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

## Product Summary

| BVDSS | RDSON | ID |
|---|---|---|
| -20V | 21mΩ | -7.0A |

## Description

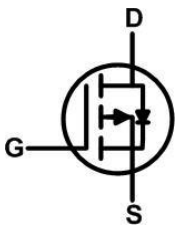
The ZX 20P07 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications

The ZX 20P07 meet the RoHS and Green Product requirement with full function reliability approved.

## SOT 23 Pin Configurations




pin assignment




Schematic diagram

## Package Marking and Ordering Information

| Product | Package | Marking | Packing | Min Unit Quantity |
|---|---|---|---|---|
| ZX 20P07 | SOT23 | * | 3000PCS/Reel | 3000PCS |

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | -20 | V |
| $V_{GS}$ | Gate-Source Voltage | ±12 | V |
| $I_D$@$T_A$=25°C | Continuous Drain Current, $V_{GS}$ @ -4.5V[1] | -7.0 | A |
| $I_D$@$T_A$=70°C | Continuous Drain Current, $V_{GS}$ @ -4.5V[1] | -4.8 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | -18.8 | A |
| $P_D$@$T_A$=25°C | Total Power Dissipation[3] | 1.5 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | °C |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | °C |

## Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient [1] | --- | 115 | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | 80 | °C/W |

## Electrical Characteristics ($T_J$=25℃ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| **Off Characteristic** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$= -250μA | -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, $V_{GS}$= ±12V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$= -250μA | -0.4 | -0.7 | -1.0 | V |
| $R_{DS(on)}$ | Static Drain-Source on-Resistance note2 | $V_{GS}$= -4.5V, $I_D$= -5A | - | 21 | 26 | mΩ |
| | | $V_{GS}$= -2.5V, $I_D$= -4A | - | 27 | 37 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$= -10V, $V_{GS}$=0V, f=1.0MHz | - | 1200 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 191 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 168 | - | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$= -10V, $I_D$= -5A, $V_{GS}$= -4.5V | - | 33.7 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 3.5 | - | nC |
| $Q_{gd}$ | Gate-Drain(“Miller”) Charge | | - | 10.5 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$ = -10V, $I_D$= -5A, $V_{GS}$= -4.5V,$R_{GEN}$=10Ω | - | 11 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 35 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 30 | - | ns |
| $t_f$ | Turn-off Fall Time | | - | 10 | - | ns |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -7.0 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -20 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$=0V, $I_S$= -5A | - | - | -1.2 | V |

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

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

## Typical Performance Characteristics

**Figure1:** Output Characteristics

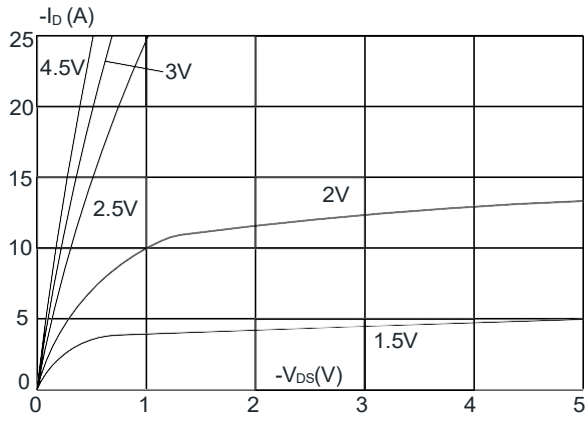



**Figure 2:** Typical Transfer Characteristics

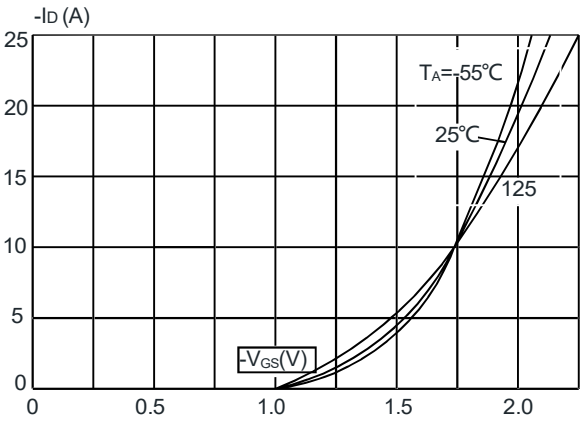



**Figure 3:**On-resistance vs. Drain Current

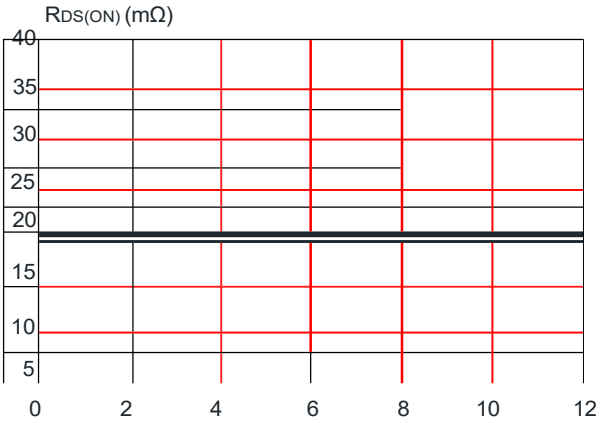



**Figure 4**: Body Diode Characteristics

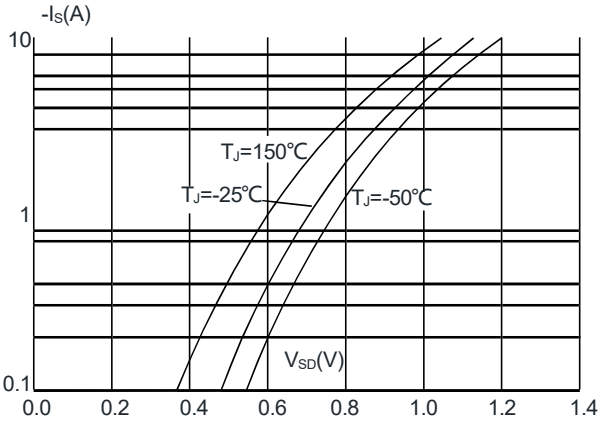



**Figure 5:** Gate Charge Characteristics

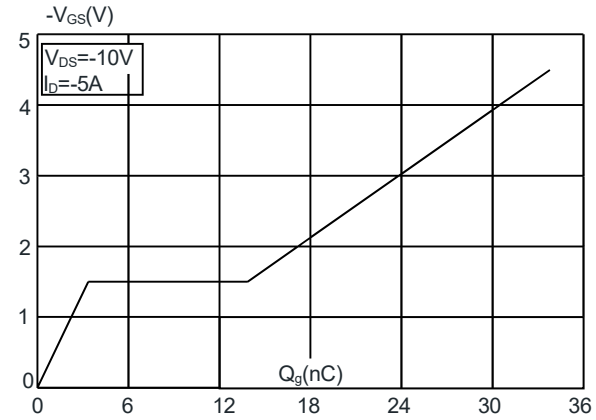



**Figure 6:** Capacitance Characteristics

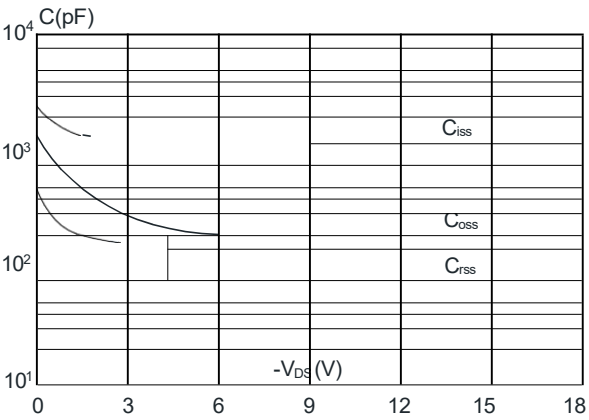


**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

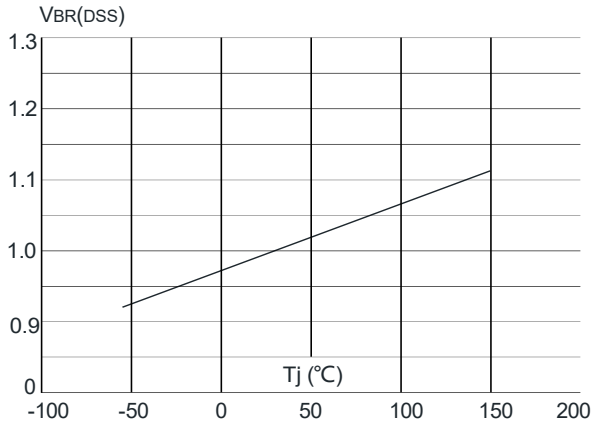



**Figure 8:** Normalized on Resistance vs. Junction Temperature

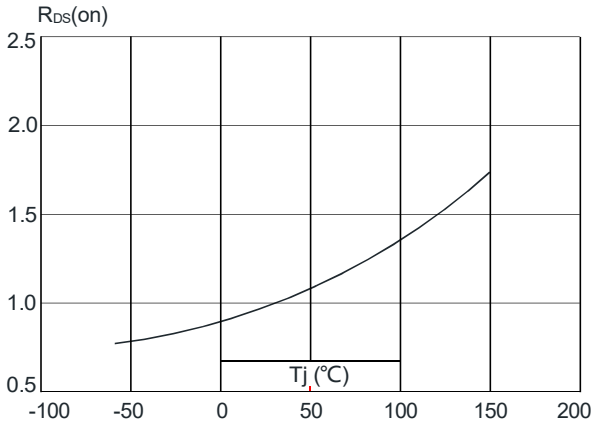



**Figure 9:** Maximum Safe Operating Area

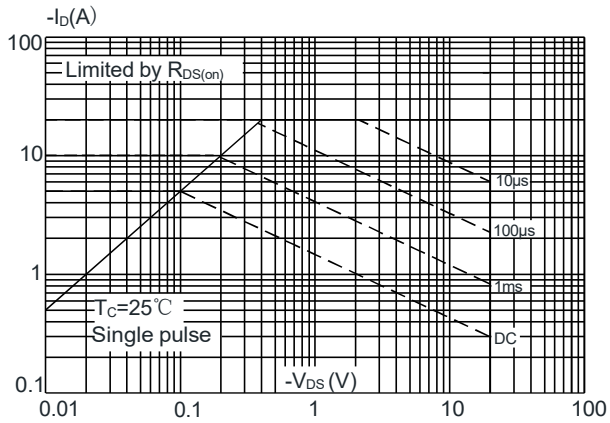



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

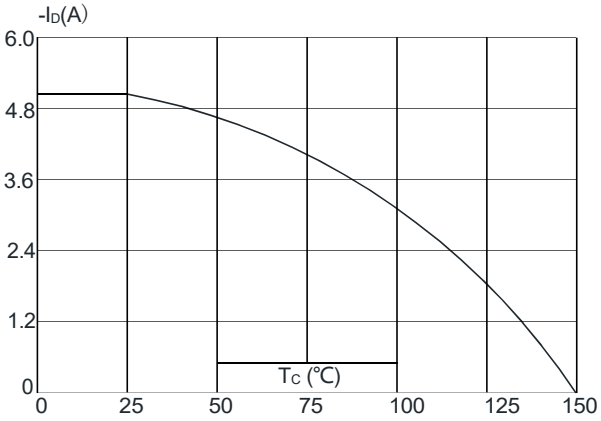
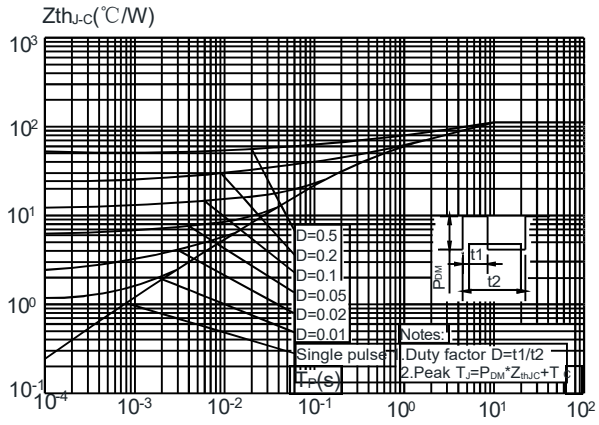
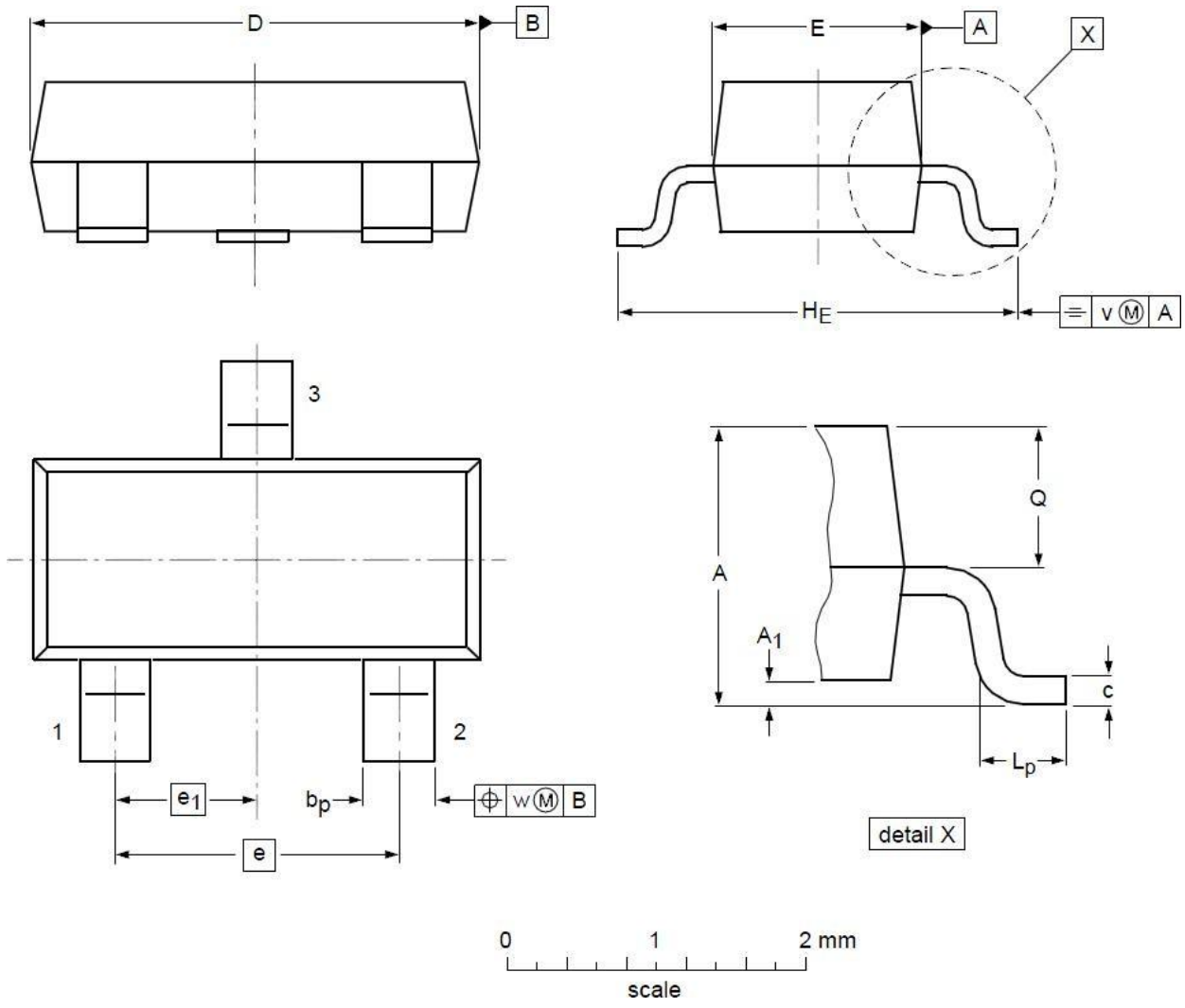



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



## SOT23 Mechanical tData




**DIMENSIONS** ( unit : mm )

| Symbol | Min | Typ | Max | Symbol | Min | Typ | Max |
|---|---|---|---|---|---|---|---|
| **A** | 0.90 | 1.01 | 1.15 | **$A_1$** | 0.01 | 0.05 | 0.10 |
| **$b_p$** | 0.30 | 0.42 | 0.50 | **c** | 0.08 | 0.13 | 0.15 |
| **D** | 2.80 | 2.92 | 3.00 | **E** | 1.20 | 1.33 | 1.40 |
| **e** | -- | 1.90 | -- | **$e_1$** | -- | 0.95 | -- |
| **$H_E$** | 2.25 | 2.40 | 2.55 | **$L_p$** | 0.30 | 0.42 | 0.50 |
| **Q** | 0.45 | 0.49 | 0.55 | **v** | -- | 0.20 | -- |
| **w** | -- | 0.10 | -- | | | | |