

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

**MAIN CHARACTERISTICS**

$I_D$	5A
$V_{DSS}$	700V
$R_{DS(ON)-typ}(@V_{GS}=10V)$	1.9Ω

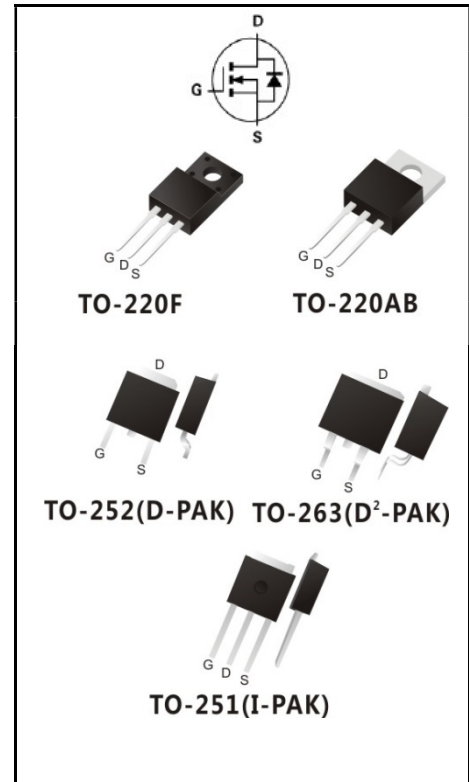


**FEATURES**

- ◆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
- ◆Case:TO-220AB, TO-220F, TO-263, TO-252, TO-251



**PRODUCT SPECIFICATION CLASSIFICATION**

Part Number	Package	Marking	Pack
YFW5N70A1	TO-220AB	5N70AT	50PCS/Tube
YFW5N70A2	TO-220F(0.5mm)	5N70AF	50PCS/Tube
YFW5N70A3	TO-263	5N70AS	50PCS/Tube
YFW5N70A3-R	TO-263	5N70AS	800PCS/Tape
YFW5N70A4	TO-251	5N70AMJ	80PCS/Tube
YFW5N70A5-R	TO-252	5N70AD	2500PCS/Tape

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

Characteristics	Symbols	Value			Units
		220AB/263	220F	251/252	
Drain-Source Voltage	$V_{DS}$	700			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	$P_D$	85	35	62	W
-Derate above 25°C		0.56	0.28	0.62	W/°C
Single Pulse Avalanche Energy (Note2)	$E_{AS}$	210			mJ
Avalanche Current (Note 1)	$I_{AR}$	5			A
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	11			mJ
Operating Temperature Range	$T_J$	150			°C
Storage Temperature Range	$T_{STG}$	-55 to +150			°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.67	3.57	2.35	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	75	°C/W

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

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	$BV_{DSS}$	700	-	-	V
Drain-Source Leakage Current	$V_{DS} = 700 V, V_{GS} = 0 V$	$I_{DSS}$	-	-	1	uA
	$V_{DS}=560V, T_C=125^\circ C$		-	-	10	
Gate Leakage Current	$V_{GS} = \pm 30 V, V_{DS} = 0 V$	$I_{GSS}$	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	3	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 2.5 A$	$R_{DS(on)}$	-	1.9	2.4	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 2.5 A$	$g_{fs}$	-	4	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$	$C_{iss}$	-	700	-	pF
Output Capacitance		$C_{oss}$	-	69	-	
Reverse Transfer Capacitance		$C_{rss}$	-	6.6	-	
Turn-on Delay Time	$I_D = 5 A, V_{DD} = 350 V, R_G = 10 \Omega (Note 3.4)$	$td(ON)$	-	10	-	nS
Rise Time		$tr$	-	11	-	
Turn-Off Delay Time		$td(OFF)$	-	35	-	
Fall Time		$tf$	-	15	-	
Total Gate Charge	$I_D = 5 A, V_{DD} = 560 V, V_{GS} = 10 V (Note 3.4)$	$Q_G$	-	14.6	-	nC
Gate to Source Charge		$Q_{GS}$	-	3.4	-	
Gate to Drain Charge		$Q_{GD}$	-	7.4	-	

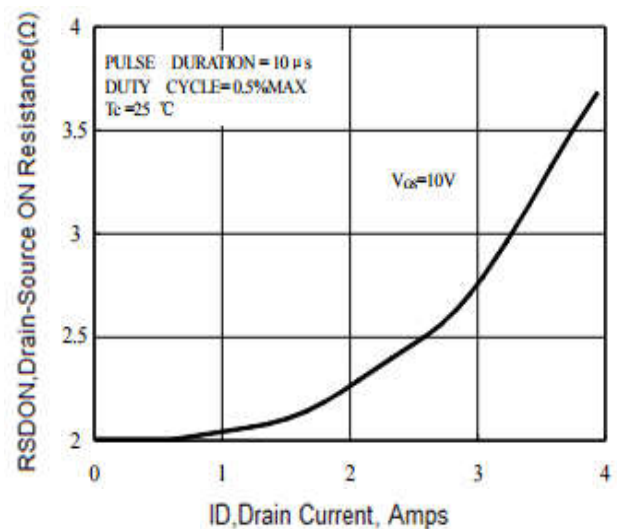
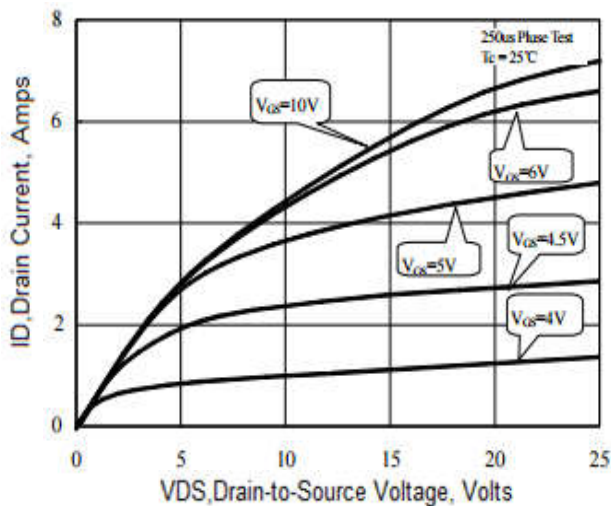
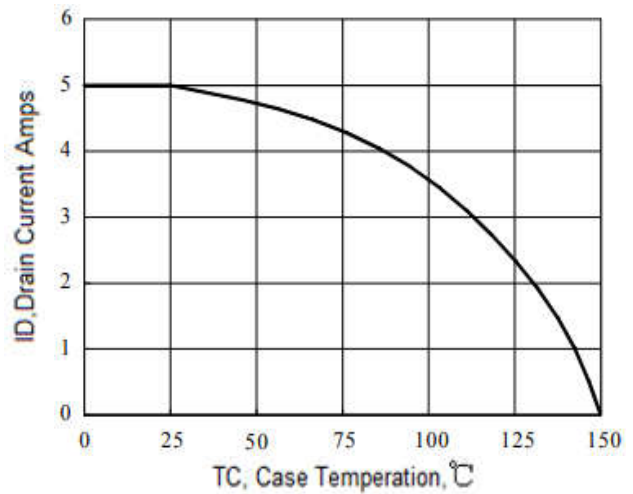
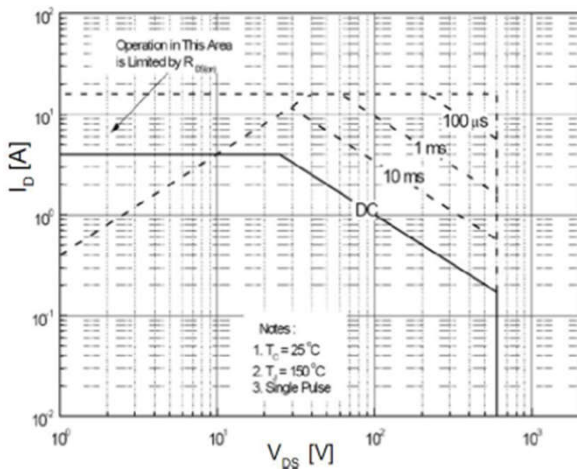
## Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximun Body-Diode Continuous Current		$I_S$	-	-	5	A
Maximun Body-Diode Pulsed Current(Note2)		$I_{SM}$	-	-	20	A
Drain-Source Diode Forward Voltage	$I_{SD} = 5\text{ A}$	$V_{SD}$	-	-	1.5	V
Reverse Recovery Time(Note2)	$I_{SD} = 5\text{ A}, V_{GS} = 0\text{ V},$ $dI_F / dt = 100\text{ A}/\mu\text{s}$	$trr$	-	196	-	nS
Reverse Recovery Charge(Note2)		$Q_{rr}$	-	0.9	-	uC

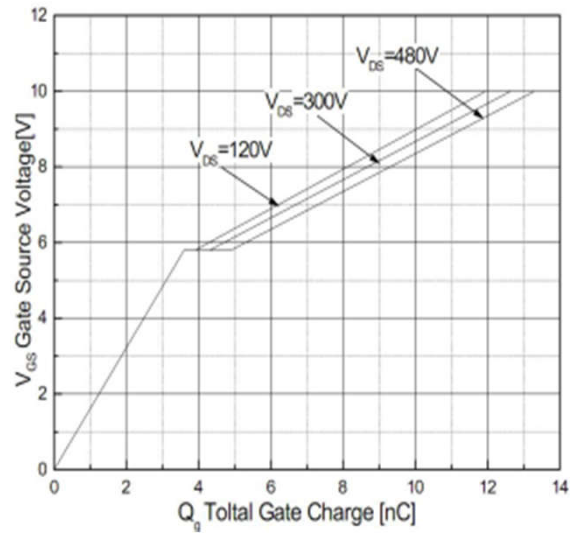
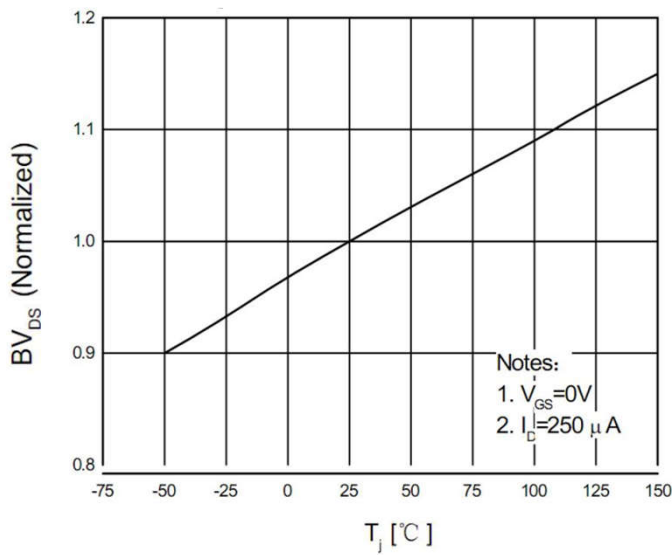
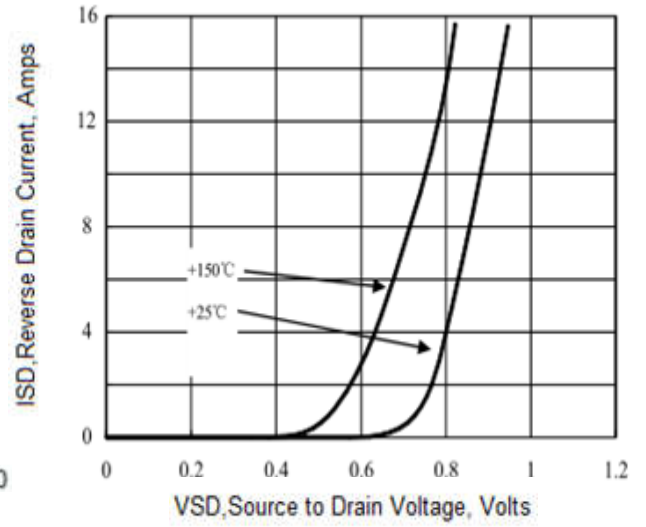
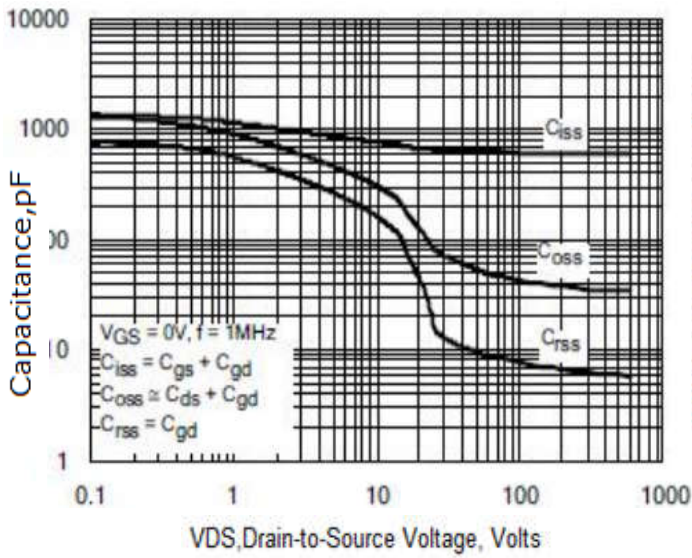
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 5 A, VDD = 50 V, L = 17mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width ≤ 300 μ s, 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.	Max.
	A	2.1	2.5
	B	0.95	1.55
	C	0.4	0.6
	D	6.4	6.7
	D1	5.1	5.8
	E	5.8	6.4
	E1	Typ 2.3	
	E2	Typ 4.6	
	B1	0.6	0.8
	B2	0.75	0.95
	O	--	0.15
	L1	9.0	11.0
	L2	1.3	1.7
L3	0.70	0.95	
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			