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	53	A
Continuous drain current[1], T_C=100 °C		33.3	
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	159	A
Continuous diode forward current[1], T_C=25 °C	I_S	53	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ pulse}$	159	A
Power dissipation[3] ,T_C=25 °C	P_D	390	W
Single pulsed avalanche energy[5]	E_{AS}	1200	mJ
MOSFET dv/dt ruggedness, V_{DS}	dv/dt	100	V/ns
Reverse diode dv/dt, V_{DS} 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	0.32	°C/W
Thermal resistance, junction-ambient[4]	R	62	°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=1 mA
		700	770			V_{GS}=0 V, I_D=1 mA, T_j=150 °C
Gate threshold voltage	$V_{GS(th)}$	3.5		4.5	V	V_{DS}=V_{GS}, I_D=2 mA
Drain-source on-state resistance	$R_{DS(ON)}$		0.06	0.069		V_{GS}=10 V, I_D=26.5 A
			0.15			V_{GS}=10 V, I_D=26.5 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}		4652.2		pF	V_{GS}=0 V, V_{DS}=50 V, 00 kHz
Output capacitance	C_{oss}		283.6		pF	
Reverse transfer capacitance	C_{rss}		8.6		pF	
Turn-on delay time	$t_{d(on)}$		41		ns	V_{GS}=10 V, V_{DS}=400 V, R_G I_D=40 A
Rise time	t_r		114.4		ns	
Turn-off delay time	$t_{d(off)}$		41.9		ns	
Fall time	t_f		2.8		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		60.2		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=30 A
Gate-source charge	Q_{gs}		24.5		nC	
Gate-drain charge	Q_{gd}		18.7		nC	
Gate plateau voltage	$V_{plateau}$		6.0		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	I_S=53 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		174		ns	I_S=30 A, di/dt=100
Reverse recovery charge	Q_{rr}		1.05		C	
Peak reverse recovery current	I_{rrm}		11.32		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

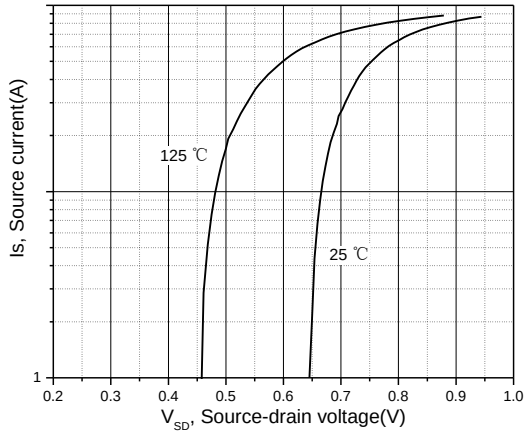

Figure 7. Forward characteristic of body diode

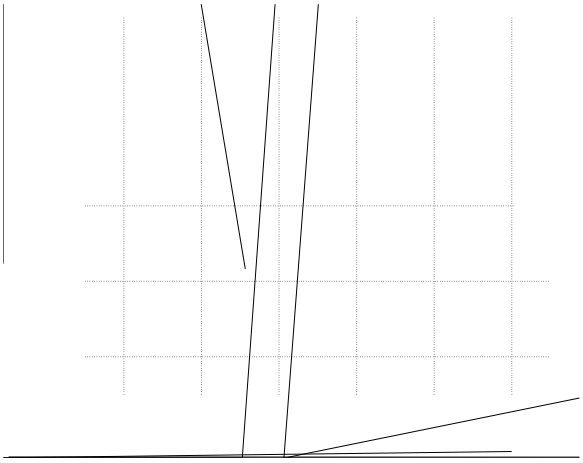

Figure 8. Drain-source on-state resistance

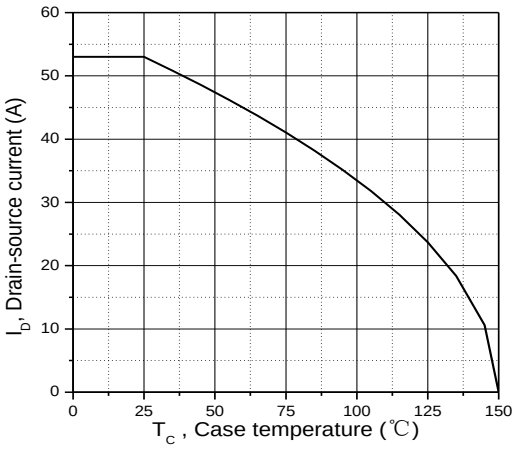

Figure 9. Drain current

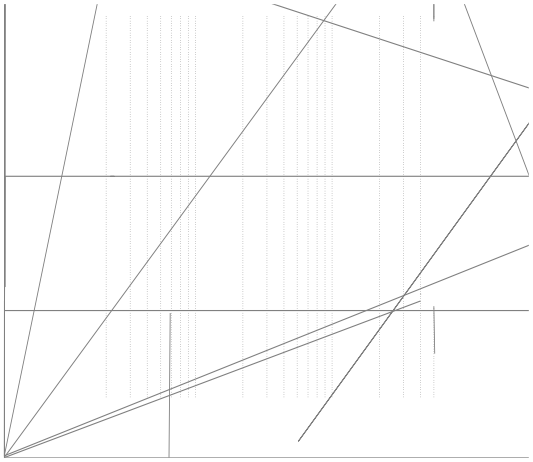

Figure 10. Safe operation area T_C=25 °C

Test circuits and waveforms

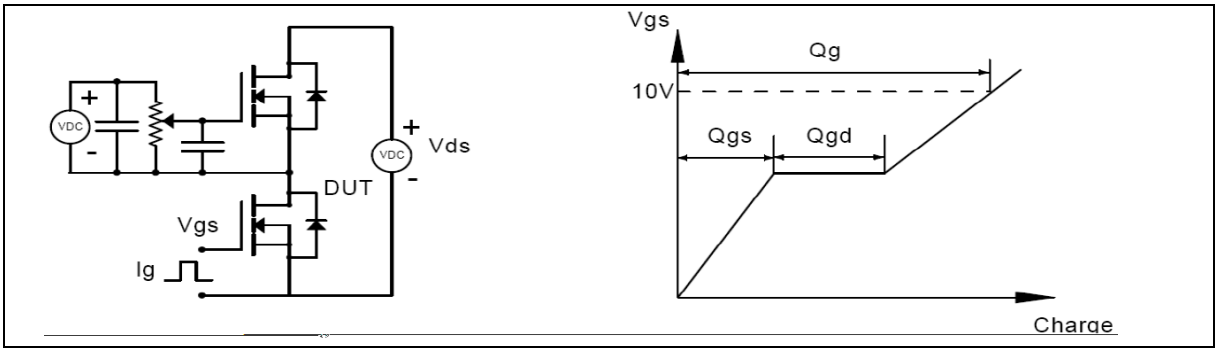

Figure 1. Gate charge test circuit & waveform

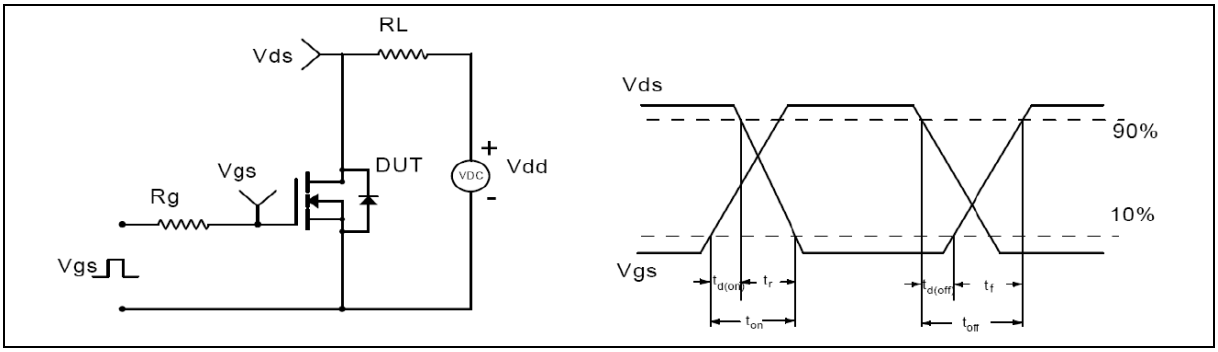

Figure 2. Switching time test circuit & waveforms

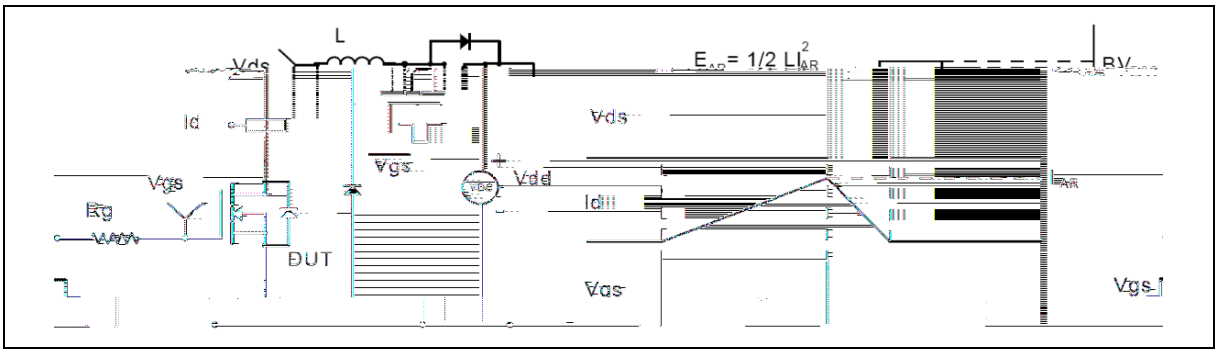

Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

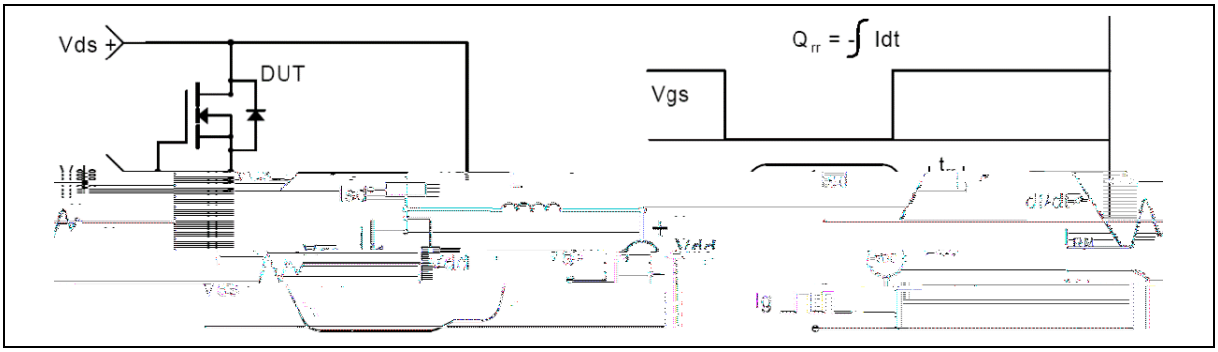

Figure 4. Diode reverse recovery test circuit & waveforms

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	20.80	21.00	21.30

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
OSG65R069HZF	TO247	yes	yes	yes