

500V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	500V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<0.68\Omega$ (Type: 0.45Ω)

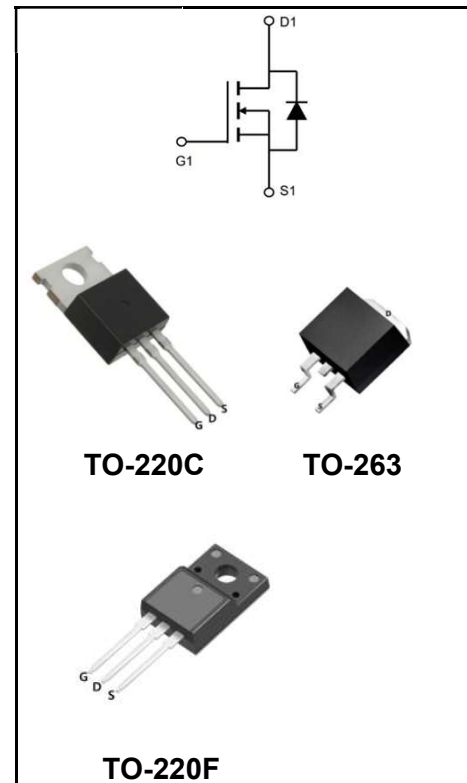
Features

- ♦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
YFW10N50BC	TO-220C	YFW 10N50BC XXXXX	50PCS/Tube
YFW10N50BF	TO-220F(0.5mm)	YFW 10N50BF XXXXX	50PCS/Tube
YFW10N50BF	TO-220F(1.3mm)	YFW 10N50BF XXXXX	50PCS/Tube
YFW10N50BS	TO-263	YFW 10N50BS XXXXX	50PCS/Tube
YFW10N50BS-R	TO-263	YFW 10N50BS XXXXX	800PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value			Units
		220C	220F	263	
Drain-Source Voltage	V _{DS}	500			V
Gate-Source Voltage	V _{GS}	±30			V
Continue Drain Current-Continuous (TC = 25°C)	I _D	10			A
-Continuous (TC = 100°C)		6			
Pulsed Drain Current (Note1)	I _{DM}	40			A
Power Dissipation	P _D	143	48	140	W
-Derate above 25°C		1.14	0.38	1.14	W/°C
Single Pulse Avalanche Energy (Note2)	E _{AS}	650			mJ
Avalanche Current (Note 1)	I _{AR}	10			A
Repetitive Avalanche Energy (Note 1)	E _{AS}	14			mJ
Operating Temperature Range	T _J	150			°C
Storage Temperature Range	T _{STG}	-55 to +150			°C
Thermal Resistance, Junction to Case	R _{θJC}	0.92	2.68	0.92	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	62.5	62.5	62.5	°C/W

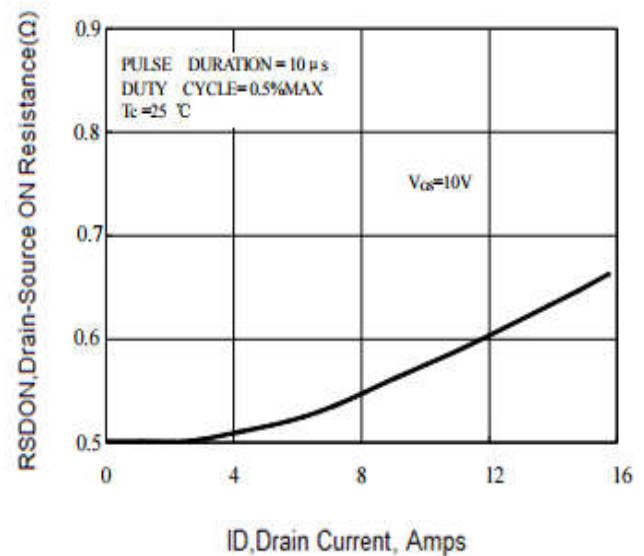
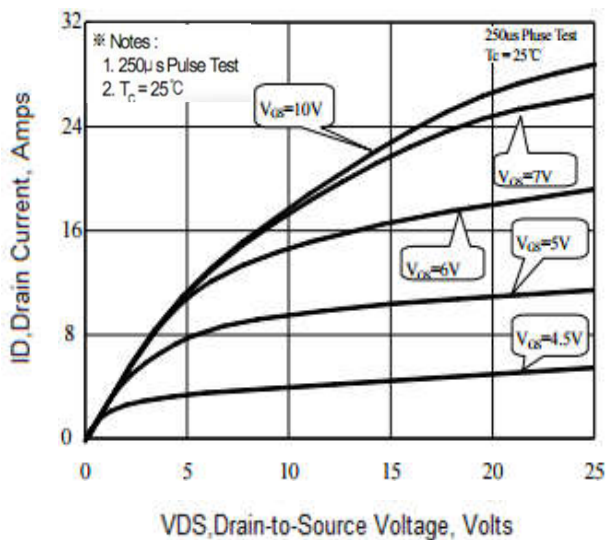
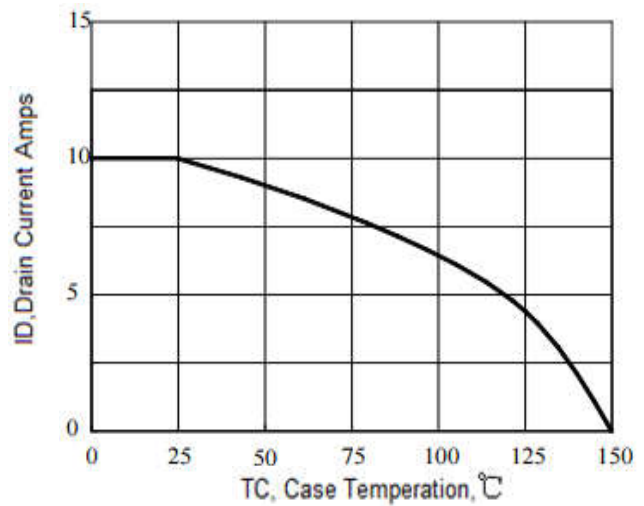
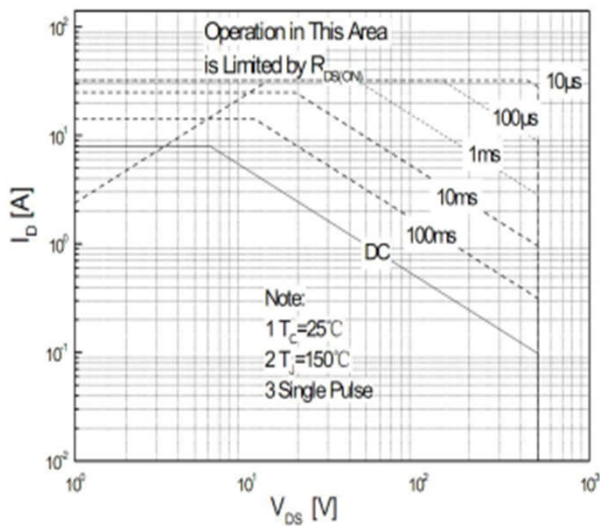
Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 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 = 5 A	R_{DS(on)}	-	0.45	0.68	Ω
Forward Transconductance(Note3)	V _{DS} = 40 V, I _D = 5 A	g_{fs}	-	10	-	S
Input Capacitance	V _{GS} = 0 V, V _{DS} = 25 V, f = 1MHz	C_{iss}	-	1620	-	pF
Output Capacitance		C_{oss}	-	156	-	
Reverse Transfer Capacitance		C_{rss}	-	7	-	
Turn-on Delay Time	I _D = 10 A, V _{DD} = 250 V, R _G = 25Ω(Note3,4)	td(ON)	-	25	-	nS
Rise Time		tr	-	20	-	
Turn-Off Delay Time		td(OFF)	-	50	-	
Fall Time		tf	-	20	-	
Total Gate Charge	I _D = 10 A, V _{DD} = 400V, V _{GS} = 10 V(Note3,4)	Q_G	-	32	-	nC
Gate to Source Charge		Q_{GS}	-	8	-	
Gate to Drain Charge		Q_{GD}	-	12	-	

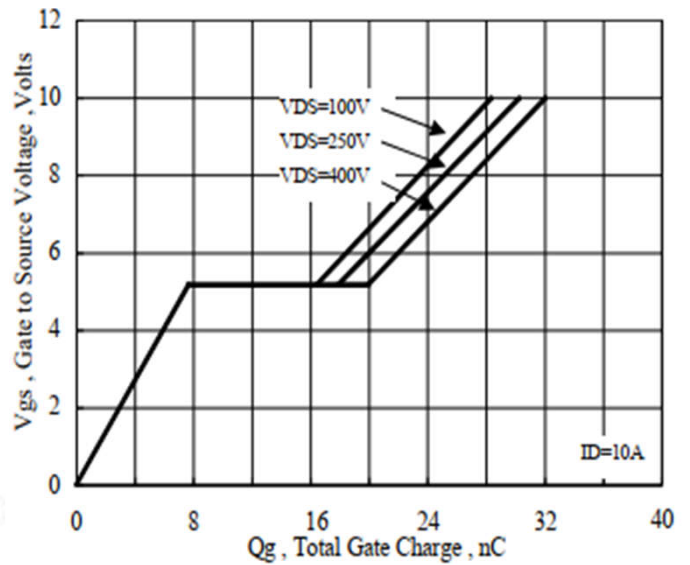
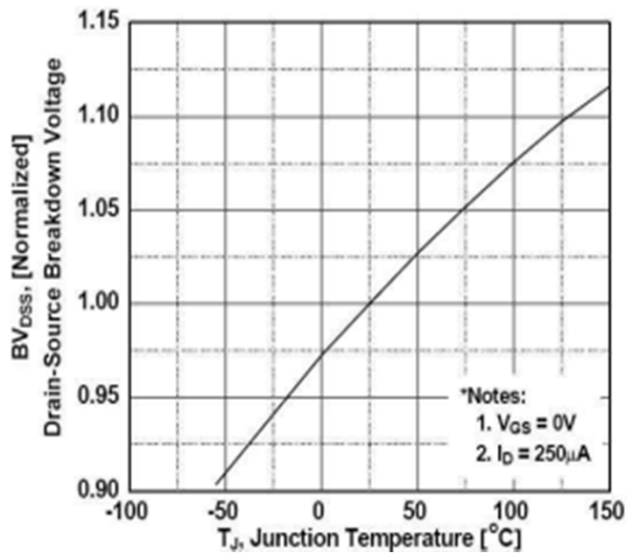
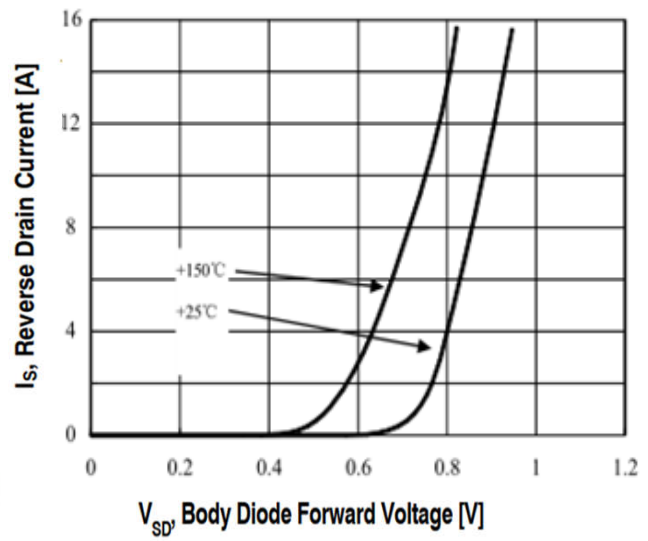
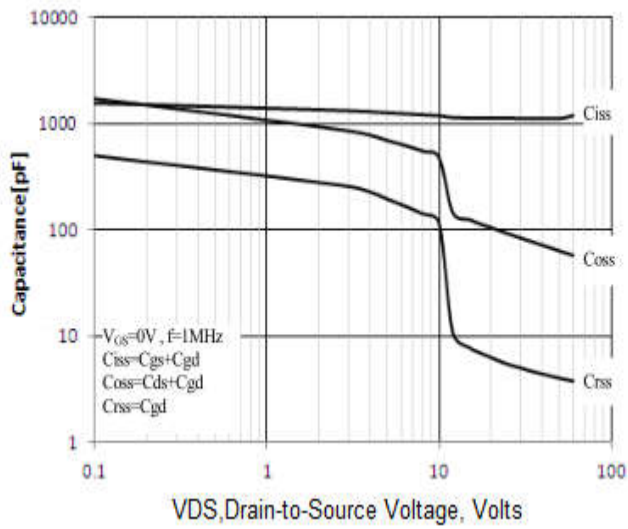
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	10	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	40	A
Drain-Source Diode Forward Voltage	$I_{SD} = 10\text{ A}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$I_{SD} = 10\text{ A}$, $V_{GS} = 0\text{ V}$, $dI_F / dt = 100\text{ A}/\mu\text{s}$ (Note3)	t_{rr}	-	398	-	nS
Reverse Recovery Charge		Q_{rr}	-	2.5	-	uC

Ratings and Characteristic Curves



Ratings and Characteristic Curves



Package Outline Dimensions millimeters

TO-220C

The image shows a technical drawing of a TO-220C package. The front view (left) shows a rectangular body with a circular mounting hole. Dimensions include A (total width), A2 (hole diameter), F (flange width), E (flange thickness), D (body diameter), S (lead thickness), M (lead length), N (lead pitch), and DIA (lead diameter). The side view (right) shows the package profile with dimensions C (lead length), C1 (lead thickness), P (lead diameter), and H (total height).

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

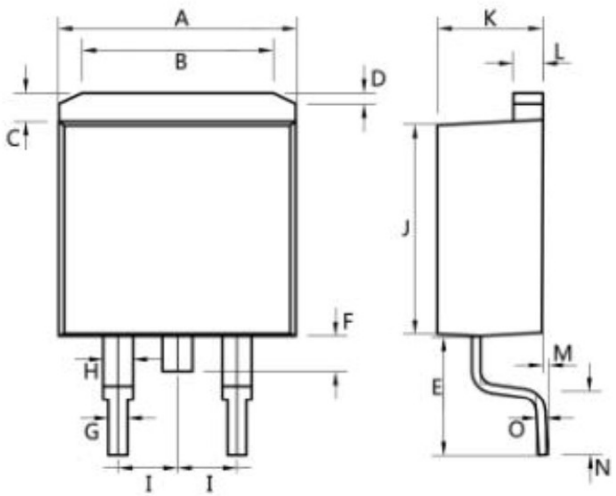
The image shows a technical drawing of a TO-220F package. The front view (left) shows a rectangular body with a central circular feature and four mounting holes. Dimensions A, B, C, D, E, F, G, H, and I are indicated. The side view (right) shows the profile of the package, including the mounting tab and the lead wires. Dimensions J, K, L, M, N, O, and P are indicated.

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			