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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.

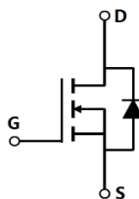
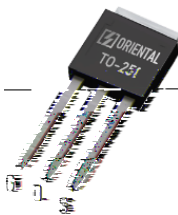
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Parameter	Value	Unit
$V_{DS, \min} @ T_{j(\max)}$	700	V
I_D, pulse	31.5	A
$R_{DS(ON)}, \text{max} @ V_{GS}=10V$	420	{
Q_g	14.8	nC

Product Name	Package	Marking
OSG65R420AF	TO251	OSG65R420A



Absolute Maximum Ratings at $T_j=25^{\circ}\text{C}$ 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⁾ , $T_C=25^{\circ}\text{C}$	I_D	10.5	A
Continuous drain current ¹⁾ , $T_C=100^{\circ}\text{C}$		6.5	
Pulsed drain current ²⁾ , $T_C=25^{\circ}\text{C}$	$I_{D, pulse}$	31.5	A
Continuous diode forward current ¹⁾ , $T_C=25^{\circ}\text{C}$	I_S	10.5	A
Diode pulsed current ²⁾ , $T_C=25^{\circ}\text{C}$	$I_{S, pulse}$	31.5	A

 Power dissipation³⁾, T_C

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		702.7		pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, $f=1\text{ MHz}$
Output capacitance	C_{oss}		52.2		pF	
Reverse transfer capacitance	C_{rss}		2.5		pF	
Turn-on delay time	$t_{d(on)}$		23.7		ns	$V_{GS}=10\text{ V}$, $V_{DS}=520\text{ V}$, $R_G=25\text{ }\Omega$, $I_D=10.5\text{ A}$
Rise time	t_r		24.1		ns	
Turn-off delay time	$t_{d(off)}$		34.1		ns	
Fall time	t_f		36.8		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		14.8		nC	$V_{GS}=10\text{ V}$, $V_{DS}=520\text{ V}$, $I_D=10.5\text{ A}$
Gate-source charge	Q_{gs}		3.8		nC	
Gate-drain charge	Q_{gd}		5.2		nC	
Gate plateau voltage	$V_{plateau}$		5.6		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	$I_S=10.5\text{ A}$, $V_{GS}=0\text{ V}$
Reverse recovery time	t_{rr}		277.3		ns	$V_R=400\text{ V}$, $I_S=10.5\text{ A}$, $dI/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge	Q_{rr}		3		C	
Peak reverse recovery current	I_{rrm}		20.5		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 $R_{\theta JC}$ 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) $V_{DD}=50\text{ V}$, $V_{GS}=10\text{ V}$, $L=10.8\text{ mH}$, starting $T_j=25\text{ }^\circ\text{C}$.

Electrical Characteristics Diagrams

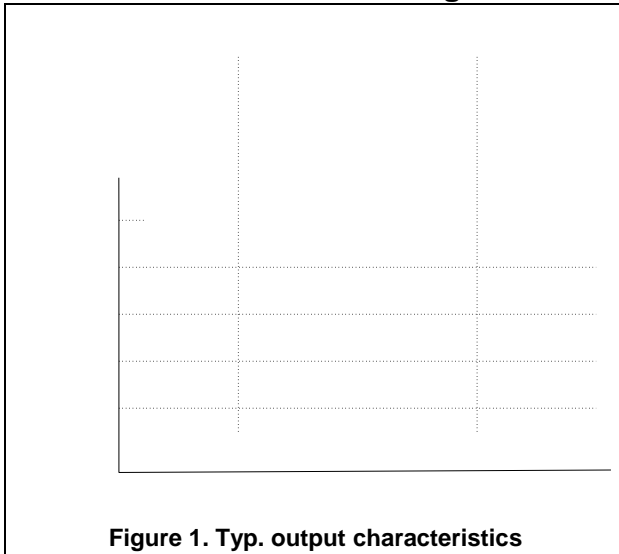


Figure 1. Typ. output characteristics

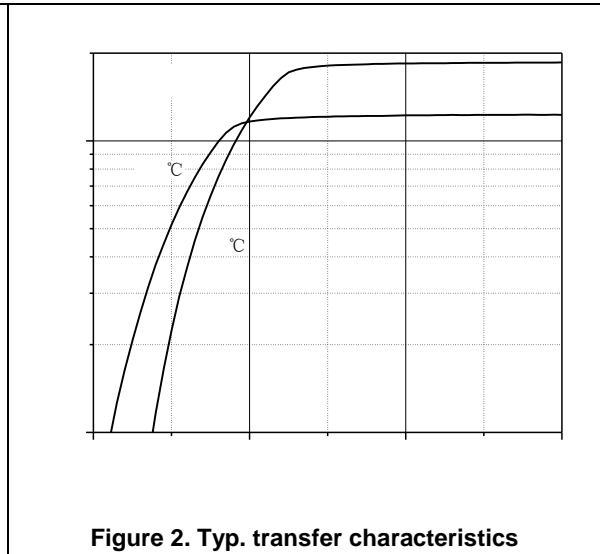


Figure 2. Typ. transfer characteristics

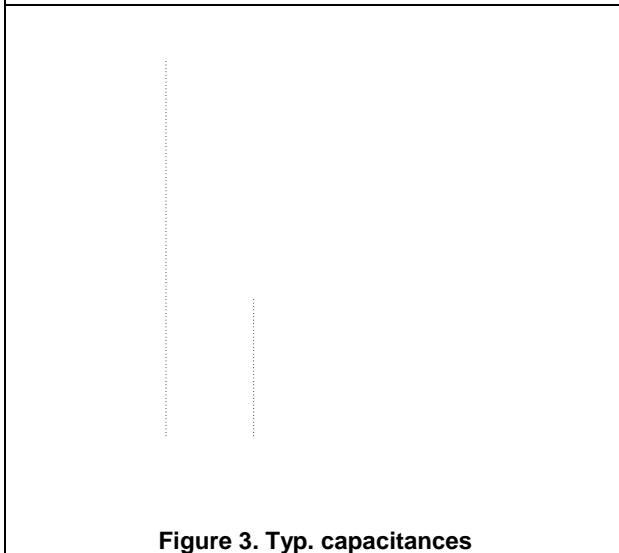


Figure 3. Typ. capacitances

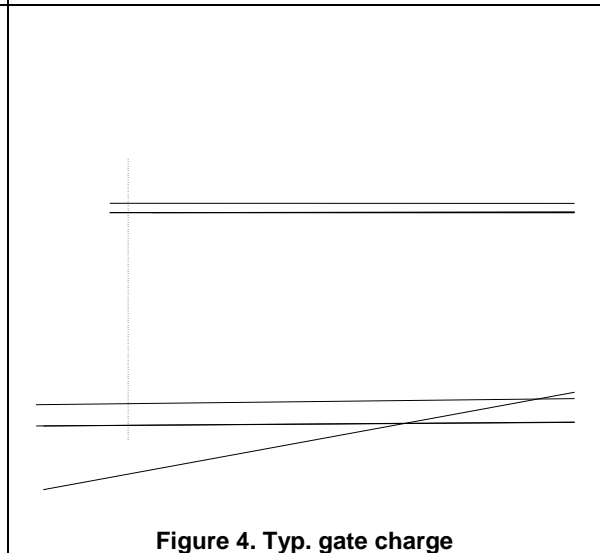


Figure 4. Typ. gate charge

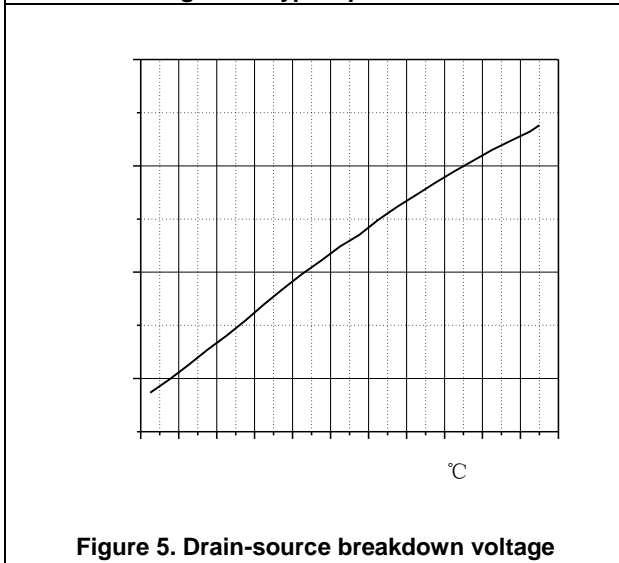


Figure 5. Drain-source breakdown voltage

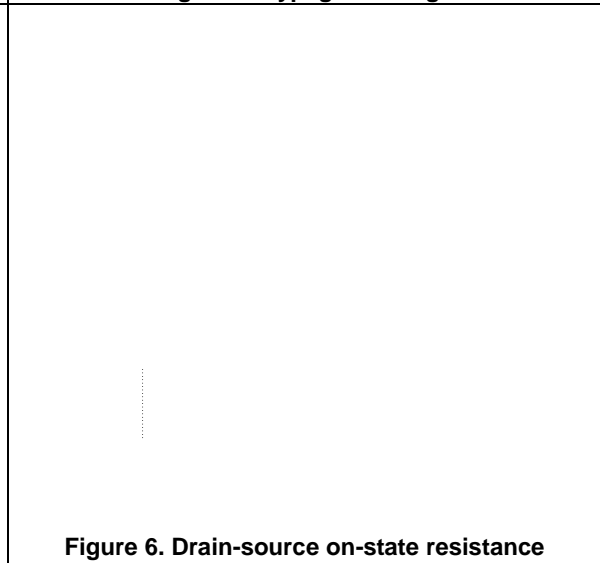


Figure 6. Drain-source on-state resistance

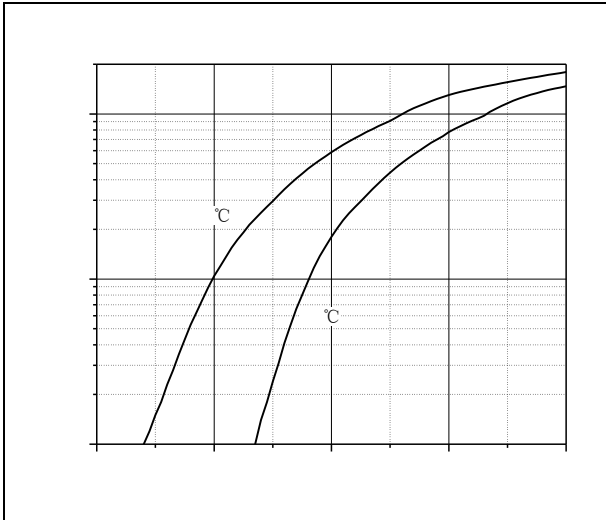


Figure 7. Forward characteristic of body diode

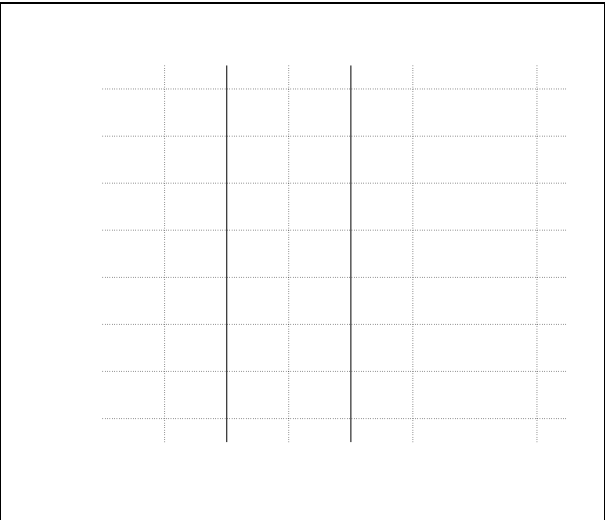


Figure 8. Drain-source on-state resistance

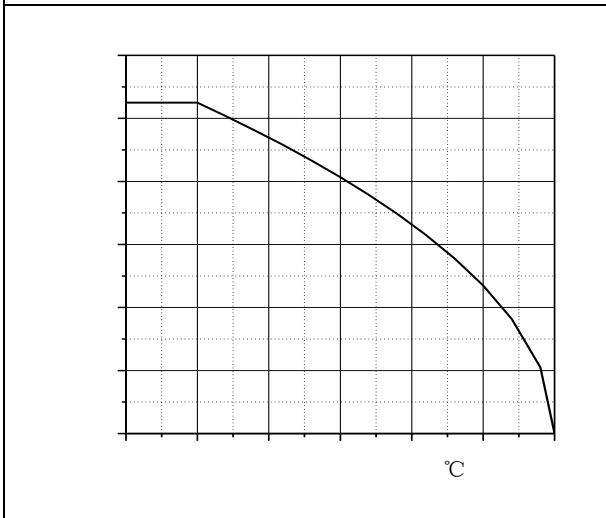


Figure 9. Drain current

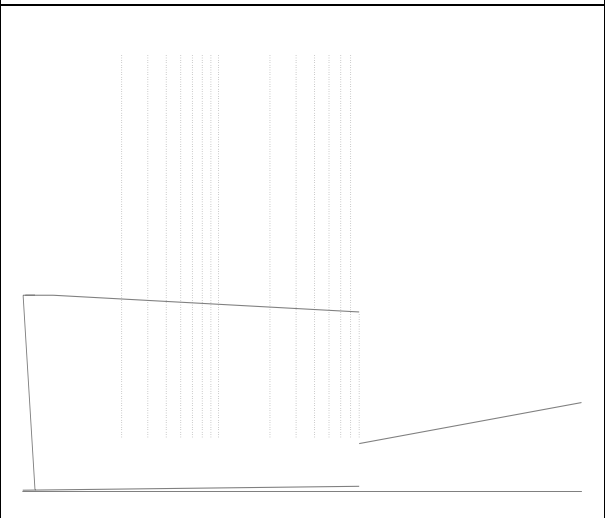


Figure 10. Safe operation area T_C=25 °C

Test circuits and waveforms

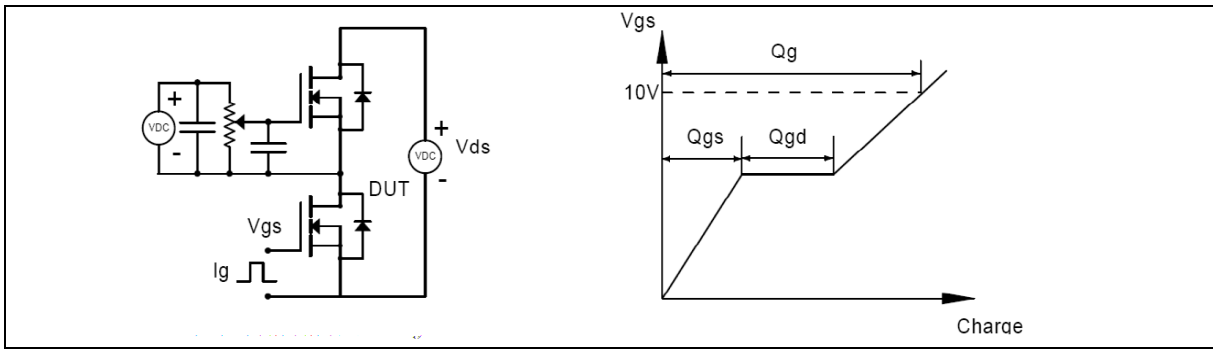


Figure 1. Gate charge test circuit & waveform



Figure 2. Switching time test circuit & waveforms

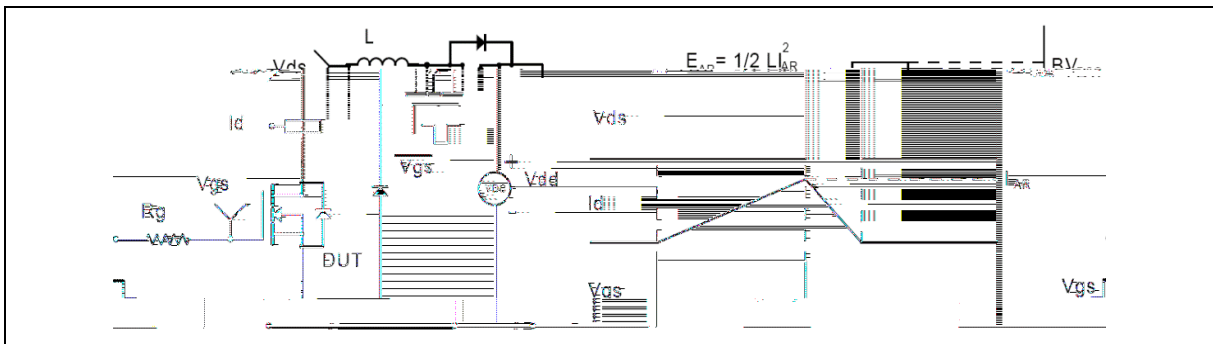


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

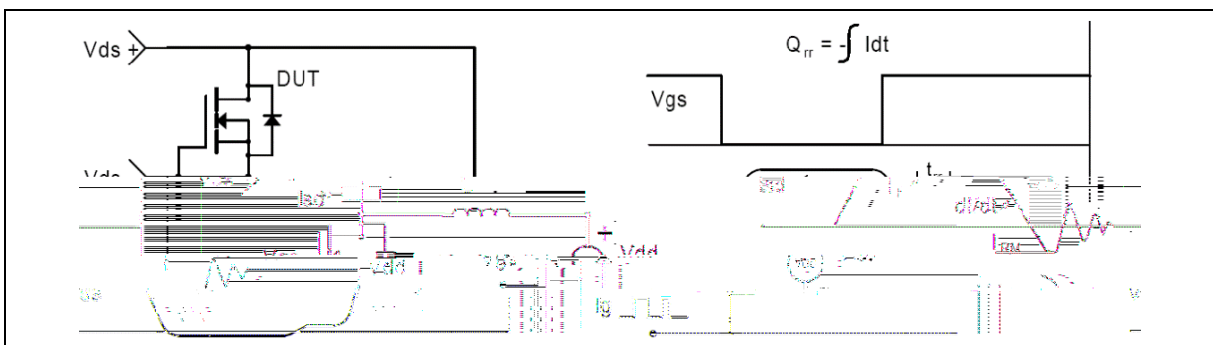


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information

Symbol	mm		
	Min	Nom	Max
A	2.20	2.30	2.40
A2	0.97	1.07	1.17

Ordering Information

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO251-C	75	66	4950	6	29700

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG65R420AF	TO251	yes	yes	yes

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