

The GreenMOS<sup>®</sup> 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<sup>®</sup> 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.

- 
- 
- 
  
- 
- 
- 
- 
- 
- 

Parameter	Value	Unit
$V_{DS, min} @ T_{j(max)}$	600	V
$I_{D, pulse}$	60	A
$R_{DS(ON), max} @ V_{GS}=10V$	190	m
$Q_g$	17.7	nC

Product Name	Package	Marking
OSG55R190PF	TO220	OSG55R190P

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

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	550	V
Gate-source voltage	$V_{GS}$	$\pm 30$	V
Continuous drain current <sup>1)</sup> , $T_C=25$ °C	$I_D$	20	A
Continuous drain current <sup>1)</sup> , $T_C=100$ °C		12.5	
Pulsed drain current <sup>2)</sup> , $T_C=25$ °C	$I_{D, pulse}$	60	A
Continuous diode forward current <sup>1)</sup> , $T_C=25$ °C	$I_S$	20	A
Diode pulsed current <sup>2)</sup> , $T_C=25$ °C	$I_{S, pulse}$	60	A
Power dissipation <sup>3)</sup> , $T_C=25$ °C	$P_D$	104	W
Single pulsed avalanche energy <sup>5)</sup>	$E_{AS}$	200	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	1.20	°C/W
Thermal resistance, junction-ambient <sup>4)</sup>	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	$BV_{DSS}$	550			V	$V_{GS}=0$ V, $I_D=250$ $\mu$ A
		600				$V_{GS}=0$ V, $I_D=250$ $\mu$ A, $T_j=150$ °C
Gate threshold voltage	$V_{GS(th)}$	2.7		3.7	V	$V_{DS}=V_{GS}$ , $I_D=250$ $\mu$ A
Drain-source on-state resistance	$R_{DS(on)}$		0.15	0.19		$V_{GS}=10$ V, $I_D=10$ A
			0.37			$V_{GS}=10$ V, $I_D=10$ 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	$I_{DSS}$			1	A	$V_{DS}=550$ V, $V_{GS}=0$ V

**Dynamic Characteristics**

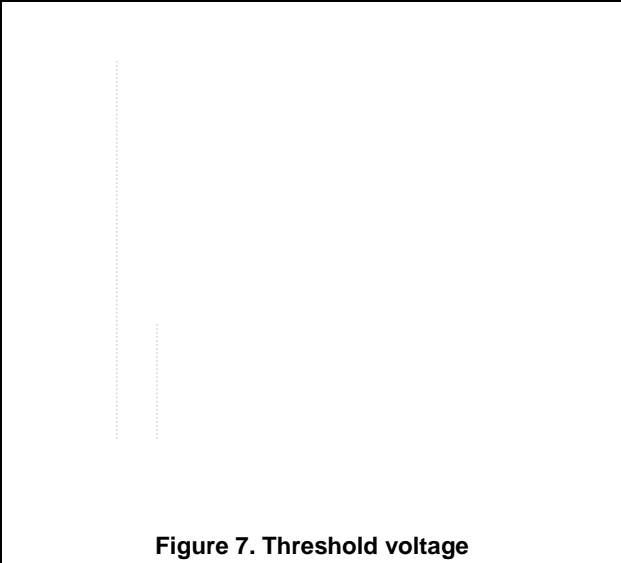
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	$C_{iss}$		991.4		pF	$V_{GS}=0\text{ V}$ , $V_{DS}=50\text{ V}$ , 00 kHz
Output capacitance	$C_{oss}$		125.9		pF	
Reverse transfer capacitance	$C_{rss}$		2.7		pF	
Turn-on delay time	$t_{d(on)}$		22		ns	$V_{GS}=10\text{ V}$ , $V_{DS}=400\text{ V}$ , $R_G=2$ $I_D=10\text{ A}$
Rise time	$t_r$		6.7		ns	
Turn-off delay time	$t_{d(off)}$		36.1		ns	
Fall time	$t_f$		3.5		ns	

**Gate Charge Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	$Q_g$		17.7		nC	$V_{GS}=10\text{ V}$ , $V_{DS}=400\text{ V}$ , $I_D=10\text{ A}$
Gate-source charge	$Q_{gs}$		4		nC	
Gate-drain charge	$Q_{gd}$					

## Electrical Characteristics Diagrams

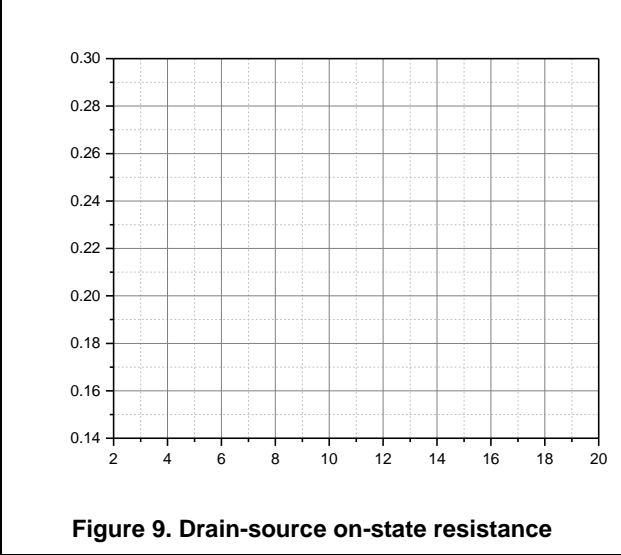
<p>Figure 1. Typ. output characteristics</p>	<p>Figure 2. Typ. transfer characteristics</p>
<p>Figure 3. Typ. capacitances</p>	<p>Figure 4. Typ. gate charge</p>



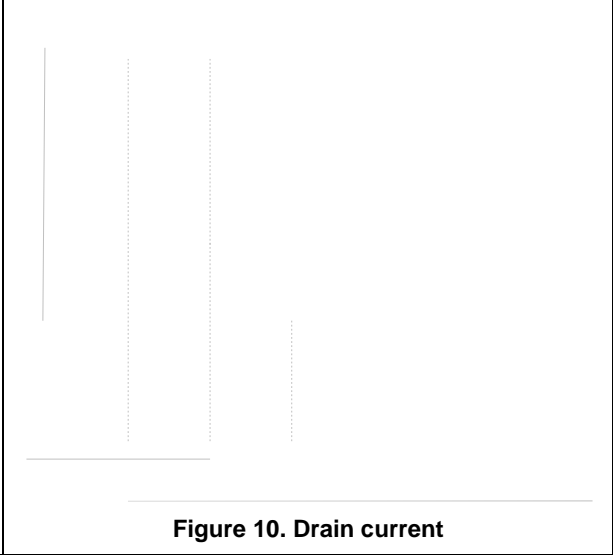
**Figure 7. Threshold voltage**



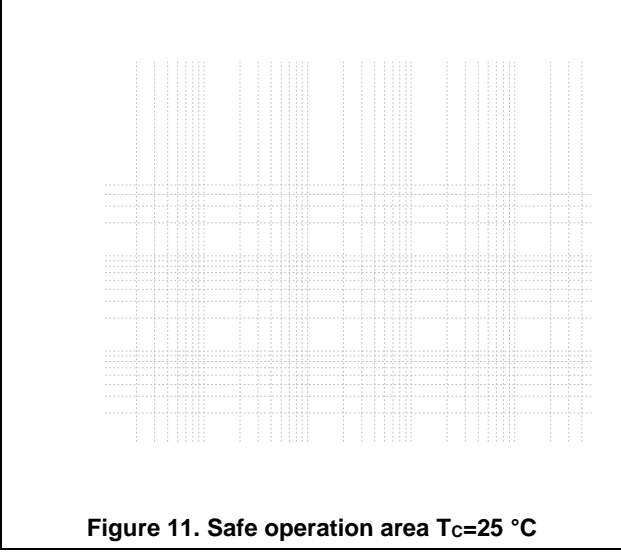
**Figure 8. Forward characteristic of body diode**



**Figure 9. Drain-source on-state resistance**

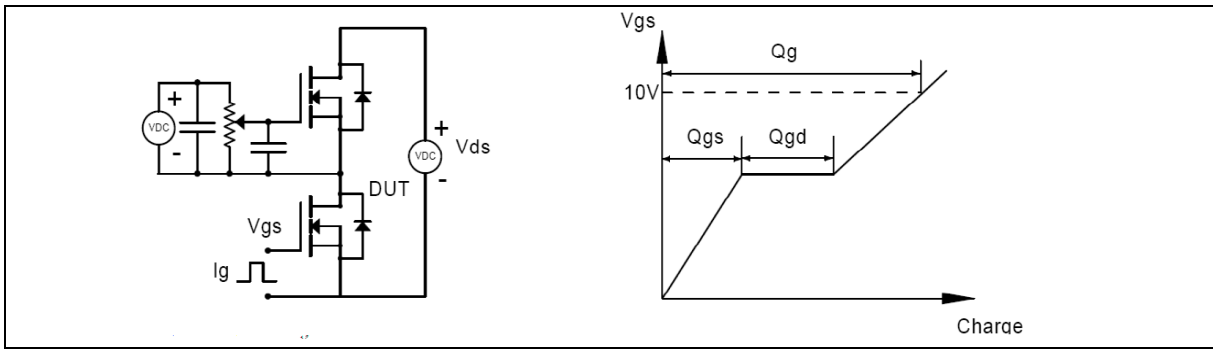


**Figure 10. Drain current**

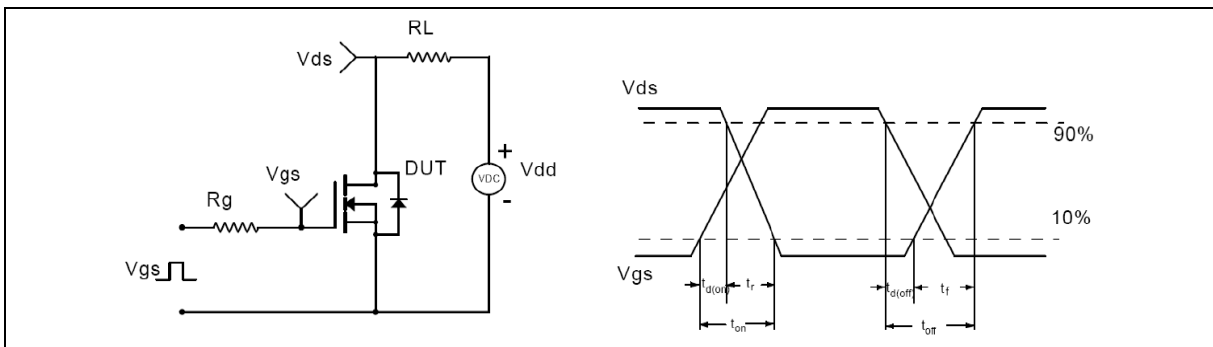


**Figure 11. Safe operation area T<sub>c</sub>=25 °C**

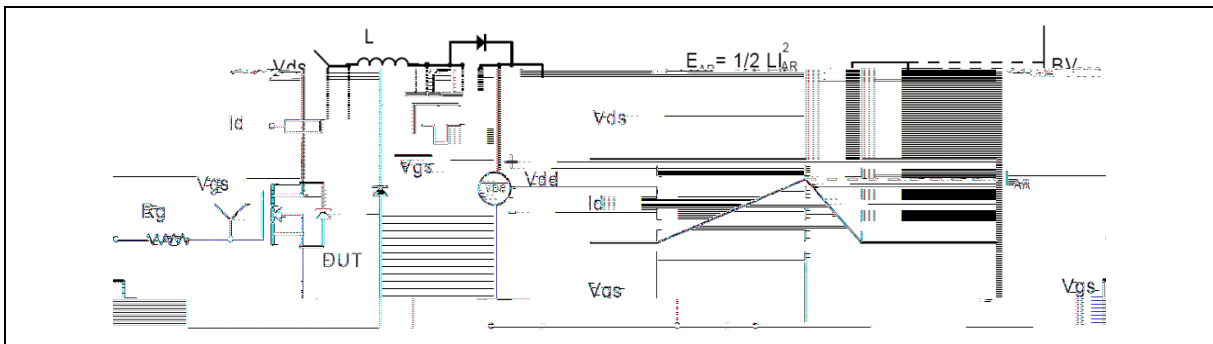
**Test circuits and waveforms**



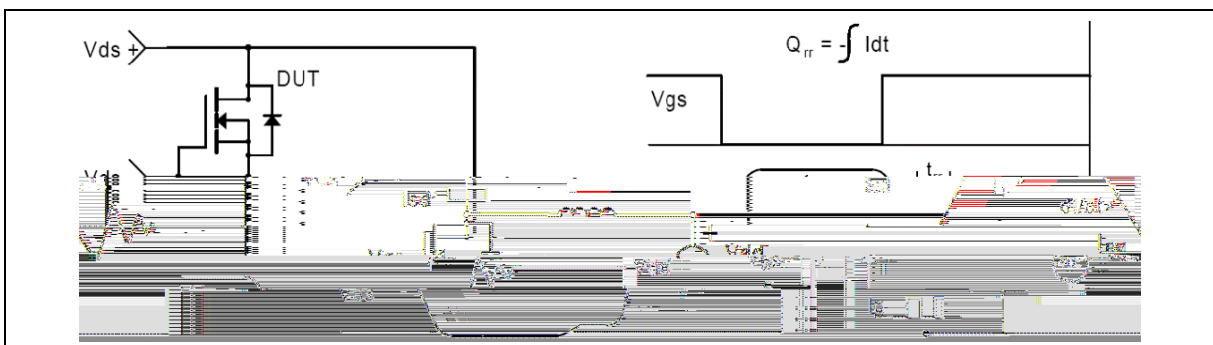
**Figure 1. Gate charge test circuit & waveform**



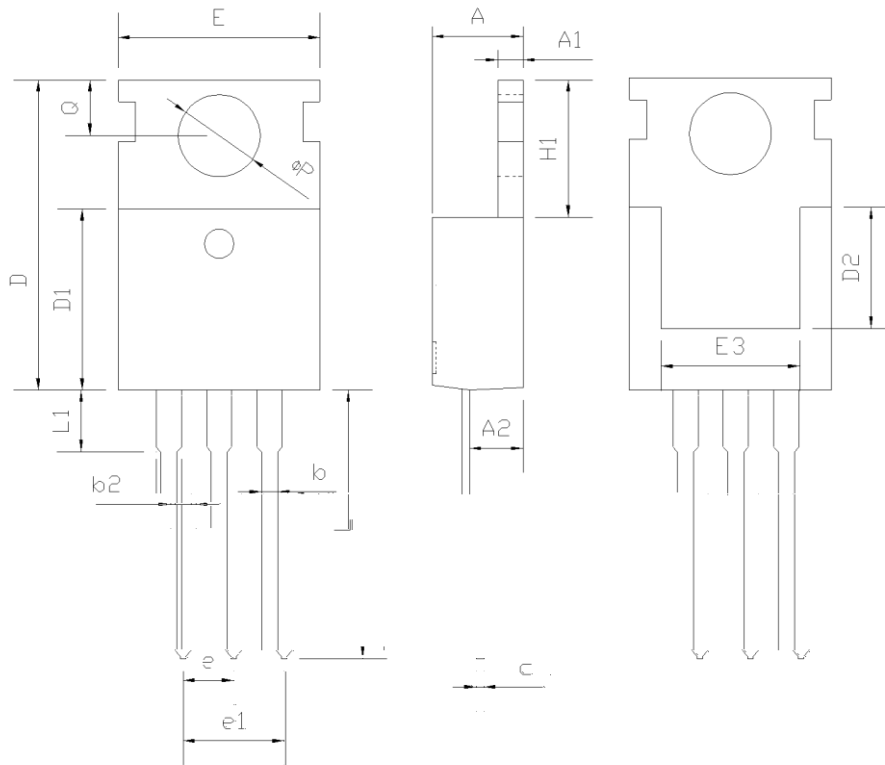
**Figure 2. Switching time test circuit & waveforms**



**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	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	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
	3.40	3.60	3.80
Q	2.60	2.80	3.00

Version 1: TO220-C outline dimension

**Ordering Information**

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

**Product Information**

Product	Package	Pb Free	RoHS	Halogen Free
OSG55R190PF	TO220	yes	yes	yes

