General Description

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.

Features

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity

Applications

- PC power
- LED lighting
- Telecom power
- Server power
- EV Charger
- Solar/UPS

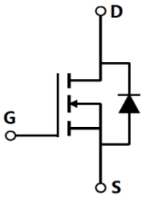
Key Performance Parameters

Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	700	V
$I_{D,\ pulse}$	45	A
$R_{DS(ON)\ ,\ max}$ @ V_{GS}=10V	340	
Q_g	15.6	nC

Marking Information

Product Name	Package	Marking
OSG65R340DZF	TO252	OSG65R340DZ

Package & Pin Information



Absolute Maximum Ratings at T_j=25°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 °C	I_D	15	A
Continuous drain current[1], T_C=100 °C		9.5	
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	45	A
Continuous diode forward current[1], T_C=25 °C	I_S	15	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ pulse}$	45	A
Power dissipation[3], T_C=25 °C	P_D	104	W
Single pulsed avalanche energy[5]	E_{AS}	270	mJ
MOSFET dv/dt ruggedness, V_{DS} 480 V	dv/dt	50	V/ns
Reverse diode dv/dt, V_{DS} 480 V, I_{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	1.2	°C/W
Thermal resistance, junction-ambient[4]	R	62	°C/W

Electrical Characteristics at T_j=25°C 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=
		700				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=
Drain-source on-state resistance	$R_{DS(ON)}$		0.26	0.34		V_{GS}=10 V, I_D=7.5 A
			0.69			V_{GS}=10 V, I_D=7.5 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}			10	A	V_{DS}=650 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		1066		pF	V_{GS}=0 V, V_{DS}=50 V, Hz
Output capacitance	C_{oss}		73		pF	
Reverse transfer capacitance	C_{rss}		2.2		pF	
Turn-on delay time	$t_{d(on)}$		25.7		ns	V_{GS}=10 V, V_{DS}=400 V, R_G I_D=8 A
Rise time	t_r		6.5		ns	
Turn-off delay time	$t_{d(off)}$		32.6		ns	
Fall time	t_f		3.9		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		15.6		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=8 A
Gate-source charge	Q_{gs}		5.6		nC	
Gate-drain charge	Q_{gd}		5.2		nC	
Gate plateau voltage	$V_{plateau}$		6.9		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.3	V	I_S=15 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		103		ns	, I_S=8 A,
Reverse recovery charge	Q_{rr}		0.5		C	
Peak reverse recovery current	I_{rrm}		9.5		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

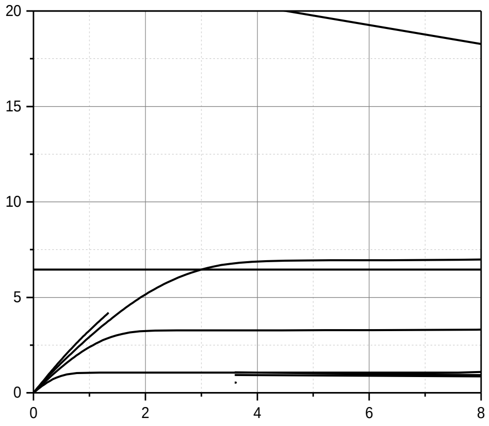


Figure 1. Typ. output characteristics

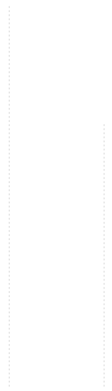


Figure 2. Typ. transfer characteristics

Figure 3. Typ. capacitances

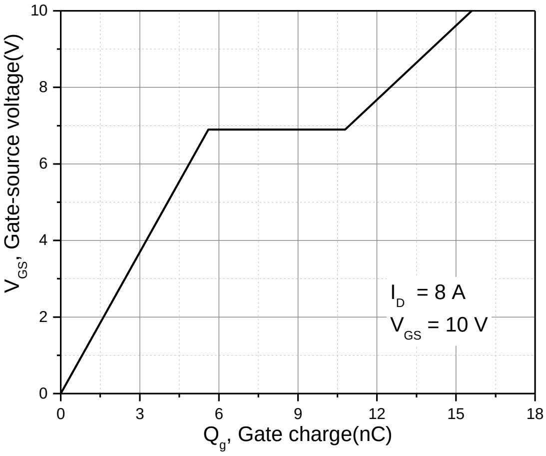


Figure 4. Typ. gate charge

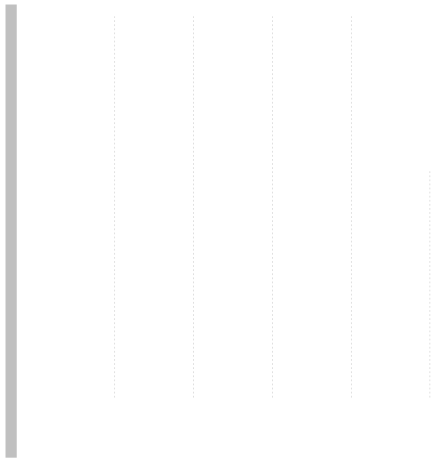


Figure 5. Drain-source breakdown voltage

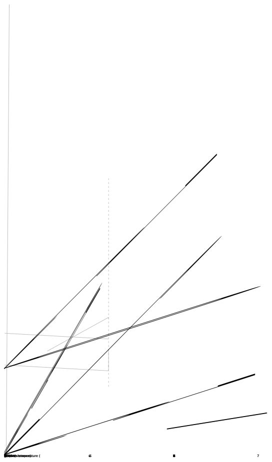


Figure 6. Drain-source on-state resistance

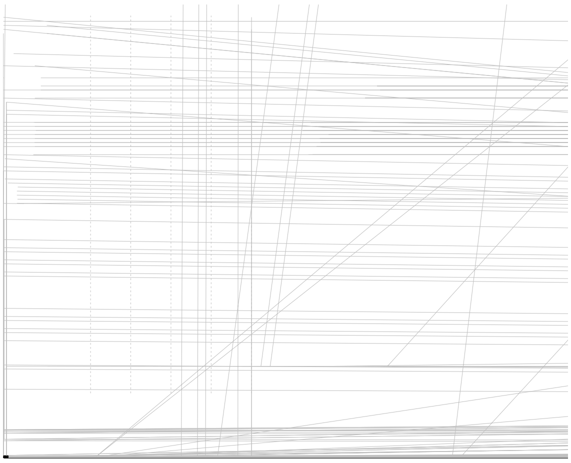


Figure 7. Threshold voltage

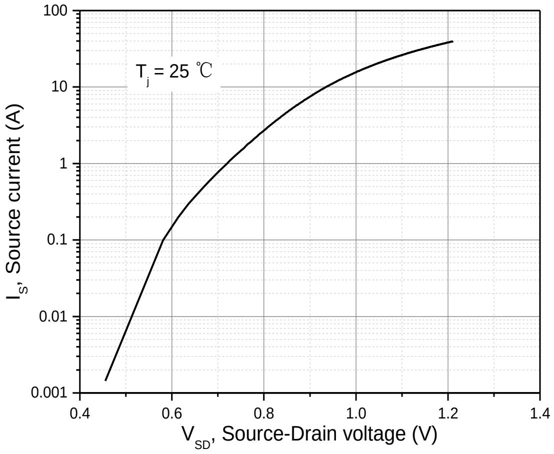


Figure 8. Forward characteristic of body diode

Figure 9. Drain-source on-state resistance

Figure 10. Drain current

Figure 11. Safe operation area T_C=25 °C

Test circuits and waveforms

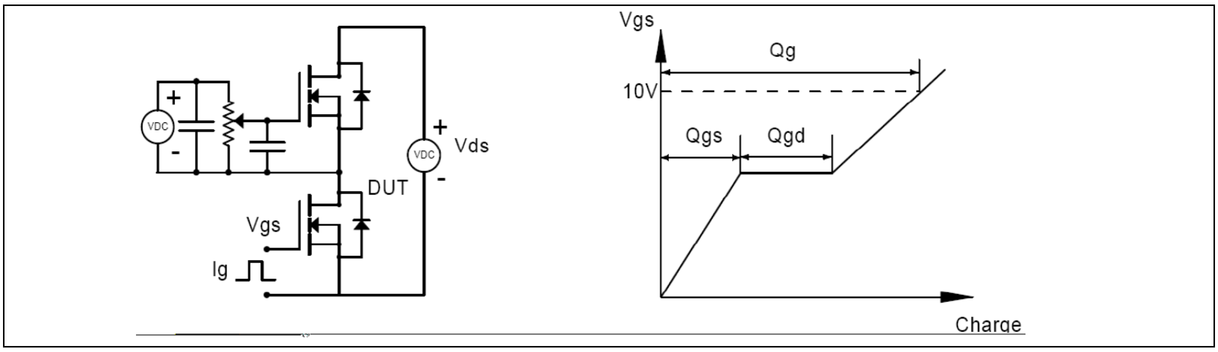


Figure 1. Gate charge test circuit & waveform

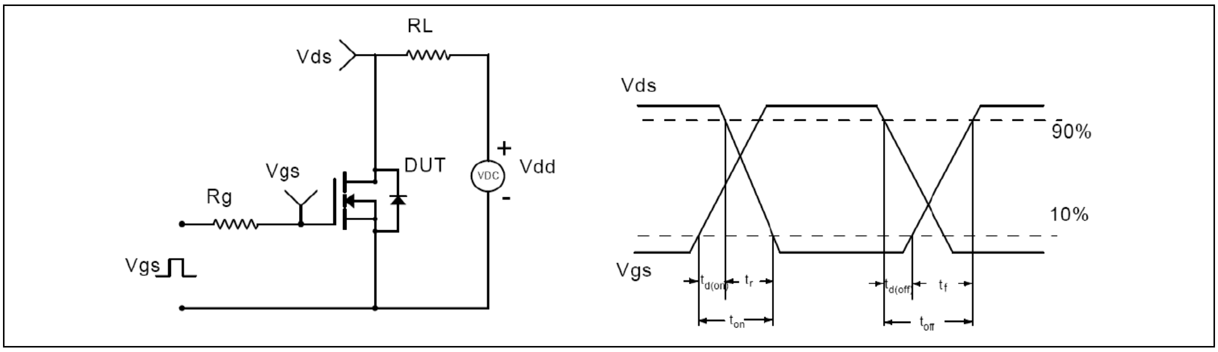


Figure 2. Switching time test circuit & waveforms

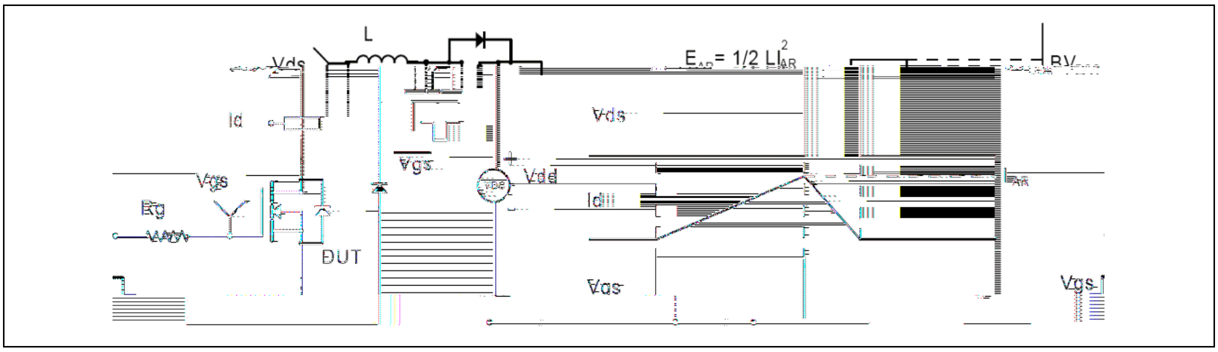


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

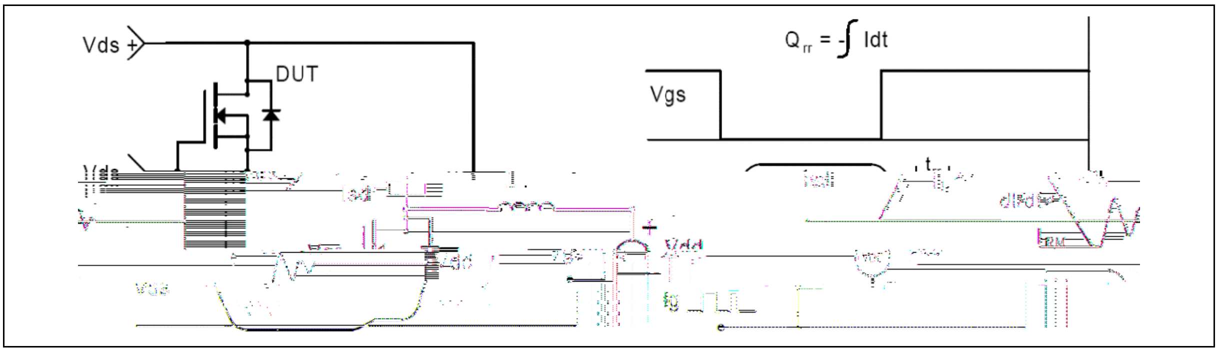
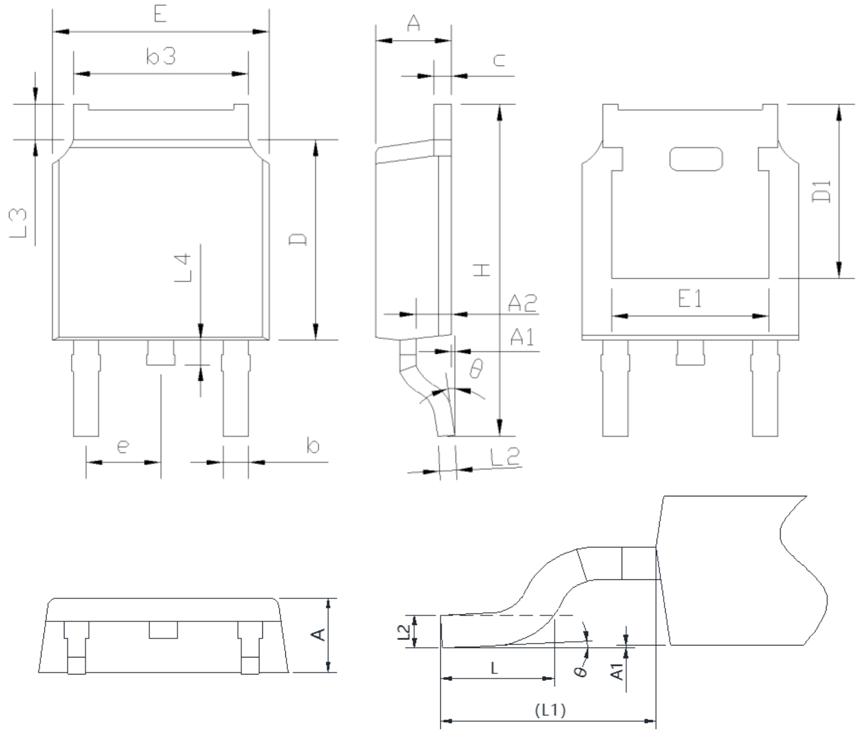


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
E	5.44 BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
	3.40	3.60	3.80
	-	-	7.30
S	6.15 BSC		

Version 1: TO252-C package outline dimension