

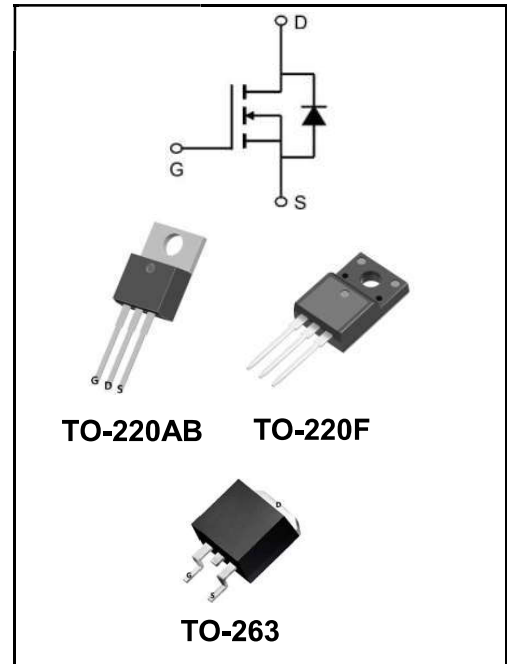
900V N-Plane ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

$I_D$	3A
$V_{DSS}$	900V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 4.8Ω

Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW3N90AT	TO-220AB	YFW 3N90AT XXXXX	1000PCS/Box
YFW3N90AF	TO-220F	YFW 3N90AF XXXXX	1000PCS/Box
YFW3N90AS	TO-263	YFW 3N90AS XXXXX	800PCS/Reel

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	$V_{DS}$	900	V
Gate - Source Voltage	$V_{GS}$	±30	V
Drain Current, $V_{GS} @ 10V^4$ $T_C=25^{\circ}C$	$I_D$	3	A
Drain Current, $V_{GS} @ 10V^4$ $T_C=100^{\circ}C$	$I_D$	1.89	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	10	A
Total Power Dissipation $T_C=25^{\circ}C$	$P_D$	25	W
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	4.5	mJ
Avalanche Current	$I_{AR}$	3	A
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C
Maximum Thermal Resistance, Junction-case	$R_{\theta JC}$	5	°C/W
Maximum Thermal Resistance, Junction-ambient	$R_{\theta JA}$	65	°C/W

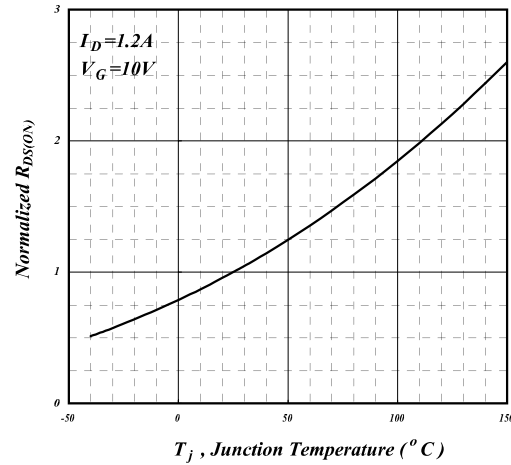
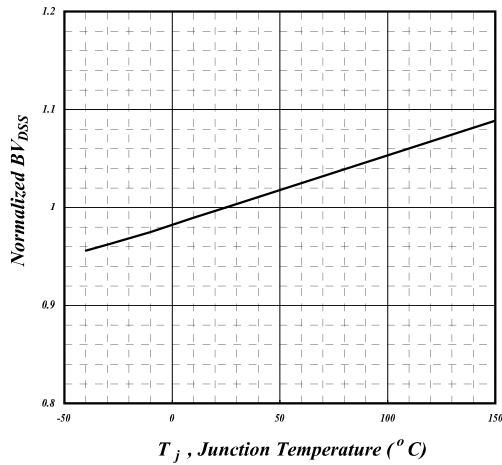
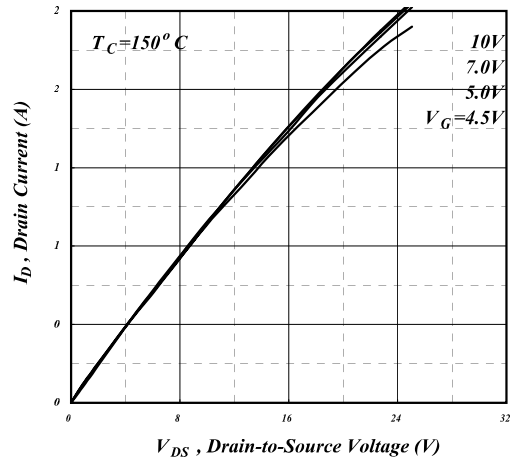
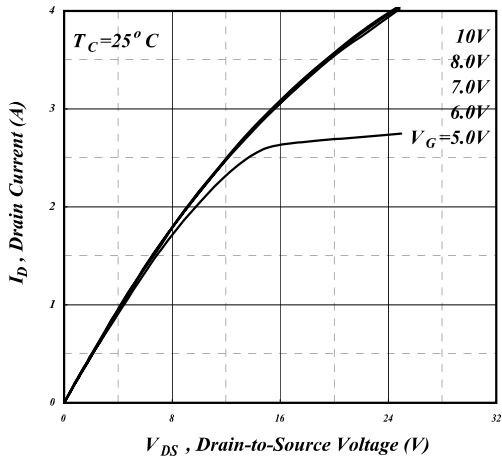
**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$BV_{DSS}$	900	-	-	V
Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=1.2A$	$R_{DS(ON)}$	-	-	4.8	$\Omega$
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2	-	4	V
Forward Transconductance	$V_{DS}=10V, I_D=1A$	$g_{fs}$	-	2	-	S
Drain-source leakage current	$V_{DS}=720V, V_{GS}=0V$	$I_{DSS}$	-	-	25	$\mu A$
Gate Source Leakage	$V_{GS}=\pm 30V, V_{DS}=0V$	$I_{GSS}$	-	-	$\pm 100$	nA
Total Gate Charge	$I_D=1A$ $V_{DS}=540V$ $V_{GS}=10V$	$Q_g$	-	18	29	nC
Gate-Source Charge		$Q_{gs}$	-	3.5	-	
Gate-Drain ("Miller") Charge		$Q_{gd}$	-	7	-	
Turn-on delay time	$V_{DD}=300V$ $I_D=1A$ $R_G=50\Omega$ $V_{GS}=10V$	$t_{d(on)}$	-	20	-	ns
Rise Time		$T_r$	-	14	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	105	-	
Fall Time		$t_f$	-	24	-	
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	$C_{iss}$	-	800	1280	pF
Output Capacitance		$C_{oss}$	-	55	-	
Reverse Transfer Capacitance		$C_{rss}$	-	4	-	
Gate Resistance	$f=1MHz$	$R_G$	-	4	6	$\Omega$
Forward voltage <sup>2</sup>	$V_{GS}=0V, I_S=1.2A$	$V_{SD}$	-	-	1.5	V
Reverse Recovery Time	$I_S=1A, V_{GS}=0V$ $di_{SD}/dt=100A/\mu s,$	$t_{rr}$	-	320	-	ns
Reverse Recovery Charge		$Q_{rr}$	-	1.3	-	nC

**Notes:**

- 1.Pulse width limited by max. junction temperature.
- 2.Pulse test
- 3.Starting  $T_j=25^{\circ}C$ ,  $V_{DD}=50V$ ,  $L=1mH$ ,  $R_G=25\Omega$
- 4.Ensure that the junction temperature does not exceed  $T_{jmax.}$ .

Ratings and Characteristic Curves



DSS v.s. Junction Temperature

Fig 4. Normalized On-Resistance v.s. Junction Temperature

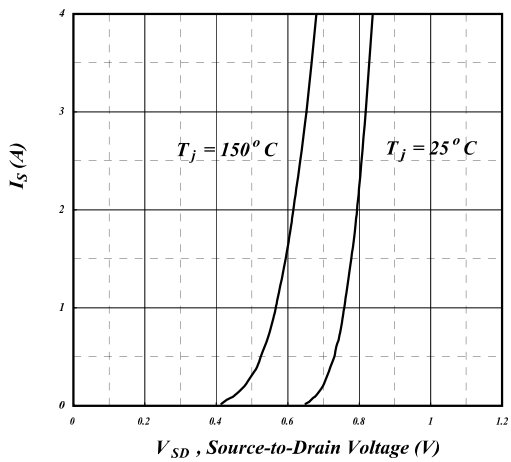


Fig 5. Forward Characteristic of Reverse Diode

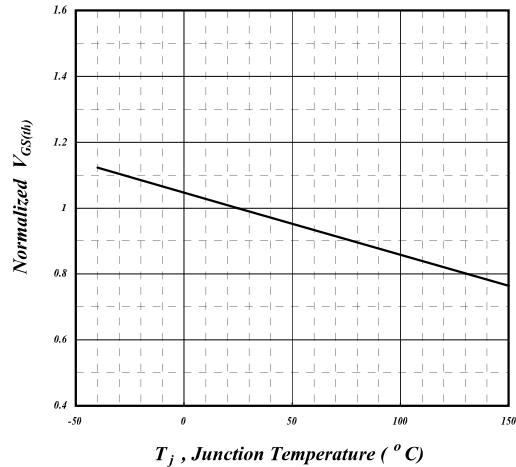


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Ratings and Characteristic Curves

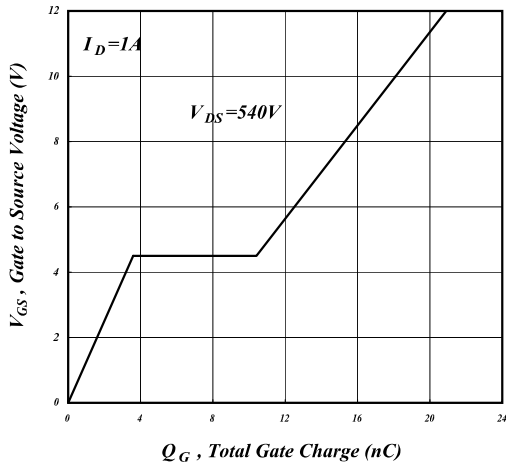


Fig 7. Gate Charge Characteristics

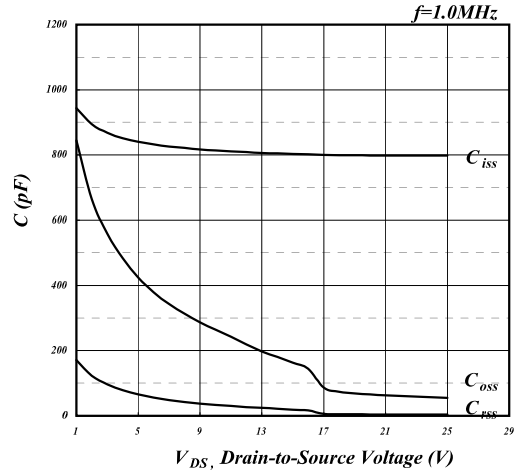


Fig 8. Typical Capacitance Characteristics

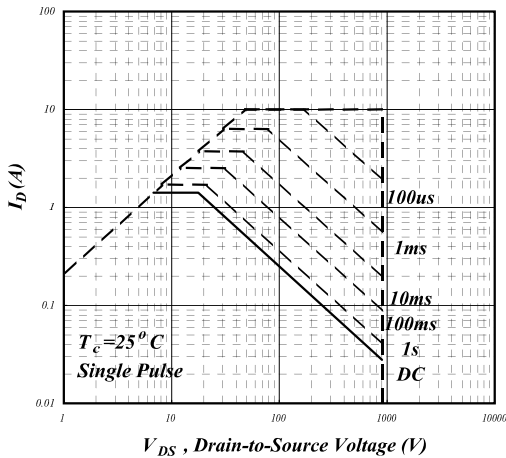


Fig 9. Maximum Safe Operating Area

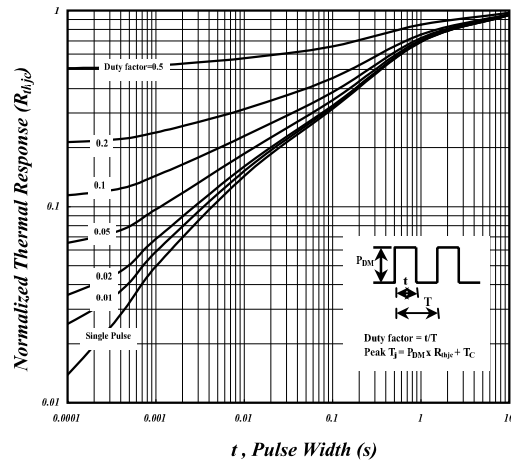


Fig 10. Effective Transient Thermal Impedance

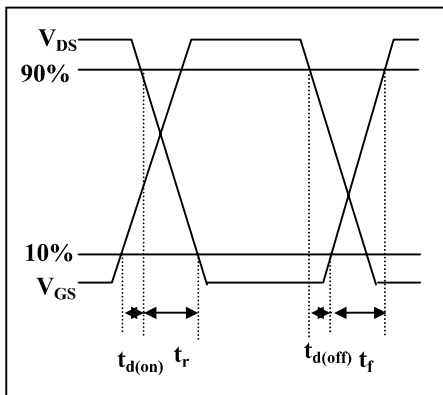


Fig 11. Switching Time Waveform

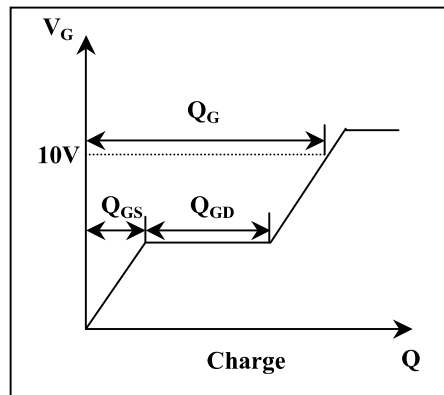


Fig 12. Gate Charge Waveform

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		