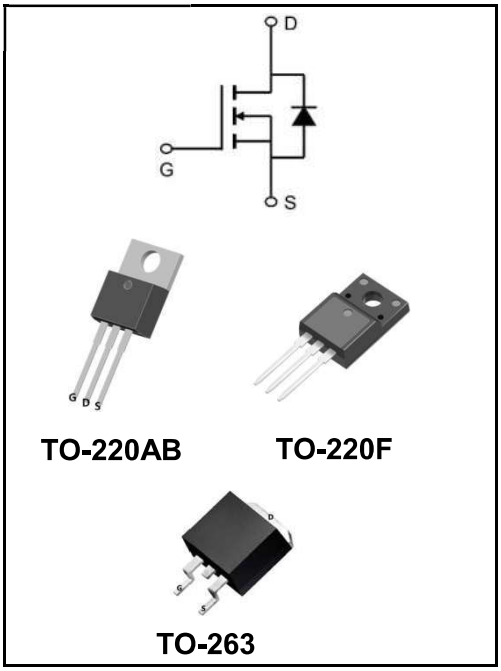
100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	170A
V_{DSS}	100V
R_{DSON}-typ(@V_{GS}=10V)	< 3.0mΩ(Type:2.5 mΩ)



Features

- Low RDS(on) & FOM
- Extremely low switching loss
- Excellent stability and uniformity or Invertors
- YFW-SGT technology

Application

- Consumer electronic power supply Motor control
- Synchronous-rectification Isolated DC
- Synchronous-rectification applications

Product Specification Classification

Part Number	Package	Marking	Pack
YFWG170N10AT	TO-220AB	YFW 170N10AT XXXXX	1000PCS/Box
YFWG170N10AF	TO-220F	YFW 170N10AF XXXXX	1000PCS/Box
YFWG170N10AS	TO-263	YFW 170N10AS XXXXX	800PCS/Reel

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous drain current[1)]	I_D	170	A
Pulsed drain current[2)]	$I_{D,\ pulse}$	540	A
Power dissipation[3)]	P_D	375	W
Single Pulse Avalanche Energy[5)]	E_{AS}	1000	mJ
Operation and storage temperature	T_{STG}, T_J	-55 to +150	°C
Thermal Resistance, Junction-case	$R_{\theta JC}$	0.33	°C/W
Thermal Resistance, Junction-ambient[4)]	$R_{\theta JA}$	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}=0V, I_D=250uA	BV_{DSS}	100	-	-	V
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	2.0	-	4	V
Drain-source on-state resistance	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	-	2.5	3	mΩ
Gate-Source Leakage Current	V_{GS}=±20V	I_{GSS}	-	-	±100	nA
Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V	I_{DSS}	-	-	1	μA
Input Capacitance	V_{GS}=0V V_{DS}=50V f=100KHz	C_{iss}	-	10952.7	-	pF
Output Capacitance		C_{oss}	-	1402.2	-	
Reverse Transfer Capacitance		C_{rss}	-	33.3	-	
Turn-on delay time	V_{GS}=10V V_{DS}=50V R_G=2.2Ω I_D=25A	$t_{d(on)}$	-	40.7	-	ns
Rise Time		T_r	-	31.4	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	75.4	-	
Fall Time		t_f	-	16.2	-	
Total Gate Charge	I_D=25A V_{DS}=50V V_{GS}=10V	Q_g	-	158.8	-	nC
Gate-Source Charge		Q_{gs}	-	38.4	-	
Gate-Drain Charge		Q_{gd}	-	41.6	-	
Gate plateau voltage		$V_{plateau}$	-	4.6	-	V
Diode forward current	VGS<Vth	I_S	-	-	180	A
Pulsed Source Current		I_{SP}	-	-	540	
Diode Forward Voltage	I_S=20A, V_{GS}=0 V	V_{SD}	-	-	1.3	V
Reverse Recovery Time	I_S=25A , dI/dt=100A/μs	t_{rr}	-	99.2	-	ns
Reverse Recovery Charge		Q_{rr}	-	401.9	-	nC
Peak reverse recovery current		I_{rrm}	-	6.7	-	A

Note
1)Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4)The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 ℃.
5)VDD=50 V, RG=25 Ω, L=0.3 mH, starting Tj=25 ℃.

Ratings and Characteristic Curves

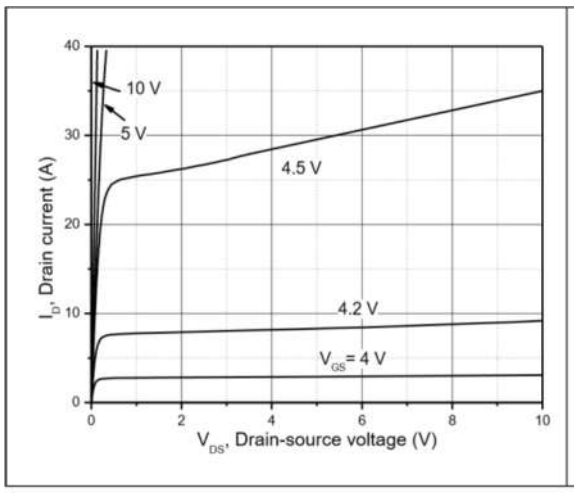


Figure 1, Typ. output characteristics

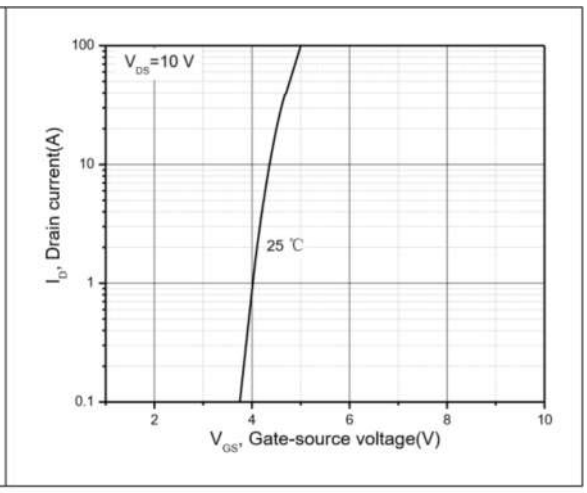


Figure 2, Typ. transfer characteristics

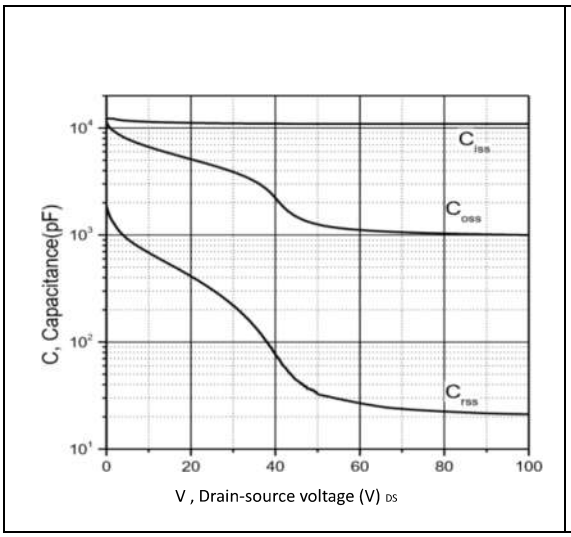


Figure 3, Typ. capacitances

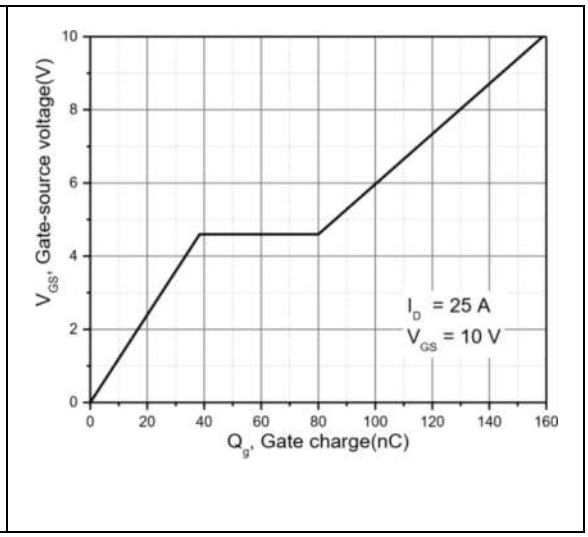


Figure 4, Typ. gate charge

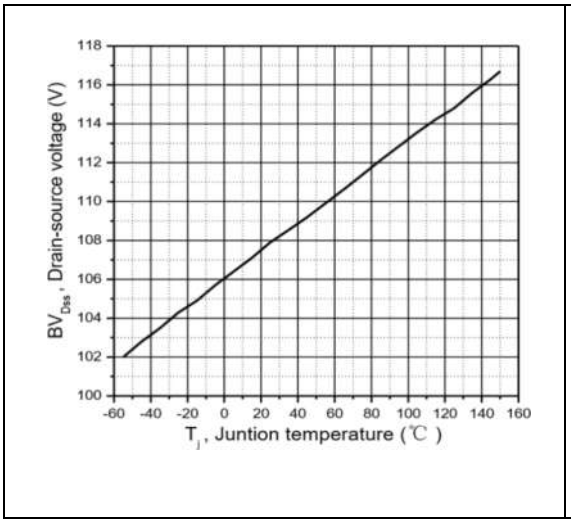


Figure 5, Drain-source breakdown voltage

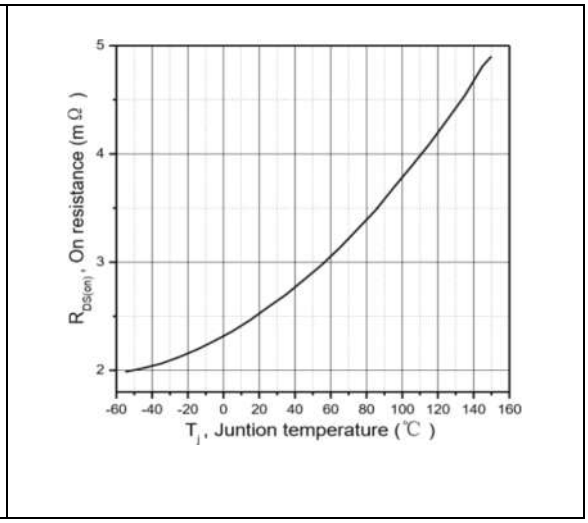


Figure 6, Drain-source on-state resistance

Ratings and Characteristic Curves

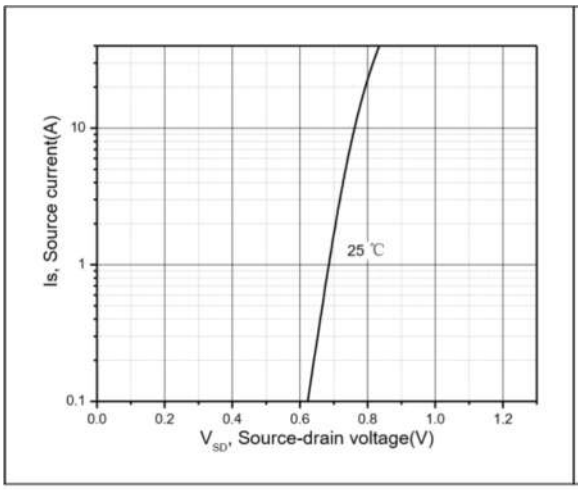


Figure 7, Forward characteristic of body diode

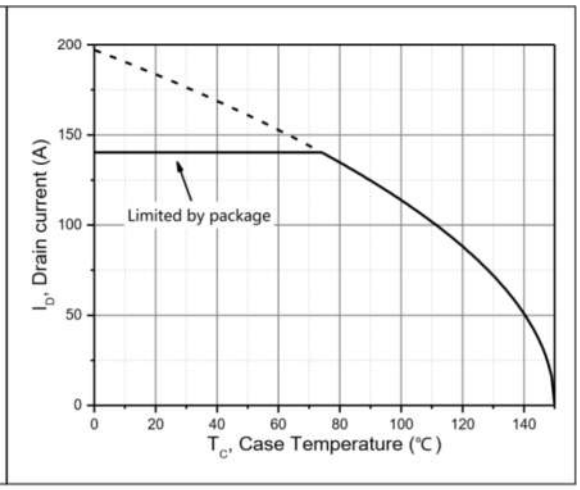


Figure 8, Drain current

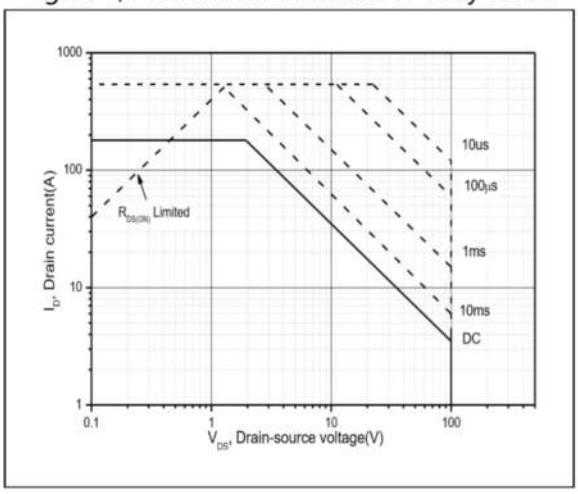


Figure 9, Safe operation area T_C=25 ℃

Ratings and Characteristic Curves

Test circuits and waveforms

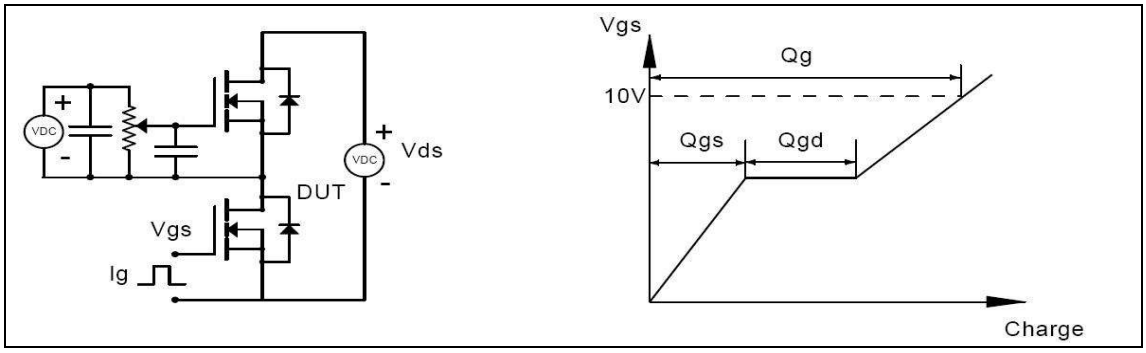


Figure 1, Gate charge test circuit & waveform

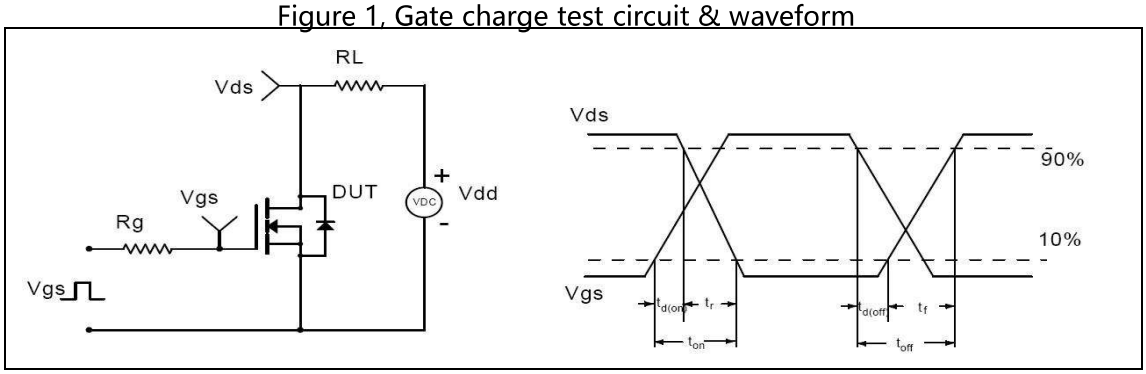


Figure 2, Switching time test circuit & waveforms

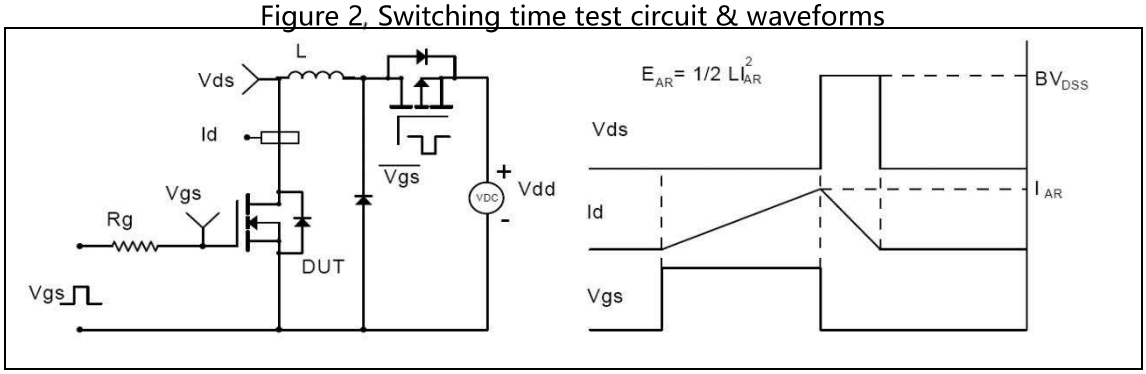


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

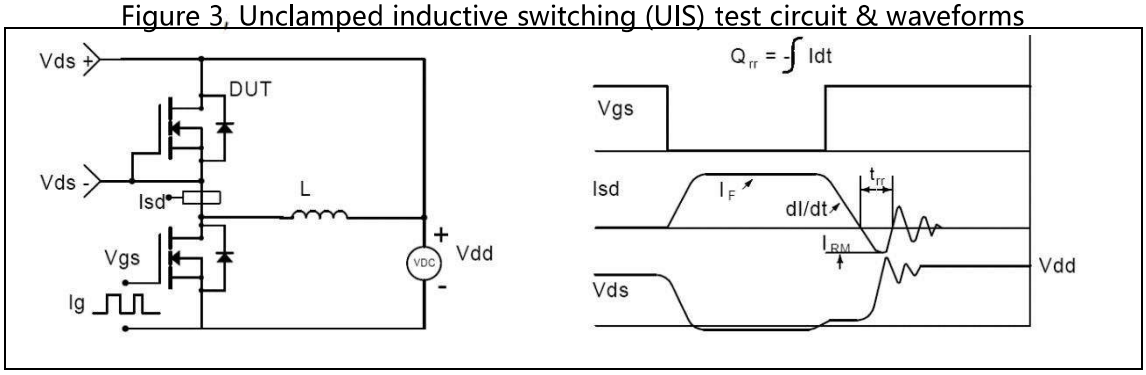
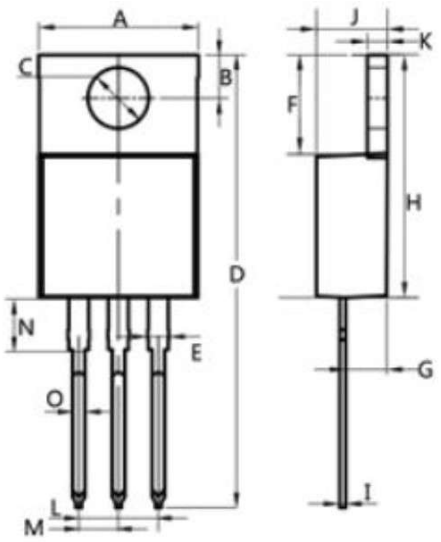


Figure 4, Diode reverse recovery test circuit & waveforms

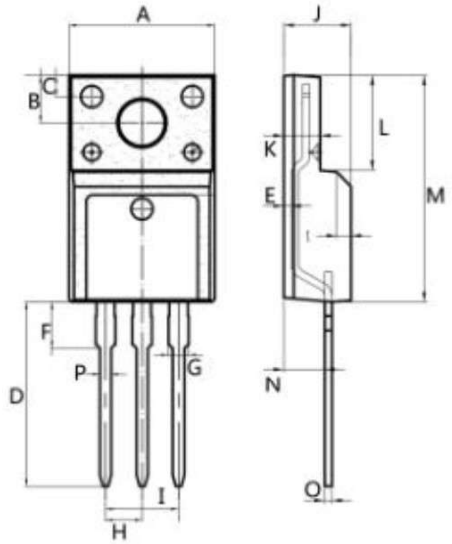
Package Outline Dimensions Millimeters

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		

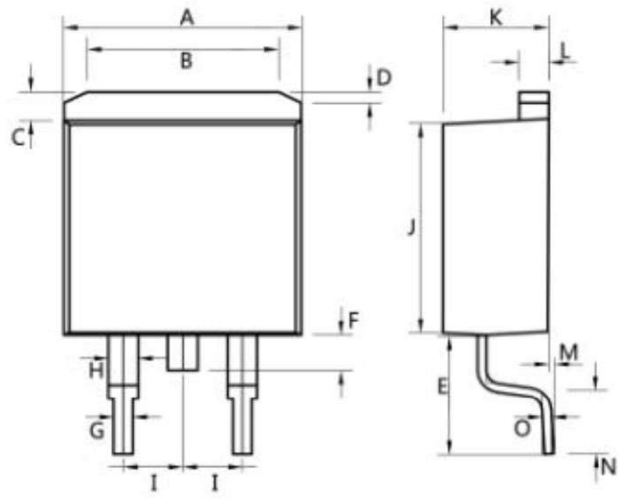
TO-220F



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		