



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.

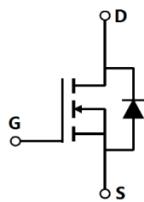


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Parameter	Value	Unit
$V_{DS, min} @ T_{j(max)}$	700	V
$I_D, pulse$	30	A
$R_{DS(ON), max} @ V_{GS}=10V$	460	
Q_g	11.5	nC

Product Name	Package	Marking
OSG65R460DZF	TO252	OSG65R460DZ



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	10	A
Continuous drain current ¹⁾ , $T_C=100$ °C		6.3	
Pulsed drain current ²⁾ , $T_C=25$ °C	$I_{D, pulse}$	30	A
Continuous diode forward current ¹⁾ , $T_C=25$ °C	I_S	10	A
Diode pulsed current ²⁾ , $T_C=25$ °C	$I_{S, pulse}$	30	A
Power dissipation ³⁾ , $T_C=25$ °C	P_D	83	W
Single pulsed avalanche energy ⁵⁾	E_{AS}	272	mJ
MOSFET dv/dt ruggedness, V_{DS}	dv/dt	50	V/ns
Reverse diode dv/dt, V_{DS}	dv/dt	15	V/ns
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R	1.5	°C/W
Thermal resistance, junction-ambient ⁴⁾	R	62	°C/W

Electrical Characteristics at $T_j=25$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	650			V	$V_{GS}=0$ V, $I_D=250$ A
		700	770			$V_{GS}=0$ V, I_D , $T_j=150$ °C
Gate threshold voltage	$V_{GS(th)}$	3.0		4.5	V	$V_{DS}=V_{GS}$, $I_D=250$ A
Drain-source on-state resistance	$R_{DS(ON)}$		0.4	0.46		$V_{GS}=10$ V, $I_D=5$ A
			1.12			$V_{GS}=10$ V, $I_D=5$ A, $T_j=150$ °C
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=30$ V
				-100		$V_{GS}=-30$ V
Drain-source leakage current	I_{DSS}			5	A	$V_{DS}=650$ V, $V_{GS}=0$ V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		761.1		pF	$V_{GS}=0\text{ V}$, $V_{DS}=100\text{ V}$, Hz
Output capacitance	C_{oss}		32.9		pF	
Reverse transfer capacitance	C_{rss}		1.06		pF	
Turn-on delay time	$t_{d(on)}$		38.4		ns	$V_{GS}=10\text{ V}$, $V_{DS}=400\text{ V}$, $R_G=25$ $I_D=5\text{ A}$
Rise time	t_r		18.8		ns	
Turn-off delay time	$t_{d(off)}$		29.5		ns	
Fall time	t_f		15.8		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		11.5		nC	$V_{GS}=10\text{ V}$, $V_{DS}=400\text{ V}$, $I_D=5\text{ A}$
Gate-source charge	Q_{gs}		3.9		nC	
Gate-drain charge	Q_{gd}		4.0		nC	
Gate plateau voltage	$V_{plateau}$		6.0		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	$I_S=10\text{ A}$, $V_{GS}=0\text{ V}$
Reverse recovery time	t_{rr}		97.2		ns	$I_S=5\text{ A}$,
Reverse recovery charge	Q_{rr}		426.8		nC	
Peak reverse recovery current	I_{rrm}		8.25		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

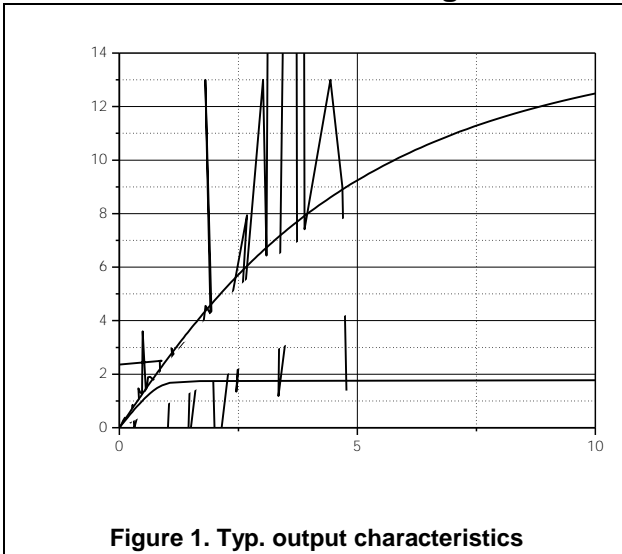


Figure 1. Typ. output characteristics

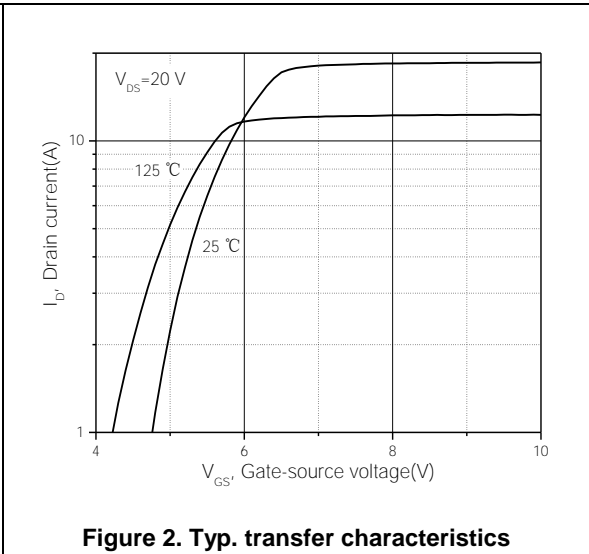


Figure 2. Typ. transfer characteristics

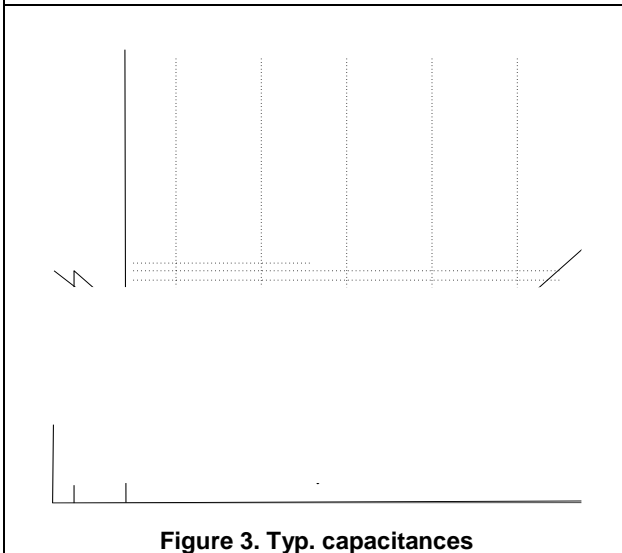


Figure 3. Typ. capacitances

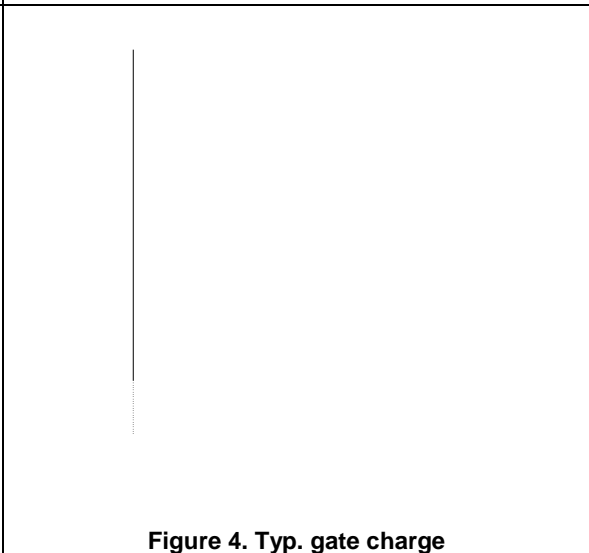


Figure 4. Typ. gate charge

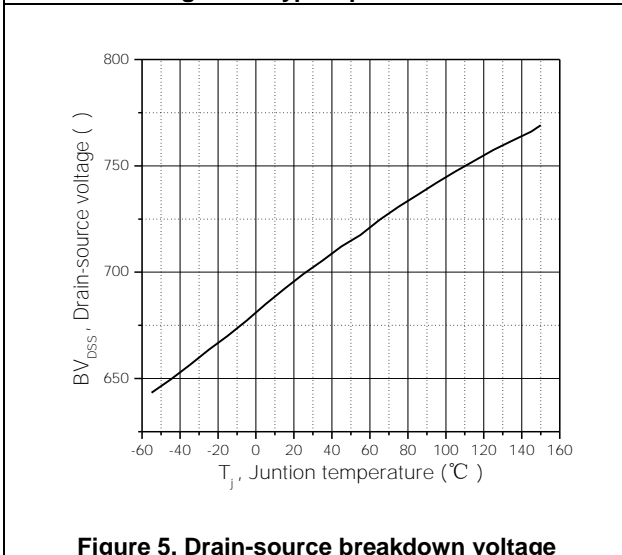


Figure 5. Drain-source breakdown voltage

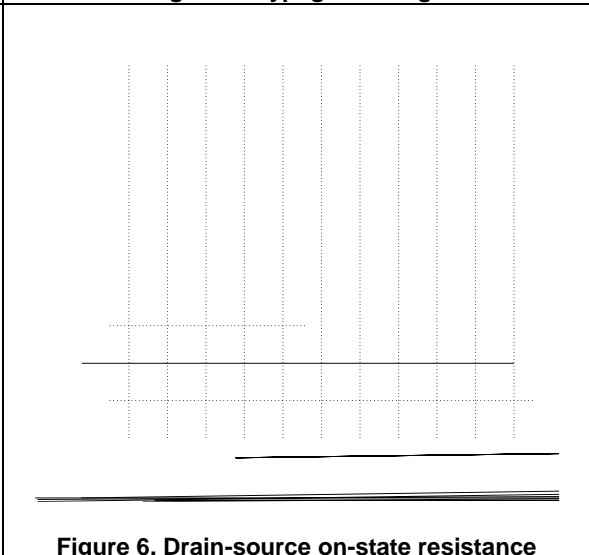


Figure 6. Drain-source on-state resistance

Enhancement Mode N-

Test circuits and waveforms

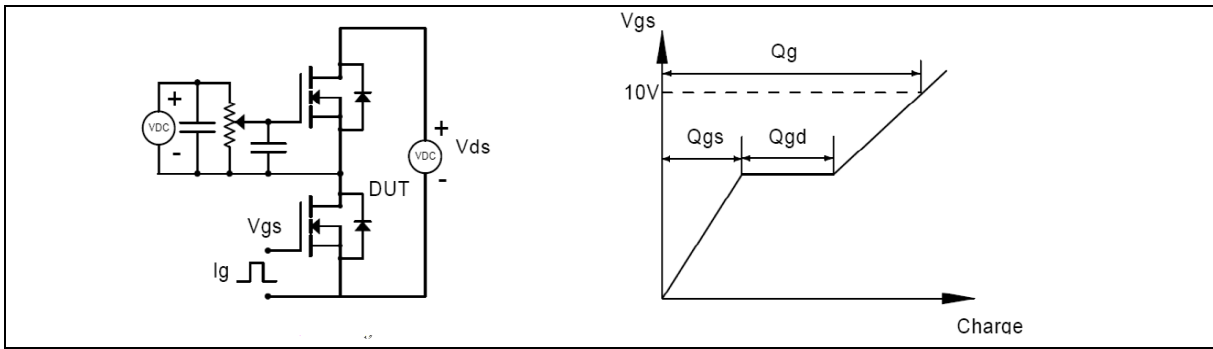


Figure 1. Gate charge test circuit & waveform



Figure 2. Switching time test circuit & waveforms

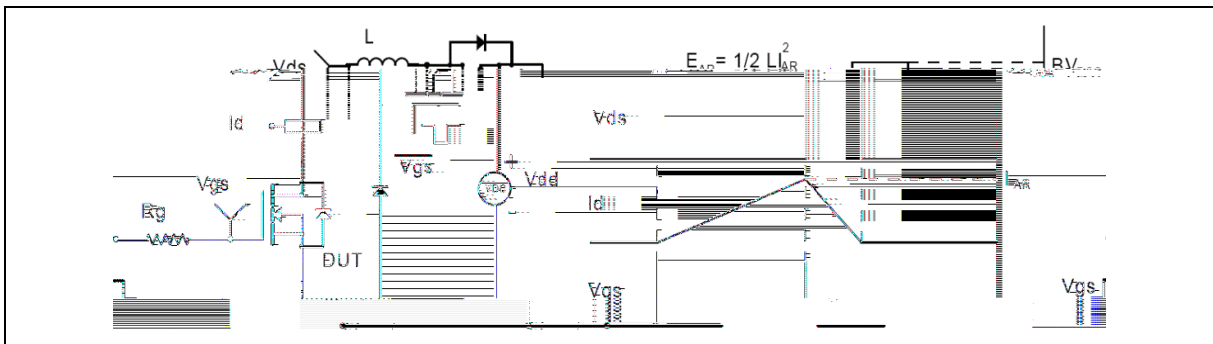


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

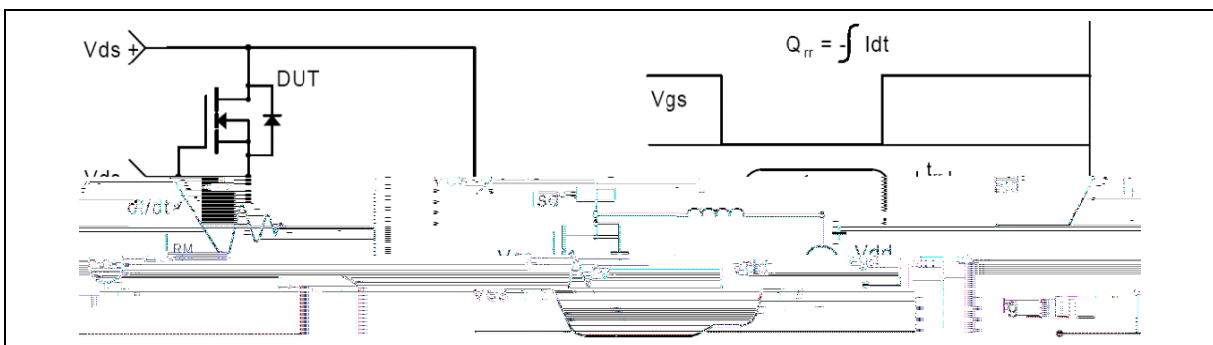
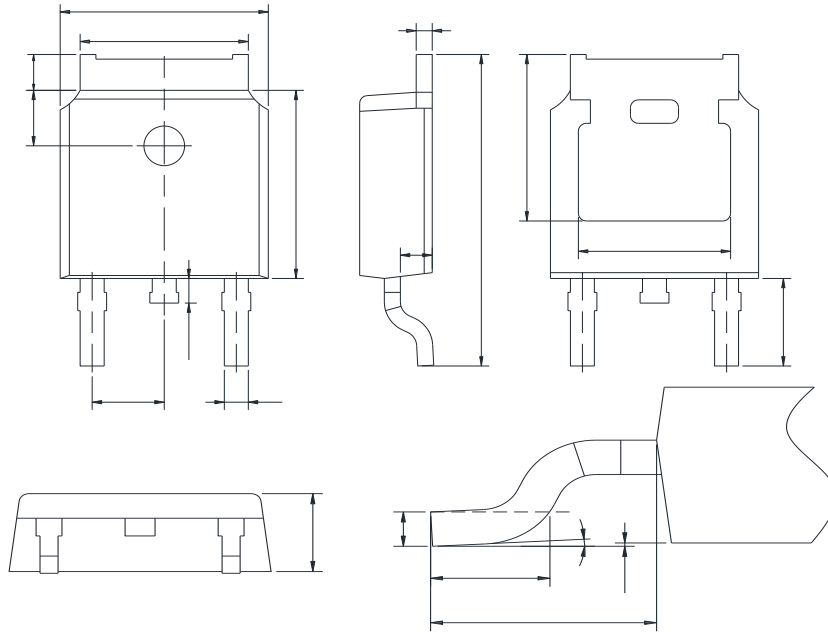


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	2.20	2.30	2.38
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.46
c	0.43	0.53	0.61
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.73
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	0.50	-	1.00
	0	-	

Version 1: TO252-C package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO252-C	2500	2	5000	5	25000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG65R460DZF	TO252	yes	yes	yes

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