

Fig. SM16169

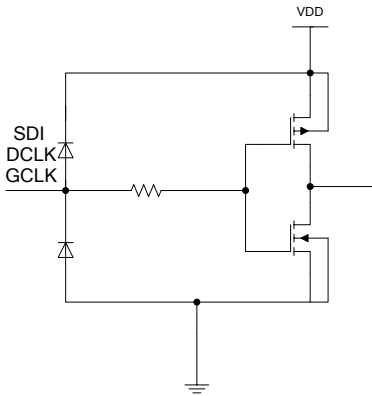
QSOP24		
1	GND	
2	SDI	
3	DCLK	
4	LE	DCLK
5-20	OUT0 OUT15	
21	GCLK	
22	SDO	SDI
23	REXT	
24	VDD	
QFN24(4*4)		
1	LE	DCLK
2-18	OUT0 OUT15	
19	SDO	SDI
20	GCLK	
21	REXT	
22	VDD	
23	SDI	
24	DCLK	

业务电话：400-033-6518

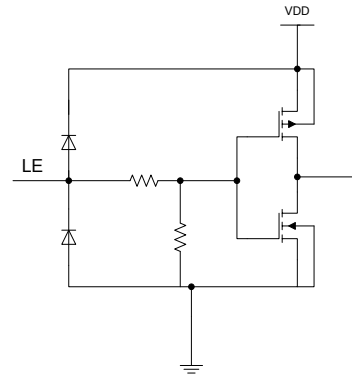
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SM16169S	QSOP24	100000 /	4000 /	13
SM16169N	QFN24(4*4)	/	5000 /	13

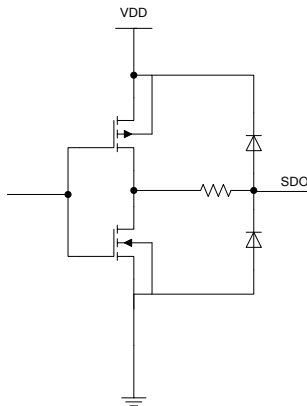
GCLK DCLK SDI



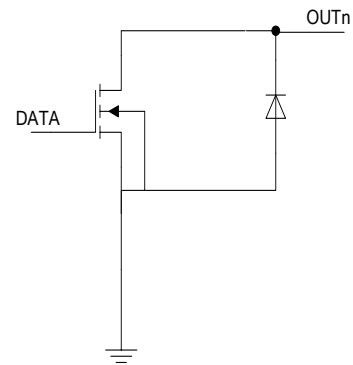
LE



SDO



OUT0~OUT15



V_{DD}		0 7.0	V
V_{IN}		-0.4 $V_{DD} + 0.4$	V
I_{OUT}	OUT	32	mA
F_{GCLK}		33	MHz
F_{DCLK}		30	
T_{opr}		-40 +150	
T_{stg}		-55 +150	
V_{ESD}	HBM	>4	KV

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$V_{DD}=4.2V$ $T_a=25^{\circ}C$

I_{DD1}		Rext		-	3.2	-	mA
I_{DD2}		Rext = 3K IOOUT OFF		-	5.2	-	mA
I_{OUT}	OUT	OUT		2	-	30	mA
I_{OH}	SDO	VDD=4.2V		-	-22	-	mA
I_{OL}				-	22	-	mA
V_{IH}	SDI	VDD=4.2V		0.7*VDD	-	-	V
V_{IL}				-	-	0.3*VDD	V
V_{OL}	SDO	IOL=+1mA		-	-	0.4	V
V_{OH}		IOH=-1mA		3.8	-	-	V
I_{OUT1}	1	$V_{DS}=1V$	$R_{EXT} = 920$ $G=1$	-	9.9	-	mA
d_{IOUT1}			$I_{OUT1}=9.9mA$	-	$\pm 2.5\%$	-	
			$V_{DS}=1.0V$		$\pm 3.0\%$	-	
I_{OUT2}	2	$V_{DS}=1.0V$	$R_{EXT} = 470$ $G=1$	-	19.4	-	mA
d_{IOUT2}			$I_{OUT2}=19.4mA$	-	$\pm 2.5\%$	-	
			$V_{DS}=1.0V$	-	$\pm 3.0\%$	-	
$\%/\Delta V_{DS}$	I_{VDS}	$V_{DS} = 1.0V$	3.0V $I_{OUT}=9.9mA$	-	1	-	$\%/V$
$\%/\Delta V_{DD}$	I_{VDD}	$V_{DD} = 4.0V$	5.0V $I_{OUT}=9.9mA$	-	1	-	$\%/V$
$R_{IN(down)}$	Pull-down	LE		-	147	-	K

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$V_{DD}=3.3V$ $T_a=25^{\circ}C$

I_{DD1}		Rext	-	3.0	-	mA
I_{DD2}		Rext = 1.8K IOOUT OFF	-	4.2	-	mA
I_{OUT}	OUT	VDD=3.3V OUT	2	-	16	mA
I_{OH}	SDO	VDD=3.3V	-	-10	-	mA
I_{OL}			-	11.5	-	mA
V_{IH}	SDI	VDD=3.3V	0.7*VDD	-	-	V

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(VDD= 4.2V Ta = 25)

t _{PLH1}		GCLK — OUT	V _{DD} =4.2V V _{IH} =V _{DD} V _{IL} =GND R _{ext} =1.1KΩ R _L =370Ω C ₁ =100nF C ₂ =10uF C _L =10pF C _{SDO} =10p	-	22	-	ns
t _{PLH2}		DCLK — SDO		-	24	-	
t _{PLH3}		LE — SDO		-	32	-	
t _{PHL1}		GCLK — OUT		-	52	-	ns
t _{PHL2}		DCLK — SDO		-	25	-	
t _{PHL3}		LE — SDO		-	32	-	
t _{OR}				-	12	-	ns
t _{OF}				-	44	-	
F _{DCLK}				-	-	30	MHz
F _{GCLK}			-	-	33	MHz	

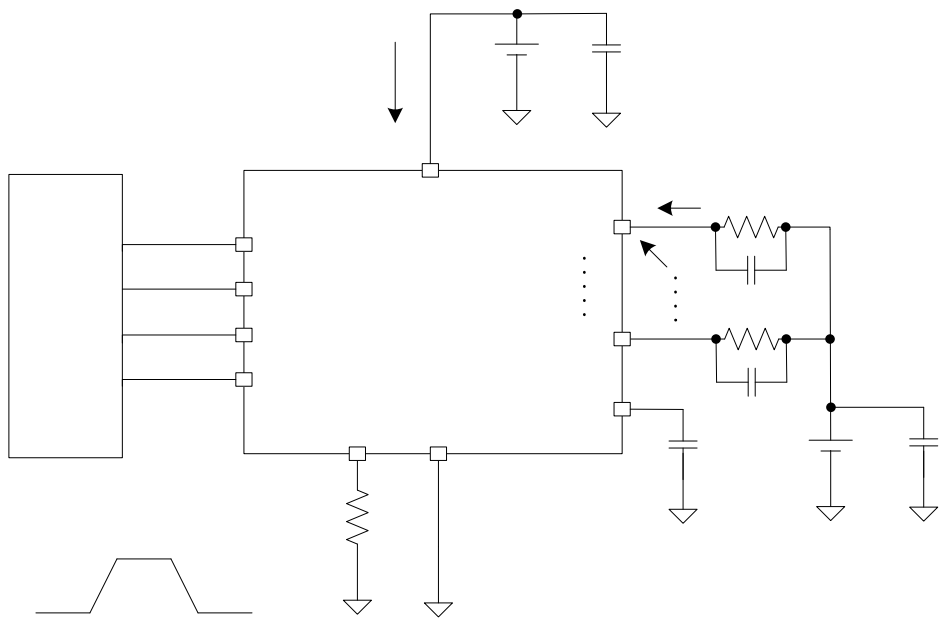
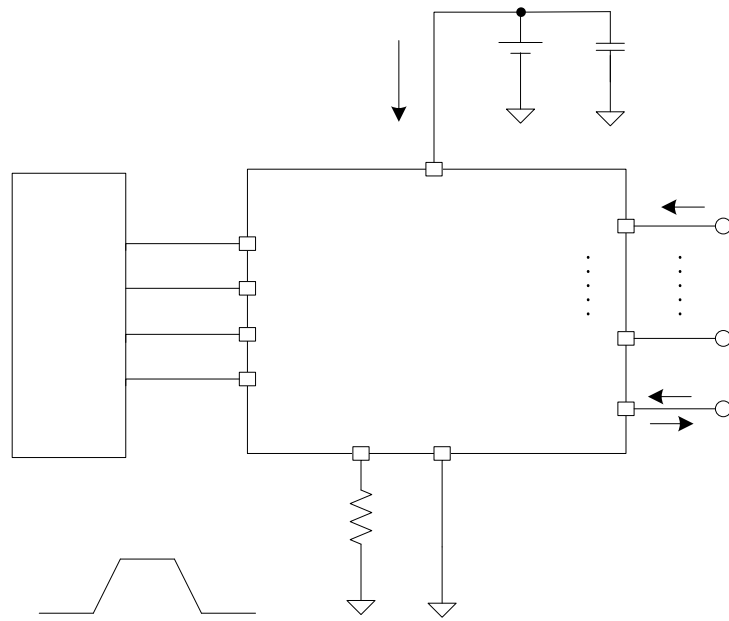
V_{DD}= 3.3V Ta=25°C

t _{PLH0}		GCLK — OUT	V _{DD} =3.3V V _{DS} =1.0V V _{IH} =V _{DD} V _{IL} =GND R _{ext} =1.1KΩ V _{LED} =2.7V R _L =370Ω C ₁ =100nF C ₂ =10uF C _L =10pF C _{SDO} =10pF	-	26	-	ns
t _{PLH1}		DCLK — SDO		-	28	-	
t _{PLH2}		LE — SDO*		-	32	-	
t _{PHL0}		GCLK — OUT		-	60	-	ns
t _{PHL1}		DCLK — SDO		-	28	-	
t _{PHL2}		LE — SDO*		-	32	-	
t _{OR}				-	12	-	ns
t _{OF}				-	48	-	
F _{DCLK}				-	-	25	MHz
F _{GCLK}			-	-	25	MHz	

* 1 LE SDO

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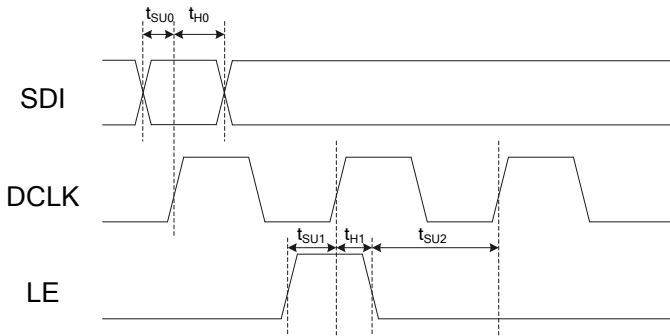
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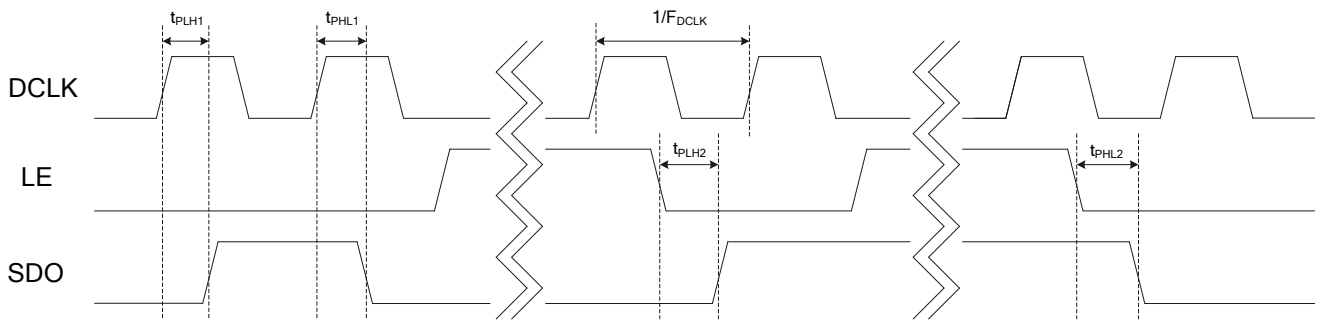
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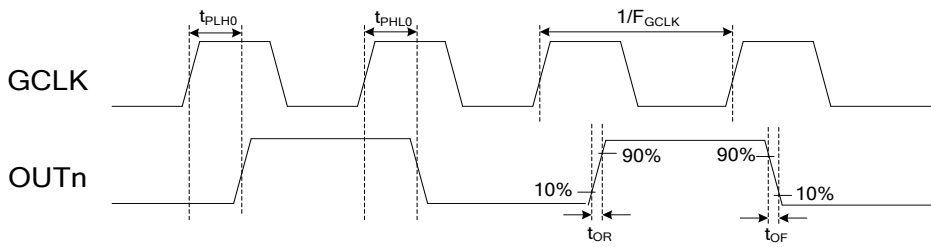
(1)



(2)



(3)



SM16169

SM16169

±2.5%

±3.0%

(V_{DS})

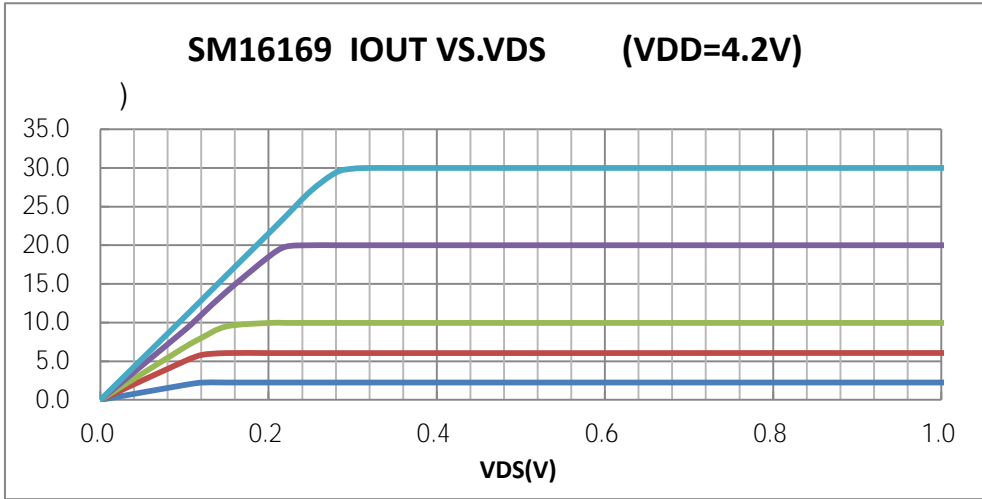


Fig. VDD=4.2V SM16169 I_{OUT} V_{DS}

R_{EXT}

I_{OUT}

mA

R_{EXT}

R_{EXT}

G

“ ”

G=1

R_{EXT}

920Ω

9.9mA

R_{EXT}

3.0kΩ

3.0mA

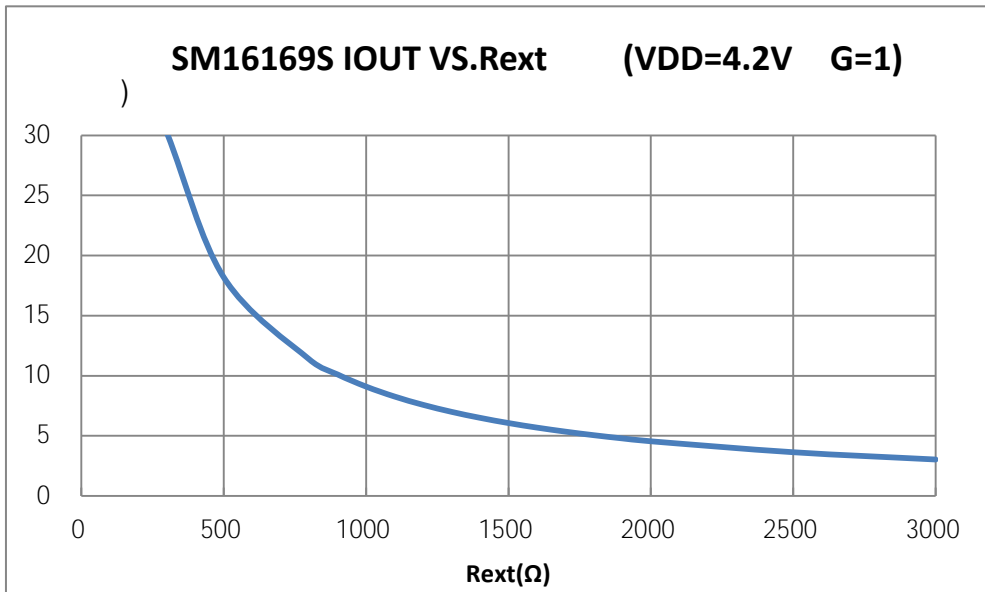


Fig. SM16169

I_{OUT} R_{EXT}

G=1

SM16169

6'b00_0000

6'b11_1111

64

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
-	-	-	-	-	-	-	-	-	-	G ₅	G ₄	G ₃	G ₂	G ₁	G ₀

G5

G0

1/8~2

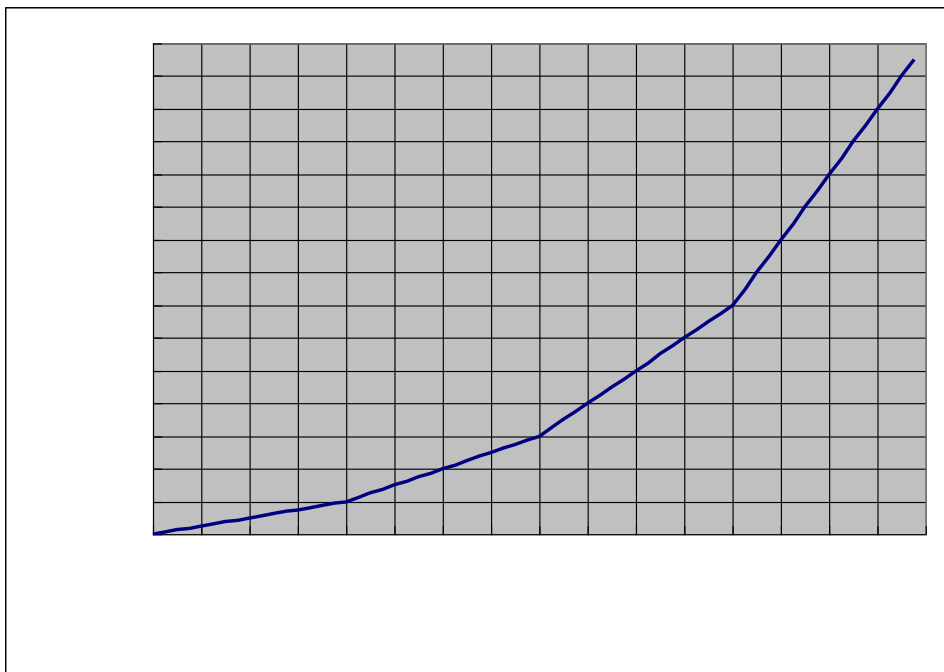


Fig. SM16169 Iout

16

$$P_{D(Act)} = I_{DD} * V_{DD} + I_{OUT} * Duty * V_{DS} * 16$$

$$P_{D(Act)} < P_{D(max)}$$

$$P_{D(Act)} < P_{D(max)}$$

T_j IC T_a V_{DS} Duty $R_{TH(j-a)}$

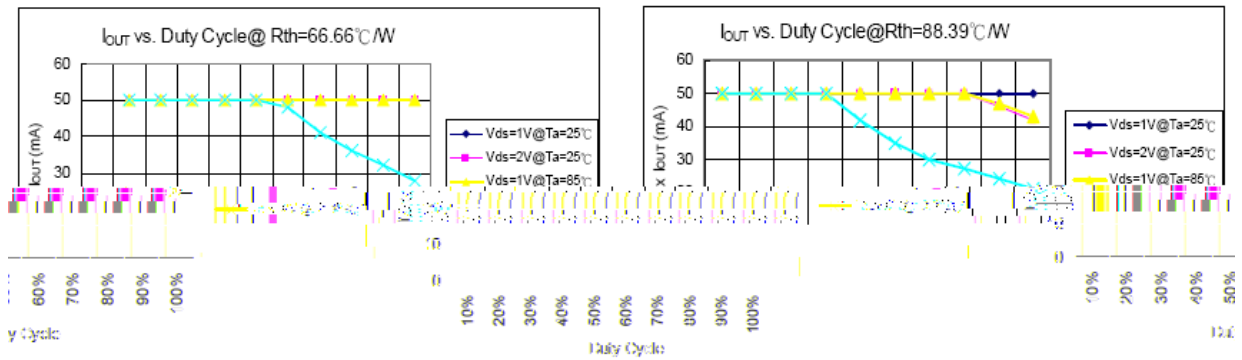


Fig.

I_{OUT}

I_{OUT}

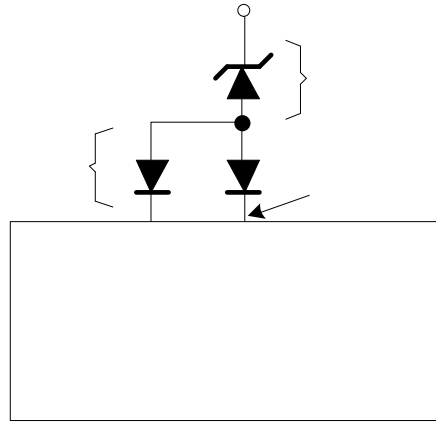
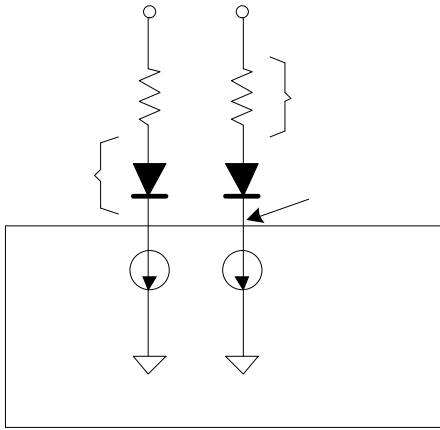
IC

R_{FC}

$V_{DS} = V_{LED} - V_F$ $V_{LED} = 5V$

V_{DROP}

(V_{DS}) $0.5V$ ($I_{OUT} = 2 \text{ } 30mA$)
 (V_{DS}) $P_{D(act)} > P_{D(max)}$ V_{LED}
 $V_{DS} = (V_{LED} - V_F) - V_{DROP}$ (V_{DS})



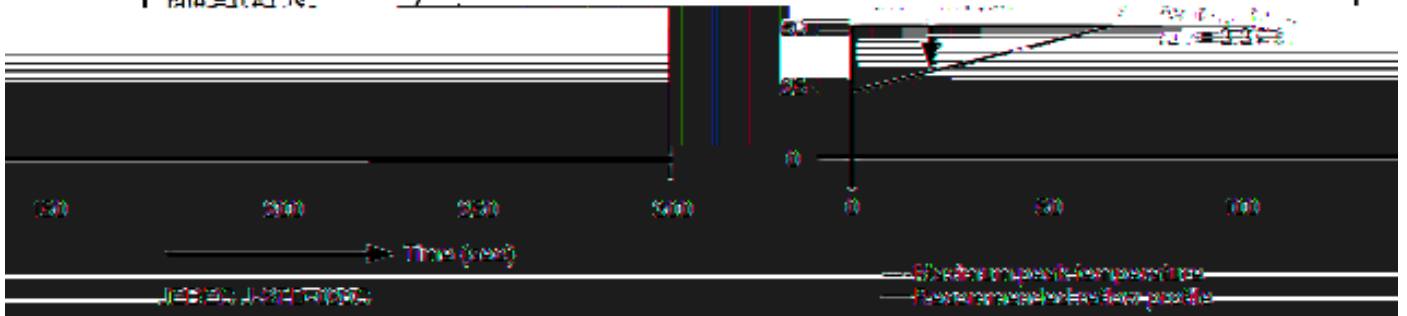
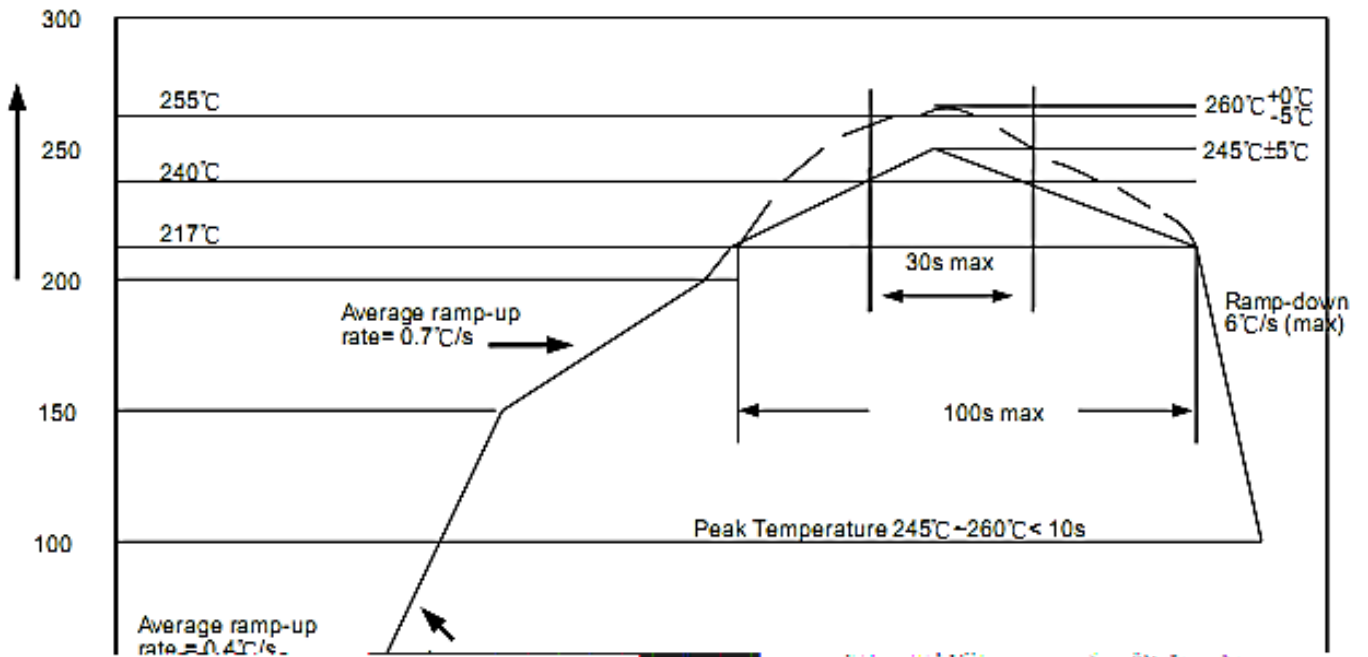
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RoHs

J-STD-020

Temperature (°C)

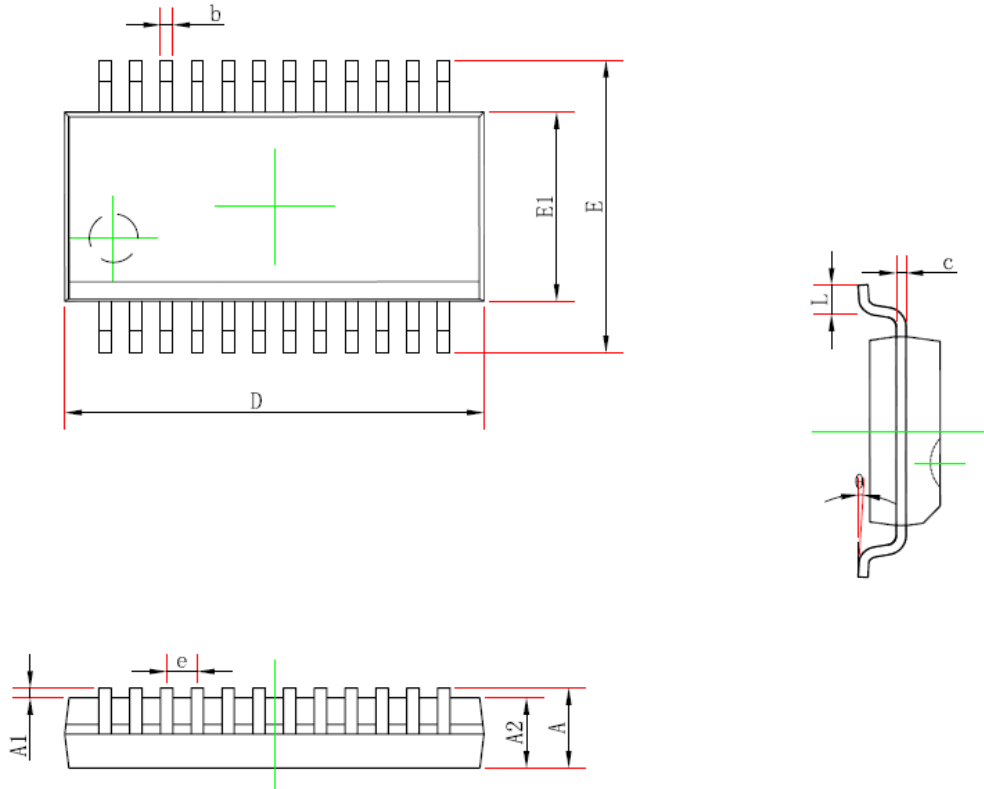


<1.6mm	260+0	260+0	260+0
1.6mm~2.5mm	260+0	250+0	245+0
≥2.5mm	250+0	245+0	245+0

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QSOP24

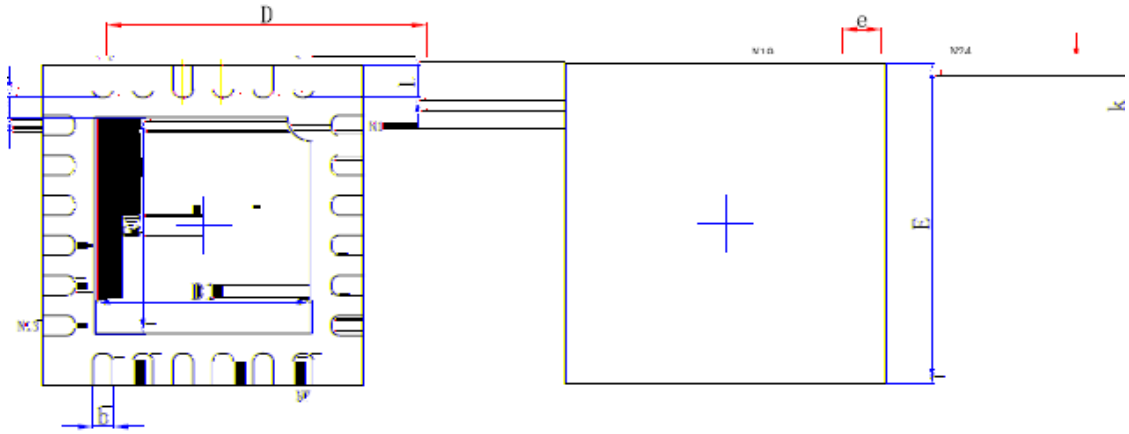


Symbol	Min(mm)	Max(mm)
A	-	1.95
A1	0.05	0.35
A2	1.05	-
b	0.1	0.4
c	0.05	0.254
D	8.2	9.2
E1	3.6	4.2
E	5.6	6.5
e	0.635TYP	
L	0.3	1.5
θ	0°	10°

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QFN24(4*4)



Bottom View

Top View

Side View

Symbol	Min(mm)	Max(mm)
A	0.6	1.0
A1	-	0.1
A3	0.203REF	
D	3.8	4.3
E	3.8	4.3
D1	2.4	3.0
E1	2.4	3.0
K	0.2min	
e	0.5TYP	
b	0.1	0.4
L	0.2	0.7

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