

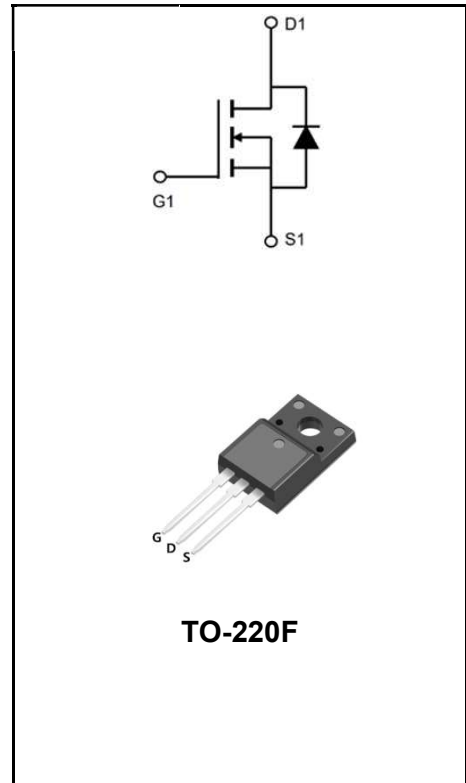
650V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	13A
V_{DSS}	650V
$R_{DS(ON)-typ}(@V_{GS}=10V)$	<0.65Ω (Type:0.52 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
YFW13N65AF	TO-220F	YFW 13N65AF XXXXX	50PCS/Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
Drain-Source Voltage	V_{DS}	650		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	42		W
-Derate above 25°C		0.4	1.14	
Single Pulse Avalanche Energy (Note2)	E_{AS}	550		mJ
Avalanche Current (Note 1)	I_{AR}	10		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}	2.65		°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	62.5		°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

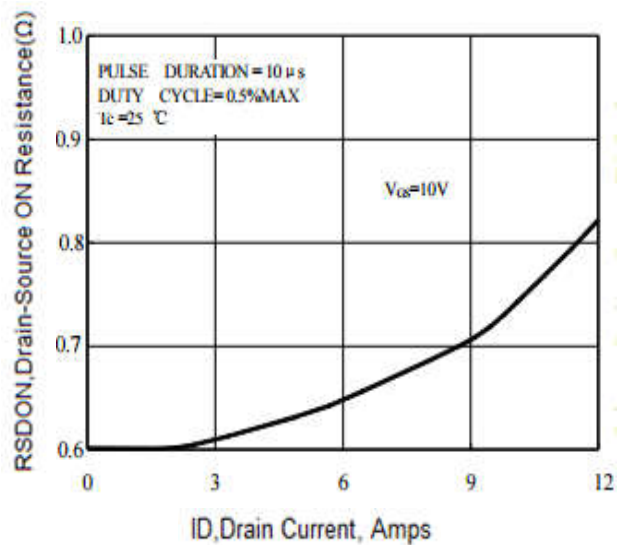
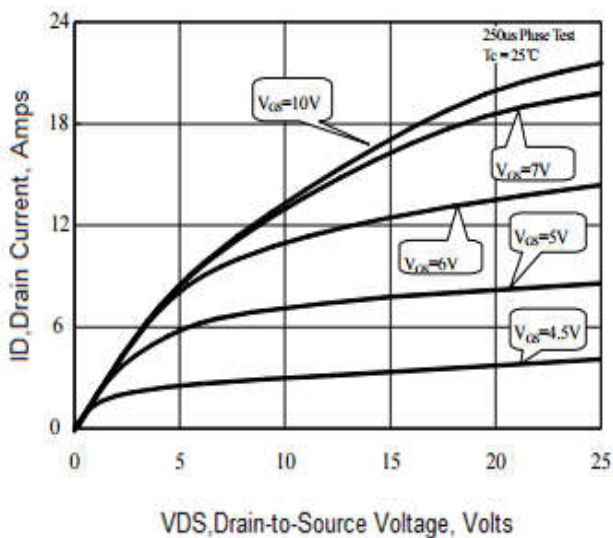
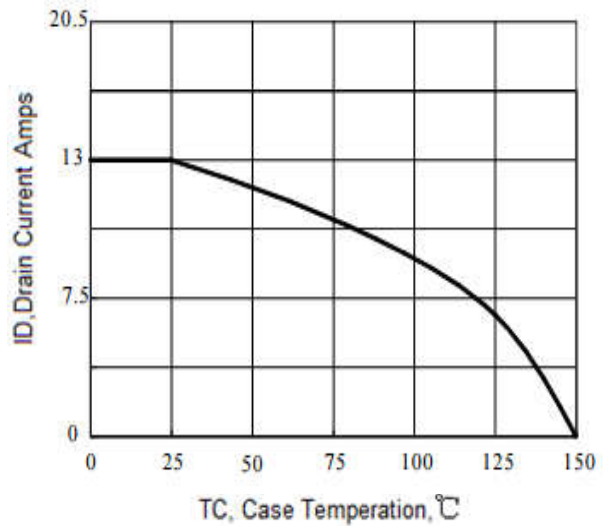
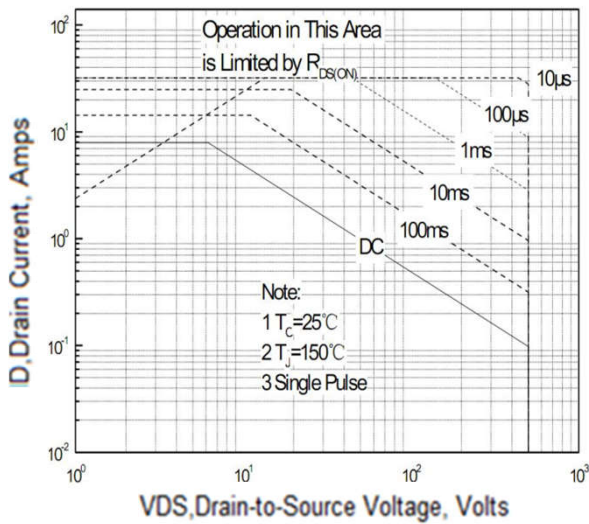
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	V _{DS} = 650 V, V _{GS} = 0 V	I_{DSS}	-	-	1	uA
	V _{DS} = 400 V, T _c = 125°C		-	-	10	
Gate Leakage Current	V _{GS} = ± 30 V, V _{DS} = 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)}	-	0.52	0.65	Ω
Forward Transconductance	V _{DS} = 15 V, I _D = 6.5 A	g_{fs}	-	12	-	S
Input Capacitance	V _{GS} = 0 V, V _{DS} = 25 V, f = 1MHz	C_{iss}	-	1700	-	pF
Output Capacitance		C_{oss}	-	170	-	
Reverse Transfer Capacitance		C_{rss}	-	7	-	
Turn-on Delay Time	I _D = 13 A, V _{DD} = 325 V, R _G = 10Ω(Note3,4)	td(ON)	-	29	-	nS
Rise Time		tr	-	27	-	
Turn-Off Delay Time		td(OFF)	-	65	-	
Fall Time		tf	-	46	-	
Total Gate Charge	I _D = 13 A, V _{DD} = 520V, V _{GS} = 10 V(Note3,4)	Q_G	-	50	-	nC
Gate to Source Charge		Q_{GS}	-	10	-	
Gate to Drain Charge		Q_{GD}	-	14	-	

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

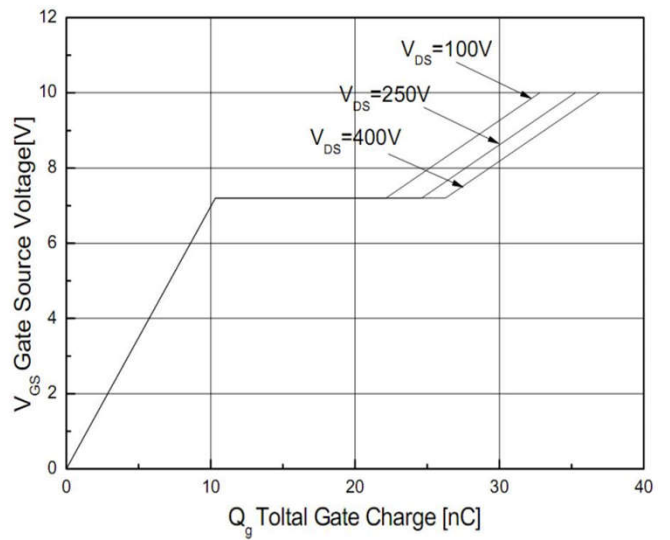
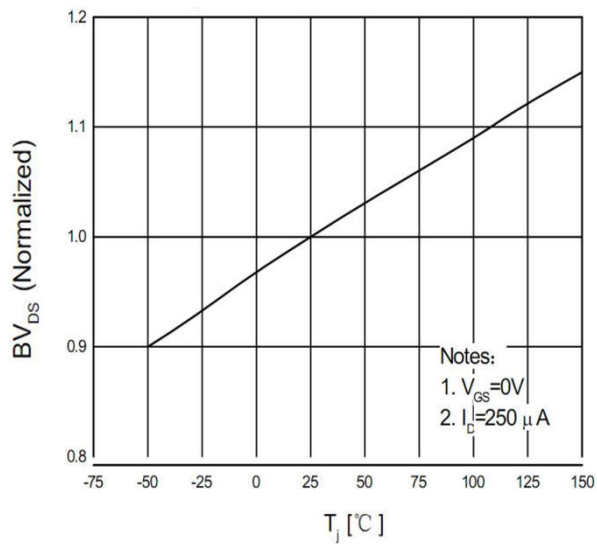
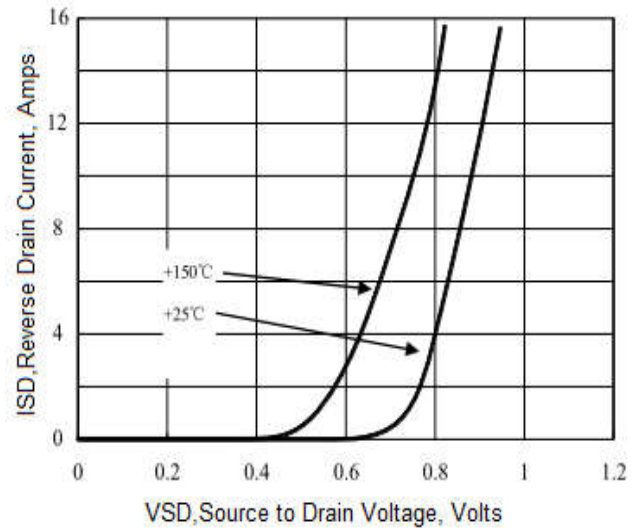
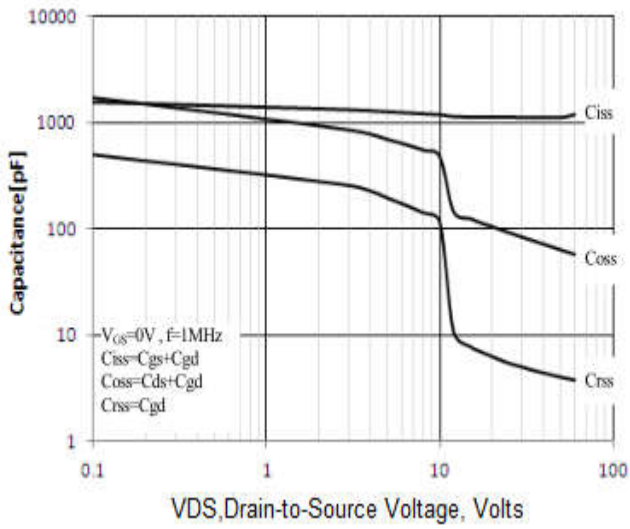
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Body-Diode Continuous Current		I_S	-	-	13	A
Maximum Body-Diode Pulsed Current		I_{SM}	-	-	48	A
Drain-Source Diode Forward Voltage	I _{SD} = 13 A	V_{SD}	-	-	1.4	V
Reverse Recovery Time	I _{SD} = 13 A, V _{GS} = 0 V, di _F / dt = 100 A/μs	trr	-	670	-	nS
Reverse Recovery Charge		Qrr	-	4.4	-	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 μ s, Duty Cycle ≤ 2%.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves


Ratings and Characteristic Curves



Package Outline Dimensions Millimeters

TO-220F

<p>The image shows a technical drawing of a TO-220F package. The left view is a front view showing dimensions A (width), B (height of the top section), C (height of the top section), D (height of the body), F (height of the lead), G (width of the lead), H (width of the lead), and I (width of the lead). The right view is a side view showing dimensions J (height of the top section), K (height of the top section), L (height of the body), M (height of the body), N (height of the lead), O (height of the lead), and Q (height of the lead).</p>	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			