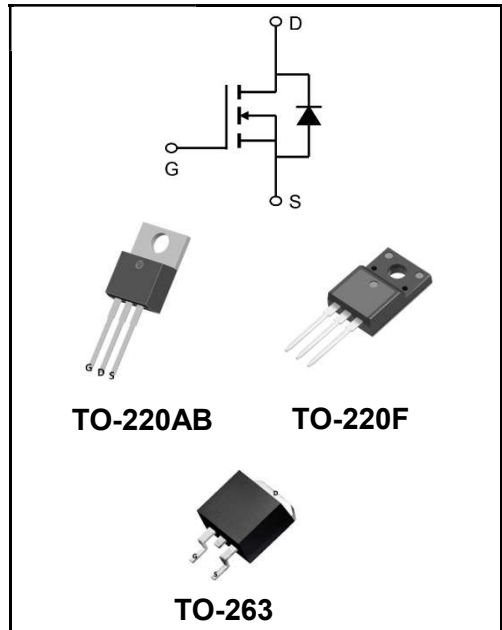


**650V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	10A
<b>V<sub>DSS</sub></b>	650V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b>	< 0.9Ω <b>(Type:0.75Ω)</b>



**Application**

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

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW10N65AT	TO-220AB	YFW 10N65AT XXXXX	1000PCS/Tape
YFW10N65AF	TO-220F	YFW 10N65AF XXXXX	1000PCS/Tape
YFW10N65AS-R	TO-263	YFW 10N65AS XXXXX	800PCS/Tube

**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>	10	<b>A</b>
Pulsed Drain Current(note1)	<b>I<sub>DM</sub></b>	58	<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>	426	<b>mJ</b>
Avalanche Current(note1)	<b>I<sub>AR</sub></b>	9	<b>A</b>
Repetitive Avalanche Energy(note1)	<b>E<sub>AR</sub></b>	41	<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>	4.46	<b>°C/W</b>
Thermal Resistance, Junction ambient	<b>R<sub>θJA</sub></b>	46.7	<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	-	4	<b>V</b>
Drain-Source On-Resistance (Note3)	$V_{GS}=10V, I_D=3.5A$	<b>R<sub>DS(ON)</sub></b>	-	0.75	0.9	<b>Ω</b>
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	<b>C<sub>iss</sub></b>	-	1037	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	138	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	5.3	-	
Total Gate Charge	$V_{DD}=520V$ $I_D=9A$ $V_{GS}=10V$	<b>Q<sub>g</sub></b>	-	19	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	7.3	-	
Gate-Drain Charge		<b>Q<sub>gd</sub></b>	-	8.5	-	
Turn-on delay time	$V_{DD}=325V$ $I_D=7A$ $R_G=25\Omega$	<b>t<sub>d(on)</sub></b>	-	18	-	<b>ns</b>
Turn-on Rise Time		<b>T<sub>r</sub></b>	-	30	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	61	-	
Turn-on Fall Time		<b>t<sub>f</sub></b>	-	36	-	
Continuous Body Diode Current	$T_C=25^\circ C$	<b>I<sub>S</sub></b>	-	-	9.0	<b>A</b>
Pulsed Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	36	<b>A</b>
Body Diode Voltage	$T_J=25^\circ C, I_{SD}=7A, V_{GS}=0V$	<b>V<sub>SD</sub></b>	-	-	1.2	<b>V</b>
Reverse Recovery Time	$V_{GS}=0V, I_S=7A$ $diF/dt=100A/\mu s$	<b>t<sub>rr</sub></b>	-	431	-	<b>nS</b>
Reverse Recovery Charge		<b>Q<sub>rr</sub></b>	-	2.6	-	<b>uC</b>

**Notes**

- 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 = 9.0A, 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

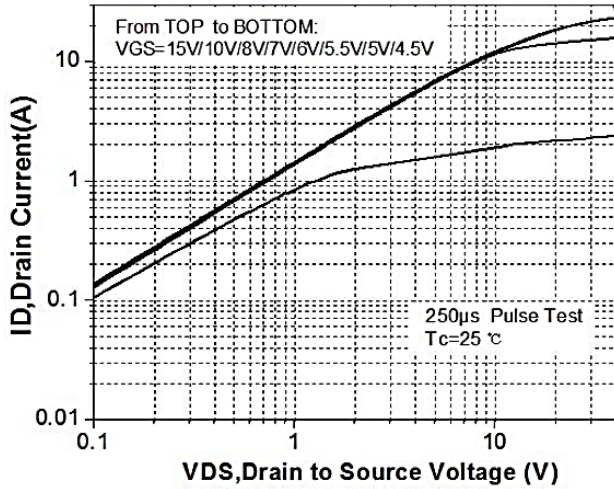


Figure 1. On-Region Characteristics

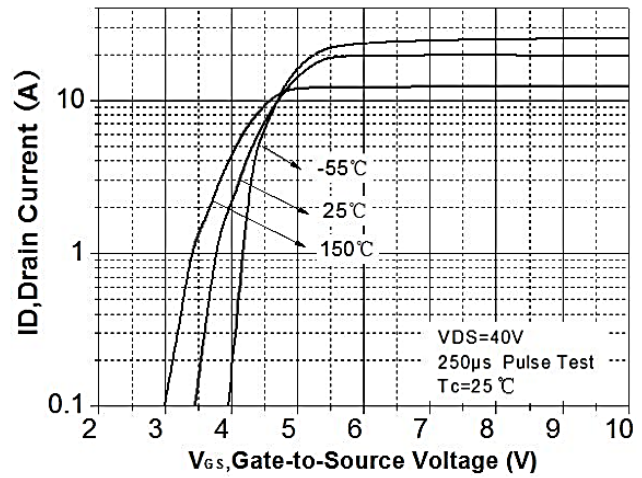


Figure 2. Transfer Characteristics

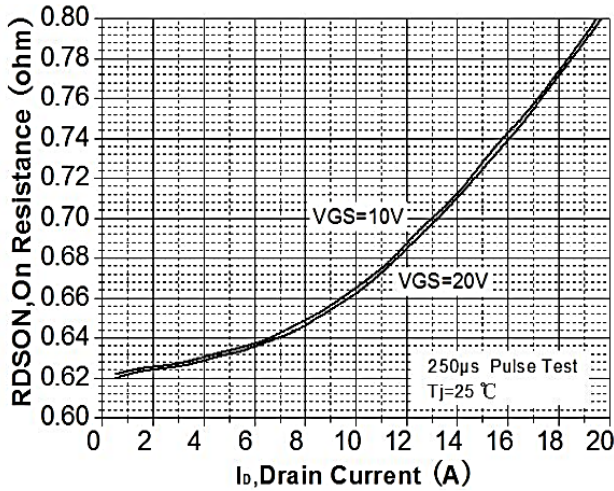


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

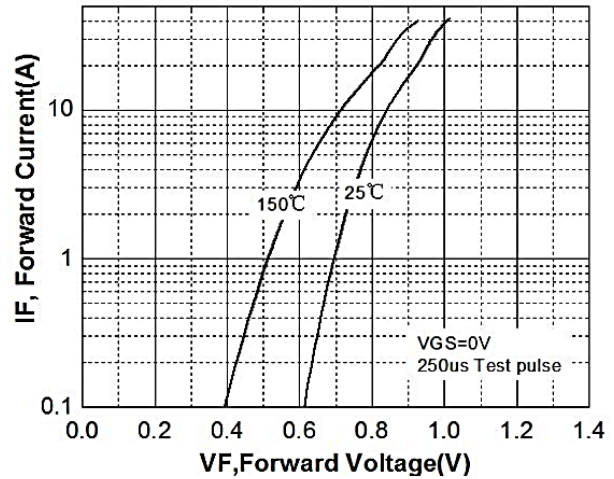


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

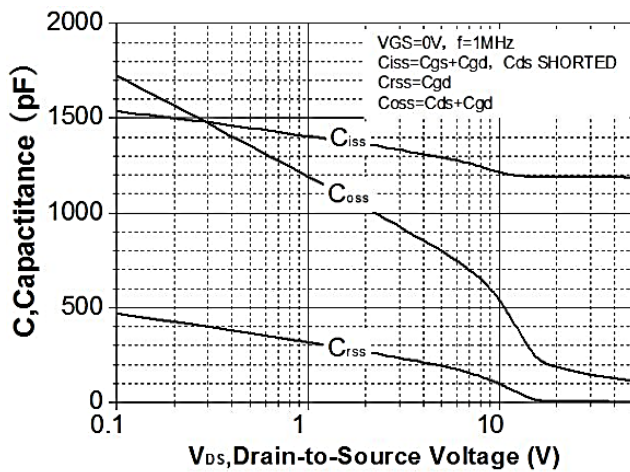


Figure 5. Capacitance Characteristics

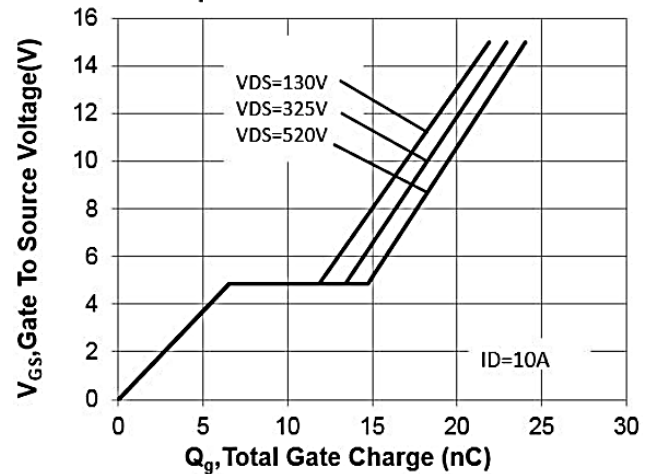


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

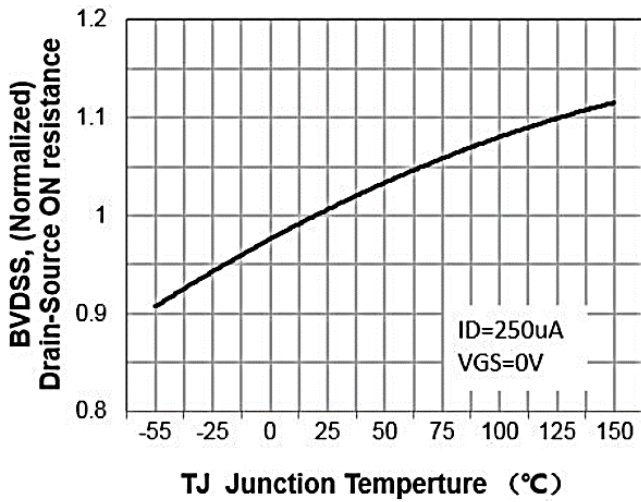


Figure 7. Breakdown Voltage Variation vs Temperature

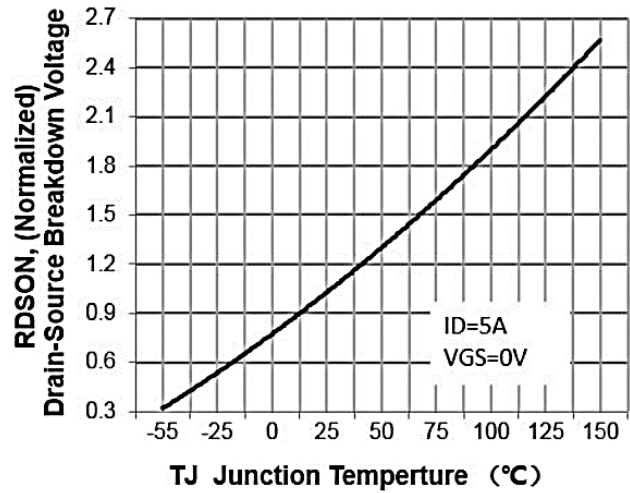


Figure 8. On-Resistance Variation vs Temperature

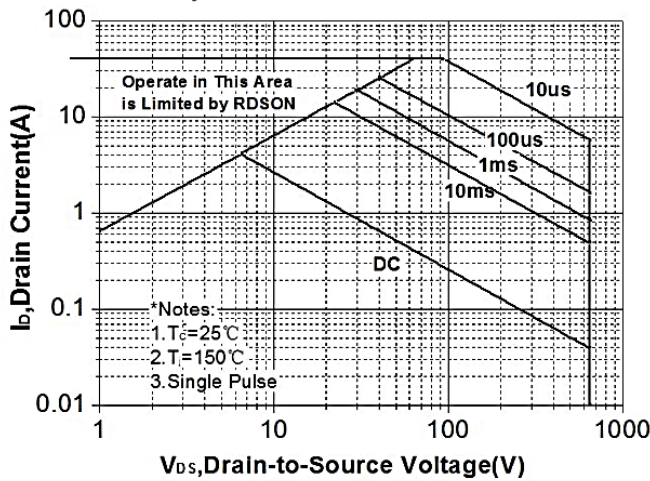


Figure 9. Maximum Safe Operating Area

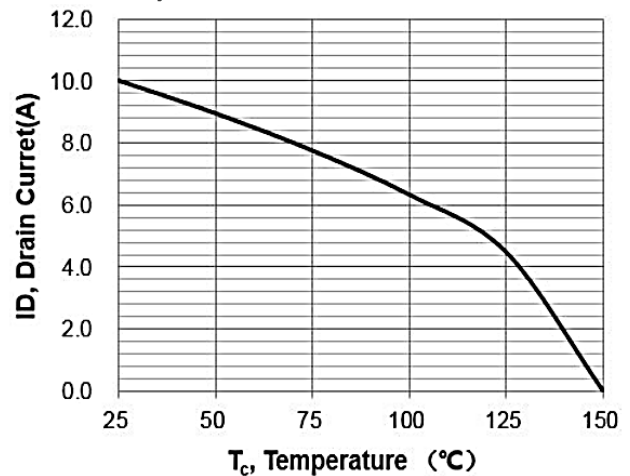


Figure 10. Maximum Drain Current vs Case Temperature

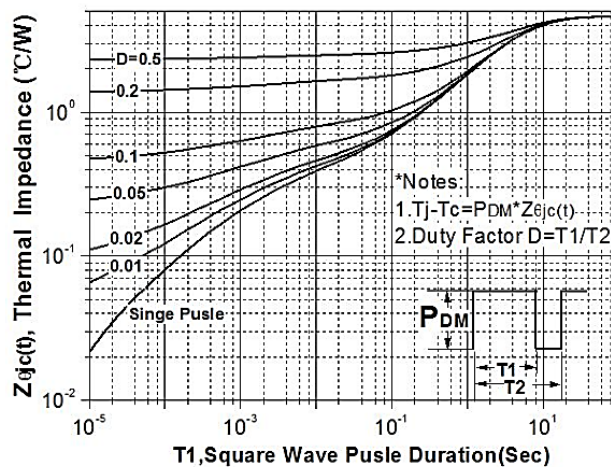


Figure 11. Transient Thermal Response Curve

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		