

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

**MAIN CHARACTERISTICS**

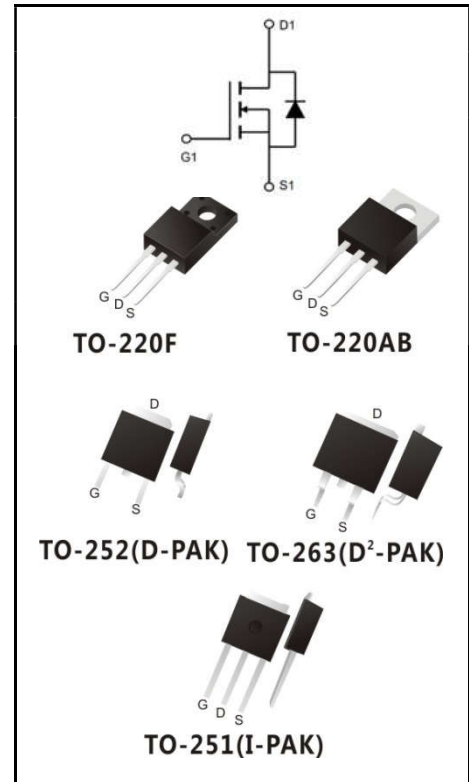
<b>I<sub>D</sub></b>	5A
<b>V<sub>DSS</sub></b>	500V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b>	<1.5Ω ( <b>Type:1.39 Ω</b> )

**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℃ maximum,10s per JESD22-106



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW5N50AT	TO-220AB	YFW 5N50AT XXXXX	50PCS/Tube
YFW5N50AF	TO-220F(0.5mm)	YFW 5N50AF XXXXX	50PCS/Tube
YFW5N50AS	TO-263	YFW 5N50AS XXXXX	50PCS/Tube
YFW5N50AS-R	TO-263	YFW 5N50AS XXXXX	800PCS/Tape
YFW5N50AMJ	TO-251	YFW 5N50AMJ XXXXX	80PCS/Tube
YFW5N50AD	TO-252	YFW 5N50AD XXXXX	2500PCS/Tape

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

Characteristics	Symbols	Value			Units
		220AB/263	220F	251/252	
Drain-Source Voltage	$V_{DS}$	500			V
Gate-Source Voltage	$V_{GS}$	±30			V
Continue Drain Current	$I_D$	5			A
- Continuous(Tc=100°C)		3.1			
Pulsed Drain Current (Note1)	$I_{DM}$	20			A
Power Dissipation	$P_D$	75	33	63	W
-Derate above 25°C		0.56	0.33	0.62	W/°C
Single Pulse Avalanche Energy (Note2)	$E_{AS}$	195			mJ
Avalanche Current (Note 1)	$I_{AR}$	5			A
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	10.1			mJ
Operating Temperature Range	$T_J$	150			°C
Storage Temperature Range	$T_{STG}$	-55 to +150			°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.65	3.46	2.25	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	62.5	°C/W

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

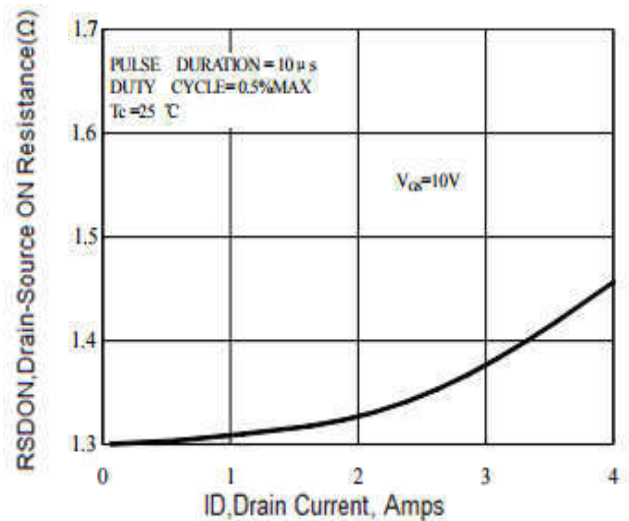
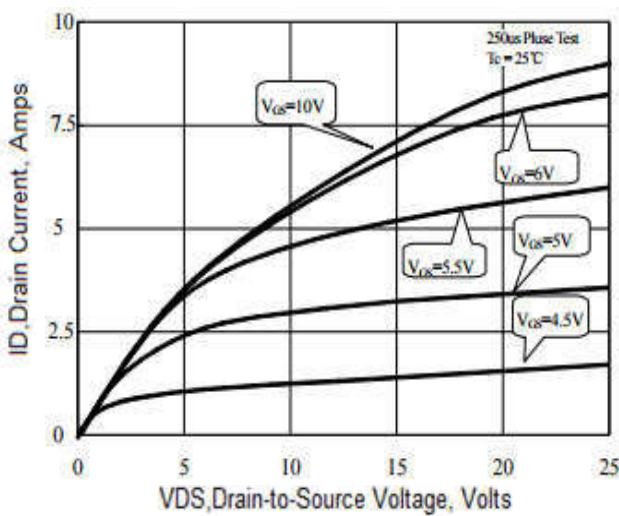
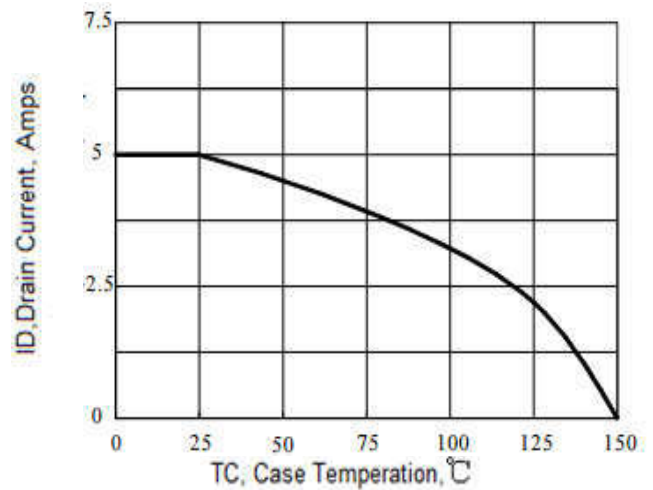
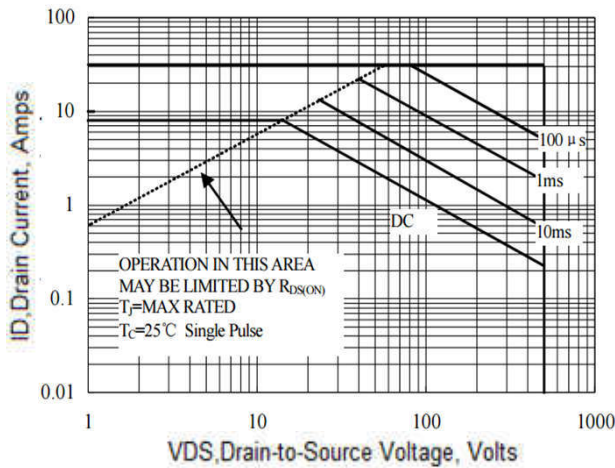
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	$BV_{DSS}$	500	-	-	V
Drain-Source Leakage Current	$V_{DS} = 500 V, V_{GS} = 0 V$	$I_{DSS}$	-	-	1	uA
	$V_{DS}=400V, T_c=125^\circ C$		-	-	10	
Gate Leakage Current	$V_{GS} = \pm 30 V, V_{DS} = 0 V$	$I_{GSS}$	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 2.5 A$	$R_{DS(on)}$	-	1.39	1.5	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 2.5 A$	$g_{fs}$	-	4	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$	$C_{iss}$	-	545	-	pF
Output Capacitance		$C_{oss}$	-	63	-	
Reverse Transfer Capacitance		$C_{rss}$	-	5.5	-	
Turn-on Delay Time	$I_D = 5 A, V_{DD} = 250 V, R_G = 10 \Omega (Note 3.4)$	$td(ON)$	-	9	-	nS
Rise Time		$tr$	-	11	-	
Turn-Off Delay Time		$td(OFF)$	-	29	-	
Fall Time		$tf$	-	16	-	
Total Gate Charge	$I_D = 5 A, V_{DD} = 400 V, V_{GS} = 10 V (Note 3.4)$	$Q_G$	-	14.5	-	nC
Gate to Source Charge		$Q_{GS}$	-	3.5	-	
Gate to Drain Charge		$Q_{GD}$	-	7	-	

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

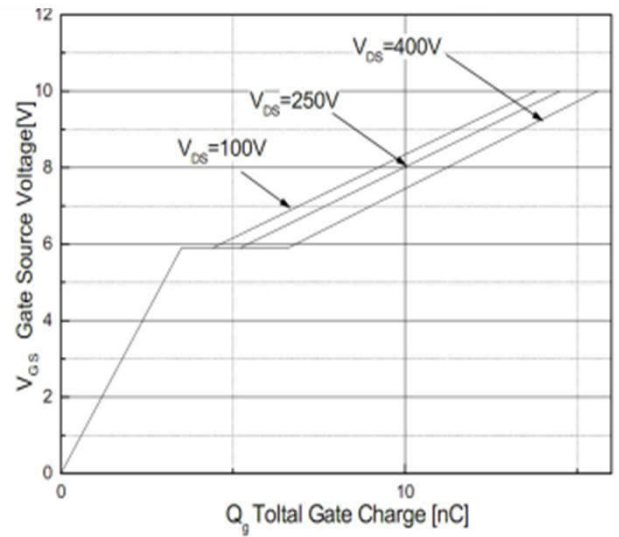
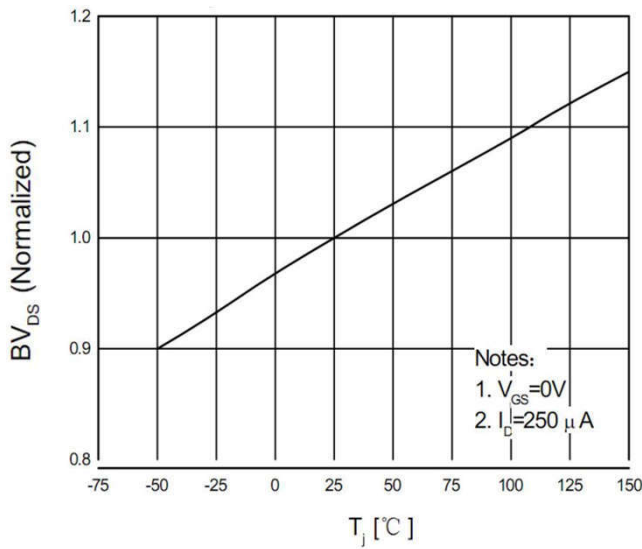
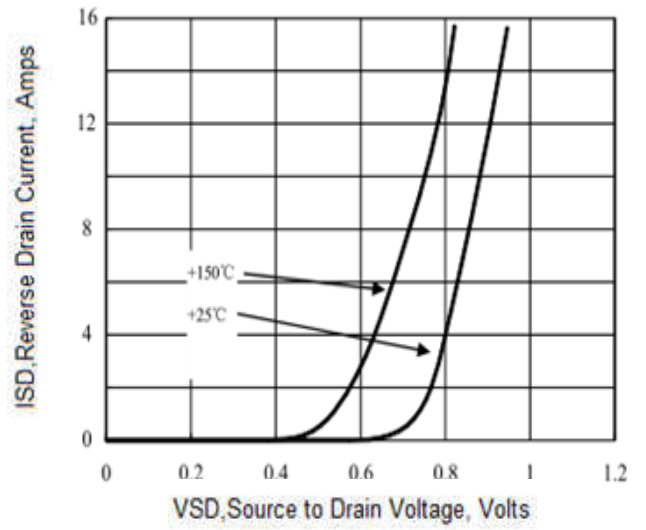
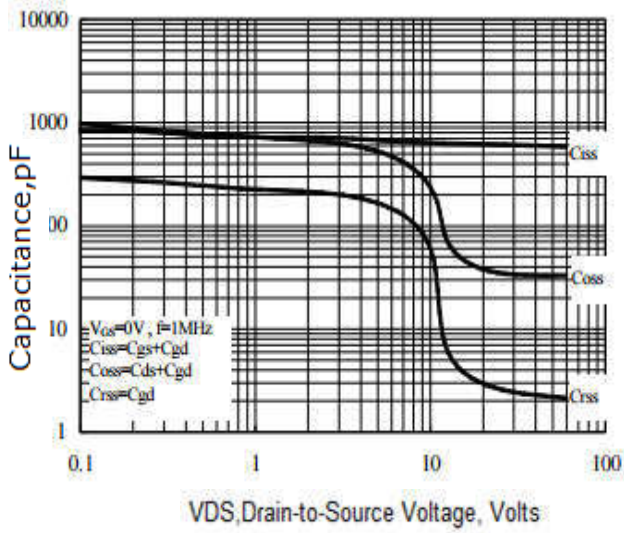
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximun Body-Diode Continuous Current		<b>I<sub>S</sub></b>	-	-	5	<b>A</b>
Maximun Body-Diode Pulsed Current(Note2)		<b>I<sub>SM</sub></b>	-	-	20	<b>A</b>
Drain-Source Diode Forward Voltage	I <sub>SD</sub> = 5 A	<b>V<sub>SD</sub></b>	-	-	1.4	<b>V</b>
Reverse Recovery Time	I <sub>SD</sub> = 5 A, V <sub>GS</sub> = 0 V, dI <sub>F</sub> / dt = 100 A/μs	<b>trr</b>	-	391	-	<b>nS</b>
Reverse Recovery Charge		<b>Qrr</b>	-	1.7	-	<b>uC</b>

- Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
  2. IAS = 5 A, VDD = 50 V, L = 16mH, RG = 25Ω, starting TJ = 25°C.
  3. ulse test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
  4. Essentially Independent of Operating Temperature.

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	1.45
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			

**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	2.4
	A2	0.95	1.15
	A3	0.45	0.65
	b	0.65	0.85
	c	0.45	0.55
	D	6.45	6.75
	D2	5.2	5.4
	E	5.8	6
	E2	0.95	1.25
	e	Typ 2.3	
	e1	Typ 4.6	
	L	4	4.2
	L1	1.2	1.5
All Dimensions in millimeter			