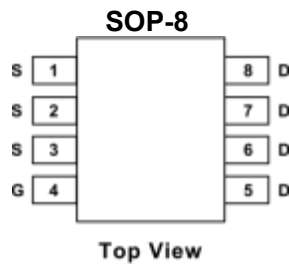
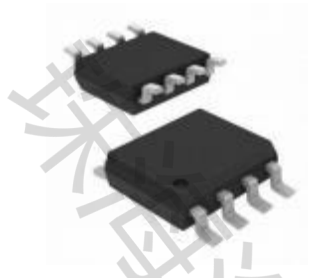


SI4453DY-T1-E3-HX P-Channel 12-V (D-S) MOSFET

| PRODUCT SUMMARY | | |
|---------------------|------------------------------------|--------------------|
| V _{DS} (V) | R _{DS(on)} (Ω) | I _D (A) |
| -12 | 0.016 at V _{GS} = - 4.5 V | -15 |
| | 0.022 at V _{GS} = - 2.5 V | |



FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested

APPLICATIONS

- Load Switch

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|-----------------------------------|-------------------------|------|
| Drain-source voltage | V _{DS} | -12 | V |
| Gate-source voltage | V _{GS} | ± 8 | |
| Continuous drain current ^a | I _D | T _C = 25 °C | -15 |
| | | T _C = 125 °C | -8.7 |
| Continuous source current (diode conduction) ^a | I _S | -5.4 | A |
| Pulsed drain current ^b | I _{DM} | -60 | |
| Single pulse avalanche current | I _{AS} | -20 | |
| Single pulse avalanche energy | E _{AS} | 20 | mJ |
| Maximum power dissipation ^b | P _D | T _C = 25 °C | 6 |
| | | T _C = 125 °C | 2 |
| Operating junction and storage temperature range | T _J , T _{stg} | -55 to +175 | °C |
| Soldering recommendations (peak temperature) | | 260 | |

THERMAL RESISTANCE RATINGS

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--------------------------|-------------------|-------|------|
| Junction-to-ambient | R _{thJA} | 92 | °C/W |
| Junction-to-foot (drain) | R _{thJF} | 25 | |

Notes

- Package limited
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- When mounted on 1" square PCB (FR4 material)
- Parametric verification ongoing

| SPECIFICATIONS (T _c = 25 °C, unless otherwise noted) | | | | | | |
|--|---------------------|---|-------|-------|-------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
| Static | | | | | | |
| Drain-source breakdown voltage | V _{DS} | V _{GS} = 0, I _D = -250 μA | -12 | | | V |
| Gate-source threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250 μA | -0.45 | -0.6 | -1 | |
| Gate-source leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ± 8 V | | | ± 100 | nA |
| Zero gate voltage drain current | I _{DSS} | V _{GS} = 0 V, V _{DS} = -12 V | | | -1 | μA |
| | | V _{GS} = 0 V, V _{DS} = -12 V, T _J = 125 °C | | | -50 | |
| | | V _{GS} = 0 V, V _{DS} = -12 V, T _J = 175 °C | | | -150 | |
| On-state drain current ^a | I _{D(on)} | V _{GS} = -4.5 V, V _{DS} ≤ -5 V | -20 | | | A |
| Drain-source on-state resistance ^a | R _{DS(on)} | V _{GS} = -4.5 V, I _b = -13.5 A | | 0.013 | 0.016 | Ω |
| | | V _{GS} = -4.5 V, I _b = -13.5 A | | | 0.020 | |
| | | V _{GS} = -4.5 V, I _b = -13.5 A | | | 0.022 | |
| | | V _{GS} = -2.5 V, I _b = -12 A | | 0.018 | 0.022 | |
| Forward transconductance ^b | g _{fs} | V _{DS} = -6 V, I _D = -12 A | | 34 | | S |
| Dynamic ^b | | | | | | |
| Input capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = -6 V, f = 1 MHz | | 2433 | 3600 | pF |
| Output capacitance | C _{oss} | | | 922 | 1380 | |
| Reverse transfer capacitance | C _{rss} | | | 752 | 1120 | |
| Total gate charge ^c | Q _g | V _{GS} = -4.5 V, V _{DS} = -6 V, I _D = -10 A | | 29 | 38 | nC |
| Gate-source charge ^c | Q _{gs} | | | 4.2 | | |
| Gate-drain charge ^c | Q _{gd} | | | 8.4 | | |
| Gate resistance | R _g | f = 1 MHz | 1.3 | 2.7 | 4 | Ω |
| Turn-on delay time ^c | t _{d(on)} | V _{DD} = -6 V, R _L = 0.6 Ω, I _D ≈ -10 A, V _{GEN} = -4.5 V, R _g = 1 Ω | | 19 | 26 | ns |
| Rise time ^c | t _r | | | 33 | 44 | |
| Turn-off delay time ^c | t _{d(off)} | | | 73 | 97 | |
| Fall time ^c | t _f | | | 30 | 40 | |
| Source-Drain Diode Ratings and Characteristics ^b | | | | | | |
| Pulsed current ^a | I _{SM} | | | | -60 | A |
| Forward voltage | V _{SD} | I _F = -10 A, V _{GS} = 0 V | | -0.8 | -1.1 | V |

Notes

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature

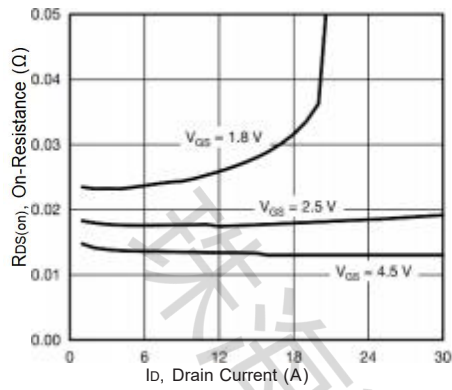


Fig 1. On-Resistance vs. Drain Current

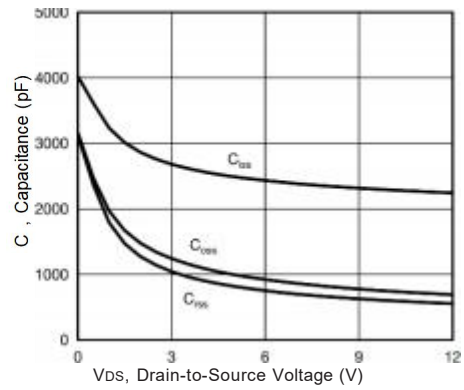


Fig 2. Capacitance

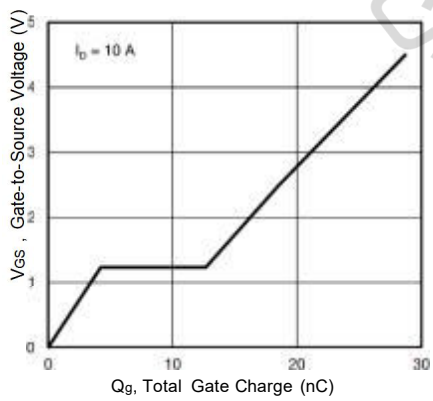


Fig 3. Gate Charge

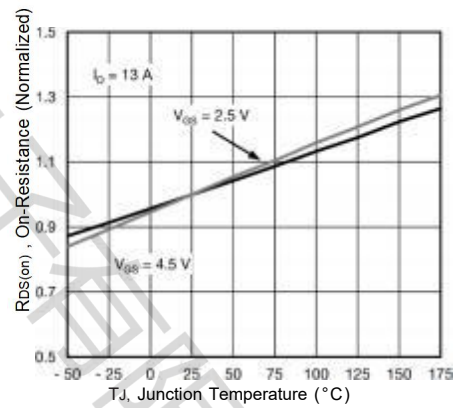


Fig 4. On-Resistance vs. Junction Temperature

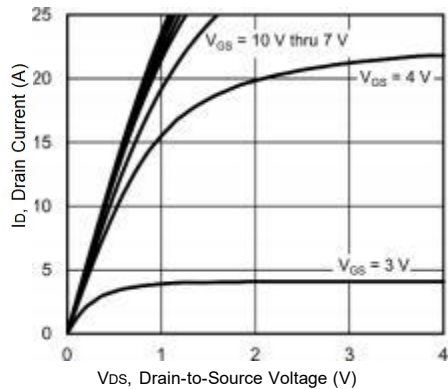


Fig 5. Output Characteristics

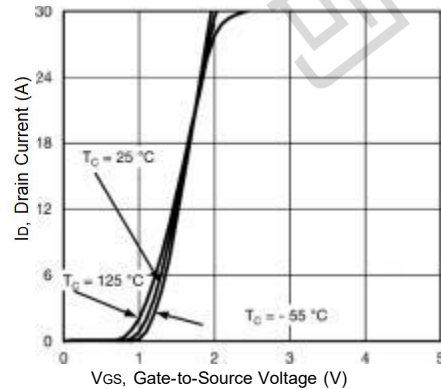


Fig 6. Transfer Characteristics

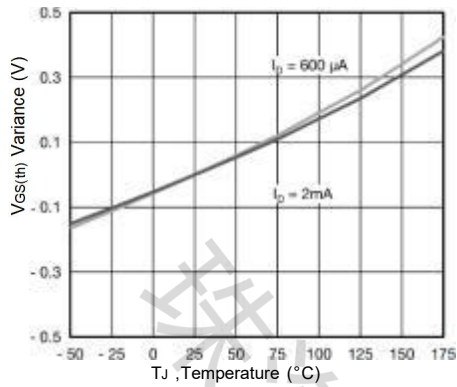


Fig 7. Threshold Voltage

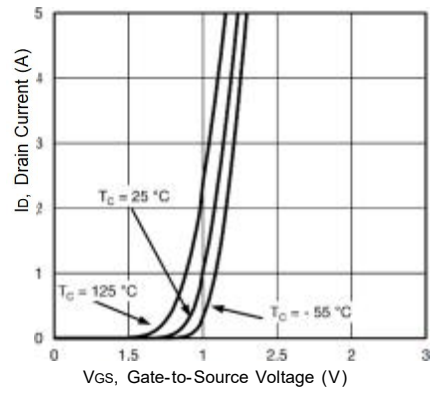


Fig 8. Transfer Characteristics

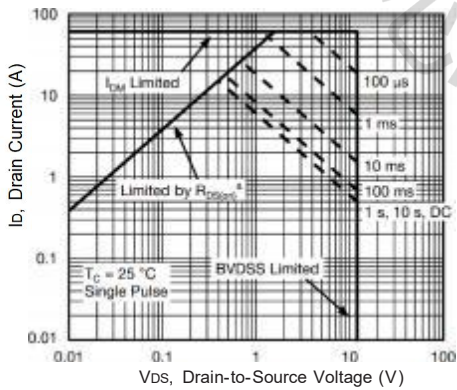


Fig 9. Safe Operating Area

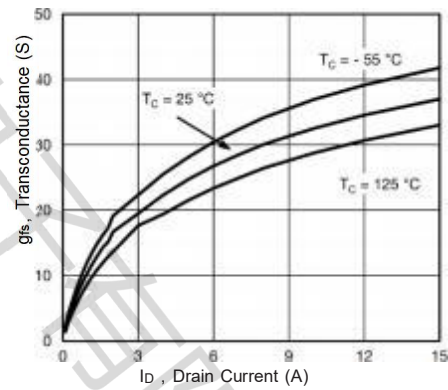


Fig 10. Transconductance

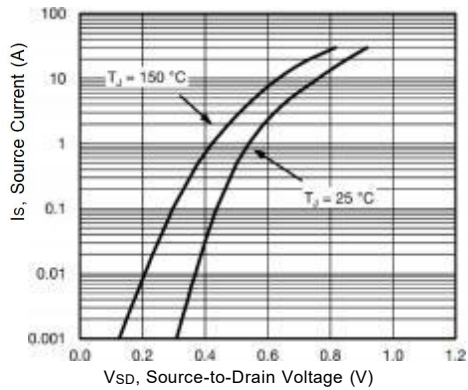


Fig 11. Source Drain Diode Forward Voltage

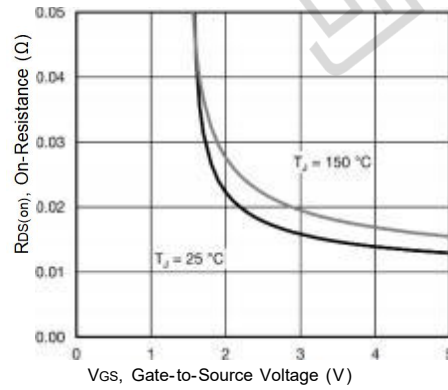


Fig 12. On-Resistance vs. Gate-to-Source Voltage

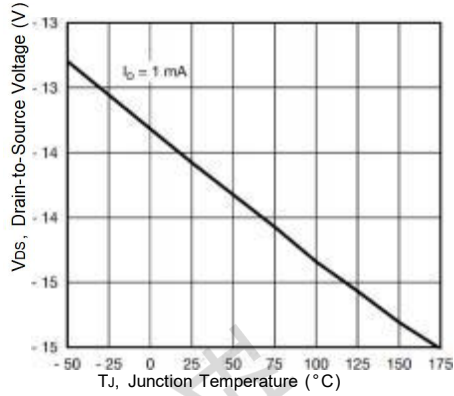


Fig 13. Breakdown Voltage vs. Junction Temperature

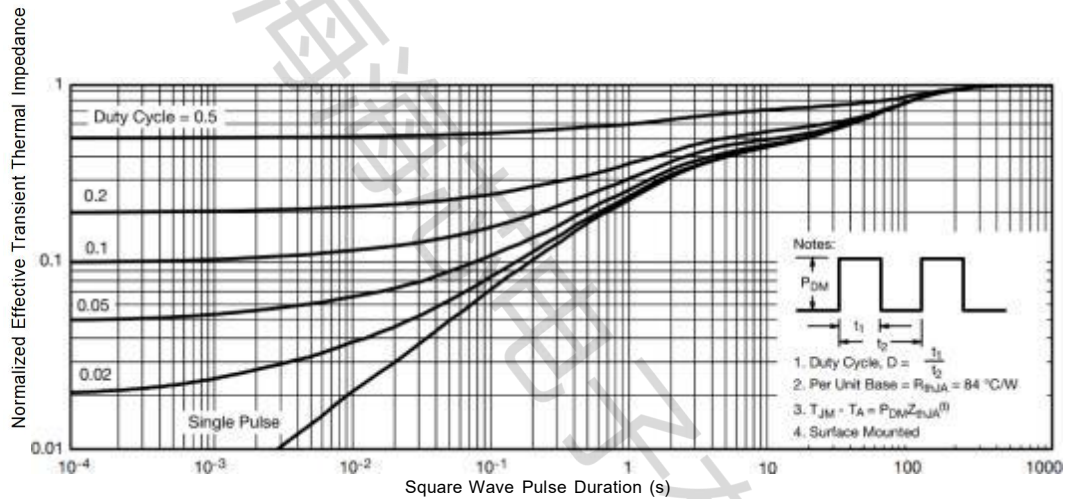


Fig 15. Normalized Thermal Transient Impedance, Junction-to-Ambient

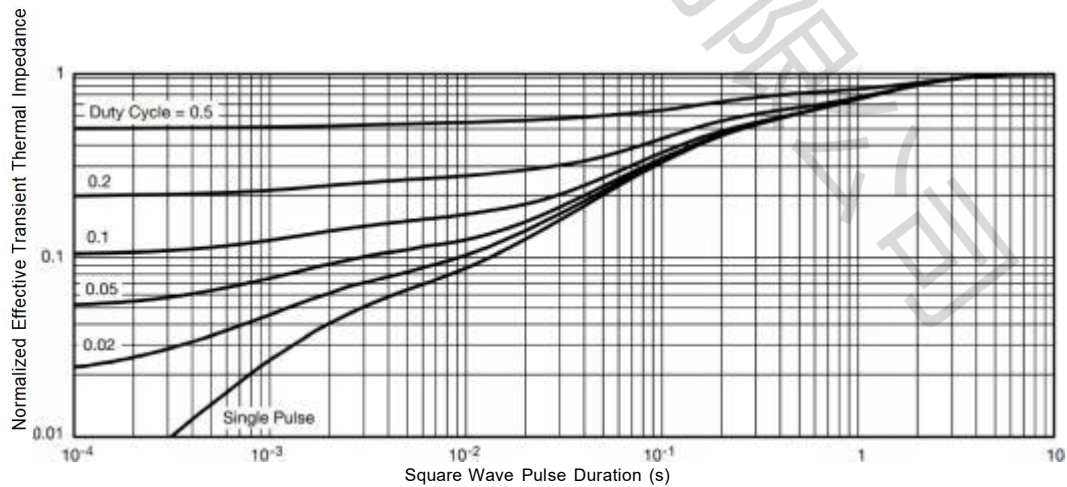
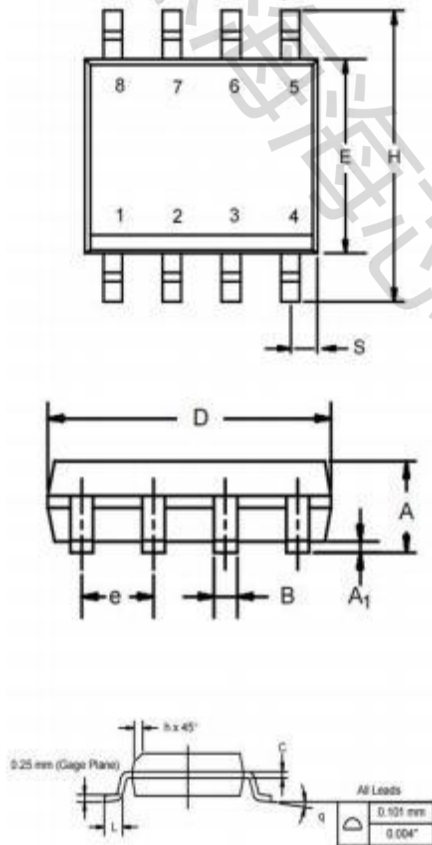


Fig 16. Normalized Thermal Transient Impedance, Junction-to-Foot

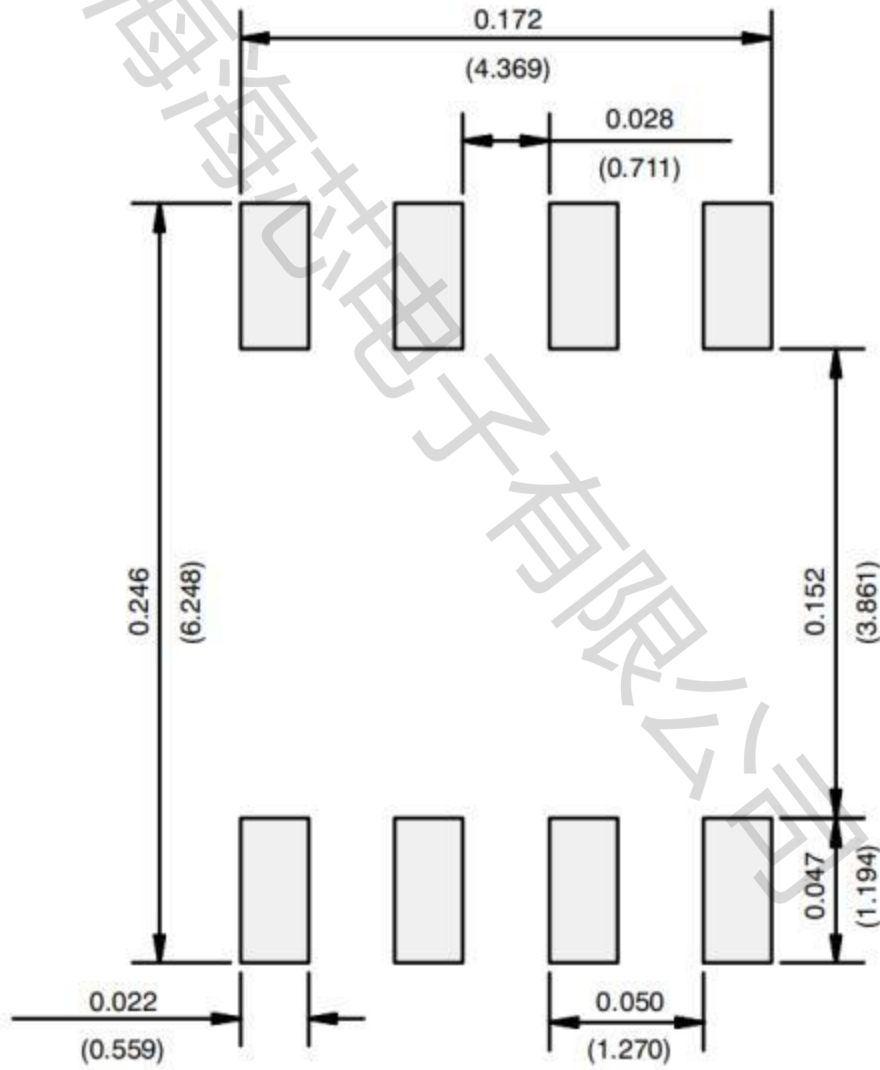
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



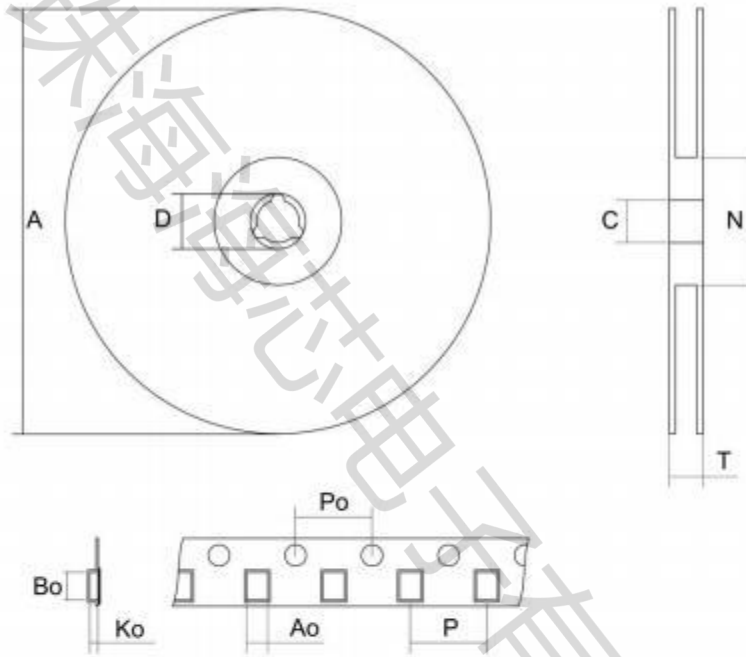
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|-----------|-------|
| | Min | Max | Min | Max |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.20 | 0.004 | 0.008 |
| B | 0.35 | 0.51 | 0.014 | 0.020 |
| C | 0.19 | 0.25 | 0.0075 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.196 |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| e | 1.27 BSC | | 0.050 BSC | |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| h | 0.25 | 0.50 | 0.010 | 0.020 |
| L | 0.50 | 0.93 | 0.020 | 0.037 |
| q | 0° | 8° | 0° | 8° |
| S | 0.44 | 0.64 | 0.018 | 0.026 |

RECOMMENDED MINIMUM PADS FOR SOP-8

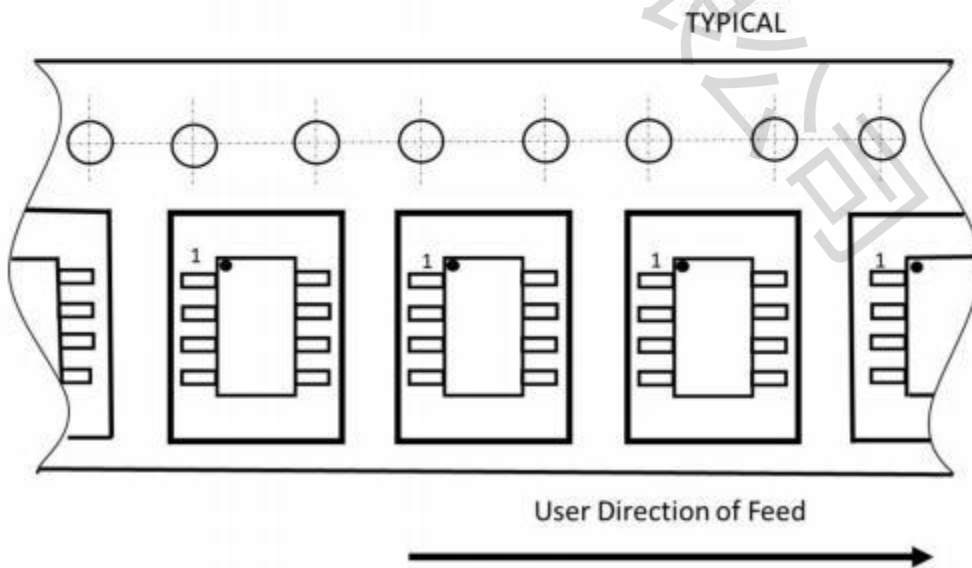


SOP-8 packing information

SOP-8 tape and reel



Tape orientation



Disclaimer

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