

500V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	16A
V_{DSS}	500V
$R_{DS(on)}^{typ}(@V_{GS}=10V)$	$<0.4\Omega$ (Type: 0.33 Ω)

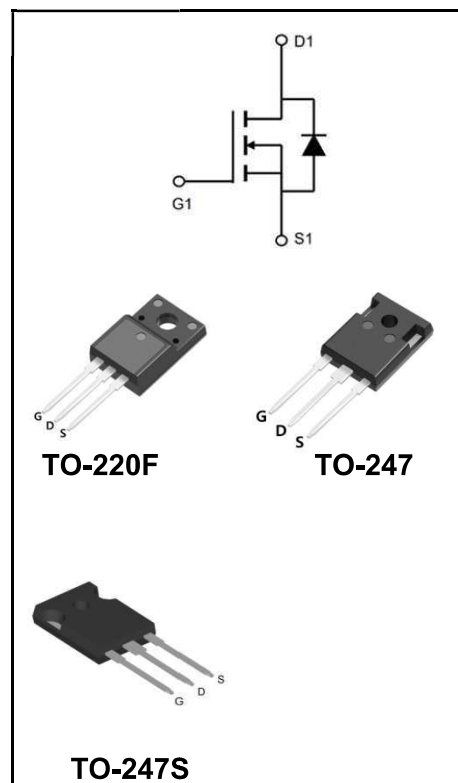
Features

- ♦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 temperature 275°C maximum, 10s per JESD22-106



Product Specification Classification

Part Number	Package	Marking	Pack
YFW16N50AF	TO-220F	YFW 16N50AF XXXXX	50PCS/Tube
YFW16N50AP	TO-247	YFW 16N50AP XXXXX	30PCS/Tube
YFW16N50APS	TO-247S	YFW 16N50APS XXXXX	30PCS/Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		220F	247/247S	
Drain-Source Voltage	V _{DS}	500		V
Gate-Source Voltage	V _{GS}	±30		V
Continue Drain Current	I _D	16		A
-Continuous (TC = 100°C)		10		
Pulsed Drain Current (Note1)	I _{DM}	64		A
Power Dissipation	P _D	45	230	W
-Derate above 25°C		0.4	1.14	W/°C
Single Pulse Avalanche Energy (Note2)	E _{AS}	1000		mJ
Avalanche Current (Note 1)	I _{AR}	16		A
Repetitive Avalanche Energy (Note 1)	E _{AS}	32		mJ
Operating Temperature Range	T _J	150		°C
Storage Temperature Range	T _{STG}	-55 to +150		°C
Thermal Resistance, Junction to Case	R _{θJC}	1.95	0.54	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	62.5	40	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	500	-	-	V
Drain-Source Leakage Current	$V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
	$V_{DS} = 400\text{ V}, T_c = 125^\circ\text{C}$		-	-	10	
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 8\text{ A}$	$R_{DS(on)}$	-	0.33	0.4	Ω
Forward Transconductance	$V_{DS} = 15\text{ V}, I_D = 8\text{ A}$	g_{fs}	-	15	-	S
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{iss}	-	1537	-	pF
Output Capacitance		C_{oss}	-	256	-	
Reverse Transfer Capacitance		C_{rss}	-	16	-	
Turn-on Delay Time	$I_D = 20\text{ A}, V_{DD} = 250\text{ V}, R_G = 10\Omega (\text{Note3,4})$	$t_d(ON)$	-	37	-	nS
Rise Time		t_r	-	70	-	
Turn-Off Delay Time		$t_d(OFF)$	-	89	-	
Fall Time		t_f	-	49	-	
Total Gate Charge	$I_D = 20\text{ A}, V_{DD} = 400\text{ V}, V_{GS} = 10\text{ V} (\text{Note3,4})$	Q_G	-	48	-	nC
Gate to Source Charge		Q_{GS}	-	13.2	-	
Gate to Drain Charge		Q_{GD}	-	18.7	-	

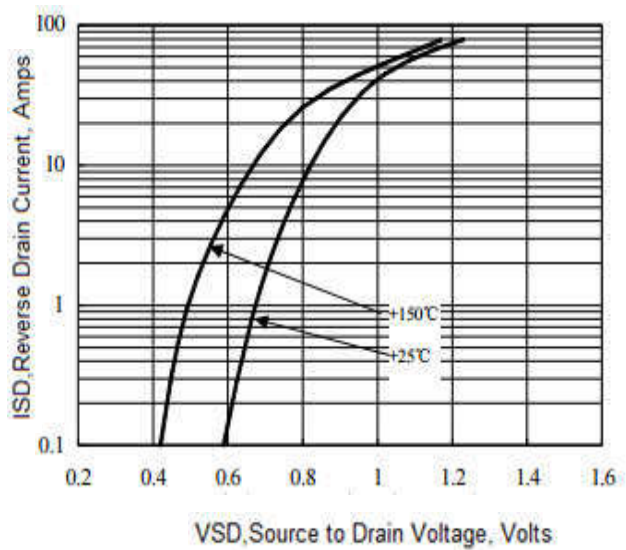
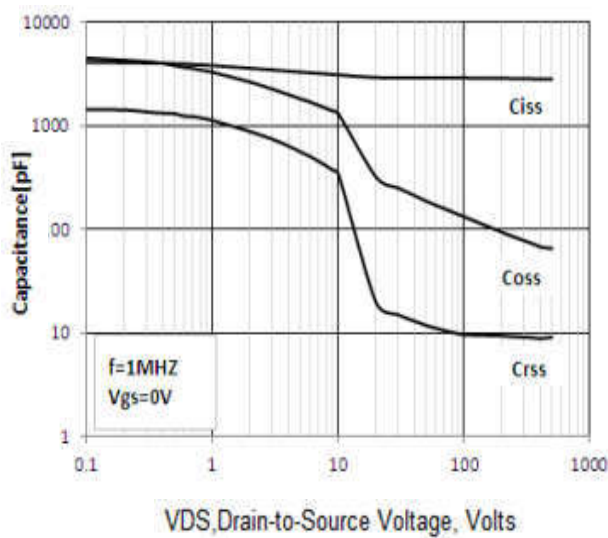
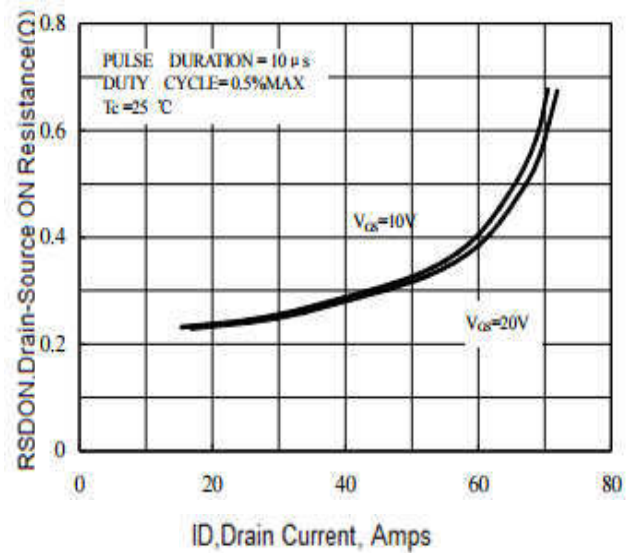
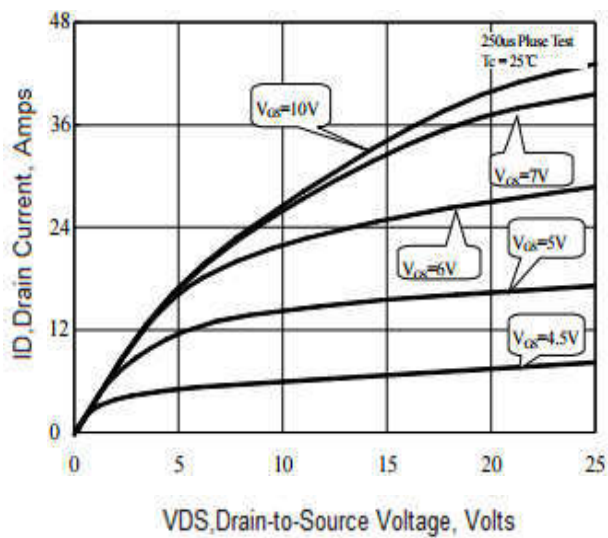
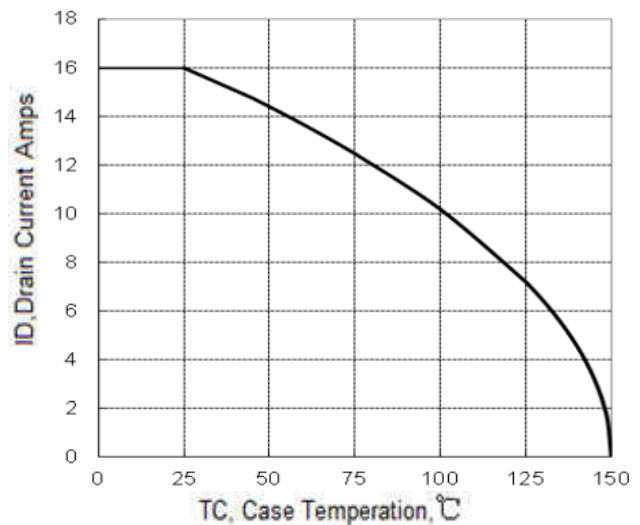
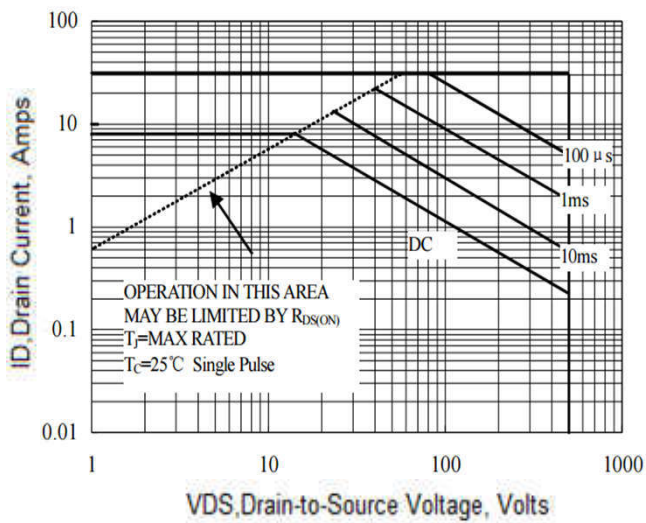
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Body-Diode Continuous Current		I_S	-	-	16	A
Maximum Body-Diode Pulsed Current		I_{SM}	-	-	64	A
Drain-Source Diode Forward Voltage	I_{SD} =20A	V_{SD}	-	-	1.4	V
Reverse Recovery Time	I_{SD} = 20A, V_{GS} = 0 V, dI_F / dt = 100 A/μs (Note3)	trr	-	382	-	nS
Reverse Recovery Charge		Qrr	-	2.7	-	uC

Note:

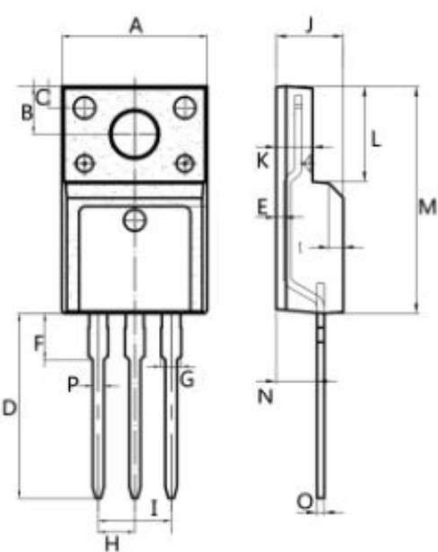
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. **I_{AS}** = 16 A, **V_{DD}** = 50 V, **L** =8mH, **R_G** = 25Ω, starting **T_J** = 25°C.
3. ulse test: Pulse Width ≤300 μ s, Duty Cycle≤2%.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves

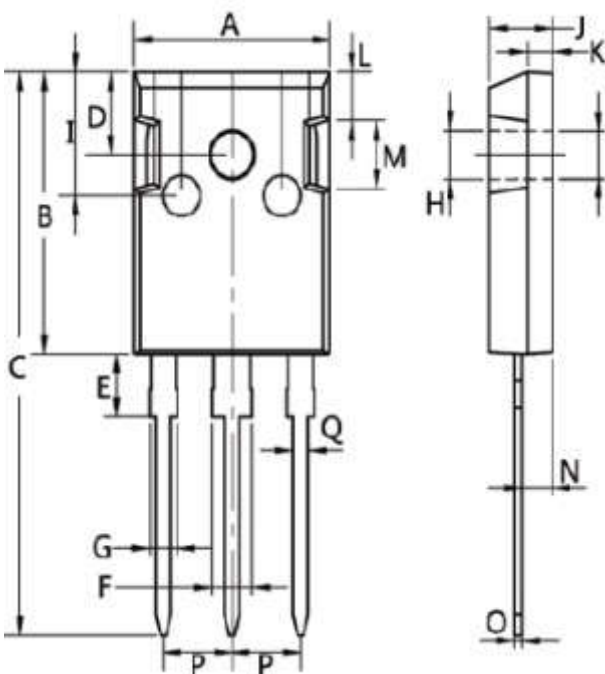


Package Outline Dimensions millimeters

TO-220F

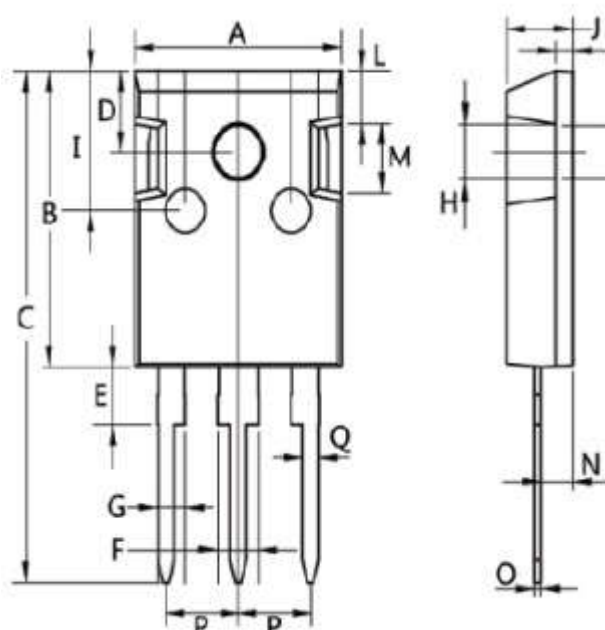
	Dim.	Min.	Max.
	A	9.95	10.25
	B	2.95	3.25
	C	1.25	1.45
	D	12.95	13.25
	E	0.50	0.65
	F	3.1	3.3
	G	1.30	1.45
	H	Typ 2.54	
	I	Typ 5.08	
	J	4.60	4.75
	K	2.50	2.65
	L	6.35	6.55
	M	15.4	16.0
	N	2.75	3.05
	O	0.48	0.52
	P	0.76	0.84
All Dimensions in millimeter			

TO-247

	Dim.	Min.	Max.
	A	15	16
	B	20	21
	C	41	42
	D	5	6
	E	4	5
	F	2.5	3.5
	G	1.75	2.5
	H	3	3.5
	I	8	10
	J	4.9	5.1
	K	1.9	2.1
	L	3.5	4
	M	4.75	5.25
	N	2	3
	O	0.55	0.75
	P	Typ 5.08	
	Q	1.2	1.3
All Dimensions in millimeter			

Package Outline Dimensions millimeters

TO-247S

	Dim.	Min.	Max.
	A	15	16
	B	19.5	20.5
	C	33.5	35.5
	D	5	6
	E	3.5	4.5
	F	2.5	3.5
	G	1.75	2.5
	H	3	4
	I	9	11
	J	4.9	5.1
	K	1	1.3
	L	3.75	4.25
	M	4.75	5.25
	N	1.8	2.2
	O	0.45	0.6
	P	Typ 5.08	
	Q	1.2	1.3
All Dimensions in millimeter			