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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GreenMOS®

RoHS compliant

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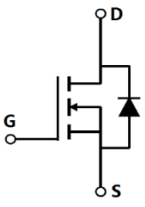
Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	650	V
$I_{D,\ pulse}$	108	A
$R_{DS(ON),\ max}$ @ V_{GS}=10V	99	
Q_g	57.8	nC

Product Name	Package	Marking
OSG60R099FEZF	TO220F	OSG60R099FEZ



Absolute Maximum Ratings at T_j=25 unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	600	V
Gate-source voltage	V_{GS}	±30	V
Continuous drain current[1], T_C=25 °C	I_D	36	A
Continuous drain current[1], T_C=100 °C		22.8	
Pulsed drain current[2], T_C=25 °C	$I_{D, pulse}$	108	A
Continuous diode forward current[1], T_C=25 °C	I_S	36	A
Diode pulsed current[2], T_C=25 °C	$I_{S, pulse}$	108	A
Power dissipation[3], T_C=25 °C	P_D	261	W
Single pulsed avalanche energy[5]	E_{AS}	845	mJ
MOSFET dv/dt ruggedness, V_{DS}	dv/dt	50	V/ns
Reverse diode dv/dt, V_{DS} SD D	dv/dt	50	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	3.57	°C/W
Thermal resistance, junction-ambient[4]	R	62.5	°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}	600			V	V_{GS}=0 V, I_D=1 mA
		650				V_{GS}=0 V, I_D=1 mA, T_j=150 °C
Gate threshold voltage	$V_{GS(th)}$	3.0		4.5	V	V_{DS}=V_{GS}, I_D=1 mA
Drain-source on-state resistance	$R_{DS(ON)}$		0.085	0.099		V_{GS}=10 V, I_D=18 A
			0.195			V_{GS}=10 V, I_D=18 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}			10	A	V_{DS}=600 V, V_{GS}=0 V
Gate resistance	R_G		6.2			Open drain

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		3231		pF	V_{GS}=0 V, V_{DS}=50 V, Hz
Output capacitance	C_{oss}		223.8		pF	
Reverse transfer capacitance	C_{rss}		2.2		pF	
Turn-on delay time	$t_{d(on)}$		40.2		ns	V_{GS}=10 V, V_{DS}=400 V, R_G=2.5 I_D=16 A
Rise time	t_r		29.4		ns	
Turn-off delay time	$t_{d(off)}$		87.2		ns	
Fall time	t_f		8.4		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		57.8		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=16 A
Gate-source charge	Q_{gs}		17.2		nC	
Gate-drain charge	Q_{gd}		18.8		nC	
Gate plateau voltage	$V_{plateau}$		5.9		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	I_S=36 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		138		ns	I_S=16 A,
Reverse recovery charge	Q_{rr}		756		nC	
Peak reverse recovery current	I_{rrm}		10.1		A	

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of R 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 °C.
5) V_{DD}=100 V, V_{GS}=10 V, L=80 mH, starting T_j=25 °C.

Electrical Characteristics Diagrams

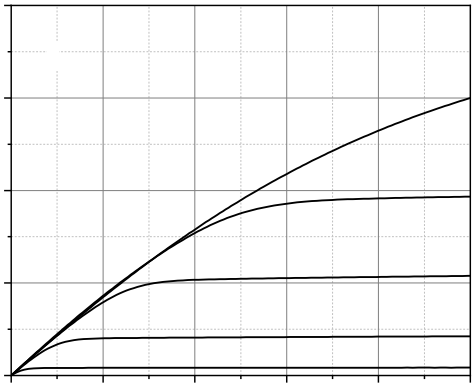


Figure 1. Typ. output characteristics

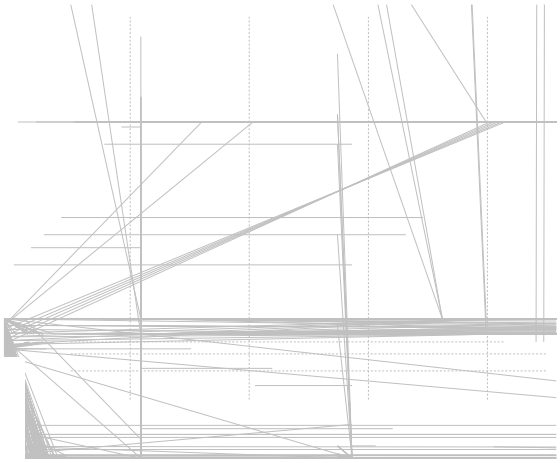


Figure 2. Typ. transfer characteristics

Figure 3. Typ. capacitances

Figure 4. Typ. gate charge

Figure 5. Drain-source breakdown voltage

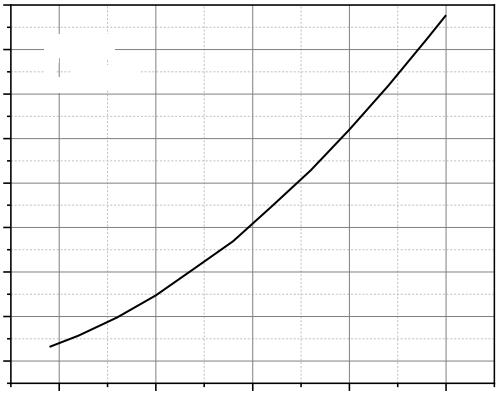


Figure 6. Drain-source on-state resistance

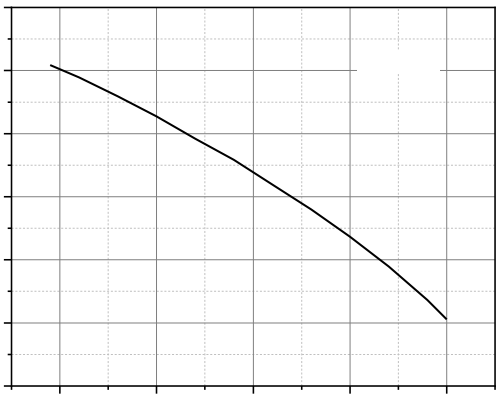


Figure 7. Threshold voltage

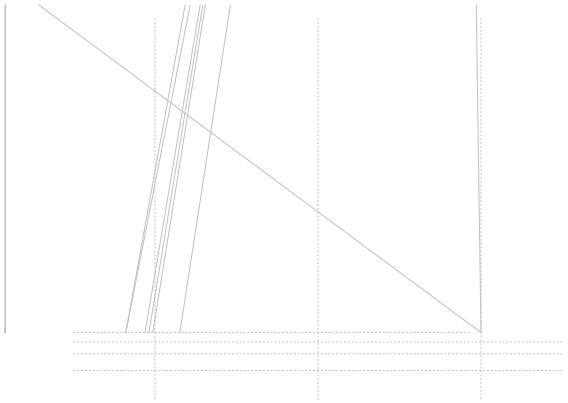


Figure 8. Forward characteristic of body diode

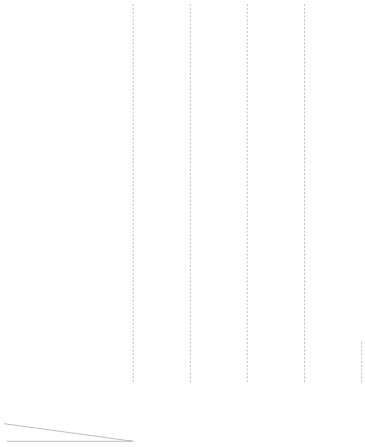


Figure 9. Drain-source on-state resistance

Figure 10. Drain current

Figure 11. Safe operation area for TC=25

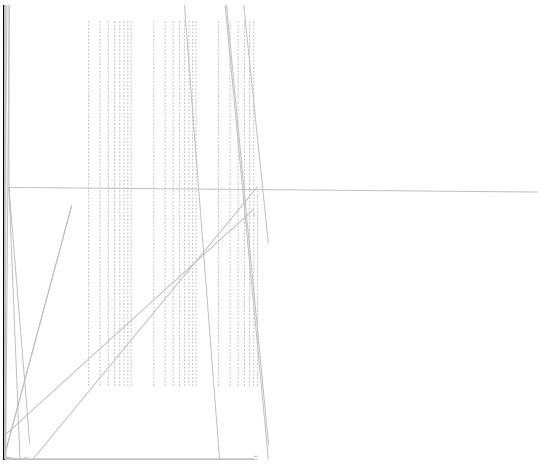


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

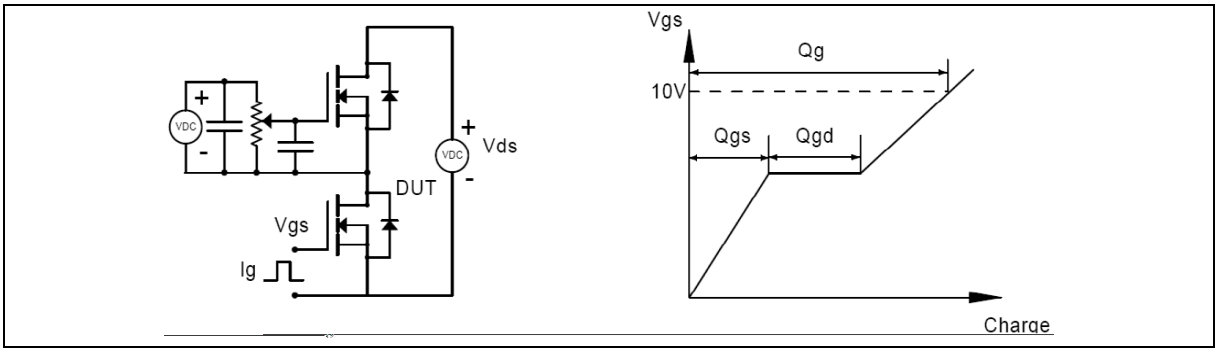


Figure 1. Gate charge test circuit & waveform

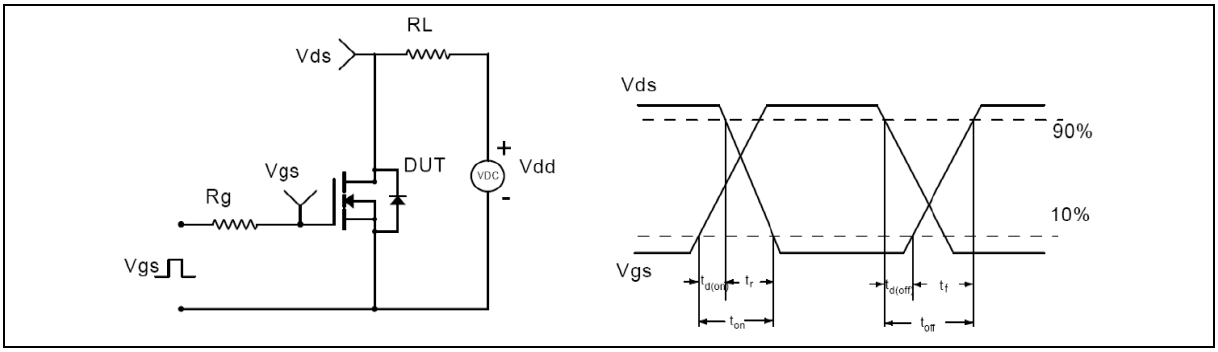


Figure 2. Switching time test circuit & waveforms

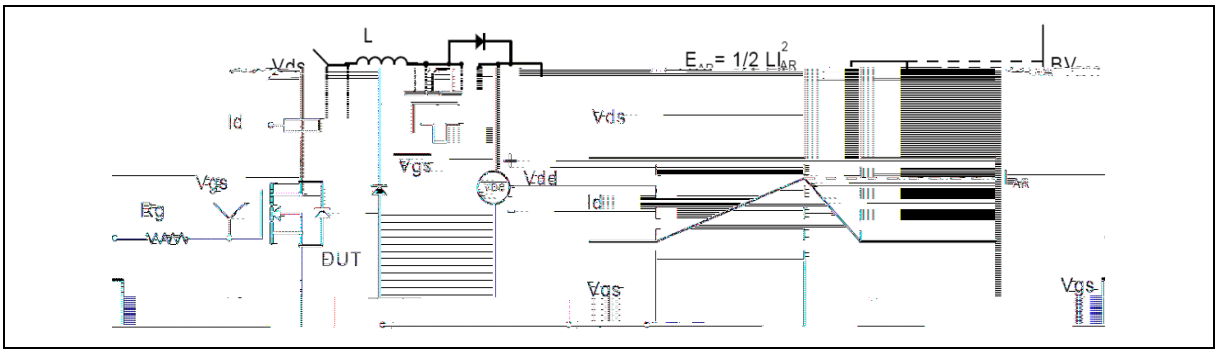


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

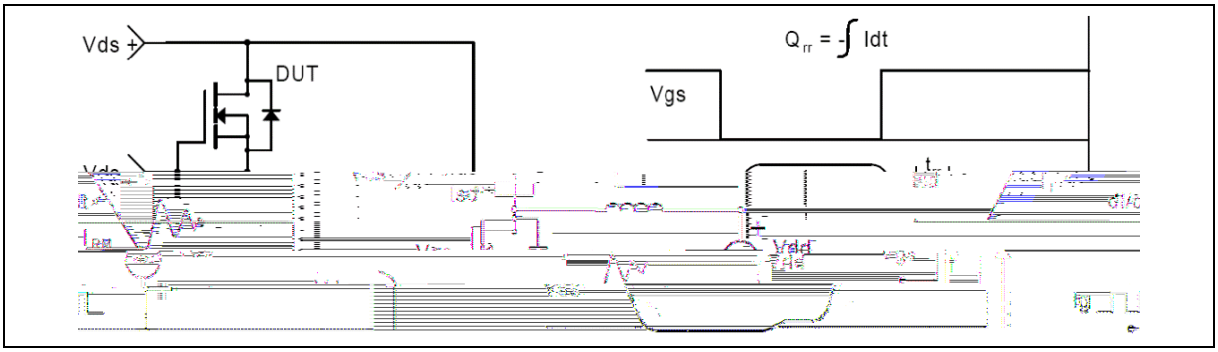


Figure 4. Diode reverse recovery test circuit & waveforms

Ordering Information

Package Type	Units/ Tube	Tubes / Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO220F-C	50	20	1000	6	6000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG60R099FEZF	TO220F	yes	yes	yes