

60V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

I_D	3.0A
V_{DSS}	60V
R_{DS(on)-typ}(@V_{GS}=10V)	<100mΩ (Type:80 mΩ)

Description

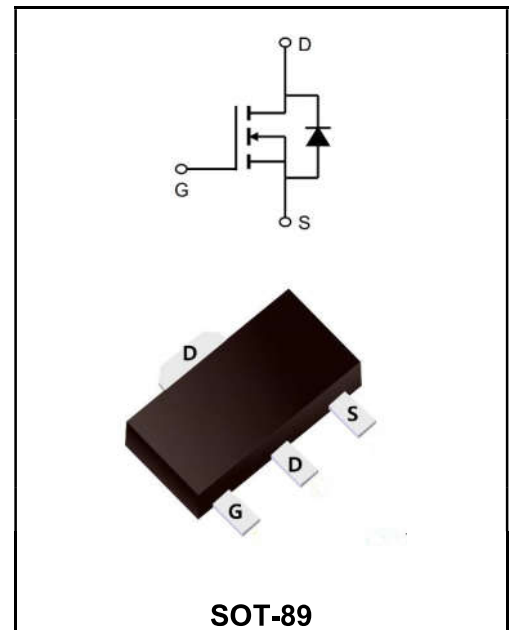
◆The YFW3N06SI uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other switching application.

General Feature

- ◆High Power and current handing capability
- ◆Lead free product is acquired
- ◆Surface mount package

Application

- ◆Battery switch
- ◆DC/DC converter



SOT-89

Marking Code

YFW3N06SI

YFW3N06SI

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current(Note1)	I_{DM}	10	A
Single Pulse Avalanche Energy(Note5)	E_{AS}	16.2	mJ
Total Power Dissipation	P_D	1.7	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance,Junction-to-Ambient (Note 2)	R_{θJA}	73.5	°C/W
Thermal Resistance,Junction-to-Case (Note 2)	R_{θJC}	10	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	BV_{DSS}	60	65	-	V
Gate Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 60 V, V _{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Threshold Voltage(Note 3)	V _{DS} = V _{GS} , I _D =250μA	V_{GS(th)}	1.0	1.3	2.0	V
Drain-Source on-Resistance (Note 3)	V _{GS} =10V, I _D =3A	R_{DS(ON)}	-	80	100	mΩ
	V _{GS} = 4.5 V, I _D = 3A	R_{DS(ON)}		90	120	mΩ
Forward Transconductance(Note 3)	V _{DS} =5V, I _D =3A	g_{fs}	4	-	-	S
Input Capacitance(Note4)	V _{DS} =30V V _{GS} =0V f=1.0MHz	C_{iss}	-	510	-	pF
Output Capacitance(Note4)		C_{oss}	-	34	-	
Reverse Transfer Capacitance(Note4)		C_{rss}	-	26	-	
Total Gate Charge(Note4)	V _{DS} =30V I _D =3A V _{GS} =10V	Q_g	-	14.6	-	nC
Gate-Source Charge(Note4)		Q_{gs}	-	1.6	-	
Gate-Drain Charge(Note4)		Q_{gd}	-	3	-	
Turn-on delay time(Note4)	V _{DD} =30V I _D =3A V _{GS} =10V R _{GEN} =1Ω	t_{d(on)}	-	6	-	ns
Rise Time(Note4)		T_r	-	15	-	
Turn-Off Delay Time(Note4)		t_{d(OFF)}	-	15	-	
Fall Time(Note4)		t_f	-	10	-	
Diode Forward Voltage (Note 3)	V _{GS} =0V, I _S =3A	V_{SD}	-	-	1.2	V
Diode Forward Current (Note 2)		I_S	-	-	3	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_j=25°C, V_{DD}=-30V, V_G=-10V, L=0.5mH, R_g=25Ω

Typical Electrical and Thermal Characteristics

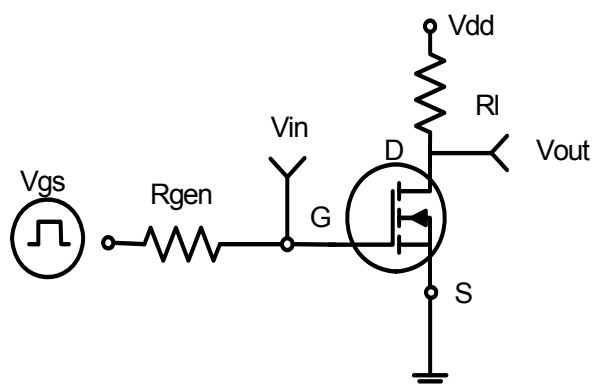


Figure 1 Switching Test Circuit

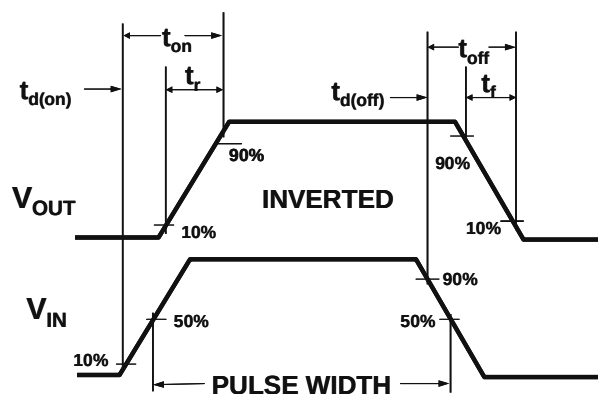


Figure 2 Switching Waveforms

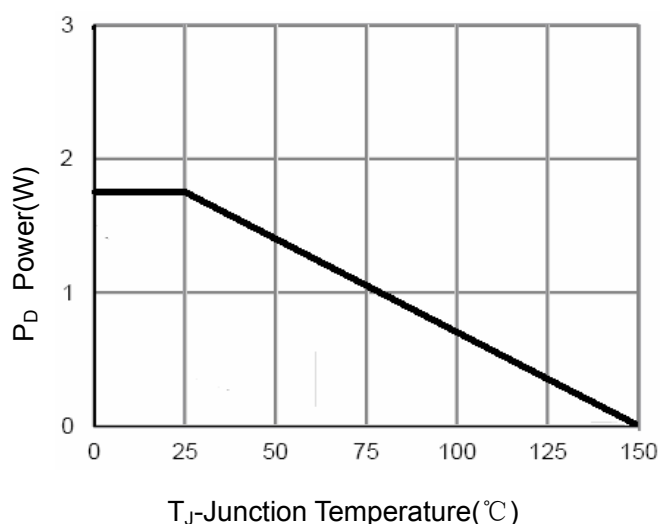


Figure 3 Power Dissipation

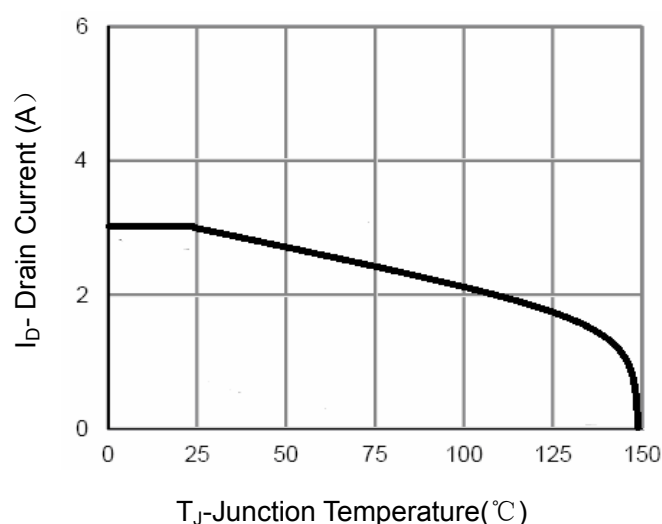


Figure 4 Drain Current

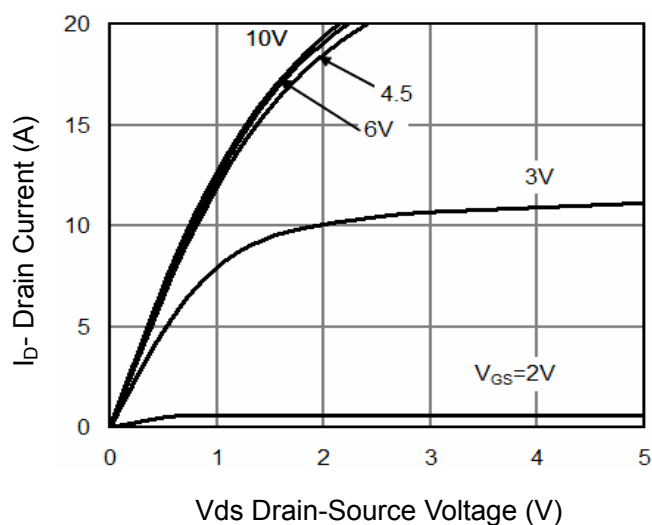


Figure 5 Output Characteristics

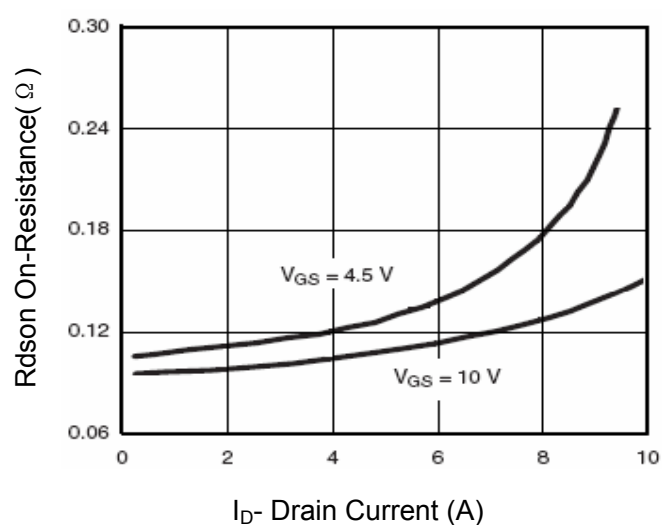


Figure 6 Drain-Source On-Resistance

Ratings and Characteristic Curves

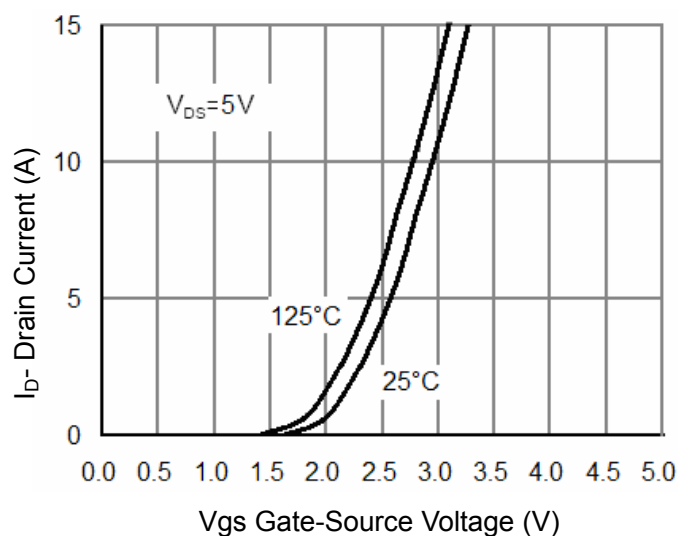


Figure 7 Transfer Characteristics

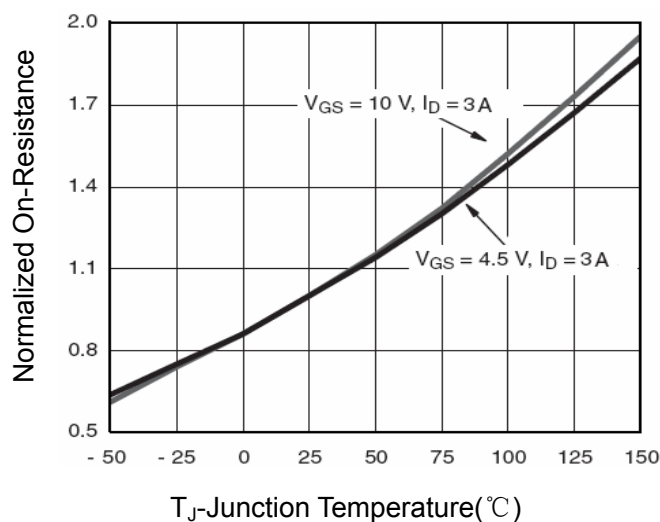


Figure 8 Drain-Source On-Resistance

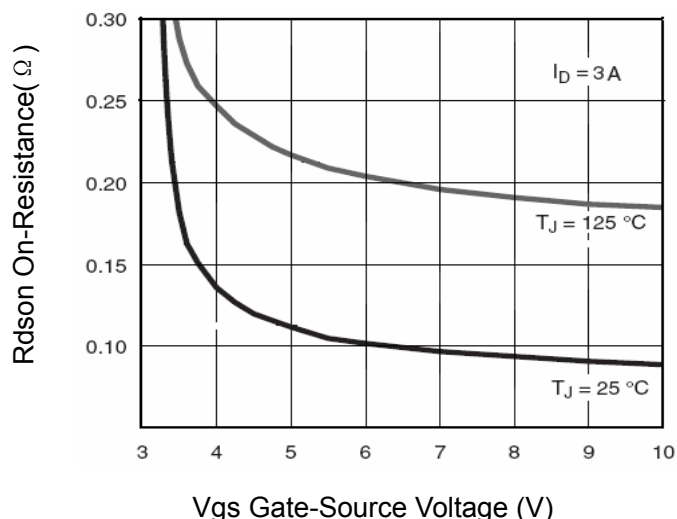


Figure 9 $R_{DS(on)}$ vs V_{GS}

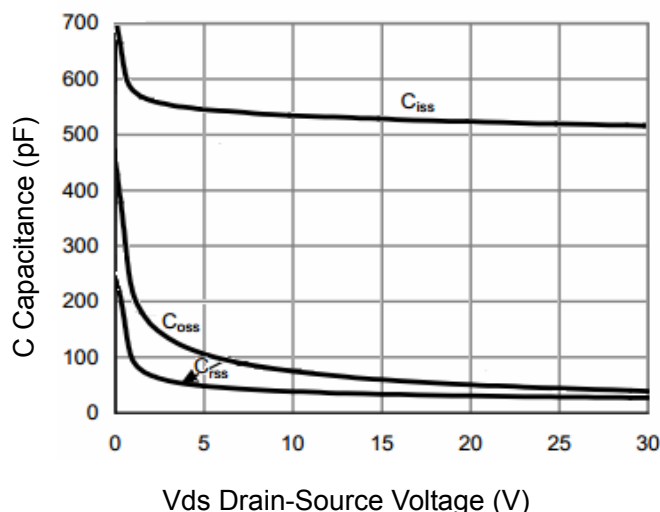


Figure 10 Capacitance vs V_{DS}

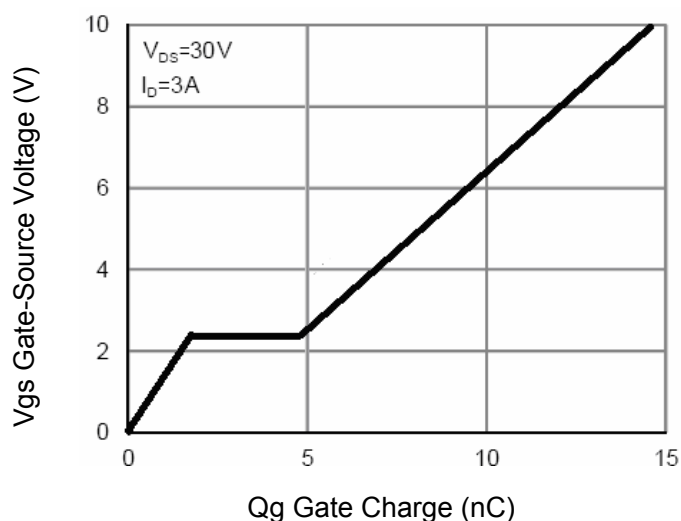


Figure 11 Gate Charge

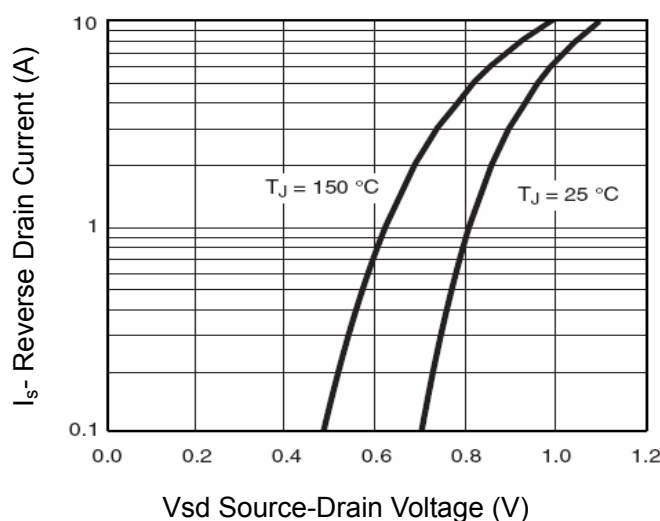


Figure 12 Source- Drain Diode Forward

Ratings and Characteristic Curves

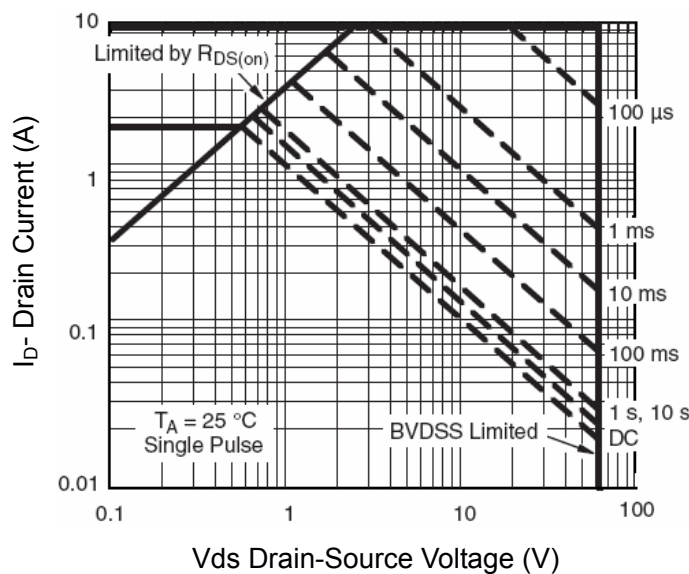


Figure 13 Safe Operation Area

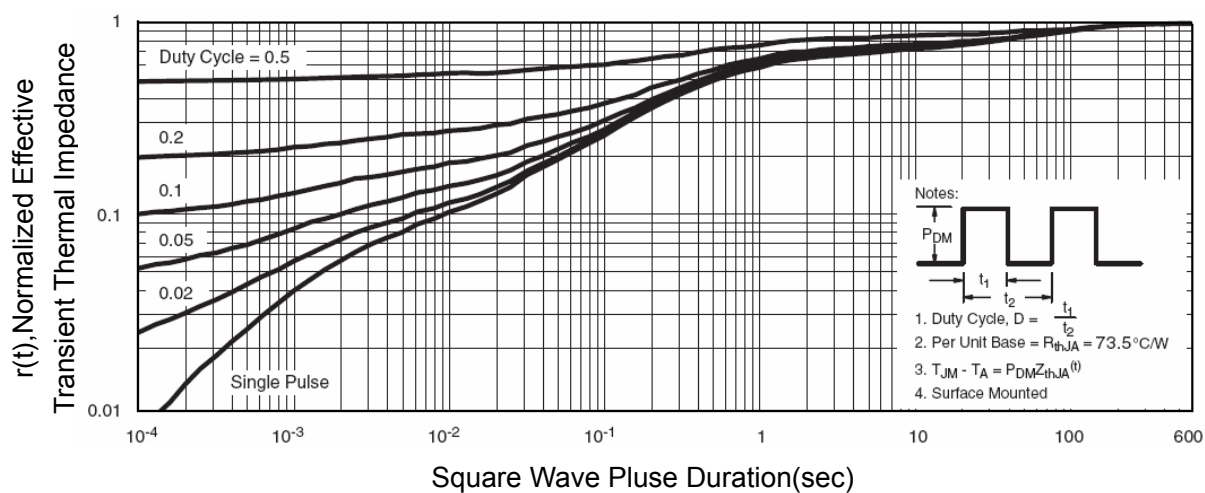


Figure 14 Normalized Maximum Transient Thermal Impedance

Ordering information

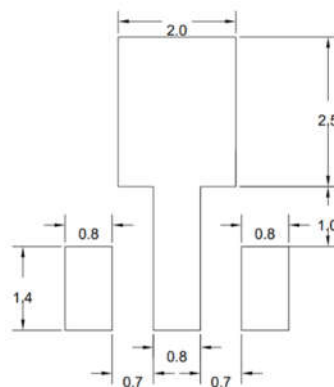
Package	Packing Description	Base Quantity	Packing Quantity
SOT-89	Tape/Reel, 7" reel	1000pcs/Reel	6000PCS/Box 30000PCS/Carton

Package Dimensions

SOT-89

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.40	1.60	0.055	0.063
b	0.32	0.52	0.013	0.020
b1	0.38	0.58	0.015	0.023
c	0.35	0.45	0.014	0.018
D	4.40	4.60	0.173	0.181
D1	1.45	1.65	0.057	0.065
D2	1.70	1.80	0.067	0.071
E	2.30	2.60	0.091	0.102
E1	3.95	4.25	0.156	0.167
E2	1.80	2.00	0.071	0.079
e	1.40	1.60	0.055	0.063
e1	2.80	3.20	0.110	0.126
L	0.90	1.20	0.035	0.047

The recommended mounting pad size



UNIT:MM

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