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	40	A
Continuous drain current[1], T_C=100 °C		25	
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	120	A
Continuous diode forward current[1], T_C=25 °C	I_S	40	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ pulse}$	120	A
Power dissipation[3] , T_C=25 °C	P_D	35	W
Single pulsed avalanche energy[5]	E_{AS}	1000	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	3.6	°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=1 mA
		700	770			V_{GS}=0 V, I_D=1 mA, T_j=150 °C
Gate threshold voltage	$V_{GS(th)}$	3.0		4.0	V	V_{DS}=V_{GS}, I_D=1 mA
Drain-source on-state resistance	$R_{DS(ON)}$		0.08	0.099		V_{GS}=10 V, I_D=20 A

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		3042.6		pF	V_{GS}=0 V, V_{DS}=50 V, 00 kHz
Output capacitance	C_{oss}		200.6		pF	
Reverse transfer capacitance	C_{rss}		3.9		pF	
Turn-on delay time	$t_{d(on)}$		68.1		ns	V_{GS}=10 V, V_{DS}=400 V, R_G=25 I_D=20 A
Rise time	t_r		53.7		ns	
Turn-off delay time	$t_{d(off)}$		109.6		ns	
Fall time	t_f		56.4		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		43.6		nC	V_{GS}=10 V, V_{DS}=400 V, I_D=20 A
Gate-source charge	Q_{gs}		13		nC	
Gate-drain charge	Q_{gd}		13.4		nC	
Gate plateau voltage	$V_{plateau}$		5.6		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	I_S=40 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		441.5		ns	I_S=20 A,
Reverse recovery charge	Q_{rr}		7.5		C	
Peak reverse recovery current	I_{rrm}		31.2		A	

Note

1) Calculated continuous current based on maximum allowable junction temperature.

Electrical Characteristics Diagrams

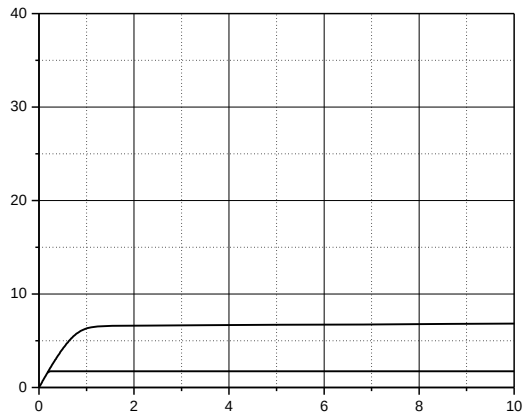

Figure 1. Typ. output characteristics

Figure 2. Typ. transfer characteristics

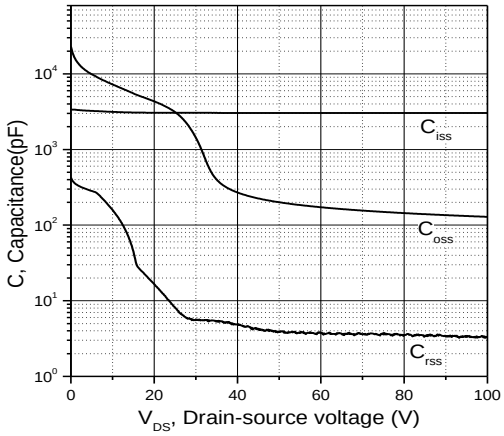

Figure 3. Typ. capacitances

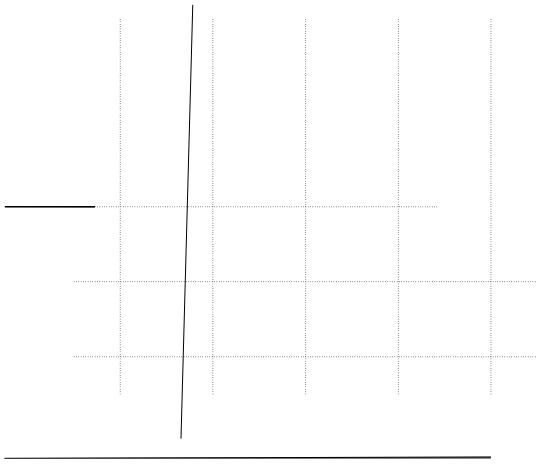

Figure 4. Typ. gate charge

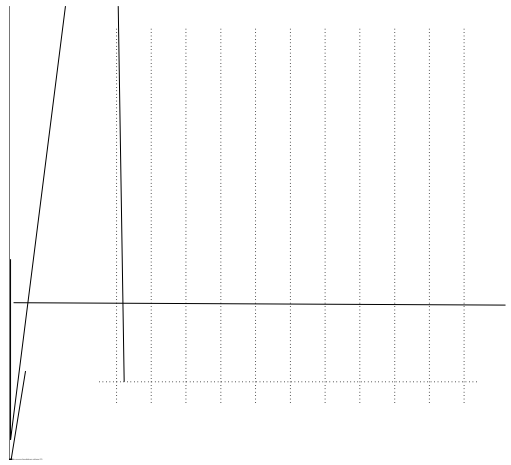

Figure 5. Drain-source breakdown voltage

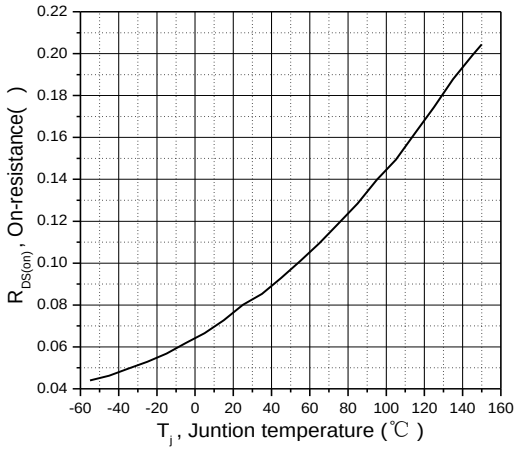

Figure 6. Drain-source on-state resistance

Figure 7. Forward characteristic of body diode

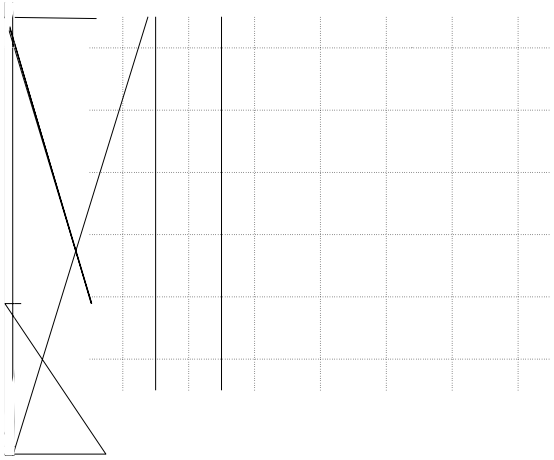

Figure 8. Drain-source on-state resistance

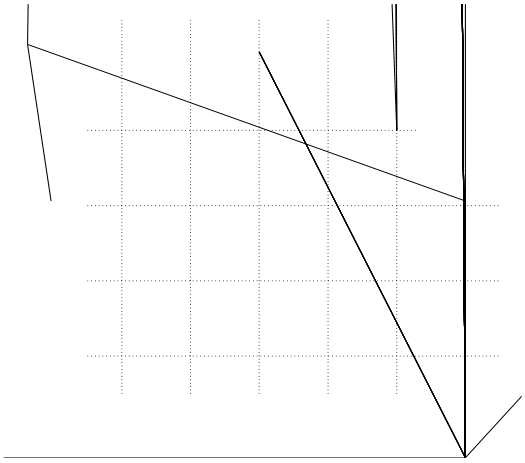

Figure 9. Drain current

Figure 10. Safe operation area T_C=25

Ordering Information

Package Type	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO220F-C	50	20	1000	6	6000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG65R099FF	TO220F	yes	yes	yes

4MOI T, KT UM

7 MVI T MJ KWL KW W4L) TT OP MM ML

ORIENTAL SEMICONDUCTOR

A Power Semiconductor Innovator