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

- LED lighting
- Telecom
- Adapter
- Sever
- Solar/UPS

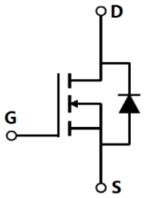
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	250	V
$I_{D,\ pulse}$	78	A
$R_{DS(ON),\ max}$ @ V_{GS}=10V	60	mΩ
Q_g	18	nC

Marking Information

Product Name	Package	Marking
OSG25R060NF	PDFN3.3×3.3	25060

Package & Pin Information



Absolute Maximum Ratings at T_j=25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	250	V
Gate-source voltage (static)	V_{GS}	±20	V
Continuous drain current$^{1)}$, T_C=25 °C	I_D	26	A
Continuous drain current$^{1)}$, T_C=100 °C		16	
Pulsed drain current$^{2)}$, T_C=25 °C	$I_{D,\ pulse}$	78	A
Continuous diode forward current$^{1)}$, T_C=25 °C	I_S	26	A
Diode pulsed current$^{2)}$, T_C=25 °C	$I_{S,\ pulse}$	78	A
Power dissipation$^{3)}$, T_C=25 °C	P_D	57	W
Single pulsed avalanche energy$^{5)}$	E_{AS}	65	mJ
Reverse diode dv/dt	dv/dt	10	V/ns
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	$R_{\theta JC}$	2.2	°C/W
Thermal resistance, junction-ambient$^{4)}$	$R_{\theta JA}$	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}	250			V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	3.0		5.0	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		46	60	mΩ	V_{GS}=10 V, I_D=13 A
			92			V_{GS}=10 V, I_D=13 A, T_j=150 °C
Gate-source leakage current	I_{GSS}			100	nA	V_{GS}=20 V
				-100		V_{GS}=-20 V
Drain-source leakage current	I_{DSS}			1	μA	V_{DS}=250 V, V_{GS}=0 V
Gate resistance	R_G		4.6		Ω	f=1 MHz, Open drain

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		1115		pF	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz
Output capacitance	C_{oss}		55		pF	
Reverse transfer capacitance	C_{rss}		2.2		pF	
Turn-on delay time	$t_{d(on)}$		12		ns	V_{GS}=10 V, V_{DS}=100 V, R_G=2 Ω, I_D=13 A
Rise time	t_r		2		ns	
Turn-off delay time	$t_{d(off)}$		24		ns	
Fall time	t_f		2		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		18		nC	V_{GS}=10 V, V_{DS}=100 V, I_D=13 A
Gate-source charge	Q_{gs}		6		nC	
Gate-drain charge	Q_{gd}		5		nC	
Gate plateau voltage	$V_{plateau}$		6.1		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.3	V	I_S=26 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		69		ns	V_R=100 V, I_S=13 A, di/dt=100 A/μs
Reverse recovery charge	Q_{rr}		0.2		μC	
Peak reverse recovery current	I_{rrm}		4.8		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 $R_{\theta JA}$ 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

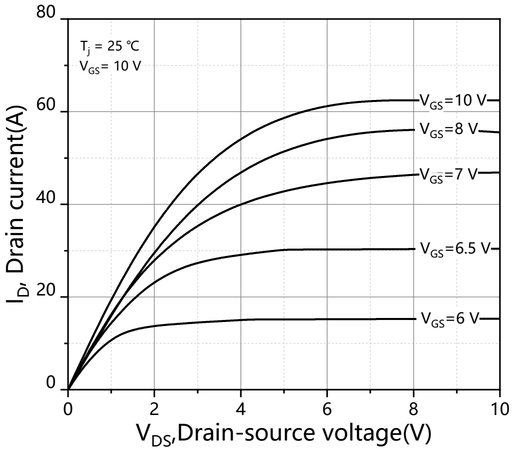


Figure 1. Typ. output characteristics T_j=25℃

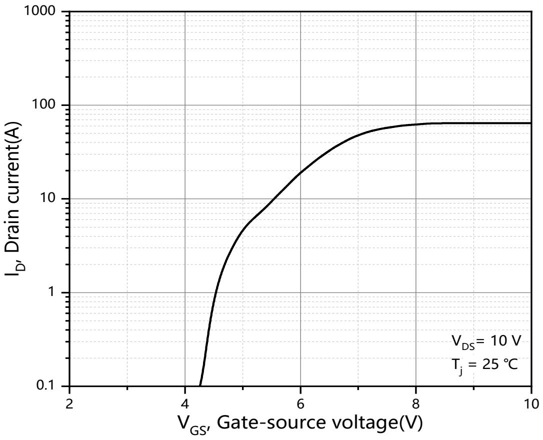


Figure 2. Typ. transfer characteristics

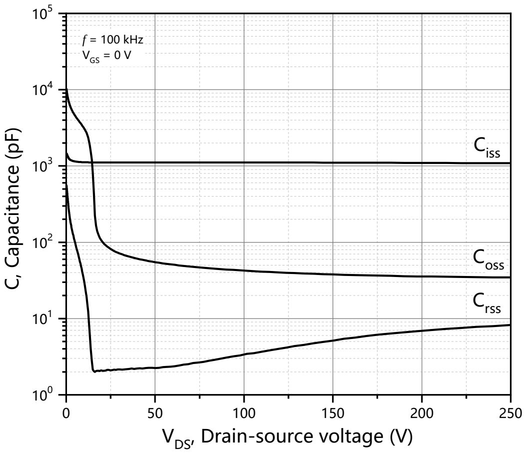


Figure 3. Typ. capacitances

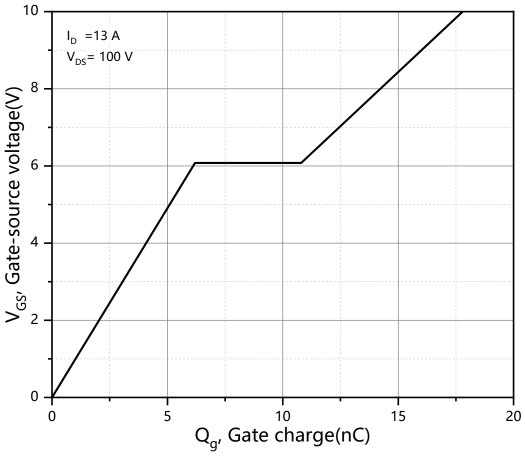


Figure 4. Typ. gate charge

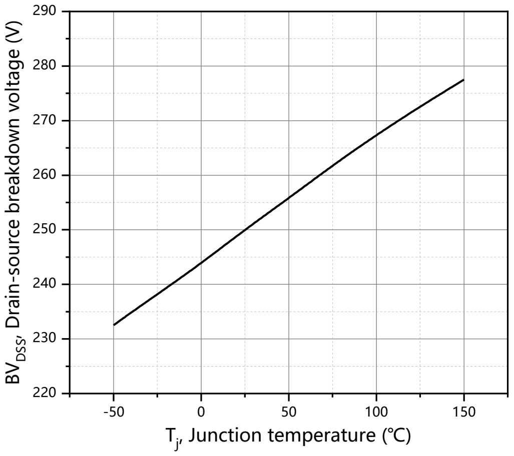


Figure 5. Drain-source breakdown voltage

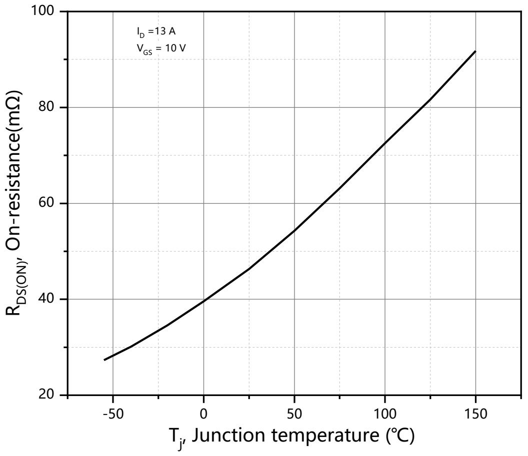


Figure 6. Drain-source on-state resistance

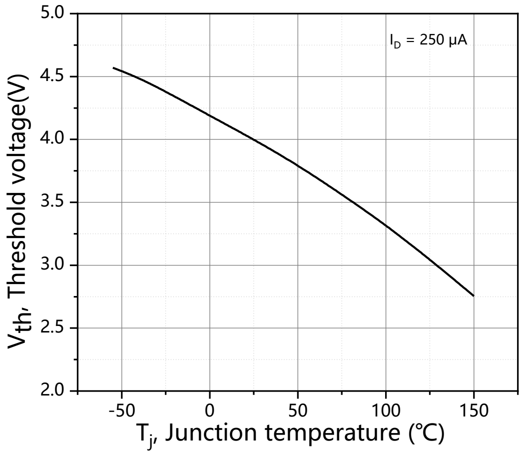


Figure 7. Threshold voltage

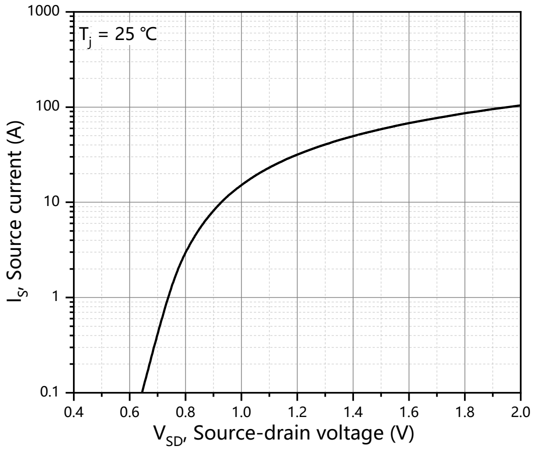


Figure 8. Forward characteristic of body diode

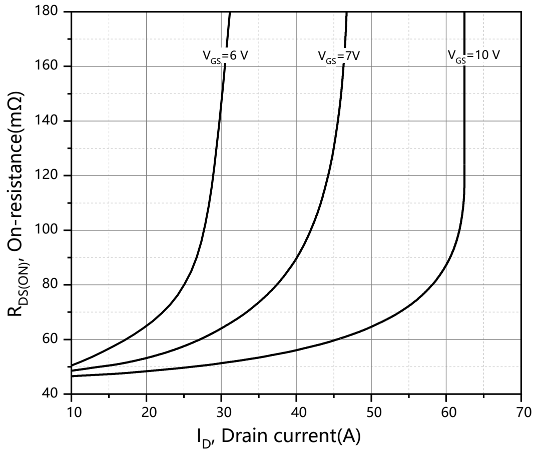


Figure 9. Drain-source on-state resistance

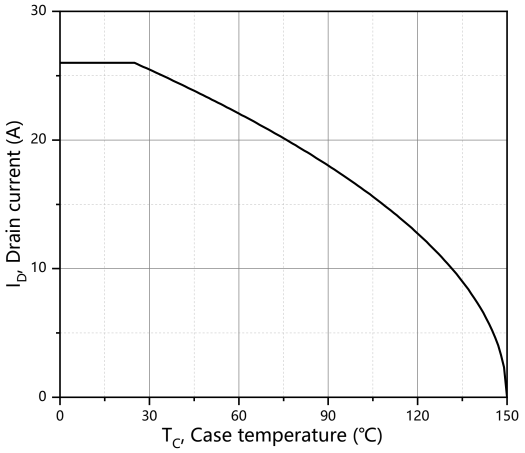


Figure 10. Drain current

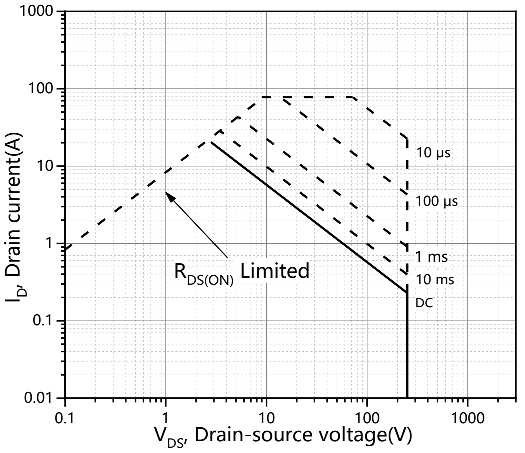


Figure 11. Safe operation area Tc=25℃

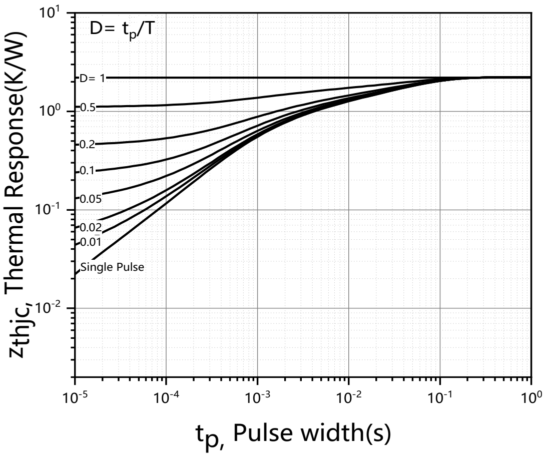


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

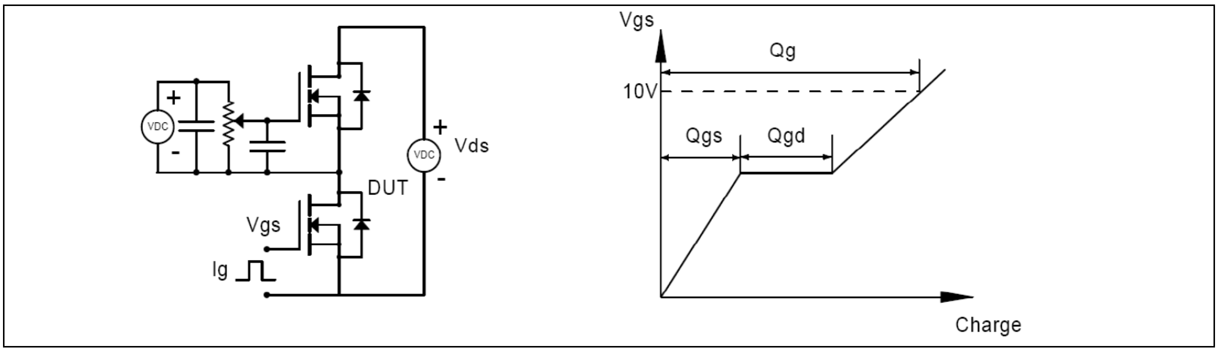


Figure 1. Gate charge test circuit & waveform

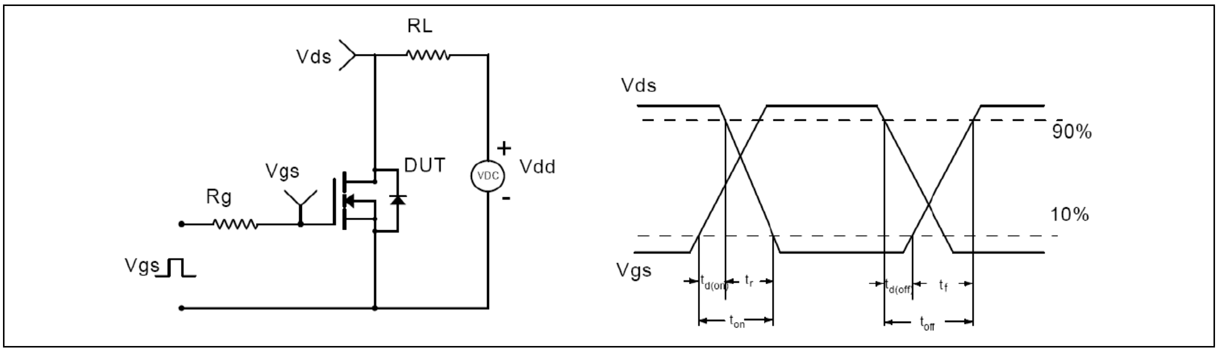


Figure 2. Switching time test circuit & waveforms

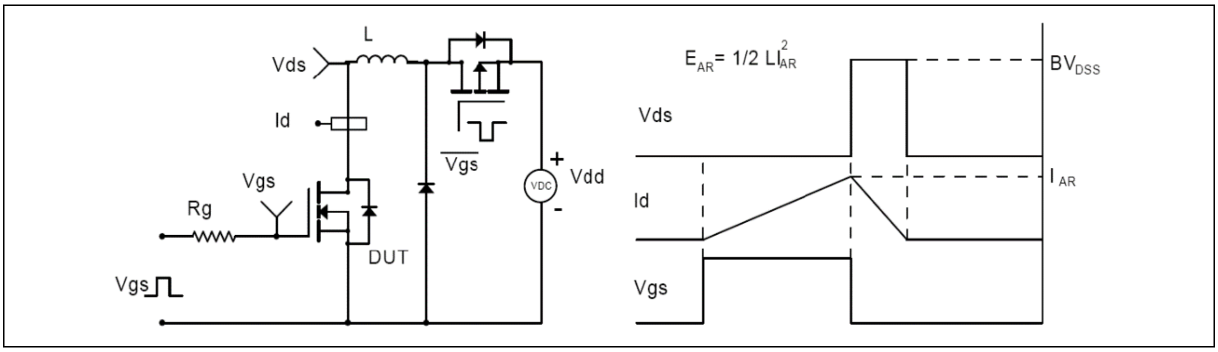


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

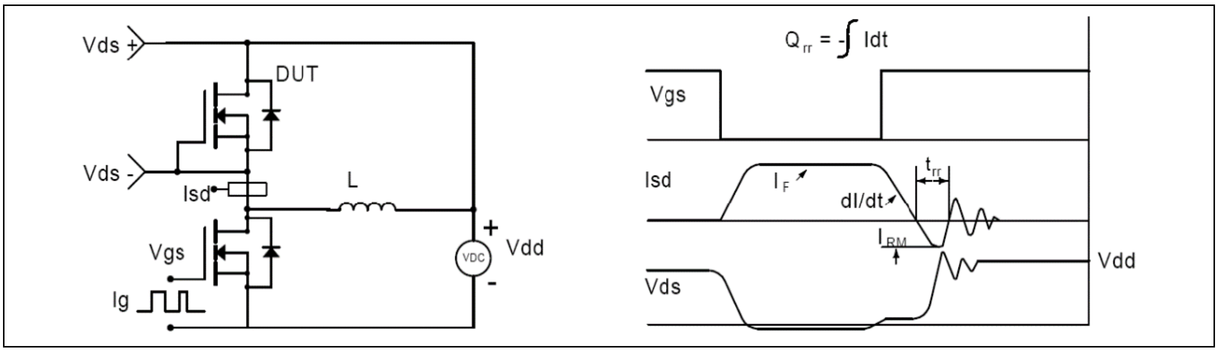
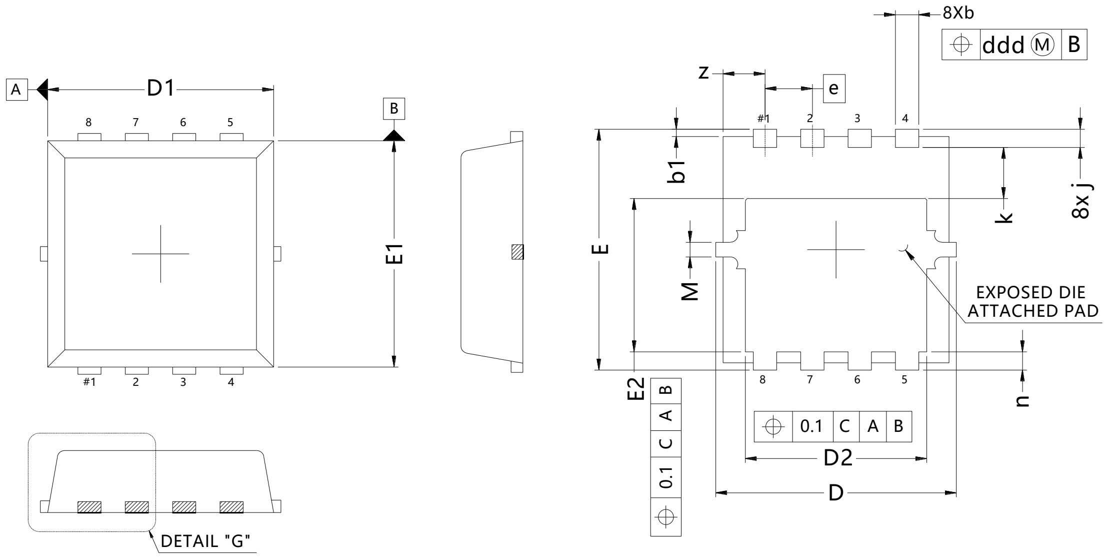


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm	
	Min	Max
A	0.80	0.90
A1	0.12	0.22
b	0.27	0.37
b1	0.05	0.15
D	3.00	3.60
D1	3.00	3.20
D2	2.29	2.69
E	3.00	3.60
E1	3.00	3.2
E2	2.00	2.2
e	0.60	0.70
j	0.15	0.35
k	0.60	0.80
n	0.15	0.35
M	0.20	
P	9°	11°
z	0.58	

Version：PDFN3.3*3.3-S package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
PDFN3.3*3.3-S	5000	1	5000	10	50000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG25R060NF	PDFN3.3*3.3	yes	yes	yes

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