

100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	220A
V_{DSS}	100V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 2.8m Ω (Type: 2.1 m Ω)

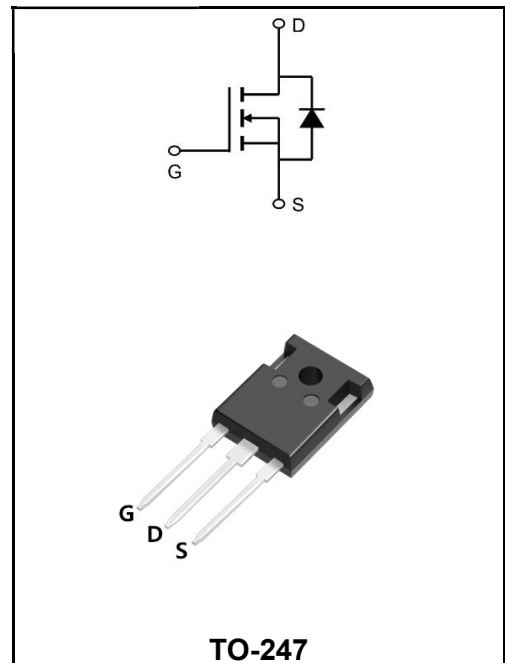
Features

◆ YFW-SGT technology



Application

- ◆ DC/DC Converter
- ◆ LED Backlighting
- ◆ Power Management Switches



Product Specification Classification

Part Number	Package	Marking	Pack
YFWG220N10AP	TO-247	YFW 220N10AP XXXXX	600PCS/Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, V_{GS} @ 10V @Tc=25°C	I_D	220	A
Continuous Drain Current, V_{GS} @ 10V @Tc=100°C	I_D	180	A
Pulsed Drain Current	I_{DM}	840	A
Single Pulse Avalanche Energy	E_{AS}	500	mJ
Avalanche Current	I_{AS}	106.8	A
Total Power Dissipation ⁴ @Tc=25°C	P_D	296	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance, Junction-ambient	$R_{\theta JA}$	0.42	°C/W
Thermal Resistance, Junction-case	$R_{\theta JC}$	40	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	VDSS	100	-	-	V
Gate -Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	IGSS	-	-	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ C$	IDSS	-	-	1	μA
	$V_{DS}=100V, V_{GS}=0V, T_J=100^\circ C$		-	-	100	
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	VGS(th)	2.0	2.9	4.0	V
Drain-Source on-Resistance ²	$V_{GS}=10V, I_D=20A$	RDS(ON)	-	2.1	2.8	mΩ
Input Capacitance	$V_{DS}=50V$ $V_{GS}=0V$ $f=1MHz$	Ciss	-	8800	-	μF
Output Capacitance		Coss	-	1290	-	
Reverse Transfer Capacitance		Crss	-	40	-	
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	Rg	-	3.4	-	Ω
Total Gate Charge	$V_{DS}=50V$ $V_{GS}=10V$ $I_D=20A$	Qg	-	150	-	nC
Gate-Source Charge		Qgs	-	34	-	
Gate-Drain Charge		Qgd	-	26	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=50V$ $R_G=3\Omega$ $I_D=20A$	td(on)	-	30.8	-	ns
Rise Time		Tr	-	26	-	
Turn-Off Delay Time		td(OFF)	-	68	-	
Fall Time		tf	-	12.4	-	
Diode Forward Voltage ²	$V_{GS}=0V, I_F=20A$	VSD	-	-	1.2	V
Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	IS	-	-	190	A
Body Diode Reverse Recovery Time	$I_F=20A, di_{SD}/dt=100A/\mu s$	trr	-	110	-	ns
Body Diode Reverse Recovery Charge		Qrr	-	202	-	nC

Notes:

- 1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is VDD=50V, VGS=10V, L=0.4mH, IAS=64A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

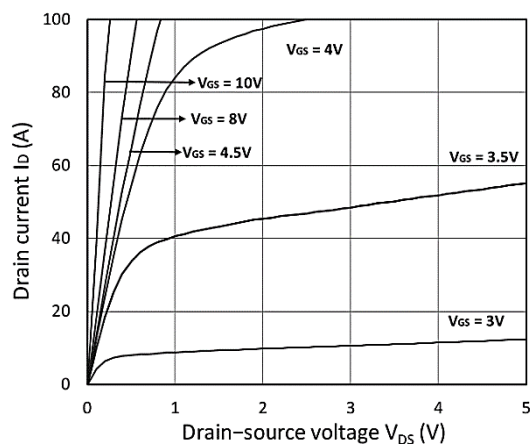


Figure 1. Output Characteristics

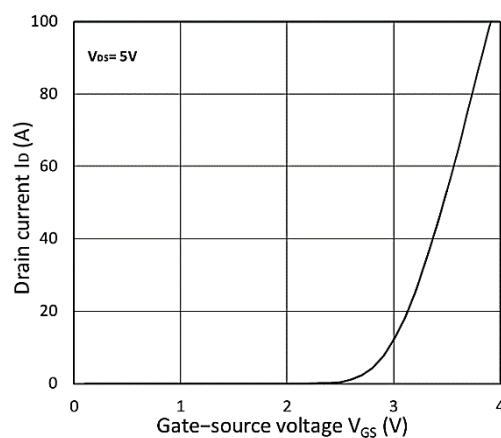


Figure 2. Transfer Characteristics

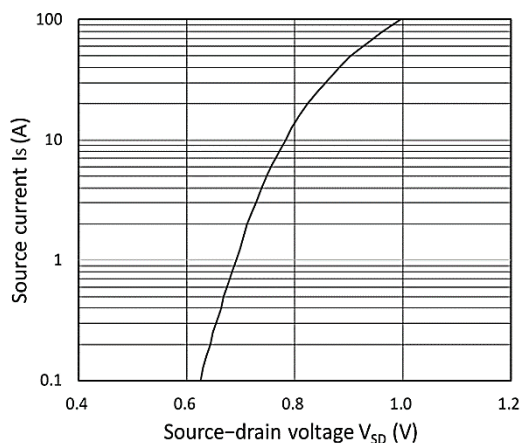


Figure 3. Forward Characteristics of Reverse

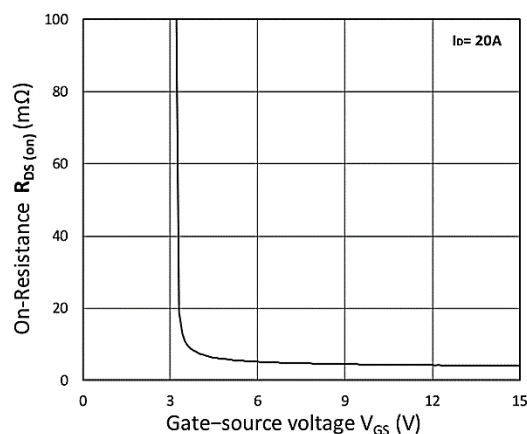


Figure 4. R_DS(ON) vs. V_GS

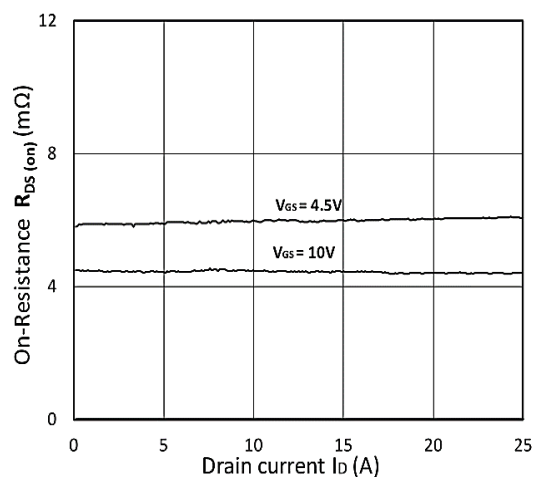


Figure 5. R_DS(ON) vs. I_D

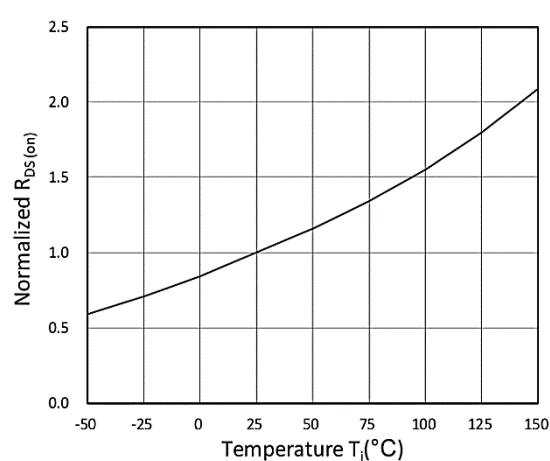


Figure 6. Normalized R_DS(on) vs. Temperature

Ratings and Characteristic Curves

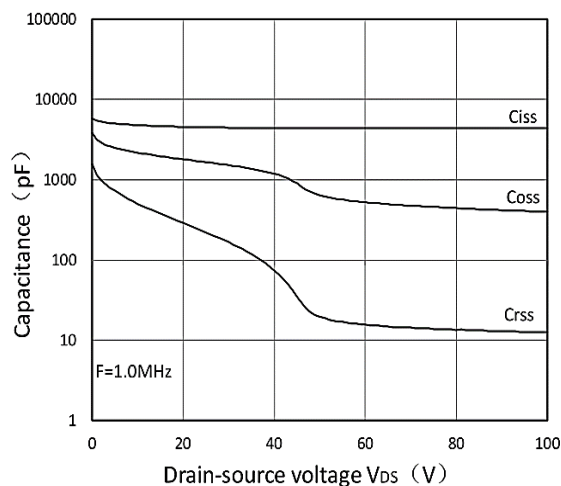


Figure 7. Capacitance Characteristics

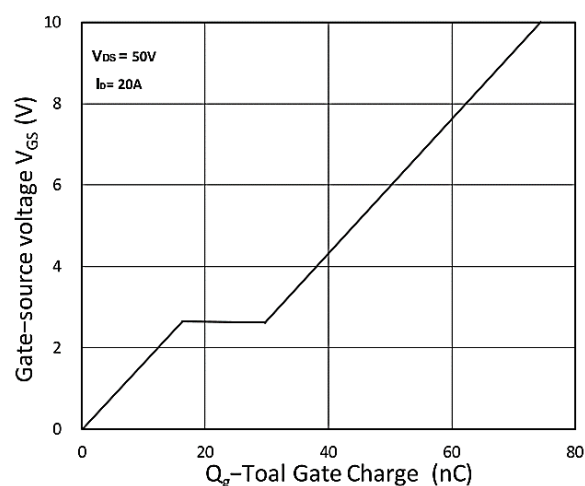


Figure 8. Gate Charge Characteristics

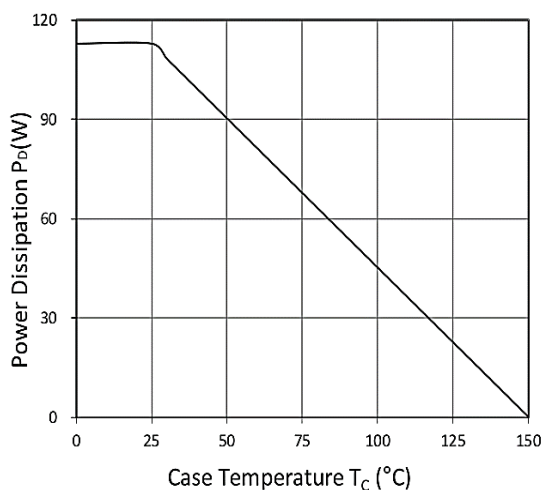


Figure 9. Power Dissipation

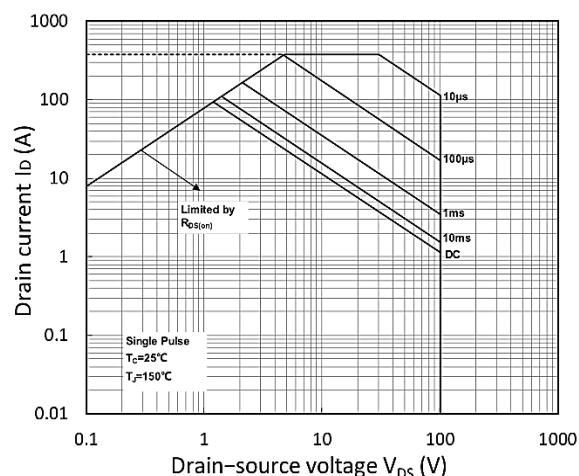


Figure10. Safe Operating Area

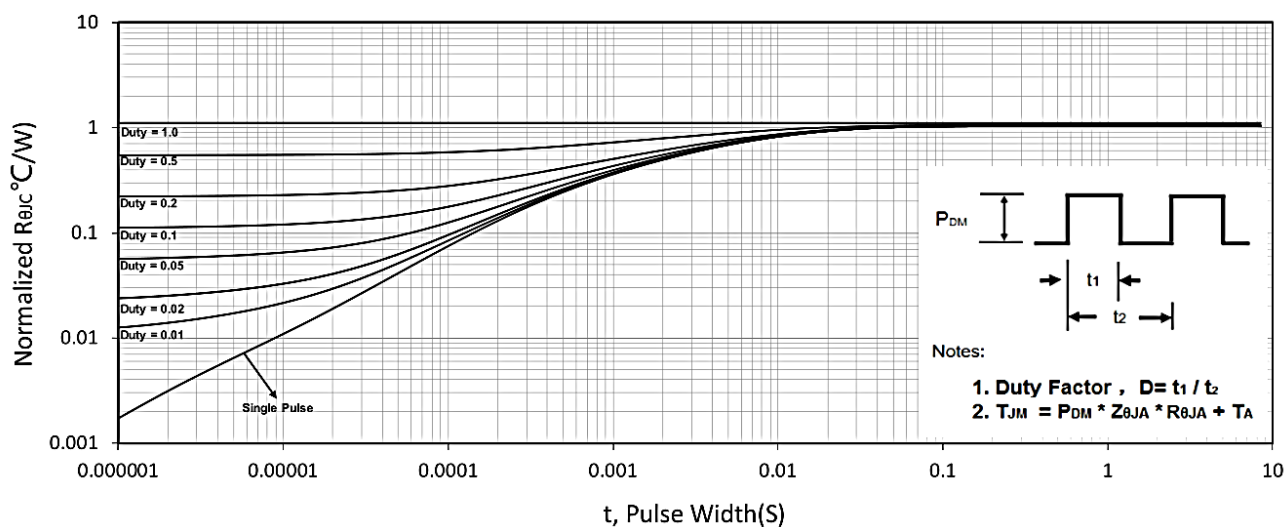
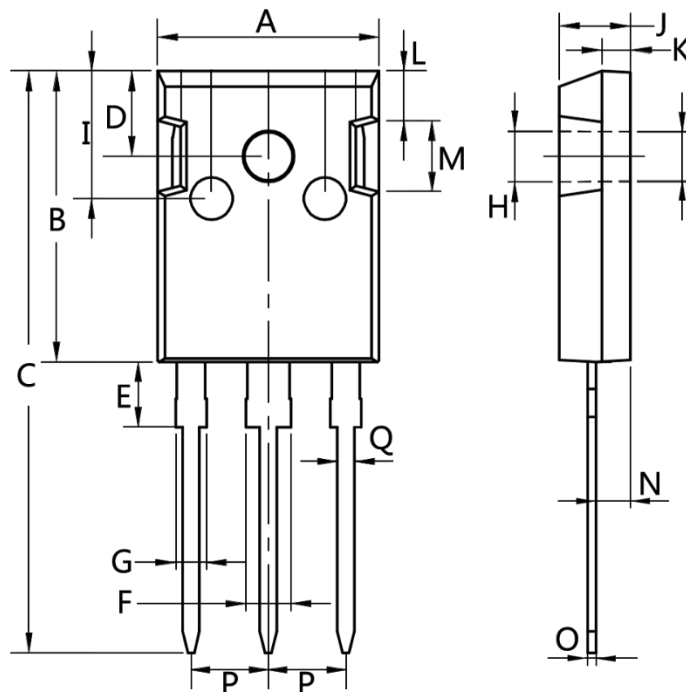


Figure 11. Normalized Maximum Transient Thermal Impedance

TO-247



Dim.	Min.	Max.
A	15.0	16.0
B	20.0	21.0
C	41.0	42.0
D	5.0	6.0
E	4.0	5.0
F	2.5	3.5
G	1.75	2.5
H	3.0	3.5
I	8.0	10.0
J	4.9	5.1
K	1.9	2.1
L	3.5	4.0
M	4.75	5.25
N	2.0	3.0
O	0.55	0.75
P	Typ 5.08	
Q	1.2	1.3