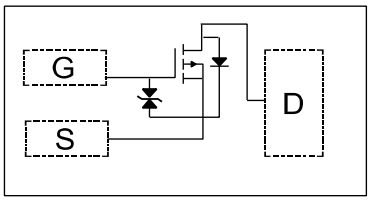
## Description

The MOSFET provide the best combination of fast switching, low on-resistance and cost-effectiveness.

| MOSFET Product Summary | | |
|---|---|---|
| $V_{DS}$(V) | $R_{DS(on)}$(Ω) | $I_D$(mA) |
| -20 | 0.45@ $V_{GS}$=-4.5V | -800 |
| | 0.62@ $V_{GS}$=-2.5V | |
| | 0.86@ $V_{GS}$=-1.8V | |




**Top View**

## Absolute maximum rating@25℃

| Parameter | | Symbol | Value | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±10 | V |
| Continuous Drain Current | Continuous | $I_D$ | -800 | mA |
| | Pulsed | $I_{DP}$ | -1200 | |
| Maximum Power Dissipation (Note 1)(Note 4) | TA=25°C | $P_D$ | 270 | mW |
| | TA=70°C | | 170 | |
| Maximum Power Dissipation (Note 2)(Note 4) | TA=25°C | $P_D$ | 240 | mW |
| | TA=70°C | | 150 | |
| Pulsed Drain Current(Note 3) | | $I_{DM}$ | -1.2 | A |
| Operating Junction Temperature | | $T_J$ | 150 | ℃ |
| Lead Temperature | | $T_L$ | 260 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | -55 to +150 | ℃ |

## Thermal resistance

| Parameter | | Symbol | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Junction-to-Ambient Thermal Resistance (Note 1) | t ≤ 10 s | $R_{\theta JA}$ | - | 350 | 400 | °C/W |
| | Steady State | | - | 395 | 460 | °C/W |
| Junction-to-Ambient Thermal Resistance (Note 2) | t ≤ 10 s | $R_{\theta JA}$ | - | 390 | 445 | °C/W |
| | Steady State | | - | 450 | 515 | °C/W |
| Junction-to-Case Thermal Resistance | Steady State | $R_{\theta JA}$ | - | 245 | 290 | °C/W |

## Electrical characteristics per line@25℃( unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-to-Source Breakdown Voltage | $BV_{DSS}$ | $I_D$ =-250uA,$V_{GS}$=0V | -20 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =-16V,$V_{GS}$=0V | - | - | -1 | μA |
| Gate-to-source Leakage Current | $I_{GSS}$ | $V_{DS}$ =0V,$V_{GS}$=±8V | - | - | ±10 | μA |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = -250uA | -0.45 | -0.55 | -0.95 | V |
| Drain-to-source On-resistance (Note 5) | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$ =-700mA | - | 450 | 700 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$ =-300mA | - | 620 | 850 | mΩ |
| | | $V_{GS}$=-1.8V, $I_D$ =-100mA | - | 1000 | 1500 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-5V, $I_D$ =-450mA | - | 1.25 | - | s |
| **CHARGES, CAPACITANCES AND GATE RESISTANCE** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{GS}$=0V, $V_{DS}$ =-10V, f=1MHz | - | 72 | - | pF |
| Output Capacitance | $C_{OSS}$ | | - | 9.5 | - | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | - | 9.8 | - | pF |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ =-4.5V,$V_{DS}$=-10V, $I_D$ =-450mA | - | 0.9 | - | nC |
| Threshold Gate Charge | $Q_{G(TH)}$ | | - | 0.1 | - | nC |
| Gate-to-Source Charge | $Q_{GS}$ | | - | 0.15 | - | nC |
| Gate-to-Drain Charge | $Q_{GD}$ | | - | 0.3 | - | nC |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| Turn-On Delay Time | td(ON) | $V_{GS}$ =-4.5V, $V_{DS}$=-10V , $I_D$ =-450mA $R_G$=6Ω | - | 43 | - | nS |
| Rise Time | tr | | - | 137 | - | nS |
| Turn-Off Delay Time | td(OFF) | | - | 1450 | - | nS |
| Fall Time | tf | | - | 2050 | - | nS |
| **BODY DIODE CHARACTERISTICS** | | | | | | |
| Forward Voltage | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-150mA | -0.5 | -0.65 | -1.1 | V |

Note:

1. Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper
2. Surface mounted on FR4 board using minimum pad size, 1oz copper
3. Pulse width<380μs, Single pulse
4. Maximum junction temperature TJ=150°C.
5. Pulse test: Pulse width <380 us duty cycle <2%.

## Typical Characteristics

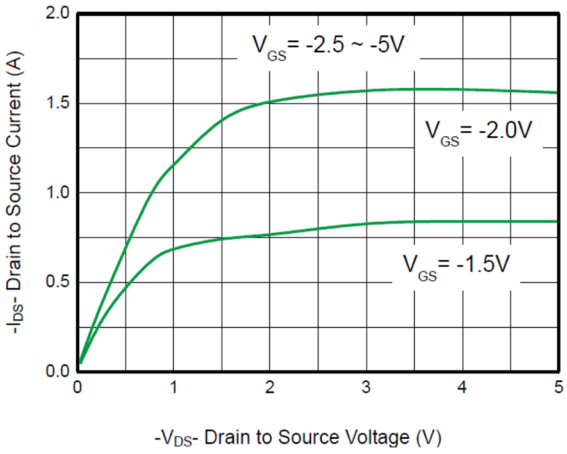



Fig 1. Output characteristics

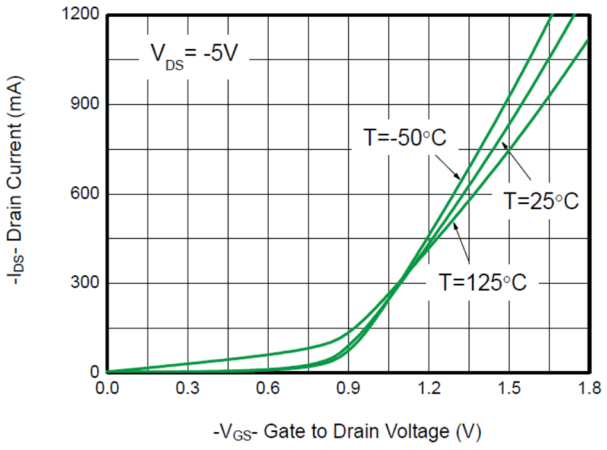



Fig 2. Transfer characteristics

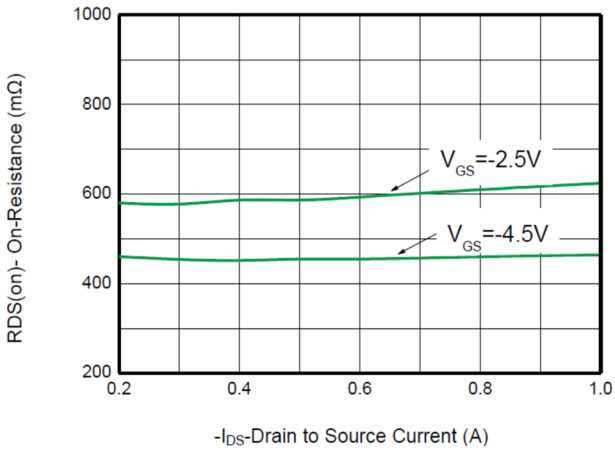



Fig 3. On-Resistance vs. Drain current

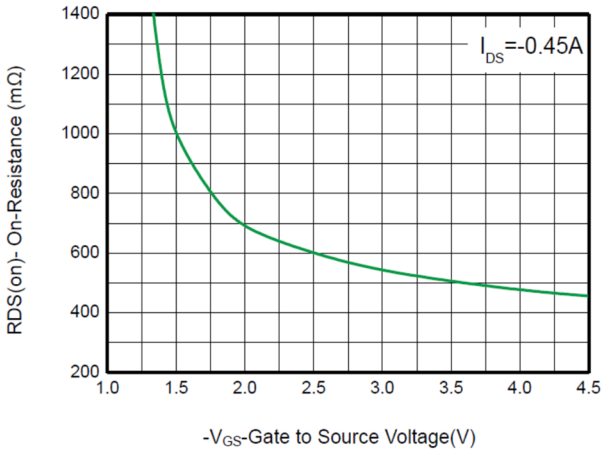



Fig 4. On-Resistance vs. Gate-to-Source voltage

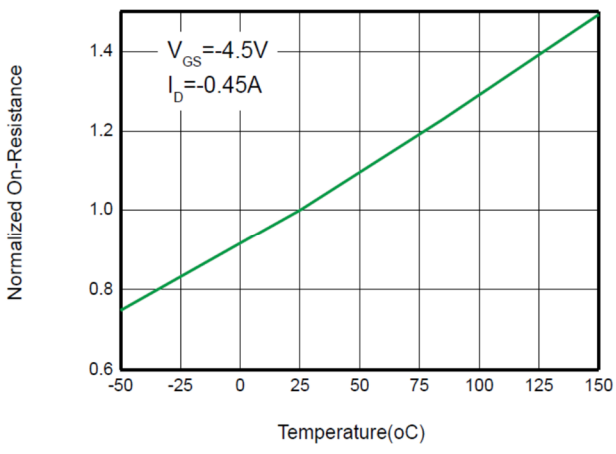



Fig 5. On-Resistance vs. Junction temperature

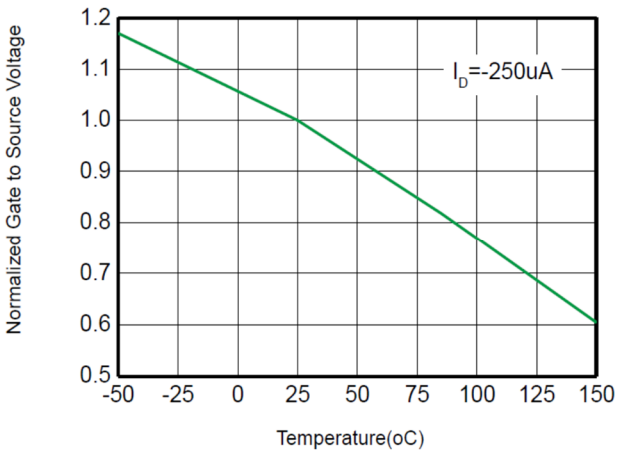



Fig 6. Threshold voltage vs. Temperature

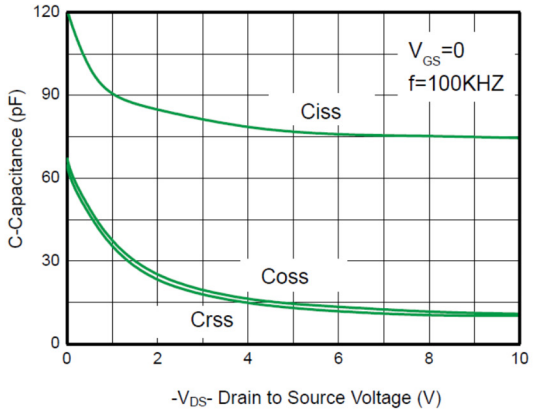



Fig 7. Capacitance.

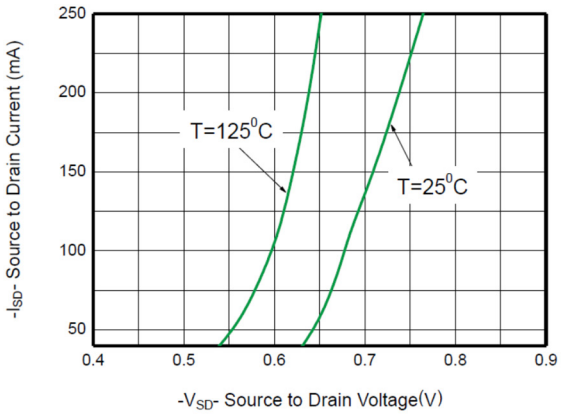
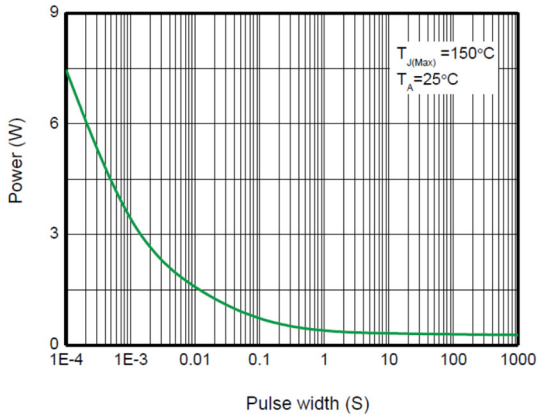
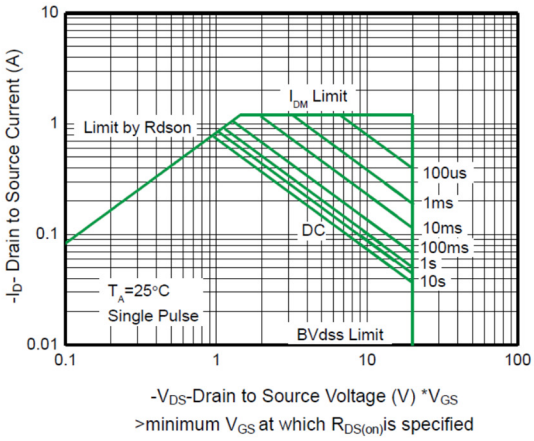
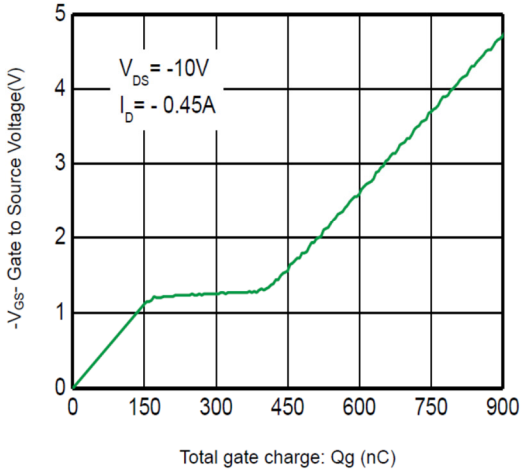
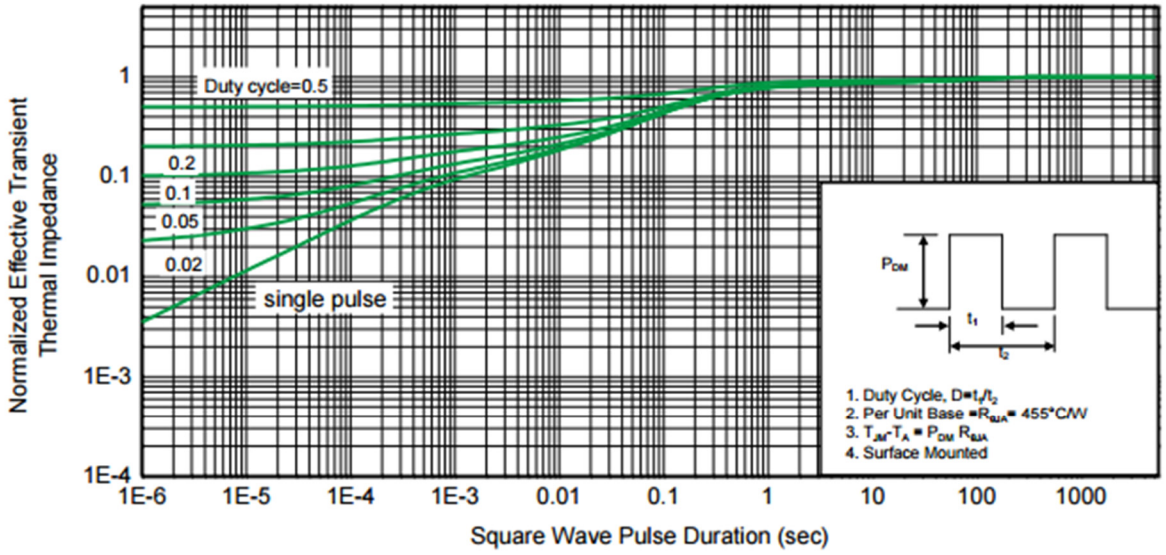



Fig 8. Body diode forward voltage



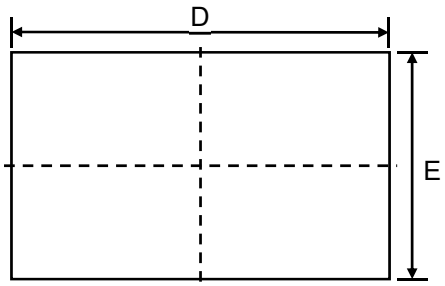



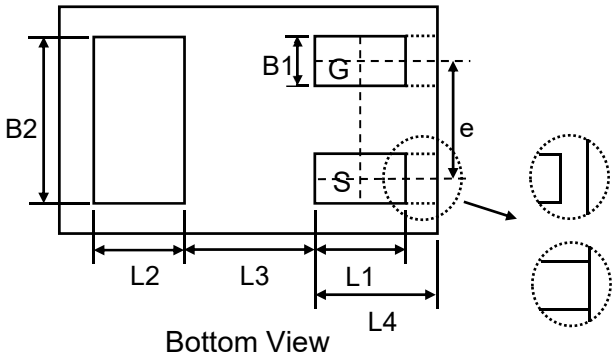



**Transient thermal response (Junction-to-Ambient)**

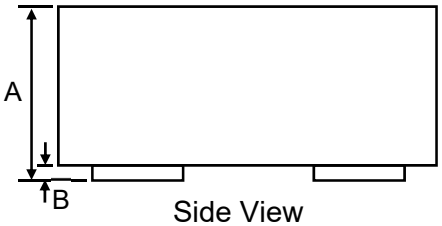
## Product dimension (DFN1006-3L)



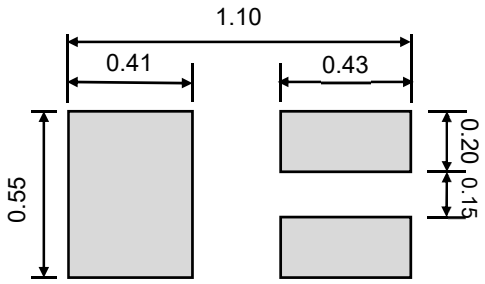

Top View




Bottom View




Side View

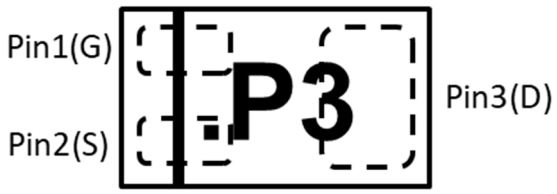



Suggested PCB Layout

Unit:mm

| Dim | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.33 | 0.55 | 0.013 | 0.022 |
| B | 0.00 | 0.05 | 0.000 | 0.002 |
| B1 | 0.10 | 0.20 | 0.004 | 0.008 |
| B2 | 0.45 | 0.55 | 0.018 | 0.022 |
| D | 0.90 | 1.05 | 0.035 | 0.041 |
| E | 0.50 | 0.65 | 0.020 | 0.026 |
| e | 0.35 | | 0.014 | |
| L1 | 0.20 | 0.30 | 0.008 | 0.012 |
| L2 | 0.20 | 0.30 | 0.008 | 0.012 |
| L3 | 0.39 | | 0.015 | |
| L4 | 0.25 | 0.35 | 0.010 | 0.014 |

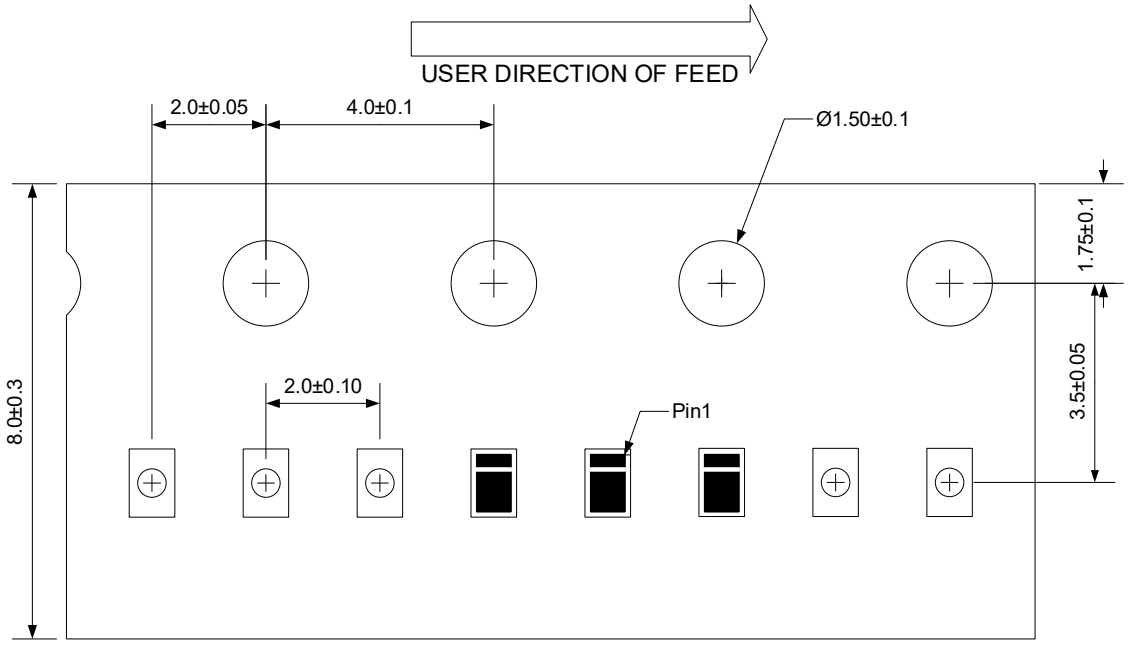
## Marking information




## Ordering information

| Device | Package | Reel | Shipping |
|---|---|---|---|
| PPM3FD20V1EN | DFN1006-3L(Pb-Free) | 7" | 10000 / Tape & Reel |

## Load with information




Unit:mm

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