

650V N-CHANNEL ENHANCEMENT MODE MOSFET

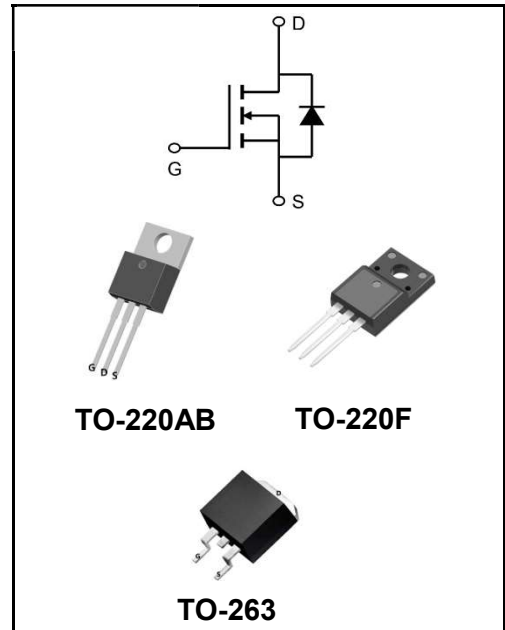
MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	650V
R_{DS(on)-typ(@V_{GS}=10V)}	< 0.9Ω (Type:0.75Ω)



Application

- ◆Uninterruptible Power Supply(UPS)
- ◆Power Factor Correction (PFC)



Product Specification Classification

Part Number	Package	Marking	Pack
YFW10N65AT	TO-220AB	YFW 10N65AT XXXXX	1000PCS/Tape
YFW10N65AF	TO-220F	YFW 10N65AF XXXXX	1000PCS/Tape
YFW10N65AS-R	TO-263	YFW 10N65AS XXXXX	800PCS/Tube

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage (V _{GS} = 0V)	V_{DS}	650	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current(note1)	I_{DM}	58	A
Gate - Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche Energy(note2)	E_{AS}	426	mJ
Avalanche Current(note1)	I_{AR}	9	A
Repetitive Avalanche Energy(note1)	E_{AR}	41	mJ
Power Dissipation(T _c =25°C)	P_D	32.1	W
Operating Junction and Storage Temperature Range	T_J , T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-to-case	R_{θJC}	4.46	°C/W
Thermal Resistance, Junction ambient	R_{θJA}	46.7	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V(BR)DSS	650	685	-	V
Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
Gate Source Leakage	$V_{GS}=\pm 30V$	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	2.0	-	4	V
Drain-Source On-Resistance (Note3)	$V_{GS}=10V, I_D=3.5A$	R_{DS(ON)}	-	0.75	0.9	Ω
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	1037	-	pF
Output Capacitance		C_{oss}	-	138	-	
Reverse Transfer Capacitance		C_{rss}	-	5.3	-	
Total Gate Charge	$V_{DD}=520V$ $I_D=9A$ $V_{GS}=10V$	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	7.3	-	
Gate-Drain Charge		Q_{gd}	-	8.5	-	
Turn-on delay time	$V_{DD}=325V$ $I_D=7A$ $R_G=25\Omega$	t_{d(on)}	-	18	-	ns
Turn-on Rise Time		T_r	-	30	-	
Turn-Off Delay Time		t_{d(OFF)}	-	61	-	
Turn-on Fall Time		t_f	-	36	-	
Continuous Body Diode Current	$T_C=25^\circ C$	I_S	-	-	9.0	A
Pulsed Diode Forward Current		I_{SM}	-	-	36	A
Body Diode Voltage	$T_J=25^\circ C, I_{SD}=7A, V_{GS}=0V$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$V_{GS}=0V, I_S=7A$ $diF/dt=100A/\mu s$	t_{rr}	-	431	-	nS
Reverse Recovery Charge		Q_{rr}	-	2.6	-	uC

Notes

- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The EAS data shows Max. rating . IAS = 9.0A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 °C
- 3、 The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

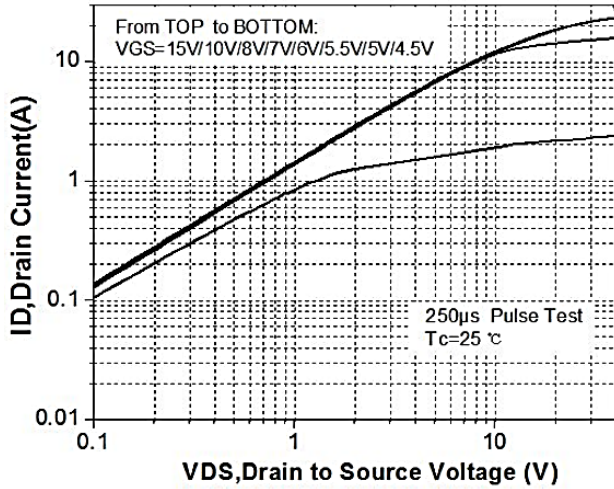


Figure 1. On-Region Characteristics

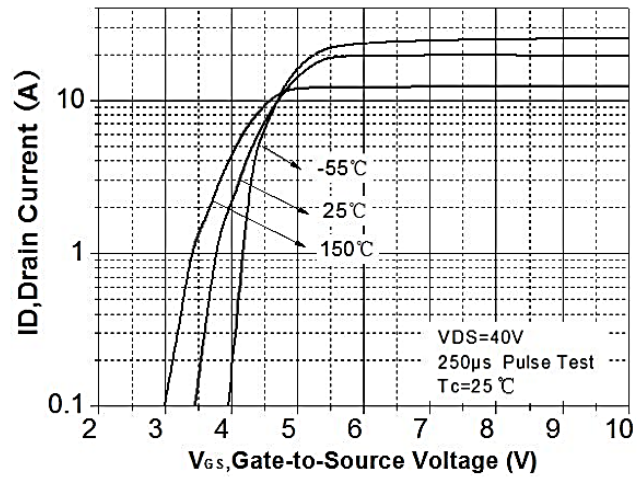


Figure 2. Transfer Characteristics

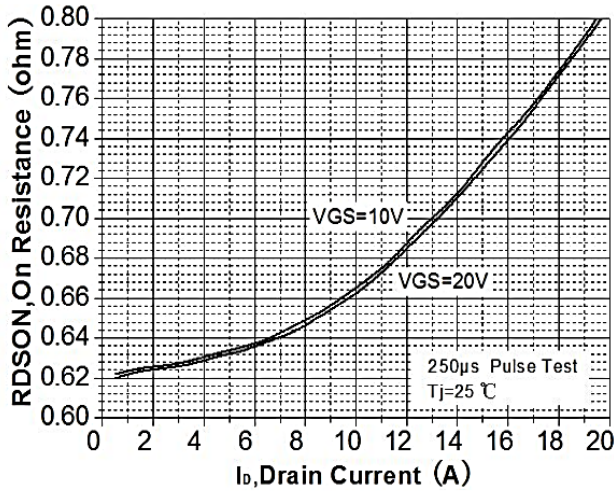


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

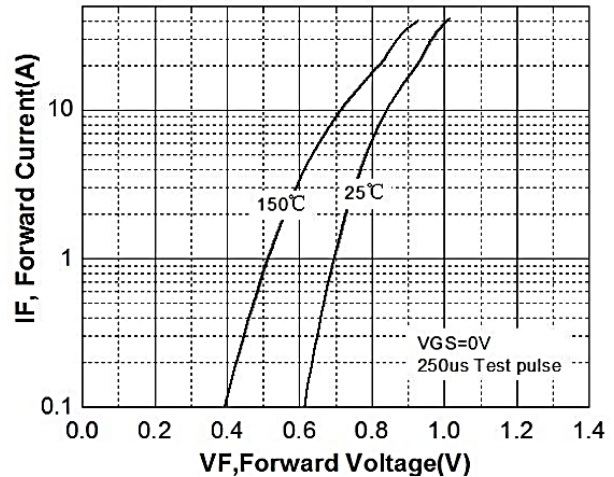


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

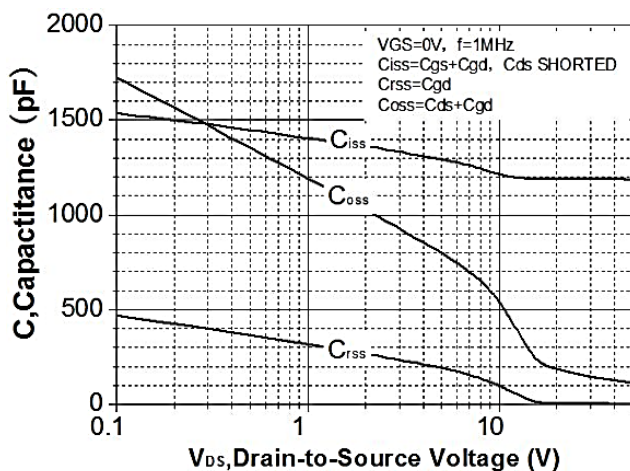


Figure 5. Capacitance Characteristics

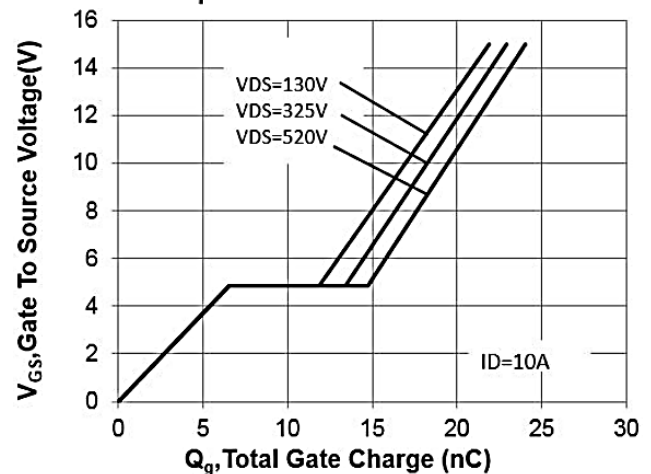


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

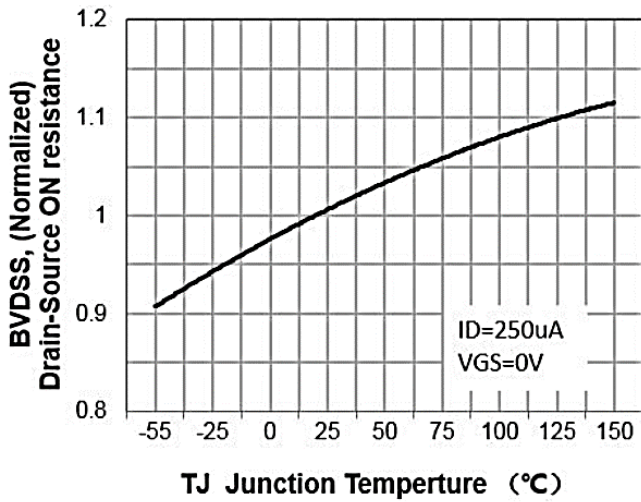


Figure 7. Breakdown Voltage Variation vs Temperature

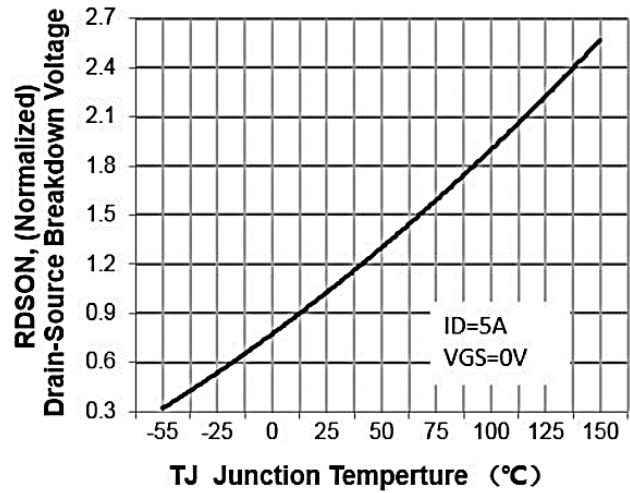


Figure 8. On-Resistance Variation vs Temperature

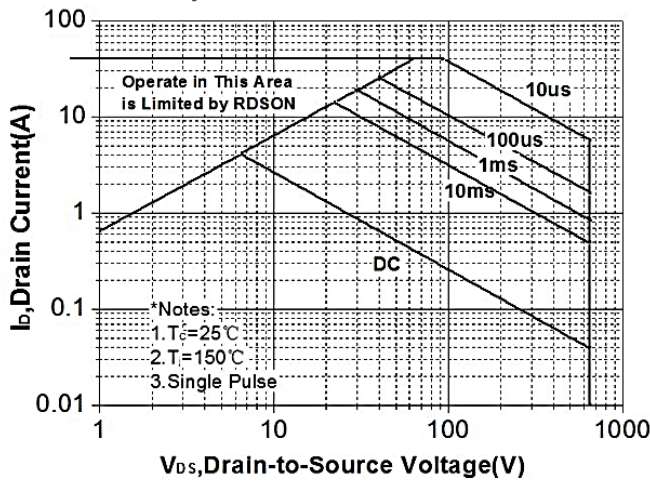


Figure 9. Maximum Safe Operating Area

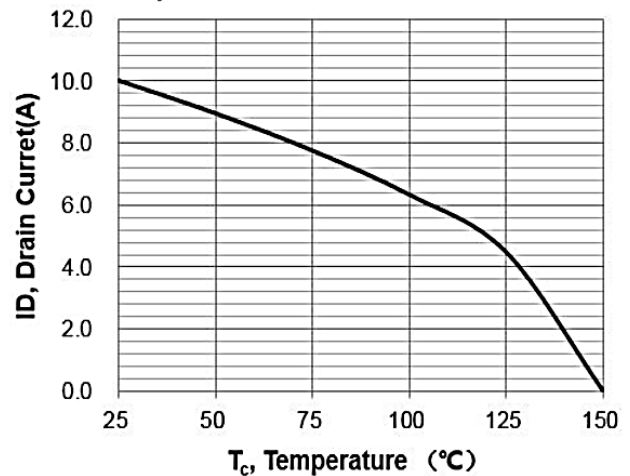


Figure 10. Maximum Drain Current vs Case Temperature

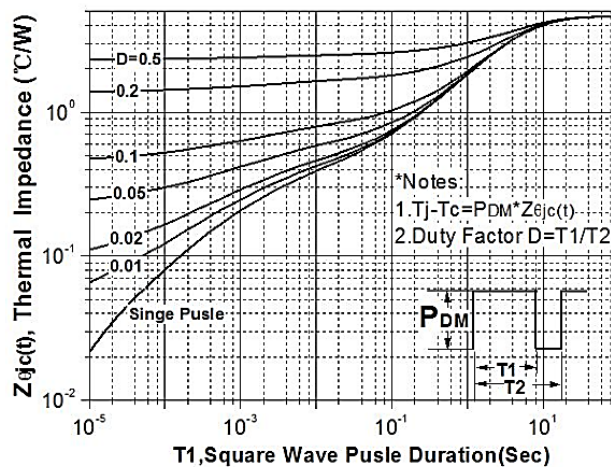


Figure 11. Transient Thermal Response Curve

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		

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