

SM18511BK LED  
 DMX512 1990  
 200kbps 750kbps  
 4096  
 OUT R/G/B 18mA,  
 OUT R/G/B 32 OUT  
 4KH PWM

SM18511BK(SOP8)

Fig.SM18511BK

DAI	DMX512 +
VDD	5V
ADRI	
ADRO	
OUTR/G/B	LED
GND	

SM18511BK	SOP8	100 /	4000 /	13

T<sub>A</sub>=25 C

V <sub>DD</sub>			-0.4 5.5	V
V <sub>IO</sub>			-0.4 V <sub>DD</sub> +0.4	V
BV <sub>OUT</sub>	OUTR/G/B		45	V
I <sub>OUT</sub>	OUTR/G/B		22	mA
I <sub>damp</sub>	VDD		20	mA
R <sub>JA</sub>	PN	2	90	C/W
P <sub>D</sub>		3	0.9	W
T <sub>J</sub>			-40 150	C
T <sub>STG</sub>			-55 150	C
V <sub>ESD</sub>	HBM		2	KV

1

2 R<sub>JA</sub> T<sub>A</sub>=25 C

JEDEC JESD51

3

T<sub>JMAX</sub> R<sub>JA</sub>

T<sub>A</sub>

P<sub>D</sub> = (T<sub>JMAX</sub>-T<sub>A</sub>) / R<sub>JA</sub>

V<sub>DD</sub>=5V T<sub>A</sub> = 25 C

V <sub>DD</sub>		V <sub>CC</sub> =12V V <sub>CC</sub> V <sub>DD</sub>	4.8	5.2	5.4	V
		R <sub>D</sub> =1K				
I <sub>DD</sub>	( )	V <sub>DD</sub> = 5V I <sub>OUT</sub> OFF	-	3.8	-	mA
	( )	V <sub>DD</sub> = 5V I <sub>OUT</sub> ON	-	5.1	-	mA
I <sub>OUT_RGB</sub>	OUT R/G/B	D5:D4:D3:D2:D1=11111	-	18	-	mA
dI <sub>OUT_RGB</sub>	OUT R/G/B	I <sub>OUT</sub> =18mA	-	3	-	%
R <sub>do_n_ADI</sub>	ADI	V <sub>DD</sub> =4.5V	-	200	-	K
R <sub>UP_ADI</sub>	ADI	V <sub>DD</sub> =4.5V	-	250	-	K
V <sub>IH</sub>	DAI	V <sub>DD</sub> = 5.0V	0.7*V <sub>DD</sub>			V
V <sub>IL</sub>		V <sub>DD</sub> = 5.0V			0.3*V <sub>DD</sub>	V
V <sub>DS_S</sub>	I <sub>OUT</sub>	I <sub>OUT</sub> = 18mA	-	0.3	-	V
% VS V <sub>DS</sub>		I <sub>OUT</sub> =18mA, V <sub>DS</sub> =1 3V	-	1	-	
%VS V <sub>DD</sub>	OUT R/G/B	I <sub>OUT</sub> =18mA, V <sub>DS</sub> =4.5 5.5V	-	1	-	%
%VS T <sub>A</sub>		I <sub>OUT</sub> =18mA, T <sub>A</sub> =-40 +85	-	4	-	
R <sub>UP_ADRI</sub>	ADRI	-	-	23	-	K
T <sub>OTP</sub>		-	-	135	-	
I <sub>leak</sub> □ I	OUT R/G/B	I <sub>OUT</sub> OFF , V <sub>DS</sub> .				

$V_{DD}=5V$   $T_A = 25\text{ }^{\circ}\text{C}$

$f_{PWM}$	OUT R/G/B	$I_{OUT}=18mA$			
	PWM	OUT R/G/B	200	VDD	- VD

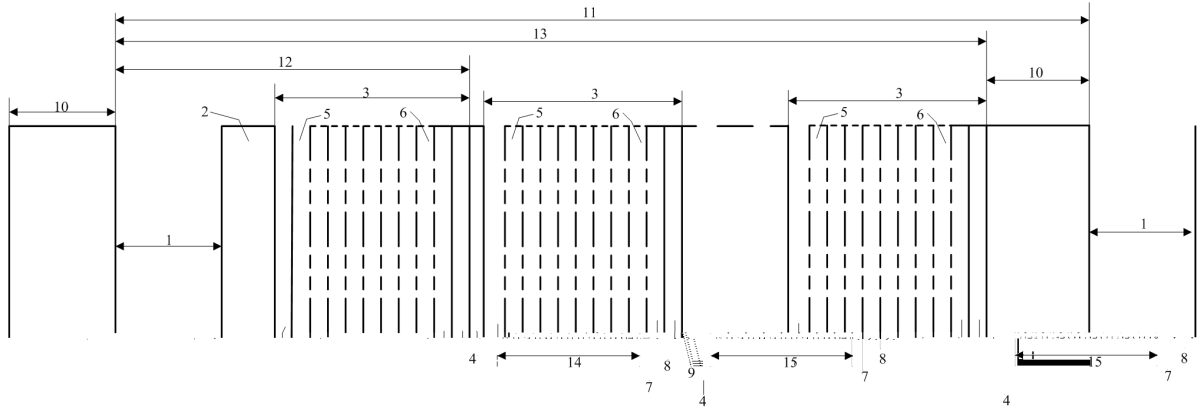


Fig. DMX512(1990)

Figuer Ke

- 1- SPACE for BREAK
- 2- MARK After BREAK (MAB)
- 3- Slot Time
- 4- START Bit
- 5- LEAST SIGNIFICANT Data BIT
- 6- MOST SIGNIFICANT Data BIT
- 7- STOP Bit
- 8- STOP Bit
- 9- MARK Time Bet een slots
- 10- MARK" Before BREAK (MBB)
- 11- BREAK to BREAK Time
- 12- RESET Sequence (BREAK,MAB,START Code)
- 13- DMX512 Packet
- 14- START CODE (Slot 0 Data)
- 15- SLOT 1 DATA
- 16- SLOT nnn DATA (Ma imun 512)

Designation	Description	Min	T pical	Ma	Unit
-	Bit Rate	245	250	255	kbit/s
-	Bit Time	3.92	4	4.08	us
-	Minimum Update Time for 513 slots	-	22.7	-	ms
-	Ma imum Update Rate for 513 slots	-	44	-	/s
1	SPACE for BREAK	88	-	-	us
2	MARK After BREAK (MAB)	8	-	-	us
9	MARK Time Bet een slots	0	-	<1.00	s
10	MARK" Before BREAK (MBB)	0	-	<1.00	s
11	BREAK to BREAK Time	1196	-	-	us
13	DMX512 Packet	1196	-	-	us

1 DMX512 1990

2 MAB

SM18511BK OUT  
V<sub>DS</sub>

I<sub>OUT</sub> OUT V<sub>DS</sub> I<sub>OUT</sub>

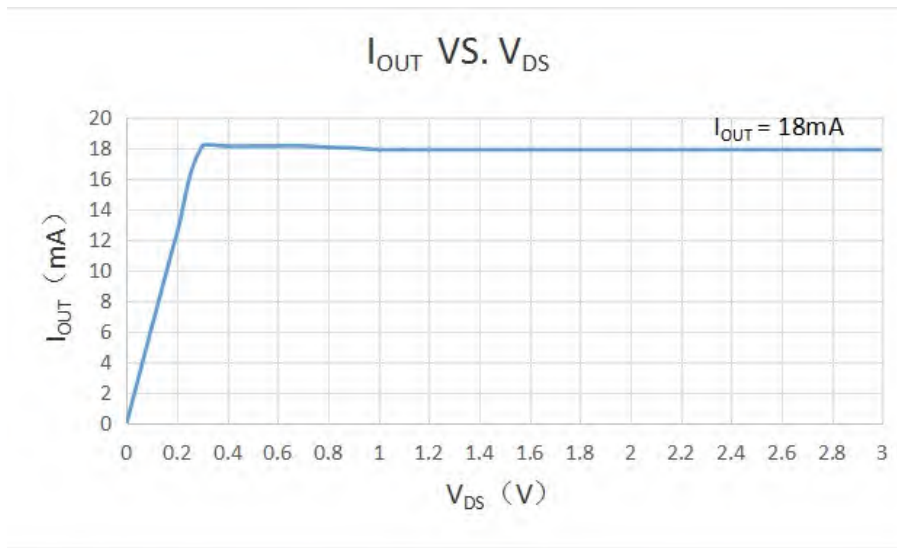


Fig. SM18511BK I<sub>OUT</sub> OUT V<sub>DS</sub>

SM18511BK OUT RGB 5bits D5 D1

	D5	D4	D3	D2	D1	mA
0	0	0	0	0	0	1.1
1	0	0	0	0	1	1.7
2	0	0	0	1	0	2.2
3	0	0	0	1	1	2.7
4	0	0	1	0	0	3.3
5	0	0	1	0	1	3.9
6	0	0	1	1	0	4.4
7	0	0	1	1	1	4.9
8	0	1	0	0	0	5.5
9	0	1	0	0	1	6.1
10	0	1	0	1	0	6.6
11	0	1	0	1	1	7.1
12	0	1	1	0	0	7.7
13	0	1	1	0	1	8.2
14	0	1	1	1	0	8.8
15	0	1	1	1	1	9.3
16	1	0	0	0	0	9.9
17	1	0	0	0	1	10.4
18	1	0	0	1	0	10.9
19	1	0	0	1	1	11.5

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1

2

ADRI

1

3

2

1

2

2

1

2

2

1

/ /

2

/

3

/

4

5

SM18511BK

1

2

SM18511BK

1

2 OUT

0.6

OUT

260ns 0

SM18511BK

DMX512 1990

4095

ADI

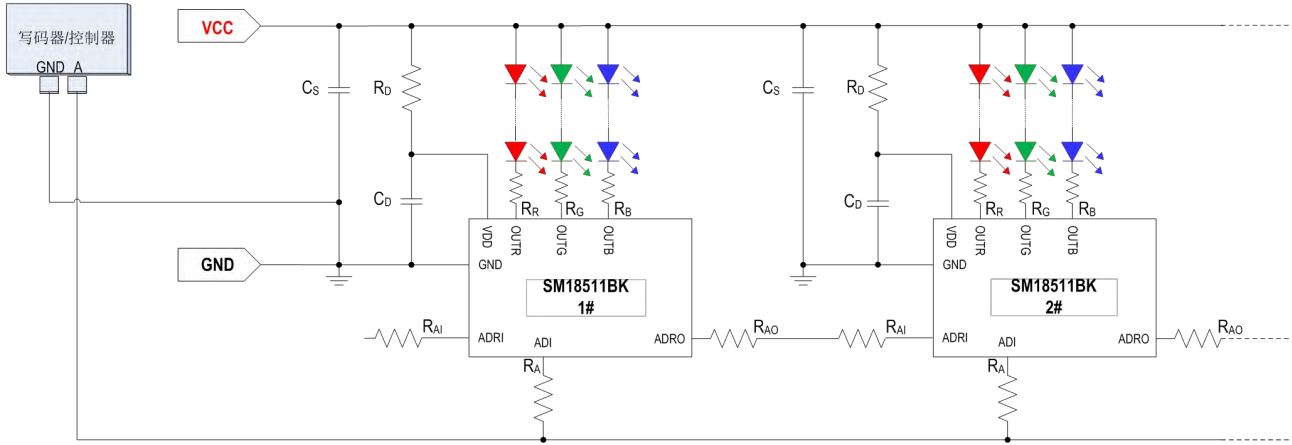


Fig. SM18511BK

SM18511BK	VCC	R <sub>D</sub>	C <sub>S</sub>	R/G/B LED
R <sub>R</sub> R <sub>G</sub> R <sub>B</sub>	R <sub>Ai</sub>	R <sub>Ao</sub> ADI		R <sub>A</sub>

1 VCC R<sub>D</sub>

$$V_{DD} = V_{DD} = VCC - (I_{DD} + I_{IN}) * R_D;$$

I<sub>IN</sub> I<sub>DD</sub> R<sub>D</sub> V<sub>DD</sub> > 3V

VCC V	5V	6V	9V	12V	15V	18V	24V	36V
R <sub>D</sub>	33	68	300	1.0K	1.5K	2.0K	3.0K	2.4K+2.4K

2 C<sub>S</sub> /

0.1uF-10uF

3 C<sub>D</sub> V<sub>DD</sub> C<sub>D</sub> 100nF

4 R<sub>A</sub> ADI ADI

5 R<sub>Ai</sub>

6 R<sub>Ao</sub>

7 R<sub>R</sub> R<sub>G</sub> R<sub>B</sub> OUTR/G/B OUTR/G/B

$$R_R/R_G/R_B = (VCC - N * V_{LED} - V_{DS}) / I_{LED}$$

VCC V<sub>LED</sub> LED I<sub>LED</sub> V<sub>DS</sub> OUTR/G/B

1V OUTR/G/B OUTR/G/B

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	OUTR/G/B	V <sub>DS</sub>	3.0V
V <sub>LED</sub>	2.2V	3.2V	3.2V

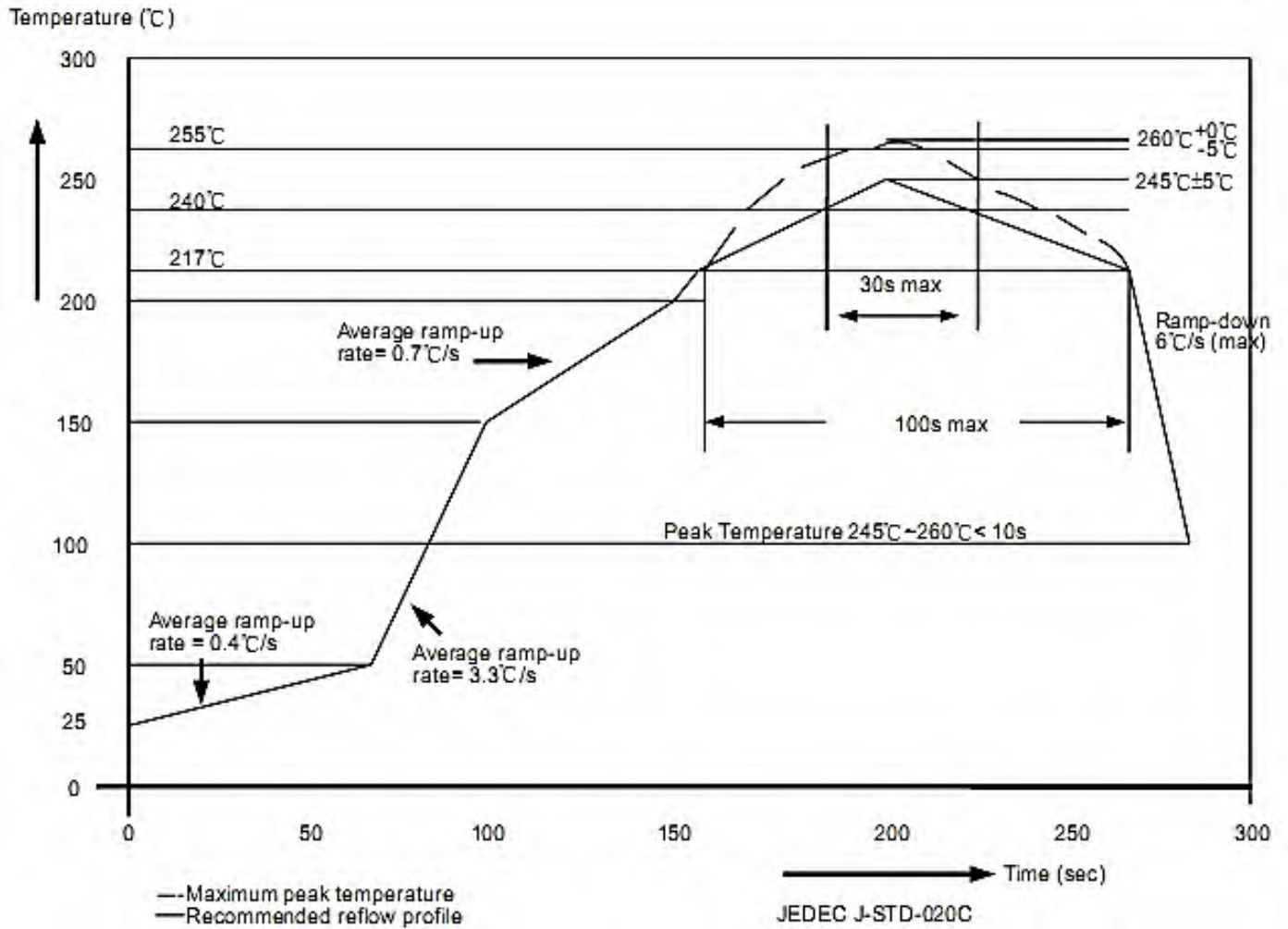
VCC	OUTR/G/B LED	R <sub>D</sub> ( )	C <sub>D</sub> nF	R <sub>A</sub> ( )	R <sub>AI</sub> ( )	R <sub>AO</sub> ( )	R <sub>R</sub> ( )	R <sub>G</sub> ( )	R <sub>B</sub> ( )
12V	3	1K	100	10K	510	510	150		
24V	6	3K	100	10K	510	510	510	150	150

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RoHs

J-STD-020



	mm <sup>3</sup> < 350	mm <sup>3</sup> 350 2000	mm <sup>3</sup> 2000
<1.6mm	260+0 C	260+0 C	260+0 C
1.6mm 2.5mm	260+0 C	250+0 C	245+0 C
2.5mm	250+0 C	245+0 C	245+0 C

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