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.

GreenMOS®

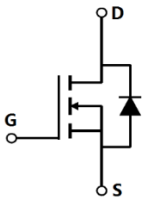
-
-
-

RoHS

-
-
-
-
-
-

Parameter	Value	Unit
$V_{DS,\ min}$ @ $T_{j(max)}$	700	V
$I_{D,\ pulse}$	60	A
$R_{DS(ON),\ max}$ @ V_{GS}=10V	200	
Q_g	45.4	nC

Product Name	Package	Marking
OSG65R200FSF_NB	TO220F_NL	OSG65R200FS



Absolute Maximum Ratings at T_j=25 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	20	A
Continuous drain current[1], T_C=100 °C		12.5	
Pulsed drain current[2], T_C=25 °C	$I_{D, pulse}$	60	A
Continuous diode forward current[1], T_C=25 °C	I_S	20	A
Diode pulsed current[2], T_C=25 °C	$I_{S, pulse}$	60	A
Power dissipation[3], T_C=25 °C	P_D	34	W
Single pulsed avalanche energy[5]	E_{AS}	578	mJ
MOSFET dv/dt ruggedness, V_{DS}	dv/dt	50	V/ns
Reverse diode dv/dt, V_{DS} SD 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	3.67	°C/W
Thermal resistance, junction-ambient[4]	R	62.5	°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}	650			V	V_{GS}=0 V, I_D=250 A
		700				V_{GS}=0 V, I_D , T_j=150 °C
Gate threshold voltage	$V_{GS(th)}$	2.9		3.9	V	V_{DS}=V_{GS}, I_D=250 A
Drain-source on-state resistance	$R_{DS(ON)}$			0.2		V_{GS}=10 V, I_D=10 A

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		1745		pF	V_{GS}=0 V, V_{DS}=50 V, kHz
Output capacitance	C_{oss}		102		pF	
Reverse transfer capacitance	C_{rss}		2.6		pF	
Effective output capacitance, energy related	Co(er)		58		pF	V_{GS} = 0V, V_{DS} = 0V-400V
Effective output capacitance, time related	Co(tr)		288		pF	
Turn-on delay time	$t_{d(on)}$		28.2		ns	V_{GS}=10 V, V_{DS}=400 V, R_G=2 I_D=10 A
Rise time	t_r		11		ns	
Turn-off delay time	$t_{d(off)}$		70.8		ns	
Fall time	t_f		7.8		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		45.4		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=4 A
Gate-source charge	Q_{gs}		10.2		nC	
Gate-drain charge	Q_{gd}		12.5		nC	
Gate plateau voltage	$V_{plateau}$		5.4		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.3	V	I_S=20 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		320		ns	

Electrical Characteristics Diagrams

Figure 1. Typ. output characteristics

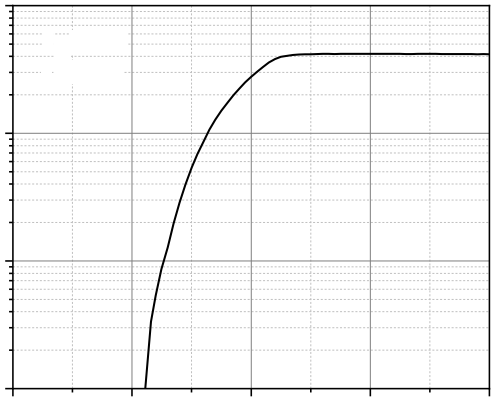


Figure 2. Typ. transfer characteristics

Figure 3. Typ. capacitances

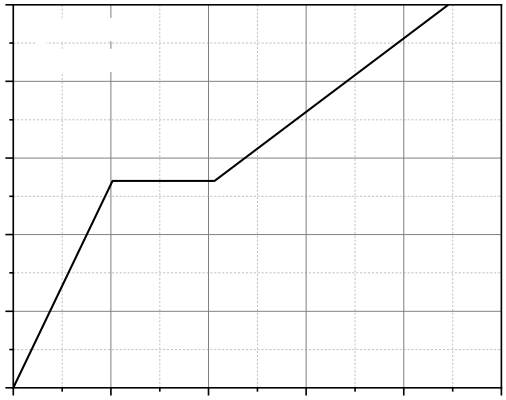


Figure 4. Typ. gate charge

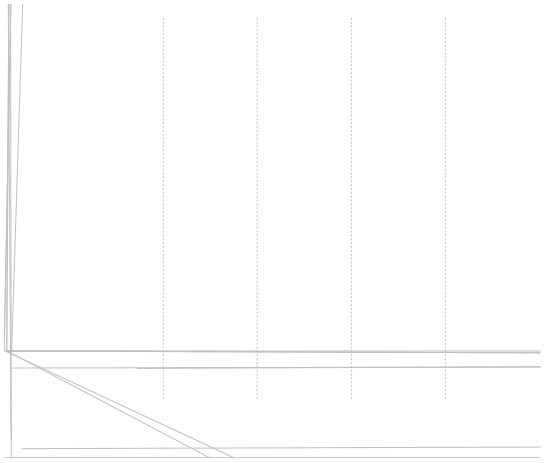


Figure 5. Drain-source breakdown voltage

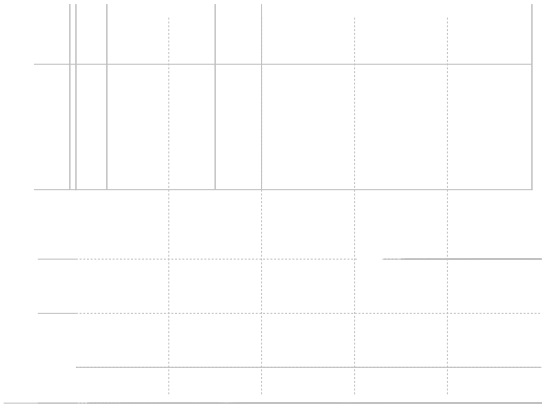


Figure 6. Drain-source on-state resistance

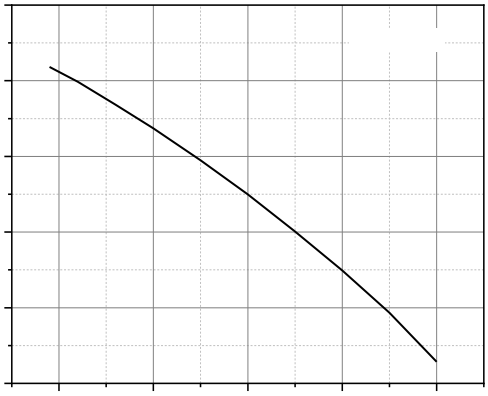


Figure 7. Threshold voltage

Figure 8. Forward characteristic of body diode

Figure 9. Drain-source on-state resistance

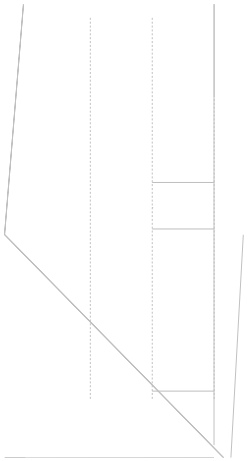


Figure 10. Drain current

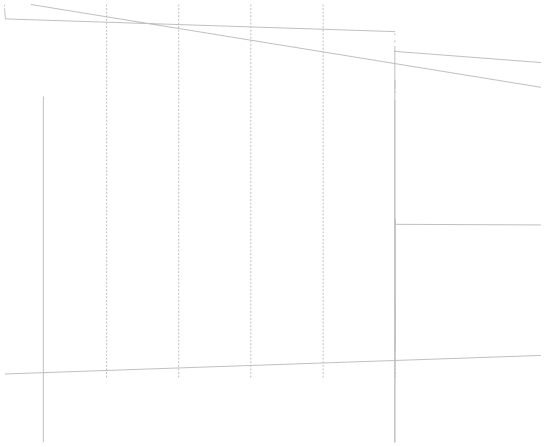


Figure 11. Safe operation area T_C=25 °C

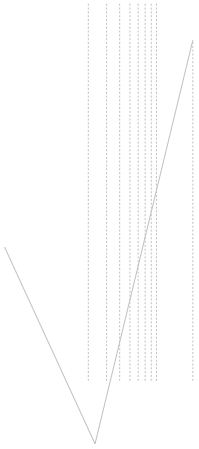


Figure 12, Safe operation area T_C=25

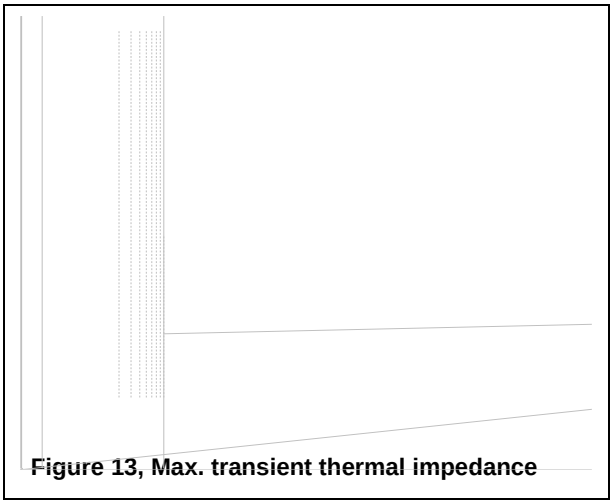


Figure 13, Max. transient thermal impedance

Test circuits and waveforms

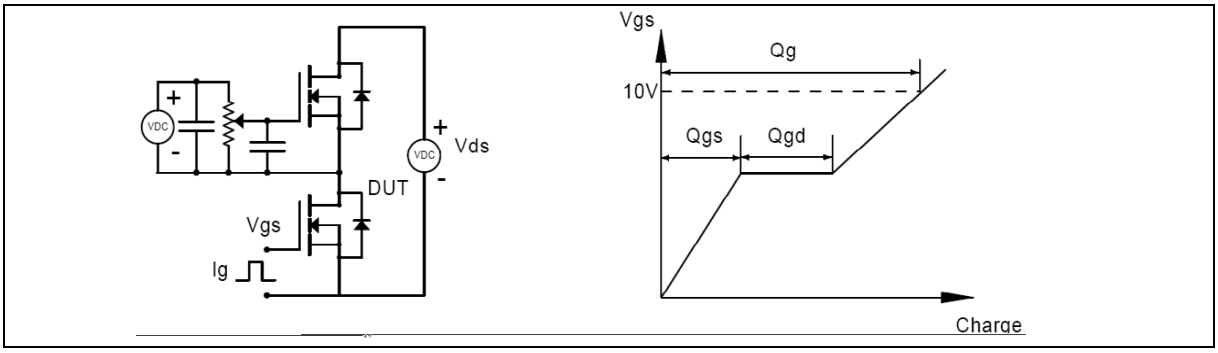


Figure 1. Gate charge test circuit & waveform

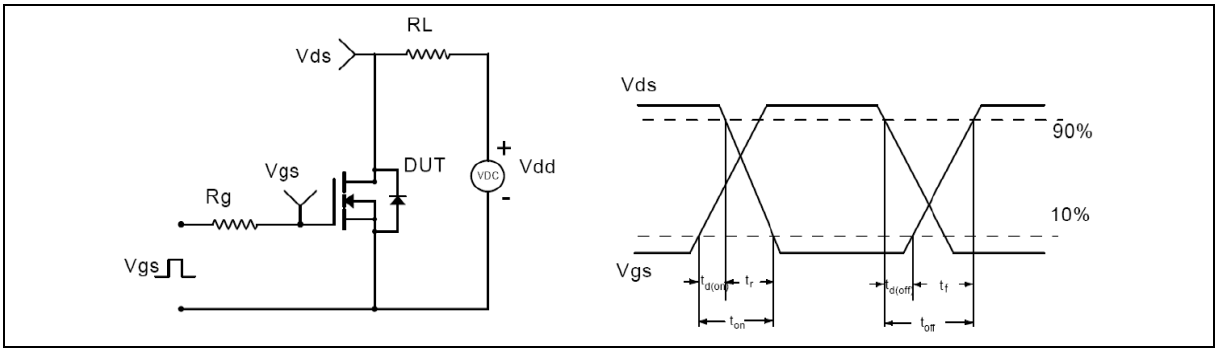


Figure 2. Switching time test circuit & waveforms

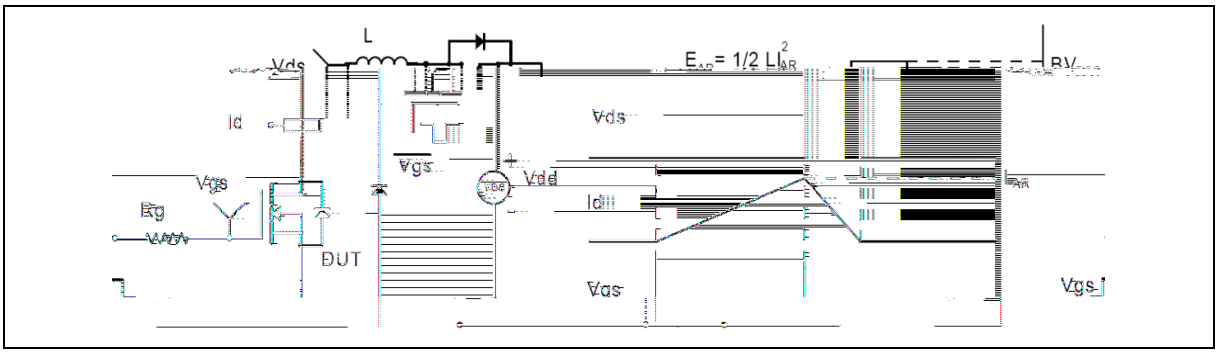


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

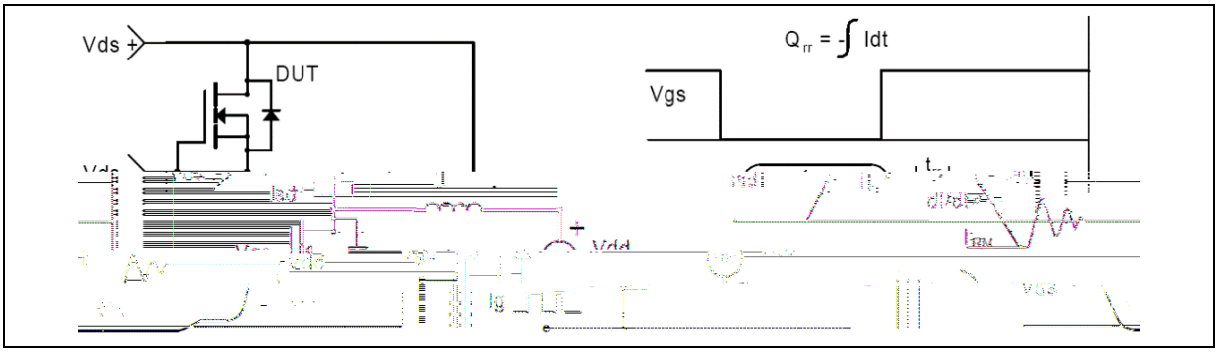
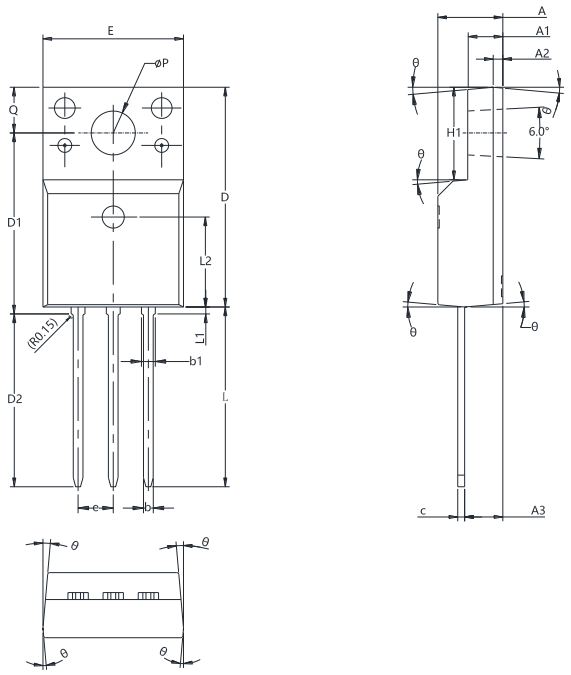


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	4.5	4.7	4.83
A1	2.34	2.54	2.74
A2		0.70 REF	
A3	2.56	2.76	2.93
b	0.6	-	0.8
b1	0.9	-	1.1
c	0.45	0.5	0.6
D	15.67	15.87	16.07
D1	12.87	13.07	13.27
D2	12.28	12.48	12.68
E	9.96	10.16	10.36
e		2.54 BSC	
H1	6.48	6.68	6.88
L	12.68	12.98	13.28
L1	-	-	0.85
L2		6.50 REF	
	3.08	3.18	3.28
Q	3.20	-	3.40
	1º	3º	5º

Version 1: TO220F_NL-J package outline dimension

Ordering Information

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO220F_NL-J	50	20	1000	5	5000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG65R200FSF_NB	TO220F_NL	yes	yes	yes