

# PCB Silkscreen DFM Checklist

A Practical Guide for Readable & Manufacturing-Ready PCB Design

## Why PCB Silkscreen Matters

PCB silkscreen is more than simple labeling—it plays a critical role in:

- Component identification
- SMT assembly accuracy
- AOI inspection efficiency
- Debugging and maintenance
- Manufacturing readability

Poor silkscreen design can lead to assembly confusion, missing polarity marks, and costly production errors.

Use this checklist before sending your PCB design to fabrication or assembly.

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## ✓ PCB Silkscreen DFM Checklist

### 1. Text Height & Readability

- ✓ Recommended text height: **≥1.0 mm (40 mil)**
- ✓ Absolute minimum: **0.8 mm** (manufacturer-dependent)
- ✓ Ensure labels remain readable after assembly

#### Common Issues

- Tiny unreadable text
- Crowded reference designators
- Difficult debugging after reflow soldering

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### 2. Minimum Line Width

- ✓ Recommended silkscreen line width: **≥6 mil (0.15 mm)**
- ✓ Avoid ultra-thin fonts or decorative text styles

## Why It Matters

Thin lines may:

- Fade during printing
- Break during manufacturing
- Become unreadable on dark solder masks

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## 3. Silkscreen Clearance Rules

✓ Maintain **4–6 mil clearance** from:

- Pads
- Vias
- Exposed copper
- Solder mask openings

## Important

Silkscreen overlapping pads is often automatically removed during CAM processing.

## Risks

- Missing labels
- Lost polarity markings
- Assembly errors

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## 4. Avoid Silkscreen Over Pads or Vias

- ✓ Keep all markings away from solderable surfaces
- ✓ Run DRC checks before Gerber export

## Common Manufacturing Issue

Silkscreen printed on pads can interfere with:

- Solder wetting
  - AOI readability
  - SMT assembly accuracy
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## 5. Polarity & Pin 1 Indicators

✓ Clearly mark:

- Diode polarity
- Electrolytic capacitor polarity
- IC Pin 1 locations

### Best Practice

Place polarity markings close to components without touching pads.

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## 6. Reference Designators

✓ Ensure all component labels are:

- Readable
- Consistent
- Properly oriented

### Recommended

Use horizontal orientation whenever possible for easier inspection.

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## 7. Contrast with Solder Mask

✓ Use high-contrast combinations:

- White silkscreen on green/black solder mask

- Black silkscreen on white solder mask

## Avoid

Low-contrast combinations that reduce readability.



## 8. Avoid Overcrowded Silkscreen Layouts

✓ Prioritize:

- Critical labels
- Polarity markings
- Test point identification

### Common Problem

Too much information can reduce:

- Operator efficiency
- Inspection speed
- Debugging clarity

## 9. AOI & Assembly Readability

✓ Ensure silkscreen supports:

- Automated Optical Inspection (AOI)
- Pick-and-place verification
- Manual debugging

## Tip

Readable silkscreen improves assembly yield and reduces rework costs.

## 10. Final DFM Verification

Before manufacturing:

- ✓ Run silkscreen DRC checks
- ✓ Review Gerber output carefully
- ✓ Verify readability at actual board size
- ✓ Confirm manufacturer silkscreen capability
- ✓ Check for clipped or mirrored text

Item	Recommended Value
Text Height	≥1.0 mm
Minimum Line Width	≥6 mil
Clearance from Pads/Vias	≥4–6 mil
Minimum Readable Text	~0.8 mm
Preferred Font Style	Simple sans-serif
Silkscreen Layer	Top and/or bottom

## Quick Reference Table

## Common PCB Silkscreen Mistakes to Avoid

- ✗ Text too small
- ✗ Silkscreen over pads
- ✗ Missing polarity marks
- ✗ Inconsistent orientation

- ✗ Poor solder mask contrast
  - ✗ Overcrowded layout
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## Final Tip

Good PCB silkscreen design improves:

- Manufacturing efficiency
- Assembly accuracy
- Inspection speed
- Long-term maintainability

Working with an experienced PCB manufacturer helps ensure your silkscreen remains clear, readable, and production-ready.

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## Related PCB Silkscreen Guides

- PCB Silkscreen Design Guidelines
  - Common PCB Silkscreen Mistakes
  - PCB Silkscreen Printing Methods
  - PCB Silkscreen vs Solder Mask
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## Why Choose Unit Circuits?

- **No MOQ** – perfect for R&D and custom builds
- **Fast PCB prototyping** (delivery in 5–7 days)
- **Functional testing & AOI** included
- **motor driver, actuator and smart control PCB assembly**
- Export-ready (RoHS, ISO, CE compliant)

- Project name
  - BOM (.xls or .csv)
  - Gerber files (.zip)
  - Target lead time
  - Testing requirements
  - Volume (prototyping or production)
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