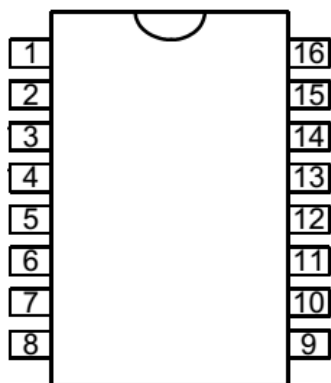


## D7258 8 channel LED large screen scanning blanking control circuit

D7258 is specially designed for LED large screen scanning screen a 8-channel blanking control circuit, its internal integration with 138 decoder, constant charge absorbing circuit, can eliminate the phenomenon of ghosting, greatly improve the refresh rate, at the same time also can eliminate because LED the caterpillar phenomena caused by leakage, short circuit. Built-in the short circuit protection, over current protection circuit, greatly improving the product's adaptation. Single chip can be used as 8S application, by cascading 2 chip EN end can be used as 16S application. D7258 using SOP-16 package to improve the compatibility of the product.

- Built-in 138 decoder
- Eliminate the phenomenon of ghosting
- Single 8-channel output can be used as 8S application
- By cascading 2 chip EN end can be used as 16S application
- Greatly improve the refresh rate
- Eliminate the phenomenon of LED leakage and short-circuit, caterpillar
- Built in short circuit protection, over current protection circuit
- D7258 using SOP - 16 package

Package: SOP-16



Note: Note: Pin1 and pin9 are VDD, layout need to be connected

PIN	definition
1	VDD
2	C
3	OUT1
4	OUT2
5	OUT3
6	OUT4
7	ENH
8	GND
9	VDD
10	ENL
11	OUT5
12	OUT6
13	OUT7
14	OUT8
15	A
16	B

### Absolute maximum ratings (T<sub>A</sub>=25°C)

symbol	parameter	value	unit
VDD	Supply voltage	6.5	V
V <sub>A, B, C, ENH, ENL</sub>	Input voltage	6.5	V
P <sub>D</sub>	maximum power dissipation	1	W
T <sub>STG</sub>	Storage temperature	-55 to 150	°C
T <sub>OPR</sub>	Operating Ambient Temperature	-30 to 85	°C

### Thermal Resistance

Symbol	Parameter	Max value	unit
R <sub>θJA</sub>	PN junction to ambient	125	°C/W

### truth table

input section					output unit							
ENH	ENL	C	B	A	OUT1	OUT2	OUT3	OUT4	OUT5	OUT6	OUT7	OUT8
H	L	L	L	L	H	L	L	L	L	L	L	L
		L	L	H	L	H	L	L	L	L	L	L
		L	H	L	L	L	H	L	L	L	L	L
		L	H	H	L	L	L	H	L	L	L	L
		H	L	L	L	L	L	L	H	L	L	L
		H	L	H	L	L	L	L	L	H	L	L
		H	H	L	L	L	L	L	L	L	H	L
H	H	×	×	×	L	L	L	L	L	L	L	L
L	L	×	×	×	L	L	L	L	L	L	L	L

Note:1) ENH, ENL, A, B, C is the input pins, they prevent float, need to set high or low potential.

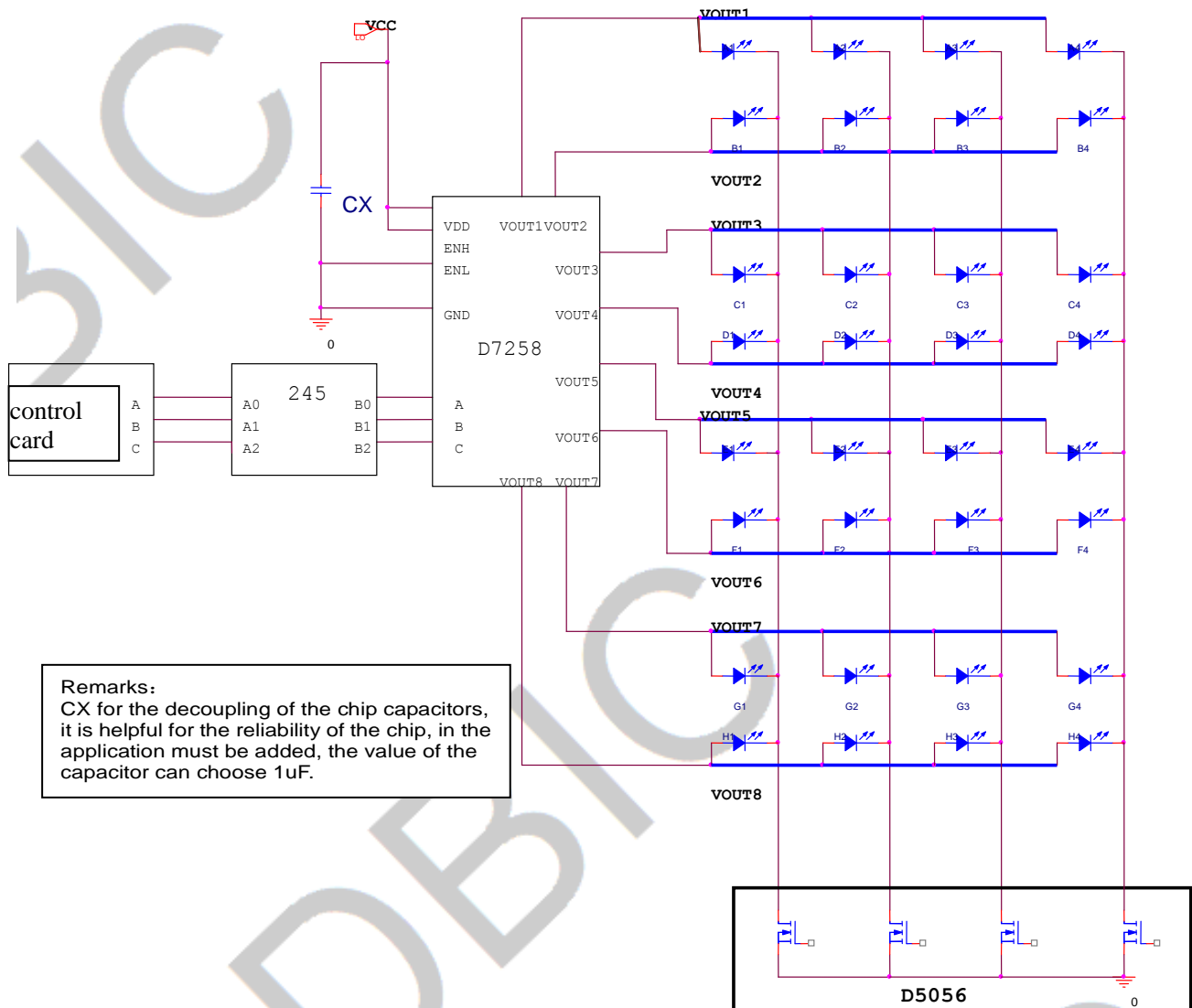
2) For input pins, the H represents a high level, and L represents a low level

3) For the output pins, the H represents the turn-on, and the L represents the shutdown

### Electrical Characteristics (T<sub>j</sub>=25°C, In the absence of other specific instructions)

Symbol	parameter	Test condition	Min	Typ	Max	Unit
IDD	Supply current	VDD=5V		1		mA
RDS	Switch on Resistance	VDD=5V, I <sub>o</sub> =1A		110		mΩ
		VDD=4V, I <sub>o</sub> =1A		120		mΩ
I <sub>o</sub>	Max operating current	VDD=5V			3	A

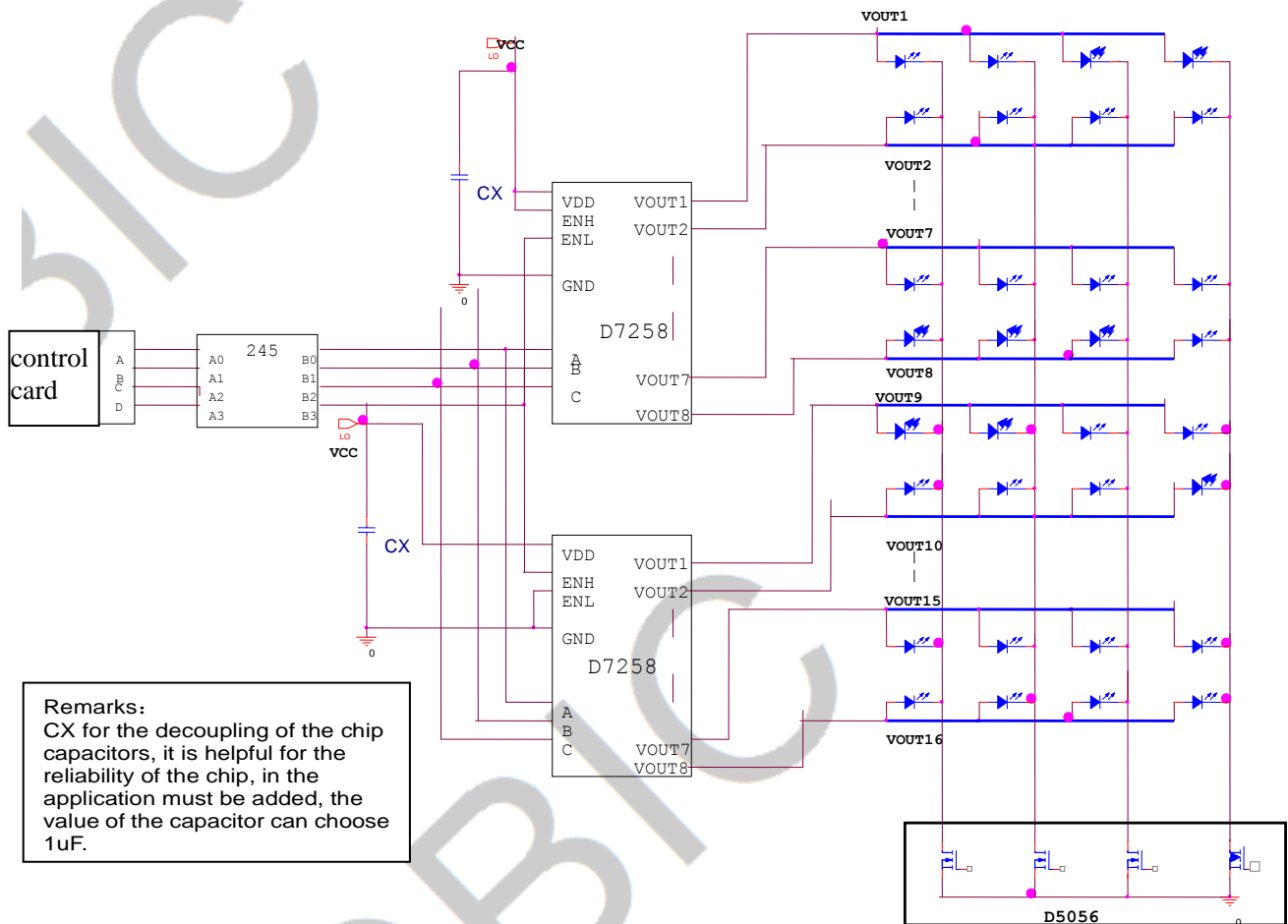
## Typical application1



8S Typical application diagram

Note: in the scanning process, if the D7258 has no output pins must be suspended.

## Typical application2



16S Typical application diagram

Note: in the scanning process, if the D7258 has no output pins must be suspended.

## Application note:

### 1. Package power dissipation $P_D$

As the temperature rises, the ratio of  $P_D$  is as below

Package	$T_a < +25\text{ }^{\circ}\text{C}$	$T_a < +70\text{ }^{\circ}\text{C}$	$T_a < +85\text{ }^{\circ}\text{C}$
SOP-16	1000mW	640mW	520mW

(1) The thermal resistance is calculated by JESD51-5.

### 2. Thermal resistance calculation

1) Taking SO-16 package as an example:

$$R_{th(j-a)} = R_{th(j-c)} + R_{th(c-a)} = 125\text{ }^{\circ}\text{C/W} \quad (T_j = 25^{\circ}\text{C})$$

Note: the package thermal resistance  $R_{th(j-a)}$  is composed of two parts,  $R_{th(j-c)}$  for PN junction to case, the  $R_{th(c-a)}$  for case to the thermal resistance of ambient.

$$P_{D\text{MAX}} = \frac{T_j - T_a}{R_{th(j-a)}} = \frac{150 - 25}{125} = 1\text{W}$$

When the LED display is N scan, the total current of the unit pixel is  $I_{led}$  (1R1G1B), can be driven by a number of:

The power dissipation of the is  $P_O = 2 \cdot I^2 R_{DS}$ .

$$\text{Power consumption of D7258 output in N scan : } D7258 P_O = \frac{8 \cdot I_{led} \cdot I_{led} \cdot R_{ds}}{N}$$

Static power consumption for D7258  $P_c = V_{DD} \cdot I_{DD}$

So the total power consumption:

$$P_D = P_O + P_c = \frac{8 \cdot I_{led} \cdot I_{led} \cdot R_{ds}}{N} + V_{DD} \cdot I_{DD} \dots \dots \dots (1)$$

Example: the input voltage is 5V,  $I_R = 23\text{ mA}$ ,  $I_G = 13\text{ mA}$ ,  $I_B = 10\text{ mA}$ . 16S, a line with M units pixels (i.e.,  $I_{led} = 0.046 \cdot M$ ), by the parameter can get  $R_{ds}$  typical value of 0.11 Ohms,  $I_{DD}$ , typical value of 1mA

So

(1) is simplified to

$$\begin{aligned} P_D &= \frac{8 \cdot I_{led} \cdot I_{led} \cdot R_{ds}}{16} + V_{DD} \cdot I_{DD} \\ &= \frac{8 \cdot 0.046M \cdot 0.046M \cdot 0.11}{16} + 5 \times 0.001 \\ &= 0.000116 \cdot M^2 + 0.005 \end{aligned}$$

When  $T_a < 25\text{ degrees}$ ,  $P_D < 1$ . So,  $M < 92$

$P_D < 1.5$ , So,  $M < 113$

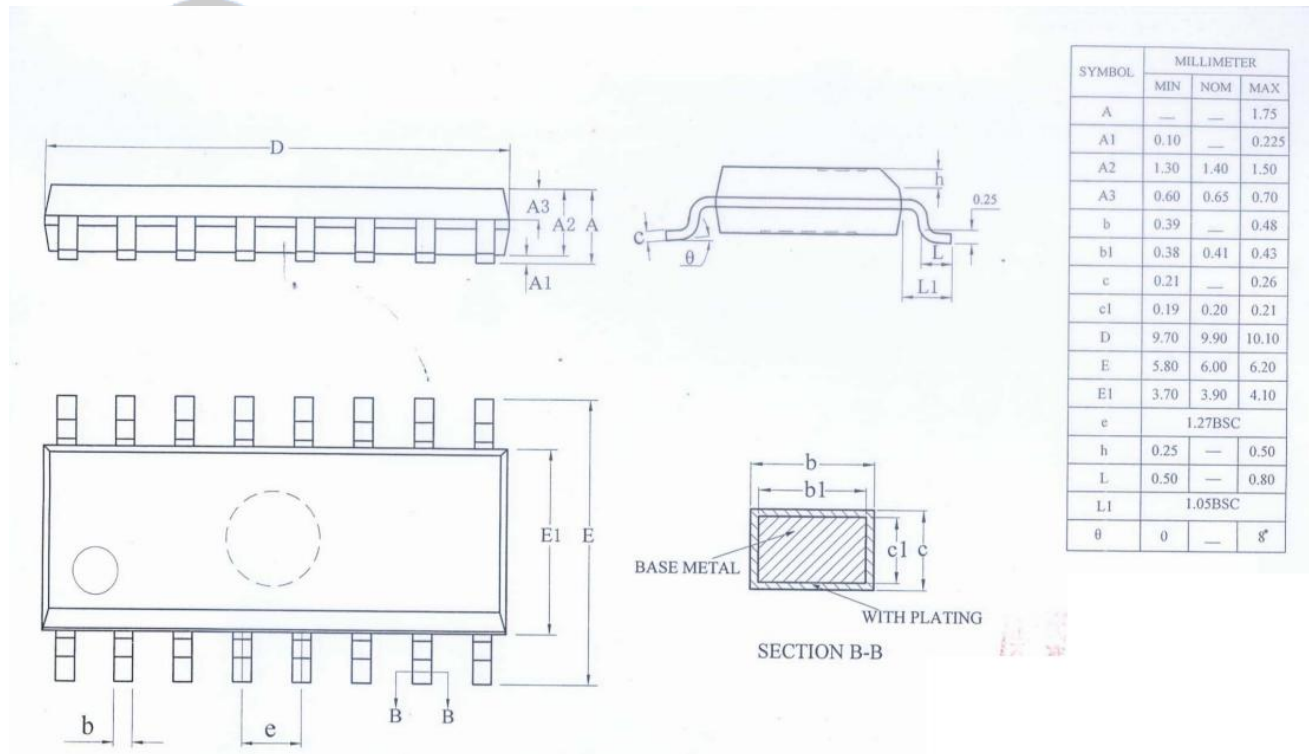
When  $T_a < 70\text{ degrees}$ ,  $P_D < 0.64$ , So,  $M < 74$

$P_D < 0.96\text{ degrees}$ , So,  $M < 90$

The above is based on the  $P_D$  to calculate the M, due to the maximum working current to take into account the 3A IC, so the unit LED drive current for the case of M, 46mA should be less than 64. When the unit drive current is 40mA, the M should be less than 70.

**3.** Because the chip is a power device, at the same time, the PCB plate is affected by the heat of LED heating, which leads to the temperature of the chip is relatively hot, easy to heat expansion factors. It should be noted that the power and ground between the chip (such as pin9 and pin10, pin7 and pin8) between the distance should be far away, while they have to have a solder mask, etc.. The vias on the VDD should be as large as possible.

## SOP-16 Outline dimension



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