

650V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	8A
V_{DSS}	650V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<1.15\Omega$ (Type: 0.95 Ω)

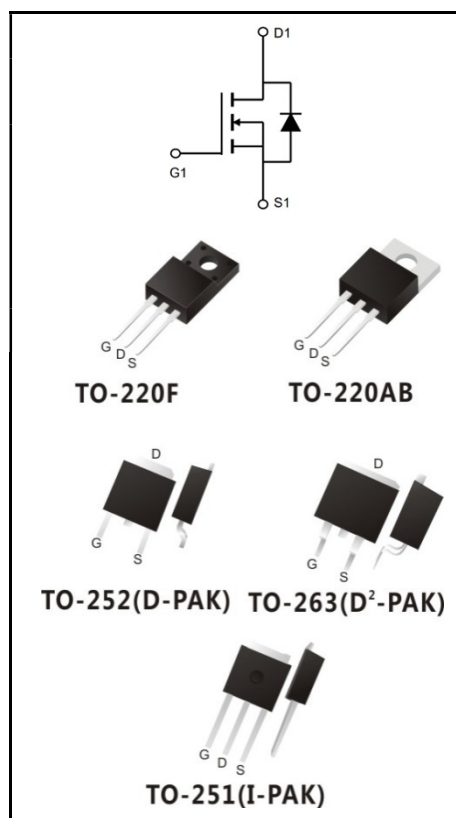
Features

- ♦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 temperature 275°C maximum, 10s per JESD22-106



Product Specification Classification

Part Number	Package	Marking	Pack
YFW8N65AT	TO-220AB	YFW 8N65AT XXXXX	50PCS/Tube
YFW8N65AF	TO-220F	YFW 8N65AF XXXXX	50PCS/Tube
YFW8N65AS	TO-263	YFW 8N65AS XXXXX	50PCS/Tube
YFW8N65AS-R	TO-263	YFW 8N65AS XXXXX	800PCS/Tape
YFW8N65AMJ	TO-251	YFW 8N65AMJ XXXXX	80PCS/Tube
YFW8N65AD	TO-252	YFW 8N65AD XXXXX	2500PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value			Units
		220AB/263	220F	251/252	
Drain-Source Voltage	V _{DS}	650			V
Gate-Source Voltage	V _{GS}	±30			V
Continue Drain Current	I _D	8			A
-Continuous (TC = 100°C)		5.6			
Pulsed Drain Current (Note1)	I _{DM}	32			A
Power Dissipation	P _D	100	48	100	W
-Derate above 25°C		1.28	0.41	1.16	W/°C
Single Pulse Avalanche Energy (Note2)	E _{AS}	600			mJ
Avalanche Current (Note 1)	I _{AR}	8			A
Repetitive Avalanche Energy (Note 1)	E _{AS}	15			mJ
Operating Temperature Range	T _J	150			°C
Storage Temperature Range	T _{STG}	-55 to +150			°C
Thermal Resistance, Junction to Case	R _{θJC}	0.83	2.44	0.76	°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	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	650	-	-	V
Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$ (Referenced to 25°C)	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	-	0.65	-	V/°C
Drain-Source Leakage Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
	$V_{DS} = 520\text{ V}, T_c = 125^\circ\text{C}$		-	-	10	
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 4\text{ A}$	$R_{DS(on)}$	-	0.95	1.15	Ω
Forward Transconductance	$V_{DS} = 20\text{ V}, I_D = 4\text{ A}$	g_{fs}	-	4.7	-	S
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V},$ $f = 1\text{ MHz}$	C_{iss}	-	1100	-	pF
Output Capacitance		C_{oss}	-	45	-	
Reverse Transfer Capacitance		C_{rss}	-	7	-	
Turn-on Delay Time	$I_D = 8\text{ A}, V_{DD} = 325\text{ V},$ $R_G = 10\Omega$ (Note3,4)	$td(ON)$	-	15.7	-	nS
Rise Time		tr	-	25.1	-	
Turn-Off Delay Time		$td(OFF)$	-	27.2	-	
Fall Time		tf	-	7.9	-	
Total Gate Charge	$I_D = 8\text{ A}, V_{DD} = 520\text{ V},$ $V_{GS} = 10\text{ V}$ (Note3,4)	Q_G	-	32	-	nC
Gate to Source Charge		Q_{GS}	-	5	-	
Gate to Drain Charge		Q_{GD}	-	9	-	

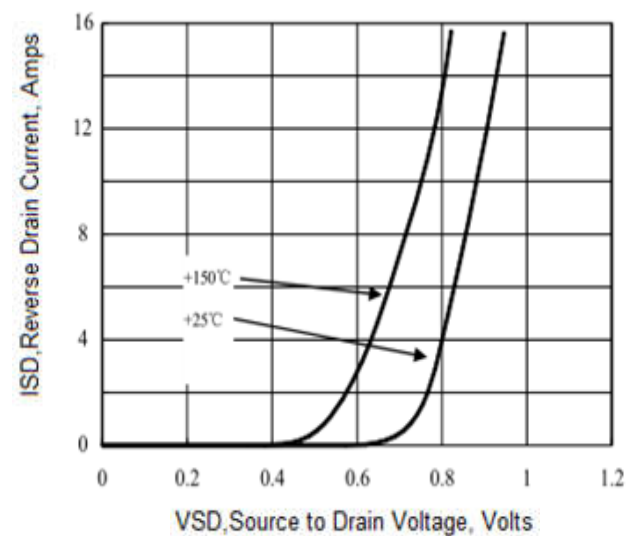
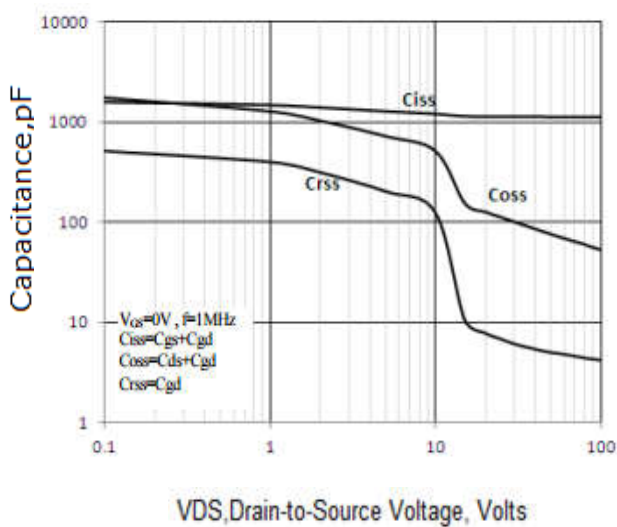
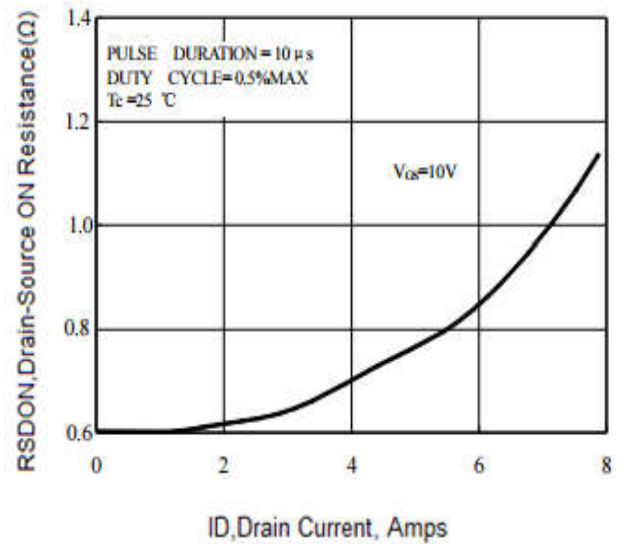
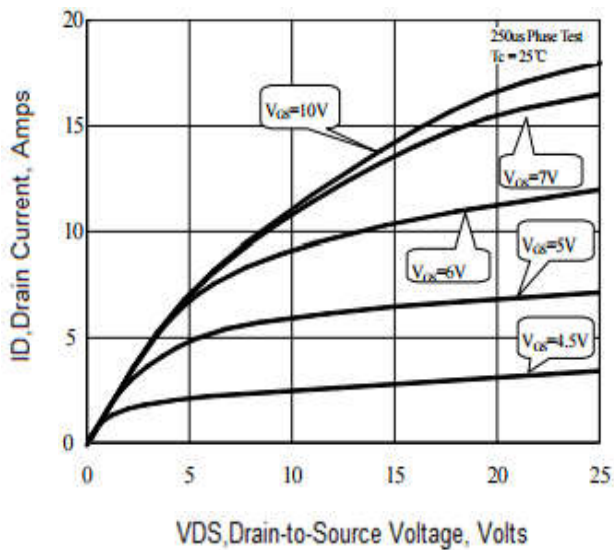
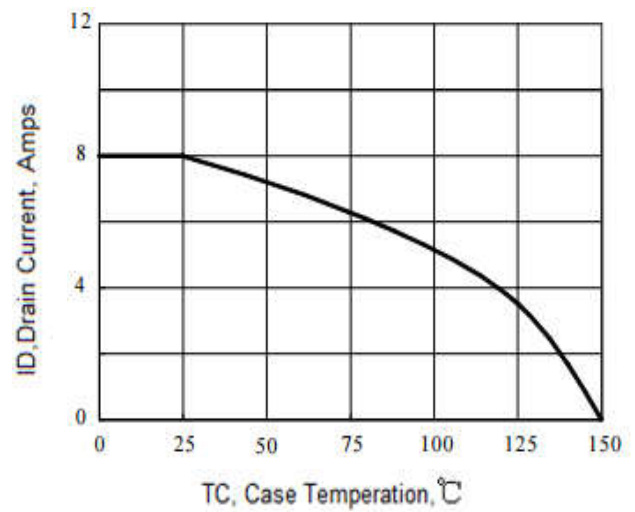
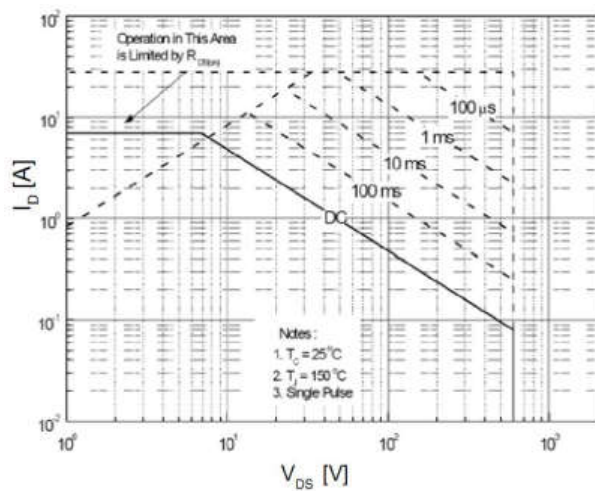
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Body-Diode Continuous Current		I_S	-	-	8	A
Maximum Body-Diode Pulsed Current		I_{SM}	-	-	32	A
Drain-Source Diode Forward Voltage	$I_{SD} = 8\text{ A}$	V_{SD}	-	-	1.5	V
Reverse Recovery Time	$I_{SD} = 8\text{ A}, V_{GS} = 0\text{ V},$ $dI_F / dt = 100\text{ A}/\mu\text{s}$	trr	-	562	-	nS
Reverse Recovery Charge		Qrr	-	2.3	-	uC

Note:

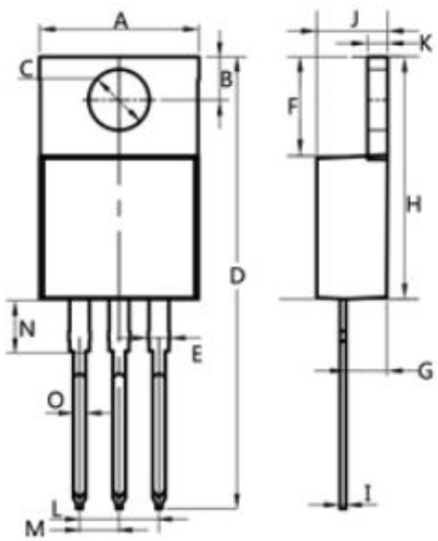
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 8A, VDD = 50 V, L = 19mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves

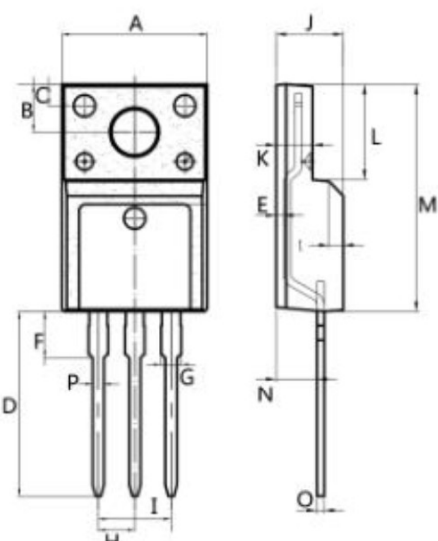


Package Outline Dimensions Millimeters

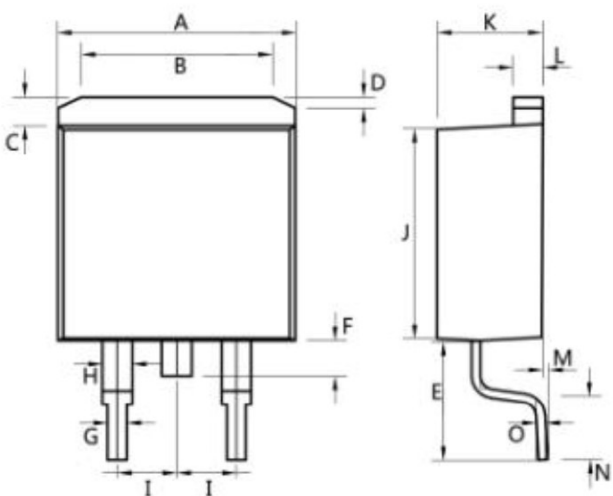
TO-220AB

	Dim.	Min.	Max.
	A	10.15	10.35
	B	2.65	2.95
	C	3.70	3.90
	D	28.5	29.5
	E	1.30	1.45
	F	6.35	6.55
	G	2.9	3.3
	H	15.0	16.0
	I	0.38	0.42
	J	4.45	4.55
	K	1.25	1.35
	L	Typ 5.08	
	M	Typ 2.54	
	N	3.1	3.3
	O	0.76	0.84
All Dimensions in millimeter			

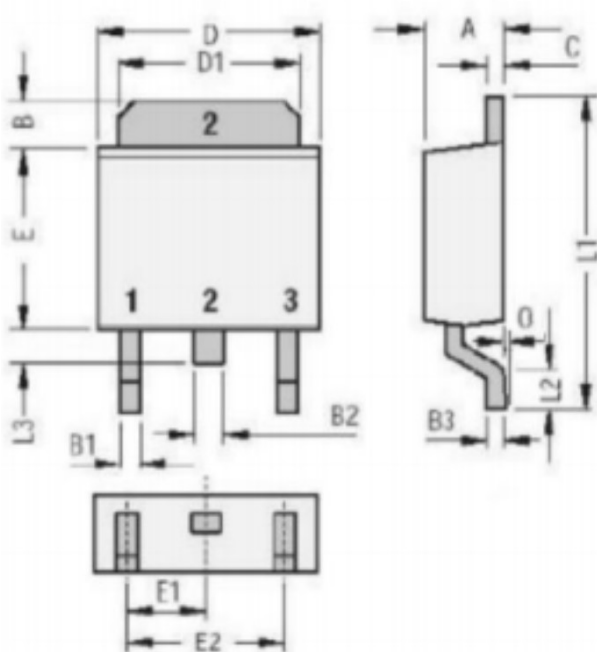
TO-220F

	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			

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			

TO-252

	Dim.	Min.	Max.
	A	2.1	2.5
	B	0.95	1.55
	C	0.4	0.6
	D	6.4	6.7
	D1	5.1	5.8
	E	5.8	6.4
	E1	Typ 2.3	
	E2	Typ 4.6	
	B1	0.6	0.8
	B2	0.75	0.95
	O	--	0.15
	L1	9.0	11.0
	L2	1.3	1.7
	L3	0.70	0.95
All Dimensions in millimeter			

Package Outline Dimensions Millimeters

TO-251

	Dim.	Min.	Max.
	A	2.2	2.4
	A2	0.95	1.15
	A3	0.45	0.65
	b	0.65	0.85
	c	0.45	0.55
	D	6.45	6.75
	D2	5.2	5.4
	E	5.8	6
	E2	0.95	1.25
	e	Typ 2.3	
	e1	Typ 4.6	
	L	4	4.2
	L1	1.2	1.5
All Dimensions in millimeter			