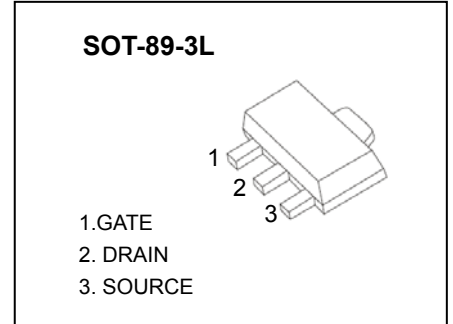


SOT-89-3L Plastic-Encapsulate MOSFETS

2N7002X MOSFET(N-Channel)

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 60V | 5Ω@10V | 115mA |
| | 7Ω@5V | |



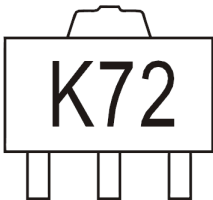
FEATURES

- High density cell design for low $R_{DS(on)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

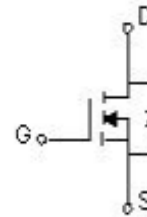
APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

MARKING



Equivalent Circuit



MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|-----------------|---|----------|---------------|
| V_{DS} | Drain-Source Voltage | 60 | V |
| V_{GS} | Gate-Source Voltage | 20 | V |
| I_D | Drain Current | 115 | mA |
| P_D | Power Dissipation | 500 | mW |
| T_J | Junction Temperature | 150 | $^{\circ}C$ |
| T_{STG} | Storage Temperature | -55~+150 | $^{\circ}C$ |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient | 250 | $^{\circ}C/W$ |

MOSFET ELECTRICAL CHARACTERISTICS

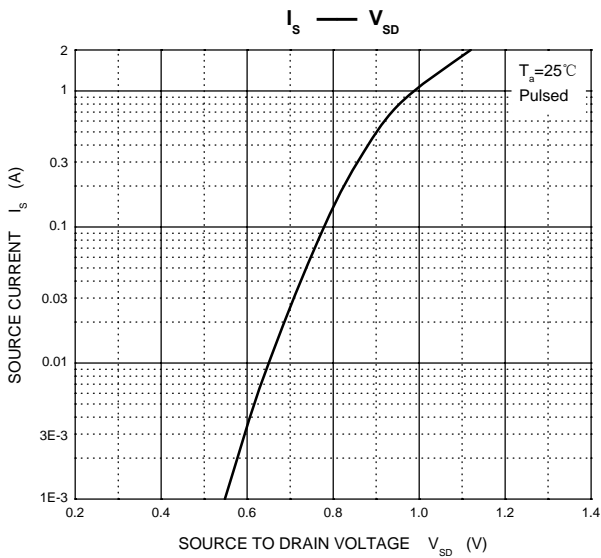
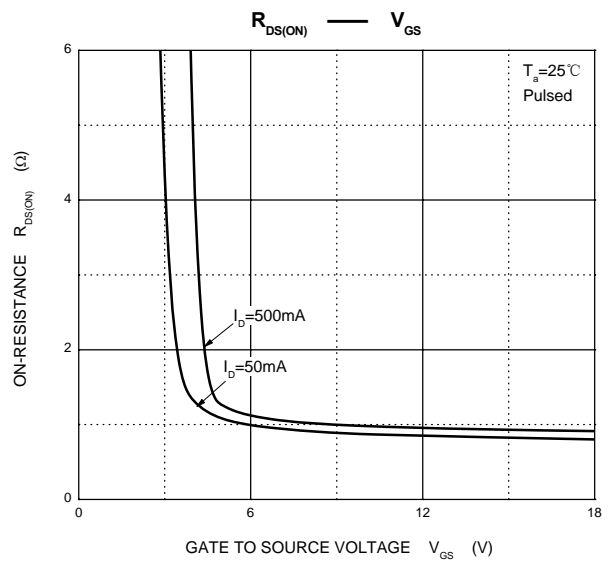
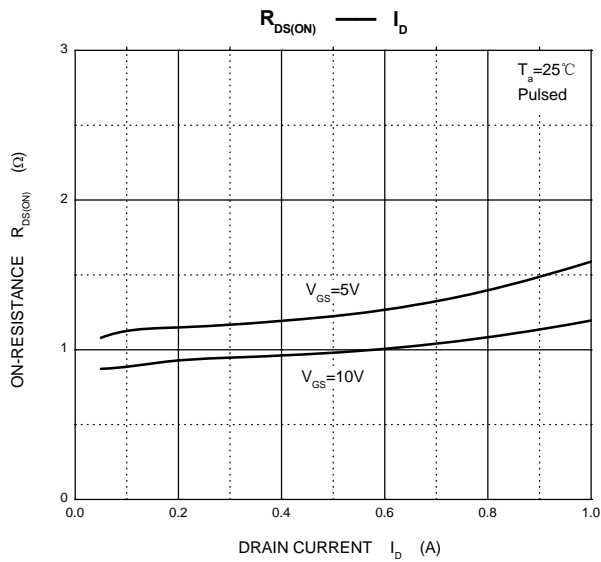
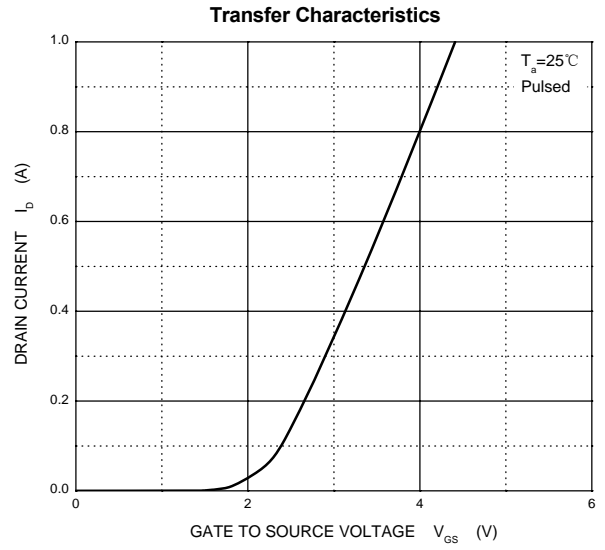
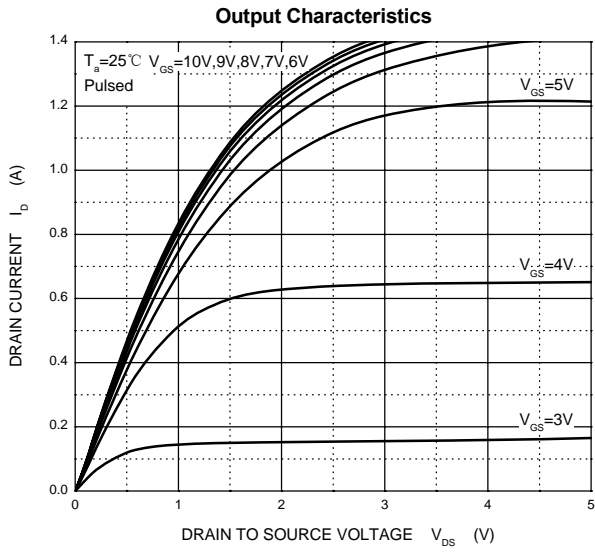
$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--|---------------|---|------|-----|----------|----------|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 60 | | | V |
| Gate-threshold voltage* | $V_{(GS)th}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1 | | 2.5 | |
| Gate-body leakage | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 80 | nA |
| Zero gate voltage drain current | I_{DSS} | $V_{DS}=60V, V_{GS}=0V$ | | | 80 | nA |
| Drain-source on-resistance* | $R_{DS(on)}$ | $V_{GS}=10V, I_D=500mA$ | | | 5 | Ω |
| | | $V_{GS}=5V, I_D=50mA$ | | | 7 | |
| Forward tranconductance* | g_{fs} | $V_{DS}=10V, I_D=200mA$ | 80 | | | ms |
| Drain-source on-voltage | $V_{DS(on)}$ | $V_{GS}=10V, I_D=500mA$ | | | 3.75 | V |
| | | $V_{GS}=5V, I_D=50mA$ | | | 0.375 | V |
| Diode forward voltage* | V_{SD} | $I_S=115mA, V_{GS}=0V$ | 0.55 | | 1.2 | V |
| Turn-on time** | $t_{d(on)}$ | $V_{DD}=25V, R_L=50\Omega, I_D=500mA,$ $V_{GEN}=10V, R_G=25\Omega$ | | | 20 | ns |
| Turn-off time** | $t_{d(off)}$ | | | | 40 | |
| Input capacitance** | C_{iss} | $V_{DS}=25V, V_{GS}=0V, f=1MHz$ | | | 50 | pF |
| Output capacitance** | C_{oss} | | | | 25 | |
| Reverse transfer capacitance** | C_{rss} | | | | 5 | |

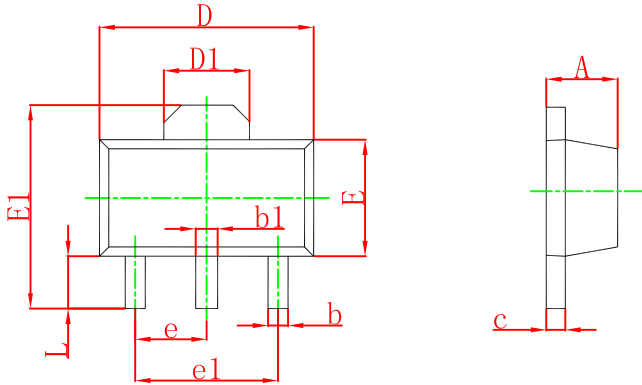
* Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

** These parameters have no way to verify.

Typical Characteristics

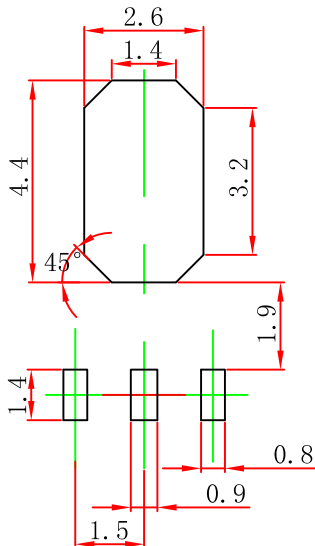


SOT-89-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF. | | 0.061 REF. | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP. | | 0.060 TYP. | |
| e1 | 3.000 TYP. | | 0.118 TYP. | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |

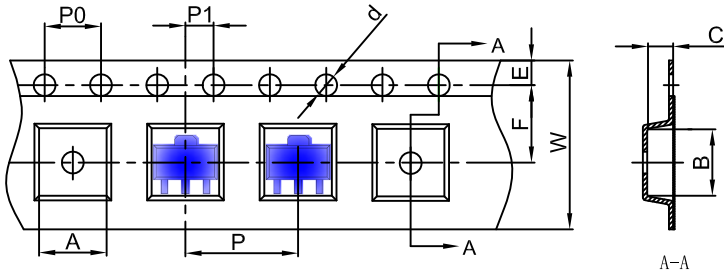
SOT-89-3L Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05 mm.
 3. The pad layout is for reference purposes only.

SOT-89-3L Tape and Reel

SOT-89-3L Embossed Carrier Tape

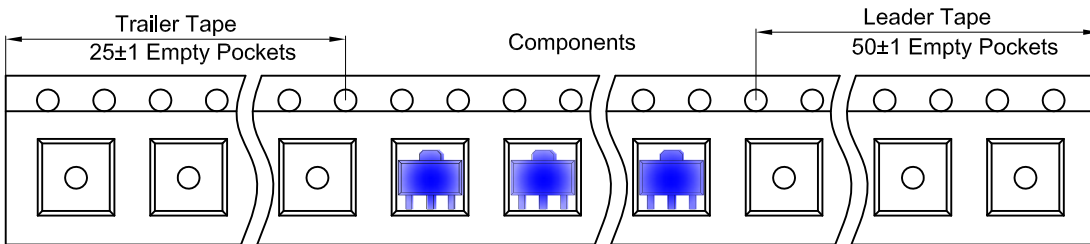


Packaging Description:

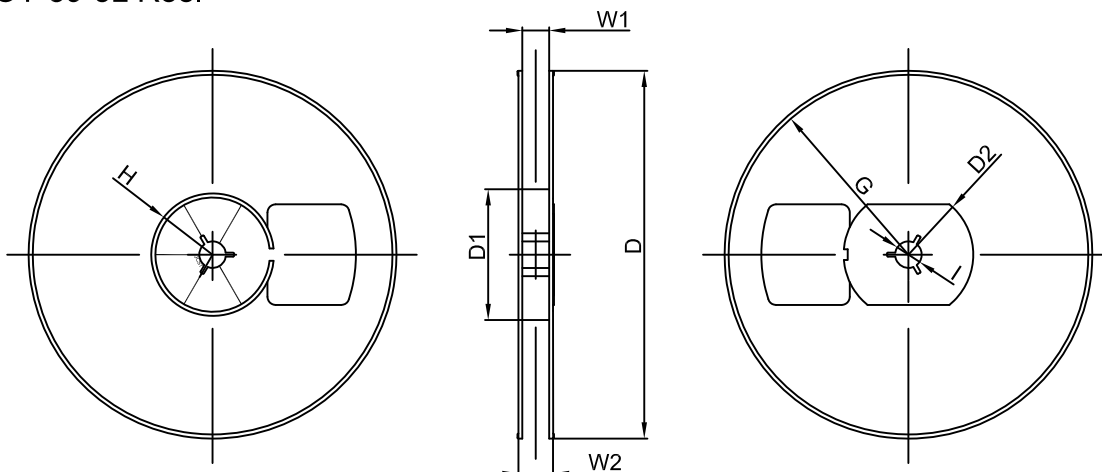
SOT-89-3L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 1,000 units per 7" or 18.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type | A | B | C | d | E | F | P0 | P | P1 | W |
| SOT-89-3L | 4.85 | 4.45 | 1.85 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

SOT-89-3L Tape Leader and Trailer



SOT-89-3L Reel



| Dimensions are in millimeter | | | | | | | | |
|------------------------------|---------|-------|--------|--------|--------|--------|-------|-------|
| Reel Option | D | D1 | D2 | G | H | I | W1 | W2 |
| 7" Dia | Ø180.00 | 60.00 | R32.00 | R86.50 | R30.00 | Ø13.00 | 13.20 | 16.50 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|------------|-----------------|----------|
| 1000 pcs | 7 inch | 10,000 pcs | 203×203×195 | 40,000 pcs | 438×438×220 | |