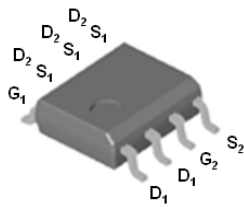


# PD1503YVS

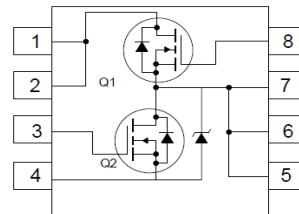
## Dual N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

|    | $V_{(BR)DSS}$ | $R_{DS(ON)}$            | $I_D$ |
|----|---------------|-------------------------|-------|
| Q2 | 30V           | 15.8mΩ @ $V_{GS} = 10V$ | 9A    |
| Q1 | 30V           | 21.0mΩ @ $V_{GS} = 10V$ | 8A    |



SOP- 08



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS                     |                      | SYMBOL         | Q2         | Q1  | UNITS |
|--|----------------------|----------------|------------|-----|-------|
| Drain-Source Voltage                           |                      | $V_{DS}$       | 30         | 30  | V     |
| Gate-Source Voltage                            |                      | $V_{GS}$       | ±20        | ±20 |       |
| Continuous Drain Current <sup>2</sup>          | $T_A = 25\text{ °C}$ | $I_D$          | 9          | 8   | A     |
|  | $T_A = 70\text{ °C}$ |                | 7          | 6   |       |
| Pulsed Drain Current <sup>1, 2</sup>           |                      | $I_{DM}$       | 35         | 30  |       |
| Avalanche Current                              |                      | $I_{AS}$       | 29         | 21  |       |
| Avalanche Energy                               | L = 0.1mH            | $E_{AS}$       | 43         | 23  | mJ    |
| Power Dissipation                              | $T_A = 25\text{ °C}$ | $P_D$          | 2          |     | W     |
|  | $T_A = 70\text{ °C}$ |                | 1.28       |     |       |
| Operating Junction & Storage Temperature Range |                      | $T_J, T_{STG}$ | -55 to 150 |     | °C    |

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS | SYMBOL      | Schottky | UNITS   |
|----------------------------|-------------|----------|---------|
| Reverse Current            | $V_R = 25V$ | $I_R$    | 0.05 mA |
| Forward Voltage            | $I_F = 1A$  | $V_F$    | 0.45 V  |

### THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE  | SYMBOL          | TYPICAL | MAXIMUM | UNITS  |
|---------------------|-----------------|---------|---------|--------|
| Junction-to-Ambient | $R_{\theta JA}$ |         | 62.5    | °C / W |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Limited only by maximum temperature allowed

# PD1503YVS

## Dual N-Channel Enhancement Mode MOSFET

### Q2 ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

| PARAMETER   | SYMBOL               | TEST CONDITIONS   | LIMITS |      |      | UNIT |
|---|----------------------|---|--------|------|------|------|
|   |                      |   | MIN    | TYP  | MAX  |      |
| <b>STATIC</b>   |                      |   |        |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA  | 30     |      |      | V    |
| Gate Threshold Voltage  | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                | 1      | 1.7  | 3    | V    |
| Gate-Body Leakage   | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V  |        |      | ±100 | nA   |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>     | V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V   |        |      | 1    | μA   |
|   |                      | V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C                      |        |      | 10   |      |
| On-State Drain Current <sup>1</sup>   | I <sub>D(ON)</sub>   | V <sub>DS</sub> = 5V, V <sub>GS</sub> = 10V   | 35     |      |      | A    |
| Drain-Source On-State Resistance <sup>1</sup>                                 | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7A   |        | 14.2 | 20   | mΩ   |
|   |                      | V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A  |        | 10.5 | 15.8 |      |
| Forward Transconductance <sup>1</sup>   | g <sub>fs</sub>      | V <sub>DS</sub> = 5V, I <sub>D</sub> = 9A   |        | 25   |      | S    |
| <b>DYNAMIC</b>  |                      |   |        |      |      |      |
| Input Capacitance   | C <sub>iss</sub>     | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz                                     |        | 1040 |      | pF   |
| Output Capacitance  | C <sub>oss</sub>     |   |        | 295  |      |      |
| Reverse Transfer Capacitance  | C <sub>rss</sub>     |   |        | 139  |      |      |
| Gate Resistance   | R <sub>g</sub>       | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz                                      |        | 1.5  |      | Ω    |
| Total Gate Charge <sup>2</sup>  | Q <sub>g</sub>       | V <sub>DS</sub> = 0.5V <sub>(BR)DSS</sub> ,<br>I <sub>D</sub> = 9A, V <sub>GS</sub> = 10V |        | 20   |      | nC   |
| Gate-Source Charge <sup>2</sup>   | Q <sub>gs</sub>      |   |        | 3.8  |      |      |
| Gate-Drain Charge <sup>2</sup>  | Q <sub>gd</sub>      |   |        | 4.3  |      |      |
| Turn-On Delay Time <sup>2</sup>   | t <sub>d(on)</sub>   | V <sub>DD</sub> = 15V, I <sub>D</sub> = 1A, V <sub>GS</sub> = 10V,<br>R <sub>G</sub> = 6Ω |        | 18   |      | nS   |
| Rise Time <sup>2</sup>  | t <sub>r</sub>       |   |        | 12   |      |      |
| Turn-Off Delay Time <sup>2</sup>  | t <sub>d(off)</sub>  |   |        | 40   |      |      |
| Fall Time <sup>2</sup>  | t <sub>f</sub>       |   |        | 8    |      |      |
| <b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b> |                      |   |        |      |      |      |
| Continuous Current  | I <sub>S</sub>       |   |        |      | 2.8  | V    |
| Forward Voltage <sup>1</sup>  | V <sub>SD</sub>      | I <sub>F</sub> = 9A, V <sub>GS</sub> = 0V   |        |      | 0.7  | V    |
| Reverse Recovery Time   | t <sub>rr</sub>      | I <sub>F</sub> = 9A, dI <sub>F</sub> /dt = 100A / μS                                      |        | 15   |      | nS   |
| Reverse Recovery Charge   | Q <sub>rr</sub>      |   |        |      | 6    |      |

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

# PD1503YVS

## Dual N-Channel Enhancement Mode MOSFET

### Q1 ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

| PARAMETER   | SYMBOL               | TEST CONDITIONS   | LIMITS |      |      | UNIT |
|---|----------------------|---|--------|------|------|------|
|   |                      |   | MIN    | TYP  | MAX  |      |
| <b>STATIC</b>   |                      |   |        |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA  | 30     |      |      | V    |
| Gate Threshold Voltage  | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                | 1      | 2    | 3    | V    |
| Gate-Body Leakage   | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V  |        |      | ±100 | nA   |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>     | V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V   |        |      | 1    | μA   |
|   |                      | V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C                      |        |      | 10   |      |
| On-State Drain Current <sup>1</sup>   | I <sub>D(ON)</sub>   | V <sub>DS</sub> = 5V, V <sub>GS</sub> = 10V   | 30     |      |      | A    |
| Drain-Source On-State Resistance <sup>1</sup>                                 | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A   |        | 25.6 | 32   | mΩ   |
|   |                      | V <sub>GS</sub> = 10V, I <sub>D</sub> = 7A  |        | 15.8 | 21   |      |
| Forward Transconductance <sup>1</sup>   | g <sub>fs</sub>      | V <sub>DS</sub> = 5V, I <sub>D</sub> = 7A   |        | 15   |      | S    |
| <b>DYNAMIC</b>  |                      |   |        |      |      |      |
| Input Capacitance   | C <sub>iss</sub>     | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz                                     |        | 560  |      | pF   |
| Output Capacitance  | C <sub>oss</sub>     |   |        | 160  |      |      |
| Reverse Transfer Capacitance  | C <sub>rss</sub>     |   |        | 84   |      |      |
| Gate Resistance   | R <sub>g</sub>       | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz                                      |        | 2    |      | Ω    |
| Total Gate Charge <sup>2</sup>  | Q <sub>g</sub>       | V <sub>DS</sub> = 0.5V <sub>(BR)DSS</sub> ,<br>I <sub>D</sub> = 7A, V <sub>GS</sub> = 10V |        | 11   |      | nC   |
| Gate-Source Charge <sup>2</sup>   | Q <sub>gs</sub>      |   |        | 2.5  |      |      |
| Gate-Drain Charge <sup>2</sup>  | Q <sub>gd</sub>      |   |        | 3.1  |      |      |
| Turn-On Delay Time <sup>2</sup>   | t <sub>d(on)</sub>   | V <sub>DD</sub> = 15V, I <sub>D</sub> = 1A, V <sub>GS</sub> = 10V, R <sub>G</sub> = 6Ω    |        | 19   |      | nS   |
| Rise Time <sup>2</sup>  | t <sub>r</sub>       |   |        | 8    |      |      |
| Turn-Off Delay Time <sup>2</sup>  | t <sub>d(off)</sub>  |   |        | 39   |      |      |
| Fall Time <sup>2</sup>  | t <sub>f</sub>       |   |        | 6    |      |      |
| <b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b> |                      |   |        |      |      |      |
| Continuous Current  | I <sub>S</sub>       |   |        |      | 2    | V    |
| Forward Voltage <sup>1</sup>  | V <sub>SD</sub>      | I <sub>F</sub> = 7A, V <sub>GS</sub> = 0V   |        |      | 1    | V    |
| Reverse Recovery Time   | t <sub>rr</sub>      | I <sub>F</sub> = 7A, dI <sub>F</sub> /dt = 100A / μS                                      |        | 20   |      | nS   |
| Reverse Recovery Charge   | Q <sub>rr</sub>      |   |        |      | 12   |      |

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

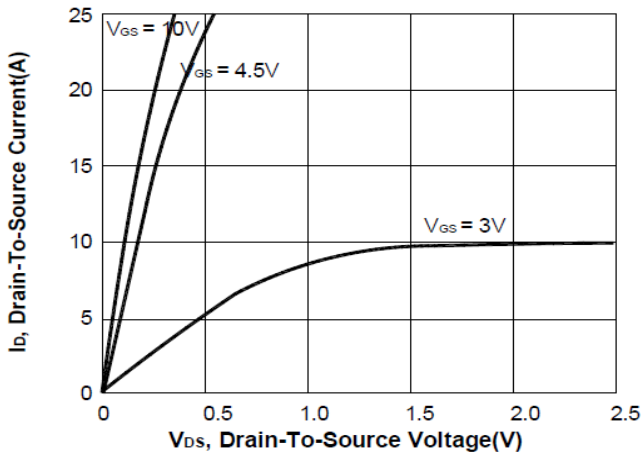
<sup>2</sup>Independent of operating temperature.

# PD1503YVS

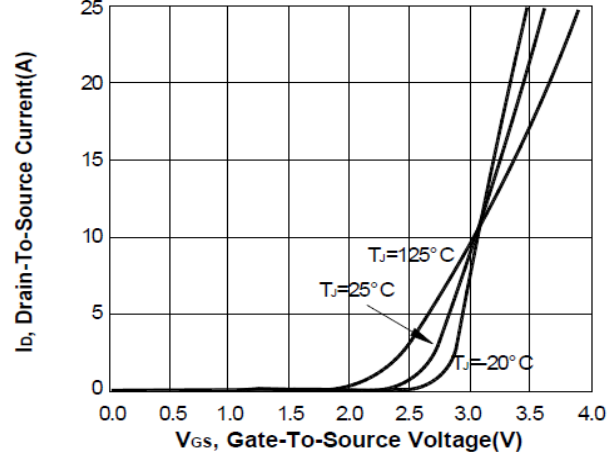
## Dual N-Channel Enhancement Mode MOSFET

### Typical Characteristics: Q2

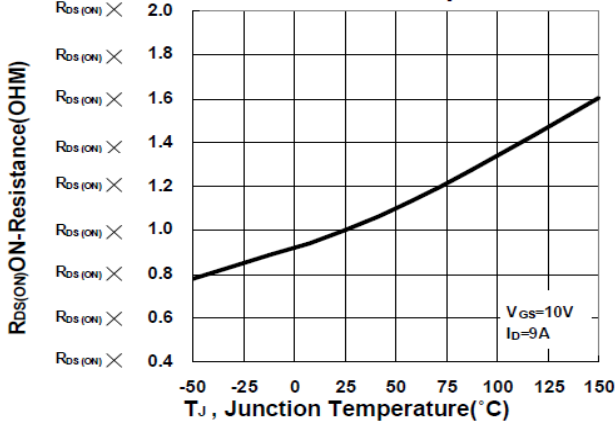
**Output Characteristics**



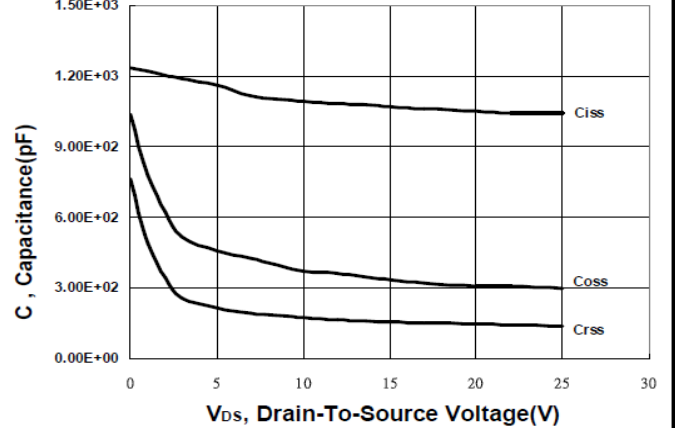
**Transfer Characteristics**



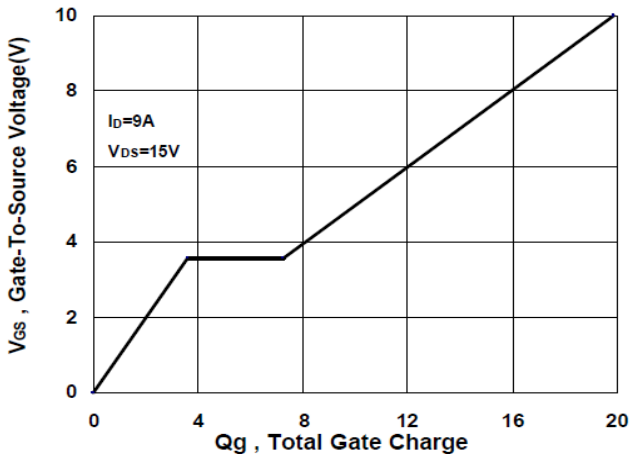
**On-Resistance VS Temperature**



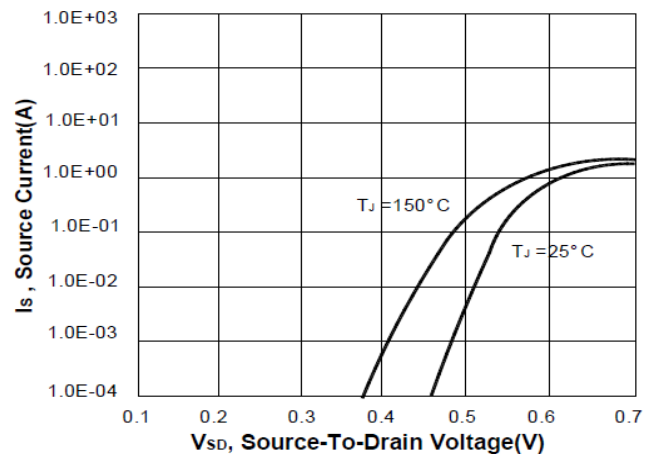
**Capacitance Characteristic**



**Gate charge Characteristics**

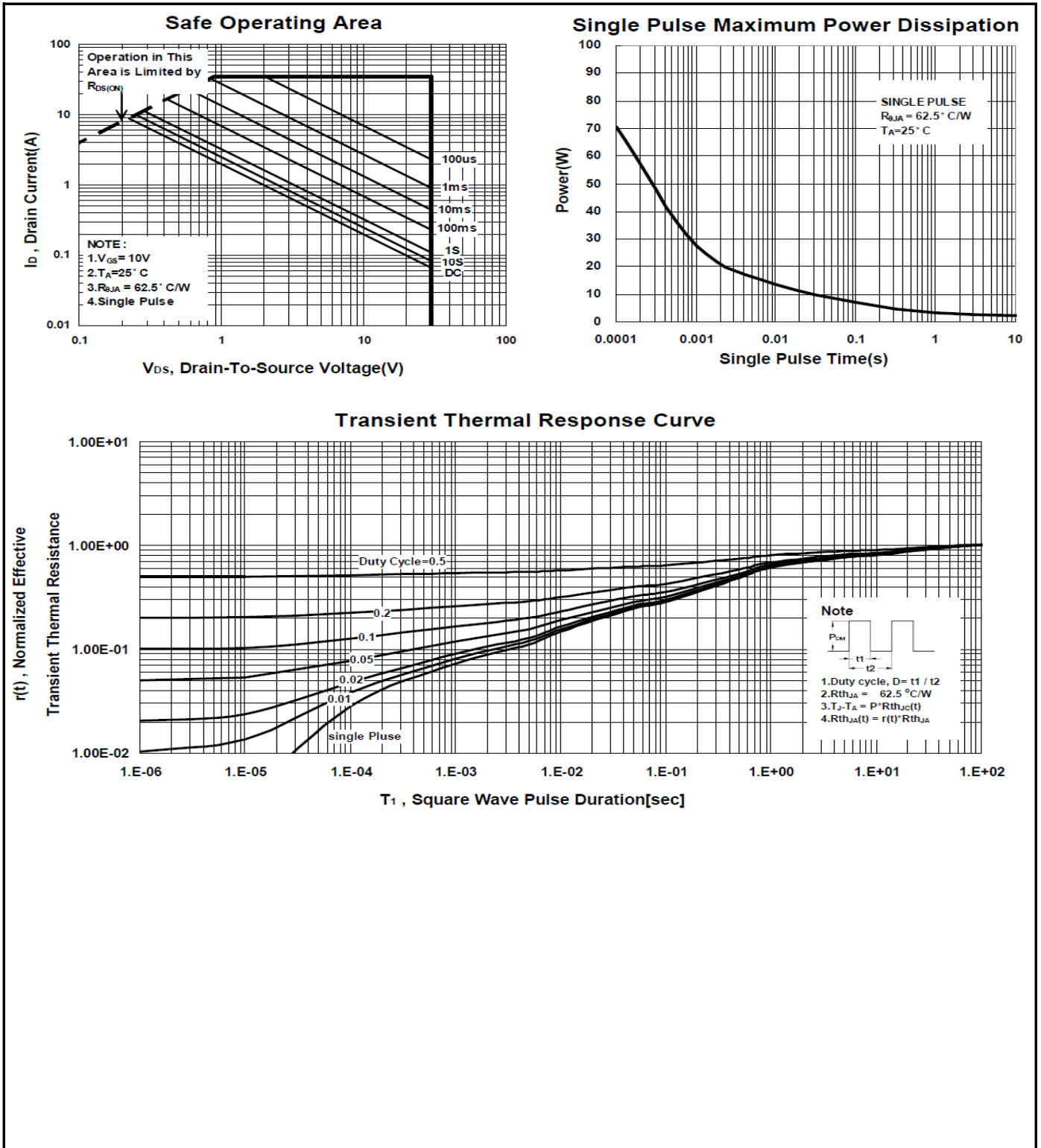


**Source-Drain Diode Forward Voltage**



# PD1503YVS

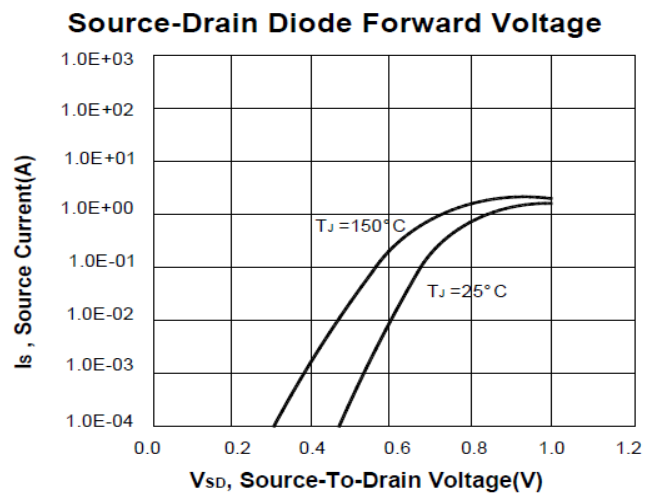
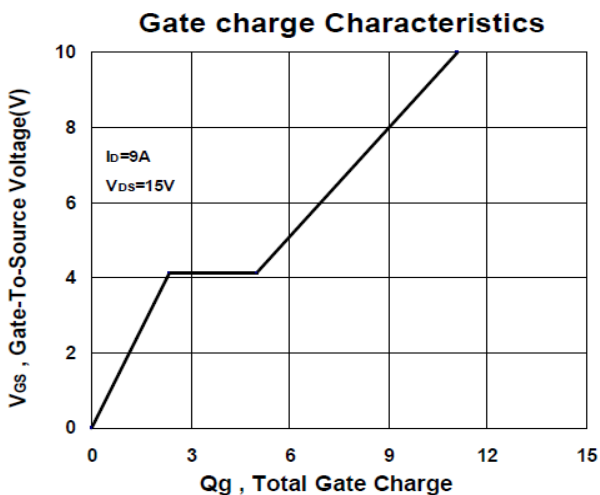
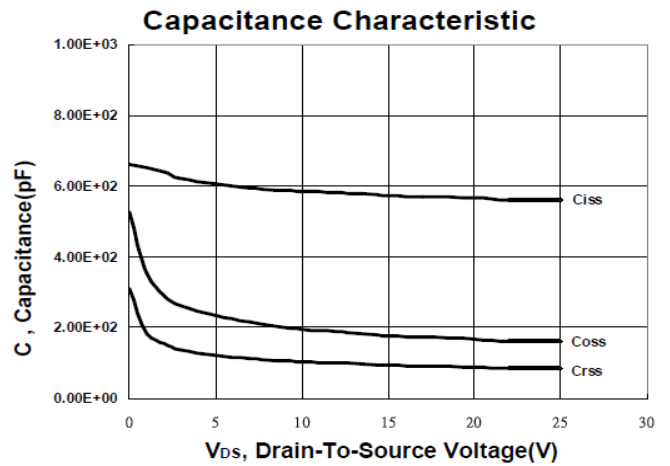
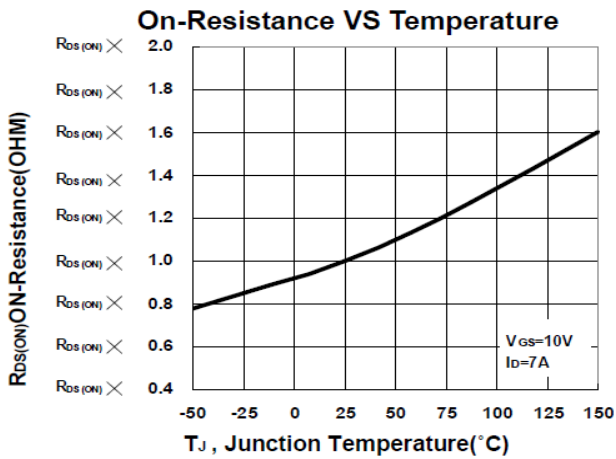
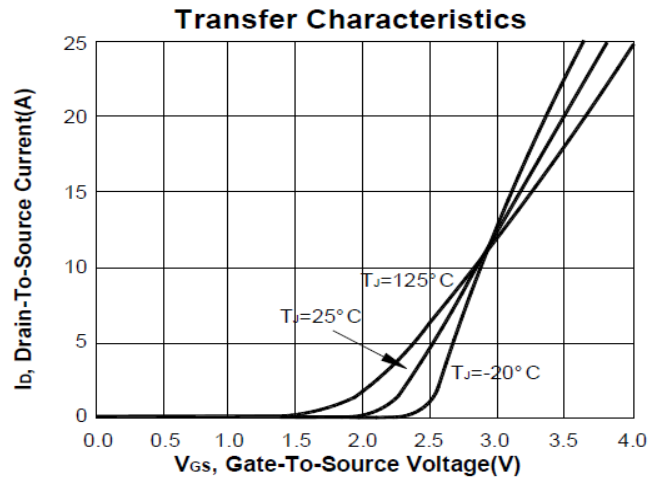
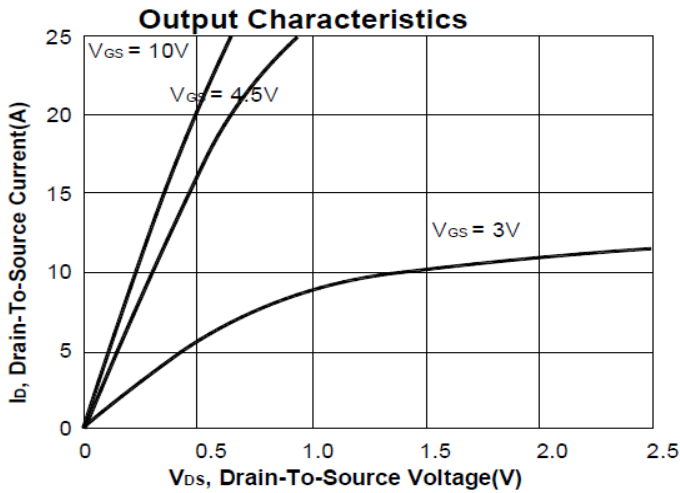
## Dual N-Channel Enhancement Mode MOSFET



# PD1503YVS

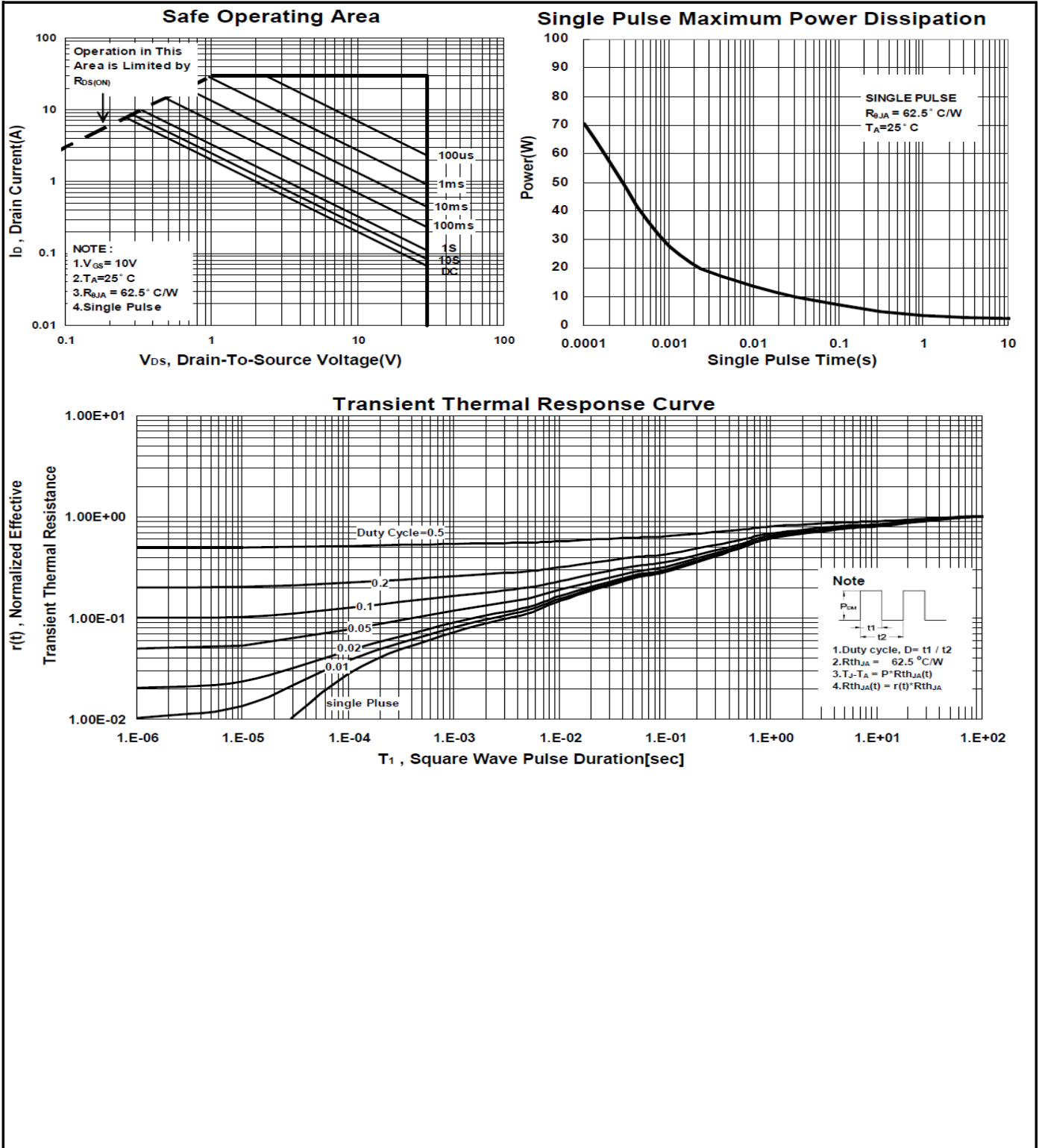
## Dual N-Channel Enhancement Mode MOSFET

### Typical Characteristics: Q1



# PD1503YVS

## Dual N-Channel Enhancement Mode MOSFET



# PD1503YVS

## Dual N-Channel Enhancement Mode MOSFET

### Package Dimension

### SOP-8 MECHANICAL DATA

| Dimension | mm   |      |      | Dimension | mm   |       |      |
|-----------|------|------|------|-----------|------|-------|------|
|           | Min. | Typ. | Max. |           | Min. | Typ.  | Max. |
| A         | 4.8  | 4.9  | 5.0  | H         | 0.4  | 0.6   | 0.93 |
| B         | 3.8  | 3.9  | 4.0  | I         | 0.19 | 0.21  | 0.25 |
| C         | 5.79 | 6.0  | 6.2  | J         | 0.25 | 0.375 | 0.5  |
| D         | 0.33 | 0.4  | 0.51 | K         | 0°   | 3°    | 18°  |
| E         | 1.25 | 1.27 | 1.29 |           |      |       |      |
| F         | 1.1  | 1.3  | 1.65 |           |      |       |      |
| G         | 0.05 | 0.15 | 0.25 |           |      |       |      |

