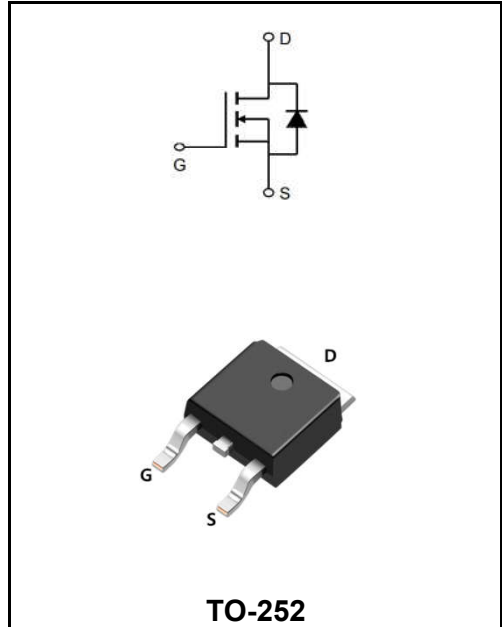


**20V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	60A
<b>V<sub>DSS</sub></b>	20V
<b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=4.5V)</b>	< 6.5mΩ ( <b>Type:4.8 mΩ</b> )



**Application**

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW60N02BD	TO-252	YFW 60N02BD XXXXX	2500PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	20	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	± 12	<b>V</b>
Continuous Drain Current, V <sub>GS</sub> @ 4.5V @T <sub>A</sub> =25°C	<b>I<sub>D</sub></b>	60	<b>A</b>
Continuous Drain Current, V <sub>GS</sub> @ 4.5V @T <sub>A</sub> =70°C	<b>I<sub>D</sub></b>	39	<b>A</b>
Pulsed Drain Current <small>note1</small>	<b>I<sub>DM</sub></b>	200	<b>A</b>
Single Pulse Avalanche Energy <small>note2</small>	<b>E<sub>AS</sub></b>	47.6	<b>mJ</b>
Power Dissipation @T <sub>A</sub> =25°C	<b>P<sub>D</sub></b>	37	<b>W</b>
Thermal Resistance Junction to Case	<b>R<sub>θJC</sub></b>	4	<b>°C/W</b>
Operating and Storage Temperature Range	<b>T<sub>J</sub> , T<sub>STG</sub></b>	-55 to +175	<b>°C</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>	20	24	-	<b>V</b>
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	<b>I<sub>DSS</sub></b>	-	-	1.0	<b>μA</b>
Gate - Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	<b>V<sub>GS(th)</sub></b>	0.5	0.7	1.2	<b>V</b>
Static Drain-Source on-Resistance note3	$V_{GS}=4.5V, I_D=30A$	<b>R<sub>DS(ON)</sub></b>	-	4.8	6.5	<b>mΩ</b>
	$V_{GS}=2.5V, I_D=20A$		-	8.2	10	
Input Capacitance	$V_{DS}=10V$ $V_{GS}=0V$ $f=1.0MHz$	<b>C<sub>iss</sub></b>	-	1832	-	<b>μF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	289	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	271	-	
Total Gate Charge	$V_{DS}=10V$ $I_D=30A$ $V_{GS}=4.5V$	<b>Q<sub>g</sub></b>	-	23	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	4.5	-	
Gate-Drain("Miller") Charge		<b>Q<sub>gd</sub></b>	-	7.3	-	
Turn-on delay time	$V_{DS}=10V$ $I_D=30A$ $R_{GEN}=3\Omega$ $V_{GS}=4.5V$	<b>t<sub>D(on)</sub></b>	-	15	-	<b>ns</b>
Turn-on Rise Time		<b>T<sub>r</sub></b>	-	37	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	52	-	
Turn- Off Fall Time		<b>t<sub>f</sub></b>	-	21	-	
Maximum Continuous Drain to Source Diode Forward Current		<b>I<sub>S</sub></b>	-	-	60	<b>A</b>
Maximum Pulsed Drain to Source Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	210	<b>A</b>
Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=25A$	<b>V<sub>SD</sub></b>	-	-	1.2	<b>V</b>

**Notes:**

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、The test condition is, VDD=10V, VG=4.5V, L=0.5mH, RG=25Ω, IAS=13.8A
- 3、The data tested by pulsed Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%
- 4、The power dissipation is limited by 150°C junction temperature

Ratings and Characteristic Curves

Typical Characteristics

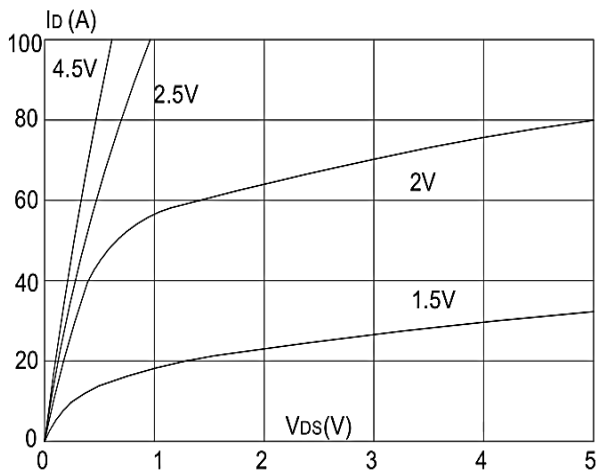


Figure1: Output Characteristics

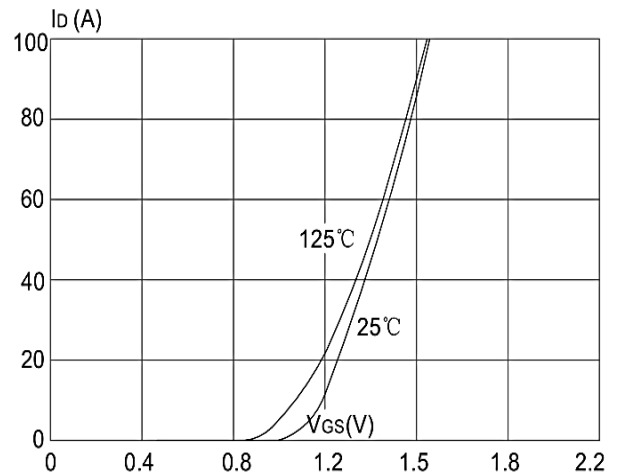


Figure 2: Typical Transfer Characteristics

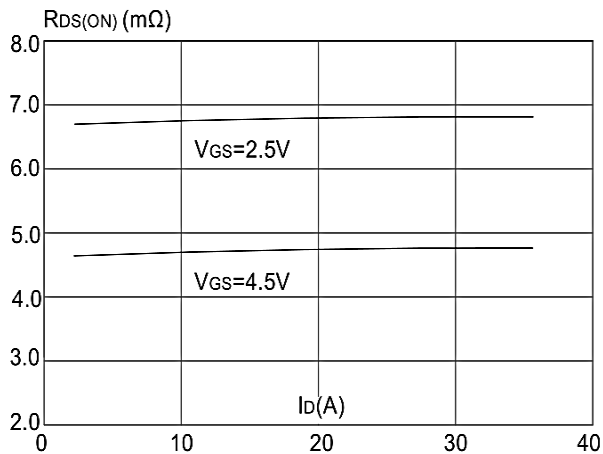


Figure 3: On-resistance vs. Drain Current

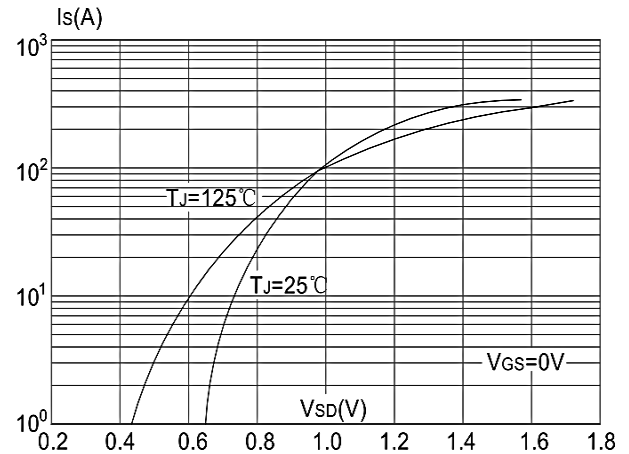


Figure 4: Body Diode Characteristics

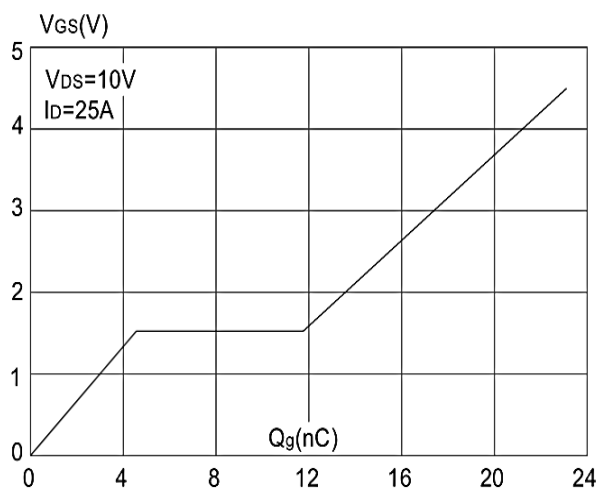


Figure 5: Gate Charge Characteristics

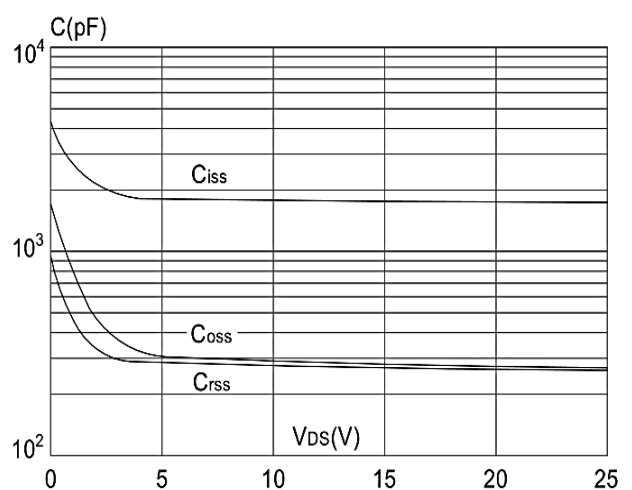
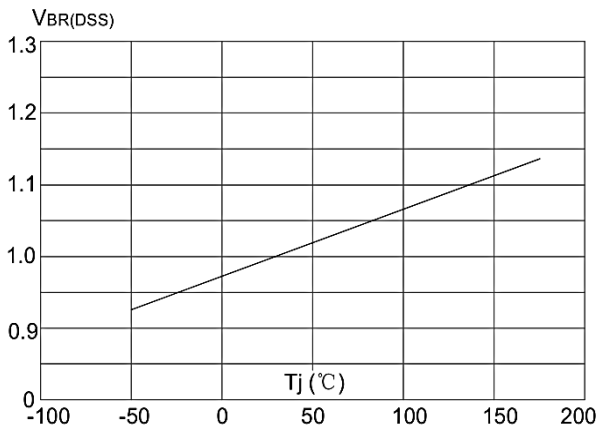
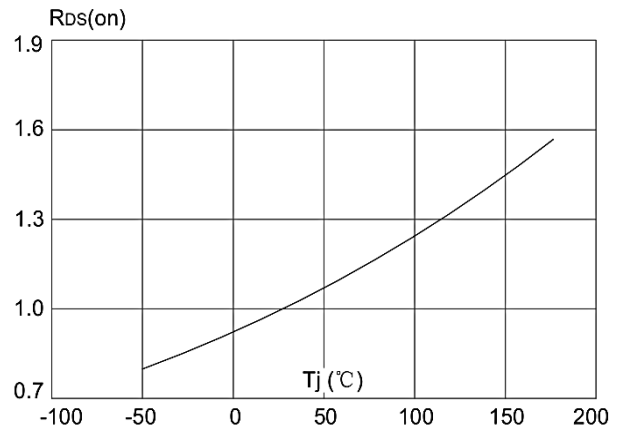


Figure 6: Capacitance Characteristics

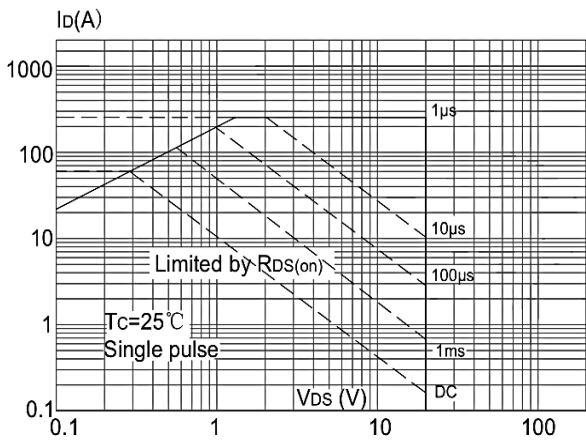
**Ratings and Characteristic Curves**



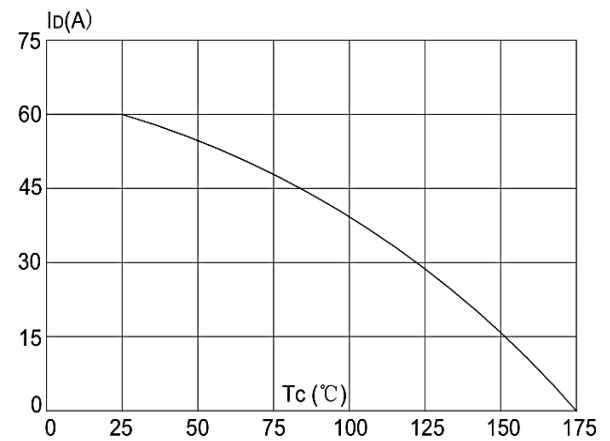
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



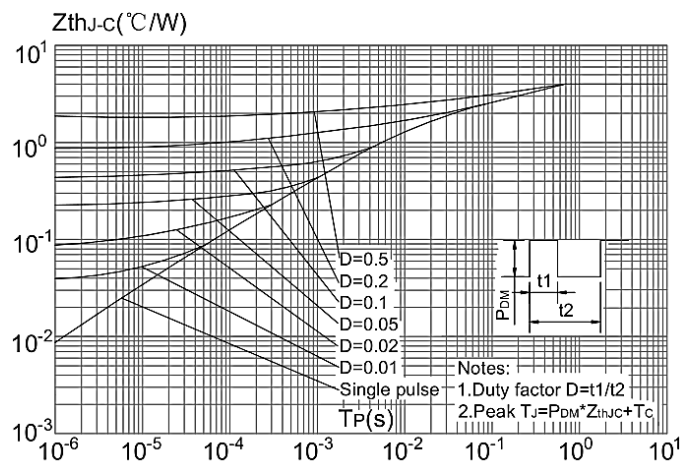
**Figure 8: Normalized on Resistance vs. Junction Temperature**



**Figure 9: Maximum Safe Operating Area Current Temperature**



**Figure 10: Maximum Continuous Drain vs. Case**



**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**

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			

