

30V N-Channel MOSFET

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| 30V | 320mΩ@4.5V | 0.6A |
| | 410mΩ@2.5V | |

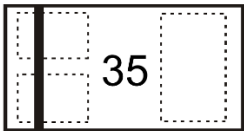
Feature

- Surface Mount Package
- N-Channel Switch with Low $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive
- AEC-Q101 qualified (Automotive grade with suffix " Q ")
- Expsemi electronics

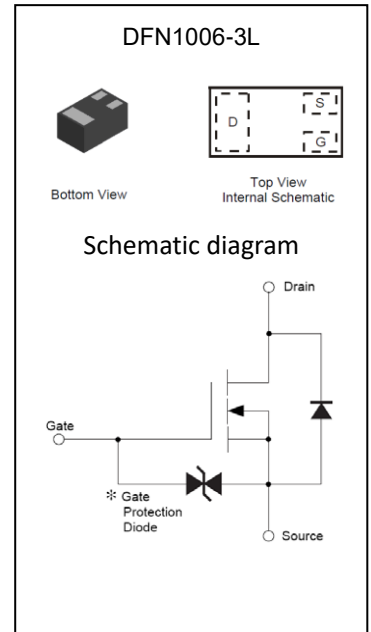
Application

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

MARKING:



Top View
Bar Denotes Gate and Source Side



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

| Parameter | Symbol | Value | Unit |
|--|-----------------|-----------|---------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ±12 | V |
| Continuous Drain Current | I_D | 0.6 | A |
| Pulsed Drain Current ⁽¹⁾ | I_{DM} | 1.8 | A |
| Power Dissipation ⁽²⁾ | P_D | 100 | mW |
| Thermal Resistance from Junction to Ambient ⁽¹⁾ | $R_{\theta JA}$ | 1250 | $^{\circ}C/W$ |
| Junction Temperature | T_J | 150 | $^{\circ}C$ |
| Storage Temperature | T_{STG} | -55~ +150 | $^{\circ}C$ |

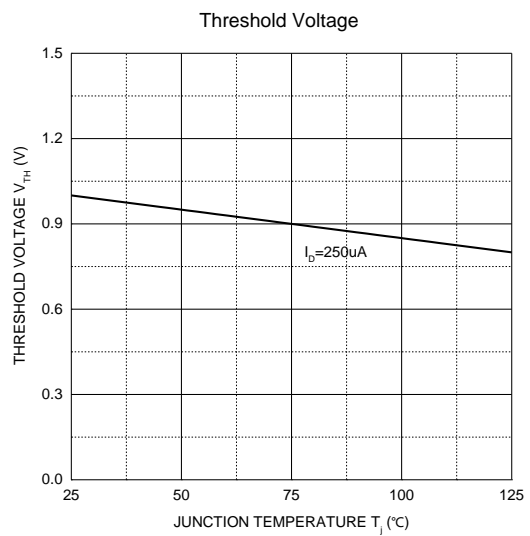
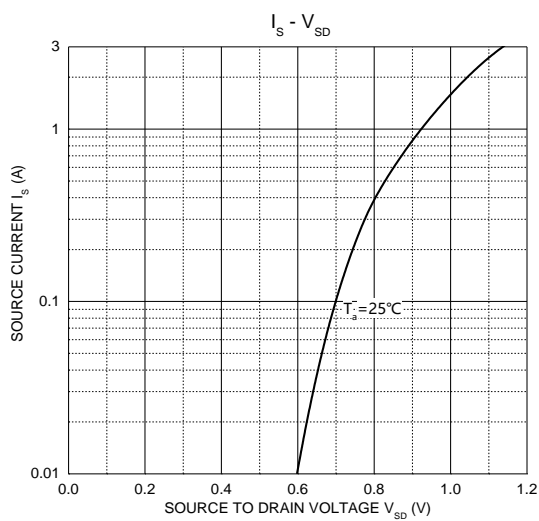
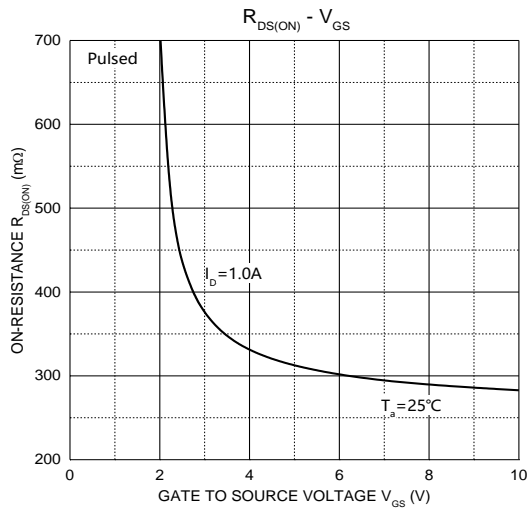
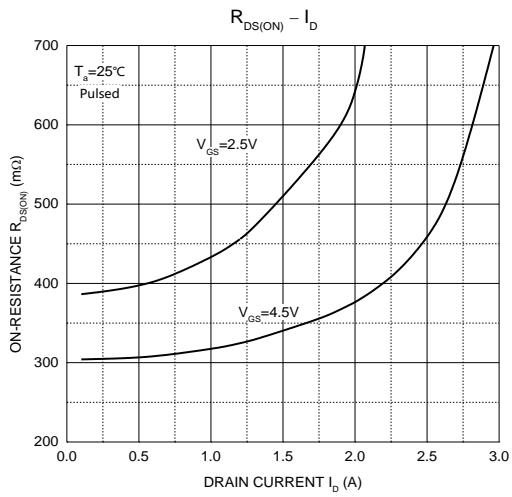
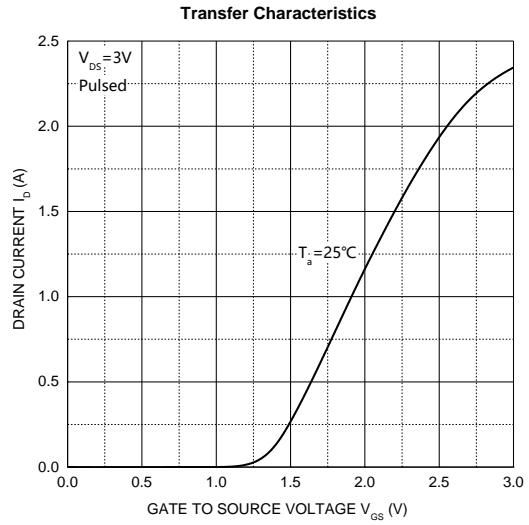
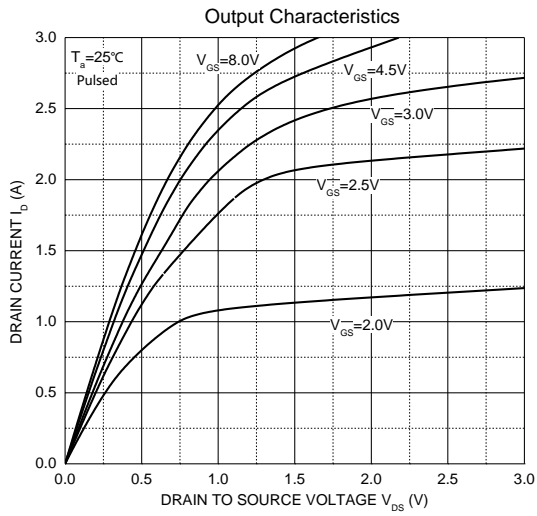
MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|--|----------------------|---|-----|------|-----|------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D =250μA | 30 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =30V, V _{GS} = 0V | | | 1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} =±10V, V _{DS} = 0V | | | ±3 | μA |
| Gate threshold voltage ⁽³⁾ | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 0.5 | 1.0 | 1.5 | V |
| Drain-source on-resistance ⁽³⁾ | R _{DS(on)} | V _{GS} =4.5V, I _D =0.6A | | 320 | 500 | mΩ |
| | | V _{GS} =2.5V, I _D =0.3A | | 410 | 600 | |
| Forward tranconductance | g _{FS} | V _{DS} =5V, I _D =0.5A | 0.1 | | | S |
| Dynamic characteristics⁽⁴⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =10V, V _{GS} =0V, f=1MHz | | 44 | | pF |
| Output Capacitance | C _{oss} | | | 15 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 8 | | |
| Total gate charge | Q _g | V _{DS} =15V, V _{GS} =4.5V, I _D =0.8A | | 1.2 | | nC |
| Gate-source charge | Q _{gs} | | | 0.28 | | |
| Gate-drain charge | Q _{gd} | | | 0.3 | | |
| Switching Characteristics⁽⁴⁾ | | | | | | |
| Turn-on delay time | t _{d(on)} | V _{DS} =15V, I _D =0.7A, V _{GS} =4.5V, R _G =51Ω | | 5.0 | | ns |
| Turn-on rise time | t _r | | | 8.2 | | |
| Turn-off delay time | t _{d(off)} | | | 23 | | |
| Turn-off fall time | t _f | | | 41 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward voltage ⁽³⁾ | V _{DS} | I _S =0.6A, V _{GS} = 0V | | 0.87 | 1.2 | V |

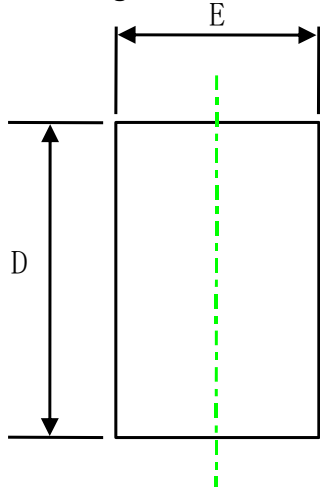
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. This test is performed with no heat sink at T_a=25°C.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.
4. These parameters have no way to verify.

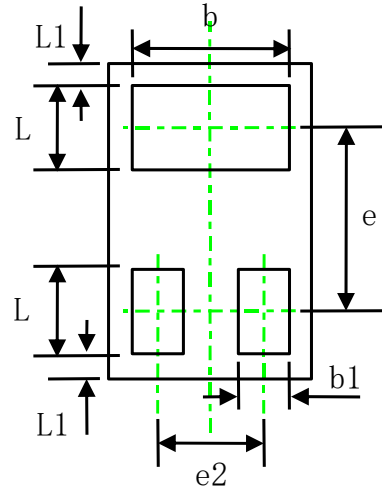
Typical Electrical and Thermal Characteristics



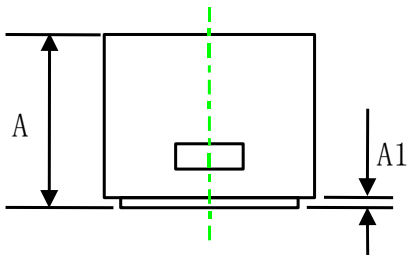
DFN1006-3L Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

| 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 | 0.400 | 0.600 | 0.016 | 0.024 |
| e | 0.65 TYP | | 0.026 TYP | |
| e2 | 0.35 TYP | | 0.014 TYP | |
| L1 | 0.05 REF | | 0.002 REF | |
| L | 0.200 | 0.300 | 0.008 | 0.012 |
| b1 | 0.100 | 0.200 | 0.004 | 0.008 |