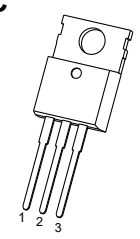
SZCJ Shenzhen Changji Semiconductor Co., LTD.

# TO-220-3L-C Plastic-Encapsulate MOSFETS

## CJP50P06S P-Channel Power MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)}$TYP | $I_D$ |
|---|---|---|
| -60V | 25mΩ@-10V | -50A |

**TO-220-3L-C**




1. GATE
2. DRAIN
3. SOURCE

### GENERAL DESCRIPTION

The CJP50P06S 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.

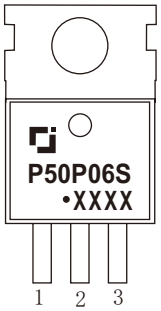
### FEATURE

- Advanced trench process technology
- Reliable and rugged
- High density cell design for ultra low On-Resistance

### APPLICATION

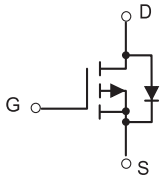
- Power management in notebook computer
- Portable equipment and battery powered systems

### MARKING




P50P06S = Device code
Solid dot = Green molding compound device, if none, the normal device
XXXX = Code

### EQUIVALENT CIRCUIT




### MAXIMUM RATINGS ( $T_a$=25℃ unless otherwise noted )

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $I_D$ ① | -50 | A |
| Pulsed Drain Current | $I_{DM}$ ② | -200 | A |
| Single Pulsed Avalanche Energy | $E_{AS}$ ③ | 160 | mJ |
| Power Dissipation | $P_D$ ① | 95 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ ⑥ | 62.5 | ℃/W |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ ① | 1.31 | ℃/W |
| Operating Junction and Storage Temperature Range | $T_J$ ,$T_{stg}$ | -55~+150 | ℃ |

## MOSFET ELECTRICAL CHARACTERISTICS

**$T_a$=25℃ unless otherwise specified**

| Parameter | Symbol | Test Condition | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Off characteristics** | | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | | -60 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =-48V, $V_{GS}$ =0V | $T_J$=25℃ | | | 1.0 | μA |
| | | | $T_J$=125℃ | | | 100 | |
| Gate-body leakage current | $I_{GSS}$ | $V_{DS}$ =0V, $V_{GS}$ =±20V | | | | ±100 | nA |
| **On characteristics** ④ | | | | | | | |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | | -1.0 | -2.0 | -3.0 | V |
| Static drain-source on-sate resistance | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-20A | | | 25 | 35 | mΩ |
| **Dynamic characteristics** ⑤ | | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{DS}$ =-25V,$V_{GS}$ =0V, f =1MHz | | | 3005 | | pF |
| Output capacitance | $C_{oss}$ | | | | 184 | | |
| Reverse transfer capacitance | $C_{rss}$ | | | | 167 | | |
| Gate resistance | Rg | f =1MHz | | | 4.0 | | Ω |
| **Switching characteristics** ⑤ | | | | | | | |
| Total gate charge | $Q_g$ | $V_{GS}$=-10V, $V_{DS}$=-30V, $I_D$=-20A | | | 72 | | nC |
| Gate-source charge | $Q_{gs}$ | | | | 15 | | |
| Gate-drain charge | $Q_{gd}$ | | | | 17 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=-30V,$R_G$=3Ω $R_L$=1.5Ω,$V_{GS}$=-10V | | | 16 | | ns |
| Turn-on rise time | $t_r$ | | | | 18 | | |
| Turn-off delay time | $t_{d(off)}$ | | | | 39 | | |
| Turn-off fall time | $t_f$ | | | | 44 | | |
| **Drain-Source Diode Characteristics** | | | | | | | |
| Drain-source diode forward voltage | $V_{SD}$ ④ | $V_{GS}$ =0V, $I_S$=-20A | | | | -1.2 | V |
| Continuous drain-source diode forward current | $I_S$ ① | | | | | -50 | A |
| Pulsed drain-source diode forward current | $I_{SM}$ ② | | | | | -200 | A |

Notes:

1.$T_C$=25℃ Limited only by maximum temperature allowed.

2.$P_W$≤10μs, Duty cycle≤1%.

3.EAS condition: $V_{DD}$=-25V,$V_{GS}$=-10V, L=0.5mH, $R_g$=25Ω Starting $T_J$= 25°℃.

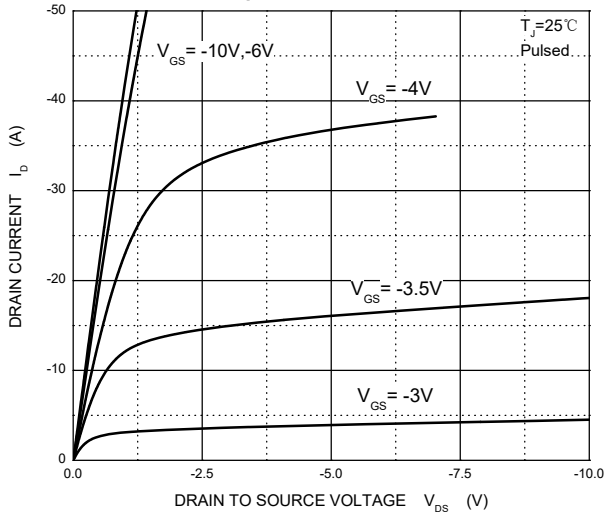
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

5.Guaranteed by design, not subject to production.

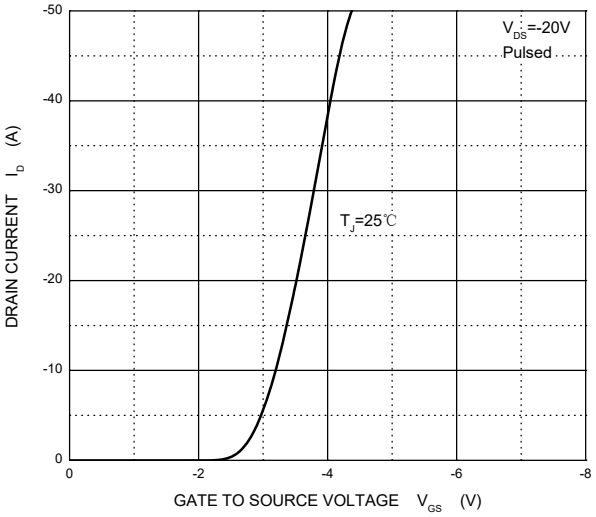
6.The value of $R_{\theta JA}$ is measured with the device in a still air environment with $T_a$=25℃.

# Typical Characteristics

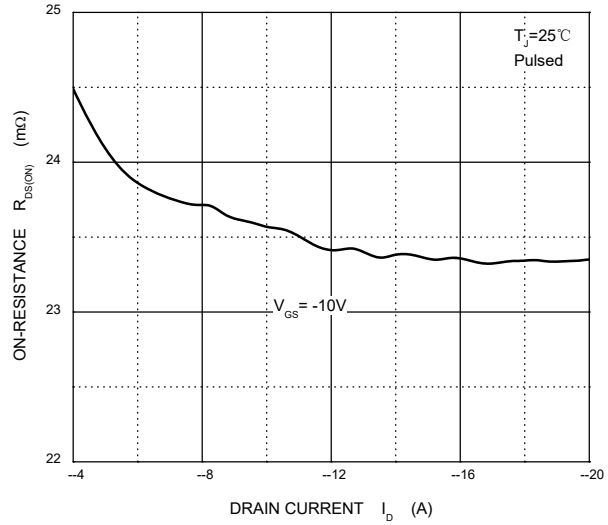
**Output Characteristics**



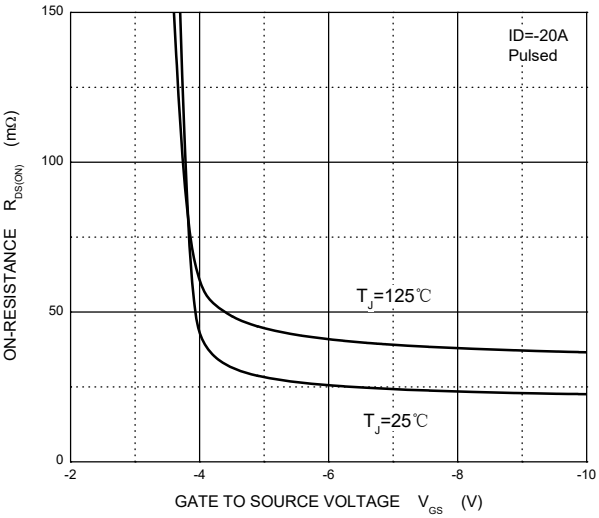

**Transfer Characteristics**



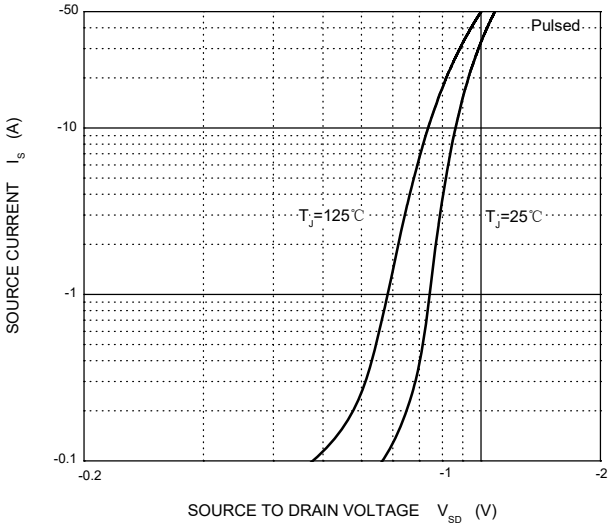

**$R_{DS(ON)}$ —— $I_D$**



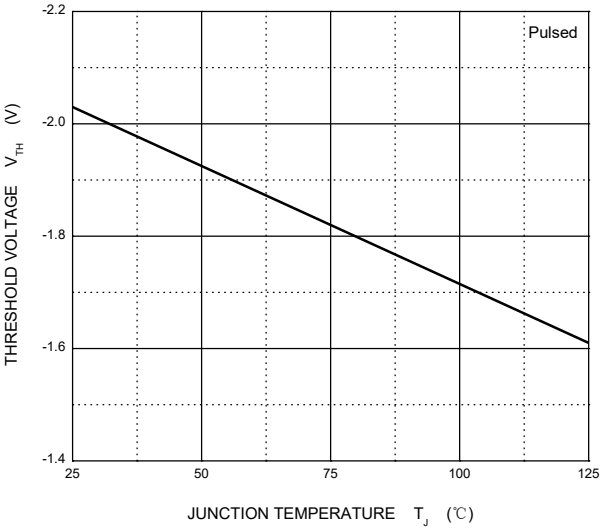

**$R_{DS(ON)}$—— $V_{GS}$**




**$I_S$ —— $V_{SD}$**

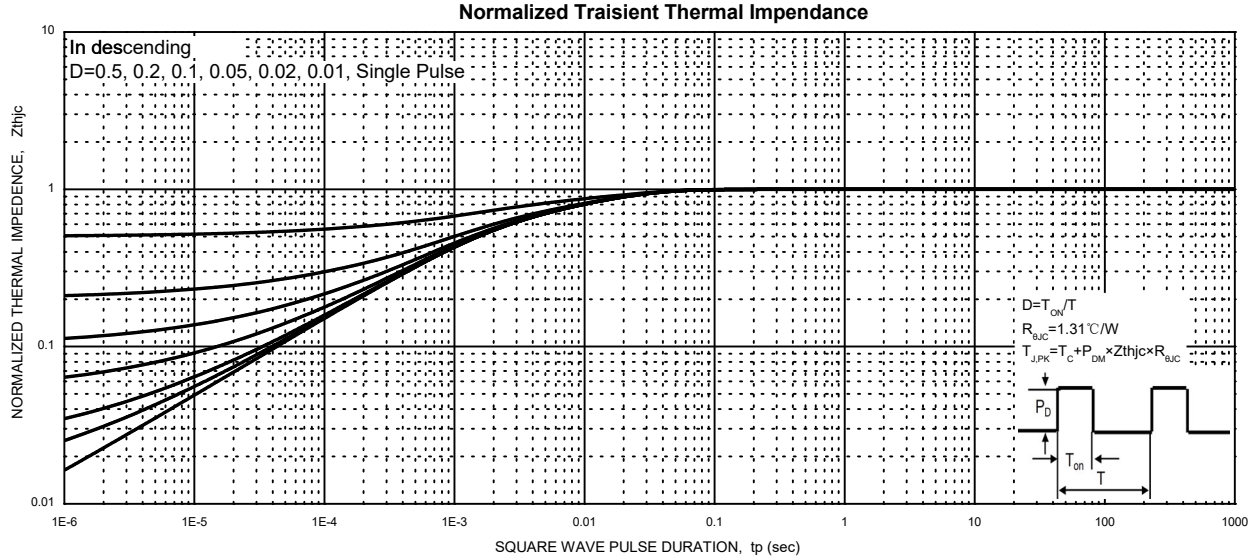



**Threshold Voltage**

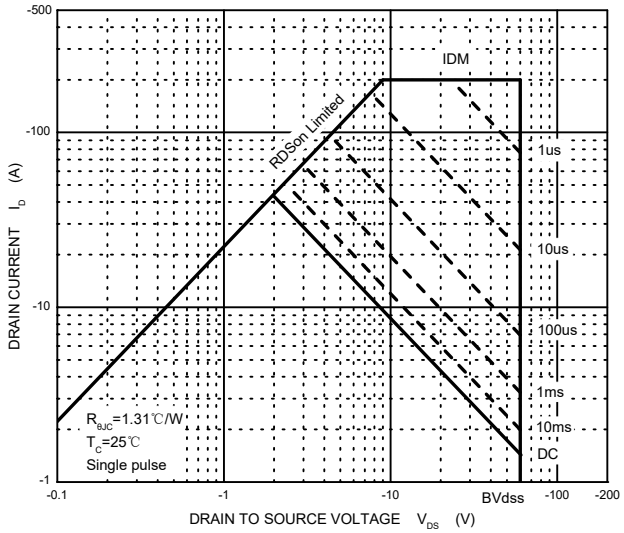


# Typical Characteristics

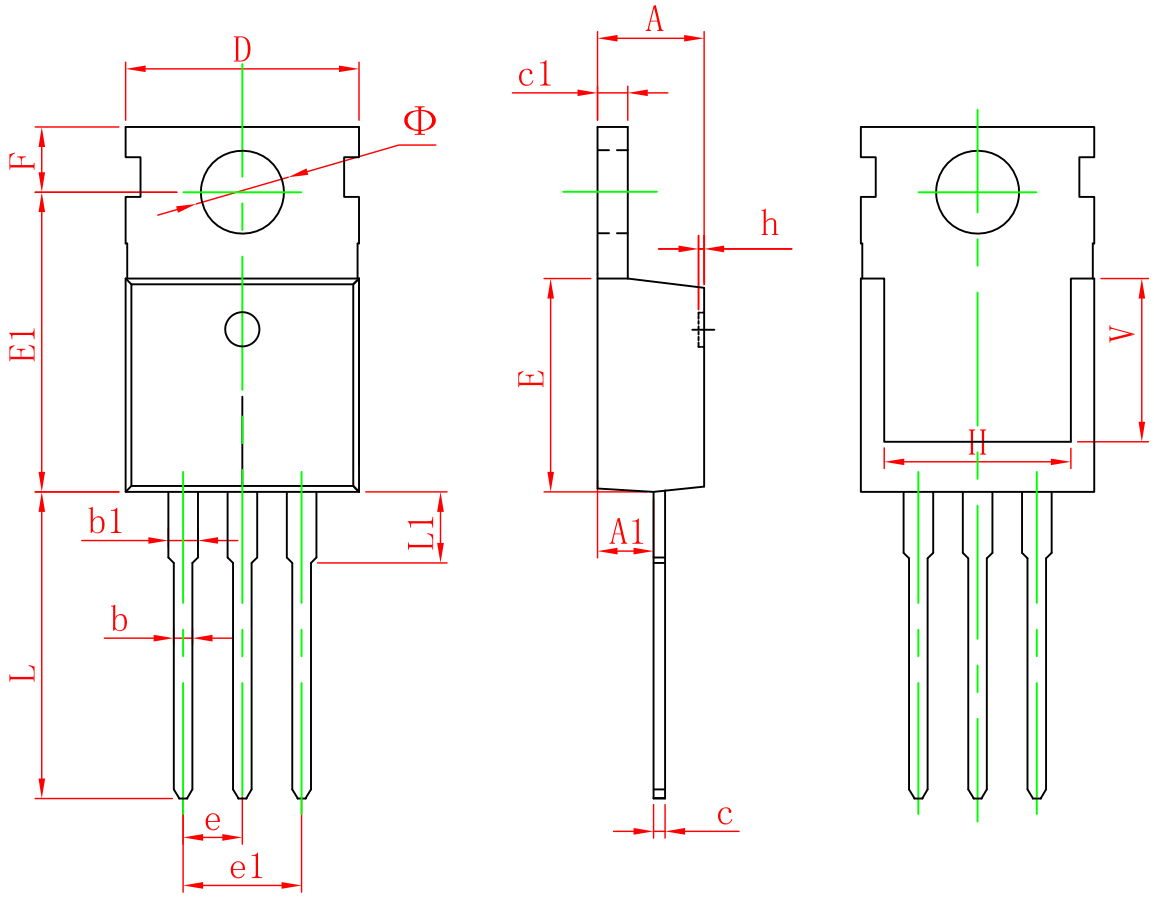
**Normalized Traisient Thermal Impendance**




**Maximun Forward Biased Safe Operating Area**



## TO-220-3L-C Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 4.400 | 4.600 | 0.173 | 0.181 |
| A1 | 2.250 | 2.550 | 0.089 | 0.100 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.330 | 0.650 | 0.013 | 0.026 |
| c1 | 1.200 | 1.400 | 0.047 | 0.055 |
| D | 9.910 | 10.250 | 0.390 | 0.404 |
| E | 8.950 | 9.750 | 0.352 | 0.384 |
| E1 | 12.650 | 12.950 | 0.498 | 0.510 |
| e | 2.540 TYP. | | 0.100 TYP. | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| F | 2.650 | 2.950 | 0.104 | 0.116 |
| H | 7.900 | 8.100 | 0.311 | 0.319 |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| L | 12.900 | 13.400 | 0.508 | 0.528 |
| L1 | 2.850 | 3.250 | 0.112 | 0.128 |
| V | 7.500 REF. | | 0.295 REF. | |
| Φ | 3.400 | 3.800 | 0.134 | 0.150 |