	4.83 REF.		
E	6.00	6.10	6.20
e	2.186	2.286	2.386
L	9.80	10.10	10.40
L1	2.90 REF.		
L2	1.40	1.50	1.60
L3	1.80 REF.		
L4	0.60	0.80	1.00
L5	0.90	-	1.25
Φ	1.10	-	1.30
θ	0°	-	8°
V	5.35 REF.		