

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

MAIN CHARACTERISTICS

I_D	5A
V_{DSS}	650V
$R_{DS(ON)-typ}(@V_{GS}=10V)$	2.0Ω

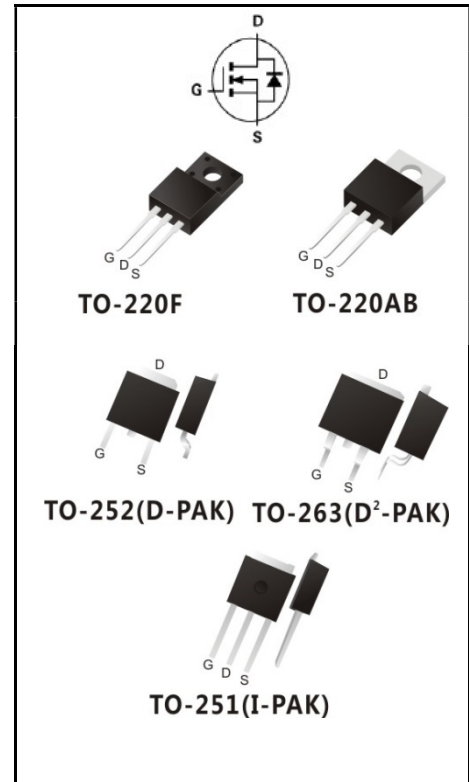


FEATURES

- ◆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
- ◆Case:TO-220AB, TO-220F, TO-263, TO-252, TO-251



PRODUCT SPECIFICATION CLASSIFICATION

Part Number	Package	Marking	Pack
YFW5N65A1	TO-220AB	5N65AT	50PCS/Tube
YFW5N65A2	TO-220F(0.5mm)	5N65AF	50PCS/Tube
YFW5N65A3	TO-263	5N65AS	50PCS/Tube
YFW5N65A3-R	TO-263	5N65AS	800PCS/Tape
YFW5N65A4	TO-251	5N65AMJ	80PCS/Tube
YFW5N65A5-R	TO-252	5N65AD	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	5			A
Pulsed Drain Current (Note1)	I_{DM}	20			A
Power Dissipation	P_D	85	30	85	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	150			mJ
Operating Temperature Range	T_J	150			°C
Storage Temperature Range	T_{STG}	-55 to +150			°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.67	4.17	1.67	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	100	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	$V_{GS} = 0 V, I_D = 250 \mu A$	BV_{DSS}	650	680	-	V
Drain-Source Leakage Current	$V_{DS} = 650 V, V_{GS} = 0 V$	I_{DSS}	-	-	1	UA
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	$V_{GS} = 10 V, I_D = 2 A$	$R_{DS(on)}$	-	2.0	2.4	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 2 A$	g_{fs}	-	3.5	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 2 V, f = 200 KHz$	C_{iss}	-	623	-	pF
Output Capacitance		C_{oss}	-	55	-	
Reverse Transfer Capacitance		C_{rss}	-	8.5	-	
Turn-on Delay Time(Note2)	$I_D = 4 A, V_{DD} = 325 V, R_G = 10 \Omega$	$td(ON)$	-	8.5	-	nS
Rise Time(Note2)		tr	-	6.5	-	
Turn-Off Delay Time(Note2)		$td(OFF)$	-	31	-	
Fall Time(Note2)		tf	-	8.5	-	
Total Gate Charge(Note2)	$I_D = 4 A, V_{DD} = 520 V, V_{GS} = 10 V$	Q_G	-	15	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	2.8	-	
Gate to Drain Charge(Note2)		Q_{GD}	-	6.3	-	

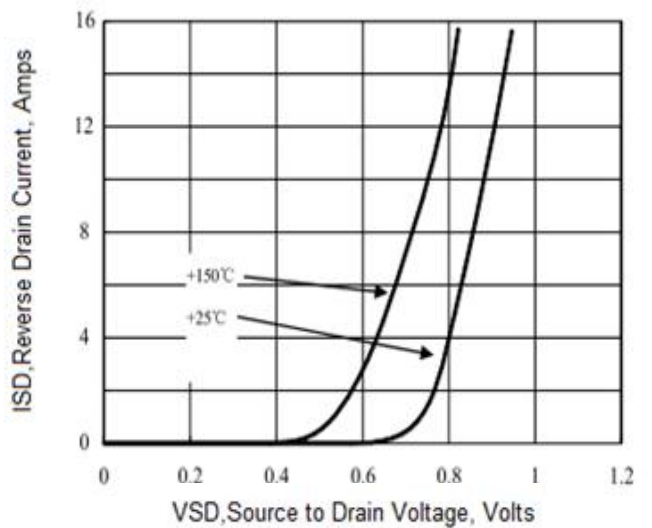
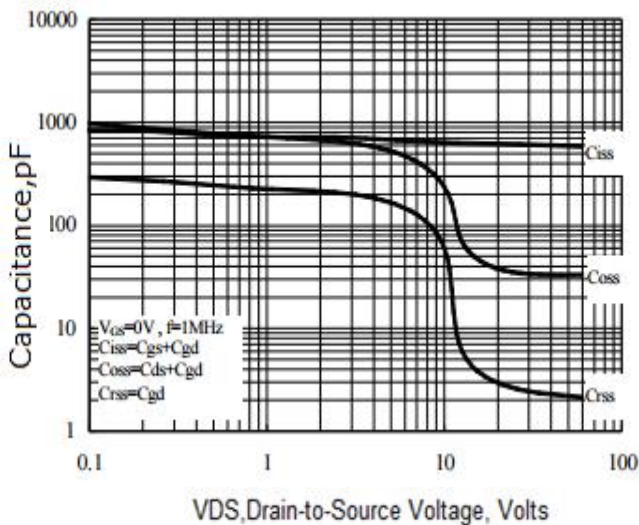
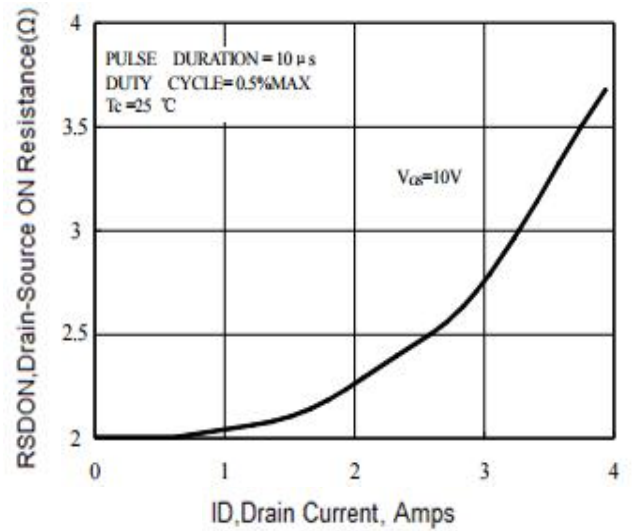
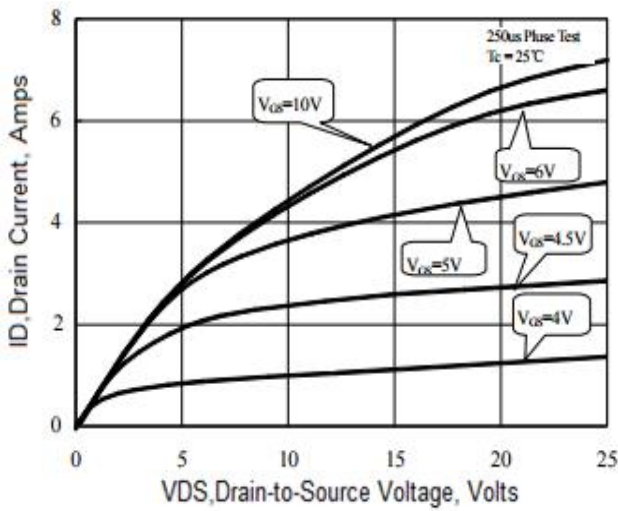
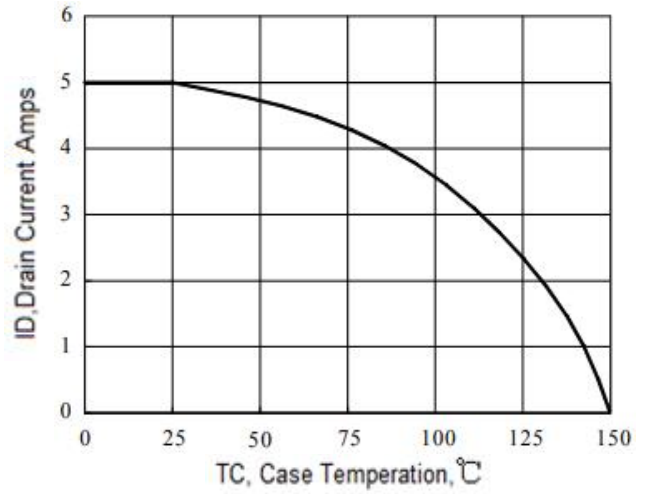
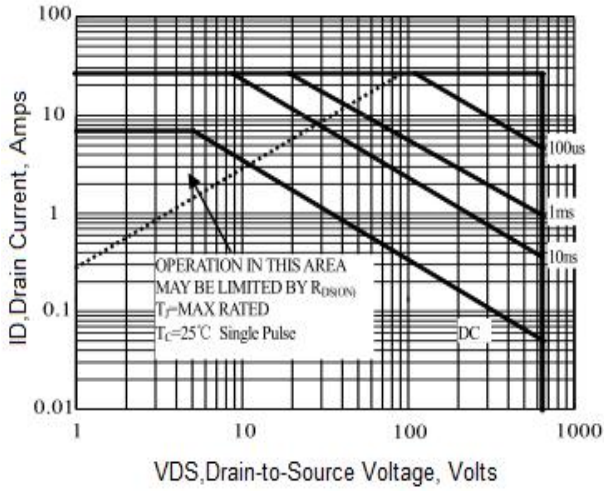
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximun Body-Diode Continuous Current		I_S	-	-	5	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	20	A
Drain-Source Diode Forward Voltage	$I_{SD} = 4 \text{ A}$	V_{SD}	-	-	1.5	V
Reverse Recovery Time(Note2)	$I_{SD} = 4 \text{ A}, V_{GS} = 0 \text{ V},$ $di_f / dt = 100 \text{ A}/\mu\text{s}$	trr	-	430	-	nS
Reverse Recovery Charge(Note2)		Qrr	-	1.27	-	uC

Note:

1. Pulse test: 300 μs pulse width, 2 % duty cycle
2. ulse test: Pulse Width $\leq 300 \mu \text{ s}$, Duty Cycle $\leq 2\%$.

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			