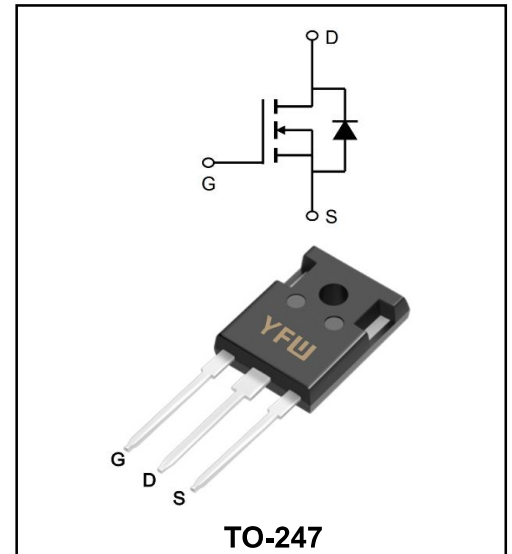


500V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

I_D	50A
V_{DS}	500V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<0.1\Omega$ (Typ: 0.08Ω)



FEATURES

- ♦Fast Switching
- ♦Low ON Resistance
- ♦Low Gate Charge
- ♦100% Single Pulse avalanche energy Test

APPLICATIONS

- ♦LED power supplies
- ♦Cell Phone Charger
- ♦Standby Power

MECHANICAL DATA

- ♦Case: TO-247/AP
- ♦Mounting Position: Any
- ♦Molded Plastic: UL Flammability Classification Rating 94V-0
- ♦Lead free in compliance with EU RoHS 2011/65/EU directive
- ♦Solder bath temperature 275°C maximum, 10s per JESD 22-B106

Maximum Ratings at $T_c=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	500	V
Gate - Source Voltage	V_{GS}	± 30	V
Continue Drain Current	I_D	50	A
Pulsed Drain Current (Note1)	I_{DM}	200	A
Power Dissipation	P_D	190	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	3250	mJ
Operating Junction Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.65	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	$^\circ\text{C/W}$

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	500	-	-	V
Drain -Source Leakage Current	$V_{DS} = 500 V, V_{GS} = 0 V$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D=20A$	$R_{DS(ON)}$	-	0.08	0.1	Ω
Input Capacitance	$V_{GS} = 0 V,$ $V_{DS} = 25 V$ $f = 1MHz$	C_{iss}	-	8405	-	pF
Output Capacitance		C_{oss}	-	597	-	
Reverse Transfer Capacitance		C_{rss}	-	218	-	
Turn-on delay time	$I_D = 20 A$ $V_{DD}=250 V$ $R_G= 10\Omega$	$t_{d(on)}$		321	-	ns
Rise Time		T_r		27	-	
Turn-Off Delay Time		$t_{d(OFF)}$		210	-	
Fall Time		t_f		46	-	
Total Gate Charge	$I_D = 20 A$ $V_{DD} = 400 V,$ $V_{GS} = 10 V$	Q_g	-	412	-	nC
Gate-Source Charge		Q_{gs}	-	171	-	
Gate-Drain Charge		Q_{gd}	-	56	-	
Maximun Body-Diode Continuous Current		I_S	-	-	50	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	200	A
Drain-Source Diode Forward Voltage	$I_{SD} = 20 A$	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_{SD} = 20 A, V_{GS} = 0 V,$ $dIF / dt = 100 A/\mu s$	t_{rr}	-	510	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	6.5	-	nC

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

Ratings and Characteristic Curves

Figure.1 Typical Output Characteristics

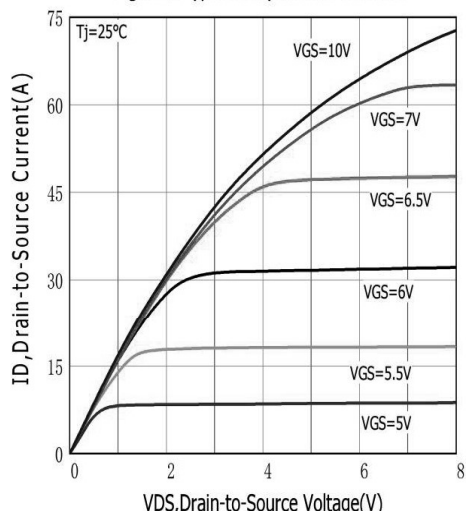


Figure.2 Typical Gate Charge vs Gate to Source Voltage

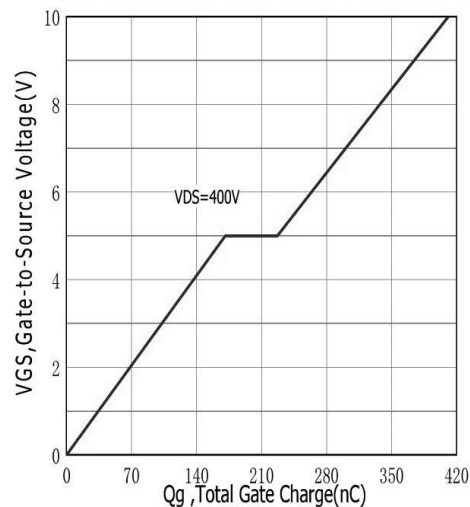


Figure.3 Typical Body Diode Transfer Characteristics

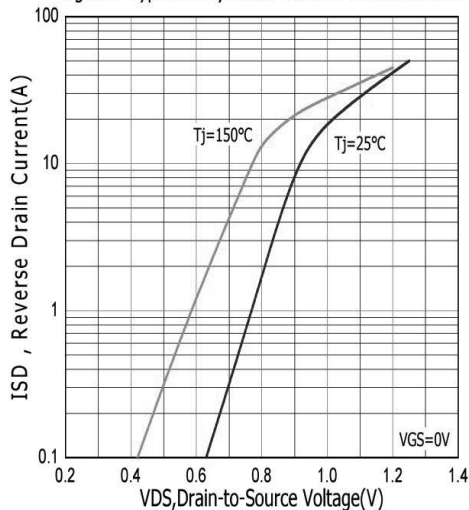


Figure.4 Typical Capacitance vs Drain to Source Voltage

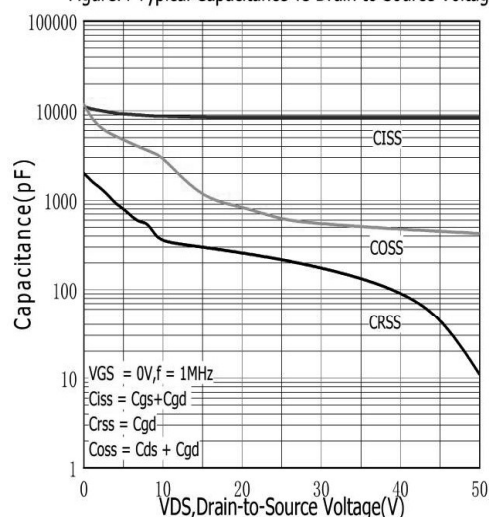


Figure.5 Typical Breakdown Voltage vs Junction Temperature

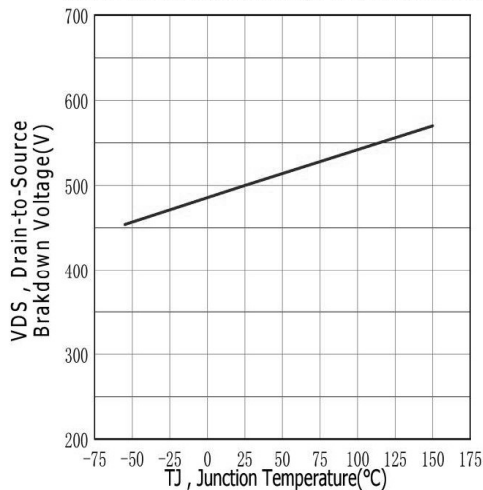
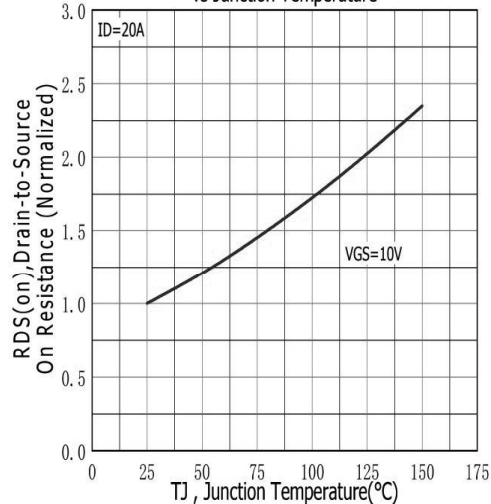


Figure.6 Typical Drain to Source On Resistance vs Junction Temperature



Ratings and Characteristic Curves

Figure.7 Maximum Forward Bias Safe Operating Area

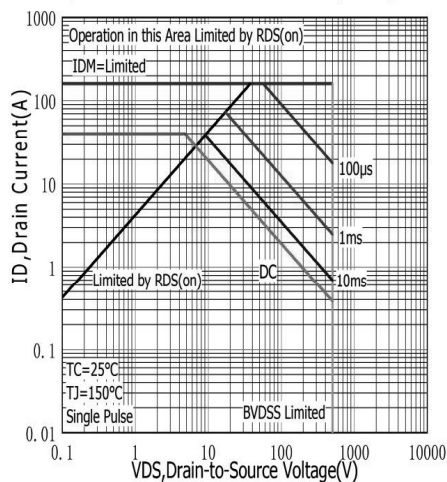


Figure.8 Typical Drain to Source ON Resistance vs Drain Current

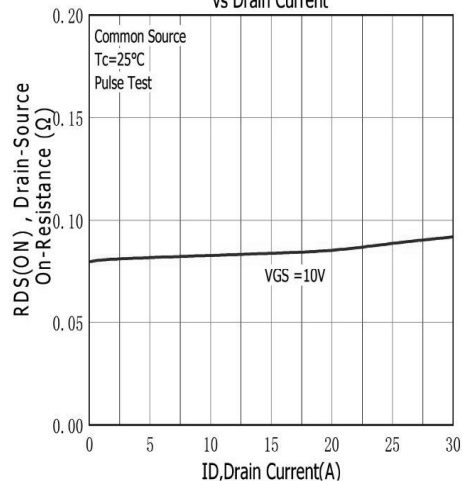


Figure.9 Maximum EAS vs Channel Temperature

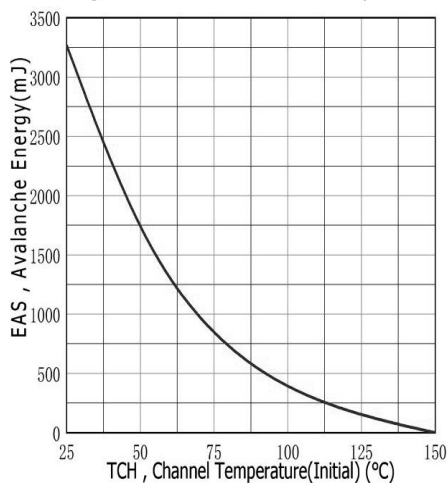


Figure.10 Typical Threshold Voltage vs Case Temperature

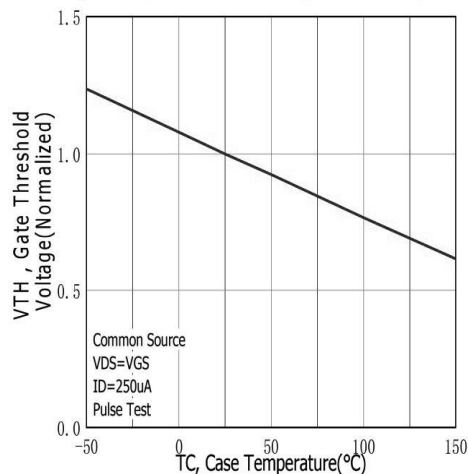


Figure.11 Maximum Effective Thermal Impedance, Junction to Case

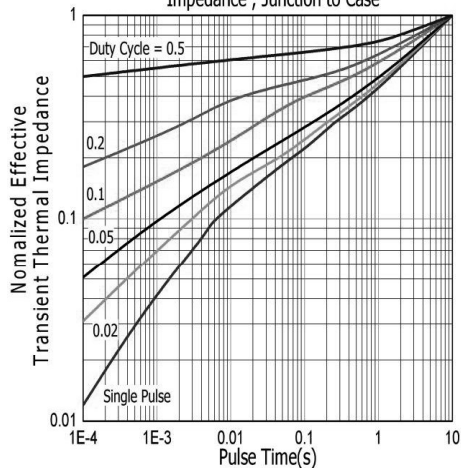
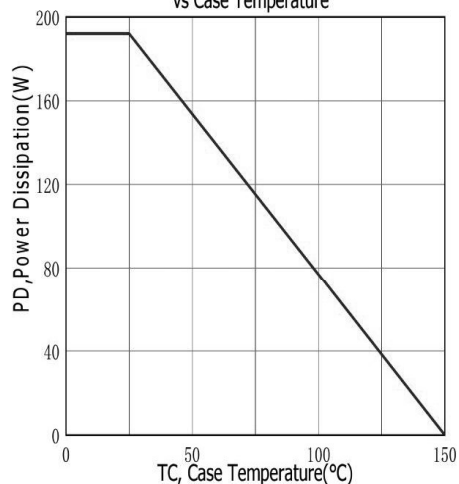
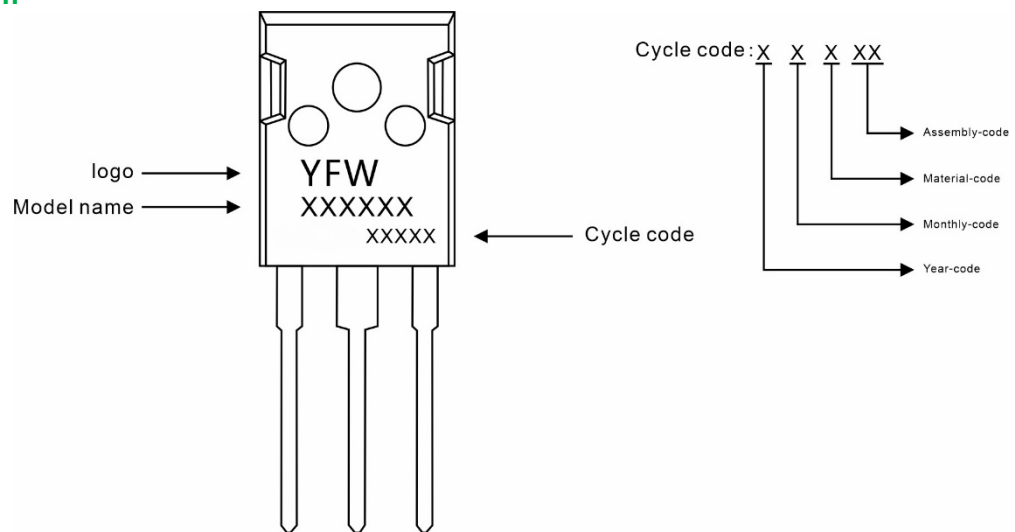


Figure.12 Maximum Power Dissipation vs Case Temperature



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW50N50AP	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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