

250V N-CHANNEL ENHANCEMENT MODE MOSFET

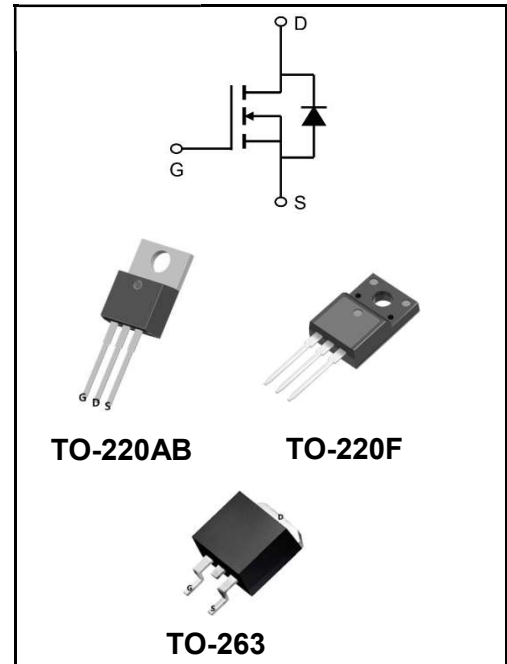
MAIN CHARACTERISTICS

I_D	60A
V_{DSS}	250V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 33mΩ (Type: 28 mΩ)



Application

- ◆ UPS
- ◆ BLDC



Product Specification Classification

Part Number	Package	Marking	Pack
YFW60N25AT	TO-220AB	YFW 60N25AT XXXXX	1000PCS/Tape
YFW60N25AF	TO-220F	YFW 60N25AF XXXXX	1000PCS/Tape
YFW60N25AS-R	TO-263	YFW 60N25AS XXXXX	800PCS/Tube

Maximum Ratings at $T_c=25^{\circ}\text{C}$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	250	V
Continuous Drain Current V_{GS} @ 10V @ $T_A=25^{\circ}\text{C}$	I_D	60	A
Continuous Drain Current V_{GS} @ 10V @ $T_A=100^{\circ}\text{C}$	I_D	40	A
Pulsed Drain Current (pulse width limited by TJM)	IDM^{a1}	230	A
Gate -to- Source Voltage	V_{GS}	± 30	V
Single pulse avalanche energy	E_{AS}	300	mJ
Avalanche Energy, Repetitive	E_{Ara1}	75	mJ
Avalanche Current	$I_{AR a1}$	45	A
Peak Diode Recovery dv/dt	dv/dt^{a2}	5.0	V/ns
Power Dissipation	P_D	360	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Maximum Temperature for Soldering	T_L	300	$^{\circ}\text{C}$
Thermal Resistance, Junction-to-case	$R_{\theta JC}$	0.45	$^{\circ}\text{C/W}$
Thermal Resistance, Junction -to-ambient	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	VDSS	250	-	-	V
Drain to Source Leakage Current	$V_{DS}=250V, V_{GS}=0V, T_a=25^{\circ}C$	IDSS	-	-	1.0	μA
	$V_{DS}=250V, V_{GS}=0V, T_a=125^{\circ}C$		-	-	100	
Gate to Source Forward Leakage	$V_{GS}=+20V$	IGSS(F)	-	-	100	nA
Gate to Source Reverse Leakage	$V_{GS}=-20V$	IGSS(R)	-	-	-100	
Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=35A$	RDS(ON)	-	28	33	mΩ
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	VGS(th)	3.6	-	5.0	V
Forward Transconductance	$V_{DS}=10V, I_D=35A$	gfs	100	-	-	S
Gate Resistance	$V_{GS}=0V, V_{DS}$ open $f=1.0MHz$	RG	-	1.5	-	Ω
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$	Ciss	-	7000	-	pF
Output Capacitance		Coss	-	480	-	
Reverse Transfer Capacitance		Crss	-	210	-	
Turn-on delay time	$I_D=35A$ $V_{DS}=50V$ $V_{GS}=10V$ $R_G=2.5\Omega$	td(on)	-	45	-	ns
Rise Time		Tr	-	70	-	
Turn-Off Delay Time		td(OFF)	-	110	-	
Fall Time		tf	-	90	-	
Total Gate Charge	$I_D=35A$ $V_{DD}=100V$ $V_{GS}=10V$	Qg	-	200	-	nC
Gate to Source Charge		Qgs	-	28	-	
Gate to Drain ("Miller") Charge		Qgd	-	60	-	
Continuous Source Current (Body Diode)		ISD	-	-	58	A
Maximum Pulsed Current (Body Diode)		ISM	-	-	230	A
Diode Forward Voltage	$I_S=35A, V_{GS}=0V$	VSD	-	-	1.2	V
Reverse Recovery Time	$I_S=30A, V_{DD}=50V$ $V_{GS}=0V, di/dt=100A/\mu s$, $T_J=25^{\circ}C$	trr	-	120	-	ns
Reverse Recovery Charge		Qrr	-	0.55	-	nC

Note :

- 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 = 35A, RG = 25 Ω , VDD=50V, VGS=10V, Starting TJ = 25 °C
- 3、The test condition is Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$
- 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.

Ratings and Characteristic Curves

Typical Characteristics

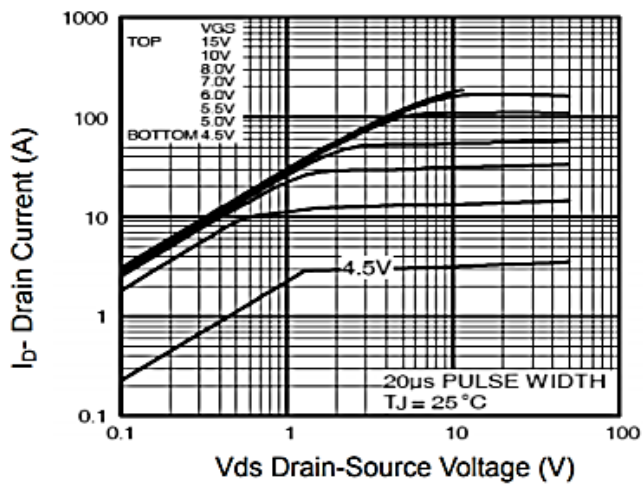


Figure 1 Output Characteristics

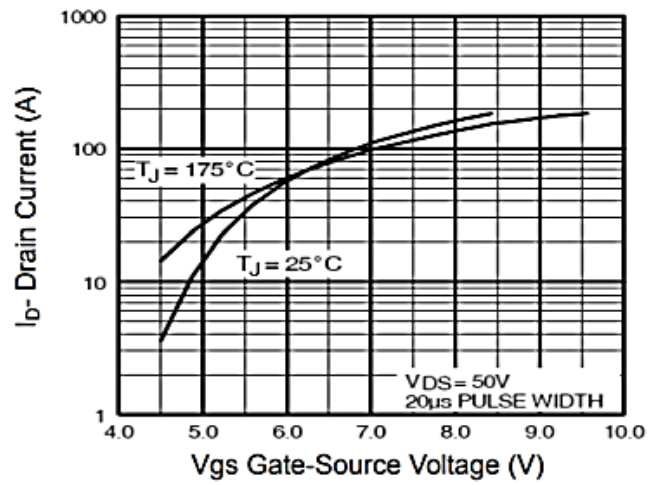


Figure 2 Transfer Characteristics

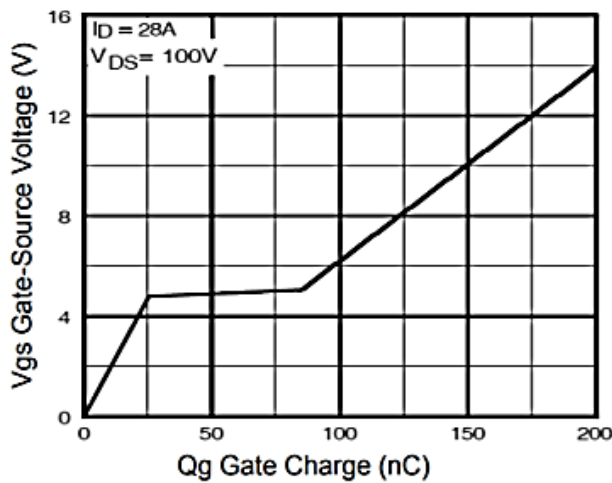


Figure 5 Gate Charge

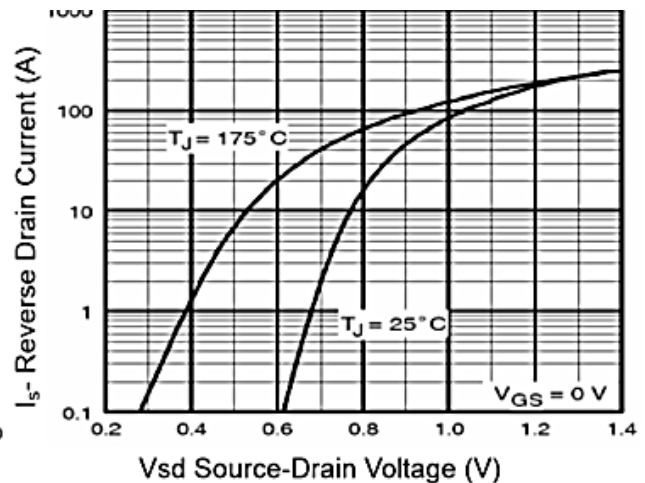


Figure 6 Source- Drain Diode Forward

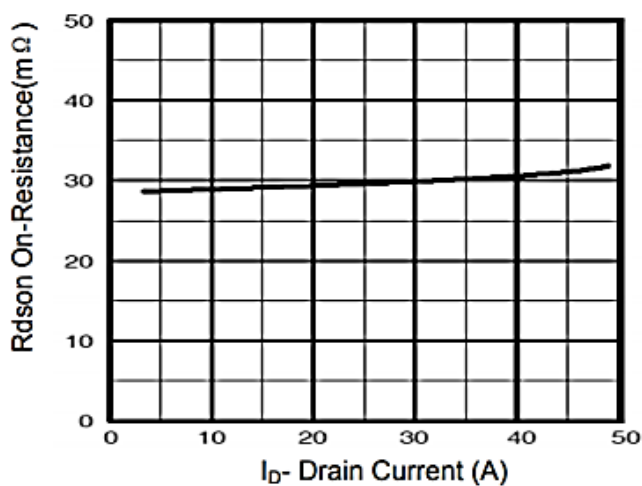


Figure 3 $R_{DS(on)}$ -Drain Current

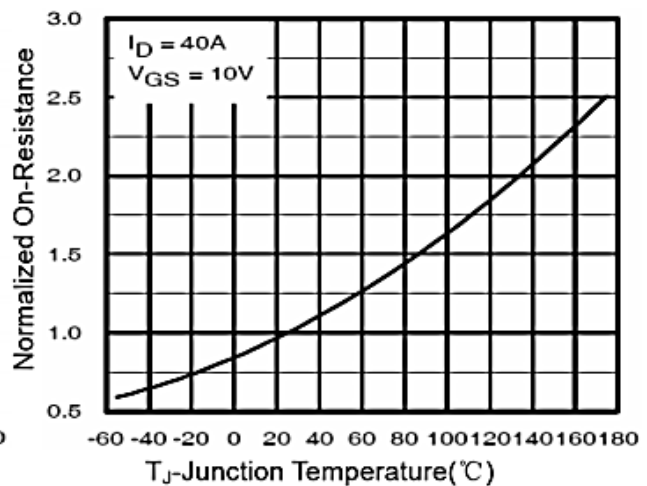


Figure 4 $R_{DS(on)}$ -Junction Temperature

Ratings and Characteristic Curves

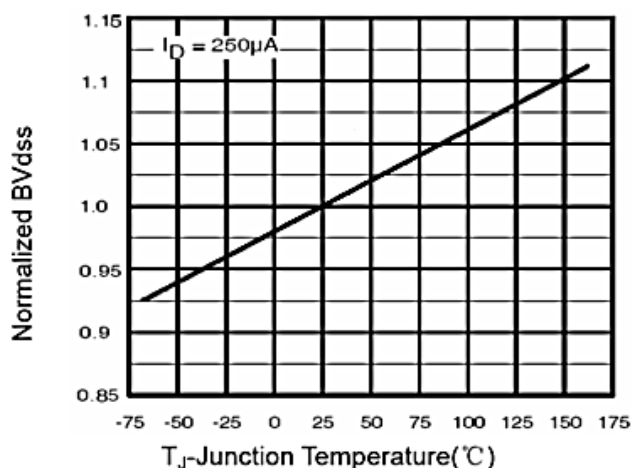


Figure 9 BV_{DSS} vs Junction Temperature

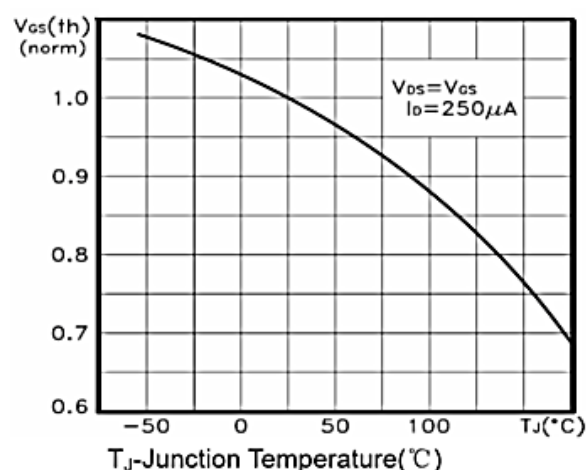


Figure 10 $V_{GS(th)}$ vs Junction Temperature

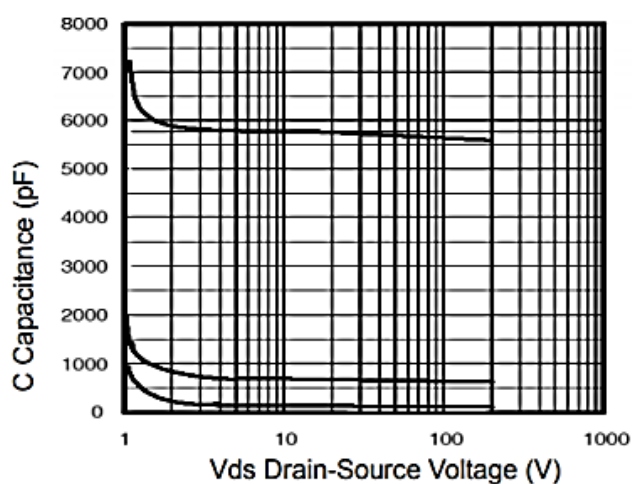


Figure 7 Capacitance vs V_{DS}

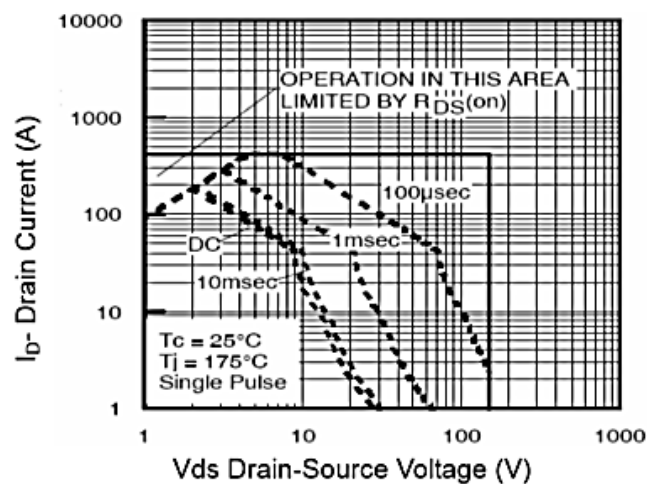


Figure 8 Safe Operation Area

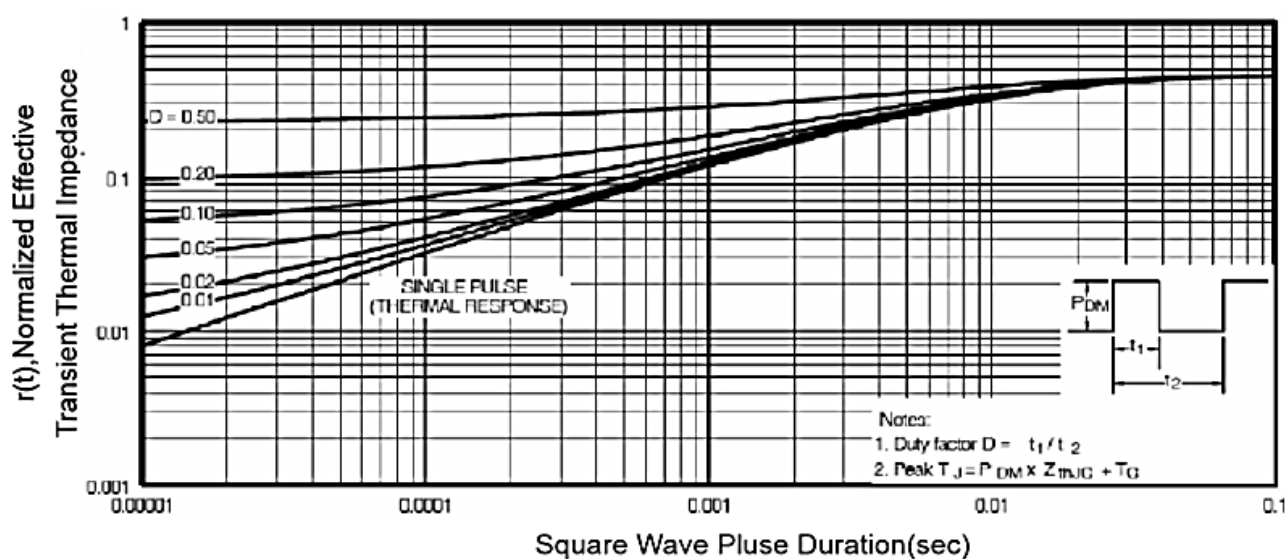
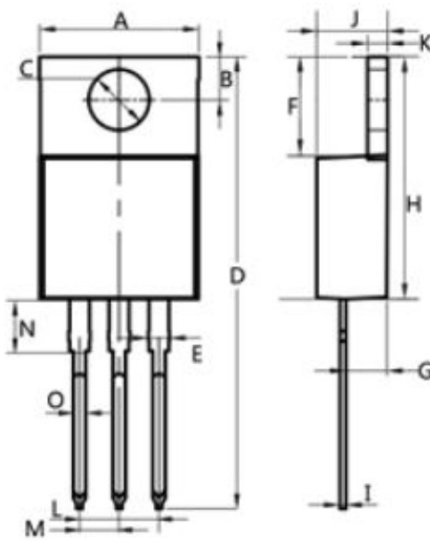


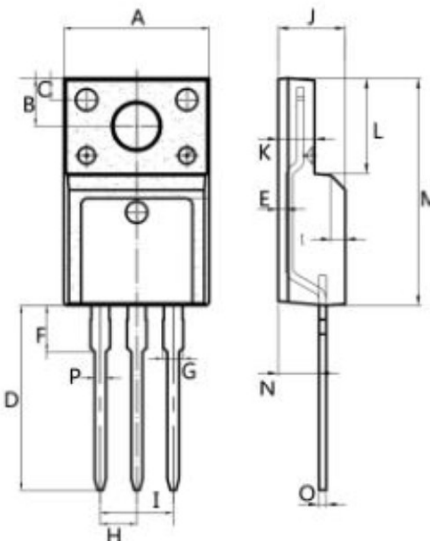
Figure 11 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions Millimeters

TO-220AB

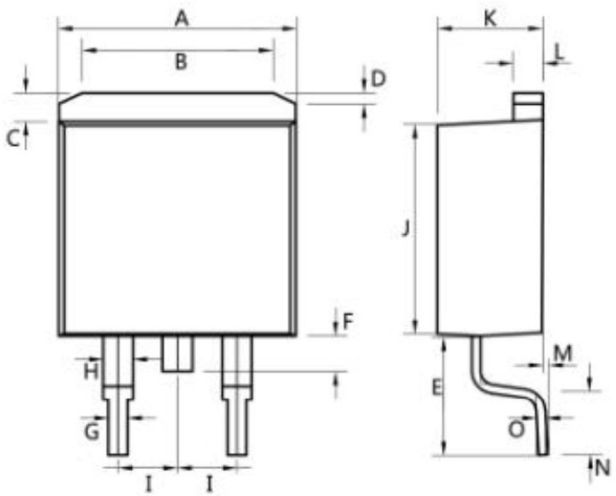
	Dim.	Min.	Max.
	A	10.15	10.35
	B	2.65	2.95
	C	3.70	3.90
	D	28.5	29.5
	E	1.30	1.45
	F	6.35	6.55
	G	2.9	3.3
	H	15.0	16.0
	I	0.38	0.42
	J	4.45	4.55
	K	1.25	1.35
	L	Typ 5.08	
	M	Typ 2.54	
	N	3.1	3.3
	O	0.76	0.84
All Dimensions in millimeter			

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			