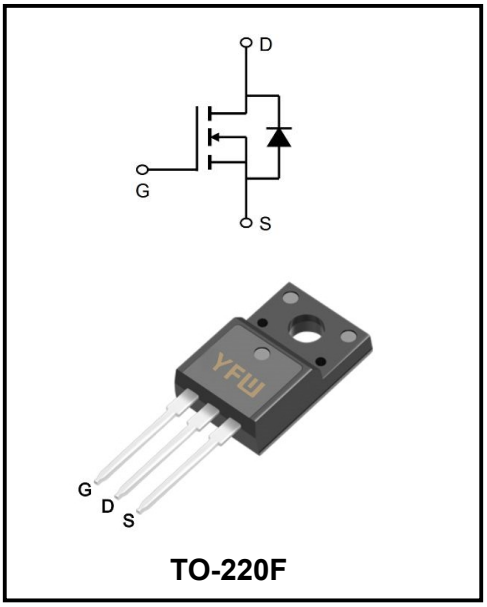
800V SiC N-Channel MOSFET

MAIN CHARACTERISTICS

I_D	36A
V_{DS}	800V
R_{DSON}-typ (@V_{GS}=18V T_C=25°C)	＜118mΩ(Typ:90mΩ)



TO-220F

FEATURES

- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery (Qrr)
- Robust against Parasitic Turn on Even 0V Turn off Gate Voltage

BENEFITS

- Reduced Switching Losses
- Increased System Switching Frequency
- Increased Power Density
- Reduction of Heat Sink Requirements
- Reduced EMI

APPLICATIONS

- High Efficiency Switch
- Motor driven
- Ammeter
- UPS power

Maximum Ratings at Tc=25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GS}	-10/+22	V
Recommended Operation Value	V_{GSop}	0~/+18	V
Continue Drain Current Tc=25℃	I_D	36	A
Continue Drain Current Tc=100℃		19.5	
Pulsed Drain Current	I_{DM}	55	A
Power Dissipation TC=25℃	P_D	130	W
Power Dissipation TC=175℃	P_D	69	W
Operating Temperature Range	T_J	-55 to +175	°C
Storage Temperature Range	T_{STG}	-55 to +175	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	°C/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 500μA	BV_{DSS}	800	-	-	V
Drain-Source Leakage Current	V_{DS} = 800 V, V_{GS} = 0 V	I_{DSS}	-	1	100	μA
Gate Leakage Current	V_{GS} = 18 V, V_{DS} = 0 V	I_{GSS}	-	-	250	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D =7.5mA	$V_{GS(th)}$	2.7	2.8	4.5	V
Drain-Source On-State Resistance	V_{GS} = 15 V, I_D = 17 A	$R_{DS(ON)}$	-	105	120	mΩ
	V_{GS} = 15 V, I_D = 17A,T_J = 175℃		-	86	-	
	V_{GS} = 18 V, I_D = 17A		-	90	118	
	V_{GS} = 18 V, I_D = 17A,T_J = 175℃		-	72	-	
Internal Gate Resistance	f=100KHz	RG	-	3	-	Ω
Input Capacitance	V_{DS}=400V V_{GS}=0V f=100KHz	C_{iss}	-	1040	-	pF
Output Capacitance		C_{oss}	-	96	-	pF
Reverse Transfer Capacitance		C_{rss}	-	7	-	pF
Total Gate Charge(Note2)	I_D =17A V_{DS}=400V V_{GS} =0/18 V	Q_g	-	44.7	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	15.3	-	nC
Gate to Drain Charge(Note2)		Q_{gd}	-	12	-	nC
Turn-on Delay Time	V_{DD}= 400 V, I_D=17 A, V_{GS} = 0/18 V, R_G = 5 Ω L=200μH	$t_{d(on)}$	-	14.4	-	ns
Rise Time(Note2)		t_r	-	43.6	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	29.6	-	ns
Fall Time(Note2)		t_r	-	28.8	-	ns
Maximun Body-Diode Continuous Current	V_{GS} = 0 V, Tc=25°C	I_S	-	36	-	A
	V_{GS} = 0V, Tc=100°C		-	19.5	-	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	38.4	-	A
Drain-Source Diode Forward Voltage	V_{GS}=-4V,I_{SD}=8.5A	V_{SD}	-	3.4	-	V
Reverse Recovery Time(Note2)	V_{GS} = 0V， I_{SD} = 17 A,V_R =400V, di/dt=1360A/μs,Tj=25℃	trr	-	15.4	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	73.5	-	nC
Peak Reverse Recovery Current		Irrm	-	7.4	-	A

Note2:Pulse test: 300 us pulse width,2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

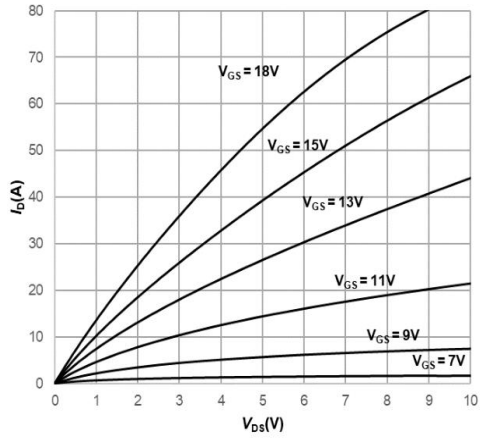


Fig1. Output Characteristics T_j=25℃

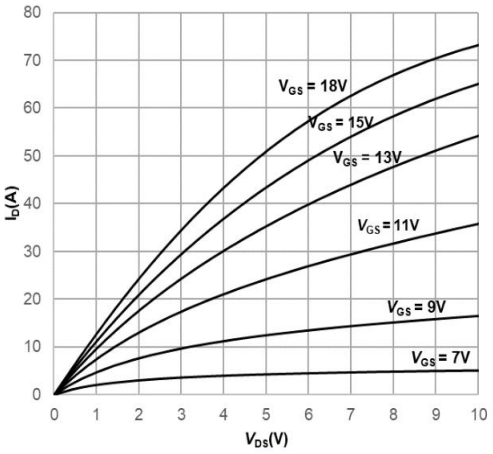


Fig2. Output Characteristics T_j=175℃

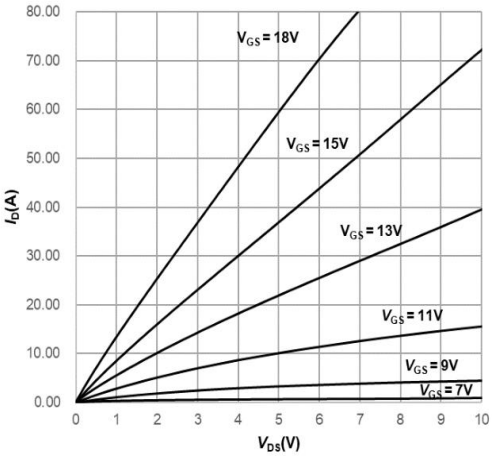


Fig3. Output Characteristics T_j=-40℃

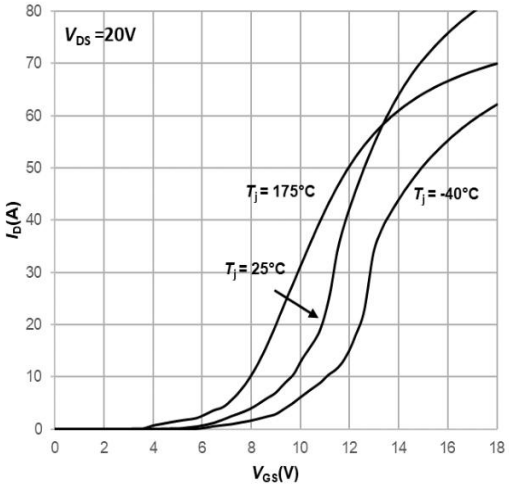


Fig4. Typical Transfer Characteristics

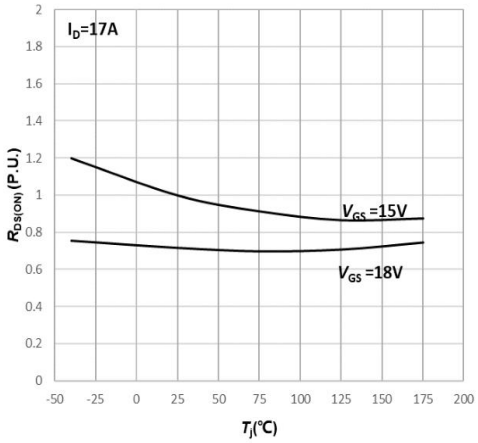


Fig5. Normalized On-Resistance vs. Temperature

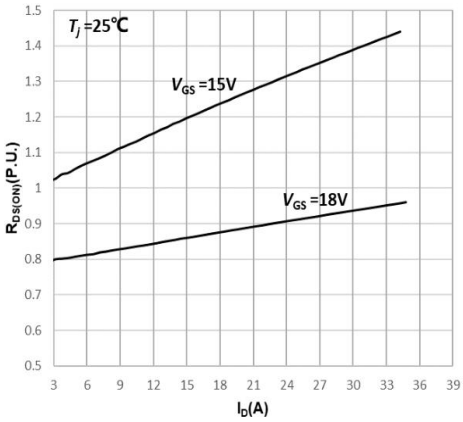


Fig6. Normalized On-Resistance vs. Drain Current For Various V_{GS}

RATINGS AND CHARACTERISTIC CURVES

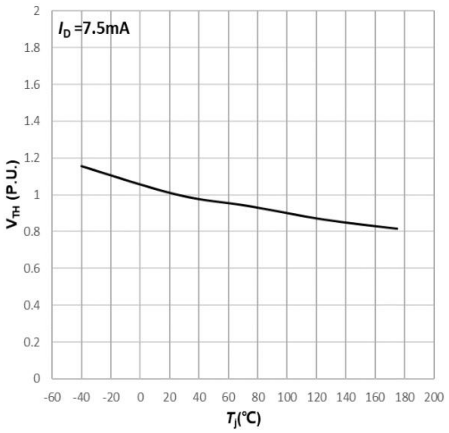


Fig7. Normalized Threshold Voltage vs. Temperature

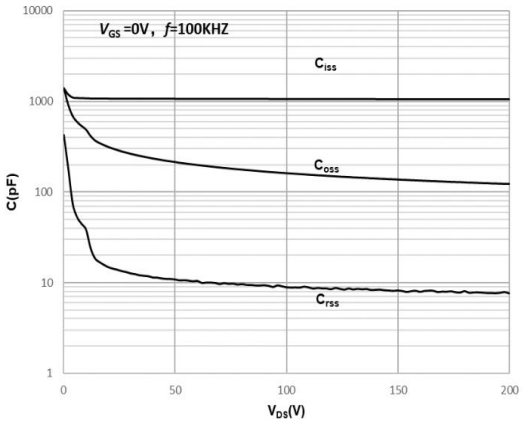


Fig8. Capacitances vs. Drain-Source Voltage (0-200V)

For T_j=25℃

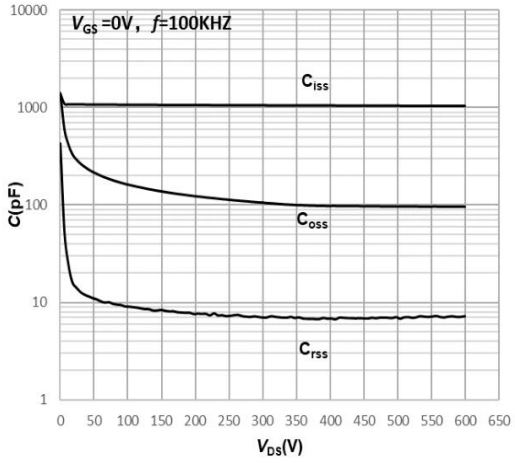


Fig9. Capacitances vs. Drain-Source Voltage (0-600V)

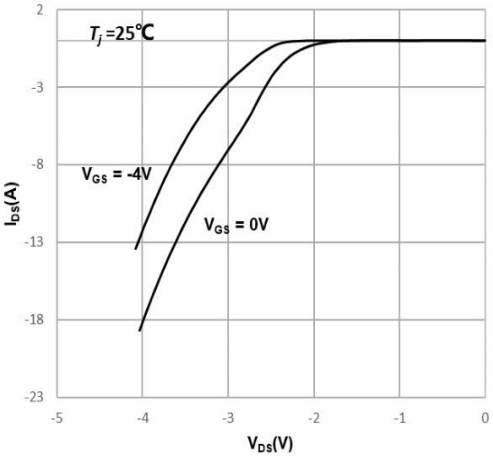


Fig10. Body Diode Characteristics

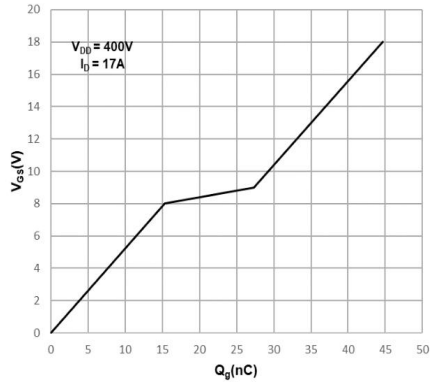


Fig11. Typical Gate Charge

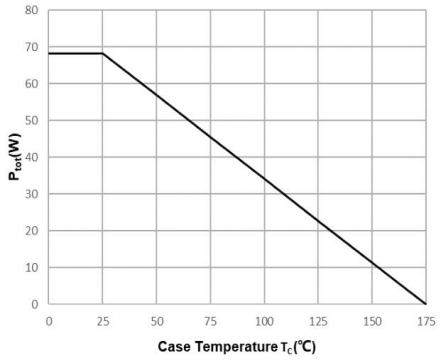
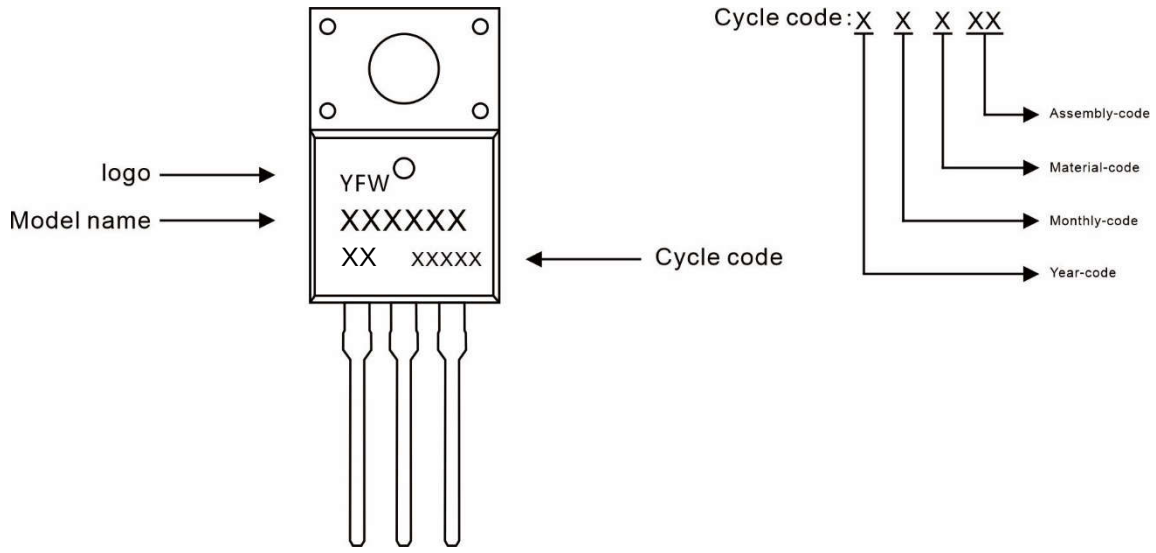


Fig12. Power Dissipation vs. Case Temperature

Marking Diagram

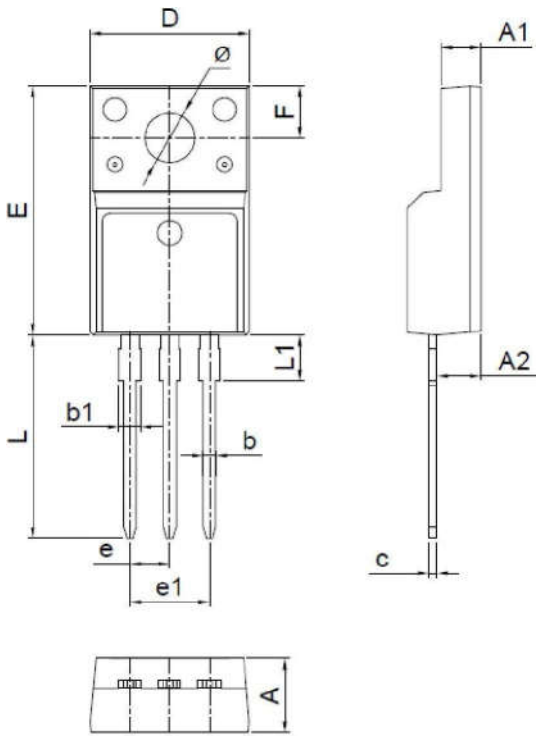


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWM309065AFG3	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220F



Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.66	2.86	0.105	0.113
b	0.75	0.85	0.030	0.033
b1	1.24	1.44	0.049	0.057
c	0.40	0.60	0.016	0.024
D	10.00	10.32	0.394	0.406
E	15.75	16.05	0.620	0.632
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	3.10	3.5	0.122	0.138
L	13.50	13.90	0.531	0.547
L1	2.90	3.30	0.114	0.130
Φ	3.10	3.30	0.122	0.130

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