

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

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	2A
<b>V<sub>DSS</sub></b>	650V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b>	<4.8Ω (Type:4 Ω)

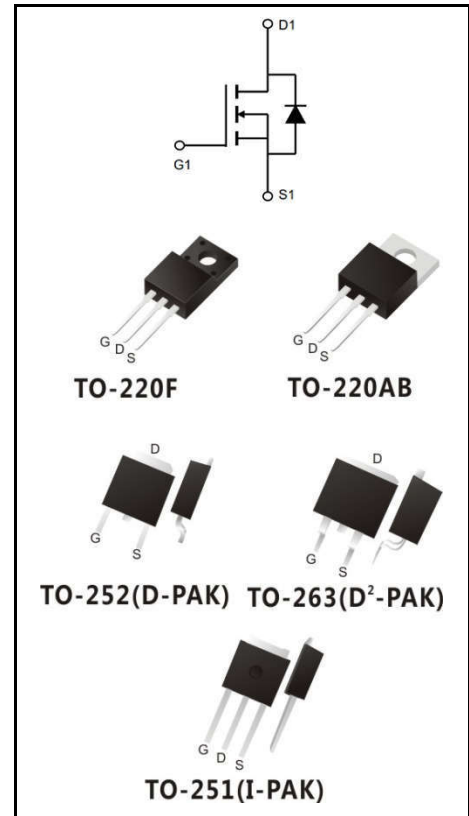


**Features**

- ◆Fast Switching
- ◆Low ON Resistance
- ◆Low Gate Charge
- ◆100% Single Pulse avalanche energy Test
- ◆LeadfreeincomplywithEUROHS2011/65/EUdirectives

**Mechanical Data**

- ◆Case: Molded plastic
- ◆Mounting Position: Any
- ◆Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆Solder bath temperature275°C maximum,10s per JESD22-106



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW2N65AT	TO-220AB	YFW 2N65AT XXXXX	50PCS/Tube
YFW2N65AF	TO-220F(0.5mm)	YFW 2N65AF XXXXX	50PCS/Tube
YFW2N65AS	TO-263	YFW 2N65AS XXXXX	50PCS/Tube
YFW2N65AS-R	TO-263	YFW 2N65AS XXXXX	800PCS/Tape
YFW2N65AMJ	TO-251	YFW 2N65AMJ XXXXX	4000PCS/Tape
YFW2N65AD	TO-252	YFW 2N65AD XXXXX	2500PCS/Tape

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

Characteristics	Symbols	Value		Units
		220F	220/251/252	
Drain-Source Voltage	<b>V<sub>DS</sub></b>	650		<b>V</b>
Gate-Source Voltage	<b>V<sub>GS</sub></b>	±30		<b>V</b>
Continue Drain Current -Continuous	<b>I<sub>D</sub></b>	2		<b>A</b>
Pulsed Drain Current (Note1)	<b>I<sub>DM</sub></b>	8		<b>A</b>
Power Dissipation	<b>P<sub>D</sub></b>	25	35	<b>W</b>
Single Pulse Avalanche Energy (Note1)	<b>E<sub>AS</sub></b>	65		<b>mJ</b>
Operating Temperature Range	<b>T<sub>J</sub></b>	150		<b>°C</b>
Storage Temperature Range	<b>T<sub>STG</sub></b>	-55 to +150		<b>°C</b>
Thermal Resistance, Junction to Case	<b>R<sub>θJC</sub></b>	5.24	3.57	<b>°C/W</b>
Thermal Resistance, Junction to Ambient	<b>R<sub>θJA</sub></b>	62.5	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 <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	<b>BV<sub>DSS</sub></b>	650	682	-	<b>V</b>
Drain-Source Leakage Current	V <sub>DS</sub> = 650 V, V <sub>GS</sub> = 0 V	<b>I<sub>DSS</sub></b>	-	-	1	<b>uA</b>
Gate Leakage Current	V <sub>GS</sub> = ± 30 V, V <sub>DS</sub> = 0 V	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Gate-Source Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	<b>V<sub>GS(th)</sub></b>	2	-	4	<b>V</b>
Drain-Source On-State Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 1 A	<b>R<sub>DS(on)</sub></b>	-	4.0	4.8	<b>Ω</b>
Forward Transconductance	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 2A	<b>g<sub>fs</sub></b>	-	2.5	-	<b>S</b>
Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 2 V, f = 200KHz	<b>C<sub>iss</sub></b>	-	415	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	32	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	6	-	
Turn-on Delay Time	I <sub>D</sub> = 2 A, V <sub>DD</sub> = 325 V, R <sub>G</sub> = 10 Ω	<b>td(ON)</b>	-	8	-	<b>nS</b>
Rise Time(Note2)		<b>tr</b>	-	6	-	
Turn-Off Delay Time(Note2)		<b>td(OFF)</b>	-	30	-	
Fall Time(Note2)		<b>tf</b>	-	11	-	
Total Gate Charge(Note2)	I <sub>D</sub> = 2A, V <sub>DD</sub> = 520 V, V <sub>GS</sub> = 10 V	<b>Q<sub>G</sub></b>	-	10.8	-	<b>nC</b>
Gate to Source Charge(Note2)		<b>Q<sub>GS</sub></b>	-	1.5	-	
Gate to Drain Charge(Note2)		<b>Q<sub>GD</sub></b>	-	4	-	

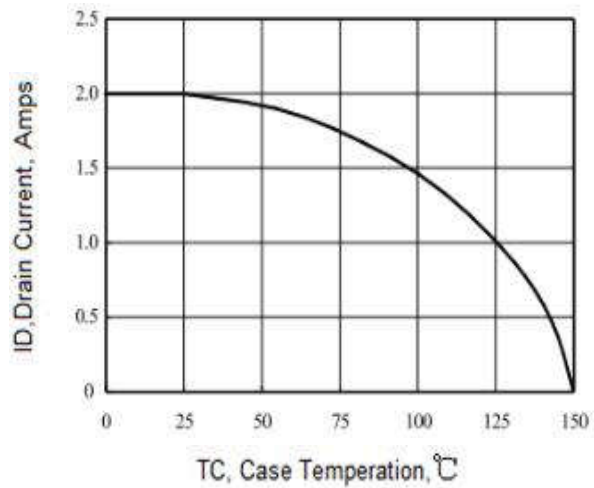
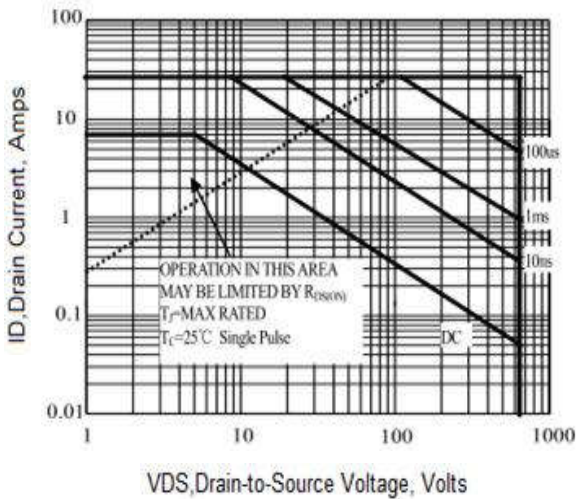
**Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Body-Diode Pulsed Current		<b>I<sub>S</sub></b>	-	-	2	<b>A</b>
Maximum Body-Diode Pulsed Current(Note2)		<b>I<sub>SM</sub></b>	-	-	8	<b>A</b>
Drain-Source Diode Forward Voltage	<b>I<sub>SD</sub> = 2 A</b>	<b>V<sub>SD</sub></b>	-	-	1.4	<b>V</b>
Reverse Recovery Time(Note2)	<b>I<sub>SD</sub> = 2 A, V<sub>GS</sub> = 0 V, dI<sub>F</sub> / dt = 100 A/μs</b>	<b>trr</b>	-	430	-	<b>nS</b>
Reverse Recovery Charge(Note2)		<b>Qrr</b>	-	1.1	-	<b>uC</b>

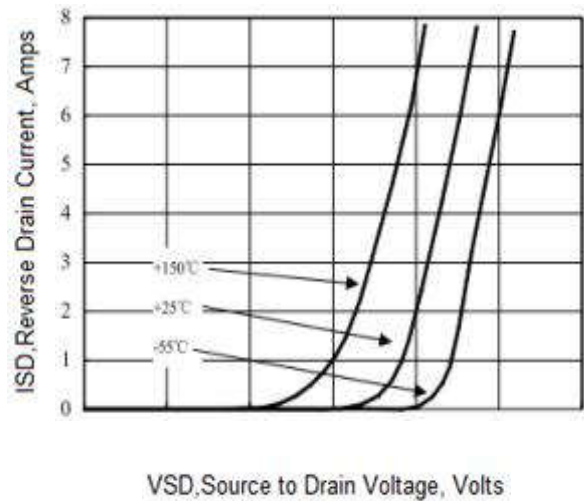
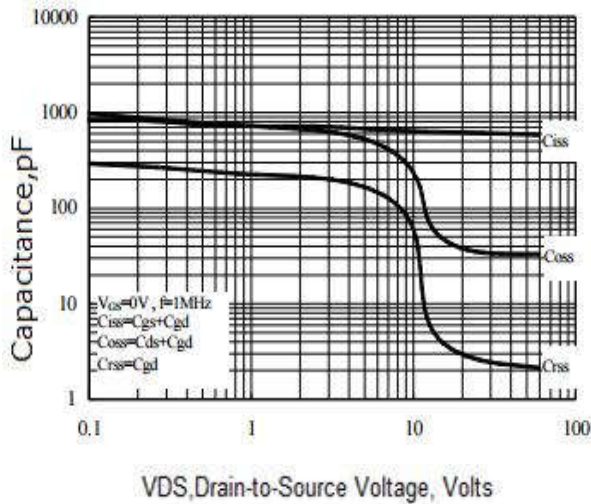
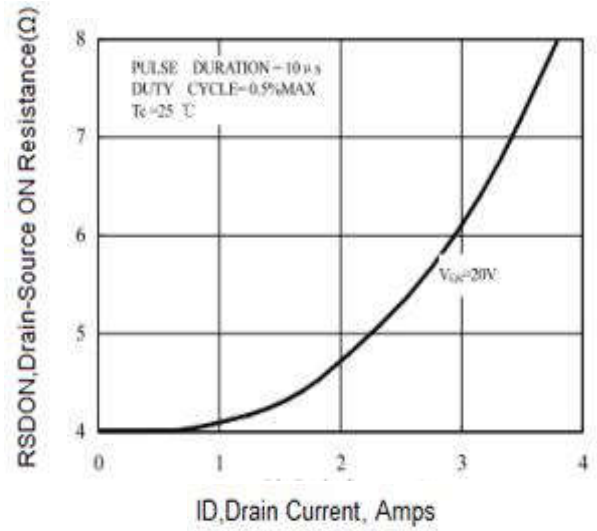
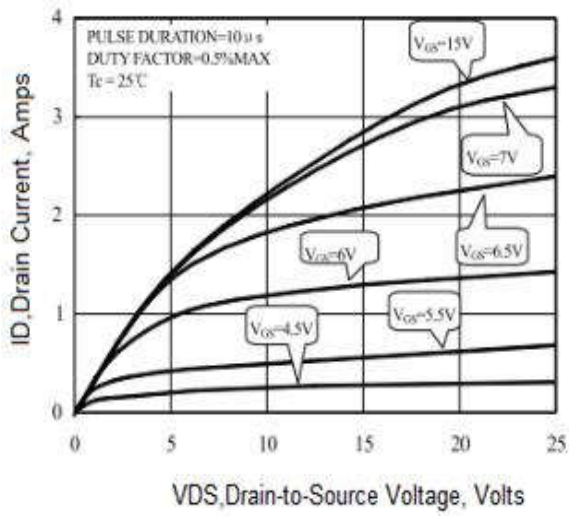
Note:

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

**Ratings and Characteristic Curves**



Ratings and Characteristic Curves



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	1.25
F	6.35	6.55
G	2.9	3.3
H	15.0	16.0
I	0.38	0.22
J	2.25	2.55
K	1.25	1.35
L	Typ 5.08	
M	Typ 2.52	
N	3.1	3.3
O	0.76	0.82
All Dimensions in millimeter		

TO-220F

Dim.	Min.	Max.
A	9.95	10.25
B	2.95	3.25
C	1.25	1.25
D	12.95	13.25
E	0.50	0.65
F	3.1	3.3
G	1.30	1.25
H	Typ 2.52	
I	Typ 5.08	
J	2.60	2.75
K	2.50	2.65
L	6.35	6.55
M	15.2	16.0
N	2.75	3.05
O	0.28	0.52
P	0.76	0.82
All Dimensions in millimeter		

Package Outline Dimensions Millimeters

**TO-263**

	Dim.	Min.	Max.
	A	10.1	10.2
	B	7.2	7.6
	C	1.3	1.5
	D	0.55	0.75
	E	5.0	6.0
	F	1.2	1.6
	G	0.78	0.86
	H	1.2	1.3
	I	Typ2.52	
	J	8.2	8.6
	K	2.25	2.55
	L	1.25	1.35
	M	0.02	0.1
N	2.2	2.8	
O	0.36	0.20	
All Dimensions in millimeter			

**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				

Package Outline Dimensions Millimeters

TO-251

	Dim.	Min.	Max.
	A	2.2	2.2
	A2	0.95	1.15
	A3	0.25	0.65
	b	0.65	0.85
	c	0.25	0.55
	D	6.25	6.75
	D2	5.2	5.2
	E	5.8	6
	E2	0.95	1.25
	e	Typ 2.3	
	e1	Typ 2.6	
	L	2	2.2
	L1	1.2	1.5
All Dimensions in millimeter			

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