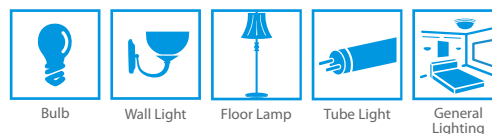


PLCC Series

2835 0.5W

Datasheet (103507)



Introduction :

Ultra high luminous efficacy, combined with the flexibility in design due to its slim and miniature size, PLCC LED Series are optimized to be used as lighting for building.

Description :

- Best luminous and color uniformity
- Enables halogen and CDM replacement
- The article itself presents the actual color.

Feature and Benefits :

- High luminous Intensity and high efficiency
- Based on InGaN / GaN technology
- Wide viewing angle : 120°
- Excellent performance and visibility
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance

Table of Contents

| | |
|-------------------------------------|----|
| General Information | 3 |
| Absolute Maximum Ratings | 4 |
| Characteristics | 4 |
| Luminous Flux Characteristic | 5 |
| Voltage Bin Structure | 5 |
| Mechanical Dimensions | 6 |
| Color BIN code | 7 |
| Characteristic curve | 9 |
| Reflow Profile | 14 |
| Reliability | 15 |
| Product Packaging Information | 16 |
| Revision History | 17 |
| About Edison Opto | 17 |

General Information

Ordering Code Format

2 T 03 X5 CW A 80 03 xxx
 X1 X2 X3-X4 X5-X6 X7-X8 X9 X10-X11 X12-X13 X14-X16

| X1 Type | | X2 Component | | X3-X4 Series | | X5-X6 Wattage | | X7-X8 Color/CCT | |
|------------|---------|-----------------|------|-----------------|------|------------------|------|--------------------|------------|
| 2 | Emitter | T | PLCC | 03 | 3528 | X5 | 0.5W | CW | Cool White |

| X9 BIN | | X10-X11 CRI | | X12-X13 Voltage | | X14-X16 Serial Number | |
|-----------|------|----------------|--------|--------------------|----|--------------------------|---|
| A | Ansi | 80 | CRI>80 | 03 | 3V | - | - |

Absolute Maximum Ratings

Absolute maximum ratings ($T_a=25^{\circ}\text{C}$)

| Parameter | Symbol | Value | Units |
|--|--------------------|--|--------------------|
| Forward Current | I_F | 200 | mA |
| Pulse Forward Current ($t_p \leq 100\mu\text{s}$, Duty cycle=0.25) | I_{pulse} | 400 | mA |
| Reverse Current | I_R | 10 | μA |
| Reverse Voltage | V_R | 5 | V |
| LED Junction Temperature | T_J | 125 | $^{\circ}\text{C}$ |
| Operating Temperature | - | $-40 \sim +85$ | $^{\circ}\text{C}$ |
| Storage Temperature | - | $-40 \sim +125$ | $^{\circ}\text{C}$ |
| ESD Sensitivity (HBM) | V_B | 2,000 | V |
| Soldering Temperature | T_s | Reflow Soldering : $255 \sim 260^{\circ}\text{C}/10 \sim 30\text{sec}$ Manual Soldering : $350^{\circ}\text{C}/3\text{sec}$ | |

Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.

Characteristics

| Parameter | Symbol | Value | Units |
|------------------------------|-----------------|--|-----------------------------|
| Viewing Angle (Typ.) | $2\theta_{1/2}$ | 120 | Degree |
| Thermal resistance | - | 20 | $^{\circ}\text{C}/\text{W}$ |
| CRI (85°C) | - | >80 | - |
| CCT (Cool White) | - | 5,700 6,500 | K |
| JEDEC Moisture Sensitivity | - | Level 2a Floor Life Conditions: $\leq 30^{\circ}\text{C}$ / 60% RH Soak Requirements(Standard) Time (hours): $120+1/-0$ Conditions: 60°C / 60% RH | |

Notes:

1. $2\theta_{1/2}$ is the off-axis angle where the luminous intensity is half of the axial luminous intensity.
2. Color Rendering index CRI tolerance: ± 2 .
3. CIE_x/y tolerance: ± 0.005 .

Luminous Flux Characteristic

Luminous Flux Characteristics, $I_F=150\text{mA}$ and $T_J=25^\circ\text{C}$

| Color | Group | Min. Luminous Flux(lm) | Max. Luminous Flux(lm) | Forward Current (mA) | Order Code |
|------------|-------|------------------------|------------------------|----------------------|------------------|
| Cool White | 60 | 60 | 65 | 150 | 2T03X5CWA8003001 |
| | 65 | 65 | 70 | | |

Note:

The luminous flux performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of $\pm 10\%$ on flux measurements.

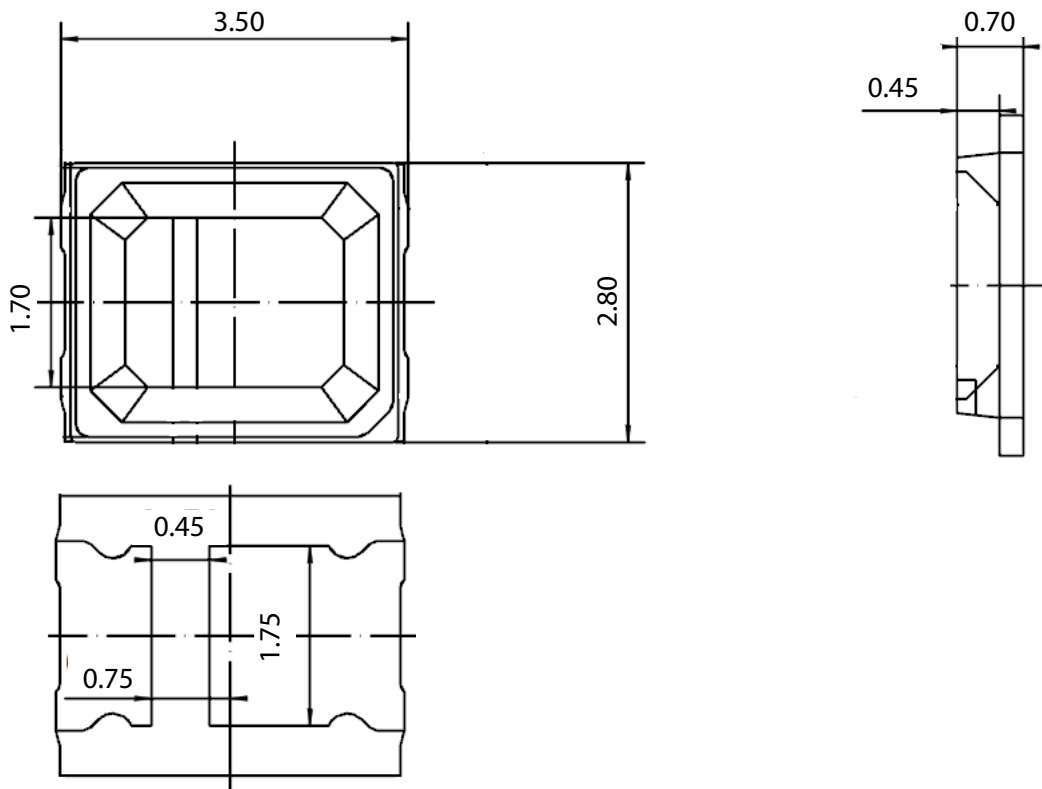
Voltage Bin Structure

| Group | Min. Voltage (V) | Max. Voltage (V) |
|-------|------------------|------------------|
| VB1 | 2.9 | 3.0 |
| VC1 | 3.0 | 3.1 |
| VA2 | 3.1 | 3.2 |
| VB2 | 3.2 | 3.3 |
| VC2 | 3.3 | 3.4 |
| VA3 | 3.4 | 3.5 |
| VB3 | 3.5 | 3.6 |

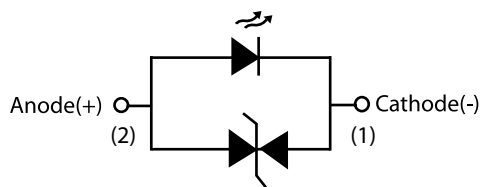
Note:

Forward voltage measurement allowance is $\pm 0.06\text{V}$.

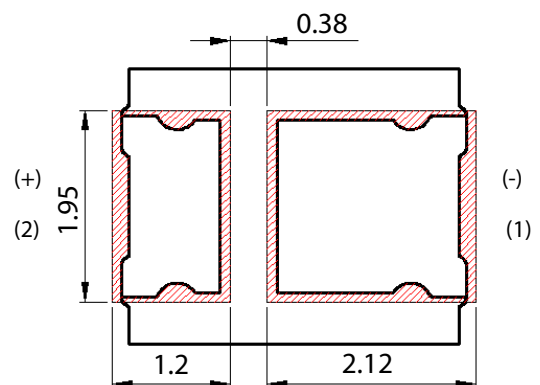
Mechanical Dimensions



Circuit



Solder Pad



Notes:

1. All dimensions are measured in mm.
2. Tolerance : ± 0.2 mm

Color BIN code

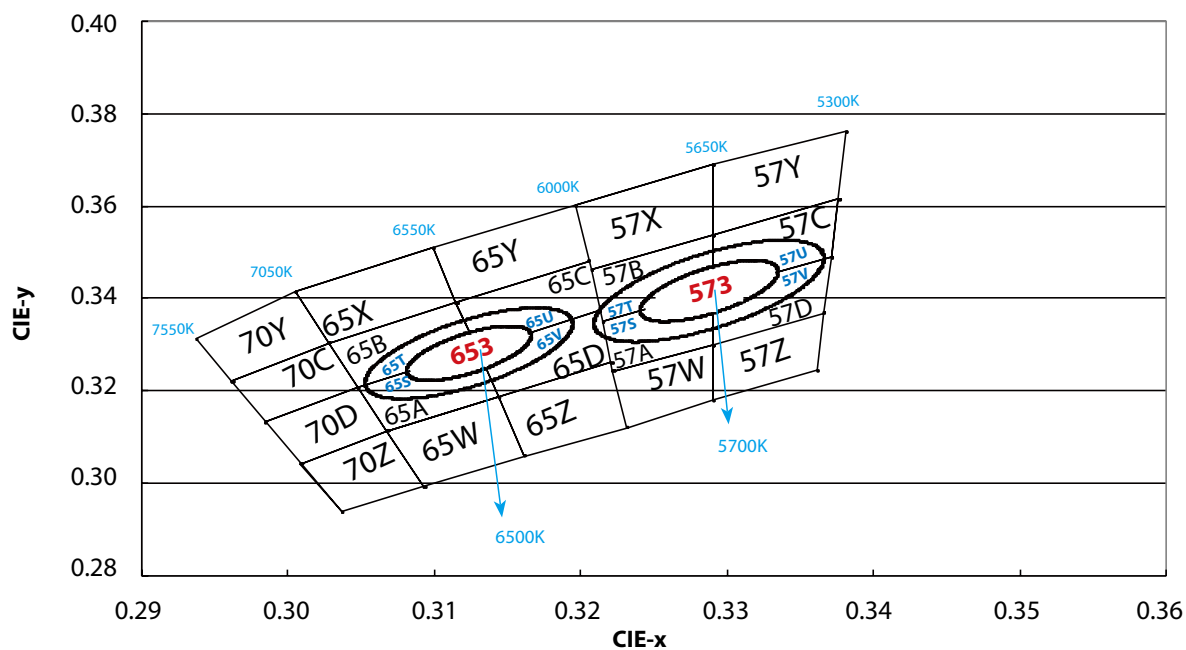
Color region stay within Macadam "3-Step/5-step" ellipse from the chromaticity center.

The chromaticity center refers to ANSI C78.377:2008.

Please refer to ANSI C78.377 for the chromaticity center.

| CCT | Steps | Cx | Cy | a | b | theta |
|-------|-------|--------|--------|---------|---------|-------|
| 5700K | 5 | 0.3287 | 0.3417 | 0.01243 | 0.00533 | 59.09 |
| 6500K | 5 | 0.3123 | 0.3282 | 0.01115 | 0.00475 | 58.57 |

| CCT | Steps | Cx | Cy | a | b | theta |
|-------|-------|--------|--------|---------|---------|-------|
| 5700K | 3 | 0.3287 | 0.3417 | 0.00746 | 0.00320 | 59.09 |
| 6500K | 3 | 0.3123 | 0.3282 | 0.00669 | 0.00285 | 58.57 |



6500K

| 65X | | 65B | | 65A | | 65W | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| X | Y | X | Y | X | Y | X | Y |
| 0.3005 | 0.3415 | 0.3115 | 0.3391 | 0.3130 | 0.3290 | 0.3068 | 0.3113 |
| 0.3099 | 0.3509 | 0.3028 | 0.3304 | 0.3048 | 0.3207 | 0.3144 | 0.3186 |
| 0.3115 | 0.3391 | 0.3048 | 0.3207 | 0.3068 | 0.3113 | 0.3161 | 0.3059 |
| 0.3028 | 0.3304 | 0.3130 | 0.3290 | 0.3144 | 0.3186 | 0.3093 | 0.2993 |

| 65Y | | 65C | | 65D | | 65Z | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| X | Y | X | Y | X | Y | X | Y |
| 0.3099 | 0.3509 | 0.3205 | 0.3481 | 0.3213 | 0.3373 | 0.3144 | 0.3186 |
| 0.3196 | 0.3602 | 0.3115 | 0.3391 | 0.3130 | 0.3290 | 0.3221 | 0.3261 |
| 0.3205 | 0.3481 | 0.3130 | 0.3290 | 0.3144 | 0.3186 | 0.3231 | 0.3120 |
| 0.3115 | 0.3391 | 0.3213 | 0.3373 | 0.3221 | 0.3261 | 0.3161 | 0.3059 |

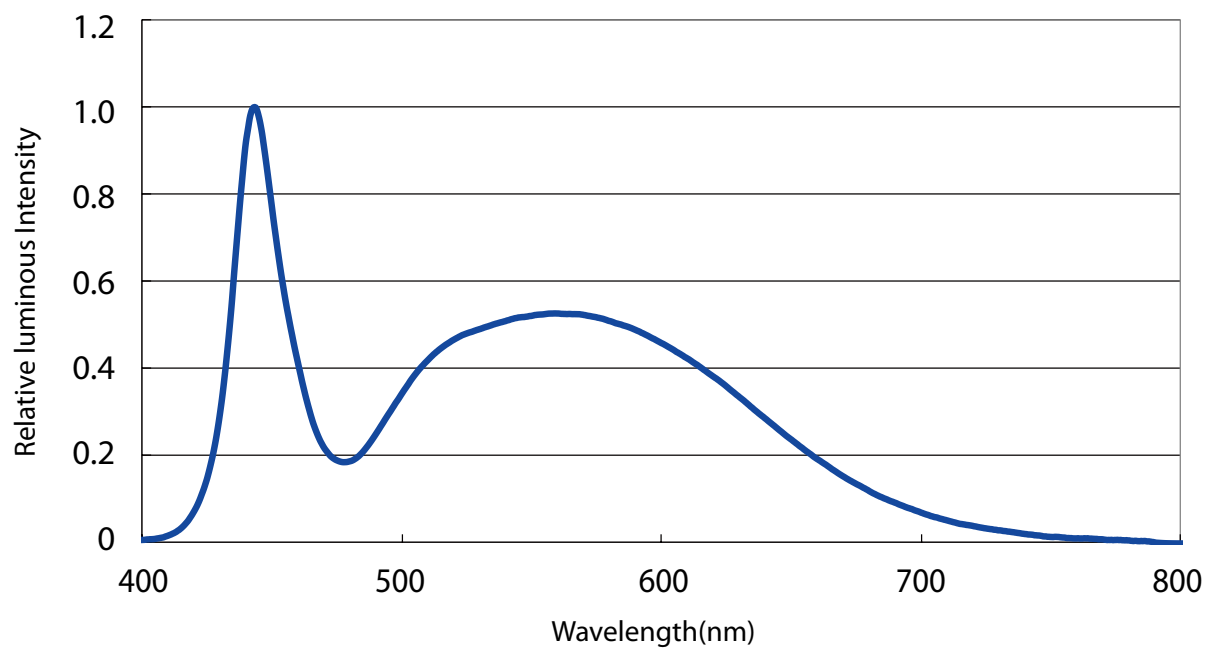
5700K

| 57X | | 57B | | 57A | | 57W | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| X | Y | X | Y | X | Y | X | Y |
| 0.3196 | 0.3602 | 0.3290 | 0.3538 | 0.3290 | 0.3417 | 0.3222 | 0.3243 |
| 0.3290 | 0.3690 | 0.3207 | 0.3462 | 0.3215 | 0.3350 | 0.3290 | 0.3300 |
| 0.3290 | 0.3538 | 0.3215 | 0.3350 | 0.3222 | 0.3243 | 0.3290 | 0.3180 |
| 0.3207 | 0.3462 | 0.3290 | 0.3417 | 0.3290 | 0.3300 | 0.3231 | 0.3120 |

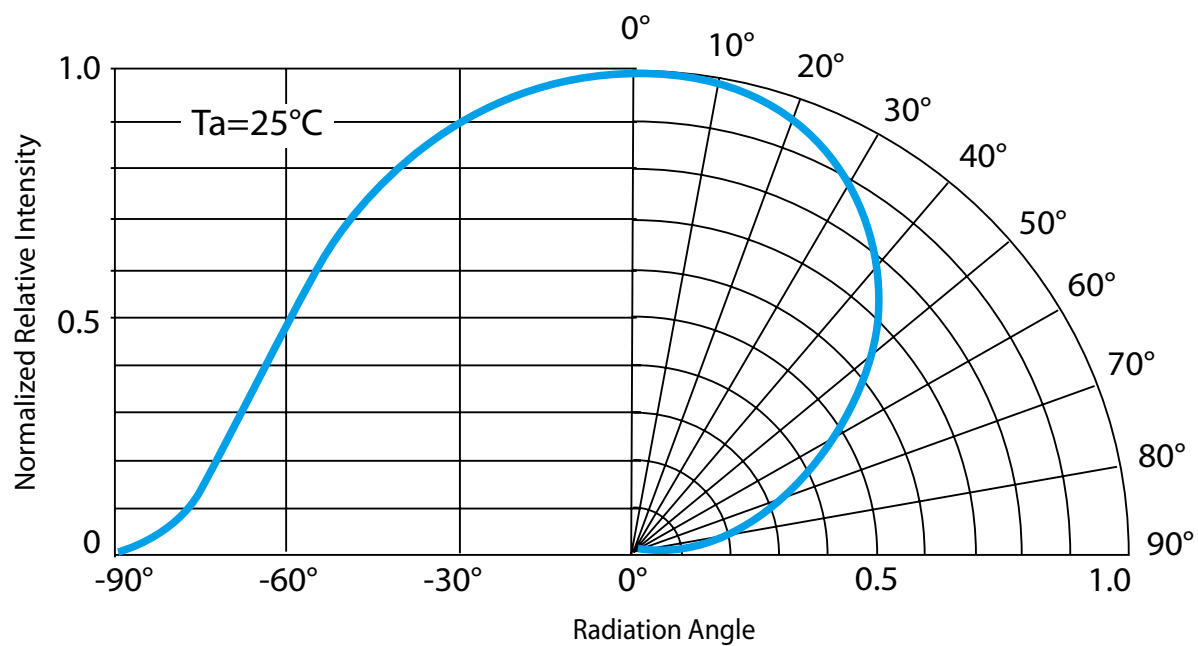
| 57Y | | 57C | | 57D | | 57Z | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| X | Y | X | Y | X | Y | X | Y |
| 0.3290 | 0.3690 | 0.3376 | 0.3616 | 0.3371 | 0.3490 | 0.3290 | 0.3300 |
| 0.3381 | 0.3762 | 0.3290 | 0.3538 | 0.3290 | 0.3417 | 0.3366 | 0.3369 |
| 0.3376 | 0.3616 | 0.3290 | 0.3417 | 0.3290 | 0.3300 | 0.3361 | 0.3245 |
| 0.3290 | 0.3538 | 0.3371 | 0.3490 | 0.3366 | 0.3369 | 0.3290 | 0.3180 |

Characteristic curve

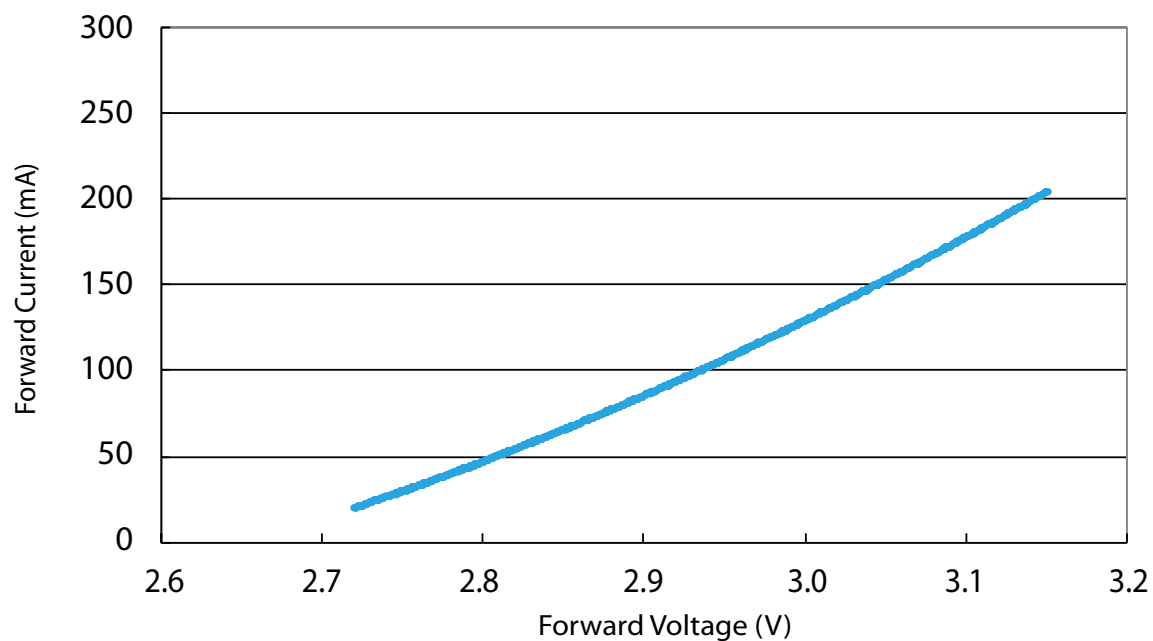
Color Spectrum



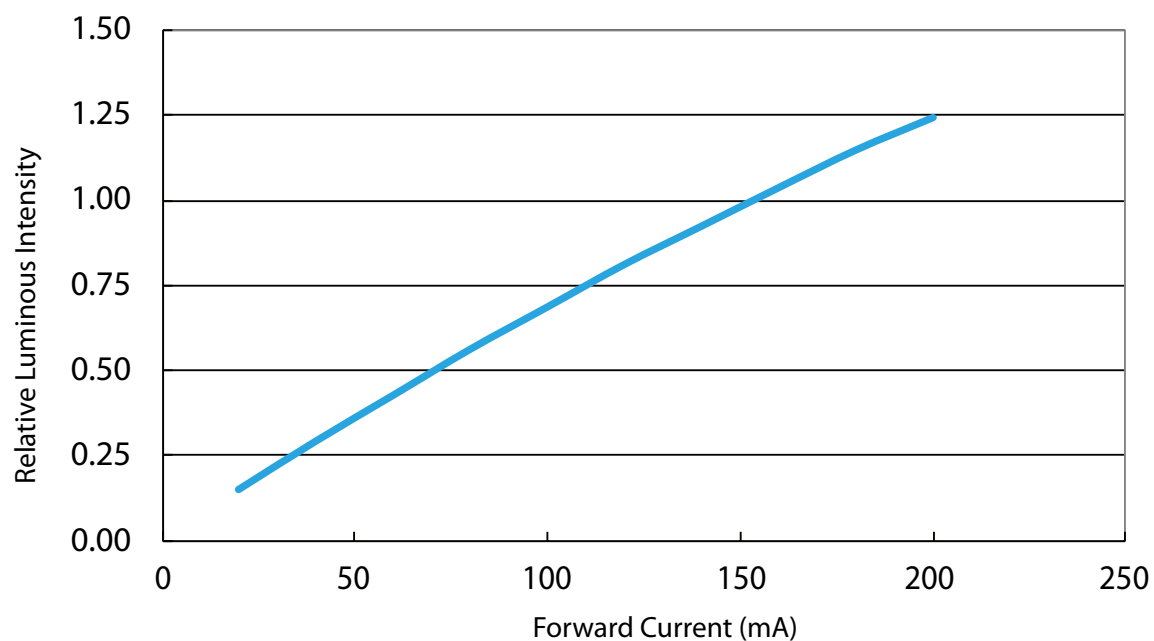
Beam Pattern



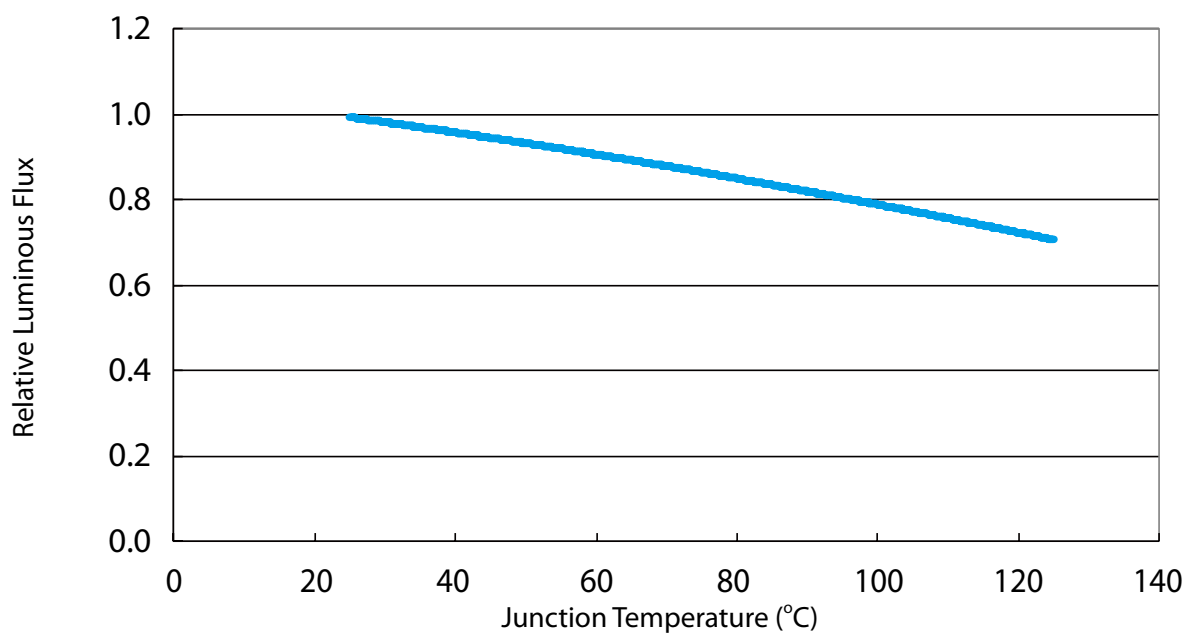
Forward Current vs. Forward Voltage



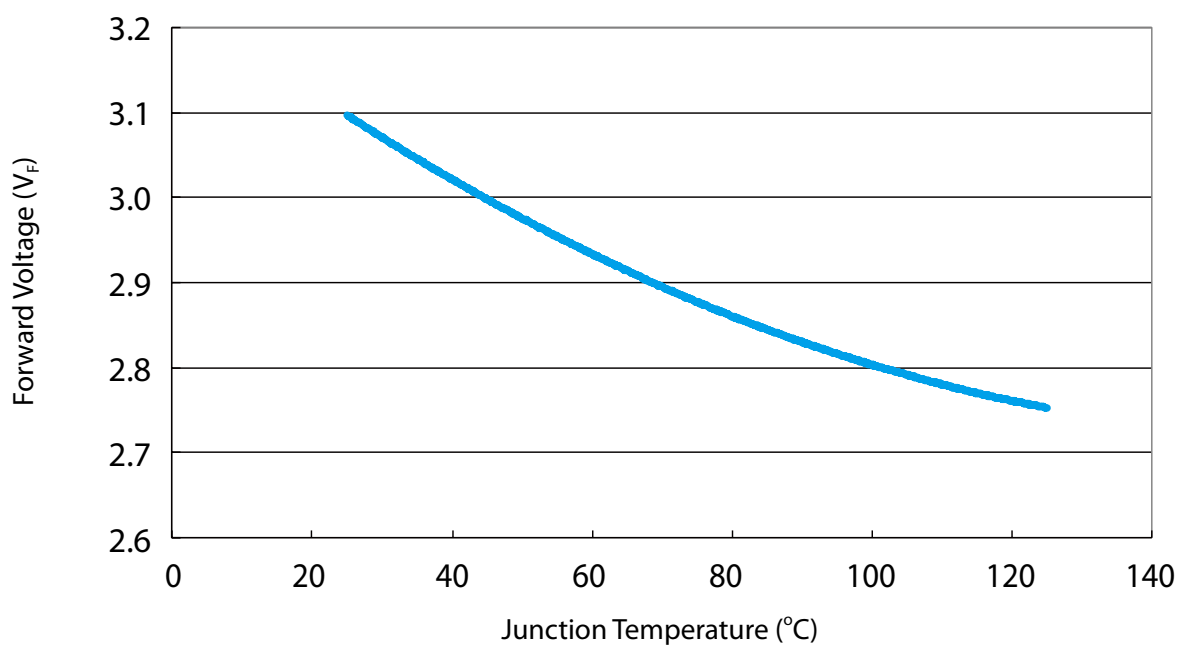
Relative Luminous Intensity vs. Forward Current



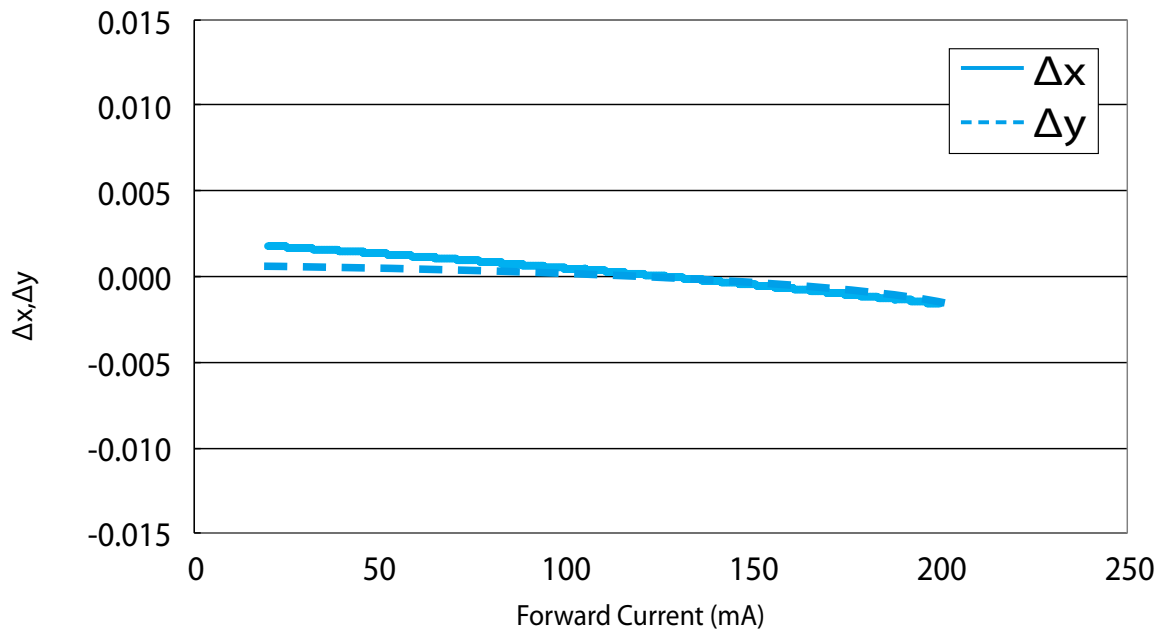
Relative Luminous Flux vs. Junction Temperature



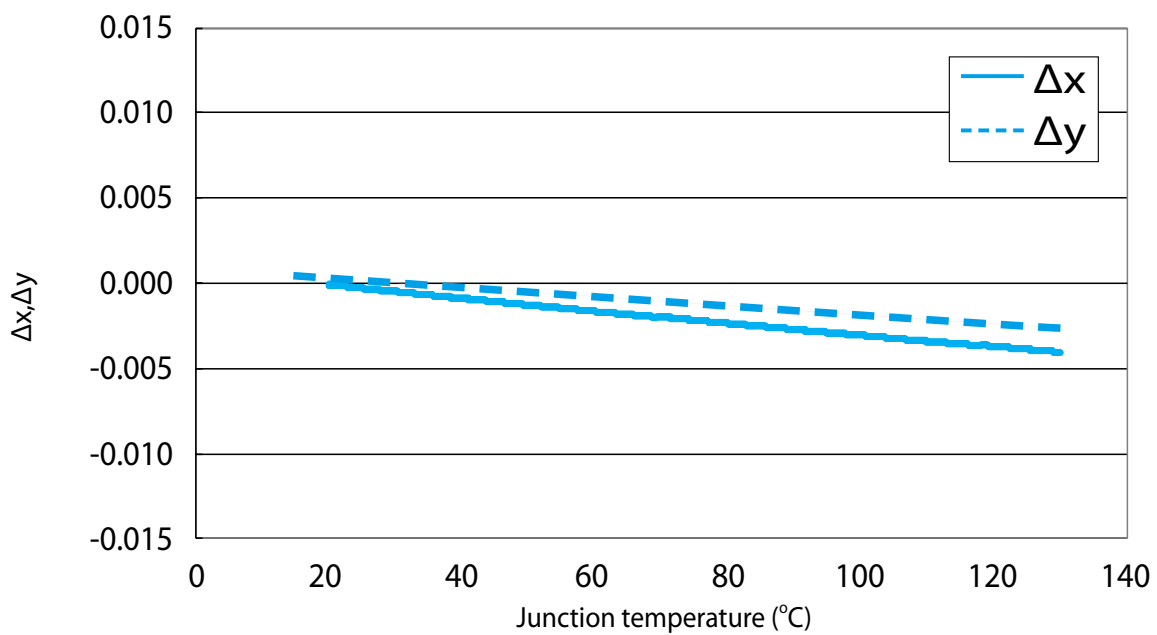
Forward Voltage vs. Junction Temperature



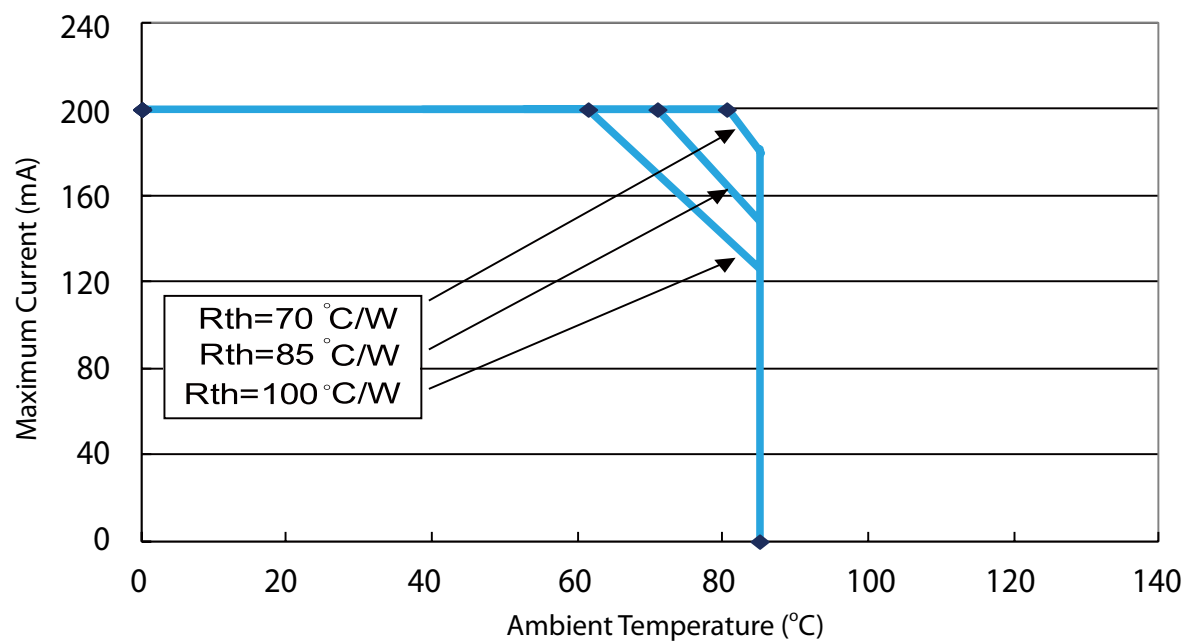
$\Delta x, \Delta y$ vs. Forward Current



$\Delta x, \Delta y$ vs. Junction Temperature

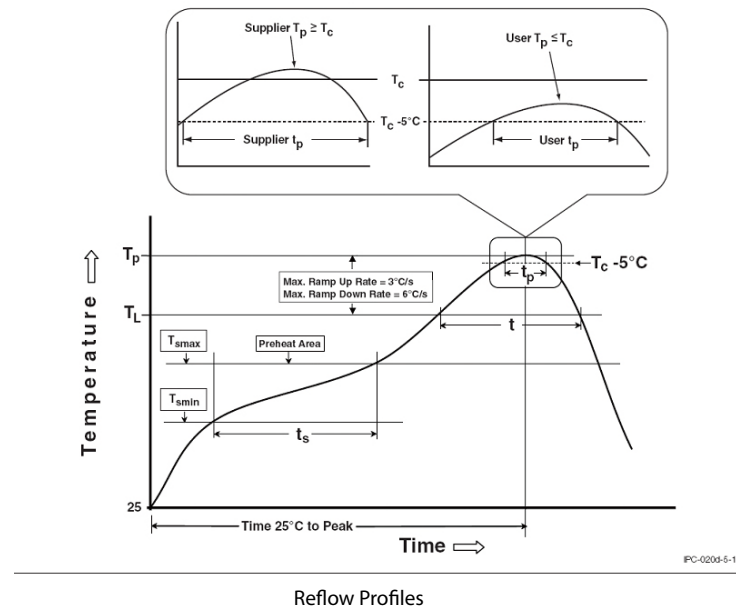


Maximum Current vs. Ambient Temperature



Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Classification Reflow Profiles

| Profile Feature | Pb-Free Assembly |
|--|------------------|
| Preheat & Soak | |
| Temperature min (T_{smin}) | 150 °C |
| Temperature max (T_{smax}) | 200 °C |
| Time (T_{smin} to T_{smax}) (t_s) | 60-120 seconds |
| Average ramp-up rate (T_{smax} to T_p) | 3 °C/second max. |
| Liquidous temperature (T_L) | 217 °C |
| Time at liquidous (t_L) | 60-150 seconds |
| Peak package body temperature (T_p)* | 255 °C ~260 °C * |
| Classification temperature (T_c) | 260 °C |
| Time (t_p)** within 5 °C of the specified classification temperature (T_c) | 30** seconds |
| Average ramp-down rate (T_p to T_{smax}) | 6°C/second max. |
| Time 25°C to peak temperature | 8 minutes max. |

Notes:

- * Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
- ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

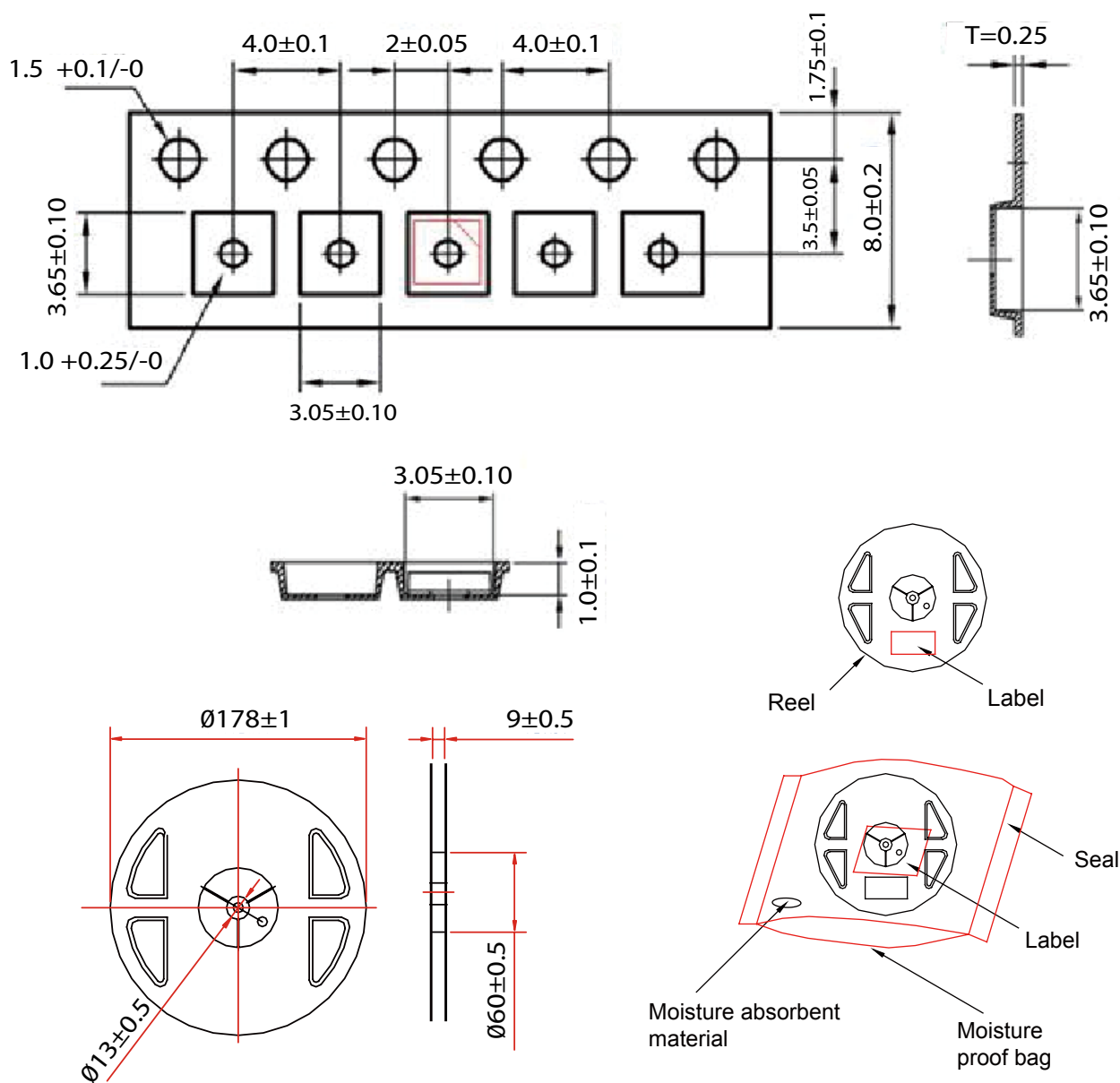
Reliability

| NO . | Test Item | Test Condition | Remark |
|------|---|--------------------------------------|------------|
| 1 | Temperature Cycle | -40°C~100°C 30, 30, mins | 100 Cycle |
| 2 | Thermal Shock | -40°C~100°C 15, 15 mins ≤ 10 sec | 100 Cycle |
| 3 | Resistance to Soldering Heat | T _{SOL} =260°C, 30 sec | 3 times |
| 4 | Moisture Resistance | 25°C~65°C 90% RH 24 hrs / 1 cycle | 10 Cycle |
| 5 | High-Temperature Storage | T _A =100°C | 1,000 hrs |
| 6 | Humidity Heat Storage | T _A =85°C RH=85% | 1,000 hrs |
| 7 | Low-Temperature Storage | T _A =-40°C | 1,000 hrs |
| 8 | Operation Life test | 25°C | 1,000 hrs |
| 9 | High Temperature Operation Life test | 85°C | 1,000 hrs |
| 10 | High Humidity Heat Life Test | 85°C, 85%RH | 1,000 hrs |
| 11 | ON/OFF Test | 30 sec ON, 30 sec OFF | 1.5W times |

Failure Criteria

| Item | Criteria for Judgment | |
|---------------------------------|--------------------------------|--------------------|
| | Min. | Max. |
| Lumen Maintenance | 85% | - |
| $\Delta u'v'$ | - | 0.006 |
| Forward Voltage | - | Initial Data x 1.1 |
| Reverse Current | - | 10 μ A |
| Resistance to Soldering Heat | No dead lamps or visual damage | |

Product Packaging Information



| Item | Quantity | Total | Dimensions(mm) |
|--|----------|----------|----------------|
| Reel | 4,000pcs | 4,000pcs | R=178 |
| Starting with 150pcs empty, and 150pcs empty at the last | | | |

Revision History

| Versions | Description | Release Date |
|----------|-----------------------|--------------|
| 1 | Establish a Datasheet | 2016/07/26 |

About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

Copyright©2016 Edison Opto. All rights reserved. No part of publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photo copy, recording or any other information storage and retrieval system, without prior permission in writing from the publisher. The information in this publication are subject to change without notice.

www.edison-opto.com

For general assistance please contact:
service@edison-opto.com.tw

For technical assistance please contact:
LED.Detective@edison-opto.com.tw