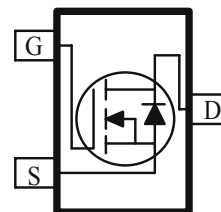
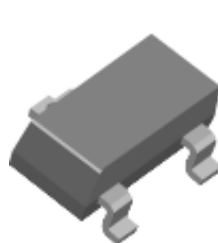


N-Channel 30V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

| PRODUCT SUMMARY | | |
|-----------------|---------------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 30 | 0.058 @ $V_{GS} = 10\text{ V}$ | 2.0 |
| | 0.082 @ $V_{GS} = 4.5\text{ V}$ | 1.7 |

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SC70-3 saves board space
- Fast switching speed
- High performance trench technology



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|--------------------------|----------------|------------|------------------|
| Parameter | | Symbol | Maximum | Units |
| Drain-Source Voltage | | V_{DS} | 30 | V |
| Gate-Source Voltage | | V_{GS} | ± 20 | |
| Continuous Drain Current ^a | $T_A = 25^\circ\text{C}$ | I_D | 2.0 | A |
| | $T_A = 70^\circ\text{C}$ | | 1.7 | |
| Pulsed Drain Current ^b | | I_{DM} | ± 20 | |
| Continuous Source Current (Diode Conduction) ^a | | I_S | 1.6 | A |
| Power Dissipation ^a | $T_A = 25^\circ\text{C}$ | P_D | 0.34 | W |
| | $T_A = 70^\circ\text{C}$ | | 0.22 | |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 150 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | | |
|--|-----------------------|-----------------|---------|--------------------|
| Parameter | | Symbol | Maximum | Units |
| Maximum Junction-to-Ambient ^a | $t \leq 5\text{ sec}$ | $R_{\theta JA}$ | 100 | $^\circ\text{C/W}$ |
| | Steady-State | | 166 | |

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

| SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | | | |
|---|--------------|---|--------|------|-----------|------------|
| Parameter | Symbol | Test Conditions | Limits | | | Unit |
| | | | Min | Typ | Max | |
| Static | | | | | | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$ | 1 | | | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$ | | | 1 | uA |
| | | $V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$ | | | 10 | |
| On-State Drain Current ^A | $I_{D(on)}$ | $V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$ | 10 | | | A |
| Drain-Source On-Resistance ^A | $r_{DS(on)}$ | $V_{GS} = 10 \text{ V}, I_D = 2.0 \text{ A}$ | | | 58 | m Ω |
| | | $V_{GS} = 4.5 \text{ V}, I_D = 1.7 \text{ A}$ | | | 82 | |
| Forward Transconductance ^A | g_{fs} | $V_{DS} = 10 \text{ V}, I_D = 2.0 \text{ A}$ | | 11.3 | | S |
| Diode Forward Voltage | V_{SD} | $I_S = 1.6 \text{ A}, V_{GS} = 0 \text{ V}$ | | 0.75 | | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 10 \text{ V}, V_{GS} = 5 \text{ V}, I_D = 2.0 \text{ A}$ | | 7.5 | | nC |
| Gate-Source Charge | Q_{gs} | | | 0.6 | | |
| Gate-Drain Charge | Q_{gd} | | | 1.0 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 10 \text{ V}, R_L = 15 \Omega, I_D = 1 \text{ A},$ $V_{GEN} = 4.5 \text{ V}$ | | 8 | | ns |
| Rise Time | t_r | | | 24 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 35 | | |
| Fall-Time | t_f | | | 10 | | |

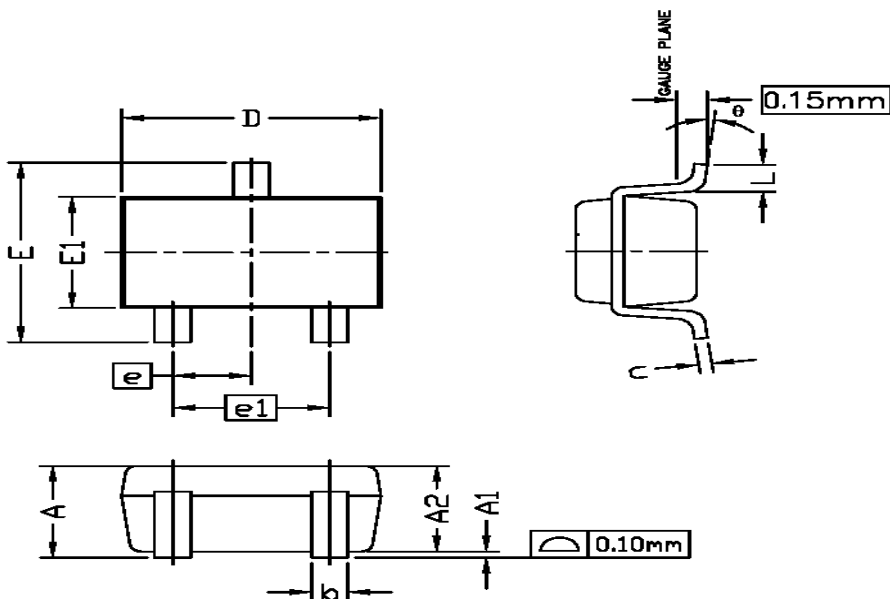
Notes

- Pulse test: $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

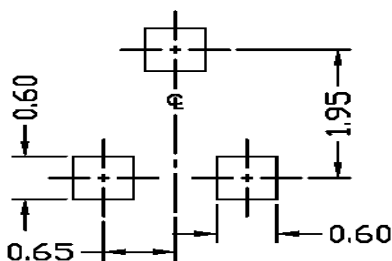
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Package Information

SC70 PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | |
|---------|---------------------------|------|------|----------------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | | | 1.10 | | | 0.043 |
| A1 | 0.00 | | 0.10 | 0.00 | | 0.004 |
| A2 | 0.7 | 0.9 | 1.00 | 0.028 | 0.035 | 0.039 |
| b | 0.15 | | 0.30 | 0.006 | | 0.012 |
| c | 0.08 | | 0.22 | 0.003 | | 0.009 |
| D | 1.85 | 2.10 | 2.15 | 0.073 | 0.083 | 0.085 |
| E | 1.80 | 2.30 | 2.40 | 0.071 | 0.091 | 0.094 |
| e | 0.65 BSC | | | 0.026 BSC | | |
| e1 | 1.30 BSC | | | 0.051 BSC | | |
| E1 | 1.1 | 1.30 | 1.4 | 0.043 | 0.051 | 0.055 |
| L | 0.26 | 0.36 | 0.46 | 0.010 | 0.014 | 0.018 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

NOTE

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONS ARE INCLUSIVE OF PLATING.
3. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 3 MILS EACH.
4. DIE IS FACING UP FOR MOLD AND FACING DOWN FOR TRIM/FORM.
ie: REVERSE TRIM/FORM.
5. DIMENSION L IS MEASURED IN GAUGE PLANE.
6. CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.