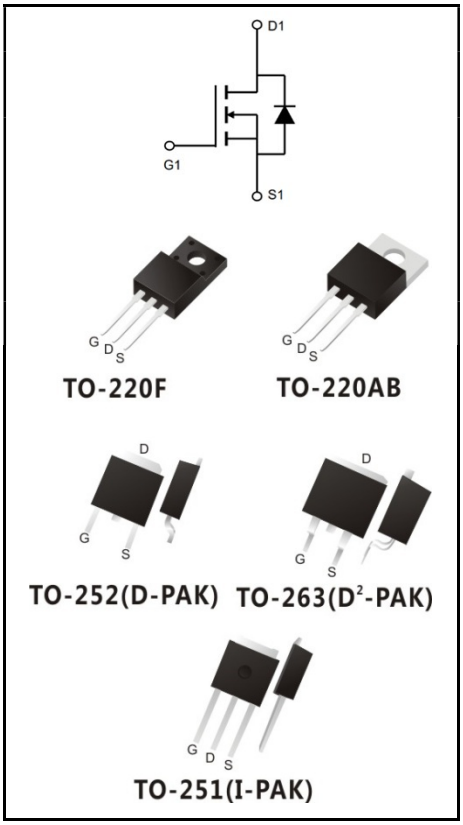
650V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	4A
V_{DSS}	650V
R_{DSON}-typ(@V_{GS}=10V)	<2.8Ω(Type:2.5 Ω)



lead-free ROHS

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℃maximum,10s per JESD22-106

Product Specification Classification

Part Number	Package	Marking	Pack
YFW4N65AT	TO-220AB	YFW 4N65AT XXXXX	50PCS/Tube
YFW4N65AF	TO-220F(0.5mm)	YFW 4N65AF XXXXX	50PCS/Tube
YFW4N65AS	TO-263	YFW 4N65AS XXXXX	50PCS/Tube
YFW4N65AS-R	TO-263	YFW 4N65AS XXXXX	800PCS/Tape
YFW4N65AMJ	TO-251	YFW 4N65AMJ XXXXX	80PCS/Tube
YFW4N65AD	TO-252	YFW 4N65AD 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 -Continuous (TC = 25°C)	I_D	4			A
- Continuous(Tc=100°C)		2.6			
Pulsed Drain Current (Note1)	I_{DM}	16			A
Power Dissipation (TC = 25°C)	P_D	75	33	51	W
-Derate above 25°C		0.62	0.26	0.39	W/°C
Single Pulse Avalanche Energy (Note2)	E_{AS}	220			mJ
Avalanche Current (Note 1)	I_{AR}	4			A
Repetitive Avalanche Energy (Note 1)	E_{AR}	10			mJ
Operating Temperature Range	T_J	150			°C
Storage Temperature Range	T_{STG}	-55 to +150			°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.26	3.94	2.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	83	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

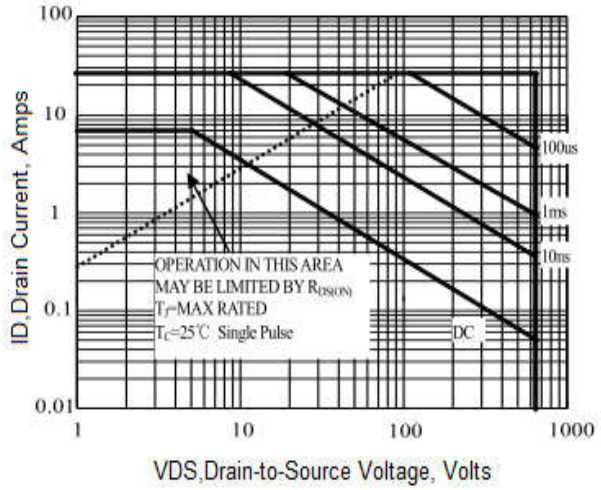
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250 μA	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	V_{DS} = 650 V, V_{GS} = 0 V	I_{DSS}	-	-	1	uA
	V_{DS}=520V, Tc=125°C		-	-	10	
Gate Leakage Current	V_{GS} = ± 30 V, VDS = 0 V	I_{GSS}	-	-	±100	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 = 2 A	$R_{DS(on)}$	-	2.5	2.8	Ω
Forward Transconductance(Note3)	V_{DS} = 40 V, I_D = 2A	gfs	-	3.5	-	S
Input Capacitance	V_{GS} = 0 V, V_{DS} = 25 V, f = 1KHz	C_{iss}	-	550	-	pF
Output Capacitance		C_{oss}	-	53	-	
Reverse Transfer Capacitance		C_{rss}	-	4	-	
Turn-on Delay Time	I_D =4 A, V_{DD} =325 V, R_G= 25 Ω	td(ON)	-	14	-	nS
Rise Time		tr	-	16	-	
Turn-Off Delay Time		td(OFF)	-	32	-	
Fall Time		tf	-	11	-	
Total Gate Charge	I_D = 4A, V_{DD} = 520 V, V_{GS} = 10 V(Note3.4)	Q_G	-	15	-	nC
Gate to Source Charge		Q_{GS}	-	3	-	
Gate to Drain Charge		Q_{GD}	-	7	-	

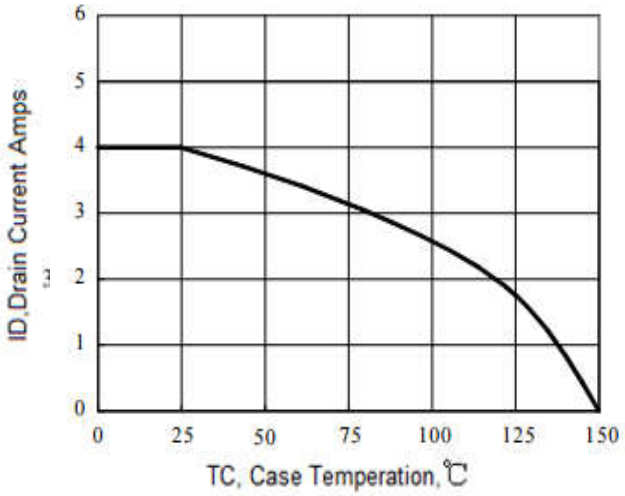
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

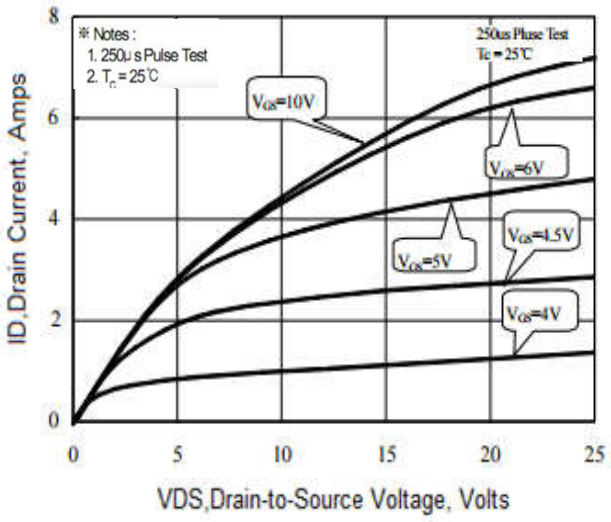
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Continuous Drain-Source Diode Forward Current		I_S	-	-	4	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	16	A
Drain-Source Diode Forward Voltage	I_{SD} = 4 A	V_{SD}	-	-	1.4	V
Reverse Recovery Time	I_{SD} =4 A, V_{GS} = 0 V, dI_F / dt = 100 A/μs (Note3)	trr	-	250	-	nS
Reverse Recovery Charge		Qrr	-	1.2	-	uC

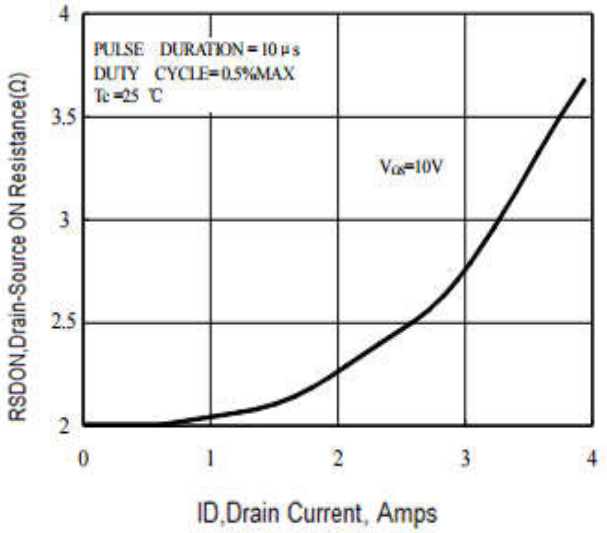
Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 4 A, VDD = 50 V, L =25mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width ≤300 μ s, Duty Cycle≤2%.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves

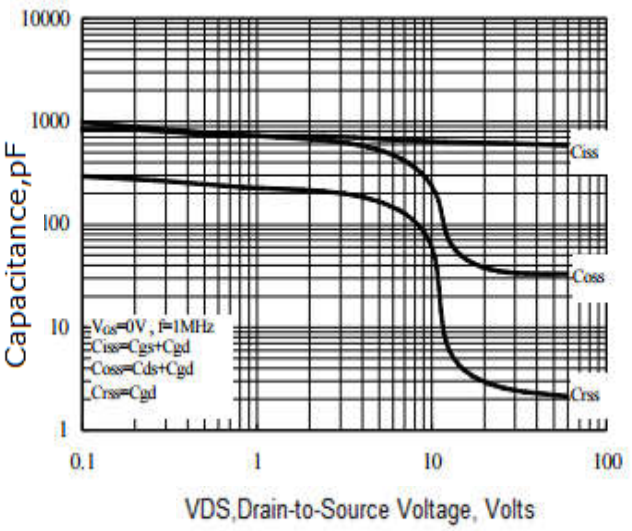


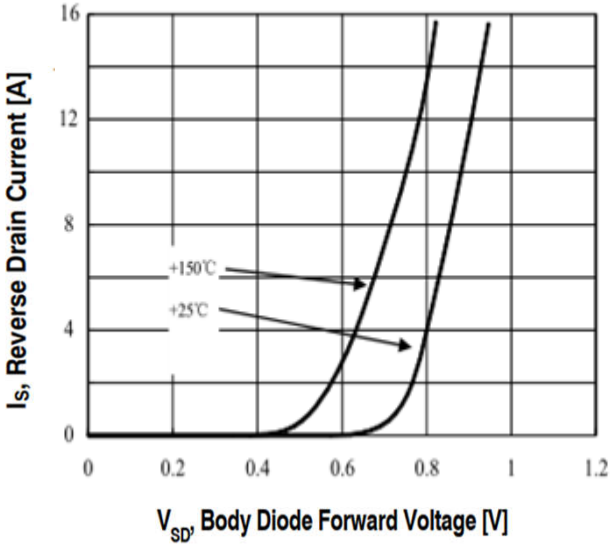


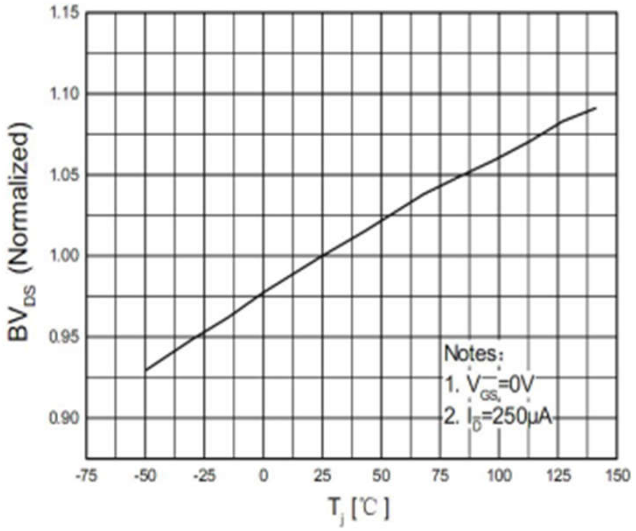


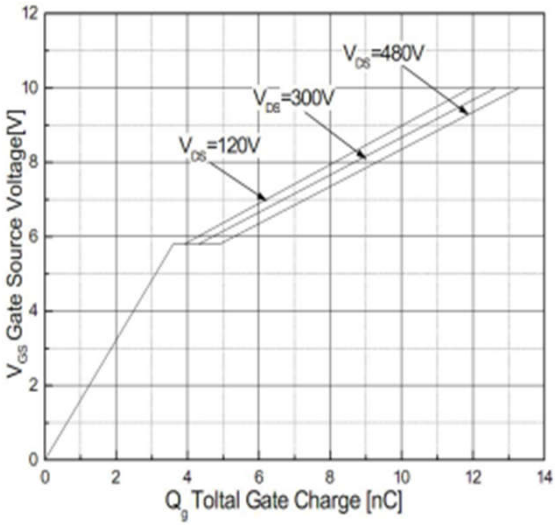


Ratings and Characteristic Curves



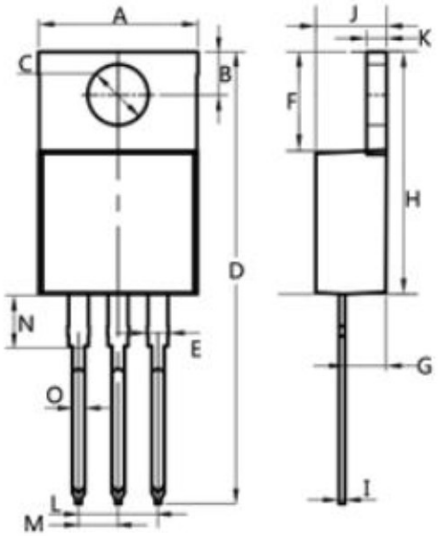






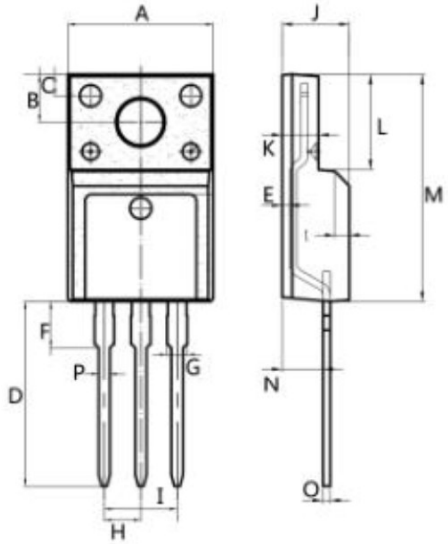
Package Outline Dimensions Millimeters

TO-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		

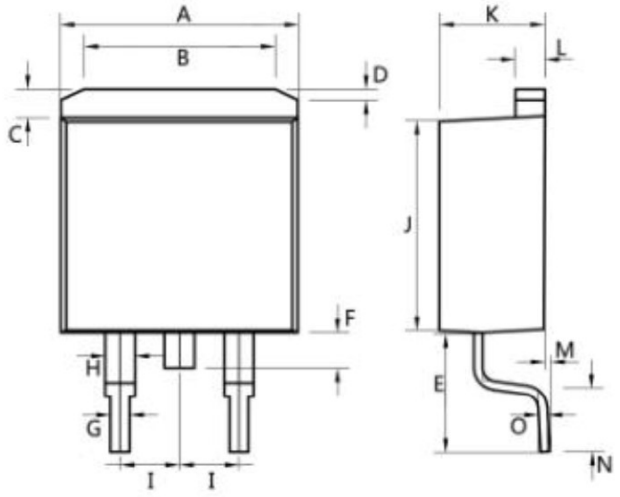
TO-220F



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		

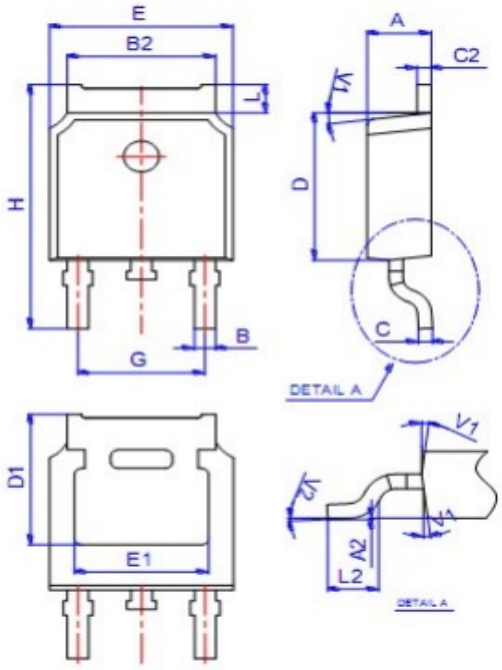
Package Outline Dimensions Millimeters

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		

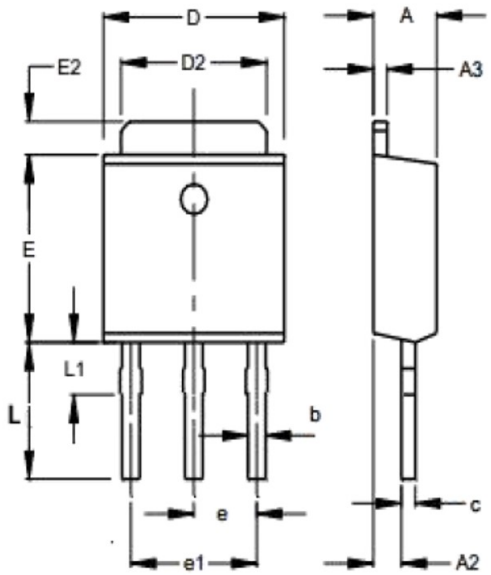
TO-252



Dim.	Min.	Typ.	Max.
A	2.10	-	2.50
A2	0	-	0.10
B	0.66	-	0.86
B2	5.18	-	5.48
C	0.40	-	0.60
C2	0.44	-	0.58
D	5.90	-	6.30
D1	5.30REF		
E	6.40	-	6.80
E1	4.63	-	-
G	4.47	-	4.67
H	9.50	-	10.70
L	1.09	-	1.21
L2	1.35	-	1.65
V1	-	7°	-
V2	0°	-	6°
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

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