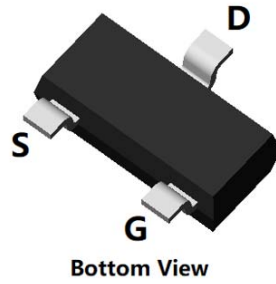
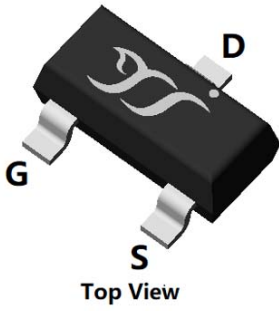
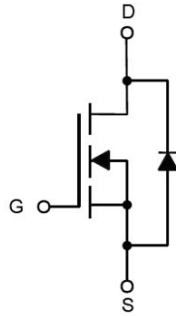


N-Channel Enhancement Mode Field Effect Transistor



SOT-23



Product Summary

| | |
|-------------------------------------|-----------|
| • V_{DS} | 60V |
| • I_D | 3.0A |
| • $R_{DS(ON)}$ (at $V_{GS}=10V$) | < 100mohm |
| • $R_{DS(ON)}$ (at $V_{GS}=4.5V$) | < 120mohm |

General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- DC-DC Converters
- Power management functions

■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|------------------------|-----------------|----------|---------------------------|
| Drain-source Voltage | | V_{DS} | 60 | V |
| Gate-source Voltage | | V_{GS} | ± 20 | V |
| Drain Current | $T_A=25^\circ\text{C}$ | I_D | 3 | A |
| | $T_A=70^\circ\text{C}$ | | 2.4 | |
| Pulsed Drain Current ^A | | I_{DM} | 12 | A |
| Total Power Dissipation | $T_A=25^\circ\text{C}$ | P_D | 1.2 | W |
| | $T_A=70^\circ\text{C}$ | | 0.8 | |
| Thermal Resistance Junction-to-Ambient ^B | | $R_{\theta JA}$ | 104 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | | T_J, T_{STG} | -55~+150 | $^\circ\text{C}$ |

■ Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|---------|----------------------|-------------------------|----------------------------|---------------|
| YJL03N06AQ | F2 | S10. | 3000 | 30000 | 120000 | 7" reel |



YJL03N06AQ

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|-----------------------------------|---------------------|---|-----|-------|------|-------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250μA | 60 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =60V, V _{GS} =0V | | | 1 | μA |
| Gate-Body Leakage Current | I _{GSS1} | V _{GS} =±20V, V _{DS} =0V | | | ±100 | nA |
| | I _{GSS2} | V _{GS} =±10V, V _{DS} =0V | | | ±50 | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 0.9 | 1.3 | 2.0 | V |
| Static Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =10V, I _D =3A | | 86 | 100 | mΩ |
| | | V _{GS} =4.5V, I _D =2A | | 92 | 120 | |
| Diode Forward Voltage | V _{SD} | I _S =3A, V _{GS} =0V | | | 1.2 | V |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =10V, V _{GS} =0V, f=1MHZ | | 409 | | pF |
| Output Capacitance | C _{oss} | | | 50 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 41 | | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q _g | V _{GS} =10V, V _{DS} =30V, I _D =3A | | 10.27 | | nC |
| Gate-Source Charge | Q _{gs} | | | 1.65 | | |
| Gate-Drain Charge | Q _{gd} | | | 2.11 | | |
| Reverse Recovery Charge | Q _{rr} | I _F =3A, di/dt=100A/us | | 6.99 | | |
| Reverse Recovery Time | t _{rr} | | | 32.6 | | |
| Turn-on Delay Time | t _{D(on)} | V _{GS} =10V, V _{DS} =30V, R _L =20Ω R _{GEN} =3Ω | | 3.6 | | ns |
| Turn-on Rise Time | t _r | | | 17.6 | | |
| Turn-off Delay Time | t _{D(off)} | | | 13 | | |
| Turn-off fall Time | t _f | | | 23 | | |

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



■ Typical Performance Characteristics

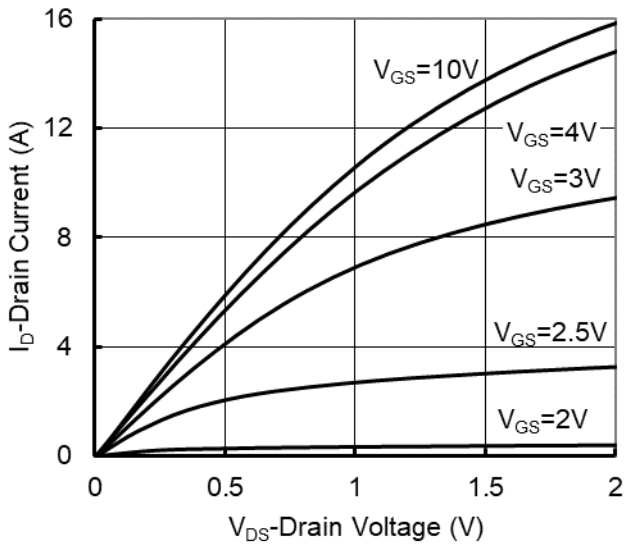


Figure1. Output Characteristics

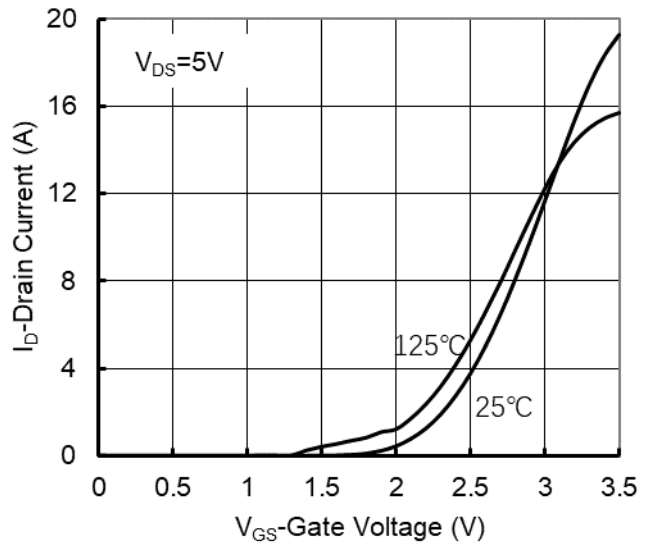


Figure2. Transfer Characteristics

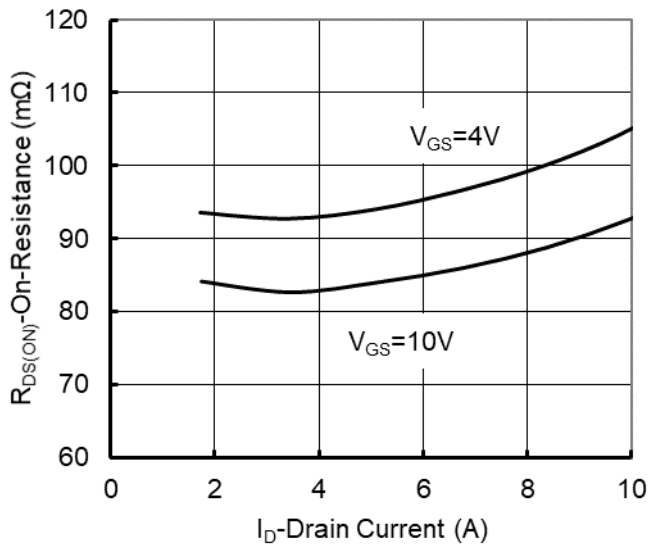


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

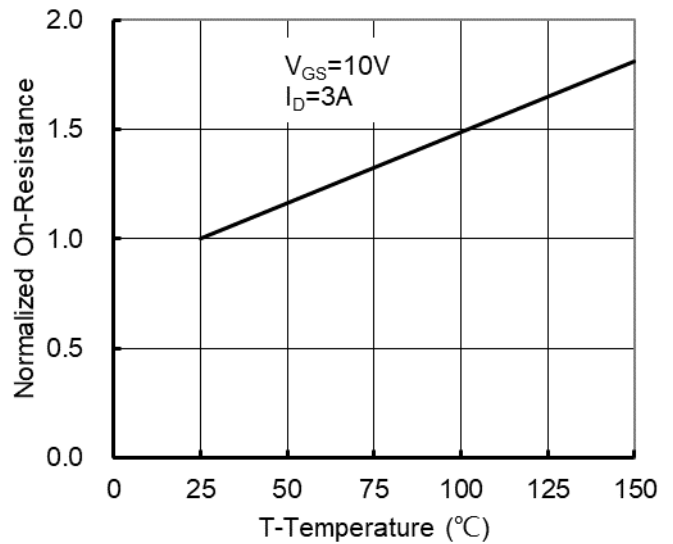


Figure 4: On-Resistance vs. Junction Temperature

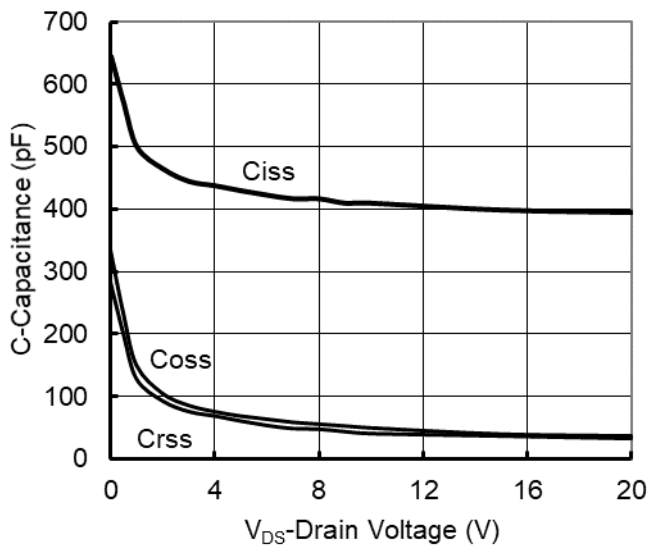


Figure5. Capacitance Characteristics

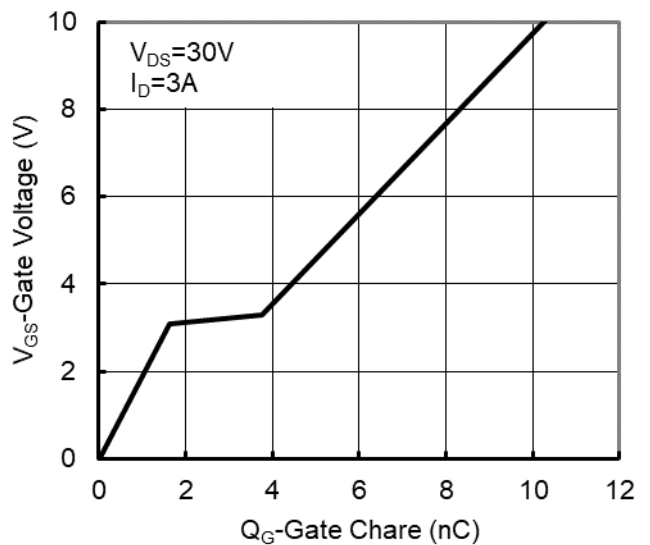


Figure6. Gate Charge



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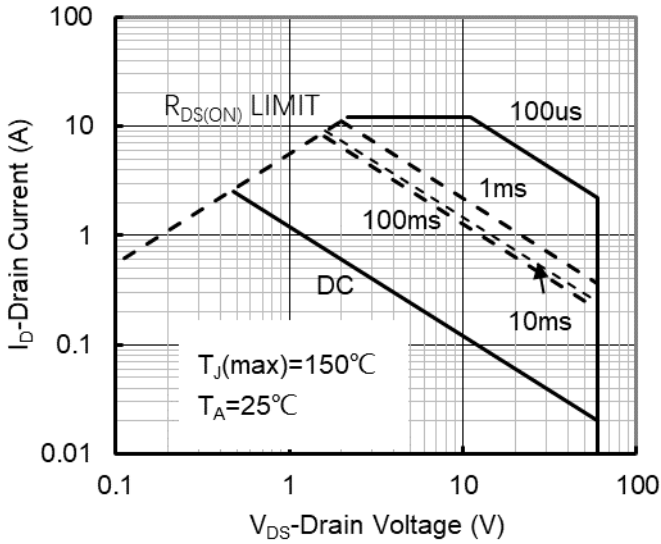


Figure7. Safe Operation Area

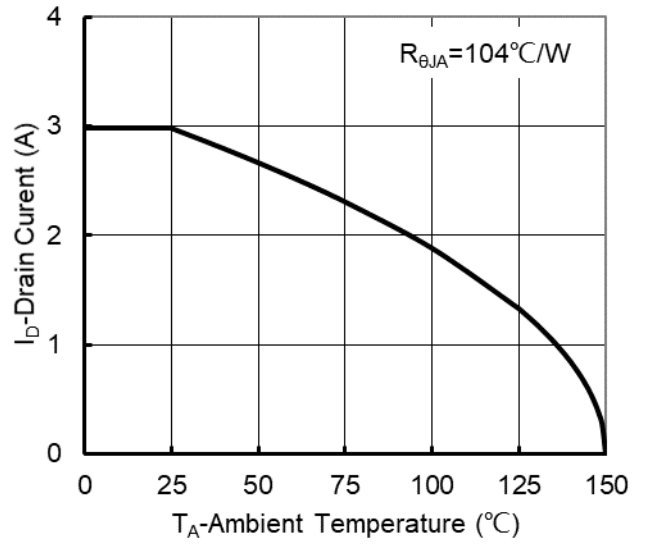


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

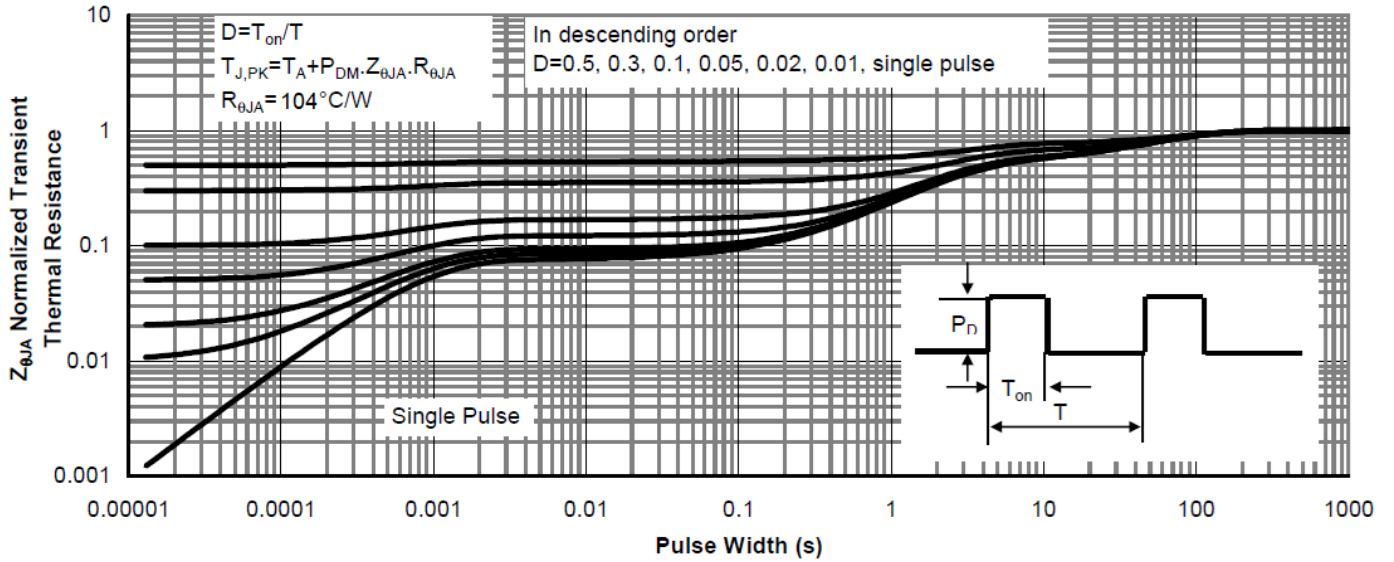
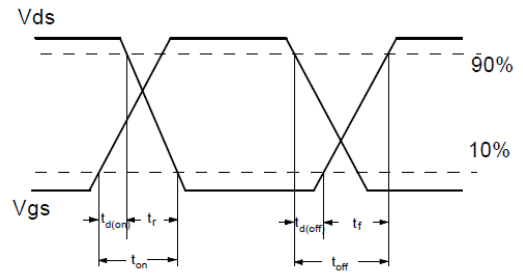
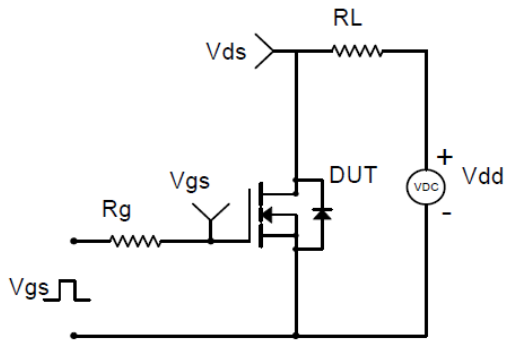
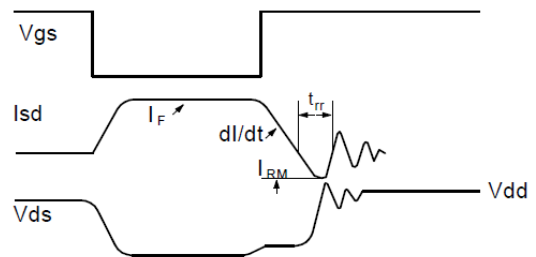
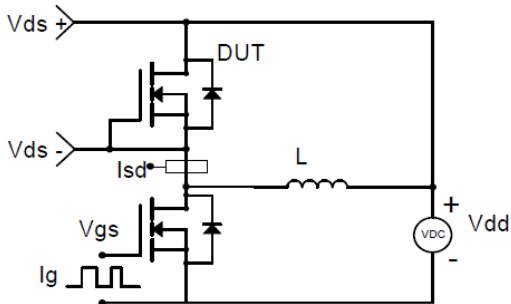


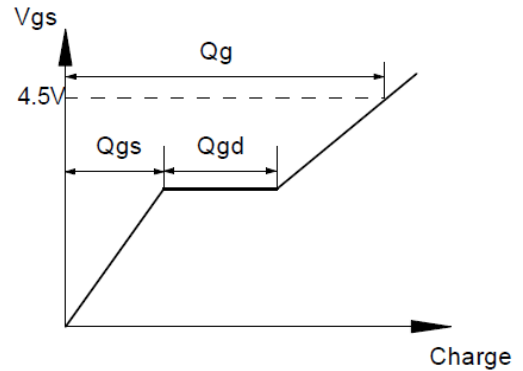
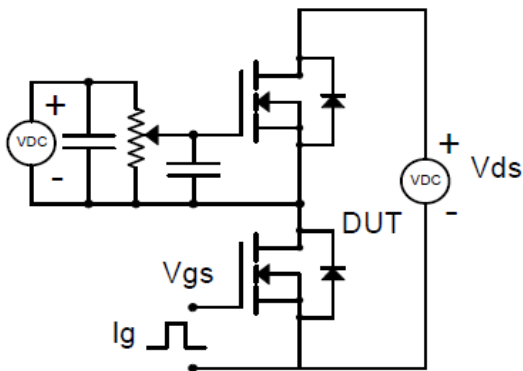
Figure9. Normalized Maximum Transient Thermal Impedance



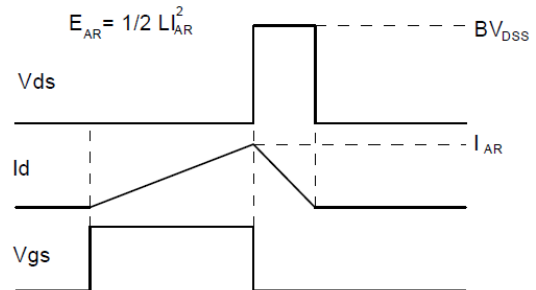
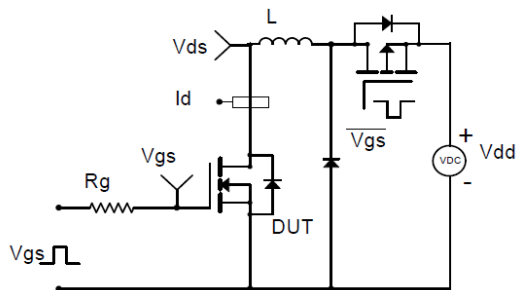
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

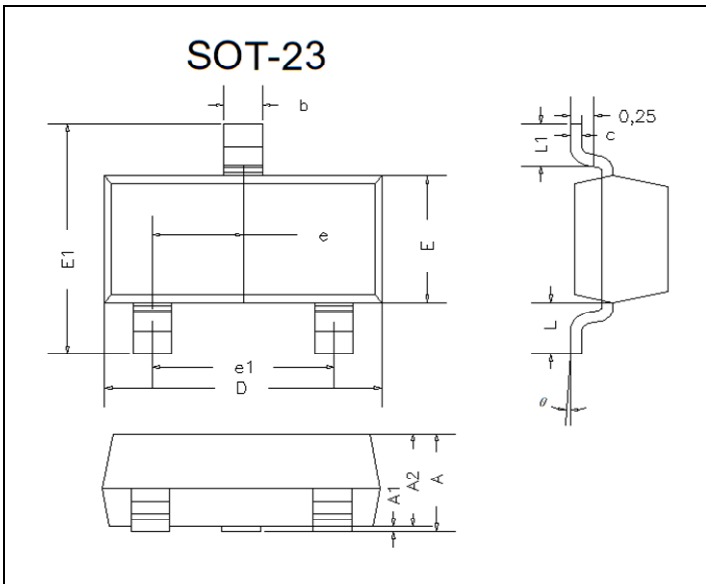


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



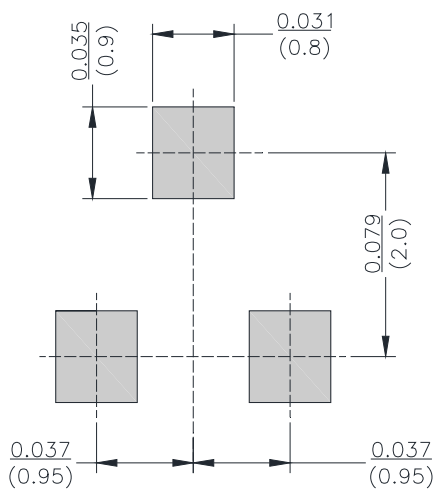
YJL03N06AQ

■ SOT-23 Package information



| DIM | INCHES | | MM | | NOTE |
|-----|----------|-------|---------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.035 | 0.045 | 0.90 | 1.15 | |
| A1 | 0.000 | 0.004 | 0.00 | 0.10 | |
| A2 | 0.035 | 0.041 | 0.90 | 1.05 | |
| b | 0.012 | 0.020 | 0.30 | 0.50 | |
| c | 0.004 | 0.008 | 0.10 | 0.20 | |
| D | 0.110 | 0.118 | 2.80 | 3.00 | |
| E | 0.047 | 0.055 | 1.20 | 1.40 | |
| E1 | 0.089 | 0.100 | 2.25 | 2.55 | |
| e | 0.370TYP | | 0.95TYP | | |
| e1 | 0.071 | 0.079 | 1.80 | 2.00 | |
| L | 0.220REF | | 0.55REF | | |
| L1 | 0.012 | 0.020 | 0.30 | 0.50 | |
| θ | 0° | 8° | 0° | 8° | |

■ SOT-23 Suggested Pad Layout





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