

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

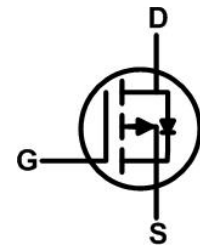
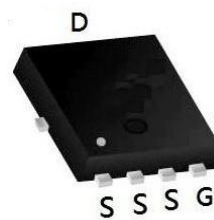

Product Summary

| BVDSS | RDSON | ID |
|-------|-------|------|
| -20V | 15mΩ | -20A |

Description

The XXW20P02D is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XXW20P02D meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

PDFN3333-8L Pin Configuration

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

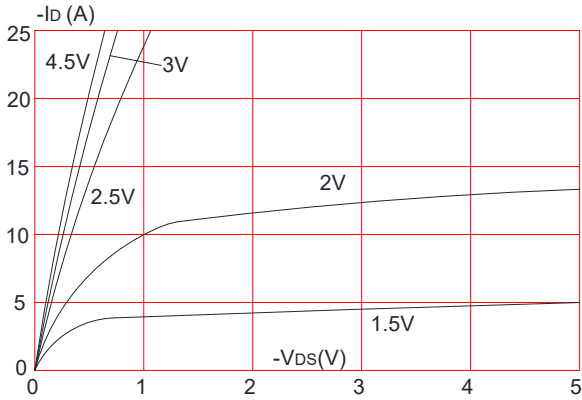
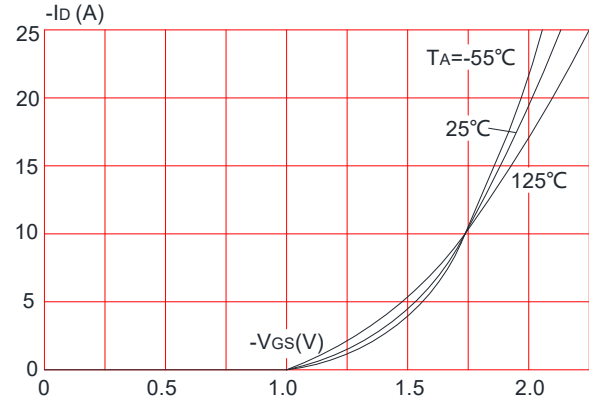
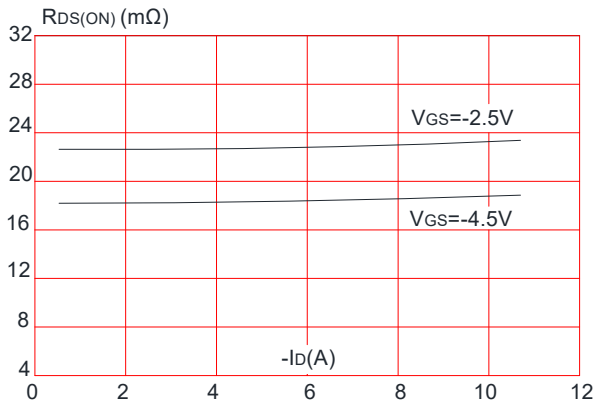
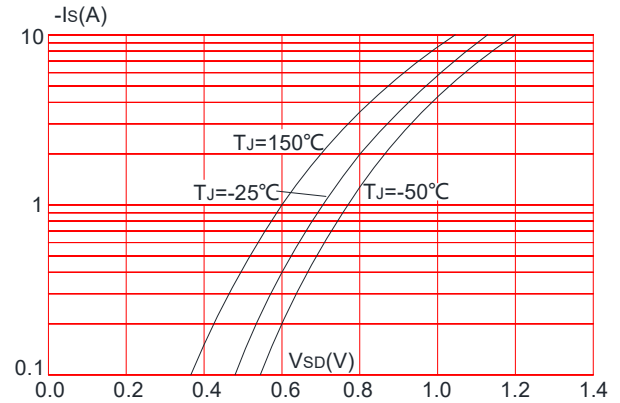
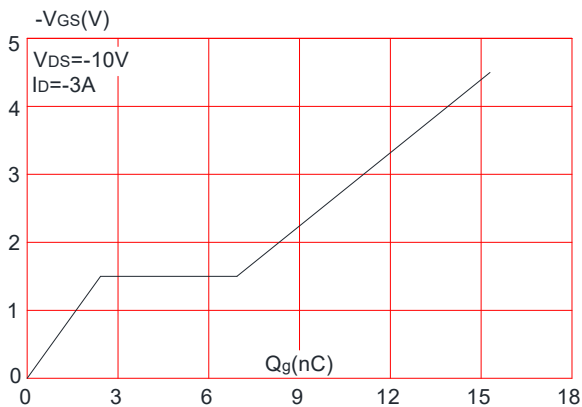
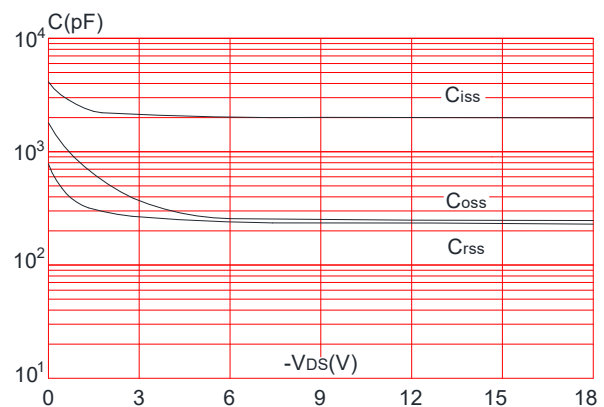
| Symbol | Parameter | Max. | Units |
|-----------------|---|-----------------------------|-----------------------------|
| V_{DSS} | Drain-Source Voltage | -20 | V |
| V_{GSS} | Gate-Source Voltage | ± 12 | V |
| I_D | Continuous Drain Current | $T_A = 25^{\circ}\text{C}$ | -20 |
| | | $T_A = 100^{\circ}\text{C}$ | -12 |
| I_{DM} | Pulsed Drain Current ^{note1} | -28 | A |
| P_D | Power Dissipation | 5 | W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 62.5 | $^{\circ}\text{C}/\text{W}$ |
| T_J, T_{STG} | Operating and Storage Temperature Range | -55 to +150 | $^{\circ}\text{C}$ |

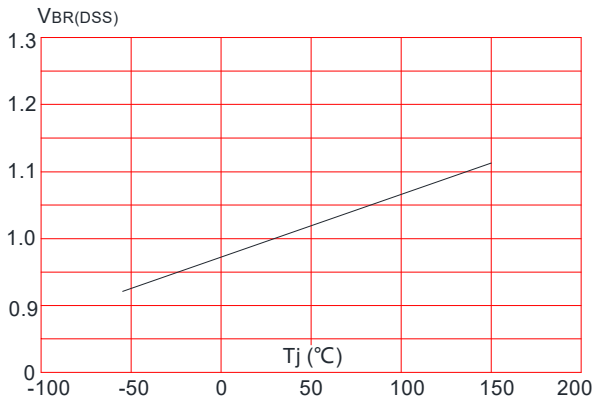
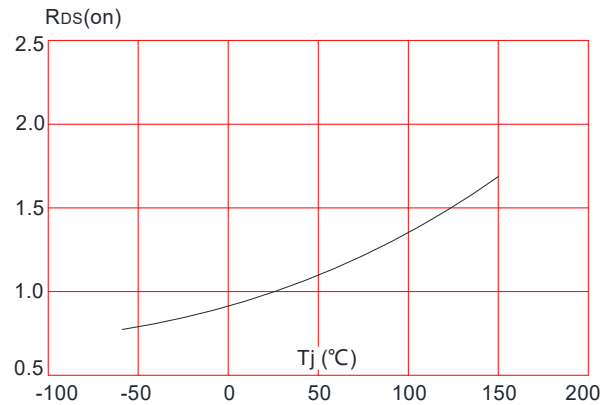
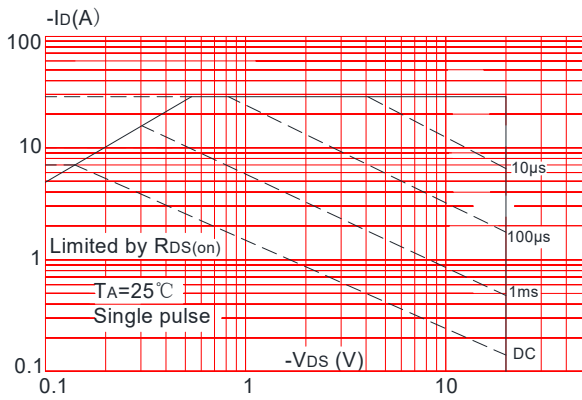
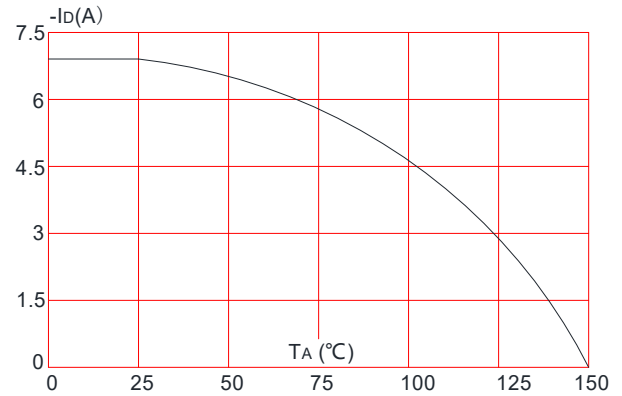
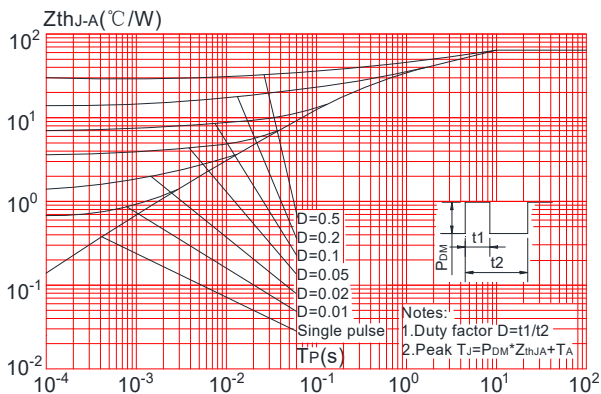
Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

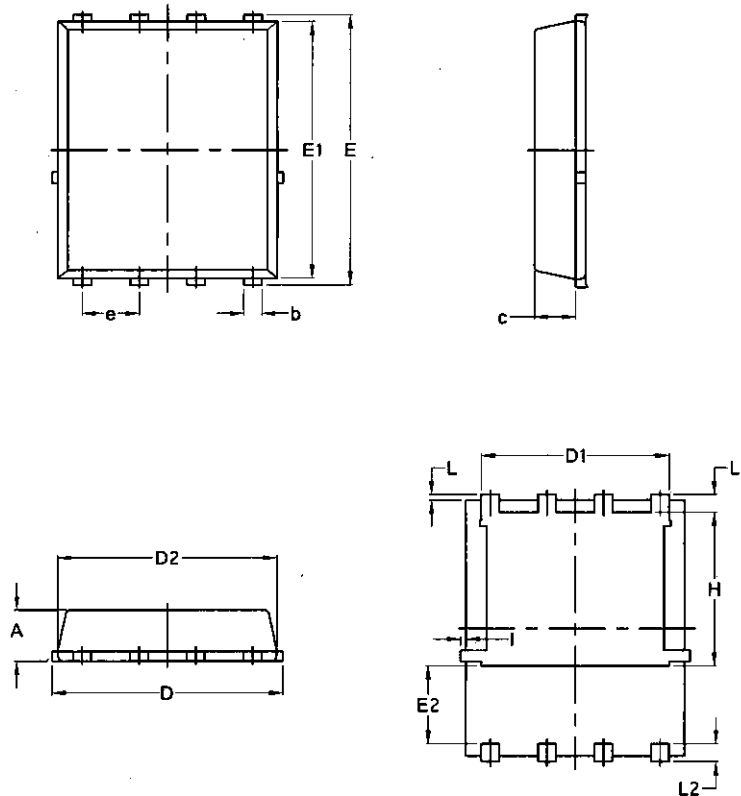
| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|--|---|------|------|-----------|------------|
| Off Characteristic | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=-250\mu A$ | -20 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=-20V, V_{GS}=0V,$ | - | - | -1 | μA |
| I_{GSS} | Gate to Body Leakage Current | $V_{DS}=0V, V_{GS}=\pm 12V$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -0.4 | -0.7 | -1.0 | V |
| $R_{DS(on)}$ | Static Drain-Source on-Resistance note2 | $V_{GS}=-4.5V, I_D=-7A$ | - | 15 | 20 | m Ω |
| | | $V_{GS}=-2.5V, I_D=-5A$ | - | 21. | 32 | |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=-10V, V_{GS}=0V,$ $f=1.0MHz$ | - | 2000 | - | pF |
| C_{oss} | Output Capacitance | | - | 242 | - | pF |
| C_{rss} | Reverse Transfer Capacitance | | - | 231 | - | pF |
| Q_g | Total Gate Charge | $V_{DS}=-10V, I_D=-3A,$ $V_{GS}=-4.5V$ | - | 15.3 | - | nC |
| Q_{gs} | Gate-Source Charge | | - | 2.2 | - | nC |
| Q_{gd} | Gate-Drain("Miller") Charge | | - | 4.4 | - | nC |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}=-10V, I_D=-7A,$ $V_{GS}=-4.5V,$ $R_{GEN}=2.5\Omega$ | - | 10 | - | ns |
| t_r | Turn-on Rise Time | | - | 31 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 28 | - | ns |
| t_f | Turn-off Fall Time | | - | 8 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I_S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -20 | A |
| I_{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -28 | A |
| V_{SD} | Drain to Source Diode Forward Voltage | $V_{GS}=0V, I_S=-7A$ | - | -0.8 | -1.2 | V |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics
Figure 1: Output Characteristics

Figure 2: Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics

Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics


P-Ch 20V Fast Switching MOSFETs
Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

Figure 8: Normalized on Resistance vs. Junction Temperature

Figure 9: Maximum Safe Operating Area

Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


Package Mechanical Data-PDFN3333-8L-Single

COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN | NOM | MAX |
|--------|-----------|------|------|
| A | 0.70 | 0.80 | 0.90 |
| A1 | 0.00 | 0.03 | 0.05 |
| b | 0.24 | 0.30 | 0.35 |
| c | 0.10 | 0.15 | 0.20 |
| D | 3.25 | 3.32 | 3.40 |
| D1 | 3.05 | 3.15 | 3.25 |
| D2 | 2.40 | 2.50 | 2.60 |
| E | 3.00 | 3.10 | 3.20 |
| E1 | 1.35 | 1.45 | 1.55 |
| e | 0.65 BSC. | | |
| H | 3.20 | 3.30 | 3.40 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.10 | 0.15 | 0.20 |
| L2 | 1.13 REF. | | |