

60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

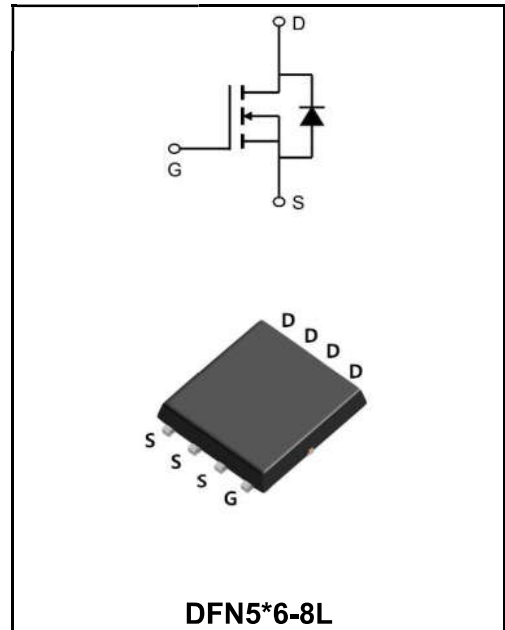
I_D	130A
V_{DSS}	60V
R_{DS(on)-typ(@V_{GS}=10V)}	< 3.0mΩ (Type:2.5 mΩ)

Features

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

Applications

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFWG130N06NF	DFN5*6-8L	YFW 130N06NF XXXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous drain current ¹⁾	I_D	130	A
Pulsed drain current ²⁾	I_{D, pulse}	390	A
Power dissipation ³⁾	P_D	140	W
Single pulsed avalanche energy ⁵⁾	E_{AS}	80	mJ
Operation and storage temperature	T_{STG}, T_J	-55 to +150	°C
Thermal Resistance Junction-Case	R_{θJC}	0.89	°C/W
Thermal Resistance, Junction-to-Ambient ⁴⁾	R_{θJA}	62	°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}	60	-	-	V
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	-	2.5	V
Drain-source on-state resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$	-	2.5	3.0	mΩ
	$V_{GS}=4.5V, I_D=10A$		-	3.5	4.5	
Gate-Source Leakage Current	$V_{GS}=20V$	I_{GSS}	-	-	100	nA
	$V_{GS}=20V$		-	-	-100	
Drain -Source Leakage Current	$V_{DS}=60V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Input Capacitance	$V_{GS}=0V$ $V_{DS}=25V$ $f=100KHz$	C_{iss}	-	5377	-	pF
Output Capacitance		C_{oss}	-	1666	-	
Reverse Transfer Capacitance		C_{rss}	-	77.7	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DD}=30V$ $R_G=2\Omega$ $I_D=25A$	$t_{d(on)}$	-	22.5	-	ns
Rise Time		T_r	-	6.7	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	80.3	-	
Fall Time		t_f	-	26.8	-	
Gate-source charge	$I_D=25A$ $V_{DS}=50V$ $V_{GS}=10V$	Q_g	-	10.7	-	nC
Gate-Drain Charge		Q_{gd}	-	10.9	-	
Gate plateau voltage		$V_{plateau}$	-	2.9	-	
Diode forward current	$V_{GS}<V_{th}$	I_S	-	-	130	A
Pulsed source current		I_{SP}	-	-	390	
Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	V_{SD}	-	-	1.3	V
Reverse Recovery Time	$I_S=25A, di/dt=100A/\mu s$	t_{rr}	-	68.3	-	ns
Reverse Recovery Charge		Q_{rr}	-	73.0	-	nC
Peak reverse recovery current		I_{rrm}	-	1.9	-	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 °C.
 - 5) VDD=50 V, RG=25 Ω, L=0.3 mH, starting Tj=25 °C.

Ratings and Characteristic Curves

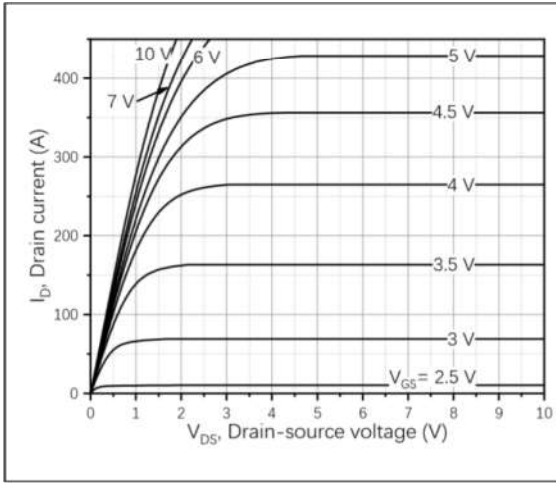


Figure 1, Typ. output characteristics

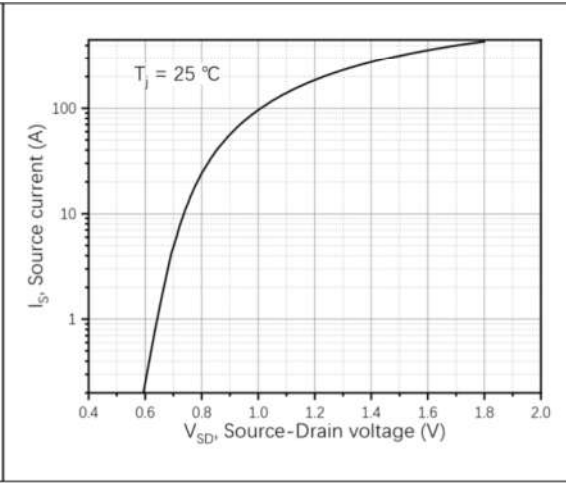


Figure 2, Typ. transfer characteristics

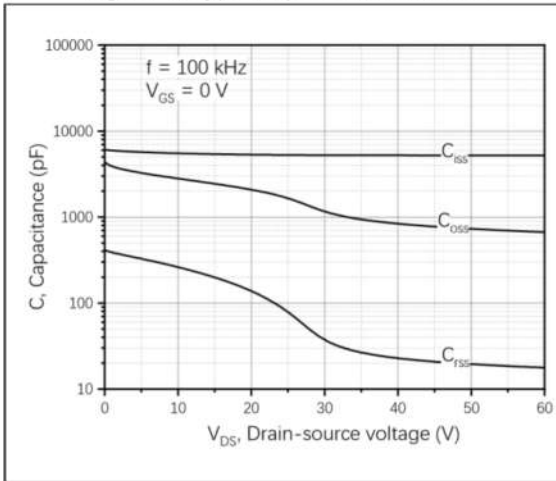


Figure 3, Typ. capacitances

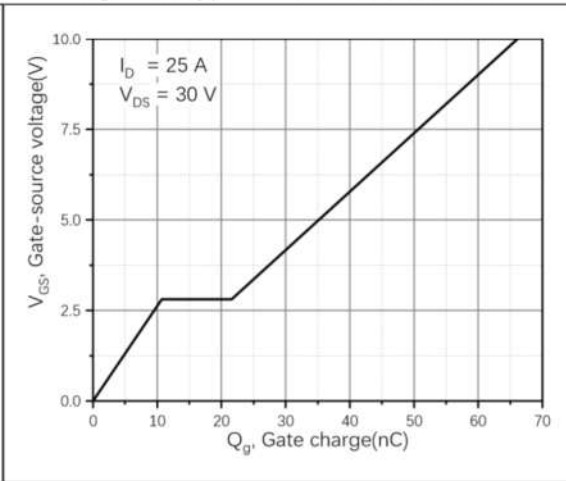


Figure 4, Typ. gate charge

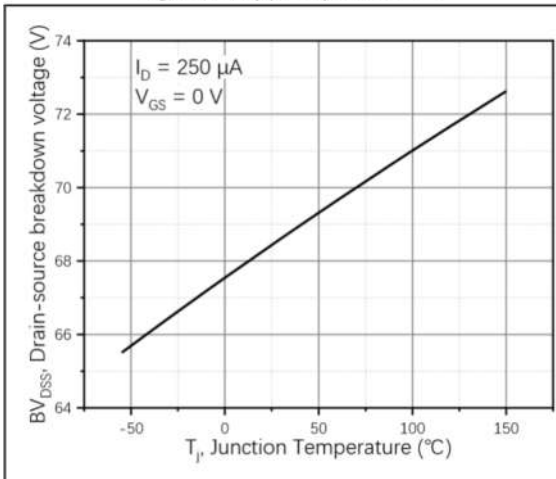


Figure 5, Drain-source breakdown voltage

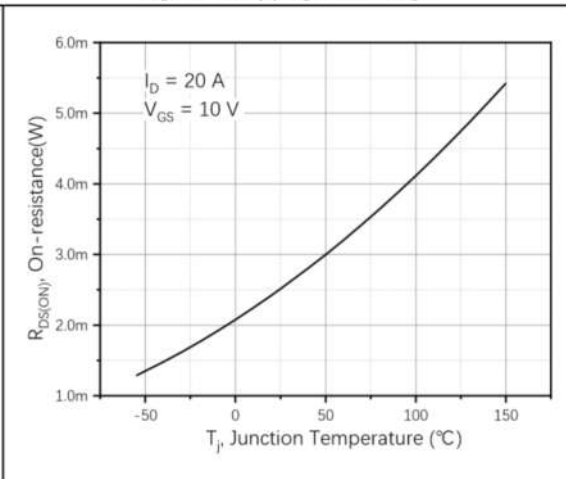


Figure 6, Drain-source on-state resistance

Ratings and Characteristic Curves

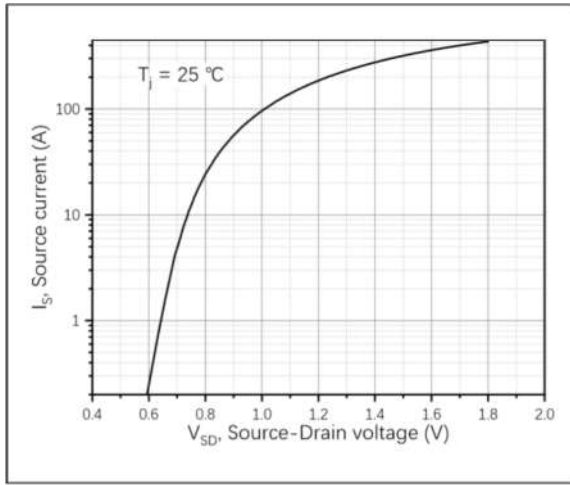


Figure 7, Forward characteristic of body diode

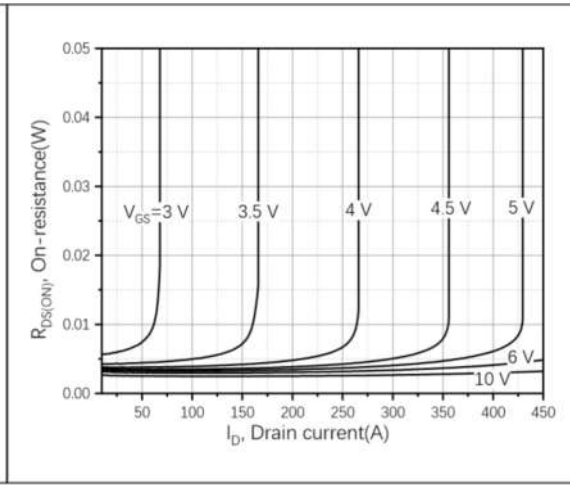


Figure 8, Drain-source on-state resistance

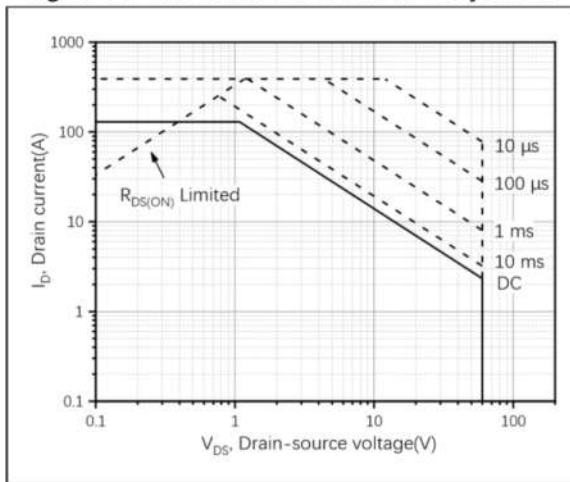


Figure 9, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

Ratings and Characteristic Curves

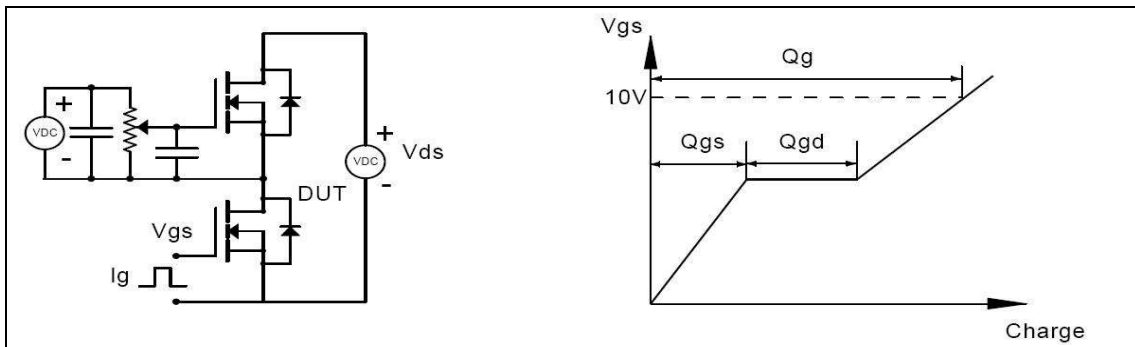


Figure 1, Gate charge test circuit & waveform

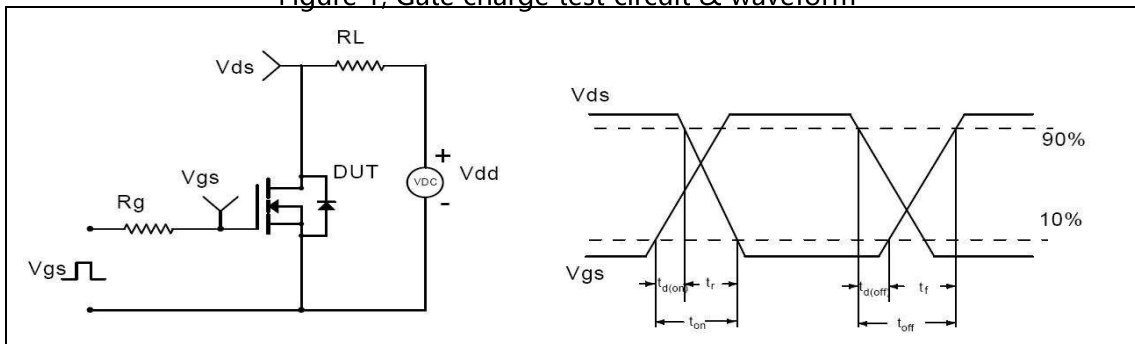


Figure 2, Switching time test circuit & waveforms

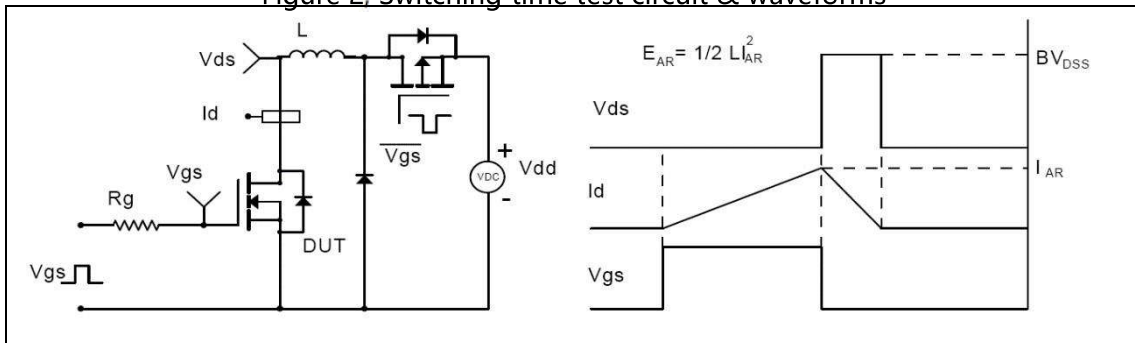


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

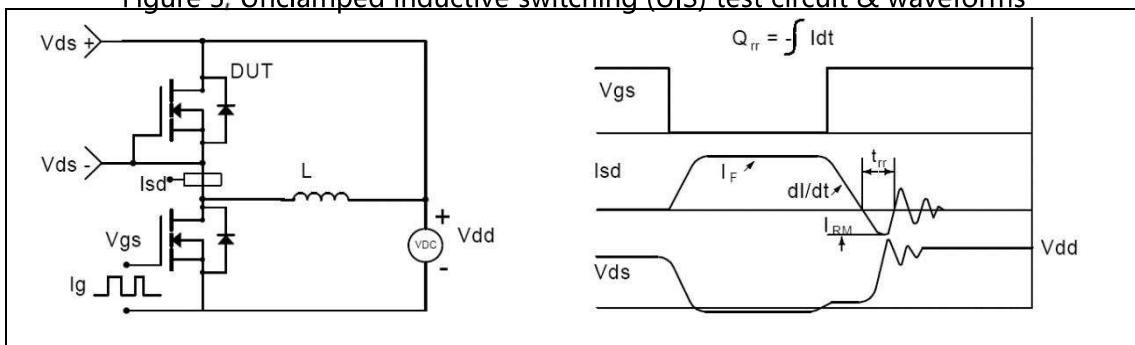
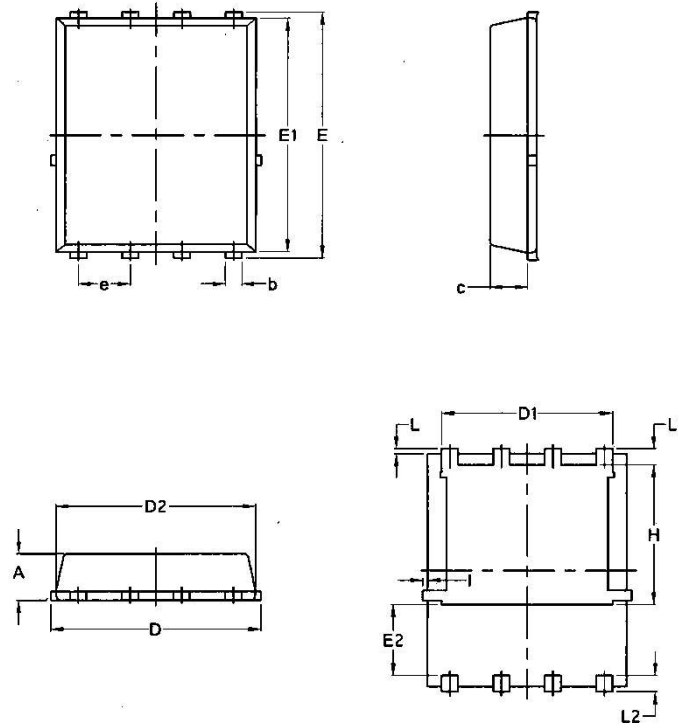


Figure 4, Diode reverse recovery test circuit & waveforms

Package Outline Dimensions Millimeters

DFN5*6-8L



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070