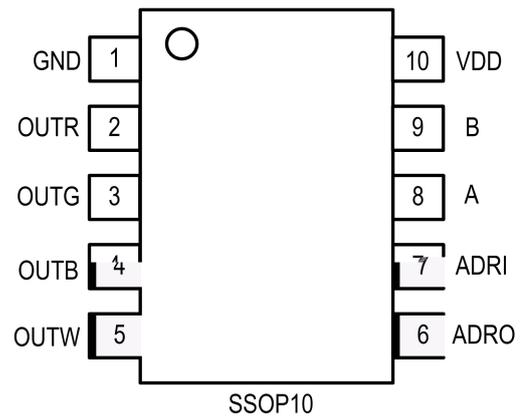◆   5V 36V

◆   DMX512(1990)

◆   200kbps 750kbps

◆   4096

◆   OUT R/G/B/W

◆

◆

◆

◆   /   /

◆   OUT   7

◆

◆ 2

◆   1/2/3/4

◆ OUT R/G/B/W   5bit

◆ OUT R/G/B/W   40V

◆

◆   SSOP10

◆   LED

◆   LED   /

◆

◆

SM18512SK

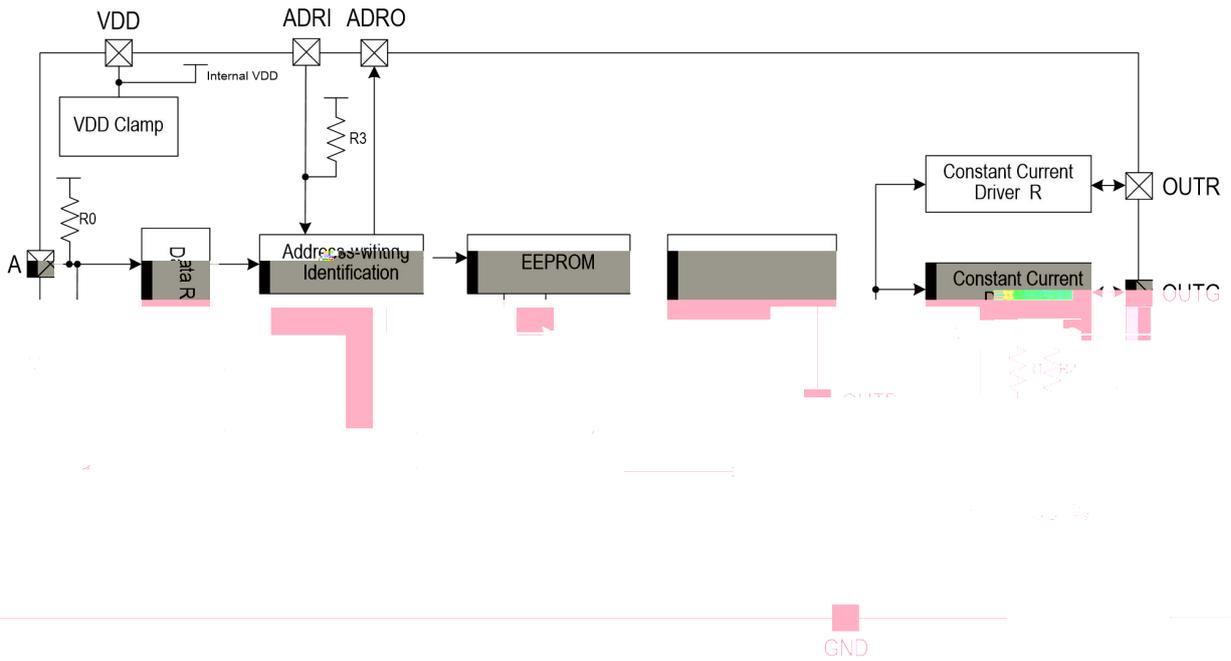LED   DMX512 1990

OUT R/G/B/W   18mA,

OUT R/G/B/W 32   OUT

4KH   PWM

	SM18512SK	
GND 1		10 VDD
OUTR 2		9 B
OUTG 3		8 A
OUTB 4		7 ADRI
OUTW 5		6 ADRO

SSOP10

Fig.SM18512SK

B	-
A	+
ADRI	
VDD	5V
GND	
OUT W/R/G/B	
ADRO	

SM18512SK	SSOP10	100000 /		4000 /	13

T_A=25 C

V_{DD}		-0.4 5.5	V
V_{IO}		-0.4 V_{DD}+0.4	V
BV_{OUT}	OUTR/G/B/W	45	V
I_{OUT}	OUTR/G/B/W	22	mA
I_{damp}	VDD	20	mA
R_{JA}	PN 2	130	C/W
T_J		-40 150	C
T_{STG}		-55 150	C
V_{ESD}	HBM	2	KV

1

2 R_{JA} T_A=25 C JEDEC JESD51

V_{DD}=5V T_A = 25 C

V_{clamp}		V_{CC}=12V V_{CC} V_{DD} R_D =1K	4.8	5.2	5.4	V
I_{DD}	( )	V_{DD} = 5V I_{OUT} OFF	-	3.8	-	mA
	( )	V_{DD} = 5V I_{OUT} ON	-	5.1	-	mA
I_{OUT_RGBW}	OUT R/G/B/W	D5:D4:D3:D2:D1=11111	-	18	-	mA
dI_{OUT_RGBW}	OUT R/G/B/W	I_{OUT}=18mA	-	3	-	%
$R_{do\ n\_AB}$	A/B	V_{DD}=4.5V	-	200	-	K
R_{UP_A}	A	V_{DD}=4.5V	-	250	-	K
V_{CM}		-	-	-	12	V
I_{AB}		-	-	-	28	◼A
V_{TH}		V_{DD} = 5V B=2.5V A	-200	-	200	mV
V_{TH}		V_{DD} = 5V B=2.5V A	-	80	-	mV
V_{DS_S}	I_{OUT}	I_{OUT} = 18mA	-	0.3	-	V
% VS V_{DS}	OUT R/G/B/W	I_{OUT} =18mA, V_{DS}=1 3V	-	1	-	%
%VS V_{DD}		I_{OUT} =18mA, V_{DS}=4.5 5.5V	-	1	-	
%VS T_A		I_{OUT} =18mA, T_A =-40 +85	-	4	-	
R_{UP_ADRI}	ADRI	-	-	23	-	K
T_{OTP}		-	-	135	-	
I_{leak}	OUT R/G/B/W	I_{OUT} OFF , V_{DS} = 40V	-	-	1	◼A

3

4

V_{DD}=5V T_A = 25 C

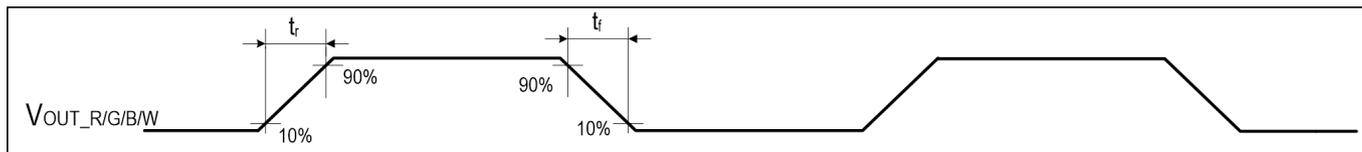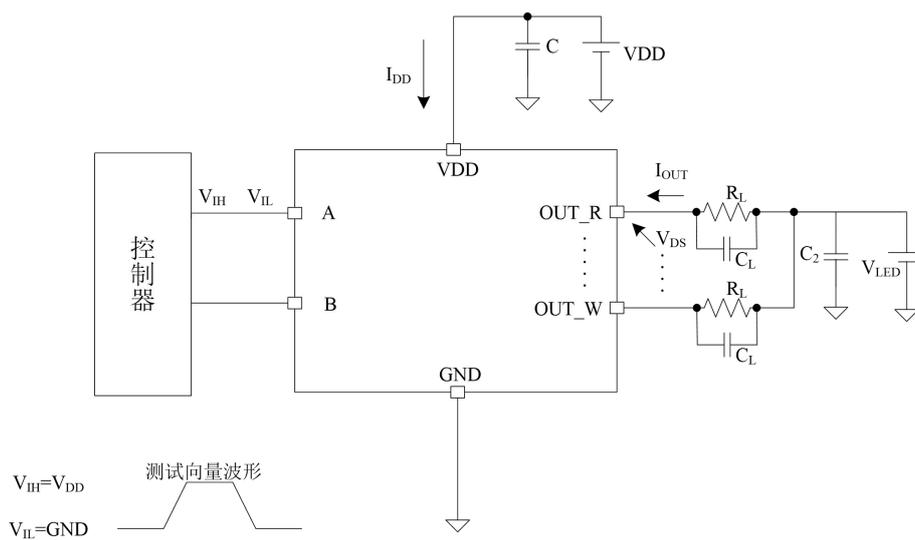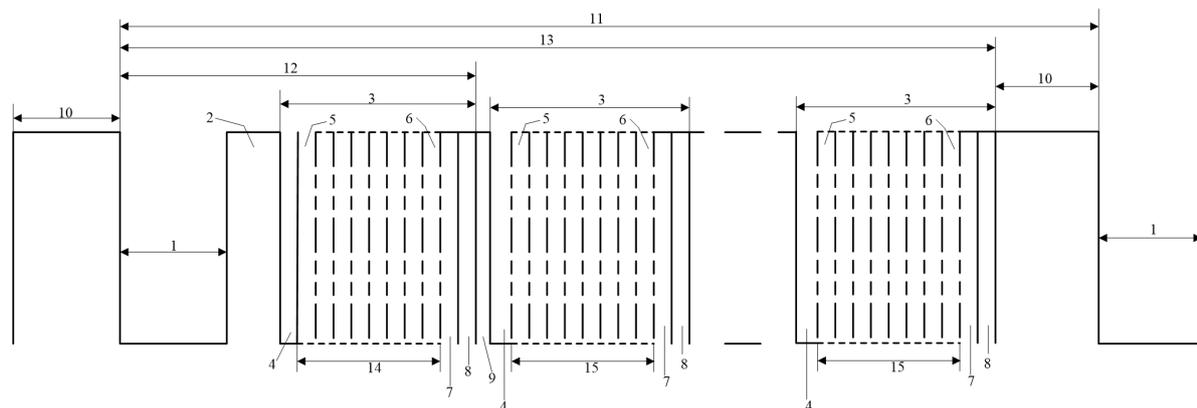| f_{PWM}	OUT R/G/B/W PWM	I_{OUT}=18mA OUT R/G/B/W 200 VDD	-	4K	-	H
t_r	OUT R/G/B/W	I_{OUT}=18mA OUT R/G/B/W 100	-	100	-	ns
t_f	5	VDD 15pF	-	170	-	ns

5

Fig. SM18512SK

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	␮s
-	Minimum Update Time for 513 slots	-	22.7	-	ms
-	Ma imum Update Rate for 513 slots	-	44	-	/s
1	SPACE for BREAK	88	-	-	␮s
2	MARK After BREAK (MAB)	8	-	-	␮s
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	-	-	␮s
13	DMX512 Packet	1196	-	-	␮s

1   DMX512   1990

2   MAB

SM18512SK OUT I_{OUT} OUT V_{DS} I_{OUT}
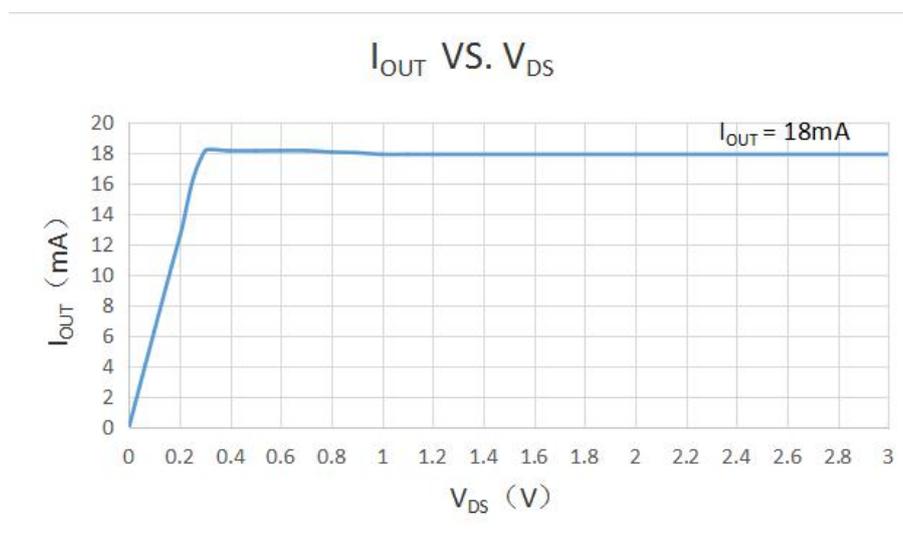
V_{DS}

I_{OUT} VS. V_{DS}

I_{OUT} = 18mA

Fig. SM18512SK I_{OUT} OUT V_{DS}

SM18512SK   OUT RGBW   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

20	1	0	1	0	0	12.0
21	1	0	1	0	1	12.6
22	1	0	1	1	0	13.1
23	1	0	1	1	1	13.6
24	1	1	0	0	0	14.2
25	1	1	0	0	1	14.8
26	1	1	0	1	0	15.3
27	1	1	0	1	1	15.8
28	1	1	1	0	0	16.4
29	1	1	1	0	1	16.9
30	1	1	1	1	0	17.5
31	1	1	1	1	1	18.0

1

2

ADRI   1

3   2

1

2   2

1
2   2

1   /   /

2   /

3   /
4
5

SM18512SK

1

2

SM18512SK

1

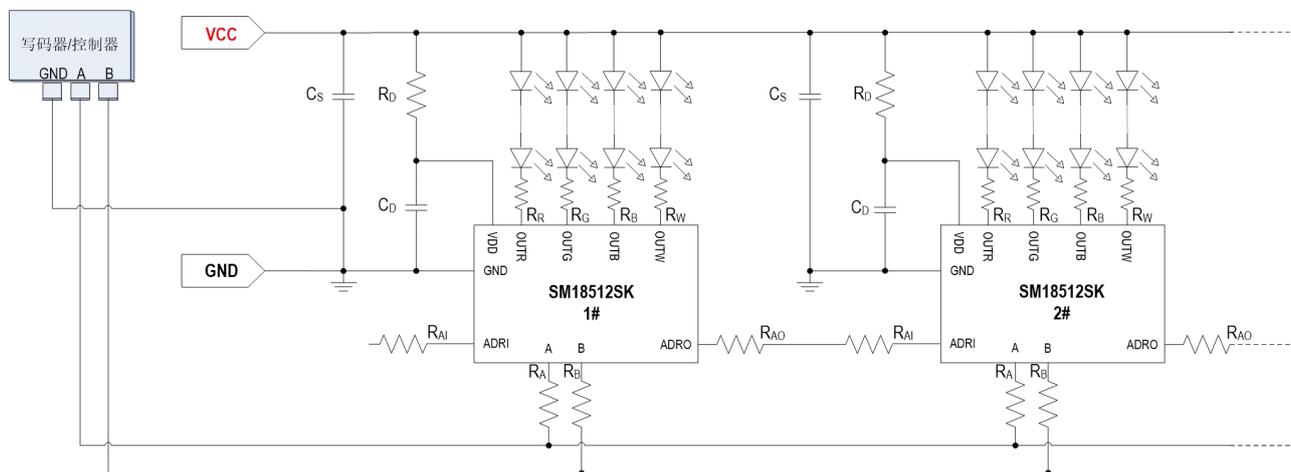2 OUT 0 6 OUT 260ns 0

SM18512SK 1/2/3/4 OUTR/G/B/W

	OUTR	OUTG	OUTB	OUTW
1				
2				
3				
4				

SM18512SK   DMX512   1990   4095

A/B

Fig. SM18512SK

SM18512SK   VCC R_D C_S R/G/B/W LED

R_R R_G R_B R_W R_{AI} R_{AO} A/B R_A R_B

1   VCC R_D

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

I_{IN} I_{DD} R_D $V_{DD}>3V$

R_D R_D

R_D VCC R_D

VCC V	5V	6V	9V	12V	15V	18V	24V	36V
R_D	33	68	300	1.0K	1.5K	2.0K	3.0K	2.4K+2.4K

2   C_S 0.1ʍF-10ʍF

3   C_D V_{DD} C_D 100nF

4   R_A R_B A/B   A   B

5   R_{AI}

6   R_{AO}

7   R_R R_G R_B R_W OUTR/G/B/W   OUTR/G/B/W

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

V_{DS} OUTR/G/B/W   1V   OUTR/G/B/W

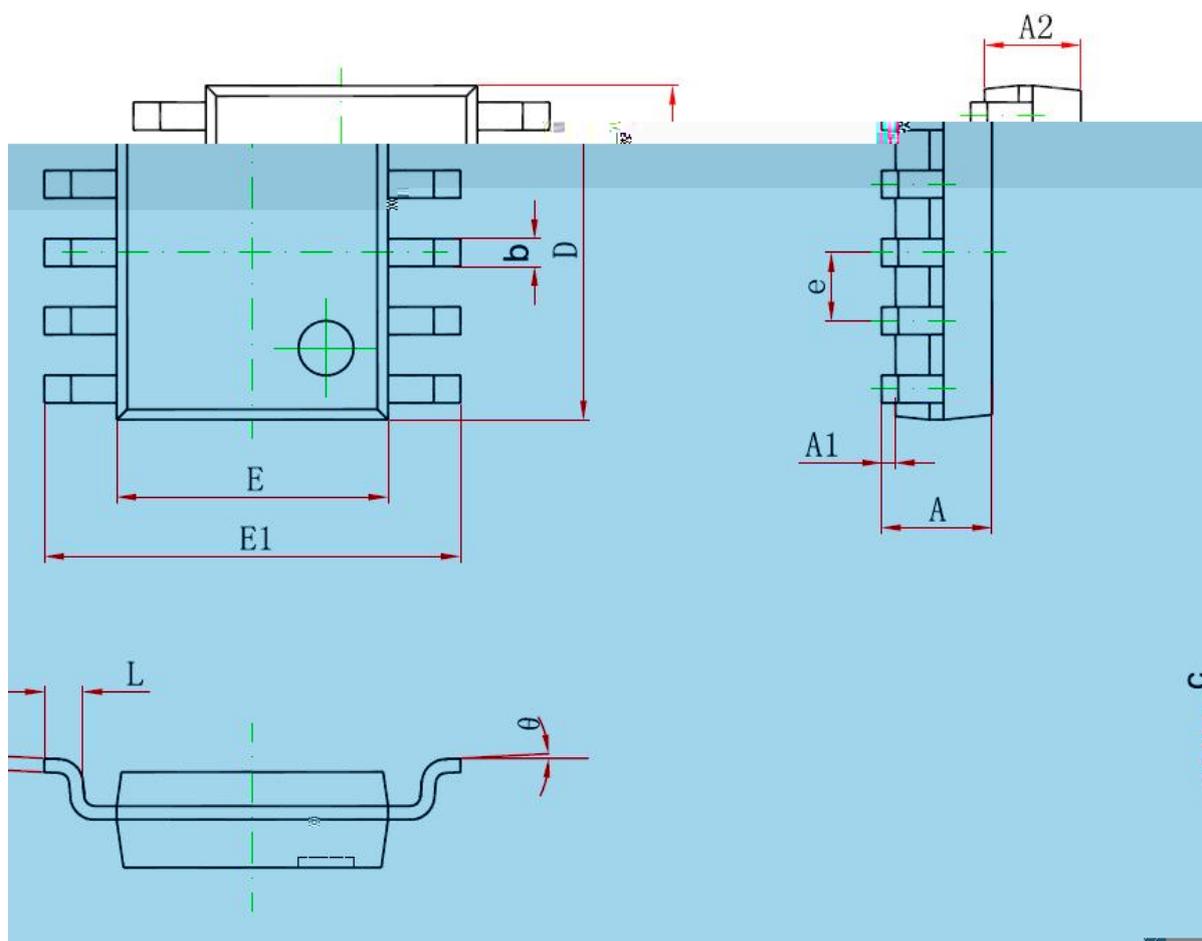OUTR/G/B/W   OUTR/G/B/W V_{DS} 3.0V

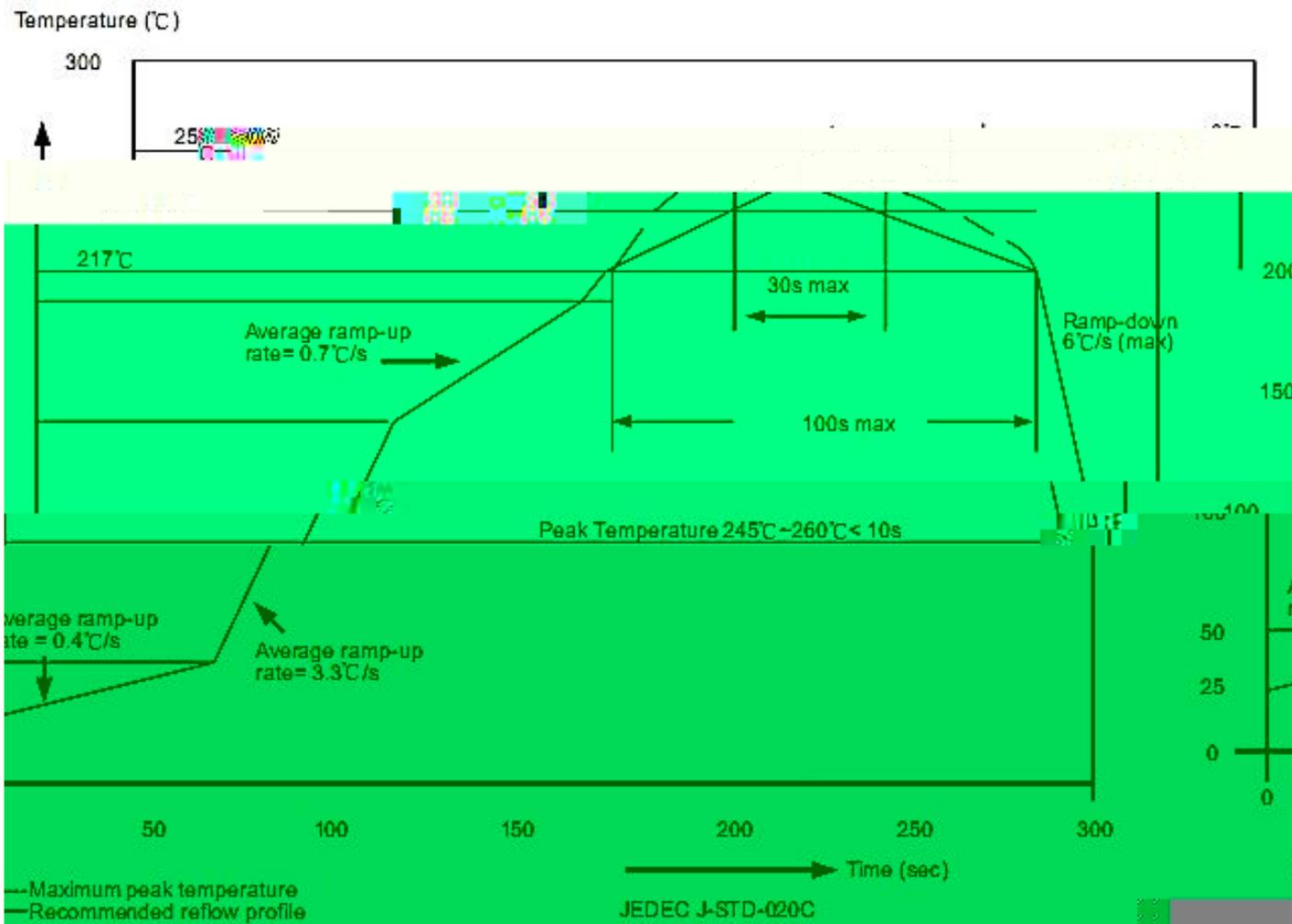V_{LED} 2.2V   3.2V   3.2V

3.2V

VCC	OUTR/G/B/W LED	$R_D()$	C_D nF	$R_A()/R_B()$	$R_{AI}()$	$R_{AO}()$	$R_R()$	$R_G()/R_B()/R_W()$
12V	3	1K	100	10K	510	510	150	
24V	6	3K	100	10K	510	510	510	150

S mbol	Millimenters		Inchs	
	Min	Ma	Min	Ma
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.300	0.450	0.012	0.018
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.000(BSC)		0.039(BSC)	
L	0.400	1.270	0.016	0.050
	0^0	8^0	1^0	8^0

RoHs   J-STD-020

Temperature (℃)

300

25℃

217℃

Average ramp-up
rate= 0.7℃/s

30s max

Ramp-down
6℃/s (max)

100s max

Average ramp-up
rate = 0.4℃/s

Average ramp-up
rate= 3.3℃/s

Peak Temperature 245℃~260℃ < 10s

200

150

100

50

25

0

50   100   150   200   250   300

Time (sec)

-- Maximum peak temperature
— Recommended reflow profile

JEDEC J-STD-020C

	mm³ < 350	mm³ 350 2000	mm³ 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