★ 100% EAS Guaranteed
★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

**Product Summary**

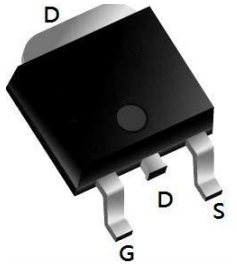
| BVDSS | RDSON | ID |
|---|---|---|
| -60V | 38mΩ | -30A |

## Description

The XXW30P06 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 XXW30P06 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

**TO252-3L Pin Configuration**



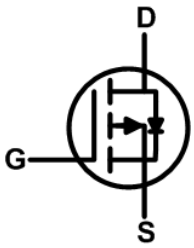




**Table 1. Absolute Maximum Ratings ($T_A$=25℃ unless otherwise noted)**

| Symbol | Parameter | Limit | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage ($V_{GS}$=0V) | -60 | V |
| $V_{GS}$ | Gate-Source Voltage ($V_{DS}$=0V) | ±20 | V |
| $I_D$ | Drain Current-Continuous($T_C$=25℃) | -30 | A |
| | Drain Current-Continuous($T_C$=100℃) | -25.5 | A |
| $I_{DM\ (pluse)}$ | Drain Current-Continuous@ Current-Pulsed (Note 1) | -144 | A |
| $P_D$ | Maximum Power Dissipation($T_C$=25℃) | 79 | W |
| | Maximum Power Dissipation($T_C$=100℃) | 39.5 | W |
| $E_{AS}$ | Avalanche energy (Note 2) | 196 | mJ |
| $T_J$, $T_{STG}$ | Operating Junction and Storage Temperature Range | -55 To 175 | ℃ |

**Table 2. Thermal Characteristic**

| Symbol | Parameter | Typ | Max | Unit |
|---|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case | | 1.9 | ℃/W |

## Table 3. Electrical Characteristics ($T_J$=25℃ unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **On/Off States** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V $I_D$=-250μA | -60 | | | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-60V, $V_{GS}$=0V | | | -1 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0V | | | ±100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1.5 | -2.4 | -3.5 | V |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$=-5V, $I_D$=-15A | | 35 | | S |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}$=-10V, $I_D$=-15A | | 38 | 50 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-10A | | 49 | 65 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-25V, $V_{GS}$=0V, f=1.0MHz | | 2616 | | pF |
| $C_{oss}$ | Output Capacitance | | | 87 | | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 64 | | pF |
| **Switching Parameters** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS}$=-10V, $V_{DS}$=-30V, $R_L$=1.5Ω, $R_{GEN}$=3Ω | | 8.1 | | nS |
| $t_r$ | Turn-on Rise Time | | | 0.65 | | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 42 | | nS |
| $t_f$ | Turn-Off Fall Time | | | 9.1 | | nS |
| $Q_g$ | Total Gate Charge | $V_{GS}$=-10V, $V_{DS}$=-30V, $I_D$=-20A | | 44 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 6.8 | | nC |
| $Q_{gd}$ | Gate-Drain Charge | | | 8.5 | | nC |
| **Source-Drain Diode Characteristics** | | | | | | |
| $I_{SD}$ | Source-Drain Current (Body Diode) | | | | 30 | A |
| $V_{SD}$ | Forward on Voltage (Note 3) | $V_{GS}$=0V, $I_S$=-15A | | | -1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_F$=-20A, di/dt=100A/μs | | 17 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | $I_F$=-20A, di/dt=100A/μs | | 19 | | nC |

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.$E_{AS}$ condition: $T_J$=25℃,$V_{DD}$=40V,$V_G$=-10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

## Typical Electrical And Thermal Characteristics (Curves)

**Figure 1. Output Characteristics**

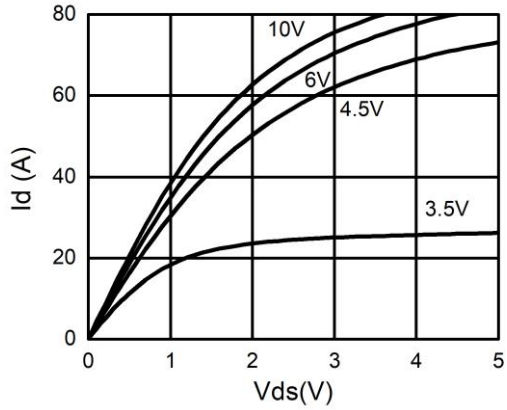



**Figure 2. Transfer Characteristics**

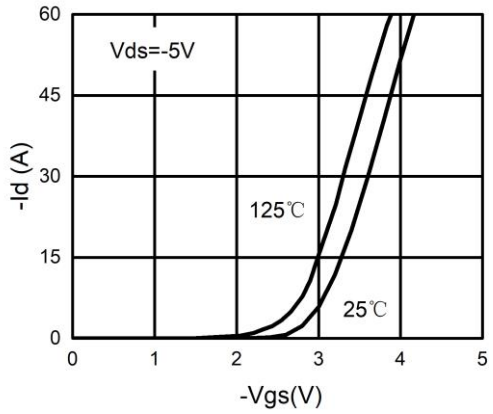



**Figure 3. Power Dissipation**

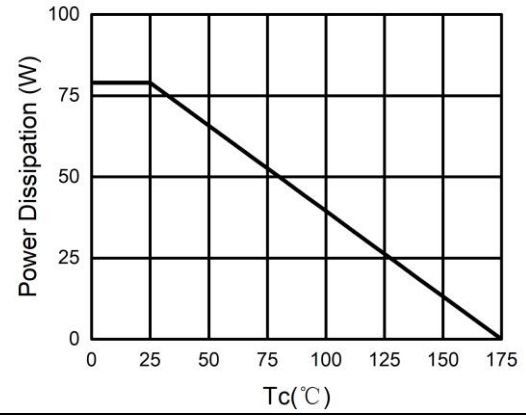



**Figure 4. Drain Current**

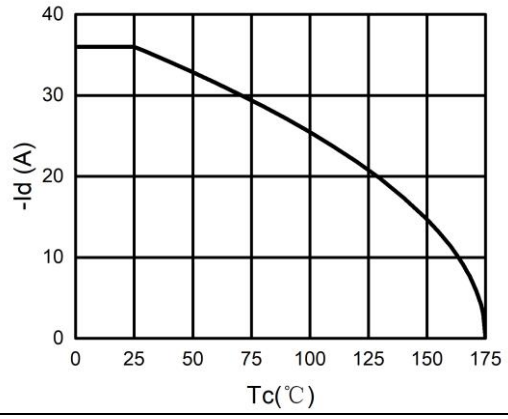



**Figure 5. $BV_{DSS}$ vs Junction Temperature**

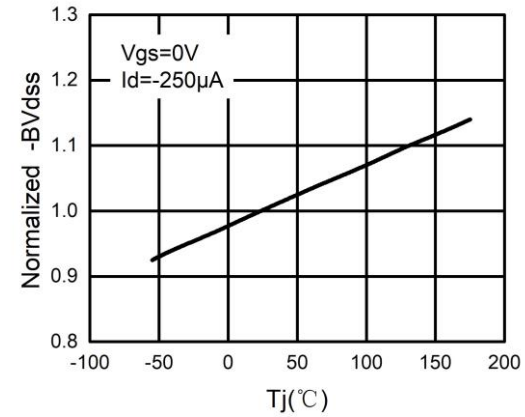
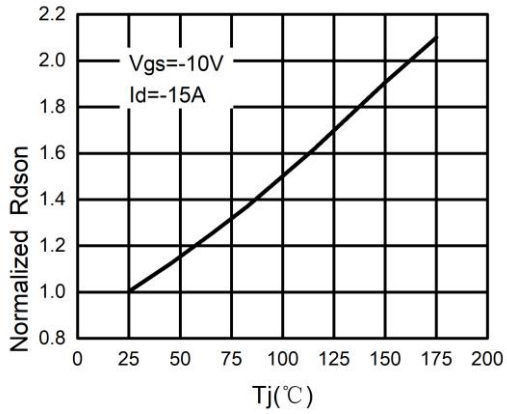
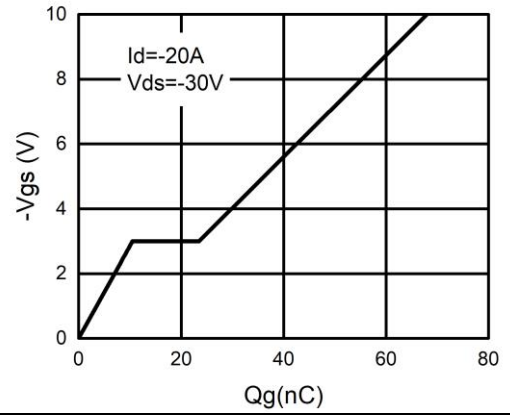
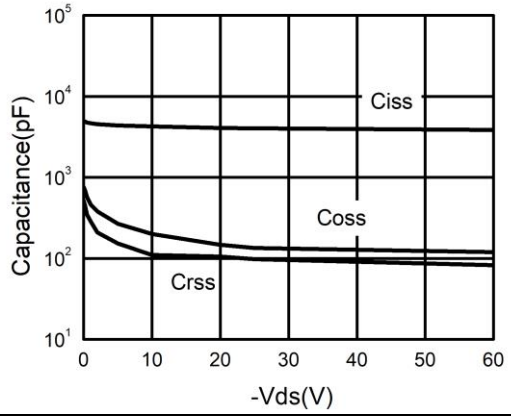
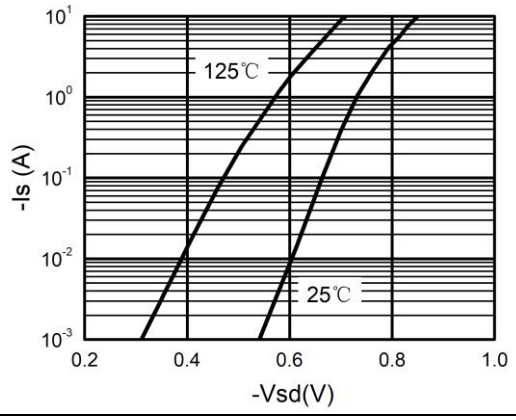
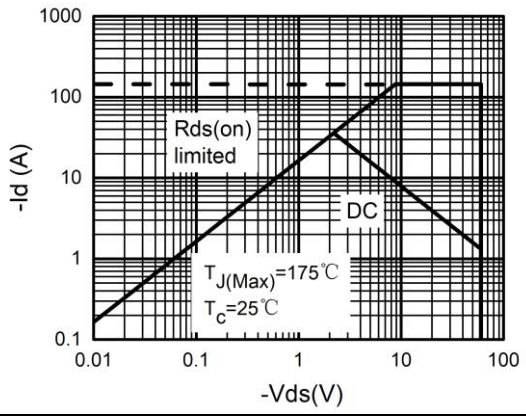



**Figure 6. $R_{DS(ON)}$ vs Junction Temperature**

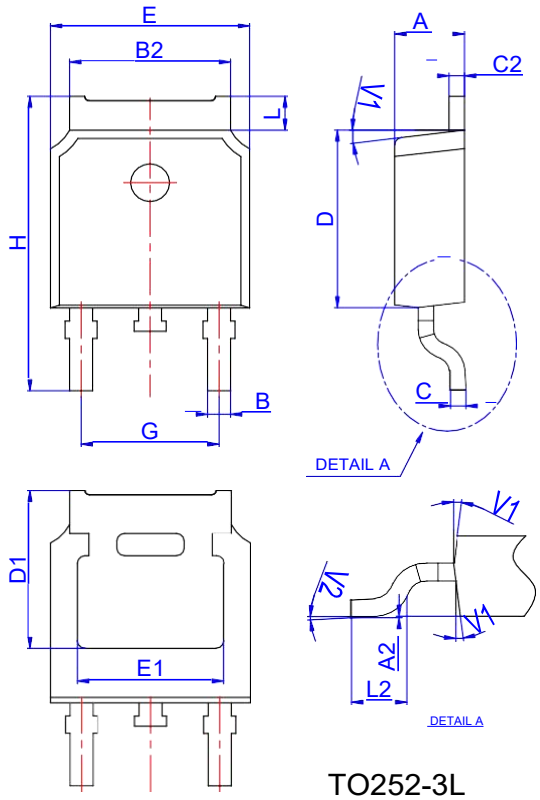


| Figure 7. Gate Charge Waveforms | Figure 8. Capacitance |
|---|---|
|  |  |



| Figure 9. Body-Diode Characteristics | Figure 10. Maximum Safe Operating Area |
|---|---|
|  |  |

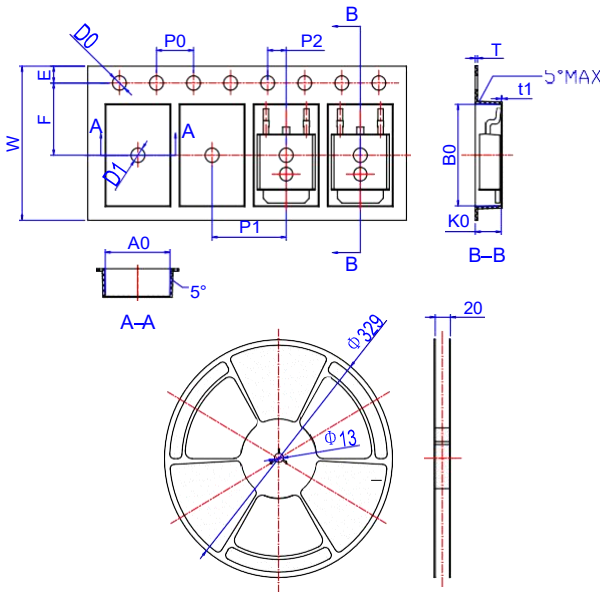
## Package Mechanical Data TO252-3L




TO252-3L

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 2.10 | | 2.50 | 0.083 | | 0.098 |
| A2 | 0 | | 0.10 | 0 | | 0.004 |
| B | 0.66 | | 0.86 | 0.026 | | 0.034 |
| B2 | 5.18 | | 5.48 | 0.202 | | 0.216 |
| C | 0.40 | | 0.60 | 0.016 | | 0.024 |
| C2 | 0.44 | | 0.58 | 0.017 | | 0.023 |
| D | 5.90 | | 6.30 | 0.232 | | 0.248 |
| D1 | 5.30REF | | | 0.209REF | | |
| E | 6.40 | | 6.80 | 0.252 | | 0.268 |
| E1 | 4.63 | | | 0.182 | | |
| G | 4.47 | | 4.67 | 0.176 | | 0.184 |
| H | 9.50 | | 10.70 | 0.374 | | 0.421 |
| L | 1.09 | | 1.21 | 0.043 | | 0.048 |
| L2 | 1.35 | | 1.65 | 0.053 | | 0.065 |
| V1 | | 7° | | | 7° | |
| V2 | 0° | | 6° | 0° | | 6° |

## Reel Specification-TO252-3L




| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| W | 15.90 | 16.00 | 16.10 | 0.626 | 0.630 | 0.634 |
| E | 1.65 | 1.75 | 1.85 | 0.065 | 0.069 | 0.073 |
| F | 7.40 | 7.50 | 7.60 | 0.291 | 0.295 | 0.299 |
| D0 | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| D1 | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| P0 | 3.90 | 4.00 | 4.10 | 0.154 | 0.157 | 0.161 |
| P1 | 7.90 | 8.00 | 8.10 | 0.311 | 0.315 | 0.319 |
| P2 | 1.90 | 2.00 | 2.10 | 0.075 | 0.079 | 0.083 |
| A0 | 6.85 | 6.90 | 7.00 | 0.270 | 0.271 | 0.276 |
| B0 | 10.45 | 10.50 | 10.60 | 0.411 | 0.413 | 0.417 |
| K0 | 2.68 | 2.78 | 2.88 | 0.105 | 0.109 | 0.113 |
| T | 0.24 | | 0.27 | 0.009 | | 0.011 |
| t1 | 0.10 | | | 0.004 | | |
| 10P0 | 39.80 | 40.00 | 40.20 | 1.567 | 1.575 | 1.583 |