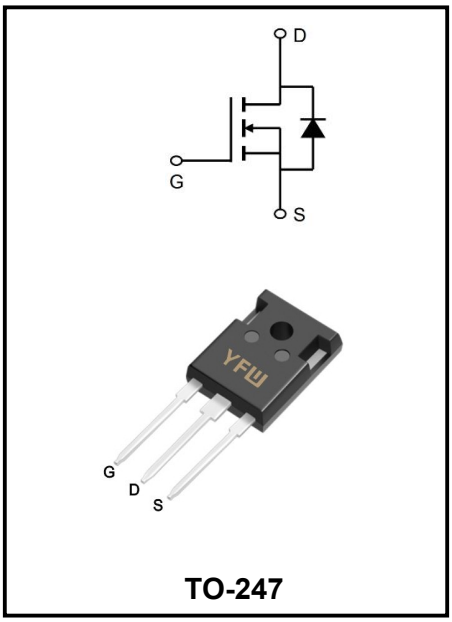
800V SiC N-Channel MOSFET

MAIN CHARACTERISTICS

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



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℃		27	
Pulsed Drain Current	I_{DM}	72	A
Power Dissipation Tc=25℃	P_D	340	W
Power Dissipation Tc=175℃	P_D	136	W
Operating Temperature Range	T_J	-55 to +175	°C
Storage Temperature Range	T_{STG}	-55 to +175	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.1	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	26.8	°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 = 100μA	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	$R_{DS(ON)}$	-	98	120	mΩ
	V_{GS} = 15 V, I_D = 17A,T_J = 175℃		-	77	-	
	V_{GS} = 18 V, I_D = 17A		-	90	118	
	V_{GS} = 18 V, I_D = 17A,T_J = 175℃		-	65	-	
Internal Gate Resistance	VAC=25mV, f=100KHz f=100KHz	RG	-	3	-	Ω
Input Capacitance	V_{DS}=500V V_{GS}=0V f=100KHz	C_{iss}	-	1045	-	pF
Output Capacitance		C_{oss}	-	97	-	pF
Reverse Transfer Capacitance		C_{rss}	-	9	-	pF
Total Gate Charge(Note2)	I_D =17A V_{DS}=500V V_{GS} =0/15V	Q_g	-	41	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	10	-	nC
Gate to Drain Charge(Note2)		Q_{gd}	-	16	-	nC
Turn-on Delay Time	V_{DD} = 500 V, I_D=17 A, V_{GS} = 0/15 V, R_G = 2 Ω	$t_{d(on)}$	-	19	-	ns
Rise Time(Note2)		t_r	-	115	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	31	-	ns
Fall Time(Note2)		t_r	-	34	-	ns
Maximun Body-Diode Continuous Current	V_{GS} = 0 V, Tc=25°C	I_S	-	36	-	A
	V_{GS} = 0 V, Tc=100°C		-	15	-	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	72	--	A
Drain-Source Diode Forward Voltage	V_{GS}=-4V,I_{SD}=8.5A	V_{SD}	-	4	-	V
	V_{GS}=-4V,I_{SD}=8.5A TJ=175°C		-	3.2	-	V
Reverse Recovery Time(Note2)	V_{GS} = 0V, I_{SD}=17A, V_R=500V, di/dt=550A/us, Tj=25℃	trr	-	17.8	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	63	-	nC
Peak Reverse Recovery Current		Irrm	-	4.9	-	A

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

RATINGS AND CHARACTERISTIC CURVES

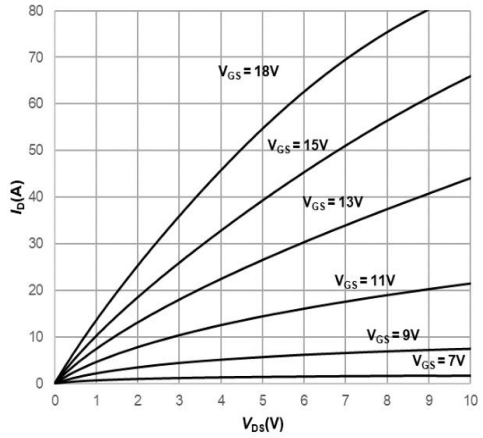


Fig1. Output Characteristics T_j=25℃

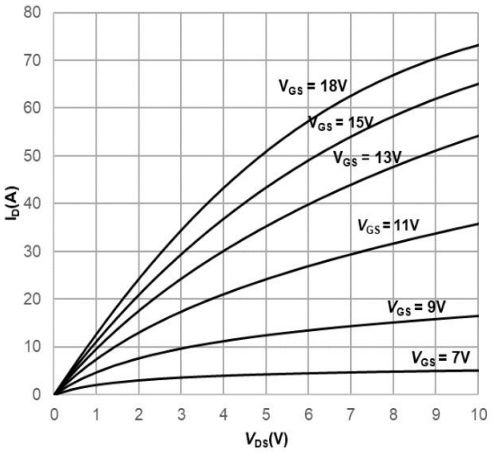


Fig2. Output Characteristics T_j=175℃

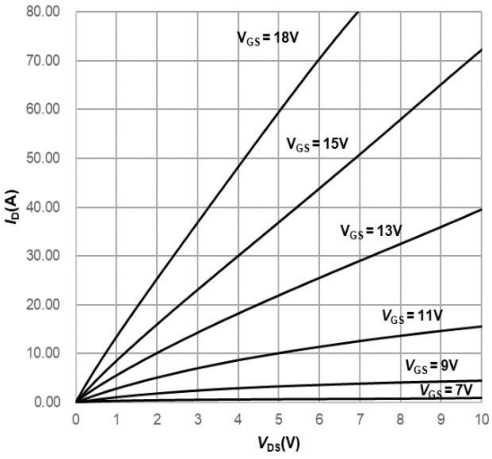


Fig3. Output Characteristics T_j=-40℃

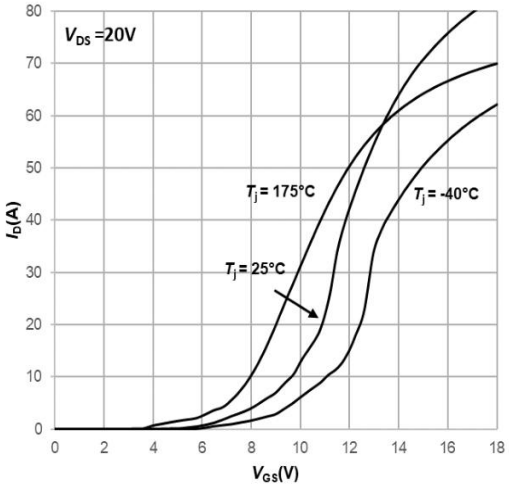


Fig4. Typical Transfer Characteristics

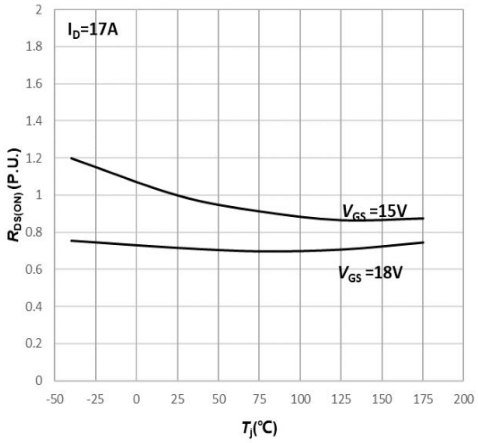


Fig5. Normalized On-Resistance vs. Temperature

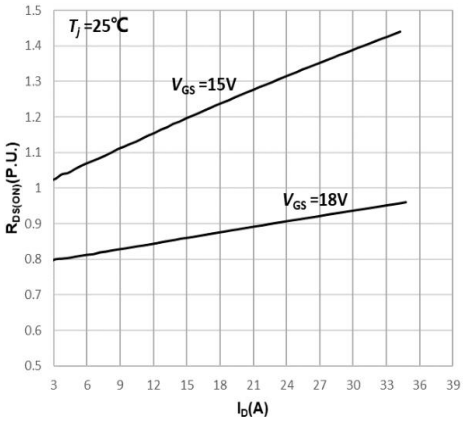


Fig6. Normalized On-Resistance vs. Drain Current For Various V_{GS}

RATINGS AND CHARACTERISTIC CURVES

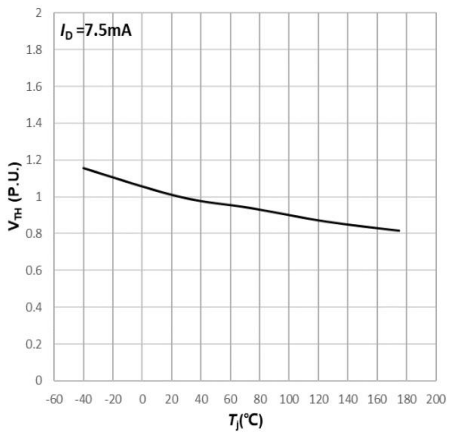


Fig7. Normalized Threshold Voltage vs. Temperature

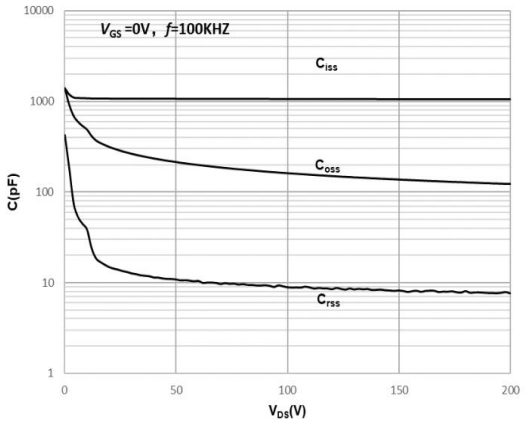


Fig8. Capacitances vs. Drain-Source Voltage (0-200V)

For T_j=25℃

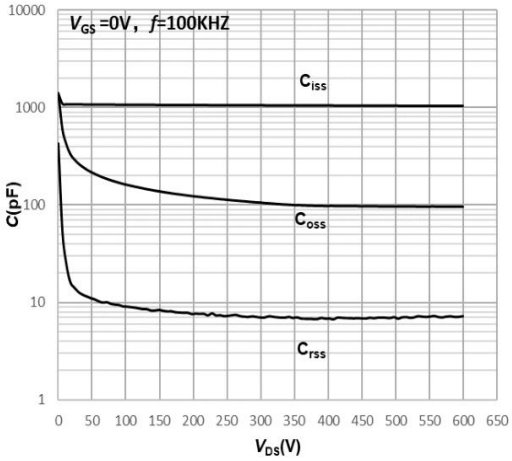


Fig9. Capacitances vs. Drain-Source Voltage (0-600V)

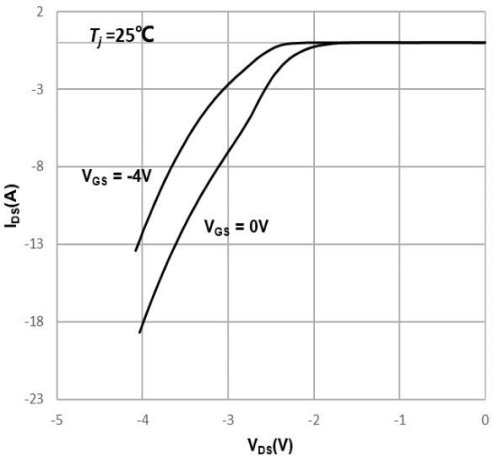


Fig10. Body Diode Characteristics

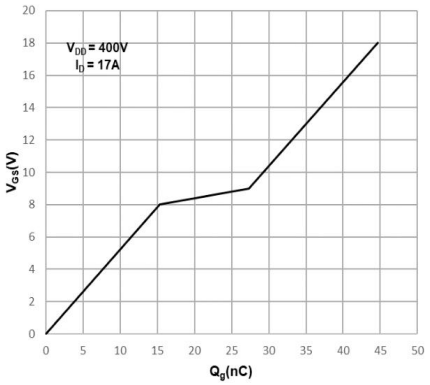


Fig11. Typical Gate Charge

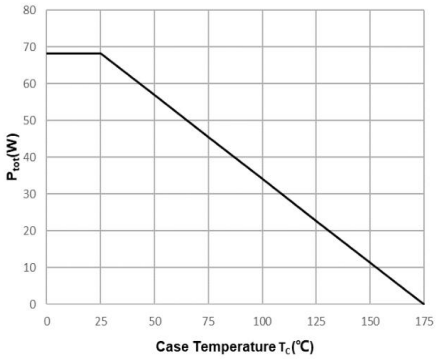
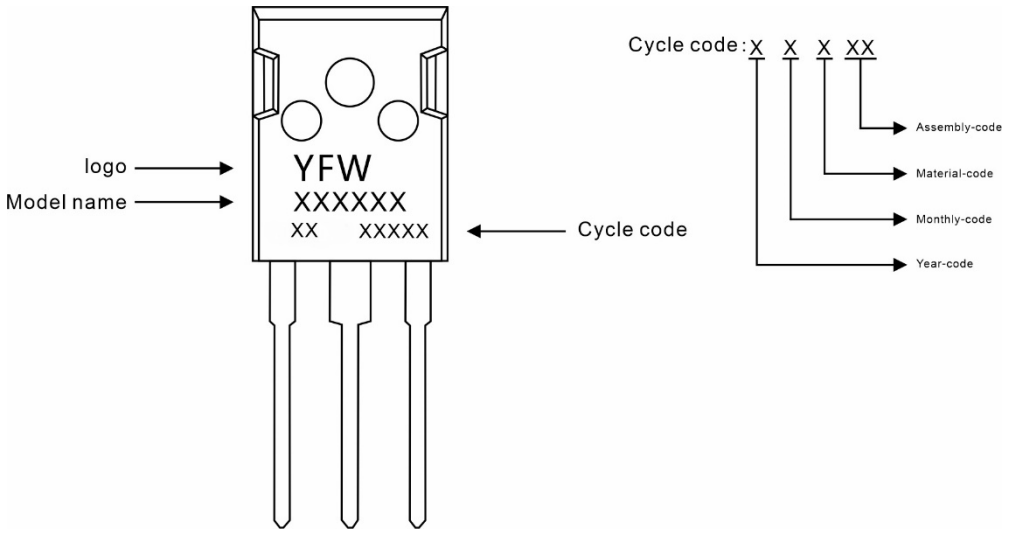


Fig12. Power Dissipation vs. Case Temperature

Marking Diagram

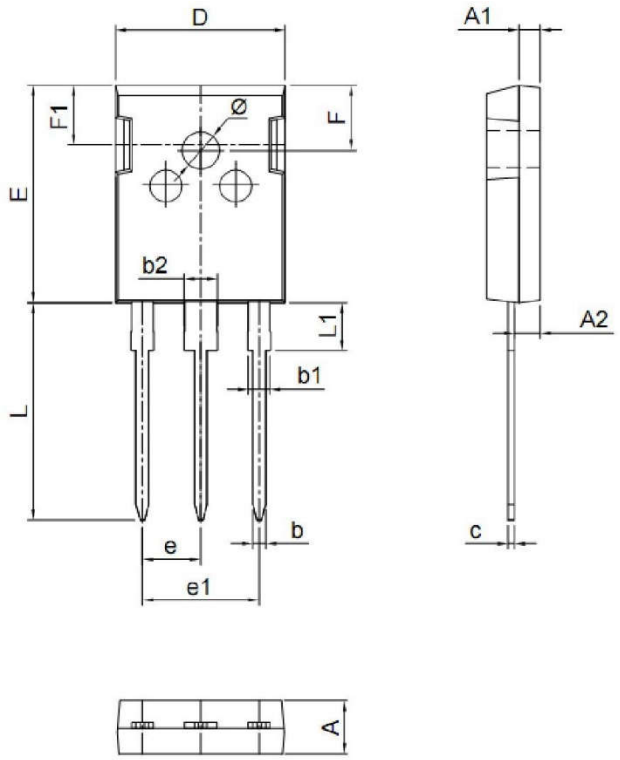


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWM309065APG3	TO-247	0.209oz(5.93g)	30pcs/tube	600PCS/Box 2400PCS/Carton

Package Dimensions

TO-247



Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	4.90	5.10	0.193	0.201
A1	1.90	2.10	0.075	0.083
A2	2.29	2.54	0.090	0.100
b	1.00	1.40	0.039	0.055
b1	2.00	2.20	0.079	0.087
b2	3.00	3.20	0.118	0.126
c	0.50	0.70	0.020	0.028
D	15.75	16.05	0.620	0.632
E	20.20	20.80	0.795	0.819
e	5.45 (BSC)		0.215 (BSC)	
e1	10.90 (BSC)		0.429 (BSC)	
F	6.05	6.25	0.238	0.246
F1	5.80	6.00	0.228	0.236
L	20.10	20.40	0.791	0.803
L1	4.05	4.35	0.159	0.171
Φ	3.50	3.70	0.138	0.146

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