

The GreenMOS[®] high voltage MOSFET utilizes charge balance technology to achieve outstanding low on-resistance and lower gate charge. It is engineered to minimize conduction loss, provide superior switching performance and robust avalanche capability.

The GreenMOS[®] Generic series is optimized for extreme switching performance to minimize switching loss. It is tailored for high power density applications to meet the highest efficiency standards.

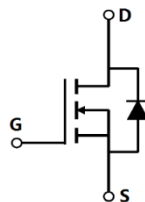
GreenMOS[®]



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| Parameter | Value | Unit |
|--------------------------------|-------|------|
| $V_{DS, min} @ T_{j(max)}$ | 700 | V |
| $I_{D, pulse}$ | 6 | A |
| $R_{DS(ON), max} @ V_{GS}=10V$ | 2.4 | |
| Q_g | 5.1 | nC |

| Product Name | Package | Marking |
|--------------|---------|------------|
| OSG65R2K4PF | TO220 | OSG65R2K4P |



Absolute Maximum Ratings at $T_j=25$ unless otherwise noted

| Parameter | Symbol | Value | Unit |
|--|----------------|----------|------|
| Drain-source voltage | V_{DS} | 650 | V |
| Gate-source voltage | V_{GS} | ± 30 | V |
| Continuous drain current ¹⁾ , $T_C=25$ °C | I_D | 2 | A |
| Continuous drain current ¹⁾ , $T_C=100$ °C | | 1.25 | |
| Pulsed drain current ²⁾ , $T_C=25$ °C | $I_{D, pulse}$ | 6 | A |
| Continuous diode forward current ¹⁾ , $T_C=25$ °C | I_S | 2 | A |
| Diode pulsed current ²⁾ , $T_C=25$ °C | $I_{S, pulse}$ | 6 | A |
| Power dissipation ³⁾ , $T_C=25$ °C | P_D | 20 | W |
| Single pulsed avalanche energy ⁵⁾ | E_{AS} | 56 | mJ |

Dynamic Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test condition |
|------------------------------|--------------|------|-------|------|------|---|
| Input capacitance | C_{iss} | | 118 | | pF | $V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, Hz |
| Output capacitance | C_{oss} | | 12.5 | | pF | |
| Reverse transfer capacitance | C_{rss} | | 0.76 | | pF | |
| Turn-on delay time | $t_{d(on)}$ | | 46.4 | | ns | $V_{GS}=10\text{ V}$, $V_{DS}=380\text{ V}$, $R_G=25$ $I_D=2\text{ A}$ |
| Rise time | t_r | | 28.8 | | ns | |
| Turn-off delay time | $t_{d(off)}$ | | 111.1 | | ns | |
| Fall time | t_f | | 48 | | ns | |

Gate Charge Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test condition |
|----------------------|---------------|------|------|------|------|---|
| Total gate charge | Q_g | | 5.7 | | nC | $V_{GS}=10\text{ V}$, $V_{DS}=480\text{ V}$, $I_D=2\text{ A}$ |
| Gate-source charge | Q_{gs} | | 1.1 | | nC | |
| Gate-drain charge | Q_{gd} | | 2.5 | | nC | |
| Gate plateau voltage | $V_{plateau}$ | | 5.4 | | V | |

Body Diode Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test condition |
|-------------------------------|-----------|------|-------|------|------|--|
| Diode forward voltage | V_{SD} | | | 1.4 | V | $I_S=2\text{ A}$, $V_{GS}=0\text{ V}$ |
| Reverse recovery time | t_{rr} | | 130 | | ns | $V_R=400\text{ V}$, $I_S=2\text{ A}$, |
| Reverse recovery charge | Q_{rr} | | 0.655 | | C | |
| Peak reverse recovery current | I_{rrm} | | 8.5 | | A | |

Note

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of R_{θ} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25\text{ }^\circ\text{C}$.
- 5) $V_{DD}=50\text{ V}$, $V_{GS}=10\text{ V}$, $L=20\text{ mH}$, starting $T_j=25\text{ }^\circ\text{C}$.

Electrical Characteristics Diagrams

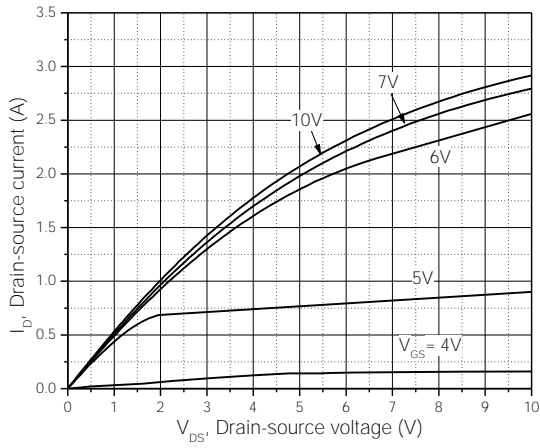


Figure 1. Typ. output characteristics

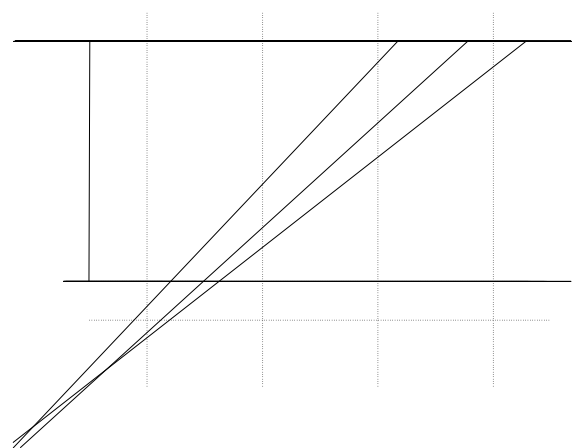


Figure 2. Typ. transfer characteristics

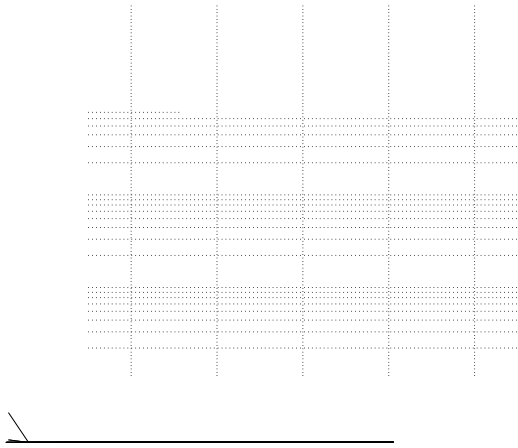


Figure 3. Typ. capacitances



Figure 4. Typ. gate charge

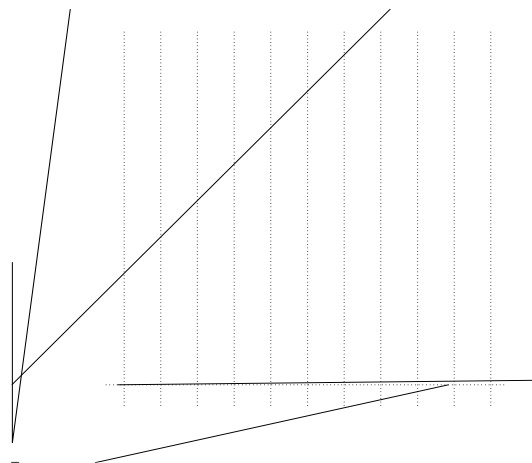


Figure 5. Drain-source breakdown voltage

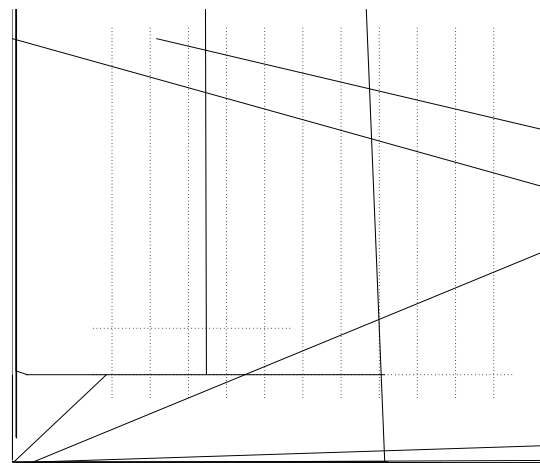


Figure 6. Drain-source on-state resistance

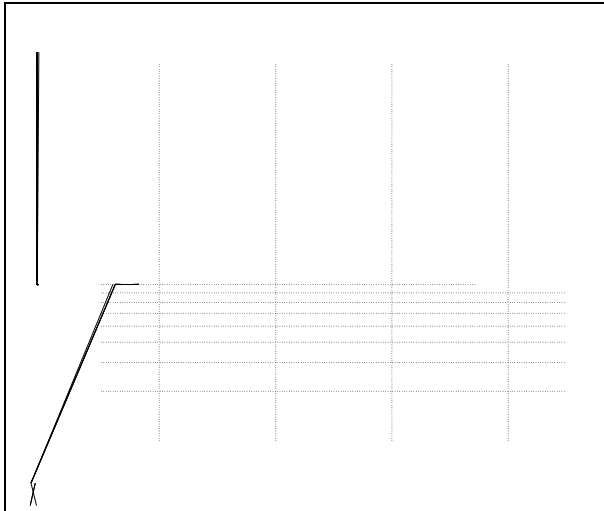


Figure 7. Forward characteristic of body diode

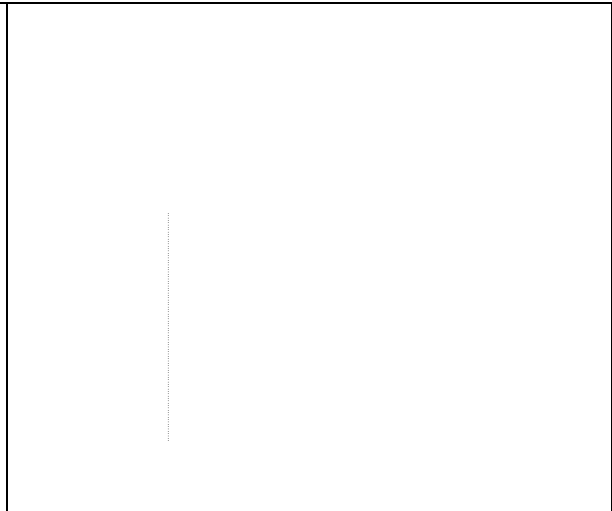


Figure 8. Drain-source on-state resistance

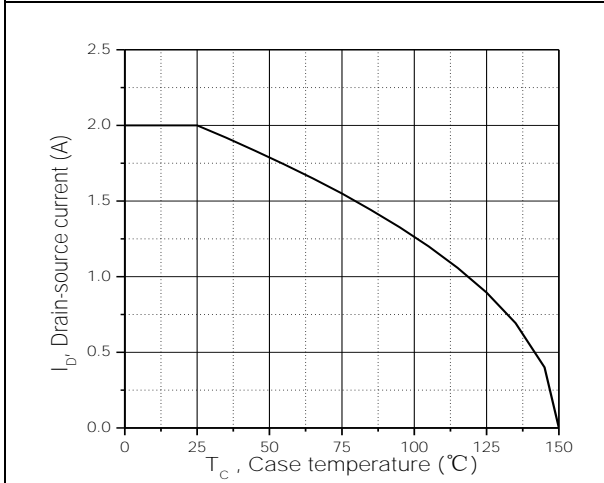


Figure 9. Drain current



Figure 10. Safe operation area $T_C=25\text{ }^\circ\text{C}$

Test circuits and waveforms

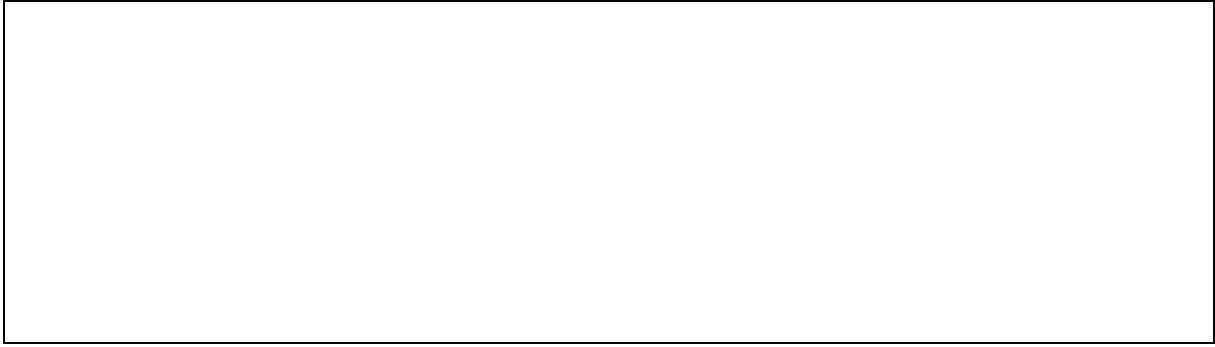


Figure 1. Gate charge test circuit & waveform

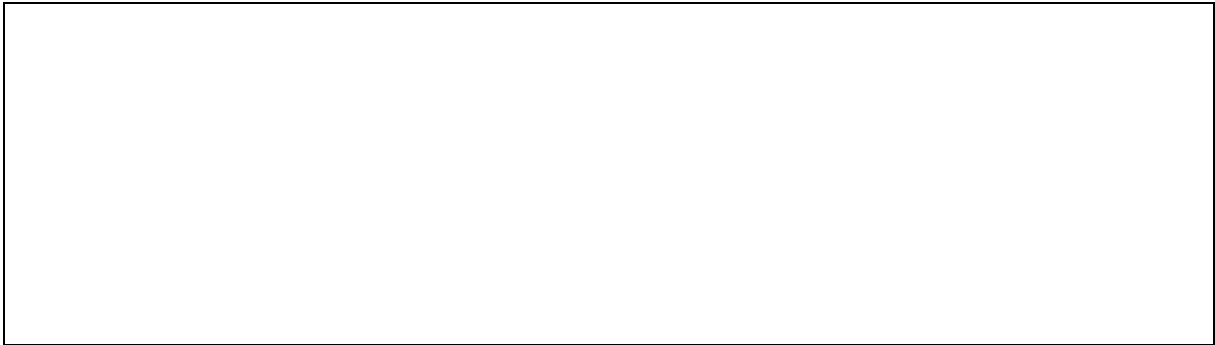


Figure 2. Switching time test circuit & waveforms

Package Information

| Symbol | mm | | |
|--------|---------|-------|-------|
| | Min | Nom | Max |
| A | 4.37 | 4.57 | 4.77 |
| A1 | 1.25 | 1.30 | 1.45 |
| A2 | 2.20 | 2.40 | 2.60 |
| b | 0.70 | 0.80 | 0.95 |
| b2 | 1.17 | 1.27 | 1.47 |
| c | 0.40 | 0.50 | 0.65 |
| D | 15.10 | 15.60 | 16.10 |
| D1 | 8.80 | 9.10 | 9.40 |
| D2 | 5.50 | - | - |
| E | 9.70 | 10.00 | 10.30 |
| E3 | 7.00 | - | - |
| e | 2.54BSC | | |
| e1 | 5.08BSC | | |
| H1 | 6.25 | 6.50 | 6.85 |
| L | 12.75 | 13.50 | 13.80 |
| L1 | - | 3.10 | 3.40 |
| | 3.40 | 3.60 | |
| Q | 2.60 | 2.80 | 3.00 |

Version1: TO220-P package outline dimension

Ordering Information

| Package Type | Units/ Tube | Tubes/ Inner Box | Units/ Inner Box | Inner Boxes/ Carton Box | Units/ Carton Box |
|--------------|-------------|------------------|------------------|-------------------------|-------------------|
| TO220-P | 50 | 20 | 1000 | 6 | 6000 |

Product Information

| Product | Package | Pb Free | RoHS | Halogen Free |
|-------------|---------|---------|------|--------------|
| OSG65R2K4PF | TO220 | yes | yes | yes |

