

900V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

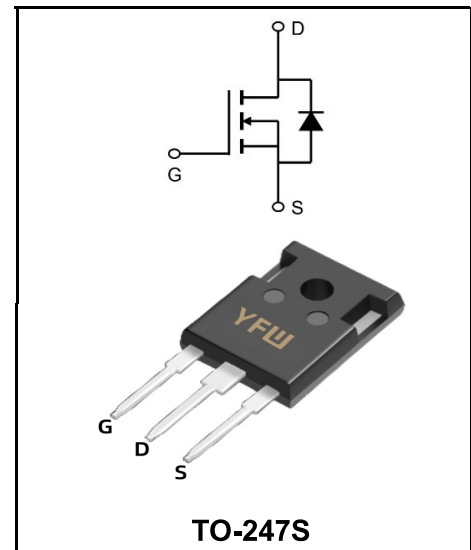
I_D	9A
V_{DS}	900V
R_{DS(on)-typ(@V_{GS}=10V)}	< 1.1Ω (Typ:0.92Ω)

FEATURES

- ◆Fast Switching
- ◆Low ON Resistance
- ◆Low Gate Charge
- ◆Low Reverse transfer capacitances
- ◆100% Single Pulse avalanche energy Test

APPLICATIONS

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



Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	±30	V
Continue Drain Current T _c =25°C	I_D	9	A
Continue Drain Current T _c =100°C		5.8	A
Pulsed Drain Current (Note1)	I_{DM}	36	A
Power Dissipation	P_D	60	W
Derating Factor above 25°C		0.48	W/°C
Single Pulse Avalanche Energy	E_{AS}	900	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	R_{θJC}	0.7	°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	62.5	°C/W

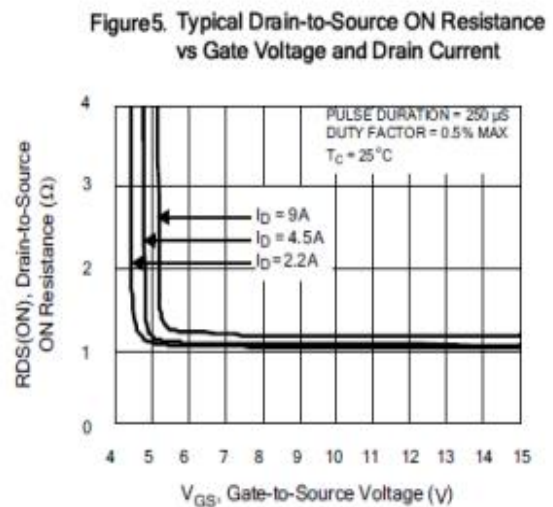
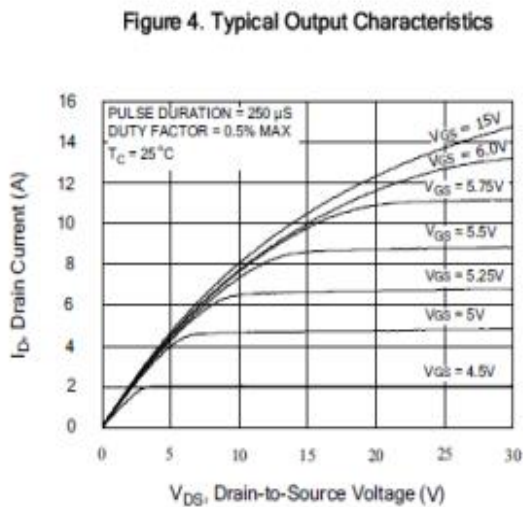
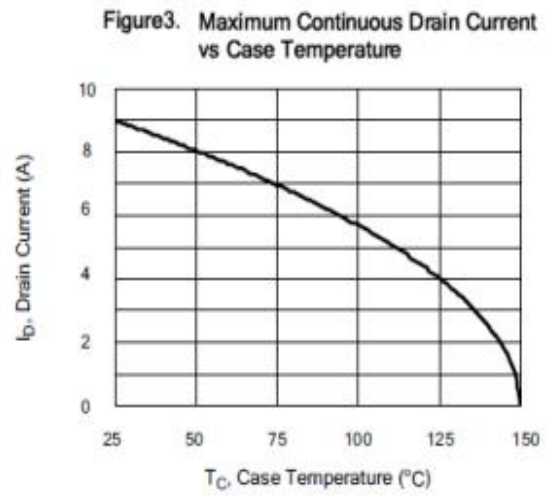
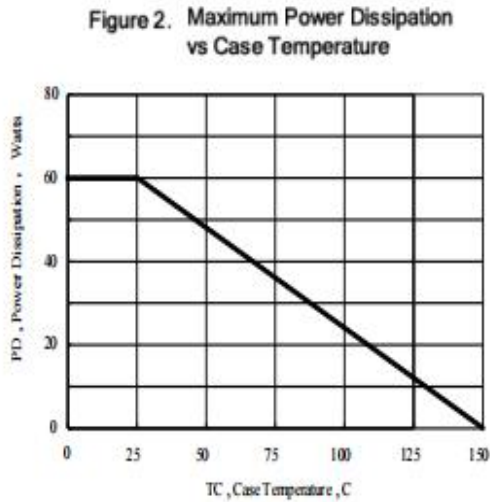
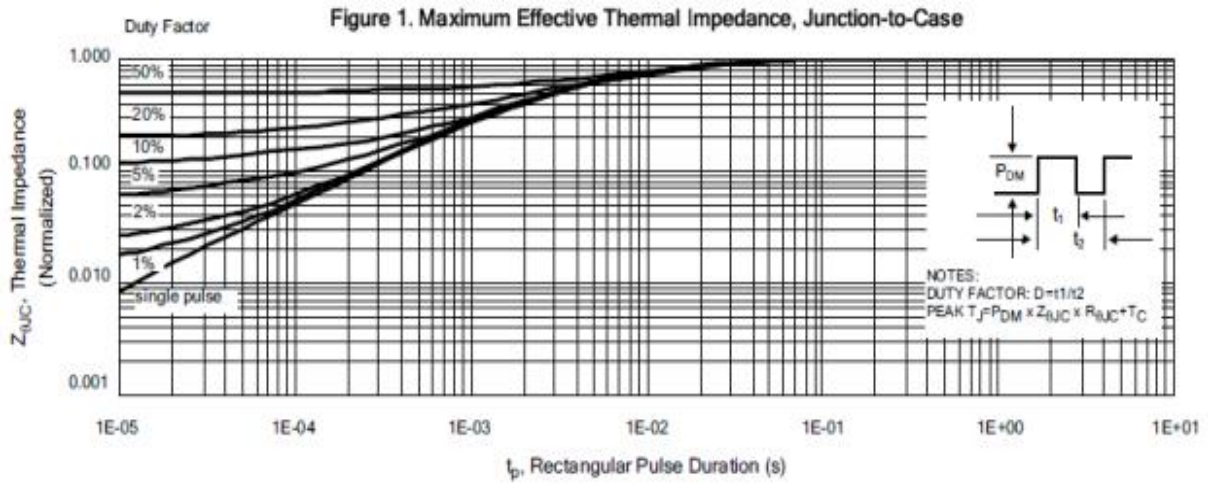
Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	BV_{DSS}	900	975	-	V
Drain-Source Leakage Current	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}, T_a = 25^\circ\text{C}$	I_{DSS}	-	-	1	μA
	$V_{DS} = 720\text{ V}, V_{GS} = 0\text{ V}, T_a = 125^\circ\text{C}$		-	-	250	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	$V_{GS(th)}$	3	3.8	5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}$	$R_{DS(ON)}$	-	0.92	1.1	Ω
Forward Transconductance	$V_{DS} = 15\text{ V}, I_D = 4.5\text{ A}$	g_{fs}	-	10	-	S
Gate resistance	$f = 1.0\text{MHz}$	R_g	-	2	-	Ω
Input Capacitance	$V_{GS} = 0\text{ V}$ $V_{DS} = 25\text{ V}$ $f = 1\text{ MHz}$	C_{iss}	-	2712	-	pF
Output Capacitance		C_{oss}	-	208	-	
Reverse Transfer Capacitance		C_{rss}	-	17	-	
Turn-on Delay Time(Note2)		$I_D = 9\text{ A}$ $V_{DD} = 450\text{ V}$ $R_G = 25\ \Omega$	$t_{d(on)}$	-	13	
Rise Time(Note2)	t_r		-	7	-	
Turn-Off Delay Time(Note2)	$t_{d(OFF)}$		-	67	-	
Fall Time(Note2)	t_f		-	24	-	
Total Gate Charge(Note2)	$I_D = 9\text{ A}$ $V_{DD} = 450\text{ V}$ $V_{GS} = 10\text{ V}$	Q_g	-	62	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	10	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	21	-	
Maximun Body-Diode Continuous Current		I_S	-	-	9	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	35	A
Drain-Source Diode Forward Voltage	$I_{SD} = 9\text{ A}, V_{GS} = 0\text{ V},$	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	$I_{SD} = 9\text{ A}, V_{GS} = 0\text{ V},$	t_{rr}	-	309	-	ns
Reverse Recovery Charge(Note2)	$dI_F / dt = 100\text{ A}/\mu\text{s}$					

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

Ratings and Characteristic Curves



Ratings and Characteristic Curves

Figure 6. Maximum Peak Current Capability

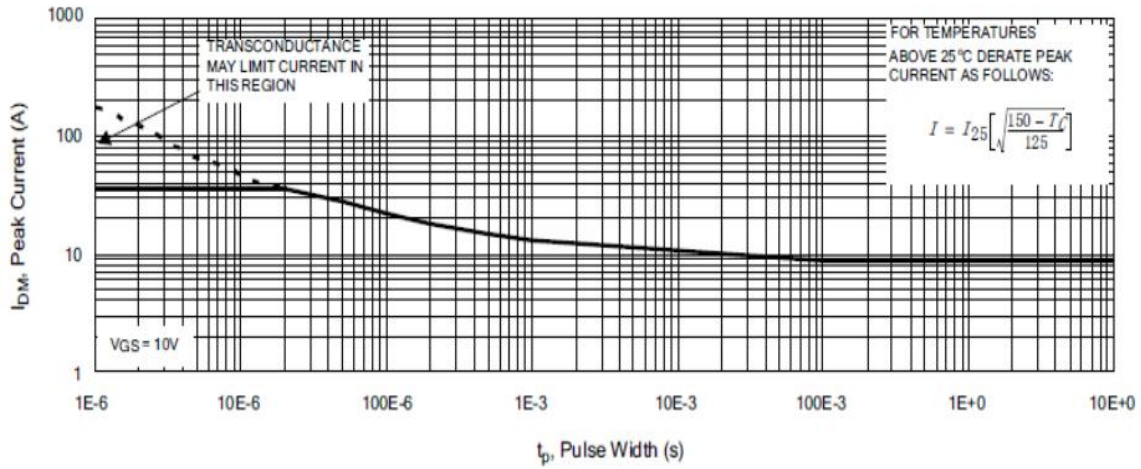


Figure 7. Typical Transfer Characteristics

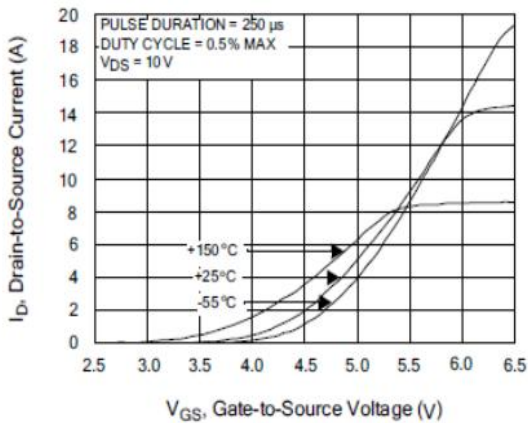


Figure 8. Unclamped Inductive Switching Capability

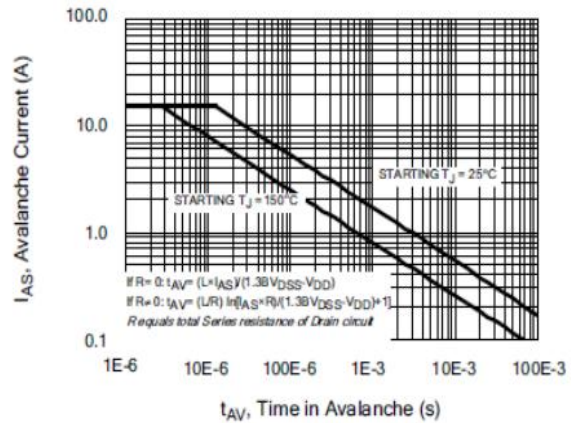


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

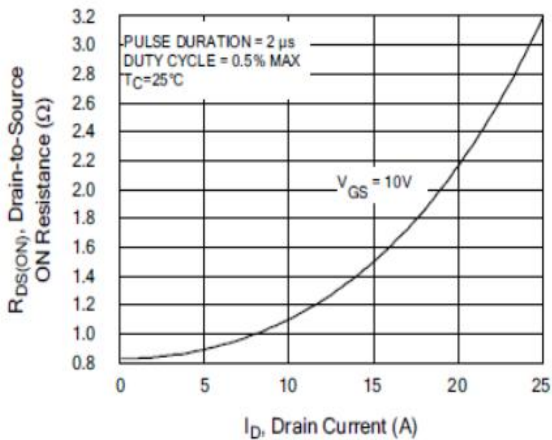
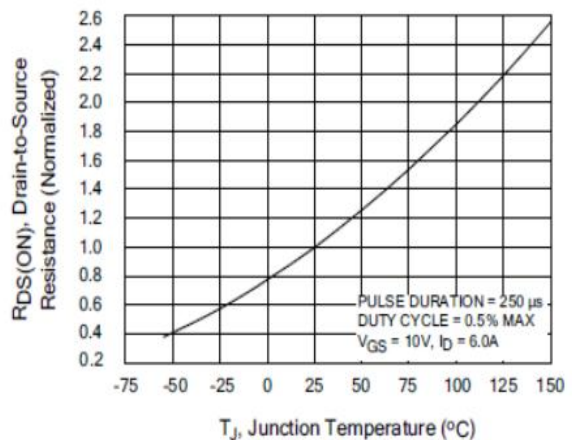


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature



Ratings and Characteristic Curves

Figure 13. Maximum Forward Bias Safe Operating Area

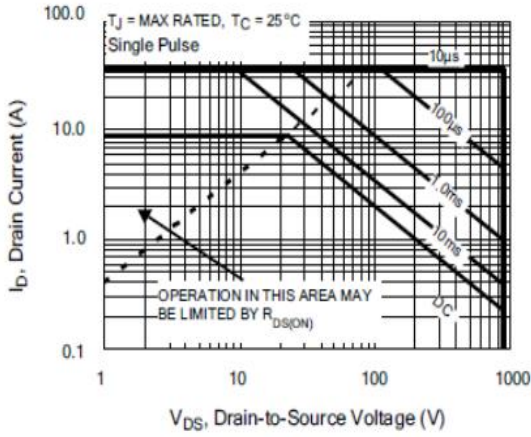


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

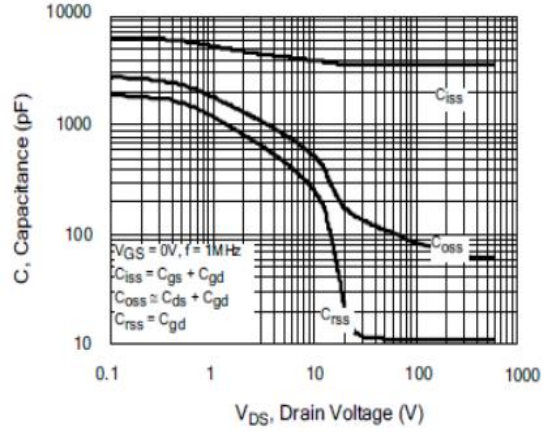


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

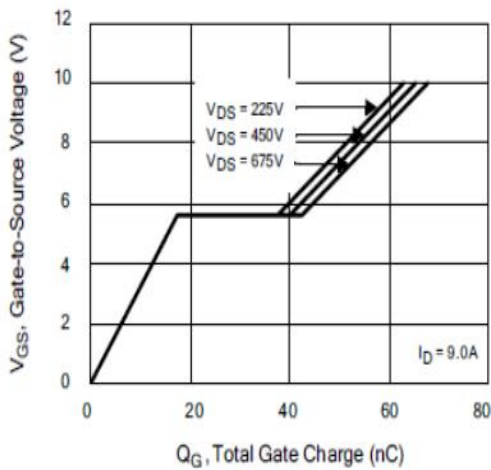
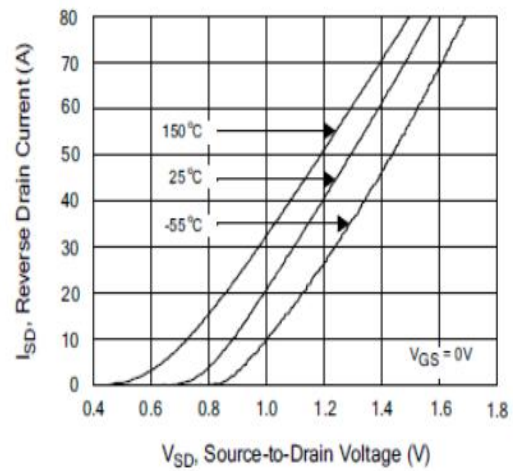
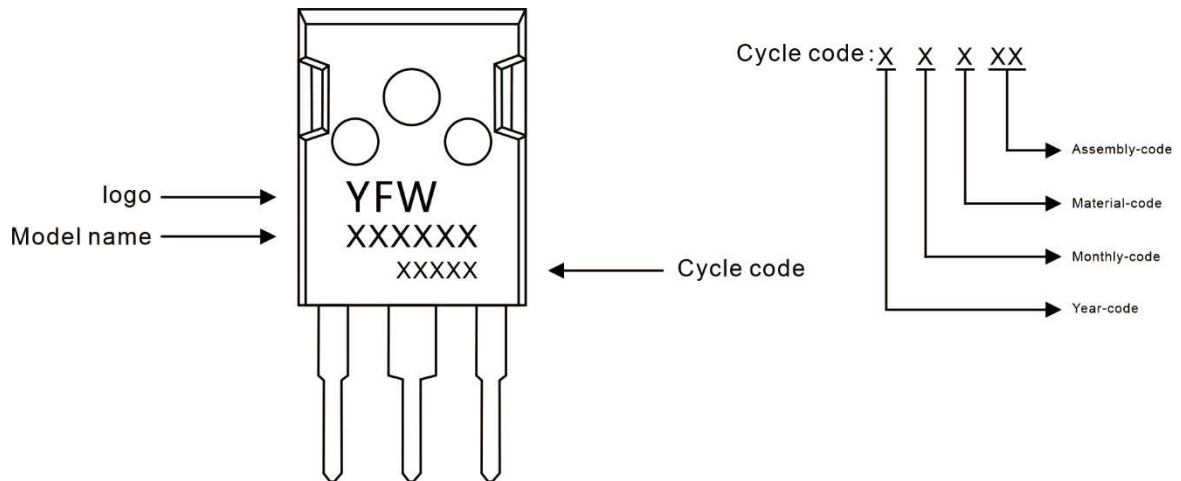


Figure 16. Typical Body Diode Transfer Characteristics



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW9N90APS	TO-247S	0.158oz(4.48g)	30pcs/tube	600PCS/Box 2400PCS/Carton

Package Dimensions

TO-247S

Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	15.0	16.0	0.59	0.63
B	19.5	20.5	0.77	0.81
C	33.5	35.5	1.32	1.40
D	5.0	6.0	0.20	0.24
E	3.5	4.5	0.14	0.18
F	2.5	3.5	0.10	0.14
G	1.75	2.5	0.07	0.14
H	3.0	4.0	0.12	0.16
I	9.0	11.0	0.35	0.43
J	4.9	5.1	0.19	0.20
K	1.0	1.3	0.04	0.05
L	3.75	4.25	0.15	0.17
M	4.75	5.25	0.19	0.21
N	1.8	2.2	0.07	0.09
O	0.45	0.6	0.018	0.024
P	5.08		0.2	
Q	1.2	1.3	0.05	0.051

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