

SM16823E

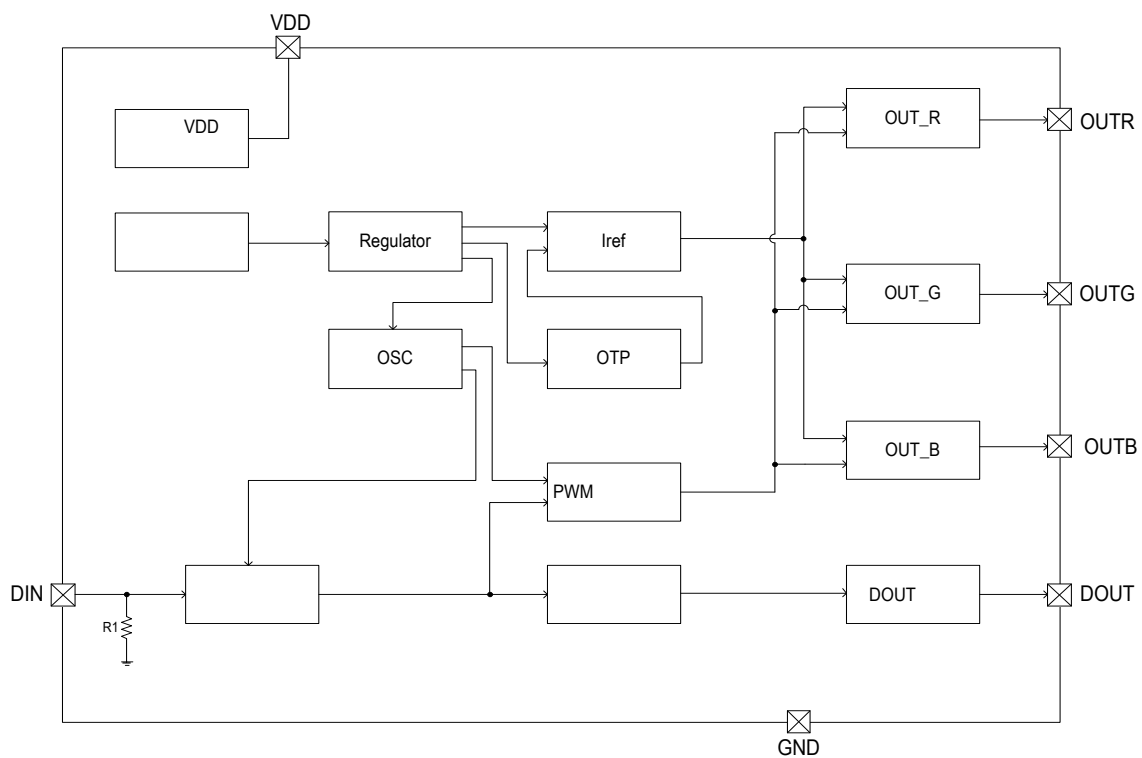


Fig. SM16823E

1	VDD	
2	DIN	
3	REXT	OUT R/G/B
4	DOUT	
5	NC	
6	OUTB	
7	OUTG	
8	OUTR	

1

T<sub>A</sub>=25°C

VDD		-0.4~+5.5	V
V <sub>I</sub>		-0.4~VDD+0.4	V
BV <sub>OUT</sub>	OUT R/G/B	30	V
I <sub>clamp</sub>	VDD	20	mA
R <sub>θJA</sub>	PN 2	65	°C/W
P <sub>D</sub>	3	1.25	W
T <sub>J</sub>		-40~+150	
T <sub>STG</sub>		-55~+150	
V <sub>ESD</sub>	HBM ESD	> 2	KV

1

2 R<sub>θJA</sub> T<sub>A</sub>=25°C

JEDEC JESD51

3

T<sub>JMAX</sub> R<sub>θJA</sub>

T<sub>A</sub>

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

4 5

VDD=5V TA=25

VDD		VIN=12V VIN VDD 1K	4.8	5.2	5.5	V	
		≤5V	3.0	-	5.0	V	
I <sub>DD</sub>		VDD=4.5V I <sub>OUT</sub> "OFF"	-	4.2	-	mA	
V <sub>IH</sub>		DIN	0.7xVDD	-	-	V	
V <sub>IL</sub>		DIN	-	-	0.3xVDD	V	
I <sub>OH</sub>		DOUT GND	-	-45	-	mA	
I <sub>OL</sub>		DOUT VDD	-	45	-	mA	
V <sub>REXT</sub>	REXT	Rext=2.2K	1.05	1.15	1.25	V	
I <sub>OUT_R/G/B</sub>	OUT R/G/B	V <sub>DS</sub> =2V 1111	Rext=2.2K	-	350	-	mA
			Rext=5.1K	-	150	-	mA
			Rext=13K	-	60	-	mA
V <sub>DS_S</sub>		I <sub>OUT</sub> =350mA	-	1.1	-	V	
		I <sub>OUT</sub> =150mA	-	0.7	-	V	
		I <sub>OUT</sub> =60mA	-	0.5	-	V	
I <sub>OUT</sub>		I <sub>OUT</sub> = 60~350mA	-5		+5	%	
%VS.V <sub>DS</sub>	OUT R/G/B	I <sub>OUT</sub> =150mA V <sub>DS</sub> =1.0~3.0V	-	1.0	-	%	
%VS.VDD		I <sub>OUT</sub> =150mA VDD=4.5~5.5V	-	1.0	-	%	
%VS.T <sub>A</sub>		I <sub>OUT</sub> =150mA T <sub>A</sub> =-40~+85	-	3.0	-	%	
OTP		-	-	140	-	°C	
I <sub>IEAK</sub>	OUT R/G/B	V <sub>DS</sub> = 26V I <sub>OUT</sub> "OFF"	-	-	1	uA	

4

5



1

SM16823E

“0” “1”

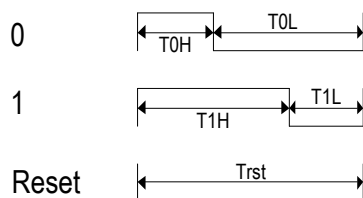


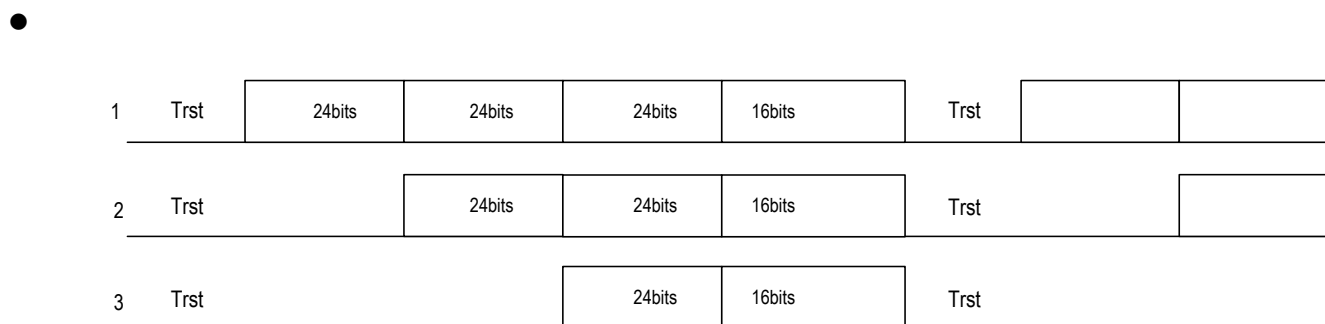
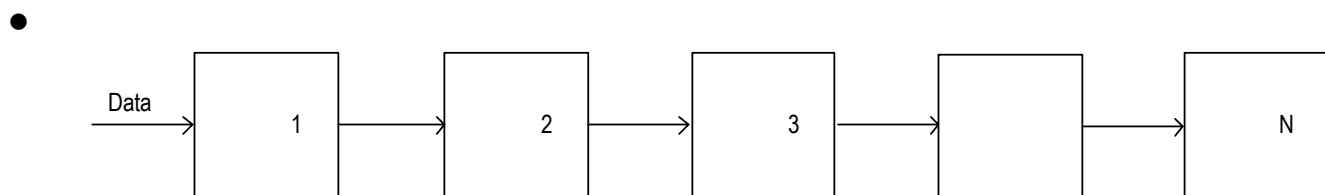
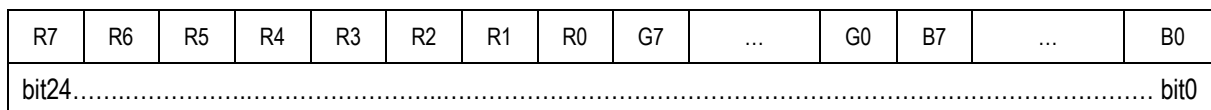
Fig. SM16823E

T0H	0	-	0.3	-	±0.05	us
T0L	0	-	0.9	-	±0.05	us
T1H	1	-	0.9	-	±0.05	us
T1L	1	-	0.3	-	±0.05	us
Trst	Reset	200	-	-	-	us

2

Trst+      24bits      +      24bits      +.....+      N      24bits      +16bits      +Trst

● 24bits      RGB



16bits				4bits				4bits				4bits S3~S0			
4bits				4bits				4bits				S3 S0			
R				G				B							
S3	S2	S1	S0	S3	S2	S1	S0	S3	S2	S1	S0	S3	S2	S1	S0

1~16

	S3	S2	S1	S0
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1
13	1	1	0	

SM16823E                      OUT                      VDS

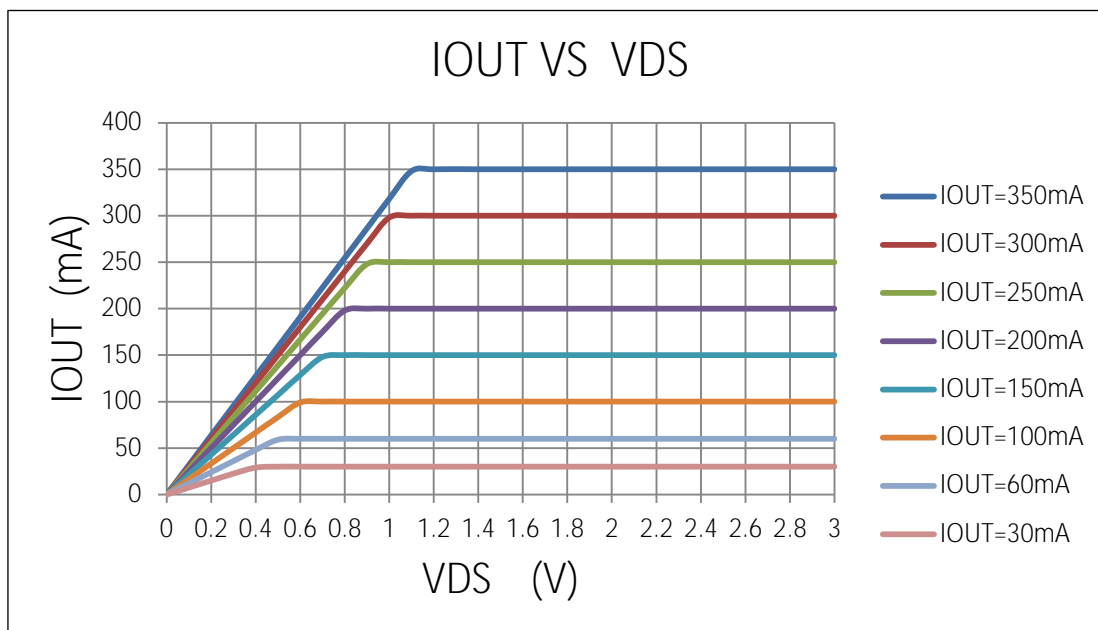


Fig. SM16823E IOUT    OUT                      Vds



SM16823E

R<sub>EXT</sub>

G

16

I<sub>OUT</sub> R<sub>EXT</sub>

$$I_{OUT} \text{ mA} = \frac{1100}{R_{est}} \times 720$$

1~15

I<sub>OUT</sub> R<sub>EXT</sub>

$$I_{OUT} \text{ mA} = \frac{1100}{R_{est}} \times (208 + (G \times 32))$$

R<sub>EXT</sub>

R<sub>EXT</sub>

G

G=1 R<sub>EXT</sub>=2200Ω

120mA

I<sub>OUT</sub> R<sub>EXT</sub>

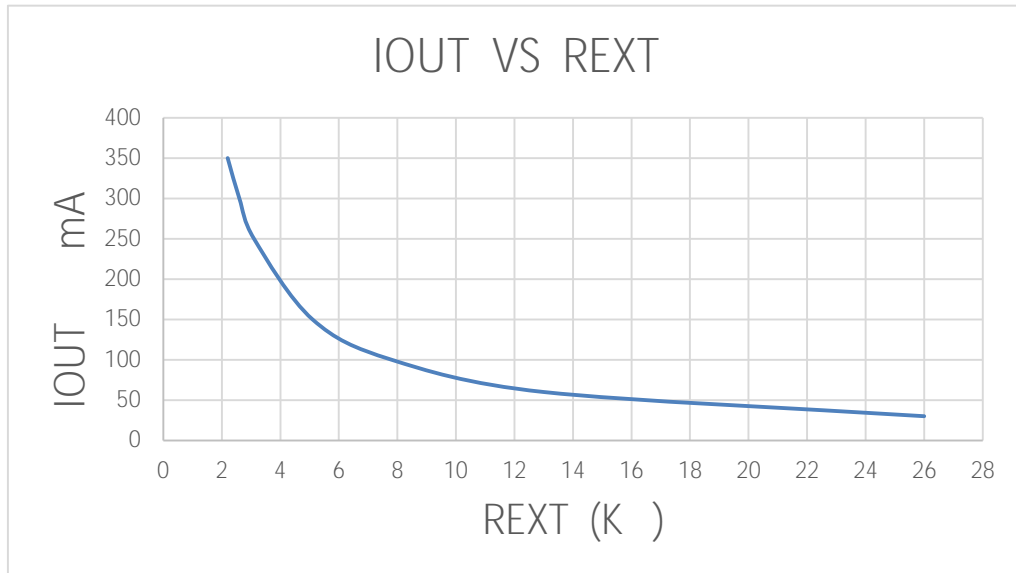


Fig. SM16823E I<sub>OUT</sub> R<sub>EXT</sub>

VDD=5.0V

LED

LED

LED

SM16823E

140°

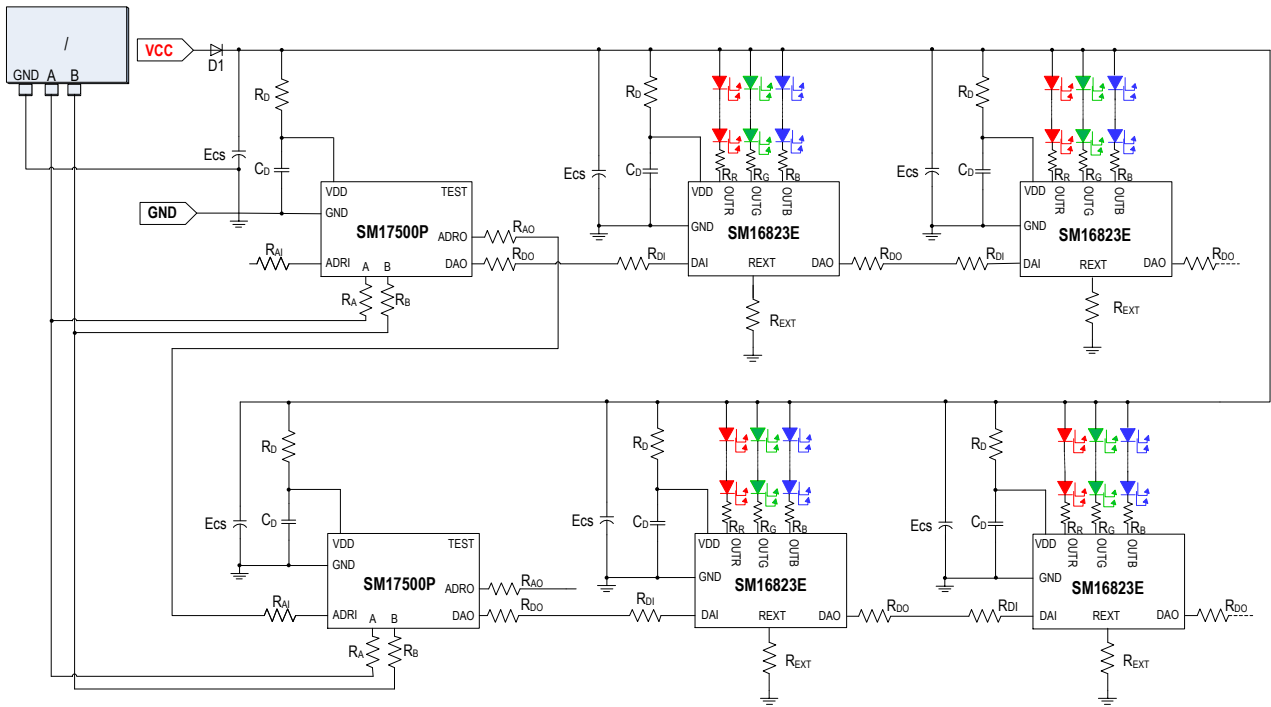


Fig. SM16823E

SM16823E				VCC	EC <sub>S</sub>		D1		
R <sub>D</sub>	VDD	C <sub>D</sub>	R/G/B LED	R <sub>R</sub>	R <sub>G</sub>	R <sub>B</sub>	DIN	R <sub>DI</sub>	DOUT
	R <sub>DO</sub>								
1	VCC		R <sub>D</sub>						
	VDD = VCC - I <sub>DD</sub> × R <sub>D</sub>		I <sub>DD</sub>		R <sub>D</sub>		VDD > 3V	R <sub>D</sub>	
		R <sub>D</sub>							R <sub>D</sub>
	VCC		R <sub>D</sub>						

VCC(V)	5	6	9	12	15	18	24
R <sub>D</sub> (Ω)	33	100	300	510	1K	1.5K	2K

2	D1						
	D1		D1				
3		EC <sub>S</sub>					4.7~100uF
4	C <sub>D</sub>		VDD			C <sub>D</sub>	100nF
5	R <sub>DI</sub>	DIN					
6	R <sub>DO</sub>	DOUT					
7	R <sub>R</sub>	R <sub>G</sub>	R <sub>B</sub>	OUT R/G/B		OUT R/G/B	
	R <sub>R</sub> /R <sub>G</sub> /R <sub>B</sub> (Ω) = $\frac{VCC - V_{DS} - N \times V_{LED}}{I_{OUT}}$		VCC	V <sub>LED</sub>	LED	I <sub>OUT</sub>	V <sub>DS</sub>

OUT R/G/B

$V_{DS}$

$V_{LED}$

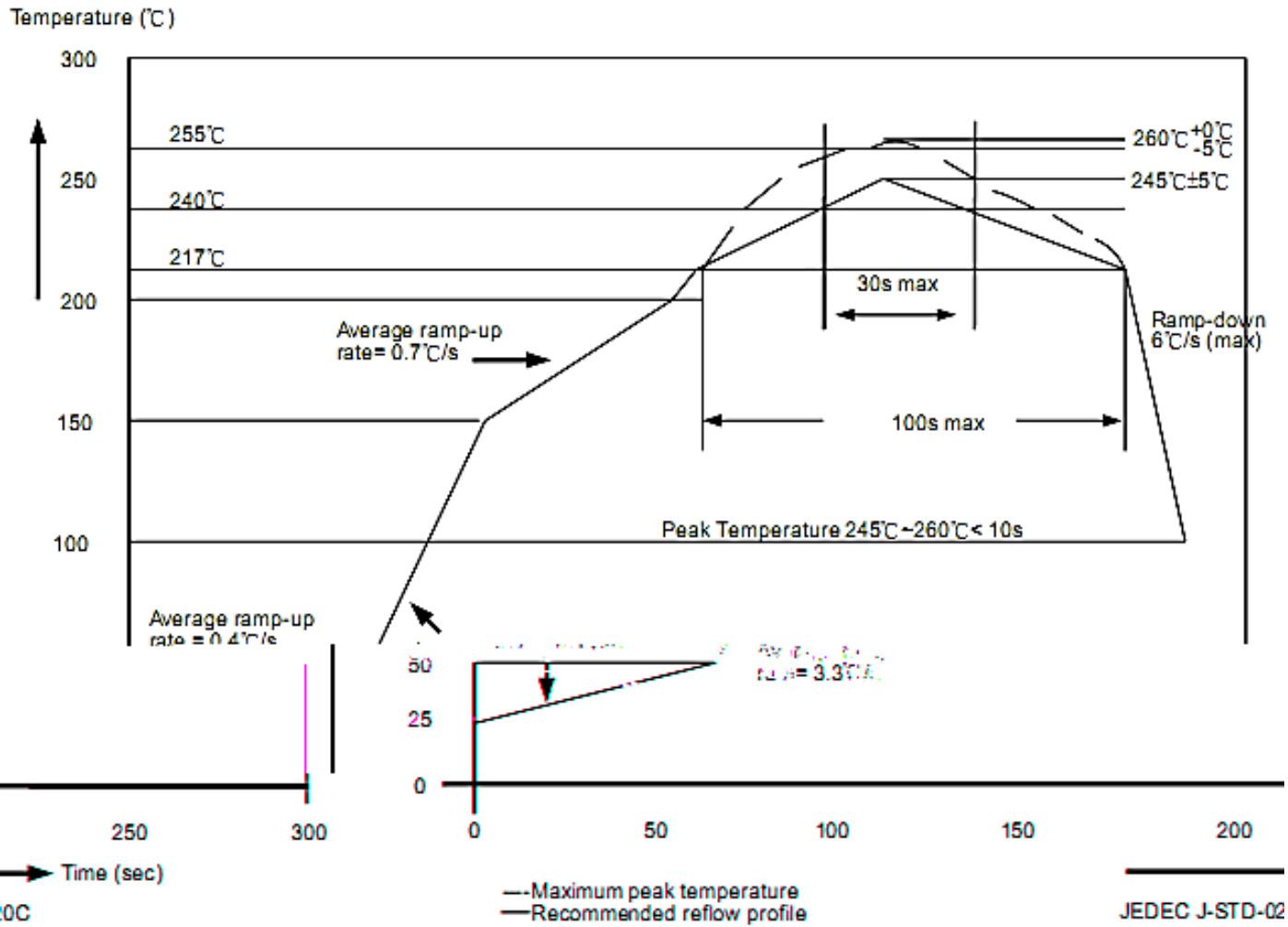
2.0~2.2V

3.0~3.2V

VCC(V)	OUT LED	$R_D(\Omega)$	$C_D(nF)$	$R_A(\Omega)$	$R_B(\Omega)$	$R_{DI}(\Omega)$	$R_{DO}(\Omega)$
5	1	33	100	10K	10K	200	200
12	3	510	100	10K	10K	510	510
24	6	2K	100	10K	10K	510	510

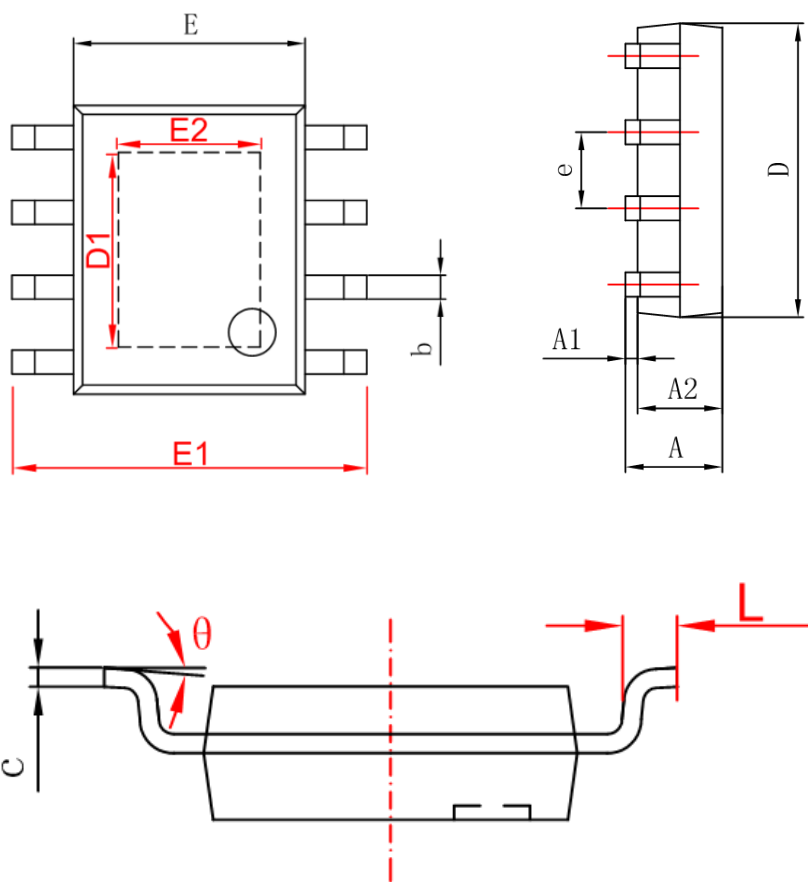
RoHs

J-STD-020



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

ESOP8



Symbol	Min(mm)	Max(mm)
A	1.25	1.95
A1	-	0.1
A2	1.25	1.75
b	0.25	0.7
c	0.1	0.35
D	4.6	5.3
D1	3.12(REF)	
E	3.7	4.2
E1	5.7	6.4
E2	2.34(REF)	
e	1.270(BSC)	
L	0.2	1.5
$\theta$	0°	10°

