Flash 2016

Flash 2016, a surface mount device with ultra-compact light source is designed for camera flash in portable digital imaging system. The Flash 2016 products provide typical luminous flux of 105 lm with a driving current of 1A. The higher brightness enabling higher resolution of picture is taken in the darker environments at greater distance. Moreover, the reflow-solderable property of Flash 2016 provides an easy path towards the optimum thermal management to achieve a promising reliability. In conclusion, Flash 2016 offers you a special experience in LED Flash.

Features

- Small emitter size
- Highest brightness Flash
- Surface mount technology
- Superior ESD protection

Typical Applications

- Portable camera-phones
- Digital still cameras
- Personal digital assistant

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Flash 2016 Nomenclature:

E S E W - 1 A D 1

X1 X2 X3 X4 X5 X6 X7

Table 1.

X1 LED Item		X2 Module		X3 Emitting Color		X4 Power		X5 Substrate Type	
Code	Type	Code	Type	Code	Type	Code	Type	Code	Type
ES	Flash 2016	E	Emitter	W	Cool White	1	350mA	A	2.0mm x 1.6mm

X6 Emitter Type		X7 Internal Usage	
Code	Type	Code	Type
D		1	

Environmental Compliance:

Flash 2016 is compliant to the Restriction of Hazardous Substances Directive or RoHS. The restricted materials including lead, mercury cadmium hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE) are not used in Flash 2016 to provide an environmentally friendly product to the customers.

Package Dimensions:

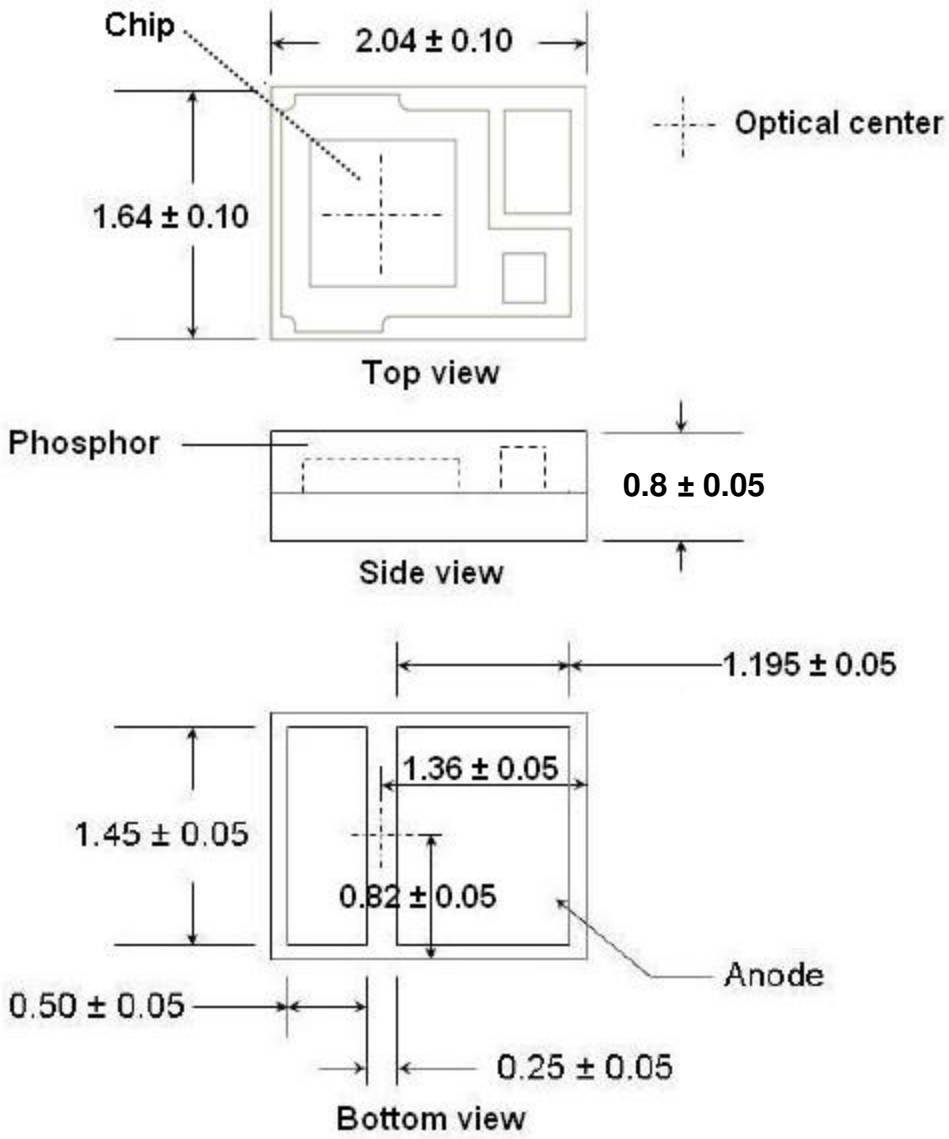


Figure 1: Package Drawings

Notes:

1. **All dimensions are in millimeters.**
2. **Drawings are not to scale.**

±

Absolute Maximum Ratings:

Table 2.

Parameter	Symbol	Rating	Units
DC Forward Current[1]	I_F	350	mA
Peak Pulsed Current; (tp≦100μs, Duty cycle=0.25)	I_{pulse}	1000	mA
Transient Surge Voltage	V_{TS}	8	V
Reverse Voltage[2]	V_r	Note 2	V
LED Junction Temperature[3]	T_j	125	˚C
Operating Temperature	T_{opr}	-40 ~ +80	˚C
Storage Temperature	T_{stg}	-40 ~ +120	˚C
ESD Sensitivity	V_B	2,000	V
Allowable Reflow Cycles	n/a	3	cycles

Notes:

1. **Maximum pulsed drive current for 3W is 1000mA < 0.1 ms, time interval is 3.9 ms.**
2. **LEDs are not designed to drive in reverse bias.**

Flux Characteristics at 350mA & 1000mA, Junction temperature, Tj = 25℃:

Table 3.

Part Name	Current(mA)	Color	Flux			Units
			Min.	Typ.	Max.	
ESEW-1AD1	350	Cool White	--	***50***	--	lm
	1000	Cool White	--	***105***	--	lm

Note:

The luminous flux performance is guaranteed within published operating conditions.
Flux is measured with accuracy of ±10%.

Color Temperature for Flash 2016, T_J=25℃ at 350mA :

Table 4.

Part Name	Current(mA)	Color	CCT			Units
			Min.	Typ.	Max.	
ESEW-1AD1	350	Cool White	***6,300***	**--**	***10,000***	K

Notes:

1. **Edison maintains a tolerance of ±5% on CCT measurement.**

Forward Voltage Characteristics, T_J=25℃:

Table 5.

Part Name	Power Consumption	Color	Forward Current (mA)	V_F			Units
				Min.	Typ.	Max.	
ESEW-1AD1	**1W**	Cool White	350	***3.0***	**--**	***3.7***	V
	3W		1000	***3.5***	**--**	***4.5***	V

Note:

Edison maintains a tolerance of 0.06V on forward voltage measurement.

Emission Angle Characteristics:

Table 6.

2Θ½(Typ.) Lambertian	Units
120	Degrees

JEDEC Moisture Sensitivity:

Table 7.

Level	Floor Life		Soak Requirements	
	Time	Conditions	Standard Time (hours)	Conditions
1	**unlimited**	**≦30℃ / 85% RH**	**168 +5/-0**	**85℃ / 85% RH**

Thermal Resistance – Junction to Thermal Pad:

Table 8.

Thermal Resistance from Junction to Thermal Pad	Units
13	°C / W

Operating Life, Mechanical and Environmental Tests on Flash 2016:

Table 9.

Stress Test	Stress Conditions	Stress Duration	Failure Criteria
Room Temperature Operating Life	55 °C, I_F =DC max[1]	1000 hours	Note 2
High Temperature High Humidity Operating Life	85 °C / 85%RH, I_F =DC max[1]	1000 hours	Note 2
High Temperature Operating Life	85 °C, I_F =DC max[1]	1000 hours	Note 2
Low Temperature Operating Life	-40 °C, I_F =DC max[1]	1000 hours	Note 2
High Temperature Storage Life	150 °C	1000 hours	Note 2
Low Temperature Storage Life	-40 °C	1000 hours	Note 2
Non-Operating Thermal Shock	-40 / 125℃, 20 min dwell ＜10 sec transfer	500 cycles	No catastrophic
Mechanical Shock	1500 G, 0.5 msec pulse, 5 shocks each 6 axis	N/A	No catastrophic
Free Drop	On concrete from 1.2 m, 3X	N/A	No catastrophic
Variable Vibration Frequency	10-2000-10 Hz, log or linear sweep rate, 20 G about 1 min, 1.5 mm, 3X/axis	N/A	No catastrophic
Solder Heat Resistance (SHR)	Three JEDEC Pb-free reflow profile	N/A	No catastrophic

Note:

1.DC max is defined to be 350mA for Flash 2016.

2. Failure Criteria:

- **Electrical failures:** V_F **shifts >= 10%**
- **Light Output Degradation: Percentage level shift >= 50% at 1,000hrs or 500cycle**
- **Visual failures: Broken or damaged package on lens or substrate**

Cool White Flash 2016 Color Spectrum, Tj = 25°C:

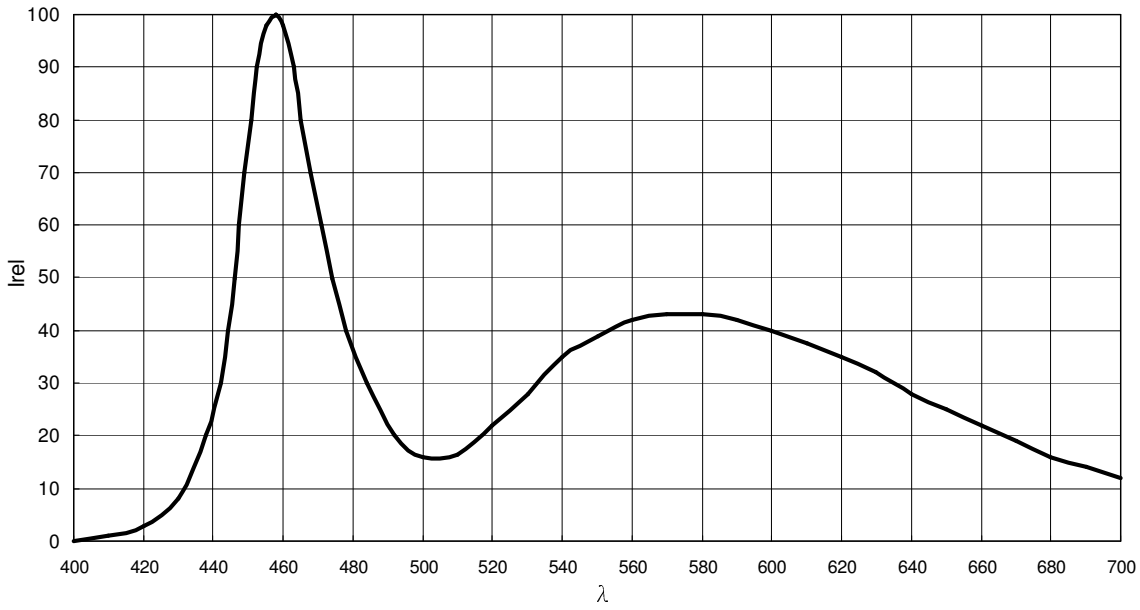


Figure 2: Color Spectrum for Cool White at a typical CCT.

Typical Radiation Pattern, Tj = 25°C:

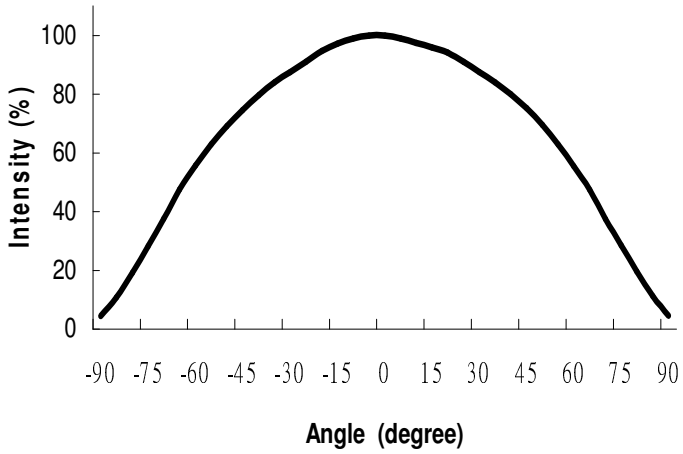


Figure 3: Lambertain Pattern for cool white at T_J=25 °C..

Typical Relative Luminous Flux for Cool White, T_j = 25℃

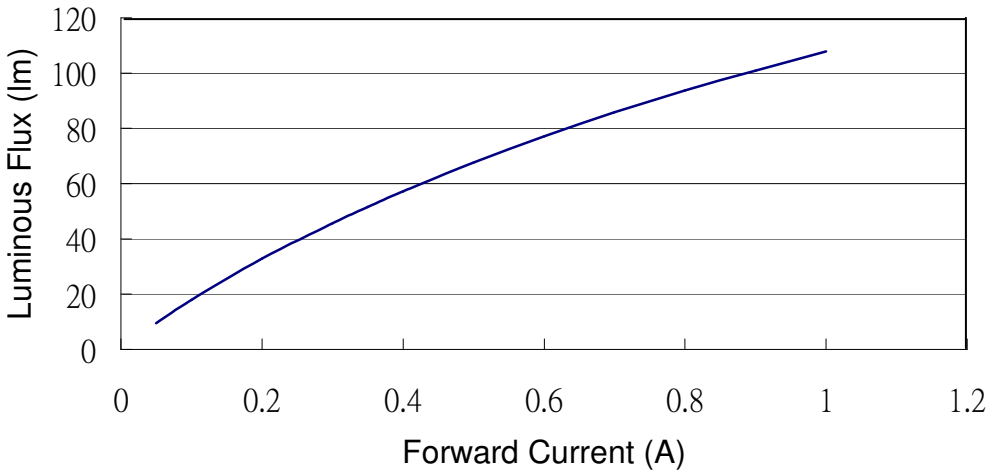


Figure 4: Operating Current vs Luminous Flux for cool white.

Typical Forward Voltage Characteristic for Flash 2016, T_j = 25℃

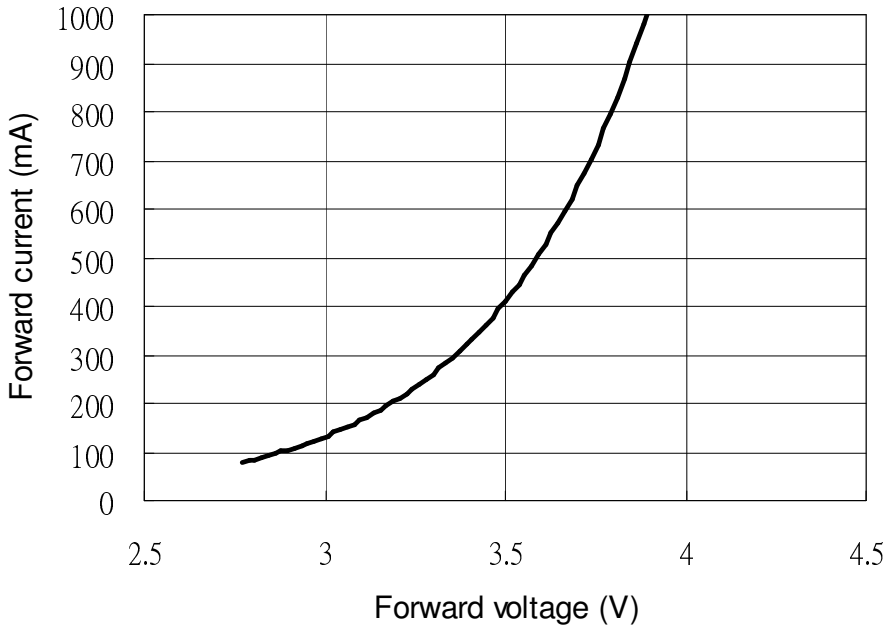
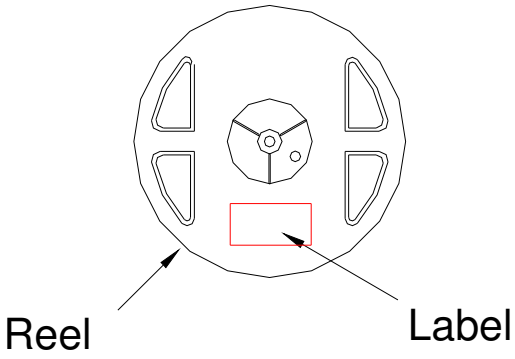
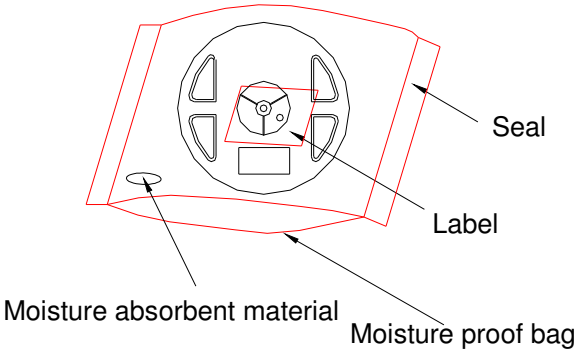


Figure 5: Forward current vs. forward voltage for Cool White.

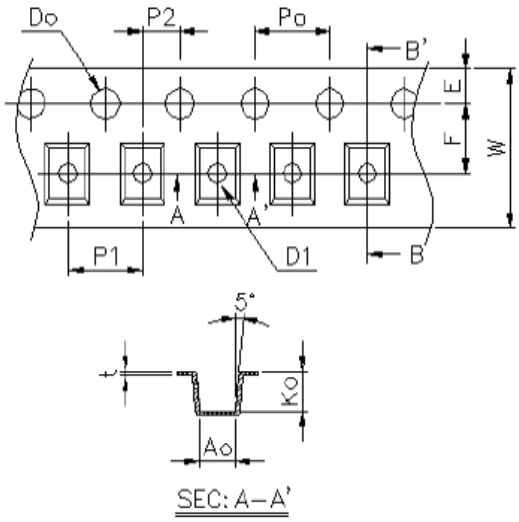
Tape & Reel Packaging:

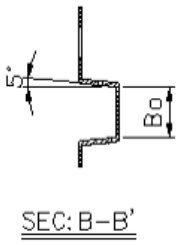




Item	Quantity	Total	Dimensions(mm)
Reel	1,000pcs	1,000pcs	Diameter=178
Inner box	5 reels	5,000pcs	240*235*67
Outer box	5 inner boxes	25,000pcs	353*254*256

Package Label





Item	Specification	Tol. (+/-)
W	8.00	± 0.20
E	1.75	± 0.10
F	3.50	± 0.05
D0	1.50	+0.10, -0
D1	1.00	± 0.10
P0	4.00	± 0.05
P1	4.00	± 0.10
P2	2.00	± 0.05
P0 x 10	40.00	± 0.20

t	0.23	± 0.05
A0	1.80	± 0.10
B0	2.30	± 0.10
K0	0.90	± 0.10

unit : mm

Figure 6: Flash 2016 Reel Dimensions.