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

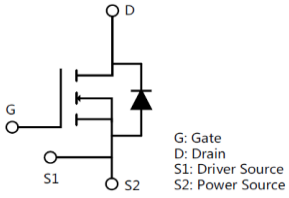
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	600	V
$I_{D, pulse}$	144	A
$R_{DS(ON), max}$ @ V_{GS}=10V	60	mΩ
Q_g	58	nC
PD	298	W

Marking Information

Product Name	Package	Marking
OSG60R060H4T4F	TO247-4L	OSG60R060H4T4

Package & Pin Information



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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	600	V
Gate-source voltage (static)	V_{GS}	±20	V
Gate-source voltage (dynamic)		±30	V
Continuous drain current[1], T_C=25 °C	I_D	48	A
Continuous drain current[1], T_C=100 °C		30	
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	144	A
Continuous diode forward current[1], T_C=25 °C	I_S	48	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ pulse}$	144	A
Power dissipation[3], T_C=25 °C	P_D	298	W
Single pulsed avalanche energy[4]	E_{AS}	410	mJ
MOSFET dv/dt ruggedness, V_{DS}=0…400 V	dv/dt	100	V/ns
Reverse diode dv/dt, V_{DS}=0…400 V, I_{SD}≤I_D	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	$R_{\theta JC}$	0.42	°C/W
Thermal resistance, junction-ambient	$R_{\theta JA}$	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}	600			V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	2.9		3.9	V	V_{DS}=V_{GS}, I_D=1 mA
Drain-source on-state resistance	$R_{DS(ON)}$		51	60	mΩ	V_{GS}=10 V, I_D=16 A
			127			V_{GS}=10 V, I_D=16 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}=600 V, V_{GS}=0 V
Gate resistance	R_G		3.8		Ω	f=1 MHz, Open drain

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		2618		pF	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz
Output capacitance	C_{oss}		195		pF	
Reverse transfer capacitance	C_{rss}		3.1		pF	
Effective output capacitance, energy related	$C_{o(er)}$		124		pF	V_{GS}=0 V, V_{DS}=0 V-400 V
Effective output capacitance, time related	$C_{o(tr)}$		686		pF	
Turn-on delay time	$t_{d(on)}$		16.4		ns	V_{GS}=10 V, V_{DS}=400 V, R_G=2 Ω, I_D=24 A
Rise time	t_r		6.4		ns	
Turn-off delay time	$t_{d(off)}$		57.6		ns	
Fall time	t_f		14		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		58		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=24 A
Gate-source charge	Q_{gs}		13		nC	
Gate-drain charge	Q_{gd}		22		nC	
Gate plateau voltage	$V_{plateau}$		5.8		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.3	V	I_S=48 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		341		ns	V_R=400 V, I_S=24 A, di/dt=100 A/μs
Reverse recovery charge	Q_{rr}		4.5		μC	
Peak reverse recovery current	I_{rrm}		23		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) V_{DD}=100 V, V_{GS}=10 V, L=75 mH, starting T_j=25 °C.

Electrical Characteristics Diagrams

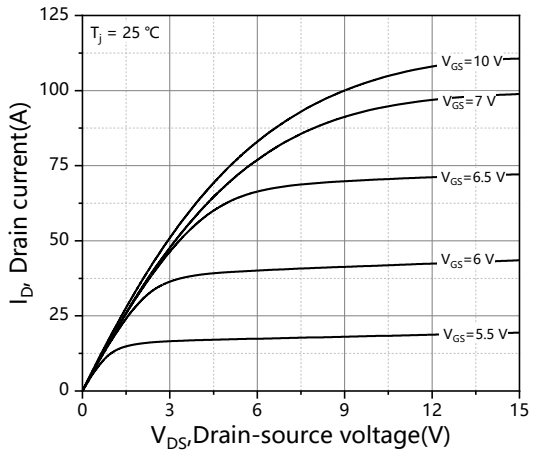


Figure 1. Typ. output characteristics T_j=25℃

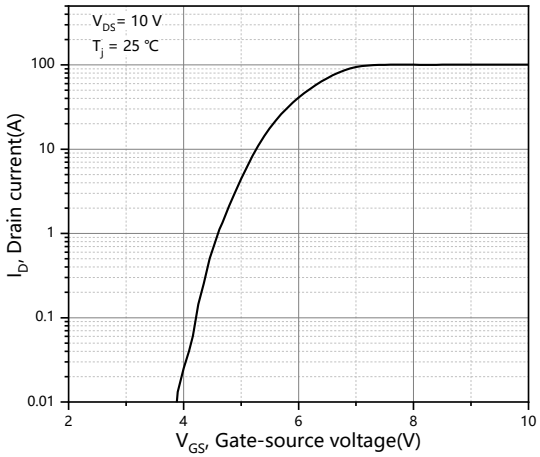


Figure 2. Typ. transfer characteristics

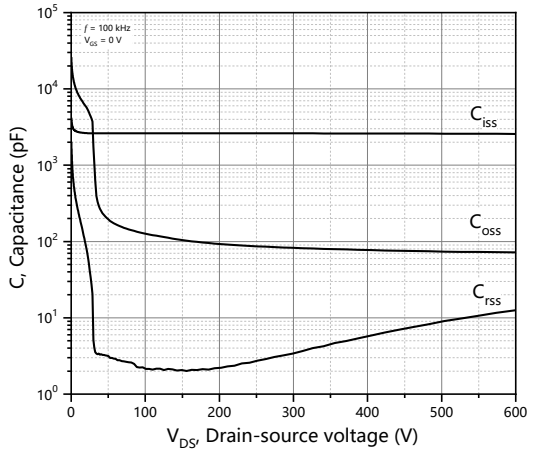


Figure 3. Typ. capacitances

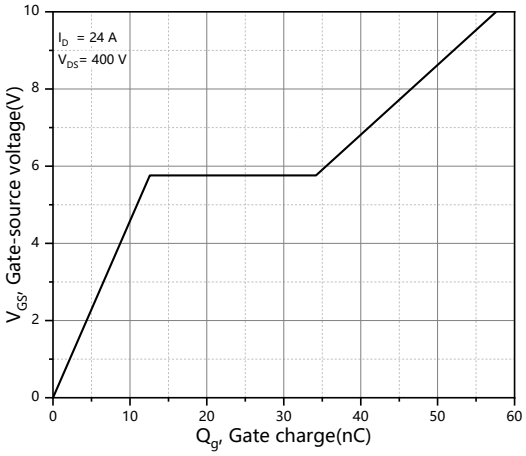


Figure 4. Typ. gate charge

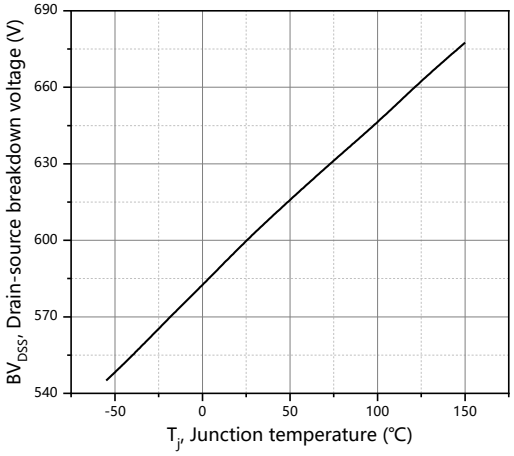


Figure 5. Drain-source breakdown voltage

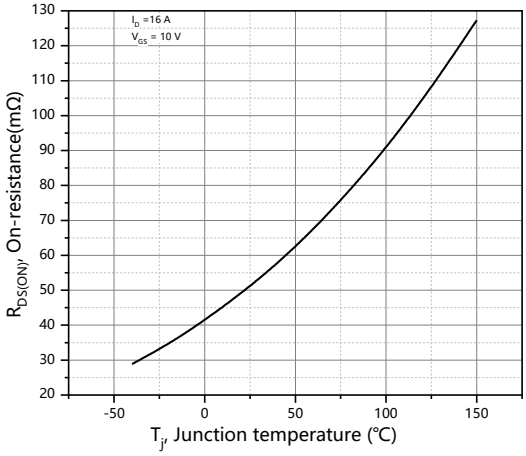


Figure 6. Drain-source on-state resistance

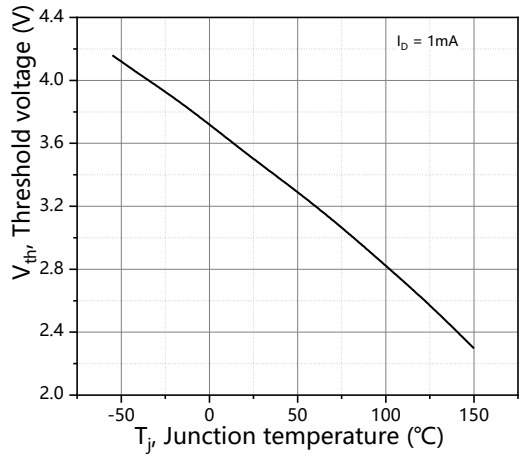


Figure 7. Threshold voltage

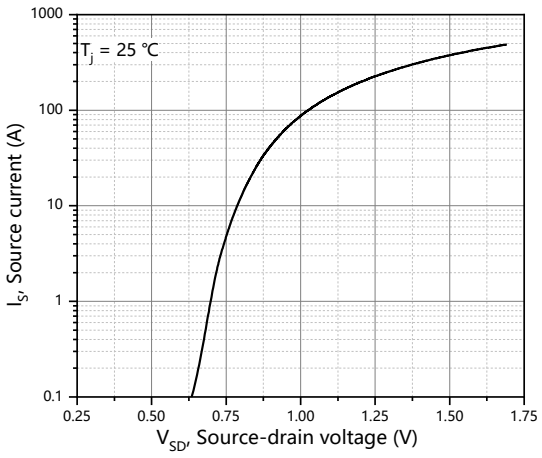


Figure 8. Forward characteristic of body diode

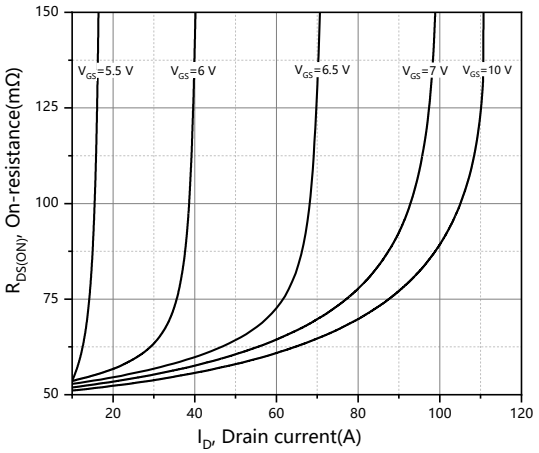


Figure 9. Drain-source on-state resistance

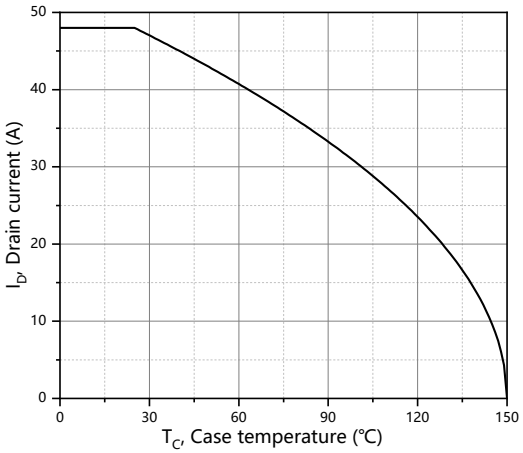


Figure 10. Drain current

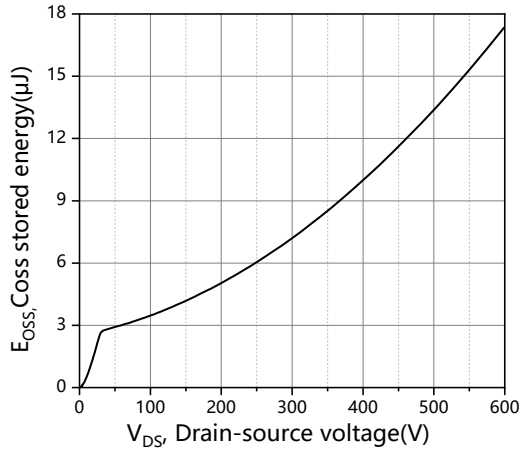


Figure 11. Typ. Coss stored energy

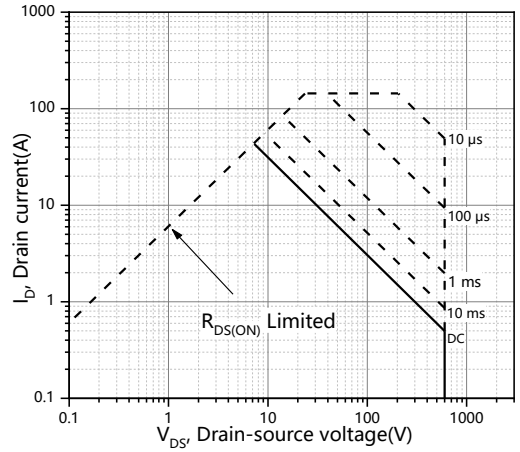


Figure 12. Safe operation area Tc=25℃

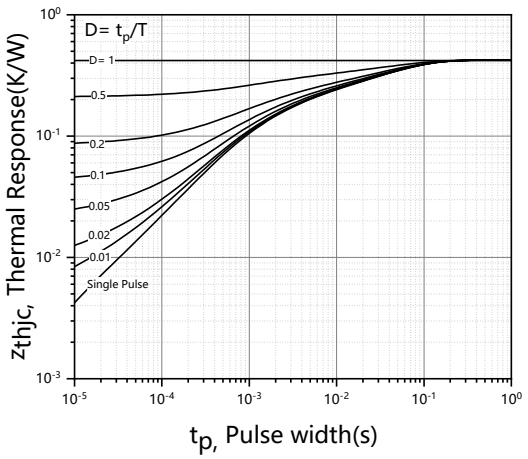


Figure 13. Max. transient thermal impedance

Test circuits and waveforms

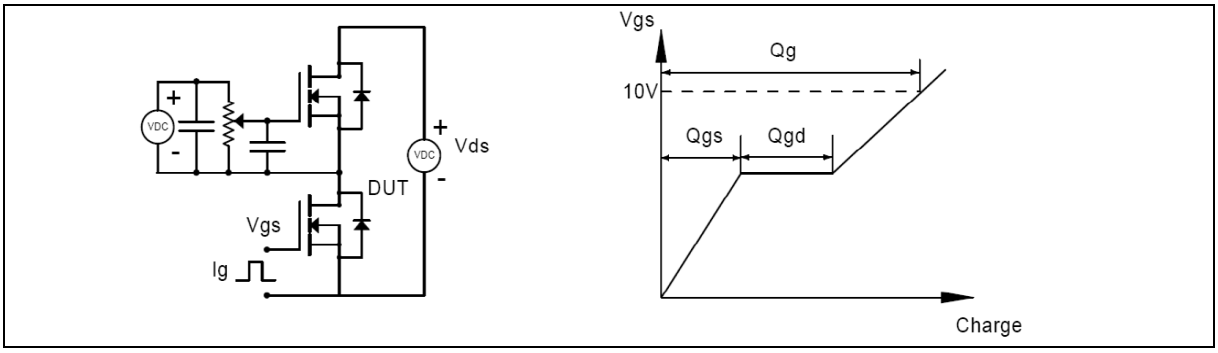


Figure 1. Gate charge test circuit & waveform

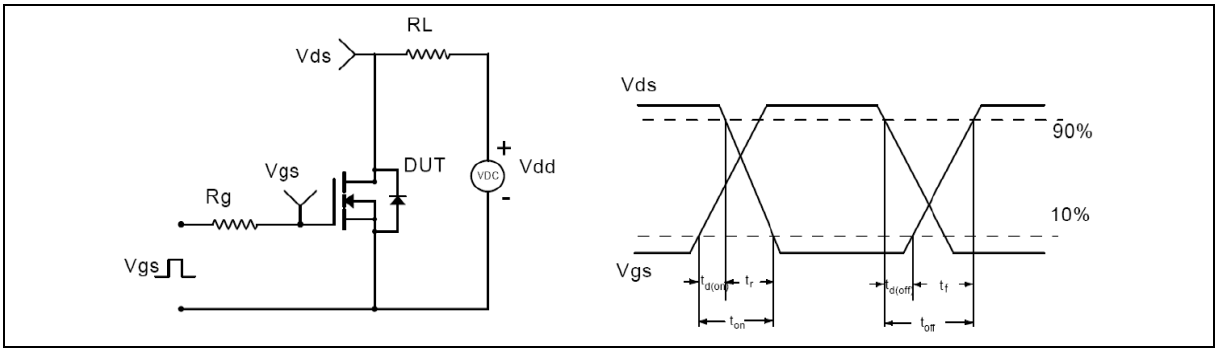


Figure 2. Switching time test circuit & waveforms

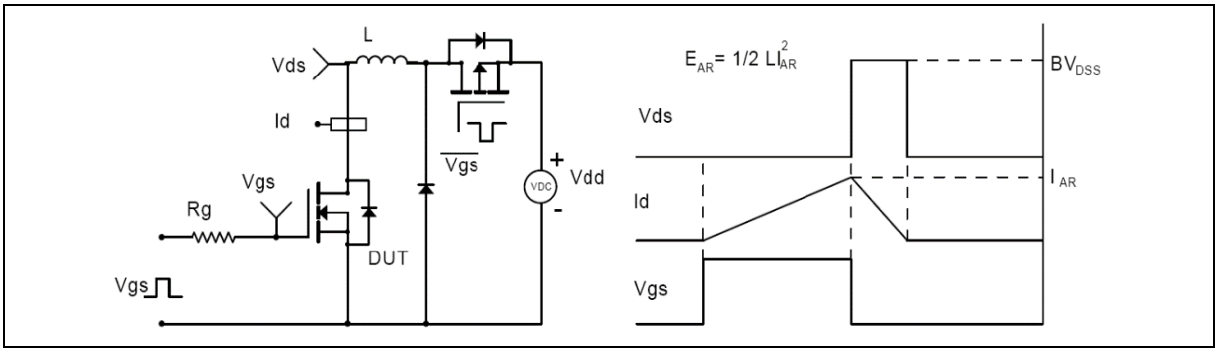


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

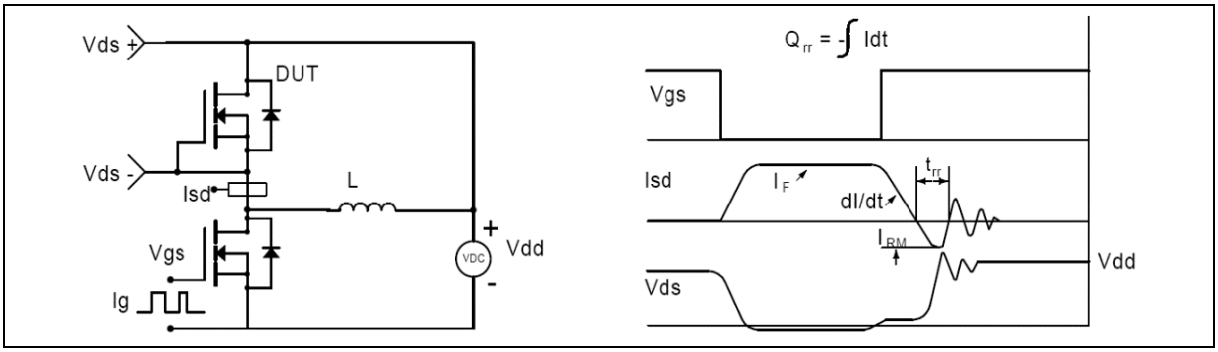
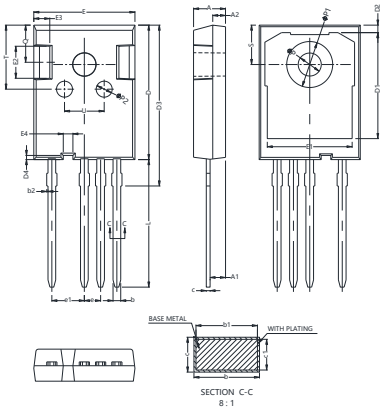


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
b	1.16		1.29
b1	1.15	1.2	1.25
b2	0.00		0.20
c	0.59		0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
D3	24.97	25.12	25.27
D4	0.55	0.65	0.75
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
E4	1.40	1.50	1.60
e	2.44	2.54	2.64
e1	4.98	5.08	5.18
L	19.80	19.92	20.10
P	3.50	3.60	3.70
P1			7.40
P2	2.40	2.50	2.60
Q	5.60		6.00
S	6.15BSC		
T	9.80		10.20
U	6.00		6.40

Version：TO247-4L-J package outline dimension

Ordering Information

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO247-4L-J	30	20	600	4	2400

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG60R060H4T4F	TO247-4L	yes	yes	yes

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Revision History

Version	Revision History	Date
V1.0	Initial release	2025-07-17

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