

500V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	13A
V_{DSS}	500V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<0.55Ω (Type:0.42 Ω)

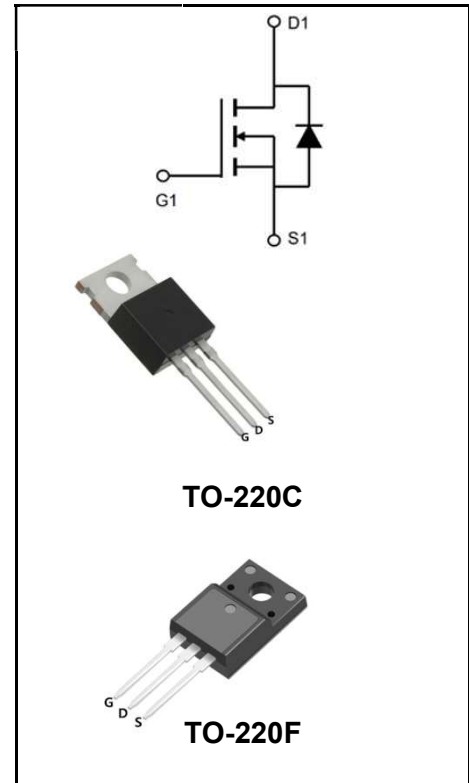
Features

- ◆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
YFW13N50AF	TO-220F	YFW 13N50AF XXXXX	50PCS/Tube
YFW13N50AC	TO-220C	YFW 13N50AC XXXXX	50PCS/Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		220F	220C	
Drain-Source Voltage	V_{DS}	500		V
Gate-Source Voltage	V_{GS}	±30		V
Continue Drain Current	I_D	13		A
-Continuous (TC = 100°C)		8		
Pulsed Drain Current (Note1)	I_{DM}	52		A
Power Dissipation	P_D	60	150	W
-Derate above 25°C		0.4	1.14	W/°C
Single Pulse Avalanche Energy (Note2)	E_{AS}	845		mJ
Avalanche Current (Note 1)	I_{AR}	13		A
Repetitive Avalanche Energy (Note 1)	E_{AS}	17		mJ
Operating Temperature Range	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C
Thermal Resistance, Junction to Case	R_{θJC}	2.6	0.93	°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	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 μA	BV_{DSS}	500	-	-	V
Drain-Source Leakage Current	V _{DS} = 500 V, V _{GS} = 0 V	I_{DSS}	-	-	1	uA
	V _{DS} = 400 V, T _c = 125°C		-	-	10	
Gate Leakage Current	V _{GS} = ± 30 V, V _{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	V_{GS(th)}	2	-	4	V
Drain-Source On-State Resistance	V _{GS} = 10 V, I _D = 6.5 A	R_{DS(on)}	-	0.42	0.55	Ω
Forward Transconductance	V _{DS} = 15 V, I _D = 6.5 A	g_{fs}	-	13	-	S
Input Capacitance	V _{GS} = 0 V, V _{DS} = 25 V, f = 1MHz	C_{iss}	-	1560	-	pF
Output Capacitance		C_{oss}	-	160	-	
Reverse Transfer Capacitance		C_{rss}	-	17	-	
Turn-on Delay Time	I _D = 13 A, V _{DD} = 250 V, R _G = 10Ω(Note3,4)	td(ON)	-	13	-	nS
Rise Time		tr	-	16	-	
Turn-Off Delay Time		td(OFF)	-	40	-	
Fall Time		tf	-	17	-	
Total Gate Charge	I _D = 13 A, V _{DD} = 400V, V _{GS} = 10 V(Note3,4)	Q_G	-	40	-	nC
Gate to Source Charge		Q_{GS}	-	8	-	
Gate to Drain Charge		Q_{GD}	-	16	-	

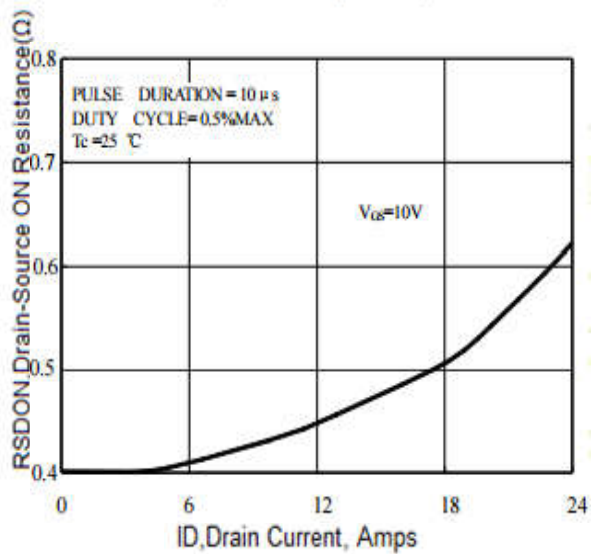
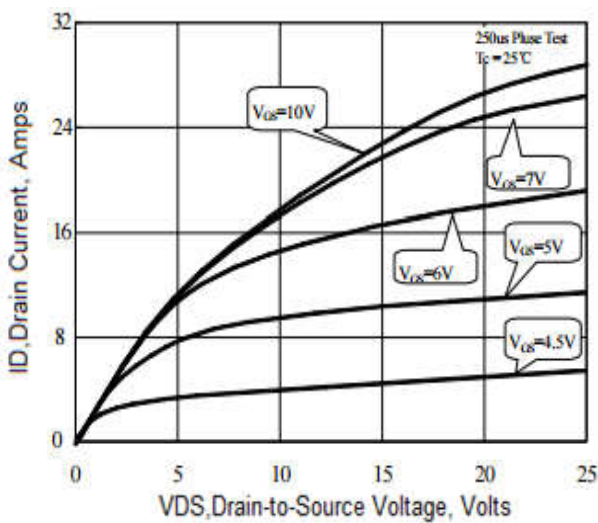
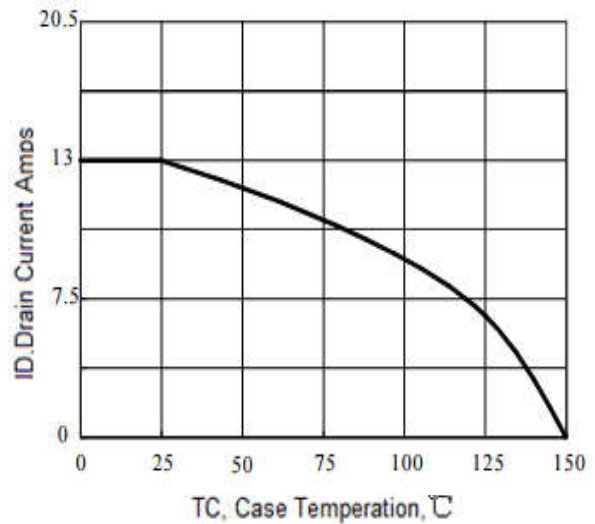
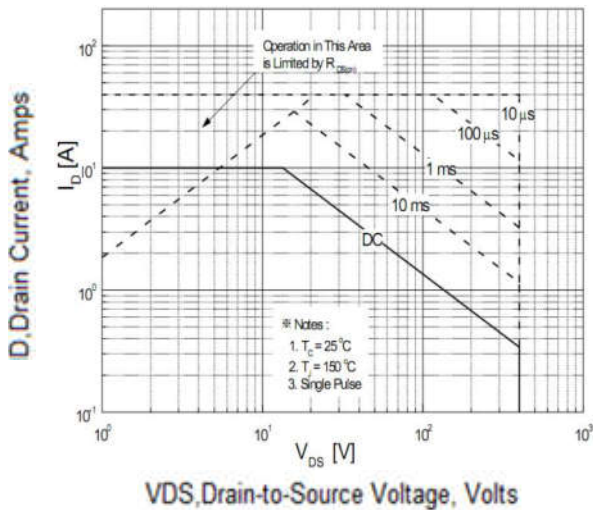
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	13	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	52	A
Drain-Source Diode Forward Voltage	$I_{SD} = 13\text{ A}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$I_{SD} = 13\text{ A}, V_{GS} = 0\text{ V},$ $di_F / dt = 100\text{ A}/\mu\text{s}$	trr	-	262	-	nS
Reverse Recovery Charge		Q_{rr}	-	1.7	-	uC

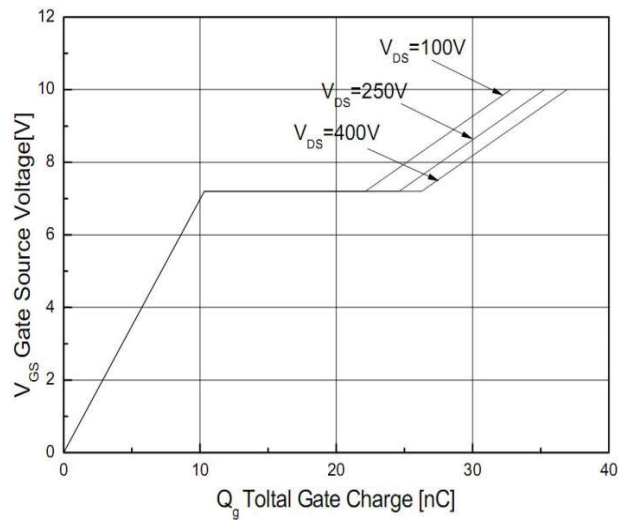
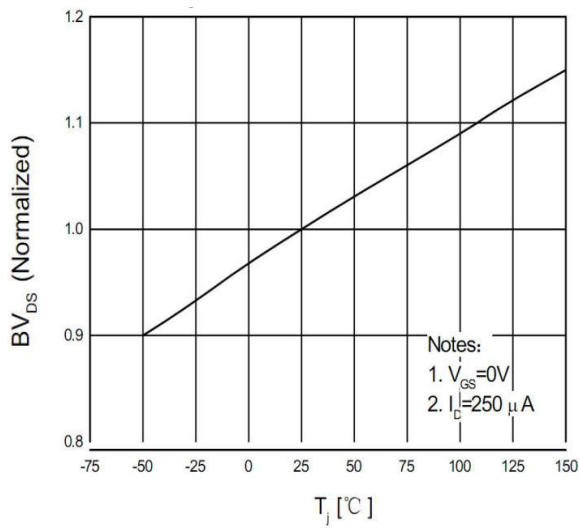
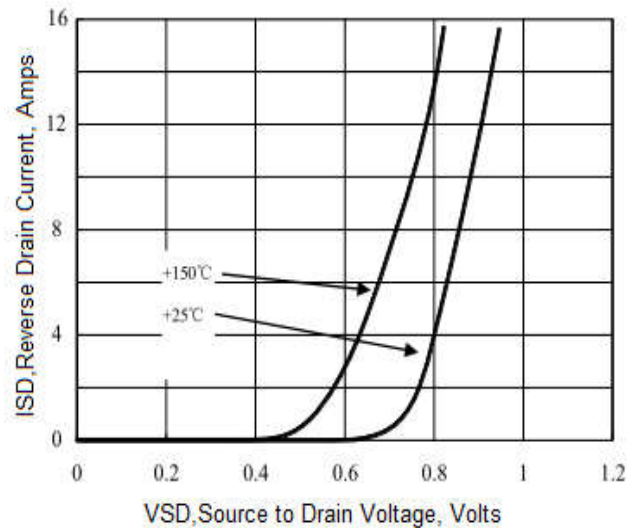
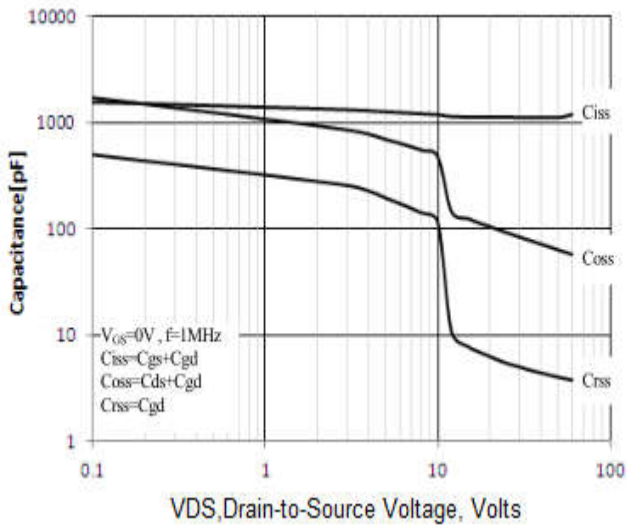
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 13 A, VDD = 50 V, L = 10mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width ≤300 μs, Duty Cycles≤2%.
4. Essentially Independent of Operating Temp

Ratings and Characteristic Curves



Ratings and characteristic Curves



Package Outline Dimensions Millimeters

TO-220C

Dim.	Min.	Max.
A	9.8	10.2
A2	4.8	5.2
C	4.35	4.65
C1	1.45	1.05
D	0.65	0.95
E	3.45	3.75
F	2.85	3.15
G	6.4	6.8
H	0.35	0.65
J	28.68	28.98
K	2.8	3.2
M	1.15	1.45
N	Typical 2.54	
P	2.2	2.6
Q	9	9.4
S	0.15	0.35
U	2.65	2.95
DIA	宽1.50±0.10 深0.50 MAX	
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		