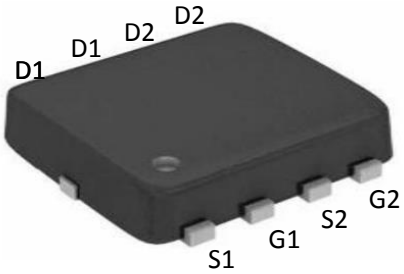
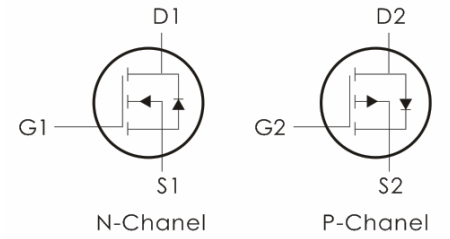
## Description：

This N+P Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.




## Features：

N-Channel:$V_{DS}$=30V,$I_D$=9.5A,$R_{DS(ON)}$<28mΩ @$V_{GS}$=10V

P-Channel: $V_{DS}$=-30V,$I_D$=-8.5A,$R_{DS(ON)}$<52mΩ @$V_{GS}$=-10V

1) Low gate charge.
2) Green device available.
3) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
4) Excellent package for good heat dissipation.

## Package Marking and Ordering Information：

| Part NO. | Marking | Package | Packing |
|---|---|---|---|
| DOZ4606K | Z4606K | DFN3*3-8D | 5000 pcs/Reel |

## Absolute Maximum Ratings： ($T_C$=25℃ unless otherwise noted)

| Symbol | Parameter | N-Channel | P-Channel | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 30 | -30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | ±20 | V |
| $I_D$ | Continuous Drain Current- Tc=25℃ | 9.5 | -8.5 | A |
| | Continuous Drain Current-Tc=100℃ | 6.5 | -6 | |
| $I_{DM}$ | Pulsed Drain Current[1] | 42 | -40 | A |
| $E_{AS}$ | Single Pulsed Avalanche Energy[2] | 17 | 15 | mJ |
| $P_D$ | Power Dissipation - Tc=25℃ | 3 | 2.8 | W |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | | ℃ |

## Thermal Characteristics：

| Symbol | Parameter | N-CH | P-CH | Units |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance,Junction to Ambient | 41.7 | 44.6 | ℃/W |

## N-Channel Electrical Characteristics: ($T_C$=25℃ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Sourtce Breakdown Voltage | $V_{GS}$=0V,$I_D$=250μA | 30 | --- | --- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{GS}$=0V, $V_{DS}$=30V | --- | --- | 1 | μA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0A | --- | --- | ±100 | nA |
| **On Characteristics**[3] | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=250μA | 1 | 1.5 | 2.6 | V |
| $R_{DS(ON)}$ | Drain-Source On Resistance[note3] | $V_{GS}$=10V,$I_D$=9.5A | --- | 18 | 28 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=5A | --- | 24 | 36 | |
| **Dynamic Characteristics**[4] | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V, $V_{GS}$=0V, f=1MHz | --- | 370 | 447 | pF |
| $C_{oss}$ | Output Capacitance | | --- | 66 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 40 | --- | |
| Qg | Gate Charge | $V_{GS}$=10V $V_{DS}$=15V $I_D$=9.5A | | 7.1 | --- | nc |
| Qgs | Gate-Source Charge | | | 1.2 | --- | |
| Qgd | Gate-Drain Charge | | | 1.6 | --- | |
| **Switching Characteristics**[4] | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=15V, $R_L$=2.1Ω $R_{REN}$=3Ω,$V_{GS}$=10V | --- | 4.4 | --- | ns |
| $t_r$ | Rise Time | | --- | 2.6 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | --- | 14.8 | --- | ns |
| $t_f$ | Fall Time | | --- | 2.8 | --- | ns |
| **Drain-Source Diode Characteristics** | | | | | | |
| $I_S$ | Continuous Drain to Source Diode | VD=VG=0V | --- | ---- | 9.5 | A |
| $I_{SM}$ | Pulsed Drain to Source Diode | VD=VG=0V | --- | --- | 42 | A |

| | | | | | | |
|---|---|---|---|---|---|---|
| $V_{SD}$ | Source-Drain Diode Forward Voltage | $V_{GS}$=0V,$I_S$=9.5A | --- | 0.74 | 1 | V |
| $t_{rr}$ | Body Diode Reverse Recovery Time | $I_F$=9.5A,dI/dt=100A/μs | --- | 10.5 | 12.6 | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery | | --- | 4.5 | --- | nC |

## Notes:

1: The value of RθJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

2: Repetitive rating, pulse width limited by junction temperature.

3. The RθJA is the sum of the thermal impedence from junction to lead RθJL and lead to ambient.

4. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

## Typical Performance Characteristics-N

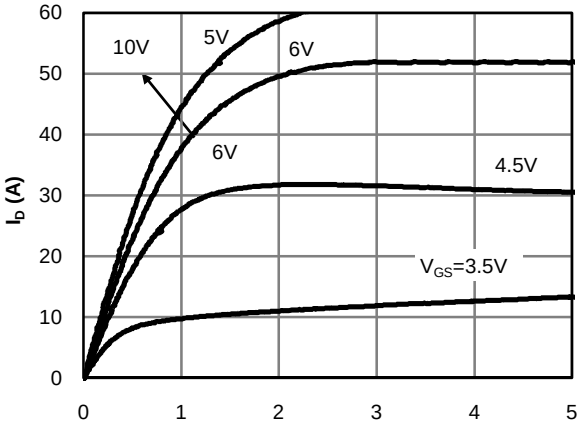



Fig 1: On-Region Characteristics

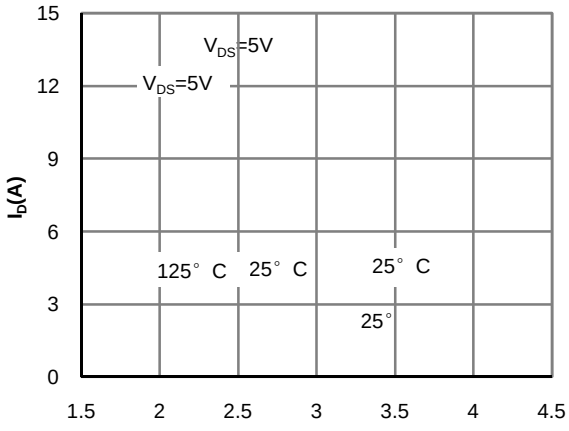



Figure 2: Transfer Characteristics

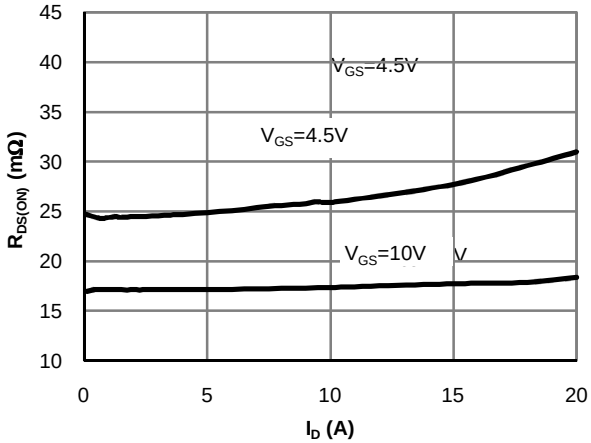



Figure 3: On-Resistance vs. Drain Current and Gate Voltage

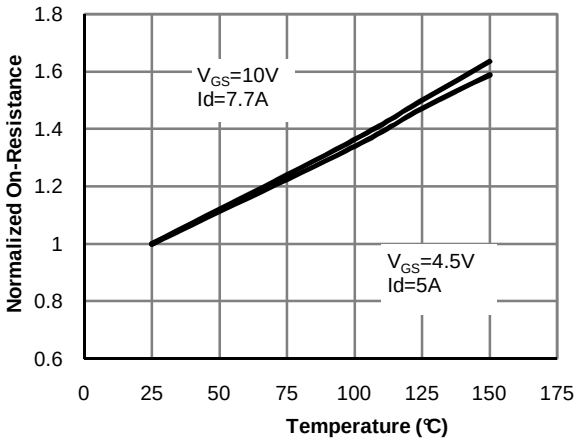



Figure 4: On-Resistance vs. Junction Temperature

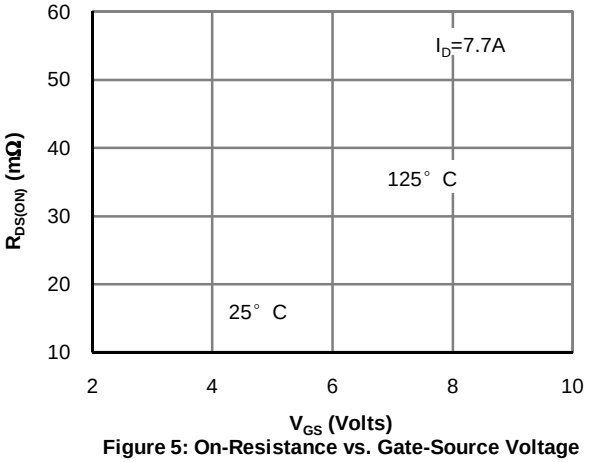



Figure 5: On-Resistance vs. Gate-Source Voltage

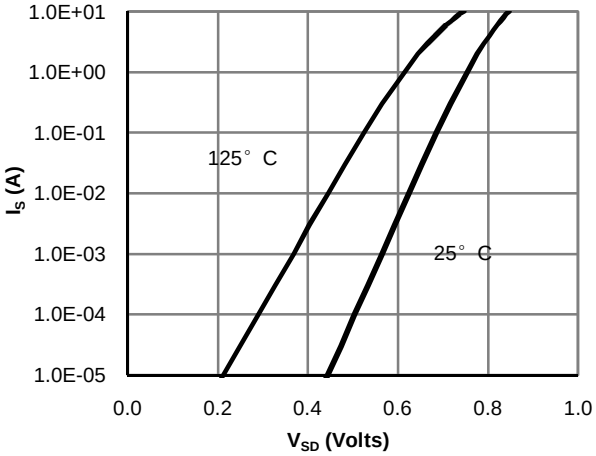



Figure 6: Body-Diode Characteristics

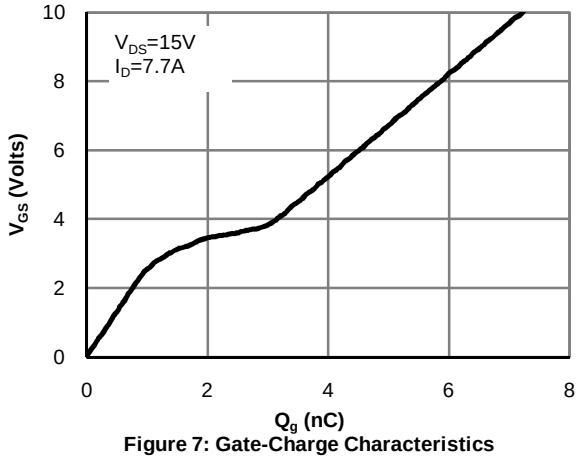



Figure 7: Gate-Charge Characteristics

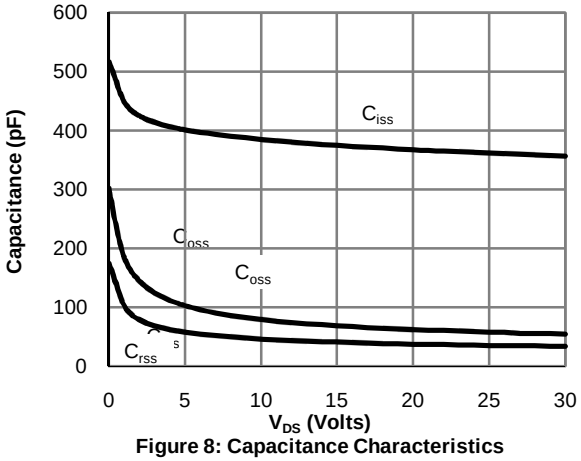



Figure 8: Capacitance Characteristics

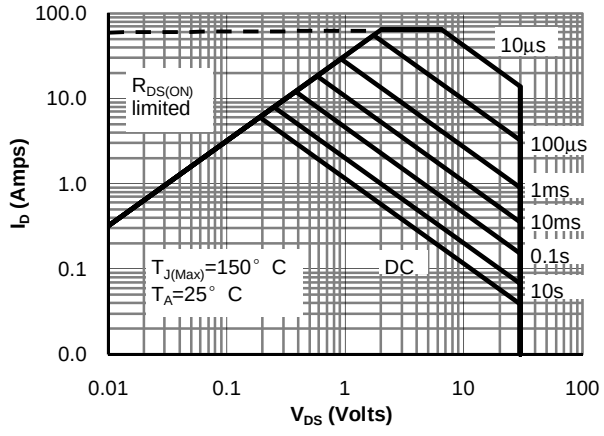



Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

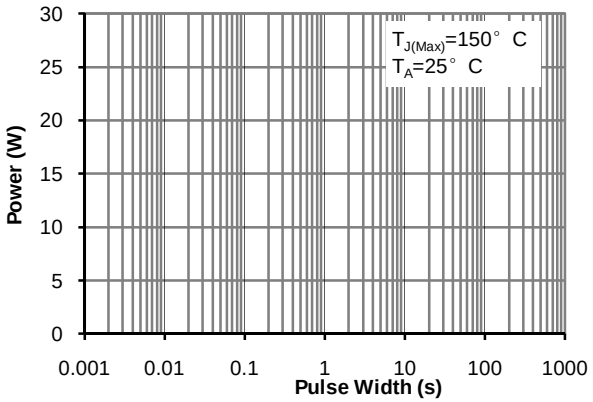



Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

## P-Channel Electrical Characteristics: ($T_C$=25℃ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Sourtce Breakdown Voltage | $V_{GS}$=0V,$I_D$=250μA | -30 | --- | --- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{GS}$=0V, $V_{DS}$=-30V | --- | --- | -1 | μA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0A | --- | --- | ±100 | nA |
| **On Characteristics**[3] | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=250μA | -1 | -1.5 | -2.4 | V |
| $R_{DS(ON)}$ | Drain-Source On Resistance[note3] | $V_{GS}$=-10V,$I_D$=-8.5A | --- | 40 | 52 | mΩ |
| | | $V_{GS}$=-4.5V,$I_D$=-6A | --- | 56 | 65 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-15V, $V_{GS}$=0V, f=1MHz | --- | 759 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 139 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 94 | --- | |
| **Switching Characteristics**[4] | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$= -15V, $R_{GEN}$=3Ω<br>$V_{GS}$= -10V, $R_D$=15Ω | --- | 7.9 | --- | ns |
| $t_r$ | Rise Time | | --- | 5.9 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | --- | 46 | --- | ns |
| $t_f$ | Fall Time | | --- | 4 | --- | ns |
| $Q_g$ | Total Gate Charge | $V_{GS}$=-10V,$V_{DS}$=-15V,$I_D$=-8.5A | --- | 13.5 | 15.9 | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 2.5 | --- | nC |
| $Q_{gd}$ | Gate-Drain “Miller” Charge | | --- | 3.1 | --- | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| $I_S$ | Continuous Drain to Source Diode | VD=VG=0V | --- | --- | -8.5 | A |
| $I_{SM}$ | Pulsed Drain to Source Diode | VD=VG=0V | --- | --- | -40 | --- |
| $V_{SD}$ | Source-Drain Diode Forward Voltage | $V_{GS}$=0V,$I_S$=-4.2A | --- | -0.8 | -1 | V |
| Trr | Reverse Recovery Time | $T_J$=25℃,<br>$I_F$=-8.5A,dI/dt=-100A/μs | --- | 15 | --- | ns |
| Qrr | Reverse Recovery Charge | | --- | 9.7 | --- | nC |

## Notes:

1: The value of RθJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

2: Repetitive rating, pulse width limited by junction temperature.

3. The RθJA is the sum of the thermal impedence from junction to lead RθJL and lead to ambient.

4. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

## Typical Performance Characteristics-P

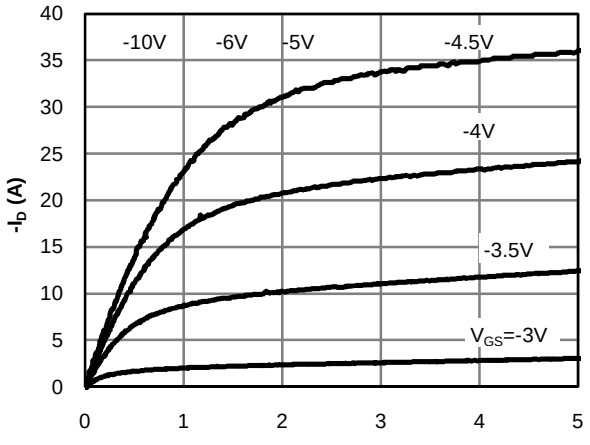



Fig 1: On-Region Characteristics

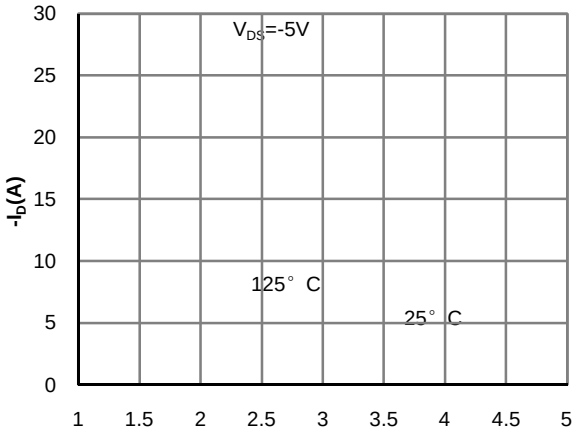



Figure 2: Transfer Characteristics

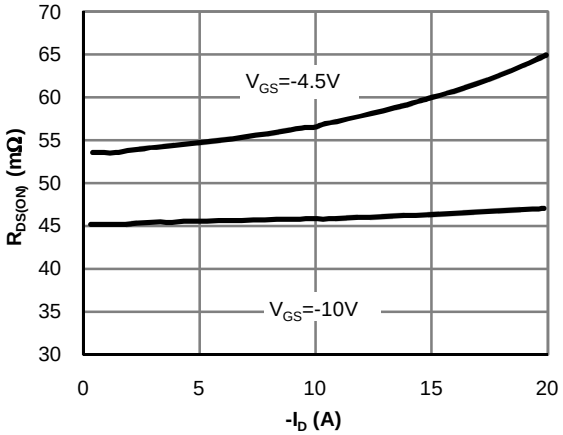



Figure 3: On-Resistance vs. Drain Current and Gate Voltage

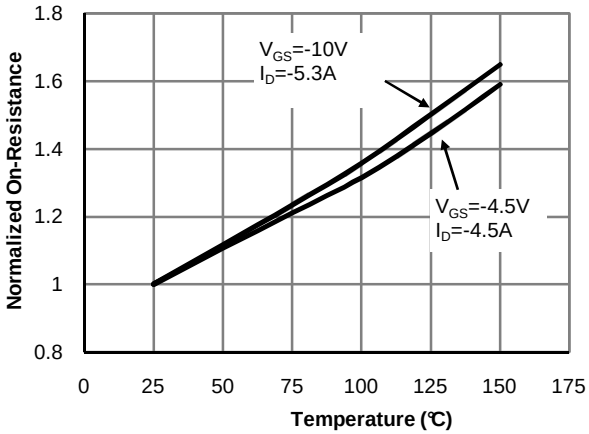



Figure 4: On-Resistance vs. Junction Temperature

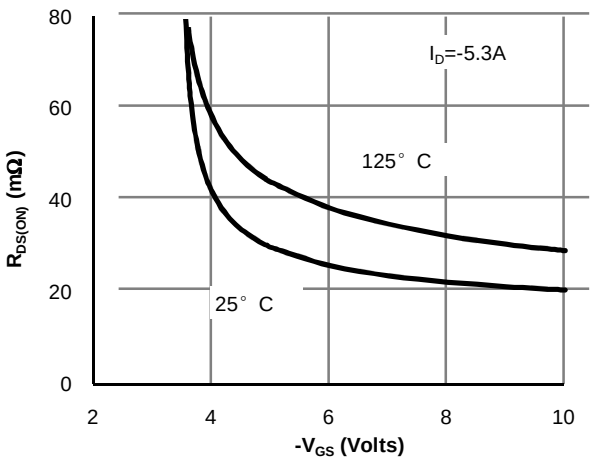



Figure 5: On-Resistance vs. Gate-Source Voltage

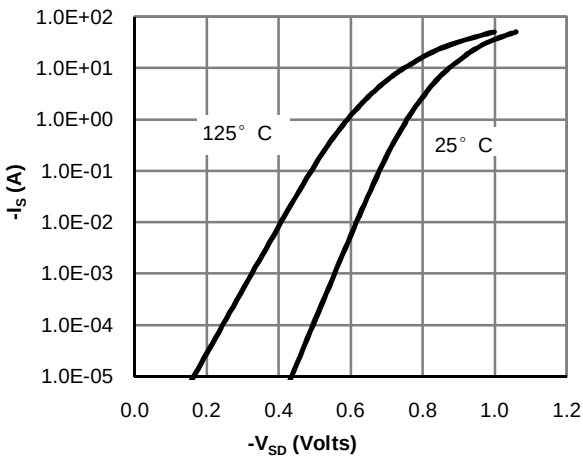



Figure 6: Body-Diode Characteristics

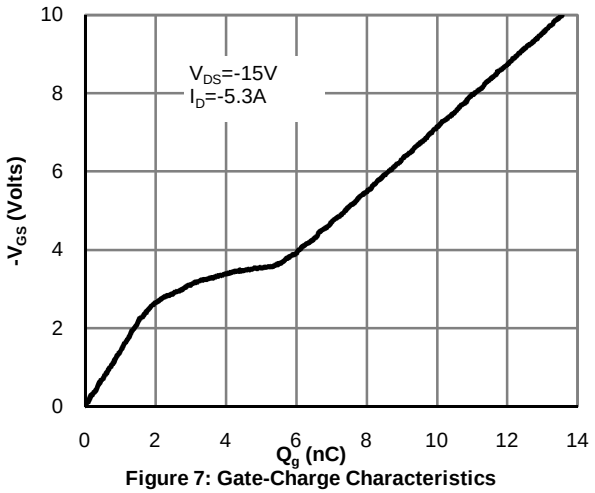



Figure 7: Gate-Charge Characteristics

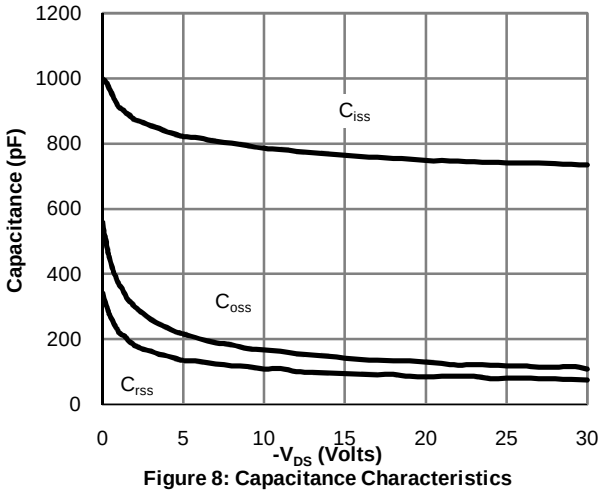



Figure 8: Capacitance Characteristics

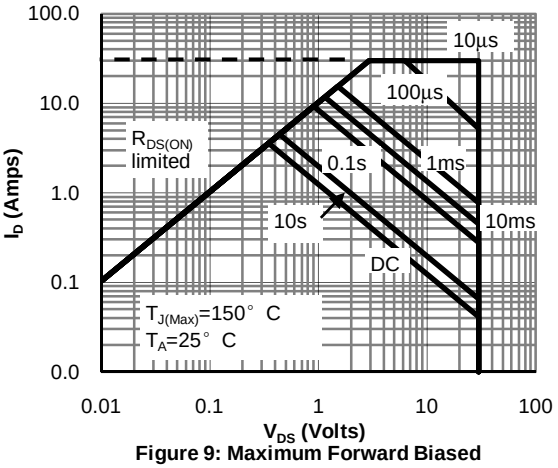



Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

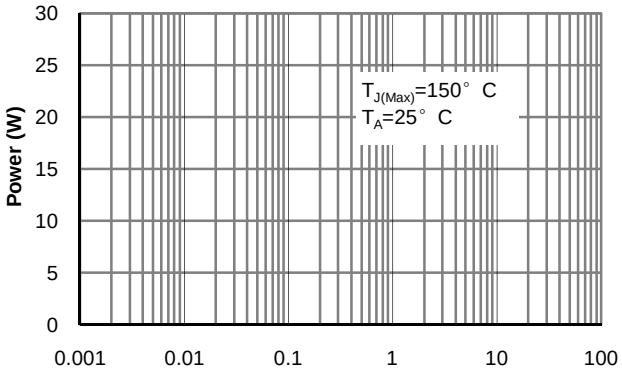



Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

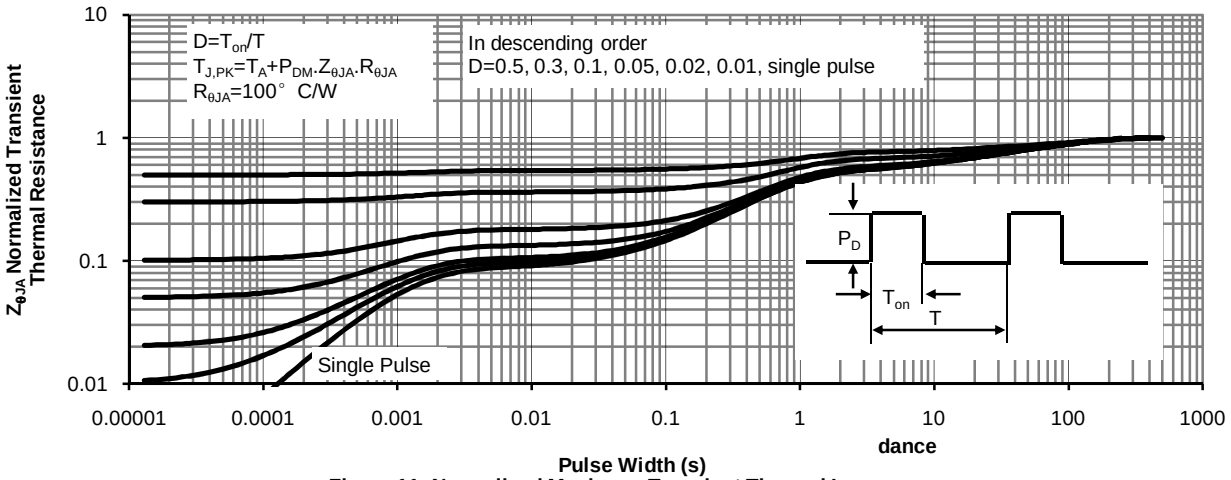
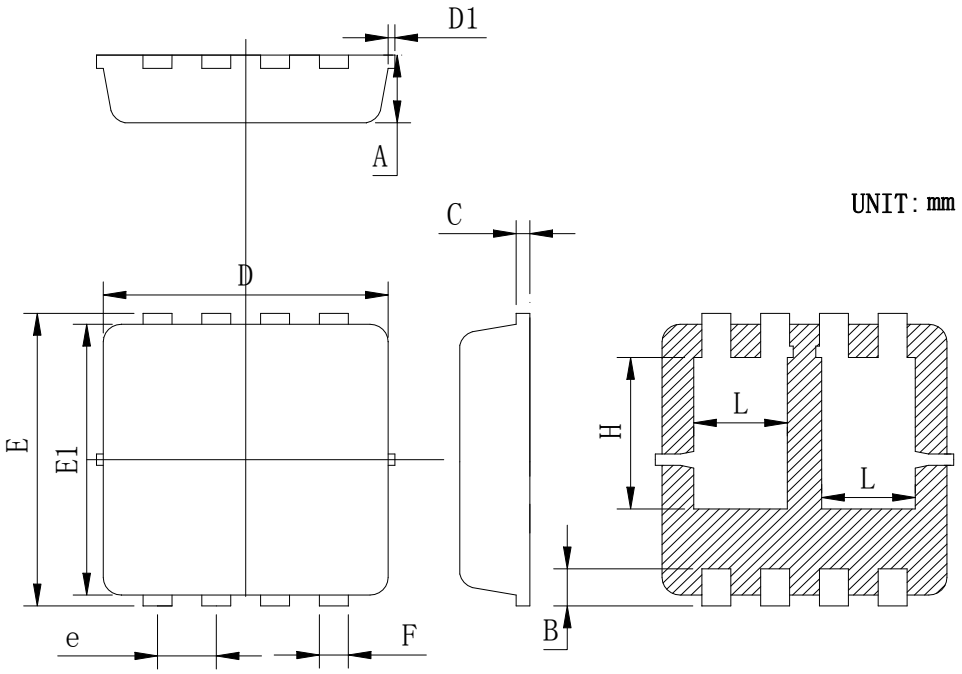



Figure 11: Normalized Maximum Transient Thermal Impe

## DFN3X3-8DPackage Outline Data




| Symbol | Min | Typ | Max |
|---|---|---|---|
| A | 0.725 | 0.775 | 0.825 |
| B | 0.28 | 0.38 | 0.48 |
| C | 0.13 | 0.15 | 0.20 |
| D | 3.05 | 3.15 | 3.25 |
| D1 | | | 0.10 |
| E | 3.25 | 3.35 | 3.45 |
| E1 | 3.0 | 3.1 | 3.2 |
| e | 0.60 | 0.65 | 0.70 |
| F | 0.27 | 0.32 | 0.37 |
| H | 1.63 | 1.73 | 1.83 |
| L | 0.93 | 1.03 | 1.13 |

## Marking Information：

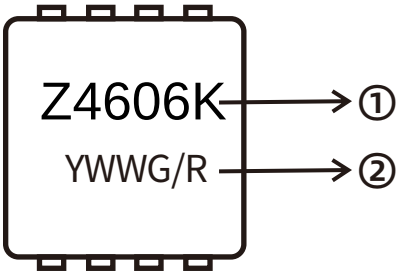
①. Part NO.

②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)




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