

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

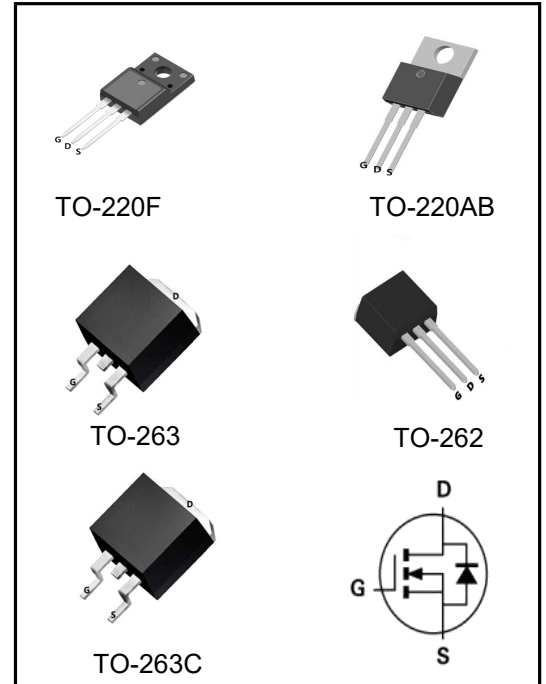
- ◆Fast Switching
- ◆Low ON Resistance
- ◆Low Gate Charge
- ◆100% Single Pulse avalanche energy Test

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°C 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 _{θJC}	2.98	0.83	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	62.5	62.5	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

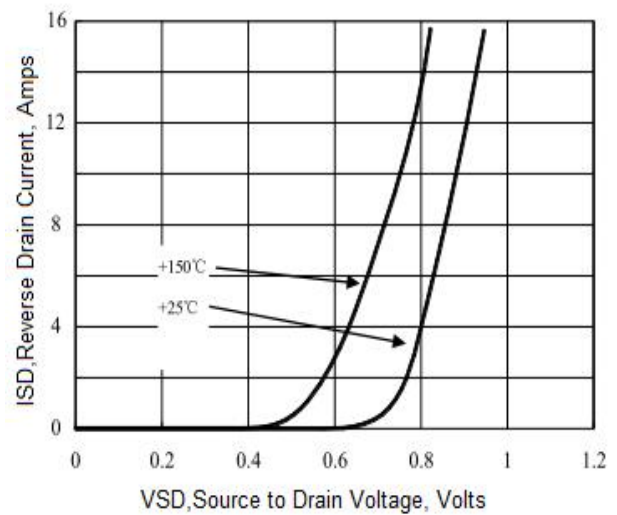
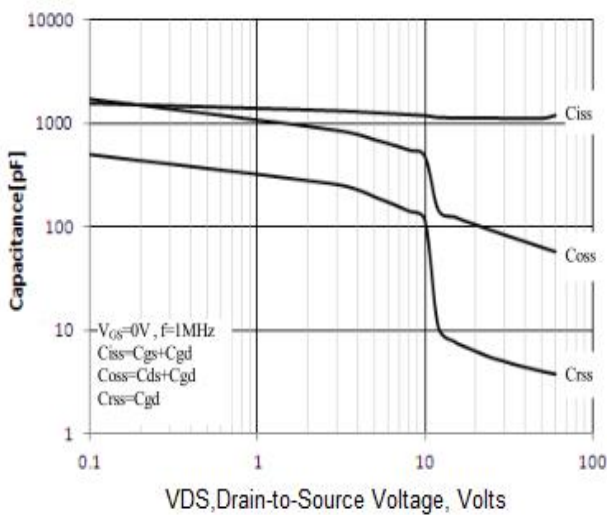
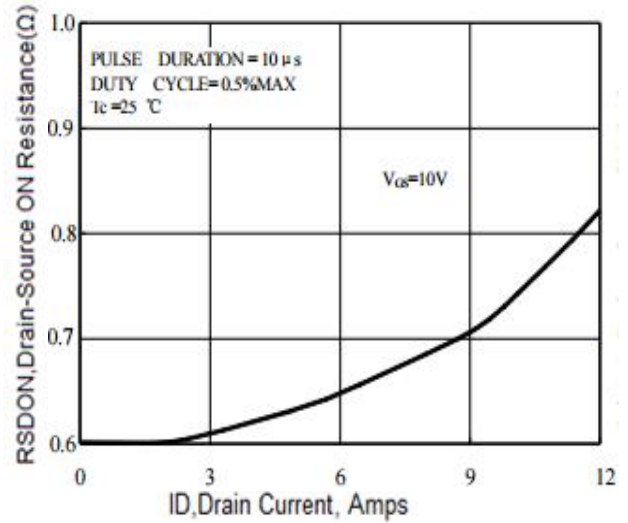
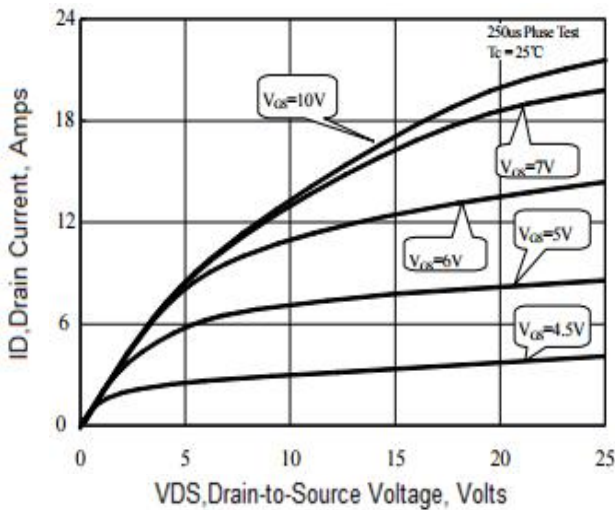
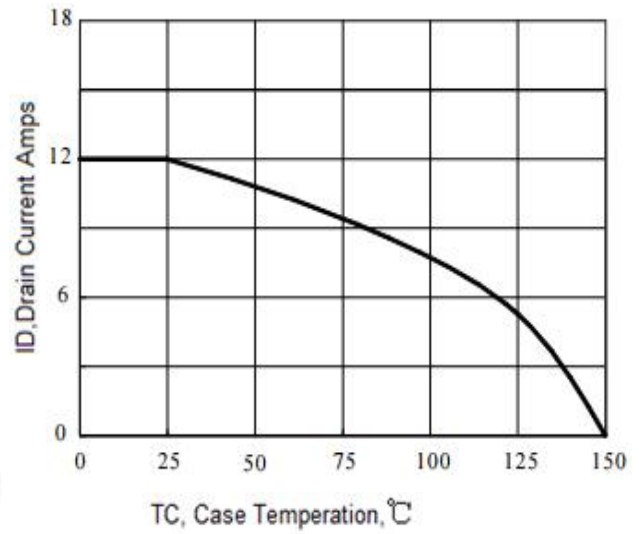
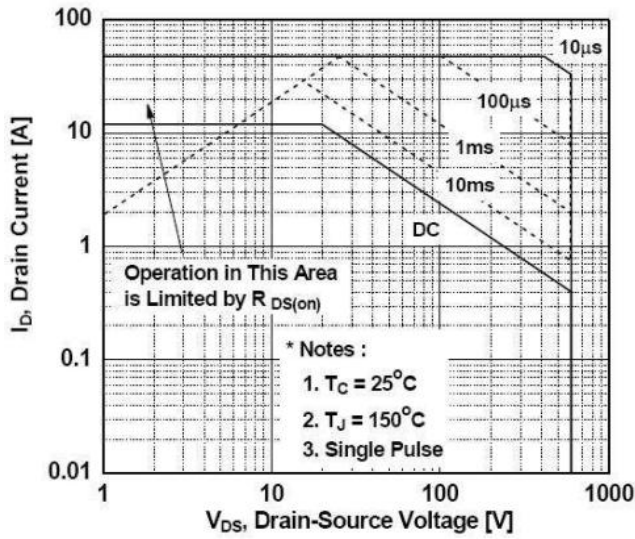
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	BV _{DSS}	650	690	-	V
Drain-Source Leakage Current	V _{DS} =650V, V _{GS} =0V	I _{DSS}	-	-	1	μA
	V _{DS} 520V, T _c =125°C		-	-	10	μA
Gate Leakage Current	V _{GS} =±30V, V _{DS} =0V	I _{GSS}	-	-	±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} =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 Ω (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

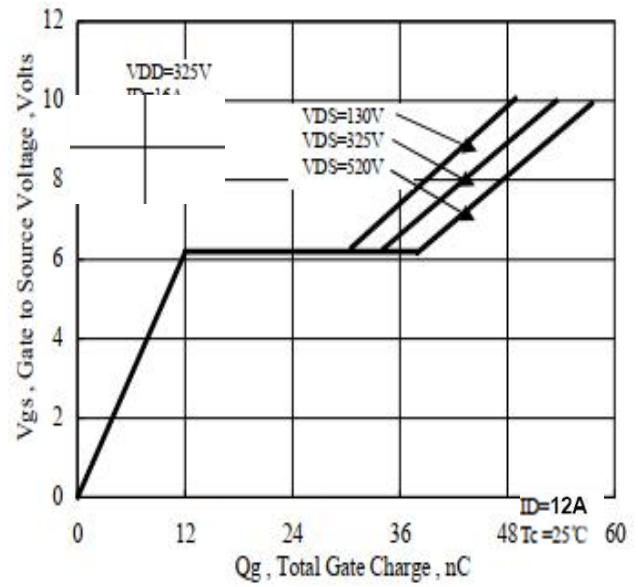
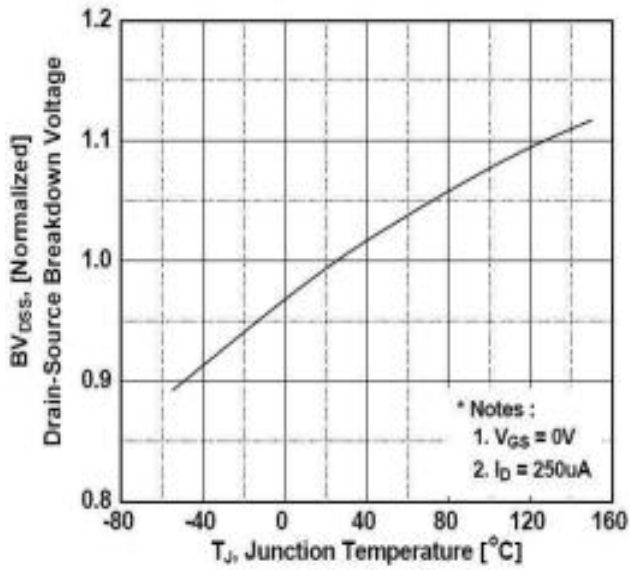
Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I _S	-	-	12	A
Maximun Body-Diode Pulsed Current		I _{SM}	-	-	48	A
Drain-Source Diode Forward Voltage	I _{SD} =12A	V _{SD}	-	-	1.5	V
Reverse Recovery Time	I _{SD} =12A, V _{GS} =0V,	t _{rr}	-	670	-	ns
Reverse Recovery Charge	dI _F / dt = 100 A/μs (Note3)	Q _{rr}	-	4.4	-	μC

Note2:Pulse test: 300 μs 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
	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			

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