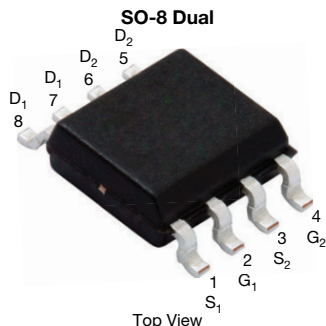


# N- and P-Channel 60 V (D-S) MOSFET



## FEATURES

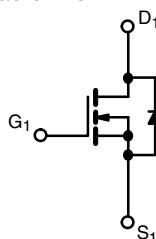
- TrenchFET® Gen IV power MOSFET
- 100 %  $R_g$  and UIS tested
- Fully lead (Pb)-free device
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



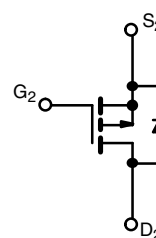
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

## APPLICATIONS

- CCFL Inverter
- FAN control
- Load switch



N-Channel MOSFET



P-Channel MOSFET

## PRODUCT SUMMARY

|                                                   | N-CHANNEL     | P-CHANNEL |
|---------------------------------------------------|---------------|-----------|
| $V_{DS}$ (V)                                      | 60            | -60       |
| $R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = \pm 10$ V  | 0.029         | 0.120     |
| $R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = \pm 4.5$ V | 0.038         | 0.150     |
| $Q_g$ typ. (nC)                                   | 3.3           | 8         |
| $I_D$ (A) <sup>a</sup>                            | 8             | -4.1      |
| Configuration                                     | N- and p-pair |           |

## ORDERING INFORMATION

|                                 |                 |
|---------------------------------|-----------------|
| Package                         | SO-8            |
| Lead (Pb)-free and halogen-free | Si4534DY-T1-GE3 |

## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25$ °C, unless otherwise noted)

| PARAMETER                                        | SYMBOL         | N-CHANNEL           | P-CHANNEL            | UNIT |
|--------------------------------------------------|----------------|---------------------|----------------------|------|
| Drain-source voltage                             | $V_{DS}$       | 60                  | -60                  | V    |
| Gate-source voltage                              | $V_{GS}$       | $\pm 20$            | $\pm 20$             |      |
| Continuous drain current ( $T_J = 150$ °C)       | $I_D$          | 8 <sup>a</sup>      | -4.1                 | A    |
|                                                  |                | 6.6                 | -3.3                 |      |
|                                                  |                | 6.2 <sup>b, c</sup> | -3 <sup>b, c</sup>   |      |
|                                                  |                | 5 <sup>b, c</sup>   | -2.4 <sup>b, c</sup> |      |
| Pulsed drain current (10 $\mu$ s pulse width)    | $I_{DM}$       | 32                  | -25                  |      |
| Source drain current diode current               | $I_S$          | 3                   | 3                    |      |
|                                                  |                | 1.7 <sup>b, c</sup> | -1.7 <sup>b, c</sup> |      |
| Single pulse avalanche current                   | $I_{AS}$       | 10                  | 15                   | mJ   |
| Single pulse avalanche energy                    | $E_{AS}$       | 5                   | 11                   |      |
| Maximum power dissipation                        | $P_D$          | 3.6                 | 3.6                  | W    |
|                                                  |                | 2.3                 | 2.3                  |      |
|                                                  |                | 2 <sup>b, c</sup>   | 2 <sup>b, c</sup>    |      |
|                                                  |                | 1.3 <sup>b, c</sup> | 1.3 <sup>b, c</sup>  |      |
| Operating junction and storage temperature range | $T_J, T_{stg}$ | -55 to +150         |                      | °C   |

## THERMAL RESISTANCE RATINGS

| PARAMETER                                   |              | SYMBOL            | N-CHANNEL |      | P-CHANNEL |      | UNIT |
|---------------------------------------------|--------------|-------------------|-----------|------|-----------|------|------|
|                                             |              |                   | TYP.      | MAX. | TYP.      | MAX. |      |
| Maximum junction-to-ambient <sup>b, d</sup> | t ≤ 10 s     | R <sub>thJA</sub> | 50        | 62.5 | 50        | 62.5 | °C/W |
| Maximum junction-to-foot (drain)            | Steady state | R <sub>thJF</sub> | 28        | 35   | 27        | 34   |      |

### Notes

- Package limited
- Surface mounted on 1" x 1" FR4 board
- $t = 10$  s
- Maximum under steady state conditions is 110 °C/W for N-channel and P-channel



| SPECIFICATIONS (T <sub>J</sub> = 25 °C, unless otherwise noted) |                                      |                                                                                                                                                     |      |      |                   |       |      |
|-----------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------------------|-------|------|
| PARAMETER                                                       | SYMBOL                               | TEST CONDITIONS                                                                                                                                     |      | MIN. | TYP. <sup>a</sup> | MAX.  | UNIT |
| Static                                                          |                                      |                                                                                                                                                     |      |      |                   |       |      |
| Drain-source breakdown voltage                                  | V <sub>DS</sub>                      | V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA                                                                                                      | N-Ch | 60   | -                 | -     | V    |
|                                                                 |                                      | V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA                                                                                                     | P-Ch | -60  | -                 | -     |      |
| V <sub>DS</sub> temperature coefficient                         | ΔV <sub>DS</sub> /T <sub>J</sub>     | I <sub>D</sub> = 250 μA                                                                                                                             | N-Ch | -    | 33                | -     | mV   |
|                                                                 |                                      | I <sub>D</sub> = -250 μA                                                                                                                            | P-Ch | -    | 50                | -     |      |
| V <sub>GS(th)</sub> temperature coefficient                     | ΔV <sub>GS(th)</sub> /T <sub>J</sub> | I <sub>D</sub> = 250 μA                                                                                                                             | N-Ch | -    | -4.8              | -     |      |
|                                                                 |                                      | I <sub>D</sub> = -250 μA                                                                                                                            | P-Ch | -    | 4                 | -     |      |
| Gate threshold voltage                                          | V <sub>GS(th)</sub>                  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA                                                                                         | N-Ch | 1    | -                 | 3     | V    |
|                                                                 |                                      | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA                                                                                        | P-Ch | -1   | -                 | -3    |      |
| Gate-body leakage                                               | I <sub>GSS</sub>                     | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V                                                                                                     | N-Ch | -    | -                 | 100   | nA   |
|                                                                 |                                      |                                                                                                                                                     | P-Ch | -    | -                 | -100  |      |
| Zero gate voltage drain current                                 | I <sub>DSS</sub>                     | V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V                                                                                                       | N-Ch | -    | -                 | 1     | μA   |
|                                                                 |                                      | V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V                                                                                                      | P-Ch | -    | -                 | -1    |      |
|                                                                 |                                      | V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C                                                                               | N-Ch | -    | -                 | 15    |      |
|                                                                 |                                      | V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C                                                                              | P-Ch | -    | -                 | -15   |      |
| Drain-source on-state resistance <sup>b</sup>                   | R <sub>DS(on)</sub>                  | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5 A                                                                                                        | N-Ch | -    | 0.022             | 0.029 | Ω    |
|                                                                 |                                      | V <sub>GS</sub> = -10 V, I <sub>D</sub> = -3.1 A                                                                                                    | P-Ch | -    | 0.100             | 0.120 |      |
|                                                                 |                                      | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 4 A                                                                                                       | N-Ch | -    | 0.029             | 0.038 |      |
|                                                                 |                                      | V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.2 A                                                                                                   | P-Ch | -    | 0.126             | 0.150 |      |
| Forward transconductance <sup>b</sup>                           | g <sub>fs</sub>                      | V <sub>DS</sub> = 10 V, I <sub>D</sub> = 10 A                                                                                                       | N-Ch | -    | 23                | -     | S    |
|                                                                 |                                      | V <sub>DS</sub> = -15 V, I <sub>D</sub> = -3.1 A                                                                                                    | P-Ch | -    | 8.5               | -     |      |
| Dynamic <sup>a</sup>                                            |                                      |                                                                                                                                                     |      |      |                   |       |      |
| Input capacitance                                               | C <sub>iss</sub>                     | N-channel<br>V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, f = 1 MHz<br><br>P-channel<br>V <sub>DS</sub> = -15 V, V <sub>GS</sub> = 0 V, f = 1 MHz | N-Ch | -    | 420               | -     | pF   |
| Output capacitance                                              | C <sub>oss</sub>                     |                                                                                                                                                     | P-Ch | -    | 650               | -     |      |
|                                                                 |                                      |                                                                                                                                                     | N-Ch | -    | 92                | -     |      |
| Reverse transfer capacitance                                    | C <sub>rss</sub>                     |                                                                                                                                                     | P-Ch | -    | 95                | -     |      |
|                                                                 |                                      |                                                                                                                                                     | N-Ch | -    | 4                 | -     |      |
|                                                                 |                                      |                                                                                                                                                     | P-Ch | -    | 60                | -     |      |
| Total gate charge                                               | Q <sub>g</sub>                       | V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5 A                                                                                | N-Ch | -    | 7.1               | 11    | nC   |
|                                                                 |                                      | V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -3.1 A                                                                           | P-Ch | -    | 14.5              | 22    |      |
|                                                                 |                                      | V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5 A                                                                               | N-Ch | -    | 3.3               | 5     |      |
|                                                                 |                                      | V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -3.1 A                                                                          | P-Ch | -    | 8                 | 12    |      |
| Gate-source charge                                              | Q <sub>gs</sub>                      | N-channel<br>V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5 A                                                                  | N-Ch | -    | 1.7               | -     |      |
|                                                                 |                                      |                                                                                                                                                     | P-Ch | -    | 2.2               | -     |      |
| Gate-drain charge                                               | Q <sub>gd</sub>                      | P-channel<br>V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -3.1 A                                                             | N-Ch | -    | 0.9               | -     |      |
|                                                                 |                                      |                                                                                                                                                     | P-Ch | -    | 3.7               | -     |      |
| Gate resistance                                                 | R <sub>g</sub>                       | f = 1 MHz                                                                                                                                           | N-Ch | 0.3  | 1.6               | 3.2   | Ω    |
|                                                                 |                                      |                                                                                                                                                     | P-Ch | 3    | 14                | 28    |      |



| SPECIFICATIONS (T <sub>J</sub> = 25 °C, unless otherwise noted) |                     |                                                                                                                                    |      |                   |      |      |    |
|-----------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------|------|-------------------|------|------|----|
| PARAMETER                                                       | SYMBOL              | TEST CONDITIONS                                                                                                                    | MIN. | TYP. <sup>a</sup> | MAX. | UNIT |    |
| Dynamic <sup>a</sup>                                            |                     |                                                                                                                                    |      |                   |      |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | N-channel<br>V <sub>DD</sub> = 30 V, R <sub>L</sub> = 6 Ω,<br>I <sub>D</sub> ≅ 5 A, V <sub>GEN</sub> = 4.5 V, R <sub>g</sub> = 1 Ω | N-Ch | -                 | 12   | 25   | ns |
| Rise time                                                       | t <sub>r</sub>      |                                                                                                                                    | P-Ch | -                 | 30   | 60   |    |
|                                                                 |                     |                                                                                                                                    | N-Ch | -                 | 16   | 35   |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> |                                                                                                                                    | P-Ch | -                 | 70   | 140  |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 11                | 25   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 40                | 80   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 15                | 30   |      |    |
| Fall time                                                       | t <sub>f</sub>      | P-Ch                                                                                                                               | -    | 35                | 70   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-on delay time                                              | t <sub>d(on)</sub>  | P-Ch                                                                                                                               | -    | 30                | 60   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 10                | 20   |      |    |
| Rise time                                                       | t <sub>r</sub>      | P-Ch                                                                                                                               | -    | 10                | 20   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               | -    | 5                 | 10   |      |    |
| Turn-off delay time                                             | t <sub>d(off)</sub> | P-Ch                                                                                                                               | -    | 13                | 25   |      |    |
|                                                                 |                     | N-Ch                                                                                                                               |      |                   |      |      |    |

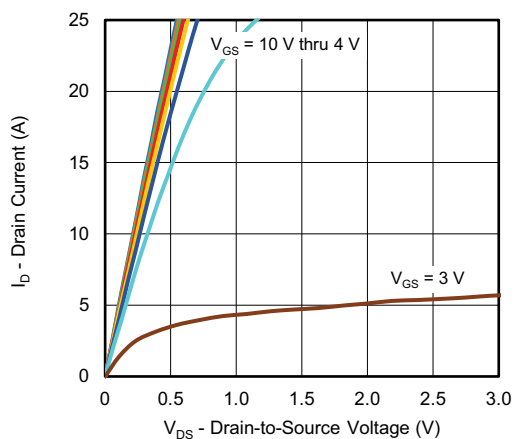
**Notes**

- a. Guaranteed by design, not subject to production testing  
b. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2$

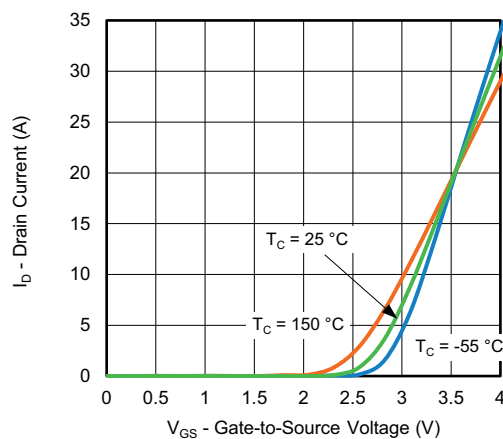
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



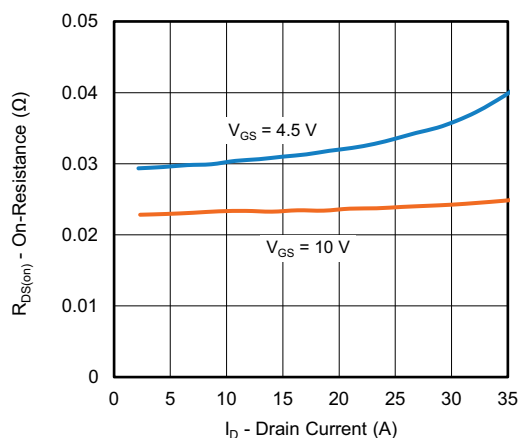
**N-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



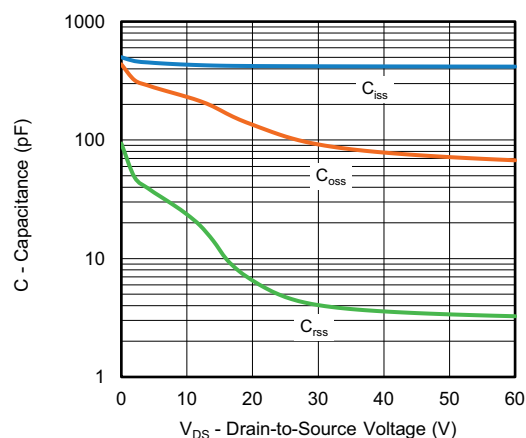
**Output Characteristics**



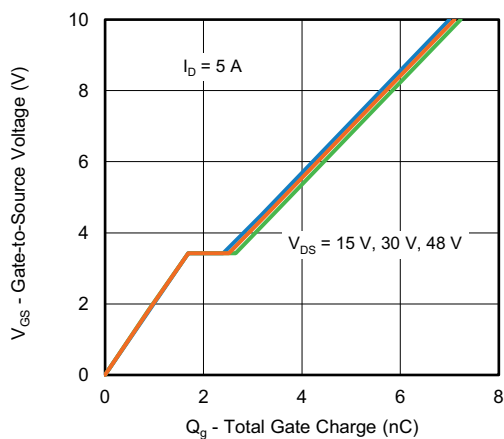
**Transfer Characteristics**



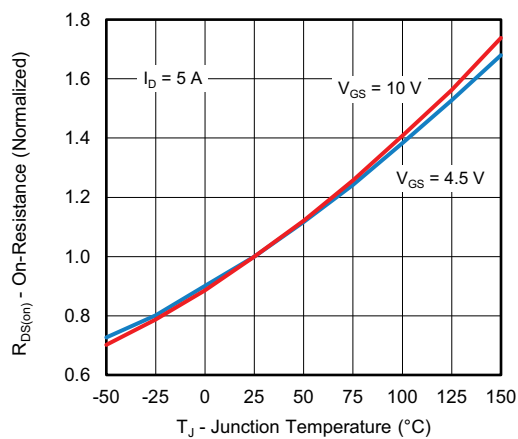
**On-Resistance vs. Drain Current and Gate Voltage**



**Capacitance**



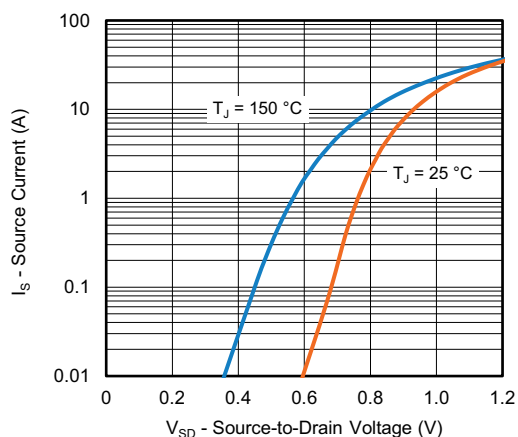
**Gate Charge**



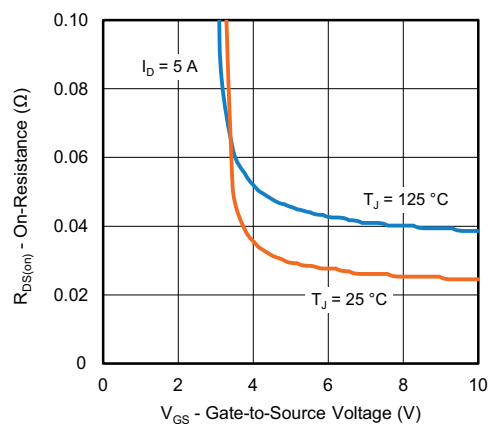
**On-Resistance vs. Junction Temperature**



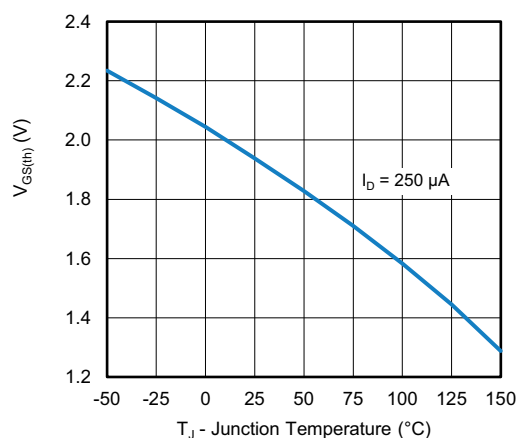
**N-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



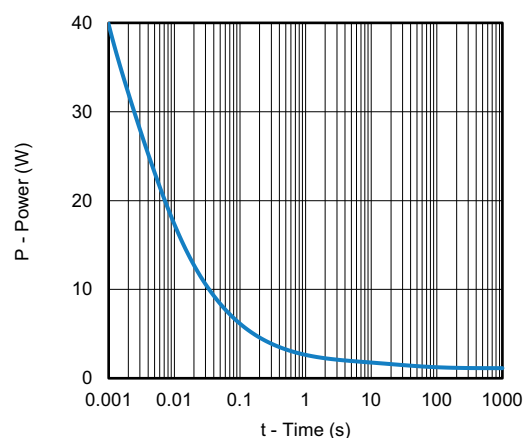
Source-Drain Diode Forward Voltage



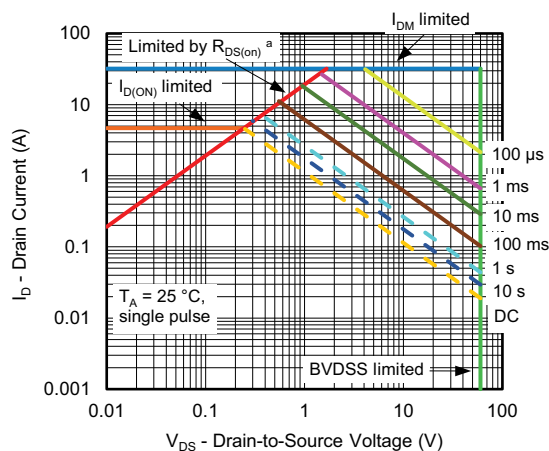
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



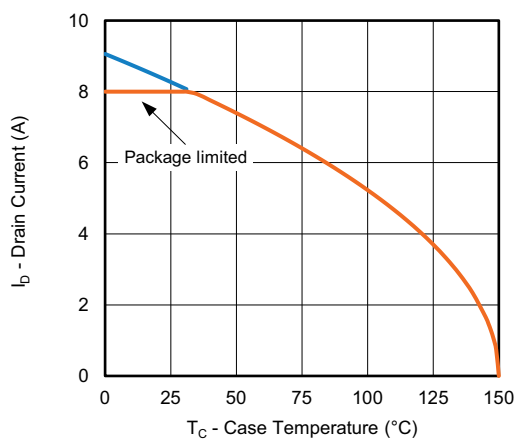
Single Pulse Power, Junction-to-Ambient



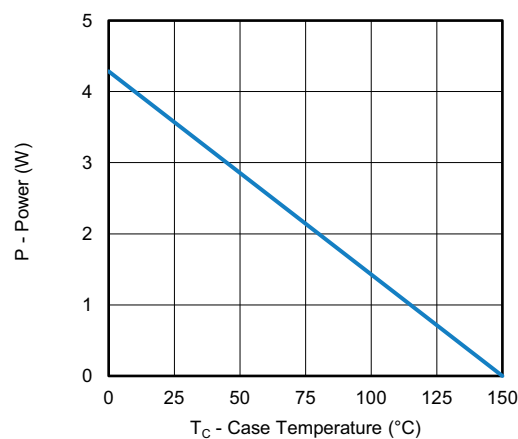
Safe Operating Area



**N-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



**Current Derating <sup>a</sup>**



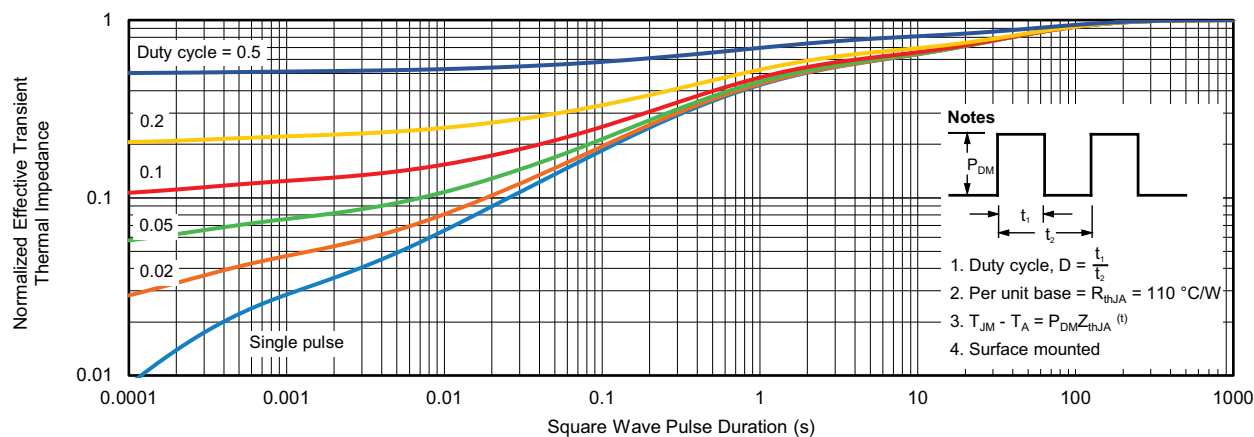
**Power Derating**

**Note**

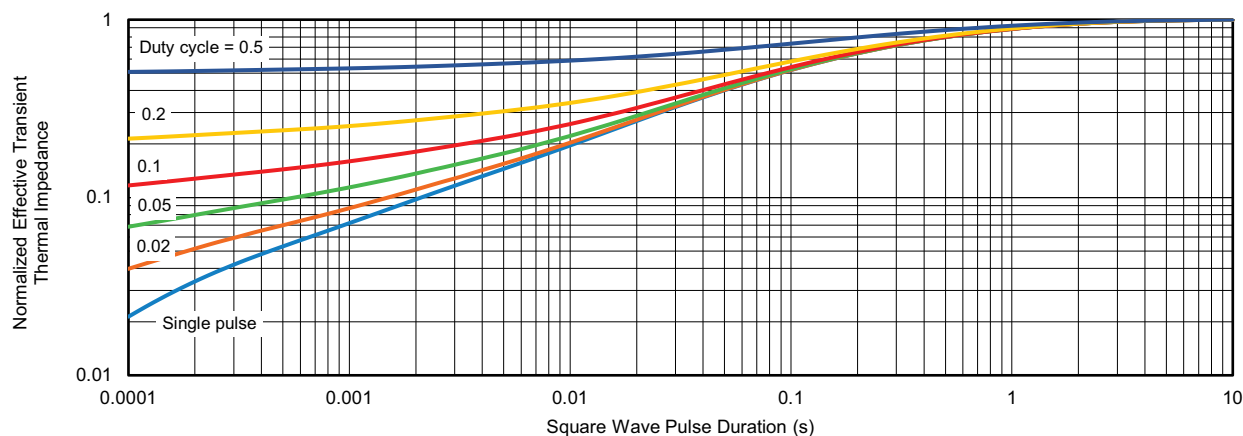
- a. The power dissipation  $P_D$  is based on  $T_J$  max = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



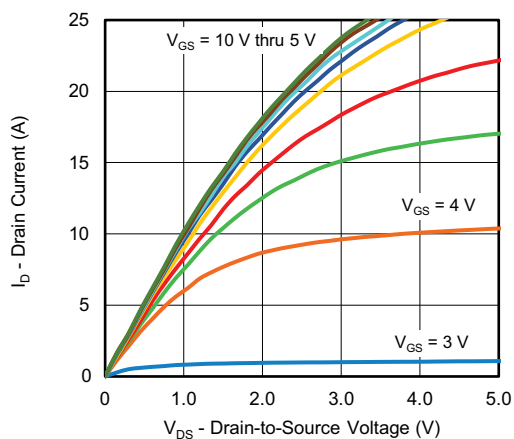
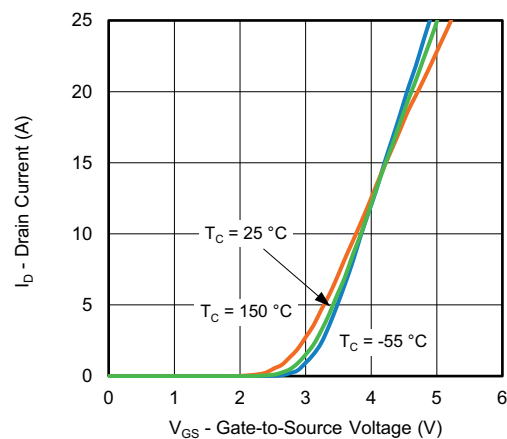
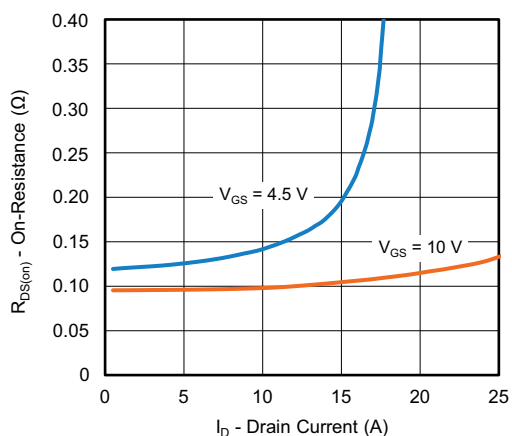
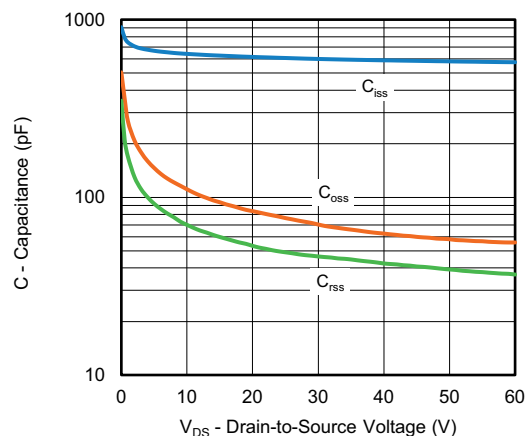
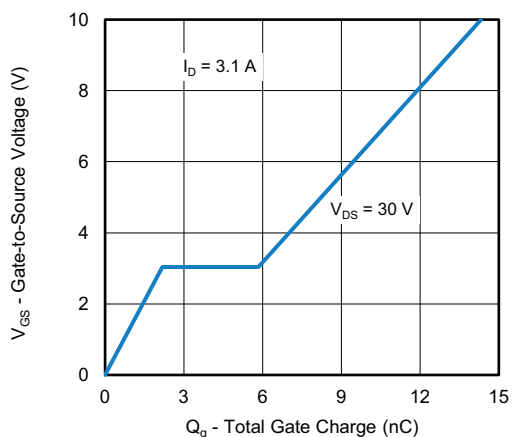
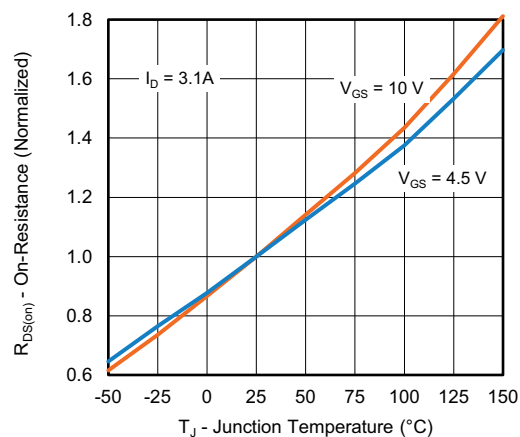
**N-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)

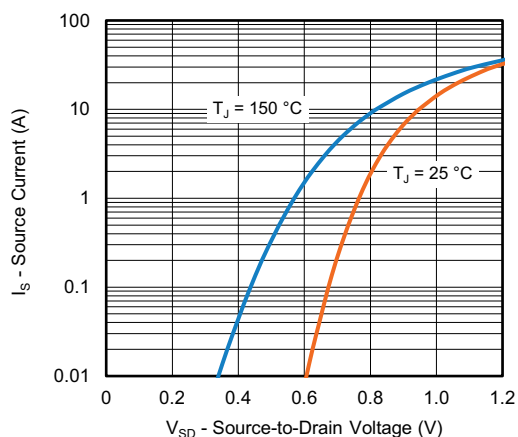
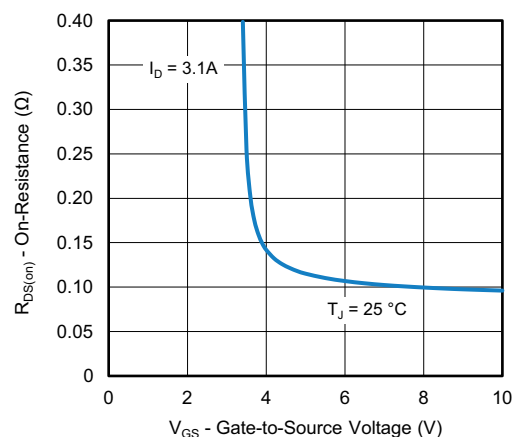
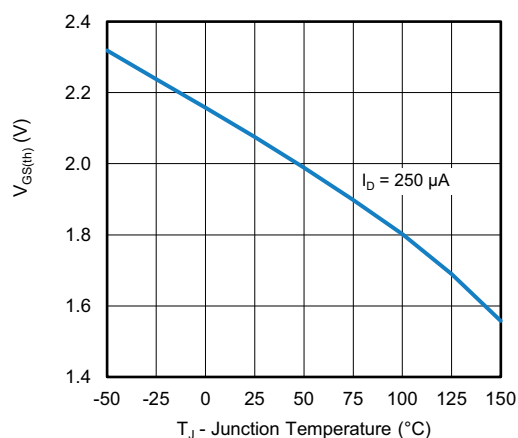
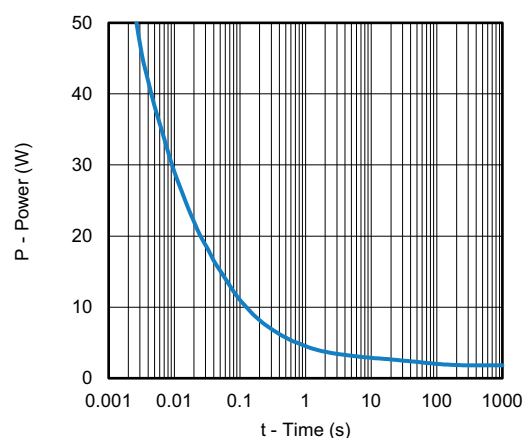
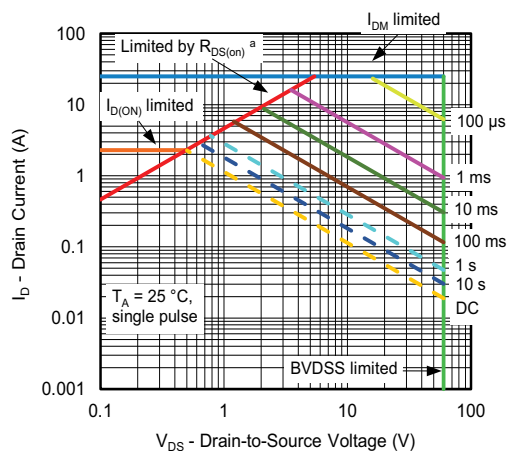


**Normalized Thermal Transient Impedance, Junction-to-Ambient**



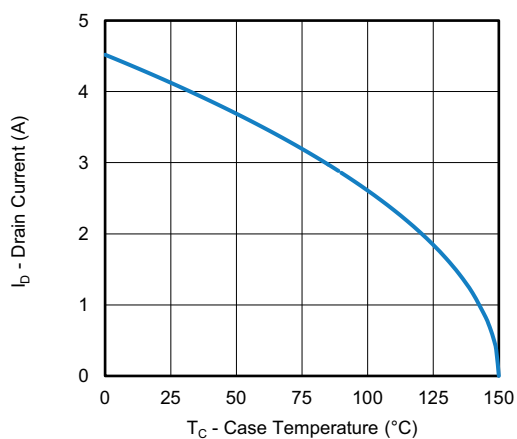
**Normalized Thermal Transient Impedance, Junction-to-Case**

**P-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)

**Output Characteristics**

**Transfer Characteristics**

**On-Resistance vs. Drain Current**

**Capacitance**

**Gate Charge**

**On-Resistance vs. Junction Temperature**

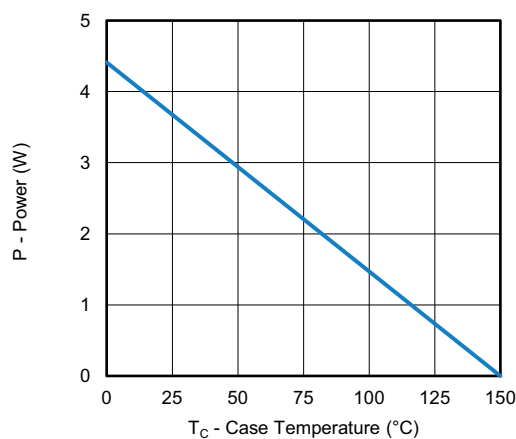
**P-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)

**Source-Drain Diode Forward Voltage**

**On-Resistance vs. Gate-to-Source Voltage**

**Threshold Voltage**

**Single Pulse Power**

**Safe Operating Area, Junction-to-Case**



**P-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



**Current Derating <sup>a</sup>**



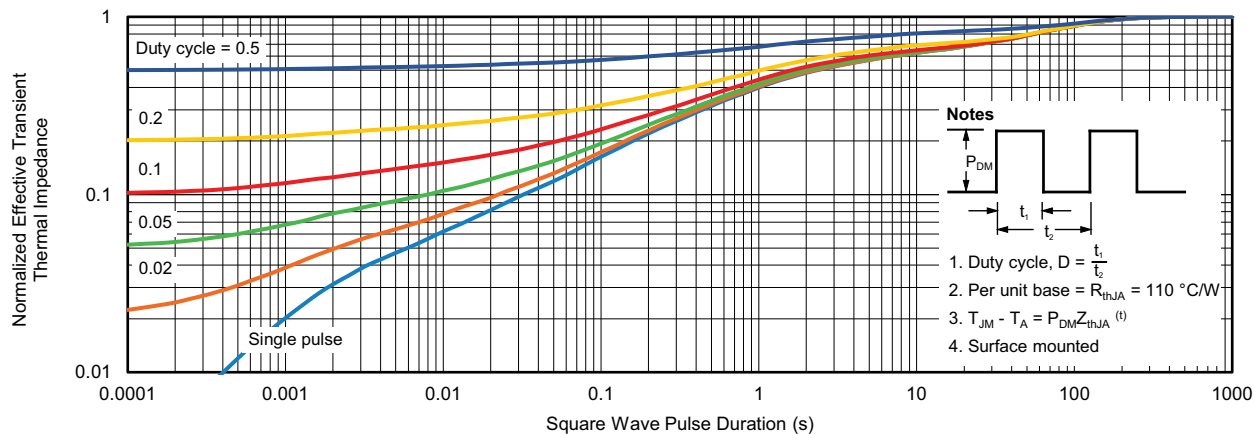
**Power Derating, Junction-to-Foot**

**Note**

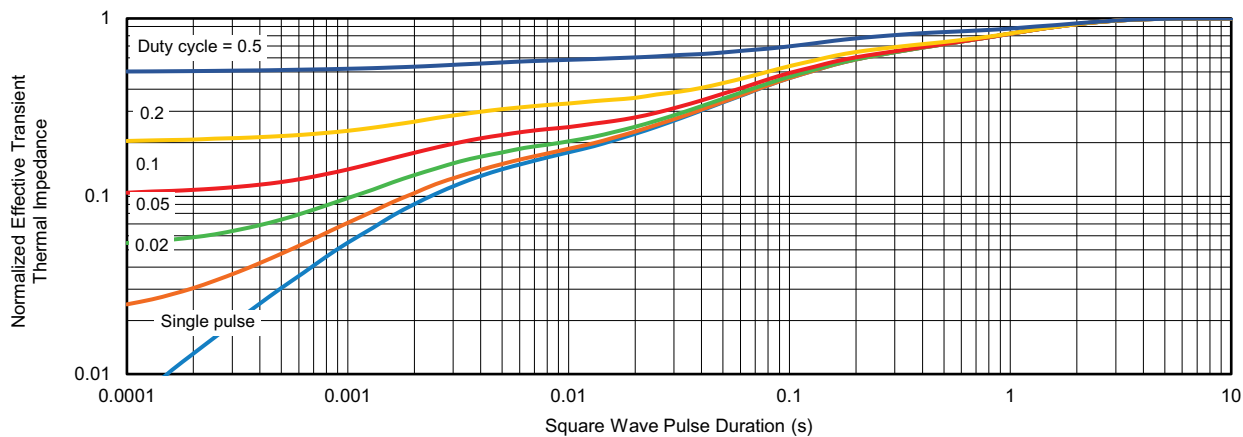
- a. The power dissipation  $P_D$  is based on  $T_J \text{ max} = 150 \text{ }^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



**P-CHANNEL TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



**Normalized Thermal Transient Impedance, Junction-to-Ambient**



**Normalized Thermal Transient Impedance, Junction-to-Foot**

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