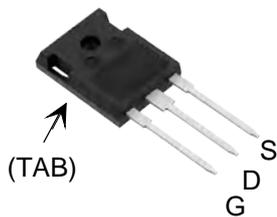


# SMOS36P10B2

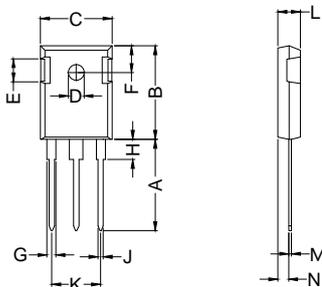
## P-Channel Enhancement Mode Avalanche Rated Power MOSFETs



Gate, D=Drain,  
S=Source, TAB=Drain



Dimensions TO-247AD



| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | Min.       | Max.  | Min.   | Max.  |
| A    | 19.81      | 20.32 | 0.780  | 0.800 |
| B    | 20.80      | 21.46 | 0.819  | 0.845 |
| C    | 15.75      | 16.26 | 0.620  | 0.640 |
| ØD   | 3.15       | 3.65  | 0.124  | 0.144 |
| E    | 4.32       | 5.49  | 0.170  | 0.216 |
| F    | 5.40       | 6.30  | 0.213  | 0.248 |
| G    | 1.65       | 2.18  | 0.065  | 0.086 |
| H    | 3.80       | 4.50  | 0.150  | 0.177 |
| J    | 1.00       | 1.40  | 0.039  | 0.055 |
| K    | 10.80      | 11.10 | 0.425  | 0.437 |
| L    | 4.70       | 5.30  | 0.185  | 0.209 |
| M    | 0.40       | 0.80  | 0.016  | 0.031 |
| N    | 1.50       | 2.49  | 0.059  | 0.098 |

| Symbol            | Test Conditions   | Maximum Ratings | Unit      |
|-------------------|---|-----------------|-----------|
| V <sub>DSS</sub>  | T <sub>J</sub> =25°C to 150°C   | -100            | V         |
| V <sub>DGR</sub>  | T <sub>J</sub> =25°C to 150°C; R <sub>GS</sub> =1MΩ   | -100            |           |
| V <sub>GS</sub>   | Continuous  | ±20             | V         |
| V <sub>GSM</sub>  | Transient   | ±30             |           |
| I <sub>D25</sub>  | T <sub>C</sub> =25°C  | -36             | A         |
| I <sub>D100</sub> | T <sub>C</sub> =100°C   | -24             |           |
| I <sub>DM</sub>   | T <sub>C</sub> =25°C; pulse width limited by T <sub>JM</sub>  | -124            | A         |
| I <sub>AR</sub>   | T <sub>C</sub> =25°C  | -36             | A         |
| E <sub>AR</sub>   | T <sub>C</sub> =25°C  | 1.46            | J         |
| dv/dt             | I <sub>S</sub> ≤I <sub>DM</sub> ; di/dt≤100A/us; V <sub>DD</sub> ≤V <sub>DSS</sub><br>T <sub>J</sub> ≤150°C; R <sub>G</sub> =2Ω | 9               | V/ns      |
| P <sub>D</sub>    | T <sub>C</sub> =25°C  | 295             | W         |
| T <sub>J</sub>    |   | -55...+150      |           |
| T <sub>JM</sub>   |   | 150             | °C        |
| T <sub>stg</sub>  |   | -55...+150      |           |
| T <sub>L</sub>    | 1.6mm(0.062 in.) from case for 10s  | 300             | °C        |
| M <sub>d</sub>    | Mounting torque   | 1.13/10         | Nm/lb.in. |
| Weight            | typical   | 6               | g         |

# SMOS36P10B2

## P-Channel Enhancement Mode Avalanche Rated Power MOSFETs

(T<sub>J</sub>=25°C, unless otherwise specified)

| Symbol              | Test Conditions  | Characteristic Values |      |           | Unit     |
|---------------------|--|-----------------------|------|-----------|----------|
|                     |  | min.                  | typ. | max.      |          |
| V <sub>DSS</sub>    | V <sub>GS</sub> =0V; I <sub>D</sub> =-250μA  | -100                  |      |           | V        |
| V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> ; I <sub>D</sub> =-250μA  | -2                    | -3   | -4        | V        |
| I <sub>GSS</sub>    | V <sub>GS</sub> =±20V <sub>DC</sub> ; V <sub>DS</sub> =0   |                       |      | ±100      | nA       |
| I <sub>DSS</sub>    | V <sub>DS</sub> =0.8V <sub>DSS</sub> ; T <sub>J</sub> =25°C, V <sub>GS</sub> =0V;<br>T <sub>J</sub> =125°C |                       |      | -1<br>-10 | μA<br>μA |

(T<sub>J</sub>=25°C, unless otherwise specified)

| Symbol  | Test Conditions  | Characteristic Values |                      |                       | Unit                 |
|---|--|-----------------------|----------------------|-----------------------|----------------------|
|   |  | min.                  | typ.                 | max.                  |                      |
| R <sub>DS(on)</sub>   | V <sub>GS</sub> =-10V; I <sub>D</sub> =0.5I <sub>D25</sub><br>Pulse test, t≤300μs, duty cycle≤2%                                   |                       | 0.038                | 0.046                 | Ω                    |
| g <sub>ts</sub>   | V <sub>DS</sub> =-10V; I <sub>D</sub> =0.5I <sub>D25</sub> ; pulse test  | 31                    | 35                   |                       | S                    |
| C <sub>ies</sub><br>C <sub>oes</sub><br>C <sub>res</sub>                      | V <sub>GS</sub> =0V; V <sub>DS</sub> =-25V; f=1MHz   |                       | 3000<br>155<br>230   |                       | pF                   |
| Q <sub>g(on)</sub><br>Q <sub>gs</sub><br>Q <sub>gd</sub>                      | V <sub>GS</sub> =-10V; V <sub>DS</sub> =0.5V <sub>DSS</sub> ; I <sub>D</sub> =0.5I <sub>D25</sub>                                  |                       | 73<br>18<br>17       |                       | nC                   |
| t <sub>d(on)</sub><br>t <sub>r</sub><br>t <sub>d(off)</sub><br>t <sub>f</sub> | V <sub>GS</sub> =-10V; V <sub>DS</sub> =0.5V <sub>DSS</sub> ; I <sub>D</sub> =0.5I <sub>D25</sub><br>R <sub>G</sub> =2Ω (External) |                       | 25<br>12<br>70<br>20 | 40<br>30<br>120<br>40 | ns<br>ns<br>ns<br>ns |
| R <sub>thJC</sub>   |  |                       |                      | 0.40                  | K/W                  |
| R <sub>thCS</sub>   |  |                       | 0.26                 |                       | K/W                  |

### Source-Drain Diode

(T<sub>J</sub>=25°C, unless otherwise specified)

| Symbol          | Test Conditions   | Characteristic Values |       |      | Unit |
|-----------------|---|-----------------------|-------|------|------|
|                 |   | min.                  | typ.  | max. |      |
| I <sub>S</sub>  | V <sub>GS</sub> =0V   |                       |       | -36  | A    |
| I <sub>SM</sub> | Repetitive;<br>pulse width limited by T <sub>JM</sub>   |                       |       | -52  | A    |
| V <sub>SD</sub> | I <sub>F</sub> =I <sub>S</sub> ; V <sub>GS</sub> =0V;<br>Pulse test, t≤300μs, duty cycle d≤2% |                       |       | -1.4 | V    |
| t <sub>rr</sub> | I <sub>F</sub> =I <sub>S</sub> ; T <sub>J</sub> =25°C   |                       | 250   |      | ns   |
| Q <sub>rr</sub> | -di/dt=100A/μs; T <sub>J</sub> =25°C<br>V <sub>R</sub> =-100V;                                |                       | 1.5   |      | μC   |
| I <sub>RM</sub> | T <sub>J</sub> =25°C  |                       | -16.6 |      | A    |



# SMOS36P10B2

## P-Channel Enhancement Mode Avalanche Rated Power MOSFETs

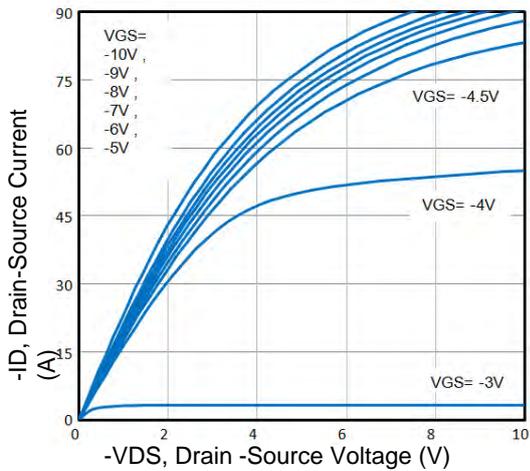


Fig1. Typical Output Characteristics

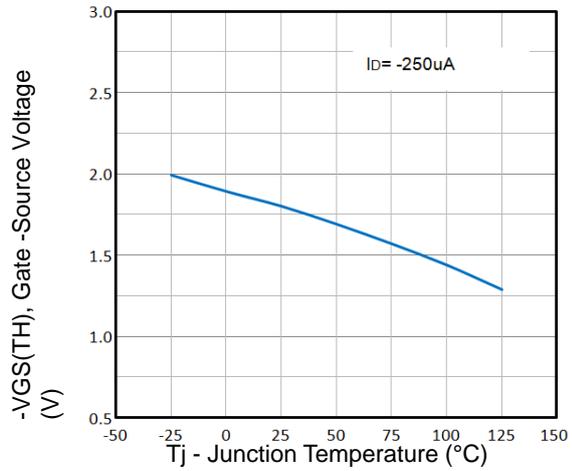


Fig2.  $V_{GS(TH)}$  Voltage Vs. Temperature

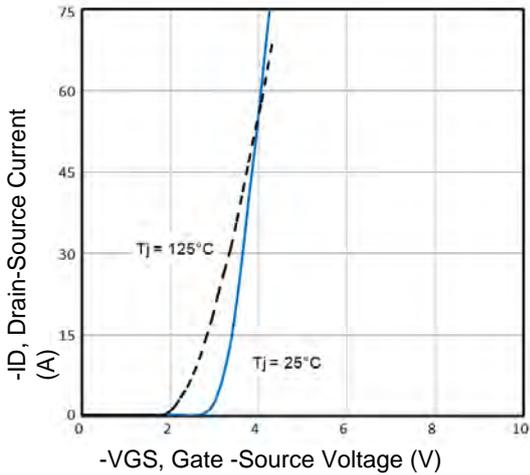


Fig3. Typical Transfer Characteristics

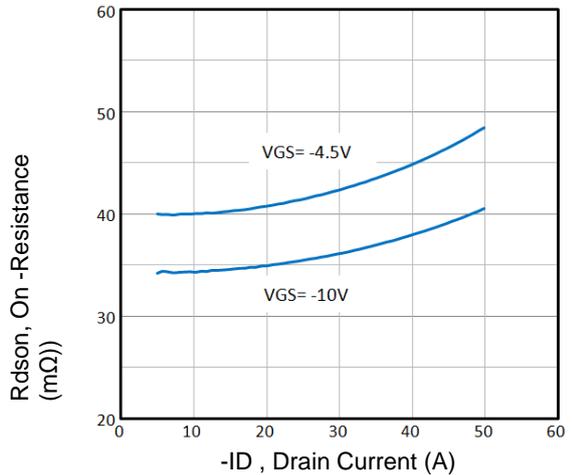


Fig4. On-Resistance vs. Drain Current and Gate Voltage

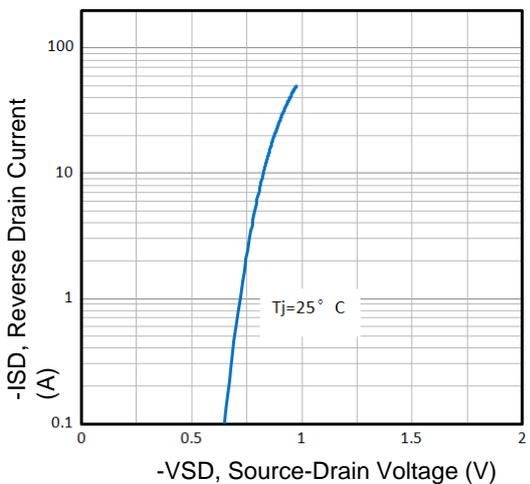


Fig5. Typical Source-Drain Diode Forward Voltage

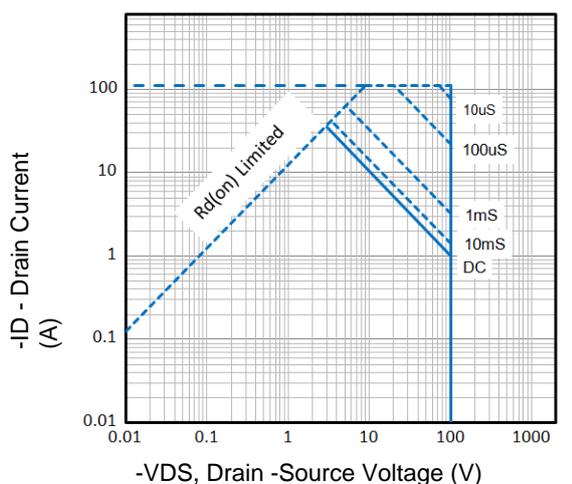


Fig6. Maximum Safe Operating Area



# SMOS36P10B2

## P-Channel Enhancement Mode Avalanche Rated Power MOSFETs

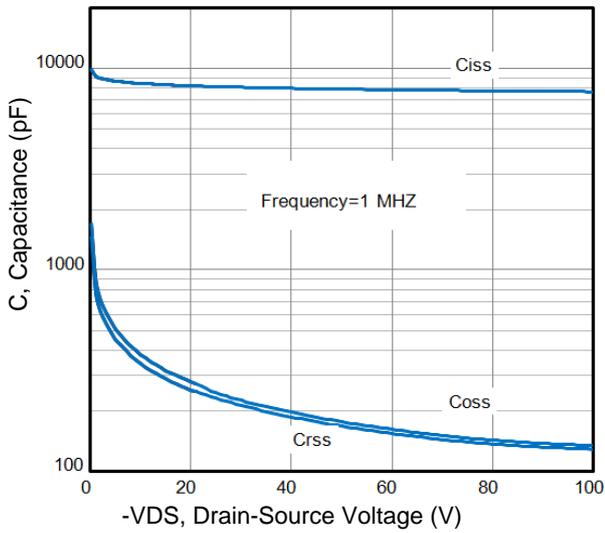


Fig7. Typical Capacitance Vs. Drain-Source Voltage

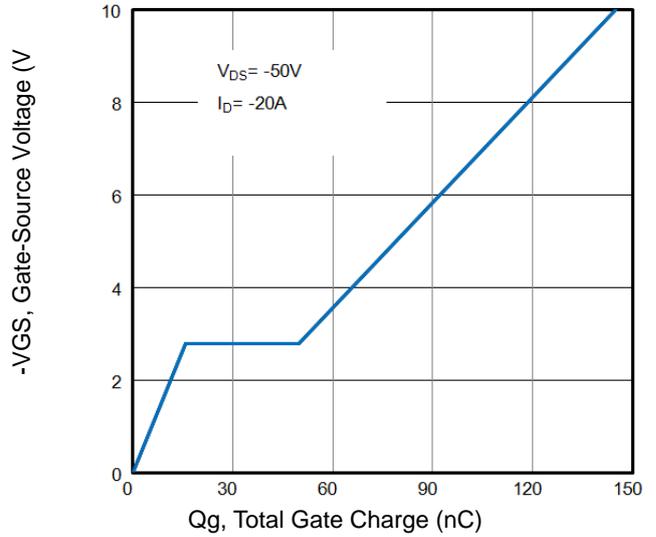


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

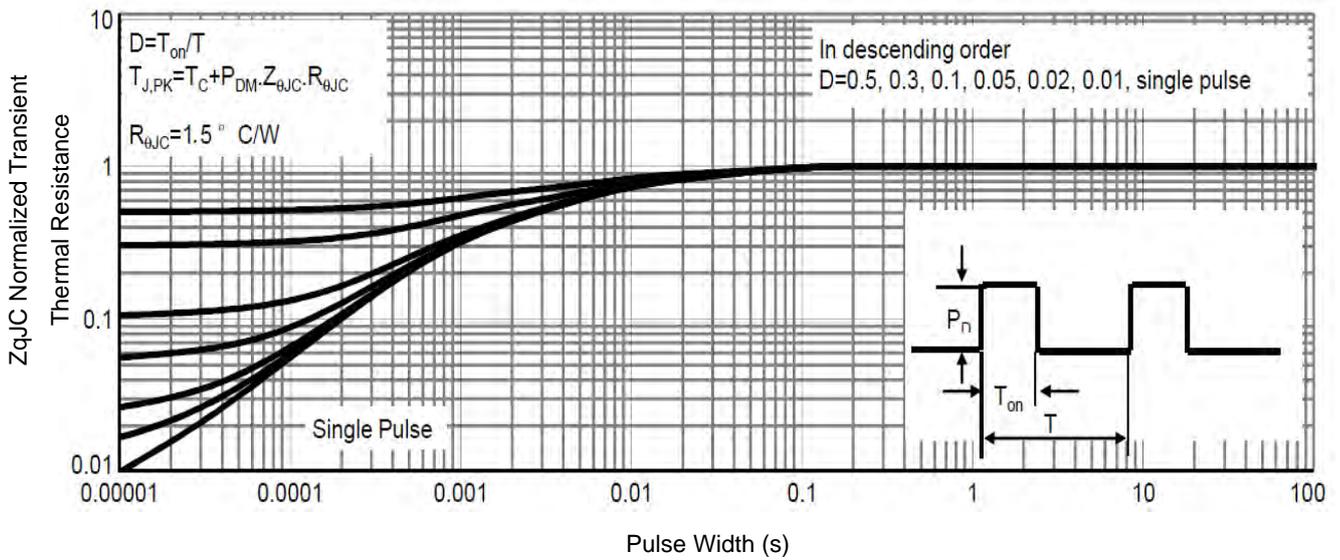


Fig9. Normalized Maximum Transient Thermal Impedance

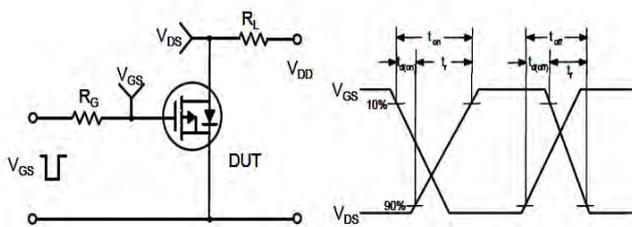


Fig10. Switching Time Test Circuit and waveforms

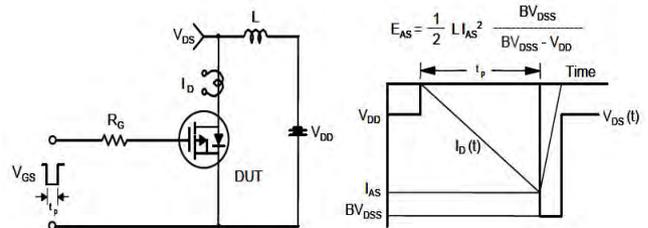


Fig11. Unclamped Inductive Test Circuit and waveforms



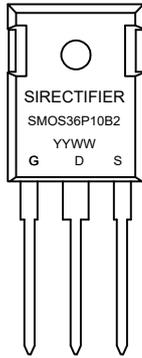
# SMOS36P10B2

P-Channel Enhancement Mode Avalanche Rated Power MOSFETs

## Marking

SMOS36P10B2

(TO-247AD)



Company Logo  
Part Number  
Lot No.



## Ordering Information

| Part Number | Package  | Shipping     | Marking Code |
|-------------|----------|--------------|--------------|
| SMOS36P10B2 | TO-247AD | 30pcs / Tube | SMOS36P10B2  |