

650V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

MAIN CHARACTERISTICS

I_D	12A
V_{DSS}	650V
R_{DS(on)-typ}(@V_{GS}=10V)	<0.74Ω(Type:0.59Ω)

FEATURES

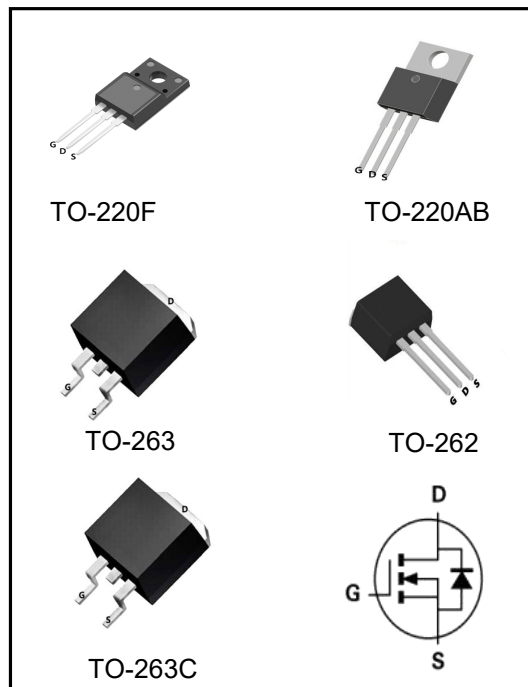
- ♦Fast Switching
- ♦Low ON Resistance
- ♦Low Gate Charge
- ♦100% Single Pulse avalanche energy Test

Application

- ♦Power switch circuit of adaptor and charger.

MECHANICAL DATA

- ♦Case: Molded plastic
- ♦Mounting Position: Any
- ♦Molded Plastic: UL Flammability Classification Rating 94V-0
- ♦Lead free in compliance with EU RoHS 2011/65/EU directive
- ♦Solder bath temperature 275℃ maximum,10s per JESD 22-B106



Product Specification Classification

Part Number	Package	Marking	Pack
YFW12N65AF	TO-220F	YFW 12N65AF XXXXX	50PCS/Tube/1000pcs/box
YFW12N65AT	TO-220AB	YFW 12N65AT XXXXX	50PCS/Tube/1000pcs/box
YFW12N65AS	TO-263	YFW 12N65AS XXXXX	800PCS/Tape/1600pcs/box
YFW12N65T	TO-262	YFW 12N65T XXXXX	50PCS/Tube/1000pcs/box
YFW12N65ASC	TO-263C	YFW 12N65ASC XXXXX	800PCS/Tape/1600pcs/box

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value		Unit
		220F	220AB/263/262/263C	
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	± 30		V
Continue Drain Current	I_D	12		A
Pulsed Drain Current (Note1)	I_{DM}	48		A
Power Dissipation	P_D	42	150	W
Single Pulse Avalanche Energy(Note2)	E_{AS}	750		mJ
Operating Temperature Range	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C
Thermal Resistance, Junction to	$R_{\theta JC}$	2.98	0.83	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	°C/W

Note1:Pulse test: 300 μ s pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

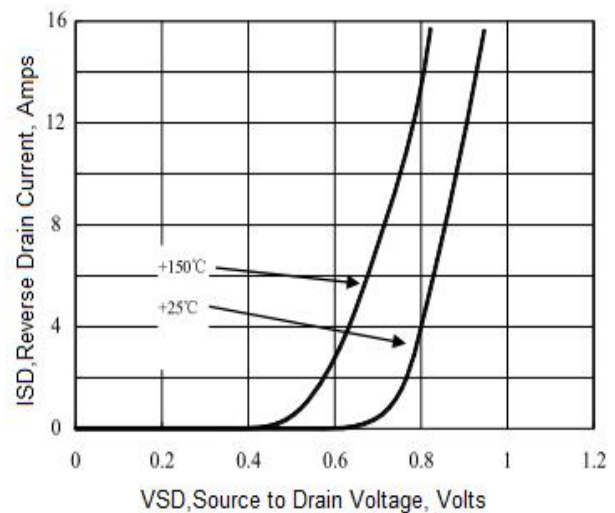
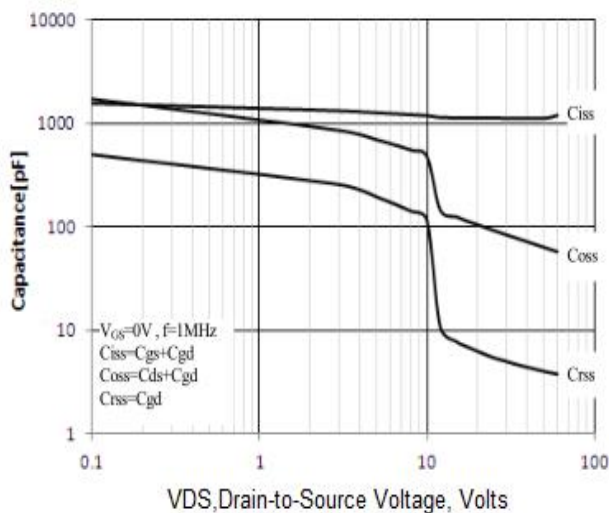
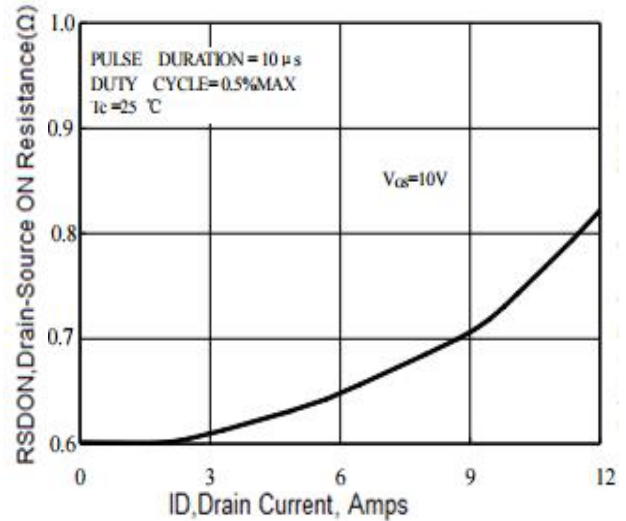
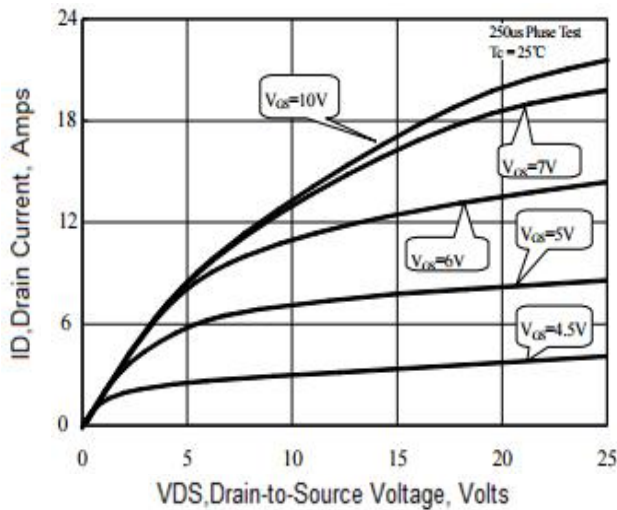
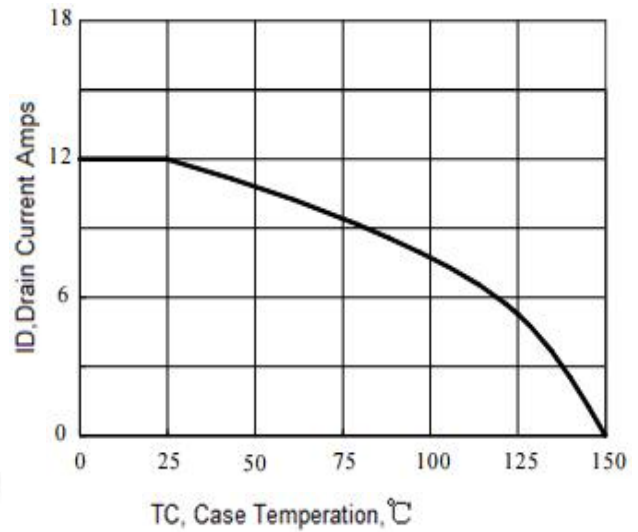
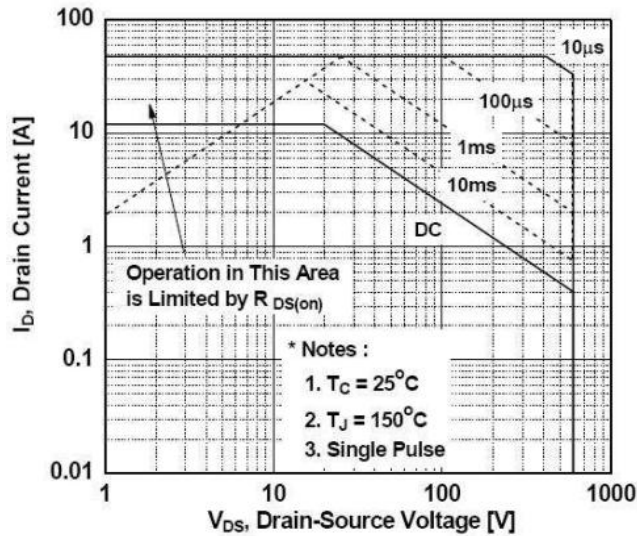
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250 \mu A$	BV_{DSS}	650	690	-	V
Drain-Source Leakage Current	$V_{DS}=650V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
	$V_{DS}=520V, T_c=125^\circ C$		-	-	10	μA
Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS}=10V, I_D=6A$	$R_{DS(on)}$	-	0.59	0.74	Ω
Forward Transconductance	$V_{DS}=40V, I_D=6A$	g_{fs}	-	11	-	S
Input Capacitance	$V_{GS}=0V, V_{DS}=25V, f = 1 MHz$	C_{iss}	-	2450	-	pF
Output Capacitance		C_{oss}	-	140	-	pF
Reverse Transfer Capacitance		C_{rss}	-	9	-	pF
Turn-on Delay Time	$I_D = 12 A, V_{DD} = 325V, R_G = 10 \Omega$ (Note3,4)	$t_{d(ON)}$	-	29	-	ns
Rise Time		t_r	-	27	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	65	-	ns
Fall Time		t_f	-	46	-	ns
Total Gate Charge	$I_D = 12 A, V_{DD} = 520 V, V_{GS} = 10 V$ (Note3,4)	Q_G	-	50	-	nC
Gate to Source Charge		Q_{GS}	-	10	-	nC
Gate to Drain Charge		Q_{GD}	-	14	-	nC

Electrical Characteristics at Tc=25°C unless otherwise specified

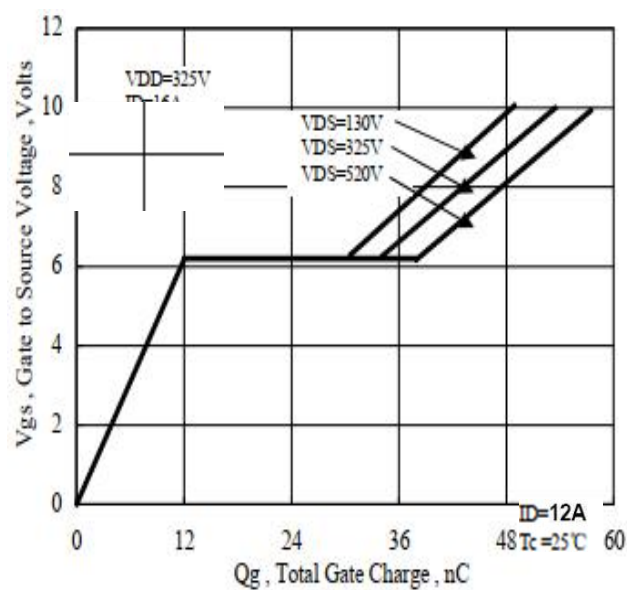
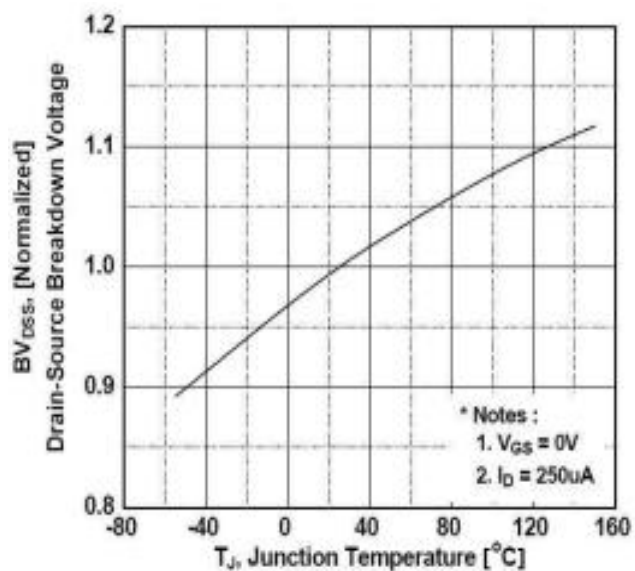
Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	12	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	48	A
Drain-Source Diode Forward Voltage	$I_{SD} = 12A$	V_{SD}	-	-	1.5	V
Reverse Recovery Time	$I_{SD}=12A, V_{GS}=0V,$	t_{rr}	-	670	-	ns
Reverse Recovery Charge	$dI_F / dt = 100 A/\mu s$ (Note3)	Q_{rr}	-	4.4	-	μC

Note2:Pulse test: 300 μ s pulse width, 2 % duty cycle

Ratings and Characteristic Curves

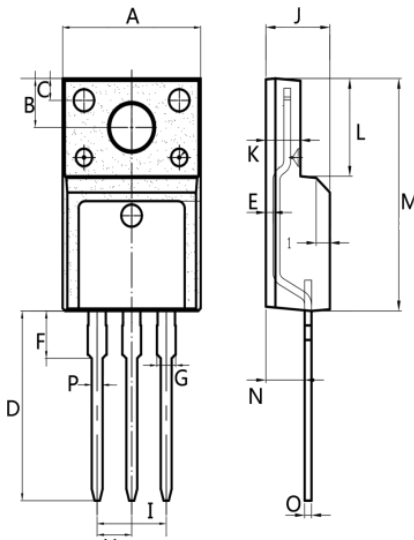


Ratings and Characteristic Curves

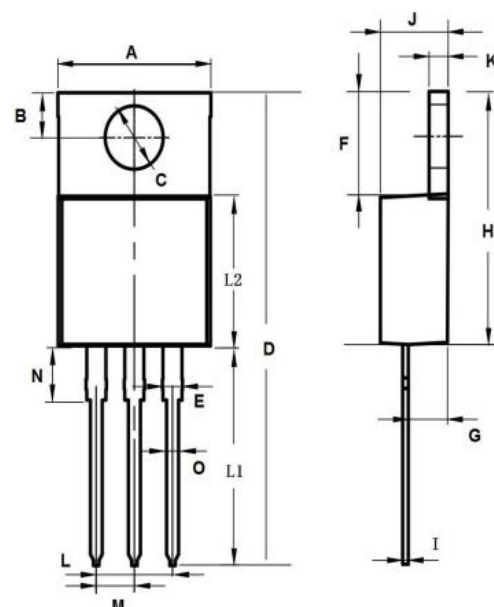


Package Outline Dimensions Millimeters

TO-220F

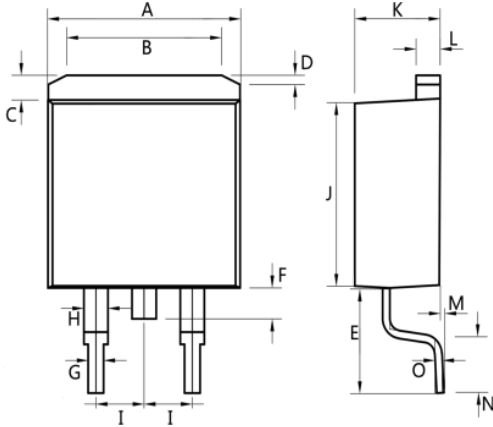
	Dim.	Min.	Max.
	A	9.95	10.35
	B	2.95	3.25
	C	1.25	1.45
	D	12.65	12.95
	E	0.4	0.6
	F	2.8	3.5
	G	1.3	1.45
	H	Typ 2.54	
	I	Typ 5.08	
	J	4.6	4.75
	K	2.45	2.65
	L	6.45	6.85
	M	15.4	16
	N	2.75	3.05
	O	0.45	0.55
	P	0.7	0.9
All Dimensions in millimeter			

TO-220AB

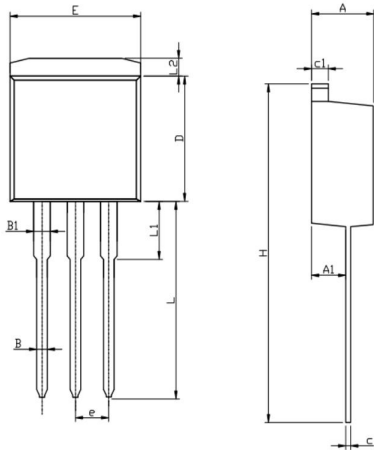
	Dim.	Min.	Max.
	A	10.15	10.35
	B	2.5	2.95
	C	3.7	3.9
	D	28.5	29.5
	E	1.2	1.4
	F	6.2	6.55
	G	2.85	3.25
	H	15	16
	I	0.35	0.42
	J	4.3	4.55
	K	1.2	1.4
	L	Typ5.08	
	L1	13	14
	L2	8.5	9.5
	M	Typ2.54	
	N	2.8	3.5
	O	0.7	0.9
All Dimensions in millimeter			

Package Outline Dimensions Millimeters

TO-263

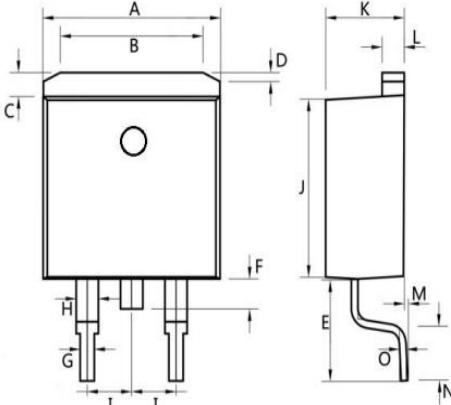
	Dim.	Min.	Max.
	A	10.1	10.35
	B	6	8
	C	1.2	1.5
	D	0.55	1
	E	4.3	5.3
	F	1.4	1.6
	G	0.75	0.85
	H	1.2	1.5
	I	Typ2.54	
	J	8.5	9.5
	K	4.3	4.55
	L	1.25	1.35
	M	0.02	0.23
	N	2.2	2.8
	O	0.3	0.4
All Dimensions in millimeter			

TO-262

	Dim.	Min.	Max.
	A	4.4	4.6
	A1	2.4	2.6
	B	0.75	0.85
	B1	1.2	1.4
	C	0.35	0.42
	C1	1.25	1.35
	D	8.5	9.5
	E	10.15	10.35
	H	23	25
	L	13	14
	L1	2.8	3.5
	L2	1.2	1.5
All Dimensions in millimeter			

Package Outline Dimensions Millimeters

TO-263C

	Dim.	Min.	Max		
	A	9.8	10.2		
	B	6.1	6.7		
	C	1.1	1.4		
	D	0.5	1.0		
	E	4.6	5.0		
	F	1.4	1.6		
	G	0.7	0.9		
	H	1.17	1.37		
	I	Typ2.54			
	J	9	9.2		
	K	4.3	4.7		
	L	1.25	1.35		
	M	0.02	0.23		
	N	2.2	2.8		
o				0.45	0.55
All Dimensions in millimeter					