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.

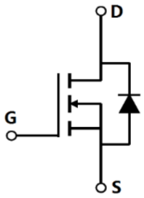
The GreenMOS® SuperSi series is based on Oriental Semiconductor's unique device design to achieve extremely fast switching characteristics. It is the perfect replacement for the Gallium Nitride (GaN) device in high frequency operations with better ruggedness and cost. It is targeted to meet the most aggressive efficiency standards of power supply systems by pushing both performance and power density to extreme limits.

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

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

Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	650	V
$I_{D,\ pulse}$	90	A
$R_{DS(ON),\ max}$ @ V_{GS}=10V	99	mΩ
Q_g	21.6	nC

Product Name	Package	Marking
OSS60R099HF	TO247	OSS60R099H



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	V_{GS}	±30	V
Continuous drain current1), T_C=25 °C	I_D	30	A
Continuous drain current1), T_C=100 °C		19	
Pulsed drain current2), T_C=25 °C	$I_{D,\ pulse}$	90	A
Continuous diode forward current1), T_C=25 °C	I_S	30	A
Diode pulsed current2), T_C=25 °C	$I_{S,\ pulse}$	90	A
Power dissipation3), T_C=25 °C	P_D	219	W
Single pulsed avalanche energy5)	E_{AS}	577.6	mJ
MOSFET dv/dt ruggedness, V_{DS}=0…480 V	dv/dt	50	V/ns
Reverse diode dv/dt, V_{DS}=0…480 V, $I_{SD} \leq I_D$	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	$R_{\theta JC}$	0.57	°C/W
Thermal resistance, junction-ambient4)	$R_{\theta JA}$	62.5	°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=250 μA
		650	740			V_{GS}=0 V, I_D=250 μA, T_j=150 °C
Gate threshold voltage	$V_{GS(th)}$	2.9		3.9	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		0.080	0.099	Ω	V_{GS}=10 V, I_D=15 A
			0.192			V_{GS}=10 V, I_D=15 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	μA	V_{DS}=600 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}				pF	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz
Output capacitance	C_{oss}		235.9		pF	
Reverse transfer capacitance	C_{rss}		9.1		pF	
Turn-on delay time	$t_{d(on)}$		24.9		ns	V_{GS}=10 V, V_{DS}=400 V, R_G=2 Ω, I_D=20 A
Rise time	t_r		32.3		ns	
Turn-off delay time	$t_{d(off)}$		42.3		ns	
Fall time	t_f		27.5		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		21.6		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=20 A
Gate-source charge	Q_{gs}		6.9		nC	
Gate-drain charge	Q_{gd}		7.8		nC	
Gate plateau voltage	$V_{plateau}$		6.5		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	I_S=30 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		416.0		ns	, I_S=20 A, di/dt=100 A/µs
Reverse recovery charge	Q_{rr}		6.8		µC	
Peak reverse recovery current	I_{rrm}		32.1		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 $R_{θJA}$ 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=60 mH, starting T_j=25 °C.

Electrical Characteristics Diagrams

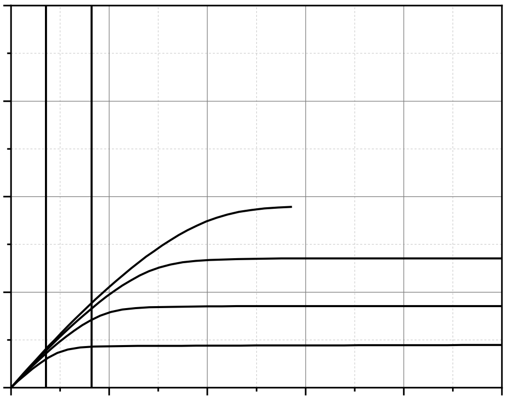


Figure 1. Typ. output characteristics

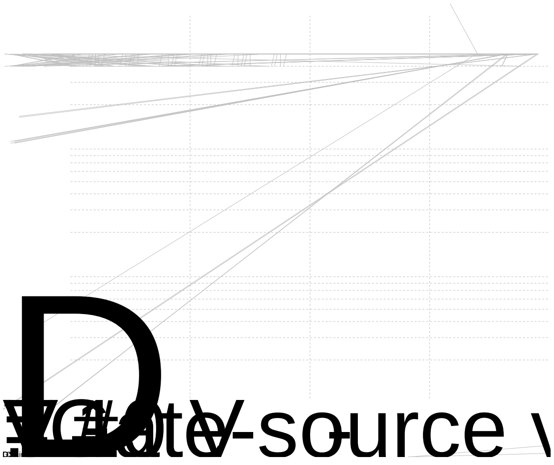


Figure 2. Typ. transfer characteristics

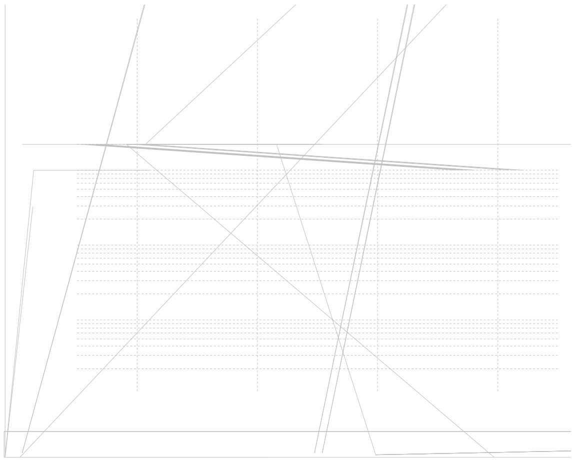


Figure 3. Typ. capacitances

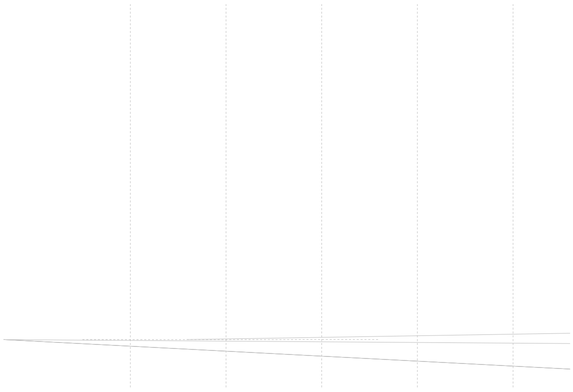


Figure 4. Typ. gate charge

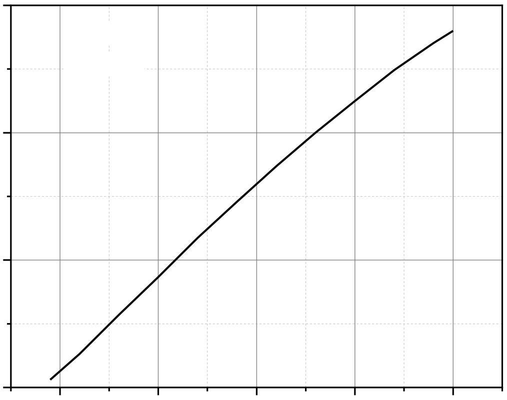


Figure 5. Drain-source breakdown voltage

Figure 6. Drain-source on-state resistance

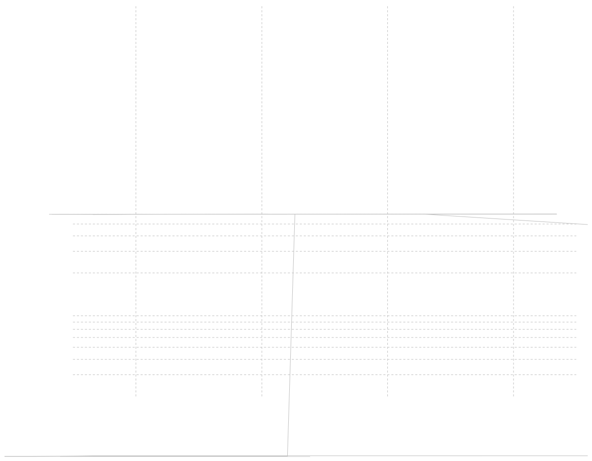


Figure 7. Forward characteristic of body diode

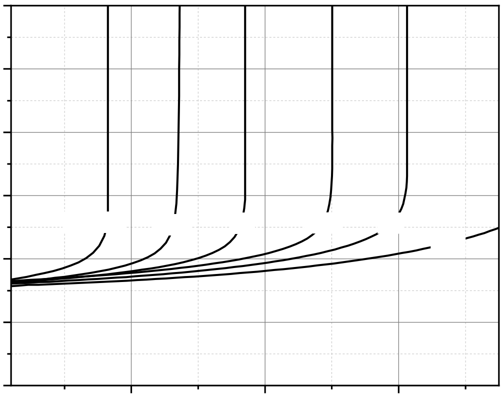


Figure 8. Drain-source on-state resistance

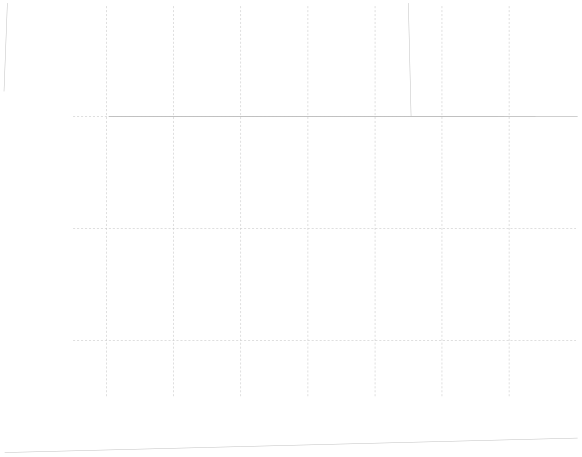


Figure 9. Drain current

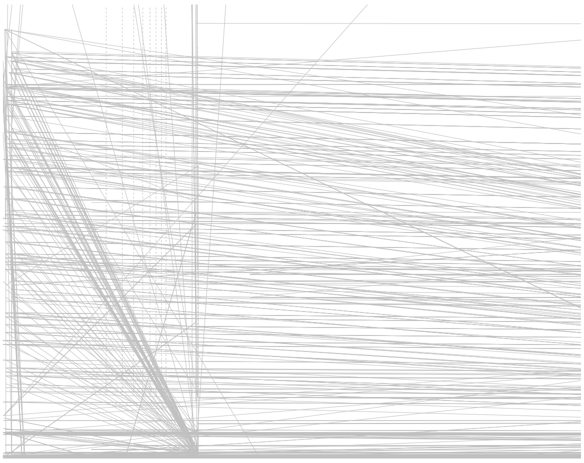


Figure 10. Safe operation area T_C=25 °C

Test circuits and waveforms

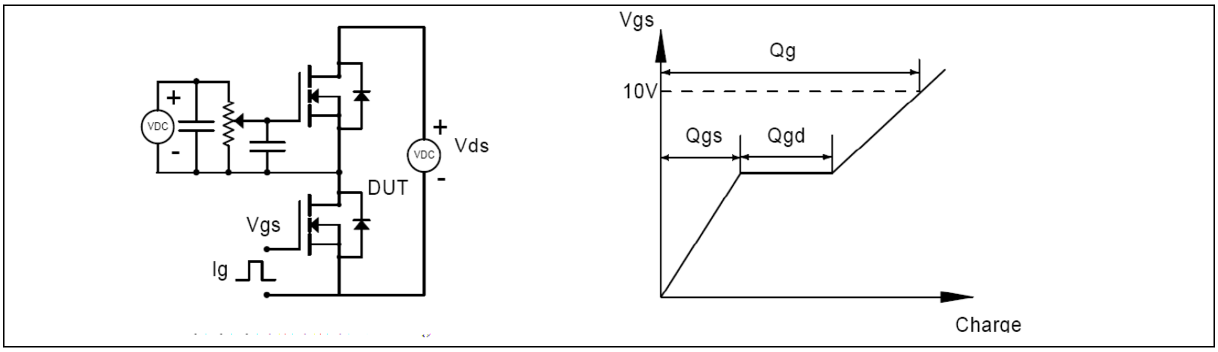


Figure 1. Gate charge test circuit & waveform

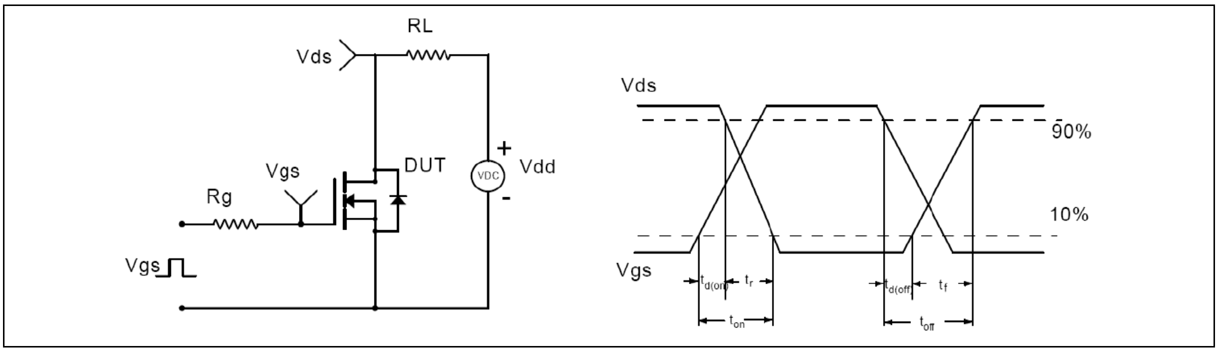


Figure 2. Switching time test circuit & waveforms

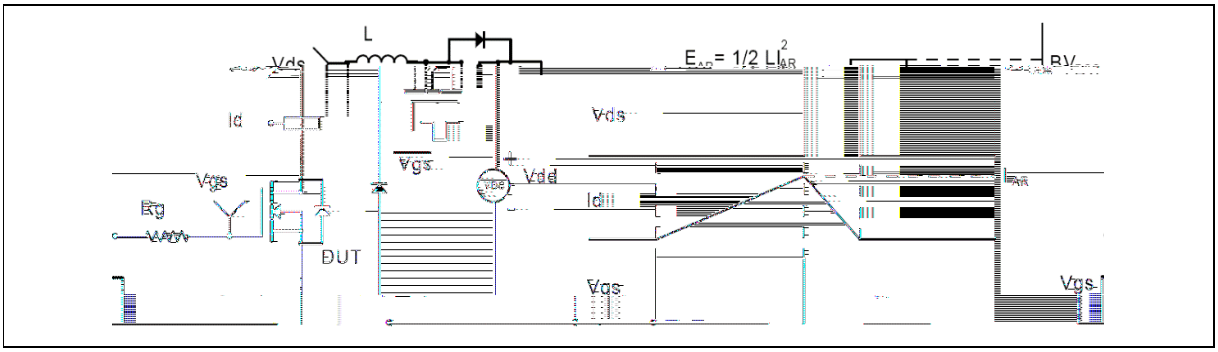


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

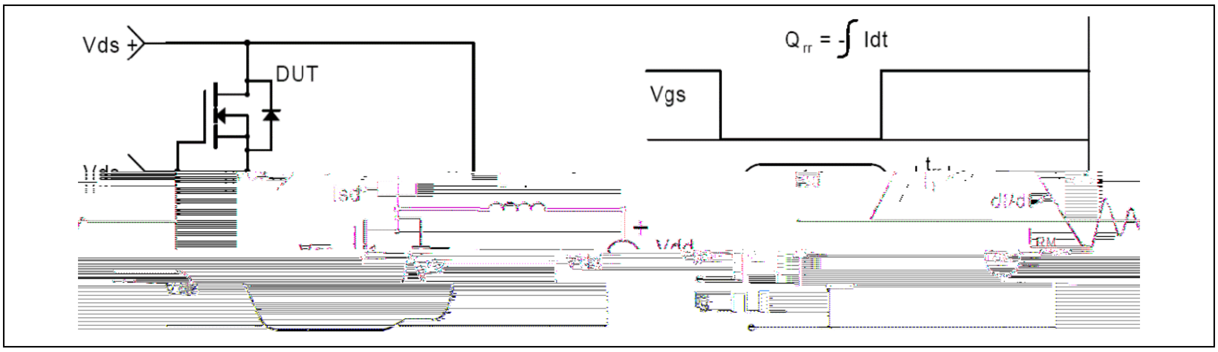


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information

Symbol	mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
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			

Ordering Information

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO247-C	30	11	330	6	1980

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSS60R099HF	TO247	yes	yes	yes

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