

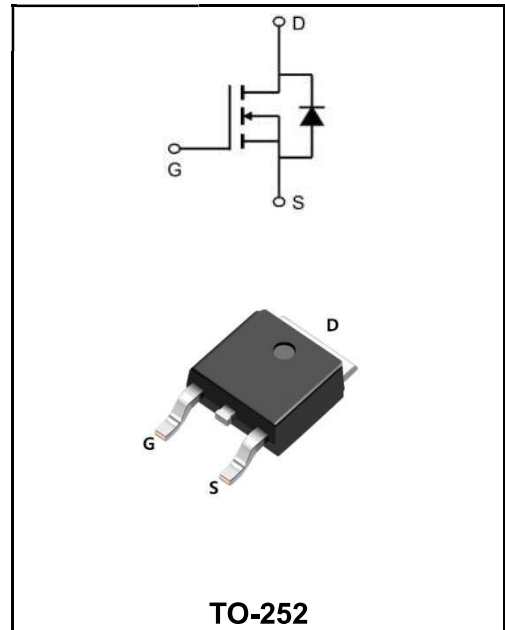
**500V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	3A
<b>V<sub>DSS</sub></b>	500V
<b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=10V)</b>	< 3.0Ω( <b>Type:2.4Ω</b> )

**Application**

- ◆Uninterruptible Power Supply(UPS)
- ◆Power Factor Correction (PFC)



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW3N50AD	TO-252	YFW 3N50AD XXXXX	2500PCS/Tape

**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage (V <sub>GS</sub> = 0V)	<b>V<sub>DS</sub></b>	500	<b>V</b>
Continuous Drain Current	<b>I<sub>D</sub></b>	3	<b>A</b>
Pulsed Drain Current(note1)	<b>I<sub>DM</sub></b>	12	<b>A</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±30	<b>V</b>
Single Pulse Avalanche Energy(note2)	<b>E<sub>AS</sub></b>	57	<b>mJ</b>
Avalanche Current(note1)	<b>I<sub>AR</sub></b>	2.4	<b>A</b>
Repetitive Avalanche Energy(note1)	<b>E<sub>AR</sub></b>	6.4	<b>mJ</b>
Power Dissipation(T <sub>A</sub> =25°C)	<b>P<sub>D</sub></b>	32.9	<b>W</b>
Operating Junction and Storage Temperature Range	<b>T<sub>J</sub> , T<sub>STG</sub></b>	-55 to +150	<b>°C</b>
Thermal Resistance, Junction-to-case	<b>R<sub>θJC</sub></b>	6.25	<b>°C/W</b>
Thermal Resistance, Junction ambient	<b>R<sub>θJA</sub></b>	62.5	<b>°C/W</b>

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	<b>V(BR)DSS</b>	500	550	-	<b>V</b>
Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ C$	<b>I<sub>DSS</sub></b>	-	-	1	<b>μA</b>
Gate-Source Leakage	$V_{GS}=\pm 30V$	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Gate- Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>V<sub>GS(th)</sub></b>	2.0	3.0	4.0	<b>V</b>
Drain-Source On-Resistance (note3)	$V_{GS}=10V, I_D=3.5A$	<b>R<sub>DS(ON)</sub></b>	-	2.4	3.0	<b>Ω</b>
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	<b>C<sub>iss</sub></b>	-	310	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	39	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	6	-	
Total Gate Charge	$V_{DD}=400V$ $I_D=3A$ $V_{GS}=10V$	<b>Q<sub>g</sub></b>	-	8	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	1.2	-	
Gate-Drain Charge		<b>Q<sub>gd</sub></b>	-	5	-	
Turn-on delay time	$V_{DD}=250V$ $I_D=3A$ $R_G=25\Omega$	<b>t<sub>d(on)</sub></b>	-	7.8	-	<b>nS</b>
Turn-on Rise Time		<b>T<sub>r</sub></b>	-	33	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	23	-	
Turn-Off Fall Time		<b>t<sub>f</sub></b>	-	59	-	
Continuous Body Diode Current	$T_C=25^\circ C$	<b>I<sub>S</sub></b>	-	-	3.0	<b>A</b>
Pulsed Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	12	
Body Diode Voltage	$T_J = 25^\circ C, I_{SD} = 3A, V_{GS} = 0V$	<b>V<sub>SD</sub></b>	-	-	1.4	<b>V</b>
Reverse Recovery Time	$V_{GS} = 0V, I_S = 3A$ $diF/dt = 100A/\mu s$	<b>t<sub>rr</sub></b>	-	80	-	<b>nS</b>
Reverse Recovery Charge		<b>Q<sub>rr</sub></b>	-	1.8	-	<b>uC</b>

Note :

- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The EAS data shows Max. rating . IAS = 2.4A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 °C
- 3、 The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
- 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.

Ratings and Characteristic Curves

Typical Characteristics

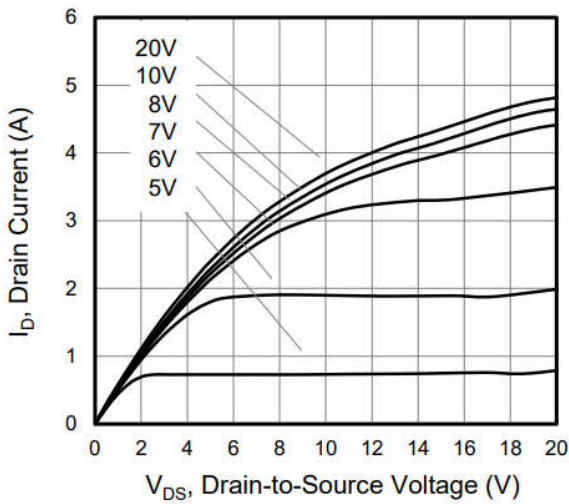


Figure 1. Output Characteristics ( $T_J = 25^\circ\text{C}$ )

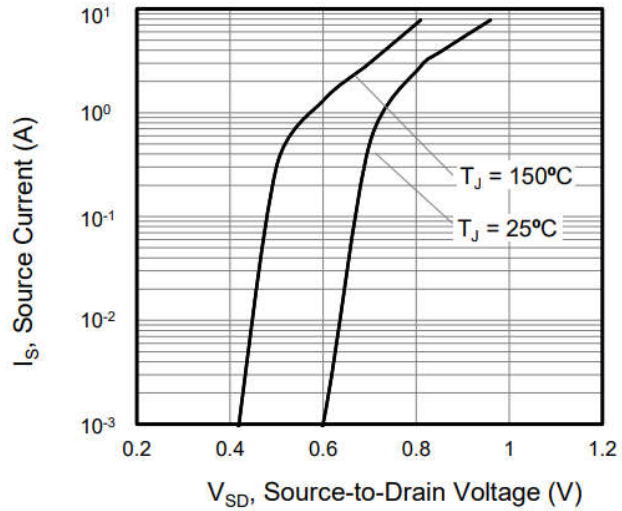


Figure 2. Body Diode Forward Voltage

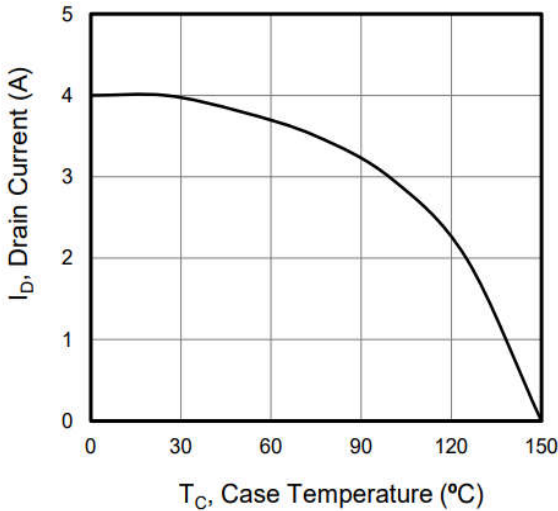


Figure 3. Drain Current vs. Temperature

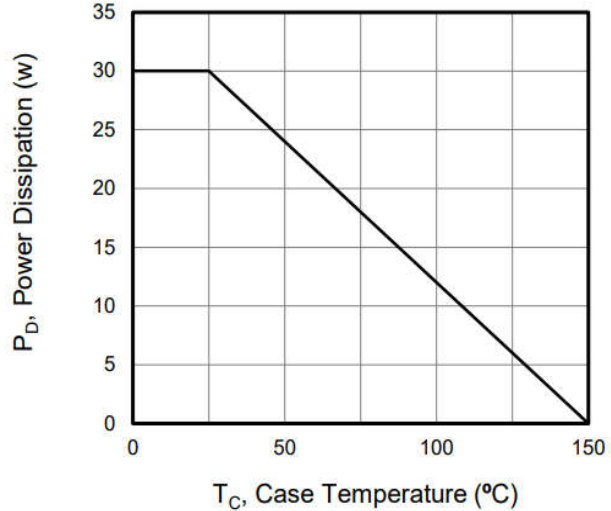


Figure 4. BV DSS Variation vs. Temperature

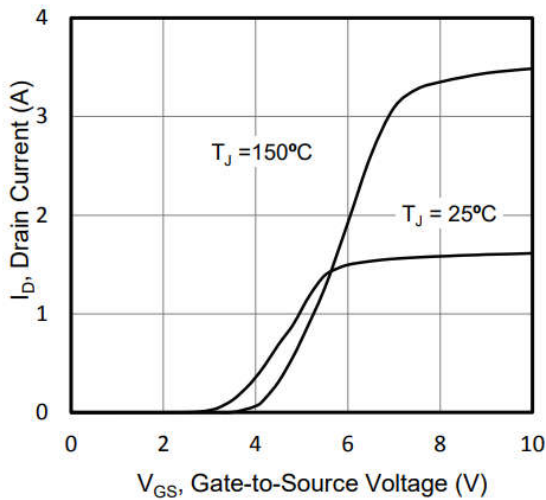


Figure 5. Transfer Characteristics

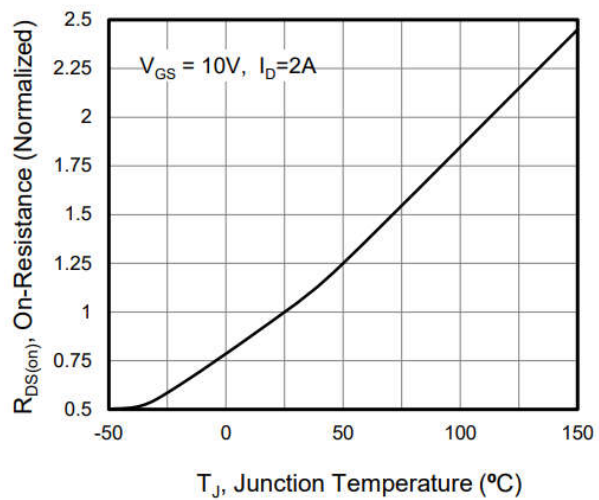
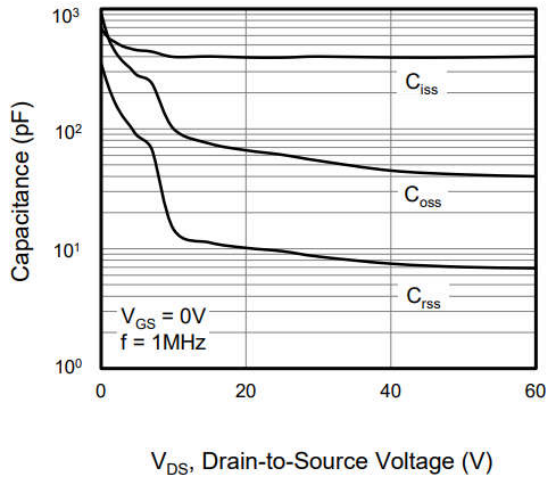
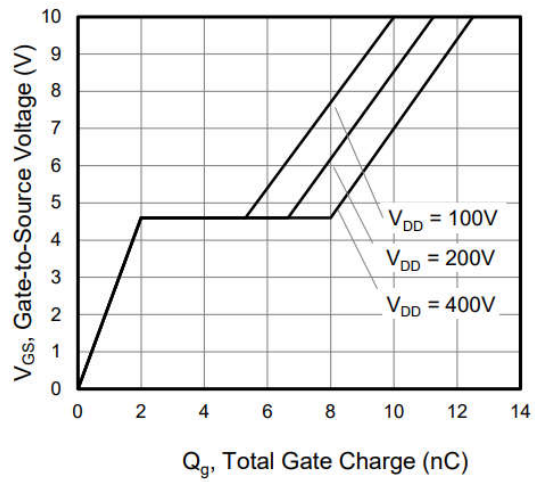


Figure 6. On-Resistance vs. Temperature

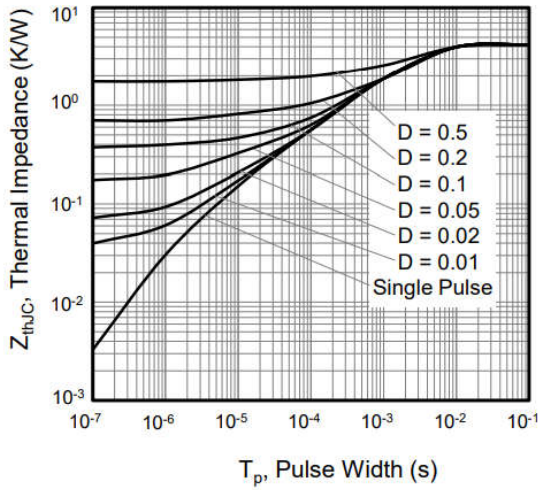
**Ratings and Characteristic Curves**



**Figure 7. Capacitance**



**Figure 8. Gate Charge**



**Figure 9. Transient Thermal Impedance**

Package Outline Dimensions Millimeters

TO-252

Dim.	Min.	Typ.	Max.
A	2.10	-	2.50
A2	0	-	0.10
B	0.66	-	0.86
B2	5.18	-	5.48
C	0.40	-	0.60
C2	0.44	-	0.58
D	5.90	-	6.30
D1	5.30REF		
E	6.40	-	6.80
E1	4.63	-	-
G	4.47	-	4.67
H	9.50	-	10.70
L	1.09	-	1.21
L2	1.35	-	1.65
V1	-	7°	-
V2	0°	-	6°
All Dimensions in millimeter			

