

650V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

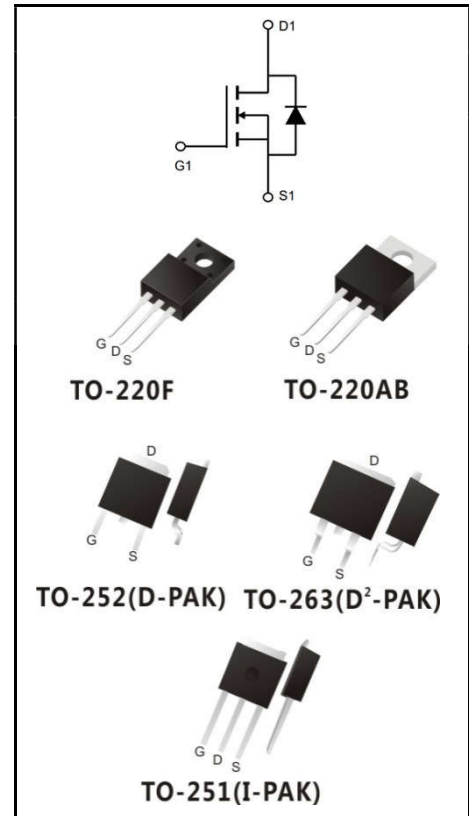
I_D	7A
V_{DSS}	650V
R_{DS(on)-typ(@V_{GS}=10V)}	<1.4Ω (Type:1.2Ω)

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
YFW7N65AT	TO-220AB	YFW 7N65AT XXXXX	50PCS/Tube
YFW7N65AF	TO-220F(0.5mm)	YFW 7N65AF XXXXX	50PCS/Tube
YFW7N65AS	TO-263	YFW 7N65AS XXXXX	50PCS/Tube
YFW7N65AS-R	TO-263	YFW 7N65AS XXXXX	800PCS/Tape
YFW7N65AMJ	TO-251	YFW 7N65AMJ XXXXX	80PCS/Tube
YFW7N65AD	TO-252	YFW 7N65AD 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	7			A
-Continuous (TC = 100°C)		4.5			
Pulsed Drain Current (Note1)	I_{DM}	28			A
Power Dissipation	P_D	130	48	93	W
-Derate above 25°C		1.15	0.38	0.78	W/°C
Single Pulse Avalanche Energy (Note2)	E_{AS}	550			mJ
Avalanche Current (Note 1)	I_{AR}	7			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	$R_{\theta JC}$	1.02	2.8	1.35	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	62	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

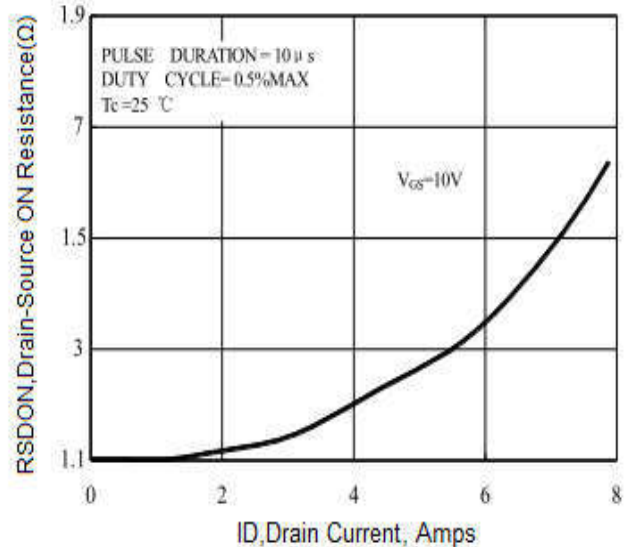
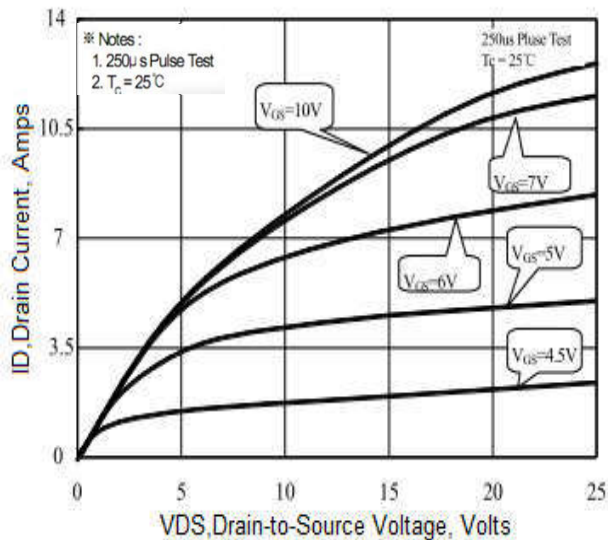
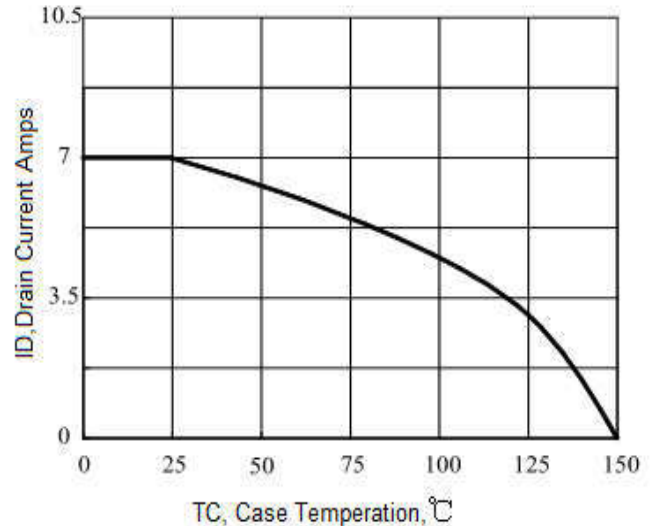
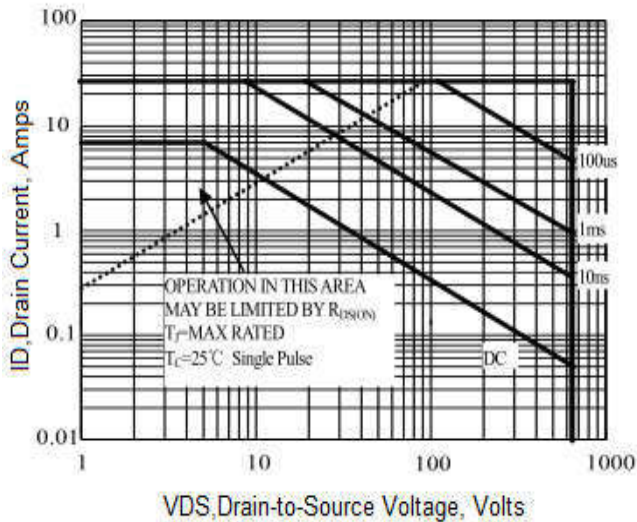
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650 V, V_{GS} = 0 V$	I_{DSS}	-	-	1	uA
	$V_{DS} = 520 V, T_c = 125^\circ C$		-	-	10	
Gate Leakage Current	$V_{GS} = \pm 30 V, V_{DS} = 0 V$	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	$V_{GS} = 10 V, I_D = 3.5 A$	$R_{DS(on)}$	-	1.2	1.4	Ω
Forward Transconductance(Note3)	$V_{DS} = 40 V, I_D = 3.5 A$	g_{fs}	-	6.5	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1MHz$	C_{iss}	-	1010	-	pF
Output Capacitance		C_{oss}	-	92	-	
Reverse Transfer Capacitance		C_{rss}	-	5	-	
Turn-on Delay Time	$I_D = 7 A, V_{DD} = 325 V, R_G = 25\Omega(\text{Note3,4})$	$td(ON)$	-	18	-	nS
Rise Time		tr	-	19	-	
Turn-Off Delay Time		$td(OFF)$	-	39	-	
Fall Time		tf	-	18	-	
Total Gate Charge	$I_D = 7 A, V_{DD} = 520V, V_{GS} = 10 V(\text{Note3,4})$	Q_G	-	33	-	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

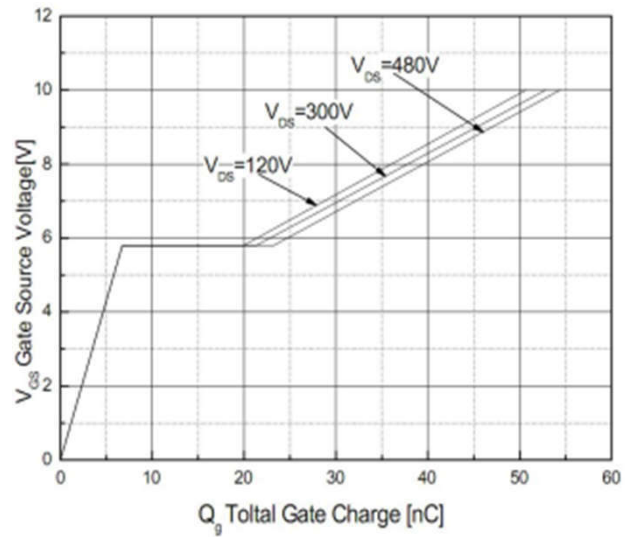
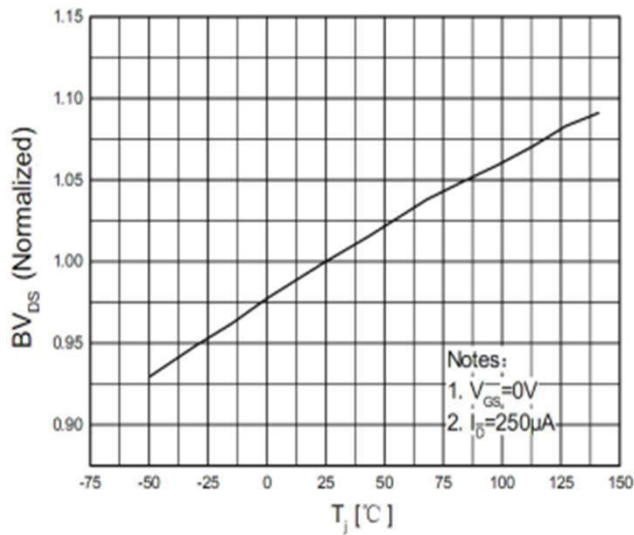
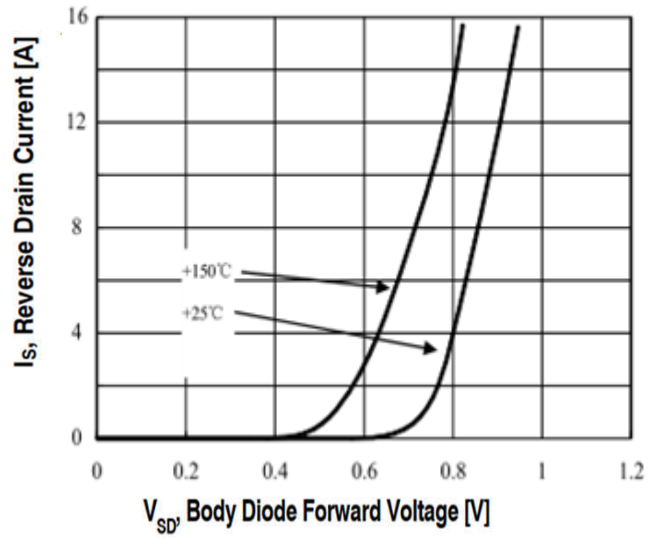
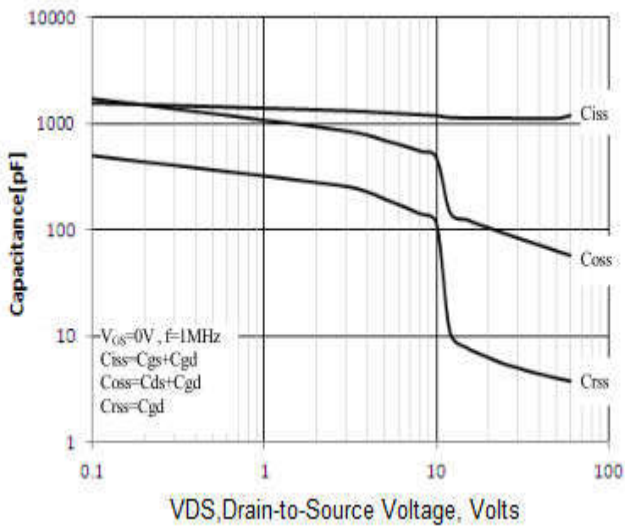
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Continuous Drain-Source Diode Forward Current		Is	-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current		ISM	-	-	28	A
Drain-Source Diode Forward Voltage	$I_{SD} = 7\text{ A}, V_{GS} = 0\text{ V}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$I_{SD} = 7\text{ A}, V_{GS} = 0\text{ V},$ $dI_F / dt = 100\text{ A}/\mu\text{s}(\text{Note3})$	trr	-	370	-	nS
Reverse Recovery Charge		Qrr	-	1.9	-	uC

- Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 2. IAS = 7 A, VDD = 50 V, L = 21mH, RG = 25Ω, starting TJ = 25°C.
 3. ulse test: Pulse Width ≤ 300 μ s, Duty Cycle ≤ 2%.
 4. Essentially Independent of Operating

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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