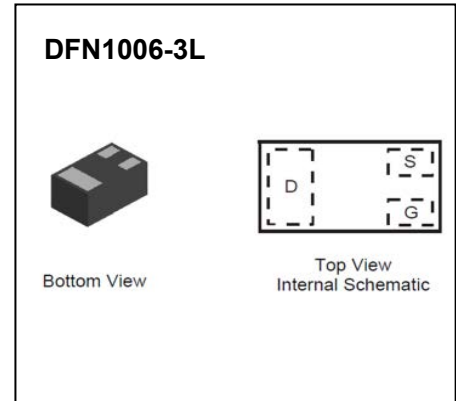




DFN1006-3L Plastic-Encapsulate MOSFETs

BA3139K P-Channel MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|------------------|--------|
| -20V | 520mΩ@-4.5V | -0.66A |
| | 780mΩ@-2.5V | |
| | 950mΩ(TYP)@-1.8V | |



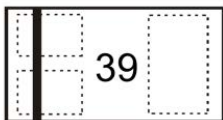
FEATURE

- Lead Free Product is Acquired
- Surface Mount Package
- P-Channel Switch with Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- ESD Protected Gate

APPLICATION

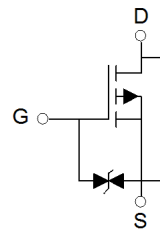
- Load/ Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

MARKING:



Top View
Bar Denotes Gate and Source Side

Equivalent Circuit



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

| Parameter | Symbol | Value | Unit |
|--|-----------------|----------|---------------------------|
| Drain-Source Voltage | V_{DS} | -20 | V |
| Typical Gate-Source Voltage | V_{GS} | ± 12 | V |
| Continuous Drain Current (note 1) | I_D | -0.66 | A |
| Pulsed Drain Current ($t_p=10\mu\text{s}$) | I_{DM} | -1.2 | A |
| Power Dissipation (note 1) | P_D | 275 | mW |
| Thermal Resistance from Junction to Ambient (note 1) | $R_{\theta JA}$ | 455 | $^\circ\text{C}/\text{W}$ |
| Operation Junction and Storage Temperature Range | T_J, T_{STG} | -55~ 150 | $^\circ\text{C}$ |
| Lead Temperature for Soldering Purposes(1/8" from case for 10 s) | T_L | 260 | $^\circ\text{C}$ |

MOSFET ELECTRICAL CHARACTERISTICS

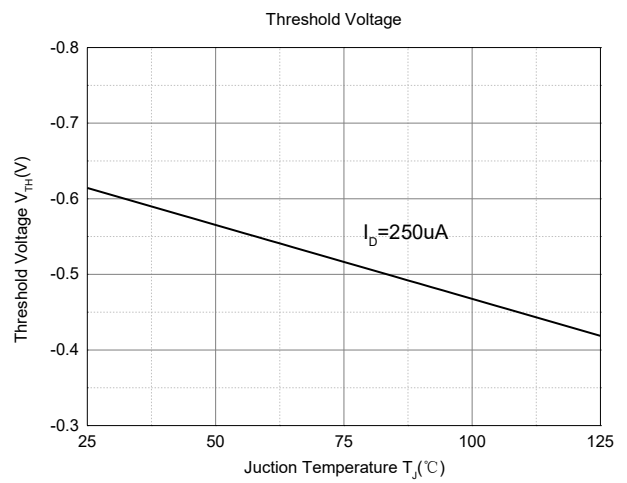
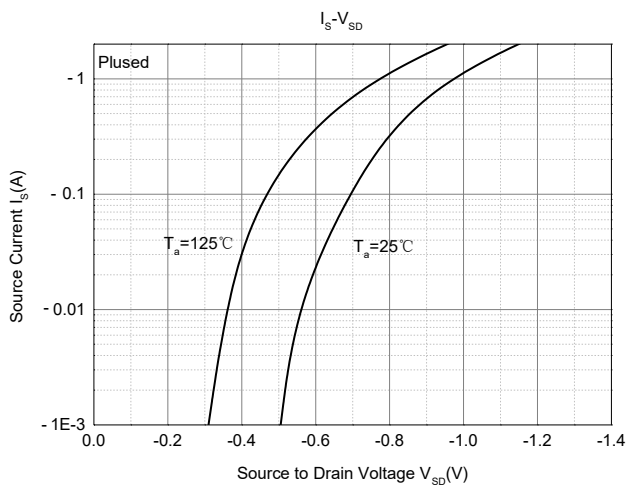
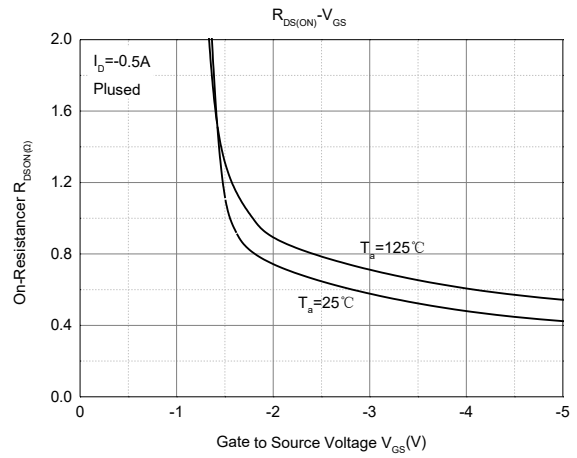
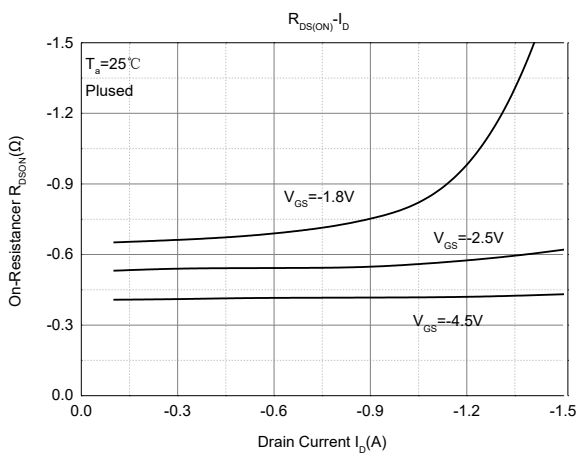
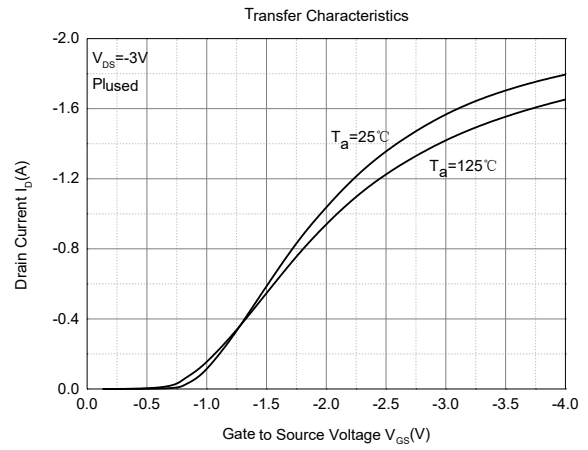
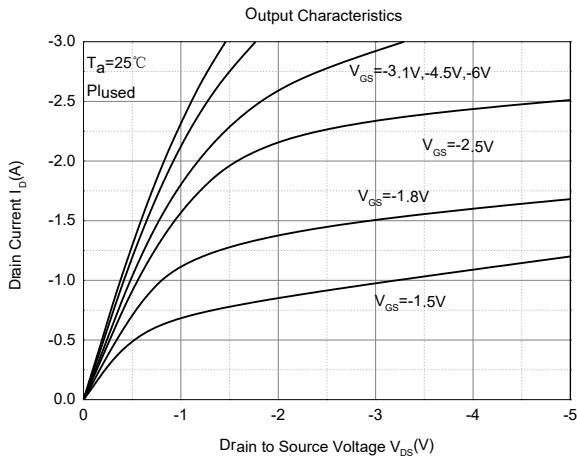
$T_a=25^{\circ}\text{C}$ unless otherwise noted

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|--------------------------------------|---------------|--|-------|-------|----------|-----------|
| STATIC PARAMETERS | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$ | -20 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = -20V, V_{GS} = 0V$ | | | -1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{GS} = \pm 10V, V_{DS} = 0V$ | | | ± 20 | μA |
| Gate threshold voltage (note 2) | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -0.35 | -0.61 | -1.1 | V |
| Drain-source on-resistance(note 2) | $R_{DS(on)}$ | $V_{GS} = -4.5V, I_D = -1A$ | | 450 | 520 | $m\Omega$ |
| | | $V_{GS} = -2.5V, I_D = -0.8A$ | | 650 | 780 | $m\Omega$ |
| | | $V_{GS} = -1.8V, I_D = -0.5A$ | | 950 | | $m\Omega$ |
| Forward tranconductance(note 2) | g_{FS} | $V_{DS} = -10V, I_D = -0.54A$ | | 1.2 | | S |
| Diode forward voltage | V_{SD} | $I_S = -0.5A, V_{GS} = 0V$ | | | -1.2 | V |
| DYNAMIC PARAMETERS(note 4) | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = -16V, V_{GS} = 0V, f = 1MHz$ | | 113 | | μF |
| Output Capacitance | C_{oss} | | | 15 | | μF |
| Reverse Transfer Capacitance | C_{rss} | | | 9 | | μF |
| SWITCHING PARAMETERS (note 4) | | | | | | |
| Turn-on delay time (note 3) | $t_{d(on)}$ | $V_{DD} = -4.5V, V_{GS} = -10V,$ $I_D = -200mA, R_{GEN} = 10\Omega$ | | 9 | | ns |
| Turn-on rise time (note 3) | t_r | | | 5.7 | | ns |
| Turn-off delay time (note 3) | $t_{d(off)}$ | | | 32.6 | | ns |
| Turn-off fall time (note 3) | t_f | | | 20.3 | | ns |

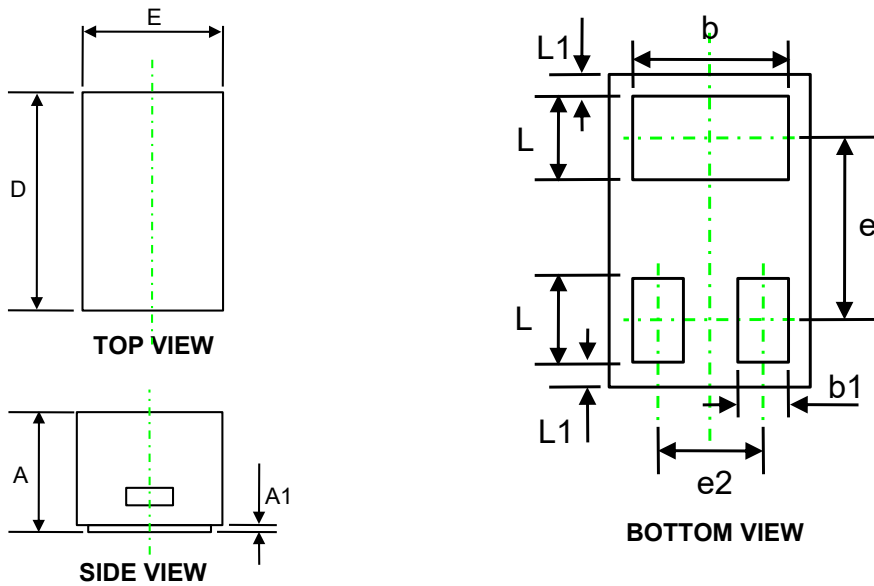
Notes:

1. Surface mounted on FR4 board using 1 square inch pad size, 1oz copper.
2. Pulse Test : Pulse Width=300 μs , Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

Typical Characteristics

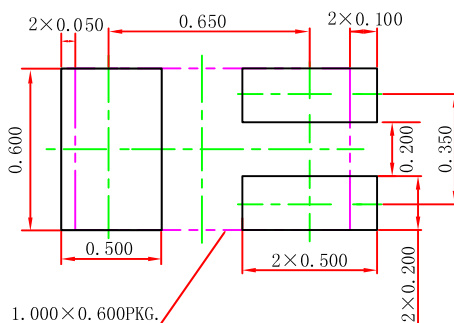


DFN1006-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.400 | 0.550 | 0.016 | 0.022 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| D | 0.950 | 1.050 | 0.037 | 0.041 |
| E | 0.550 | 0.650 | 0.022 | 0.026 |
| b | 0.450 | 0.550 | 0.018 | 0.022 |
| e | 0.650 REF. | | 0.026 REF. | |
| e2 | 0.350 REF. | | 0.014 REF. | |
| L1 | 0.050 REF. | | 0.002 REF. | |
| L | 0.200 | 0.300 | 0.008 | 0.012 |
| b1 | 0.100 | 0.200 | 0.004 | 0.008 |

DFN1006-3L Suggested Pad Layout

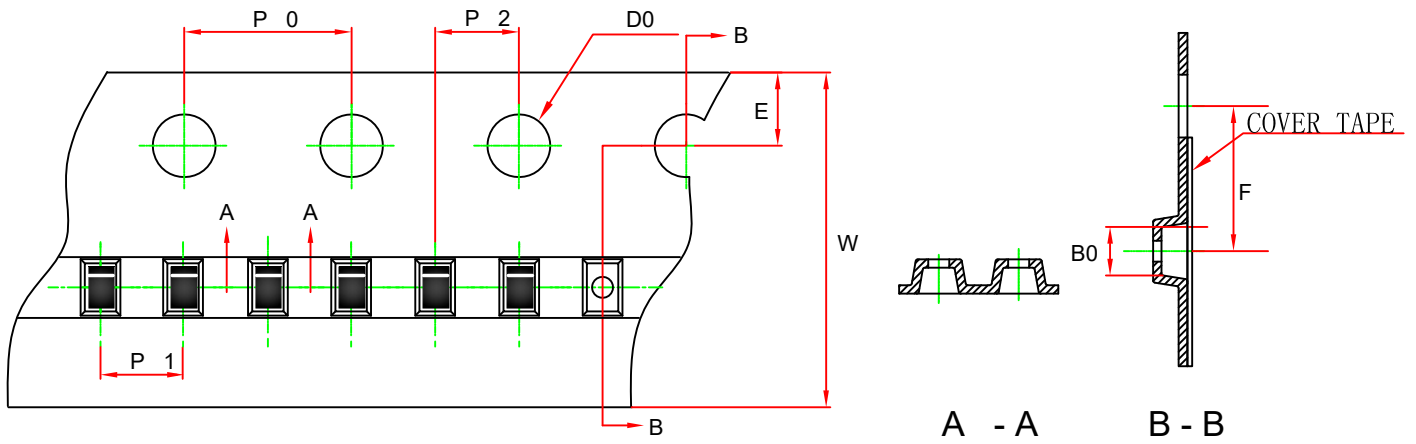


Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.050 mm.
3. The pad layout is for reference purposes only.

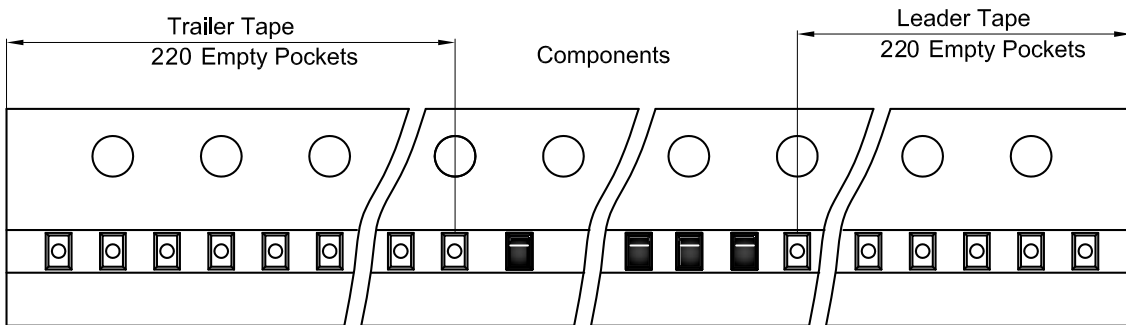
DFN1006-3L Tape and Reel

DFN1006-3L Embossed Carrier Tape

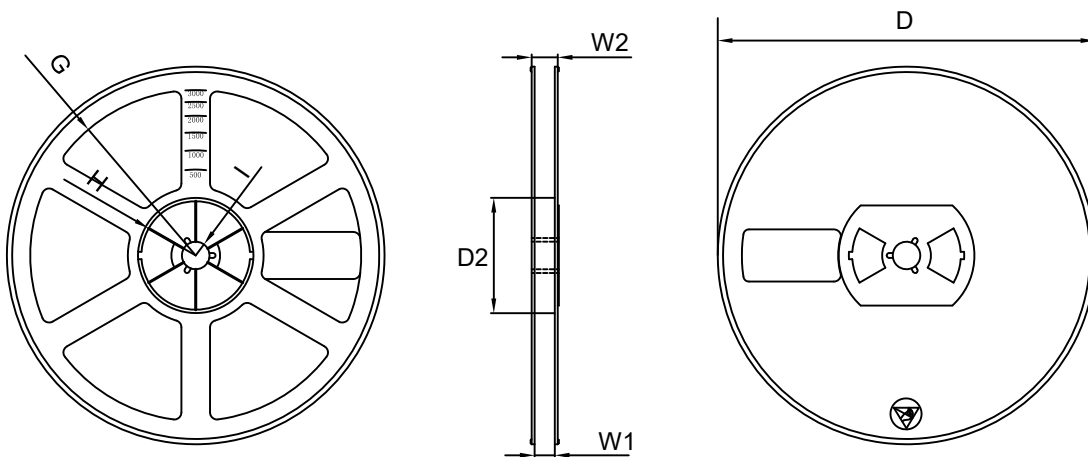


| Dimensions In Millimeters (mm) | | | | | | | | |
|--------------------------------|---------|--------|--------|--------|--------|--------|--------|--------|
| Pkg type | B0 | P0 | P1 | P2 | E | F | W | D0 |
| DFN1006-3L | 1.11 | 4.00 | 2.00 | 2.00 | 1.75 | 3.50 | 8.00 | 1.55 |
| Tolerance | +/-0.06 | +/-0.1 | +/-0.1 | +/-0.1 | +/-0.1 | +/-0.1 | +/-0.3 | +/-0.1 |

DFN1006-3L Tape Leader and Trailer



DFN1006-3L Reel



| Symbol | Dimensions In Millimeters (mm) | | | | | | |
|-----------|--------------------------------|-------|--------|-------|------|------|--------|
| | D | D2 | G | H | I | W1 | W2 |
| 7" Dia | Φ178.00 | 54.50 | R78.00 | R25.6 | R6.5 | 9.50 | 12.30 |
| Tolerance | +/-2 | +/-1 | +/-1 | +/-1 | +/-1 | +/-2 | +/-1.5 |

| REEL | Reel Size | Box | Box size(mm) | Carton | Carton Size(mm) |
|-----------|-----------|------------|--------------|-------------|-----------------|
| 10000 pcs | 7 inch | 150000 pcs | 220×220×210 | 6 00000 pcs | 450×450×240 |