

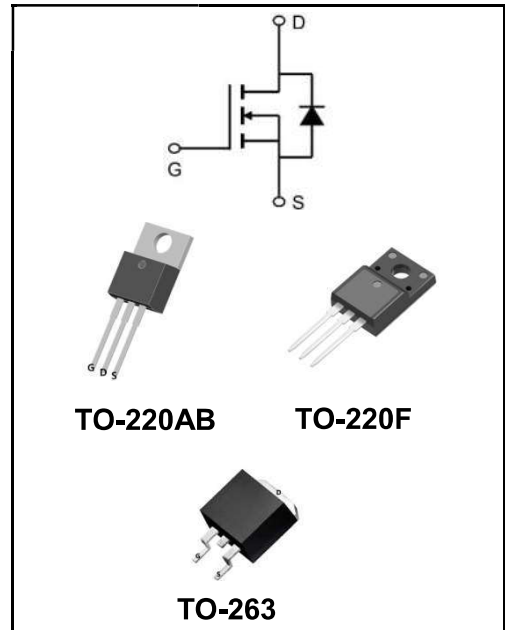
**650V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	12A
<b>V<sub>DSS</sub></b>	650V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b>	< 0.72Ω <b>(Type:0.6Ω)</b>

**Application**

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



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW12N65AT	TO-220AB	YFW 12N65AT XXXXX	1000PCS/Box
YFW12N65AF	TO-220F	YFW 12N65AF XXXXX	1000PCS/Box
YFW12N65AS	TO-263	YFW 12N65AS XXXXX	800PCS/Reel

**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>	650	<b>V</b>
Continuous Drain Current	<b>I<sub>D</sub></b>	12	<b>A</b>
Pulsed Drain Current(note1)	<b>I<sub>DM</sub></b>	44	<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>	304	<b>mJ</b>
Avalanche Current(note1)	<b>I<sub>AR</sub></b>	7.7	<b>A</b>
Repetitive Avalanche Energy(note1)	<b>E<sub>AR</sub></b>	65	<b>mJ</b>
Power Dissipation(T <sub>c</sub> =25°C)	<b>P<sub>D</sub></b>	32.1	<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>	1.92	<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>	650	685	-	<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	3.5	4	<b>V</b>
Drain-Source On-Resistance (Note3)	$V_{GS}=10V, I_D=5.5A$	<b>R<sub>DS(ON)</sub></b>	-	0.6	0.72	<b>Ω</b>
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	<b>C<sub>iss</sub></b>	-	1528	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	147	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	16	-	
Total Gate Charge	$V_{DD}=520V$ $I_D=11A$ $V_{GS}=10V$	<b>Q<sub>g</sub></b>	-	46	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	7	-	
Gate-Drain Charge		<b>Q<sub>gd</sub></b>	-	23	-	
Turn-on delay time	$V_{DD}=325V$ $I_D=11A$ $R_G=25\Omega$	<b>t<sub>d(on)</sub></b>	-	43	-	<b>ns</b>
Turn-on Rise Time		<b>T<sub>r</sub></b>	-	29	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	196	-	
Turn-on Fall Time		<b>t<sub>f</sub></b>	-	51	-	
Continuous Body Diode Current	$T_C=25^\circ C$	<b>I<sub>S</sub></b>	-	-	11	<b>A</b>
Pulsed Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	44	<b>A</b>
Body Diode Voltage	$T_J=25^\circ C, I_{SD}=5.5A, V_{GS}=0V$	<b>V<sub>SD</sub></b>	-	-	1.4	<b>V</b>
Reverse Recovery Time	$V_{GS}=0V, I_S=11A$ $diF/dt=100A/\mu s$	<b>t<sub>rr</sub></b>	-	482	-	<b>nS</b>
Reverse Recovery Charge		<b>Q<sub>rr</sub></b>	-	2.85	-	<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 = 11A, 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.

Typical Characteristics

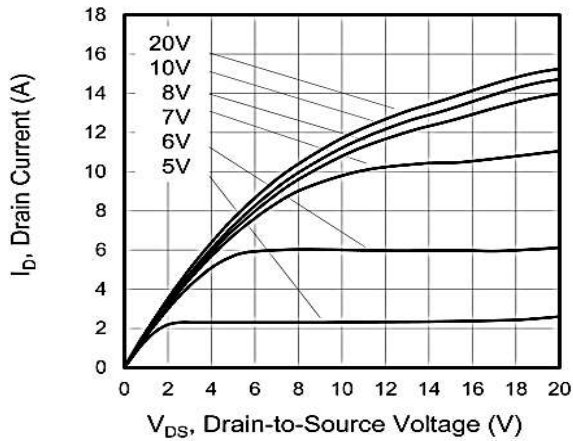


Figure 1. Output Characteristics ( $T_J = 25^\circ\text{C}$ )

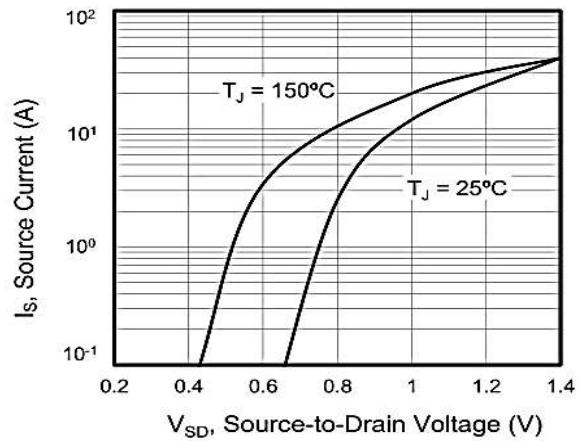


Figure 2. Body Diode Forward Voltage

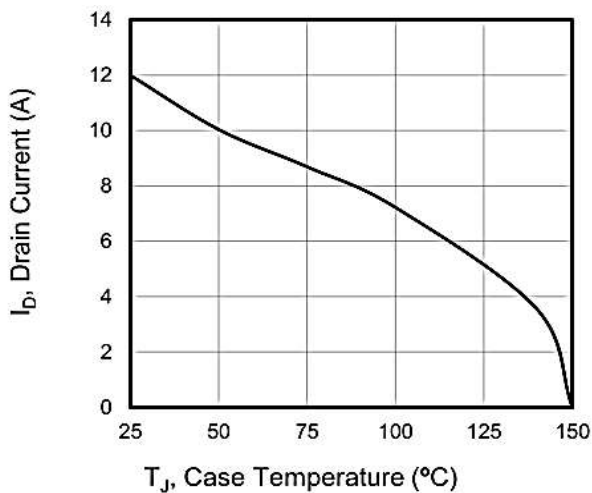


Figure 3. Drain Current vs. Temperature

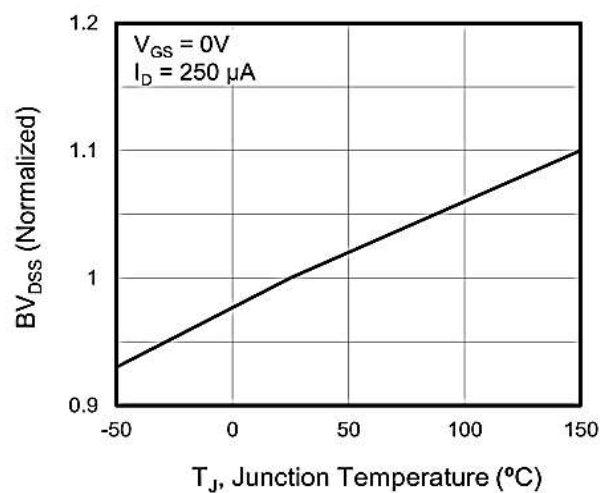


Figure 4.  $BV_{DSS}$  Variation vs. Temperature

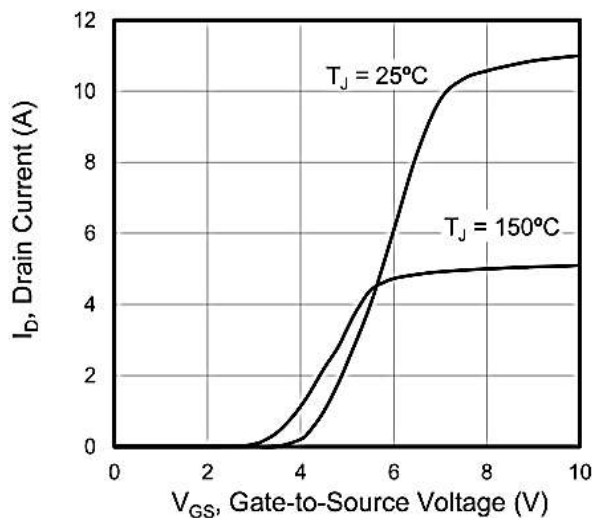


Figure 5. Transfer Characteristics

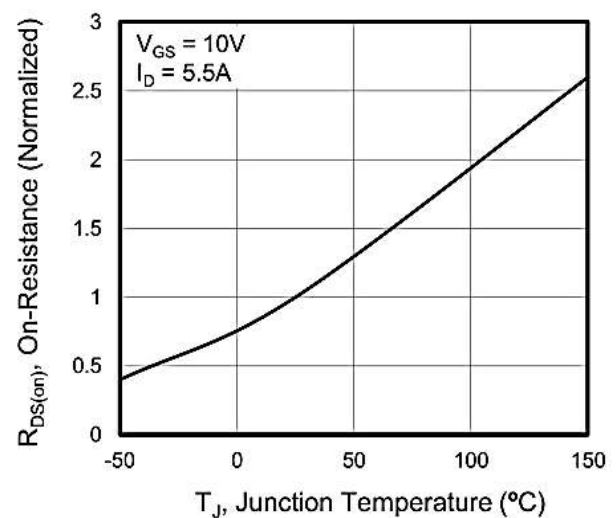


Figure 6. On-Resistance vs. Temperature

Ratings and Characteristic Curves

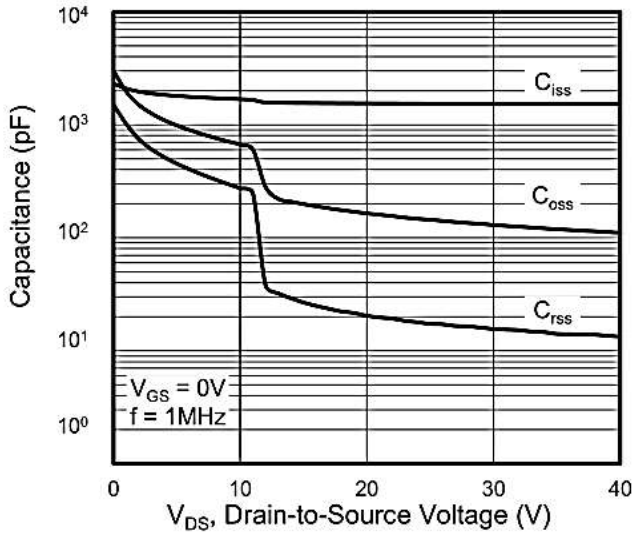
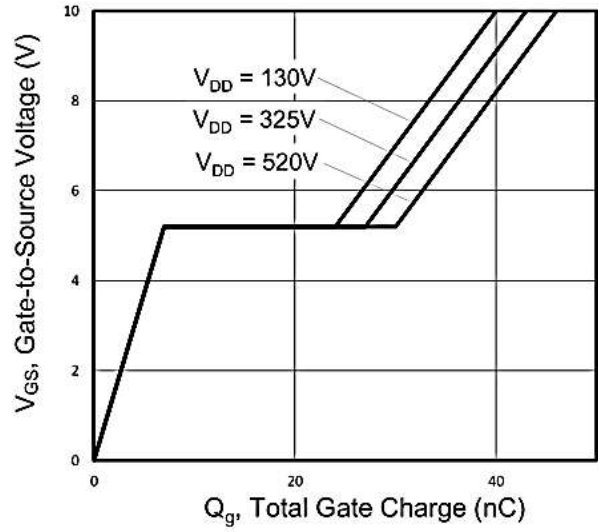


Figure 7. Capacitance Figure



8. Gate Charge

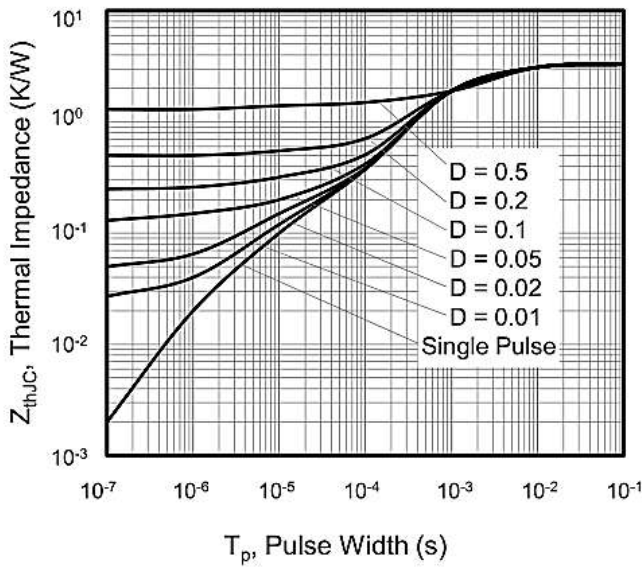


Figure 9. Transient Thermal Impedance

Package Outline Dimensions Millimeters

TO-220AB

Dim.	Min.	Max.
A	10.15	10.35
B	2.65	2.95
C	3.70	3.90
D	28.5	29.5
E	1.30	1.45
F	6.35	6.55
G	2.9	3.3
H	15.0	16.0
I	0.38	0.42
J	4.45	4.55
K	1.25	1.35
L	Typ 5.08	
M	Typ 2.54	
N	3.1	3.3
O	0.76	0.84
All Dimensions in millimeter		

TO-220F

Dim.	Min.	Max.
A	9.95	10.25
B	2.95	3.25
C	1.25	1.45
D	12.95	13.25
E	0.50	0.65
F	3.1	3.3
G	1.30	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.60	4.75
K	2.50	2.65
L	6.35	6.55
M	15.4	16.0
N	2.75	3.05
O	0.48	0.52
P	0.76	0.84
All Dimensions in millimeter		

Package Outline Dimensions Millimeters

TO-263

	Dim.	Min.	Max.
	A	10.1	10.2
	B	7.4	7.6
	C	1.3	1.5
	D	0.55	0.75
	E	5.0	6.0
	F	1.4	1.6
	G	0.78	0.86
	H	1.2	1.3
	I	Typ2.54	
	J	8.4	8.6
	K	4.45	4.55
	L	1.25	1.35
	M	0.02	0.1
	N	2.4	2.8
O	0.36	0.40	
All Dimensions in millimeter			